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## Cover Letter

January 30, 2012

City of Charlotte  
Procurement Services Division  
600 East 4<sup>th</sup> Street, CMGC 9<sup>th</sup> Floor  
Charlotte, NC 28202  
Attn: Sarah Poulton

Re: RFP # 269-2011-065 for Technology Products and Associated Services

Dear Ms. Poulton,

DISYS Solutions, Inc. (DSI) is pleased to submit our proposal to provide Technology Products and Associated Services to the City of Charlotte and the Charlotte Cooperative Purchasing Alliance (CCPA). Our submission is in compliance with all the terms and conditions listed throughout the above referenced solicitation and its addenda.

Please consider this transmittal letter, the completed bid documents, and the following proposal as our response.

Headquarter Office:

DISYS Solutions, Inc  
4151 Lafayette Center Drive, Suite 600  
Chantilly, VA 20151  
Phone: (888) 286-3896 or (703) 802-0500  
Fax: (800) 601-2944 or (703) 802-0798

Executive Officer

Vinu Luthra, Chief Operating Officer

Project Understanding

The City of Charlotte has established the CCPA and would like to establish a comprehensive Master Agreement that will allow the City's Procurement Services Division and CCPA members to purchase technology products and associated services.

Summary of Approach

DSI has the capability to provide a complete breath of products and services to meet the City of Charlotte and CCPA's needs. We are able to provide a full range of technology hardware, software, and associate peripherals through our many distributor and manufacturer partnerships. In order to offer the City and CCPA contracts users with a full scope of services, DSI has established partnerships with industry leading companies in Cloud, Data Center, Unified Security, Unified Communications, Web Hosting, Disaster Recovery and Backup. DSI has the right people, processes, and tools to successfully provide technology products and associated services to the City of Charlotte and CCPA members.

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Summary of Costs

Please see Section 4.7 – Proposed Pricing of our proposal for details regarding the costs for this Master Agreement. DISYS is proposing a discount of 2% off of our Online Store price for technology products – hardware, software, and peripherals. Pricing for services are detailed in Section 4.7.

Representations and Warranty

The information contained in this Proposal or any part thereof, including its Exhibits, Schedules, and other documents and instruments delivered or to be delivered to the Lead Public Agency, is true, accurate, and complete. This Proposal includes all information necessary to ensure that the statements therein do not in whole or in part mislead the Lead Public Agency as to any material facts.

Patrick Sinclair will be your contact person for questions related to this proposal response. He can be reached via phone at toll-free (888) 286-3896 or at (703) 234-6268 and by email at [patrick.sinclair@disysolutions.com](mailto:patrick.sinclair@disysolutions.com). Please do not hesitate to contact him should you require any additional information.

Sincerely,



Vinu Luthra  
Chief Operating Officer  
DISYS Solutions, Inc.

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## 1. Executive Summary

DISYS Solutions, Inc., (DSI) together with its local, dedicated account, support, management and engineering teams have assembled an aggressive and technologically broad scope of IT products and services that exceed the requirement of this Request for Proposal. We have developed these solutions to benefit taxpayers, end users such as fire, police, city and state governments and with our team we will make administering this contract as simple for the CCPA and the City of Charlotte as possible.

Our corporate philosophy is to provide best-in-class products and services. In this regard that we were able to bring together the best suppliers and partners who rank in Gartner's upper quadrant, at very aggressive price points.

Our suppliers are confident in their ability to meet any requirement of the CCPA as all our solutions are delivered by DSI ECO-System Alliance Partners that are specifically focused on the Public Sector – Non-Profit, FED & SLED; these partners are best-in-class in their respective solution sets. Adding that we have built the right team, processes, and technology to successfully help integrate the City of Charlotte, CCPA and the products and services that we are offering as part of this general IT Contract as a market and time proven formula for success.

### **People and Process**

DSI has been providing Consultative IT products and services for over 20 years. It is in these areas, our people and processes, we feel that we will be more agile, responsive and capable of working with the City and CCPA Clients and within the technical offerings we have suggested when called upon to perform, be that a quote, a design question up to and including a project.

We understand that the requests from the CCPA will be of a wide variety of technical environments that are sometimes broadly diversified across many manufacturers. Because of our agility and expanded portfolio that we have had success with, we are confident our ability to acknowledge a request, analyze the requirement, make a recommendation and propose an aggressive, consultative solution is superior to other responses to this request.

Engineering, Tracking and Reporting Performance within the CCPA/City Contract will play a vital role in a successful, long term implementation of this contract. Because we are able to focus on response time, accuracy and have a team in place to review requests, we at DIYS are confident our service will be unparalleled implementing this contract.

### **Related Experience**

DSI has 20 years of experience providing products and services to Government and Education agencies. We have held similar contracts to provide technology hardware, software, and services in States including: Arizona, Arkansas, California, Colorado, Connecticut, Florida, Georgia, Indiana, Maryland, Missouri, New York, North Carolina, Oklahoma, Oregon, Pennsylvania, Virginia, and Wisconsin.

## **Breadth of Products and Services**

DSI has the capability to provide a complete range of technology products and services. Through our manufacturer and distributor partnerships, we are able provide more than 1,000,000 different products from over 1,000 manufacturers. We are also able to provide installation, configuration, training and services in areas such as cloud, data center, unified security, unified communications, web hosting, disaster recovery and backup, and more. The ability to provide the type of breadth is an asset to CCPA, but more importantly it is the ability of DSI to leverage the technology choices available in the market place. DSI provides best value because our dedicated sales teams take the time to review an agency's specifications for technology products and leverage our 20 years of technology procurement experience, multitude of manufacturer partnerships, and resource pool of engineers to provide products that will fit an agency infrastructure now and in the future. This document is an overview of the methodologies DSI will undertake to provide best value for technology products needed by CCPA affiliates.

When it comes to choosing computer products, CCPA requires devices which use industry standards “open-systems”, and have the flexibility and functionality to easily upgrade with current and emerging technologies. DSI takes the time to evaluate all brands of products on the market, not just those manufacturers we sell the most of. Our selling practice is to first review a customer’s need, research brands which might meet those needs, taking into consideration the customer’s unique infrastructure, and determine which products will meet their current and future needs. We normally also leverage pricing and product trade-in values. While pricing is a consideration, our focus is more on meeting critical mission suitability of the products to our customer specifications. We provide them with well researched choices. This type of services frees education agency personnel and saves money in time, resources, and the bottom line.

## **Overview of Solutions**

Unified Security Solution - The products selected for the 3 subsets of CCPA Unified Security – Physical Security, Asset Management, and IT Security are best in class in this industry. Delivered in partnership with Eco-Systems Alliance Partner, DFISS, and recognized pioneer and leader in the Unified Security and Command and Control Centers space; with the added value proposition that for the “Unifying Fabric”, we are proposing the world’s leading application for managing both Physical and Information Security Incidents and Alerts – and one that can support, out of the box, 150+ different security products. This flagship product is Proximex Surveillint.

Surveillint is the only COTS application in the industry that can fuse all security products, irrespective of vendor brand – and manage their alerts and incidents, in a single-click, single window view. The ability to perform in multi-vendor environments will be of paramount concern to many CCPA End Users. We can integrate Physical Security IM (“PSIM”) and Information Security IM (“SIEM”) incidents and alerts.

DSI is also proud to offer Terremark Services for Cloud Computing Solutions. Terremark is among the top 2 rated Cloud Services Providers, in Gartner’s Magic Quadrant. Equally important, we have secured the deepest discounts for these services available that we have passed on to the CCPA End Users in this Contract.

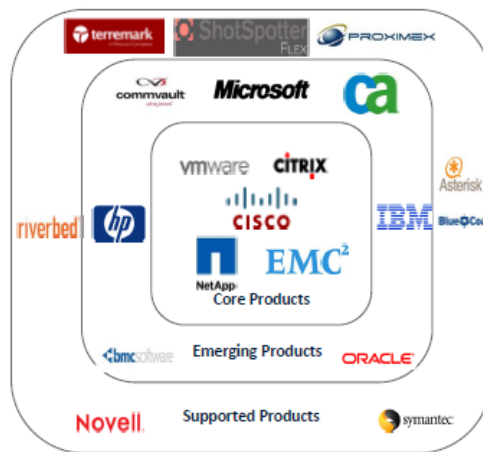
DSI is also offering best in class Data Center Solutions through Eco-Systems Alliance Partner InvPower, a subsidiary of TSS – one of the leading national service providers in Data and Fusion Center Design, Construction, Products and Services. InvPower is one of Schneider Electric/ APC’s exclusive Authorized Federal Installation and Maintenance Partners, for Data Center Power Protection and Monitoring systems.

Microsoft Implementation and Training is also among the many solutions we have included in this response. In the next 5 years, which is the initial term of this Contract, most, if not all organizations will be going to Office 2010 and most will require training along with implementation for this requirement. DSI has teamed with a local expert in the training arena, CPI Training. Similar to DSI, CPI is certified with the City of Charlotte as an SBE, the state of North Carolina as HUB and also CCR certified with the federal government. The committee may be familiar with them as their clients include UNCC, Charlotte-Mecklenburg Schools and several community colleges such as Trident Technical College in North Charleston, SC.

DSI Unified Architectures Eco-System Products and Services

The graphic bellows shows our Unified Architectures Eco-System Alliance Partners for products and services:

**DSI – Unified Architectures Eco-System Alliance Partners - Products**



- **Unified Command & Control**
  - Proximex
  - Cisco
  - HP
- **Unified Security**
  - Proximex
  - SmartVue
  - Ubiquiti
  - Red Cloud
  - STS - ShotSpotter
- **Unified Communications**
  - Cisco
  - Asterisk
- **Unified Data Centers**
  - Terremark
  - Cisco
  - VMware
  - NetApp
  - HP
  - IBM
- **Unified Cloud**
  - Terremark
  - Cisco
  - HP
  - IBM

## DSI – Unified Architectures Eco-System Alliance Partners - Services



- **Unified Command & Control**
  - Delex Fairfax/ DFISS
  - TSS/ InvPower
- **Unified Security**
  - Delex Fairfax/ DFISS
  - Arrow ESI
  - SST
- **Unified Communications**
  - VOSS
  - Digium
- **Unified Data Centers**
  - TSS
  - Arrow ESI
  - Terremark
- **Cloud Services**
  - Arrow Fusion
  - Terremark
  - HP

### Customer Satisfaction Excellence Recognition

DSI has consistently received accolades for achieving Customer Satisfaction Excellence. Our customer satisfaction ratings through independent reviews such as Open Ratings and manufacturer partners are consistently well over 90%. Our local, inside and management teams are all dedicated to making this contract successful in both the initial term and beyond.

### Value-Add Services

Depending on volumes, as mentioned in our pricing, DSI will provide free consultation and training to the City and CCPA qualified personnel as well as the appropriate reporting and billing reports to the City and CCPA. Should buyers require Professional Services and any additional training, this can be provided on a time and materials basis.

### Conclusion

With the insight and knowledge gained from years of experience working with State/Local Government and Education agencies throughout the County, DSI can hit the ground running on day one of the contract. DSI can provide the City and CCPA contract users with best-in-class technology products and services. We will work diligently to market the new CCPA contract to customers throughout the State of North Carolina as well as the County. DSI has the capability and resources to help make the CCPA Technology Products and Associated Services contract a success.

## 2. Service Provider Minimum Qualifications

### 2.1 Local Presence

DSI's local offices are located at:

401 North Tryon Street  
10th Floor, Suite 1093  
Charlotte, NC 28202

and:

7467 Sedgebrook Drive W  
Stanley NC 28164

Our outside sales rep will be able to respond to the City of Charlotte in-person within a maximum of two business days.

### 2.2 Dedicated Account Representative

Our Director of Operations, Vijay Soni, will be the sole point of contact for this Master Agreement. Dedicated Account Representatives include (please see Section 4.11 for a complete overview of our dedicated account team for the City of Charlotte and CCPA):

- Pankaj Sharma – NC Sales Team Leader
- Vinant Prahlad – NC Inside Sales Rep
- Chuck Griffith – NC Outside Sales Rep
- Tina Tiwana – Customer Service Rep

DSI agrees to acknowledge any report issues within one business day of receipt of notification. Our escalation procedures normally require us to respond within one business hour or receipt of notification.

### 2.3 Portfolio of Technology Products and Associated Services

DSI has the capability to offer a full range of technology products and services. The sections below detail the different categories of products and services that we can provide.

In the sections below, DSI has detailed the amount of products and variety of brands we can provide. The ability to provide the type of breadth is an asset to CCPA, but more importantly it is the ability of DSI to leverage the technology choices available in the market place. DSI provides best value because our dedicated sales teams take the time to review an agency's specifications for technology products and leverage our 20years of technology procurement experience, multitude of manufacturer partnerships, and resource pool of engineers to provide products that will fit an agency infrastructure now and in the future. This document is an overview of the methodologies DSI will undertake to provide best value for technology products needed by CCPA contract users.

When it comes to choosing computer products, CCPA contract users will require devices which use industry standards “open-systems”, and have the flexibility and functionality to easily upgrade with current and emerging technologies. DSI takes the time to evaluate all brands of products on the

market, not just those manufacturers we sell the most of. Our selling practice is to first review a customer’s need, research brands which might meet those needs, taking into consideration the customer’s unique infrastructure, and determine which products will meet their current and future needs. We normally also leverage pricing and product trade-in values. While pricing is a consideration, our focus is more on meeting critical mission suitability of the products to our customer specifications. We provide them with well researched choices. This type of services frees education agency personnel and saves money in time, resources, and the bottom line.

### 2.3.1 Technology Products – Hardware and Software

Through our distribution partners, we have immediate access over 1 million different technology products. An example of the product categories that we can offer is shown in the table below. DSI is able to offer all information technology hardware and software products and services available on the market with very few exceptions.

<p><b>Accessories and Supplies</b></p> <p>Cables and Connectors; Switches and Boxes; Desk Accessories; Monitor Accessories; Notebook Accessories; Printer Accessories; Cases and Covers; CPU Mounting Kits and Accessories; Other Accessories and Equipment; Media and Tape Cartridges; Media and Floppy Disks; Media and Removable Disks; Media and Optical Disks; Paper Supplies; Printer Supplies; Carrying Case; Label Supplies; Camera Accessories; Scanner Accessories.</p>
<p><b>Computers and Terminals</b></p> <p>Multiprocessor Systems; Desktop Computers; Thin Clients or Terminals; Tower Computers; Rackmount Computers; Handheld Computers or PDAs; Notebook Computers</p> <p>Chassis Types</p> <p>Desktop; Mini Tower; Mid Tower; Full Tower; File Server; Rack Mount</p> <p>Motherboard Types</p> <p>NLX; BAT; AT; LPX; FAT; MATX; ATX; EATX</p>
<p><b>Education</b></p> <p>Training Courses; Self Study Courses; On Site Training</p>
<p><b>Enhancement Products</b></p> <p>Adapters and Interfaces; RAID Adapters; Audio Output Devices; Sound and Multimedia; Performance Enhancements; Input Output Boards and Systems; Other Add In Boards and Chips</p>
<p><b>Input Devices</b></p> <p>Audio Input Devices; Camera Imaging; Graphics Tablets; Bar Code Scanners; Keyboards and Keypads; Pointing Devices; Image Scanners</p>
<p><b>Network and Communications</b></p> <p>Bridges or Routers or Gateways; Multi Service Chassis; WAN Communication Products; Satellite Communication Products; Host Connectivity or Emulation Hardware; LAN Media Connectors; Network Hubs and MAUs; Network Switches or Chassis; Routing Switches; Network Repeaters; Network Adapters or Interfaces; Peripheral Servers or Sharing Units; Internet Server or Access Units; Test or Monitoring Equipment or Tools; Modems or Chassis or Terminal Adapter; Facsimile</p>



<p><b>Memory</b></p> <p>Memory Boards and Chips; Other Add In Boards and Chips; Proprietary or 3rd Party Memory; Generic Memory</p>
<p><b>Office Equipment and Accessories and Supplies</b></p> <p>Binding Supplies; Furniture and Accessories; Filing Supplies; Forms and Record Keeping; Office Equipment and Accessories; Paper Products; Writing Instruments; Dated Products; Shipping and Warehouse Supplies; Cashier Equipment and Accessories; Meeting Supplies; Office Supplies</p>
<p><b>Power Equipment</b></p> <p>UPS Systems Line Interactive; Power Adapters; Power Isolators; Power Conditioners; Supplies and Batteries; UPS Systems Standby; Surge Suppressors; UPS Systems On Line</p>
<p><b>Premise Wiring and Rack Systems</b></p> <p>Premise Wiring and Cables and Rack Systems; Bulk Cable and Accessories; Patch Cords and Finished Cables; WAN Interface Cables</p>
<p><b>Printed Information</b></p> <p>Manuals; Books; Education Products; Graphics and Photo Cds; Documentation; Periodicals</p>
<p><b>Printers and Plotters</b></p> <p>Dot Matrix Printers; Laser or LED Page Printers; Solid Ink Printers; Dye Sublimation Printers; Label Printer; Multifunctional Laser; Multifunctional Inkjet; Thermal Printers; Plotters; Line Printers; Ink Jet Printers; Video Printers; Copier</p>
<p><b>Services and Agreements</b></p> <p>On Line Services; Hardware Maintenance Agreements; Configuration Services; Software Maintenance Agreements; Program Fulfillment; Technical Support Services; Training</p>
<p><b>Software Applications, Communications, Systems</b></p> <p>Accounting; Word Processing; Tax Preparation; Spreadsheets; Mapping or Atlas Products; Presentation Graphics; Contact Management; Organization and Time Mgmt; Business Productivity or Automation; Reference; Multimedia Applications; Imaging; Integrated Applications; Document Imaging or Mgmt; Graphics; Fonts; Screen Saver; Home and Hobbies; Entertainment; Education; CAD CAM; Desktop Publishing; Charting and Forms; Database; Education; Communications; Communications Utilities; Computer to Computer Links; E Mail; EDI; Internet Software and Utilities; Electronic Software Distribution Systems; Fax; Groupware; Gateways and Interfaces; Network Management and Utilities; Network Operating Systems; Network Integrated Information System; Network Resource Sharing; Internet or Intranet Software and Utilities; Intranet Software and Utilities; Internet Server; Internet Browser; OCR; Terminal Emulation; Remote Control; Speech Recognition; UPS Monitoring; Remote Access; Telephony; Compilers and Languages; Backup Utilities; File Management; Data Entry and Acquisition; Drivers and Installation; Printer Utilities; Menuing Systems; Multimedia Engines and Tools; Operating Systems and Enhancements; Graphical User Interface; Programming Utilities; Object Class Library; Protocol Stack Managers; Security and Auditing; Anti-Virus; Other Utilities; Database Servers or Engines; Database Client; Database Drivers; Application Development Tools; System Management Tools; Data Warehousing Software; Decision Support Software; Database Report Generators</p>
<p><b>Storage Devices or Enclosures</b></p> <p>Floppy Drives; Notebook Hard Drives; Servers; Drive Enclosures; Tape Drives; Disk Arrays; Portable Drives; Removable Drives; DVD Drives; Optical and CD ROM Drives; Hard Drives; External Hard Drives</p>
<p><b>Telephony</b></p> <p>Audio or Video Conferencing; CTI Kits; Facsimile; Messaging; PBX; PC Based PBX; Software; Telephones; Voice Over IP</p>



**Video Adapters and Displays**

Monochrome Monitors; Video Adapters or Accelerators; Color Monitors; Video Projection Products; Touchscreen; LCD Flat Panel Displays; Plasma Display

**Accessibility**

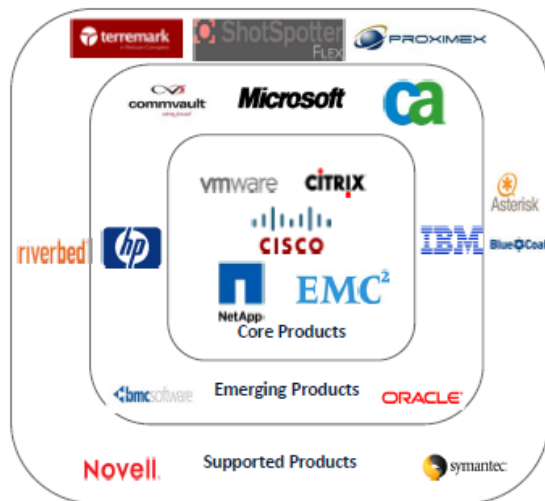
Additionally, DSI can provide the following non inclusive types of accessibility products which are Section 508 Compliant as needed.

Section 508 Standard Equipment	Vendors and Products Offered
Braille Readers	EnableMart - Braille Embossers; Braille Displays; Braille Labelers TVI - Reading Machines, Note Takers; Braille Printers/Embossers
Print Readers	TVI - Magnilink GW Micro - Vocal-Eyes; Window-Eyes
Low Vision Aids	EnableMart - Screen Magnifiers; Screen Readers; Video Magnifiers (CCTV);
Voice Recognition	EnableMart - Amplified Telephones; TTY Devices
Braille Keyboards	EnableMart - Ergonomic Keyboards; Large Keys/Large Print Keyboards; One-Handed Keyboards; Ergonomic and Alternative Mice; Touch Pads; Trackballs
Alternative Authentication Access Control Devices	Sony Fingerprint Identity Device; Targus Defcon Fingerprint Reader; Identix BioTouch Fingerprint Scanner; Onclick VIA Fingerprint Scanner; Keytronic SmartCard Reader

**DSI Unified Architectures Eco-System Products**

The graphic bellows shows our Unified Architectures Eco-System Alliance Partners:

**DSI – Unified Architectures Eco-System Alliance Partners - Products**



- **Unified Command & Control**
  - Proximex
  - Cisco
  - HP
- **Unified Security**
  - Proximex
  - SmartVue
  - Ubiquiti
  - Red Cloud
  - STS - ShotSpotter
- **Unified Communications**
  - Cisco
  - Asterisk
- **Unified Data Centers**
  - Terremark
  - Cisco
  - Vmware
  - NetApp
  - HP
  - IBM
- **Unified Cloud**
  - Terremark
  - Cisco
  - HP
  - IBM

## Hardware and Software Brands

The following list is an example of the brands that we can offer:

### Hardware Brands:

3Com Corporation; 3K Computers, Inc; 3M; 3ware; ACCO Brands Corporation; Acer, Inc; ACP - Memory Upgrades; ACP-EP Memory; ActivIdentity, Inc; Adaptec, Inc; A-DATA Technology Co., Ltd; Addonics Technologies; Adesso, Inc; Ads Technologies; Adtran; Advanced Industrial Computec; Advanced Micro Devices, Inc; AITech; Aleratec, Inc; Alliance Storage Technologic., Allied Telesis, Inc; Allsop, Inc; Altec Lansing; Aluratek, Inc; American Microsystems, Ltd; American Power Conversion Corp; AMX; Anchor Audio, Inc; Antec, Inc; AOC; AOpen, Inc; Apricorn, Inc; ASUS Computer International; ATDEC PTY LTD; Aten Technologies; Atto Technology; Audiovox Corporation; Avaya, Inc; Avid Technology, Inc; Avocent Corporation; Axiom Memory Solutions; Axis Communications; Baracoda, Inc; Belkin International, Inc; BenQ Corporation; Best Data Products, Inc; BIC; Black Box Corporation; Blue Start, Inc.; Boss Audio Systems; Brady Corporation; Brainboxes Limited; Bretford Manufacturing, Inc; Brocade Communications Systc.; Brother Industries, Ltd; Buffalo Technology (USA), Inc; Buslink Media; Bytecc, Inc; Cable Manufacturing, Inc; Cables To Go; Cables Unlimited; Canon, Inc; Casio Computer Co., Ltd; Cavalry Storage, Inc; Centon Electronics; Certance; Check Point Software Technod; Chelsio Communications; Chenbro Micom Co., Ltd; Cherry Corporation; Chief Manufacturing; Chip Pc, Inc; Ciena Corporation; Cisco Systems, Inc; Citizen Micro HumanTech; Clearone Communications; Clickfree; Clover Electronics U.S.A; CMS Products, Inc; Cobra Electronics Corporation; Coby Electronics Corporation; Colorgraphic Communications Inc.; Comtrol Corporation; Conair Corporation; Connectpro; Cooler Master Co., Ltd; Coolmax Technology, Inc; Corsair Memory; CP Technologies; Creative Labs; Creston Electronics, Inc; CRU Acquisitions Group, LLC; Crucial Technology; CTA Digital, Inc; CTL; CTO PRO Macbook Pros; Cybernet Manufacturing, Inc; CyberPower Systems, Inc; Da-Lite Screen Company; Dane-Elec Memory; Dane-Elec Memory; Data Domain; Datalogic S.p.A; Dataram Corporation; Dell, Inc; Diamond Multimedia, USA; Digi International; DigiStore Solutions (S) Pted; Digital Peripheral Solution Inc.; D-Link Systems, Inc; DoubleSight Displays, LLC; DPI, Inc; Dreamgear net, LLC; DT Research, Inc; DuVoice Corporation; DXG Technology USA, Inc; Eastman Kodak Company; Eaton Corporation; EDGE Tech Corporation; Eizo Nanao Tech; Elgato Systems; Elite Screens, Inc; Elotouch; EMC Corporation; Emerson Radio Corporation; Emulex Corporation; Enterasys Networks; Envoy Security Group; EP Memory; Epson Corporation; Ergotron, Inc; EverFocus Electronics Corpon; EVGA Corporation; Exabyte Corporation; Excel Meridian Data, Inc; Fantom Drives; Fargo Electronics; Fellowes, Inc; First Mobile Technologies; Fluke Networks; Fortinet, Inc; Fuji Photo Film Co. Ltd; Fujitsu; Fujitsu Siemens Computers; Future Memory Solutions, LLC; Garmin, Ltd; Gateway; GBICS; Gear Head, LLC; Gefen, Inc; Generic; GeoVision, Inc; Getac, Inc; Giga-Byte Technology CO; Gigabyte Technology, Inc; Grandtec USA; Guillemot Corporation B.P.; GVision, Inc; Haier America; Hannspree, Inc; Hauppauge Computer Works; Hawking Technologies, Inc; Hewlett-Packard; HID Global Corporation; Hitachi; Hitachi, Ltd; Honest Technology; Hosa Technology, Inc; Hyundai ImageQuest., Ltd; Hyundai IT Corporation; IBM Corporation; Iiyama; Imation Corp; Imation Corp.; In Win Development, Inc; InFocus Corporation; Innovation First, Inc; Intec, Inc; Intel Corporation; Intermec Technologies Corpon; International Innovations, Inc; IOGEAR, Inc; IOMAGIC Corp.; Iomega Corporation; iStarUSA, Inc; Jatou Corporation; JVC Information Products; jWIN Electronics Corporation; Kanguru Solutions; Kensington Computer Product; Kingston Technology; Kingston Technology Company; KONFTEL AB; Konica Minolta; Kramer Electronics LTD; La Cie / Quantum; LaCie; Lava Computer MFG, Inc; Lenovo Group Limited; Lexar Media, Inc; Lexmark International, Inc; LG Electronics; LifeSize Communications, Inc; Lind Electronic Design; Link Depot Corporation; Linksys; Lite-On Technology Corporation; Logic Controls, Inc; Logicube, Inc; Logitech; LSI Logic Corp; Mace Group, Inc; Mace Security International; Marshall Electronics, Inc; Matrox; Maxell; McAfee, Inc; Mediamounts, Ltd; Mediatech Industrial, Inc; Mellanox Technologies Ltd; Memorex Products, Inc; Micro Innovations; MicroNet Technology; Micropac Technologies; Microsoft Corporation; Micro-Star International Cod; Minicom Advanced Systems, Ltd; Minolta; Miracle Business, Inc; Miracle Computers; Mitsubishi; Mobile Edge; Monster Cable Products, Inc; Motion Computing, Inc; M-S Cash Drawer Corporation; MSI Computer Corporation; Multi-Tech Systems, Inc; Mushkin, Inc; NB Open Distribution; NEC Corporation; NEC Display Solutions; Netgear, Inc; Network Assoc. Academic; Nokia; Norazza, Inc; Nortel Networks Limited; Notebook Memory Upgrades; Novell, Inc; Numark Industries, LLC; OCZ Technology, Inc; Oki Electric Industry Co., Ltd; Olixir Technologies; Olympus Corporation; Optoma Technology; Overland Storage; Panasonic; Parallels, Inc; Partner Tech USA; Peerless Industries, Inc; Pentax Imaging Company; Peripheral Enhancements Corn; Perle Systems, Inc; Philips Electronics; Pioneer POS, Inc; Pioneer Research; Planar Systems, Inc; Plasmon IDE, Inc; Plector Corporation; PNY Technologies; Power Acoustik Electronics; Premier Mounts; Primera Technology; Printronix, Inc; Promise Technology; Pyle Audio, Inc; QLogic Corp; QNAP Systems; Quantum Corp; Quantum Corporation; Quatech, Inc; Ricoh Company, Ltd; Rose Electronics; Sabrent, Inc; Saic; Sakar International, Inc; Samsung; SanDisk Corporation; Sanyo Electric Co. Ltd; Sato Corporation; SCM Micro Systems, Inc; Seagate Technology; Seal Shield Corporation; Second Source; Sharp Electronics; Shuttle, Inc; Siig, Inc; Socket Mobile, Inc; Sole Source Technology, LLC; SonicWALL; Sonnet Technologies, Inc; Sony Corporation; Speco Technologies; StarTech.com; Steren Electronics, LLC; Stewart; Storage H/W & Support; Storage Soft; Sun Microsystems; Supermicro Computer, Inc; Supermicro, Inc; Symantec Corporation; Synology, Inc; TAA Products LLC.; Tallygenicom, L.P; Tandberg Data Corporation; Targus Group International; Tatung Co.; TDK Electronics; Teac America, Inc; Thermaltake Technology Co.; Third Party Parts; Toshiba; Transcend Information, Inc; Transition Networks, Inc; Trend Micro Incorporated; TRENDnet; Tripp Lite; Trustin Technology, Inc; TTX Canada, Inc; Tyan Computer Corp; Tyco Electronics; Ultra

Products; Unibrain, Inc; Unitech Electronics Co., Ltd; United Digital Technologies, Inc; Unotron, Inc; UnyTouch Manufacturing; UPEK, Inc; Uptime Devices; V7; Valcom, Inc; Vanguard(USA), Inc; VASCO Data Security Internal; Verbatim America, LLC; Victory; Viewcast Osprey; Viewsonic Corporation; Vinpower Digital; VisionTek Products, LLC; Vizio, ncC; Voyetra Turtle Beach, Inc; VTech Holdings, Ltd; Vxl Instruments Limited; Wasp Barcode Technologies; Watchguard Technologies, Inc; Western Digital Corporation; WiebeTech, LLC; Winnov; Wintech Software Design; Wyse Technology, Inc; Xerox Corporation; XFX Technologies, Inc; Zebra Technologies Corporation; ZOTAC International; Zyxel Communications Corp.

### Software Brands:

3Com Corporation; Aastra Technologies Limited; Abbyy Software House; Absolute Software Corp; Acer, Inc; Acronis, Inc; ActivIdentity, Inc; Adobe Systems, Inc; Adtran; AEC Software, Inc; Allied Telesis, Inc; Alloy Software, Inc; AltiGen Communications, Inc; Ambir Technology, Inc; American Microsystems, Ltd; American Power Conversion Corp; Archos Technology; Array Networks, Inc; Attachmate Corporation; Atto Technology; Auto/Virtual Software; Autodesk, Inc; Availability Education; Avanquest Software; Avaya, Inc; AVG Technologies; Avid Technology, Inc; Axis Communications; Barracuda Networks, Inc; Brady Corporation; Brocade Communications Systems; Brother Industries, Ltd; Canon, Inc; Century Software; Channel Sources; Channel Vision Technology; Check Point Software Technologies; Chip Pc, Inc; Cisco Systems, Inc; CMS Products, Inc; Coby Electronics Corporation; Computer Associates International; Corel Corporation; CP Technologies; Creative Labs; CyberGuard Corporation; CyberLink Corp; DataCore Software Corporation; Datalogic S.P.A; Dataram Corporation; Datawatch Corporation; Detto Technologies; Dialogic Corporation; Digi International; Diskeeper Corporation; D-Link Systems, Inc; Double-Take Software, Inc; DuVoice Corporation; DYMO Corporation; Eastman Kodak Company; Eaton Corporation; EDGE Tech Corporation; Eizo Nanao Tech; Elgato Systems; Embarcadero Technologies, Inc; EMC Corporation; Emerson Network Power Solutions; Enterasys Networks; Epson Corporation; Ergotron, Inc; Ericom Software; Exacq Technologies, Inc.; Excel Meridian Data, Inc; Extensis Corporation; Extreme Networks, Inc; Fargo Electronics; Fellowes, Inc; Filemaker, Inc; Fluke Networks; Force10 Networks, Inc; Frontrange Solutions; Fuji Photo Film Co. Ltd; Fujitsu; Garmin, Ltd; GeoVision, Inc; GFI Software Ltd; Hewlett-Packard; HID Global Corporation; Honest Technology; Honeywell International, Inc; HumanConcepts; IBM Corporation; ILine Communications, Inc.; Imation Corp; Impulse Point; IMSI/Design, LLC; Intego; Intel Corporation; Intuit, Inc; Ipswitch, Inc; IRIS, Inc; Ironmonkey, Inc.; ISI Research Soft (Thomson I); JDS Uniphase Corporation; Kanguru Solutions; Kerio Technologies, Inc.; Kofax Image Products; Lantronix, Inc; Laplink Software, Inc; Lenovo Group Limited; Lexmark International, Inc; Liebert Corporation; Lite-On Technology Corporation; Logicube, Inc.; LPI Level Platforms, Inc; LSI Logic Corp; Matrox; McAfee, Inc; Mediatech Industrial, Inc; Meru Networks; MessageLabs, Inc; Micro Focus (IP) Ltd; Microsoft Corporation; Milestone Systems; Monster Cable Products, Inc; Moog, Inc; Motorola, Inc; Mount10 Holding AG; Mushkin, Inc; Myob Us; N-able Technologies, Inc; NEC Display Solutions; Nero AG / Nero, Inc; Nero Software Academic; Netgear, Inc; Netop Solutions, A/S; Network Assoc. Academic; Network Engines, Inc; Nolo Press, Inc; Nortel Networks Limited; NovaStor Corporation; Novell, Inc; Nuance Communications, Inc; Numark Industries, LLC; Oki Electric Industry Co., Ltd; Olympus Corporation; Open Text Corporation; Oracle Corporation; Overland Storage; Palo Alto Software, Inc; Panasonic; Paragon Software Group; Parallels, Inc; Peerless Industries, Inc; Personics; Pervasive Software, Inc; Philips Electronics; Pinnacle Systems, Inc; PNY Technologies; Power Strips; Printronix, Inc; Proxim Wireless Corporation; Punch Software; QLogic Corp; Quantum Corp; Quantum Corporation; Quark, Inc; Quest Software; Raritan Computer; Red Hat, Inc; Research In Motion Limited; Ricoh Company, Ltd; Rose Electronics; RSA Security, Inc; Safend, Inc; SAP America, Inc; Scalable Software, LLC; SCM Micro Systems, Inc; ScriptLogic Corporation; Second Source; Sharp Electronics; Siemens AG; Software Shelf International; Softwin Group; SolarWinds Network Management; Sole Source Technology, LLC; Sonic Solutions; SonicWALL; Sony Corporation; St. Bernard Software; Stoneware, Inc; STORAGE VIRTUALIZATION; Supermicro Computer, Inc; Supermicro, Inc; Sybase, Inc; Symantec Corporation; Synergy Software; Synology, Inc; Systran Software, Inc; Tandberg Data Corporation; Teac America, Inc; TechSmith Corporation; Teklynx International; The Sage Group plc; The SCO Group, Inc; Toshiba; Trend Micro Incorporated; TRENDnet; Tripp Lite; Trustin Technology, Inc; TT International Limited; Unitech Electronics Co., Ltd; United Digital Technologies; UnXis, Inc; Uptime Devices; Valcom, Inc; VASCO Data Security International; VEEAM Software - Maintenance; Veramarq Technologies, Inc; Victory; Viewsonic Corporation; Visioneer, Inc; VMware, Inc; Wasp Barcode Technologies; Watchguard Technologies, Inc; Wavelink Corporation; Webroot Software, Inc; Websense, Inc; WebTrends, Inc; Wyse Technology, Inc; Xerox Corporation; X-Rite, Inc; Zebra Technologies Corporation; ZManda, Inc.; Zyxel Communications Corp.

### 2.3.2 Services

DSI can offer a full range of technical and professional services. We have an in-house staff of manufacturer certified technicians and engineers that can provide support for a wide variety of technology needs including installation, configuration, testing, integration, maintenance, and much more. Through our own resources and partners, DSI can provide support for the following technology services referenced in the RFP (please refer to the referenced Appendices for more information about each of these solutions):

3.6.2.A – Infrastructure Capabilities	Appendix A
3.6.2.B – Unified Security Capabilities	Appendix B
3.6.2.C – Unified Communications Capabilities	Appendix C
3.6.2.O – Disaster Backup and Recovery	Appendix D
3.6.2.Q – Web Hosting Services	Appendix E
3.6.3 – Ongoing Support and Maintenance	Appendix F

In addition to the categories above, DSI can also provide Help Desk, Training, and Consulting services.

#### DSI Unified Architectures Eco-System Services

The graphic bellows shows our Unified Architectures Eco-System Alliance Partners:

### DSI – Unified Architectures Eco-System Alliance Partners - Services



- **Unified Command & Control**
  - Delex Fairfax/ DFISS
  - TSS/ InvPower
- **Unified Security**
  - Delex Fairfax/ DFISS
  - Arrow ESI
  - SST
- **Unified Communications**
  - VOSS
  - Digium
- **Unified Data Centers**
  - TSS
  - Arrow ESI
  - Terremark
- **Cloud Services**
  - Arrow Fusion
  - Terremark
  - HP

### 2.3.3 Help Desk

DSI can provide CCPA with helpdesk technicians required to support the infrastructure of desktops, their associated monitors, personal printers, laser printers, and other desktop peripheral equipment. As part of the Help Desk offering, DSI can provide warranty and non-warranty repair (break/fix) services to agency locations. DSI can also provide senior system engineers to work on the following types of projects: computer replacement rollouts and other installation, replacement, or upgrade projects at the CCPA contract user locations. DSI will provide the set of tools needed for break/fix work on all types of computer equipment for each technician if needed.

Below is a summary of our Helpdesk process:

CCPA contract users can contact DSI's toll-free number via the contact methods listed below 24-hours per day, seven-days per week to receive technical support. After hours support requires selecting the emergency option number on the voice greeting, as prompted, and leaving a message. In addition to telephonic support, customers will be provided with support services via Email and Internet access.

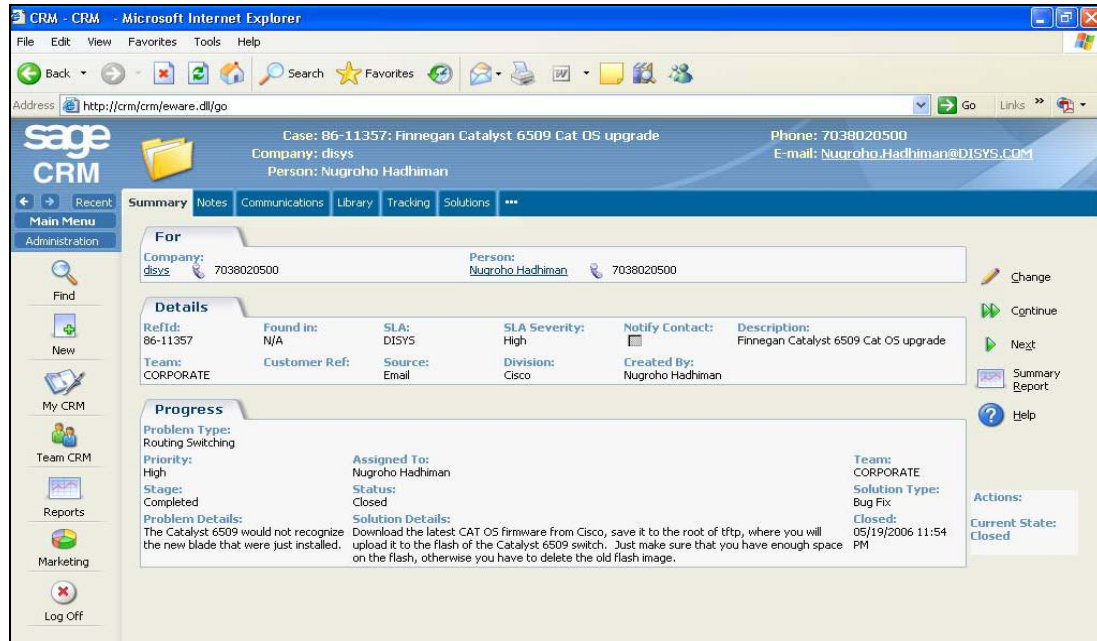
<b>Help Desk Phone:</b>	Toll Free: (888) 286-3896
<b>Email:</b>	<a href="mailto:services@disysolutions.com">services@disysolutions.com</a>
<b>Fax:</b>	Toll Free: (703) 802-0798

#### Service Request Process

When a call comes into DSI, first and foremost a service ticket is opened in our e-ticketing system. At that time the priority level is assigned in accordance with the customer's maintenance agreement and/or problem severity. All calls are forwarded to our technicians or manufacturer call center within a maximum of one hour; however most calls are responded to in less than fifteen minutes. A standard escalation procedure is set for manufacturers such as Cisco which include information for both DSI and Manufacturer Technical and Account Team contacts. As shown below the ticket is assigned and progress recorded at every step. Once the case is entered, DSI technical support personnel track the progress of the case using Sage CRM.

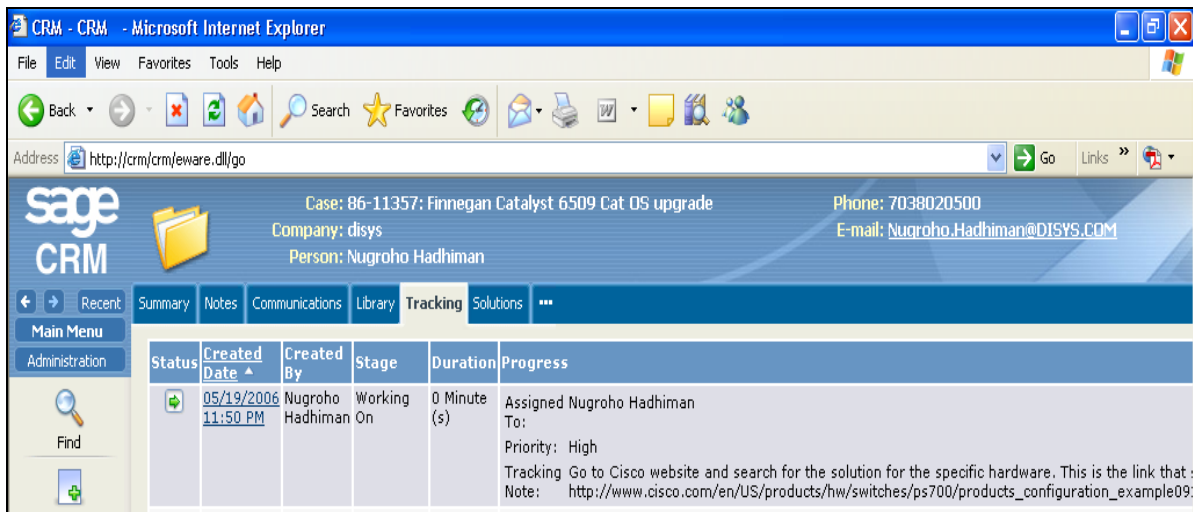


### Sample Service Ticket



The figure below shows an example of how progress is tracked

### Tracking Service Progress Example



### Close Out Procedures

As previously mentioned in other sections, to ensure prompt service all requests for any type of service is assigned a Help Desk Ticket using our SAGE CRM Help Desk and Service Software.. SAGE CRM contributes to the success of a project by ensuring clear communication of project

deliverables and expected timelines. SAGE CRM provides the project leader with the ability to generate reports showing concise and pertinent information related to the status of assigned work and its adherence to the schedule.

When a ticket is created, a tracking number is issued to the customer. At any later point, the customer may inquire the status of a call using their tracking number by either calling in to our offices or via the web. Each ticket has an associated escalation schedule which assigns the ticket to a staff member on duty who must complete the ticket or delegate it. If the ticket is unresolved by a set timeframe it is escalate on to senior staff members and ultimately to the CEO of the Company.

Once a DSI technician resolves the problem and closes the ticket, the customer will receive notification that the issue has been resolved. If the customer believes that the issue has not been resolve, he/she can reopen the ticket.

Once a case is closed, information describing how the case was resolved is kept on Sage CRM, providing a store of knowledge that can be used to resolve similar issues quickly in the future.

### **Escalations and Notifications**

Handling trouble calls and repairs from the receipt of the trouble report until the trouble is cleared requires a proven methodology. When a call comes in to the Service Department, or a Help Desk Ticket is created via the web, a tracking number is issued to the customer. At any later point, the customer may inquire about the status of a call using their tracking number by either calling in to our offices or via the web. The following escalation takes place from the time a ticket is created:

The following escalation takes place from the time a ticket is created:

}A case is opened with problem description entered into a problem resolution database, and assigned to DSI Phone Duty technician  
**(Level 1 Expertise, see definitions below).**



}Discuss and set priorities with customer in accordance with DSI' priority guidelines  
**(Defined below in the priority response time's section).**

For in warranty items, DSI will co-ordinate with the manufacturer on behalf of the customer to deliver support conforming to the service level agreements.



}Assign to available Technician, based on type of problem and severity.



}Problem isolation and diagnosis with DSI Technician (Level of Expertise based on type of problem) call back, on-site visit (if necessary).





}Problem escalation to higher level  
([Defined below in escalation section](#)).



}Test and ensure customer satisfaction regarding fix provided.



}Quality control check performed by customer service representative, to insure highest level of customer satisfaction after a call is completed.

### **Technician Experience Levels**

Level 1 - Desktop/LAN Technician: This type of engineer provides service and preventive maintenance activities on products with element exchange service and traditional maintenance philosophies. (i.e. terminals, printers, PC's, laptops)

Abilities & Certifications:

- A+ Certification
- Tier 1 Certifications on minimum of one (1) on the following OEM's (i.e. HP, IBM, Sun)
- Microsoft 2000, XP, Vista, and Windows7 knowledge
- Laser printer experience
- Basic client knowledge of Ethernet and Token Ring topologies

Level 2 - Junior Network Technician: This type of engineer has the ability to manage, control, and operate centralized and distributed network systems in a multi-vendor environment. Some applicable services would be installing network facilities, providing configuration and maintenance support for network components.

Abilities & Certifications:

- Server +, Network +
- Novell CNE
- Citrix CCA
- Cisco CCNA,CCDA
- HP/Compaq AASE
- Tape back-up knowledge
- Minimum of one (1) certification on the following, Compaq, HP, and IBM File Servers

Level 3 - Junior Network Engineer: This type of engineer designs a network system and maintenance plan for that system.

Abilities & Certifications:

- Novell MCNE
- Microsoft MCSE
- HP/Compaq ASE
- Citrix CCEA
- Cisco Authorized CCNP, CCDP, CCIP, CCSP, CCVP
- Can perform project management functions

Level 4 – Senior Network Engineer: This type of engineer is an expert in Project Management, designing and implementation of Firewall Security, LAN/WAN and Storage Solutions.

Abilities & Certifications:

- PMI
- Cisco CCIE
- HP/Compaq Master ASE
- Check Point CCSE
- A designer or architect who can develop a solution for the customer’s networking system needs.

**Priority Response Times for Standard Hardware and Software Services**

We have four levels of response times as listed below. Once a service requests is entered into the Sage CRM, a priority level is assigned, depending on issue.

Priority Level	Service Description
<b>Priority 1</b>	P1 trouble calls are defined as a system outage that affects many employees and prohibits production. These calls must be acknowledged within 15 minutes and resolved within 2 - 4 hours.
<b>Priority 2</b>	P2 trouble calls are defined as a small-scale system outage affecting some employees and not the entire department or the enterprise. These calls must be acknowledged within 30 minutes and resolved within 8 hours. Department heads receive a one level escalation for trouble calls.
<b>Priority 3</b>	P3 trouble calls are defined as a system outage affecting one employee. These calls must be acknowledged within 2 working hours and resolved within 2 working days.
<b>Priority 4</b>	P4 trouble calls are defined as scheduled work that needs to be performed. These calls must be acknowledged within 8 working hours and resolved within 2 weeks. An example of a priority 4 call is when DSI replaces a broken printer with a loaner printer and we give the user back the fixed printer when the repair is complete.

**Escalation Example for Priority 1**

Below is an example of the escalation process for priority 1 level tickets

Duration Since Call	Personnel Involved in Escalation Notification
0 – 15 minutes	DSI Phone Duty Technician (Level 1 or 2 Expertise) and Manufacturer Call Center Service Technician
1 hour	DSI Lead Technician (Level 3 or 4 Expertise) and Manufacturer Service Manager
2 hours	DSI IT Manager and Manufacturer Operations Manager
4 - 6 hours	DSI Director of Operations and Manufacturer Vice President of Technical Support
8 hours	DSI COO
24 hours	Contracting Officer, DSI CEO, and Manufacturer President of Technical Support, and Manufacturer Local Channel Account Manager

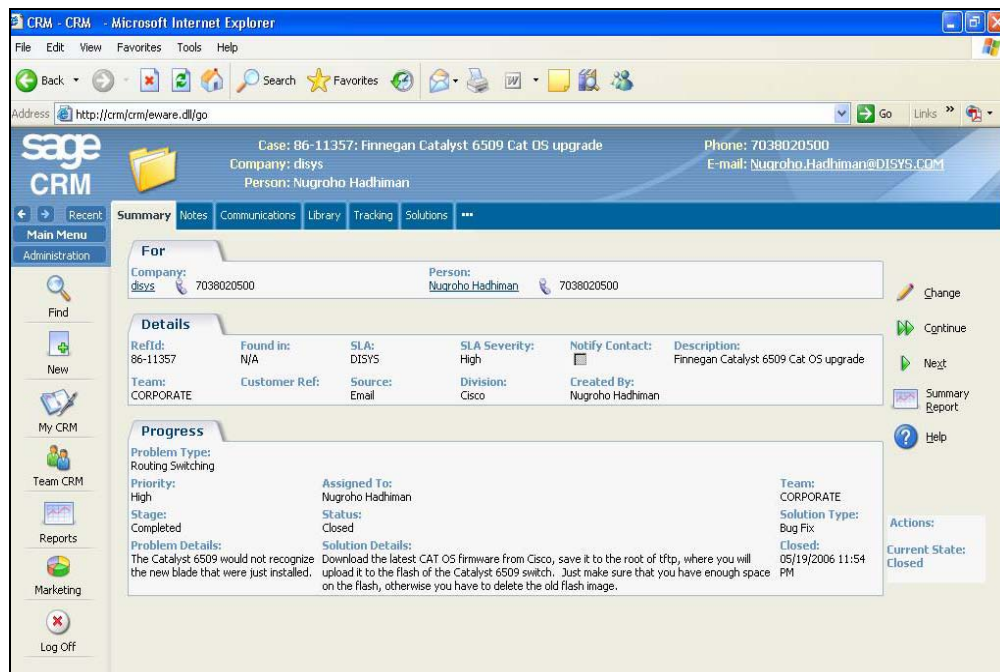
## Escalation Contacts

Trouble escalation procedures names, titles, and contact information for Priority 1 tickets are provided below.

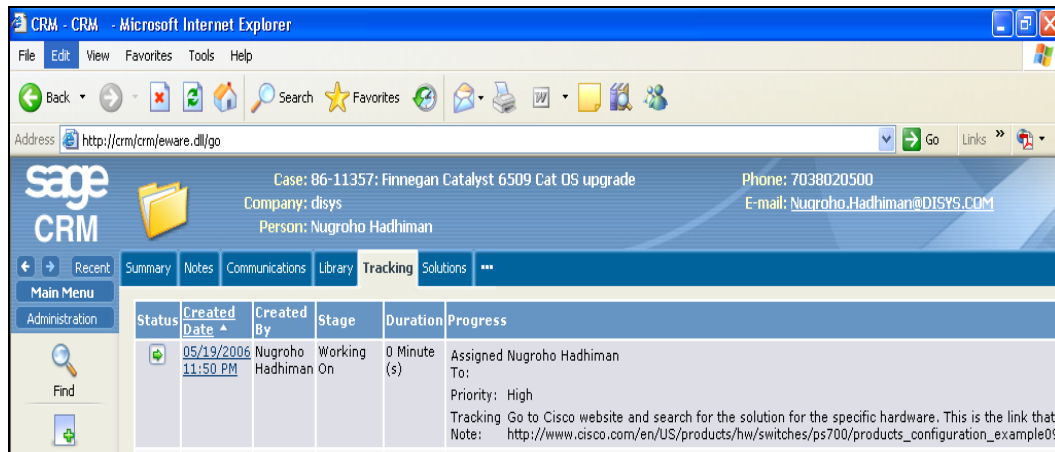
Elapsed Time	Contact Name	Contact Title	Contact Phone: (888-286-3896)
1 hour	Nugroho Hadhiman	Network Engineer	Nugroho.hadhiman@disyssolutions.com
2 hours	Varun Gulati	Senior Network Engineer	Varun.gulati@disyssolutions.com
4 hours	Vijay Soni	Director of Operations	Vijay.Soni@disyssolutions.com
8 hours	Vinu Luthra	COO	Vinu.Luthra@disyssolutions.com
24 hours	Atul Bhatia	CEO	Atul.Bhatia@disyssolutions.com

## Identifying Reoccurring Problems

The DSI Technical Department must provide monthly reports to the Chief Operating Officer detailing the number of service calls, the technician assigned, the priority level assigned, the escalation time period from entry to resolution, parts replaced, cost, and the resolution. In most cases, a pattern of component failure will have been noticed by DSI and the manufacturer as service calls for the same problem will be noticed on the report. Resolutions which will be communicated to CCPA and sent to all customers who ordered the product might consist of a bios or software upgrade, free replacement part, or entire product recall and replacement. To combat component failures, DSI maintains a nationwide spare parts presence to limit product downtime. The following shows how cases are tracked in the CRM software tool. Once the case is entered, DSI technical support personnel track the progress of the case using Sage CRM.



Once a case is closed, information describing how the case was resolved is kept on Sage CRM, providing a store of knowledge that can be used to quickly resolve similar issues in the future.



### 2.3.4 Training

DSI provides a full range of learning systems, services and support, including course content development, delivery, and materials. Our capabilities include evaluation, planning, development, delivery and integration of systems, solutions, and technical support. Our training is always focused on specific agency needs. Course outlines are used solely as a starting point. We value our customers by listening to their concerns and analyzing their environment before designing any training solution. Whether you want to solve a particular problem, learn about a specific feature or just find out about the capabilities of a product, the training is tailored to you.

*Information Technology Core Concepts Training Classes Available (Non-Inclusive):*

<ul style="list-style-type: none"> <li>Application Development and Programming <ul style="list-style-type: none"> <li>Application Development</li> <li>Introduction to Programming Languages</li> <li>MS WinNT Programming for UNIX Developers</li> <li>Objects</li> <li>Programming Fundamentals</li> <li>-Visual Basic</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Internet and Intranet Infrastructure <ul style="list-style-type: none"> <li>Desktop Operating Systems</li> <li>Enterprise Operating Systems</li> <li>Fundamentals</li> <li>Internet and Intranet</li> <li>Internet Research</li> <li>Internetworking</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Systems and Database Design <ul style="list-style-type: none"> <li>Data Analysis and Design</li> <li>Data Management</li> <li>Data Warehousing</li> <li>Database Programming</li> <li>ORDBMS</li> </ul> </li> </ul>	<ul style="list-style-type: none"> <li>Computing for Beginners <ul style="list-style-type: none"> <li>Basic IT Concepts I</li> <li>Basic IT Concepts II</li> <li>Using the Computer</li> <li>Information and Communication</li> <li>PC Fundamentals: Components</li> <li>PC Fundamentals: Software, Memory, and Storage</li> <li>PC Fundamentals: Safety and Security</li> <li>Palm OS</li> <li>Wireless Networking Basics</li> <li>Network Fundamentals</li> </ul> </li> </ul>
<ul style="list-style-type: none"> <li>Managing Information Systems <ul style="list-style-type: none"> <li>Information Architecture</li> <li>Process Management and Improvement</li> <li>Software Management</li> </ul> </li> </ul>	

*Outline Samples Information Technology Core Concepts for above listed Courses:*

**Network Fundamentals Outline**

<p>Introduction to networking          Introduction to networking          Computer network history          Benefits of using computer networks          Network design considerations</p> <p>Network strategies and topologies          Node connecting strategies          Network computing strategies          Network coverage          Network topologies</p> <p>Network hardware          Network hardware components          Transmission media          Interface devices          Internetworking devices</p> <p>Network software          Network operating systems          Network applications</p> <p>Introduction to the OSI model          An overview of the OSI model          How network layers communicate</p>	<p>TCP/IP and the Internet          TCP/IP the Internet protocol suite          The Internet</p> <p>Network management          Functional areas of network management          Daily network management responsibilities</p> <p>The future of networking          The future of networking          What next?</p> <p>Appendix A: Cabling specifications</p> <p>Appendix B: Suggested reading list</p> <p>Standards and protocols          Network standards          Network protocols          Differences between standards, protocols,          and protocol implementations</p> <p>Data transmission          Data transmission          Signaling •Switching strategies          Media access control (MAC)</p>
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**Microsoft Office 2007 and 2010 Course Offerings**

<p><b>Microsoft Office 2007 Course Offerings</b></p> <p>Microsoft Access 2007 Basics (3350R2)          Microsoft Access 2007 Intermediate (3359)          Microsoft Excel 2007 Basics (3351R3)          Microsoft Excel 2007 Intermediate (3361R3)          Microsoft Excel 2007 Advanced (3355)          Microsoft PowerPoint 2007 Basics (3352R5)          Microsoft PowerPoint 2007 Intermediate (3362R2)          Microsoft Word 2007 Basics (3349R2)          Microsoft Word 2007 Intermediate (3357)          Microsoft Word 2007 Advanced (3360R2)          Introduction to Office 2007 (3353R2)          Learning to use Outlook 2007 (3371NC)          Learning to Use Computers with Windows XP and Office 2007 (3372)          Learning to Use Computers with Vista and Office 2007 (3374)          Learning to Use Computers with Windows 7 and Office 2007 (3399Win7R)</p>	<p><b>Microsoft Office 2007 Mini-Course Offerings</b></p> <p>Mini-Access 2007 Basics (3387)          Mini-Access 2007 Tables (3388)          Mini-Access 2007 Queries (3398)          Mini-Access 2007 Forms &amp; Reports (3390)          Mini-Excel 2007 Basics (3380R)          Mini-Excel 2007 Formatting and Lists (3391R)          Mini-Excel 2007 Charts and PivotTables (3381R)          Mini-Excel 2007 Simple Formulas (3392R)          Mini-Word 2007 Basics (3373R)          Mini-Word 2007 Formatting (3378R2)          Mini-Word 2007 Forms &amp; Merges (3379R)          Mini-Word 2007 Advanced Features (3386R2)</p>
<p><b>Microsoft Office 2010 Course Offerings</b></p> <p>Microsoft Access 2010 Basics (3421Win7R)          Microsoft Access 2010 Intermediate (3422Win7)          Microsoft Excel 2010 Basics (3414Win7)          Microsoft Excel 2010 Intermediate (3415Win7)          Microsoft Excel 2010 Advanced (3417Win7)          Microsoft PowerPoint 2010 Basics (3416Win7)          Microsoft PowerPoint 2010 Intermediate (3419Win7)          Microsoft Word 2010 Basics (3412Win7)          Microsoft Word 2010 Intermediate (3420Win7)          Microsoft Word 2010 Advanced (3426Win7)          (12 to 18 hours duration)          Introduction to Office 2010 (3411Win7)          Learning to Use Computers with Office 2010 (3410Win7R)</p>	<p><b>Microsoft Office 2010 Mini-Course Offerings</b></p> <p>Mini-Access 2010 Basics          Mini-Access 2010 Tables          Mini-Access 2010 Queries          Mini-Access 2010 Forms &amp; Reports          Mini-Excel 2010 Basics (3318Win7)          Mini-Excel 2010 Formatting and Lists (3423Win7)          Mini-Excel 2010 Charts and PivotTables (3424Win7)          Mini-Excel 2010 Simple Formulas (3425Win7)          Mini-Word 2010 Basics (3413Win7)          Mini-Word 2010 Formatting          Mini-Word 2010 Forms &amp; Merges          Mini-Word 2010 Advanced Features</p>

*Staff Technician Certification*

DSI can facilitate CCPA contract users with the manufacturers’ “Technician Certification Programs” available for customer staff. Prices for these services will vary depending on criteria such as the number of certified technicians the agency wants to have, the type of product and anticipated purchase volume. For any agency interested in this service DSI will offer administrative support to help research what types of programs are available, what requirements are needed, and what fees and reimbursements there are.

Manufacturer Self-Maintenance programs provide the following benefits:

- Manufacturer hardware maintenance training (purchased separately by Customer)
- Discount on parts (for out-of-warranty products and spare part stocking)
- Warranty replacement parts for parts consumed during the product warranty
- Electronic warranty claims processing and parts ordering
- Electronic access to service information
- Toll-free remote troubleshooting assistance for backup support
- Labor reimbursements

**2.3.5 Consulting**

*Project Management & Staff Augmentation Services*

DSI has a wealth of expertise providing qualified people who can integrate easily into an organization. Whether clients require full life cycle project management or staff augmentation, DSI takes over the burden of finding quality personnel providing IT consultants that embody our clients’ values.

DSI offers managed knowledge of the latest environment and technology needs including proving compliance testing for HIPAA, Sarbanes-Oxley, and the Patriot Act. An example of DSI’s capabilities and experience providing consulting and technical services include:

Application Systems Design	Network Installation
Configuration Services	Network Integration
Consulting	Network Management
Data Center Design/Implementation	Project Management
Design/Development	Software Customization
Help Desk Support	Software Development
Implementation Support	Systems Analysis
Maintenance Support	Systems Engineering
Needs Assessment	Systems Integration
Network Design	Training



### 2.3.6 Value Added Services

DSI provides the following types of value added services and support to the CCPA related to all functional areas.

#### *End-of-Life / Trade-in Options*

The DSI Trade-In Program provides a total end-to-end solution for life cycle management on your technology investments. We offer cash-back for any parts and systems that still have residual value (typically within 3 1/2 years of age), and recycling services for hardware that has become obsolete.

Our Trade-In Program has proven to be one of the most comprehensive tools to assist education and government end-users to:

- Recover value from used or excess hardware
- Minimize excess inventory buildup
- Create a fresh bucket of money in their budget
- Provide environmentally friendly recycling services
- Logistical support for nationwide pickups
- Procurement channel to purchase any discontinued hardware requirements

We offer a fast, flexible, and responsive process, committed to the highest level of satisfaction. We can customize a trade-in program specifically designed for CCPA's requirements. Fees for this service are dependent on number of products and will be provided on a quote basis from the dedicated sales team. Additionally, many manufacturers have their own recycling programs which include money saving trade-in offers.

For any manufacturer trade-in program, DSI will assist CCPA in all aspects of potential equipment trade-in. When an agency desires to replace old equipment, DSI should be notified regarding the equipment to be replaced and the serial numbers of the parts in question. DSI will then work with the manufacturer to determine the fair market value of the equipment being traded-in. DSI will help facilitate all aspects of the trade-in process, including coordination of return merchandise authorizations and shipping information.

#### *Disposal Services*

DSI provides an environmentally friendly, safe, and secure method for recycling hardware that no longer has residual value. This service offers transportation, recycling, and asset management reports, along with certificates of destruction that meet all state, local, and federal EPA guidelines. Some of the feature and requirements of DSI recycling program include:

- DSI will coordinate transportation logistics from customer facility to recycling center for hardware that is properly palletized and loading dock accessible.
- Hardware will be received, audited, bar coded and de-manufactured. Hard drives are removed, secured / shredded. Plastic, metal, glass, and boards are disassembled.
- Certificates of de-manufacturing which meet environmental compliance issued.



- Fees for this service are dependent on the type and number of items being recycled and will be provided on a quote basis from the dedicated sales team.
- Minimum quantity requirements of 50 units.

### *Environmentally Preferable Purchasing Program*

DSI understands that the purchase and use of environmentally preferable products can have a profound impact—and not just on the environment. Buying less-hazardous products can reduce regulatory liability, improve worker safety, and lower disposal costs. This includes Mercury content research and documentation to provide compliance with Mercury standards published by the State for all products.

Environmentally preferable products are defined as products that have a lesser or reduced effect on human health and the environment when compared with competing products that serve the same purpose. DSI will work with all manufacturer products we resell, to identify environmentally preferable products that are manufactured with less toxic materials; are designed for recycling; contain recycled material in plastic housings or other parts; and are shipped in recycled or reduced packaging.

### *Specialized Manufacturer Web Access*

Through DSI and the support of the manufacturer, CCPA agencies will have access to sales and marketing tools, product pricing, software patches and more which can be provided to customers who wish to request product information and configure network equipment on their own. This access is performed through Manufacturer's applicable program any may not be available from some.

DSI will facilitate the following types of manufacturer online tool support as applicable the manufacturer offering:

- *Software Download Center* - Includes access to downloadable software updates, the Software Bug Toolkit, software release notes, and other software information.
- *Technical Support Knowledge Base* - Provides assistance with complex technical questions.
- *Lead Times Tool* - Allows users to view product lead times.
- *Configuration Tool* - Interactive tool to create product configurations for Manufacturer products and then forward the configurations via email.
- *Pricing Tool* - Enables users to check the current retail price list to view their cost savings via the contract vehicle.
- *Order Status Tool* - Allows a user to see the status of their orders their Partner has placed on their behalf.

### *Help Desk Support*

Help Desk Support for products purchased through DSI. CCPA can call DSI' toll-free number during normal business hours and any time thereafter to receive technical support. After hours support requires selecting the emergency option number on the voice greeting and leaving a message. The message is relayed via pager to a DSI technician who will call back within one hour.

### *Warranty Status Tracking*

DSI can provide free warranty status reporting for purchases made under this contract. In brief this would include electronically tracking each product purchased, the date received, the standard warranty time, and any additional warranty upgrades purchased. Information can be provided the Requesting Agency in a variety of reporting mediums and frequencies.

### *Documentation*

During the term of the contract, DSI can provide a supply of descriptive literature to CCPA member agencies considering the purchase of any contract equipment. This descriptive literature would include the glossy, marketing type literature, product brochures, CD-ROM tutorials and product configurations. The Outside Sales Rep assigned to call on the CCPA can bring product updates with them on visits. This information can also be requested from the CCPA dedicated account rep. All products shipped will include standard product manuals or CD-Rom based documentation, which, if missing, may also be obtained through the Sales Team.

### *New and Refurbished Equipment*

DSI does not sell refurbished equipment. When effecting repairs of products, refurbished equipment and materials may be used to replace or repair defective products. Any reconditioned/refurbished products replaced in this manner will be warranted with the same terms as new materials and with the warranty length as per current commercial practice of the manufacturer.

### *Complete Configuration and Delivery*

All equipment purchased under this agreement will be configured with, and delivered with, all required cables, keys (if applicable), License Keys, documentation, proof of all software licenses (if applicable), and appropriate media. DSI already performs this service for current customers who purchase items and components off the current contracts held by DSI. DSI normally performs this function in-house in order to test and deliver the equipment according to manufacturer specifications as well as customer expectations. However, in most cases we can provide installation of components at a customer's site or have the items configured prior to them shipping from the manufacturer. Many products ordered will already have the option of being configured to customer specifications prior to ordering.

### *Compatibility*

All peripherals and components configured and ordered with a system will be compatible with that system. DSI tests all installed equipment prior to delivery to ensure that all components ordered are working properly.

### *Manufacturer Approved Components*

All components will be manufacturer approved, unless otherwise noted, and therefore, eligible for full manufacturer's warranty. DSI works very closely with the manufacturer to ensure any parts installed in a machine do not void the manufacturer warranty. In cases where a customer requests installation of an item that is not approved by the manufacturer, DSI will not install the component without customer's approval.

### *Labeling*

All items offered will be the same model indicated by its external label and source of manufacture. This will be verified by DSI in the staging area prior to shipment.

### *Operable Peripherals/Adaptors*

All software and/or necessary drivers related to peripherals and/or adaptors, will be installed and operational prior to time of delivery. DSI normally performs this function in-house in order to test and deliver the equipment according to customer specifications. However, in some cases we can provide installation of components at a customer's site or have the items configured prior to them shipping from the manufacturer. Many products ordered will already have the option of being configured to customer specifications prior to ordering.

### *Information Regarding New Products*

#### Emerging Technology Training

DSI can provide CCPA with emerging technology training in a variety of ways such as providing training/informative sessions for new product/technology releases, product brochure updates, interactive training CD-ROM tutorials, and web based training and demo equipment. Rather than CCPA paying for shipping or labor cost to obtain knowledge through these types of resources, DSI and our manufacturer partners can provide them free of charge. This provides the ability to learn about the latest technology as well as see if a product will meet the needs of the customer without them having to spend any money first.

#### Lab Equipment and Road Shows

DSI can provide access to products in our technical lab as well as manufacturer partner sites. Many manufacturers have annual "road shows" where they display all of the latest product releases and invite resellers and education and government purchasers to learn about the new product features. DSI emails customers who have agreed to remain our mailing list when these types of events come around.

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*Notification of Withdrawal of Support*

The DSI Sales Team is required to re-certify in all major brand product lines every 6 months. All Sales Team Leaders must be certified in Cisco, Hewlett Packard, Toshiba, and IBM depending on the contract and customer base they are responsible for. DSI sales staff attends a minimum of one training per month for various manufacturers such as Sony, 3Com, etc. Because of this, DSI is continually aware of products that are coming out and products that are being discontinued.

Each month DSI is sent updated newsletters that inform us as to what promotions are offered, as well as what products are being discontinued. DSI has a Promotions Department responsible for ensuring that all of the information communicated in these manufacturer monthly newsletters is forwarded to the DSI Operational Departments. Information is sent to the Sales Department (whom normally has already received the newsletter from the manufacturer directly) so they will be able to inform their customers. Information is also sent to the Marketing Department so e-mail blasts can be sent out to customers in our database. In this way, all of our current customers are informed of changes in product availability and “trade-in” or “trade-up” of existing equipment promotions. Product information regarding “end-of-life” projections for product-lines is communicated to avoid delay in customer orders.

If pre-arranged by a CCPA contract user, DSI can track warranty information for products purchased through DSI via this contract vehicle and provide notice to customers at least 12 months prior to the withdrawal of support for any equipment following the initial warranty period.

### *Online Configuration Tools*

DSI can provide a secure website with catalog downloads, online configuration tools, technical specification sheets, and online ordering. The following is an example of some of the configuration sites DSI can provide links to so customers can configure products in order to review product offerings prior to the creation of a quote request.

[Memory Configurator](#)



<http://www.apcc.com/sizing/selectors.cfm>



[Axiom Upgrade Configurator](#)



[Belkin Configurator](#)



[BTI Configurator](#)



[Cables to Go Configurator](#)



[Cisco Configurator](#)



[CMS Hard Drive and Backup System Configurator](#)



[Corsair Memory Configurator](#)



[D-Link Configurator](#)



[Edge Memory Configurator](#)



[Enterasys Product Finder](#)



[Exabyte](#)



[Fellows Configurator](#)



[HP Enterprise Configurator](#)



[IBM Server Configuration Tools](#)



[Iomega Configurator](#)



[Kingston Memory Configurator](#)



[Olympus Configurator](#)



[PNY Configurator](#)



[SimpleTech Configurator](#)



[SMART Configurator](#)



[UPS Selector Guide](#)

[RBC Configurator](#)

[Surge Configurator](#)

[Cables Configurator](#)



[Verbatim Toner Search](#)

### **2.3.7 Manufacturer's Extended Warranty**

#### Additional Types of Warranties Available

DSI is offering the standard manufacturer's warranty on all products purchased. There are three basic types of additional warranties that can be purchased from the manufacturer via DSI.

#### Warranty Extensions

Warranty extensions lengthen the original warranty (e.g., from one year to three on-site) by simply extending coverage beyond the term specified by the original manufacturer warranty. Customers typically need to buy warranty extensions at the time of product purchase or within 90 days thereof.

#### Warranty Upgrades

Warranty upgrades lift the original manufacturer's warranty response time to a higher level (e.g. from next business day on-site to 24/7 on-site), ensuring a faster response than the standard warranty. For example, customers could choose to upgrade from next-business-day response to same-day response. To extend service availability hours from daytime hours to round-the-clock, customers may opt for warranty upgrades. Remote notebook support is also available.

#### Post-Warranty

Post-warranties support the equipment after the original manufacturer's warranty has expired; usually contracted for one year. Products that are no longer covered by manufacturer warranties can still be covered by post-warranty maintenance service contracts. Single-manufacturer and multi-manufacturer contracts are available. Maintenance contracts are sold as separate services.

DSI understands many customers find that they will retain their equipment for much longer than the normal product life cycle (usually three years). Customers that opt to keep purchased equipment in service for a longer period of time will have an adequate maintenance/service option for CCPA based customers.

- (a) DSI will provide the option to extend warranty coverage for any item purchased under this contract beyond the initial warranty period.
- (b) Customer will purchase Post Warranty Maintenance before the expiration of the prior warranty (to assure that equipment is in good working order).
- (c) Post Warranty Maintenance will be available and renewable on an annual basis, per unit.



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### Warranty Support Options

Optional warranties, which extend beyond the standard warranty, can be purchased via manufacturer packaged services or hourly rates. The following is a non-inclusive list of warranty support packages offered by most manufacturers with their products.

- Next Day Express Exchange
- Next Day Onsite Response
- 7 Day, Next Day Onsite Response
- 4-Hour Onsite, Standard Hours Response
- 4-Hour Onsite, Extended Hours Response
- Advanced Maintenance Service, Next Day Onsite Response
- Advanced Maintenance Service, 4-Hour Onsite Response
- Accidental-Damage Protection, Next Day Exchange
- Return to Manufacturer
- Return to Local Service Center
- Post Warranty Service, Exchange
- Post Warranty Service, Onsite Response

### 3. Background and Experience

#### 3.1 Official Name

DISYS Solutions, Inc. is not owned by another firm:

<b>Legal Company Name</b>	DISYS Solutions, Inc.
<b>Address of Company</b>	4151 Lafayette Center Drive, Suite 600 Chantilly, VA 20151
<b>State of Incorporation</b>	Virginia

DSI has assembled a team of partners and subcontractors to provide a comprehensive line of products and services to the City of Charlotte and CCPA Contract Users. The list below shows some of these partners and provides a short description of the services they will be providing:

<b>Company Name</b>	<b>Website</b>	<b>Services Provided</b>
Delex Systems, Inc.	<a href="http://www.delex.com">www.delex.com</a>	Unified Security Solutions
Arrow Electronics, Inc.	<a href="http://www.ecs.arrow.com">www.ecs.arrow.com</a>	Arrow FUSION Cloud Services Server and Network Infrastructure Solutions Helpdesk Support Consulting Services
Terremark	<a href="http://www.terremark.com">www.terremark.com</a>	Infrastructure and Cloud: Colocation, Enterprise Cloud, Managed Hosting, Network & Connectivity, IT Professional Services.  Security Services: Governance, Risk and Compliance Management; Identity and Access Management; Data Protection; Management Security
Total Site Solutions	<a href="http://www.totalsitesolutions.com">www.totalsitesolutions.com</a>	Complete Data Center Services and Technology Consulting Services
CPI Training Solutions, Inc.	<a href="http://www.solutionsrus.com">www.solutionsrus.com</a>	Microsoft Office 2007 and 2010 Training

## DSI Distribution Channel

DSI’s distribution channel method provides timely product delivery nationwide by utilizing its partnerships with Synnex Technologies, Ingram Micro, Tech Data, HP Direct, IBM Direct, Cisco Direct, and other manufacturers and distributors to provide products. DSI considers fill rate and on-time delivery to be synonymous. If an item is not delivered within the expected timeframe required by the contract or customer, it reflects negatively on our fill rate. DSI choice to use a vast resource of distributors and manufacturers combines strengths in manufacturing, distribution, and electronic commerce, and offers greater efficiencies in time to market, cost, and real-time links in the supply chain. DSI’s distribution channel choices brings product procurement and manufacturing expertise together which results in the highest quality products built with industry-leading components being delivered in the least amount of time at the most current costs at time of shipment. Our online ordering tools and resources allow us to see availability and pricing at all of our distributor partners as well as other online resources. This allows us to ensure our fill rate remains above 99% at the lowest acquisition cost. Online features also allow us to track shipment status and communicate unforeseen delays immediately. Additionally DSI uses SAGE CRM software to manage and synchronize sales, purchasing and customer care activities across all points of contact to ensure adherence to deliverable timeframes. The tables below provides the distribution warehouse locations of our three main distribution partners:

### Distribution Center Locations US (non-inclusive)

#### Distribution Center Locations

Locations for Synnex Technologies Distribution Centers And Shipping Locations		
Virginia 3900 Stonecroft Blvd. Suite M Chantilly, VA 20151 703-961-0432	California 21950 Arnold Center Road Carson, CA 90810 310-549-0000	California 44201 Nobel Drive Fremont, CA 94538 510-656-3333
California 3655 E. Philadelphia St. Ontario, CA 91761 909-923-8900	Florida 11190 NW 25th Street Miami, FL 33172 786-464-1990	Georgia 200 Best Friend Ct., Suite 250 Norcross, GA 30071 800-544-3584
Illinois 1850 International Blvd. Glendale Heights, IL 60139 630-588-8772	Mississippi 10381 Stateline Rd Olive Branch, MS 38654 662-892-5100	New Jersey 1000 Riverside Drive, Suite A Keasbey, NJ 08832 732-661-0032
Ohio 4001 Gantz Road, Suite A Grove City, OH 43123 614-539-6995	Oregon 6505 SW 110th Avenue Beaverton, OR 97008 503-645-8188	South Carolina 39 Pelham Ridge Dr. Greenville, SC 29615 864-289-4000
Texas 660 N. Dorothy Dr., #100 Richardson, TX 75081 800-544-3613		

<b>Locations for Tech Data Distribution Centers And Shipping Locations</b>		
California 13472 Marlay Fontana, CA 92337 727-539-7429	Florida 2200 NW 112th Avenue Miami, FL 33172 305-599-4799	Georgia 3055 Shawnee Ind. Parkway Suwanee, GA 30024 727-539-7429
Indiana 7701 Vorden Court South Bend, IN 46628 727-539-7429	New Jersey 1 Technology Drive Swedesboro, NJ 08085 727-539-7429	Texas 5100 Liberty Way Alliance Gateway Park Ft. Worth, TX 76177 727-539-7429
<b>Locations for Ingram Micro Distribution Centers And Shipping Locations</b>		
California - Branch 10 12510 Micro Drive Mira Loma, CA 91752 909-727-3300	Illinois - Branch 40 415 E. Lies Road Carol Stream, IL 60188 630-668-0106	Pennsylvania - Branch 80 80 Micro Drive Jonestown, PA 17038 717-865-0800
Tennessee - Branch 30 3820 Micro Drive Millington, TN 38053 901-873-8800	Texas - Branch 20 1809 W. Frankford Rd., Ste 100 Carrollton, TX 75007 972-512-2700	

## 3.2 Service Provider Background

### 3.2.1 Company Overview

DSI is a Small Minority Owned business with over 20 years of experience providing state, local, and education agencies with computer hardware, servers, peripherals, software, network management services, and integration services. DSI is headquartered in Chantilly, VA. We have over 60 employees working across the country to meet the demands of our customers. Our clientele covers Government and Educational Institutions and Commercial clients nationwide. We are a financially sound company who recycles profits back into the firm in areas such as research and development. DSI employs a talented staff of remote and on-site sales, marketing, administrative, human resources, accounting, consultants, software analysts, network engineers, and service technician personnel nationwide.

DSI provides knowledge and know-how relative to recommendations for the purchasing of hardware and software in light of rapidly changing technology market trends and conditions. DSI procurement methodologies support organization-wide procurement strategies and systems to procure IT assets effectively. Part of making procurement decisions includes recommendations for action, advice on negotiating tactics, knowledge of contract terms & conditions as well as primary and secondary market pricing trends and financing alternatives. DSI provides products and support for all types of equipment from servers, desktops, and printers to audio-visual equipment, routers and hubs. DSI has a highly qualified staff of Certified Sales Representatives and Network Engineers which provide pre and post-sales product support, warranty, integration services, and more.

### **Government and Education Focus**

DSI is an experienced value added reseller who provides free value added services with every product and service we provide. Since 1994, our core market focus has been providing information technology products and services to government and education agencies nationwide. DSI understands the unique computing requirements of Government and Education agencies. DSI knows to stay in business we need to provide a level of support far superior than our competitors. We have unique record of winning term contracts in the State, Local, and Education market.

### **Technology Procurement and Integration**

DSI provides knowledge and know-how relative to recommendations for the purchasing of hardware and software in light of rapidly changing technology market trends and conditions. DISYS procurement methodologies support organization-wide procurement strategies and systems to effectively procure IT assets. Part of making procurement decisions includes recommendations for action, advice on negotiating tactics, knowledge of contract terms & conditions as well as primary and secondary market pricing trends and financing alternatives. DISYS provides products and support for all types of equipment from servers, desktops, and printers to audio-visual equipment, routers and hubs. DISYS has a highly qualified staff of Certified Sales Representatives and Network Engineers which provide pre and post-sales product support, warranty, integration services, and more. In order to offer outstanding product services, DISYS must maintain partnerships with world leading hardware and software technology companies such as:



Partnership status requires DISYS have manufacturer certified sales and engineers on staff, high customer service standards, positive past performance, and industry standard practices. Some of DISYS highest partner levels include being a Cisco Gold Certified Partner, and a Hewlett Packard (HP) Gold Partner with specializations in Wireless LAN, VPN Security, and IP Telephony products and services. In return for our dedication we are provided with service, technical support, productivity tools, online training, marketing resources and sales promotions which we in turn share with our clients.

### **Technology Deployment and Migration**

DISYS provides senior level engineers to evaluate emerging wireless technologies, develop technology migration paths, and create deployment plans that help clients make the best strategic decisions. Understanding network topology, protocols and operating systems allows us to provide our clients with network design, implementation and performance analysis. Additionally, we support high and low end network backup tools, fault tolerance modules, and disaster recovery processes. DISYS maintains a large staff of advanced and mid-level CISCO, HP, Microsoft and Novell administrators ready to help our clients. Technologies supported include SAN/NAS, VoIP, and Wireless LAN/WAN.

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### **Project Management & Staff Augmentation Services**

DISYS has a wealth of expertise providing qualified people who can integrate easily into an organization. Whether clients require full life cycle project management or staff augmentation, DISYS takes over the burden of finding quality personnel. DISYS provides IT consultants that embody our clients' values. Our methodology and processes allow us to offer:

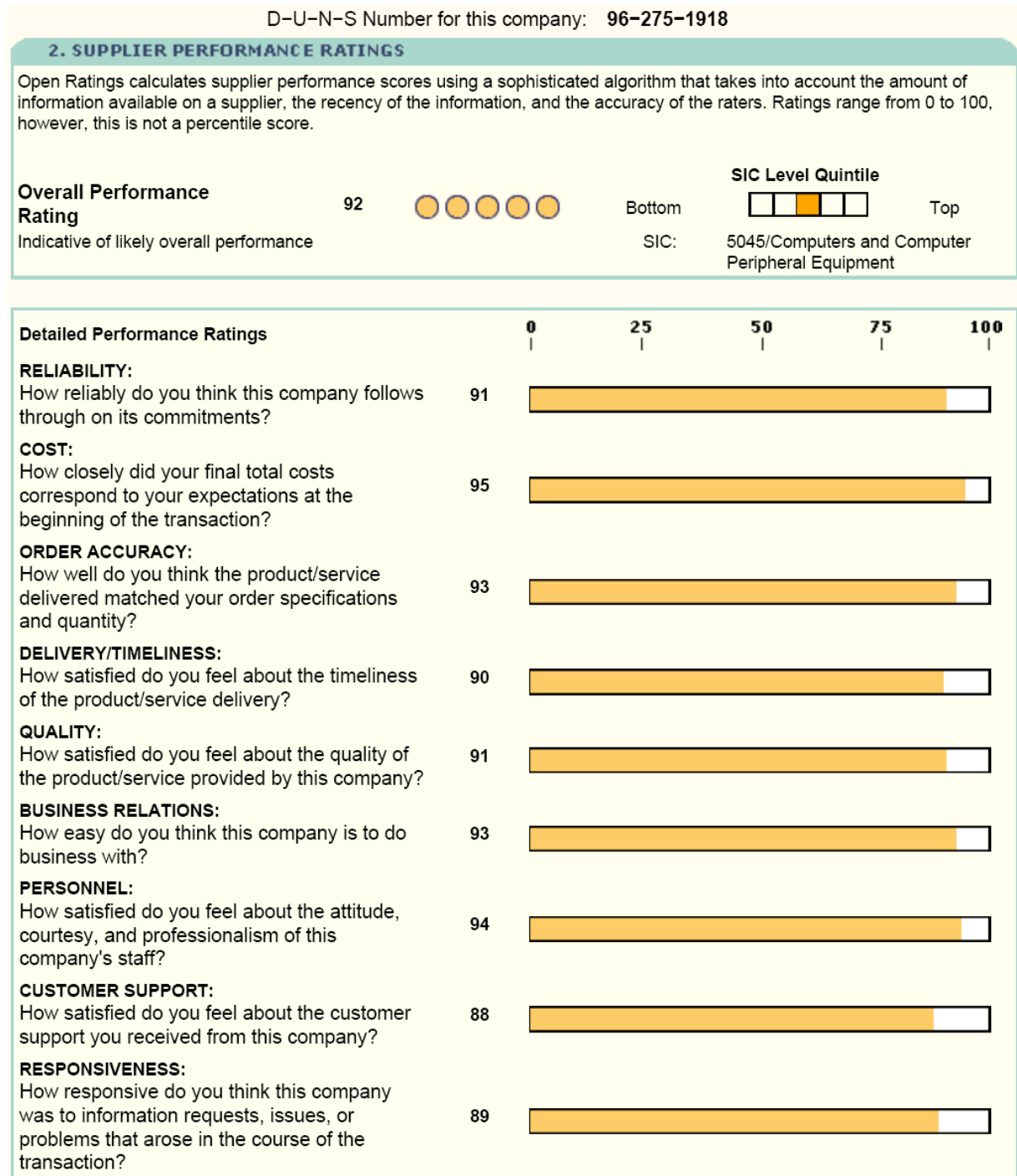
- An extensive proprietary database of local candidates to guarantee a ready supply of IT professionals.
- A seasoned IT savvy recruiting team that comprehends technology providing faster turn-around time in identifying target candidates for our clients' IT staffing needs.
- A Strong Bench.
- A speed-to-hire center of expertise for pipelining various IT staff augmentation skills that align with client needs. This enables us to not only utilize our bench consultants for various projects, but also allows us to have a consistent pipeline of candidates for our speed-to-hire process.
- Formalized processes to insure recruiting best practices are adhered to at all times.
- Candidates with satisfactory background checks, work references, and drug testing.

DISYS brings our clients a vast amount of industry knowledge, best practices, and lessons learned using our past experience providing services to various Fortune 100+ rated companies in industries including Aerospace and Defense, Biotechnology, Broadcasting and Cable, Building Technologies, Capital Goods, Chemicals, Communications Equipment, Consumer Products, Electronics, Environmental & Waste Management, Financial, Healthcare, Industrial Automations, Information Technology, Internet Security, Medical Devices, Metals, Movies and Home Entertainment, Petrochemicals, Pharmaceuticals, Power/Energy, Telecommunications, Testing and Measurement, and Transportation.



## Customer Satisfaction

DSI has been a proud member of the Open Ratings report provided by Dun and Bradstreet for many years. This report is run on prospering supplier businesses with regards to past performance evaluation. DSI has consistently score above 90% on our Open Ratings reviews. Please see below for the ratings from our most current report:



## **Customer Satisfaction Excellence Recognition**

One of our core capabilities is providing Cisco products and services. Although this RFP does not request those products or services, we would like to reference our consistently high ratings from customers to whom we have provided these products and services. Cisco conducts regular independent reviews on their Gold partners. DSI has consistently received accolades for achieving Customer Satisfaction Excellence – the highest distinction a partner can achieve within the Cisco Partner Program.

From: [csat-program@cisco.com](mailto:csat-program@cisco.com) [<mailto:csat-program@cisco.com>]  
Sent: Sunday, July 31, 2011 1:30 PM  
To: Vijay.Soni; Jatinder.Vohra  
Cc: [nancbrow@cisco.com](mailto:nancbrow@cisco.com); [prainvil@cisco.com](mailto:prainvil@cisco.com); [camecole@cisco.com](mailto:camecole@cisco.com)  
Subject: Congratulations on Achieving Cisco Customer Satisfaction Excellence

Cisco Systems is pleased to recognize and congratulate DISYS SOLUTIONS INC. (USA) for achieving Cisco Channel Customer Satisfaction Excellence.

Customer Satisfaction Excellence is the highest distinction a partner can achieve within the Cisco Channel Partner Program. DISYS SOLUTIONS INC. (USA) will be recognized for Customer Satisfaction Excellence in the Cisco Partner Locator ([www.cisco.com/go/partnerlocator](http://www.cisco.com/go/partnerlocator)) with a special star indicator representing your achievement. Customers, Cisco personnel and partners will be able to identify you as having achieved outstanding customer satisfaction as part of Cisco's worldwide assessment process.

Channel Customer Satisfaction Excellence assessment is based upon the customer satisfaction results captured in the Cisco Partner Access Online tool ([www.cisco.com/go/pal](http://www.cisco.com/go/pal)). Each measurement period, Cisco will acknowledge Certified Partners that have the highest customer satisfaction distinction within each geographic region.

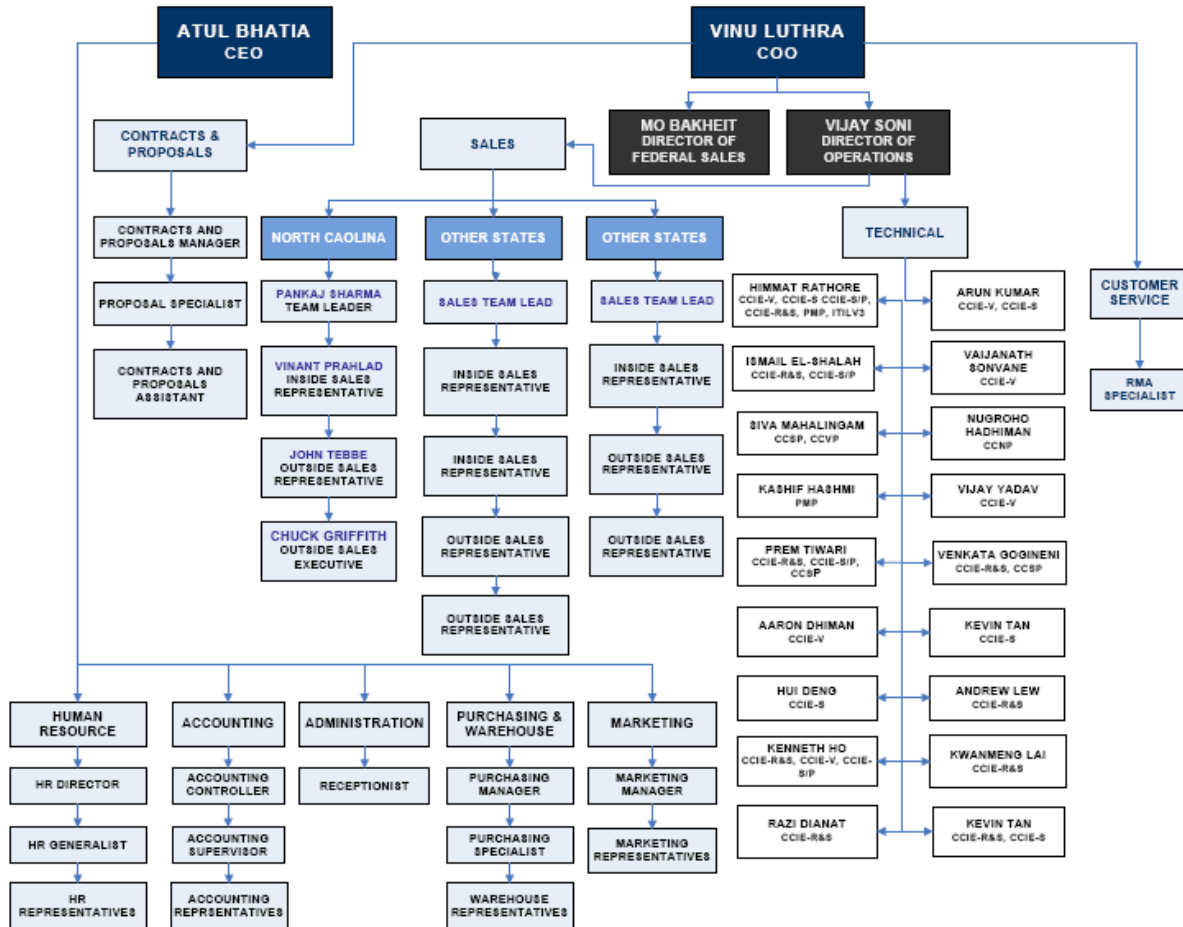
Customer Satisfaction Excellence is a core value we both share and a key driver of our current and future success. Thank you for your commitment to the success of your customers.

For more information on Cisco Channel Customer Satisfaction Excellence, please visit:  
[http://www.cisco.com/web/partners/pr11/pr20/partners\\_customer\\_satisfaction\\_concept\\_home.html](http://www.cisco.com/web/partners/pr11/pr20/partners_customer_satisfaction_concept_home.html)

Sincerely,  
Cisco Channels Team

### 3.2.2 Organization and Ownership

The chart below shows our overall organizational structure.



#### Management Support

DSI’s principals oversee 100% of business operations. The owners are directly involved in personally overseeing the day-to-day activities so that their ideas and philosophies related to customer service and business growth remain the focus of each employee. The division of responsibility among DSI’s principals is listed below:

Atul Bhatia, Chief Executive Officer, oversees the financial related business operations such as accounting, purchasing and human resources. He ensures our internal business practices achieve a solid company profit while maintaining cost savings to customers and ethical accounting practices.

Vinu Luthra, Chief Operating Officer, oversees the success of DSI customer service by ensuring all DSI technology product and services contracts include a staff of sales and engineering personnel that possess above standard customer service skills and knowledge of current and emerging technologies.

Our owners stay abreast of technology changes and serve as mentors for the staff they manage. Each major business unit of DSI is led by an industry seasoned Department Manager who reports directly to one of the principal owners. The most common meetings take place between the Sales and Technical Departments who work closely to coordinate orders with installation rollout schedules, and the Sales and Purchasing Departments who work closely to ensure orders are delivered on time and customers are made aware immediately as to possible delays. Every week, the Chief Operating Officer meets with the department managers in an open forum to share positive and negative issues which may affect the business in the coming weeks, and discuss tactics for assisting each other in maintaining the health of the organization.

### 3.2.3 Experience with Similar Projects

DSI has numerous contracts providing similar technology products and associated services projects. Please see below for an example of contracts on which we have provided technology hardware and services:

Agency	Eligible Customers	Type of Products	Contract Length
Maryland Department of Information Technology (DOIT)	Any Education and Government Agency in MD	Microcomputers, Printers, Network Communication Equipment and Services	1996-Current
Maryland Department of Information Technology (DOIT)	Any Education and Government Agency in MD	Commercial of the Shelf Software and Services	2000-Current
University Systems of Maryland (MEEC)	Any Education and Government Agency in MD	Microcomputer Hardware, PCs, Laptops, Servers, and related Peripherals	1997-Current
Virginia Information Technologies Agency (VITA)	Any Education and Government Agency in VA	Catalog of all DSI products via eVA procurement site	2000-Current
Pennsylvania Education Purchasing Program for Microcomputers (PEPPM)	Any of the 700+ members of the PEPPM cooperative	Provide catalog of Audio Visual, General Hardware and Software, Educational Software, and Networking and Telecommunications Products	2005-Current
Educational and Institutional Cooperative Service, Inc (E&I)	Any Higher Education Agency Nationwide that is a E&I Member	Contract to provide Hewlett Packard Printers, Supplies and Accessories to Higher Education Entities nationwide	2004-2010
Miami-Dade County Florida	Miami-Dade County Government Agencies	IT Hardware and Associated Equipment	2009-Current
Atlanta Public Schools (APS)	All APS Locations	IT Consulting Services	2009-Current
Mississippi Department of Information Technology Services	Any Education and Government Agency in MS	Computer & Telephone Hardware, Software, and Services	2009-2010
Oregon Department of Administrative Services	Any Education and Government Agency in OR	Statewide Contract to sell multiple brands of peripherals based in DSI's catalog	2004-2010
Pennsylvania Department of General Services (DGS)	Any Education and Government Agency in PA	IT Hardware and Peripherals	2008-2009



Agency	Eligible Customers	Type of Products	Contract Length
Wisconsin Department of Administration, Bureau of Procurement	Any Education and Government Agency in WI	Statewide Peripherals contract to sell entire DISYS catalog	2005-2010
Texas Department of Information Resources (DIR)	Any Education and Government Agency in TX	Networking Products including 3Com, Allied Telesyn, D-Link, IMC, Linksys, MultiTech, Netgear and SMC.	2006-2010
Fauquier County Government, Virginia	All Fauquier County Government Agencies	IT Consulting Services	2011-Current
New York Metropolitan Transportation Authority (MTA)	All-Agencies	Supply and Delivery of PC Peripherals	2009-Current
Virginia Community College System (VCCS)	VCCS System Office and twenty-three community colleges on an “as needed” basis	Computer Hardware, Software and Services	2008-Current
Maryland Department of Information Technology (DOIT)	Any Education and Government Agency in MD	Telecommunications Equipment and Services (PBX III)	2011-Current
Prince Georges County Government (PGCG), Maryland	All PCGC Government Agencies	Desktop Printers, COT Software, and Associated Peripherals	2009-2011

### 3.3 Proposing Organization’s Structure

**a. Describe your total organization, including any parent companies, subsidiaries, affiliates, and other related entities;**

DSI is a privately owned corporation. We do not have any parent companies, subsidiaries, affiliates, or other related entities.

**b. Describe the ownership structure of your organization, including any significant or controlling equity holders;**

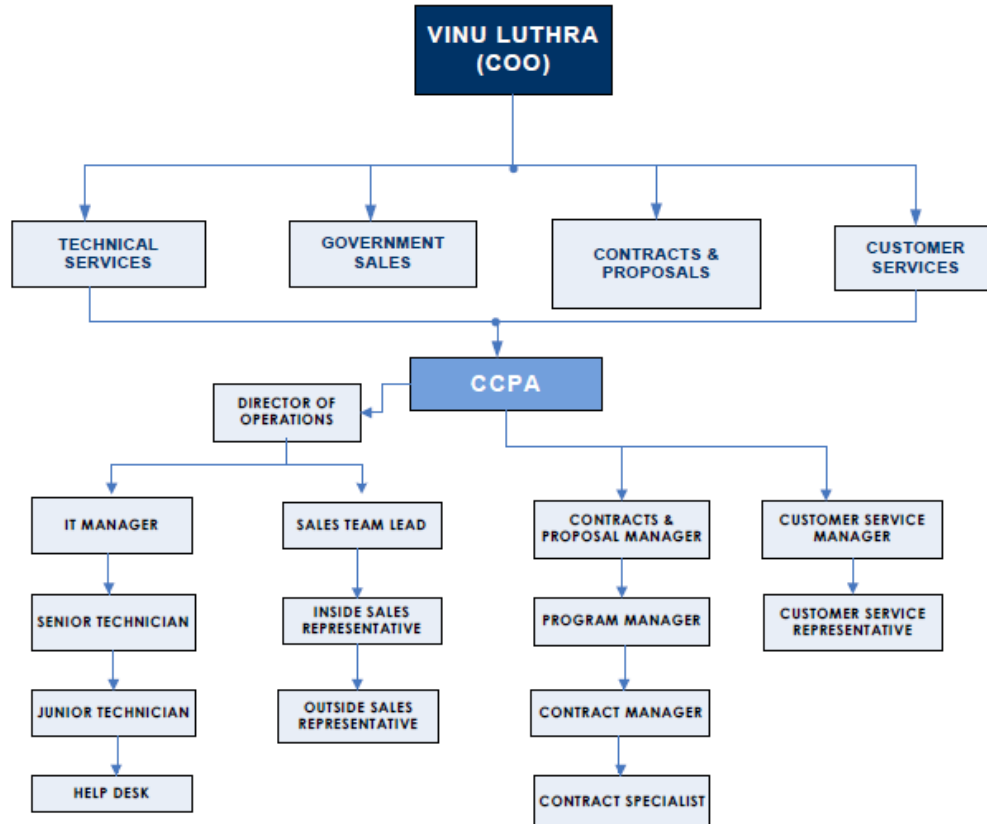
DSI is a privately owned corporation with 2 principals:

- Atul Bhatia – Chief Executive Officer –44.4 % ownership share
- Vinu Luthra - Chief Operating Officer – 44.4% ownership share
- Maruf Ahmed – Shareholder - 11.2% ownership share

DSI three principals oversee 100% of business operations. The significance of all the owners being directly involved in personally overseeing the day-to-day activities of the company is that their ideas and philosophies related to customer service and business growth, remain the focus of each employee.

- c. Provide a management organization chart of your overall organization, showing director and officer positions and names and the reporting structure. Provide detailed information for the Technology Products and Associated Services business segments of your organization, showing the reporting structures within these segments and among these segments and the overall organization;

The chart below shows our organizational structure as it relates to this procurement. Our overall Organization Chart with personnel names has been provided in Section 4.2.2 above.



- d. Describe any organizational changes such as divestitures, acquisitions, or spin-offs involving such business segments that have occurred in the latest two (2) years or are anticipated in the future.

DISYS Solutions, Inc was incorporated in Virginia on 05/20/2010. We were previously part of Digital Intelligence Systems Corp. (DISYS) – incorporated June 23, 1994 – and recently transitioned as a new entity DISYS Solutions, Inc. This change is effective as of June 11, 2010.

Digital Intelligence Systems Corp. (DISYS) has separated its State, Local and Education division from its Consulting division. The State, Local and Education (SLED) division will operate under a new company, DISYS Solutions Inc. As a part of this move, the entire DISYS SLED team consisting of team leaders, inside sales staff, technical and support staff has transitioned to DISYS Solutions, Inc.



### 3.4 Analytic Approach

DSI understands these requirements and will provide the required information to the City as requested.

### 3.5 Guarantor

DSI is a privately owned independent company and will act as our own guarantor for this contract

### 3.6 Financial Information

DSI understands this requirement and will provide the required information, without exception, within 24-hours upon request. DISYS is a private company and considers our financial statements confidential under the Federal Freedom of Information Act section 5 U.S.C. §552(b)(4). As such, financial information is kept with our corporate principals only. Any information requested will be provided directly from our Chief Operating Officer, Vinu Luthra. If this information is provided, please take care to keep this information confidential and use it only for internal purposes to determine vendor suitability.

### 3.7 Proposed Project Team

DSI is teaming with some partners on this proposal – however, we are unable to estimate the percentage of services that will be provided by these team members as this is an IDIQ contract. Please see the following table for a brief list of teaming partners with DSI with a brief description of the services they will be providing.

Company Name	Website	Services Provided
Delex Systems, Inc.	www.delex.com	Unified Security Solutions
Arrow Electronics, Inc.	www.ecs.arrow.com	Arrow FUSION Cloud Services Server and Network Infrastructure Solutions Helpdesk Support Consulting Services
Terremark	www.terremark.com	Infrastructure and Cloud: Colocation, Enterprise Cloud, Managed Hosting, Network & Connectivity, IT Professional Services.  Security Services: Governance, Risk and Compliance Management; Identity and Access Management; Data Protection; Management Security
Total Site Solutions	www.totalsitesolutions.com	Complete Data Center Services and Technology Consulting Services
CPI Training Solutions, Inc.	www.solutionsrus.com	Microsoft Office 2007 and 2010 Training

### **3.8 Past of Pending Judgments**

DSI has no past or pending criminal, civil or administrative litigation any or within the past five (5) years nor are there any cases pending against DSI.

### **3.9 Financial and Legal Considerations**

DSI understands this requirement and will provide the required information, without exception, within 24-hours upon request.

### **3.10 Management Approach**

#### **3.10.1 Customer Service Philosophy**

DSI's customer service philosophy starts from the top down. Our owners are involved in the day-to-day operations of our company. The significance of all the owners being directly involved in personally overseeing the day-to-day activities is that their ideas and philosophies related to customer service and business growth, remain the focus of each employee. DSI has built a large clientele of satisfied customers due to the successful implementation of its owner's philosophies and procedures, which make up our Management Plan.

The impact of all of our owners being directly involved in the business is, that even though we experienced significant growth, the focus and philosophy of providing goods and services with the utmost concern for customer service, is an integral part of every action throughout the company. The focus of our owners has always been to provide excellent customer service.

Customer satisfaction sets us apart from our competition. We work with our clients through such issues as duplicate/incorrect shipments, erroneous configurations, inaccurate pricing, incompatible products, etc. The DSI customer service team is dedicated to solving problems that arise on an unexpected basis. The department has been trained to handle problems/inquiries in conjunction with all vendors represented by our company. In addition, all sales and technical support personnel have been trained in customer service. Sales Team members who consistently do not follow DSI sales processes in the required time frame are reprimanded up to and including termination. DSI expects all staff members to share in our dedicated customer service philosophy. This ensures that all customer-related issues will be handled in the shortest time and most effective manner possible. DSI dedication to customer service will ensure that all aspects of service for customers are met and exceeded.

#### **ITIL Methodology**

DSI also provides seamless customer service by using a project management tool/philosophy called ITIL. DSI is compliant with all ITIL strategies and methodologies. ITIL is the most complete, and globally accepted "methodology" or "library" for delivering IT services across the country.

### 3.10.2 Total Quality Plan

#### **Quality Management Methodology**

DSI has adopted a Quality Management Methodology (QMM) because we are dedicated to providing solutions that focus on helping our customers meet or exceed their mission and achieve their goals. As a national Information Technology Product & Service Provider, we are committed to consistently meeting or exceeding our customers' requirements and expectations of the products and services we deliver.

#### **Quality Objectives**

DSI uses customer feedback to continually improve the usefulness of the solutions we deliver. The following quality objectives were developed to assist us in meeting our goal:

- Quality Products
- Timeliness of Performance
- Cost Control
- Sound Business Relations
- Overall Customer Satisfaction
- Effective Subcontractor Management.

Our objectives are measured during our Customer Satisfaction Assessment (CSA) process and reviewed at regular intervals by Top Management at formal management reviews. Top management communicates the importance of meeting the customer requirements to all employees and ensures the availability of the necessary resources to implement the QMM.

#### **Quality Control**

DSI Quality Control includes but is not limited to the following activities:

- In order to ensure adherence to contractual requirements, business meetings and other reviews are held, as required, during contract performance.
- Contract requirements are assessed to ensure (1) customer requirements are adequately defined; (2) statutory and regulatory requirements are identified and evaluated; (3) DSI has the in-house capability to satisfy the technical requirements. When in-house capability is not available, DSI can acquire external resources such as a subcontractor, associate, or consultant to satisfy the technical, cost and schedule requirements. The review is performed prior to submission of a quote or proposal.
- For each customer order, documented Order Processing Guidelines are followed which define and document how the customer's requirements are to be satisfied. This plan is documented in a format that allows electronic transfer for timely action.
- Purchasing procedures and guidelines ensure that supplies, materials or services, which are purchased by DSI, conform to specified requirements. Evaluation and re-evaluation of suppliers, associate contractors, and consultants are widely used by DSI to add value, as well as, augment the company's support service capability. DSI evaluates, re-evaluates and selects subcontractors, associates, and consultants on the basis of their ability to meet subcontract requirements.

- To ensure calls are actually handled according to their purchased or requested level of support, DSI uses an online system to track and automatically escalate calls to someone more senior. DSI currently uses SAGE® Customer Relationship Management (CRM) Software Program for all of our Service Requests. The following is an excerpt from other parts of the proposal outlining escalation.

#### Problem Correction

DSI emphasizes the use of problem correction to determine the actual cause of non-conformances (including customer complaints, nonconforming products, and nonconforming processes) to prevent their recurrence in the following ways:

- Effective handling of customer complaints and reports of product nonconformity
- Investigation of the root cause of nonconformity relating to product, process, and recording the results of the investigation
- Corrective Actions are recorded on Corrective Action Requests (CARs)
- Determination of the corrective action needed to eliminate the cause of nonconformity
- Application of controls to ensure that corrective action is taken and that it is effective.

#### Order turnaround time

The following are two examples of how DSI uses the SAGE CRM system to track and escalate orders and requests. See “Order processing and routing” above for specific steps and days to process orders from start to finish.

#### Sales Call Escalation Procedures for Order Entry

3 hours for Sales Rep

2 hours for any team member assigned

6 hours for Contract Administrator

9 hours for COO

12 hours for CEO

Total hours: 12

*Note: Sales Rep will have 3 hours to close the ticket. They can assign this ticket to anyone in their group. They will receive a notification on the 2<sup>rd</sup> hour. Assigned person will have 2 hours to finish the ticket. Contract Administrator will receive the ticket (escalation) on the 6<sup>th</sup> hour, COO on 9<sup>th</sup> and CEO on 12<sup>th</sup>.*

Sales Call Escalation Procedures for Quotes

1 hour for Sales Rep  
.50 hours for any team member assigned  
2 hours for Team Leader  
4 hours for Contract Administrator  
9 hours for COO  
12 hours for CEO  
Total hours: 12

*Note: POS will have a longer escalation timeframe since most will have due dates at least a week out. Once awarded a contract an escalation schedule will be implemented. Sales Rep will have 1 hour to close the ticket. They can assign this ticket to anyone in their group. They will receive a notification on the half hour. Assigned person will have thirty minutes to finish the ticket. Team Leader will receive the ticket (escalation) on the 2<sup>nd</sup> hour. Contract Administrator will receive the ticket (escalation) on the 4<sup>th</sup> hour, COO on 9<sup>th</sup> and CEO on 12<sup>th</sup>.*

The Result

While availability issues come up due to many factors, DSI has made sure that we have procedures set in place to ensure delivery requirements are met or exceeded. On all of the contracts that we have been a Prime Contractor or Sub Contractor, we have not failed to maintain a delivery schedule for the majority of our customers. Our primary goal is going beyond to meet the needs and goals of our customers no matter how small or large their orders are. DSI intends to continue to perform according to proper business principles and ethics, in effect offering the best value to Contract Agency.

**3.10.3 Continuous Improvement Program**

**Continuous Improvement Program**

In order to stay in business and be profitable, DSI must continuously improve our processes and capabilities. We set measurable goals and review our processes for continuous improvement. We review our internal data on a quarterly basis, generate internal reports, prepare action plans for improvement, as well as assess improvement needs. DSI utilizes our Quality Management Methodology and Contract Management Processes to continuously improve the usefulness of solutions we deliver. We constantly aim to improve the quality of products we offer, to control our costs, enhance timeliness of delivery, and achieve customer satisfaction.

DSI continuously seeks customer feedback so that we can improve our processes and quality of our deliverables. Our owners and Top Management review are objectives and conduct Customer Satisfaction Assessment (CSA) at regular intervals in order to ensure that we meet our goals. Top management communicates the importance of meeting the customer requirements to all employees and ensures the availability of the necessary resources to implement DSI' QMM.

DSI focuses on the following key areas to ensure the success of our Continuous Improvement Program:

- Focus on customer requirements
- Clear leadership direction and plans
- Develop competent and committed employees
- Develop informative relationships with customers
- Continually improve processes, products and services

### 3.10.4 Adapting to Changing Technologies

#### **Adapting to Changing Technologies**

Effectively adapting to changing technology is key to survival in the Information Technology business. In order to be competitive in the Information Technology industry, DSI must stay on top of emerging technologies and trends. We must constantly prepare and plan for changes. DSI has had over a decade of experience providing knowledge and extensive know-how relative to recommendations for the purchasing of hardware and software in light of rapidly changing technology market trends and conditions. Vinu Luthra, our Chief Operating Officer, personally oversees DSI Information Technology Procurement and Services division. He personally ensures all DSI technology product and services contracts have a staff of sales and engineering personnel that maintain above standard customer service skills and knowledge of current and emerging technologies. DSI dedicated team members receive constant training on emerging technologies. Providing cost-effective solutions, quality deliverables, an expeditious response time, added value, outstanding support, and knowledge transfer of emerging technologies is the reason DSI continues to grow.

DSI is also using ITIL methodologies to continue with improving our services and adapting to new technologies. DSI adheres to ongoing technology advances and keeps all employees abreast of what it takes to have a knowledgeable understanding of new forms and versions of technologies this day and age.

Continual service improvement, defined in the ITIL continual service improvement aims to align and realign IT services to changing business needs by identifying and implementing improvements to the IT services that support the business processes. It incorporates many of the same concepts articulated in the **Deming Cycle** of Plan-Do-Check-Act. The perspective of CSI on improvement is the business perspective of service quality, even though CSI aims to improve process effectiveness, efficiency and cost effectiveness of the IT processes through the whole lifecycle. To manage improvement, CSI should clearly define what should be controlled and measured.

CSI needs to be treated just like any other service practice. There needs to be upfront planning, training and awareness, ongoing scheduling, roles created, ownership assigned, and activities identified to be successful. CSI must be planned and scheduled as process with defined activities, inputs, outputs, roles and reporting.



Improvement initiatives typically follow a seven-step process:

1. Identify the strategy for improvement
2. Define what you will measure
3. Gather the data
4. Process the data
5. Analyze the information and data
6. Present and use the information
7. Implement improvement

## 3.11 Personnel Management

### 3.11.1 Dedicated Account Team

#### **Dedicated Account Team Structure / Resources**

DSI utilizes a dedicated account team structure for all of our contracts. DSI is made up of motivated professionals who are committed to applying their skills, knowledge, experience, special training, and energies to the achievement of the objectives of our organization. Our dedicated sales team for the City of Charlotte has been in place for over 6 years, with no turnover. However, should one of the Key Personnel leave DSI employ and a trained replacement is not immediately available, DSI will adjust the resources of other sales and administrative teams in order to ensure requests are handled according to contract deliverable timeframes. This scenario typically occurs when a Dedicated Account Team member goes on vacation. All contract team leaders and sales staff use the same software and server resources, are cross trained on all of the top brands, and are familiar with educational and government procurement policies. Additionally, the CRM software which provides DSI with tracking and escalation of all requests which enter DSI allows us to store pertinent customer data so that any one team member can assist a customer if the individual the customer has been dealing with is unavailable.

In addition to the dedicated sales team, DSI also has a dedicated technical team in place for CCPA. We have assigned a dedicated technical team to support government customers to the CCPA.

The dedicated sales and technical teams are managed by our Director of Operations, Vijay Soni, who will provide oversight for this contract and ensure that all issues are handled to the customer's satisfaction.

The following chart provides the specific contacts for the CCPA Contract. The Dedicated Sales Reps will process orders, provide advance notice of upcoming product changes, provide pre-sales support of "optional" products, coordinate delivery with manufacturers, as well as provide post-sales support of all delivered and installed products. Additionally corporate staff will serve as backups to perform installation, training, and repair as needed to meet Requesting Agency needs.



Office Locations and Key Support Personnel

DSI has the following office locations and support personnel to service this contract.

Headquarters Office: 4151 Lafayette Center Drive, Suite 600  
Chantilly, VA 20151  
Contact: Vijay Soni, Director of Operations  
Phone: (888) 286-3896  
Fax: (801) 601-2944  
E-Mail: [ncsales@disyssolutions.com](mailto:ncsales@disyssolutions.com)  
*This location will serve as the primary location for all North Carolina contract related functions.*

North Carolina Office: 7467 Sedgebrook Drive W  
Stanley NC 28164  
Contact: Chuck Griffith, Outside Sales Executive  
E-Mail: [ncsales@disyssolutions.com](mailto:ncsales@disyssolutions.com)  
*This location will serve as the secondary location for all North Carolina contract related functions.*

Sales Team representatives are available 8:00 am – 5:00 pm Eastern Time, Monday – Friday. The North Carolina Dedicated Sales Team contact information is below (in brief):

<p><b>Ordering, Sales, Inquiries</b>  4151 Lafayette Center Drive, Suite 600  Chantilly, VA 20151-1691  <b>Phone:</b> (888) 286-3896  <b>Fax:</b> (800) 601-2944  <b>Email:</b> <a href="mailto:ncsales@disyssolutions.com">ncsales@disyssolutions.com</a>  <b>Online:</b> <a href="http://www.disyssolutions.com/online">www.disyssolutions.com/online</a></p>	<p><b>Remittance:</b>  P.O. Box 405881  Atlanta, GA 30384-5881  <b>Phone:</b> (888) 286-3896  <b>Fax:</b> (800) 601-2944  <b>Email:</b> <a href="mailto:accounting@disyssolutions.com">accounting@disyssolutions.com</a>  <b>FIN:</b> 27-2586114</p>
<p><b>Your Dedicated Team</b></p> <p><b>Director of Operations:</b> Vijay Soni, (703) 234-6270  <b>Team Leader:</b> Pankaj Sharma, (703) 234-6276  <b>Inside Sales:</b> Vinant Prahlad, (703) 234-6275  <b>Outside Sales:</b> Chuck Griffith, (704) 827-2511</p> <p><b>Returns:</b> <a href="mailto:returns@disyssolutions.com">returns@disyssolutions.com</a> or (888) 286-3896  <b>Technical Support:</b> <a href="mailto:services@disyssolutions.com">services@disyssolutions.com</a> or (888) 286-3896</p>	

### Dedicated Sales Team

The Dedicated Sales Team chart below shows the complete project staffing, detailing the various positions, which will be used by DSI to ensure success of the City of Charlotte contract requirements.

Name	Position	Qualifications
Vijay Soni	Director of Operations	<ul style="list-style-type: none"> <li>• 8+ years experience as contracts manager post award</li> <li>• 15+ years experience providing Cisco products and services</li> <li>• Strong technical and educational background</li> <li>• Certifications: IP Tel Certified II, Cisco Sales Expert 2.0, Cisco Call Manager Express Sales, Cisco Service Expert Program, Wireless LAN Specialization for AM's v3.0, MS Certified Professional</li> <li>• Single Point of Contact for all Contracts related issues.</li> </ul>
Pankaj Sharma	Sales Team Leader	<ul style="list-style-type: none"> <li>• 10+ years experience as account manager for sales.</li> <li>• Cisco Sales Expert, CCDA, Cisco Advanced Wireless LAN Sales Specialist</li> </ul> <p>Responsible for:</p> <ul style="list-style-type: none"> <li>• Develop relationships with customers</li> <li>• View status reports, ensures timely and accurate shipment of orders, and coordinates and manages activities within the Dedicated Sales Team</li> </ul>
Vinant Prahlad	Dedicated Inside Sales Representative	<ul style="list-style-type: none"> <li>• 6+ years experience as sales representative for state, local and education sales.</li> <li>• Cisco Services Expert</li> </ul> <p>Responsible for:</p> <ul style="list-style-type: none"> <li>• Processes all customer requests for quotes, customer orders;</li> <li>• Receive customer feedback</li> <li>• Perform hardware/software analyses to provide comparative data of performance characteristics and suitability within the existing systems environment.</li> <li>• Prepare trade-off studies and evaluations for vendor equipment.</li> <li>• Recommend network design changes/ enhancements for improved system availability and performance</li> <li>• Report to Team Leader</li> </ul>
Chuck Griffith	Outside Sales Representative	<ul style="list-style-type: none"> <li>• Project experience in all areas of IT since 1996, including analog, digital communications, collaboration, telecommunications, data transport and protocols, storage, software, security and collaboration.</li> <li>• Current Cisco CSE, NetApp, VMWare (VSP5) &amp; EMC Sales Accreditations</li> <li>• Responsible for:</li> <li>• Support customers in analyzing needs and identifies ideal solutions.</li> <li>• Maintains customer relationships and primary point of contact for customer service.</li> <li>• Assists with project planning and resource allocation.</li> <li>• Provides product updates and consultation.</li> <li>• Responsible for Client and Internal reporting, as required.</li> </ul>
Tina Tiwana	Customer Service Representative	<ul style="list-style-type: none"> <li>• 8+ years experience as Service Representative.</li> </ul> <p>Responsible for:</p> <ul style="list-style-type: none"> <li>• Administrative support to sales team</li> <li>• Process customer requests for RMAs and over-shipments</li> <li>• Work with Credit Department to ensure proper customer credit</li> <li>• Facilitate warranty service/returns with manufacturers</li> </ul>

### Dedicated Technical Team

DSI's technical personnel are trained and manufacturer certified annually in a variety of products/services. The technical personnel below are dedicated to contracts within the State of North Carolina. Additional personnel can be assigned to support the contract as needed.

Personnel	DSI Position	Yrs. Exp.	Relevant Certifications/Skills
Sivakumar Mahalingam	Senior Voice Engineer	9	Microsoft Certified Professional, MS-Office, Visio, Windows XP/NT/2000/2003/Vista/MAC X, TFTP/FTP/TELNET, Active Directory, DHCP, DNS, Exchange 2003, GPO, Develop Implementation Plans Write Design Documents, Test and Acceptance documents, As-Built, CCVP, CCNA Security, CCSP, CCNA, IPS Specialist, Rich Media Communications Specialist, Advanced Wireless Field Specialist, Network Admission Control Specialist, Sales Expert 3.0, IP Contact Center Express Specialist, Data Center Application Services Support Specialist, Foundation Express field Specialist
Nugroho Hadhiman	Senior Network Engineer	12	Other: HP Procurve Security and Mobility Professional, Microsoft Office 2010, Windows XP, Vista and 7, CCNP, CCNA, CCDA, Service Expert, Wireless/LAN & IP Telephony Operations Specialist, Advanced Wireless Design Specialist, Advanced Wireless Field Specialist; Optical Fiber, VPN
Ismail El-Shalh	Senior Network Engineer	10	CQS-CDCNID, CCNP, CQS-DCNIS, CQS-ARSFE, CCNA, CQS-DCASD, CCDA, CCIE-Routing/Switching
Himmat Singh Rathore	Senior Network Engineer	12	Project Management Professional (PMP), Juniper Networks Certified Internet Specialist (Firewall), ITIL V3 Foundation, Microsoft Certified Systems Engineer, CCIE – Voice, CCIE – Security, CCIE – Routing & Switching, CCIE – Service Provider, CQS - IP Telephony Design Specialist, CQS - IP Telephony Operations Specialist, CQS - IP Telephony Express Specialist
Vijay Yadav	Senior Network Engineer	3	CCIE – Voice, Web Security Field Engineer,
Brian Keyes	Senior Network Engineer	14	Microsoft Certified Systems Engineer, CompTia Security Plus, CCNA
Vaijanath Sonvane	Senior Network Engineer	5	CCNA, CCVP, CCNA – Voice, CCIE – Voice, CCNP - Voice
Prem Tiwari	Senior Network Engineer	6	LCSAS, Networks Certified Internet Associate (Enterprise Routing), Networks Certified Internet Associate (Enterprise Switching), Networks Certified Internet Associate (Firewall/VPN), Networks Certified Internet Associate (M/T- Series Router), Networks Certified Internet Specialist (Enterprise Routing), Networks Certified Internet Specialist, Networks Sales Associate Unified Access Control, Networks Sales Associate SSL, Networks Sales Associate Firewall, Networks Sales Associate IDP, Networks Sales Associate Enterprise Switch, Networks Sales Associate WAN Acceleration, Networks Sales Associate Enterprise Routing, Networks Sales Associate Advanced Network Infrastructure, Networks Sales Specialist Unified Access Control, Networks Sales Specialist SSL, Networks Sales Specialist Firewall, Networks Sales Specialist IDP, Networks Sales Specialist Enterprise Switch, Networks Sales Specialist WAN Acceleration, Networks Sales Specialist Enterprise Routing, Networks Sales Specialist Advanced Network Infrastructure, CCIE – Routing & Switching, CCIE – Service Provider, CCNP, CCSP, CCNA
Arun Kumar	Senior Network Engineer	10	Firm knowledge of QOS, Implemented CBWFQ, Modular QOS, E1 line Configuration, Frame relay traffic shaping, Virtualization: OpenVZ, Linux XEN, Microsoft Hyper-V, VMware ESX/ESXi 3.5/4.x, VMware vSphere 4.x, VMware Server 2.0, Workstation, VMware Virtual Desktop Infrastructure (Cloud Infrastructure), Firewall/Security: PIX/ASA, packet filters, IOS Firewall feature set, ipchains, iptables, pfctl, Novell Security Manager, Astro Firewall, Untangle, COPS, Tripwire, Satan, Saint, Portmapper, SecureLIB, TCP Wrappers, ISS, Snort, NetCat, SSH, PGP/GPG, Nmap, Nessus, Ethereal, ethercap, snoop, tcpdump, ntop, dsniff, Lan Watch, VPN Technology, VPN Concentrator, OpenVPN, OpenSWAN, IPsec Compliant products, IPSEC, DMVPN, GRE Tunnel, CQS-CUSS, CQS-DCASS, CQS-CUDN, CCNP-V, CCNA, CCVP, CCIE-Voice, DCSSS

### **Certified Technical Support**

DSI will assign Technical personnel that have been trained and certified by various manufacturers such as Cisco, IBM, HP, Microsoft, Symantec, and more - to perform installation, configuration, training, and maintenance of all proposed equipment. DSI maintains a staff of Certified Engineers at various levels who stay current with emerging product technology in order to pass re-certification exams.

Our staff is not only certified but experienced in advising customers in the best methods of successfully deploying networking communications products and technologies. DSI has an in-house lab with various networking equipment for the sole purpose of securing the benefit of hands-on evaluation and testing. DSI will not assign any technical personnel to this contract who has not received the required training to perform the necessary services at a high level. The table on the following page is a list of Technical Team Members that will be assigned to the City of Charlotte contract. This list details the experience and technical certifications possessed by each of the team members. Team members are constantly adding and/or upgrading technical certifications.

- a. Describe your organization's approach, policies, and experience with respect to deployment of your personnel; and

#### **Approach to Deployment of Personnel**

DSI will review a customer's need, research project requirements, taking into consideration the customer's unique infrastructure, and then determine how to meet their current and future needs. DSI offers a unique advantage to the City of Charlotte by being both a nationally recognized hardware reseller and an experienced consulting and technical services provider. Having a consulting arm allows us to provide quick and efficient deployment of technicians for large projects that may come up with little notice. DSI is highly experienced at analyzing the needs and requirements of Government and Education agencies. We are aware of the unique networking requirements of particular agencies and will be able to deploy the correct personnel for the job.

Our approach to deployment will vary depending on the requirements. Please see Attachment A – Installation Capabilities for our approach to Installation Projects, Please see Attachment B – Technical Support Capabilities for our approach to individual support requests.

- b. Has your organization been the subject of a dispute or strike by organized labor within the last five (5) years? Describe the circumstances and the resolution of the dispute.

#### **Organized Labor Dispute or Strike**

DSI, Inc. has not been under any dispute or strike within the past five (5) years

### **3.12 References**

Please see Section 5 for the required references.

## 4. Proposed Solution

### 4.1 Process

For all new contracts, we believe it is essential to arrange a meeting with the relevant agency representatives before or within 30 days of contract award to discuss content, procedures, and specific requirements of the Contract. At this meeting, our objective is to find out as much as we can about the agency (organization, structure, culture, technology, etc) and the specific role or roles which affect DSI doing business. By developing a clear understanding of our customers' contract goals, priorities and environment's, we have a successful track record fulfilling contract requirements above expectation.

### 4.2 Transition Plan

The following transition plan is of a general nature and will focus on how to gain relationships quickly and in an orderly fashion. Among these will be how DSI will gain recognition and the major market share of the opportunities available in the City of Charlotte. DSI recommends we meet with City of Charlotte Contract POC's upon award to discuss goals and their suggestions for the new contract compared to services previously offered so that we can develop a more detailed transition plan.

#### **Contract Transition Plan Timeline**

*Transition Efforts for Award + 1 week:*

Task	Department Involved						
	<u>Contract</u>	<u>Sales</u>	<u>Marketing</u>	<u>Accounting</u>	<u>HR</u>	<u>Technical Support</u>	<u>Purchasing</u>
Scan/Copy all related proposal and contract documents for Administrative File and Sales Department.	X						
Prepare Contract Overview and highlight customer specific terms, pricing, and response times.	X						
Schedule meeting Contract Agency Contract Administrator to discuss marketing, news release, logo requirements, agency contact list, etc.	X	X					
Create Custom Web Page to include contract details, contact data, links to contract agency, online store, manufacturer sites, and price lists.	X		X				
Post Contract Award on DSI Government Contracts and News Sites.			X				
Set up customer specific email alias ("X"SALES@disysolutions.COM) and test to ensure assigned sales team is receiving messages.	X	X				X	
Set up customer specific online store pricing rules based on awarded pricing. Test sample parts for discount accuracy. Create hard copy catalog if required.	X	X					
Create Contract Tag in Accounting System to record/report purchases.				X			
Create Account Code in Accounting System for Contract Admin Fee tracking and payment.				X			





Task	Department Involved						
	<u>Contract</u>	<u>Sales</u>	<u>Marketing</u>	<u>Accounting</u>	<u>HR</u>	<u>Technical Support</u>	<u>Purchasing</u>
Create sales tax codes and payment terms.				X			
Add to Reporting Calendar and prepare templates, design custom reports if applicable.	X			X			
Schedule group meeting with assigned dedicated sales team, contract admin, and technical team to review contract requirements and set escalation procedures in CRM tool.	X	X	X			X	
Review staffing levels, redistribute team member or hire additional staff if needed.		X			X		
Provide receptionist with information to send calls to appropriate Sales Team.		X			X		
Create flyer announcing award, benefits to users, company contact info, etc and send to eligible buying agencies.		X	X				
Dedicated Sales Team members to call eligible buying agencies to introduce contract and company.		X					
Create special pricing discounts with purchasing resources to offer lower pricing as it becomes available.							X

*Transition Efforts for Award + 2 weeks:*

Sales Department – Sales and Marketing Staff to implement the following Action, Research, and Promotion Agendas:

ACTION Agenda

- A. DSI will assign an Account Team that will become familiarized with the needs of individual City of Charlotte contract users. DSI will determine the size of the team required upon meeting with City of Charlotte to discuss their needs.
- B. Sales and Contract Team members to contact Cisco representatives to develop special promotions, meet with Customers, discuss training and technology needs, and obtain knowledge about competitor contracts as well as discuss ways they can help promote the contract to customers in the areas they call upon.
- C. Receive contact list of eligible City of Charlotte Customers. Begin “Phone Campaign Plan” to introduce company, verify proper agency contacts, provide contract benefits, and discuss ways we can assist them. A major part of this action is also to record information which will be used in the research step later. Detailed customer information will be recorded and logged in a database. Important types of information will include their average computer spending, major brands purchased, buying quarter and if they will purchase all applicable products from the Contract and if not, why.
- D. Prepare “Onsite Visit Campaign.” Initially, agencies with the largest sales will be contacted for on-site visits. Once visits are completed then each eligible City of Charlotte customer in geographic order will be personally contacted.

RESEARCH Agenda

- A. The Sales team will review the research provided during the phone and on-site visits and determine a course of action for any items that may need addressing. For example,

DSI would research the reasons why customers (especially agencies not required to use the contract) may not buy all applicable items off the contract. This information will allow DSI to ensure it takes steps to resolve any reasons a customer would not want to purchase from the contract.

- B.
- B. Current DSI customers who are eligible to purchase from the contract vehicle will be reviewed and a campaign to contact each contracting agency will be implemented. This campaign will involve informing these customers of our contract and discussing ways they can benefit.

### PROMOTION Agenda

- A. DSI will develop campaigns that will visually advertise the new contract, show promotions, highlight value-added tools, and provide information on how to use the resources provided by DSI. These campaigns will include e-mail blasts, mailers, and trade organization advertising.
- B. DSI will develop various promotions for eligible customers to take advantage of. These will be advertised using e-mail blasts, in our on-line store promotions corner, on the City of Charlotte dedicated website, and as a pop-up when participants log in to DSI Online.
- C. To keep eligible customers and gain new ones DSI will aggressively advertise pricing as well as value added benefits. This type of advertisement will show the contract benefits such as pricing, delivery schedule, and free support offerings. This type of promotion is effective for DSI as well as the City because we will constantly be evaluating what offerings need to be increased to keep and gain customers. DSI will also advertise promotions, trade shows, training and other offers.

### **Marketing the Master Agreement to Other CCPA Members**

We will aggressively advertise pricing and other valued added contract benefits to all agencies. This includes e-mail blasts, trade shows, outbound sales calls, on-site visits, and flyer mailings that will show the value-added items in place and what other contracts have. This type of promotion is effective for DSI as well as City of Charlotte because we will constantly be evaluating where the prices and services need to be to keep and gain agencies.

DSI currently holds more than 25 state and local contracts nationally. Part of the Research Agenda section of DSI City of Charlotte Marketing Plan will be to contact each of the City of Charlotte Agencies to inform them of the benefits to purchasing from the City of Charlotte contract. We will emphasize the cost-savings via the valued-added services and support City of Charlotte customers receive.

### **New Business Development**

Developing new business leads to offer non-participating agencies the benefits of using the City of Charlotte contract for all their technology purchasing needs will involve a lot of research. Exactly where the sales and marketing staff will focus their energy will be spelled out in the Research Agenda of DSI City of Charlotte Marketing Plan. A major part of this research will be to first record the contract vehicles currently used to purchase IT products. Each technology category and major product

brand will be researched. At a minimum, the information to be recorded will be the prospective new customer name, their website link, purchasing contact info, technology department contact info, IT budget for the current and upcoming year, and what means they currently use to purchase products.

Some examples of the Research Agenda items will be:

📁 **K-12 Listing by State** - to determine if non-Participating agencies use their own vehicle, a statewide vehicle, or a cooperative purchasing group vehicle. Identify the Top 50 education entities not currently customers of City of Charlotte.

📁 **New Grants Issued** - this will determine the focus of the Sales Team on additional business which will be generated in the next 6 months to 1 year.

#### **Current Research**

We will continue to use the Marketing Plan and break down sales territories nationally and evaluate the opportunities available to sell products under a newly awarded contract to all government and education agencies eligible to purchase from it.

For the City of Charlotte contract, we will continue to develop new strategies which make use of the data compiled on existing contracts to help identify new opportunities.

#### **Marketing Tools**

Within the first quarter, to develop Cisco product awareness and leads we plan mailing two or more flyers each month to potential users. Additionally, we will blanket the purchasing sites with fax broadcasts to increase our joint name recognition, product and contract awareness and to stimulate immediate sales. We will also plan strategic e-mail announcements of products and opportunities.

DSI has been successful in many State territories by utilizing flyers for special products or promotions. We intend to utilize direct mail pieces to announce the contract as well as follow up monthly highlighting special offerings or products.

DSI will approach the initial marketing efforts using a mix of: flyers, fax broadcasts, e-mail blasts, person to person outside sales, inside sales, telemarketing, and trade shows. As additional support in developing Cisco product awareness and leads, we plan to establish a routine attendance at various trade and or location shows. These will highlight product demonstrations and incentive give a-ways to assist in opportunity development and awareness.

In addition to direct efforts, DSI has established a web presence that will highlight the Cisco contract and allow investigation of the products, company contact and purchasing from the web.

#### **Additional Research Tools**

We will continue to involve the Contracts and Proposals (CP) Department for the City of Charlotte contract. The CP Department currently researches ways to receive bid opportunities, actively looks for current bids and proposals, and responds to all applicable opportunities. We will continue to employ the CP department as a resource to increase new business by:

- Completing new bid opportunities using the City of Charlotte contract pricing and stipulating that upon award agency must be an approved City of Charlotte Agency to receive the special pricing.
- Provide information to the DSI City of Charlotte Contract Administrator regarding City of Charlotte Agencies who are soliciting competitive bids for items already on City of Charlotte contracts.
- Provide information to the DSI City of Charlotte Contract Administrator for expiring contracts before they come up for extension or re-bid so non-participating agencies can be convinced to save the administrative burden of soliciting proposals.

#### **Quarterly Meetings with Contract Administrator**

DSI will hold quarterly meetings with the City of Charlotte Contract Administrator to:

1. Review renewal and attach rates under the contract
2. Discuss any pending issues

### **4.3 Service Transition**

DSI will use the ITIL methodologies to provide a smooth and seamless transition of services to our platform. Service transition, as described by the ITIL service transition volume, relates to the delivery of services required by a business into live/operational use, and often encompasses the "project" side of IT rather than "BAU" (**Business as usual**). This area also covers topics such as managing changes to the "BAU" environment.

#### **List of ITIL processes in Service Transition (ST):**

1. Transition planning and support
2. Change management
3. Service asset and configuration management
4. Release and deployment management
5. Service validation and testing
6. Change evaluation
7. Knowledge management

#### **Change management**

Change Management aims to ensure that standardized methods and procedures are used for efficient handling of all changes. A change is an event that results in a new status of one or more **Configuration items (CIs)**, and which is approved by management, cost-effective, enhances business process changes (fixes) – all with a minimum risk to IT infrastructure.

The main aims of change management include:

- Minimal disruption of services
- Reduction in back-out activities
- Economic use of resources involved in the change

### **Service asset and configuration management**

Service asset and configuration management is primarily focused on maintaining information (i.e., configurations) about Configuration Items (i.e., assets) required to deliver an IT service, including their relationships. Configuration management is the management and traceability of every aspect of a configuration from beginning to end and it includes the following key process areas under its umbrella:

- Identification,
- Planning,
- Change Control,
- Change Management,
- Release Management, and
- Maintenance.

### **Release and deployment management**

Release and deployment management is used by the software migration team for platform-independent and automated distribution of software and hardware, including license controls across the entire IT infrastructure. Proper software and hardware control ensures the availability of licensed, tested, and version-certified software and hardware, which functions as intended when introduced into existing infrastructure. Quality control during the development and implementation of new hardware and software is also the responsibility of Release Management. This guarantees that all software meets the demands of the business processes.

The goals of release management include:

- Planning the rollout of software
- Designing and implementing procedures for the distribution and installation of changes to IT systems
- Effectively communicating and managing expectations of the customer during the planning and rollout of new releases
- Controlling the distribution and installation of changes to IT systems

Release management focuses on the protection of the live environment and its services through the use of formal procedures and checks.

A Release consists of the new or changed software and/or hardware required to implement approved changes. **Release categories** include:

- Major software releases and major hardware upgrades, normally containing large amounts of new functionality, some of which may make intervening fixes to problems redundant. A major upgrade or release usually supersedes all preceding minor upgrades, releases and emergency fixes.
- Minor software releases and hardware upgrades, normally containing small enhancements and fixes, some of which may have already been issued as emergency fixes. A minor upgrade or release usually supersedes all preceding emergency fixes.

- Emergency software and hardware fixes, normally containing the corrections to a small number of known problems.

Releases can be divided based on the release unit into:

- Delta release: a release of only that part of the software which has been changed. For example, security patches.
- Full release: the entire software program is deployed—for example, a new version of an existing application.
- Packaged release: a combination of many changes—for example, an operating system image which also contains specific applications.

#### 4.4 Project Plan

DSI develops a project plan for each individual project. Below is an example of a project plan that DSI recently put together for one of our projects. An MS Project Format of this Project Plan is provided in soft copy of our CD-ROM submission

Task #	Task Name	Duration in Days	Start	Finish
1	Award of Project	3d	Mon 1/17/11	Wed 1/19/11
2	Procurement	52d	Thu 1/20/11	Fri 4/1/11
3	Meet Towson University	2d	Thu 1/20/11	Fri 1/21/11
4	Finalize Bill of Material for Phase 1	3d	Mon 1/24/11	Wed 1/26/11
5	Ordering of equipment on Receipt of PO	2d	Thu 1/27/11	Fri 1/28/11
6	Receive Equipment	45d	Mon 1/31/11	Fri 4/1/11
7	Project Management	16d	Mon 1/24/11	Mon 2/14/11
8	Project Kickoff	1d	Mon 1/24/11	Mon 1/24/11
9	Project Launch workshop	14d	Tue 1/25/11	Fri 2/11/11
10	Establish Roles and Responsibilities	1d	Mon 2/14/11	Mon 2/14/11
12	Site Readiness Assessment	15d	Tue 2/15/11	Mon 3/7/11
13	Produce Site Requirement Specifications	1d	Tue 2/15/11	Tue 2/15/11
14	Current Network Assessment	5d	Wed 2/16/11	Tue 2/22/11
15	"Assess the physical ,electrical and environmental specifications"	5d	Wed 2/23/11	Tue 3/1/11
16	Assess the gaps between site requirements and site survey	1d	Wed 3/2/11	Wed 3/2/11
17	Provide recommendations related to the gaps	1d	Thu 3/3/11	Thu 3/3/11
18	Document the gap analysis	1d	Fri 3/4/11	Fri 3/4/11
19	Present and discuss the gap analysis and recommendations	1d	Mon 3/7/11	Mon 3/7/11
21	Detailed Design Development	19d	Tue 3/8/11	Fri 4/1/11
22	Conduct a Planning meeting to set expectations and to define deliverables	2d	Tue 3/8/11	Wed 3/9/11
23	Evaluate existing network design and documentation	2d	Thu 3/10/11	Fri 3/11/11
24	"Verify the chosen platform, features and functionality meets the design objective"	2d	Thu 3/10/11	Fri 3/11/11
25	Perform Network design activities	15d	Mon 3/14/11	Fri 4/1/11
26	Bandwidth modeling and QoS	2d	Mon 3/14/11	Tue 3/15/11

Task #	Task Name	Duration in Days	Start	Finish
27	Capacity planning	2d	Wed 3/16/11	Thu 3/17/11
28	Architecture review and Overall RISK assessment	1d	Fri 3/18/11	Fri 3/18/11
29	Network devices naming conventions	1d	Mon 3/21/11	Mon 3/21/11
30	VLAN and IP address scheme	1d	Tue 3/22/11	Tue 3/22/11
31	Scalability and redundancy assessment	1d	Wed 3/23/11	Wed 3/23/11
32	Security assessment in accordance with Best Practices	1d	Thu 3/24/11	Thu 3/24/11
33	Integrate technical requirements and design goals into the low level design	1d	Fri 3/25/11	Fri 3/25/11
34	"Develop ,deliver and discuss low level design document"	1d	Mon 3/28/11	Mon 3/28/11
35	Present the design with physical and logical topology	1d	Tue 3/29/11	Tue 3/29/11
36	Document the recommendations if any	1d	Wed 3/30/11	Wed 3/30/11
37	Provide QOS Snippets and requirements to University	2d	Thu 3/31/11	Fri 4/1/11
38	Perform Voice Design Activity	6d	Mon 3/14/11	Mon 3/21/11
39	Buildings and Phones per Building	1d	Mon 3/14/11	Mon 3/14/11
40	Departments and Extensions	1d	Tue 3/15/11	Tue 3/15/11
41	Dial Plan	1d	Wed 3/16/11	Wed 3/16/11
42	PRIs and Existing PBX	1d	Thu 3/17/11	Thu 3/17/11
43	User data for Phase 1A	1d	Fri 3/18/11	Fri 3/18/11
44	Define User set for University Phones	1d	Mon 3/21/11	Mon 3/21/11
45	OTS Faculty Help Desk & Discovery Session (UCCX)	1d	Mon 3/14/11	Mon 3/14/11
48	Implementation and Migration	103d	Mon 4/4/11	Wed 8/24/11
49	Implementation	103d	Mon 4/4/11	Wed 8/24/11
50	Verify Received equipment against BOM (Phase 1)	2d	Mon 4/4/11	Tue 4/5/11
51	Off Site SETUP and testing Hardware	12d	Wed 4/6/11	Thu 4/21/11
52	"Unpack all the Hardware, check for any hardware damages"	1d	Wed 4/6/11	Wed 4/6/11
53	Assemble system components.	1d	Thu 4/7/11	Thu 4/7/11
54	Power on all the Devices and make sure it works	1d	Fri 4/8/11	Fri 4/8/11
55	Put the asset tags on the switches if provided by TU	1d	Mon 4/11/11	Mon 4/11/11
56	Cisco Unified Communications Managers Cluster	8d	Tue 4/12/11	Thu 4/21/11
57	OS installation for Communications Managers	3d	Tue 4/12/11	Thu 4/14/11
58	Install Latest Patches for Communications Managers	1d	Fri 4/15/11	Fri 4/15/11
59	CallManager Cluster Configuration	1d	Fri 4/15/11	Fri 4/15/11
60	Provision Initial Users	1d	Mon 4/18/11	Mon 4/18/11
61	Dial Plan Configuration	1d	Tue 4/19/11	Tue 4/19/11
62	Conferencing and DSP Configuration	1d	Wed 4/20/11	Wed 4/20/11
63	Verify Cluster	1d	Thu 4/21/11	Thu 4/21/11
64	Cisco Unity Connection Voicemail Cluster	4d	Tue 4/12/11	Fri 4/15/11
65	OS installation Unity Connection Voicemail	1d	Tue 4/12/11	Tue 4/12/11
66	Install Latest Patches for Unity Connection Voicemail	1d	Wed 4/13/11	Wed 4/13/11
67	Unity Configuration	1d	Thu 4/14/11	Thu 4/14/11



Task #	Task Name	Duration in Days	Start	Finish
68	Integrating with CUCM	1d	Fri 4/15/11	Fri 4/15/11
69	Verifying Active / Active configuration	1d	Fri 4/15/11	Fri 4/15/11
70	Cisco Emergency Responder Server Group	5d	Tue 4/12/11	Mon 4/18/11
71	OS installation for CER	1d	Tue 4/12/11	Tue 4/12/11
72	Install Latest Patches for CER	1d	Wed 4/13/11	Wed 4/13/11
73	CER Initial Configuration	1d	Thu 4/14/11	Thu 4/14/11
74	Integrating with CUCM	1d	Fri 4/15/11	Fri 4/15/11
75	Verifying Active / Standby Configuration	1d	Mon 4/18/11	Mon 4/18/11
76	Cisco Unified Contact Center Express	4d	Tue 4/12/11	Fri 4/15/11
77	OS installation UCCX Server	1d	Tue 4/12/11	Tue 4/12/11
78	Install Latest Patches for UCCX Server	1d	Wed 4/13/11	Wed 4/13/11
79	Integrating with CUCM	1d	Thu 4/14/11	Thu 4/14/11
80	Verifying Active / Standby Configuration	1d	Fri 4/15/11	Fri 4/15/11
81	Voice Gateways	1d	Thu 4/21/11	Thu 4/21/11
82	Configure Voice Gateway with Initial Configuration	1d	Thu 4/21/11	Thu 4/21/11
83	Ship Equipment Onsite	1d	Fri 4/22/11	Fri 4/22/11
85	Onsite Setup and Testing	88d	Mon 4/25/11	Wed 8/24/11
86	Initial Setup and Cisco Integrations	6d	Mon 4/25/11	Mon 5/2/11
87	"Unpack all the Hardware, check for any hardware damages"	1d	Mon 4/25/11	Mon 4/25/11
88	Assemble system components.	1d	Mon 4/25/11	Mon 4/25/11
89	Rack the Equipment	1d	Mon 4/25/11	Mon 4/25/11
90	Power on and test	1d	Mon 4/25/11	Mon 4/25/11
91	Connect to Network	1d	Tue 4/26/11	Tue 4/26/11
92	Check for connectivity and redundancy among the clusters and check for Integrations among Servers	2d	Wed 4/27/11	Thu 4/28/11
93	Install Voice Gateways	1d	Fri 4/29/11	Fri 4/29/11
94	Configure and Add Voice Gateways to CUCM	1d	Mon 5/2/11	Mon 5/2/11
95	Integration with Microsoft	4d	Tue 5/3/11	Fri 5/6/11
96	Integrate CUCM with AD for User sync and auth.	1d	Tue 5/3/11	Tue 5/3/11
97	Integrate with Exchange for UM / VM	1d	Wed 5/4/11	Wed 5/4/11
98	Integrate CUCM with OCS	2d	Thu 5/5/11	Fri 5/6/11
99	Integration with NEC PBX	5d	Tue 5/3/11	Mon 5/9/11
100	Establish physical layer connectivity	1d	Tue 5/3/11	Tue 5/3/11
101	Configure NEC PBX for CUCM	1d	Wed 5/4/11	Wed 5/4/11
102	"Configure Voice GW and CUCM, for NEC"	1d	Thu 5/5/11	Thu 5/5/11
103	Configure appropriate Call Routing for initial set of Phones	1d	Fri 5/6/11	Fri 5/6/11
104	"Provide Proof of Concept, RISK Assessment and Fallback plan for all Phases"	1d	Mon 5/9/11	Mon 5/9/11
105	Third party Integration	2d	Tue 5/10/11	Wed 5/11/11
106	Integration with NICE	1d	Tue 5/10/11	Tue 5/10/11
107	Integration with Call Accounting system	1d	Wed 5/11/11	Wed 5/11/11

Task #	Task Name	Duration in Days	Start	Finish
108	Integration with Telepresence	2d	Thu 5/12/11	Fri 5/13/11
109	Deploy Music on Hold	1d	Mon 5/16/11	Mon 5/16/11
110	Configure BACKUP and DR	1d	Tue 5/17/11	Tue 5/17/11
110	Migration and Phone RollOut	77d	Tue 5/10/11	Wed 8/24/11
112	Phase 1A	18d	Tue 5/10/11	Thu 6/2/11
113	Install Initial 20 Phones	1d	Tue 5/10/11	Tue 5/10/11
114	Install and configure Analog Gateway	1d	Wed 5/11/11	Wed 5/11/11
115	Configure appropriate Call Routing in NEC	1d	Thu 5/12/11	Thu 5/12/11
116	"UCCx Script, Prompt,"	5d	Tue 5/10/11	Mon 5/16/11
117	"Agent Desktop, Integration and workflow(UCCX)"	5d	Tue 5/17/11	Mon 5/23/11
118	QA Testing(UCCX)	1d	Tue 5/24/11	Tue 5/24/11
119	Testing	3d	Fri 5/13/11	Tue 5/17/11
120	"Calls between extension, remote PBX and PSTN"	1d	Fri 5/13/11	Fri 5/13/11
121	Testing user feature	2d	Mon 5/16/11	Tue 5/17/11
122	Test Voicemail	2d	Mon 5/16/11	Tue 5/17/11
123	"Test e911 calls, Call Accounting"	2d	Mon 5/16/11	Tue 5/17/11
124	Training	15d	Fri 5/13/11	Thu 6/2/11
125	End User	2d	Fri 5/13/11	Mon 5/16/11
126	Administrator	15d	Fri 5/13/11	Thu 6/2/11
127	Cutover and day 2 Support	1d	Wed 5/18/11	Wed 5/18/11
128	Cutover and day 2 support for UCCX	1d	Wed 5/25/11	Wed 5/25/11
129	Phase 1B	18d	Fri 6/3/11	Tue 6/28/11
130	Collect User Data	3d	Fri 6/3/11	Tue 6/7/11
131	BAT in phones	1d	Wed 6/8/11	Wed 6/8/11
132	Install Phones	5d	Thu 6/9/11	Wed 6/15/11
133	Install and Configure Analog Gateway	2d	Thu 6/9/11	Fri 6/10/11
134	Configure appropriate Call Routing in NEC	5d	Thu 6/9/11	Wed 6/15/11
135	Testing	2d	Thu 6/16/11	Fri 6/17/11
136	"Calls between extension, remote PBX and PSTN"	2d	Thu 6/16/11	Fri 6/17/11
137	Testing user feature	2d	Thu 6/16/11	Fri 6/17/11
138	Test Voicemail	2d	Thu 6/16/11	Fri 6/17/11
139	Test e911 calls	2d	Thu 6/16/11	Fri 6/17/11
140	Training	7d	Mon 6/20/11	Tue 6/28/11
141	Agent and Supervisor	1d	Mon 6/20/11	Mon 6/20/11
142	End User Training	7d	Mon 6/20/11	Tue 6/28/11
143	Cutover and day 2 Support	5d	Mon 6/20/11	Fri 6/24/11
145	Phase 2A	18d	Mon 6/27/11	Wed 7/20/11
146	Collect User Data	3d	Mon 6/27/11	Wed 6/29/11
147	BAT in phones	1d	Thu 6/30/11	Thu 6/30/11
148	Install Phones	5d	Fri 7/1/11	Thu 7/7/11
149	Configure appropriate Call Routing in NEC	5d	Fri 7/1/11	Thu 7/7/11

Task #	Task Name	Duration in Days	Start	Finish
150	Testing	2d	Fri 7/8/11	Mon 7/11/11
151	"Calls between extension, remote PBX and PSTN"	2d	Fri 7/8/11	Mon 7/11/11
152	Testing user feature	2d	Fri 7/8/11	Mon 7/11/11
153	Test Voicemail	2d	Fri 7/8/11	Mon 7/11/11
154	Test e911 calls	2d	Fri 7/8/11	Mon 7/11/11
155	Training	7d	Tue 7/12/11	Wed 7/20/11
156	End User	7d	Tue 7/12/11	Wed 7/20/11
157	Cutover and day 2 Support	5d	Tue 7/12/11	Mon 7/18/11
161	Phase 2B per Cutover	18d	Mon 8/1/11	Wed 8/24/11
162	Collect User Data	3d	Mon 8/1/11	Wed 8/3/11
163	BAT in phones	1d	Thu 8/4/11	Thu 8/4/11
164	Install Phones	5d	Fri 8/5/11	Thu 8/11/11
165	Configure appropriate Call Routing in NEC	5d	Fri 8/5/11	Thu 8/11/11
166	Testing	2d	Fri 8/12/11	Mon 8/15/11
167	"Calls between extension, remote PBX and PSTN"	2d	Fri 8/12/11	Mon 8/15/11
168	Testing user feature	2d	Fri 8/12/11	Mon 8/15/11
169	Test Voicemail	2d	Fri 8/12/11	Mon 8/15/11
170	Test e911 calls	2d	Fri 8/12/11	Mon 8/15/11
171	Training	7d	Tue 8/16/11	Wed 8/24/11
172	End User	7d	Tue 8/16/11	Wed 8/24/11
173	Cutover and day 2 Support	5d	Tue 8/16/11	Mon 8/22/11
174	UCCX Install and Testing	15d	Thu 8/4/11	Wed 8/24/11
175	Additional Discovery	1d	Thu 8/4/11	Thu 8/4/11
176	"UCCx Script, Prompt, Document, Development"	5d	Fri 8/5/11	Thu 8/11/11
177	Agent Desktop Integration and Workflow	5d	Fri 8/12/11	Thu 8/18/11
178	Quality Assurance Testing	1d	Fri 8/19/11	Fri 8/19/11
179	Agent and Supervisor Training	1d	Mon 8/22/11	Mon 8/22/11
180	Cutover	1d	Tue 8/23/11	Tue 8/23/11
181	Second Day Support	1d	Wed 8/24/11	Wed 8/24/11
183	Option I (PRI move per cutover)	2d	Tue 8/23/11	Wed 8/24/11
184	Make list of DID's moved per Cutover/Migration	1d	Tue 8/23/11	Tue 8/23/11
185	Coordinate with Service provider to Move PRI / move numbers	1d	Tue 8/23/11	Tue 8/23/11
186	Install New/Moved PRI on Voice Gateway	1d	Tue 8/23/11	Tue 8/23/11
187	Provision in CUCM to route calls via new PRI	1d	Tue 8/23/11	Tue 8/23/11
188	Test Calls	1d	Tue 8/23/11	Tue 8/23/11
189	Day 2 Support	1d	Wed 8/24/11	Wed 8/24/11
190	Option II (PRI move in One GO)	2d	Tue 8/23/11	Wed 8/24/11
191	Coordinate with Service provider to Move PRIs	1d	Tue 8/23/11	Tue 8/23/11
192	Schedule Downtime	1d	Tue 8/23/11	Tue 8/23/11
193	Move PRIs and Test calls	1d	Tue 8/23/11	Tue 8/23/11
194	Provision in CUCM to route calls via new PRI	1d	Tue 8/23/11	Tue 8/23/11

Task #	Task Name	Duration in Days	Start	Finish
195	Test Calls	1d	Tue 8/23/11	Tue 8/23/11
196	Day 2 Support	1d	Wed 8/24/11	Wed 8/24/11
197	Documentation	10d	Wed 8/24/11	Tue 9/6/11
198	Hardware Inventory list with IP and Location information	2d	Wed 8/24/11	Thu 8/25/11
199	Usernames and password	2d	Fri 8/26/11	Mon 8/29/11
200	Running configurations for all the switches installed	2d	Tue 8/30/11	Wed 8/31/11
201	Versions installed	2d	Thu 9/1/11	Fri 9/2/11
202	Network Topology using MS-Visio	2d	Mon 9/5/11	Tue 9/6/11

## 4.5 Client Relationship Management

DSI uses a well-defined and logical contract management process for controlling work and providing our customers with insight into our activities at every step. The two main processes we will use to keep the city informed of this project will be to setup regular meetings with the City of Charlotte contract administrator and to provide monthly reports. This initial step is to set up a meeting with the City of Charlotte contract administrator and personnel in order to gain a complete understand of the City’s requirements and needs for this contract. DSI strives to maintain an informative relationship with our customers. Our Sales Staff is constantly trained on new products and informed about what products will be replaced. Their primary responsibility when sending quotations to customers is not to just quote current catalog or web site items, but to check availability of the products and inform customers of any availability issues that may arise. If we know that a requested item is going to be discontinued, we will inform the customer and let them know the status of a replacement item.

DSI customer service procedures involve constant follow up with customers for both quote requests and orders. Each time a quote is submitted a dedicated sales rep will follow up with the customer to ensure their goals have been met. We also call customers to inform them of receipt of their order so they can plan delivery and installation of their products if applicable. DSI uses our own CRM software to provide in-house and external reports designed to track and monitor order progress, as well as to provide agencies with requested contract reports. Reports include but are not limited to Warranty Status Tracking, Items Sold Detail by Agency, Subcontracting Spend, Cost Savings, Fill Rate, and Invoice Timeliness. In addition our online ordering system provides the ability for an agency to manage user accounts and create reports based on agency login account setup. Online store reports include Budget vs. Actual spend by cost center and by buyer, Quotes/Orders by buyer, and Orders by brand. This allows us to provide the City with contract information and keep them informed of the current progress of certain projects.

DSI will assign a dedicated team to oversee the City of Charlotte contract. DSI currently has a full time Dedicated Account Team which consists of highly qualified personnel on staff to properly perform the contract tasks for the City of Charlotte contract users. In addition to providing quotes and processing orders, their purpose is to develop and maintain relationships with City of Charlotte contract users. Personnel which make up the Dedicated Account Team consist of a dedicated Technical, Sales and Administrative staff who have become familiar with all aspects of the contract

in order to efficiently perform contract related tasks such as order processing (sales), design assistance (sales), hardware and software installation (technical), product documentation (marketing), product support (customer service), invoice processing (accounting) and more. The Account Manager, Team Leader, and Lead Engineer will conduct frequent meetings with Authorized Users and City of Charlotte to discuss emerging technology and infrastructure changes, oversee local subcontractors, maintain delivery schedules, deliverables, perform installation, training, repair, and receive contract feedback.

#### 4.6 Risk Management

DSI has obtained an in-depth understanding of the unique networking requirements of State and Local Government and Education agencies from over 13 years of experience as a provider of Information Technology products and services. The majority of our experience comes directly from the exact products and services being requested in this RFP. Through this experience, DSI has been able to develop an effective Quality Management Methodology and Contract Management Plan. We have gained in-depth knowledge of how to develop Transition Plans and Pre/Post-Sales Support Plans tailored specifically to each contract we are awarded in order to mitigate any potential risks. With our proven processes, DSI is able to reduce any possible risks that may face City of Charlotte and our company on this contract.

##### Risk Assessment and Management Plan

DSI risk assessment approach is depicted below. This approach has been successfully utilized on both Government and commercial contracts. DSI minimizes risk by using a proactive approach early in the project planning process. Although DSI strives to prevent problems, it is also prepared to identify issues early on to minimize their impact on schedule and cost.

Risk identification processes assure continuous risk assessment at project levels. Project risks are identified and documented at the beginning of the project and are continuously monitored and assessed throughout the life of the project. Project risks are identified during the Project Planning phase. For those risks not identified initially, periodic risk assessments are built into a Project Plan for the purpose of identifying new issues and associated risks.



### *Change Planning*

Change planning that identifies the risk level of a change and builds change planning requirements to ensure that the change is successful. The key steps for change planning which DSI performs are as follows:

- Assign all potential changes a risk level prior to scheduling the change.
- Document at least three risk levels with corresponding change planning requirements.
- Identify risk levels for software and hardware upgrades, topology changes, routing changes, configuration changes, and new deployments.
- Assign higher risk levels to non-standard add, move, or change types of activity (the high-risk change process that is documented includes lab validation, vendor review, peer review, and detailed configuration and design documentation).
- Create solution templates for deployments affecting multiple sites. Include information about physical layout, logical design, configuration, software versions, acceptable hardware chassis and modules, and deployment guidelines.
- Document the network standards for configuration, software version, supported hardware, and Domain Name System (DNS) to include device naming, design, and services supported.

### *Change Management*

DSI change management process approves and schedules the change to ensure the correct level of notification with minimal user impact. The key steps for change management are as follows:

- Assign a change controller who can run change management review meetings, receive and review change requests, manage change process improvements, and serve as the liaison for user groups.
- Hold periodic change review meetings to include system administration, application development, network operations, and facilities groups, as well as general users.
- Document change input requirements including change owner, business impact, risk level, reason for change, success factors, back-out plan, and testing requirements.
- Document change output requirements including updates to DNS, network map, template, IP addressing, circuit management, and network management.
- Define a change approval process that verifies validation steps for higher-risk change.
- Hold postmortem meetings for unsuccessful changes to determine the root cause of change failure.
- Develop an emergency change procedure which ensures that the optimal solution is either quickly restored or that one is created.

### *Problem Correction*

DSI management is committed to the highest levels of customer satisfaction. We will constantly analyze CPPA's needs to ensure that we can provide them the best possible services. We want to be seen not only as a staffing vendor, but a partner who is keenly dedicated to the success of CPPA. The entire DSI Staffing Resources team convenes for weekly and quarterly meetings to discuss outstanding issues and process improvement suggestions for individual CPPA task order situations.

DSI emphasizes the use of problem correction to determine the actual cause of non-conformances (including customer complaints, nonconforming consultants, and nonconforming processes) to prevent their recurrence in the following ways:

- Effective handling of customer complaints and reporting of nonconformity
- Investigation of the root cause of nonconformity relating to services, processes, and QMS, and recording the results of the investigation
- Corrective Actions are recorded on Corrective Action Requests (CARs) and Change Orders (Cos) are implemented if required.
- Determination of the corrective action needed to eliminate the cause of nonconformity
- Application of controls to ensure that corrective action is taken and that it is effective.

#### *Internal Performance Indicators to Measure Success*

DSI will consistently review the total procurement cost and implement processes to manage all components. Additionally, DSI will ensure steps are constantly initiated to reduce both internal costs associated with the Staff Augmentation process. Periodic stewardship meetings will be performed with CPPA to share performance and pricing information and discuss future staffing opportunities.

Key Performance Indicators: KPIs will ensure consultant quality performance and DSI IT staff augmentation fulfillment. Example of some KPI's are:

- Candidate Requisition Processing: Requisition form ease of use, requisition form thoroughness
- Candidate Selection: Process response time, Lead-time to fill, Screening ratio (resumes submitted per interview)
- Success ratio: resumes submitted per placement
- Interview efficiency: # of interviews per placement
- Bill rate management: Pay (and fee) rates by role, # of exceptions
- Candidate On-boarding: Completion times for contract processing, background/drug checks and CPPA background investigation status report, safety compliance, orientation time, documentation completion, supervisor "on-boarding" feedback
- Candidate monitoring: Performance checks, position renewal rates, supervisor quality feedback, early termination percentage, short-term attrition percentage, termination reasons

#### **Pre- and Post-Sales Support Plan**

DSI will have a dedicated sales team to provide sales support to State agencies. Pankaj Sharma will be the team leader for the City of Charlotte contract users. Our dedicated sales team will be able to provide pre-sales support at no additional charge to the State agency. This support will include, but not be limited to, current and new product information, configuration assistance, and product pricing.



### *Pre-Sales Support Methodology*

The DSI dedicated sales team will ensure that all products ordered by and delivered to the State will be compatible with the environment for which it is ordered. DSI offers the following pre-sales support activities:

- Organize and conduct fact-finding processes necessary to improve part quality, integrity, application-specific reliability, and cost effectiveness;
- Assessment of Cisco's life cycles' obsolescence including life cycle phases and their characteristics, technology trends driving obsolescence, device family trends, and obsolescence management strategies;
- Choose parts to properly fit the functionality of the product, to satisfy system, assembly and design level constraints, and to support any manufacturing and handling requirements within the customer's environment;
- Understand and evaluate the parts' actual "micro-environment" within a system and then choose the correct technique to fit the parts to their intended environmental requirements;
- Maximize system supportability by preparing for and meeting the challenge of parts becoming obsolete during system life;
- Reliability assessment using manufacturer integrity to assess reliability including assembly compatibility, routing compatibility, testing and rework acceptability.

### *Pre and Post-Sales Support Plan*

DSI will offer the following list of non-inclusive support services from our Chantilly, VA office. The tables on the following pages show the specific actions that will be required to effectively provide City of Charlotte customers with the best support. DSI has listed these to demonstrate our knowledge of the support required to provide City of Charlotte agencies with the best value, as well as to show the personnel roles within the organization that will be assigned to this contract. These actions are not all inclusive and may be changed to suit the needs of City of Charlotte customers over the life of the contract.

<b>Contract Support Actions Pre- and Post-Sales</b>		
<b>Contract Action</b>	<b>Description</b>	<b>DSI Department or Personnel Role Responsible for Action</b>
<b>Pre-Delivery Support</b>		
Requests for Product Information / Briefings on Emerging Technologies	Assist City of Charlotte customers with product requests, price quotes, and other contract information. Sales staff will ask qualifying questions to ensure suggested products match customer needs. Brochures, price lists, and other information provided as requested. Turnaround time for quotes not requiring configuration will be done immediately and take no longer than 30 minutes.	Available via phone, online, email or fax through the dedicated Sales Account Executive and Sales Team Leader. Information also available via Cisco's website.
Configuration Assistance	Configurations will be turned around from 30 minutes to 4 hours depending on number of parts being requested.	Dedicated Sales Team Leader and Sales Account Executive.
Network Design Assistance	Network design assistance support can be performed via phone, email, meetings and site surveys. Design assistance would involve a review of the current infrastructure and the additional network scope the agency wants to achieve.	Dedicated Sales Team Leader.
Order Receipt	Orders will be accepted via phone, email, online store and fax. Orders are reviewed for configuration accuracy and availability and entered into our system within 24 hours of receipt.	Orders can be placed with any dedicated Sales Team Member.
Order Confirmation and Validation	Within 24 hours the order is reviewed and entered, the customer is informed of expected delivery date via email or other preferred medium, and any problems related to their order. In the event of invalid configuration or availability issues the agency will be informed of corrective options.	Dedicated Sales Team Member.
Order Placement	Barring any configuration or availability issues all orders are placed with manufacturer 24-48 hours after receipt.	Dedicated Sales Team Member.
Order Tracking, Upgrade requests, and Delivery Date Confirmation	Backorder and Open order reports are run twice a week and all orders listed are checked to ensure they are still on schedule for expected delivery date. Customers are informed of shipment when it is released from manufacturer or DSI warehouse. Upgrade requests can be made via online help desk or via phone, email, or fax to any dedicated Sales Team Member	Dedicated Sales Team Member.
Roll-Out Schedule or Installation Project Tracking (if ordered).	Once order is received Team Leader will coordinate with agency and DSI technicians to coordinate delivery and installation according to customer schedule request. Projects are recorded in our tracking system to ensure escalation occurs should any timeframe not be met. Weekly meetings with DSI Sales Team Leader and agency contact via email, phone or agency preferred medium are recommended.	Dedicated Sales Team Leader and Network Engineer.

<b>Contract Support Actions Pre- and Post-Sales</b>		
<b>Contract Action</b>	<b>Description</b>	<b>DSI Department or Personnel Role Responsible for Action</b>
<b>Post-Delivery Support</b>		
Warranty Status Tracking	A spreadsheet per agency location can be created for all new purchases made. The specific contract warranties begin and end date and any purchased upgrades are recorded. DSI can provide monthly (or any frequency requested) updates to the individual agency and/or City of Charlotte POC.	Sales Team Leader or designated Sales Account Executive.
Documentation and Reporting	All reports will be automatically generated and sent to the requesting agency. Requests for additional reports and documentation can be made to any dedicated Sales Team Member.	Sales Team Leader or designated Sales Account Executive.
Order Inaccuracies	The correction of all order inaccuracies including damaged and dead on arrival products will be processed within 24 hours of request receipt.	Any dedicated Sales Team member and/or Customer Service Department (RMA).
Evaluation of Customer Service	All customers who purchase products are contacted within 1-2 months after their purchase via the dedicated Sales Team Leader to inquire about product and service satisfaction. Customers are encouraged to complete online surveys. Customers that express dissatisfaction are contacted by the DSI Contract Administrator to resolve the problem and take corrective procedural actions to prevent future occurrences.	Contract Administrator
Repair Requests	DSI can provide a 24x7 help desk support phone number. Repair tickets can also be opened online. A technician will respond within one hour to establish problem resolution.	Done via online, fax, email, or phone. First assigned to Technical Team Leader or Sr. Network Engineer, then available qualified Network Engineer.
Repair Escalation	All customers who request repairs are issued a ticket number. At anytime they can go online or call and escalate their ticket to the next priority level.	Done via online, fax, email, or phone. First assigned to Technical Team Leader or Sr. Network Engineer, then available qualified Network Engineer.
Repair and Installation Satisfaction	Upon completion of any repair or installation the Network Engineer must have the agency sign off stating the work was completed to their satisfaction. In addition a survey is provided to the agency requesting them to provide additional detailed information related to the service.	Technical Team Leader. Customers can also go online and complete surveys, which are sent to the President.
Contract Performance Review / Adherence to Security Requirements	Copies of surveys received can be forwarded to the requesting agency monthly or quarterly. Reports can also be generated to track delivery performance and other contract deliverables upon request; Ensures adherence to any security requirements and addresses areas of concern and any possible follow-up actions required.	Contract Administrator

## Service Level Agreements

Performance Metric	Description	Performance Target	Calculation	Frequency of Review	Remedy
Order Confirmation	Measures response time from receipt of order to confirmation of order receipt	95% or higher	Number of orders which received confirmation within 4 hours / total number of orders	Monthly	Hire additional order entry personnel to augment the dedicated sales team to ensure that all response times are less than 4 hours. We currently meet this requirement on several state and national contracts we hold.
Delivery Date	Measures Supplier's ability to meet its commitment to deliver by the due date on the confirmed Order	95% or higher	Number of orders fulfilled by the due date on the confirmed order / total number of orders	Monthly	Work with distributors and manufacturers to gain better insight into these unforeseen delays. If needed we may purchase the product from a higher cost source with immediate stock, and/or pay rush delivery charges with no additional charges passed on the agency. Our current fill rate and delivery promptness is above 95% even with stringent delivery timeframes such as 2-7 days.
Incident Resolution	Measures Supplier's ability to expeditiously resolve technical issues: Indicates how many incidents are successfully resolved.	95% or higher	Number of incident reports successfully resolved and closed on time for the month / total number of incident reports initiated for the month	Monthly	Hire additional manufacturer certified trained technicians to augment the dedicated technical team. In addition we may seek the assistance of subcontractors, especially SMWBE business to help augment our staff. DISYS has specific escalations in place which inform senior levels of management if technical support is not resolved within 24 hours.
Catalog Accuracy	Measures Supplier's ability to attentively provide all products at the correct rates in accordance with the contract: Indicates interval from notification of an error or omission in the catalog until the error or omission is corrected.	95% or higher	Total number of errors or omissions fixed within one business day / total number of errors or omissions reported	Monthly	Work with our online store company (VarStreet) to determine the problem and ensure all products are being entered in the online store based on the availability and price lists which come directly from the manufacturer. DSI has over 20 contracts which utilize a catalog powered by our online store or using punch out technology. We have a very low incident rate of inaccurate pricing or products, currently better than the 95% target.
Billing Accuracy	Monthly invoice is complete and correct, submitted on time (based on summary report)	99% or higher	Number of accurate invoices received on time / total number of invoices	Semi-annually	Hire additional admin and accounting staff to review the process and content of Purchase Order receipt to Invoice generation to ensure inaccurate products are not shipped and invoices accurately reflect products ordered. Invoice accuracy is currently 99%.

Timely Reports	Measures Supplier's ability to provide all required reports in a timely manner: Indicates number and extent of delinquent reports	95% or higher	Number of days during which no reports delinquent / total number of days in reporting period	Monthly	Hire additional contract personnel if reports cannot be generated timely using the current staff. DSI already generates the exact reports requested in the RFP with little non-automated intervention. Most reports are completed and sent prior to their due date, none are sent late.
Customer Satisfaction Surveying	Measures Supplier's ability to consistently provide customer satisfaction surveys	95% or higher	Number of Authorized Users surveyed with last invoice / Number of last invoices issued	Quarterly	Hire a third party firm to perform these services quarterly should DSI be unable to do it with our current marketing staff. As part of our Certified Partner Status, Cisco already performs this separately from DSI' survey campaigns to ensure we are meeting customer expectations. In addition to quarterly campaigns, a link to DSI survey site is also sent out periodically with quotes, invoices, and email correspondence.
Customer Satisfaction	Measures Supplier's ability to consistently confirm that they have provided customers with measurably good service	95% or higher	Number of customer satisfaction surveys resulting in an overall rating of "Good" or better / Total number of customer satisfaction surveys issued	Quarterly	Add or replace personnel who consistently fail to meet performance levels and escalation guidelines. Because DSI fosters a working environment where staff is rewarded for their efforts, we provide familiarity to our customers which increase their satisfaction with our services. For example a vast majority of our corporate sales staff has been with DSI for over five years.

## 4.7 Proposed Pricing

### **Hardware and Software**

DSI is offering a 2% discount off our entire Online Store Catalog. Our Online Store can access via the following link:

<http://www.disyssolutions.com/store.htm>

Click to enter as a guest user to see DSI's Online Store Price.

### **DSI Online Store Pricing**

DSI has an online store similar to most high volume technology product providers. DSI uses e-commerce software powered by a company called VARStreet. VARStreet is a leading provider of business systems, tools and information. Their partners include all the 1<sup>st</sup> tier distribution companies such as Synnex, TechData, IngramMicro, Cisco, HP, IBM, and others. These distributors/manufacturers are the largest information technology distributors and currently offer the best pricing for information technology products. Via an ftp file link, the online store software automatically goes to these companies' website and uploads all active products, cost, list price, availability, and product specifications to VARStreet daily. This process allows DSI to offer our customers the most current products at the most competitive pricing through an e-commerce ordering tool.

DSI maintains an online Global Catalog Price List with standard margins at a discount off the manufacture list price, or above the lowest acquisition cost available at any of our distributors. Normal prices are referred to as "DSI Online Store" or "Guest User". The normal price we charge to customers without a negotiated contract is the price shown when a customer enters the store as a guest user, shown below. Customers who do not have negotiated contract pricing with DSI are provided with our online catalog (guest price). Customers with negotiated contract pricing have *their own personal web store* created by DSI reflecting the discounts of our regular online store pricing as

**Help Desk / Consulting / Installation / Training**

DSI can provide the fee based services stated below.

Product Category	Product Number	Product Description	Pricing Description	Price
Services	PS-TECH- 1	<p>(Product Design, De-Install/Re-Install, Maintenance Support, Training during normal business hours - 8AM to 5PM Monday through Friday excluding holidays) will be responsible for, but is not limited to, simple installation of commercial IT products, PC's, printers and scanners.</p> <p>Education: Minimum of A+ Certification.</p> <p>Experience: Minimum 1-year of general experience  Duties: Simple installation of Commercial IT products, PC's, printers and scanners; Supports a TECH 2 or higher as required. Performs other duties as assigned.</p>	Hourly Fee	\$60.00
Services	PS-TECH-2	<p>(Product Design, De-Install/Re-Install, Maintenance Support, Training during normal business hours - 8AM to 5PM Monday through Friday excluding holidays) will be responsible for, but is not limited to, installing or repairing PC's, printers and parts such as modems, CD ROMs, floppy drives, etc.</p> <p>Education: Minimum of A+ Certification and at least 1 certificate of a hardware manufacturer's training and authorization for PC's.</p> <p>Experience: Minimum 3-years of general experience  Duties: Repair of or Installation of PC's, printers and parts such as modems, CD ROMs, floppy drives, etc.; Supports a TECH 3 or higher as required. Performs other duties as assigned.</p>	Hourly Fee	\$75.00
Services	PS-TECH- 3	<p>(Product Design, De-Install/Re-Install, Maintenance Support, Training during normal business hours - 8AM to 5PM Monday through Friday excluding holidays) will be responsible for, but is not limited to, installing or repairing PC's, printers and parts such as modems, CD ROMs, floppy drives, etc. as well as installation of standard operating systems, low level debug of standard operating system problems.</p> <p>Education: Minimum of A+ Certification and at least 1 certificate of an operating system manufacturer's training and authorization.</p> <p>Experience: Minimum 3-years of general experience.  Duties: Installation or repair of PC's, printers and parts such as modems, CD ROMs, floppy drives, etc.; Installation of standard operating systems; Low level debug of standard operating system problems; Supports a TECH 4 as required. Performs other duties as assigned.</p>	Hourly Fee	\$85.00
Services	PS-TECH- 4	<p>(Product Design, De-Install/Re-Install, Maintenance Support, Training during normal business hours - 8AM to 5PM Monday through Friday excluding holidays) will be responsible for, but is not limited to, low level debug of server operating systems problems, and installation or repair of server components on PC's and servers.</p> <p>Education: Minimum of A+ Certification and at least 1 certificate of a manufacturer's training and authorization for Operating Systems, Servers and PCs, MCP or CNA.</p> <p>Experience: Minimum 5-years of general experience  Duties: Installation of standard operating systems; Installation of server operating systems; Low level debug of standard and server operating system problems; Perform hardware repair of servers and PCs; Supports a System Engineer as required. Performs other duties as assigned.</p>	Hourly Fee	\$100.00



Product Category	Product Number	Product Description	Pricing Description	Price
Services	PS-ENGR-1	<p>(Product Design, De-Install/Re-Install, Maintenance Support, Training during normal business hours - 8AM to 5PM Monday through Friday excluding holidays) will be responsible for, but is not limited to, being able to add clients, debug client connection problems and set client profiles.</p> <p>Education: Minimum of MCP, CNA, CCNA, or CCDA.</p> <p>Experience: Minimum 3-years of general experience.</p> <p>Duties: Add clients; Debug client connection problems; Design, install, support, and operate a wireless LAN solution; Configure WLAN products including access points, bridges, client devices and accessories; Perform a site survey covering WLAN; Set client profiles; Support a Network Engineer 2 or higher as required. Performs other duties as assigned.</p>	Hourly Fee	\$105.00
Services	PS-ENGR- 2	<p>(Product Design, De-Install/Re-Install, Maintenance Support, Training during normal business hours - 8AM to 5PM Monday through Friday excluding holidays) will be responsible for, but is not limited to, being able to consult with customers, design, implement, debug and maintain non-enterprise networks. Has cross platform experience and possesses a good knowledge of networking.</p> <p>Education: Minimum of MCSE, CNE, CCNP, or CCDP.</p> <p>Experience: Minimum 5-years of general experience cross platform experience and possess a good knowledge of networking.</p> <p>Duties: Consult with customers, design, implement, debug and maintain non-enterprise networks; Design, install, support, and operate a wireless LAN solution; Configure WLAN products including access points, bridges, client devices and accessories; Perform a site survey covering WLAN; Supports a Networking Engineer 3 or higher as required. Performs other duties as assigned.</p>	Hourly Fee	\$150.00
Services	PS-ENGR- 3	<p>(Product Design, De-Install/Re-Install, Maintenance Support, Training during normal business hours - 8AM to 5PM Monday through Friday excluding holidays) will be responsible for, but is not limited to, being able to consult with customers, design, implement, debug and maintain low-level enterprise networks. Has cross platform experience and possesses a good knowledge of networking. May have training in one or more specialized aspect of networking.</p> <p>Education: Is trained and certified by a manufacture of hardware - Compaq ASE, IBM PSE or HP Star is trained and certified by a manufacture operating system - MCSE or CNE. May have training in one or more specialized aspect of networking.</p> <p>Experience: Minimum 5-years of general experience cross platform experience and possess a good knowledge of networking.</p> <p>Duties: minimum 5-years of general experience cross platform experience and possess a good knowledge of networking; Supports a Networking Engineer 4 or higher as required. Performs other duties as assigned.</p>	Hourly Fee	\$170.00

Product Category	Product Number	Product Description	Pricing Description	Price
Services	PS-ENGR-4	<p>(Product Design, De-Install/Re-Install, Maintenance Support, Training during normal business hours - 8AM to 5PM Monday through Friday excluding holidays) will be responsible for, but is not limited to, being able to consult with customers, design, implement, debug and maintain high-level enterprise networks. Has cross platform experience and possesses a thorough knowledge of networking and internetworking. Has training in one or more specialized aspect of networking.</p> <p>Education: Is trained and certified by a manufacture of hardware - Compaq ASE, IBM PSE or HP Star or is trained and certified by a manufacturer operating system - MCSE, CNE, CCSP, CCIP, or CCIE. Has training in one or more specialized aspect of networking.</p> <p>Experience: Minimum 5-years of cross platform experience and possesses a thorough knowledge of networking. May have project management experience.</p> <p>Duties: Consult with customers, design, implement, debug and maintain high-level enterprise networks; Scale IP addresses with advanced Network Address translation, manage network performance using queuing and compression, configure PPP, PAP, CHAP, and interVLAN routing in a network containing both routers and switchers; Supports a Networking Engineer 5 or higher as required. Performs other duties as assigned.</p>	Hourly Fee	\$200.00
Services	PS-ENGR-5	<p>(Product Design, De-Install/Re-Install, Maintenance Support, Training during normal business hours - 8AM to 5PM Monday through Friday excluding holidays) will be responsible for, but is not limited to, consults with customers, designs, implements, debugs and maintains high-level enterprise networks, has cross platform experience and possesses a thorough knowledge of networking and internetworking; has specialization in Networking Storage, VPN or Security.</p> <p>Education: Is trained and certified by a manufacture of hardware - Compaq ASE, IBM PSE or HP Star or is trained and certified by a manufacture operating system - MCSE, CNE, CCSP, CCIP, or CCIE. Has training in one or more specialized aspect of networking.</p> <p>Experience: Minimum 5-years of cross platform experience and possesses a thorough knowledge of networking. May have project management experience.</p> <p>Duties: Implement complete security solutions, secure network access using Cisco IOS Software and Cisco PIX and Adaptive Security Appliance (ASA) Firewall Technologies, operate and monitor Cisco IOS Software and Intrusion Prevention Systems (IPS) technologies to prevent, understand, and respond to intrusion attempts, configure VPNs across shared public networks using Cisco IOS Software and Cisco VPN 3000 Series Concentrator technologies. Performs other duties as assigned.</p>	Hourly Fee	\$230.00

Product Category	Product Number	Product Description	Pricing Description	Price
Services	PS-TELE- 1	<p>(Product Design, De-Install/Re-Install, Maintenance Support, Training during normal business hours - 8AM to 5PM Monday through Friday excluding holidays) will be responsible for, but is not limited to voice/data switching/routing infrastructures, voice/data transport technologies, voice systems architectures, and/or computer telephony integration. Incumbent has experience in implementation, support, and problem resolution within telecommunications systems, networks, and/or converged voice/data systems and networks.</p> <p>Education: Bachelor’s degree or equivalent experience in telecommunications, information systems, or related engineering field; certification in at least one network-based telecommunications system; and certification in at least one network infrastructure technology and/or operating system.</p> <p>Experience: Minimum two years’ experience including at least one year in telecommunications (key systems and PBX’s) networks and systems design, implementation, and support; and one year voice/data or data-only network design, implementation, and support. Must have two years experience in telecommunications and/or data networks Layer 1 infrastructure or equivalent certification.</p> <p>Duties: Provides implementation and support for telecommunications systems, voice/data (converged) systems and networks, CTI applications; Consults with customers regarding system requirements, design issues, and performance expectations; Supports a Senior Telecommunications Engineer Level 2 or higher as required. Performs other duties as assigned.</p>	Hourly Fee	\$150.00
Services	PS-TELE- 2	<p>(Product Design, De-Install/Re-Install, Maintenance Support, Training during normal business hours - 8AM to 5PM Monday through Friday excluding holidays) will be responsible for, but is not limited to, multiple aspects of telecommunications or voice/data (converged) systems and networks. Incumbent is also specialized at least two of the following technology areas: voice/data switching/routing infrastructures, voice/data transport technologies, voice systems architectures, and/or computer telephony integration.</p> <p>Education: Bachelor’s degree or equivalent experience in telecommunications, information systems, or related engineering field; CCVP, CCSP, or CCIP</p> <p>Experience: Minimum four years’ telecommunications and/or voice/data experience including at least one year in telecommunications (key systems and PBX’s) networks and systems design, implementation, and support, and one-year voice/data or data-only network design, implementation, and support.</p> <p>Duties: Designs and provides implementation and support for telecommunications systems, voice/data (converged) systems and networks; Consults with customers regarding system requirements, design, and performance expectations. Supports a Senior Telecommunications Engineer Level 3 as required. Performs other duties as assigned.</p>	Hourly Fee	\$200.00

Product Category	Product Number	Product Description	Pricing Description	Price
Services	PS-TELE-3	<p>(Product Design, De-Install/Re-Install, Maintenance Support, Training during normal business hours - 8AM to 5PM Monday through Friday excluding holidays) will be responsible for, but is not limited to, multiple aspects of telecommunications or voice/data (converged) systems and networks. Incumbent is also specialized at least two of the following technology areas: voice/data switching/routing infrastructures, voice/data transport technologies, voice systems architectures, and/or computer telephony integration. Incumbent has in-depth experience in implementation, support, and problem resolution within telecommunications systems, networks, and/or converged voice/data systems and networks and is capable of supervising teams of Telecommunications Engineers, specialization in IP Communications.</p> <p>Education: Bachelor's degree or equivalent experience in telecommunications, information systems, or related engineering field; CCIE.</p> <p>Experience: Minimum four years' telecommunications and/or voice/data experience including at least one year in telecommunications (key systems and PBX's) networks and systems design, implementation, and support, and one-year voice/data or data-only network design, implementation, and support.</p> <p>Duties: Designs and provides implementation and support for telecommunications systems, voice/data (converged) systems and networks; Design IP Telephony multi-service network solutions, design a scalable, converged network using QOS, Cisco Call Manager clustering, H.323, MGCP, or SIP signaling protocols, assess the scope of work required to integrate legacy TDM PBXs and voice mail systems into an existing data network; Consults with customers regarding system requirements, design, and performance expectations. Performs other duties as assigned.</p>	Hourly Fee	\$250.00
Services	After Hours Support	<p>On-site maintenance service on a 24-hour per day, seven-day per week basis (including all holidays) outside the hours of 8-5 M-F with a one hour response time and critical repair time. Critical repair time shall be defined as equipment repair occurring within 4 hours after notification of the problem. Includes labor and parts.</p>	ADD TO HOURLY RATE of NORMAL BUSINESS HOUR SERVICE	\$50.00

Below are some of the categories and rates under which DSI can provide consulting and staff augmentation services:

Labor Category	Straight	Premium
Program Manager	\$ 146.00	\$ 175.20
Project Manager	\$ 131.00	\$ 157.20
Sr. Telecommunications Analyst	\$ 101.00	\$ 121.20
Sr. Telecommunications Specialist	\$ 101.00	\$ 121.20
Testing Specialist	\$ 101.00	\$ 109.20
Training Specialist/Instructor	\$ 101.00	\$ 121.20
Sr. Systems Engineer	\$ 101.00	\$ 121.20
Systems Engineer	\$ 101.00	\$ 121.20
Sr. Systems Analyst	\$ 101.00	\$ 121.20
Sr. Information Technology Architect	\$ 121.00	\$ 145.20
Sr. Information Technology Planner	\$ 121.00	\$ 145.20
Office Automation Specialist	\$ 71.00	\$ 97.20
Help Desk Manager	\$ 91.00	\$ 109.20
Sr. Help Desk Specialist	\$ 81.00	\$ 97.20
Jr. Help Desk Specialist	\$ 71.00	\$ 85.20
System Administrator	\$ 121.00	\$ 145.20
Project Control Specialist	\$ 107.00	\$ 128.40
Program Administration Specialist	\$ 109.00	\$ 130.80
Sr. Business Process Consultant	\$ 116.00	\$ 139.20
Telecommunications Engineer	\$ 86.00	\$ 103.20
Sr. Telecommunications Consultant	\$ 101.00	\$ 121.20
Telecommunications Systems Analyst	\$ 96.00	\$ 115.20
Network Manager	\$ 106.00	\$ 127.20
Network Administrator	\$ 101.00	\$ 121.20
Sr. Network Technician	\$ 101.00	\$ 121.20
Jr. Network Technician	\$ 96.00	\$ 115.20
Network Security Engineer	\$ 110.00	\$ 132.00
Licensed Master Electrician	\$ 111.00	\$ 133.20
Journeyman Electrician	\$ 96.00	\$ 115.20
Electricians Helper	\$ 76.00	\$ 91.20

### Microsoft Office 2007 and 2010 Training

Instruction	
Executive Level	\$225/hour
Basic Level	\$145/hour
Consulting	
Executive Level	\$225/hour
Basic Level	\$145/hour
Custom Course Development	\$145/hour
Publications	
Microsoft Office 2007 and 2010 Courseware Manuals	\$14.95 to \$30.14 each (Printed and bound workbooks)
Documentation Templates	
Per Site License Manuscript (includes all training materials for one Course)	\$1,400.00 per entity*

## Pricing Example

### Public Cloud - 5GHz, 10GB, 500GB

#### Committed Resources

##### Public Cloud Computing Resources: 5GHz/10GB RAM

Quantity	1
CPU Resources	5 GHz
Memory Resources	10 GB

##### Public Cloud Storage Resources: 500GB

Quantity	1
Fiber Storage Resources	500 GB

#### Network and Security

##### Public Cloud Security Resources

Quantity	1
Security Resources	Public Cloud HA Utility Firewall
Security Resources	2 x Public Cloud Software Client-LAN VPN

##### Public Cloud Network Resources

Quantity	1
Network Resources	Public Cloud HA Utility Load Balancer
Public IP Resources	5 x Public IP(s)
Private IP Resources	Private IP's (DMZ/27)
Private IP Resources	Private IP's (INT/28)

#### Bandwidth

##### Connectivity - Committed Bandwidth

Quantity	1
Bandwidth	1 Mbps

<b>Total Non-Recurring Charges</b>	<b>\$0</b>
<b>Total Monthly-Recurring Charges</b>	<b>\$2,949.50</b>
Monthly Services - Hosting	\$2,232.00
Monthly Services - Network	\$62.50
Monthly Services - Security	\$0.00
Monthly Services - Storage	\$625.00

## Virtual Server

### Pricing Grid – Unreserved Capacity

Per Hour Usage Charges – Unreserved Capacity				
<b>SC Operating System 32-bit Configuration</b>	Copper	Bronze	Silver	Gold
Red Hat Enterprise Linux	\$1.875	\$2.175	\$3.345	\$5.540
SUSE Linux Enterprise Server 11.0	\$1.425	\$1.725	\$3.300	\$4.95
Windows Server (2003 and 2006 Versions)	\$1.150	\$1.180	\$3.360	\$5.55
<b>CP Operating System 32-bit Configuration</b>				
Customer Provided Linux operating System	\$1.125	\$1.425	\$2.270	\$4.465

<b>SC Operating System 64-bit Configuration</b>	Copper	Bronze	Silver	Gold	Platinum
Red Hat Enterprise Linux	\$450	\$600	\$720	\$1.11	\$2.190
SUSE Linux Enterprise Server 11.0	\$405	\$555	\$675	\$1.065	\$2.085
Windows Server (2003 and 2006 Versions)	\$510	\$600	\$750	\$1.44	\$2.985
<b>CP Operating System 64-bit Configuration</b>					
Customer Provided Linux operating System	\$375	\$525	\$645	\$1.035	\$2.055

Persistent Storage	
<b>Charge per GA per hour</b>	
.000225	
<b>Storage Input and Output Access Requests</b>	
Requests per million per portion thereof	\$165

Internet Data Transfer	
<b>Rate Tier for Monthly Terabyte (TB) Usage</b>	Per GB Charge
For transfer amounts up to and including the 10 <sup>th</sup> TB	\$.225
For transfer amounts from the 10 <sup>th</sup> TB up to and including the 50 <sup>th</sup> TB	\$.165
For transfer amount from the 50 <sup>th</sup> TB up to and including the 150 <sup>th</sup> TB	\$.135
For transfer amounts above the 150 <sup>th</sup> TB	\$.120
<b>Reserved IP Address</b>	
<b>Each Reserved IP Address</b>	Charge per hour
For each reserved IP address	\$.015

## Virtual Desktop

Feature	Bronze	Silver	Gold
<b>Contract Term</b>	Trial = 3 mos (with 3 mo renewal option) Production IBM Cloud = 36.60 months		
<b>vCPU</b>	1	1	1
<b>RAM</b>	1GB	1GB	2GB
<b>Disk Space</b>	7.5GB	10GB	15GB
<b>VM Type</b>	Non-Persistent	Persistent or Non-Persistent	Persistent or Non-Persistent
<b>HDX</b>	Option	Included	Included
<b>Billing</b>	No one-time charge: pr VM per month. Billing starts after on-boarding		
<b>SLA</b>	99.5% Availability		
<b>Sold in blocks of:</b>	50 VMs	50 VMs	30 VMs
<b>Pricing</b>	\$54/month per VM	\$72/month per VM	\$100.50/month per VM



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## 5. Required Forms

To be deemed responsive to this RFP, Service Providers must complete in detail, all Proposal Forms listed in this Section 4, items numbered e through j.

This section contains the following required forms

- Addenda Receipt Confirmation and RFP Exceptions
- Proposal Submission
- Pricing Worksheet
- Non-Discrimination Provision
- Vendor References

**Section 7**  
**Required Forms – Form Two**

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**REQUIRED FORM 2 - ADDENDA RECEIPT CONFIRMATION  
AND RFP EXCEPTIONS**

**RFP # 269-2011-065**

**TECHNOLOGY PRODUCTS AND ASSOCIATED SERVICES**

1. **Proposal/Proposal Submission Check List:** Confirm by placing a check mark in the space provided that as the bidder or proposer the information listed below has been reviewed and complied with in the submission of a response to this RFP.

- (A)  Addenda acknowledgement. Please contact the Procurement Services Division representative to verify the number of addenda issued.

<i>Procurement Services Rep. Name</i> Jeanne Simmons	<i>Telephone Number</i> 704-336-8084
---	---

**Addenda Receipt: The following confirms receipt of any and all addenda issued for this RFP:**

Addendum #	Date Issued
<u>1</u>	<u>12/21/2011</u>
<u>2</u>	<u>1/24/2012</u>
_____	_____

- (B)  Proposal document has been signed by authorized bidder/proposer official.
- (C)  Proposal package has been properly labeled per the instructions. (See **Cover Letter**)
- (D)  Proposal Response Package Forms
- Proposal Acknowledgement Form One
  - Addenda Acknowledgement Form Two
  - Proposal Submission Form Three
  - Pricing Worksheet Form Four
  - Non-Discrimination Certification Form Five
  - Vendor References, **Attachment 1**

2. **Exceptions:** The undersigned Service Provider agrees to provide all Products and Services requested in the RFP for the price(s) set forth in the Pricing Sheet, all in strict conformance with the terms, conditions, Specifications and Requirements set forth in the RFP (including any addenda or amendments) as well as the terms of the Sample Contract shown in **Section 8** of the RFP, subject only to the exceptions stated in the chart below.

**Section 7**  
**Required Forms – Form Two**

**FORM 2 - Part 2**

**2.1**

RFP Section Number	RFP Section Title	Exception and Proposed Change to RFP
		NO EXCEPTIONS TAKEN

**2.2**

RFP Section Number 8	Sample Contract Clause No.	Exception / Proposed Change to the Sample Contract
		NO EXCEPTIONS TAKEN

The signature below certifies the Proposal response complies with the requirements of this RFP and the terms and conditions of the Sample Contract included therein, except to the extent of the exceptions submitted above.

01/30/2012  
Date

Steve Isert  
Printed/Typed Name

Steve Isert  
Signature

**Section 7**  
**Required Forms – Form Three**

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**REQUIRED FORM 3 - PROPOSAL SUBMISSION FORM**

**RFP # 269-2011-065**

**TECHNOLOGY PRODUCTS AND ASSOCIATED SERVICES**

This Proposal is submitted by:

Service Provider Name: DISYS Solutions, Inc.

Representative (printed): Steve Isert

Representative (signed): Steve Isert

Address: 4151 Lafayette Center Drive, Suite 600  
Chantilly, VA 20151

Lead Public Agency/State/Zip: City of Charlotte, North Carolina, 28202

Telephone: 888-286-3896  
(Area Code) Telephone Number

Facsimile: 800-601-2944  
(Area Code) Fax Number

**It is understood by the Service Provider that the Lead Public Agency reserves the right to reject any and all Proposals, to make awards on all items or on any items according to the best interest of the Lead Public Agency, to waive formalities, technicalities, to recover and re-bid this RFP. Proposal is valid for one-hundred-eighty (180) calendar days from the Proposal due date.**

DISYS Solutions, Inc.  
**Service Provider**  
[Signature]  
**Authorized Signature**

01/30/2012  
**Date**  
Vinu Luthra  
**Please type or print name**

**Section 7**  
**Required Forms – Form Four**

**REQUIRED FORM 4 - PRICING WORKSHEET**

Regardless of exceptions taken, Service Providers shall provide pricing based on the requirements and terms set forth in this RFP. Pricing must be all-inclusive and cover every aspect of the Project. Cost must be in United States dollars rounded to the nearest quarter of a dollar and be valid for the term of the Agreement. **If there are additional costs associated with the Services, please add to this chart. Your Price Proposal must reflect all costs that the Lead Public Agency will be responsible for.**

**Technology Products and Associated Services Global Pricing Structure**

Item	Description of Hardware, Software or Service	Unit Price	% Discount from Unit Price	Trade-in Credits Apply (Y/N)	Training Credits Apply (Y/N)
1	DISYS Solutions Complete Catalog of Hardware and Software	See DISYS Solutions Online Store	2%	Y	Y
2	see Proposal response for services pricing				
3					
4					
5					
6					
7					



**Section 7**  
**Required Forms – Form Four**

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**Pricing Incentives & Rebates:** Per Section 3.8.1, identify any incentives and rebates offered based on incremental volume discount, specified incremental levels (among the Lead Public Agency and/or Participating Public Agency), electronic ordering, training credits, Product credits or other criteria:

For each \$1 million in annual sales, DSI will provide an additional 0.3% in fees to the City of Charlotte

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**Trade-In Product Credits:** If noted as “Y” above, Service Provider agrees to accept trade-in equipment and issue TBD\* (dollars, % of initial price, etc.) in credits to the Lead Public Agency and Participating Public Agency for new Products.

*\*Trade-in credit will be determined at the time of product trade-in*

**Training Credits:** If noted as “Y” above, Service Provider shall provide # 1 of training # 100 (seats, credit hours, etc.) to the Lead Public Agency and Participating Public Agency based on every \$ 30,000 purchased by the Lead Public Agency and/or Participating Public Agency.

**Administrative Fees:** Per Section 3.12.4, the Service Provider shall pay the Lead Public Agency an administrative fee of 1 % based on all of the City of Charlotte, and Participating Public Agency sales volumes within 30 days of the end of each calendar quarter set out in the Agreement. It is the responsibility of the Service Provider to set the Administrative Fee.

**Total Proposal Price** must include all equipment, labor, delivery, installation, consultation, vendor profit, taxes, and all other costs associated with this Project. No additional cost will be allowed.

Payment Terms: Net 30

The undersigned hereby certifies the Service Provider has read the terms of this bid document, including the sample contract (Section 8) and is authorized to bind the firm to the information herein set forth.

Date: 01/30/2012  
By: 

DISYS SOLUTIONS, INC.  
Legal Name of Firm  
Vinu Luthra, COO  
Name and Title of Person Signing (please print)

**Section 7**  
**Required Forms – Form Five**

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**REQUIRED FORM 5 – NON-DISCRIMINATION PROVISION**

AGREEMENT TITLE: TECHNOLOGY PRODUCTS AND ASSOCIATED SERVICES

SERVICE PROVIDER: DISYS Solutions, Inc.

The undersigned Service Provider hereby certifies and agrees that the following information is correct:

1. In preparing its proposal, the Service Provider has considered all proposals submitted from qualified, potential subcontractors and suppliers; and has not engaged in or condoned prohibited discrimination.
2. For purposes of this section, *prohibited discrimination* means discrimination against any person, business or other entity in contracting or purchasing practices on the basis of race, color, sex, or national origin. Without limiting the foregoing, *prohibited discrimination* also includes retaliating against any person, business or other entity for reporting any incident of prohibited discrimination.
3. Without limiting any other provision of the solicitation for proposals on this Project, it is understood and agreed that, if this certification is false, such false certification will constitute grounds for the Lead Public Agency to reject the bid submitted by the Bidder on this Project and to terminate any contract awarded based on such bid.
4. As a condition of contracting with the Lead Public Agency, the Service Provider agrees to maintain documentation sufficient to demonstrate that it has not discriminated in its solicitation or selection of subcontractors. The Service Provider further agrees to promptly provide to the Lead Public Agency all information and documentation that may be requested by the Lead Public Agency from time to time regarding the solicitation and selection of subcontractors. Failure to maintain or failure to provide such information constitutes grounds for the Lead Public Agency to reject the bid submitted by the Service Provider or terminate any contract awarded on such bid.

DISYS Solutions, Inc.

NAME OF FIRM

BY: 

SIGNATURE OF AUTHORIZED OFFICIAL

Chief Operating Officer

TITLE



## Section 7 Attachment One

**Company Name:** DISYS Solutions, Inc

**Provide an organization name, address, contact name, and contact telephone number for five (5) customers of comparable size and scope of service that your Company has been under contract with to provide Technology Products and Associated Services for during the past two (2) years:**

1-NAME OF FIRM: Maryland Department of Information Technology
ADDRESS OF FIRM: 45 Calvert St, Room 445A, Annapolis, MD 21401
CONTACT PERSON: Mike Balderson
TELEPHONE NUMBER: (410) 260-7549, Mike.Balderson@doit.state.md.us
FAX NUMBER: (410) 974-5615
2-NAME OF FIRM: PEPPM
ADDRESS OF FIRM: 90 Lawton Lane, Milton, PA 17847
CONTACT PERSON: Dave Manney
TELEPHONE NUMBER: (570) 523-1155 x2174, dmanney@peppm.org
FAX NUMBER: N/A
3-NAME OF FIRM: University Systems of Maryland
ADDRESS OF FIRM: 3501 University Blvd East, Rm ICC-3120, Adelphi, MD 20783
CONTACT PERSON: Tamara Petronka
TELEPHONE NUMBER: (410) 455-5617, tpetronka@umuc.edu
FAX NUMBER: (240) 684-5131
4-NAME OF FIRM: Virginia Information Technologies Agency
ADDRESS OF FIRM: 11751 Meadowville Lane, Chester, VA 23836
CONTACT PERSON: James MacKenzie
TELEPHONE NUMBER: (804) 416-6247, james.mackenzie@vita.virginia.gov
FAX NUMBER: (804) 416-6361
5- NAME OF FIRM: Atlanta Public Schools
ADDRESS OF FIRM: 130 Trinity Avenue, Atlanta, GA 30303
CONTACT PERSON: Chad Zemer
TELEPHONE NUMBER: (404) 802-2134, czemer@atlanta.k12.ga.us
FAX NUMBER: (404) 802-1404

## Attachment 1 – Marketing and Reporting

### Attachment 1.A – Marketing

Proposals must include in detail how the Service Provider plans to market and service all Participating Public Agencies as it relates to the CCPA as Attachment #1 to the Proposal.

#### Marketing/Business Plan

DSI already has an established relationship with numerous government and education customers in multiple States through our many contract vehicles. DSI's sales team will market HP products to these existing customers. In addition, each Sales Team Member will be provided a list of potential targets within the state. It will be the responsibility of each Sales Team Member to determine the size of that particular entities purchase ability and rank these according to size. Their goal will then be to ensure the account is aware of all the products, pricing, and services available to them. Within our staff, each individual will contact and meet with their assigned accounts. In addition the top twenty customers will be visited often by the DSI.

DSI will focus on identified clients who have not purchased the products provided by DSI in this contract, or have old versions of products being offered. The goal then is to convince them of the cost efficiency of upgrading their existing equipment (by use of trade-in programs. etc.), or to switch to products because of their low total cost of ownership, excellent warranties, awards, and trade-in programs.

DSI has developed a general marketing plan for our National and Statewide contracts. The plan is of a general nature and will focus on how to gain relationships quickly and in an orderly fashion. Specific products and services will be discussed upon award. Among these will be how DSI will gain recognition and the major market share of the opportunities available in the territory. A more specific plan can be tailored to meet the required of this program.

#### Contract Marketing Plan Timeline

##### Marketing Efforts for Award + 1 week:

###### *Bid/Contract Department*

- Copy Contract for Administrative File and Sales Department.
- Highlight Specific terms and conditions from RFP, proposal response, and contract. Meet with Sales Director to discuss.
- Schedule Meeting with Sales, Administrative, and Technical Departments to discuss contract requirements.
- Schedule Meeting with Administrative Departments to discuss contract requirements and personnel issues.
- Assign Contract Page and Contract Pricing Info to Tech Department for web posting.

###### *Administrative Departments*

- Hire additional staff and/or re-assign specific Sales Staff if needed.

- Provide Receptionist with information on Sales Staff responsibilities.
- Provide Accounting with reporting and invoicing requirements.

#### *Marketing Efforts*

- Marketing Department to create flyer for email.
- National Accounts Manager to request email or mail addresses of customers to send flyers with contract info to include online support info.
- Marketing Department to create catalog containing contacts, policies, and pricing. Submit to Tech Department for posting.

#### *Sales Department*

- Dedicated Sales Staff to call customers as well as other current local contracts and introduce company and contract opportunity.

#### *Technical Department*

- Create customized web page for customers to include hot links to agencies, manufacturer sites, online store, and contract details.
- National technical personnel will be provided with contract requirements such as technical support, warranty offering, fee-based services and participant locations.

### **Marketing Efforts for Award + 2 weeks:**

Sales Department – Sales and Marketing Staff to implement the following Action, Research, and Promotion Agendas from the Marketing Plan:

#### **ACTION Agenda**

- A. DSI has separate Dedicated Sales Teams (3 personnel on each team), one of which will be assigned to CCPA contract. The Sales Team Leader will be required to develop marketing plans consistent with the DSI Marketing Plan format but taking into account their individual States and territories.
- B. Contact manufacturer and products Account Representatives in each area to develop special promotions, meet with participants, discuss training and technology needs, and obtain knowledge about competitor contracts as well as discuss ways they can help promote the Master Agreement to customers in their area they call upon. This will put more feet on the street pushing both current participants and prospective agencies.
- C. Begin Phone Campaign Plan to introduce company, verify proper agency contacts, provide contract benefits, and discuss ways we can assist them. A major part of this action is also to record information, which will be used in the research step later. Detailed customer information will be recorded and logged in a database. Important types of information will include their average computer spending, major brands purchased, buying quarter and if they purchase all applicable products from the Master Agreement and why they don't.

- D. Prepare Onsite Visit Campaign. Initially both government and education agencies with the largest sales will be contacted for on-site visits. Once visits are completed then each participating agency in geographic order will be personally contacted.

### **RESEARCH Agenda**

- A. Each team will review the research provided during the phone and onsite visits and determine a course of action for any items that may need addressing. For example DSI would research the reasons customers do not buy all their items off the Master Agreement. This information will allow DSI to ensure it takes steps to resolve any reasons a participant would not want to purchase from the Master Agreement.
- B. Current DSI contracts will be reviewed and a campaign to contact each contracting agency will be implemented. This campaign will involve informing these agencies of our purchasing contracts, and discussing ways they can participate.
- C. Research will need to be conducted to determine what areas have Trade-Shows we can attend and their frequency, what means of communication customers prefer based on their area, and what type of laws prevent advertising and promotions.

### **PROMOTION Agenda**

- A. DSI will develop campaigns that will visually advertise the new Master Agreement, show promotion, highlight value-added tools, and provide information on how to use the resources provided by DSI. These campaigns will include email blasts, mailers, and trade organization advertising.
- B. DSI will develop various promotions for participants to take advantage of. These will be advertised using email blasts, in our online store promotions corner, on the dedicated contract website, and as a pop-up when participants log in to DSI online.
- C. To keep current Master Agreement participants and gain new ones DSI will aggressively advertise pricing as well as value added benefits. This type of advertisement will show the contract benefits such as pricing, delivery schedule, and free support offerings in comparison to other contracts and brands. This type of promotion is effective for DSI as well as HP because we will constantly be evaluating what offerings need to be increased to keep and gain participants. DSI will also advertise promotions, trade-shows, training and other offers.

### **Marketing Efforts- for Contract Life:**

#### Access to New Technology

DSI has procedures in place that allow us to provide access to new technology through loaned demonstration equipment, innovative pilot projects, beta testing projects, grant programs such as e-rate, manufacture direct sponsored grants, give-away programs, and other creative means. The dedicated Sales Team will be the point of contact for any agency requests.

### Information Regarding New Products

Utilizing our large customer database, DSI sends invitations via email and direct mail to customers regarding upcoming Manufacturer “New Product Preview” as well as Technology Exhibits held nationally. DSI attends/sponsors an average of one show every two months. DSI has been very active in allowing functional communication of new product releases to the education community. DSI will continue to attend trade shows in areas where customer accounts are located.

### Technical Product Information

Our Outside Sales Representative is able to perform training sessions along with a representative from the Manufacturer. It is in our best interest as a company to provide such things as technical information and briefs on all products offered, via area workshops, mini-training sessions, or presentations to provide valuable technical information for “buy” decisions.

### Notification of Withdrawal of Support/End-of-Life Options

DSI Sales Staff is required re-certify in all the major brand product lines every 6 months. DSI Management and Owners ensure that DSI sales and technical staff are fully certified and current on knowledge of HP’s product line.

DSI has a Promotions Department who is responsible for ensuring that all of the information communicated in these newsletters is forwarded to the DSI Operational Departments. Information is sent to the Sales Department (whom normally has already received the newsletter from the manufacturer), so they will be able to inform their customers. Information is also sent to the Marketing Department so email blasts can be sent out to customers in our database. In this way all of our current customers are informed of changes in product availability and “trade-in” or “trade-up” of existing equipment promotions. Product information regarding “end-of-life” projections for product-lines is communicated to avoid delay in customer orders.

### Documentation

In addition to documentation available online, DSI will provide a supply of descriptive literature to agencies considering purchase of any contract equipment. This descriptive literature will include the glossy, marketing type literature, as well as product brochures, CD-ROM tutorials and product configurations. The Outside Sales Reps assigned to call on customers will bring product updates with them on visits. All product shipped will include standard product manuals or CD-Rom based documentation, which, if missing, may also be obtained through the Sales Team.

DSI will promote HP TSG products to current customers using the following steps from Action Agenda Section of our Marketing Plan. These steps are also used in the process to convince prospective agencies to purchase HP TSG products from DSI. Also refer to the detailed information already provided above.

- 
- Step 1:** Identify all possible customers of HP TSG products – establish list of customers and have outside sales reps meet with customers personally on site.
- Step 2:** Establish Rapport with Customer – Via onsite visits and phone campaigns. The goal will be to discuss what the customer wants to achieve from a purchasing prospective.
- Step 3:** Determine Customer Objective and Situational Factors - Focus on what the customer wants to achieve and those factors in the environment that will influence these results.
- Step 4:** Develop a Customer Action Plan – by making sure that we can achieve what the customer wants.
- Step 5:** Obtaining Customer Commitment – By agreeing that the customer will purchase HP TSG products from DSI.

### **Contacting Agencies by Territory**

DSI Sales Staff performs the following minimum functions related to contacting customers: Each inside sales person must make contact with at least 10 customers every day for proactive sales calls. They are required to learn about individual profiles of each in order to help suggest products that will fit into their environment. Try to determine sales opportunities for new projects or replacement projects. Status of customers' warranty and services should be reviewed with each customer. A list of territories and contacts to make must be kept current.

Follow up on all sales quotes and carry out analysis for better results and profitability. It is important to find out why a customer decided not to purchase the products and services they were looking for from DSI.

Our Outside Sales representatives are required to do 16 appointments every week. The Outside Sales Reps must go through the complete list of accounts to see the accounts that they have not visited. They should strike a good balance between visits to major accounts and smaller/new accounts. Inside sales representatives are called upon to help in setting appointments for the Outside Sales Representatives.

### **Current DSI Contracts**

In order to keep current customers and gain new ones, DSI will aggressively advertise pricing. DSI advertising will include email blasts, trade shows, outbound sales calls, on-site visits, and flyer mailings that will show the value added items in place and what other contracts have. This type of promotion is effective for DSI as well as HP because we will constantly be evaluating where the prices need to be to keep and gain customers.

DSI currently holds multiple statewide contracts in multiple states. Part of the Research Agenda Section of DSI' Marketing Plan will be to contact each of the contracting agencies and participating contract agencies to inform them of the benefits to purchasing IT Hardware and

Software products from DSI. DSI will emphasize the cost-saving via the extra services and support customers receive.

### **New Business Development**

Developing new business leads to offer government and education agencies the benefits of purchasing IT Hardware and Software products for all their technology purchasing needs will involve a lot of research. Exactly where the sales and marketing staff will focus their energy will be spelled out in the Research Agenda of the Marketing Plan.

A major part of this research will be to first record the contract vehicles used to purchase IT Products. At a minimum the information to be recorded will be the prospective new customer name, their website link, purchasing contact info, technology department contact info, IT budget for the year, and what means they currently use to purchase products.

### **Marketing Tools**

Within the first quarter, to develop product awareness and leads we plan mailing two or more flyers each month to potential users. Additionally, we will blanket the purchasing sites with fax broadcasts to increase our joint name recognition, product and contract awareness and to stimulate immediate sales. We will also plan strategic e-mail announcements of products and opportunities. DSI current database holds over 10,000 Procurement and IT Professional Customers including 100s in the state of North Carolina.

DSI has been successful in many State territories by utilizing flyers for special products or promotions. We intend to utilize direct mail pieces to announce the contract as well as follow up monthly highlighting special offerings or products.

DSI will approach the initial marketing efforts using a mix of: flyers, fax broadcasts, e-mail blasts, person to person outside sales, inside sales, telemarketing, and trade shows. As additional support in developing product awareness and leads, we plan to establish a routine attendance at various trade and or location shows. These will highlight product demonstrations and incentive give a-ways to assist in opportunity development and awareness.

In addition to direct efforts, DSI has established a web presence that will highlight the contract and allow investigation of the products, company contact and purchasing from the web.



## Attachment 1.B – Reporting

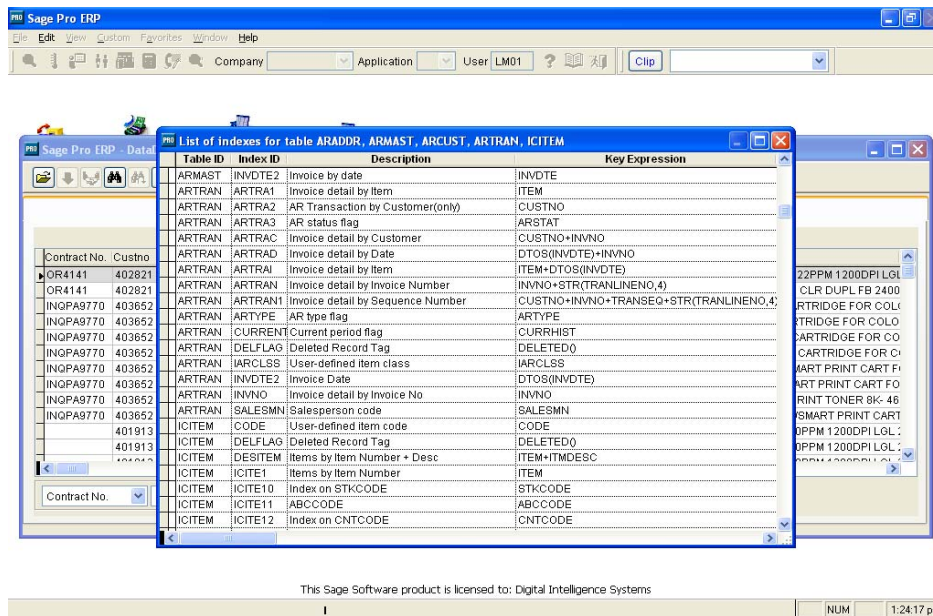
### Reporting Capabilities

DISYS understands US Communities Reporting Procedures as detailed in Attachment IIA – page 28. DISYS uses ACCPAC Pro by Sage Software for our internal accounting and operational activities. The following is a list of the various modules of the software relative to performance of work as a contractor for USC.

System Manager; General Ledger; Accounts Receivable; Accounts Payable; Inventory Control; Order Entry; Purchase Orders; Project Accounting; Payroll; EFT Direct Deposit; Job Cost; Customer Connect; Production Entry; Work Orders; Shop Control; Serial Control; Lot Control; Bills of Materials; Bills of Lading; Multicurrency; Customization Manager

ACCPAC Pro Series accounting software allows us to perform document tracking for each of our contracts and allows us to tailor our reports based on agency needs. DISYS has the capability to print almost any type of report using data created from Sage Pro, including the reports required by USC. All reports will be generated in accordance with the agreed upon electronic formats and within the required timeframes as specified in the RFP.

ACCPAC Pro Series’ exclusive DataDriller™ technology delivers sophisticated multilevel drill-down functionality. DISYS can display data in any order and customize it to produce unlimited report data. For security of the data the software allows us to assign permissions and security codes. Pro Series delivers time-tested accounting functionality that ensures high-level audit control. The following screen shots show various fields which can be queried to produce reports.



### Maintaining Records

DISYS currently keeps accurate records both in soft and hard copy formats for audit purposes. In addition, for government agencies that may request information on past transactions DISYS must keep proper records for financial auditing as required by law and for the health of our business. USC has the right to audit books as required to ensure accuracy of data provided.

DISYS currently generates several reports for our various contracts including but not limited to, reports to track minority participation, sales by brand, and sales by agency. DISYS accomplishes this by assigning key fields to each account and product code generated, as well as tagging each order with specific contract tags. By doing this we are able to generate reports by many different criteria.

### Timeliness of Reports

On the 1<sup>st</sup> day of each month a designated staff member runs through a documented list of reports which must be generated for each agency contract. The respective reports are then forward to the Sales Director, who will then forward them to the appropriate agency contact via the required contract method (e-mail, fax, mail, etc).

### Types of Reports

#### *Metric Report – Report of various performance metrics*

- Fill Rate Accuracy Metric (expressed as percentage of orders that were completely filled as ordered)
- Invoice Accuracy Metric (expressed as percentage of invoices that were prepared correctly and matched to order)
- Average Order Time (the average time to book, ship and receive order)
- Average Backorder Time (the average time an item is on backorder)
- Average Backorder Size (the average # of items on backorder)
- Customer Satisfaction (level of customer service satisfaction experience)
- Customer Service Calls Return Time
- List of Discontinued Items

#### *Sales Report – Report of hardware/software sales*

- Contract Number
- Customer Number
- Agency Name
- Purchase Date
- Purchase Order #
- Invoice Date
- Invoice #
- Manufacturer Name
- Manufacturer Part #
- Product Description
- Serial Number
- Subcategory Type (Cables, Monitors, PDAs)
- Supplier Part # (if different)
- Unit of Measure (Each, Lot)

- Quantity of Measure
- Quantity Purchased
- Price Index Type (MSRP, DISYS Catalog)
- List (Index) Price per Unit
- Discount
- Purchase Price Per Unit
- Extended Price
- Ship To Name
- Ship To Street Address
- Ship To City
- Ship To State
- Ship To Zip Code

*IT Services Supplier Reporting – Report of Consultant placements*

- Invoice Date
- Invoice #
- Purchase Order Date
- Purchase Order #
- Agency Name
- Contractor Title and Level (Programmer-Analyst 1)
- Contractor Category (Applications)
- First Name of Contracted Personnel
- Last Name of Contracted Personnel
- Employee Company (if subcontracted)
- # Hours Worked For This Month
- Cumulative # Hours Worked From Beginning of Each Fiscal Year
- Employee Pay Rate (Hourly)
- Contractor Mark-Up %
- Overall Bill Rate (Hourly)
- Invoiced Amount – Current Month
- Cumulative Invoiced Amount From Beginning of Each Fiscal Year
- Start Date
- End Date (if applicable)

*MBE Reports – Report of Minority Subcontracting*

- Account number
- Name of department / agency / institution
- Vendor Name
- FEIN
- MBE status
- Spend from account with Contractor

## Sample Reports

Reports examples are included below.

### High Spend Report with Discount Pricing Stated

Rank	Product Subcategory	Product SKU Number	Index Price	Discount Offered	Actual Price Charged	Quantity Ordered	Total Monthly Amount Charged	VCAF Rate	Total Monthly VCAF	Total Monthly Amount Charged Less VCAF
1	Memory	KVR133X72C2256	65.56	10.00%	59.00	100	5900.00	3.00%	177.00	5723.00
2	Memory	A0084549	112.77	6.00%	106.00	98	10388.00	3.00%	311.64	10076.36
3	Memory	SDCFX1024786	107.80	10.00%	97.02	27	2619.54	3.00%	78.59	2540.95
4	Power Supply and Pro	PH8T3	17.93	8.00%	16.50	25	412.50	3.00%	12.38	400.13
5	Input Devices	9115300403	6.86	10.00%	6.17	25	154.25	3.00%	4.63	149.62
6	Input Devices	F8E813BLKPS2	3.91	5.00%	3.71	25	92.75	3.00%	2.78	89.97
7	Memory	KTMTP390X256	169.22	10.00%	152.30	16	2436.80	3.00%	73.10	2363.70
8	Printers	Q5927A	399.54	6.00%	375.57	14	5257.98	3.00%	157.74	5100.24
9	Memory	SDDR89A15	32.10	10.00%	28.89	12	346.68	3.00%	10.40	336.28
10	Input Devices	F8E814OPT	12.02	5.00%	11.42	10	114.20	3.00%	3.43	110.77
11	Cables	U002010R	4.20	5.00%	3.99	10	39.90	3.00%	1.20	38.70

### Monthly Sales by Product

Line #	Customer Account Number	Invoice Date	Authorized Purchaser (ensure correct spelling)	Manufacturer Name	Product Subcategory	Product SKU Number	Product Description	Product Line	Product Model Name/#	Index Price	Discount Offered	Actual Price Charged	Quantity Ordered	Total Extended Price
1	402794	7/15/2005	OR DEPT.	Canon	Cameras	8403A001AA	CANON P	Cameras	8403A001AA	14.19	6.00%	13.34	2	26.68
2	402794	7/28/2005	OR DEPT.	D-Link	Networking Access	DSS8+	DLINK 8P	Networkin	DSS8+	40.55	5.00%	38.53	2	77.06
3	402794	7/15/2005	OR DEPT.	Kingston	Memory	SD256	KINGSTO	Memory	SD256	26.17	10.00%	23.56	2	47.12
4	402794	7/15/2005	OR DEPT.	Lacie	Optical and Storage	300806	LACIE 40	Optical an	300806	126.54	5.00%	120.22	3	360.66
5	402794	7/12/2005	OR DEPT.	Logitech	Input Devices	9043530403	LOGITEC	Input Devi	9043530403	28.63	10.00%	25.77	1	25.77
6	402794	7/31/2005	OR DEPT.	Microsoft	Input Devices	M2000001	MS NOTE	Input Devi	M2000001	23.14	5.00%	21.99	1	21.99
7	402794	7/18/2005	OR DEPT.	Seagate	Optical and Storage	ST380011A	SEAGATE	Optical an	ST380011A	64.54	5.00%	61.32	1	61.32
8	402794	7/27/2005	OR DEPT.	Targus	Other Peripherals	DBUC02	TARGUS	Other Peri	DBUC02	10.06	8.00%	9.26	1	9.26
9	402794	7/15/2005	OR DEPT.	ViewSonic	Monitors	VG710B	VIEWSON	Monitors	VG710B	321.41	4.00%	308.56	1	308.56
10	402811	7/12/2005	OR DEPT.	Labtec	Input Devices	9804210403	LABTEC	Input Devi	9804210403	4.07	5.00%	3.87	4	15.48
11	402812	7/25/2005	OR DEPT.	HP	Printers	Q3669A	HP 4650N	Printers	Q3669A	2070.59	6.00%	1946.36	1	1946.36

### Warranty Status Tracking

SCHOOL NAME	ITEM	SERIAL#	WARRANTY PH#	WARRANTY TYPE	PURCHASE DATE	END WARRANTY
ABERDEEN HS SOUTH	4050N LASER PRIN	SUSBB352984	H5479E	3YR NEXT DAY ONSITE	11/21/2000	11/21/2003
ABINGDON ELEMENTARY SCHOOL	4050N LASER PRIN	SUSBB229458	H5479A	3YR NEXT DAY ONSITE	2/23/2000	2/23/2003
ABINGDON ELEMENTARY SCHOOL	4050N LASER PRIN	SUSBB204926	H5479A	3YR NEXT DAY ONSITE	1/17/2000	1/17/2003
ABINGDON ELEMENTARY SCHOOL	4050N LASER PRIN	SUSQA045452	H5479A	3YR NEXT DAY ONSITE	9/18/1999	9/18/2002
BEL AIR ELEMENTARY	4050N LASER PRIN	SUSBB228792	H5479A	3YR NEXT DAY ONSITE	2/23/2000	2/23/2003
BEL AIR HIGH SCHOOL	4050N LASER PRIN	SUSBF001963	H5479E	3YR NEXT DAY ONSITE	1/15/2001	1/15/2003
BEL AIR HS	4050N LASER PRIN	SUSBB097745	H5479A	3YR NEXT DAY ONSITE	9/1/1999	9/1/2002
BEL AIR MIDDLE SCHOOL	4050N LASER PRIN	SUSBC152161	H5479A	3YR NEXT DAY ONSITE	8/24/2000	8/24/2003
BEL AIR MIDDLE SCHOOL	4050N LASER PRIN	SUSBC156472	H5479A	3YR NEXT DAY ONSITE	8/24/2000	8/24/2003
BEL AIR MIDDLE SCHOOL	4050N LASER PRIN	SUSBB358536	H5479A	3YR NEXT DAY ONSITE	8/22/2000	8/22/2003
BEL AIR MIDDLE SCHOOL	4050N LASER PRIN	SUSBB357027	H5479A	3YR NEXT DAY ONSITE	8/25/2000	8/25/2003
BEL AIR MIDDLE SCHOOL MEDIA CTR	4050N LASER PRIN	SUSBB198853	H5479A	3YR NEXT DAY ONSITE	1/17/2000	1/17/2003
CHURCH CREEK SCHOOL	4050N LASER PRIN	SUSQC041794	H5479A	3YR NEXT DAY ONSITE	9/18/1999	9/18/2002
DARLINGTON ELEMENTARY	4050N LASER PRIN	SUSBB229832	H5479A	3YR NEXT DAY ONSITE	2/23/2000	2/23/2003
DEERFIELD ELEMENTARY	4050N LASER PRIN	SUSBH009406	H5479E	3YR NEXT DAY ONSITE	10/27/2000	10/27/2003
DEERFIELD ELEMENTARY	4050N LASER PRIN	SUSBB367587	H5479A	3YR NEXT DAY ONSITE	8/9/2000	8/9/2003
DUBLIN ELEMENTARY	4050N LASER PRIN	SUSBB301816	H5479A	3YR NEXT DAY ONSITE	7/13/2000	7/13/2003
DUBLIN ELEMENTARY	4050N LASER PRIN	SUSBB229100	H5479A	3YR NEXT DAY ONSITE	2/23/2000	2/23/2003
EDGEWOOD ELEMENTARY	4050N LASER PRINTE	SUSBGC10835	H5479E	3YR NEXT DAY ONSITE	4/9/2001	4/9/2004
EDGEWOOD ELEMENTARY	4050N LASER PRIN	SUSBB230732	H5479A	3YR NEXT DAY ONSITE	2/24/2000	2/24/2003
EDGEWOOD HS	4050N LASER PRIN	SUSBB253811	H5479A	3YR NEXT DAY ONSITE	3/13/2000	3/13/2003
EMMORTON ELEMENTARY	4050N LASER PRIN	SUSBB230850	H5479A	3YR NEXT DAY ONSITE	2/23/2000	2/23/2003
EMMORTON ELEMENTARY	4050N LASER PRIN	SUSBB225696	H5479A	3YR NEXT DAY ONSITE	2/23/2000	2/23/2003
EMMORTON ELEMENTARY	4050N LASER PRIN	SUSQX019312	H5479A	3YR NEXT DAY ONSITE	9/18/1999	9/18/2002

### Minority Spend

Minority/Women Supplier Name (name of MWBE agency, not individuals)	Minority Indicator MBE or WBE	ExxonMobil section/project	Direct Spend in support of EM contract (\$)
11D Solutions Inc.	MBE	151,960.00	151,960.00
Altek	MBE	67,981.25	67,981.25
Chuc Nguyen	MBE	55,362.00	55,362.00
Clifton Consulting, LLC	WBE	87,455.45	87,455.45
Matsuda & Associates, Inc	MBE & WBE	44,139.63	44,139.63
MilleniumSoft, Inc	MBE	29,649.92	29,649.92
Sagarsoft	MBE	143,421.00	143,421.00
Trinin Corp.	MBE	154,650.00	154,650.00
YLJ Associates	MBE	81,272.42	81,272.42
<b>Section 2: MWBE percent of Total sales to ExxonMobil</b>			<b>\$815,891.67</b>
1. Total IT CORE Contractor Sales to ExxonMobil this period		3,170,347.44	
2. Sales through MWBE (15d above)		815,891.67	
3. % of Sales by MWBEs (#2 divided by #1)		25.74%	





### Sales by Ship to City with Discount Pricing Stated

Microsoft Excel - WI Periph 1520400505 Sales Report 0906 DISYS.xls

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Full Vendor Name		Reporting Period	
Digital Intelligence Systems Corp. (DISYS)		Start Date	End Date
		9/1/2006	09/30/06
This Form Filled Out By:		Email:	
Laura Marsh, Manager, Contracts & Proposals		contract@disys.com	
Tel:		888-286-3866	

Agency/ UW Campus/ Municipal Body making the purchase	Purchase Date	Purchase Order #	Invoice Date	Invoice #	Manufacturer Name	Manufacturer #	Product Description	Subcategory Product Type	Supplier Product # (if different from manufacturer)	Unit of Measure
Department of Transportation	9/15/2006	1846	9/21/2005	21135	Microsoft	BT535	Optical Trackball Mouse	Input Devices	A3-838tk	Each

Agency/ UW Campus/ Municipal Body making the purchase	Purchase Date	Purchase Order #	Invoice Date	Invoice #	Manufacturer Name	Manufacturer #	Product Description	Subcategory Product Type	Supplier Product # (if different from manufacturer)	Unit of Measure
University of Wisconsin	8/30/06	BDEZ0N1A0	8/30/2006	510220	ADAPTEC	1838100	ACK-68488HD-LVD-2M EXT LVD VHDCI 88M TO HD68M W/FLEX JACKIE	Cables		EACH
Univ of WI River Falls	9/7/06	424040011	5/3/2006	510468	APC	BEE50R	BACKUPS ES 350VA 120V 80UT	Power Protection		EACH
Univ of WI River Falls	9/7/06	424040011	5/3/2006	510468	APC	BEE50R	BACKUPS ES 350VA 120V 80UT	Power Protection		EACH
Univ of WI River Falls	9/7/06	424040011	5/3/2006	510468	APC	BEE50R	BACKUPS ES 350VA 120V 80UT	Power Protection		EACH
Univ of WI River Falls	9/7/06	424040011	5/3/2006	510468	APC	BEE50R	BACKUPS ES 350VA 120V 80UT	Power Protection		EACH
Univ of WI River Falls	9/7/06	424040011	5/3/2006	510468	APC	BEE50R	BACKUPS ES 350VA 120V 80UT	Power Protection		EACH
Univ of WI River Falls	9/7/06	424040011	5/3/2006	510468	APC	BEE50R	BACKUPS ES 350VA 120V 80UT	Power Protection		EACH
Univ of WI River Falls	9/7/06	424040011	5/3/2006	510468	APC	BEE50R	BACKUPS ES 350VA 120V 80UT	Power Protection		EACH
Univ of WI River Falls	9/7/06	424040011	5/3/2006	510468	APC	BEE50R	BACKUPS ES 350VA 120V 80UT	Power Protection		EACH
Univ of WI River Falls	9/7/06	424040011	5/3/2006	510468	APC	BEE50R	BACKUPS ES 350VA 120V 80UT	Power Protection		EACH
Univ of WI River Falls	9/7/06	424040011	5/3/2006	510468	APC	BEE50R	BACKUPS ES 350VA 120V 80UT	Power Protection		EACH
Univ of WI River Falls	9/7/06	424040011	5/3/2006	510468	APC	BEE50R	BACKUPS ES 350VA 120V 80UT	Power Protection		EACH
Univ of WI River Falls	9/7/06	424040011	5/3/2006	510468	APC	BEE50R	BACKUPS ES 350VA 120V 80UT	Power Protection		EACH
Univ of WI River Falls	9/7/06	424040011	5/3/2006	510468	APC	BEE50R	BACKUPS ES 350VA 120V 80UT	Power Protection		EACH
Univ of WI River Falls	9/27/06	JOSHUA SE E	9/29/2006	511256	APC	BR 1500	BACKUPS RS 1500VA/USB 120V/LINE INT 80UT	Power Protection		EACH
University of WI Platteville	9/7/06	ECLINE0002009	9/6/2006	510546	ASUS COMPUTER	EA9550T D128MSA	ATI X850 128MB PCIET VOUT DV	Expansion Cards		EACH
University of WI Milwaukee	9/6/06	VSCHUH09 082006	9/14/2006	510957	BELKN	F5U021	4PORT USB HUB ECONOMY W/8FT CABLE & AC PWR SUPPLY FOR PC/M	Other Peripherals		EACH
University of WI Milwaukee	9/6/06	VSCHUH09 082006	9/14/2006	510957	BELKN	F5U021	4PORT USB HUB ECONOMY W/8FT CABLE & AC PWR SUPPLY FOR PC/M	Other Peripherals		EACH
University of WI Milwaukee	9/6/06	VSCHUH09 082006	9/14/2006	510957	BELKN	F5U021	4PORT USB HUB ECONOMY W/8FT CABLE & AC PWR SUPPLY FOR PC/M	Other Peripherals		EACH

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### Sales by Ship to City with Discount Pricing Stated Sales by Ship to City with Discount Pricing Stated

Microsoft Excel - WI Periph 1520400505 Sales Report 0906 DISYS.xls

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State of Wisconsin

Agency/ UW Campus/ Municipal Body making the purchase	Quantity per unit of Measure	Quantity purchased	Price Index	List (Index) Price per Unit	Discount	Purchase Price Per Unit	Extended Price	Ship to City
Univ of WI Platteville	1	1	DISYS Online Store - Guest User	64.86	6.00%	\$ 60.97	\$ 60.97	Platteville
Univ of WI Platteville	1	1	DISYS Online Store - Guest User	64.86	6.00%	\$ 60.97	\$ 60.97	Platteville
Univ of WI Oshkosh	1	1	DISYS Online Store - Guest User	65.41	6.00%	\$ 61.40	\$ 61.40	Platteville
Univ of WI Oshkosh	1	1	DISYS Online Store - Guest User	65.41	6.00%	\$ 61.40	\$ 61.40	Platteville
Univ of WI Oshkosh	1	1	DISYS Online Store - Guest User	65.41	6.00%	\$ 61.40	\$ 61.40	Platteville
Univ of WI Oshkosh	1	1	DISYS Online Store - Guest User	65.41	6.00%	\$ 61.40	\$ 61.40	Platteville
Univ of WI Oshkosh	1	1	DISYS Online Store - Guest User	65.41	6.00%	\$ 61.40	\$ 61.40	Platteville
Univ of WI Oshkosh	1	1	DISYS Online Store - Guest User	65.41	6.00%	\$ 61.40	\$ 61.40	Platteville
Univ of WI Oshkosh	1	1	DISYS Online Store - Guest User	65.41	6.00%	\$ 61.40	\$ 61.40	Platteville
Univ of WI Platteville	1	1	DISYS Online Store - Guest User	65.80	6.00%	\$ 61.66	\$ 61.66	Platteville
Univ of WI Platteville	1	1	DISYS Online Store - Guest User	65.80	6.00%	\$ 61.66	\$ 61.66	Platteville
Univ of WI Platteville	1	1	DISYS Online Store - Guest User	65.80	6.00%	\$ 61.66	\$ 61.66	Platteville
Univ of WI Platteville	1	1	DISYS Online Store - Guest User	65.80	6.00%	\$ 61.66	\$ 61.66	Platteville
Univ of WI Platteville	1	1	DISYS Online Store - Guest User	67.41	6.00%	\$ 63.37	\$ 63.37	Platteville
Univ of WI Platteville	1	1	DISYS Online Store - Guest User	67.41	6.00%	\$ 63.37	\$ 63.37	Platteville

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# Appendix A – Infrastructure Capabilities

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# Appendix B – Unified Security

# Appendix C – Unified Communications

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# Appendix D – Disaster Recovery and Backup

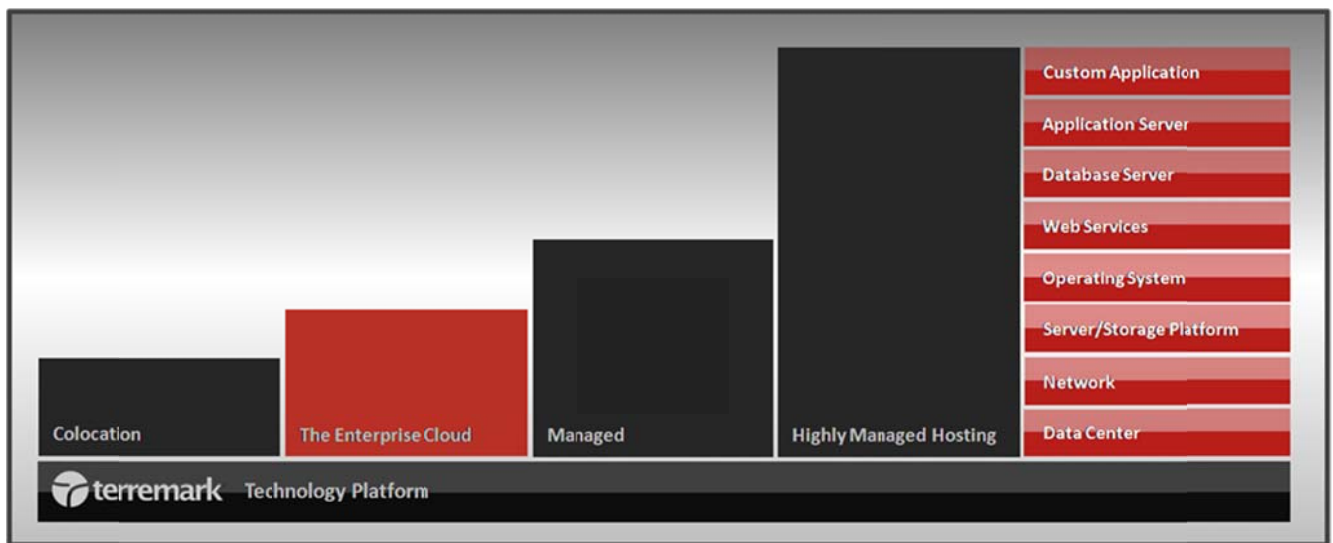
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# Appendix E – Web Hosting

## Section 3.6.2 A – Cloud Services Infrastructure-As-A-Service

### The Public Cloud

For more than a decade, we have been helping our clients exploit the latest technologies by leveraging custom-built software and leading practices in design and operations to maximize performance and reduce risks. Many clients take further advantage of our experience by engaging our Professional Services practices to solve for performance tuning, optimization, disaster recovery, and security issues.



The Public Cloud™ completes the Arrow Fusion hosting service suite with a unique option allowing clients to purchase computing resources as a utility service while leaving the Operating System layer and up under each client's complete control. This comprehensive portfolio of hosting products gives Arrow Fusion clients the most flexible hosting platform options available.

### Architecture

#### No single point of failure

Redundancy is our way of life. By utilizing the latest technologies we are able to provide an Enterprise Class infrastructure with every component working in parallel. Redundant Cisco Firewalls, Netscaler load balancers, NIC's, power supplies, 4Gbps SAN connections, and virtual SAN storage; literally every component of the Public Cloud is redundant and prepared to supply 100% uptime. Welcome to a cloud computing environment you can trust with mission critical applications.



## Clustering

Worrying about the business impact of hardware failures is a thing of the past. By virtualizing your environment on Arrow Fusion technologies you immediately benefit from fully redundant and clustered resources. Server-waste is eliminated, while peace of mind remains intact.

## Continuous Refresh

Through our partner relationships we are continually refreshing infrastructure hardware to mitigate potential failures, adjust for industry needs, and make sure the most robust and relevant resources available back your environment. By virtue of our unique solution these upgrades are completed seamlessly in the background, ensuring that your environment is not only current, but also always available.

## More than just storage

Gone are the days of renting space to dump your files. With Arrow Fusion's Public Cloud, you are given a complete computing environment with total control over network, server, and storage layers. Manage firewall rules, set resource availability for mission critical servers, and manage your data exactly as you want to.

## Performance

No skimping. At every critical layer of infrastructure we provide best-of-class resources, from industry leading fiber SAN technology, to Gigabit network backbones, and robust HP DL585 and DL580 servers packing the fastest processing power available.

## Interface

### Deploy, Change, Delete

Deploy a server in 5 minutes, not 5 hours. Using the intuitive Public Cloud wizard, your VM goes from a template to fully available computing resource in a matter of minutes. Prepare servers in advance; while powered off, your resource pool remains unaffected, giving you immediate availability when the need arises. By utilizing the Public Cloud interface you have the flexibility of resource control unmatched by other cloud providers. Simply shut down the server to allocate additional processors, memory, or storage space. The paradigm of rebuilding a server from scratch has shifted.



### No serious technical skills required

The Public Cloud gives you total control without a technical headache. Create a server, load your applications, and publish it to the internet without touching a network device, racking a server, or wasting hours in configuration.

### Automation

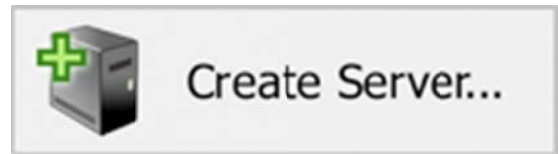
The Public Cloud interacts with many virtual technologies and automates network provisioning, firewall settings, load balancing configuration, O/S Installation, storage provisioning and much more. You are given the freedom to leave these settings as-is or tailor settings to fit your unique needs.

### SLA

Having a server online is useless if you cannot manage it. With the Public Cloud Console, we guarantee 99.5% availability to the interface. Anytime, anywhere, you have access when you need it.

### Copy Server

With our easy server duplication functions you have the ability to copy servers for sudden needs, or create unique copies to speed along the already fast deployment process.



### Anywhere

Special software is not required. The environment is accessible from any system with a web browser and is compatible with the most popular flavors: IE, Firefox, Safari, and more. Anywhere and anytime, our system is available to give you the flexibility and freedom you need to access your systems.



## Unique Features

### Resources (Processors, Memory, and Storage)

Unlike other clouds, Arrow Fusion's Public Cloud allows you to distribute your resources among servers as you see fit. No locked in processor/memory/storage configurations; allocate these to each server as needed, independently of one another. Experience bulk power without constraints.



### Virtual Machines

The Public Cloud™ from Arrow Fusion is currently the only cloud computing platform built for the Enterprise utilizing VMWare ESX and VMWare Infrastructure 3. Clients control this powerful platform from an easy-to-use web interface.

### Template Library

Companies often deploy a wide variety of Windows, Linux, or Solaris machines to meet a variety of user needs. These needs still exist when switching to a virtualized environment and that is why we offer a vast library of these operating system templates; just pick the OS template you prefer and build your virtual machine in minutes.

### Copy Server

After doing all the work to build the perfect web server, configuration, application load, and content load; why spend hours redoing it to build your second. With the 3 steps on the Public Cloud you can have an exact copy of your server ready and waiting.

### ISO Upload

If you have pre-existing ISOs or custom OS needs you have the freedom to upload and install from the ISO of your choice onto blank virtual machines. This is just one more way you gain total freedom and control over your environment while removing stress, wasted time, and hassle from your server-build workflow.

### Network

Load balancing, IP management, Network Address Translation, VLAN segmentation, and custom firewall rule sets are just the beginning of what you control within your environment. Enjoy the same control over your network that the Public Cloud™ offers over your servers.

## Pricing Structure

Pricing is monthly and based on the following variables:

- Compute Resources

- Enterprise Cloud Resource Bundle - 1Ghz, 2GB MEM
- Enterprise Cloud Resource Bundle - 5Ghz, 10GB MEM
- Enterprise Cloud Resource Bundle - 10Ghz, 20GB MEM
- Enterprise Cloud Resource Bundle - 25Ghz, 50GB MEM
- Enterprise Cloud Resource Bundle - 50Ghz, 100GB MEM
- Enterprise Cloud Resource Bundle - 100Ghz, 200GB MEM
- Cloud LAN-LAN VPN
  - Enterprise Cloud LAN-LAN VPN: Initial Network + 1 x 1Mbps Tunnel
  - Enterprise Cloud LAN-LAN VPN: Initial Network + 1 x 3Mbps Tunnel
  - Enterprise Cloud LAN-LAN VPN: Initial Network + 1 x 6Mbps Tunnel
  - Enterprise Cloud LAN-LAN VPN: Initial Network + 1 x 10Mbps Tunnel
- Network Resources
  - 1 Public Enterprise Cloud IP (Additional)
  - 5 Public Enterprise Cloud IP's (Additional)
  - 10 Public Enterprise Cloud IP's (Additional)
  - 25 Public Enterprise Cloud IP's (Additional)
- Storage Resources
  - 100GB Enterprise Cloud Fiber Storage
  - 250GB Enterprise Cloud Fiber Storage
  - 1000GB Enterprise Cloud Fiber Storage
  - 5000GB Enterprise Cloud Fiber Storage
  - 10000GB Enterprise Cloud Fiber Storage
- Bandwidth
  - Committed Bandwidth (1 to 50 Mbps)
  - Committed Bandwidth (51 to 100 Mbps)
  - Committed Bandwidth (101 to 150 Mbps)
  - Committed Bandwidth (151 to 200 Mbps)
  - Committed Bandwidth ( 201+ Mbps)
- Software Licenses
  - Windows 2008 Web Edition, 32-bit (Per VM)
  - Windows 2008 Web Edition, 64-bit (Per VM)
  - Windows 2008 Std. 32-bit (Per VM)
  - Windows 2008 Std. 64-bit (Per VM)
  - Windows 2008 Ent. 32-bit (Per VM)
  - Windows 2008 Ent. 64-bit (Per VM)
  - Windows 2003 Std. 32-bit (Per VM)
  - Windows 2003 Std. 64-bit (Per VM)
  - Windows 2003 Ent. 32-bit (Per VM)
  - Windows 2003 Ent. 64-bit (Per VM)
  - Microsoft Windows Server 2003, Standard Edition (64-bit) w/ SQL Server 2005 Standard Edition (Per VM)
  - Microsoft Windows Server 2003, Standard Edition (64-bit) w/ SQL Server 2008 Standard Edition (Per VM)
  - Microsoft Windows Server 2008, Standard Edition (64-bit) w/ SQL Server 2008 Standard Edition (Per VM)
  - Microsoft Windows Server 2008, Standard Edition (64-bit) w/ SQL Server 2008 Standard Edition (Per VM)

- Microsoft Windows Server 2008, Web Edition (64-bit) w/ SQL Server 2008 Standard Edition (Per VM)

## Pricing Example

### Public Cloud - 5GHz, 10GB, 500GB

#### Committed Resources

##### Public Cloud Computing Resources: 5GHz/10GB RAM

Quantity	1
CPU Resources	5 GHz
Memory Resources	10 GB

##### Public Cloud Storage Resources: 500GB

Quantity	1
Fiber Storage Resources	500 GB

#### Network and Security

##### Public Cloud Security Resources

Quantity	1
Security Resources	Public Cloud HA Utility Firewall
Security Resources	2 x Public Cloud Software Client-LAN VPN

##### Public Cloud Network Resources

Quantity	1
Network Resources	Public Cloud HA Utility Load Balancer
Public IP Resources	5 x Public IP(s)
Private IP Resources	Private IP's (DMZ/27)
Private IP Resources	Private IP's (INT/28)

#### Bandwidth

##### Connectivity - Committed Bandwidth

Quantity	1
Bandwidth	1 Mbps

<b>Total Non-Recurring Charges</b>	<b>\$0</b>
<b>Total Monthly-Recurring Charges</b>	<b>\$2,949.50</b>
Monthly Services - Hosting	\$2,232.00
Monthly Services - Network	\$62.50
Monthly Services - Security	\$0.00
Monthly Services - Storage	\$625.00

## Virtual Server

### **IBM SmartCloud Enterprise**

**Issue:** How can I reduce the costs required to set up and maintain environments for development, testing and other dynamic workloads while accelerating my time to market and improving the quality of results?

**Solution:** Leverage a more flexible cloud computing environment, designed with enterprise-class security, reliability and control, to help reduce capital expense and operational costs, shorten development cycle times, improve quality and enable collaboration. We partner with IBM to give you access to the IBM SmartCloud Enterprise cloud computing environment.

Today's dynamic business environment is challenging. To support it, you need a cost-effective, agile IT infrastructure to drive new services and applications to market more quickly. But setting up and maintaining your own IT infrastructure to meet these needs can mean high up-front capital expenses and operational costs as well as poorly utilized infrastructures that are difficult to reallocate in response to unpredictable or intermittent workloads. Application development and test activities often suffer from insufficient test environments, resulting in prolonged development cycles and quality issues. Cloud computing can help you cope with these challenges, but you need a cloud infrastructure that offers enterprise-class flexibility, security, reliability and control.

With IBM SmartCloud™ Enterprise, you gain access to an infrastructure as a service (IaaS) cloud that enables you to deploy new servers and storage environments across the globe in minutes (as opposed to weeks or months) and pay for them only for as long as you need them. You have virtually no up-front capital expenses, and, with almost no infrastructure to maintain, you may also reduce your labor costs. In addition, IBM SmartCloud Enterprise provides you with highly standardized and automated processes, which can help you improve the quality of your projects by reducing development and deployment errors. Built to support the security, reliability and control needs of large and mid-sized enterprises and their partners, this flexible cloud infrastructure provides a platform that can help you rethink your IT solutions and reinvent your business.

### **Reinventing business with reduced up-front investments and lead times**

Without the need to invest in IT capacity up front and by only paying for the capacity actually needed when it is needed, you can gain the flexibility to explore a broader set of business opportunities. This flexibility has propelled many of our customers to new levels of business innovation and agility. Although media companies and electronic game developers were some of the first to leverage cloud economics, companies from many other industries, including financial services, life sciences, manufacturing, distribution and retail, have since joined them. Examples range from global Internet collaboration and media sharing to focusing massive cloud compute power on performing genome mapping, financial analysis, stress testing and distribution optimization.

The automation and capacity in IBM SmartCloud Enterprise can also help you achieve greater business agility by shortening application development and deployment lead times. IBM SmartCloud Enterprise can provide you with nearly instant Internet access to virtual servers and storage that is exclusively yours to use and customize as you like. You or your partners can install applications and tools on top of



the standard images and operating systems, configure storage and adjust security settings, just as you would in your own data center. Once your configuration meets your requirements, you can automatically deploy identical copies of it to developers and production environments around the globe in minutes. IT infrastructure can be taken out of the critical path on your projects.

### **Helping you reduce costs with automation and pay-as-you-go pricing**

You can generate considerable savings in capital expenditures for servers, storage and software and in their associated operational costs by using the cloud to more closely match server capacity to your immediate needs. In addition, the highly automated IBM SmartCloud Enterprise provisioning process also reduces the need for many traditional IT tasks, helping you avoid the labor costs associated with the time-consuming procurement of servers, storage and operating system software and with installing, configuring and maintaining them. The IBM SmartCloud Enterprise cost estimator can help you compare cloud costs to the cost of a traditional implementation.

IBM SmartCloud Enterprise provides a number of software licensing options designed to help you reduce your overall software costs. The cloud asset catalogs contain a selection of ready-to-deploy software that you can use on a bring-your-own-license or pay-as-you-go basis. Pay-as-you-go software with hourly rates can drive significant cost reductions if you have short-term workloads or workloads with variable capacity requirements. In addition, you can bring open source software and software that you own or already have a license for to the cloud by importing an image or installing it directly on cloud virtual machines.

To realize these cost reductions, you need to select and redeploy appropriate workloads to the cloud. Intermittent or short-term workloads and workloads with very dynamic capacity requirements, such as product launch workloads, are good initial candidates because they can provide immediate benefits and are difficult to handle without a cloud. Next, you should identify workloads with moderate availability and security requirements that fit well into a cloud context (for example, the majority of development and test activities and many production workloads with less sensitive data such as static website applications). Studies show that over half of all enterprise workloads fall into this category.

### **Enabling enterprises and their partners to rethink IT solutions**

IBM SmartCloud Enterprise has been designed to be open and flexible to help enterprises extend their data centers into the cloud as well as to allow their partners to leverage the cloud in delivering their services. The following are a few examples of the features that accomplish this:

- Users have full (root) unique secured access to configure their x86 servers and storage in the cloud.
- Software bundles and images can be imported or created and managed using tools and image catalogs.
- The object storage Internet file system service can be set up to create a global, private or public, enterprise web file sharing system.
- Virtual private networks, firewalls and filtering of network traffic can be set up to match enterprise requirements.
- The entire provisioning process can be customized using an extensive set of application programming interfaces.

- A cloud service framework within the cloud portal allows users to define and manage their own platform-as-a-service and software-as-a-service offerings.

IBM SmartCloud Enterprise does not include or mandate IBM managed services that interact directly with a running server instance. Enterprises can choose the IT management processes and providers they prefer to satisfy requirements for such things as application and image management, system monitoring, backup and recovery, and security management. They may choose to provide these services themselves or to purchase them separately from their partners or from IBM.

**Offering enterprise-class cloud security, reliability and control**

When you are considering a new technology such as cloud, there are always challenges and dependencies that need to be addressed. Numerous studies have documented that enterprises considering cloud computing are most concerned about security, reliability and control. IBM has carefully considered each of these themes when building the IBM SmartCloud Enterprise offering.

IBM SmartCloud Enterprise is designed to be a security-rich infrastructure. The design considerations have been guided by the IBM Security Framework and IBM internal best practices. They range from tight physical security of the cloud data centers to intrusion protection systems, access controls and constant vulnerability scanning of the infrastructure. In addition, optional security features such as virtual private networking can help you extend your existing security disciplines to the cloud.

Around-the-clock monitoring and management of the global IBM SmartCloud infrastructure is focused on delivering at least 99.5 percent availability, as specified in the IBM SmartCloud Enterprise service-level agreement. In addition, the cloud environment provides a number of features that allow you to deploy highly resilient configurations. These features include 'anti-collocation,' 'virtual IP addressing,' and image and storage cloning for implementing failover strategies. These and other features have motivated a number of enterprises to rethink their disaster recovery strategies to now rely on the cloud.

Enterprise-class control of cloud users, processes and assets is a differentiating feature of IBM SmartCloud Enterprise. This control starts at cloud account creation time when an enterprise account administrator is given sole access to the cloud portal and the means to authorize other users to order cloud services within defined limits. The built-in control panel continuously provides a view of cloud assets and spending on servers, storage, images and preconfigured service instances. Software asset libraries, private and shared across the account, with tools provide a way to encourage and control reuse, standardization and proper entitlement. Usage charge detail reports enable you to allocate cloud costs to individual users and service instances. You can manually control the automated cloud provisioning engine or customize it to add or delete servers and storage on a fixed schedule or in response to unpredictable or intermittent loads, helping you to maintain service levels and control costs.

## Pricing Structure

Packages are defined as follows:

<b>Virtual Machine Component - 32 bit configuration</b>	<b>Copper</b>	<b>Bronze</b>	<b>Silver</b>	<b>Gold</b>	
Virtual CPUs @ 1.25GHz	1	1	2	4	
Virtual Memory (GB)	2	2	4	4	
Virtual Local Storage (GB)	60	235	410	410	
<b>Virtual Machine Component - 64 bit configuration</b>	<b>Copper</b>	<b>Bronze</b>	<b>Silver</b>	<b>Gold</b>	<b>Platinum</b>
Virtual CPUs @ 1.25GHz	2	2	4	8	16
Virtual Memory (GB)	4	4	8	16	16
Virtual Local Storage (GB)	60	910	1084	1084	2108

Pricing is pay per use per hour and based on the following variables:

- Reserved or unreserved capacity
- Operating System (Linux or Windows)
- Persistent Storage (per GB per hour)
- Internet Data Transfer (per GB per month)
- Reserved IP Address
- Pay-as-you-go Software Images

### Pricing Grid – Unreserved Capacity

Per Hour Usage Charges – Unreserved Capacity				
<b>SC Operating System 32-bit Configuration</b>	<b>Copper</b>	<b>Bronze</b>	<b>Silver</b>	<b>Gold</b>
Red Hat Enterprise Linux	\$.1875	\$.2175	\$.345	\$.540
SUSE Linux Enterprise Server 11.0	\$.1425	\$.1725	\$.300	\$.495
Windows Server (2003 and 2006 Versions)	\$.150	\$.180	\$.360	\$.555
<b>CP Operating System 32-bit Configuration</b>				
Customer Provided Linux operating System	\$.1125	\$.1425	\$.270	\$.465

<b>SC Operating System 64-bit Configuration</b>	<b>Copper</b>	<b>Bronze</b>	<b>Silver</b>	<b>Gold</b>	<b>Platinum</b>
Red Hat Enterprise Linux	\$.450	\$.600	\$.720	\$1.11	\$2.190
SUSE Linux Enterprise Server 11.0	\$.405	\$.555	\$.675	\$1.065	\$2.085
Windows Server (2003 and 2006 Versions)	\$.510	\$.600	\$.750	\$1.44	\$2.985
<b>CP Operating System 64-bit Configuration</b>					
Customer Provided Linux operating System	\$.375	\$.525	\$.645	\$1.035	\$2.055

<b>Persistent Storage</b>	
<b>Charge per GA per hour</b>	
.000225	
<b>Storage Input and Output Access Requests</b>	
Requests per million pr portion thereof	\$.165

<b>Internet Data Transfer</b>	
<b>Rate Tier for Monthly Terabyte (TB) Usage</b>	Per GB Charge
For transfer amounts up to and including the 10 <sup>th</sup> TB	\$.225
For transfer amounts from the 10 <sup>th</sup> TB up to and including the 50 <sup>th</sup> TB	\$.165
For transfer amount from the 50 <sup>th</sup> TB up to and including the 150 <sup>th</sup> TB	\$.135
For transfer amounts above the 150 <sup>th</sup> TB	\$.120
<b>Reserved IP Address</b>	
<b>Each Reserved IP Address</b>	Charge per hour
For each reserved IP address	\$.015

## Virtual Desktop

### **IBM SmartCloud Desktop**

As your traditional desktop environment becomes more complex, you may be looking at virtualization to help reduce the substantial effort required for deployments or upgrades and labor-intensive end-user support, not to mention the amount of lost productivity your end users can experience in a traditional PC environment. And the lack of in-house skills or sufficient capital could hamper your transition. IBM Smart Business Desktop on the IBM Cloud offers a fully managed, pay-as-you-go subscription service that helps transform your desktop environment with virtualization. By extending the refresh cycle of your PCs, you can use existing equipment to deliver the most up-to-date applications to your end users, with fewer costly hardware upgrades or additional support costs. Or you can migrate to the latest thin clients. And as more of your workers bring in their own devices, such as iPad or Android tablets, you can benefit from the expertise of IBM's virtualization and cloud computing professionals, who can help you find the most effective way to address your client computing issues.

### **Addressing unpredictable desktop virtualization costs**

Using the IBM Cloud, we can help provide cost efficiencies, reduce infrastructure and staffing costs and improve end-user support. Desktops that might have been refreshed every two or three years can become thin clients, enabled to receive virtualized applications and operating systems regardless of their legacy status.

And because the virtualization services are delivered on a convenient, pay-as-you-go, monthly subscription basis, we can help you establish a more predictable desktop budget that allows you to scale to meet changing business requirements.

### **Helping deliver security-rich data access to end users**

Having critical business information on demand is essential to your responsiveness, and virtualization provides near anytime, anywhere access to users. By moving data away from the physical desktop where it can be compromised, you can create a fundamentally more security-rich environment. For instance, users can access their desktops from home without the inherent security risk to a highly distributed desktop environment.

In addition, IBM separates controls for end-user access, so you can continue to use your enterprise's security framework to control access to your sensitive data and applications.

### **Using virtualization specialists to help simplify your desktop infrastructure**

IBM Smart Business Desktop on the IBM Cloud offers the services of experienced virtualization professionals to manage the hardware, software and support within a hosted environment. From assessment and planning to migration services, our extensive experience in end-user services helps you identify the right approach for your organization – whether you are integrating employee-owned devices like iPad or Android tablets, new thin clients or just repurposing existing desktops. With the IBM Cloud, your desktops can be provisioned in hours instead of weeks, enhancing productivity for both end users and your IT staff.

**Issue:**

Traditional desktop environments require substantial effort for deployments, upgrades and end-user support, but many companies lack in-house resources to move to virtualization. And as employees bring in their own devices, integrating iPad or Android tablets can add to the complexity.

**Solution:**

Transform your client environment to a virtual cloud for more security-rich access and higher productivity. We partner with IBM to give you access to IBM Smart Business Desktop on the IBM Cloud.

**Pricing Structure**

Feature	Bronze	Silver	Gold
Contract Term	Trial = 3 mos (with 3 mo renewal option) Production IBM Cloud = 36.60 months		
vCPU	1	1	1
RAM	1GB	1GB	2GB
Disk Space	7.5GB	10GB	15GB
VM Type	Non-Persistent	Persistent or Non-Persistent	Persistent or Non-Persistent
HDX	Option	Included	Included
Billing	No one-time charge: pr VM per month. Billing starts after on-boarding		
SLA	99.5% Availability		
Sold in blocks of:	50 VMs	50 VMs	30 VMs
Pricing	\$54/month per VM	\$72/month per VM	\$100.50/month per VM

## Platform Management

### Colocation

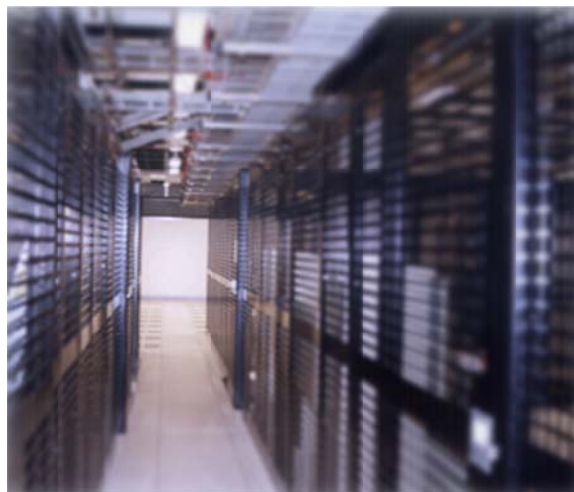
Terremark's Colocation services offer a highly secure and reliable carrier-neutral environment to deploy your computing, telecom, storage and IT equipment. Our fortress-style facilities, complete with redundant infrastructure and systems, help you eliminate the capital and operational expense required to house and protect your mission-critical hardware, software and systems. Terremark's Colocation Services offer a controlled and managed space with multiple connectivity options for your data equipment in a secure and reliable facility. Custom designed to exceed industry standards, Terremark provides 100% Service Level Agreements (SLAs) for power and environmental systems through a number of redundant subsystems, including power and fiber trunks from multiple sources. This scalable solution allows you to upgrade space, connectivity and services as your requirements grow.

Space options include:

- Open Racks
- Caged Space
- Customized, locked caged areas starting at 100 square feet
- Virtually any configuration of equipment mounting up to 10' 10" in height
- AC and DC power
- Analog, ISDN, DS0 telephone lines available

Fully Enclosed Cabinet Options include:

- 7' H x 23" W x 27.5" or 36" D (mounting depth)
- AC and DC power



### Interconnection & Cross-Connects

Our Interconnection and Cross-connect services enable you to conveniently share data with any other customer connected to Terremark's sophisticated network. This "zero-mile" distance between you and the partners you connect with helps you to avoid many of the costs and performance issues often associated with a complex patchwork of local-loops and long-haul circuits. Whether you are purchasing transit from any of the leading global carriers located at our facility, or providing an innovative IP-based service to the marketplace, Terremark's Cross-connect service can help meet your needs. Terremark's carrier-neutral facilities provide the optimal environment for this flexible connectivity option. With direct connections to some of the largest backbone providers in the world, this service offers immediately recognizable cost and performance benefits.

Our network has been designed to meet demanding cost and performance requirements in both metropolitan as well as transoceanic applications. We recognize that some customers may connect to our network via international SDH standards, while domestic customers may choose SONET standards. Our network performs the necessary conversions and gateway functionality to convert SONET signals to SDH signals and vice-versa. This capability eliminates the need for customers to purchase and maintain their own expensive optical switches, while providing immense flexibility for customers to terminate and



connect with each other. Terremark's Interconnection service extends to the VF level to perform u-law to A-law conversion for T-1 to E1 circuits, thus eliminating your need to purchase advanced channel bank equipment.

## Managed Router Service

Terremark Managed Router Service (MRS) leverages the extensive amount of connectivity that is present at the NAP of the Americas today to provide the customer with choice, performance and rapid time to market for their Internet access needs. This level of connectivity is a direct result of having nearly all the largest multinational carriers and ISPs as customers of the NAP of the Americas. MRS takes advantage of this “marketplace” of carriers and provides value as a turnkey solution for Internet access bandwidth that is highly reliable, has very low latency, improved performance and is extremely quick to provision.

MRS has been implemented at the NAP of the Americas via the installation of a state-of-the-art platform, designed and implemented by the Terremark technical team. At the core of this platform is a pair of state-of-the-art Cisco routers capable of transferring up to 40 million packets per second, at core switching speeds ranging from 5 Gbps up to 160 Gbps. The core routers are connected in a fully redundant mesh configuration to the NAP of the Americas Peering Network where access to the carriers and worldwide connectivity is provided via multiple Gig-E connections run over multimode fiber. Reliability is further enhanced via interconnections between the two Cisco routers via Gig-E trunks. Customer connections to the platform are supported via patch panels located in either the East or West Meet Point Rooms.

MRS creates value and provides exceptional network performance for our customers by condensing the worldwide reach of several network providers into one single connection. By connecting to MRS, the customer immediately receives a complete package of benefits, including:

- Multiple Tier One Providers
- Continuous Monitoring and Reporting
- BGP Configuration Recommendations
- Traffic and Route Reporting
- Performance Analysis
- Low Latency
- Optimized Routing
- Excellent Network Performance
- DDOS Reporting and Protection



MRS can also be provided in a redundant configuration, providing even greater overall Internet access reliability.

The Terremark MRS provides customers with access to the Internet without the need to purchase or manage an Internet router, thus realizing the benefits of cost savings, convenience, and rapid provisioning. For customers who already have a presence in the NAP of the Americas, MRS can be provisioned in a matter of days, far quicker and more cost efficient than having to obtain a costly and time-consuming local loop from traditional solutions.

Connections to the MRS platform are offered from 1 Mbps to 10 Gbps bandwidth connections providing the opportunity for an entry-level connection that can be upgraded as traffic demands warrant. For larger traffic loads, multiple 10-Gbps connections can be implemented to form a “super trunk”, offering superior network performance and reliability.

## **Smart Hands & Remote Hands Services**

Terremark’s SmartHands and RemoteHands services assist customers that need remote access to their equipment for performing simple trouble-shooting or maintenance tasks. Our 24x7 on-duty staff can perform basic tasks that do not require the use of tools or equipment. Terremark’s SmartHands and RemoteHands services are available on demand or by subscription in 8-hour blocks per month. On demand customers can expect best effort response times with an average response time of @ 1-hour. On-Demand requests are billed in one-hour increments. Subscription customers can expect a 15-minute response time Service Level Agreement (SLA) providing them with a dependable resource for maintaining maximum uptime. Subscription services are billed in 30-minute increments at a significant savings over on demand hourly rates.

Customers can remotely manage their operations at our locations from anywhere in the world and maximize operational uptime by utilizing the SmartHands and RemoteHands services. This remote service, performed by our skilled staff, reduces costs by eliminating the need for the customer to dispatch technical personnel to our facilities to perform simple tasks. Leveraging the round-the-clock availability of the SmartHands and RemoteHands services helps customers increase the uptime of their mission-critical systems.

Terremark’s RemoteHands Services include:

- 24x7 coverage
- Power Cycling (turning equipment on and off)
- Toggling a switch or pushing buttons
- Securing cabling to connections
- Observing, describing or reporting on indicators or display information on equipment or consoles; and basic observation and reporting on the environment in the data center.

Terremark’s RemoteHands service does not include any service requiring a tool or diagnostic equipment, opening equipment or movement of connected equipment. Those are services provided by our Engineering Team on a case-by-case basis.

Terremark’s SmartHands Service includes:

- 24x7 coverage
- Management of Equipment Components (e.g. cards, drives, memory)
- Installing, replacing or removing
- Troubleshooting
- Media Management
- Supply management
- Inventory and archiving
- Complex cable configurations
- Loop-back and signal testing

- RMA and shipping of replaced equipment
- Equipment testing and troubleshooting
- Circuit testing
- Trouble ticket management

## Managed Hosting Services

Terremark’s Managed Hosting Services help IT organizations their talents on improving their core business by taking on day-to-day system management tasks. Terremark’s offers two levels of managed hosting services to our customers. The first level provides system administration and support at the device level (i.e. OS and down); the second level extends our operational responsibilities to include the uptime and availability of the applications deployed. We provide these services using ITIL-based processes and procedures to ensure consistent, high quality results.

## Implementation & Deployment

Terremark’s systems design and architecture service helps you maximize the return on your hosting investment by leveraging proven processes and the latest technologies to design and size your infrastructure. Our digitalOps System Designer uses a drag & drop interface on top of a rules-based engine to allow our architectural team to rapidly design and present infrastructure design concepts.

Our standards based implementation process assigns a project manager to your deployment to ensure an efficient, comprehensive deployment that includes the build, deployment, and verification of your newly contract environment.



## Service Delivery

Every customer is assigned a Service Manager and a Customer Relationship Manager who are responsible for ensuring Terremark meets or exceeds all expectations. Customers purchasing our application support services are also assigned an Application Services Engineer (ASE), who will develop an in depth knowledge of the systems and applications being deployed. In addition to direct contact

with these personnel, customers are given access to various reports and metrics collected through our DigitalOps platform.

## Change & Patch Management

Change threatens the stability of any system, whether it comes in the form of software patching or device configuration changes. Terremark's Global Change Management system provides complete analysis, tracking and workflow for system change, minimizing risk and maximizing availability. Our Patch Management system involves testing and evaluation of all commercial software patches for our supported technologies before a single fix is applied. Our digitalOps Contact Manager ensures complete communication of fixes and changes.



## Alert Management

Intelligent, proactive systems monitoring is only the first step in ensuring the ongoing health and availability of a production system. Terremark's digitalOps Alert Manager reconciles multiple independent monitoring and reporting systems into one rules-based console and correlates alerts, surfacing critical issues and giving our team of experts a jump start on any issue.

Custom multi-tier transaction monitors can be made available to monitor your application from the standpoint of an end user or back-end business process, ensuring a green light really does mean you're running. Live multi-dimensional systems topography and detailed asset and configuration data puts the information and tools at hand to understand overall application health and performance.

Our digitalOps Command Center console will further assist you in understanding performance, predicting trends, and planning for the future.





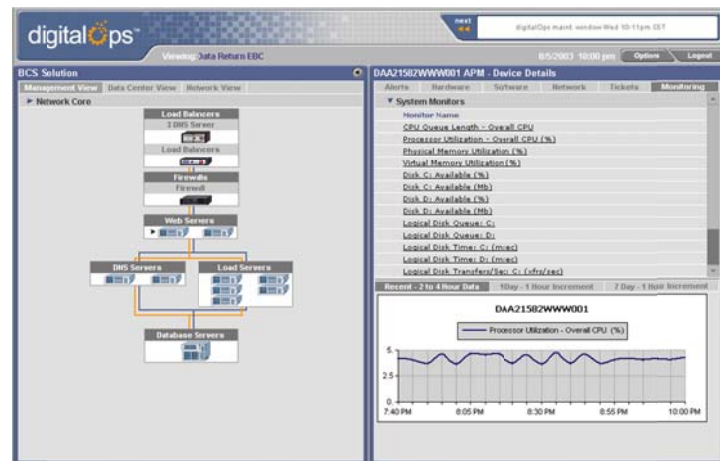
## Problem Management

Your managed devices are only as successful as our ability to resolve unforeseen or unavoidable issues in a timely manner. Terremark's combination of experience, systemic change management, intelligent monitoring, event correlation, and live system asset and configuration data gives us the tools necessary to swiftly fix the immediate problem, research root-cause issues and implement solutions. We don't staff a call center of first-level support staff; your dedicated support team engineers are the frontline of defense. Return-to-service is insufficient; our comprehensive root cause analysis process means we'll get to the problem with your supported technologies and eliminate it.

## Customer Console

Command Center is a Web-based portal for consolidation of monitoring, configuration, and availability data. Command Center provides a system-wide view of site availability, global incidents, system diagrams, and device configuration details.

Using Command Center, customers can drill down to see device-specific monitoring data and real-time graphs of recent history, enabling on-the-spot trend analysis and more proactive management of solutions.



## Scalability Center

The ability to accurately predict performance and reliability of an application on the Internet is critical to the application's success. Organizations cannot afford to misunderstand these "unknown variables." The risk of having an application fail or perform poorly could mean millions of dollars in lost revenue, lower productivity, and customer dissatisfaction.

The Terremark Scalability Center is an insurance policy for verifying that applications will function and perform on the Internet as expected. This state-of-the-art facility helps customers correctly size their applications, determine minimum and maximum thresholds for performance, predict when applications will need additional development work, and prove the viability of solutions for business.

The Scalability Center includes services that target specific areas of an application. In each lab, customers receive access to facilities and specially trained engineers who assist customers in determining real-world viability of an application's design, including maximum system thresholds and capacity planning issues.



**SECTION 1**  
**TECHNOLOGY CONSULTING**  
**SERVICES**



# SECTION 1

## 1 TECHNOLOGY CONSULTING SERVICES

### 1.1 TSS/INVPOWER PROVIDED CONSULTING SERVICES

- **New Data Center design:** TSS and Innovative Power Systems have provided significant consulting and project execution services for new Data Centers throughout the US and in Europe, Asia, and the Middle East. We have provided technology consulting, design and engineering, program and project management, construction management, installation management, long lead equipment procurement, budgeting and financial management, critical path scheduling, system commissioning, and facilities management services.
- **Upgrade of existing Data Center facilities:** TSS has performed the same services for existing Data Centers as listed under New Design above. Approximately 75% of our work is associated with upgrades, improvements, and expansions to existing Data Centers. Often we are engaged to upgrade critical infrastructure systems while a Data Center is operating.
- **Design and construction of LEED (Green Data Center) facilities:** TSS has conducted several LEED evaluations for Data Center clients and provided detailed analysis and recommendations for energy conservation initiatives and Green improvements. TSS is a member of the Green Grid and regularly participates in educational seminars and industry discussions on this subject. Please see our white paper, "Implementing Green Initiatives in the Data Center Environment."
- **Utility industry:** TSS engineers and construction managers work closely with utility companies on a regular basis to secure and deliver reliable utility services to our clients. Regarding Data Center work we have performed for utility firms as our clients, we have worked in the past for several utility companies. Most recently, performing energy analysis and major infrastructure engineering services (for energy improvements) for Potomac Electric Power Company (PEPCO) and their clients at Salisbury State University and the Washington Metro Area Transit Authority; and for PGE, performing electrical power system upgrades.

We are currently working on Facility Assessment Project for Arizona Public Service (APS). This effort includes the facility evaluation of APS' existing Phoenix, Arizona Data Center and includes the activities that will enable APS to evaluate its options for improving reliability, as well as develop a plan methodology for supporting future IT requirements. Among some of the more significant services included for this specific project are:

- Detailed IT growth modeling requirements
- Single point-of-failure assessments for both IT infrastructure and cable plant
- Detailed mechanical, electrical, and fire protection assessments
- Detailed phasing plan for the implementation of recommendations, and
- An a Cost/Benefit ROI Analysis

In the past, under our previous company name, Com-Site, we performed in a design/build capacity for a significant Data Center expansion for Florida Power and Light in Miami. This engagement included design and construction management for a new power plant building with UPS, batteries, generators, and switchgear. We also performed a Data Center upgrade for Atlantic Electric in New Jersey.

**SECTION 2**  
**EVALUATION PHASE**

## **2 EVALUATION PHASE**

### **2.1 ASSESSMENT APPROACH**

TSS completes Facility Assessment Services for many clients. As part of this effort we typically follow the process as outlined below which includes a for a four step assessment approach:

1. Assessment of IT requirements
2. Assessment of the existing facility
3. Establishment of the Design Criteria Benchmark
4. Facility Evaluation & Recommendations for Modification/Upgrade

Step 4 of the process essentially provides a “gap analysis” for the following elements:

- Current IT requirements versus projected future requirements
- Existing facility infrastructure versus projected future requirements
- Existing facility infrastructure versus required reliability requirements
- Existing facility infrastructure versus energy efficiency requirements

TSS’ Facility Assessment Service is the programmatic definition of requirements, facility evaluation, and estimating activities that are required for client to evaluate its options for improving the reliability and efficiency of its existing Data Center. As part of its report, TSS will provide recommendations for the best practices to apply to Data Center operations, use of high density servers and monitoring power consumption and energy efficiency in the Data Center.

#### **2.1.1 Technology Growth Programming**

TSS will coordinate with representatives of client to obtain background information on the current Data Center equipment counts and preliminary projections for future equipment increases. TSS will evaluate the information obtained and provide an advisory analysis of growth using Best Practices for IT systems growth trending. TSS will then develop and document the projections and future requirements of the technology infrastructure that Siemens will need to support with any proposed Data Center modifications.

The projections will take the form of a Growth Model matrix, spanning multiple tables to reflect the sophisticated trends that may influence the project over a prolonged period of time. This programming effort will ensure that the Data Center facility will properly support business goals.

#### **2.1.2 IT-Based Design Parameters**

TSS will also develop and document the basic performance expectations, reliability requirements, and facility infrastructure requirements concerning the technology that supports the critical business operations of client, in order to establish the general design parameters of the technology infrastructure. These Data Center requirement projections will also be rooted in TSS’ design experience and Best Practices in the implementation of a Data Center. TSS will establish the Program and Design Criteria necessary to support the facility’s mid- and long-term technology infrastructure based upon these documented expectations and requirements.

TSS will work with appropriate client personnel to identify current and future IT system requirements. Business growth, Uptime Institute requirements, functional requirements, and application requirements will have direct influence on decisions relative to the level of redundancy and reliability of any new proposed Data Center. TSS will identify the basic design parameters in relation to the facility’s infrastructure which are necessary for supporting technology systems. Evaluation parameters concerning the infrastructure will include: performance, availability, reliability, and maintainability of the Electrical, Mechanical, Fire Protection/Detection, and Security

Systems. The Program and the Design Criteria for the facility's technology infrastructure will be established based upon TSS' findings.

The results of the Preliminary IT Assessment Report will include the following outputs:

- **Technology Equipment Assumptions** – TSS will document the current assumptions surrounding client technology equipment and will review any pre-existing inventory documentation which client may already possess.
- **Computer Hardware Growth Modeling** – TSS will work with appropriate Siemens personnel to identify current and future (3 and 5 year) system requirements and address any issues of consideration that may influence decisions relative to the level of redundancy and reliability such as growth, functional requirements, and application support requirements.
- **Space Projections** – TSS will develop proposed space requirements for each business and functional area within the technology areas based upon preliminary Siemens space allocations.
- **Load Projections** – TSS will establish projections for mechanical cooling, electrical power based upon the loads that result from the technology equipment analysis.
- **Equipment Plans – Utilizing an existing plan provided by client as a basis**, TSS will develop a recommended plan for supporting future requirements. TSS will identify the optimal location and configuration of IT, cooling and power distribution equipment within the Data Center.

## 2.2 FACILITY ASSESSMENT

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### 2.2.1 Site Survey/Document Review

TSS will conduct a site survey of the facility to document and evaluate the existing Electrical Mechanical, and Fire Protection/Detection infrastructure. An assessment of the existing Mechanical and Electrical Systems will be conducted to confirm the type of equipment, age, condition, capacity, and operation and maintenance records. The capability of the existing systems to support the current and planned IT systems will be reviewed and basic recommendations provided for upgrades or enhancements.

The site survey is expected to be a one day event and will include interviews with Data Center management staff and Building Systems Engineers. The site visit would also incorporate a turnover of documentation from the Owner's representatives including power utility invoices, Data Center and central plant design drawings along with IT equipment inventories on a rack by rack basis (if permitted for release and if available).

TSS efforts during this initial visit will include the following evaluations:

- Document Review. TSS will perform a review of existing drawings, Operations & Maintenance records and other related documentation for the Data Center and support infrastructure.
- Field Survey Assessment. TSS will conduct a field survey to assess the existing Data Center equipment layout, cooling systems, power distribution and power generation systems.
- Interviews. TSS will interview facility engineering staff and determine existing system operating characteristics.
- Power Utilization Data. TSS will collect utilization data from UPS and PDU equipment to determine the Data Center's Power Utilization Effectiveness (PUE).
- Environmental Readings. TSS will spot check floor space temperature and humidity readings to map a preliminary temperature profile.

- Cabinet Locations. TSS will document the cabinet layout and compare with available as-built plans.
- Floor Tile Locations. TSS will document the floor tile layout and compare with available as-built plans.
- Air Flow Obstructions and Conditions. TSS will document below floor and above ceiling (plenum spaces) obstructions and existing conditions.

This survey will require complete access to Mechanical/Electrical rooms, UPS/Battery rooms, emergency generator locations and roof top heat rejection equipment. This survey will require between 4 and 8 hours for completion.

### **2.2.2 Design Criteria Benchmark**

The outcome of a Facility Assessment will highlight cooling, power and energy efficiency issues that require resolution to meet client goals for the facility. TSS will develop a Design Criteria Benchmark that will describe the Architectural and Engineering design guidelines that Siemens and TSS identify as achievable goals for the facility.

The Design Criteria Benchmark will be based upon the IT growth, load, and timeframe information developed from the IT Assessment, Section (2.1), of this proposal, ensuring that the project approach will incorporate a modular and flexible implementation process. The Design Criteria Benchmark will provide a documented source of design information including system capacity, reliability, redundancy, and the basis of any design assumptions. Each area is represented independently and through a summary perspective that integrates each discipline into a holistic design approach.

TSS will develop energy assessment criteria that will include modeling the existing environment (the “base model”) and then generating an energy usage simulation. The resulting document will summarize the findings from the field assessment and provide a “snap-shot” of the Data Center energy use compared with other, similar facilities and current design benchmarks. TSS will complete a heat load calculation and compare it to available cooling capacities in order to provide an indication of the current Data Center’s overall efficiency.

### **2.2.3 Facility Evaluation & Recommendations for Modification/Upgrade**

TSS will produce a report which will consist of survey results and recommendations for each subsystem outlined below. TSS staff will identify and document their recommendations for the modifications/upgrades which are necessary for bringing the facility into compliance with the Design Criteria outlined in this proposal.

The Architectural, Mechanical, Electrical, Fire Detection/Protection, and Security design teams will outline their recommendations within the following general parameters:

#### **Architectural Recommendations**

TSS will make recommendations concerning Architectural standards for the design and construction of the facility.

Architectural recommendations will address the following:

- Clear heights
- Structural floor loading
- Partition construction and glazing
- Fire-resistive construction
- Access floor system as applicable
- Audio Visual system
- Ceiling system
- Fire-suppression containment measures

- Insulation and vapor barriers
- Interior finishes, furnishings and material selections to be coordinated with tenant architect

### **Electrical System Recommendations**

Innovative Power Systems will provide Electrical Systems selection, sizing, location, and operation recommendations based on the calculated loads and operational requirements.

The following Electrical Systems supporting the technology areas will be evaluated:

- Data Center Power Distribution System
- UPS and Battery or Power Conditioning Systems
- Emergency or Standby Power Generator Systems
- Automatic Power Transfer Switching and Paralleling Systems
- Safety and Signal Reference Grounding Systems
- Lighting Systems
- Lightning Protection System where applicable
- Monitoring, Recording, and Control systems
- Emergency Power Off (EPO) Systems
- Grounding Systems

### **Mechanical System Recommendations**

Innovative Power Systems will provide Mechanical System selection, sizing, location, and operation recommendations based upon the equipment loads and operational requirements.

The following Mechanical Systems serving the technology areas within the facility will be evaluated:

- Cooling systems, including heat rejection equipment
- Area air-distribution systems
- Ventilation and exhaust systems
- Water detection alarm systems
- Humidification
- HVAC redundancy

### **Fire Detection/Protection Systems Recommendations**

TSS will provide recommendations with respect to the following Fire Detection/Protection Systems:

- Fire Detection/Protection System (including aspirated smoke detector system options)
- Fire Alarm System
- Wet Pipe Sprinkler Fire Suppression System in the office areas
- Pre-action Sprinkler Fire Suppression System in the Data Center
- Clean Agent Fire Suppression System (e.g. FM200 or alternative)
- Hand Held Extinguishing Systems

### **Security Systems Recommendations**

TSS will develop the functional security requirements for the security system based on the data collected, including the following:

- Access control requirements and levels
- Access monitoring and control

### **Energy Systems Recommendations**

The final Energy Assessment section will highlight Energy Conservation Measures (ECMs). This section of the audit will also include a Life Cycle Cost (LCC) analysis with simple payback calculations for each ECM. The LCC analysis will include construction budgets, energy costs and

maintenance costs over the anticipated life of the measure, with savings expressed in 2008 Dollars, and will include current energy escalation rates from the U.S. Department of Energy.

The Energy Audit's foundation will rely heavily upon the information that was gathered during the site assessment and quality of documents received. TSS assumes that the following information will be available for our review and use during the project duration:

- Up to date as-built drawings of the existing Data Center layout including Architectural, Mechanical and Electrical, Fire Protection and Security design documents
- Up to date as-built drawings of cabinet layout and equipment densities – An exact inventory of all Data Center equipment is not necessary but will provide a much more precise level of detail resulting in the most effective recommendations (The minimum IT information level required to develop good ECM recommendations is rack-by-rack power consumption) TSS requires this information will be furnished by Siemens through existing documentation. If not, TSS is capable of collecting this data for an additional fee (depending on level of detail needed).

#### **2.2.4 Facility Assessment Deliverables**

TSS anticipates that the Facility Assessment study will be completed within approximately 4 to 6 weeks from receiving the notification to proceed. The exact schedule will be dependent upon the time requirements for the provision of Siemens information, reviews and approvals, as well as scheduled site visits.

The deliverables will consist of a Facility Assessment Report, which will include documentation of existing infrastructure and recommended modifications/upgrades for the Data Center.

The report will contain the following specific information:

- Basic performance and reliability requirements for the Technology Infrastructure
- Technology equipment assumptions and projections
- Technology equipment electrical and mechanical load profiles
- Recommendations for deployment of server technology
- Recommended modifications and upgrades for the Facility Infrastructure, specific to the Siemens environment as surveyed, including:
  - Architectural Considerations
  - Electrical Considerations
  - Mechanical Considerations
  - Fire Detection/Protection Considerations
  - Security Considerations
- Energy usage simulation results
- Recommended Energy Conservation Measures and upgrades for the infrastructure systems, specific to the Siemens environment as surveyed, including:
  - Proposed Energy Conservation Measures (ECM)
  - Electrical considerations
  - Mechanical considerations
  - Facility Envelope & Raised Floor considerations
- Budget for recommended modifications and upgrades
- Drawings and Diagrams As Required
  - Computer hardware layout
  - Mechanical single-line drawing
  - Electrical single-line drawing



**SECTION 3**  
**TURN KEY**  
**INSTALLATION SERVICES**

### **3 DCIM TURN KEY INSTALLATION SERVICES**

Successful Data Center Infrastructure installations often rely on close coordination between many organizations and vendors. Innovative Power Systems (IPSI) has built a reputation with APC by providing close coordination and project management between all the parties involved in very complex installations.

Beginning with a pre-delivery assessment to ensure that the equipment that was ordered can be delivered to the site without special rigging or changes to the facility. Often times building owners require special coverings on wall and floors before large equipment can be off loaded and delivered within a facility. These requirements are documented and passed on the freight carrier so that valuable time is not missed by refused deliveries. During the Pre-Delivery visit, the project manager will also verify distances to electrical feeds, cooling pipes, raised floor height, and any other critical elements that could impact installation of the equipment and is documented in the Project Plan document and becomes a living document that is updated throughout the life of the project. The Project Plan document is outlined below.

1. PROJECT MANAGER
2. PROJECT SUMMARY
3. ROLES & RESPONSIBILITIES
4. CONTACT INFORMATION
5. COMMUNICATION PLAN
6. RISK MANAGEMENT PLAN
7. PROJECT MILESTONES
8. PROJECT ISSUES LOG
9. PROJECT CHANGE LOG
10. PROJECT PUNCH LIST
11. PROJECT ACCEPTANCE SIGN-OFF

**SECTION 4**  
**REPRESENTATIVE**  
**PROJECTS**

## 4 REPRESENTATIVE PROJECTS

### 4.1 PROJECT REFERENCES

These project references discuss client's business case, clients need for our consulting services and our effort regarding the scope of work. Below, we are submitting the names and descriptions of client contacts for this purpose.

#### 4.1.1 Consulting Project Experience

**Contract Customer:** Bearing Point  
**End Client Name:** British Petroleum  
**Address:** London, Singapore; Houston, Texas; Chicago, Illinois, and Tulsa, Oklahoma; Watford England

**Scope of Work:** TSS, as a subcontractor for Bearing Point, initially provided complete Site Assessment services with written recommendations for four British Petroleum (BP) locations around the globe, including: London, Singapore; Houston, and Chicago. Following that initial effort, TSS also conducted expanded Site Evaluations for each location to provide more detail of the necessary improvements that were required to ensure a fully-equipped environment for the mission-critical activities at each location. In addition to the four original sites, TSS also provided evaluations for two additional locations in Tulsa, Oklahoma, providing extensive written recommendations for those facilities as well.

Through a combination of site tours, comprehensive interviews, and a review of relevant documentation, TSS worked to develop accurate "as-is" pictures of each of BP's Data Center Infrastructure environments and identified both site-specific strengths and weaknesses. TSS analyzed BP's requirements and the hosting facility's infrastructure in both a general context and as they related to the base building security, architectural, mechanical, and electrical infrastructure.

TSS also reviewed documentation submitted by Bearing Point and BP, pertaining to the firm's Sentrum III facility located in Watford, England, to determine if the Sentrum facility design met the criteria of the functional specifications. The documentation included the Sentrum III/EMDC2 functional specifications, plans, electrical diagrams, and a narrative specific to the site. Ultimately, TSS provided Bearing Point and BP with details, comments and recommendations on all of the documentation, providing explanation of the written comments via follow-up briefings.

**Contract Customer:** Burgess Property and Company- Corporate  
**Address:** San Diego, CA  
**Scope of Work:** Burgess Property and Company plans to develop regional Data Center Campus sites at several locations across the United States. Each campus will support multiple Data Center buildings served by a centralized mechanical and electrical plant. Tenants will be able to select their desired Tier level 2 - 4 and electrical capacity from

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50 -200 watts per square foot.

TSS provided conceptual schematic design services for the site Security and Telecommunications Infrastructure that will be provided at each site. Telecommunications considerations included: Campus Pathway Systems (Non-Secure & Secure), Schematic Site Requirements, recommended routing options, requirements from street to the site, duct bank requirements, manhole and vault requirements, Point of Presence (POP) requirements, Meet Me Rooms (MMRs) requirements, Premise Cable Distribution requirements.

Security considerations included: Site and Building setbacks, vehicle entrance design and location, campus vehicular traffic pattern, force protection features, technical security systems, building perimeter surveillance, intrusion detection, lighting, interior space planning, security management and control.

<b>Contract Customer:</b>	Hunt Midwest, Inc.
<b>Address:</b>	Kansas City, MO
<b>Scope of Work:</b>	<p>TSS conducted a series of marketing projects including a hosting market analysis, a telecommunications evaluation and a facility assessment for Hunt Midwest. TSS also developed mission-critical site marketing materials for the firm's underground facility located in Kansas City, MO. These services were performed in support of the anticipated development of a portion of the Sub Troplis as a Data Center space.</p> <p>TSS assessed the site to determine requirements for upgrading the facility infrastructure of the Sub Troplis in support of a potential Tier 3 or 4 Data Center hosting environment. Telecommunications capabilities and service provider capacities were reviewed and documented for the areas that surround the facility.</p> <p>Marketing support materials that can be incorporated into Hunt Midwest's overall marketing package and approach to the facility were developed once the evaluative studies were complete.</p>

<b>Contract Customer:</b>	MGM Mirage (MGM)
<b>Address:</b>	Las Vegas, NV
<b>Scope of Work:</b>	<p>TSS provided comprehensive services associated with the development of a new Data Center for the MGM Mirage in Las Vegas, Nevada.</p> <p>TSS coordinated with the appropriate representatives of MGM to develop and document the requirements for the new Data Center and supporting infrastructure. The programming effort ensured that MGM's corporate business goals are properly supported in the project.</p> <p>TSS also identified site selection criteria with MGM, which will be used to access potential new Data Center locations. As part of this process, TSS developed a matrix and rating system to evaluate each of the candidate sites for MGM's approval. The matrix takes into</p>

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account such factors as: physical characteristics of each site, expansion potential, the site's compatibility with the local master plan, availability and reliability of utilities, telecommunications, etc.

TSS also provided Advance Transition Planning (part of its Technology Relocation Planning Services), which emphasized broad issues such as scheduling and finalizing the strategic approach to the movement of technology. TSS' efforts were targeted at establishing a strategic understanding of the tasks and resources required for the effective transition of circuits, equipment, and services, as well as outlining steps that must be taken leading up to these events.

TSS performed a Data Center Analysis for MGM. TSS coordinated with appropriate MGM representatives to develop and document the requirements for the new Data Center. The programming effort ensures that MGM's corporate business goals are properly supported.

TSS provided Conceptual Design and Engineering of the Data Center, as well as all of the supporting Engineering efforts. Site and building modifications were performed in accordance with all applicable codes and standards.

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<b>Contract Customer:</b>	Vanderbilt University and Medical Center
<b>Address:</b>	Nashville, TN
<b>Scope of Work:</b>	TSS developed a growth model for 2 existing Data Centers (one for the University and one for the Medical Center) based on past growth patterns, interviews with IT personnel, and current equipment. TSS analyzed the potential useful life of the Data Centers based on the growth model and made recommendations for improvements. TSS also developed design criteria for a new facility that would replace the 2 existing Data Centers and provide room for future growth.

### 4.1.2 Design & Engineering Project Experience

<b>Contract Customer:</b>	Interactive Data Corporation (IDCO)
<b>Address:</b>	Boxborough, MA
<b>Scope of Work:</b>	<p>TSS provided design and construction administration services for IDCO's 50,000 square foot Boxborough Data Center 3 location. The design team is providing and delivering a complete package of construction documents suitable for vendor bidding, with the focus on both the Data Center as well as targeted offices that were relocating as a result of the project.</p> <p>The design team took a scalable/modular approach to the design, enabling a controlled implementation process including cost for expansion of the Data Center and providing overall design program management services.</p> <p>The design team also reviewed the commissioning services (provided by others) for the facility's HVAC, Electrical, Plumbing, and Fire Protection Systems. The design team was engaged during the construction and occupancy phases of this project for construction administration services</p> <p>TSS also managed the procurement of Long Lead Equipment. The equipment was initially identified and designed as a part of the preliminary expansion drawings and specification.</p>

<b>Contract Customer:</b>	DBT-Data Technology Center
<b>Address:</b>	Harrisonburg, VA
<b>Scope of Work:</b>	TSS is currently providing Construction Management Services for DBT-Data Technology Center's (DBT) new Data Center space located in Harrisonburg, Virginia, thus providing DBT with a complete turnkey package. The building was most recently utilized as a manufacturing/warehouse facility. The site is a high bay industrial structure with a partial basement and multi-level space totaling approximately 97,000 square feet and was constructed in the early 1980's. DBT is converting the building to a data processing facility for use by one or more tenants. The baseline requirement for the facility technologies is a power rating of 125 watts per square foot.



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Throughout the Construction Management phase of this project, a TSS Project Manager oversees the construction process, including qualifying subcontractors and vendors, finalizing specifications, securing bids, and negotiating contracts for project execution. TSS is also providing the Center with 3 additional generators.

TSS' Engineering services were completed for Mechanical, Electrical, Fire Detection & Protection, and Security. The design centered on the needs of DBT's inaugural customers, satisfying their growth and application needs. TSS provided Electrical Power pricing for comparison and analysis services in conjunction with these efforts. TSS applied progressive engineering techniques to develop a comprehensive set of Construction Documents for the base building and tenant infrastructure associated with the new Data Center space.

The final design was based upon an initial set of Programming and Schematic Design Services, which were provided by TSS to define the programmatic requirements for the facility. TSS had conducted a Requirements Assessment (RA) for the Center. The RA served as the basis for the design effort. The study provided recommendations to improve the property to meet the facility's functional needs. DBT intended the site to be used as a Tier 3 Data Center. Design criteria included available documentation, site surveys, requirement projections, and engineering recommendations.

<b>Contract Customer:</b>	A Major Collocation Service Provider
<b>Address:</b>	Southern California
<b>Scope of Work:</b>	<p>TSS is providing Design/Build and Commissioning Services for a major collocation service provider's new Data Center facility. The TSS Construction Management Services will qualify subcontractors and vendors; finalize specifications; and on behalf of the owner, secure bids and negotiate contracts for the construction of their new facility. Prior to the Construction Management phase, TSS will be providing a set of Full Design Drawings and Engineering Services to facilitate the construction of the new Data Center facility. The construction documents are being provided at 30%, 70%, and 100% design intervals.</p> <p>TSS is also providing Commissioning Services, acting as Commissioning Agent (CA), for the owner. The Commissioning Services begin with the design development phase for the new Data Center and will continue through the development of construction documents and the actual construction process through the startup and testing phase.</p>

<b>Contract Customer:</b>	A Major Collocation Service Provider
<b>Address:</b>	Northern Virginia
<b>Scope of Work:</b>	TSS is providing Design/Build and Commissioning Services for major collocation service provider's new Data Center facility. The TSS Construction Management Services will qualify subcontractors and vendors; finalize specifications; and on behalf of the owner,

## SECTION 4

secure bids and negotiate contracts for the construction of their new facility. Prior to the Construction Management phase, TSS will be providing a set of Full Design Drawings and Engineering Services to facilitate the construction of the new Data Center facility. The construction documents are being provided at 30%, 70%, and 100% design intervals.

TSS is also providing Commissioning Services, acting as Commissioning Agent (CA), for the owner. The Commissioning Services begin with the design development phase for the new Data Center and will continue through the development of construction documents and the actual construction process through the startup and testing phase.

### 4.1.3 Design/Build Project Experience

**Contract Customer:** Interactive Data Corporation (IDCO)  
**Address:** Boxborough, MA  
**Scope of Work:** TSS provided Design/Build services for the construction of approximately 25,000 square feet of Class A office space on the second floor of the Boxborough facility for IDCO. TSS developed a complete set of Design/Build Documents that satisfied the long-term construction requirements of IDCO. The documents were approved and now TSS is moving to construct the office area in a timely and effective manner; meeting the requirements specified for occupancy.

TSS demolished the second floor of the Boxborough facility for IDCO and is currently rebuilding 25,000 sq. ft. of second floor office space per TSS' drawings generated earlier.

**Contract Customer:** Amdex  
**End Client:** U.S. Customs  
**Address:** Springfield, VA  
**Scope of Work:** TSS prepared construction documents for the US Customs and Border Protection Service (US Customs) for two individual projects: upgrade of existing transformer and conversion of 5,000 square feet of existing office space to a Data Center. This included Architectural, Civil, Structural, Mechanical, Electrical, Plumbing, and Fire Protection design services, as well as construction administration services. This ultimately led to the design of an expansion for the US Customs' Data Center at its current Springfield location.

TSS has completed the design and is presently constructing the NDC1 Phase 2 Data Center Upgrade for Amdex's client, U.S. Customs. Services provided by TSS, for this upgrade, include Construction Management, Construction Administration, and long-lead purchasing activities. TSS is furnishing Mechanical and Electrical long-lead equipment in accordance with the NDC1 Phase 2 U.S. Customs & Border Protection (CBP) Data Center upgrade

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100% design documents.

TSS is responsible for biweekly updates of the project schedule and the management and coordination of construction subcontractors to facilitate a construction start date of September 16, 2007. TSS is managing and coordinating the construction in an effort to expedite the completion date to March 18, 2008. TSS is providing Engineering and Construction Management Services to provide an electrical power solution to include back-up generator power for selective NDC1 administrative spaces per CBP needs. TSS is managing and coordinating Engineering and construction including Dominion Virginia Power to provide and install an additional transformer for the increased capacity and associated utility work made necessary for the upgrading of the NDC1.

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**Contract Customer:**

**Undisclosed Government Facility**

**Value:**

\$125M

**Scope of Work:**

TSS was the design-build project integrator for the development, design, and construction/renovation of a multi-phased US Government facility. The facility—previously used as a large manufacturing center—was converted to use for several Data Centers, an operations command center, a processing facility, and a new multi-unit generator and chiller building. All these areas are fully integrated into common building automation, security/communications, and fire alarm systems. TSS encountered and successfully managed multiple project challenges, included strict site security controls, recurring client-driven design changes, and construction rework caused by redesign and phasing.

**Planning and Design Services**

TSS considered the client's stated needs and goals and then successfully provided an efficient, workable series of design documents; often well above the level of complexity typically found in a technology facility. During design development, TSS directed frequent meetings between designers, clients, and many other project participants who provided valuable input. Evolving changes in project scope were incorporated both during the design period and throughout the construction cycle. Including these changes represented a sophisticated challenge, requiring not only close communications across design disciplines, but also between multiple building occupants and phases of construction. TSS proved itself up to the challenge, ensuring that the final design solutions were implemented successfully.

**Construction Services**

Similar to the design efforts, the single-facility, multi-phased build-out (where the phases often overlapped) also proved to be a challenge. Again, TSS met the challenge successfully.

Conversion of the existing facility required many exacting construction activities: Removal of hazardous materials, significant

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modifications to the structural concrete and steel infrastructure, upgrades to meet code requirements, extensive utilization of raised access flooring systems, construction of a central plant housing generators, UPSs and new mechanical systems, install of FM200 suppression pre-action sprinkler and sophisticated combustion detection systems, and site security infrastructure.

<b>Contract Customer:</b>	WellSpan Health
<b>Address:</b>	York, PA
<b>Scope of Work:</b>	<p>TSS was contracted to provide a Design-Build solution for the new Data Center for Well Span Health at the Indian Rock Office Building in York, PA. Well Span Health required the Design-Build effort in support of a new disaster recovery site in York, PA. The work integrated an existing Data Center and expanded the live Data Center.</p> <p>As a part of the expansion TSS provided a standby generator, UPS, ATS, PDU and RFPs as the electrical distribution. Also, a new HVAC farm was created to serve the Data Center only.</p>

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<b>Contract Customer:</b>	Stifel Nicolaus & Company, Inc. (Stifel) - Baltimore
<b>Address:</b>	Baltimore, MD
<b>Scope of Work:</b>	<p>TSS provided services associated with the development of a new Stifel Baltimore location and the relocation of Stifel equipment and staff to the new facility. Stifel now occupies floors 15, 16, and 17 of the office building located in Baltimore, MD. The Trading Floor is located on the 15<sup>th</sup> Floor while the Data Center is on the 16<sup>th</sup> Floor. The balance of the floors is office space.</p> <p>TSS developed and documented the requirements for the new Trading Floor, Data Center, and office areas. The project team provided design and engineering of the Trading Floor, Data Center, and all the engineering efforts required for all of the Stifel floors, as well as coordinated with the tenant architect. The project team also provided Advance Transition Planning services, which emphasized broader issues, such as scheduling and finalizing the strategic approach to the moment of technology.</p> <p>TSS also provided Construction Management Services, in parallel with the design effort; providing Stifel with a complete turnkey package.</p> <p>Currently, TSS is performing ongoing Facilities Management Services for Stifel Baltimore's Data Center. This includes on-site Facility Management, with the use of the TSS "Start-up team", full maintenance and warranty coverage on many the major systems supporting the Data Center. Specifically, this includes the air conditioning, pumps, air handlers, IR Scanning of main electrical components, as well as Mechanical and Electrical Systems. TSS is also providing a 4-hour emergency service program.</p>

<b>Contract Customer:</b>	Stifel Nicolas & Company, Inc. (Stifel)- Denver
<b>Address:</b>	Denver, Colorado
<b>Scope of Work:</b>	<p>TSS provided services for consolidation/renovation of Stifel offices in Denver. Stifel consolidated occupancy for its Denver, Colorado facility. Stifel occupied Floors 15, 16, and 17 of an office building. Floors 15 and 17 were returned to the landlord and Stifle consolidated all staff and Data Center operations to the 16<sup>th</sup> floor.</p> <p>TSS provided TC and CM Services for the consolidation and transition of the four departments to the 16<sup>th</sup> floor and relocated the 17<sup>th</sup> floor. TSS designed the site and building modifications in accordance with applicable codes and standards. TSS also provided Advance Transition Planning services, which emphasized broad issues such as scheduling and finalizing the strategic understanding of the tasks and resources required for effective transition.</p>

### 4.1.4 Migration Project Experience

<b>Contract Customer:</b>	Bureau of National Affairs (BNA)
<b>Address:</b>	Washington, DC

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### Scope of Work:

TSS is providing a Data Center Requirements Analysis and is providing Technology Planning Services necessary for the relocation of the Bureau of National Affairs, Inc. to its new location in Crystal City Virginia. Services include the following:

- Data Center Requirements Analysis. TSS is planning and programming to evaluate existing space, replace, modify, reuse, expand, migrate, and move BNA's existing Data Center into BNA's new headquarters in Virginia.
- Structured Cable Plant Design and Coordination. TSS is designing the distribution voice, data, and video cable plant (estimated at between 1400 and 1600-drop positions, plus Data Center requirements) for BNA's new facility in accordance with applicable codes and standards. To facilitate a cohesive effort, TSS is working in close cooperation with the established building design team.
- LAN/WAN Network Communications Architecture. In this phase, TSS will assess the physical and functional foundation of BNA's telecommunications requirements by conducting a staff survey and a documentation review. TSS will provide a written memorandum of its findings, summarizing both the interviews/surveys and the documentation review.
- Voice Switch Requirements. TSS will design BNA's new voice network environment and manage its installation. TSS will specify a robust voice system in accordance with industry standards and will satisfy the local and remote demands of the BNA user base.
- Technology Transition Planning. To successfully support the IT transition aspect of the project, TSS will assist BNA by providing the Advanced Planning component of Technology Transition Planning and Implementation services. Following the completion of this effort, TSS will provide BNA a proposal for completing the Implementation Planning and Relocation Execution services.

### Contract Customer:

Smithsonian Institution (SI)

### Address:

Herndon, VA

### Scope of Work:

TSS provided transition planning and construction consulting for the occupancy of the Smithsonian's (SI) new central Data Center located in Herndon, VA. Chief among the TSS responsibilities were coordination and documentation of all equipment inventory, development of transition details and schedules and preparation of technical installation and testing plans.

TSS role in the transition planning effort was comprehensive. TSS developed SI's Advance Transition Concept Plan (including identification of the baseline project planning assumptions) and then turned to more detailed planning activities. Within this detail, TSS was actively involved throughout the effort: Devised detailed transition event project schedules for each migration event; coordinated the services of numerous equipment and move vendors; maintained the equipment inventory on behalf of the client;

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organized the event-specific Move Operations Center; defined the roles, responsibilities and assignments for event staffing; and maintained regular management contact to update them on the planning/performance process.

TSS also assisted SI by ensuring that the infrastructure of their Data Center was adequate for the institution's future requirements. TSS services included space planning, as well as load confirmation for both power and cooling requirements. TSS first developed a growth model, analyzing technology concepts and relating them to the facility design considerations. TSS developed facility design criteria, as well as multiple layout options suggesting alternatives for the placement of specific equipment and room furnishings.

During the course of construction, TSS performed regular site observations for the cabling installation and participated in construction progress meetings. TSS ensured that construction activities were performed in accordance with the guidelines and requirements of the drawings and specifications, as well as from instructions obtained through periodic discussions with SI's representatives.

Our FM division was instrumental in the design and build of this facility, including approximately 28,000 square feet of office space and nearly 20,000 square feet of Data Center. Beginning with a facility analysis, Vortech performed a physical inventory of all Electrical, Mechanical, Security, and Network Infrastructure components. This assessment led to a design-build renovation. Vortech performed a complete electrical renovation, from general purpose power requirements for office areas to critical power and control requirements for Data Center applications. Also, Vortech installed all security pathways including backbone trough and branch conduits for devices throughout the facility.

<b>Contract Customer:</b>	Time Warner Cable (TWC) -National Data Center (NDC)
<b>Address:</b>	Herndon, VA
<b>Scope of Work:</b>	TSS provided transition planning and construction consulting for the occupancy of Time Warner Cable's new National Data Center in Herndon, VA. Chief among the TSS responsibilities were coordination and documentation of all equipment inventory, development of transition details and schedules and preparation of technical installation and testing plans.

TSS also assisted TWC by ensuring that the infrastructure of their Data Center was adequate for the firm's future requirements. TSS services included space planning, as well as load analyses for both power and cooling requirements. TSS first developed a growth model, analyzing technology concepts and relating them to the NDC's facility design considerations. Facility design criteria were developed, as well as multiple layout options suggesting alternatives on the placement of specific equipment and room furnishings.

TSS briefed the TWC Operations Team on the design concepts and utilization of the potential new NDC infrastructure. The



## SECTION 4

Management Team accepted the recommendations and initiated the facility project improvements.

During the course of construction, TSS performed regular site observations and participated in construction progress meetings. TSS ensured that construction activities were performed in accordance with the guidelines and requirements of the drawings and specifications, as well as from instructions obtained through periodic discussions with Road Runner representatives.

<b>Contract Customer:</b>	University of Oklahoma
<b>Address:</b>	Norman, OK
<b>Scope of Work:</b>	<p>TSS is providing Oklahoma University Health Science Center (OUHSC) which is located on the Oklahoma City campus, with a program of requirements for a new primary Data Center and a detailed relocation plan for the consolidation /relocation of IT servers, storage, network, and telecom equipment from the existing University of Oklahoma campus locations into the new Data Center.</p> <p>The University of Oklahoma currently maintains four (4) separate technology areas across its campus and is moving all four into a single Data Center. The four (4) areas to be moved into the single facility are as follows: Primary Data Center, Network Operations Center (NOC), Telephony Operations Center (TOC), and a Back-up Data Center.</p> <p>OHSC is part of the Oklahoma Health Center comprised of thirty-one entities that are strategically co-located in a 300-acre complex near downtown Oklahoma city with a capital investment of \$25 Billion and a combined employee base of 12,500. The new Data Center will house mission-critical IT infrastructure, supporting the use of the telephone, network, storage, and servers for teaching, research, administrative, clinical, and hospital application purposes.</p>


<b>Contract Customer:</b>	Fannie Mae Reston Data Center
<b>Address:</b>	Washington, DC
<b>Scope of Work:</b>	<p>TSS' staff planned and managed the transition of Fannie Mae's Data Center from Washington, DC to Reston, VA. Fannie Mae backfilled the space formerly occupied by Sallie Mae's Data Center.</p> <p><i>Advanced Transition Planning.</i> Fannie Mae was faced with the daunting task of moving more than 1600 Data Center devices without impacting its financial business operations. TSS first developed a sophisticated Advance Plan to determine both the strategy and tech transition budget for the project. TSS also identified issues to be addressed and tracked through the use of a comprehensive project plan. Potential conflicts between vendors were also defined and resolved.</p> <p><i>Implementation Planning.</i> In order to identify risks and prepare for contingencies, TSS' technical teams followed-up by preparing detailed implementation plans and logistical procedures for the move</p>

## SECTION 4

phases. They defined the role for a *Move Operations Center (MOC)* to provide each move with a strong command and control element. TSS also continued to coordinate with many of the outside equipment vendors (Compaq, Sun, and IBM) who were involved in the transition, as well as specifying the responsibilities for Move Vendor and coordinating their contract vehicle.

The move was performed over 13 weekend move phases, with minimal disruption to Fannie Mae's internal operations or access by any of its customers.

*Facilities Infrastructure Consulting.* TSS has also assisted Fannie Mae by ensuring that the infrastructure of their Herndon Data Center would amply support the firm's future requirements. TSS services included space planning, as well as load analyses for both power and cooling requirements. TSS first developed a growth model, analyzing technology concepts and relating them to the facility design considerations. Design criteria were then developed, as well as multiple layout options suggesting alternatives on the placement of specific equipment and room furnishings.



**SECTION 4**  
**DATA CENTER**  
**CONSULTING**

### 5 DATA CENTER CONSULTING

#### 5.1 INNOVATIVE PROJECT APPROACH

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TSS has utilized a process for numerous clients over the past 25 years. A key element that makes us uniquely qualified to support client is our in house IT expertise which enables us to interact with our clients business and IT management in order to begin at the “Starting Point” in the “determination/confirmation of User Requirements”. By understanding the overall IT strategy a comprehensive and consistent facility framework can be established for the design and operation of the corporate Data Center facility infrastructure

Our IT expertise coupled with an outstanding group of Architects and Engineers focused only on mission critical Data Center infrastructures, has enabled us to develop conceptual and schematic level Basis of Designs (BOD) as the critical starting point for the completion of over 80% of our projects. We are firm believers that establishing the correct requirements including the identification of a facility’s day one and projected future needs is critical to the success of any project. We apply this principal to existing facilities as well as the first component in the site selection process for new facilities.

#### 5.2 DIFFERENTIATOR

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TSS possesses four main characteristics that differentiate us from our competition within the mission critical field:

1. Experience in the Mission-Critical Industry. The Total Site Solutions team has more experience in the mission-critical industry than most firms in the country. Many members of the TSS team have been designing mission-critical space and infrastructure systems since the early 1980s.
2. Only Mission-Critical Focus. The TSS team provides services in the mission-critical industry only. All team members are specifically focused on the requirements and challenges of the mission-critical client.
3. IT Professionals are In-House. TSS employees IT professionals and telecommunications engineers as part of our in-house staff. These professionals perform services such as future systems modeling and load projections, network design, telecom/cabling infrastructure. These capabilities further enhance the team's ability to deliver a project that meets both current and future requirements. This in-house talent also helps augments and supports the client's IT staff by providing certain services (equipment configurations, load calculations, growth models). In addition, the TSS IT staff can offer industry best practices and alternative system configurations that can help a client see new perspectives of the IT market
4. Personnel Depth. The TSS team has significant depth of personnel in all design disciplines. TSS has the architectural, mechanical, electrical, telecomm, IT, and security system design professionals required to deliver this project on-time and within budget.
5. Planning and Estimating. The TSS in-house Planning and Estimating team provides significant budgeting experience that is employed from the initial programming phase throughout the project life cycle. TSS’ in-house construction and facility maintenance capability provides input to the design team ensuring that the design approach includes a “Hands On” constructability, scheduling, and budget consciousness throughout the project.

We believe that these factors, combined with our history and general industry experience, truly set us apart in the Data Center services industry.

**SECTION 5**  
**DATA CENTER**  
**MIGRATION**  
**EXPERIENCE**

### 6 DATA CENTER MIGRATION EXPERIENCE

#### 6.1 EXPERIENCE WITH DATA CENTER MIGRATIONS

Yes, TSS has staff dedicated to the management and support of Data Center migrations. While our services can be highly customized to meet the varying needs of our clients, we have developed a structured approach for these types of projects that helps assure a comprehensive yet efficient consideration of the broad range of planning issues presented by these migration projects.

We have provided a description of our typical information technology migration project approach below. Some representative migration projects can be found in the Project Reference section.

#### 6.2 INFORMATION TECHNOLOGY MIGRATION SERVICES

TSS has supported numerous clients through the scope of services relating to our process for **IT Transition Planning**. These planning services are targeted at addressing the technical challenges linked to the migration of desktop systems, servers, network environment and telecommunications services from the client's present facility to its proposed new location.

1. Through the first step, **Advanced Planning**, TSS performs a needs analysis and establishes the framework for commencing the project. TSS' established Advance Planning identifies the scope of the transition, and develops a clear understanding of the objectives, priorities, timeframes and areas of concern regarding the transition.

Advanced Planning emphasizes broad planning issues such as project scheduling and the strategic approach to technology migration. Our efforts will be targeted at establishing a clear understanding of the tasks, resources and timeframes required for the effective transition of circuits, equipment, applications and services, as well as outlining steps that must be taken leading up to those events. TSS would conduct a round of interviews and meetings to develop a set of major transition concerns and issues. A schedule of major milestones would also be developed. Anticipated budget costs (organized into different scenario options), any long-lead requirements, and other demands on resources are also developed.

2. In the **Implementation Planning Phase**, specific objectives and detailed planning criteria are developed. A project schedule for the tasks required to prepare for the migration is developed, and then used to track project progress. Regular planning meetings are conducted and documented in order to assign specific tasks and responsibilities to the vendors/internal parties; follow-up is performed to ensure their completion. TSS develops detailed, move event schedules, which model each migration event. These schedules are used to estimate migration event staffing requirements, and to track equipment and other related migration task completion for each migration phase. TSS also develops a command and control plan for the conduct of migration events, which includes issue tracking and escalation, communications, and contingency management procedures.

TSS can also provide support for third party services procurements (Mover; Cable Plant Installation; Phone System; Telco Services; Technical Support; etc.) and coordination of those services.

3. In the **Relocation Implementation Phase**, the actual physical or logical relocation of any server equipment, communications equipment, and user systems takes place. The relocation plans developed in the previous phases are implemented. TSS provides on-site management and coordination throughout the move to ensure the timely completion of all elements of the

## **SECTION 5**

relocation plan and schedules. TSS support staff performs the relocation tasks, and coordinates the resources, for which they are made responsible.

### **6.3 INFORMATION TECHNOLOGY MIGRATION EXPERIENCE**

TSS has provided IT migration planning services to over 50 clients (representing over 10,000 servers or related Data Center items), in the public and private sector. Our project experience includes:

- The relocation of over 1500 servers and related Data Center equipment for a client across 13 migration events
- The relocation of over 300 servers and related equipment in a single migration event
- The relocation of servers between Data Centers more than 600 miles apart
- Support for both the physical and logical relocation of application platforms



**SECTION 6**  
**INDUSTRY TRENDS**

**7 INDUSTRY TRENDS****7.1 TREND TRACKING**

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TSS is actively tracking the following mission-critical strategic issues. As each continues to develop, TSS is monitoring the concepts, their impact upon the design of mission-critical facilities and proposed industry solutions for each area:

- Information Technology Virtualization and Consolidation – Virtualization and consolidation of applications from many small platforms onto larger platforms is having an impact on how organizations address operational issues including; centralization of infrastructure and management, capacity planning and business continuity. These issues directly influence the overall Data Center design concepts utilized in developing a new facility including; expansion, flexibility, reliability, and maintainability.
- High Density Computing Environment – Many organizations have begun to utilize High Density Blade (HDB) equipment. This equipment can cause rack power consumption to be as high as 20 kW today projected to reach 30 kW in the next 18 months. New mechanical systems and design methods will need to be employed to address the evolving HDB environment.
- DC Power Distribution Within the Data Center – There are potential facility infrastructure advantages that may be attributable to the utilization of distributing Direct Current (DC) power within the Data Center. This is a relatively new concept that is applicable in the high density IT equipment environment. We are evaluating the viability of this concept and the advantages it suggest; reduced energy costs, lower heat loads, reduced floor space requirements, etc. Implementation of this concept also requires the cooperation by IT Equipment Manufacturers.
- Energy costs have risen significantly over the past 5 years. - As a result, Data Center operating costs are almost equal to the IT capital expenditures for new equipment. Electrical energy costs now represent 30% of the entire Data Center operating budget. From this perspective, we have abandoned outdated design practices that result in the implementation of systems with very low energy efficiencies. Without reducing systems' reliability, our findings and recommendations have resulted in a comprehensive team mission, which is aimed at implementing energy saving strategies

**7.2 DESIGN INNOVATION**

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At TSS we realize that Data Center environments are different from occupied commercial space environments. Many of the commercial design methodologies are either outdated or inefficient. As such, when applied to Data Centers the overall design will result in increased energy consumption and lower system efficiencies. From this perspective, we have abandoned outdated design practices that result in the implementation of systems with very low energy efficiencies. Without reducing systems' reliability, our findings and recommendations have resulted in a comprehensive team mission, which is aimed at implementing the following innovative design strategies:

- High efficiency UPS and PDU's
- Variable Primary pumping systems
- High delta cooling
- Non condensing loops with >60 F Chilled water temperatures
- Thermal storage systems (where applicable)

## SECTION

- Use of economizers to capture the natural cooling cycles of mother nature
- Redirecting waste heat from the IT equipment for other uses in buildings or processes
- Consideration of DC power where possible
- Use of renewable energy where possible
- Use of exterior building and site development features to reduce energy consumption

Most recently, TSS is engaged in designing a prototype “pod” Data Center design, which utilizes a central air handling unit for cooling. Within the pod, the hot aisle cold aisle are completely segregated, a supply wall delivers the cool air at 68F db, 50% RH, 50 F dp to the cold aisle. Energy savings are realized by raising the hot aisle temperature to 105 F thus increasing the temperature difference and reducing the airflow and fan horsepower. The pod is designed in such a way that the air handler supplies and returns air directly over the hot and cold aisles with no ductwork necessary. We believe there are significant savings to be realized from the higher temperature deltas, reduced horsepower, reduced use of ductwork and material and improved air management within the pod.

All the practices mentioned above are available today, sometimes with associated increases in project capital cost, but always with significant realizations in savings of the total cost of ownership (TCO). These strategies translate directly to lowering the facility Power Usage Effectiveness (PUE).

With regard to tools to measure and analyze the effectiveness of individual elements, TSS believes that the most important foundational data for Data Center design analysis is an accurate inventory of our clients existing equipment as well as a clear picture of the organization's expected future growth. This important information determines the facility's power starting point, the life-cycle growth trends and, ultimately, the size of the connected infrastructure. With this critical data in-hand, we can achieve an effective mechanical/electrical plant design, with the highest possible efficiency and power factor from the mission's earliest stage throughout its useful life. An accurate growth model also helps to plan a system that will expand with ideal step sizes, maximizing efficiency throughout the Data Center's lifespan.

At TSS, we use specific software for load calculations to determine coincident, peak power and resulting cooling load. Loads are also calculated using a custom spreadsheet program to ensure quality control of data. Where life cycle cost analysis is required, TSS typically conducts a second analysis using DOE's Equest application or a customized spreadsheet (depending on the project's complexity). These tools collectively allow us to build “what if” scenarios and compare different factors of system performance at varying loads.

To maximize space cooling and air flow, TSS often utilizes an industry practice of “hot aisle/cold aisle” design with direct path or plenum return air. For very high density applications, TSS utilizes passive design methods such as in-row cooling and compartmentalized configuration approaches. We also utilize computational fluid dynamics (CFD) software to help design space layouts of a more complicated nature, where high density applications and/or non-standard architectural elements are present. All calculations are conducted using TSS' full-time engineering staff.

### **7.3 LEED CERTIFICATION**

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Several of our engineering team members have been actively involved with LEED projects either at TSS or during previous employments. As such, we are very familiar with the certification process and we realize the importance of LEED in achieving “greener” and more efficient design. At TSS we realize that the LEED certification system was intended for occupied buildings and there are some shortfalls when it is applied to Data Centers. This is why we tend to emphasize the budget and life cycle cost associated with implementing each LEED point. We have recently completed several LEED evaluations for:

- A major utilities customers

## SECTION

- A major Co-location services providers new Data Center in Southern California
- A major IT equipment vendor and service provider

### **7.4 PROJECT COST CONTROL**

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We have found that the development of a Basis of Design with a rough order of magnitude construction cost at the beginning of the project is the best way to control costs throughout the project. This serves two purposes; it establishes a realistic estimate of probable cost from which to work from, and it spells out the design criteria from which the construction documents will be developed. Identifying the design criteria benefits both the designer and client, particularly later in the construction document phase when design decisions are made. The construction cost estimates are produced by TSS' Planning & Estimating Department, part of the Construction Management Division. Because estimates are prepared by our in-house construction professionals, TSS can assure that the project can be built for that for that cost.

One of the strengths and uniqueness of TSS is that we have an in-house design department as well as a construction estimating department. At key milestones of the design process, the drawings are submitted to the estimating department for an internal budget check. Accordingly, the results are shared with the client and measures are taken to control cost and budget back to the original target. For certain clients, TSS engages the services of an independent third party to obtain budget construction cost estimates.

At each design milestone, the construction cost will be updated based on the information developed to date, and any deviations from the original BOD and estimate will be readily apparent. If costs are higher than desired, modifications or reductions to the scope can be implemented. Should costs be less than budgeted, the client may consider additional scope or other improvements to the project not originally included in the BOD. At every design milestone there is an opportunity to discuss value engineering options that can benefit the project.

### **7.5 PROJECT SCHEDULE CONTROL**

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We utilize a variety of Project Management Processes within the Technology Consulting Division to maintain the project schedule. On virtually all design projects, a Project Director is assigned to manage and coordinate our in-house resources and to interface with the client and other project team members. The PD is the client's primary point of contact at TSS; there is also a Principal in Charge assigned to each project.

At the award of a project, an internal kick-off meeting is conducted by the PD to review the project scope and to designate the responsibilities of all team members, including estimated hours and timeframes. Subsequently a kick-off meeting is held with the client and their project team to identify roles and responsibilities, and to establish project milestones and deliverables.

Communication among all parties throughout the design phase is vital to the success of any project. Working along with outside consultants on a complex project is a difficult task. To expedite the flow of information in both directions, our Project Director acts as the liaison between TSS's design engineers and the clients project team. This helps ensure that milestones will be met and the project will remain on schedule.

TSS' Accounting Department provides data in a format that allows the PD to monitor in-house hours expended and other project costs on a biweekly basis. Additionally, TSS utilizes Microsoft Project to track progress, including project deliverables, milestone dates, etc.

### **7.6 LIFE-CYCLE DESIGN**

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Data Centers are made up of two separate entities with different life cycles. IT equipment and facilities infrastructure equipment. While IT equipment has life cycles of 3 to 5 years at most,

## SECTION

facility infrastructure life cycles can go up to 15 - 20 years if well maintained. In addition to the difference in life cycles, the impact of Moore's law on processors translates to faster servers that consume more power and cooling. If any design consideration needs to be accounted for at day-one, it is that the Data Center needs to accommodate the ever changing server configurations at faster speeds and higher power and cooling requirements. At TSS we realize that any Data Center design will need to take into consideration these life cycle factors:

- Reliability/Availability
- Maintainability/Serviceability
- Upgradeability
- Sustainability
- Installability
- Testability/Inspectability
- Safety
- Human Factors

These life cycle factors provide the engineering team with a basis from which modular and scalable solutions are evaluated and ranked. TSS' design team also looks at the costs involved over the life cycle in order to calculate the Total Cost of Ownership or Life Cycle Costs (LCC) for each design approach. This is an essential exercise during the design process whereby the costs of several design approaches are evaluated using a present net worth dollar figure. At TSS we have found very interesting results which show that while scalable and modular designs may cost higher initially, the savings over the life cycle is tangible and is worth investing in.

### 7.7 DESIGN APPROACH

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The earlier sections highlighted TSS' approach during the design phases of a new project. We would implement the same methodology for this type of project. Our design team will gather data through meetings and surveys with our client. We will investigate the most efficient systems, rank and weigh each system and eventually after discussions with the client, focus the effort to the preferred list of candidates. During the selection phase, life cycle analysis will be undertaken to fine tune the system selection process and further at certain design milestones, construction budgets will be prepared for the client. These budgets are internally dissected and changes within the design made so that the project remains within the target construction budget. Other progress milestones are submitted to the client as well as internally quality controlled by the design team. The final preparations are then made to finalize the construction document drawings and submit for permits and bids.

## CASE STUDY

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# The Library of Congress Revolutionizes the Visitor Experience with Help from Terremark

### CHALLENGE

The Library of Congress is America's oldest federal cultural institution and the largest library in the world. Its collections include more than 32 million books and other print materials, 2.9 million recordings, 12.5 million photographs, 5.3 million maps, 5.5 million pieces of sheet music, and 61 million manuscripts. And while the Library of Congress serves officially as the research arm of the U.S. Congress, its goal is to make its resources available and useful to the American people and preserve a universal collection of knowledge and creativity for future generations.

As the Library began looking for ways to manage growing visitor volume and deliver an outstanding experience, it became clear that interactive technology and the Library's Web site would play critical roles in meeting these needs.

### DEFINING A NEXT-GENERATION VISITOR EXPERIENCE

While the Library of Congress is home to significant historical materials and artifacts, it does not function like a museum. Instead of simply putting rare, fragile artifacts on display, the Library team wanted to create a window into the Library and into the creative processes that result in knowledge. For example, the Library houses the original handwritten rough draft of the Declaration of Independence, which shows words crossed out, substitutions, and new ideas—tracing the authors' actual thought processes that resulted in the final draft. The only way to allow millions of people to actually experience the Declaration of Independence's evolution to its final form, while protecting the original documents, would be to make it available online.

The solution that emerged is the Library of Congress Experience at [www.myloc.gov](http://www.myloc.gov). Based on interactive, on-site kiosks that enable visitors to interact virtually with three-dimensional models of artifacts and documents, it also includes a companion Web site that replicates the on-site visitor experience.

Developing the project and ensuring continuous availability of the interactive experiences, a richly-interactive Web site, and the links between them for millions of users made this project exceptionally challenging. The Library of Congress Experience team decided to look outside of the organization for help. Microsoft, Portal Solutions, and other technology partners provided the software and expertise for the interactive kiosks and content management system. To make the entire new interactive experience available online, the Library chose Terremark to provide a fully managed infrastructure for the site.

"Terremark provided an unusual combination of hosting expertise and a global experience" said Robert Sokol, program manager of the Library of Congress Experience. "The company's international reach is important because many of our collections and constituency are international, and 60 percent of our materials are in languages other than English. We are pleased that the company can securely manage four to five million accounts and hundreds of millions of page views per year."

## ACCELERATING DELIVERY OF A WORLD-CLASS SITE

Initially the Library's requirements for its Web site specified hosting, intrusion prevention, and firewall services. However, Terremark quickly identified additional requirements:

- Access to significant and diverse Internet connectivity for sustaining extraordinary traffic volumes from visitors around the world
- High performance for delivering interactive content to visitors worldwide
- 100-percent service level agreements (SLAs) for power, connectivity, and 24x7 network operations and monitoring
- Access to development and professional services expertise
- Comprehensive managed security services delivered with a 24x7 Security Operations Center
- An experienced implementation team to successfully accelerate deployment

The Library of Congress chose Terremark's Highly Managed Hosting™ service, which provides the highest levels of support and availability in the industry. Hosted in Terremark's NAP of the Americas® datacenter, the Library's hosting solution helps ensure that its site adheres to rigorous application SLAs, in addition to hardware and network uptime measures. Terremark created custom transaction monitors to measure the Library's site performance. For example, HTML monitors continuously verify that the site is up and operational. Transactional application monitors track the application's availability. Other tools are used by the Library's I.T. team to review server statistics, network statistics, and service calls.

Highly Managed Hosting includes full support and troubleshooting throughout the stack including custom application code. In order to effectively provide this service, Terremark establishes comprehensive application documentation that details which steps are required to return the Library's application to service in the event of a failure. This knowledge base accelerates incident response and problem resolution to minimize downtime in the event of issues.

The Library team is also able to make use of Terremark's digitalOps® Command Center. This innovative web-based portal provides real-time visibility into service ticketing, systems configuration data, performance trending and reporting tools and a comprehensive monitoring and availability interface. Today the Library team can see the same data and views that the Terremark staff sees in real time, increasing transparency and facilitating effective communication between Terremark and Library infrastructure and application teams.

## PROVIDING MANAGEMENT SUPPORT

The Library of Congress has access to a dedicated Terremark systems engineer who is deeply familiar with the Library's site and application. As the site was launched, the Terremark team provided expert management recommendations that significantly simplified site management for the Library's I.T. team. Terremark continues to monitor usage trends and to proactively identify unusual application behavior in order to prevent potential performance issues.

## NO ORDINARY HOSTING PROJECT - A MAXIMUM SECURITY POSTURE

Because the Library's hosted myloc.gov site is highly strategic, the Library decided to supplement its security protection with several new services from Terremark, such as the Managed Security Portal. This comprehensive service enables the Library team to access custom reports, track the status of all security tickets, review incident management notes, and see all of the security data that Terremark collects on their behalf.



In addition to its traditional strong firewall protection, Terremark added inline intrusion prevention devices that inspect all inbound and outbound data packets, identify malicious behavior and block threats as they occur. Terremark integrated its Managed Intrusion Detection and Prevention Service into the Security Portal for the Library project, and this capability is now being offered to all Terremark clients. The Terremark Security Operations Center (SOC) provides proactive, around-the-clock monitoring and management.

As part of the intrusion prevention services, Terremark aggregates log files from the Library's hosted myloc.gov network, security, and server devices using its Log Aggregation Service. This includes a unique ability to integrate network security scan information with "as-it-happens" log information to correlate a threat with a known vulnerability and take proactive action. The Log Aggregation and Security Information Management Service delivers comprehensive visibility across the entire security and network architecture to monitor how it is responding to security threats, and helps ensure that the SOC is mitigating real threats.

Many recent Web site attacks have taken advantage of application vulnerabilities in Web and database servers. To help prevent similar attacks on the Library's Web site, Terremark used innovative application vulnerability assessments to coordinate late-night scans, so that any vulnerability could be mitigated. Now that the site is launched, Terremark is conducting additional testing to identify any new, potential vulnerabilities.

## SUCCESSFUL LAUNCH

The Library of Congress Experience opened in April 2008 allowing visitors for the first time to virtually "handle" artifacts like the Gutenberg Bible and original books from Thomas Jefferson's library. Visitors receive their Passports to Knowledge, which guide them through the exhibits and the building.

"Without Terremark, I don't think we could have done this," said Jo Ann Jenkins, Library COO. "The project scope was far outside our scope of experience, but Terremark brought it all together. Instead of being a local Washington, D.C. attraction, we have become a significant bridge between the national and international community—as well as a bridge to the future."

Thanks to Terremark Highly Managed Hosting, the Library has ensured that its hosted myloc.gov Web site will continue to support large numbers of virtual visitors, including students and teachers who use browser sessions to make their Library of Congress Experiences highly interactive and personalized. As the number of site visitors grows, the Library can be confident that its hosting platform, storage area network, security, network, and applications are operating optimally. In addition, as security threats evolve, so can the Library's protection with Terremark's security capabilities.

"The Library's skills in envisioning an innovative, feature-rich site strongly complemented Terremark's significant hosting, network and security expertise," said Jamie Dos Santos, CEO of Terremark's Federal Group. "The results are magnificent."

The Library will complete its launch of the Library of Congress Experience on December 11, 2008. By then visitors will have additional kiosks, expanded interactive access to Library treasures and collections, and expanded access to online accounts.

## The Independent Purchasing Cooperative for SUBWAY® Restaurants Takes a Fresh Approach to High-Availability Services

### Executive Summary

#### Company

**INDEPENDENT PURCHASING COOPERATIVE**  
A purchasing cooperative for SUBWAY® Restaurants in  
the US and Canada operating from Miami, Florida, USA.

[www.ipcoop.com](http://www.ipcoop.com)

### Business Challenge

Ensure high availability for the SUBWAY® cash card  
program, providing franchisees with 24x7 access to  
their accounts.

### Terremark Solutions: Terremark Managed Router Services Terremark Professional Services—Remote Hands

## Business Results

- Achieved 100-percent uptime and Internet connectivity
- Greatly reduced risk of external threats to data security
- Gained flexibility to easily deploy new franchisee services

## Quote:

“We are very impressed with Terremark. They run a first-class data operation — from guaranteed power and environmental controls to the secure, purpose-built facility. Terremark took a very progressive stance in providing us with the technology infrastructure that we needed.”

— George Labelle, Chief Information Officer

“From the person operating the service elevator, to the receiving department, to the NOC — they are extremely conscious of our needs, polite, and professional. They understand our business and are committed to us as a customer. The customer service at Terremark is outstanding.”

— Tom Endter, Network Administrator

## **Taking a Fresh Look at Service Availability**

The SUBWAY® Restaurant system is the world's largest submarine sandwich franchise, with more than 27,600 restaurants in 85 countries. Franchisees of the 24,000 North American restaurants are members of the Independent Purchasing Cooperative (IPC), which has the charter of helping franchisees succeed and maintain a competitive advantage in the fiercely competitive restaurant industry. IPC negotiates optimal pricing for all of the goods and services that franchisees purchase. In addition, IPC helps monitor food quality and safety, manages a network of vendors and distributors to ensure timely product deliveries, and facilitates purchase transactions.

In 2006, the company launched an important initiative to introduce SUBWAY® electronic cash cards, which can be purchased and redeemed in any North American location. Because restaurants are owned by 11,000 different franchisees, the program required a significant investment in operational and financial systems to allow the cards to work seamlessly anywhere in North America while ensuring that each franchisee's account was safeguarded. In addition, franchisees must be able to easily view their account balances and reconcile them with their own point-of-sale data to ensure proper crediting.

In 2006, IPC decided to bring the program in-house, along with the IPC web site, to simplify program management and to develop the tools that provide franchisees with around-the-clock access to their account information. Prior to 2006, IPC had dedicated a portion of its office space to house its email and file servers. In addition, IPC had to invest substantially in dedicated electrical circuits to overcome problems with unreliable power.

“If disaster struck, our building was vulnerable to power outages and our systems would be at risk,” said George Labelle, IPC chief information officer. “In 2005 we experienced four hurricanes, including Wilma and Katrina. When an outage does occur, it really affects our business. In the past, we had discussed co-locating our servers in a data center, but the real tipping point came when we took ownership of the cash card program. Because the SUBWAY® cash card program is mission-critical for franchisees, it had to be available 24x7.”

## **IPC and Terremark—A Fresh Fit**

To meet its new high availability requirements, IPC undertook a detailed RFP process. Mr. Labelle and his team narrowed their search to four facilities and scrutinized every detail — from the facility specifications and size of the diesel tanks attached to the facility's generators, to security, price, and the company's financial stability. They chose Terremark and its NAP of the Americas.® The NAP of the Americas® is a fortress-style facility that provides state-of-the-art security and guaranteed power and environmental, and availability for peering, managed, and dedicated hosting services.

World-leading carriers, Internet service providers, and content providers are housed at the NAP of the Americas® enabling customers to take advantage of massive, carrier-neutral connectivity for extending their reach anywhere in the world. And the NAP facility itself is designed to withstand a Category 5 hurricane.

“I was surprised that we had decided to colocate services to avoid the effects of hurricanes and here in Miami we were touring a state-of-the art bunker that had been proven reliable one hurricane season after another,” stated Mr. Labelle. “We are very impressed with Terremark. They run a first-class data operation — from guaranteed power and environmental controls to the secure, purpose-built facility. Terremark took a very progressive stance in providing us with the technology infrastructure that we needed.”

Terremark’s Managed Router Service delivers reliable high-capacity, low-latency Internet Access and ensures IPC best performance routing across the world’s leading domestic and international Tier-1 carriers. With direct access to the backbones of leading European, Latin American, and Asia/Pacific Rim carriers, IPC is connected directly to the heart of the Internet. No other platform in the world offers this kind of redundancy and close proximity to routes on the public Internet.

With a global community of service providers located at the NAP of the Americas®, IPC can easily scale its Internet services up to 10 Gbps if necessary, giving it plenty of capacity for handling franchisee web site traffic. The Terremark Remote Hands offering enables IPC to receive help from a Terremark technician for basic troubleshooting and maintenance tasks when necessary.

“Terremark people go out of their way to help,” said Tom Endter, IPC network administrator. “From the person operating the service elevator, to the receiving department, to the NOC — they are extremely conscious of our needs, polite, and professional. They understand our business and are committed to helping us succeed. The customer service at Terremark is outstanding.”

### **A Fresh Approach Pays Off**

IPC successfully launched the SUBWAY® cash card program system-wide and recorded more than \$23,000,000 in cash card sales in 2006. The service also recorded 100-percent levels of uptime and Internet connectivity. Mr. Labelle no longer worries about data security either. While the office building is as secure as any office building can be, moving the data to the NAP of the Americas® significantly reduced the risk of external threat to the company’s data.

“We’re extremely pleased with their performance,” said Mr. Labelle. “Moving everything to Terremark was a huge relief for everyone.”

## Next Steps

Now that IPC's data and systems reside at the NAP of the Americas,<sup>®</sup> the organization is considering taking ownership of other mission-critical systems to further drive benefits for its franchisees.

"With Terremark, we now have those capabilities whenever we're ready, and that's a good feeling," said Mr. Endter. "We're always looking for ways to enhance franchisee services and reduce costs. It's now much easier."

## About Terremark

**Terremark Worldwide, Inc. (NASDAQ:TMRK) is a leading global provider of IT infrastructure services delivered on the industry's most robust and advanced operations platform. Leveraging datacenters in the United States, Europe and Latin America and access to massive and diverse network connectivity, Terremark delivers government and enterprise customers a comprehensive suite of managed solutions including hosting, colocation, connectivity and security services. Terremark's acclaimed Infinistructure™ utility computing architecture has redefined industry standards for scalable and flexible computing infrastructure and its DigitalOps® service platform combines end-to-end systems management workflow with a comprehensive customer portal. More information about Terremark Worldwide can be found at <http://www.terremark.com>.**

## CASE STUDY

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# Informática El Corte Inglés and Terremark Help the Dominican Republic Launch its Number Portability Service in Record Time



Marcelo Comino  
Director of International Operations

Mobile voice services have taken off in Latin America and the Caribbean, making mobile telephony the fastest-growing telecom market and revolutionizing telecommunications for people in the region. According to Latin American Mobile Voice and Mobile Data Market (8th ed.), rapid growth in coverage and in subscriber numbers has resulted in approximately 5 million 3G wireless subscribers throughout Latin America and the Caribbean by early 2009. Mobile penetration has reached about 80 percent—well above the world average, which was about 58 percent in early 2009. With rapid growth comes a need for number portability, and Spain's Informática El Corte Inglés (IECISA) is playing a key role in helping countries implement their systems. The El Corte Inglés Group includes 13 divisions and has more than 100,000 employees around the world. IECISA is a leading provider of technology consulting, IT solutions, and IT services across a wide range of market sectors in Europe, the Caribbean, and Latin America.

### A CHALLENGING NUMBER PORTABILITY LAUNCH

In January 2009, Indotel, the Dominican Republic's state agency responsible for regulating and overseeing the country's telecommunication market, began the country's process to implement number portability. The agency requested bids from firms around the world to manage the project, which called for mobile-to-mobile and fixed-to-fixed portability services to be implemented in approximately six months, by July 2009. One of the firms asked to bid was IECISA, which had successfully deployed Spain's number portability system a few years earlier. Based on its portability software application and IT services expertise, IECISA won the project.

With less than six months to launch the new system, IECISA began seeking a hosting provider that could host its application and provide disaster recovery capabilities across locations in Spain, the Dominican Republic, and the United States. The hosting provider also had to be carrier-neutral to meet Indotel's requirements. IECISA also wanted a strong partner that was financially stable with a proven reputation. After evaluating numerous providers, only one already had facilities in the three desired locations and provided complete carrier neutrality. Terremark provides top-tier datacenters in the United States, Europe, and Latin America, combined with access to massive and diverse network connectivity from more than 160 global carriers. It delivers a comprehensive suite of colocation, managed hosting, cloud computing, disaster recovery, and security services from these datacenters, including those located in Madrid, Santo Domingo (Dominican Republic), and Miami. In addition, Terremark datacenters are built to be exceptionally robust and hurricane-resistant, which was a critical factor for IECISA in choosing a datacenter located in a Caribbean nation.

## IMPLEMENTING THE PLATFORM GLOBALLY

To host its number portability application, IECISA selected Terremark and its managed hosting service, powered by Infinistructure™, Terremark's next-generation utility computing solution. Terremark managed hosting delivers utility-enabled, managed infrastructure that offers revolutionary levels of flexibility and scalability. The Terremark digitalOps® service delivery platform also simplifies management with a live control center, including service ticketing, system configuration data, performance trending and reporting tools, and a comprehensive monitoring and availability interface. The Terremark team worked hand in hand with IECISA to deploy the number portability application across locations in three countries.

The datacenter operated by Terremark in the Dominican Republic aggregates connections from the country's mobile operators, either directly or over the Internet. Data is sent over an Internet Virtual Private Network (VPN) link to the Madrid datacenter for processing. The Dominican Republic datacenter also maintains an Internet VPN connection to Terremark's NAP of the Americas facility in Miami.

The Madrid datacenter provides the web, application and database servers that process number portability transactions, maintain records, and provide storage and backup. A completely mirrored environment is maintained and continuously replicated in the NAP of the Americas facility in Miami. In the event of an outage, the entire site fails over to the Miami datacenter over the Internet. The Miami datacenter also functions as a testing site for new applications.

"We worked as a team with Terremark as they deployed the systems and we worked with our customer to deploy the portability software application," said Marcelo Comino, Director of International Operations for IECISA. "At Terremark the platforms were already integrated and ready, which greatly simplified and accelerated our deployment. Throughout the project we received excellent communication and proactive support from Terremark."

## MASSIVE CONNECTIVITY WITH CARRIER NEUTRALITY

Terremark is not itself a carrier, yet it provides direct links to more than 160 of the world's telecommunications companies through its facilities. Dominican Republic carriers connect directly to the IECISA number portability application through Terremark's carrier neutral datacenter, meeting a key Indotel requirement.

## RIGHT PLACES AT THE RIGHT TIME

No other hosting provider offered carrier neutrality across three global locations. Terremark was able to help IECISA deploy its application, storage, and disaster recovery infrastructure as easily in Madrid and Santo Domingo as in Miami. Premium engineering, support, and monitoring services are offered to each facility, and with three global locations, the implementation has built-in redundancy. Terremark also provides bilingual support to IECISA and its Indotel customers.

## ON-TIME DELIVERY

The Terremark Infinistructure utility computing platform provides IECISA with easily scalable computing resources while Terremark staff manages all aspects of the infrastructure. Because IECISA did not have to buy, deploy or manage systems itself, it was able to meet an aggressive time-to-market deadline. After a brief testing period the number portability service went live on October 1, 2009.

"When you are searching for a hosting provider, you hear all of the promises," said Mr. Comino. "With Terremark, we receive proactive information, highly responsive service, and no surprises. Terremark went beyond simply delivering on its promises."





September 25, 2009

## Case Study: USA.gov Achieves Cloud Bursting Efficiency Using Terremark's Enterprise Cloud

by **James Staten**

with Lauren E. Nelson, Allison Herald, and Simon Yates

### EXECUTIVE SUMMARY

USA.gov, one of the busiest US government Web sites, has achieved significant cost savings by embracing cloud computing. The US General Services Administration (GSA) has migrated all of the core resources of the USA.gov Web portal to Terremark's IaaS platform, The Enterprise Cloud. By using The Enterprise Cloud, USA.gov can maintain a small persistent footprint and deploy on-demand scaling as traffic fluctuates. GSA said this migration to the cloud has brought about a number of benefits and savings, such as avoiding idle server costs while still accommodating huge traffic spikes, acting on users' requests in real time, and applying security constraints atop this platform. With infrastructure flexibility at the foundation, GSA has found both cost savings and capability improvement with its new cloud platform.

### SITUATION: SPIKY AND UNPREDICTABLE USER-FACING APPLICATIONS

When you need important information about the government and government services, the best place to go is USA.gov, official Web portal and resource for the federal government. This Web site is designed to help the public interact with the government more efficiently by directing people to a wide variety of government services such as grant instructions, consumer guides, health and nutrition updates, tax forms, driver's license renewal, voter registration, student financial aid, and critical national disaster information. This award-winning interagency-run Web site connects local, state, and federal governments to one central, linked resource for the benefit of the public.<sup>1</sup>

What does this mean logistically? On any given day, USA.gov receives approximately 100 million visits. However, because this Web site serves primarily as a hub for accessing critical information, traffic varies substantially. For instance, when unemployment statistics are released or during a hurricane, traffic increases dramatically. During high traffic periods in the past, users suffered long delays and downtime. To accommodate these spikes, GSA procured and deployed hardware that for the most part sat idle — needlessly wasting power. Not only did GSA need a new solution to improve service, but it also needed to meet significant security regulations, such as multifactor authentication (MFA), resource tracking, packet flow analysis, PCI compliance, the Health Insurance Portability and Accountability Act (HIPAA), and on-site security at the data center facility.

## BEST PRACTICE: USA.GOV USES CLOUD BURSTING TO HANDLE TRAFFIC FLUCTUATION

Finding the right combination of business requirements and applications is the key to success when considering moving to the cloud. Some of the most successful cloud deployments involve Web applications with unpredictable traffic patterns, capitalizing on the pay-per-use structure. The USA.gov situation fits nicely into this category of applications. In its deployment, GSA took into consideration the following elements:

- **Flexibility of the cloud computing platform.** GSA uses Terremark's self-service, portal-based cloud service, The Enterprise Cloud. In this infrastructure-as-a-service (IaaS) platform, USA.gov has a minimum baseline capacity on a 12-month contract, while the rest is all burst capacity or flexible capacity. In other words, when traffic is at normal levels, GSA pays only the contracted baseline fee — but it can accommodate large traffic when needed and not pay for it when it's not needed. As GSA never knows exactly what kind of capacity it will need, it made perfect sense to move to a cloud platform of this benefit.
- **Minimal time for migration.** USA.gov required a short, quick migration and testing process. The site had previously been deployed in-house on Egenera BladeFrame systems, which store workloads in VMs — making the transition to Terremark's VM-based cloud platform simple. The actual migration took 10 days, while the test validation occurred over the course of a single weekend.
- **Additional security elements.** Terremark designed its multitenant environment to meet the rigorous security monitoring and transparency demands of customers like government agencies. With only a few adjustments, GSA was able to get the monitoring and reporting it desired to manage this environment. In addition to these adjustments, GSA added a number of its own security elements atop this cloud environment. GSA required multifactor authentication (MFA) to access the USA.gov administrative portal, along with resource tracking, 128-bit encryption for traffic, and packet flow analysis. GSA's cloud resides in Terremark's Culpeper, Va. data center that also meets special security and defense requirements.<sup>2</sup>

## Best Practice Results: USA.gov Cuts Costs And Improves Capabilities

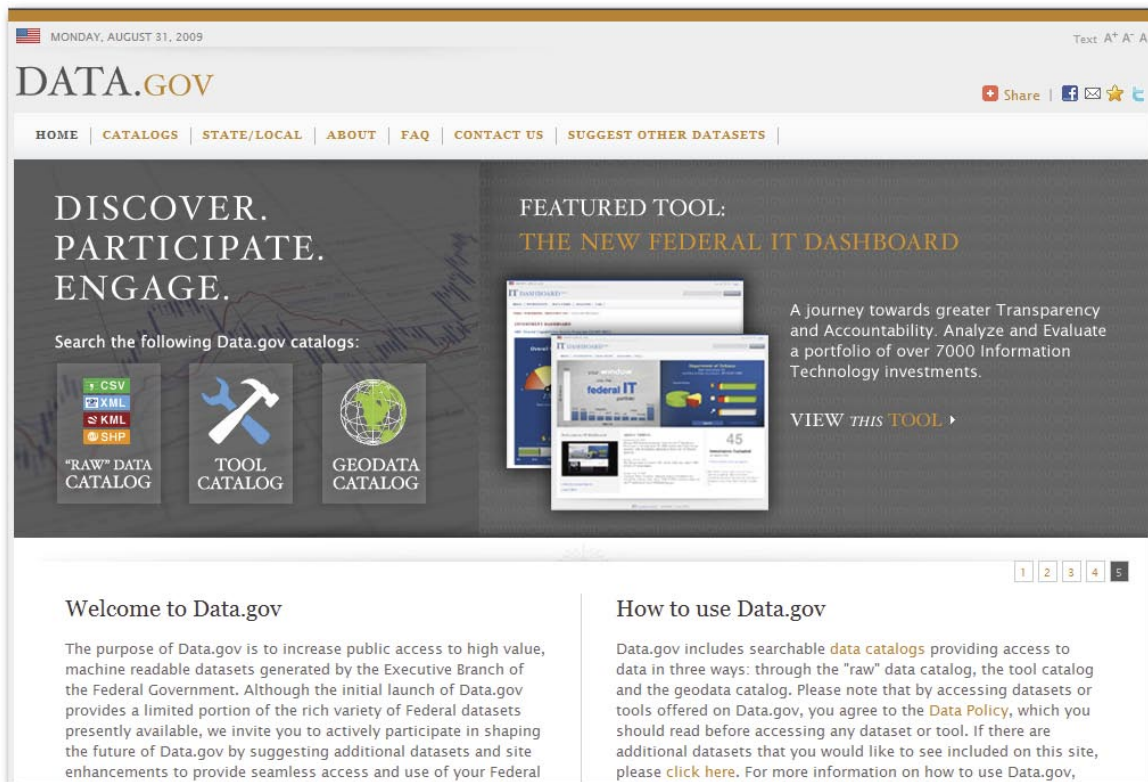
Deputy Associate Administrator of The Office of Citizen Services, Martha Dorris, has estimated that the move to Terremark's cloud platform will cut costs by 90%, while improving capabilities with the newfound infrastructure flexibility.<sup>3</sup> Originally, customer requests were assigned a ticket that GSA members had to act on to fulfill the request. Through the portal, each customer request is acted on in real time. There's no cheating on the backend, so it's fully automated.

## NEXT STEPS: USA.GOV DISCUSSES PLANS FOR EXPANSION OF CLOUD RESOURCES

Moving forward, GSA has a few ideas in the works for further using the Terremark Enterprise Cloud. These ideas include:

- **Connecting the customer's cloud pool directly to dedicated resources.** By leveraging Terremark's network architecture and GSA's added security, the agency plans to link IaaS and traditionally deployed applications. The service provider expects to bridge the two environments via secure, low latency VLAN links. This will let GSA place resources in either environment based on cost efficiency, architectural constraints, or other reasons.
- **Automating on-demand expansion of storage capacity.** GSA is also considering moving Data.gov to the same cloud platform sometime in the next year. Data.gov is a public warehouse of all data feeds the government makes available to citizens (see Figure 1). Moving this Web site to an IaaS cloud service would let users access data for building mashups or integrating with other Web sites. If GSA decided to make this switch, it would be cutting-edge in the cloud world.
- **Exposing infrastructure APIs.** Exposing APIs to USA.gov would let users build mashups of its content and access data programmatically — allowing them to access the information without going through the Web site. The GSA team has yet to determine whether this will be a next step for them. They're discussing whether it's beneficial to keep customers accessing through the Web interface or if the team should move forward with exposing the infrastructure APIs instead.

**Figure 1** Data.gov May Be The Next Government Web Site To Move To The Cloud



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Source: Forrester Research, Inc.

## ENDNOTES

- <sup>1</sup> In June 2009, the Brookings Institution named USA.gov the No. 1 federal government Web site, and Web100.com has rated it No. 48 in its "Top 100 Websites" — above AOL, NPR, Fandango, MSNBC, and Yelp. Source: USA.gov (<http://www.usa.gov/About/Awards.shtml>).
- <sup>2</sup> The data center campus in Culpeper, Va. needs to meet a number of on-premises security requirements. Some measures that Terremark has taken include: 250 motion sensor cameras, Department of Defense-approved fences, and blast-proof exteriors. Source: J. Nicholas Hoover, "Inside Terremark's Secure Government Data Center," *InformationWeek*, July 28, 2009 (<http://www.informationweek.com/news/government/cloud-saas/showArticle.jhtml?articleID=218700118>).
- <sup>3</sup> Martha Dorris, acting deputy associate administrator for the General Services Administration's (GSA) Office of Citizen Services and Communications, said the move will cut the portal's infrastructure costs by as much as 90% and improve its capabilities. Source: Steve Towns, "Federal Web Portal Moves to Cloud Computing Platform," *Government Technology*, May 1, 2009 (<http://www.govtech.com/gt/654240>).

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# Club Med Takes a Vacation from Downtime Worries

## Executive Summary

### Company

**CLUB MÉDITERRANÉE**  
Resort Vacations  
Paris, France  
[www.clubmed.com](http://www.clubmed.com)

## Business Challenge

- Implement a business continuity strategy
- Optimize Internet connectivity for North American operations
- Create ability to access applications remotely in the event of a disaster

## Terremark Solutions: Terremark Facility Services

## Business Results

- Ensured 100-percent power availability and simplified operations
- Gained many more capabilities for less than previous connectivity costs
- Found new business flexibility

## Quote:

“While our first priority was to ensure disaster recovery, Terremark enabled us to gain hosting services, massive worldwide connectivity, better performance, scalability, and unmatched protection — for less than we had been paying for connectivity alone.”

— Stéphane Magnat, IT Director for Club Med North American Zone

“Now if there is any natural disaster, all we have to do is turn off the lights and walk out because everything is secure at Terremark. We can access our systems remotely through a VPN or relocate to a temporary office — a new cross-connect gets us up and running quickly.”

— Jorge Lopez, Technical Support Manager for Club Med North America

## Seeking a Permanent Vacation from Disaster Worries

What's the perfect vacation? It might be swinging upside-down from a flying trapeze. Snorkeling above a school of tropical fish. Or letting the kids enjoy award-winning activities while you relax on a white sugar-sand beach. For a refined, generous, personalized vacation experience, more than 1.4 million guests visit one of 80 Club Méditerranée (Club Med) resorts around the world every year.

Headquartered in Paris, France, Club Med's North American operations are located in Coral Gables, Florida. Here, the IT organization supports an office in Mexico City; call centers in Scottsdale, Arizona and Montreal, Canada; and the Club Med villages Sandpiper (Florida), Cancun and Ixtapa (Mexico), Punta Cana (Dominican Republic), La Caravelle (Guadaloupe), Buccaneer's Creek (Martinique), Columbus Isle (Bahamas), and Turkoise (Turks & Caicos).

Until recently, applications and Internet connections were hosted and managed through Paris headquarters, while local Internet service providers delivered access and voice services for each village. As operations became increasingly interrelated and critical, high Internet traffic volumes slowed performance for Web-based applications. Routine after-hours system maintenance performed in Paris shut down operations in the U.S., Mexico, and the Caribbean during peak time periods. System backups were performed locally and shipped out to other locations when needed, extending downtime. In 2005, Hurricane Wilma placed Club Med's business continuity and disaster recovery strategies on the fast track.

"After Wilma hit Florida, the Coral Gables office was down for ten days while local power blocks were restored," said Jorge Lopez, technical support manager for Club Med North America. "Because all of the circuits terminated in our offices, the resorts were down as well. Call centers in Scottsdale and Montreal could take phone calls, but agents could not access the applications they needed to process reservations." Having to manually process each reservation reduced the number of customers served by 75 to 80 percent.

With so much at stake, the company began investigating options for reducing downtime in the event of a disaster, securing and backing up data offsite, and creating redundancy. After evaluating several possibilities, Club Med chose Terremark and its NAP of the Americas.<sup>®</sup> The NAP of the Americas<sup>®</sup> is a fortress-style facility that provides state-of-the-art security and guaranteed availability for peering, managed, and dedicated hosting services. World-leading carriers, Internet service providers, and content providers are housed at the NAP of the Americas,<sup>®</sup> enabling customers to take advantage of massive, carrier-neutral connectivity for extending their reach anywhere in the world. And the NAP facility itself is designed and built to withstand a Category 5 hurricane.

"Terremark allowed us to transition our data center in phases," said Mr. Lopez. "The NAP team was extraordinarily helpful in helping us ensure a smooth transition. The entire move was completed in a relatively short amount of time."

## **An All-Inclusive Solution**

Today the Coral Gables offices, Turkoise, and Columbus Isle are connected directly to the NAP, while Sandpiper, Caribbean and Mexican villages, and call centers are connected over an MPLS network. An additional new circuit provides dial-up capabilities for accessing applications remotely in the event of a disaster. Club Med takes advantage of Terremark's peering and dedicated hosting services, with access to backup-and-restore services if needed.

"While our first priority was to ensure disaster recovery, Terremark enabled us to gain hosting services, massive worldwide connectivity, better performance, scalability, and unmatched protection — for less than we had been paying for connectivity alone," said Stephane Magnat, IT director for Club Med's North American zone.

All of Club Med's carriers and main connections reside at the NAP of the Americas,<sup>®</sup> including Cable & Wireless, France Telecom, Nexogy, Global Crossing, and others. Because equipment is housed at the NAP of the Americas,<sup>®</sup> the company also eliminated security risks from possible break-ins. Mr. Lopez can monitor operations remotely, deploy new circuits, or make changes with a phone call.

"Now if there is a natural disaster, all we have to do is turn off the lights and walk out because everything is secure at Terremark," said Mr. Lopez. "We can access our systems remotely through a VPN or relocate to a temporary office — a new cross-connect gets us up and running quickly."

## **Generous Coverage**

The Terremark solution also quadrupled Club Med's local Internet circuit, so now the company has the bandwidth to ensure full redundancy between Coral Gables and Paris. Internet-based application performance has dramatically improved, giving Mr. Magnat the ability to outsource several local applications, such as payroll processing, and eliminate the burden of managing and supporting those servers and databases.

The Terremark solution provides Club Med executives with new peace of mind as well. Business changes quickly, but with everything at the NAP of the Americas,<sup>®</sup> the company has the flexibility to easily move people and locations without having to move its entire infrastructure.



## Next Steps

Through the NAP of the Americas,<sup>®</sup> Club Med is able to take advantage of promising new technologies and vendors. A voice over IP (VoIP) project is testing the company's plan to deliver voice calls between Coral Gables and Paris over the network.

"Instead of having to negotiate a separate agreement with a long-distance carrier, we can easily set up calls over the network," said Mr. Magnat. "Running a high percentage of these calls through the NAP would save significant international calling costs." Using VoIP, Club Med could also reduce the cost of calls between Mexican and Caribbean villages and the U.S. mainland, enabling guests to take advantage of reasonably priced calls to phone home.

Club Med is also planning to virtualize its call centers to automatically re-route calls when one call center is overloaded. Instead of having to hire more agents to handle calls during peak periods, Club Med can optimize the resources it already has, ensure good service, and increase its business.

"It's more than just the connectivity and network," said Mr. Lopez. "As we move forward and expand our presence, Terremark is extremely helpful in identifying excellent technology providers in the NAP who can help us achieve our goals."

## About Terremark

**Terremark Worldwide, Inc. (NASDAQ:TMRK) is a leading global provider of IT infrastructure services delivered on the industry's most robust and advanced operations platform. Leveraging datacenters in the United States, Europe and Latin America and access to massive and diverse network connectivity, Terremark delivers government and enterprise customers a comprehensive suite of managed solutions including hosting, colocation, connectivity and security services. Terremark's acclaimed Infinistructure™ utility computing architecture has redefined industry standards for scalable and flexible computing infrastructure and its DigitalOps® service platform combines end-to-end systems management workflow with a comprehensive customer portal. More information about Terremark Worldwide can be found at <http://www.terremark.com>.**



## CASE STUDY

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# Agora Games Changes the Gaming Playing Field with Terremark's Enterprise Cloud

**AGORA GAMES** Brian Corrigan  
Chief Technology Officer

Aspiring living-room rock stars or players soldiering through a battlefield can join millions of others online in their quests, thanks to Agora Games. The company develops video game middleware and creates custom online gaming communities. Award-winning games such as Guitar Hero and Call of Duty include technology from Agora Games that allows players to track their scores, meet other game enthusiasts, and compete with players around the world. For game developers and publishers, Agora provides in-game data capture and analytics that deliver valuable game-play information for improving the game, the community, and future games.

Each game's website is closely integrated with the game itself. Players can go to the game's site, view what they just played and share it with their friends. As a result, site performance is critical to the game's success. Slow performance or features that don't work correctly can result in players leaving in favor of other publishers' games.

In the past, Agora Games leased servers for testing and hosting game sites and had to constantly monitor servers, troubleshoot hardware issues, and reinstall applications or data if a hard drive failed or became corrupted. Managing physical servers for testing and production use was complex. Ideally, the team would test a game on the same hardware that would be used for production. However, they had to continually reallocate servers between testing and production environments, cleaning up the testing servers and reconfiguring them to make them production-ready.

Even more difficult was preparation for the launch of a new game. If the game exceeded expectations, server capacity was strained, affecting performance and players' adoption of the game. However, adding servers to improve performance could take several days and for game publishers, several days of sub-optimum performance increased the risk that players would drop the game. Agora Games would have to call the hosting provider for assistance in adding servers, reconfiguring the network, upgrading hardware, or removing extra servers.

When new games do not generate the expected traffic, servers that are not used sit idle, which is costly. In addition, most games have peak usage when they are launched, after which traffic volumes sharply decrease and server capacity that was needed at launch sits idle later.

Because Agora Games' technology delivers game-play data to the site, the company must also pull high volumes of data over the Internet to a game's web site – quickly and securely. Game-play data analytics demand high network capacity and massive connectivity.

"Building the type of datacenter that we need is very expensive," said Brian Corrigan, Agora's chief technology officer. "Yet, we need to ensure extremely high levels of uptime and responsiveness for our customers and their players. We don't want to have to manage hardware, but we do need control over the systems. That's why we began looking for a virtualized solution."

## A CLOUD-BASED SOLUTION

Corrigan and his team evaluated several providers of cloud-based services, but none of the solutions adequately met Agora's three critical requirements. First, Agora needed a service that supported both Ubuntu Linux and Microsoft Windows platforms. The Microsoft Xbox is one of the leading game consoles, and Agora needed to be able to work with Windows-based platforms. Second, high uptime is critical to systems supporting online gaming, but not all services guaranteed system uptime. After having to monitor servers and replace hard drives in their leased systems, Agora preferred to leave hardware management to a service provider. Finally, the company wanted superior support. If it became necessary to pick up a phone and call for assistance, Agora wanted to ensure that the provider was ready to help.

"We called Terremark and immediately received great support from the sales team," said Corrigan. "When we started asking highly technical questions, they put a sales engineer on the phone. We threw every question we could think of at her, and she answered all of them. She was terrific."

The solution that Terremark recommended is The Enterprise Cloud™, which allows precise, dynamic allocation of computing resources when and where they're needed. The Enterprise Cloud resides in Terremark's global footprint of world-class top-tier datacenters, providing the highest standards of security, availability and power. The solution's grid architecture provides complete physical redundancy to eliminate any downtime due to hardware failure. The system can even move applications across physical devices dynamically – without service interruption – while automated resource balancing provides continuous monitoring and optimization to ensure peak performance.

The Enterprise Cloud is based on Terremark's proven Infinistructure™ utility computing platform, massive and diverse network connectivity, and top-tier technology from world-class infrastructure partners such as HP, IBM, VMware and Cisco. Its powerful Infinicenter web portal enables Enterprise Cloud customers to dynamically provision servers from pre-allocated resource pools of dedicated memory, processing and storage. In minutes, Agora can configure and provision a virtual server, organize its servers according to role, and dynamically extend them based on how they needed to be used. An available burst mode provides an automated, cost-effective way for Agora to deal with spikes in demand.

Agora Games deployed a test system with Terremark's help. As Agora became more familiar with the differences between managing virtual servers and managing physical servers, Terremark was there to answer questions and provide immediate assistance.

"We hammered the test system hard, and we were impressed with the results," said Corrigan. "When comparing results from similar systems in our old environment, we found performance gains across the board."

## UNMATCHED CONTROL AND FLEXIBILITY

The Enterprise Cloud gives Agora complete control over its systems without having to manage hardware and provisioning. Through the Infinicenter web portal, Agora can easily configure servers for testing or production in just minutes.

"We can set up an exact copy of the planned production system for testing prior to live deployment," explained Corrigan. When we're done with our testing, we simply delete the test system and recover the resources in use – all without picking up the phone."

Now Agora does not have to purchase or lease more servers than they actually need, and they can scale the number of servers used up or down on demand. When a new game is introduced at Christmas, Agora can deploy additional servers to handle the peak load and scale back as usage normalizes over time. They no longer have to pay for capacity that isn't fully utilized. When servers are turned down as demand scales back, resources can be retired back into the cloud or reallocated elsewhere, enabling Agora to respond in real-time to their business needs.

## MASSIVE CONNECTIVITY FOR EXTENDED REACH

Agora's previous provider offered connectivity to multiple Internet points of presence, but Terremark offers plug-and-play bandwidth from more than 160 global carriers. This massive connectivity will eventually allow Agora to establish servers in countries outside of the U.S. in order to meet privacy requirements for users in other countries.

"Because Terremark is a much larger company, we get additional benefits that don't cost extra," said Corrigan. "Its easy to set up servers in different locations worldwide in order to meet the privacy of different customers" In addition, Agora has access to a closed, private network of servers behind a virtual firewall, for added security in comparison to its servers residing directly on the Internet, which was the case with their previous provider.

## SUPERIOR PERFORMANCE FOR PULLING DATA

With network-level integration across the country, there are minimal hops required for transporting data, which significantly improves data collection performance. Previously, high volumes of data had to go through multiple hops from users' ISPs to reach the game web site. The Agora team was concerned about performance, because immediate access to game data is a critical factor in game players' satisfaction with their gaming experience. The Enterprise Cloud's nodes reside in a global footprint of carrier-neutral datacenters, which allows Agora access to more than 160 global carriers.

"We just assumed that this would be a problem, and when we actually did the testing it turned out there was no problem at all," laughed Corrigan. "We received much higher performance from the Terremark's NAP of the Americas in Miami than from the local datacenter. We all just scratched our heads and said 'hmm, that was easy'."

## HIGHLY RESPONSIVE SERVICE

Agora has been impressed with the support it receives from Terremark as well. The Terremark team has been extremely accommodating to Agora's requests and made adjustments to the virtual environment, power management, and other features.

"We haven't been a customer for very long, but Terremark has addressed many of the items that we have asked to be integrated," said Corrigan. "That is really important. We even named a server after one of the Terremark technical engineers."

## AND IT IS ALL COST-EFFECTIVE

With The Enterprise Cloud, Agora has gained more powerful hardware resources and higher performance than it could have achieved by building its own environment. The company only pays for what it uses and at the same time, can focus its internal resources on its own business - building gaming environments.

"If we didn't have Terremark, I would have budgeted for round the clock hardware support this year," said Corrigan. "We are excited about leveraging our Terremark capabilities to involve new game developers, studios, and publishers in our new Hydra product. Terremark will greatly simplify building and running that product, and it will help us be much more price-competitive."

## THE STRENGTH OF COMPLEMENTARY RELATIONSHIPS

Agora also appreciates Terremark's relationships with a wide range of Internet services companies. For example, content delivery services, such as Akamai and Limelight, also reside in the NAP of the Americas datacenter in Miami, which makes it easy for Agora to quickly connect with complementary services if necessary.

"If one of our games goes viral, it is much more cost-effective to outsource specific video or music delivery capabilities," said Corrigan. "Now, Terremark handles that connectivity and make sure that it works. We just get to use it."

## NEXT STEPS

Agora plans to transition the rest of its existing products to Terremark to virtually eliminate the need to manage hardware from now on. This frees the company to focus entirely on delivering top-tier services to its customers and gaming innovation.

“Our biggest competitive advantage is that we don’t run a datacenter,” said Corrigan. “We think it’s fun when the competition says that it has a 7000 square-foot datacenter – and we can say that we have a 750,000 square foot datacenter. Now we can focus on new toys, instead of keeping servers running. Which is always a lot more fun.”

# ***Executive Summary and Response to Section 3.6.2 B***



Prepared by DSI and DFISS ISS Teams

Last Update: January 23<sup>rd</sup>, 2012

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# 1 Overview

DISYS Solutions, Inc. (“DSI”), in partnership with DSI Physical Security Eco-System Alliance member Delex Fairfax (“DFISS”), is pleased to deliver to CCPA, a world-class blue-print, for its Unified Security Solutions requirement. *The uniqueness of this solution is that it will deliver to CCPA, a DHS Safety Act Certified design; as well as one compliant with both the DHS NIPP Reference Architecture, as well as the US Department of Justice’s recommendations for a FUSION Center, Command and Control framework. The world’s leading security experts are in full agreement that what makes a Unified Security Solution, “Unified”, is absolutely its ability to: Process and receive alerts from the entire security eco-system, both Physical (i.e., “PSIM”) and Cyber (i.e., “SIEM”) irrespective of vendor brand; and to able to view this 360 degree Situational Awareness, from a Single Management Platform, and execute actionable intelligence and counter-measures from that same single platform.*

DSI is proud to propose to CCPA, a best in class Unified Security Solution consisting of best-of-breed products for each Unified Security Solution category in **Section 3.6.2 B:**

## B. Unified Security Capabilities

- **Physical Security**
  - Video Surveillance;
  - Access Control;
  - Fire / Smoke Alarm;
  - Intrusion Detection; and
  - Video Analytics.
- **Asset Management**
  - RFID;
  - Inventory management; and
  - Asset tagging.
- **IT Security**
  - Endpoint;
  - Information Assurance;
  - Network;
  - Storage; and
  - Identity Management.

With the critical addition of the “Unifying” element, for all of the above solutions – *the world’s leading Situational Awareness and Incident Management (PISM & SIEM) platform* – **Proximex SURVEILLINT**, or the Cisco OEM version, known as **Cisco PSOM**. The provided solution is globally unique, inclusive of Patents, and best-in-class features and functionality; and optimized for both Network-Centric and Cloud Based deployment.



The following are the *Unified Security Management Platform's* key differentiators:

- **Best-in-Class Scalability** - As a service-oriented architecture (SOA), the platform can scale to support thousands of sensors and can flexibly support any type of security system. The solution has ability to scale both vertically (numbers of sensors managed) and horizontally (number of technologies integrated into it). A recently conducted scalability and availability testing has shown impressive results for a similar solution that is proposed: *each low-end Surveillint/ Cisco PSOM server can support over 200 simultaneous client consoles, over 25,000 sensors, and over 1,000 alerts per second* – more than adequate for even the most demanding environments. *For environments that require more than this, additional servers can be added or the specifications for the server could be enhanced.*
- **Best-in-Class, High availability and failover capabilities** - More servers can be added for additional capacity to support the largest environments. What's more, failover occurred within seconds using failover technologies provided by Microsoft and NEC. Failover and high availability can also be achieved using NEC fault tolerant solutions, Microsoft SQL Server replication, Microsoft Network Load Balancing and Microsoft Cluster technologies.
- **Business Logic Designer** – through Visio-friendly *drag & drop*, visually create automated actions and decisions to deliver *counter-measures across all supported security platforms* – Video, Fire, Life-Safety, IDS, BMS, Radar, Fencing, other.
- **EZ-Track** – video pursuit across cameras, and cameras from different vendors (**Patent Awarded**)
- **Investigate Users** – Investigate and trace users *across multiple access control systems and platforms*
- **Trend Reporting** – proactively report on statistical trends *across multiple security systems and platforms*

- **Open, Standards Based SDK** – The only solution in the Physical Security Management and Incident Management space that offers a fully documented, open web services SDK that can be leveraged to integrate additional systems. It provides a standard way to send information to different systems such as communications systems, Computer Aided Dispatch, notification systems, etc. or a standard way to receive alarm/alert information and associated details (such as tracking information or additional metadata).
  
- **3<sup>rd</sup> Party Physical Security Platforms – Integration Modules** – the solutions has built *the industry's most extensive library of integrations with security systems* – more than 150+ system integrations in all and continues to add 5-10 integrations per quarter. These integrations include:
  - Video Management Systems
  - Access Control Systems
  - Fire Alarm Monitoring Systems
  - Intrusion Alarm Systems
  - Intelligent Video Systems
  - Intercom Systems
  - Computer-Aided Dispatch Systems
  - Mass Notification Systems
  - RADAR Systems
  - Chemical/Biological Sensors and Detection sensors
  - IT Systems supporting SNMP, WMI, Syslog, etc.
  - Building Management Systems

In addition to the **large breadth** of integrations, the solution also provides the **deepest** level of integrations compared to other PSIM Platform. The solution provides bi-directional capabilities to synchronize alert status between systems (alert updates in each system are kept in synch), control doors, move cameras, provide door activity, display badge IDs, and investigate/trace specific card holders. .

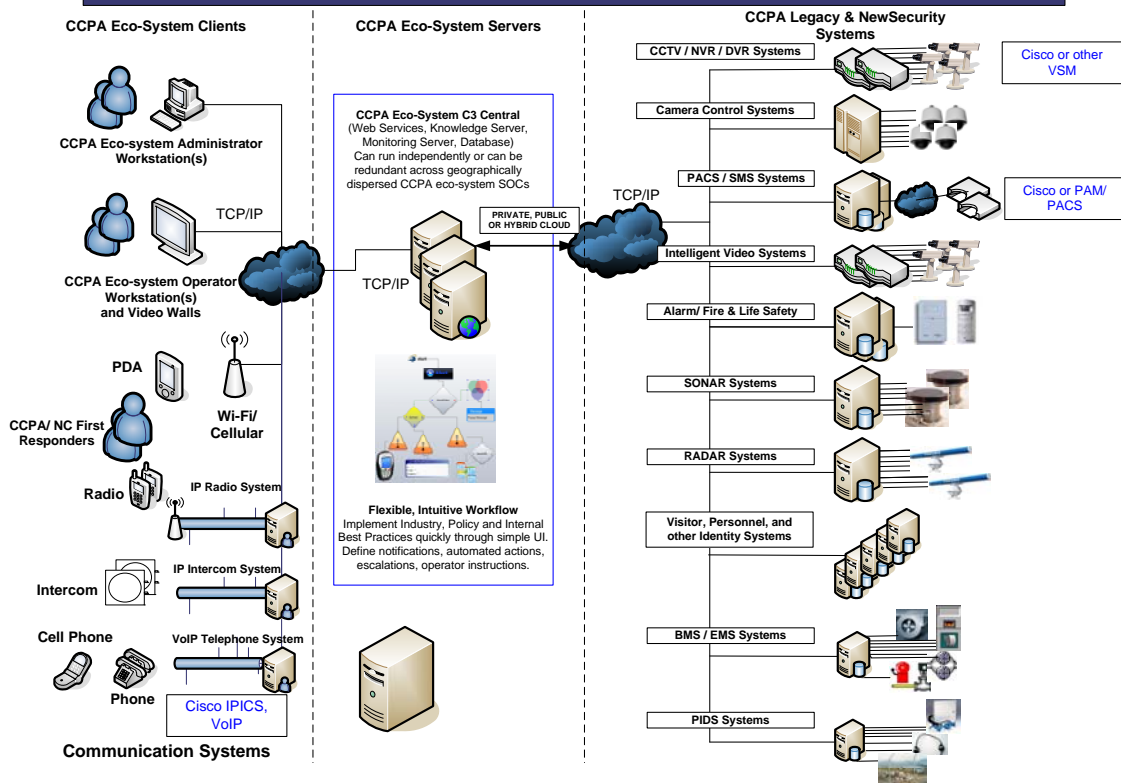
In summary, the solution presented is ***designed, from the ground up, to support ALL 3<sup>rd</sup> PARTY security systems, Video, Fire, Life-Safety, IDS, BMS, Radar, Fencing, and many others*** to provide the best situational awareness experience in a complex Command & Control environment.

For CCPA agencies and constituents, the system will be used to provide integration between the multiple security systems deployed – *whether legacy or new* – and either, at a single site, or across multiple buildings, sites and campuses.

### **Figure 1 – High Level View of a Enterprise Wide CCPA Unified Security Solution**

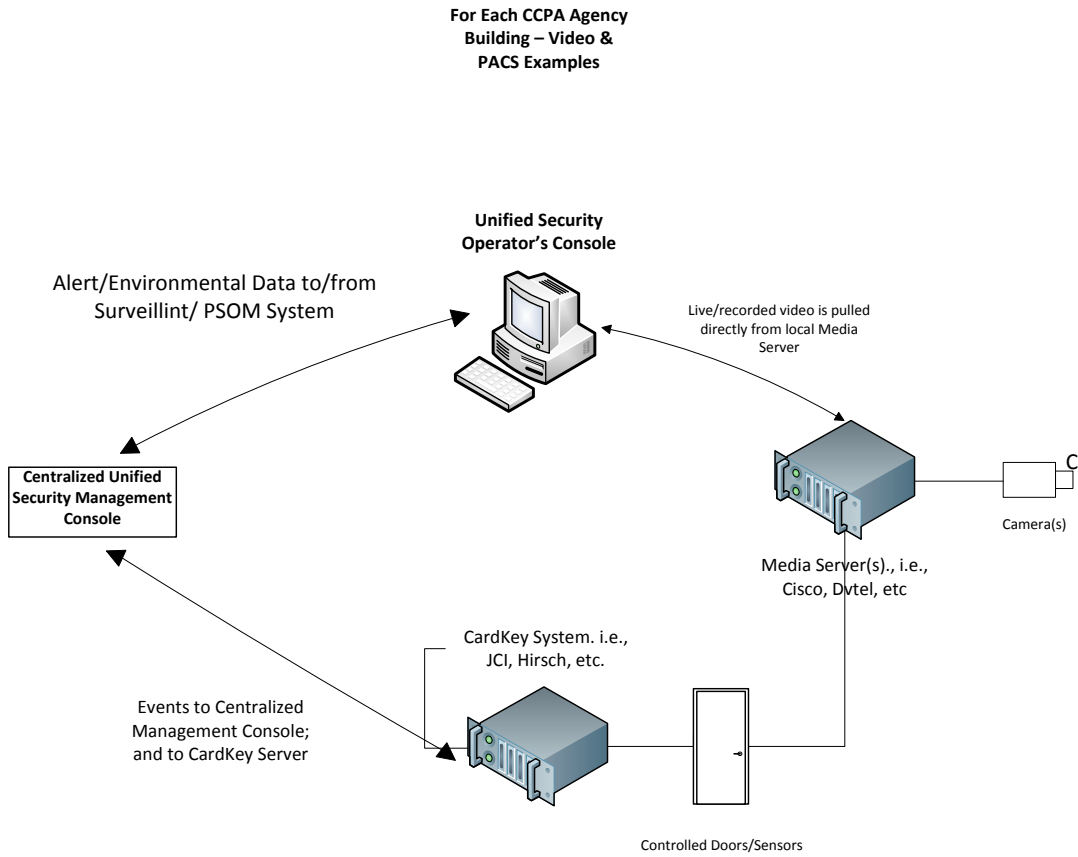
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**Disys Solutions Unified Security Command and Control Architecture – One-Click, One-View - all Security Events**

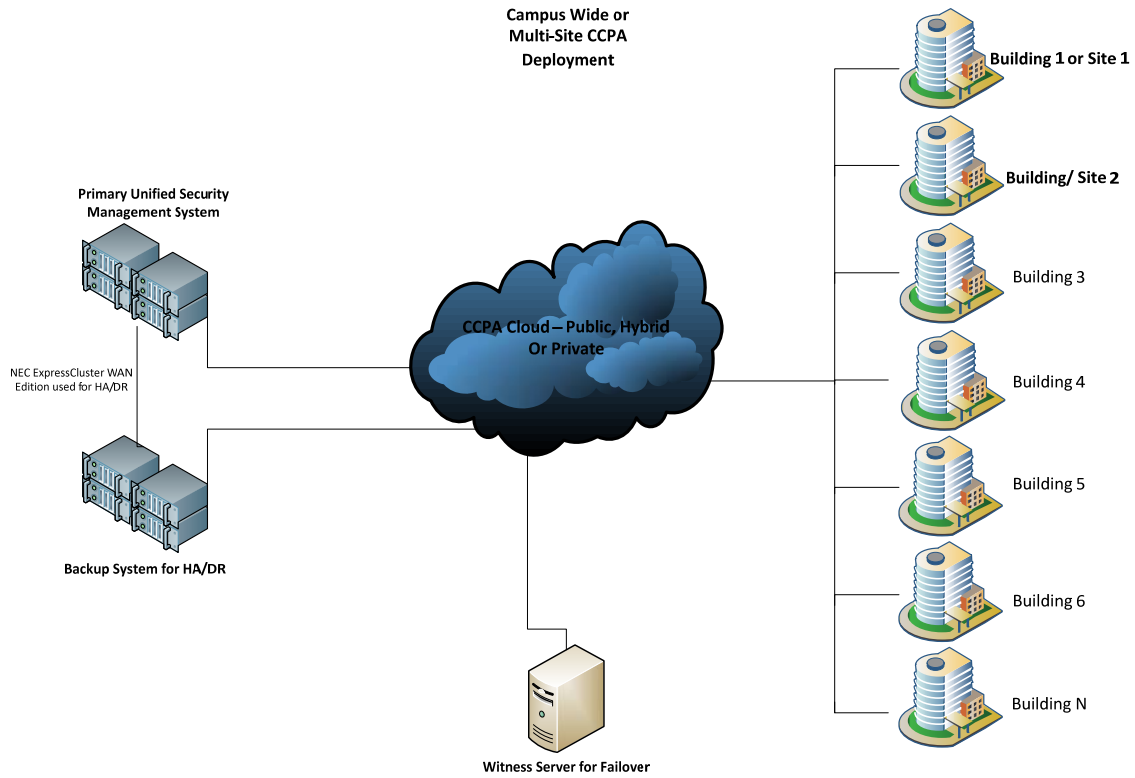


This document describes two options for deploying a Unified Security Solution within CCPA agencies and institutions. Option 1 is for standalone systems to be deployed at each building providing incident management capabilities for that building. Option 2 is for a centralized Surveillint/ Cisco PSOM deployment for a multi-site CCPA agency deployment, providing a centralized view of security incidents across the entire network while allowing security operators in each building or site to have incident management capabilities for their building only. Each option is schematically depicted below.

## 2 Option 1 – Standalone/ Single-Site or Per Building Integrated Security System Example



### 3 Option 2 – Campus-Wide or Multi-Site Deployment



**Services Pricing**

**Labor Categories** **List Price** **CCPA**

**Price** - Per hour \$180 \$150

**Project Manager**

*Qualifications:* Five (5) years experience performing tasks focused on leadership and/or  
*Functional Responsibility:* Manages the execution of single projects of simple to complex. Hold Overall responsibility for customer satisfaction, scheduling for a project as specified  
*Education:* Bachelor’s Degree or equivalent (e.g. 8 years experience) in Electrical Engineering

**Sr. Systems Engineer** \$225 \$175

*Qualifications:* Twelve (12) years of mechanical, electrical engineering experience or Ten (10) years  
*Functional Responsibility:* Integrates project/program-engineering efforts across disciplines including software and hardware. Derives project/program requirements through analysis of clients  
*Education:* Master’s Degree or equivalent (e.g. Bachelor’s Degree + 4 years experience or 12)

**Jr. Systems Engineer** \$150 \$125

*Qualifications:* Seven (7) years of electrical engineering, information systems engineering  
*Functional Responsibility:* Integrates project/program-engineering efforts across disciplines including software and hardware. Derives project/program requirements through analysis of clients  
*Education:* Bachelor’s Degree or equivalent (e.g. 8 years experience) in Electrical Engineering

**Sr. Technician** \$150 \$125

*Qualifications:* At least Eight (8) years of experience of which at least four (4) years must be  
*Functional Responsibility:* Organizes and directs electronic installations and performs site surveys, assesses and documents current site network configuration and client requirements  
*Education:* Suitable training and/or experience as applicable to ensure the individual is fully versed and capable of executing his/her tasks within acceptable workmanship standards and industry conventions comparable to an Associate’s Degree

**Jr. Technician** \$120 \$100

*Qualifications:* At least Four (4) years of experience and two (2) years specialized experience  
*Functional Responsibility:* Assists in site surveys, assesses and documents current site network configuration and client requirements. Configures computer work stations, communication  
*Education:* Suitable training and/or experience as applicable to ensure the individual is fully versed and capable of executing his/her tasks within acceptable workmanship standards and industry conventions comparable to an Associate’s Degree

**Training Specialist** \$100 \$80

*Qualifications:* At least Two (2) years of experience related to professional training  
*Functional Responsibility:* Prepares and delivers training, training plans and training materials (e.g. course materials and/or instructor guidelines, etc.) to client, instructors and other interested parties  
*Education:* B.A./B.S. or equivalent (e.g. 4 years experience) in a related or technical field

# **SAMPLE STATEMENT OF WORK FOR A UNIFIED COMMUNICATIONS SYSTEM**

VII. STATEMENT OF NEEDS:

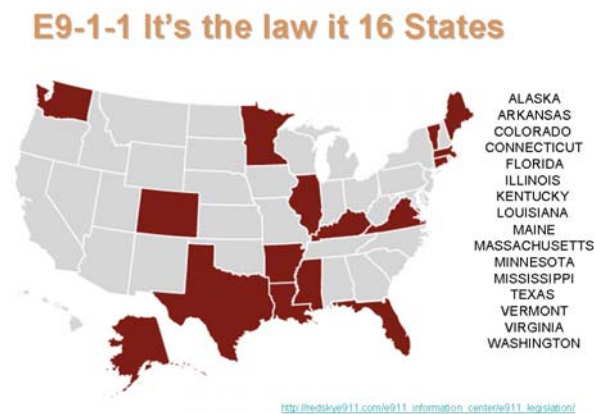
Virginia Tech requires a contractor to provide a unified communications system including all ancillary services, products, and support required for implementation, operation, and maintenance, in order to support the voice, messaging, and collaboration requirements of the university.

A. Proposed solutions shall:

1. Facilitate compliance with current and future federal, state, and local E911 requirements.

**Response:**

For the E911 services, DISYS Solutions will partner with RedSky. Our proposed E911 solution meets or exceeds all current Federal, State and Local government E911 mandates and E911 laws throughout the USA.



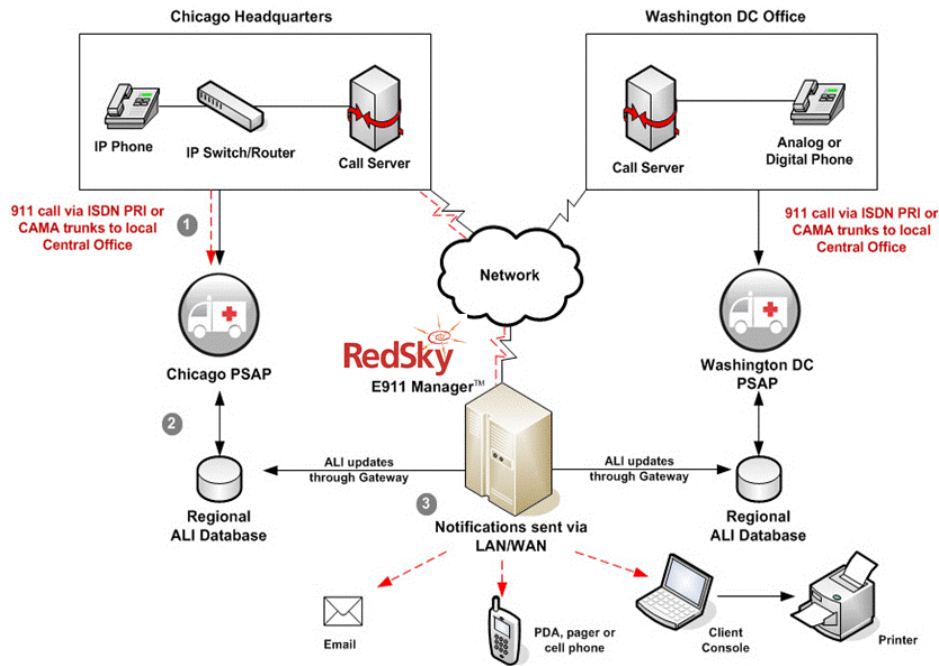
**Figure 2. E911 State Map**

**E911 Manager**

Our E911 proposed solutions is RedSky's E911 Manager. E911 Manager is the most reliable and scalable E911 solution on the market, automatically capturing location data from your network of call server/ Unified Communication Manager (UCM) to eliminate the manual maintenance of an ALI database and deliver significant time and cost savings. E911 Manager is a centralized server that interfaces with multiple call servers to capture, manage and deliver location information for traditional and IP endpoints. The diagram below depicts how E911 Manager interfaces with multiple switches across the country and multiple regional ALI database providers.



## RedSky A Single Server Enterprise Solution



**Figure 3. Single Server Enterprise Solution**

Our partner, RedSky Technologies, Inc., is a USA based Small Business, headquartered in Chicago, IL, and has partnerships with other leaders in the telecommunications and 9-1-1 industries to help shape 9-1-1 policy, leverage emerging technology, and comply with evolving regulatory requirements. RedSky is a certified Cisco Technology Partner and offers the only premise based E911 solution that is certified to run on all three of these leading telecommunication platforms. E911 Manager is certified to integrate with the Cisco's UCM Platform. RedSky allows our customers to rest assured that every 911 call will be processed with the proven 99.999% availability provided by our proposed Cisco Unified Communication Manager Platform.

In addition to its core functionality, E911 Manager provides a complete audit trail, reports and notifications to ensure that your ALI data is being properly maintained.

2. Be designed to deliver calling number information to the appropriate PSAP for E911 calls from the main campus locations, satellite office locations, and home office locations.

### **Response:**

E911 Manager™ supports location management for digital and analog phones in a variety of ways, adapting to the particular methods supported by major PBX and call server manufacturers. Cisco Call Manager (v4.1.3 – 8.0) – ALI records for analog phones are created manually in E911 Manager™ and uploaded to LEC ALI databases.

3. Be designed to deliver calling number information that facilitates access to accurate location information for E911 calls made from fixed or mobile clients.

**Response:**

The E911 Manager delivers accurate location information for all E911 calls from landline or wireless users. For Cisco Analog telephone instruments RedSky's E911 Manager solution will be updated by an internally developed automated process that represents changes in the NI&S customer database in a NENA (National Emergency Number Association) standard formatted flat file that will supplement / replace the current Virginia Tech developed ALI database that is imported nightly by the Virginia Tech owned and managed ALI database. We understand that the Verizon ALI database is utilized primarily for resolving location information for cellular callers.

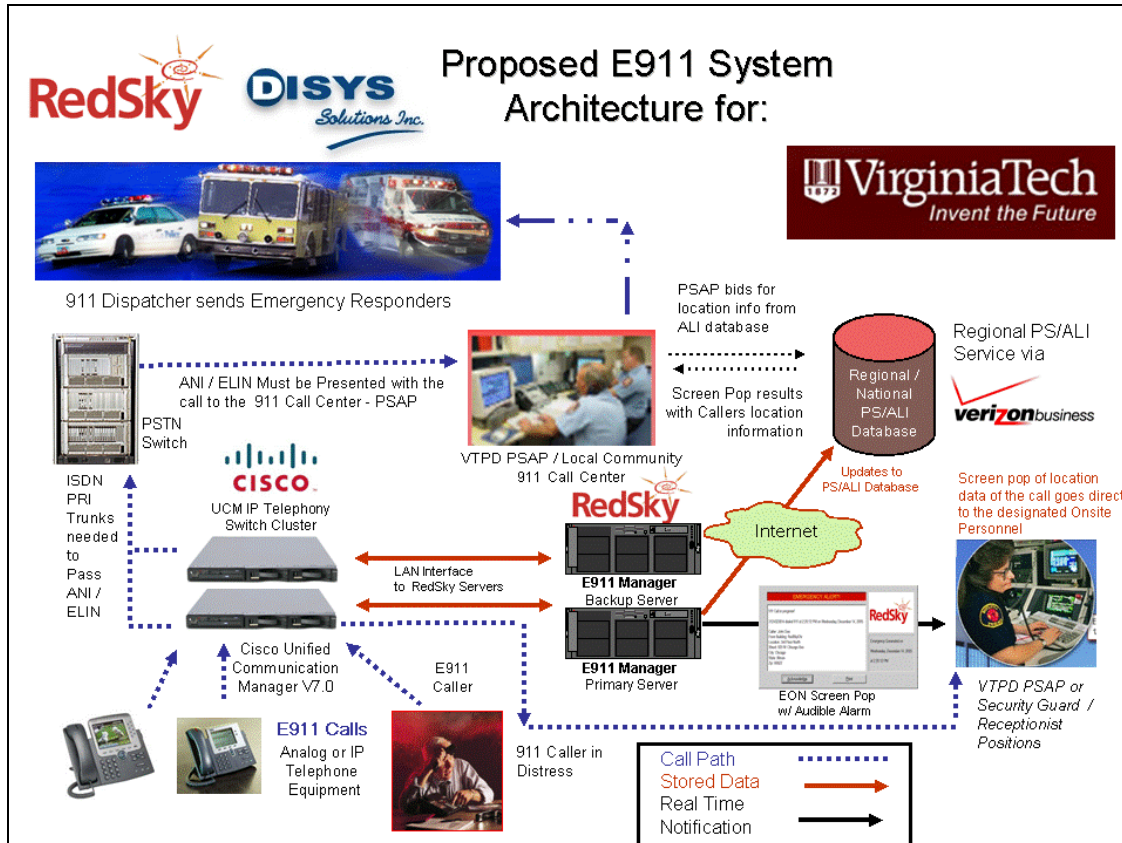
By automating this function for Analog and IP phones, Virginia Tech will save hundreds of FTE hours by no longer requiring staff to manually update ALI databases. In addition, you can be assured that every time a phone is moved within your organization the change will be properly submitted to both the Verizon Regional ALI database and the Virginia Tech owned and managed ALI database since this process will now be automated and not subject to potential human error. Our proposed RedSky E911 solution will ensure that Virginia Tech will continue to provide building name/address, floor and room number to either VTPD dispatchers or local community PSAPs for all e911 calls regardless of whether they are coming from Analog or IP Telephony soft or hard phones anywhere within or outside of your enterprise environment. DISYS Solutions and RedSky will further ensure that e911 calls from the Northern Virginia Center UCM are dispatched to the PSAP servicing the city of Falls Church, VA and that the local PSAP in Falls Church has the correct location information for callers in Northern Virginia.

We recommend for the vast majority of Virginia Tech telephone stations that the university continue to use traditional on-site Virginia Tech Police Department (VTPD) PSAP / Automatic Location Identification Database approach for E911 location provisioning on campus in Blacksburg. Using this approach, location records will continue to be automatically updated and uploaded into the VTPD owned ALI database using an automated database uploading technique between our proposed E911 Manager and Virginia Tech's on site PSAP ALI database. For location records that need to be provisioned for E911 service to Virginia Tech's facilities in Northern Virginia, we recommend using E911 Manager in combination with a Verizon provided PS/ALI gateway account that will allow Virginia Tech to automatically export ALI records from E911 Manager into the Verizon PS/ALI database that serves PSAP locations in Northern Virginia where Virginia Tech does business.

Whether E911 calls stay on campus at Virginia Tech in Blacksburg or take place in Northern Virginia, the local PSAP retrieves ALI records from the ALI DB in a "data dip" when a 911 call arrives at the PSAP. If the Virginia Tech enterprise ultimately spans beyond more than one geographical region - beyond Verizon territory - the ILEC PS/ALI database in each region (that may be provided by a different ILEC - i.e. AT&T, or Qwest) will need to be updated by E911 Manager with separate PS/ALI accounts for each region. If this becomes the case, Virginia Tech may need to open up a gateway account with each of these ILECs. Regardless of this potentially happening in the future, the same centralized network based E911 Manager will be capable of automatically updating each of these individual ILEC ALI DBs throughout the USA.

For remote employees, mobile workers and Windows based softphone users, we recommend that Virginia Tech deploy our E911 Anywhere Network Service to provision both dynamic ALI

database provisioning as well as real time call routing of 911 calls to our Nationwide E911 Anywhere Network Service. This service can also be used in place of establishing multiple PS/ALI accounts as described above. E911 Anywhere Network Service will be explained in detail later in our proposal.



**Figure 4. Proposed E911 Solution**

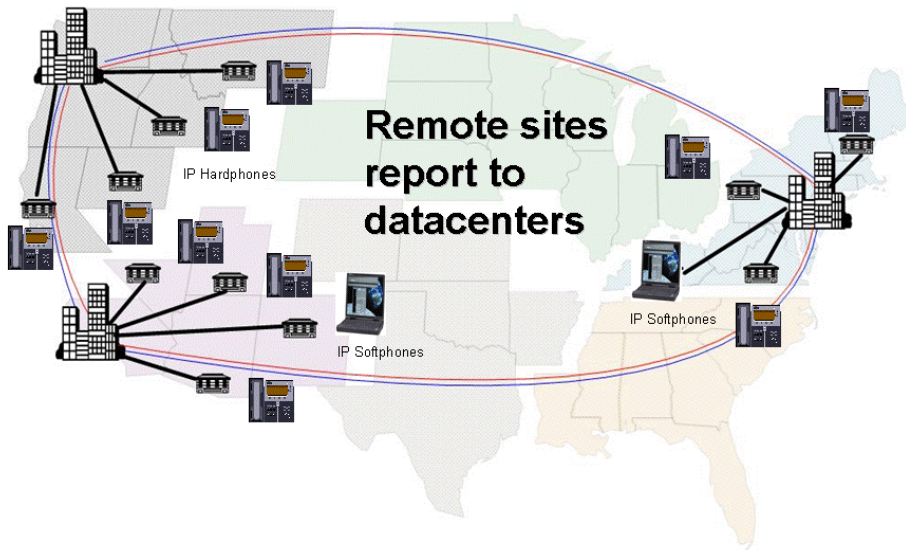
4. Be designed to facilitate return calls from the PSAP for E911 calls made from fixed or mobile clients.

**Response:**

To facilitate return calls from PSAP for E911, we recommend RedSky’s E911 Anywhere. This is an additional RedSky service that can connect a 911 call to any PSAP in the USA based on the location of the caller. E911 Anywhere is ideal for those enterprises that use CLEC trunking and find it difficult to establish a PS/ALI account with the Incumbent E911 Service Provider serving their region, or have remote offices connected to a centralized call server, as well as those with remote teleworkers / soft phone users. E911 Manager connects to the E911 Anywhere™ service using TCP/IP with SSH establishing an authenticated session using a digital certificate.

## Solutions for Distributed Enterprises

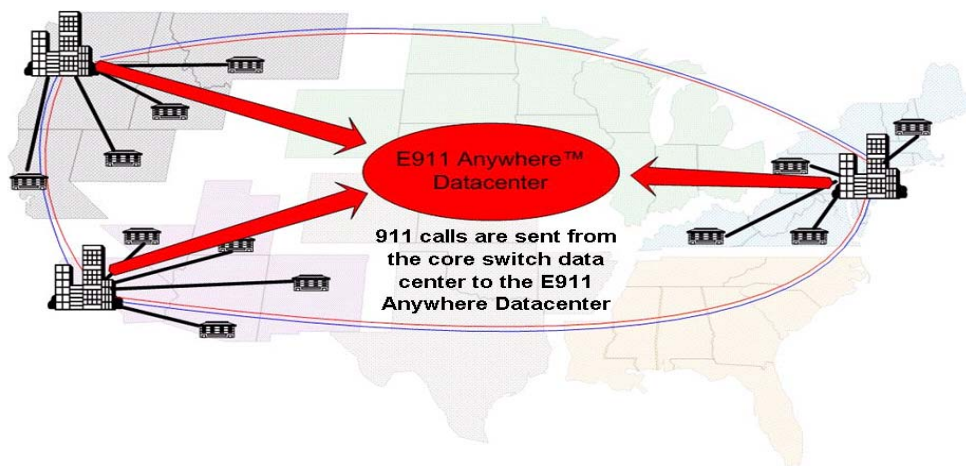
- Remote site phones register with the call server cluster in the datacenter
- Remote sites are connected to the datacenter via SIP trunks



**Figure 5. Remote Site Solutions**

With E911 Anywhere, all 911 calls from any call server in the enterprise are sent as Session Initiation Protocol (SIP) calls to the E911 Anywhere service. The E911 Anywhere service then routes the 911 call, along with the caller location, to the correct PSAP anywhere in the USA based upon the location record of the 911 caller.

## Solutions for Distributed Enterprises



**Figure 6. E911 Anywhere DataCenter**



## 911 Call Back

911 call back is defined as the process where a 911 call that was successfully completed to a PSAP drops and the PSAP attempts to call back on the telephone number designated as the call back number. In the case where the phone dialing 911 has a DID and the DID is used, the PSAP simply calls back on the DID to reach the 911 caller.

In the case where the phone dialing 911 does not have a DID and an ELIN was substituted as the outbound number and the call back number, the PSAP, when calling back on the ELIN, will be connected to the 911 caller by the call server which caches the extension of the phone that actually called 911 and routes the incoming call to this phone. This is a programmable function in the call server software for the Cisco call server platform.

5. Facilitate compliance with the Family Educational Rights and Privacy Act (FERPA), Health Insurance Portability and Accountability Act (HIPPA), Gramm-Leach-Bliley Act (GLBA), Payment Card Industry (PCI) specifications, and all other applicable federal, state, and local laws and regulations.

### **Response:**

Our proposed solution is compliant with FERPA, HIPPA, GLBA, PCI and all other current laws and regulations.

6. Stipulate specific network, physical space, power, and heat dissipation requirements to enable Virginia Tech to plan and design the necessary infrastructure upgrades required to support the proposed solution.

### **Response:**

DISYS Solutions has read and understands the requirement and has provided a tubular list of Network Equipment including rack space, power and heat dissipation of each of the device. This is provided as Attachment 1. Quantity of each device in each building/Data Center location is also indicated. This information is provided for all four solutions proposed in our response. Virginia Tech may like to choose the best option that meets their operational and financial requirements.

B. Proposed Solutions should:

1. Provide for four-hour, on-site support for critical system failures.

### **Response:**

DISYS Solutions will provide onsite one dedicated Sr. Voice Engineer to Virginia Tech for one year. This engineer will be in addition to the installation and support teams. This individual will provide support in addition to the Cisco SMARTnet offering as stated below.

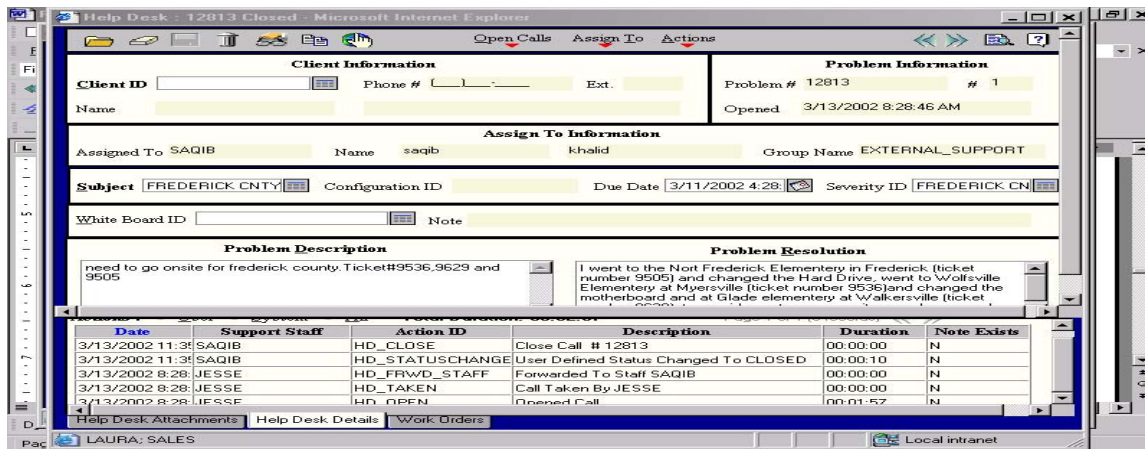
DISYS Solutions provides on-site support services for critical system failures within four hours. This support is provided through Cisco's SMARTnet offering provided in the Bill of Materials (BOM). Although Cisco will be providing the 4 hour onsite response, DISYS Solutions keeps a very close eye to make sure that Service Level Agreements (SLAs) are met by Cisco.

## Service Ticketing System

When a call comes into DISYS Solutions, first and foremost a service ticket is opened in our e-ticketing system. At that time the priority level is assigned in accordance with the customer's maintenance agreement and/or problem severity. All calls are forwarded to our technicians or

manufacturer call center within a maximum of one hour; however most calls are responded to in less than fifteen minutes. A standard escalation procedure is set for manufacturers such as Cisco which include information for both DISYS Solutions and Manufacturer Technical and Account Team contacts.

As shown below the ticket is assigned and progress recorded at every step.



The screenshot displays a web-based service ticket system interface. The top navigation bar includes 'Open Calls', 'Assign To', and 'Actions'. The main form is divided into several sections: 'Client Information' (with fields for Client ID, Name, Phone #, Ext.), 'Problem Information' (with fields for Problem # 12813, # 1, and Opened 3/13/2002 8:28:46 AM), 'Assign To Information' (with fields for Assigned To SAQIB, Name saqib, khalid, and Group Name EXTERNAL\_SUPPORT), 'Subject' (with fields for FREDERICK CNTY, Configuration ID, Due Date 3/11/2002 4:28, and Severity ID FREDERICK CN), and 'White Board ID'. Below these are sections for 'Problem Description' and 'Problem Resolution'. The 'Problem Description' contains the text: 'need to go onsite for frederick county. Ticket#9536,9529 and 9505'. The 'Problem Resolution' contains the text: 'I went to the Nort Frederick Elementary in Frederick (ticket number 9505) and changed the Hard Drive, went to Wolfsville Elementary at Myersville (ticket number 9536) and changed the motherboard and at Glade elementary at Walkersville (ticket...'. At the bottom, there is a table with columns: Date, Support Staff, Action ID, Description, Duration, and Note Exists. The table contains the following data:

Date	Support Staff	Action ID	Description	Duration	Note Exists
3/13/2002 11:39	SAQIB	HD_CLOSE	Close Call # 12813	00:00:00	N
3/13/2002 11:39	SAQIB	HD_STATUSCHANGE	User Defined Status Changed To CLOSED	00:00:10	N
3/13/2002 8:28	JESSE	HD_FRWD_STAFF	Forwarded To Staff SAQIB	00:00:00	N
3/13/2002 8:28	JESSE	HD_TAKEN	Call Taken By JESSE	00:00:00	N
3/13/2002 8:28	JESSE	HD_OPEN	Opened Call	00:01:57	N

**Figure 7. Sample Service Ticket**

Handling trouble calls and repairs from the receipt of the trouble report until the trouble is cleared requires a proven methodology. When a call comes in to the Service Department, or a Help Desk Ticket is created via the web, a tracking number is issued to the customer. At any later point, the customer may inquire about the status of a call using their tracking number by either calling in to our offices or via the web. The following escalation takes place from the time a ticket is created:

- ✓ A case is opened with problem description entered into a problem resolution database, and assigned to DISYS Solutions Phone Duty technician (Level 3 Expertise, see definitions below).
- ✓ Discuss and set priorities with customer in accordance with DISYS Solutions priority guidelines (Defined below in the priority level section).
- ✓ For in warranty items, DISYS Solutions will co-ordinate with the manufacturer on behalf of the customer to deliver support conforming to the service level agreements.
- ✓ Assign to available Network Engineer, based on type of problem and severity.
- ✓ Problem isolation and diagnosis with DISYS Solutions Network Engineer (Level of Expertise based on type of problem) call back, on-site visit (if necessary).
- ✓ Problem escalation to higher level (Defined below in escalation section).
- ✓ Test and ensure customer satisfaction regarding fix provided.
- ✓ Quality control check performed by customer service representative, to insure highest level of customer satisfaction after a call is completed.

We have four levels of response times as listed below. Once a service requests is entered into the Sage CRM, a priority level is assigned, depending on issue.

*Priority Response Times for Standard Hardware and Software Services*

Priority 1	P1 trouble calls are defined as a system outage that affects many employees and prohibits production. These calls must be acknowledged within 15 minutes and resolved within 2 - 4 hours.
Priority 2	P2 trouble calls are defined as a small-scale system outage affecting some employees and not the entire department or the enterprise. These calls must be acknowledged within 30 minutes and resolved within 8 hours. Department heads receive a one level escalation for trouble calls.
Priority 3	P3 trouble calls are defined as a system outage affecting one employee. These calls must be acknowledged within 2 working hours and resolved within 2 working days.
Priority 4	P4 trouble calls are defined as scheduled work that needs to be preformed. These calls must be acknowledged within 8 working hours and resolved within 2 weeks. An example of a priority 4 call is when DISYS Solutions replaces a broken printer with a loaner printer and we give the user back the fixed printer when the repair is complete.

**Table 1. DISYS Solutions Priority Response Times**

*Escalation Example for Priority 1*

Duration Since Call	Personnel Involved in Escalation Notification
<b>0 – 15 minutes</b>	DISYS Solutions Phone Duty Technician (Level 1 or 2 Expertise) and Manufacturer Call Center Service Technician
<b>1 hour</b>	DISYS Solutions Lead Technician (Level 3 or 4 Expertise) and Manufacturer Service Manager
<b>2 hours</b>	DISYS Solutions IT Manager and Manufacturer Operations Manager
<b>4 - 6 hours</b>	DISYS Solutions Director of Operations and Manufacturer Vice President of Technical Support
<b>8 hours</b>	DISYS Solutions COO
<b>24 hours</b>	Virginia Tech Contracting Officer, DISYS Solutions CEO, and Manufacturer President of Technical Support, and Manufacturer Local Channel Account Manager

**Table 2. Sample Priority Escalation**

*Escalation List:*

Trouble escalation procedures names, titles, and contact information are provided below.

Elapsed Time	Name	Title	Contact
			Phone: (888-286-3896)
1 hour	Varun Gulati	Senior Voice Engineer	Varun.gulati@disyssolutions.com
2 hours	Lenu Philip	DISYS Solutions IT Manager	Lenu.philip@disyssolutions.com
4 hours	Vijay Soni	DISYS Solutions Director of Operations	Vijay.Soni@disyssolutions.com
8 hours	Vinu Luthra	DISYS Solutions COO	Vinu.Luthra@disyssolutions.com
24 hours	Atul Bhatia	DISYS Solutions CEO	Atul.Bhatia@disyssolutions.com

**Table 3. DISYS Solutions Escalation List**

2. Provide for 24 hours a day/7 days a week/365 days a year remote support and allow for continuing the established self-maintenance model supplemented by a contractual maintenance support agreement.

**Response:**

DISYS Solutions will provide onsite one dedicated Sr. Voice Engineer to Virginia Tech for one year. This engineer will be in addition to the installation and support teams. This individual will provide support in addition to the Cisco SMARTnet offering as stated below.

Cisco SMARTnet offerings provide 24x7x365 remote support. This support is included in our BOM. The account team is well knowledgeable in SMARTnet replacement options and will assist in selecting the different types of hardware replacement options. Post award we will assist Virginia Tech in accessing Cisco's TAC center. Although Cisco will be providing the 24x7x365 remote support, DISYS Solutions keeps a very close eye to make sure that Service Level Agreements (SLAs) are met by Cisco.

3. Fully support capabilities of a modern, unified communications system; anticipate to the greatest extent possible future capabilities; and be flexible enough to allow for adaptation to changes in the technology environment.

**Response:**

DISYS Solutions understands the requirement of Virginia Tech and is proposing best in class Unified Communications Solution which unifies voice, video, data, and mobile applications on fixed and mobile networks, delivering an easy-to-use, media-rich collaboration experience across your workspaces. These applications use the network as a platform to enable users to collaborate every time, everywhere, while helping to reduce costs. Cisco periodically upgrades and updates and incorporates new and advanced features into its product line and Cisco Unified Communications solution can be upgraded to those new features without any downtime.

In Cisco Unified Communications, you can install upgrade software on your server while the system continues to operate. Two partitions exist on your system: an active, bootable partition and an inactive, bootable partition. The system boots up and operates entirely on the partition that is marked as the active partition.

When you install upgrade software, you install the software on the inactive partition. The system continues to function normally while you are installing the software. When you are ready, you activate the inactive partition and reboot the system with the new upgrade software. The current active partition will then get identified as the inactive partition when the system restarts. The current software remains in the inactive partition until the next upgrade. Your configuration information migrates automatically to the upgraded version in the active partition.

If for any reason you decide to back out of the upgrade, you can restart the system to the inactive partition that contains the older version of the software. However, any configuration changes that you made since upgrading the software will be lost.

4. Have levels of performance, reliability, and maintainability consistent with systems used for commercial communications service delivery.

**Response:**

DISYS Solutions understands the requirement and is proposing a High Performance and Redundant Solution based on Cisco Unified Communications Systems version 8.0 on latest high end UCS C series servers.



The solution involves 3 UCS C servers each of the two Data Center locations on the main Campus providing redundancy against the failure of one of the servers or the complete Data Center. Provided below is the logical diagram of the intended Solution.

Cisco Unified Call Manager or the CCM as mentioned in the figure is the central Call Processing unit and we are proposing a 7 VM server based solution with a Publisher for dedicated administrative operations and 6 subscribers with 1:1 redundancy options.

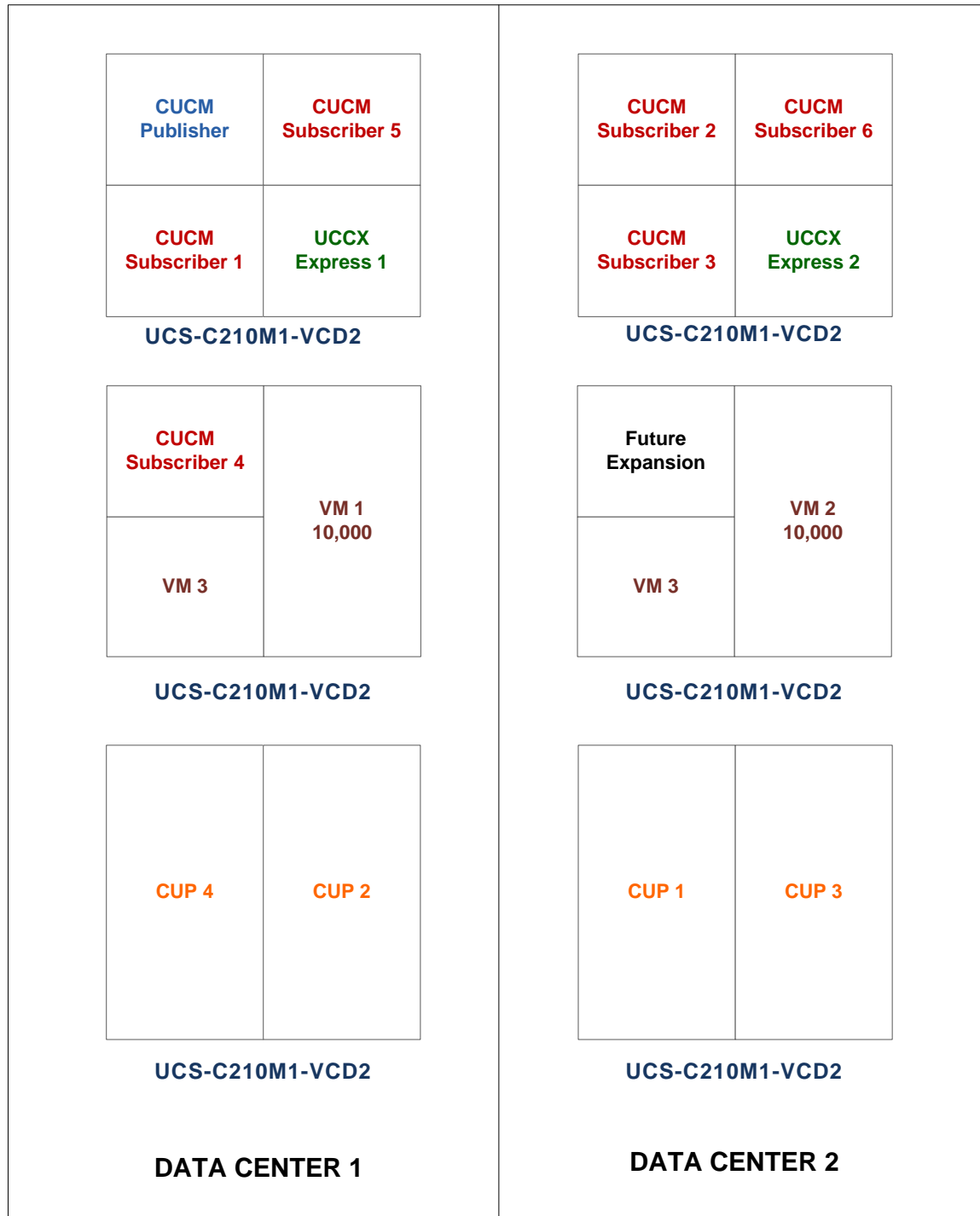
Cisco Unified Connection, also referred to as Unity Connection is the Voice Mail (VM) Server for providing Unified Voicemail Support. We are proposing one VM server in each of the two datacenters and will operate in Active/ Active Configuration mode.

Cisco Unified Presence Server also referred to as Unified Presence in the figure below is open and extensible platform facilitates the highly secure exchange of availability and Instant Messaging (IM) information between Cisco Unified Communications and other applications. We are proposing one server in each of the two datacenters location.

Cisco Unified Contact Center Express (IPCC Express) is the Contact Center Server for Midmarket Enterprise level solution for sophisticated customer interaction management. We are proposing one server in each of the two datacenters; one being active and second being failover.

More technical details about each of these products are mentioned in the Technical Capabilities Section.

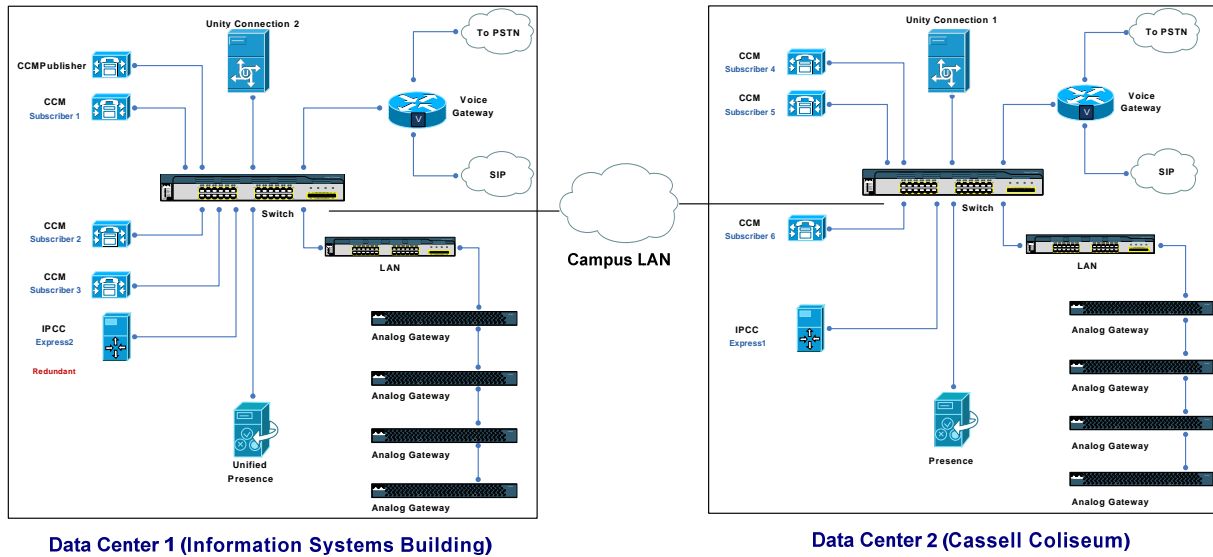
## Physical Server with Hosted VMs



## OVF Templates for various VM Machines

	vCPU	RAM	vNIC	vDISK	Limit
Cisco Unified Communications Manager	2	6 GB	1	vDisk 1 = 80 GB vDisk 2 = 80 GB	7500 Users
Cisco Unified Connection - 10000 Users (Active/Active Cluster Configuration)	4	4 GB	1	vDisk 1 = 146 GB vDisk 2 = 146 GB	10,000 Users 300 ports G.711 or G.729a 70 ports iLBC or G.722
Cisco Unity Connection 5000 User (Active/Active Cluster Configuration)	2	4 GB	1	vDisk 1 = 200 GB	5000 Users 200 ports G.711 or G.729a 50 ports iLBC or G.722
Cisco Unified Presence Server - 5000 User	4	4 GB	1	vDisk 1 = 80 GB vDisk 2 = 80 GB	5000 Users
Cisco Unified Contact Center Express/IPIVR	2	4 GB	1	vDisk 1 = 146 GB vDisk 2 = 146 GB	300 Agents

- The Call Manager Servers are in 1:1 redundancy and can support a total of 21,000 end points even in event of failures
- Unity Connection servers are being proposed as 2 locations both in active/ active configuration supporting a max of 15000 Users in event of any failure.
- Unified Presence servers are proposed as 2 Clusters with Balanced – Non Redundant High Availability Deployment, each Cluster can have 2 Servers. If one node fails, the other node *may* handle the full load of the additional 50% of users in the subcluster, but may not be able to sustain this full load at peak traffic



**Figure 8. Proposed Solution diagram**

5. Allow full fault, configuration, accounting, performance and accounting management by Virginia Tech's operations personnel.

**Response:**

The proposed solution has multiple set of tools that help identify, troubleshoot faults a few examples being:

- 1) Real Time monitoring tool
- 2) Dial number analyzer

Configurations are primarily done through Interactive Web based interface and also with the help of scripts and bulk edits, add, delete and imports.

The system has inbuilt CDR Analysis and Reporting interface for Account Management.

System uses Secure HTTP (SSL) for management, and the underlying hardened operating system requires SSH with limited CLI functionality. The Unified Communications environment provides role-based authorization to limit configuration access.

More detail about each of these and capabilities of the Unified Communications solutions can be found in Technical Capabilities Section.

6. Be designed to allow for fifty percent growth of the initial capacity requirements without replacing the initial hardware or software investment.

**Response:**

The solution has been developed considering 50% growth without replacing the initial hardware or software investment.

7. Be able to provide 99.999 percent availability and be designed such that a failure of any single hardware or software component will not prohibit immediate access to telephony, messaging, collaboration, or call center applications for more than one percent of the clients configured in the system.

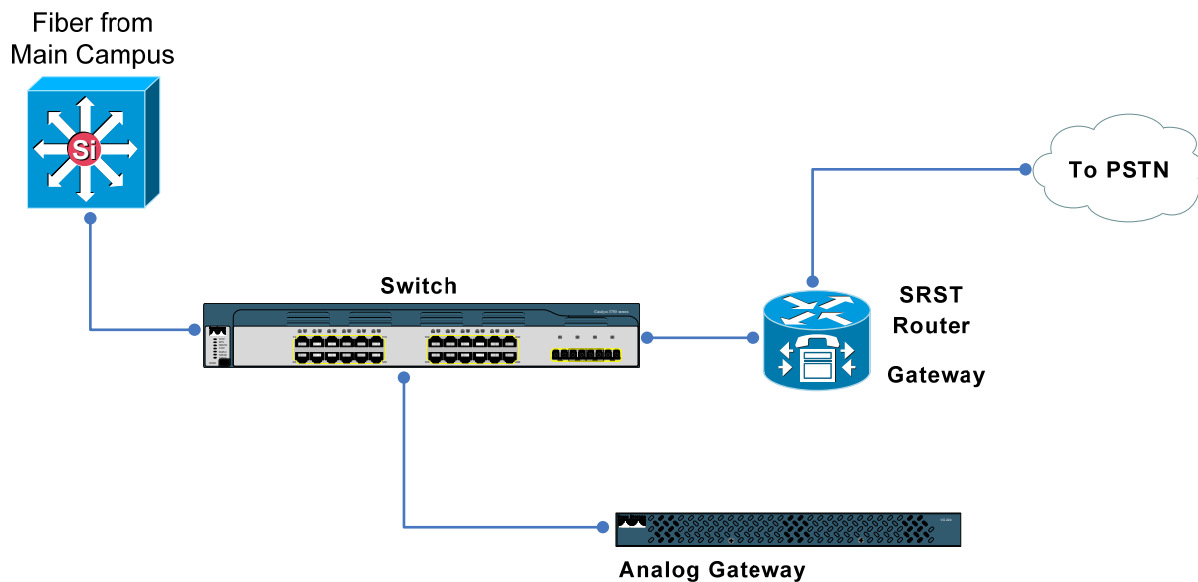
**Response:**

DISYS Solutions understands the requirement and has designed the solution for providing redundant solution for the main campus with a brief explanation provided in paragraph 4 (above) and a detailed explanation in the Technical Capabilities section. For the remote /Satellite offices, we have proposed Survivable Remote Site Telephony wherein Local Gateway becomes in charge of the Call Handling activity when it losses connection to the main Campus. When configured in CME mode, the Local gateways can provide advanced features like Conferencing and Hunt Groups.

Detailed solution about SRST capabilities of the proposed solution can be found in the Technical Capabilities section.

The proposed solution provides 99.999% availability.

Logical diagram of a remote Satellite office:



**Figure 9. Logical diagram of Remote Satellite office**

8. Include a robust and well-documented application-programming interface (API) to facilitate access to the system's call processing, media control, and administrative features.

**Response:**

The proposed solution supports several APIs for application developers to extend the feature set of Cisco Communications Manager, Cisco IPCC Express, and other applications. More details pertaining to this is provided in the Technical Capabilities section. Cisco provides full support to the developer community thru Cisco Developer Network and can be accessed online at “[developer.cisco.com](http://developer.cisco.com)”.

9. Provide Virginia Tech and third party developers with interfaces and support resources to facilitate the development of communication-enabled business processes, productivity applications, and system management applications.

**Response:**

As discussed above the solution has certain API’s and interfaces available to the developers to develop applications based on the Unified Communication’s Solution.

More details are discussed in the Technical Capabilities section.

10. Be designed with a robust and well-documented set of fault, configuration, accounting, performance, and security management capabilities.

**Response:**

The proposed solution has many multiple set of tools that help identify, troubleshoot faults. A few examples being:

1. Real Time monitoring tool
2. Dial number analyzer

Configurations are primarily done thru Interactive Web based interface and also with the help scripts and bulk edits, add, delete and imports

The system has inbuilt CDR Analysis and Reporting interface for Account Management.

System uses Secure HTTP (SSL) for management, and the underlying hardened operating system requires SSH with limited CLI functionality. The Unified Communications environment provides role-based authorization to limit configuration access.

More detail about each of these and capabilities of the Unified Communications Solutions can be found in Technical Capabilities Section.

11. Include management tools to facilitate the installation, operation, maintenance, and optimization activities of Virginia Tech’s system administrators.

**Response:**

As mentioned above, majority of Administration, operation and maintenance on all the Cisco Unified Communications products is done primarily through a Web Based GUI. System does however provide a variety of options for Bulk Edit, Add or Delete from the GUI itself. Optimization can be achieved thru BAT (Bulk Administration Tool) for provisioning end points and Users using File Import and Exports.

Apart from this Cisco does have Cisco Unified Operations Manager, which provides a set of tools for Monitoring and provisioning, this product is not being proposed as a part of the proposal.

12. Be designed to ensure the integrity, confidentiality, privacy, continuity, and quality of all voice, messaging, and collaboration sessions.

**Response:**

The proposed solution caters to all the requirement:

Integrity, confidentiality and Privacy is achieved at various levels through measures such as:

- Use of secure protocols such as sRTP for media traffic, SCCP and Secure SIP for signaling.
- Multilevel Authorization and Authentication. Authentication can be done using LDAP.
- Access to system can only be achieved using SSL for command line and https for GUI.
- All communication to the external systems are secure.

For Continuity, high availability is proposed in the solution for all the key systems such and Call Manager and Voice Mail systems. Gateways at remote site are designed to provide fallback support in case of link failure.

QoS and bandwidth has been taken into account while designing the proposed solution. All the Gateways and system support standards based DSCP marking and mark the packets with appropriate value. We have gone through the existing infrastructure at Virginia Tech and made sure if it is in complaint with the similar QoS characteristics.

13. Provide an extensive set of security capabilities protecting system components from malicious, network-based activities.

**Response:**

The access to the system is protected through a multilevel authorization. An authenticated user with appropriate privileges can only make changes to the system. The system is based on RedHat Linux platform with minimal access to the OS. Access to the system is via a Web Interface which can be accessed using https. More details pertaining to security can be found in Technical Capabilities section and in document “Virginia Tech Security Questions for Technical Procurements”.

14. Be capable of providing access to a robust and well-documented set of telephony, messaging, desktop video, mobility, collaboration, presence, and call center application features.

**Response:**

The proposed system meets all of the above mentioned requirements. The detailed capability of each of these systems is described in detail in the Technical Capabilities section. Additionally, administration guides and data sheets are included for your review.

15. Be designed to allow for partitioning the telephony application into groups representative of individual university departments.



**Response:**

Cisco's Call Manager provides a few different options of partitioning the end points.

Device Pool for example defines sets of common characteristics for devices. End points can be clubbed under a device pool based on those Characteristics.

Also partitioning can be achieved through Class of Service, which is implemented using Calling Search Spaces and Partitions. A partition comprises a logical grouping of Directory Numbers (DNs) and route patterns with similar reachability characteristics. A calling search space comprises an ordered list of partitions that users can look at before users are allowed to place a call. When a calling search space is assigned to a device, the list of partitions in the calling search space comprises only the partitions that the device is allowed to reach. All other DN's that are in partitions that are not in the device calling search space receive a busy signal.

Partitions and calling search spaces address three specific problems:

- Routing by geographical location
- Routing by tenant
- Routing by class of user.

More Details pertaining to this can be found in Technical Capabilities Section.

16. Support at least three business-class IP telephone instruments including an economy, advanced, and executive model.

**Response:**

DISYS Solutions understands the customer's requirement and is proposing 3 different models of telephones:

- 1) 6921 as economy phones: It's a two-line IP endpoint supporting light-to-moderate voice communications, delivered in an intuitive, clutter-free, ergonomic design.
- 2) 7965 as Advanced: It's a 6 button phone with high-fidelity wideband audio, new backlit color displays, and improved navigation options.
- 3) 9971 as executive: It's a 12 button high-performance business video and wireless communications phone.

The detail about each of these phones is described in the Technical Capabilities section.

17. Support business-class, TDM telephone instruments.

**Response:**

TDM telephone instruments will continue to be supported with Virginia Tech's current PBX Exchange and the new Cisco solution during the migration. However, this support will stop when Virginia Tech stops using the existing (current) PBX Exchange.

18. Support wireless LAN telephone instruments.

**Response:**

CUCM based system supports wireless based phones from Cisco or any 3rd party service provider using SIP. For example Cisco's 7921 and WIP 310 wireless phone are supported by CUCM.

19. Support soft client applications for Windows and Macintosh operating systems.

**Response:**

Cisco Unified Personal Communicator software supports both Windows and Mac Operating Systems. It provides soft phone presence, instant messaging (IM), voicemail, video, and multiparty conferencing to effectively communicate and collaborate from anywhere.

20. Support web client applications for Internet Explorer, Gecko and/or WebKit browsers.

**Response:**

Cisco Unified Communication's GUI is supported on the following browsers for Users and Administrators:

Rel 8.5

- Internet Explorer
  - o IE 8 on WinXP SP3, Win Vista SP2, Win 7
- Firefox
  - o 3.x on WinXP SP3, Win Vista SP2, Win 7
  - o 3.x on Mac OS X
- Safari
  - o 4.x on Mac OS X

Rel 8.0(x)

- Internet Explorer
  - o IE 8 on WinXP SP3, Win Vista SP2, Win 7
  - o IE 7 on WinXP SP3
- Firefox
  - o 3.x on WinXP SP3, Win Vista SP2
  - o 3.x on Mac OS X
- Safari
  - o 4.x on Mac OS X

Rel 7.1(x)

- Internet Explorer
  - o IE 6 & 7 on WinXP SP3, Win Vista SP2
- Firefox
  - o 1.5 on all supported platforms (WinXP SP3, Linux)

21. Support analog devices (e.g., fax machines, modems, elevator phones.)

**Response:**

The proposed solution supports analog devices like fax machines, modems, elevator phones and traditional phones using Analog Gateways.

DISYS Solutions understands Virginia Tech's requirement and provides two different options pertaining to Analog Gateways.

Here is the feature Comparison of the two options:

Feature	Cisco 112-FXS Bundle	Cisco VG 224
Port Density	112	24
AC Input Voltage	100 to 240 VAC autoranging	100 to 240 VAC
AC Input Current (max)	7.1 to 3.0Amp	1 Amp
Power Dissipation	540W	60W
Space Consumed	3 RU	1RU

**Table 4. Support Analog solutions**

22. Support TDD devices.

**Response:**

Most of the TDD devices are supported as Analog Devices in CUCM environment and the proposed solution includes support for Analog Devices.

23. Be designed with devices or interfaces to enable connectivity to the PSTN.

**Response:**

The proposed solution meets the requirement of Virginia Tech. We are proposing 2 different solutions; the first solution use PRI's and the second solution utilizes SIP Trunks. Both solutions provide connectivity to PSTN.

24. Be capable of supporting lawful interception of signaling, accounting, and media as specified by the Communications Assistance for Law Enforcement Act (CALEA).

**Response:**

Cisco's architecture supports CALEA.

25. Be capable of supporting a phased migration of subscribers from the existing legacy system to the unified communications system.

**Response:**

DISYS Solutions understands the existing telephony infrastructure and will ensure that there is minimal service interruption and will ensure the best user experience while migrating to the new system. The new solution will interact with the old system until the migration is complete. The CUCM based solution is capable of interacting with the old telephony system using PRI's or Q-SIG interface which can be used for passing of Calling Name, Calling Number, and Supervised Call Transfers to voicemail.

26. Be capable of supporting bi-directional communication with the Micros Opera property management system used at the Inn at Virginia Tech.

**Response:**

Our solution supports bi-directional communication with the Micros Opera property management system. Our proposals include this integration. Details of the integration are included in the cd.

27. Be capable of integrating with Virginia Tech's Microsoft Active Directory and Open LDAP enterprise directories.

**Response:**

The solution is capable of integrating with both Open LDAP and Microsoft Active Directory. Additional material pertaining to Integration is attached in **Attachment 2**.

28. Be capable of integrating with Virginia Tech's Microsoft Exchange enterprise messaging system.

**Response:**

The solution is capable of integrating with Microsoft Exchange using Integrated Messaging via IMAP or Secure IMAP. Users can read, reply, and forward messages. You can further leverage the capability of the system using ViewMail for Outlook wherein you can record messages.

Outlook 2007 and above, provides users the ability to review upcoming meetings by phone and import contacts to be used with personal call transfer rules and voice dialing. Please refer to Technical Capability section for more details.

29. Be capable of integrating with standard Internet Message Access Protocol (IMAP) messaging systems.

**Response:**

Yes, the system is capable of integrating with any standard IMAP based messaging system to access voice mail.

30. Balance the need to provide employees with a robust set of features and capabilities while maintaining established service-availability expectations and recognizing the network, power, cable plant, and environmental infrastructure constraints described in the Current Technology Environment, Section IV.

**Response:**

Our proposed solution is a feature rich, scalable and robust solution. We have designed the solution taking into consideration all the parameters pertaining to high availability and service continuity. Cisco's Unified Communications Infrastructure utilizes the existing Network Infrastructure for communication. Each Cisco phone consists of an inbuilt switch, eliminating the need for an additional network port for computer, saving on wiring, and also ports on the switch. This therefore minimizes alterations to the existing cable infrastructure.

The power for operation to the devices is provided using switch 802.3af standards.

The proposed solution hosts most of its servers as virtual machines providing significant cost savings from both the deployment of multiple physical machines and the power consumed by equal number of devices. This feature minimizes effect on the existing power infrastructure.

DISYS Solutions is also proposing multiple options to Virginia Tech for analog gateways and presenting them with significant cost savings. Virginia Tech has an option for selecting a high density analog gateway C112-FXS which cost more and consumes less space or go for low power consuming VG224s which are cheaper in cost but provides 24 Analog Connections per Gateway requiring more space. Virginia Tech can select one of these two options that meet environmental infrastructure constraints.

The system features have been explained in response 4 and 7 above.

*Rack Units, Power and Heat Dissipation Chart*

This information is provided in **Attachment 1**.

31. Make use of available standard protocols and interfaces when possible.

**Response:**

DISYS Solutions understands the concern and has devised a solution with standard protocols. System as such is capable of supporting any open standard based device such as SIP Phones and open to integration to several Telephony systems or solution.

32. Allow for a single point of contact for billing-related account inquiries.

**Response:**

Yes, our system allows for a single point of contact for billing related inquiries.

33. Include a comprehensive training program to allow Virginia Tech's application administrators and support engineers to assume responsibility for system maintenance.

**Response:**

*Trainings*

DISYS Solutions prepares training curriculum that meets the needs for each customer.

Here are a few of the sample training provided by DISYS Solutions.

*End User Training*

Course Objectives

- Learn how to use basic features on Cisco IP phones to place calls, answer calls, transfer and forward calls
- Learn how to use more advanced features which will make you more productive such as quickly setting up ad-hoc conference calls or forwarding your calls to mobile or home phones.
- Learn how to access voice mail from your Cisco IP phone.
- Learn how to use information services now available to you such as missed calls or accessing the corporate directory.
- Learn how to tailor your phone to your needs such as changing ring sound, adjusting the LCD display, adjusting handset and speaker volume.
- Learn how to maximize the use of your IP telephony solution by using your web browser to forward you calls when outside the offices as well as setting up speed dial numbers easily.

Course Outline

1. Basic User Features

- \* Connecting Your Cisco IP Phone to the Corporate Network
- \* Adjusting the Footstand
- \* Placing a Call
- \* Answering a Call
- \* Ending a Call
- \* Stabilizing the Handset

- \* Transferring a Call
  - \* Putting a Call on Hold
  - \* Redialing a Number
  - \* Using Call Park
2. Advanced User Features
- \* Forwarding All Calls
  - \* Placing a Conference Call
  - \* Initiating a Meet-Me Conference
  - \* Joining a Meet-Me Conference
  - \* Using Call Pickup
  - \* Using Group Call Pickup
3. Information Features
- \* Accessing Online Help
  - \* Using Call History
  - \* Changing the LCD Contrast
  - \* Setting Up Voice Mail
  - \* Accessing Voice Mail
  - \* Using a Corporate Directory
  - \* Viewing Information Services
4. Audio Features
- \* Changing the Ringer Sound
  - \* Adjusting the Ringer Volume
  - \* Adjusting the Handset, Speaker, and Headset Volume
  - \* Muting a Call
5. Web Browser Features
- \* Forwarding All Calls from the Web
  - \* Configuring Speed Dial Buttons
  - \* Subscribing to Information Services
  - \* Changing Your Subscriptions
6. Using Cisco Personal Communicator
- \* Preparing To Use Cisco Unified Personal Communicator
  - \* Availability Status and Privacy in Cisco Unified Personal Communicator

- \* Having Conversations Using Cisco Unified Personal Communicator
- \* Using Video With Cisco Unified Personal Communicator
- \* Using Web Conferencing With Cisco Unified Personal Communicator
- \* Sending Messages With Cisco Unified Personal Communicator
- \* Managing Contacts in Cisco Unified Personal Communicator
- \* Working With Recent Communications With Cisco Unified Personal Communicator

## **Administrator Training**

### **1. Introduction to Cisco Unified Communications Manager (CUCM)**

- \* Telephony and IP Phones
- \* CUCM Architecture
- \* Endpoints in CUCM
- \* Connecting End-User Devices
- \* CUCM Administration

### **2. Configuring Users and Phones**

- \* Managing User Accounts in CUCM
- \* Implementing IP Phones
- \* Remote Monitoring and Troubleshooting

### **3. CUCM Dial Plan and Calling Privileges**

- \* Route Patterns
- \* Calling Privileges and Restrictions

### **4. Configuring CUCM Applications and Features**

- \* Music on Hold, Annunciator, and Conferencing
- \* Video Advantage
- \* User Features and Web Pages
- \* Call Detail Records and Billing
- \* Configuring Voice Mail

### **5. Unity and Unity Connection**

- \* Integration
- \* General Setup
- \* Administration
- \* Subscriber Setup

- o Configuring Global Subscriber Settings
- o Configuring Subscriber Accounts and Settings
- \* Building a Voice Mail Menu and Audiotext Application
  - o Call and Interview Handlers

## **Attendant Console Training**

### *Introduction*

- Logging In
- Go Unavailable (F10)
- Interface
- Menu Bar
- Tool Bar
- Queues (F9) (for Cisco Unified Business Attendant Console Only)
- All Queues (F8)
- Active Calls (F7)
- Directories
- Internal Directory (F3)
- External Directory (F4)
- Call Progress (F5)
- Call Parking Devices Field
- Speed Dial Field (F6)
- Adding an entry to the Speed Dial Field
- Deleting an entry from the Speed Dial Field
- Updating an entry in the Speed Dial field
- Working in the Fields
- Dialing a Number
- Finding Contacts in the Directories
- Customizing AC
- General
- Dialing
- Call Transfers



- Call Park
- Mute
- Tones
- Display
- Internal Directory
- External Directory
- Field Headers
- Secondary Sort
- Filter Search
- Primary Server (Information only)
- Presence
- Logging
- Using Attendant Console
- Answering Calls
- Answer Next
- Cherry Picking
- Alternative Numbers and Presence Status
- Transfer Calls
- Initiating A Blind Transfer
- Blind Transferring to a Known Number
- Blind Transferring to a Directory Contact
- Initiating a Consult Transfer
- Consult Transferring to a Known Number
- Consult Transferring to a Directory Contact
- Making Calls 10 Make an Internal Call
- Making External Calls
- Placing Calls on Hold
- Retrieving Held Calls
- Muting Calls
- Call Parking
- Retrieving Parked Calls

- Conference Calls
- Re-establish Calls
- Toggle Calls
- Reverted Call Control
- Call Controls for Reverted Calls
- FAC and CMC Settings
- Forced Authorization Code (FAC)
- Client Matter Code (CMC)
- Clearing Calls
- Using Emergency Mode
- Sending Email
- Call Status
- Contact Properties
- Adding Absent Message and Contact Information 3
- Cisco Unified Presence Status

VIII. PROPOSAL PREPARATION AND SUBMISSION:

A. General Requirements

1. RFP Response: In order to be considered for selection, Offerors must submit a complete response to this RFP. One original, five copies and one electronic copy, on either a flash drive or CD/DVD, of each proposal must be submitted to:

Virginia Tech

Purchasing Department (0333) 270 Southgate Center

Blacksburg, VA 24061

Reference the Opening Date and Hour, and RFP Number in the lower left hand corner of the return envelope or package.

No other distribution of the proposals shall be made by the Offeror.

**Response:**

We have submitted the response per the Proposal instructions. We have provided a signed original document and 5 copies and 1 CD.

2. Proposal Preparation:

a. Proposals shall be signed by an authorized representative of the Offeror. All information requested should be submitted. Failure to submit all information requested may result in Virginia Tech requiring prompt submission of missing information and/or giving a lowered evaluation of the proposal. Proposals which are substantially incomplete or lack key information may be rejected by Virginia Tech at

its discretion. Mandatory requirements are those required by law or regulation or are such that they cannot be waived and are not subject to negotiation.

**Response:**

Mr. Vinu Luthra is authorized to sign on behalf of DISYS Solutions, Inc.

b. Proposals should be prepared simply and economically providing a straightforward, concise description of capabilities to satisfy the requirements of the RFP. Emphasis should be on completeness and clarity of content.

**Response:**

We have provided a clear proposed solution to Virginia Tech.

c. PROPOSALS SHOULD BE ORGANIZED IN THE ORDER IN WHICH THE REQUIREMENTS ARE PRESENTED IN THE RFP. All pages of the proposal should be numbered. Each paragraph in the proposal should reference the paragraph number of the corresponding section of the RFP. It is also helpful to cite the paragraph number, subletter, and repeat the text of the requirement as it appears in the RFP. If a response covers more than one page, the paragraph number and subletter should be repeated at the top of the next page. The proposal should contain a table of contents which cross references the RFP requirements. Information which the offeror desires to present that does not fall within any of the requirements of the RFP should be inserted at an appropriate place or be attached at the end of the proposal and designated as additional material. PROPOSALS THAT ARE NOT ORGANIZED IN THIS MANNER RISK ELIMINATION FROM CONSIDERATION IF THE EVALUATORS ARE UNABLE TO FIND WHERE THE RFP REQUIREMENTS ARE SPECIFICALLY ADDRESSED.

**Response:**

We have read, understand, and have provided a response to each requirement of the RFP.

d. Each copy of the proposal should be bound in a single volume where practical. All documentation submitted with the proposal should be bound in that single volume.

**Response:**

The response is submitted in a single bound volume.

e. Ownership of all data, material and documentation originated and prepared for Virginia Tech pursuant to the RFP shall belong exclusively to Virginia Tech and be subject to public inspection in accordance with the Virginia Freedom of Information Act. Trade secrets or proprietary information submitted by an Offeror shall not be subject to public disclosure under the Virginia Freedom of Information Act. However, to prevent disclosure the Offeror must invoke the protections of Section 2.2-4342F of the Code of Virginia, in writing, either before or at the time the data or other materials is submitted. The written request must specifically identify the data or other materials to be protected and state the reasons why protection is necessary. The proprietary or trade secret material submitted must be identified by some distinct method such as highlighting or underlining and must indicate only the specific words, figures, or paragraphs that constitute trade secret or proprietary information. The classification of an entire proposal document, line item prices and/or total proposal prices as proprietary or trade secrets is not acceptable and may result in rejection of the proposal.

**Response:**

We have read, understand, and will comply.

3. Oral Presentation: Offerors who submit a proposal in response to this RFP may be required to give an oral presentation of their proposal to Virginia Tech. This will provide an opportunity for the Offeror to clarify or elaborate on the proposal but will in no way change the original proposal. Virginia Tech will schedule the time and location of these presentations. Oral presentations are an option of Virginia Tech and may not be conducted. Therefore, proposals should be complete.

**Response:**

We have read, understand, and will comply.

**B. Specific Requirements**

Proposals should be as thorough and detailed as possible so that Virginia Tech may properly evaluate your capabilities to provide the required services. Provide a comprehensive explanation of how the proposed solution meets the specified requirements. Utilize reference diagrams, white papers, and product documentation to supplement the information provided in the response as necessary. Explicitly identify components of the proposed solution that adhere to established industry standards and protocols. Explicitly identify components of the proposed solution that utilize proprietary technology instead of established industry standards or protocols.

Offerors may submit more than one proposal.

Offerors are required to submit the following information/items as a complete proposal utilizing the following guidelines:

**1. Technical Capabilities:**

a. Describe the following characteristics of the proposed solution:

i. Scalability

**Response:**

In the proposed solution, the dial tone is provided by the handset. When a phone goes off hook, a Cisco Communications Manager server instructs the phone to play the dial tone. Since this is a relatively low overhead function, the system has been sized to provide a dial tone to over 10,000 plus endpoints at any one time. Since Communications Manager is never in the direct path of the voice media and only handles call signaling, the solution can accommodate call signaling for up to 15,000 endpoints, meeting the need for the system to accommodate growth of up to 50 percent.

In the proposed solution, Cisco is proposing four UCS C-Series platforms. Two of the platforms will be dedicated to call processing through Cisco Communications Manager. Each platform can run up to four instances of Cisco Communications Manager and each instance can support up to 7,500 endpoints. The other pair of UCS servers will be dedicated to voicemail, contact center, and presence applications.

ii. Availability

**Response:**

The proposed solution is engineered with multiple levels of redundancy and for geographic 1-to-1 call processing redundancy. This protects against both CPU and data center site failure. In the event that a remote site loses its WAN connectivity, the local gateway router will stand in and provide local dial tone, phone registration, and PSTN connectivity.

In the event of a call processor failure, all calls handled by that call processor will remain in progress since the call processor is not in the direct path of the voice media and is only handled during call setup. If a network failure occurs while the call is in progress on the link that the call is traversing, then the call will fail.

The way the proposed solution is engineered, only two circumstances will cause a call to be disrupted. The first is a complete loss of power to the phone at a specific site. The other is physical hardware failure and a WAN outage in combination.

iii. Geographic diversity

**Response:**

The proposed solution is engineered with multiple levels of redundancy and for geographic 1 to 1 call processing redundancy. This protects against both CPU and data center site failure. In the event that a remote site loses its WAN connectivity, the local gateway router will stand in and provide local dial tone, phone registration, and PSTN connectivity.

Cisco is proposing four UCS C-Series Servers: two will be located at the Cassell Coliseum and other pair will be located at the Information Systems Building. In addition, Cisco is proposing another pair be located at the Northern Virginia location for purposes of disaster recovery.

iv. Extensibility

**Response:**

The Cisco Unified Communications System is a cluster-based solution and can grow by adding additional servers and Cisco Communications Manager subscribers to the solution. Since the solution runs on the network, subscribers can be located anywhere there is network connectivity. This architecture allows the system to grow to 60,000 endpoints per cluster.

The proposed solution has Cisco Communications Manager subscribers running on UCS C-Series hardware. Each UCS platform can support four instances of Cisco Communications Manager running in a VMWare 4.0 ESXi environment.

b. Describe the API and support resources available to facilitate access to the system's call processing, media control, and administrative features.

**Response:**

The proposed Cisco solution supports several APIs for application developers to extend the feature set of Cisco Communications Manager, Cisco IPCC Express, and other applications within the proposed solutions.

Cisco Communications Manager supports the JTAPI or Java Telephony API. Several Cisco products, specifically Cisco Unified Contact Center Express (UCCX) and other third-party applications leverage this API for monitoring and controlling call routing and call state. Cisco Communications Manager also supports a SOAP interface call the AXL API. This API allows developers controlled access to the database layer of Communications Manager. This allows developers to develop applications that control the configuration of phones, users, dial plan, and other data contained within Cisco Communications Manager. Cisco provides an SDK for extending the feature set and for developing applications that run under the IP phones services window.

Cisco UCCX provides an ACMI interface for developers who want to extend or develop to the UCCX CTI interface. This API exposes the development layer of the CAD desktop for purposes of programmatically controlling how the desktop presents itself to users and how it handles calls.

The UCCX also has a Script Editor application for development of call flows. The existing call flow object can be modified or new objects can be developed through the use of Java Beans. A new object can be developed and registered within UCCX for purposes of extending the capabilities of the Editor.

Cisco provides full documentation and support for application developers through the developer Web site located at [www.developer.cisco.com](http://www.developer.cisco.com).

c. Describe the following management characteristics of the proposed solution:

- i. Fault management
- ii. Configuration management
- iii. Accounting management
- iv. Performance management
- v. Security management

**Response:**

Cisco Unified Communications includes a suite of integrated features and applications to support fault, configuration, accounting, performance, and security management.

At a high level, the following features of Cisco Unified Communications support the FCAPS model.

**Fault Management**

- Cisco Unified Serviceability, including Real-Time Monitoring Tool.

**Configuration Management**

- Cisco Unified Communications Manager Administration.

**Accounting Management**

- Call Detail Records and CDR Analysis and Reporting.

**Performance Management**

- Cisco Unified Serviceability, including Real-Time Monitoring Tool, Quality Reporting Tool, and Cisco Unified Analysis Manager.

**Security Management**

- Cisco Unified Communications uses Secure HTTP (SSL) for management, and the underlying hardened operating system requires SSH with limited CLI functionality. The Unified Communications environment provides role-based authorization to limit configuration access.

The following paragraphs are brief descriptions of the management components included with Cisco Unified Communications Manager.

**Cisco Unified Communications Manager Administration**

Cisco Unified Communications Manager Administration is a Web-based tool which provides the following functionality:

- System Configuration
- Call Routing Configuration
- Media Resource Configuration
- Advanced Features Configuration
- Device Configuration
- Application Configuration
- User Management Configuration
- Bulk Administration.

### **Cisco Unified Serviceability**

Cisco Unified Serviceability, an included Web-based troubleshooting tool, provides the following functionality:

- Saves alarms and events for troubleshooting and provides alarm message definitions.
- Saves trace information to various log files for troubleshooting.
- Monitors real-time behavior of components through the Cisco Unified Real-Time Monitoring Tool (RTMT).
- Generates Cisco Unified Communications Manager reports for Quality of Service, traffic, and billing information through Cisco Unified Communications Manager CDR Analysis and Reporting (CAR).
- Provides audit capability by logging any configuration changes to the Cisco Unified Communications Manager system by a user or as a result of the user action. This functionality supports the Information Assurance feature of Cisco Unified Communications Manager.
- Provides feature services that you can activate, deactivate, and view through the Service Activation window.
- Provides an interface for starting and stopping feature and network services.
- Generates and archives daily reports; for example, alert summary or server statistic reports.
- Allows Cisco Unified Communications Manager and Cisco Unity Connection to work as a managed device for SNMP remote management and troubleshooting.
- Monitors the disk usage of the log partition on a server.
- Monitors the number of threads and processes in the system; uses cache to enhance the performance of Cisco Unified Serviceability.

### **Cisco Unified Communications Operating System Administration**

Cisco Unified Communications Operating System Administration, an included Web-based tool, allows you to configure and manage the Cisco Unified Communications Operating System. Administration tasks include the following:

- Check software and hardware status
- Check and update IP addresses

- Ping other network devices
- Manage NTP servers
- Upgrade system software and options
- Manage server security, including IPSec and certificates
- Manage remote support accounts
- Restart the system.

### **Cisco Unified Reporting**

Cisco Unified Reporting is accessed from the Cisco Unified Communications Manager console and generates reports for troubleshooting or inspecting cluster data. This convenient tool provides a snapshot of cluster data without requiring multiple steps to find the data. The tool design facilitates gathering data from existing sources, comparing the data, and reporting irregularities. A report combines data from one or more sources on one or more servers into one output view. For example, you can view a report that shows the hosts file for all servers in the cluster. The application gathers information from the publisher server and each subscriber server. A report provides data for all active cluster nodes that are accessible at the time that the report is generated.

### **Disaster Recovery System**

The Disaster Recovery System (DRS), which can be invoked from Cisco Unified Communications Manager Administration, provides full data backup and restore capabilities for all servers in a Cisco Unified Communications Manager cluster. The Disaster Recovery System allows you to perform regularly scheduled automatic or user-invoked data backups.

The Disaster Recovery System performs a cluster-level backup, which means that it collects backups for all servers in a Cisco Unified Communications Manager cluster to a central location and archives the backup data to physical storage device.

DRS restores its own settings (backup device settings and schedule settings) as part of the platform backup/restore. DRS backs up and restores drfDevice.xml and drfSchedule.xml files. When the server is restored with these files, you do not need to reconfigure DRS backup device and schedule.

### **Call Detail Records**

When CDR collection is enabled, Cisco Unified Communications Manager writes CDRs to flat files on the subsequent servers as calls are completed. You can use this information for post-processing activities such as generating billing records and network analysis.

### **CDR Analysis and Reporting**

CDR Analysis and Reporting (CAR), a Web-based reporting application, generates reports based on the CDRs and Call Management Records (CMRs) that Cisco Unified Communications Manager collects. CAR processes the CDR and CMR flat files that the CDR repository service places in the CDR repository and stores the information in the CAR database. CAR uses the information to generate reports that provide information regarding voice quality, traffic, and billing.

### **Bulk Administration Tool**



The Cisco Unified Communications Manager Bulk Administration Tool (BAT), a Web-based application, performs bulk transactions to the Cisco Unified Communications Manager database. BAT lets you add, update, or delete a large number of similar phones, users, or ports at the same time. When you use Cisco Unified Communications Manager Administration, each database transaction requires an individual manual operation, while BAT automates the process and achieves faster add, update, and delete operations.

### **Dialed Number Analyzer**

Dialed Number Analyzer installs as a feature service along with Cisco Unified Communications Manager. The tool allows you to test a Cisco Unified Communications Manager dial plan configuration prior to deploying it. You can also use the tool to analyze dial plans after the dial plan is deployed.

Because a dial plan can be complex, involving multiple devices, translation patterns, route patterns, route lists, route groups, calling and called party transformations, and device level transformations, a dial plan may contain errors. You can use Dialed Number Analyzer to test a dial plan by providing dialed digits as input. The tool analyzes the dialed digits and shows details of the calls. You can use these results to diagnose the dial plan, identify problems if any, and tune the dial plan before it is deployed.

### **Quality Report Tool**

The Quality Report Tool (QRT), a voice-quality and general problem-reporting tool for Cisco Unified IP Phones, acts as a service that allows users to easily and accurately report audio and other general problems with their IP phone. QRT automatically loads with the Cisco Unified Communications Manager installation. As system administrator, you can enable QRT functionality by creating, configuring, and assigning a softkey template to associate the QRT softkey on a user IP phone. You can then create, customize, and view phone problem reports by using the QRT Viewer application.

### **Real-Time Monitoring Tool**

The Cisco Unified Real-Time Monitoring Tool (RTMT), which runs as a client-side application, uses HTTPS and TCP to monitor system performance, device status, device discovery, CTI applications, and voice messaging ports. RTMT can connect directly to devices via HTTPS to troubleshoot system problems.

RTMT allows you to perform the following tasks:

- Monitor a set of pre-defined management objects that monitor the health of the system
- Generate various alerts, in the form of emails, for objects when values go over/below user-configured thresholds
- Collect and view traces in various default viewers that exist in RTMT
- Translate Q931 messages
- View syslog messages in SysLog Viewer
- Work with performance-monitoring counters.

### **Cisco Unified Analysis Manager**

The Cisco Unified Analysis Manager (Unified Analysis Manager), a tool included with the Cisco Unified Real-Time Monitoring Tool (RTMT), is used to perform troubleshooting operations. When the Unified Analysis Manager is launched, it collects troubleshooting information from your system and provides an analysis of that information. You can use this information to perform your own troubleshooting operation or to send the information to Cisco Technical Assistance for analysis.

The Analysis Manager application is installed as an option when you install the RTMT software. The Analysis Manager interface is accessed from the RTMT main menu and quick launch channel.

Once it is installed, the application can identify the supported UC products and applications that you have in your system and troubleshoot call failures across these UC applications, collecting trace and log files.

The Unified Analysis Manager will support the following products:

- Cisco Unified Communications Manager
- Cisco Unified Contact Center Enterprise
- Cisco Unified Contact Center Express
- Cisco IOS Voice Gateways
- Cisco Unity Connection
- Cisco Unified Presence.

The three primary components of the Unified Analysis Manager interface are the following:

- Administration — The system component lets you import device and group configuration from an external file and provide a status of jobs run by the Unified Analysis Manager.
- Inventory — The inventory component is used to identify all of the devices in your system that can be accessed and analyzed by the Unified Analysis Manager.
- Tools — The tools component contains all of the functions that Unified Analysis Manager supports. This includes configuring traces settings, collecting logs, and viewing configurations.

## **Roles and User Groups**

Cisco Unified Communications Manager Administration uses roles and user groups to provide varying levels of privilege (access). This technique permits granting only the required privileges for a selected group of users and limits the configuration functions that users in a particular user group can perform.

Roles and user groups provide multiple levels of security to Cisco Unified Communications Manager Administration and to other applications. The system groups the resources that are available to Cisco Unified Communications Manager Administration and to other applications into roles. Each application comes with standard, pre-defined roles. Unified Communications manager includes over 20 pre-defined roles and user groups.

Administrators can configure additional roles for an application. A role contains, for a particular application, the list of resources that an application comprises. For each resource that a role

comprises, the administrator defines the access privilege. For the Cisco Unified Communications Manager Administration application, the access privileges include read and update.

d. Describe the security features and capabilities of the proposed solution.

**Response:**

The Cisco System Internet Operating System (IOS) includes many built-in security controls that contribute to an architecture that is able to secure voice and data IP networks.

- **Separate Voice and Data VLANs:** Segmentation of devices and traffic at Layer 2 is an effective method for protecting the voice and data networks. Voice VLANs can be assigned automatically from the switch to the phone, thus allowing for Layer 2 and Layer 3 separations between voice data and all other data on a network. A voice VLAN also allows for a different IP addressing scheme because the separate VLAN can have a separate IP scope at the Dynamic Host Configuration Protocol (DHCP) server.
- **Port Security:** Port security prevents an attacker from flooding the Content-Addressable Memory (CAM) table of a switch and from turning any VLAN into a hub that transmits all received traffic to all ports. It also prevents unapproved extensions of the network by adding hubs or switches into the network.
- **DHCP Snooping:** Dynamic Host Configuration Protocol (DHCP) Snooping prevents unapproved DHCP servers from being on a network. DHCP Snooping prevents any single device from capturing all the IP addresses in any given scope.
- **Dynamic Address Resolution Protocol (ARP) Inspection (DAI):** DAI prevents an attacker from running ARP-based attacks in a network to disrupt or sniff the traffic between people who are adjacent to the attacker at Layer 2.
- **Quality of Service (QoS):** QoS can be used to control not only the priority of the traffic in the network but also the amount of traffic that can travel through any specific interface. Cisco Smartports templates have been created to assist in deploying voice QoS in a network at the access port level. A rigorous QoS policy can control and prevent denial-of-service attacks in the network by throttling traffic rates.
- **Access Control Lists (ACL):** ACLs provide the ability to control the network traffic in and out of a Virtual Local Area Network (VLAN) as well as the ability to control the traffic within the VLAN. Cisco switches have the capability of controlling Layers 2 to 4 within a VLAN ACL. Depending on the types of switches in a network, VLAN ACLs can be used to block traffic into and out of a particular VLAN. They can also be used to block intra-VLAN traffic to control what happens inside the VLAN between devices.  
  
ACLs at Layer 3 are one of the first opportunities to apply control to voice data and other non-voice data in the network. This is the perfect location to apply a Layer 3 ACL to control which areas the devices in each of the VLANs have the ability to access within a network.
- **802.1x:** Cisco IOS supports Multi-Domain Authentication (MDA), which allows both a data device and voice device, such as an IP phone (Cisco or non-Cisco), to authenticate on the same switch port. The port is divided into a data domain and a voice domain. MDA can use Media Access Control (MAC) authentication bypass as a fallback

mechanism to allow the switch port to connect to devices that do not support IEEE 802.1x authentication.

## **Phone Authentication and Encryption**

When the security features are properly configured in Unified CM, all supported phones will have the following capabilities:

- Integrity — Does not allow TFTP file manipulation but does allow Transport Layer Security (TLS) signaling to the phones when enabled.
- Authentication — The image for the phone is authenticated from Unified CM to the phone and the device (phone) is authenticated to Unified CM. All signaling messages between the phone and Unified CM are verified as being sent from the authorized device.
- Encryption — For supported devices, signaling and media can be encrypted to prevent eavesdropping.
- Secure Real-time Transport Protocol (SRTP) — Is supported to Cisco IOS gateways and, of course, phone-to-phone. Cisco Unity (the voice messaging system) also supports SRTP for voicemail.

## **Signaling and Media Encryption**

To maintain the privacy of communications, CUCM provides separate features for protection of the signaling traffic (TCP or UDP) and the media traffic (RTP).

## **Security of SIP Trunks**

To provide security of SIP trunks, the CUBE terminate and re-originates all calls before they enter your network. All SIP traffic passes through the SIP stack on the B2BUA twice (on ingress and egress) so that all malformed packets are dropped.

## **Phone Security**

Cisco Unified IP Phones contain built-in features to increase security on an IP telephony network. These features can be enabled or disabled on a phone-by-phone basis to increase the security of an IP telephony deployment. Depending on the placement of the phones, a security policy will help determine if these features need to be enabled and where they should be enabled.

## **PC Port on the Phone**

The phone has the ability to turn on or turn off the port on the back of the phone, to which a PC would normally be connected. This feature can be used as a control point to access the network if that type of control is necessary. Depending on the security policy and placement of the phones, the PC port on the back of any given phone might have to be disabled. Disabling this port would prevent a device from plugging into the back of the phone and getting network access through the phone itself.

## **Gratuitous ARP**

The phones have features to prevent some of the common data attacks that can occur on a corporate network. One such feature is Gratuitous ARP (Gratuitous Address Resolution Protocol, or GARP). GARP helps protect the phones from having an attacker capture the signaling and RTP voice streams from the phone if the attacker was able to get onto the voice segment of the

network. This feature protects only the phones; it does not protect the rest of the infrastructure from a GARP attack. This feature is of less importance if you are running a Cisco infrastructure because the switch port provides features that protect both the phones and the network gear.

### **Communications Manager and Telephony Applications**

All server-based applications run on an “embedded” Linux operating system based on Red Hat Enterprise Edition. Cisco calls the operating system Voice Operating System (VOS). The Linux operating systems is closed and does not allow end users root or administrative access. A CLI is provided, allowing a Communications Manager Administrator to select command sets for managing upgrades and change to network configuration on the platform. In addition, a Cisco-optimized version of CSA runs on all telephony servers as well as a customized version of the IP Chains firewall.

e. Download, complete and attach the Virginia Tech Information Technology Security Office’s technology procurement questionnaire. <http://security.vt.edu/Downloads/forms/Security%20Questions-Procurements%2012-10-09%20rev.pdf>

#### **Response:**

The completed Virginia Tech Security Questions for Technology-Based Procurements document has been provided as Additional Material.

f. Describe the following user features of the proposed solution:

i. Basic telephony

#### **Response:**

Cisco Unified Communications Manager system features are listed in **Tables 5** and **6**.

In addition to these system and user features, the proposed Cisco Unified Workspace Licensing (CUWL) Standard Edition provides the following features:

- Increased reachability with Single Number Reach
- Single voice mailbox with Single Number Reach
- Mobile Employees with SoftPhone Client (15 – 31 percent increased productivity, increased employee satisfaction, disaster planning)
- Desktop video
- Reaching the right people at the right time
- Advanced voicemail access.

**Table 5. System Capabilities Summary**

Alternate Automatic Routing (AAR)
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<p>Analysis Manager: Analysis Manager supports the following products:</p> <ul style="list-style-type: none"><li>■ Cisco Unified Communications Manager</li><li>■ Cisco Unified Communications Manager Business Edition</li><li>■ Cisco Unified Customer Voice Portal</li><li>■ Cisco Unified Intelligent Contact Management Enterprise</li><li>■ Cisco Unified Contact Center Express</li><li>■ Cisco IOS Gateway devices and Cisco IOS ACS</li><li>■ Cisco Unified Expert Advisor</li><li>■ Cisco Unified Contact Center Enterprise</li></ul>
Annunciator support for SCCP and SIP
Audio Message-Waiting Indicator (AMWI)
Automated bandwidth selection
Automatic Route Selection (ARS)
AXL Simple Object Access Protocol (SOAP) API with performance and real-time information
Basic Rate Interface (BRI) endpoint support: Registers BRI endpoints as SCCP devices
Call Admission Control <ul style="list-style-type: none"><li>■ Static modeling using locations-based Call Admission Control (CAC)</li><li>■ Dynamic admission control using RSVP intercluster and intracluster Application ID for voice and video CAC differentiation</li></ul>
Call coverage <ul style="list-style-type: none"><li>■ Forwarding based on internal and external calls</li><li>■ Forwarding out of a coverage path</li><li>■ Timer for maximum time in coverage path</li><li>■ Time of day</li></ul>
Call display restrictions
Call preservation-redundancy and automated failover-on call-processing failure
Call recording for encrypted and non-encrypted calls
Codec support for automated bandwidth selection: G.711 (mu-law and a-law), G.722, G.722.1, G.723.1, G.728, G.729A/B, Global System for Mobile-Enhanced Full Rate (GSM-EFR), Global System for Mobile-Full Rate (GSM-FR) Internet Low Bitrate Codec (iLBC), iSAC, wideband audio (proprietary 16-bit resolution; 16-kHz sampled audio), and Advanced Audio Codec (AAC) for use with Cisco TelePresence devices
Digit analysis and call treatment (digit-string insertion, deletion, stripping, dial access codes, digit-string translation, and dial-pattern transformation)

<p>Database resiliency to increase feature availability for the following:</p> <ul style="list-style-type: none"> <li>■ Extension Mobility</li> <li>■ Call forward all</li> <li>■ MWI</li> <li>■ Privacy</li> <li>■ Device mobility</li> <li>■ Do not disturb</li> <li>■ End-user and Application User Certificate Authority Proxy Function (CAPF) for CTI</li> <li>■ Monitoring</li> <li>■ Hunt groups</li> </ul>
<p>Device mobility changes in the location-specific information when a device moves within the cluster</p>
<p>Dial-plan partitioning</p>
<p>Distributed call processing</p> <ul style="list-style-type: none"> <li>■ Deployment of devices and applications across an IP network</li> <li>■ Virtual clusters of up to eight Cisco Unified Communications Manager servers for scalability, redundancy, and load balancing</li> <li>■ Maximum of 7500 Cisco Unified IP Phones per Cisco Unified Communications Manager server and 30,000 per server cluster (configuration dependent)</li> <li>■ Maximum of 100,000 Busy-Hour Call Completions (BHCCs) per Cisco Unified Communications Manager server and 250,000 per server cluster (configuration dependent)</li> <li>■ Intercluster scalability to more than 100 sites or clusters through H.323 gatekeeper</li> <li>■ Intracluster feature and management transparency</li> </ul>
<p>Divert calls to voicemail (iDivert)</p>
<p>External Call Control, which provides an API (Routing Rules Interface) that allows routing decisions to be made outside of Cisco Unified Communications Manager</p>
<p>Fax over IP: G.711 pass-through and Cisco Fax Relay</p>
<p>Forced authorization codes and client matter codes (account codes)</p>
<p>H.323 interface to selected devices</p>
<p>H.323 FastStart (inbound and outbound)</p>
<p>Hotline and Private-Line Automated Ringdown (PLAR)</p>
<p>Hunt groups: broadcast; circular; longest idle; and linear, login, and logout</p>
<p>Cisco Intercompany Media Engine support for intercompany business-to-business communication</p>
<p>Interface-to-H.323 gatekeeper for scalability, CAC, and redundancy</p>
<p>IPv4</p>

Language support for client-user interfaces (languages specified separately)
Multi-location: Dial-plan partition
Multiple ISDN protocol support
Multiple remote Cisco Unified Communications Manager platform administration and debug utilities <ul style="list-style-type: none"><li>■ Prepackaged alerts, monitor views, and historical reports with RTMT</li><li>■ Real-time and historical application performance monitoring through operating system tools and SNMP</li><li>■ Monitored data-collection service</li><li>■ Remote terminal service for off-net system monitoring and alerting</li></ul>
<ul style="list-style-type: none"><li>■ Real-time event monitoring and presentation to common syslog</li><li>■ Trace setting and collection utility</li><li>■ Browse to onboard device statistics</li><li>■ Cluster-wide trace-setting tool</li><li>■ Trace collection tool</li></ul>
Multi-site (cross-WAN) capability with inter-site CAC
Off-Premises eXtension (OPX)
Outbound call blocking
Out-of-band Dual-Tone Multi-Frequency (DTMF)
Programmable line keys
PSTN failover on route no availability: AAR



## Q.SIG

- Alerting name specified in ISO 13868 as part of the Connected Name Identification Presentation (SS-CONP)
- Basic call
- ID services
- General function procedures
- Call back: ISO/IEC 13870: 2nd Edition, 2001-07 (Completion of Calls to Busy Subscriber [CCBS] and Call Completion on No Reply [CCNR])
- Call diversion: SS-CFB (busy), SS-CFNR (no answer), and SS-CFU (unconditional); service ISO/IEC 13872 and ISO/IEC 13873, first edition 1995-call diversion by forward switching and by rerouting
- Call transfer by join
- H.323 Annex M.1 (Q.SIG over H.323)-ITU recommendation for Annex M.1
- Identification restriction (Calling Name Identification Restriction [CNIR], Connected Line Identification Restriction [COLR], and Connected Name Identification Restriction [CONR])
- Loop prevention, diversion counter and reason, loop detection, diverted to number, diverting number, original called name and number, original diversion reason, and redirecting name
- MWI
- Path replacement ISO/IEC 13863: 2nd Ed. 1998, and ISO/IEC 13974: 2nd Ed. 1999

## Station through trunk (MGCP gateways)

- JTAPI and TAPI applications enabled with automated failover and automatic update
- Triple Cisco Unified Communications Manager redundancy per device (phones, gateway, and applications) with automated failover and recovery
- Trunk groups
- MGCP BRI support (ETSI BRI basic-net3 user-side only)

## Security

- Secure conferencing is available to all members of the conference.
- Configurable operation modes: Non-secure or secure modes can be configured.
- Device authentication: New model phones have an embedded X.509v3 certificate; a CAPF is used to install a locally significant certificate in the phones.
- Data integrity: The Transport Layer Security (TLS) cipher NULL-SHA is supported; messages are appended with the SHA1 hash of the message to help ensure that they are not altered on the wire and can be trusted.
- Cisco Unified Communications Manager offers secure HTTP support for Cisco Unified Communications Manager Administration, Cisco Unified Communications Manager Serviceability, Cisco Unified Communications Manager User Pages, and Cisco Unified Communications Manager CDR Analysis and Reporting Tool.
- Privacy: Signaling and media are encrypted, including Cisco Unified IP Phone 7906G, 7911G, 7921G, 7940G, 7931G, 7941G, 7941G-GE, 7942G, 7945G, 7960G, 7961G, 7961G-GE, 7962G, 7965G, 7970G, 7971G, and 7975G models; Cisco Unified SRST; and MGCP gateways.
- Secure Sockets Layer (SSL) for directory: Supported applications include Cisco Unified Communications Manager Bulk Administration Tool (BAT), Cisco Unified Communications Manager CDR Analysis and Reporting Tool, Cisco Unified Communications Manager Admin User Pages, Cisco Unified Communications Manager Assistant Admin Pages, Cisco Unified IP Phone Options Pages, Cisco Conference Connection, Cisco CTI Manager, Cisco Communications Manager Extension Mobility, and Cisco Communications Manager Assistant.
- A USB eToken containing a Cisco rooted X.509v3 certificate is used to generate a Certificate of Trust List (CTL) file for the phones and to configure the security mode of the cluster.
- Phone security: Trivial File Transfer Protocol (TFTP) files (configuration and firmware loads) are signed with the self-signed certificate of the TFTP server; the Cisco Unified Communications Manager system administrator can disable HTTP and Telnet on IP phones.
- SIP trunk (RFC 3261) and line side (RFC 3261-based services) are supported.
- Cisco Unified SRST is supported.

## Service Advertisement Framework - Call Control Discovery

### Shared resource and application management and configuration

- Transcoder resource
- Conference bridge resource
- Topological association of shared resource devices (conference bridge, Music-on-Hold [MoH] sources, and transcoders)
- Media Termination Point (MTP): Support for SIP trunk and RFC 2833
- Annunciator

## Silence suppression and Voice Activity Detection (VAD)

### Silent monitoring

Simplified North American Numbering Plan (NANP) and non-NANP support
SIP routing (centralized) with Session Management Edition
SIP trunk Call Admission Control (SIP CAC)
T.38 fax support (H.323, MGCP, and SIP)
Third-party applications support <ul style="list-style-type: none"> <li>■ Broadcast paging: Through Foreign eXchange Station (FXS)</li> <li>■ Simple Messaging Desktop Interface (SMDI) for MWI</li> <li>■ Hook-flash feature support on selected FXS gateways</li> <li>■ TSP 2.1</li> </ul>
Support for hunt lists, call pickup, and call forward <ul style="list-style-type: none"> <li>■ JTAPI 2.0 service provider interface</li> </ul>
Support for hunt lists, call pickup, and call forward <ul style="list-style-type: none"> <li>■ Billing and call statistics</li> <li>■ Configuration database API (Cisco AXL)</li> </ul>
Time-of-day, day-of-week, and day-of-year routing and restrictions
Toll restriction: Dial-plan partition
Toll-fraud prevention <ul style="list-style-type: none"> <li>■ Prevent trunk-to-trunk transfer</li> <li>■ Drop conference call when originator hangs up</li> <li>■ Require forced-authorization codes</li> </ul>
Unified device and system configuration
Unified dial plan
Video codecs: H.261, H.263, H.264, and Cisco Wideband Video Codec (Cisco Unified Video Advantage)
Video telephony (SCCP, H.323, and SIP)

**Table 6. Summary of User Features**

Abbreviated dial
Answer and answer release
Auto answer and intercom
Callback busy and no reply to station
Call connection
Call coverage
Call forward: All (off net and on net), busy, no answer, no bandwidth, and not registered
Call hold and retrieve
Call join

Call park and pickup
Call pickup group: Universal
Call pickup notification (audible or visual)
Call status per line (state, duration, and number)
Call waiting and retrieve (with configurable audible alerting)
Calling Line Identification (CLID) and Calling party Name Identification (CNID)
Calling Line Identification Restriction (CLIR) call by call
Conference barge
Conference chaining
Conference list and drop any party (impromptu conference)
Dialed-number display
Direct Inward Dialing (DID) and Direct Outward Dialing (DOD)
Directed call park with Busy Lamp Field (BLF)
Directory dial from phone: Corporate and personal
Directories: Missed, placed, and received calls list stored on selected IP phones
Distinctive ring for on- and off-net status, per-line appearance, and per phone
Do not disturb (do not ring and call reject)
Drop last conference party (impromptu conferences)
Extension Mobility
Extension Mobility Cross Cluster
Extension Mobility PIN change from phone
Hands-free, full-duplex speakerphone
HTML help access from phone
HTTPS for phone services; for example, Extension Mobility
Hold reversion
Immediate divert to voicemail
Intercom with whisper
Join across lines
Last-number redial (on and off net)
Log in and log out of hunt groups
Malicious-call ID and trace

<p>Manager-assistant service (Cisco Unified Communications Manager Assistant application) proxy line support</p> <ul style="list-style-type: none"> <li>■ Manager features: Immediate divert or transfer, do not disturb, divert all calls, call intercept, call filtering on CLID, intercom, and speed dials</li> <li>■ Assistant features: Intercom, immediate divert or transfer, divert all calls, and manager call handling through assistant console application</li> </ul>
<p>Manager-assistant service (Cisco Unified Communications Manager Assistant application) shared-line support</p> <ul style="list-style-type: none"> <li>■ Manager features: Immediate divert or transfer, do not disturb, intercom, speed dials, barge, direct transfer, and join</li> <li>■ Assistant features: Handle calls for managers; view manager status and calls; create speed dials for frequently used numbers; search for people in directory; handle calls on their own lines; immediate divert or transfer, intercom, barge, privacy, multiple calls per line, direct transfer, and join; send DTMF digits from console; and determine MWI status of manager phone</li> </ul>
<p>Manager-assistant service (Cisco Unified Communications Manager Assistant application) system capabilities: Multiple managers per assistant (up to 33 lines) and redundant service</p>
<p>Manager-assistant service now available on a Cisco Unified IP Phone with Cisco Unified Communications Manager 6.0</p>
<p>MWI (visual and audio)</p>
<p>Multiparty conference: Impromptu with add-on meet-me features</p>
<p>Multiple calls per line appearance</p>
<p>Multiple line appearances per phone</p>
<p>MoH</p>
<p>Mute capability from speakerphone and handset</p>
<p>On-hook dialing</p>
<p>Original calling party information on transfer from voicemail</p>
<p>Privacy</p>
<p>Real-time QoS statistics through HTTP browser to phone</p>
<p>Recent dial list: Calls to phone, calls from phone, autodial, and edit dial</p>
<p>Service URL: Single-button access to IP phone service</p>
<p>Single-button barge</p>
<p>Single-directory number and multiple phones: Bridged line appearances</p>
<p>Speed dial: Multiple speed dials per phone</p>
<p>Station volume controls (audio and ringer)</p>
<p>Transfer: Blind, consultative, and direct transfer of two parties on a line</p>
<p>User-configured speed dial and call forward through web access</p>
<p>Video (SCCP, H.323, and SIP)</p>

VPN client on IP Phone
Web services access from phone
Web dialer: Click to dial
Wideband audio codec support: Proprietary 16-bit resolution; 16-kHz sampling rate codec

ii. Unified messaging

**Response:**

Cisco Unity Connection is a feature-rich voice messaging platform based on the same Linux Unified Communications Operating System as Cisco Unified Communications Manager. With Cisco Unity Connection, you can access voice messages using Cisco Unified Personal Communicator (**Figure 10**), or use the display on your Cisco Unified IP Phone (see **Figure 11**) to view, search, sort, and play messages. Cisco Unity Connection also provides robust Automated-Attendant functions that include intelligent call routing and easily customizable call-screen and message-notification options.



**Figure 10. Example of Cisco Unified Personal Communicator**



1216p005/a

### **Figure 11. Rich Messaging Experience on Cisco Unified IP Phone**

At its core, Cisco Unity Connection is a powerful voice messaging system with many advanced capabilities that you can customize to maximize your individual and team productivity. You can personalize communications options and interact with the system to manage calls and messages in the way that is most comfortable and convenient for you. The flexible user interface makes messaging more efficient for "power users" and occasional voicemail users alike. For example, you can even customize your Telephone User Interface (TUI) and touchtone mappings to make migration from traditional voicemail systems much easier.

To maximize the productivity of mobile workers, Cisco Unity Connection offers a natural and robust speech-activated user interface that allows you to browse and manage your voice messages using simple, natural speech commands.

In addition, the Speech Connect for Cisco Unity Connection feature is a built-in speech-enabled Automated Attendant that enables you to call other Cisco Unity Connection users or personal contacts by simply using your voice.

Manage your voice messages from a variety of devices and locations, whichever best suits the way you work.

- Cisco Unified Personal Communicator voicemail integration
  - You can access your voice messages directly from the Cisco Unified Personal Communicator client.
  - You can use the integrated media player to play and delete messages.
  - You can easily access presence and availability information about the person you are calling in the Cisco Unified Personal Communicator client; then click to call the person back and escalate to web chat, video, or other multimedia session.
- Cisco Unity Connection Inbox web browser interface to voice messages
  - You can view, sort, play, compose, forward, and reply to voice messages.

- ❑ You can use the Digital Video Recorder (DVR)-style interface to play, rewind, pause, or fast forward messages.
- ❑ You can easily address messages to multiple recipients and distribution lists.
- ❑ Voice messages in the Cisco Unity Connection Inbox are synchronized with the Message-Waiting Indicator (MWI) on your telephone.
- ❑ Web browser-based tools are supported on Internet Explorer, Firefox, and Safari.
- Internet Message Access Protocol (IMAP)-based email client to access voice messages
  - ❑ You can access email and voicemail messages and play and delete voice messages from within the same desktop email client using the built-in ViewMail for Outlook or ViewMail for Notes player.
  - ❑ Voice messages in your email inbox are synchronized with the MWI on your telephone.
  - ❑ Various standards-based desktop email clients are supported, including Microsoft Outlook, Lotus Notes, and Entourage for Mac.
  - ❑ You can compose, reply to, and forward messages by using IMAP clients.
- Visual voicemail on your Cisco Unified IP Phone
  - ❑ You can view, sort, play, compose, forward, and reply to voice messages from the screen on your IP phone without having to dial in to the system.

iii. Mobility

**Response:**

Cisco mobile solutions offer a variety of intelligent endpoints, including wireless IP phones and applications for smartphones. Employees communicate however they like, whether they are in the office, on the road, or at home. Cisco Collaboration Solutions allow all endpoints to operate from a highly secure, enterprise-managed platform.

With mobile solutions, you combine the convenience, flexibility, and reach of mobile communications with the benefits of Cisco collaboration. This combination greatly enhances employee effectiveness by:

- Reducing complexity
- Supporting the use of a single business number and voice mailbox
- Allowing communications to shift more easily between voice calls, voicemail, email, conferencing, and instant messaging
- Improving the ability to make the right connection, or find the appropriate information the first time.

Cisco Unified Mobility makes it easy for enterprise workers to keep in touch with the business at hand, whether at their desks or mobile. It introduces Cisco Mobile Connect enterprise mobility services to extend the benefits of IP communications to workers inside and outside the enterprise campus. An application server that integrates with Cisco Unified Communications Manager, Cisco Unified Mobility intelligently manages, filters, routes, and places calls between a worker's IP phone and remote mobile phone. With Cisco Unified Mobility, a worker can receive and place business calls from the devices most convenient for the task without interrupting the calls,



whether in the office, in transit, or at a remote location. Cisco Unified Mobility also helps enterprise IT and telecom managers better serve the communication needs of their mobile workers, while enabling them to take advantage of the enterprise IP communications network resources available with Cisco Unified Communications Manager.

### **Single Business Number Reach**

Cisco Unified Mobility makes Cisco Mobile Connect services available to Cisco Unified Communications Manager users who want to consolidate all their business calls with a single enterprise IP phone number and immediately connect wherever they are working. Enterprise customers now need only a single phone number to reach enterprise workers and the enterprise can provide more responsive service with no additional effort. For enterprise mobile workers, Cisco Unified Mobility also reduces the burden of having to share their private mobile phone number and having to check for business calls in their mobile voicemail box.

### **Single Business Voicemail**

If mobile workers are unable to answer Cisco Mobile Connect calls, they can rely on Cisco Unified Mobility to store the unanswered calls in the Cisco Unity voice messaging system, or other enterprise voicemail system. Workers can manage all voicemail using the single enterprise voicemail box.

### **Device Mobility**

Mobile phones are great when moving from location to location, but when a mobile worker arrives at the office, the mobile phone becomes less convenient. With the Cisco Mobile Connect services of Cisco Unified Mobility, mobile workers can continue a call on their IP desk phone after they arrive at the office and take advantage of speakerphone or other IP phone services. Important calls can be continued without interruption, and workers can use the best available IP or mobile features for the specific time and place.

### **Cisco Mobile Voice Access**

Cisco Unified Mobility makes all the major enterprise IP communications features available to workers while they are traveling. For example, an enterprise mobile worker who needs to call one of the enterprise's foreign offices while traveling can use the Cisco Mobile Voice Access line to place the call as if from the enterprise home office. The worker dials the Cisco Mobile Voice Access line from the mobile phone and places the call on the enterprise IP communications network over a tie line. The connection is completed, and telecom costs are kept under control.

Cisco Unified Mobile Communicator is an easy-to-use software application that securely extends unified communications to smartphones. It delivers measurable cost savings by routing mobile calls through the corporate telephony infrastructure and productivity enhancements with mobile presence, visual voicemail, corporate directory access, and access to office call logs (**Figure 12**).



1216p006/a

**Figure 12. Cisco Unified Mobile Communicator**

According to Forrester Research, inefficient communications – specifically the inability to quickly reach mobile and remote colleagues – is the cause of internal decision delays. Time-sensitive concerns depend on reaching people and resources quickly and efficiently. With Cisco Unified Mobile Communicator, your mobile users are more connected and have real-time access to critical information. Mobile users get alerted to missed office calls and new voice messages. Visual voicemail enables workers to prioritize messages and respond to calls faster and more efficiently (**Figure 13**). Presence on the smartphone eliminates failed attempts to reach someone, and helps find an available resource to get help quickly.



1216p007/a

**Figure 13. Visual Voicemail on iPhone and Nokia and BlackBerry**

Cisco Unified Mobile Communicator is currently available on the following mobile platforms:

- Apple iPhone 3G and 3GS
- BlackBerry OS (most models except for touch devices)

- Nokia N series and E series (most models)
- Windows Mobile 6.0 and 6.1 Standard Edition.

iv. Desktop video

**Response:**

Cisco Unified Communications Solutions unify voice, video, data, and mobile applications on fixed and mobile networks, delivering a media-rich collaboration experience across business, government agency, and institutional workspaces. These applications use the network as the platform to enhance comparative advantage by accelerating decision time and reducing transaction time. The security, resilience, and scalability of the network help users in any workspace to easily connect every time, everywhere, using any media, device, or operating system. Cisco Unified Communications is part of a comprehensive solution that includes network infrastructure, security, wireless, management applications, lifecycle services, flexible deployment and outsourced management options, and third-party applications.

**Interactive Face-to-Face Communications**

Cisco Unified Video Advantage (**Figure 14**) brings video telephony functions to Cisco Unified IP Phones (Cisco Unified IP Phones 6900 and 7900 Series models and the Cisco IP Communicator softphone application).



1216p008/a

**Figure 14. Cisco Unified Video Advantage**

This video telephony solution consists of Cisco Unified Video Advantage software and Cisco VT Camera (**Figure 15**), a video telephony Universal-Serial-Bus (USB) camera. You can make calls from your Cisco Unified IP Phone using the familiar phone interface, and calls are displayed with video on your PC without pushing any button or clicking your mouse.



1216p009/a

**Figure 15. Cisco VT Camera**

When registered to Cisco Unified Communications Manager, the Cisco Unified Video Advantage-enabled phone transforms your phone into a full-featured IP videophone. It supports conversations on any video endpoint supported by Cisco Unified Communications Manager. System administrators can provision a Cisco Unified IP Phone with Cisco Unified Video Advantage just as they would any other Cisco Unified IP Phone, greatly simplifying deployment and management. Enterprise customers now have a cost-effective, scalable, and visually interactive IP communications solution.

### **Important Features and Benefits**

Cisco Unified Video Advantage is innovative in that video telephone calls are just like regular phone calls. Features such as call forward, transfer, conference, and hold are now available with video, and they are all initiated through the Cisco Unified IP Phone. IP telephony and IP video telephony are delivered to every employee using a unified dial plan and a common directory over a single Cisco Unified Communications infrastructure.

The video codec and bandwidth selection in Cisco Unified Video Advantage is completely controlled by Cisco Unified Communications Manager, Cisco Unified Communications Manager Business Edition, or Cisco Unified Communications Manager Express, so you need no special experience or knowledge about video capabilities or settings. You no longer need to pre-determine if the other end of the call is a video endpoint or phone.

Enabling interactive face-to-face communications at the desktop enhances productivity and the quality of communications, streamlines business decision making, and improves teamwork. By reducing the need for in-person meetings, Cisco Unified Video Advantage can help your company save money on travel expenses, strengthen an existing telecommuting program, or reduce your organization's carbon footprint in traveling to meetings. Cisco Unified Video Advantage is designed to deliver enhanced modes of communication while protecting existing unified communications investments.

## Optimized Business Communications

Cisco Unified Video Advantage features the latest technology and advancements available with true IP communications today. You can now take full advantage of your IP network to extend enterprise-class voice and video to everyone in your organization. This dynamic solution is designed to grow with new system capabilities.

### Cisco Unified Video Advantage Features

Cisco Unified Video Advantage is intuitively designed and easy to use, and it delivers convenient access to a host of features.

- **Phone association choice:** You can place Cisco Unified Video Advantage video calls with either a Cisco Unified IP Phone or Cisco IP Communicator
- **Camera on and off:** You can opt to “receive only” by disabling your camera
- **Video preview:** You can check your video before placing or receiving calls
- **Video confirmation:** You can optionally enable confirmation before sending a video
- **Mute video on audio mute option:** When you mute the audio on the phone, video is automatically muted until you resume the audio
- **Easy access to video controls:** Controls for showing the console, video window options, and video window position are conveniently available from the video windows
- **Video signal indicators:** Quality of incoming and outgoing video signals is graphically displayed.

### Video Features

Cisco Unified Video Advantage is interoperable with most third-party H.323 video terminals from verified IP video telephony partners. In addition, it offers the following video features:

- H.263 and H.264 video codecs: Bit rates from 50 kbps to 1.5 Mbps
- Video formats (up to 30 frames per second): 352 x 288, 320 x 240, 176 x 144, and 160 x 120.

#### v. Collaboration

### Response:

As today’s workplace becomes more complex, global, and mobile, businesses are seeking better, smarter ways to collaborate. The new collaboration experience is about connecting people, information, and teams, providing context so they can find the people and information they need — fast. Cisco Communications Manager Express lets you provide unified communications capabilities in your organization. This solution features powerful call processing for Cisco Unified IP Phones as part of a converged voice and data solution, powered by a Cisco router.

Cisco Unified Communications solutions let you deliver a media-rich collaboration experience to employees, customers, and business partners. These solutions let you use the network as a platform to improve your competitive advantage by accelerating decision time and reducing transaction time. The security, resilience, and scalability of the network enable users in any workspace to easily connect anywhere, anytime, and anyplace, using virtually any medium, device, or operating system.

Cisco Unified Communications Manager Express delivers the advanced communications capabilities you need to better compete in today's global market:

- **Rich phone feature set:** Innovative key system and Private Branch Exchange (PBX) capabilities are available within feature-rich Cisco IOS Software
- **Low cost:** This full-featured call processing solution is available on the Cisco Integrated Services Routers (ISRs), which are simple to deploy, administer, and maintain
- **Increased employee productivity:** Users have call control, location, and status of other users with Cisco Unified CallConnector for Microsoft Windows, a presence-based Windows application
- **User-specified call handling:** Users can take advantage of single number reach by extending incoming business calls to mobile or home phones based on rules they specify with Cisco Unified CallConnector Mobility
- **Easy installation and changes:** An intuitive management interface makes moves, adds, and changes easy
- **Business process transformation:** Integration with your existing business process applications, such as Customer Relationship Management (CRM), is delivered in combination with Cisco Unified CallConnector applications
- **Industry-leading investment protection:** The solution supports up to 450 users, interoperates with Cisco Unified Communications Manager, and enables planned migration strategies in support of future growth.

vi. Presence

### Response:

Cisco Unified Presence “Powered by Jabber,” part of the Cisco Unified Communications Solutions suite, is delivered on an appliance that provides standards-based dual protocol enterprise instant messaging and presence as part of Cisco Unified Communications. This secure, scalable, and easy to manage solution offers users feature rich communications capabilities both within and external to the enterprise.

Cisco Unified Presence is tightly integrated with various desktop clients and applications. It enables Cisco Unified Personal Communicator, the Cisco Unified Communications enterprise desktop client, to perform numerous functions such as instant messaging, click to call, phone control, voice, video, and Web collaboration. Cisco Unified Presence provides a unified presence service for Cisco Unified Mobile Communicator and other mobile clients. The solution also provides an integrated Instant Messaging and presence experience for various contact center applications. Cisco Unified Presence supports the interfacing of third-party Extensible Messaging and Presence Protocol (XMPP) clients and has built-in support for persistent chat. In addition, it provides Cisco Unified Communications Manager telephony presence for IBM Sametime and telephony enablement of Microsoft Office Communicator.

Cisco Unified Presence offers customers and partners the flexibility of rich, open interfaces that allow enablement of Instant Messaging and presence to enable business applications.



## Product Overview

Customers adopt Cisco Unified Communication Solutions to increase productivity, speed up communication, and enable collaboration with either colleagues within the enterprise or external partners and suppliers.

Cisco Unified Presence takes the rich feature set of the Jabber Extensible Communications Platform (XCP) and delivers it as part of Cisco Unified Presence. Using this Jabber technology, it delivers enhanced enterprise instant messaging features, including group chat, persistent chat, and IM logging, along with a suite of business-to-business and business-to-consumer Instant Messaging and presence open federations.

Cisco Unified Presence lays the foundation to deliver enterprise Instant Messaging and presence enabled collaboration capabilities. Customers powered by Cisco Unified Presence and Cisco Unified Communications Solutions can then view the presence status or availability of the people they want to communicate with, exchange instant messages with these individuals, and escalate to a voice call or rich collaborative session.

Cisco Unified Presence natively supports standards-based Jabber XMPP and SIP for Instant Messaging and Presence Leveraging Extensions (SIP/SIMPLE). With this dual protocol capability, Cisco Unified Presence offers customers a choice of either rich featured Cisco Unified Communications clients or any third-party XMPP-compliant Instant Messaging and presence client.

Cisco Unified Presence also supports presence oriented Simple Object Access Protocol (SOAP) and Representational State Transfer (REST) interfaces. In addition, Cisco Unified Presence enables integration through Cisco XMPP Libraries, which is a Java script presence and Instant Messaging interface that allows customers and application developers to extend presence and Instant Messaging to Web based applications.

Cisco Unified Presence offers customers many communication client options. The client a customer uses depends on the services or environment in which the customer deploys Cisco Unified Presence. Cisco Unified Presence allows the ability to mix and match clients depending on the needs of the enterprise.

Cisco Unified Personal Communicator (Mac and PC) provides one of the richest desktop unified communications experiences, supporting Instant Messaging, presence, video, desktop phone control, and soft phones with rich collaborative integrations into Cisco Unity and Cisco Unity Connection applications. It also allows for escalation to collaborative desktop sharing into Cisco WebEx and Cisco Unified MeetingPlace applications.

Mobile workers often need to be connected to the enterprise, and they can use Cisco Unified Mobile Communicator embedded in a smart mobile device to connect and then get and set presence to Cisco Unified Presence, breaking the boundary of the enterprise and remaining connected and part of it, despite being on the move.

Customers who require a secure, policy controlled, rich Instant Messaging and presence solution as part of their enterprises but do not require a full unified communications experience can also deploy Cisco Unified Presence. Cisco Unified Presence supports the connection of third-party desktop and mobile XMPP clients that comply with the XMPP standard to get access to the integrated Instant Messaging and presence services of Cisco Unified Presence.

First call resolution is a critical part of any contact center interaction. Cisco Unified Presence in conjunction with Cisco Unified Expert Advisor enables contact centers to deliver on first call resolution to increase productivity by allowing an agent or a self-service Interactive Voice Response (IVR) application to automatically engage an expert using presence if the customer needs expert assistance in closing out an inquiry.

vii. Contact center

**Response:**

Cisco Unified Contact Center Express meets the needs of mid-market and enterprise branch-office or departmental companies that need easy-to-deploy, easy-to-use, secure, virtual, highly available, and sophisticated customer interaction management for up to 300 agents. Cisco Unified Contact Center Express support for powerful, agent-based service as well as fully integrated self-service applications results in reduced business costs and improved customer response by providing sophisticated and distributed Automatic Call Distributor (ACD), Interactive Voice Response (IVR), Computer Telephony Integration (CTI), and agent and desktop services in a single-server, contact-center-in-a-box deployment while offering the flexibility to scale to larger, more demanding environments. Cisco Unified Contact Center Express helps ensure your business rules for inbound and outbound voice and email; and customer interaction management helps ensure that each contact is delivered to the right agent the first time.

To help companies provide efficient, effective, customer-focused service in the contact center, supervisors must have the tools they need to manage team performance. Cisco Unified Workforce Optimization for Cisco Unified Contact Center Express helps supervisors and other managers align contact center performance with business objectives by integrating workforce optimization into the team's daily workflow. Cisco Unified Contact Center Express is provided in three versions: Standard, Enhanced, and Premium, to better match product functions with your customer contact interaction management requirements. All Cisco Unified Contact Center Express products are tightly integrated with Cisco Unified Communications Manager.

Maximum Return on Investment (ROI) for contact centers is provided when your company's business rules can influence the behavior of the contact center. The routing capabilities of Cisco Unified Contact Center Express facilitate categorization and prioritization of customer contacts in a way that best meets your business requirements to help ensure that each contact is routed to the right agent at the right location the first time to maximize resolution on the first call. Cisco Unified Contact Center Express routing supports a wide range of routing logic that can accurately target and selectively route different classes of contacts, or even single out individual contacts for customized, prioritized routing treatment.

Cisco Unified Contact Center Express offers call-routing behaviors based on conditional events, such as time of day, day of week, or holiday routing, as well as the ability to specify service levels, move contacts between agent groups, and reprioritize contacts in the queue based on your business rules. With Cisco Unified Contact Center Express Premium, product integration with your enterprise's customer database can help ensure that the optimal routing decisions are made. In addition, the application can give agents extensive information on a per-contact basis through a Customer-Relationship-Management (CRM) or other application screen pop.



Customers are turning to company Web sites to locate information about products and services, to seek support, and to conduct transactions. In addition, customers are seeking alternative ways, such as email, to contact customer support centers, and the volume of incoming email interactions to contact centers is growing. Cisco Unified Contact Center Express offers the Agent E-Mail feature for email management.

Agent E-Mail is a basic email queuing and response system, designed specifically for Cisco Agent Desktop for the Cisco Unified Contact Center Express platform. Agent E-Mail is a zero-footprint feature that is tightly integrated into the Agent Desktop embedded browser, with controls built into the toolbar and display. It enables contact centers to queue and route email messages to staff and skilled agents, helping strike a balance between email and call-handling activities.

Cisco Unified Contact Center Express can integrate with any CRM or other application that can run on the agent's Microsoft Windows desktop. Integration is achieved by using a powerful real-time programmable CTI workflow engine that invokes keystroke-macro emulation to automate the transfer of caller-entered information, or performing an external application action. Cisco Unified Contact Center Express provides powerful integration tools through support for custom Java classes and methods that can be invoked under real-time workflow control. These features facilitate the integration of Cisco Agent Desktop with other Windows and Web-based applications with minimal software development.

In addition, Cisco Unified Contact Center Express Premium allows you to apply HTTP integration to provide integration and a screen pop with browser-based applications such as Salesforce.com running in the Cisco Agent Desktop embedded browser.

Finally, Cisco Unified Contact Center Express third-party CTI protocol provides for deep integration with ACD and IVR subsystems for traditional custom CTI integrations.

Unlike many competitive products, Cisco Unified Contact Center Express does not require purchase of additional IVR services, but rather provides an integrated, ready-to-use IVR solution. Every package provides an IVR queue point, custom call treatment, arbitrarily deep voice menus, custom voice prompts, and the ability to process customer phone-keypad presses through Dual Tone Multi-Frequency (DTMF) processing to make routing decisions or to present a screen pop to the agent.

Cisco Unified Contact Center Express Premium adds the ability to have true, sophisticated, and fully automated self-service applications integrated with your agent-assisted contact interaction management. This critical feature enables significant cost reduction on a per-contact basis and provides significant flexibility in handling customer contacts.

Two, full self-service IVR ports are packaged at no additional charge with each Cisco Unified Contact Center Express Premium seat. In addition, support is provided for adding advanced self-service technologies such as Automatic Speech Recognition (ASR), Text to Speech (TTS), and Voice XML. The application also supports real-time notification services through email and third-party fax or paging solutions, as well as the ability to invoke custom workflow processing (for example, Web-based callback) through HTTP requests.

Each Cisco Unified Contact Center Express seat provides optimal flexibility in your contact center by providing full licensing to use the seat as either an agent or a supervisor seat. Enhanced

and Premium agent seats can be either PC- or Cisco Unified IP Phone-based agent stations. Standard seats provide a Cisco Unified IP Phone Agent IP Phone-based agent station. Each seat provides full licensing for Cisco Agent Desktop or Cisco IP Phone Agent, Cisco Supervisor Desktop, Cisco Desktop Administrator, and Cisco Historical Reporting Client; for the Enhanced and Premium versions, Cisco Supervisor and Agent Desktop include on-demand recording in addition to full licensing. With the Enhanced and Premium versions, even if a PC failure occurs, an agent is fully licensed to continue working through the Cisco IP Phone Agent.

Cisco Unified Contact Center Express keeps the agent in touch with every call through critical data and call-state information by providing the ability to present a screen pop to the agent for each call. Information presented to the agent includes customer-entered data as well as call-state information describing how long the call has been connected to the ACD, how long the call has been in queue, and how long the agent has been talking with the caller.

Cisco Agent Desktop gives agents tools to access information and respond rapidly to customer requests. Voice contact workflows, the enterprise data pane, and the integrated browser display (screen pop) show agents customer data as calls are presented, preventing redirection of calls and the necessity for customers to repeat information. Task automation buttons and the personal phone directory allow agents to instantly activate frequently performed functions that shorten response time and automate after-call work to follow up on a customer inquiry. Collaboration tools such as chat and transfer of caller data help keep responses accurate.

Additionally, Cisco Agent Desktop offers the ability to provide workflows that process business rules based on critical call-state events, the ability to invoke any CRM or other application able to run on the agent's Microsoft Windows desktop, and the ability to display information in the form of a screen pop from the ACD or IVR subsystem to that application.

The ability of Cisco Supervisor Desktop to monitor critical performance metrics and actively chat, monitor, record, and send team messages allows managers to coach, train, and encourage agent behavior so that agents consistently perform their job function and process calls efficiently. The ability to send agents scrolling team messages and chat with individual members or the entire team allows supervisors to coach agents, resolve problems, and instantly communicate business changes. Supervisors can coach agents unobtrusively on cross-sell and up-sell opportunities and help agents resolve customer situations.

Within the supervisor desktop, contact center managers can see team performance, agent statistics, and status at a glance by using easy-to-navigate tabbed pages and graphical reports. To coach agents, they can silently monitor calls and offer encouragement using chat. They can also initiate call recording for later review and training.

Supervisors can interrupt an agent's call to create a three-way conference, and then interact with both the caller and the agent to help resolve a concern. A supervisor can remove the agent from a call using the Intercept feature, allowing the supervisor and caller to complete the call on their own while the agent handles another customer request.

Supervisors can change an agent's state from their desktop. For example, agents may forget to make themselves available to take calls after a break or neglect to log out when they are away from their workstation for an extended period. With Cisco Supervisor Desktop, supervisors can easily log out missing agents or make unintentionally idle agents ready to take calls. This function is critical to highly distributed contact center deployments. Supervisors can also change

an agent’s skill profile in real time. This capability gives supervisors tactical tools to manage their agent teams and support contact center management objectives.

For mobile supervisors or supervisors who want to be more in tune with their team in the contact center, there is Cisco Mobile Supervisor, which allows supervisors to remain connected to real-time reporting information and monitor their teams from their mobile devices. Supervisors can view a subset of Cisco Supervisor Desktop reports, including a list of queues belonging to a selected team, the queue summary report for a selected queue, and agents belonging to a selected team or a queue, along with their current agent state. If a problem arises, the supervisor is connected, sees the problem, and can communicate with the team to adjust resources appropriately to meet or exceed customer satisfaction requirements.

The Cisco Unified Contact Center Express solution provides the real-time and historical data necessary for mission-critical contact center reporting. Real-time reports are provided at the supervisor level (integrated with the Cisco Supervisor Desktop) on a per-agent or per-team basis and also at the administration level, across the entire contact center.

The reporting function provides accurate and timely reports on contact center activity, helping managers make informed decisions regarding staffing levels, contact-handling procedures, and technology investments. Standard reporting templates provide automatically operational functions for common reporting needs. Custom reports can extend the standard reporting package to meet specific reporting needs. Furthermore, the open software architecture of Cisco Unified Contact Center Express allows for export of reporting data in a variety of formats.

g. Describe the group partitioning features and capabilities of the proposed solution.

**Response:**

The proposed solution utilizes the function of class of services to implement group partitioning features. Class of Service is implemented through calling search spaces and partitions in Cisco Unified Communications Manager. A partition comprises a logical grouping of Directory Numbers (DNs) and route patterns with similar reachability characteristics. Devices that are typically placed in partitions include DN and route patterns. These entities associate with DN that users dial. For simplicity, partition names usually reflect their characteristics, such as “NYLongDistancePT,” “NY911PT,” and so on.

A calling search space comprises an ordered list of partitions that users can look at before users are allowed to place a call. Calling search spaces determine the partitions that calling devices, including IP phones, softphones, and gateways can search when attempting to complete a call.

When a calling search space is assigned to a device, the list of partitions in the calling search space comprises only the partitions that the device is allowed to reach. All other DN that are in partitions that are not in the device calling search space receive a busy signal.

Partitions and calling search spaces address three specific problems:

- Routing by geographical location
- Routing by tenant
- Routing by class of user.

Partitions and calling search spaces provide a way to segregate the global dialable address space. The global dialable address space comprises the complete set of dialing patterns to which Cisco Unified Communications Manager can respond.

Partitions do not significantly impact the performance of digit analysis, but every partition that is specified in a calling device search space does require that an additional analysis pass through the analysis data structures. The digit analysis process looks through every partition in a calling search space for the best match. The order of the partitions that are listed in the calling search space serves only to break ties when equally good matches occur in two different partitions. If no partition is specified for a pattern, the pattern goes in the null partition to resolve dialed digits. Digit analysis always looks through the null partition last.

You can associate partitions with a time schedule and a time zone. Associating a partition to a time schedule and a time zone allows configuration of time-of-day routing for calls that are coming into a partition and the associated calling search spaces of the partition.

h. Describe the following telephony instruments included in the proposed solution:

i. Economy model IP telephone

**Response:**

The Cisco Unified IP Phone 6921 is an innovative endpoint that delivers affordable, business-grade voice communications and support for video communications services to customers worldwide.

The Cisco Unified IP Phone 6921 (**Figure 16**) supports two lines and offers a full-duplex speakerphone for a more productive, more flexible, and easier-to-use endpoint experience. The Cisco Unified IP Phone 6921 supports single-call per-line appearance, offering traditional telephony-like user experience for customers who seek this type of call interaction for their users. Fixed keys for hold, transfer, and conference; tri-color LED line and feature keys also make the phone simpler and easier to use.



**Figure 16. Cisco Unified IP Phone 6921 Offers Two Colors and Two Handset Style Options**

The Cisco Unified IP Phone 6921 offers greater personalization, with the choice of two colors and two handset style options. Right-to-left language presentation is also supported on the displays, addressing the language localization needs of global customers.

The Cisco Unified IP Phone 6921 is also more energy-efficient and eco-friendly, in support of customer green initiatives. A Deep-Sleep option provides energy savings. With this option, the Cisco Unified IP Phone 6921 consumes up to 50 percent less power in off-hours versus when the phone is idle during normal business hours. In addition, reground and recyclable plastics deliver a more earth-responsible solution.

With adoption of Cisco Unified Video Advantage 2.2 and later and the VTIII camera, you can elevate your communication experience with support for video communications. Your PC monitor provides support for the video communications while voice communications are supported by your IP Phone 6921 endpoint. **Table 7** lists the features and benefits of the Cisco Unified IP Phone 6921.

**Table 7. Cisco Unified IP Phone 6921 Features and Benefits**

<i>Feature</i>	<i>Benefit</i>
Lighted Hold Key	The key lights when pressed to put a call on hold and stays lit until the held call has been resumed, or flashes if one call is held while another is engaged; the key is dark when no calls are on hold.
Lighted Menu Key	The key lights when pressed to access voicemail messages, call logs, network settings, user preferences, corporate directories, and XML services; it stays lit while menu items are active.
Lighted Message Waiting Indicator	The key lights when there is new voicemail, and the light is visible on both the phone chassis and the handset; it stays lit until you process your new voicemail.
Graphical Display	A 396 x 81 pixel-based, anti-glare, monochrome display with white backlight provides scrollable access to calling features and text-based XML applications.
Deep-Sleep Option	Power savings can be recognized by cycling power by time of day and day of week.
Co-Branding	Co-Branding button allows customers to include their logo on the Cisco Unified IP Phone 6900 Series phones. Cisco has approved third-party vendors to produce the buttons.
Multiple-Language Support	The following languages are supported: <ul style="list-style-type: none"> <li>■ Arabic (Arabic area)</li> <li>■ Bulgarian (Bulgaria)</li> <li>■ Catalan (Spain)</li> <li>■ Chinese (China)</li> <li>■ Chinese (Hong Kong)</li> <li>■ Chinese (Taiwan)</li> <li>■ Croatian (Croatia)</li> <li>■ Czech (Czech Republic)</li> </ul>

<i>Feature</i>	<i>Benefit</i>
	<ul style="list-style-type: none"> <li>■ Danish (Denmark)</li> <li>■ Dutch (Netherlands)</li> <li>■ English (United Kingdom) (Prompts only)</li> <li>■ Estonian (Estonia)</li> <li>■ French (France)</li> <li>■ Finnish (Finland)</li> <li>■ German (Germany)</li> <li>■ Greek (Greece)</li> <li>■ Hebrew (Israel)</li> <li>■ Hungarian (Hungary)</li> <li>■ Italian (Italy)</li> <li>■ Japanese (Japan)</li> <li>■ Latvian (Latvia)</li> <li>■ Lithuanian (Lithuania)</li> <li>■ Korean (Korea Republic)</li> <li>■ Norwegian (Norway)</li> <li>■ Polish (Poland)</li> <li>■ Portuguese (Portugal)</li> <li>■ Portuguese (Brazil)</li> <li>■ Romanian (Romania)</li> <li>■ Russian (Russian Federation)</li> <li>■ Spanish (Spain)</li> <li>■ Slovak (Slovakia)</li> <li>■ Swedish (Sweden)</li> <li>■ Serbian (Republic of Serbia)</li> <li>■ Serbian (Republic of Montenegro)</li> <li>■ Slovenian (Slovenia)</li> <li>■ Thai (Thailand)</li> <li>■ Turkish (Turkey).</li> </ul>
Speakerphone	Full-duplex speakerphone allows for flexibility in placing and receiving calls.
Headset Support	RJ9 interface to optional headset allows customers to enjoy additional options for place and receiving calls.
Four Softkey Buttons and a Scroll Toggle Bar	Your calling options are dynamically present; the scroll toggle bar allows easy movement through the displayed information.
Network Features	Network features include Cisco Discovery Protocol and IEEE 802.1 p/q tagging and switching.
Ethernet Switch	The phone has a 10/100BASE-T Ethernet connection



<i>Feature</i>	<i>Benefit</i>
	through two RJ-45 ports, one for the LAN connection and the other for connecting a downstream Ethernet device such as a PC.
Volume Control	A volume-control toggle provides easy decibel-level adjustments of the handset, monitor speaker, and ringer.
Dual-Position Foot Stand	The display is easy to view and the buttons and keys are easy to use; you can remove the foot stand for wall mounting, with mounting holes located on the base of the phone.
Multiple Ring Tones	The phone offers seven user-adjustable ring tones.
American Disabilities Act (ADA) Features	The Hearing-Aid-Compatible (HAC) handset meets the requirements set by the ADA; it also meets ADA HAC requirements for a magnetic coupling to approved hearing aids. The phone dialing pad also complies with ADA standards.
Signaling Protocol Support	The phones are supported in Cisco Unified Communications Manager and Cisco Unified Communications Manager Business Edition Versions 7.1.2 and later using Skinny Client Control Protocol (SCCP).
Codec support	G.711a, G.711, G.729a, G.729b, and G.729ab audio-compression codecs are supported.
Voice quality	Comfort-noise generation and Voice-Activity-Detection (VAD) programming is provided on a system basis.
Video Communications	Requires Cisco Unified Video Advantage 2.2 and the VTIII camera for support.

For additional information, please see the Cisco Unified IP Phone 6921 Data Sheet provided as Additional Material with this response.

- ii. Advanced model IP telephone

**Response:**

The Cisco Unified IP Phone 7965G (**Figure 17**) demonstrates the latest advances in VoIP telephony, including wideband audio support, backlit color display, and an integrated Gigabit Ethernet port. It addresses the needs of the executive or major decision maker, administrative assistants, and those working with bandwidth-intensive applications on collocated PCs. This IP phone includes a large, backlit, easy-to-read color display (**Figure 18**) for easy access to communication information, timesaving applications, and features such as date and time, calling party name, calling party number, digits dialed, and presence information. It also accommodates Extensible Markup Language (XML) applications that take advantage of the display. The phone provides direct access to six telephone lines (or combination of lines, speed dials, and direct access to telephony features), four interactive soft keys that guide you through call features and

functions, and an intuitive four-way (plus Select key) navigation cluster. A hands-free speakerphone and handset designed for high-fidelity wideband audio are standard, as is a built-in headset connection.



1216p011/a

**Figure 17. Cisco Unified IP Phone 7965G**



1193p008/a

**Figure 18. Close-Up of Display and Lighted Line Keys**

The Cisco Unified IP Phone 7965G is designed to grow with your organization and enhancements to your system capabilities. The dynamic feature set allows the phone to keep pace with your requirements through regular software updates. Firmware changes can be downloaded from Cisco.com. No hands-on moves and changes are required with the phone—you can simply pick up the phone and move to a new location anywhere on your network. The Cisco Unified IP Phone 7965G also provides many accessibility features. **Table 8** lists the phone's features.

**Table 8. Cisco Unified IP Phone 7965G Features**



<b>Feature</b>	<b>Description/Benefit</b>
Display	5-inch (12.5 cm) graphical TFT color display, 16-bit color depth, 320 x 240 effective pixel resolution, with backlight. Allows for greater flexibility of features and applications, and significantly expands the information viewed when using features such as Services, Information, Messages, and Directory. Display also supports localization requiring double-byte Unicode encoding for fonts.
Wideband Audio	Support for wideband (G.722 codec, adherence to TIA 920), including handset, headset, and speakerphone.
Codec Support	G.711a, G.711 $\mu$ , G.729a, G.729ab, G.722, and iLBC audio compression codecs are supported.
Speakerphone	Full-duplex speakerphone with acoustic echo cancellation.
Messages Key	Provides direct access to voicemail.
Directories Key	Ready access to missed, received or placed calls (plus intercom history and directories). Incoming messages are identified and categorized on the display, allowing users to quickly and effectively return calls using direct dial-back capability. Corporate directory integrates with the Lightweight Directory Access Protocol Version 3 (LDAP3) standard directory.
Settings Key	Allows user to adjust display brightness, select background images (if available), and select ringer sounds through the User Preference menu. Network Configuration preferences also can be set up (usually by the system administrator). Configuration can be set up either automatically or manually for Dynamic Host Control Protocol (DHCP), Trivial File Transfer Protocol (TFTP), Cisco Unified Communications Manager, and backup Cisco Unified Communications Manager instances. Other available Settings submenus include Device Configuration, Security Configuration, and Model Information.
Services Key	Allows users to quickly access diverse information such as weather, stocks, quote of the day, or any Web-based information using XML.
Help Button	Online Help gives users information about the phone keys, buttons, and features.
Speakerphone, Mute, and Headset Buttons	Speakerphone includes Speaker On/Off, Microphone Mute, and Headset buttons that are lit when active. For added security, the audible DTMF tones are masked when the speakerphone mode is used.
Navigation Cluster with 'Select' Button	Four-way navigation cluster allows users to scroll vertically and horizontally. At the center of the cluster is a 'Select' button that can be used for selection of an in-focus item (for example, to open an underlying menu).
Display Button	Indicates when phone is in power-saving sleep/inactivity mode (button is lit), and can be used to awaken the display. Inactivity period is configured by the system administrator.

<i>Feature</i>	<i>Description/Benefit</i>
Ethernet Switch	Internal 2-port Cisco Ethernet switch allows for a direct connection to a 10/100/1000 BASE-T Ethernet network through an RJ-45 interface with single LAN connectivity for both the phone and a co-located PC. System administrator can designate separate VLANs (802.1Q) for the PC and phone, providing improved security and reliability of voice and data traffic.
Headset Port	Dedicated headset port eliminates the need for a separate headset amplifier and allows the handset to remain in its cradle, making headset use simpler. Both wideband (G.722) and narrowband headsets are supported.
Volume Control	Provides easy decibel-level adjustments for the speakerphone, handset, headset, and ringer. The handset is HAC. Additional volume control gain can be achieved using an inline headset amplifier.
Adjustable Foot-Stand	Stand is adjustable from flat to 60 degrees to provide optimum display viewing and comfortable use of all buttons and keys. The foot stand is keyed to match standard wall-jack configurations for wall mounting. Optional wall-mount brackets are also offered.
Expansion Module Support	An optional add-on module, the Cisco Unified IP Phone Expansion Module 7914, provides 14 additional buttons for programming directory numbers or speed dials. Up to two expansion modules may be used.
Multiple Ring Tones	More than 24 defined user-selectable ring tones are available. Ring tones may also be personalized through use of the Cisco Unified Phone Application Suite.
Americans with Disabilities Act (ADA) Features	Handset is hearing aid-compatible and meets Federal Communications Commission (FCC) loudness requirements for the Americans with Disabilities Act (ADA). Section 508 loudness requirements can be achieved using industry-standard inline handset amplifiers such as Walker Equipment W-10 or CE-100 amplifiers. Dial pad is also ADA-compliant.
Quality of Service (QoS) Options	Supports Differentiated Services Code Point (DSCP) and 802.1Q/p standards.
Security	Positive device identity through X.509v3 Certificates, digitally signed images, cryptographically secure provisioning, and secure signaling and secure media with AES-128. The phone also contains an 802.1X supplicant and supports EAPOL pass-through.
Language Support	Built-in support for more than 30 languages (dependent on Cisco Unified Communications Manager version).
Configuration Options	IP address assignment can be statically configured or configured through the DHCP client.

For additional information, please see the Cisco Unified IP Phone 7965G Data Sheet provided as Additional Material with this response.

iii. Executive model IP telephone

**Response:**

The Cisco Unified IP Phone 9971 (**Figure 19**) is an advanced collaborative media endpoint that provides voice, video, applications, and accessories. Highlights include interactive multiparty video, high-resolution color touch screen display, High-Definition (HD) voice, desktop Wi-Fi connectivity, Gigabit Ethernet and a new ergonomic design and user interface designed for simplicity and high usability. Accessories, sold separately, include the Cisco Unified Video Camera and the Cisco Unified IP Color Key Expansion Module.



**Figure 19. Cisco Unified IP Phone 9971**

Key attributes of the Cisco Unified IP Phone 9971 include:

- Newly developed ergonomic design and user experience designed specifically for use with the high-resolution, VGA, graphical, backlit, anti-glare, color touch-screen display
- H.264 video support for two-way standard-definition calling with USB support for the Cisco Unified Video Camera (Note: Multiparty video communications supported with Multipoint Control Unit)
- Choice of 802.11 a/b/g desktop Wi-Fi connectivity or Gigabit Ethernet network connectivity and switch port available for a downstream PC
- Embedded Bluetooth radio and 2 USB ports for added freedom and convenience, with support for both wireless and wired headsets
- Firmware support for XML and MIDlet-enabled applications.

Features and benefits of the Cisco Unified IP Phone 9971 are listed in **Table 9**.

**Table 9. Cisco Unified IP Phone 9971 Features and Benefits**

<i>Feature</i>	<i>Benefits</i>
<i>Hardware</i>	

<i>Feature</i>	<i>Benefits</i>
Industrial design	The phone offers a highly usable and intuitive arrangement of lines, features, and calls. Transfer, Conference, and Hold appear on hard keys to reduce the number of presented softkeys to a maximum of four per call state.
Customization	You can order this model in arctic white or charcoal gray. Handsets are available internationally as slimline (140g) or standard (170g), and you can mix and match them in your work environment to enable a feeling of customization and ownership among your team.
Display	The phone delivers VGA presentation for calling, video calling, and applications, in addition to a 5.6-inch (14-cm) graphical TFT color touch-screen display, 24-bit color depth, 640 x 480 effective pixel resolution, and backlighting. The display also supports localization, requiring double-byte Unicode encoding for fonts.
Ethernet	An internal 2-port Cisco Ethernet switch allows for a direct connection to a 10/100/1000BASE-T Ethernet network through an RJ-45 interface with single LAN connectivity for both the phone and a co-located PC. The system administrator can designate separate VLANs (802.1Q) for the PC and phone, providing improved security and reliability of voice and data traffic.
Desktop Wi-Fi Ethernet	As an alternative to wired Ethernet, this model supports an onboard Wi-Fi radio and antenna that enables connectivity to Wi-Fi access for greater Return on Investment (ROI) with a voice-enabled Cisco Unified Wireless Network.
Bluetooth	Mobility is possible for headset users within 10m/30 feet of their desktop, so you can go to the printer, a colleague's desk, or nearby private location while on a call.
USB	Two USB ports increase the usability of call handling and applications by enabling accessories such as the Cisco Unified Video Camera, and USB wired headsets.
External audio ports	General-purpose audio-in and audio-out ports enable a relaxed speakerphone experience over external speakers and the microphone.
Six lines expanding to 114 with 3 key expansion modules	The phone offers many speed dials and programmable features, so you can follow the activity of many lines. Up to 200 calls per device are supported.
Buttons	<ul style="list-style-type: none"> <li>■ Six feature buttons with state-indicating LEDs</li> <li>■ Six call-session buttons with state-indicating LEDs</li> <li>■ Applications, Directories, and Voicemail</li> </ul>

<i>Feature</i>	<i>Benefits</i>
	<ul style="list-style-type: none"> <li>■ Conference, Transfer, and Hold</li> <li>■ Volume Up or Down</li> <li>■ Back-lit Mute, speakerphone, and headset [[stet caps if these are actual button names]]</li> <li>■ Back, End Call, and 5-way navigation pad [[stet caps if this is actual button name]]</li> </ul>
Industrial design	The phone offers a highly usable and intuitive arrangement of lines, features, and calls. Transfer, Conference, and Hold appear on hard keys to reduce the number of presented softkeys to a maximum of 4 per call state.
<i>Accessories</i>	
Cisco Unified IP Color Key Expansion Module	Available separately, the IP Color Key Expansion Module easy expansion and advanced use of lines, speed dials, and features.
Cisco Unified Video Camera	Available separately, the camera enables two-way video calling between phones or to a media conference unit.
Headset support	Off-the-shelf Bluetooth and USB headsets are supported. You can use your own Bluetooth headset that you use for your cell phone or smartphone. HD voice analog headset support is also provided through a dedicated RJ-9 headset port on the back of the phone.
<i>Firmware</i>	
New user experience	Advanced organization of lines, speed dials and programmable features separate from call appearances. Great for those who make few calls per day, and even for those who handle dozens of calls per hour.
Session Initiation Protocol (SIP) signaling	SIP interoperation with the call-control and partner applications enables a rich unified communications experience.
Application support	XML and MIDlet-enabled applications are provided by Cisco application development partners or customers' own development staff.

For additional information, please see the Cisco Unified IP Phone 9971 Data Sheet provided as Additional Material with this response.

iv. Economy model digital TDM telephone

**Response:**

Cisco is not proposing any digital sets as part of the solution.

v. Advanced model digital TDM telephone

**Response:**

Cisco is not proposing any digital sets as part of the solution.

vi. Executive model digital TDM telephone

**Response:**

Cisco is not proposing any digital sets as part of the solution.

i. Indicate with a 'YES' or a 'NO' whether all telephone instruments included in the proposed solution are manufactured in accordance with the FCC's hearing aid compatibility technical standards contained in Section 68-316 of the Telecommunications Act of 1996.

**Response:**

Yes. The Cisco phones comply with FCC Part 68 (CFR 47) (Hearing Aid Compatibility [HAC]) to support hearing aids that contain tele-coils.

j. Describe the hardware and software components available in the proposed solution that facilitate connectivity to the PSTN.

**Response:**

Cisco access gateways enable Cisco Unified Communications Manager (Unified CM) to communicate with non-IP telecommunications devices. There are two types of Cisco access gateways, analog and digital.

There are two categories of Cisco access analog gateways, trunk gateways and station gateways.

- Access analog station gateways
  - Analog station gateways connect Unified CM to Plain Old Telephone Service (POTS) analog telephones, Interactive Voice Response (IVR) systems, fax machines, and voice mail systems. Station gateways provide Foreign Exchange Station (FXS) ports.
- Access analog trunk gateways
  - Analog trunk gateways connect Unified CM to PSTN Central Office (CO) or PBX trunks. Trunk gateways provide Foreign Exchange Office (FXO) ports for access to the PSTN, PBXs, or key systems, and E&M (recEive and transMit, or ear and mouth) ports for analog trunk connection to a legacy PBX. Whenever possible, use digital gateways to minimize any answer and disconnect supervision issues. Analog Direct Inward Dialing (DID) and Centralized Automatic Message Accounting (CAMA) are also available for PSTN connectivity.

A Cisco access digital trunk gateway connects Unified CM to the PSTN or to a PBX via digital trunks such as Primary Rate Interface (PRI), Basic Rate Interface (BRI), or T1 Channel Associated Signaling (CAS). Digital T1 PRI trunks may also be used to connect to certain legacy voicemail systems.

All gateways in the proposed solution for both analog and digital access are Cisco 2900 or 3900 series ISR routers with appropriate analog or digital interface cards for connectivity into the PSTN. These gateways all run Cisco IOS with an appropriate voice license. These gateways have been positioned in each of the existing switching centers and in remote locations.

k. Describe the SIP trunking capabilities of the proposed solution.



## Response:

Cisco has positioned the existing digital gateways as Cisco Unified Border Element devices in order to facilitate SIP Trunking. Cisco Unified Border Element is a feature set that exists on the voice IOS license allowing for gateways to terminate analog, digital or SIP calls.

Using a SIP trunk for connecting to PSTN and other destinations outside the enterprise involves an IP-to-IP connection at the edge of the enterprise's VoIP network. The same functions traditionally fulfilled by a TDM gateway are still needed at this interconnect point, including demarcation, call admission control, ensuring QoS, a troubleshooting boundary, security checks, and so forth. For SIP trunking connections, the Cisco Unified Border Element fulfills these functions as a Session Border Controller (SBC) at the interconnect point between the enterprise and the service provider network. Cisco Unified Border Element also performs protocol translation functions to interconnect H.323 and SIP equipment, or to interconnect SIP equipment using different variations of SIP implementations. Cisco Unified Border Element can also perform transcoding. If used for one of these functions, Cisco Unified Border Element may also be used internal to the enterprise network at interconnect points between equipment that cannot interoperate without a protocol translation or transcoding service.

The Cisco Unified Border Element is an intelligent, unified communications network border element. In addition to other Cisco IOS Software features, the Cisco Unified Border Element includes SBC functions that help enable end-to-end, IP-based transport of voice, video, and data between independent unified communications networks. SBCs are critical components for scaling unified communications networks, enabling them to grow from IP islands within a single customer network to an end-to-end IP community. One of the most significant uses of the Cisco Unified Border Element is to allow call control elements such as Cisco Unified Communications Manager to connect to service provider Session Initiation Protocol (SIP) trunks for Public Switched Telephone Network (PSTN) access offerings, generally known as SIP trunks.

Cisco IOS Software helps enable the simultaneous operation of the following:

- **Cisco Unified Border Element:** An application that terminates and re-originates both signaling (H.323 and SIP) and media streams (Real-Time Transport Protocol [RTP] and RTP Control Protocol [RTCP]) while performing border interconnection services between IP networks.
- **Cisco IOS Software H.323 Gatekeeper:** An application that acts as the point of control for a variety of voice and video components that can be attached to an IP network (such as IP telephony devices, IP-PSTN gateways, H.323 videoconferencing endpoints, and H.323 multipoint control units) while facilitating build-out of large-scale multimedia service networks.
- **Cisco TDM Gateway:** An application that allows Time-Division Multiplexing (TDM) switching between TDM interfaces or TDM-to-IP interfaces.

The Cisco Unified Border Element provides numerous functions and services when interconnecting IP networks. Generally, these functions can be categorized into four basic types:

- Session management, the capability to count and manage the number of sessions flowing through a router
- Interworking, the capability to interconnect different signaling methods and variants



- Demarcation, the capability to act as a distinct demarcation point between the two networks
- Security, the capability to act as a Layer 7 device that intelligently allows or disallows traffic between networks.

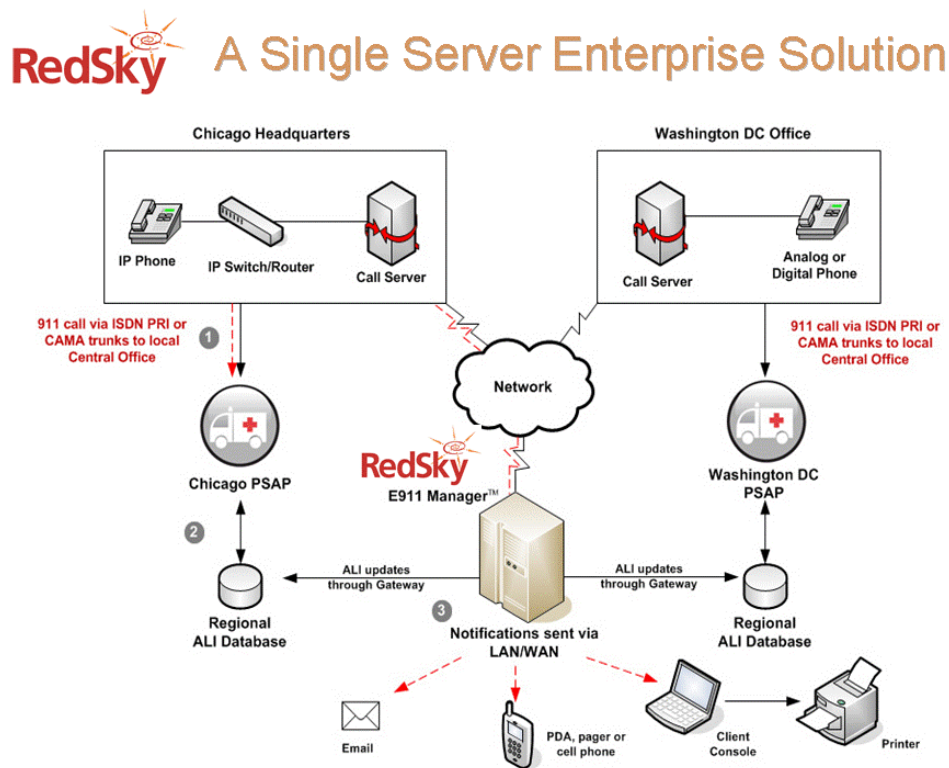
The Cisco Unified Border Element supports VoIP protocols such as H.323 and SIP. Video is also supported for both H.323 and SIP.

I. Describe the E911 capabilities and features of the proposed solution.

**Response:**

E911 Manager helps to ensure that firemen, police and paramedics have accurate location information and can find those in distress when responding to emergency calls initiated from a multi-line telephone system. E911 Manager automatically interfaces to each UCM Cluster on your network to systematically capture station location information and update the regional ALI databases in a timely manner.

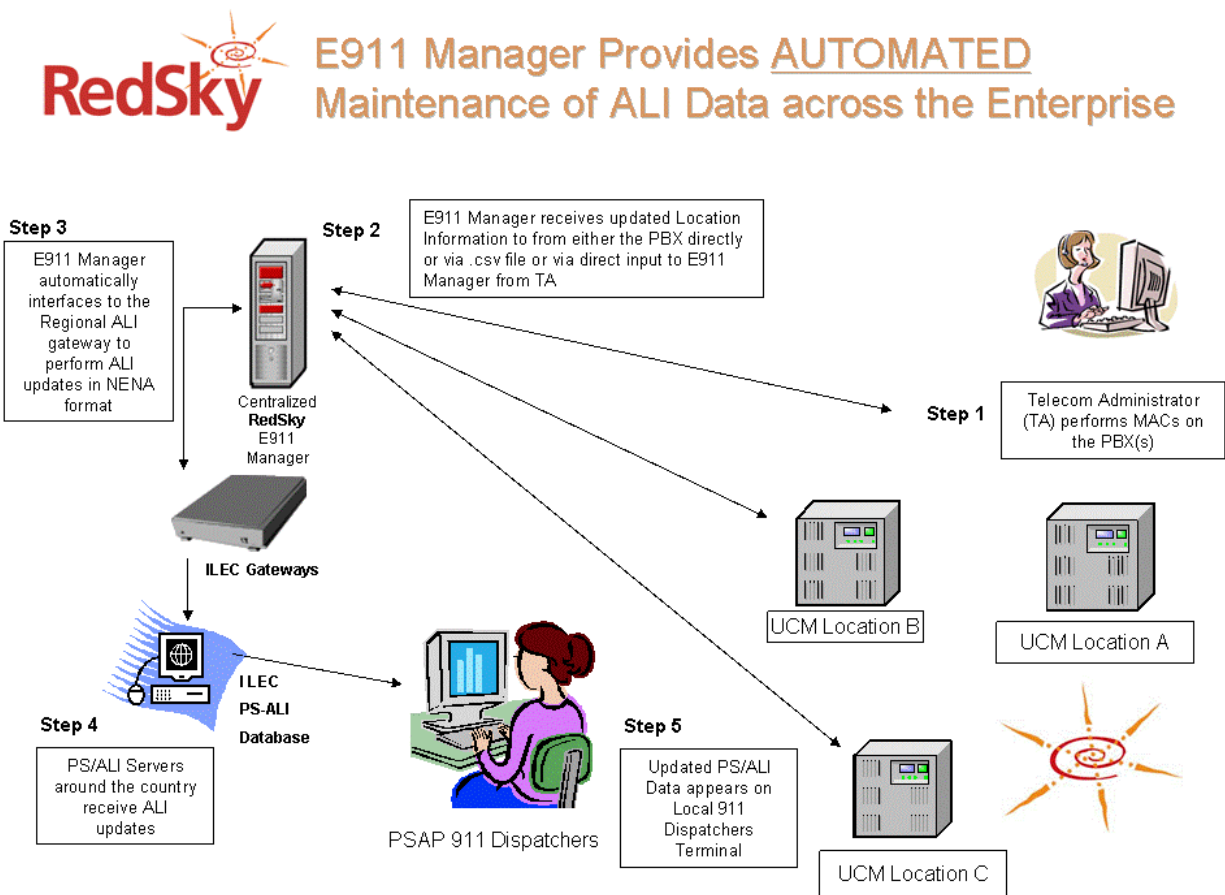
E911 Manager is a centralized server that interfaces with multiple call servers to capture, manage and deliver location information for traditional and IP endpoints. The diagram below depicts how E911 Manager interfaces with multiple switches across the country and multiple regional ALI database providers.



**Figure 20. E911 Manager**

E911 Manager provides documented proof that location records were transferred and accepted into the local ALI database. E911 Manager also logs all other important events including all 911

calls, time of notification of a 911 call, time of acknowledgement of a 911 call. Scheduled tasks can be created to automatically distribute logs and reports by email.



**Figure 21. E911 Manager ALI Data**

#### Automated

- Fully automated to ensure every move, add and change is updated in the regional ALI database.
- Optional Emergency On-site Notification (EON) feature notifies on-site security immediately of the location of a 911 caller to improve internal response times

#### Reliable

- Tasks can be scheduled to occur automatically and personnel can be notified via email to identify and correct any errors or warnings
- E911 Manager updates ALI information with the proper database before the 911 call is made – completion of the 911 call is not dependent on the E911 Manager server

#### Scalable

- Central administration talks to hundreds of call server/UCM and multiple regional ALI databases to facilitate continuous ALI updates and database synchronization

- Location tracking and identification for thousands of traditional and IP end-points is executed from a single server

### Cost Effective

- Streamlines processes through automation and scalability
- Easily migrated from existing systems to IP telephony or both

### Task Scheduler

When properly configured, E911 Manager runs automatically in the background, handling all necessary tasks, so administrators can focus on other tasks. The Task Scheduler is powerful feature that allows you to configure E911 Manager to perform routing tasks and notify administrators that tasks are completed. Administrators can schedule dozens of tasks and reports as well as set email alarm notifications if tasks cannot e completed.

### Reports and Logs

E911 Manager protects the enterprise by logging all E911 location activity, documenting the enterprise’s honest effort to determine locations and protect employees. E911 Manager’s log files document all location record activity particularly the transfer of ALI records to the local RBOC and LEC ALI databases.

### Automated ALI Interfaces

E911 Manager features automated interfaces to all RBOC and LEC ALI databases in the USA. These interfaces allow E911 Manager to perform ALI record updates to the RBOC and LEC ALI databases automatically, without user intervention. E911 Manager automatically synchronizes the latest moves, adds and changes to your voice network with the regional ALI database so all your locations are made available to your local PSAP.

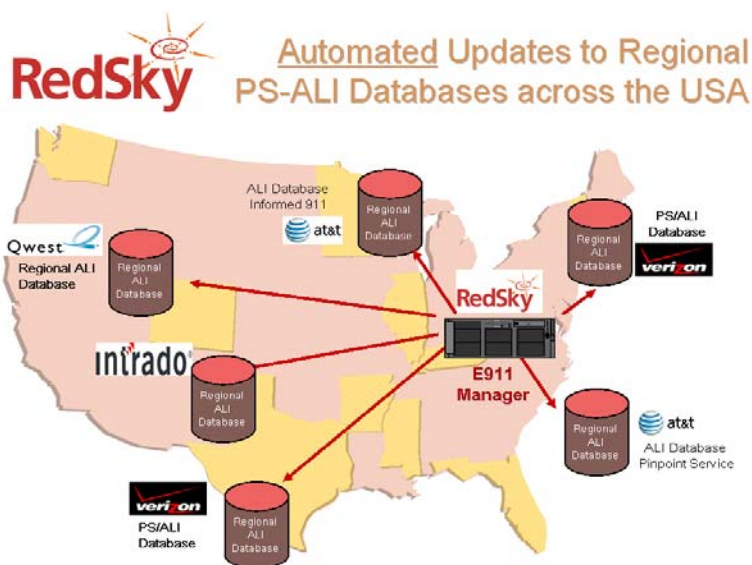


Figure 22. ALI Database

m. Indicate with a 'YES' or a 'NO' whether the proposed solution is capable of supporting dialing 911 without an access code.

**Response:**

Yes.

n. Indicate with a 'YES' or a 'NO' whether the proposed solution is CALEA-compliant.

**Response:**

Yes, our proposed solution supports CALEA compliant.

o. Describe the features and capabilities of the proposed solution related to CALEA compliance.

**Response:**

**Cisco Adaptive Security Appliance**

***TLS Proxy***

The Cisco ASA allows for two voice services to be deployed that offer distinct functionality when deployed in a Cisco Unified Communications in a Cisco environment.

The transparent LAN services (TLS) Proxy allows for firewall services to be implemented in a Cisco voice environment where encryption is deployed. When deployed in front of Cisco Unified Communications Manager, the TLS Proxy, proxies TLS and encrypted media traffic between the Cisco IP phone and Cisco Unified Communications Manager.

This proxy capability allows for inspection of both the signaling and media traffic. In addition, the firewall can become an insertion port for call recording and Communications Assistance for Law Enforcement Act (CALEA) compliance.

p. Describe how the proposed solution will, at a minimum, support a common dialing plan, bi-directional calling number delivery, supervised call transfers, and voice message forwarding with subscribers serviced from the legacy Siemens/ROLM PBX and PhoneMail systems.

**Response:**

The proposed solution could integrate into the Siemens/ROLM PBX and PhoneMail environment in several ways. The final solution will be dependent on agreement between all parties as to exactly how the migration will take place. At a minimum, the Cisco solution will use one of the proposed gateways to trunk into the existing ROLM PBX. The proposed solution can facilitate this integration through a PRI interface or a Q-SIG interface for passing of Calling Name, Calling Number, and Supervised Call Transfers to voicemail.

The Cisco Communications Manager can use the Calling Search Space and Partitioning functions described above to facilitate partitioning-off a portion of the dial plan so that the proposed solution can operate seamlessly as part of the dial plan. The proposed solution can also serve as a node off the ROLM PBX and an access code can be used as part of the dial plan to reach users on the system.

q. Describe the hospitality features and capabilities of the proposed solution.

**Response:**

The proposed solution does not natively support any specific hospitality features; however, it does integrate into existing hospitality applications.

r. Describe the capabilities of the proposed solution to support leveraging Virginia Tech's existing Open LDAP and Active Directory enterprise directories.

**Response:**

The proposed solution supports integration into both Open LDAP and Microsoft's Active Directory. There are three key elements to the integration. The first element is IP phone access to directories. The proposed solution supports IP phones accessing either Active Directory or Open LDAP through an XML interface. This access is specific for access to phone book applications.

The second element is for synchronization of users within a directory with users within the proposed solution. Synchronization is specifically for keeping usernames and phone numbers online with a centralized repository so that they will only have to be maintained in one centralized system.

The third element is integration for purposes of authentication to either Active Directory or Open LDAP. The proposed solution supports user authentication with either directory services for user name and password. User PINs for TUI access are still maintained locally to the proposed solution.

Please refer to the LDAP Directory Integration document provided as Additional Material with this response. This document details the specific integration points and features of the proposed solution.

s. Describe the capabilities of the proposed solution to support leveraging Virginia Tech's existing Exchange enterprise messaging system.

**Response:**

Virginia Tech's existing Exchange enterprise messaging system can be leveraged with the proposed Cisco Unity Connection messaging solution in a number of ways.

**Integrated Messaging**

Integrated Messaging uses IMAP or Secure IMAP (SSL) to allow access from an Outlook client to voice messages stored on Cisco Unity Connection. This integrated messaging approach allows users to read, reply, and forward messages. An optional component plug-in for Outlook called Unity Connection ViewMail allows users to additionally record messages from Outlook.

**RSS**

Outlook version 2007 and beyond, the RSS functionality can be used to retrieve voice messages.

**Calendar and Contacts**

Exchange 2007 and beyond, you can integrate Cisco Unity Connection to provide users the ability to review upcoming meetings by phone and import contacts to be used with personal call transfer rules and voice dialing.

## Connect Directly to the Experts at Cisco TAC

Cisco SMARTnet Service connects you directly to the Cisco TAC, staffed by Cisco professionals certified in a broad range of Cisco foundational and advanced technologies (see **Table 12**). The Cisco TAC employs a sophisticated system that automatically routes your service request to the appropriate technology team and automatically escalates your case to the next level of support if it is not resolved within a specified timeframe.

The Cisco TAC is available 24 hours a day, 365 days a year around the world, with support available in local languages. If your assigned TAC engineer changes for any reason before your service request is resolved, a personal handoff is completed between all parties to provide service continuity through issue resolution. You can interact with Cisco TAC engineers in a way that is most convenient and useful for you, including email, telephone, Web-based collaboration, and even a state-of-art, face-to-face discussion using Cisco WebEx collaboration. Live chat is ready to help you through a service request submission, and online video collaboration is the perfect option for a virtual troubleshooting session.

To confirm the right remediation action, Cisco engineers can test solutions in a laboratory environment that simulates your network. These simulation labs are equipped with Cisco device and technology solutions so that an engineer can accurately mirror a customer IT configuration to make sure a proposed solution will solve your problem. Throughout a TAC engagement, the goal of every Cisco engineer is to use the best resources at hand to solve your issues and empower your staff through active knowledge transfer.

**Table 12. Cisco Technical Assistance Center**




<i>Technical Support</i>	
Number of CCIE Certified TAC Engineers	<ul style="list-style-type: none"> <li>■ 1,590</li> </ul>
Average Experience	<ul style="list-style-type: none"> <li>■ 5 to 10 years experience in customer solutions, including MPLS core, VPN applications, metro Ethernet, security, broadband triple play, and video</li> </ul>
Number of Global Service Requests	<ul style="list-style-type: none"> <li>■ 2,700+ daily (1,000,000 per year)</li> </ul>
Global TAC Locations	<ul style="list-style-type: none"> <li>■ Four 24-hour support locations in San Jose, California, USA; Raleigh, North Carolina, USA; Brussels, Belgium; and Sydney, Australia</li> <li>■ Satellite sites in China, Japan, Korea, Brazil, Mexico, and the USA</li> <li>■ Outsourced TAC locations include: Amman, Jordan; Budapest, Hungary; Haryana, India; Manila, Philippines; Mexico City, Mexico; and San Jose, Costa Rica</li> </ul>



Cisco TAC consistently receives high customer satisfaction ratings, as well as industry recognition and awards. Cisco technical service is consistently ranked among the best by independent surveys and analysts, including the Walker Survey and the Yankee Group.

**Table 13** shows TAC certifications and awards.

**Table 13. Industry-Recognized High-Quality Technical Service**

<i>Awards</i>	
	<p><b>2008 STAR Award for Best Practices</b></p> <p>Cisco Services earned two STAR Awards for Best Practices in 2008, sponsored by the Service and Support Professionals Association (SSPA). These awards for Best Practices recognize companies for developing, implementing, and benchmarking the most innovative and efficient processes for service and support delivery. Cisco was awarded in both the Service Delivery Optimization category for its best practices in the Cisco Technical Assistance Center service technology development and support delivery methodology and the Customer Commitment category for the Cisco TAC customer feedback process that allows Cisco to implement tangible changes in support practices to directly improve the customer experience.</p>
	<p><b>VARBusiness Annual Report Card</b></p> <p>Cisco rates highest in “post-sales support” and “quality of tech support” in the areas of Security Appliances, Security Software, and Voice over IP (VoIP) in their 2006 VARBusiness Annual Report Card.</p>
	<p><b>Kepner-Tregoe</b></p> <p>Cisco Technical Services, Asia Pacific team has been awarded with a 2006 Kepner-Tregoe (KT) International Rational Process Achievement Award for Organizational Use of Process. Their winning entry chronicled how KT processes have been embedded in the organization, exceeding targeted goals.</p>

d. Describe the remote monitoring, diagnostic, and problem resolution applications, resources, and technology available to support the proposed solution.

**Response:**

Cisco Unified Communications Manager provides a rich feature set for monitoring, diagnostic, and problem resolution.

**Monitoring:**

- Performance-monitoring SNMP statistics from applications to SNMP manager or to operating system performance monitor.
- Real-Time trace monitoring.



- **Analysis Manager:** Analysis Manager is a feature of the Cisco Unified Communications Manager Real-Time Monitoring Tool (RTMT) that allows RTMT to provide solution-level diagnostic features for other Cisco Unified Communications applications.
- All system management activities – for example, disk-space monitoring, system monitoring, and upgrades – are controlled through the GUI. Because onboard agents are no longer supported on the appliance, all Cisco Unified Communications Manager management interfaces are enhanced to allow tight integration with third-party applications.

#### Administration and debug utilities:

- Prepackaged alerts, monitor views, and historical reports with RTMT
- Real-time and historical application performance monitoring through operating system tools and SNMP
- Monitored data-collection service
- Remote terminal service for off-net system monitoring and alerting
- Real-time event monitoring and presentation to common syslog
- Trace setting and collection utility
- Browse to onboard device statistics
- Cluster wide trace-setting tool
- Trace collection tool
- SNMP is available to manage Cisco Unified Communications Manager, allowing managers to set and report traps on conditions that could affect service and send them to remote-monitoring systems.

#### **Cisco Unified Serviceability**

Cisco Unified Serviceability, an included Web-based troubleshooting tool, provides the following functionality:

- Saves alarms and events for troubleshooting and provides alarm message definitions.
- Saves trace information to various log files for troubleshooting.
- Monitors real-time behavior of components through the Cisco Unified Real-Time Monitoring Tool (RTMT).
- Generates Cisco Unified Communications Manager reports for Quality of Service, traffic, and billing information through Cisco Unified Communications Manager CDR Analysis and Reporting (CAR).
- Provides audit capability by logging any configuration changes to the Cisco Unified Communications Manager system by a user or as a result of the user action. This functionality supports the Information Assurance feature of Cisco Unified Communications Manager.
- Provides feature services that you can activate, deactivate, and view through the Service Activation window.
- Provides an interface for starting and stopping feature and network services.

- Generates and archives daily reports; for example, alert summary or server statistic reports.
- Allows Cisco Unified Communications Manager and Cisco Unity Connection to work as a managed device for SNMP remote management and troubleshooting.
- Monitors the disk usage of the log partition on a server.
- Monitors the number of threads and processes in the system; uses cache to enhance the performance of Cisco Unified Serviceability.

### **Quality Report Tool**

The Quality Report Tool (QRT), a voice-quality and general problem-reporting tool for Cisco Unified IP Phones, acts as a service that allows users to easily and accurately report audio and other general problems with their IP phone. QRT automatically loads with the Cisco Unified Communications Manager installation. As system administrator, you can enable QRT functionality by creating, configuring, and assigning a softkey template to associate the QRT softkey on a user IP phone. You can then create, customize, and view phone problem reports by using the QRT Viewer application.

### **Cisco Unified Analysis Manager**

The Cisco Unified Analysis Manager, a tool included with the Cisco Unified Real-Time Monitoring Tool (RTMT), is used to perform troubleshooting operations. When the Unified Analysis Manager is launched, it collects troubleshooting information from your system and provides an analysis of that information. You can use this information to perform your own troubleshooting operation or to send the information to Cisco Technical Assistance for analysis.

The Analysis Manager application is installed as an option when you install the RTMT software. The Analysis Manager interface is accessed from the RTMT main menu and quick launch channel.

Once it is installed, the application can identify the supported UC products and applications that you have in your system and troubleshoot call failures across these UC applications, collecting trace and log files.

The Unified Analysis Manager will support the following products:

- Cisco Unified Communications Manager
- Cisco Unified Contact Center Enterprise
- Cisco Unified Contact Center Express
- Cisco IOS Voice Gateways
- Cisco Unity Connection
- Cisco Unified Presence.

The three primary components of the Unified Analysis Manager interface are the following:

- Administration — The system component lets you import device and group configuration from an external file and provide a status of jobs run by the Unified Analysis Manager.
- Inventory — The inventory component is used to identify all of the devices in your system that can be accessed and analyzed by the Unified Analysis Manager.

- **Tools** — The tools component contains all of the functions that Unified Analysis Manager supports. This includes configuring traces settings, collecting logs, and viewing configurations.

e. Describe the regional field service organization available to provide on-site support for major system failures or disasters.

**Response:**

**DISYS Solutions Onsite Engineer**

DISYS Solutions will provide onsite one dedicated Sr. Voice Engineer to Virginia Tech for one year. This engineer will be in addition to the installation and support teams. This individual will provide support in addition to the Cisco SMARTnet offering as stated below.

**Support from DISYS Solutions Headquarters**

DISYS Solutions provides remote support from its Headquarters based in Chantilly, VA from 8am-6pm EST Monday to Friday. Telephone support of a Service Engineer is available 24x7x365. These engineering resources coordinate with Cisco and onsite DISYS Solutions resources for problem resolutions within the SLAs.

**Cisco Onsite Service Support (for critical components only)**

DISYS Solutions provides on-site support services for critical system failures within four hours. This support is provided through Cisco's SMARTnet offering provided in the Bill of Materials (BOM). Although Cisco will be providing the 4 hour onsite response, DISYS Solutions keeps a very close eye to make sure that Service Level Agreements (SLAs) are met by Cisco.

Cisco SMARTnet offerings provide 24x7x365 remote support. This support is included in our BOM. Your account team is well knowledgeable in SMARTnet replacement options and will assist in selecting the different types of hardware replacement options. Post award we will assist Virginia Tech in accessing Cisco's TAC center. Although Cisco will be providing the 24x7x365 remote support, DISYS Solutions keeps a very close eye to make sure that Service Level Agreements (SLAs) are met by Cisco.

The following paragraphs outline the processes for Cisco TAC engagement.

*Submit a Cisco Service Request*

- **S1 or S2 Service Requests:** for S1 or S2 issues, or if you do not have Internet access for S3 and S4 issues, contact the Cisco TAC by telephone to submit your service requests.
- **S3 or S4 Service Requests:** use the online Cisco TAC Service Request Tool to quickly submit S3 and S4 service requests: [www.cisco.com/techsupport/servicerequest](http://www.cisco.com/techsupport/servicerequest) (registered Cisco.com users with valid service contracts).

*Three Ways to Get Support*

- Email: [tac@cisco.com](mailto:tac@cisco.com)
- Online: [www.cisco.com/techsupport/servicerequest](http://www.cisco.com/techsupport/servicerequest)
- Phone Support: For a list of global contact numbers, go to:
  - [www.cisco.com/en/US/support/tsd\\_cisco\\_worldwide\\_contacts.html](http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html).

*Creating a Service Request Using the TAC Service Request Tool*

The fastest way to create S3 and S4 service requests and submit them to the TAC is to use the online TAC Service Request Tool.

What you will need:

- Your Cisco Service Contract Number
- Product Serial Number and Chassis Serial Number
- Product Model Number and its hardware configuration
- Physical location of the product
- Severity Level of the Issue (see definitions provided previously).

The following information will help expedite your case:

- Meaningful case title stating the problem accurately
- History of the problem
- Network topology and explanation
- Output from “show tech” command (if applicable) and all other relevant output
- Software versions and types of equipment
- Relevant syslog/tacac logs before the issue occurred.

Follow these steps:

- Go to [www.cisco.com/techsupport/servicerequest](http://www.cisco.com/techsupport/servicerequest).
- Describe your issue.
- After you describe your issue, the TAC Service Request Tool will recommend resources for an immediate solution.
- If your issue is not resolved using these automatic solutions, your service request will be assigned to a Cisco TAC engineer.
- At the bottom of the Query screen, you may leave case notes. Please document relevant case events such as business impact, even if they are not purely technical in nature.

#### *Status of Cisco Service Requests*

You can use the online Cisco TAC Service Request Tool to track progress or to update your service requests with notes and attached files. [www.cisco.com/techsupport/servicerequest](http://www.cisco.com/techsupport/servicerequest)

Status notations include the following:

- **Customer Updated:** A service request has been updated using the Cisco TAC Service Request Tool.
- **Customer Requested Closure:** You requested that the service request be closed.
- **Cisco Pending:** Your Cisco TAC engineer is currently investigating the issue. No workaround has been identified at this time.
- **Close Pending:** Your Cisco TAC engineer has provided you with a solution that will solve your issue. Contact the assigned engineer if the problem has not been solved.
- **Customer Pending:** Your Cisco TAC engineer has requested information from you and is waiting for your response. No workaround has been identified.

- **Release Pending:** Cisco Development Engineering is reviewing the issue for a code fix that would resolve the issue; however, the software release with the fix is not yet available.
- **Service Order Pending:** Your Cisco TAC engineer has sent you a hardware replacement.

g. Describe the procedures, processes, and personnel available to support the escalation of problems reported to the service organization.

**Response:**

The following escalation takes place from the time a ticket is created:

- ✓ A case is opened with problem description entered into a problem resolution database, and assigned to DISYS Solutions Phone Duty technician (Level 3 Expertise, see definitions below).
- ✓ Discuss and set priorities with customer in accordance with DISYS Solutions priority guidelines (Defined below in the priority level section).
- ✓ For in warranty items, DISYS Solutions will co-ordinate with the manufacturer on behalf of the customer to deliver support conforming to the service level agreements.
- ✓ Assign to available Network Engineer, based on type of problem and severity.
- ✓ Problem isolation and diagnosis with DISYS Solutions Network Engineer (Level of Expertise based on type of problem) call back, on-site visit (if necessary).
- ✓ Problem escalation to higher level (Defined below in escalation section).
- ✓ Test and ensure customer satisfaction regarding fix provided.
- ✓ Quality control check performed by customer service representative, to insure highest level of customer satisfaction after a call is completed.

We have four levels of response times as listed below. Once a service requests is entered into the Sage CRM, a priority level is assigned, depending on issue.

*Priority Response Times for Standard Hardware and Software Services*

Priority 1	P1 trouble calls are defined as a system outage that affects many employees and prohibits production. These calls must be acknowledged within 15 minutes and resolved within 2 - 4 hours.
Priority 2	P2 trouble calls are defined as a small-scale system outage affecting some employees and not the entire department or the enterprise. These calls must be acknowledged within 30 minutes and resolved within 8 hours. Department heads receive a one level escalation for trouble calls.
Priority 3	P3 trouble calls are defined as a system outage affecting one employee. These calls must be acknowledged within 2 working hours and resolved within 2 working days.
Priority 4	P4 trouble calls are defined as scheduled work that needs to be preformed. These calls must be acknowledged within 8 working hours and resolved within 2 weeks. An example of a priority 4 call is when DISYS Solutions replaces a broken printer with a loaner printer

	and we give the user back the fixed printer when the repair is complete.
--	--

**Table 15. Priority Level chart**

*Escalation Example for Priority 1*

Duration Since Call	Personnel Involved in Escalation Notification
<b>0 – 15 minutes</b>	DISYS Solutions Phone Duty Technician (Level 1 or 2 Expertise) and Manufacturer Call Center Service Technician
<b>1 hour</b>	DISYS Solutions Lead Technician (Level 3 or 4 Expertise) and Manufacturer Service Manager
<b>2 hours</b>	DISYS Solutions IT Manager and Manufacturer Operations Manager
<b>4 - 6 hours</b>	DISYS Solutions Director of Operations and Manufacturer Vice President of Technical Support
<b>8 hours</b>	DISYS Solutions COO
<b>24 hours</b>	Virginia Tech Contracting Officer, DISYS Solutions CEO, and Manufacturer President of Technical Support, and Manufacturer Local Channel Account Manager

**Table 16. Example of Priority Level escalation**

*Escalation List:*

Trouble escalation procedures names, titles, and contact information are provided below.

Elapsed Time	Name	Title	Contact Phone: (888-286-3896)
1 hour	Sivakumar Mahalingam	Senior Network Engineer	Sivakumar.Mahalingam@disyssolutions.com
2 hours	Lenu Philip	DISYS Solutions IT Manager	Lenu.philip@disyssolutions.com
4 hours	Vijay Soni	DISYS Solutions Director of Operations	Vijay.Soni@disyssolutions.com
8 hours	Vinu Luthra	DISYS Solutions COO	Vinu.Luthra@disyssolutions.com
24 hours	Atul Bhatia	DISYS Solutions CEO	Atul.Bhatia@disyssolutions.com

**Table 17. Escalation chart**

**Escalation**

If you feel that progress on your service request or the quality of Cisco Services is not satisfactory, Cisco encourages you to escalate the service request. You can do this by contacting the TAC and asking for the TAC duty manager. The phone numbers to contact your local Cisco TAC are available at: [http://www.cisco.com/en/US/support/tsd\\_cisco\\_worldwide\\_contacts.html](http://www.cisco.com/en/US/support/tsd_cisco_worldwide_contacts.html).

As part of ISO standards for escalation process workflow, email alerts are generated by the TAC trouble ticketing system, notifying the individuals listed in **Table 18** if no activity (update or status change) is recorded against a service request for the following periods. Severity 1 alert times are measured in calendar hours — 24 hours per day, 7 days per week. Severity 2 alert times corresponds with standard business hours.

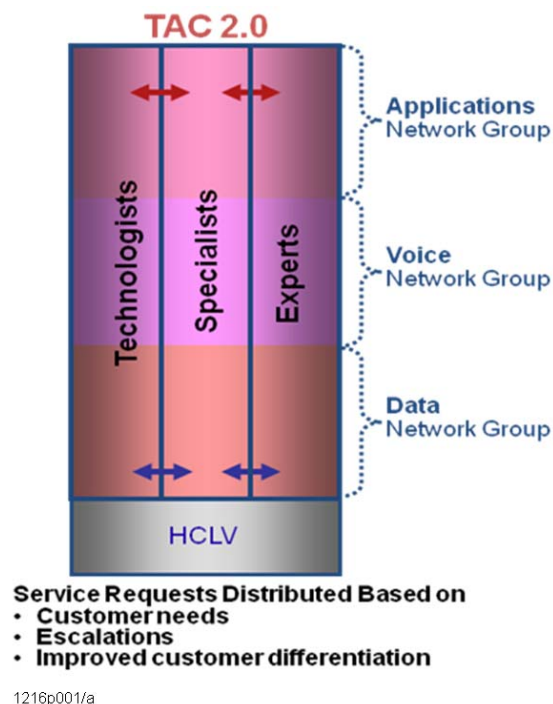
**Table 18. Automatic Email Alert Escalations for Cisco TAC Service Requests**

	<b>Severity 1 Network Down</b>	<b>Severity 2 Severe Impact</b>
1 Hour	TAC Manager	

4 Hours	TAC Director	TAC Manager
24 Hours	VP Customer Advocacy	TAC Director
48 Hours	President	VP Customer Advocacy
96 Hours		President

### TAC Response

The Cisco TAC model (as depicted in **Figure 11**) drives faster and better solutions by allocating Service Requests (SRs), or TAC cases on the basis of customer needs, time-based escalations, and improved customer differentiation. Cisco Systems Engineers (CSEs) or TAC engineers operate in well-defined technologist, specialist, and expert roles that are mutually supportive. The model also recognizes that a specific process should be used to handle High Complexity Low Volume (HCLV) SRs.



**Figure 26. Cisco TAC SR Distribution Model**

h. Provide an electronic copy, on either a flash drive or CD/DVD, of all product support documentation applicable to the hardware and software components included in the proposed solution.

**Response:**

All support documentation is provided in the accompanying cd.

i. Provide an electronic copy, on either a flash drive or CD/DVD, of user guides for all telephone instruments and soft client applications included in the proposed solution.

**Response:**

All user guides are provided in the accompanying cd.



j. Describe the software upgrade programs included with the proposed solution to ensure accessibility to the most recent software release for all components and applications included in the proposed solution.

**Response:**

Cisco SMARTnet Service also entitles Virginia Tech to online access to the latest operating system software updates and upgrades. Rather than purchasing OS software upgrades individually, a SMARTnet support contract saves Virginia Tech time and money by covering the cost of updates, bug fixes, and upgrades for your licensed feature set. These upgrades enhance your existing equipment with the latest features such as advanced security, regulatory compliance, and greater network capacity, potentially adding years of service and improved performance to your network. Software Application Support (SAS), Software Application Support plus Upgrades (SASU), and Unified Communications Essential Operate Service cost-effectively provide timely, uninterrupted access to application software updates and extensive technical support resources to help you keep your network available and secure. For more information, please visit: Cisco Application Support [http://www.cisco.com/en/US/products/svcs/ps3034/ps2827/ps2993/serv\\_group\\_home.html](http://www.cisco.com/en/US/products/svcs/ps3034/ps2827/ps2993/serv_group_home.html).

k. Provide a detailed description of the system administration training courses included in the proposal to prepare Virginia Tech's operations support personnel to conduct installation, system administration, and maintenance. Identify any prerequisite requirements to participate in the training.

**Response:**

Please refer to response # 33.

l. Describe any applicable vendor certification programs.

**Response:**

Cisco offers four levels of general IT certification: Entry, Associate, Professional, and Expert (CCIE representing the highest level of achievement).

**CCENT Certification**

Cisco Certified Entry Networking Technician (CCENT) validates the ability to install, operate, and troubleshoot a small enterprise branch network, including basic network security. With a CCENT, a network professional demonstrates the skills required for entry-level network support position – the starting point for many successful careers in networking. The curriculum covers networking fundamentals, WAN technologies, basic security and wireless concepts, routing and switching fundamentals, and configuring simple networks. CCENT is the first step toward achieving Cisco Certified Network Associate (CCNA), which covers medium-size enterprise branch networks with more complex connections.

**CCNA Certification**

CCNA validates the ability to install, configure, operate, and troubleshoot medium-size route and switched networks, including implementation and verification of connections to remote sites in a WAN. CCNA curriculum includes basic mitigation of security threats, introduction to wireless networking concepts and terminology, and performance-based skills. This new curriculum also includes (but is not limited to) the use of these protocols: IP, Enhanced Interior Gateway Routing

Protocol (EIGRP), Serial Line Interface Protocol Frame Relay, Routing Information Protocol Version 2 (RIPv2), VLANs, Ethernet, Access Control Lists (ACLs).

### **CCIP Certification**

Cisco Certified Internetwork Professional (CCIP) validates advanced knowledge and skills required to manage service provider infrastructures. With a CCIP certification, a network professional working in a service provider organization demonstrates competencies in infrastructure IP networking solutions. The CCIP curriculum includes IP routing, IP Quality of Service (QoS), Border Gateway Protocol (BGP), and Multiprotocol Label Switching (MPLS).

### **CCIE Certification**

The Cisco Certified Internetwork Expert (CCIE) certification is accepted worldwide as the most prestigious networking certification in the industry. Network engineers holding an active Cisco CCIE certification are recognized for their expert network engineering skills and mastery of Cisco products and solutions. The CCIE community has established a reputation of leading the networking industry in deep technical networking knowledge and members are deployed into the most technically challenging network assignments.

The program continually updates and revises its testing tools and methodologies to ensure unparalleled program quality, relevance, and value. Through a rigorous written exam and a performance-based lab, the CCIE program sets the standard for internetworking expertise.

Cisco introduced the CCIE certification in 1993 to assist the industry in distinguishing the top echelon of internetworking experts worldwide. Today, CCIE certification holders represent less than 3 percent of all certified Cisco professionals and less than 1 percent of the networking professionals worldwide.

m. Provide a detailed description of the attendant console training included in the proposal to prepare Virginia Tech's attendant console operators to fully realize the utility provided by the solution's attendant console features.

### **Response:**

Please see response #33.

n. Provide a detailed description of the end user training included in the proposal to prepare Virginia Tech's end users to fully realize the utility provided by the solution's telephony, messaging, and collaboration features.

### **Response:**

#### **Course Objectives**

Learn how to use basic features on Cisco IP phones to place calls, answer calls, transfer and forward calls

Learn how to use more advanced features which will make you more productive such as quickly setting up ad-hoc conference calls or forwarding your calls to mobile or home phones.

Learn how to access voice mail from your Cisco IP phone.

Learn how to use information services now available to you such as missed calls or accessing the corporate directory.

Learn how to tailor your phone to your needs such as changing ring sound, adjusting the LCD display, adjusting handset and speaker volume.

Learn how to maximize the use of your IP telephony solution by using your web browser to forward you calls when outside the offices as well as setting up speed dial numbers easily.

### **Course Outline**

1. Basic User Features
  - Connecting Your Cisco IP Phone to the Corporate Network
  - Adjusting the Footstand
  - Placing a Call
  - Answering a Call
  - Ending a Call
  - Stabilizing the Handset
  - Transferring a Call
  - Putting a Call on Hold
  - Redialing a Number
  - Using Call Park
  
2. Advanced User Features
  - Forwarding All Calls
  - Placing a Conference Call
  - Initiating a Meet-Me Conference
  - Joining a Meet-Me Conference
  - Using Call Pickup
  - Using Group Call Pickup
  
3. Information Features
  - Accessing Online Help
  - Using Call History
  - Changing the LCD Contrast
  - Setting Up Voice Mail
  - Accessing Voice Mail
  - Using a Corporate Directory
  - Viewing Information Services
  
4. Audio Features
  - Changing the Ringer Sound
  - Adjusting the Ringer Volume
  - Adjusting the Handset, Speaker, and Headset Volume
  - Muting a Call
  
5. Web Browser Features
  - Forwarding All Calls from the Web
  - Configuring Speed Dial Buttons

- Subscribing to Information Services
- Changing Your Subscriptions

o. Provide detailed warranty information for all equipment included in the proposed solution.

**Response:**

Warranties provide short-term limited liability for Cisco to repair and/or replace defects in Cisco products. They are limited in both the duration and the support they offer, and warranties do not include Cisco TAC support, software updates, or any of the additional benefits obtained under a support service contract, as illustrated in **Table 19**. It is the responsibility of Cisco to repair and/or replace the Cisco product within the timeframe specified in the warranty card that accompanied the originally purchased Cisco product. Elements covered under a Cisco warranty are:

- **Hardware:** This guarantees that the piece of hardware will be free of defects in material and workmanship under normal use, or it will be replaced by Cisco.
- **Software:** This guarantees that the physical media are free from defects or they will be replaced by Cisco. Also, the warranty guarantees that the software generally conforms to the published specifications for the product. The warranty is explicitly “as is,” and no new releases are included.

Your formal Warranty Statement, including the warranty applicable to Cisco software, appears in the Cisco Information Packet that accompanies your Cisco product. A copy of this Information Packet has been included as Additional Material with this response.

**Table 19. Warranty Support vs. SMARTnet Support**

<i>Available Support</i>	<i>SMARTnet</i>	<i>SMARTnet Onsite</i>	<i>90-Day Warranty</i>	<i>1-Year Warranty</i>	<i>5-Year Warranty (Optical Products Only)</i>
Maintenance releases for operation system software (upon request)	Yes	Yes	No	No	No
Minor and major releases for operation system software (upon request)	Yes	Yes	No	No	No
Cisco.com registered access (where available)	Yes	Yes	No	No	No
TAC support	Yes	Yes	No	No	No
24-hour access to TAC	Yes	Yes	No	No	No
Advanced Replacement of parts 8x5xNBD 8x5x4 24x7x4 24x7x2	Yes	Yes	10 days	10 days	15 days
Onsite field engineer for parts replacement and installation	No	Yes	No	No	No

Cisco SMARTnet Service is an award-winning technical support service that offers direct, anytime access to Cisco engineers and an extensive range of technical resources. SMARTnet

delivers rapid issue resolution, flexible device-by-device coverage, and premium service options to help maximize operational efficiency.

The following replacement service-level options are available on Cisco SMARTnet Service:

- Next Business Day (NBD): Advanced replacement parts, with or without a field engineer, are delivered the next business day between 9 a.m. and 5 p.m. (provided the request is received before 3 p.m. local depot time).
- 8x5x4: Advanced replacement parts, with or without a field engineer, are delivered within 4 hours of determining that part replacement is required during a standard work week (8 hours per day, 5 days per week).
- 24x7x4: Advanced replacement parts, with or without a field engineer, are delivered within 4 hours of determining that part replacement is required during a standard work week (24 hours per day, 7 days per week).
- 24x7x2: Advanced replacement parts, with or without a field engineer, are delivered within 2 hours of determining that part replacement is required during a standard work week (24 hours per day, 7 days per week).
- Return for Repair (RfR): Customer returns failed hardware to Cisco for repair. Cisco will use commercially reasonable efforts to repair failed hardware and ship hardware to customer within 30 days from receipt of failed hardware.
- Equivalent onsite service options are available that provide a trained field engineer to install the replacement part when it arrives at your site.

## Case Studies

Cisco does not release client information into the public arena in order to protect client data. Your Cisco Account Manager can arrange for a meeting with the customer if the College so desires. Customer Case Studies have been provided in the paragraphs that follow.

### Brandeis University

#### *Challenge*

Located in Waltham, Massachusetts, Brandeis University is a highly ranked private university with strong research, sciences, and social policy programs and an undergraduate enrollment of 3200. The university needed to overhaul its communications system for several reasons. The existing copper wiring, some of it as old as the university, was failing. The aging PBX system needed replacement. In addition, the existing system lacked sufficient capacity for a new dormitory.



The university IT group wanted a new communications solution that would deliver a superior experience to students, parents, faculty, and staff. For example, anxious parents and students who call Student Financial Services prefer to reach a live person right away rather than navigating through menus. Campus safety requires the ability to alert students and employees anywhere on campus if an incident occurs. And IT also sought a way to help faculty members who have issues

with classroom technology or the online grading system and might need to reach the help desk early in the morning or very late at night.

After investigating new PBX systems, the IT department realized that it could capitalize on its new Cisco network for voice and video, as well as data. “Using our new network as the platform for unified communications would increase our return on investment and also give us new capabilities,” says John Turner, director of networks and systems, Brandeis University. “A unified communications solution would also avoid the high costs of replacing our copper telephone network.”

### *Solution*

Brandeis installed a Cisco Unified Communications Manager server on its main campus in Waltham and a Cisco Integrated Services Router with Unified Communications Manager Express in the New York City alumni house. Students receive a Cisco Unified IP Phone the first day they arrive on campus and keep it until they graduate. The IT group wrote an application for the Enterprise Resource Planning (ERP) system that automatically adds new students to the Cisco Unified Communications Manager system, a feat made possible because of the open interfaces in Cisco Unified Communications, according to Turner. This eliminates the \$25,000 annually that the university used to pay a service provider to provision phones.

The availability of the communications system is critical in a university environment, and Brandeis uses a Session Initiation Protocol (SIP) trunking service from Zone Telecom for cost-effective backup. “Using a SIP trunk instead of a Private Rate Interface (PRI) line for backup reduced our costs by \$18,000 annually because the service provider does not have to provide a local loop,” says Turner.

In the summer of 2007, Brandeis upgraded its IP network, adding Cisco Catalyst 6500 switches in regional points of presence and Cisco routers in each building. The IT group also consolidated its data center infrastructure by deploying Cisco Firewall Service Modules (FWSMs) and Cisco Application Control Engine (ACE) modules. These modules, which fit right into Cisco Catalyst 6500 Series Switches, provide load balancing and application security to increase performance and availability. Each Cisco ACE module can act like multiple virtual modules, reducing the number of devices that the IT department must purchase and manage, as well as data center space and power requirements.

### *Results*

The Cisco solution has had a dramatic impact throughout the campus:

- Students use their Cisco Unified IP Phones for work and play, taking advantage of five-digit dialing, transfers, conferencing, and call parking. One student even wrote a wake-up call application.
- Callers to the campus help desk also enjoy faster service. Using Cisco Unified Contact Center Enterprise, the IT group easily merged its previously separate faculty help desk, student help desk, and library services into a unified Library and Technology Services contact center. Each contact center is staffed at different hours, so callers can reach a live person any time from 8 a.m. to 2 a.m.
- The fact that faculty can get faster answers to questions about classroom technology improves educational excellence. “Some classes meet only 10 times a semester, so if we can

help a professor who is having problems with classroom technology, we have just saved 10 percent of the course content,” says Turner.

- The university IT group wrote a time-clock application for Cisco Unified IP Phones that improves job satisfaction for hourly employees and saves time for managers. Rather than walking up to 15 minutes to a time-clock location on campus, employees can clock in and out by logging into a Cisco Unified IP Phone near their reporting location. “Managers used to spend one full day each week calculating their employees’ hours,” says Turner. “Now they just need an hour, using a time-clock application on the Cisco Unified IP Phone that ties into our enterprise time-and-attendance application.”
- Student safety is of paramount importance to the university, and Brandeis also uses Cisco Unified Communications for campus-wide Public Address (PA) announcements. Administrators use Singlewire InformaCast software to send emergency announcements to the built-in speakers of the Cisco Unified IP Phones in every office, public area, and dorm room. The IT group had the solution up and running in less than 2 hours and saved hundreds of thousands of dollars for a separate network.

Now that the Cisco Unified Communications platform is in place, Brandeis is considering additional plans to use it for other applications that increase efficiency and improve the experience for students, parents, and faculty. “More than a telephone system, Cisco Unified Communications is a complete communications platform that also supports rich-media conferencing, video, and more,” says Turner. “It supports our current needs and also gives us flexibility to add new capabilities in the future.”

## **Madison Area Technical College**

### *Challenge*

To achieve a 21st century standard of learning, Madison Area Technical College realized that it needed to provide a variety of advanced communications services to its students and enhance its popular distance learning program. By deploying key technologies across its campuses, the college is linking its past record of commitment to student learning with a determination to prepare them for the future by equipping them with skills needed in our evolving, globalized world.



The college’s decision to pursue a more sophisticated communications technology was based on the institution’s competition, not just from other schools, but from factors that affect students’ time and attention span. Today’s youth use increasingly sophisticated technology in their daily lives: iPods, smartphones, PDAs, Web-based collaboration and social networking technologies, high-definition television, etc. College officials recognized that students have grown accustomed to a high level of quality, as well as variety, in their learning and communication methods and expect it to be matched in every area of their lives, particularly from a technical education.

“Accessibility to instruction was once enough of an offset that the technology didn’t have to be perfect,” says Roger Price, vice president of infrastructure services for Madison Area Technical College. “That’s no longer the case. Technology matters immensely in how we deliver our education to our students and communicate our value to prospective students.”

### *Solution*



Cisco Unified Communications was integrated to enhance overall communication throughout the college, including a platform to deliver superior customer service and collaboration opportunities to students, faculty, and staff. In addition, Madison Area Technical College deployed Cisco TelePresence to create a live communication experience for distance learning over the network, giving access to capabilities unmatched by any other technical college in the country.

The college turned to Cisco, and partner Inacom Information Systems, for a Unified Communications platform and in particular Cisco TelePresence because it offers an innovative solution for distance learning, creating an “in-person” classroom experience over a converged network. As a first-of-its-kind deployment for community colleges, the new Cisco TelePresence positions Madison Area Technical College as a leader in its use of technology to enhance the quality of education for students.

By providing this advanced technology to its students, Madison Area Technical College is further supporting its mission to “deliver high-quality instruction and services that are responsive, flexible, and accessible.”

### *Results*

The Cisco technology deployed at Madison Area Technical College gives the college an advantage over other area schools. The college faces competition from a variety of other higher education institutions, including the University of Wisconsin-Madison, ITT, the University of Phoenix, and Herzing College, among others. However, with the opportunities provided by Cisco Unified Communications and Cisco TelePresence, Madison Area Technical College will be able to offer students educational services not available at the other schools.

“There is no one else doing what we are trying to do right now, using this tool with a primarily academic focus,” says Price. “It’s a cool education tool; it’s a cool collaboration tool. Plus, it expands our educational opportunities. There are people out there who would love to get an MATC education, but they just haven’t been able to reach us. Now they can.”

Also, Cisco Unified Communications and TelePresence are “green technologies,” which save the college money in a number of other areas. Faculty, staff, and students will have unprecedented ability to communicate, collaborate, and learn without regard to location. Travel expense is reduced, even as the number of student-faculty and student-student interactions increases, delivering a much more robust learning experience. The project timeline and financing were also structured to maximize efficiency in procurement and deployment of that technology. In a tough economic climate, Madison Area Technical College put in place new technologies that were cost effective and demonstrated a responsible budgetary decision.

“During the last few years, we have approached enrollment with the desire to grow,” says Bettsey Barhorst, president of Madison Area Technical College. “In fact, 2 years ago, we grew some 5 to 6 percent. Last year we dipped a bit, though we aim to maintain a healthy 2 percent a year, capturing what we feel are untapped groups of students who are going elsewhere at a premium cost.”

By reaching out to serve larger groups, Madison Area Technical College strives to provide an advanced technical education as a way to help people enhance their personal skills and knowledge base, a goal that will improve the quality of life of those in the Madison area in a time of economic uncertainty.

## University of North Carolina at Charlotte

### *Challenge*

One of the fastest growing campuses in the University of North Carolina system, University of North Carolina (UNC) at Charlotte enrolls more than 23,300 students and 1000 full-time faculty and staff. The university expects to add 7000 students and 150 faculty members by 2012.



To prepare for growth, the UNC Charlotte IT group needed to upgrade its communications system and data center. The previous PBX system could not scale to support 11 new planned buildings and had become expensive to maintain. “We also wanted to improve the communications experience for faculty, staff, students, and parents,” says Tom Lamb, chief technology officer for the university.

At the beginning of each semester, the university receives approximately 8000 weekly calls regarding financial aid, account status, and class registration. The old PBX could not handle the volume, resulting in busy signals and dropped calls. Callers who do not get through often hang up after becoming frustrated with long wait times or the inability to reach a live person. “Improving our service to callers was a priority for the vice chancellor, who was receiving complaints from parents,” Lamb says.

### *Solution*

UNC Charlotte prepared for growth by migrating from its old PBX system to Cisco Unified Communications. The university deployed Cisco Unified Communications in six buildings in 2005 and began converting the remaining 39 buildings in 2007. “We chose Cisco Unified Communications not only for what it does today, but also for the flexibility that it gives us to introduce new communications services as our needs change,” says Lamb. For example, Cisco Unified Communications Manager supports Session Initiation Protocol (SIP), which will enable the IT group to provide university voice, voicemail, and other communications services to employees’ homes, thus supporting remote workers.

Faculty and staff now have more flexibility to connect, communicate, and collaborate from any location. They use either Cisco Unified IP Phones or laptops with Cisco Unified Personal Communicator, a desktop application that integrates voice, instant messaging, presence, voice message access, click-to-call, video, conferencing, user directory, and call history. A single Cisco Unified Workspace Licensing agreement provides access to all of these applications, simplifying management and administration. With Cisco Unified Personal Communicator, mobile employees can just bring their laptops wherever they go on campus to make and receive calls with their usual extension.

Several campus offices use Cisco Unified Personal Communicator to speed up decision-making. “An administrator who needs an immediate answer to a question can look at experts’ presence information to see who is available right now, saving the time to call multiple people and leave voicemails,” says Lamb. “And if we see that someone is on the phone, we can just send an instant message without even having to open another application.”

The university’s contact centers (the IT help desk, financial aid, graduate admissions, student accounts, and registrar’s office) use Cisco Unified Contact Center Express, which has

transformed call handling to improve the caller experience. Skills-based routing directs calls to a qualified agent in any location, making it faster for students, parents, or employees to reach a live person. The contact center director can now view real-time metrics and, if needed, add new agents in any campus location to help ensure that callers receive prompt service.

### *Results*

The university provided its best-ever service to callers as the fall 2008 semester began:

- Decreased average wait time from 1 minute 32 seconds to 54 seconds for calls regarding undergraduate admissions
- Handled 1200 more calls about financial aid with only a 20-second increase in average wait time
- Increased answer rate from 82.3 percent to 93.4 percent for calls about graduate admissions while handling 25 percent more calls.

“The vice chancellor is no longer receiving complaints from parents,” Lamb says.

The ability to see colleagues’ presence information, whether they are available and how they prefer to be reached, speeds up collaboration. Mobile employees are now easier to reach because the Cisco Unified Mobility single-number reach feature simultaneously rings their desktop phones and mobile phone when their main office number is dialed. “It’s not uncommon for researchers to work in several offices as well as a lab,” says Lamb. “Now we can dial just one number to reach them in any workspace.” And when mobile employees receive a voicemail message on their desktop phone, they receive an audible and visual alert on their mobile phone so that they can respond right away, enhancing collaboration.

With Cisco Unified Communications in place, UNC Charlotte is preparing to leverage the platform to evaluate other unified communications applications:

- **Emergency notification:** UNC Charlotte can use the system to simultaneously dial groups of students on their mobile phones and dorm-room phones to play a recorded message.
- **Communications interoperability:** Using Cisco IP Interoperability and Collaboration Solution (IPICS), campus emergency personnel will be able to communicate directly with the Charlotte Police Department, using any type of radio as well as cell phones, traditional phones, or laptops with the appropriate software.
- **Cisco Unified Mobile Communicator:** Mobile employees will be able to use Cisco Unified Communications applications on their smartphones.
- **Cisco Virtual Office:** To support pandemic planning as well as its green initiatives, UNC Charlotte is planning to enable employees to access university voice, video, and collaboration services from home.

“Before we had Cisco Unified Communications, I had to worry whether our infrastructure could support new communication services,” says Lamb. “Now, with our open platform, I’m confident that we can take advantage of new services as our needs change.”

**Western Technical College**



### *Challenge*

Located in El Paso, Texas, home of the U.S. Army's Fort Bliss, Western Technical College provides a broad training curriculum to help students successfully pursue a career in their chosen field — from medical to automotive, computers, and high tech. Fort Bliss provides a significant pool of prospective students, as military personnel and their spouses require training to transition into civilian careers. Although the college's enrollment surged 12 percent in 2007, the local education market remained extremely competitive. "Students and employers have many choices, so every interaction becomes part of their decision-making process," says Jose Perez, IT director at Western Technical College. "As the volume of inbound calls increases, the calls need to be handled with the same high levels of efficiency and service to which our customers have become accustomed. This system will allow us more latitude in doing so."

Perez and his team identified the college's PBX as a key area for improvement, since the aging system proved to be limited and inflexible as the school grew. In January 2007, Western Technical College relocated its main campus to Plaza Circle in east El Paso, 25 miles from its original branch campus in northeast El Paso, more than doubling its square footage. The former PBX did not allow the two campuses to be connected into a single virtual network, thus complicating even the simplest of communications exchanges. "When customers called the main branch campus switchboard, we had to ask them to hang up and direct-dial numbers at the main campus. This presented a significant risk in losing the caller, and customer, forever," Perez says.

In addition to the customer service challenge, Perez also needed a solution that would allow his team to scale Western Technical College's telephony capabilities cost effectively as the school grew. "The main campus more than doubled our square footage—but a proportional increase in telephony cabling costs was not feasible."

### *Solution*

Perez found the solution to both business challenges — enhancing customer service and cost-effectively scaling the communications system — in Cisco Unified Communications solutions. "While Western Technical College has been a Cisco customer and has taught the Cisco curriculum as part of our education offering, I considered two other solution providers in addition to Cisco," he says. "I have been in the IT field for 20 years, and only Cisco met all of my expectations and requirements in terms of delivering an IP-based, Unified Communications system. Only Cisco could deliver a system that was interoperable, standards-based, cost-competitive, and from a trusted technology leader."

Leveraging the Cisco network infrastructure installed at the new Plaza Circle campus, Perez was able to quickly deploy Cisco Unified Communications Manager and the Cisco Unity Express voicemail solution to provide nearly turnkey IP-based communications capabilities. The main campus is served by approximately 60 Cisco Unified IP Phones that allow users to transfer extensions between campuses, using a single point of contact to intercept calls for both campuses.

After successfully deploying Cisco Unified Communications Manager at the main campus, Western Technical College then brought IP telephony to the Diana campus, which has approximately 40 Cisco Unified IP Phones. Both locations are integrated into a single Cisco Unified Communications Manager environment.

INX Inc., a Cisco Gold Certified Partner with Master Unified Communication Specialization, has a long-standing relationship with Western Technical College and has provided design and implementation services for the school’s voice and data projects, including the unified communications rollout. “Both Cisco and INX made every effort to help ensure a smooth deployment of our unified communications system,” Perez says. “Having engineers from both organizations onsite gave me all the assurance I needed to make sure that the deployment would be smooth and free of major problems. This assurance was crucial, since communications are so important to our business.”

### *Results*

With the Cisco Unified Communications solution up and running smoothly, Perez has noted a number of strong benefits that help Western Technical College achieve its dual goal of providing exemplary customer service, while cost-effectively expanding its infrastructure to support business growth.

Most apparent is the reduction in telephony cabling costs. By leveraging existing Cisco data networks to support the IP-based system, Western Technical College has reduced telephony cabling costs by 50 percent. “Cabling materials and labor comprise a major cost driver in building out any new facility such as the main campus. By choosing a Cisco Unified Communications solution, we have achieved cost savings that go straight to the bottom line,” Perez says.

The Cisco Unified Communications solution has also made a significant contribution toward Western Technical College’s ability to enhance the level of customer service that it provides. The Cisco solution has resulted in a 50 percent reduction of calls into the school’s main switchboard due to enhanced direct dialing. Fewer calls into the main switchboard allow receptionists to focus their attention on guests, creating a more welcoming experience. Callers who do reach the receptionist are handled more quickly, because they are no longer directed to hang up and call another number in their attempt to reach the intended party. In addition, since calls can now be transparently received by, and forwarded to, the recipient’s desk phone and mobile phone, callers are much more likely to reach the recipient instead of voicemail.

Western Technical College’s Unified Communications system delivers business-critical availability through a highly fault-tolerant solution configuration that helps ensure that staff and students will be able to make and receive calls, even in the event of total network failure.

“In the past, companies feared that if they lost a network connection, they would lose their VoIP communications services,” Perez says. “Now, with the redundancy provided by Cisco Unified Survivable Remote Site Telephony (SRST)—a unique feature embedded within Cisco IOS Software running on Cisco routers—if I lose one of the T1 lines between our campuses, the Cisco Unified Communications Manager will take over as an independent communications tool. If I lose the branch campus, the calls will be routed through the main campus, and vice versa. In addition, if connectivity is lost on both T1 lines, each campus can independently route calls to the public switched telephone network. I now can be confident that we will never lose a call.”

With the integration of the two campuses now completed, employees have the ability to contact each other through extensions from one campus to another, saving time from connecting through a general reception area. All of these improvements ultimately reduce time and contribute to better time management and customer service.

Perez says, “The education market is extremely competitive. The Cisco Unified Communications solution significantly improved our competitive position by enhancing customer service and internal communications between our two sites.”

## **West Virginia University**

### *Challenge*

Located in Morgantown, West Virginia, West Virginia University (WVU) has a faculty of 1,800 and more than 27,000 students. The university has 57 buildings on three separate campuses spanning 90 miles. Previously, some buildings received Centrex voice services over an ISDN network, while others had their own PBX systems, maintained by the university IT staff. Costs were high: The Centrex services cost \$200,000 annually, and maintenance costs for the aging PBX services were increasing. In addition, telephone extension moves, additions, and changes for university faculty and staff, who move frequently as their buildings are renovated, cost \$60,000 to \$100,000 annually. “We wanted to reduce our voice system costs and invest the savings in upgrading our IP network to support advanced applications,” says Tim Williams, director of telecommunications and network operations.



The university also wanted to increase the efficiency of its 12 voice and data professionals. “If we continued maintaining separate voice and data networks, we would not have the resources to support our growing student body, increasing research activities, and expanding campus,” says Ed Leatherman, senior voice engineer. “A converged voice-and-data network would make us more efficient.”

### *Solution*

The network operations group met its business needs by migrating from ISDN to an IP network and deploying a Cisco Unified Communications solution. Rather than upgrading the entire voice system at once, WVU decided to upgrade individual departments and buildings when it made financial sense. “Our first priority was to upgrade the ISDN portions of the network to IP because we would immediately begin saving money on leased-line costs,” says Leatherman. Departments using PBX systems would be transitioned as their equipment leases expired.

When it converts a department or building to Cisco Unified Communications, the IT group first assesses the network to be sure that it has the intelligence to assign priority to voice traffic, as well as the security to protect voice as well as data. To upgrade the network to support voice, the IT group deploys Cisco Catalyst switches with connections to two Cisco Unified Communications Manager servers in different locations. The network was upgraded to 2-Gigabit Ethernet, and an upgrade to 10-Gigabit Ethernet was planned by 2010. After performing any necessary upgrades, the IT group installed Cisco Unified IP Phones and trained employees.

Departments that have caller queues, such as the help desk, university operators, and extending learning office, use Cisco Unified Contact Center Express. People who call the help desk are prompted to press a button to indicate if they need a password reset or another problem, and the call is routed to an available agent with the appropriate skills. The IT group set up agent skills, so that managers can help answer calls when call volume is heavy, such as at the beginning of a



new semester. University operators use Cisco Unified Contact Center Express for call queuing, helping just a few operators to efficiently handle hundreds of calls daily. For example, if the caller dialed an 800 number to request someone's phone number, the operator sees a pop-up message with instructions to provide the phone number rather than transfer the call.

Voice traffic is protected by the same Cisco security features that safeguard the data network from infections and intrusion. For additional security, the network operations group set up a separate Virtual LAN (VLAN) for voice, preventing data traffic from touching voice traffic. Cisco Security Agent software on the Cisco Unified Communications Manager server detects and stops anomalous application behavior that could signal a security breach.

### *Results*

The West Virginia University IT department eliminated \$200,000 in annual Centrex costs and invested the savings in new network equipment. Eliminating service charges for moves, additions, and changes has saved another \$100,000 annually. What is more, calls between the main campus, the Health Sciences campus, Potomac State College, and Ruby Memorial Hospital now travel over the university WAN instead of the public switched telephone network, eliminating toll charges. "The migration to Cisco Unified Communications resulted in payback in just 18 months for the departments that previously used ISDN," says Leatherman. "All departments increased their productivity."

Temporary or permanent moves are now easier and less expensive. Employees can connect their Cisco Unified IP Phone in the new location without assistance, avoiding a \$200 service charge. The savings are significant: the Health Sciences department alone had 1,100 moves, additions, and changes in 2006. Cisco Emergency Responder software automatically registers the new phone location in a database so that if the employee calls 911, the dispatcher can see the caller's current location. "A department with 200 employees recently moved to a temporary building for several months while its permanent building is being renovated and wired for IP," says Leatherman. "We did not have to move a PBX and employees simply connected their Cisco Unified IP Phones in their temporary offices to become productive immediately. They will be able to do the same thing when they move back to their original building."

Converging the university's previously separate voice and data groups has created organizational efficiencies in the IT group. "We have a relatively small staff," says Williams. "A single-vendor solution avoids interoperability issues, which has been a major factor in the success of our VoIP projects. In addition, our network operations staff can use their existing skills to manage the voice network." The university did not need to add any employees to support unified communications, and instead retrained its telephony engineers to support the converged IP network.

Cisco Unified Communications Manager also helps the university comply with Homeland Security requirements by recording all call detail information, including their origin and duration. The detailed reporting also helps the university staff its contact centers more efficiently.

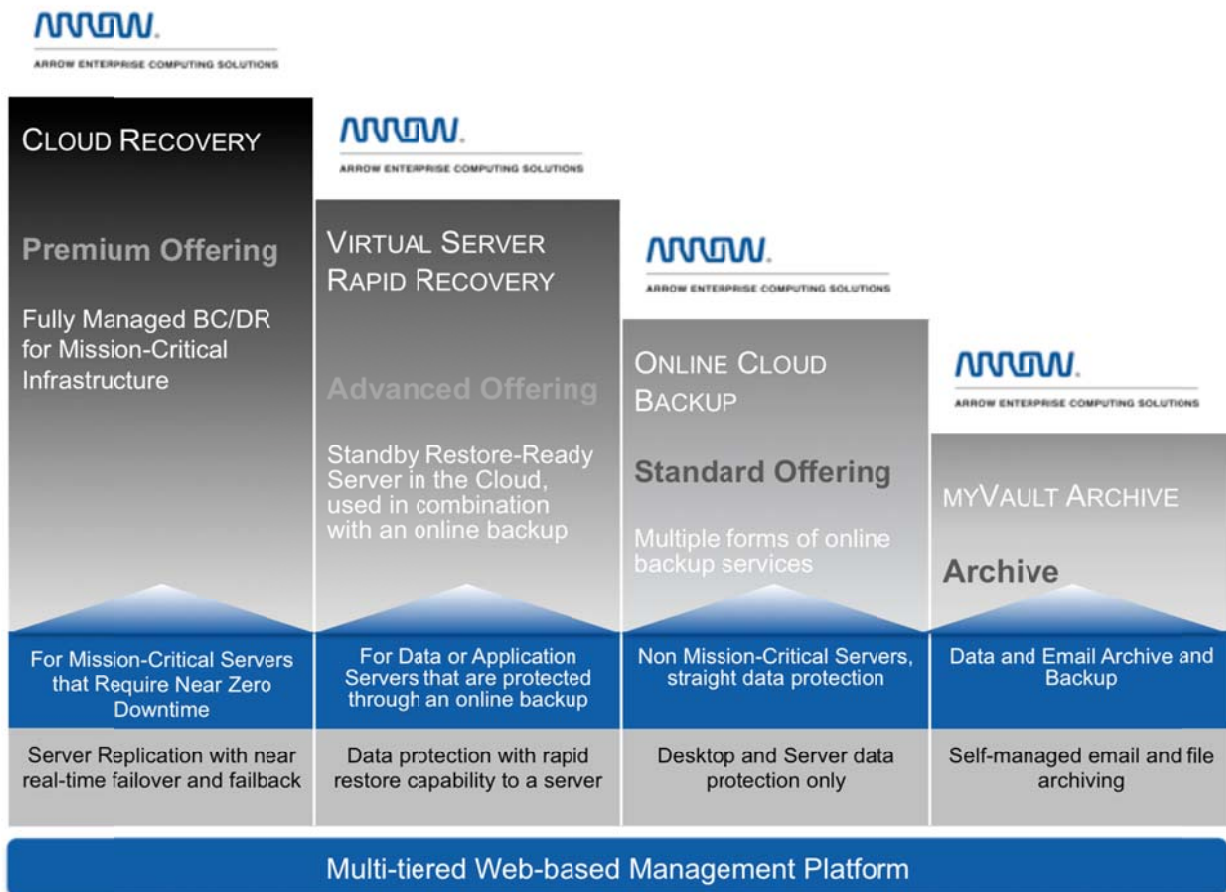
"Our transition to Cisco Unified Communications has been achieved with minimal disruption," Williams says. "We are not rushing, but rather following a carefully thought-out plan. As we upgrade each department to VoIP, our users benefit from the productivity-enhancing features of their Cisco Unified IP Phones, as well as increased mobility and flexibility."



## Section 3.6.2.O – Disaster Recovery & Backup

### The Managed Data Protection Services Suite

Arrow's Data Protection Services delivers a full range of Business Continuity, Disaster Recovery and data Protection solutions. Customers can protect their business from server and site outages with near-instantaneous failover to the Cloud, and at the same time secure their valuable data assets and applications for internal and external constituents through the industry's first backup and archiving solutions with the ability to store data on virtually any public or private cloud storage platform. The diversity and integration of the Data Protection Services suite means BC/DR solutions can be tailored to suit individual needs, whether its continuous uptime for mission-critical systems, or compliance with data storage regulatory mandates.



The complete Data Protection Suite includes the following offerings:

## Cloud Recovery | Instant On Cloud Continuity

Cloud Recovery allows your organization to conduct business as usual during a critical server failure through auto-failover and redirection of your users to a real-time, replicated server environment in a top-tier DC Cloud.



## Virtual Server Rapid Recovery

Virtual Server Rapid Recovery links your production server, protected by your current online backup service, to a standby restore-ready server in a secure DC Cloud, giving you the ability to quickly restore data and applications following a server outage and to fully leverage your existing online backup implementation with no additional capital expenditure.



## Online Cloud Backup

Online Cloud Backup is a disk-based online backup and retrieval system for both physical and virtual servers. With no capital investment required, Online Cloud Backup can be installed quickly and easily, immediately protecting for all your data.



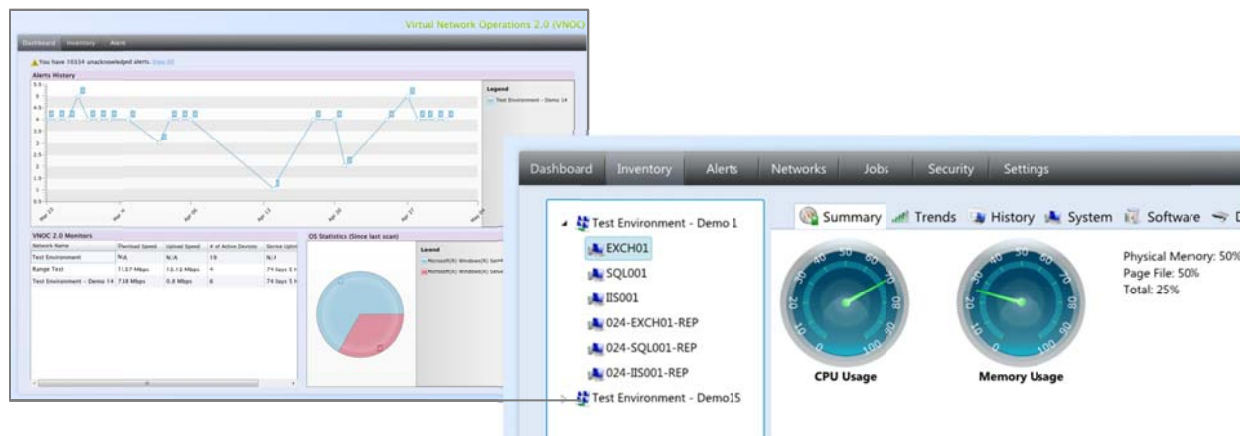
## Automated Network, Management & Alerting Included

### Virtual NOC

Fully integrated with all Data Protection Services is Arrow's Virtual NOC (VNOC) which consists of an embedded network, server and resource monitoring engine that runs automatically and continuously – watching your network 7x24x365 and alerting users of any changes or problems. VNOC is presented through an easy to understand Dashboard via the web-based, online Portal, providing anywhere, any time access to the entire network and services.

Service availability alerts provide an early warning of potential system failure and the possible need to restore, either through Rapid Recovery or Cloud Recovery. And the advanced change management engine notifies users immediately of any state, application or system modifications that may impact recovery.

Predictive analytics ensure that all systems are operating as expected, providing immediate and detailed notifications and follow-ups.



## Multi-tiered Management Portal

### Web-Based Portal

Arrow's web-based management portal is a single sign-on interface providing 7x24 infrastructure management for the entire Data Protection Services suite, for any and all services enabled. The industry-unique multi-tiered capability means multiple levels of administrative access addressing the channel partner–distributor–customer hierarchy. The portal provides complete access to, and control over, a channel partner's entire distribution, partner and end customer network, with individual customer environments and data remaining secure and isolated.

At every level, the management portal offers monitoring, alerting, and reporting using the VNOO's continuous and automatic network, server and resource monitoring, as well as a complete multi-tiered billing system.

## Pricing Structure

### Cloud Recovery | Instant On Cloud Continuity

Pricing is based on the number of servers protected and the total amount of data protected. Fee structure has a one-time provisioning fee and a monthly fee based on a 12 month contract. Some form of on-line backup must be included. The on-line backup can come from our on-line backup solution or a supported third party backup solution (i.e Iron Mountain LiveVault, CA ARCserve, EMC Avamar). Pricing for our on-line backup solution is included later in this section.

### Cloud Recovery Pricing Example Server Description

Type	Name	Quantity	Data Size
<i>Windows File Server</i>	<i>Server 1 Server 2 Server 3</i>	<b>3</b>	<b>134 GB</b>

**Fee Structure**

Description	Quantity	Unit Price	Total
<b>One Time Service Provisioning Fee</b>	3	\$ 310.00	\$ 930.00

**One-Time Total \* \$930.00**

<b>Service Fee (includes 100GB storage each)</b>	3	\$ 611.00	\$ 1,833.00
<b>Additional Storage (blocks of 25GB)</b>	4	\$33.00	\$ 132.00

**Monthly Total \* \$1965.00**

\* Pricing does not include applicable taxes.

### Virtual Server Rapid Recovery (VSRR)

Pricing is based on the number of servers protected and the length of archive. Fee structure has a one-time set-up fee and a monthly fee for standby mode. Some form of on-line backup must be included. The on-line backup can come from our on-line backup solution or a supported third party backup solution (i.e Iron Mountain LiveVault, CA ARCservr, EMC Avamar). Pricing for our on-line backup solution is included later in this section. Active recovery pricing is implemented in the event of a disaster.

**VSRR**

**Pricing Example  
Server Description**

Type	Qty	Size	Data Vol	Retention Period
<i>Windows File Server</i>	<b>3</b>	<i>Medium</i>	<b>500 GB</b>	<i>1 year archived</i>
<i>Windows File Server</i>	<b>2</b>	<i>Large</i>	<b>560 GB total</b>	<i>1 year archived</i>
<i>Windows File Server</i>	<b>5</b>	<i>Extra Large</i>	<b>430 GB total</b>	<i>1 year archived</i>

**Fee Structure**

One-Time Setup	Quantity	Unit Price	Total
<b>Standard Template</b>	10	\$ 229.00	\$ 2,290.00
<b>Custom Template</b>	TBD	\$ 499.00	\$ 0.00

**One-Time Total \* \$2,290.00**

<b>Standby Mode</b>	10	\$ 46.00	\$ 460.00
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**Monthly Total \* \$ 460.00**

<b>Active Recovery Mode</b>	3 Medium	\$ 1.81 /hr /server	<i>Incident-based</i>
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<b>Active Recovery Mode</b>	2 Large	\$ 2.50 /hr /server	<i>Incident-based</i>
<b>Active Recovery Mode</b>	5 Extra Large	\$ 5.00 /hr /server	<i>Incident-based</i>
<b>Storage</b>	1490 GB	\$.250 / GB / mo	<i>Incident-based</i>
<b>Bandwidth IN</b>		\$.250 / GB / mo	<i>Incident-based</i>

\* Pricing does not include applicable taxes.

## Online Cloud Backup

Pricing is based on the number of devices and storage amount. Fee structure monthly

<b>Online Cloud Backup Example Pricing</b>				
<b>Server Description</b>				
Type	Qty	Size	Data Vol	Retention Period
<i>Windows File Server</i>	<i>13</i>	<i>4 Med, 3 Lrg, 6 XLrg</i>	<i>1.624 TB total</i>	<i>1 year archived</i>

<b>Fee Structure</b>				
Description	Quantity	Unit Price		Total
<b>Per Device Fee</b>	13	\$3.69 / mo		\$47.97
<b>Storage (includes 10 GB each)</b>	1663 GB	\$1.54 / GB / mo		\$ 2561.02
<b>Monthly Total *</b>				<b>\$ 2608.99</b>

\* Pricing does not include applicable taxes.

## Cloud Recovery | Instant On Demand Cloud Continuity Details

- Services are sold as a 12-month subscription.
- Ninety (90) days technical support from the time of order is provided at no charge for the unmanaged service.
- Three (3) failover days per year are included at no additional charge for both unmanaged and managed services offerings.

## RR Standby Mode Details

- Services are sold as a 12-month subscription.
- Ninety (90) days technical support from the time of order is provided at no charge for the Restore-Ready Server Setup.
- One (1) full recovery test is provided per server during the setup process.
- Server sizes are defined as:
  - Small [1GB RAM, 1 CPU Core]
  - Medium [up to 4GB RAM, 1CPU Core]
  - Large [up to 4GB RAM, 2 CPU Core]
  - Extra Large [4+ GB RAM, 2+ CPU Core]

## RR Active Failover Mode Details

- All Failover Mode Services are sold On-Demand and are either hourly, daily or monthly as indicated.
- Standby Servers can be turned on and off via the Arrow portal system and will incur Compute charges only while powered on.
- While running in Active Mode the Recovery Server continues the backup per designated schedule.

## Cancellation Policy

- All services are purchased as one (1) year subscriptions. Within the first 30 days of order, customer may cancel at anytime with no penalty.
- Upon cancellation within 30 days of order, Arrow will reimburse the reseller the one month cost of the service less the applicable service set up fees.
- Cancellation of service after 30 days of order will be subject to a penalty of 25% of the remaining 12 month subscription plus a disconnect fee of \$79.
- Subscription will be automatically renewed for one (1) year unless customer provides cancellation notice within 30 days of subscription end.
- Disconnect fee of \$79 will not apply when subscription is cancelled within 30 days of subscription end.

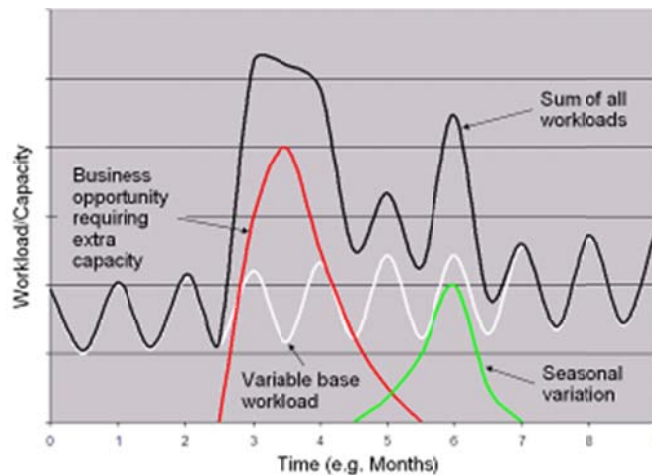


## Section 3.6.2 Q – Web Hosting

Based on the requirements specified we recommend using the Virtual Server option described in the section 3.6.2.O above. This solution is based on IBM SmartCloud Enterprise. Customers often have hundreds of service oriented websites that just serve up read requests and some minor state updates. Example: blogs and social media web applications. The costs for these kinds of environments often add up, and typically dedicated servers are required to service these workloads.

### **Web Hosting Workloads: Why Applicable to SmartCloud Enterprise?**

- Rapid deployment of infrastructure to avoid capital investment for projects with an uncertain business case
  - Pay as you go pricing
  - Opex vs. Capex
- Elastic scalability and geographic reach reduce risk of uncertain capacity needs for Web Applications
- Some customer workloads can either accept the IBM Cloud SLA or be redesigned with resiliency patterns in the application



### **Cloud Web Hosting Across Multiple Industries**

- Insurance
  - Deployment of new financial services products to meet spike in demand
  - Workload specific for non compliance related areas such as marketing sites
- Life Sciences
  - Drug and product safety can often drive up spikes in call center and web site demand
  - Product information and marketing materials are often good candidates for Cloud deployment
- Energy and Utilities



- Collaboration of applications and integration with other departments/organizations
- Launching of new initiatives such as portals

## 1. On-going Support and Maintenance.

Throughout the life of the Agreement, the successful Service Provider(s) will maintain expertise, resources and capabilities to:

- Perform consulting, assessment, design, integration, installation, and managed Services or solutions at the task order level;
  - Professional services include consulting around design, planning, integration, installation, migrations, upgrades and solution services for Data Center, Servers & Storage, Security, and Software
    - Core Products:
      - NetApp
      - EMC
      - Citrix
      - Microsoft
      - VMware
      - Cisco
    - Packaged Services are offered for NetApp & VMware Services
    - Custom Services are offered on ALL technologies supported and are priced at daily rates with an estimated duration, hourly rates for remote engineering engagements or fixed price if requested
    - Pricing provided will include labor rates for engineer or consultant, project management and estimated travel expenses
- Perform a wide range of professional, technical support and on going management services
  - Technical Support and Managed Services include:
    - Remote Break/Fix Support
      - Incident based support for multiple vendors in the data center, list of supported vendors upon request
      - Support contracts are available for 24x7 or business day, purchased in 5 pack increments
    - Remote Engineering Support
      - Used for assistance for upgrades, migrations or other technical projects
      - Priced in ten (10) hour blocks
    - Desktop Support
      - Basic includes remote end user support for standard applications and basic administration
      - Enhanced includes proactive maintenance including OS patching, virus definition files updates and defrag
      - Flexible pricing options including per user/month or per call/month (minimum commitment required)
    - Remote Monitoring and Management
      - Services are performed 24x7, 365 days a year by experienced, certified technicians, who use enterprise-class technologies and follow proven ITIL processes to ensure continuous uptime for servers, infrastructure applications, custom applications, Database, Storage, network devices, and desktops
      - “AID” Services
        - Industry standard monitoring checks the availability and performance of Windows and Linux operating system services, event logs, SNMP based network devices, as well as hardware errors
      - “MANAGE” Services

- in addition to monitoring, SOP remediation and full issue resolution, Arrow Fusion personnel reviews incoming alerts and log files to quickly pinpoint an issue and remediate the problem
- Custom pricing is based on per device/month

# Enterprise Elite Services

REMOTE INFRASTRUCTURE AND DESKTOP MANAGED SERVICES



Arrow Fusion Enterprise Elite Services (EES) are designed to provide solution providers with a comprehensive suite of remote infrastructure and desktop managed services for enterprise clients with a large IT footprint or sophisticated technology solutions. Arrow Fusion services are performed 24x7, 365 days a year by experienced, certified technicians, who use enterprise-class technologies and follow proven ITIL processes to ensure continuous uptime for servers, infrastructure applications, custom applications, Database, Storage, network devices, and desktops.

## Server and Network Infrastructure Services

Two levels of EES services are available:

**AID proactively monitors the health of your client’s server and network infrastructure:** industry standard monitoring checks the availability and performance of Windows and Linux operating system services, event logs, SNMP based network devices, as well as hardware errors. Arrow Fusion personnel reviews incoming alerts and log files to quickly pinpoint an issue and proceed with pre-defined standard operating procedures (SOPs) for remediation. If the SOPs fail to resolve the problem, the ticket is updated and immediately escalated to a designated partner contact or ISP vendor for resolution of the issue.

**MANAGE lets you profit from full remediation and management of your client’s server and network infrastructure:** in addition to monitoring, SOP remediation and full issue resolution, Arrow Fusion personnel reviews incoming alerts and log files to quickly pinpoint an issue and remediate the problem. If the Arrow Fusion personnel is unable to resolve the problem, the ticket will be updated with detailed troubleshooting steps and immediately escalated to the vendor Tech Support<sup>1</sup> or ISP vendor for further troubleshooting and full resolution.

### Preventive Maintenance Minimizes Business Risk

To reduce the risk of system failure or outages, both Arrow Fusion EES AID and MANAGE services include Windows patch management<sup>2</sup> for operating systems, as well as proactive Antivirus definition updates, Active Directory (AD) and Exchange health checks. Partners will approve all major updates performed.

ENTERPRISE ELITE SERVICES FOR SERVERS AND NETWORK	AID	MANAGE
24x7 Monitoring of Windows Server (Availability, Performance, Services and Event logs), Synth Xaction, Network Devices and Backup Processes	✓	✓
Alert Validation & Escalation	✓	✓
Verifying Completion of Backup Jobs	✓	✓
Arrow Fusion Pre-defined Standard Operating Procedures-(SOPs) Initial Remediation	✓	✓
Client’s Custom Standard Operating Procedures (SOPs)-based Initial Remediation	✓	✓
ISP Vendor <sup>3</sup> escalations for Link Downtime	✓	✓
Anti-virus Definition Updates Validated	✓	✓
Windows Patch Management Per Customer Approval	✓	✓
2-way Integration with Autotask/Connectwise or Access to Portal for Case Tracking and Metrics Reports	✓	✓
Executive Dashboard (web portal), On-Demand, Weekly & Monthly Reports	✓	✓
Monthly Health Checks for Active Directory and Exchange		✓
Troubleshooting and Full Remediation		✓
Vendor Tech Support <sup>1</sup> for Further Troubleshooting and Full Resolution		✓
Hardware Vendor <sup>1</sup> Coordination for Hardware Failures		✓
Move, Add, Change (MACs) <sup>4</sup> and Service Requests <sup>5</sup>		✓

### EES Target End Client

Mid-sized and large enterprises. Or, end clients with a minimum of 101 and up to 250 devices, desktops or users. End clients with more than 250 devices will be scoped separately.

### Always On

24x7 monitoring of critical IT infrastructure.

### No Disruption

Preventive maintenance is performed for updates, changes, and performance-intense services during non-peak periods to eliminate client business impact.

### Complete Control

Solution providers set SOP standards for the review of incoming alerts and initial execution. Detailed reports reveal work performed.

### Proactive

Incoming alerts are reviewed and immediately remediated by Arrow Fusion. If required, we coordinate with Vendor tech support<sup>2</sup> on your behalf.

### Fully Integrated

All alerts are updated in Autotask and Connectwise PSA tools. Arrow Fusion will support published RMM tools, platform or infrastructure hardware used by our partners and their clients.

### Accountable

Arrow Fusion EES AID and MANAGE services include detailed reports generated on all activity performed – alerts, trouble tickets, preventive maintenance, and infrastructure performance -- all instantly available from a secure web portal or pushed to you each week or month.

# Enterprise Elite Services

REMOTE INFRASTRUCTURE AND DESKTOP MANAGED SERVICES



## Desktop Services

### Improve Productivity

Improve desktop/laptop reliability and performance with security patch management and Antivirus Definition Updates.

### No Disruption

Operating system and application updates and upgrades are delivered during non-peak periods, reducing impact to your client's productivity.

### Free-up Resources

Your clients can contact Arrow Fusion by Chat, Email or via alert Tickets to resolve any issue without tying up your team.

**Arrow Fusion EES Desktop services help solution providers maintain the productivity, as well as optimize the performance, reliability and security of their client's Windows-based desktops and portable devices.** EES Desktop services are performed 24x7, 365 days a year by experienced, certified Windows administrators, who use enterprise-class technologies and follow proven ITIL processes to ensure minimal impact on user productivity of desktop and portable devices.

Arrow Fusion partners may choose from two levels of EES Desktop services for Windows desktops and portable systems – AID and MANAGE. EES AID provides remote Windows patch management and Antivirus updates for preventive maintenance. EES MANAGE includes the same services offered within AID, and includes access to your Arrow Fusion desktop support team by Chat, Email or via alert Ticket for any desktop or laptop issue. Arrow Fusion will respond as if they are a member of your own IT Staff.

ENTERPRISE ELITE SERVICES FOR DESKTOPS	AID	MANAGE
Management of Windows Patch Releases (Operating System, IE, Office) to Desktops and Portable Systems	✓	✓
Anti-virus Definition Updates Validated	✓	✓
Inventory Reporting (desktops/laptops)	✓	✓
Contact via Phone, Email, or Web for Desktop/Laptop Issues, Access or Problems with Network(s) or Printer(s), User Password Resets, PDA Synchronization, Virus Removal and VPN Client Configuration/Access. All Requests/Issues Ticketed and Escalated (Per Customer Specification)		✓

1 – Microsoft Vendor Tech Support Included. Must have valid vendors' maintenance/technical agreement for Network devices, Non-Microsoft or 3<sup>rd</sup> party applications, and Anti-virus products. Expiration of maintenance/technical support agreement places limits on AID & MANAGE services. Software & Hardware put into 'End of Life' by vendor will be limited to AID and MANAGE service only.

2 – Default Windows patch Management includes Security & Critical patches. Genuine Windows license is the responsibility of the customer.

3 – Customer or solution providers should authorize Arrow Fusion personnel to escalate link failures to ISP vendor. Valid support contracts managed by the customer.

4- MACs for AD, Exchange mail boxes, Blackberry, Terminal servers and Citrix are included.

5- Service requests limited to 30 minutes in length. 5 hours per month maximum per customer.

### IT INFRASTRUCTURE

### SUPPORTED TECHNOLOGY

<b>Server Operating Systems</b>	Windows Server, SBS Server, Linux Flavors (Red Hat, Centos & Ubuntu), Unix
<b>Server Applications</b>	Domain Controller (Active Directory), Email (Microsoft Exchange), Backup (Symantec, NT Backup), Mobile (Blackberry), Virtualization (VMware, Xen), Terminal Servers, Citrix, SharePoint, Web Servers (Apache, Tomcat, IIS, Web logic, JBoss, J2EE), Custom Applications
<b>Databases</b>	MS SQL (EXP, STD, ENT), My SQL (STD, ENT)
<b>Network</b>	Switches, Router, Firewall, WAP (Cisco, HP & Juniper) and VoIP (Cisco)
<b>Storage</b>	EMC, HDS, HP, IBM, NetApp
<b>Desktops</b>	Windows XP and upwards
<b>Antivirus Products</b>	Symantec, McAfee & Trend Micro



### About Arrow Fusion

Arrow Fusion offers the IT channel a better way to grow infrastructure, enterprise, cloud and data center IT managed and professional services. The company's innovative remote and comprehensive suite of IT services (IT-as-a-Service) gives solution providers and MSPs instant access to expert, certified IT engineers, proven ITIL processes and an ISO27001 certified, SAS70 audited network operating center (NOC) at a much lower cost than full-time resources. Partners purchase Arrow Fusion IT-as-a-Service on a monthly or hourly basis to enhance or augment their IT capabilities; some choose to resell Arrow Fusion directly to their end customers. Visit us at [www.ecs.arrow.com](http://www.ecs.arrow.com) or call 800.544.7674.

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# Mid-market Services

## REMOTE INFRASTRUCTURE AND DESKTOP MANAGED SERVICES



**Arrow Fusion Mid-market Services (MMS) are designed to provide solution providers with a comprehensive suite of remote infrastructure and desktop managed services for their mid-sized business clients.** Arrow Fusion services are performed 24x7, 365 days a year by experienced, certified technicians, who use enterprise-class technologies and follow proven ITIL processes to ensure continuous uptime for servers, network devices, infrastructure applications and desktops.

## Server and Network Infrastructure Services

Two levels of MMS are available:

**AID proactively monitors the health of your client's server and network infrastructure:** industry standard monitoring checks the availability and performance of Windows & Linux operating system services, event logs, SNMP based network devices as well as hardware errors. Arrow Fusion personnel reviews incoming alerts and log files to quickly pinpoint an issue and proceed with pre-defined standard operating procedures (SOPs) for remediation. If the SOPs fail to resolve the problem, the ticket is updated and immediately escalated to a designated partner contact or ISP vendor for resolution of the issue.

**MANAGE lets you profit from full remediation and management of your client's server and network infrastructure:** in addition to monitoring, SOP remediation and full resolution of problems or issues, Arrow Fusion personnel reviews incoming alerts and log files to quickly pinpoint an issue and remediate the problem. If the Arrow Fusion personnel is unable to resolve the problem, the ticket will be updated with detailed troubleshooting steps and immediately escalated to the vendor Tech Support<sup>1</sup> or ISP vendor for further troubleshooting and full resolution.

### Preventive Maintenance and Weekly Reporting

Reduce the risk of system failure or outages with Arrow Fusion SBS AID and MANAGE. Services include Windows patch management<sup>2</sup> for operating systems, as well as proactive Anti-virus definition updates, Active Directory (AD) and Exchange health checks. Partners will approve all major updates performed.

Weekly and monthly reporting is provided and reports are available on demand for both Arrow Fusion SBS AID and MANAGE services. Arrow Fusion reports provide valuable data for Arrow Fusion partners to regularly assess the overall health of their client's IT infrastructure under management.

MID-MARKET SERVICES FOR SERVERS AND NETWORK	AID	MANAGE
24x7 Monitoring of Windows Server (Availability, Performance, Services and Event logs), Network Devices and backup processes	✓	✓
Alert Validation & Escalation	✓	✓
Verifying Completion of Backup Jobs	✓	✓
Standard Operating Procedures(SOPs)-based Initial Remediation	✓	✓
ISP Vendor <sup>3</sup> Escalations for Link Downtime	✓	✓
Anti-virus Definition Updates Validated	✓	✓
Windows Patch Management Per Customer Approval	✓	✓
2-way Integration with Autotask/Connectwise or Access to Portal for Case Tracking and Metrics Reports	✓	✓
Executive Dashboard (web portal), On-Demand, Weekly & Monthly Reports	✓	✓
Monthly Health Checks for Active Directory and Exchange		✓
Troubleshooting & Full Remediation		✓
Vendor Tech Support for Further Troubleshooting and Full Resolution		✓
Move, Add, Change (MACs) <sup>4</sup>		✓

### MMS Targets End Client

More complex Small and Mid-sized businesses.. Or, end clients with up to 250 users and a minimum of four (4) and maximum of 100 servers or network devices.

### Always On

24x7 monitoring of critical IT infrastructure.

### No Disruption

Preventive maintenance is performed for updates, changes, and performance-intense services during non-peak periods, eliminating impact to client business operations.

### Complete Control

Arrow Fusion sets SOP standards for the review of incoming alerts and initial execution. Detailed reports show work performed.

### Proactive

Incoming alerts are reviewed and immediately remediated by Arrow Fusion. If required, we coordinate with Vendor tech support<sup>2</sup> for remediation.

### Fully Integrated

All alerts are updated in Autotask and Connectwise PSA tools. Arrow Fusion will support published RMM tools, platform or infrastructure hardware used by our partners and their clients.

### Accountable

Detailed reports are generated on all activity performed – alerts, trouble tickets, preventive maintenance, and infrastructure performance -- all instantly available from a secure web portal.

# Mid-market Services

REMOTE INFRASTRUCTURE AND DESKTOP MANAGED SERVICES



## Desktop Services

### Improve Productivity

Improve desktop/laptop reliability and performance with consistent security patch management and Anti-virus Definition Updates.

### No Disruption

Operating system, application updates and upgrades are delivered during non-peak periods to reduce the impact to client productivity.

### Free-up Resources

Your clients can contact Arrow Fusion by Chat, Email or via alert Tickets to resolve any issue without tying up your team.

**Arrow Fusion MMS Desktop services help solution providers maintain the productivity, as well as optimize the performance, reliability and security of their client's Windows-based desktops and portable devices.** MMS Desktop services are performed 24x7, 365 days a year by experienced, certified Windows administrators, who use enterprise-class technologies and follow proven ITIL processes for minimal impact on user productivity of desktop and portable devices.

Arrow Fusion partners may choose from two levels of MMS Desktop services for Windows desktops and portable systems – AID and MANAGE. MMS AID provides remote Windows patch management and Anti-virus updates for preventive maintenance. MMS MANAGE includes the same services offered within AID, and includes access to your Arrow Fusion desktop support team by Chat, Email or via alert Ticket for any desktop or laptop issue. Arrow Fusion will respond as if they are a member of your own IT Staff.

MID-MARKET SERVICES FOR DESKTOPS	AID	MANAGE
Management of Windows Patch Releases (Operating System, IE, Office) to Desktops and Portable Systems	✓	✓
Anti-virus Definition Updates Validated	✓	✓
Inventory Reporting (desktops/laptops)	✓	✓
Contact via Phone, Email, or Web for Desktop/Laptop Issues, Access or Problems with Network(s) or Printer(s), User Password Resets, PDA Synchronization, Virus Removal and VPN Client Configuration/Access. All Requests/Issues Ticketed and Escalated (Per Customer Specification)		✓

1 – Microsoft Vendor Tech Support Included. Must have valid vendors' maintenance/technical agreement for Network devices, Non-Microsoft or 3<sup>rd</sup> party applications, and Anti-virus products. Expiration of maintenance/technical support agreement places limits on AID & MANAGE services. Software & hardware put into 'End of Life' phase by vendor will be limited to AID & MANAGE service only.

2 – Default Windows patch Management includes Security & Critical patches. Genuine Windows license is the responsibility of the customer.

3 – Customer or solution providers should authorize Arrow Fusion personnel to escalate link failures to ISP vendor. Valid support contracts managed by the customer.

4- MACs for AD, Exchange mail boxes, Blackberry, Terminal servers and Citrix are included.

### IT INFRASTRUCTURE

### SUPPORTED TECHNOLOGY

<b>Server Operating Systems</b>	Windows Server 2000 and upwards, SBS Server Linux Flavors (Red Hat, Centos & Ubuntu )
<b>Server Applications</b>	Domain Controller (Active Directory), Email (Microsoft Exchange), Backup (Symantec, NT Backup), Mobile (Blackberry), Virtualization (VMware, Xen), Terminal Servers, Citrix, SharePoint, Web Servers (Apache, Tomcat, IIS, Web logic, JBoss, J2EE)
<b>Databases</b>	MS SQL (EXP, STD), My SQL (STD)
<b>Network</b>	Switches, Router, Firewall, WAP and VoIP (Cisco, HP & Juniper)
<b>Website Monitoring</b>	Website Monitoring
<b>Desktops</b>	Windows XP and upwards
<b>Anti-virus Products</b>	Symantec, McAfee & Trend Micro



### About Arrow Fusion

Arrow Fusion services give solution providers a better way to manage IT from the closet to the cloud. The company's innovative remote and comprehensive suite of IT services (IT-as-a-Service) gives solution providers and MSPs instant access to expert certified IT engineers, proven ITIL processes and an ISO27001 certified, SAS70 audited network operating center (NOC) at a much lower cost than full-time resources. Partners purchase Arrow Fusion IT-as-a-Service on a monthly or hourly basis to enhance or augment their IT capabilities; some choose to resell Arrow Fusion directly to their end customers. Visit us at [www.ecs.arrow.com](http://www.ecs.arrow.com) or call 800.544.7646.

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ARROW ENTERPRISE COMPUTING SOLUTIONS

# Arrow Fusion<sup>SM</sup> Professional Services

## Desktop Support

Do your customers need to minimize their IT support costs without sacrificing employee productivity? Then you'll be glad to know that Arrow Fusion Professional Services offers 24/7 Desktop Support. A quick call, email, web or chat request provides assistance for all major desktop operating systems and applications, as well as traditional and virtual desktop environments.

Desktop productivity drives business productivity. With so much riding on desktop availability, it's good to know that fast, personalized assistance is just minutes away.

### Features and Benefits

- Seamless, remote troubleshooting, configuration and maintenance for all desktop operating systems, including traditional and virtual environments.
- Users request support by phone, email, web and chat.
- *No voicemail or automated menu systems.* Service requests ALWAYS answered by a person.
- One Year Contract, Billed Monthly.
- Preventative Maintenance of Desktops.
- Unlimited support 24/7 in North America.
- Staffed by qualified, certified, US-based engineers.

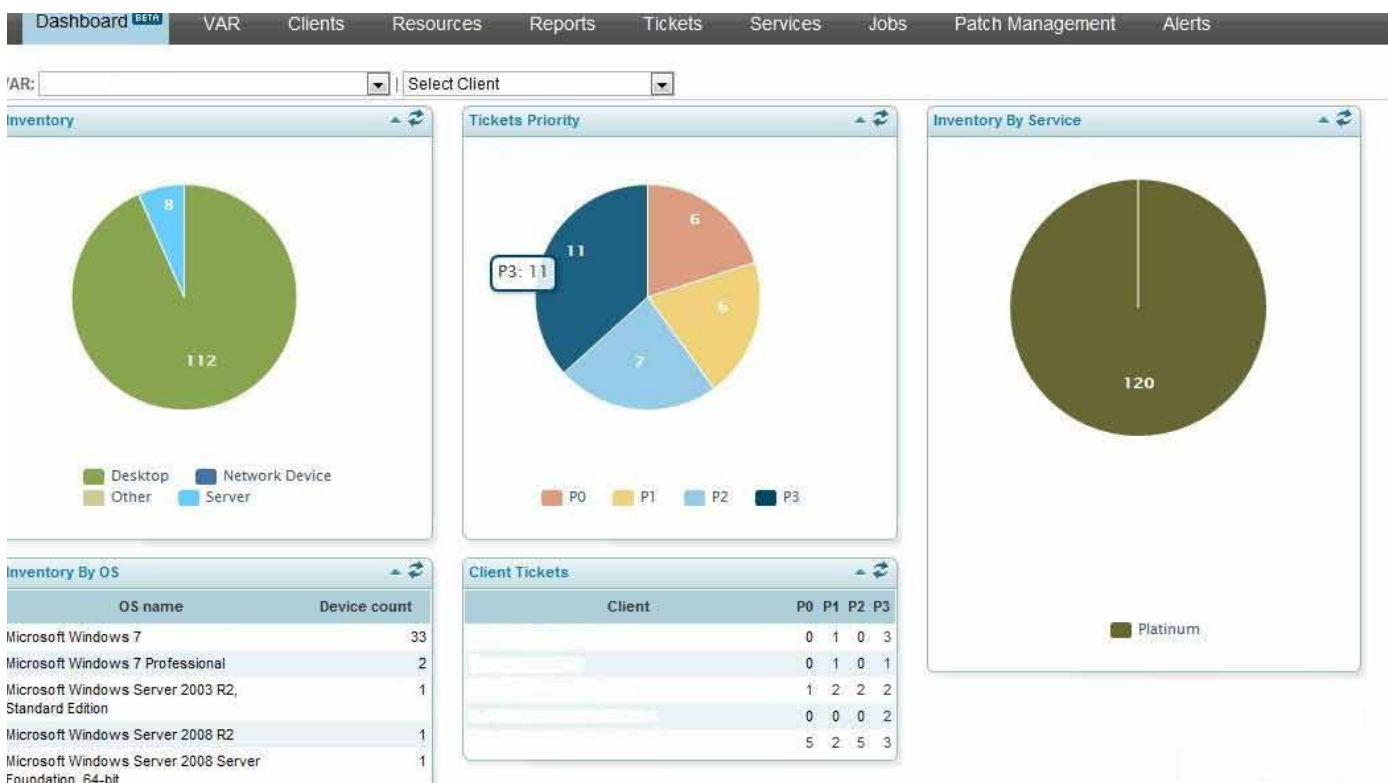


Fig. 1 Enhanced Desktop Support Dashboard

## Support Services

- IT Infrastructure Library (ITIL)-based service delivery model with ticketing system, real-time metrics reporting and knowledgebase management.
- Extensive knowledgebase that speeds problem resolution for common issues.
- White-labeled services and web portal for reseller rebranding.

### Options

- Standard Desktop Support includes all major operating systems, standard applications (including 3<sup>rd</sup> party or proprietary applications) and related services, such as network and printer configuration, mobile device synchronization, virus removal and general administrative tasks.
- Enhanced Desktop Support includes Standard services plus system cleanup and optimization, patch management, antivirus and spyware scanning, asset and inventory reporting and portal access.

Whether you are focusing on growing your business, entering new markets, building your pipeline, or closing more opportunities, Arrow Fusion desktop support provides an option to meet your needs.

	Standard Desktop Support	Enhanced Desktop Support
<b>Software:</b> Desktop operating systems, standard applications, third party or proprietary applications (Case by case basis)	•	•
<b>Services:</b> Network and printer configuration, PDA synchronization and configuration, general administrative tasks	•	•
<b>Preventative Maintenance:</b> Patch installation and management, security scanning, file and folder cleanup, asset and inventory reporting		•
<b>Web Portal Access:</b> Single Point access to all your clients Ability to manage all the devices. Tickets for clients from a single portal.		•

### CREDENTIALS/EXPERIENCE:

When you contract with us, you can be confident of the high level of knowledge and expertise you are extending to your client's projects. Staffed with experts on multiple products and technologies, each member of our professional services team has years of real-world experience, ensuring your client's project will be a success in any environment.

### PROFESSIONAL SERVICES ENGAGEMENT PROCESS

We make it easy to partner with us giving you access to our broad portfolio of professional services. Leverage our complete turnkey solutions including presales support, available project planning and management, and the technical expertise to ensure the job is done right from start to finish. All you have to do is contact your Arrow ECS sales representative and we'll do the rest.

### COMPETITIVE DIFFERENTIATORS

- Arrow Fusion will NEVER compete against our VARs for their client's business.
- "No strings attached": VAR has the flexibility to decide when and how to combine additional products, solutions, or services.
- Streamlined yet flexible engagement model accelerates the sales cycle while preserving your client relationships.
- One-stop-shopping: Our engineers and consultants are experts in multiple products and technologies and can leverage our extensive line card for solution recommendations.

**For more information, contact Arrow Fusion<sup>SM</sup> professional services at 877.558.6677 or visit [http://ecs.arrow.com/services/professional\\_services.html](http://ecs.arrow.com/services/professional_services.html)**



# Arrow Fusion<sup>SM</sup> Professional Services

## Consulting Services

As a value-added reseller (VAR), servicing your clients with the best possible solutions is a top priority. But at times you might lack the time, training, and cross-technology expertise to support new technologies. Increasing technical complexity and competitive pressures place mounting demands on your internal resources, and a major new technology implementation can stretch those resources beyond their limits. Arrow ECS professional services acts as an extension to your services team providing rapid scalability and expertise needed to address virtually any professional services need. Our Subject Matter Experts (SMEs) can help you deliver product and services solutions that fill the critical business needs of your customers.

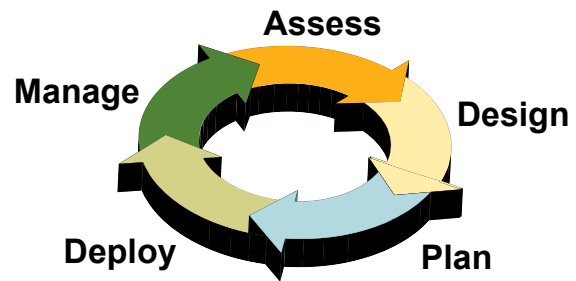
Whether your client is evaluating a new technology deployment, needs to upgrade or migrate a legacy system, or just needs to optimize a part of their network, we focus on the entire life cycle of your customers' network—and expand technology opportunities that bring you more business.

### Consulting Services helps you:

- Manage business growth with a smaller engineering staff.
- Explore opportunities outside your normal geographic coverage area.
- Deliver new skill sets, which would be unavailable with your current staff.
- Capture revenue for a greater range of projects and services than previously possible.

### Consulting Services Area of Expertise:

Following industry best practices and procedures, our industry and vendor-certified consultants provide resources and expertise to augment your existing capabilities. Our areas of expertise include:



#### Data Center

- Allot
- Blue Coat
- Cisco
- Citrix
- CommVault
- Double-Take

- Lakeside Software
- Microsoft
- Novell
- Radware
- Riverbed
- Vizioncore

#### Storage and Servers

- NetApp
- DataCore
- EMC

- Hitachi Data Systems
- HP
- IBM
- Brocade

#### Security Consulting

- Fortinet
- McAfee
- SafeNet
- SonicWALL
- Watchguard

- Regulatory Compliance
- Penetration Testing
- Incident Response
- Forensics

#### Software

- CA
- Oracle

Project management services are available on every Arrow ECS consulting engagement or as a standalone service according to the VAR's needs.

## Consulting Services

Whether you are focusing on growing your business, entering new markets, building your pipeline, or closing more opportunities, Arrow ECS professional services provides the necessary tools, resources, and support to accelerate your efforts and ensure your success.

SERVICE	NEED	SOLUTION
<b>Consulting Services</b> <ul style="list-style-type: none"> <li>Vendor / Industry-certified experts</li> <li>Specializing in Data Center, Storage, Servers, Security, and Software</li> <li>Assessment, Design, Planning, Migration, Implementation</li> <li>Project Management</li> </ul>	VARs that need to grow their business faster than the market and faster than the competition but lack the technical staff and/or resources to address all of their clients needs.	We act as an extension to a VAR's services team providing rapid scalability and expertise needed to address virtually any professional services opportunity. Our Subject Matter Experts (SMEs) can help deliver product and services solutions that fill the critical business needs of our reseller's clients.
<b>Education Services</b> <ul style="list-style-type: none"> <li>Vendor authorized training</li> <li>Open enrollment, Private / VAR-hosted, Online</li> <li>Microsoft, VMware, Novell, Blue Coat, Fortinet, SonicWALL</li> </ul>	VARs that need to gain engineering certifications or capture additional revenue and profit by training their clients on new technology.	We provide Vendor-authorized training as a turnkey service to VARs and their clients. We enable the VAR to expand their vendor/product portfolio through increased engineering certifications and to enable the VAR's clients to maximize their technology investments.
<b>Support Services</b> <ul style="list-style-type: none"> <li>24x7 telephone-based help desk</li> <li>OneCall incident-based support</li> <li>Elite / Managed support</li> <li>Multi-vendor / Multi-product</li> </ul>	VARs that need to improve their ability to provide technical support after the sale but have limited resources to build or expand their own help desk.	We enable VARs to offer a wide range of post-sales technical support services to their clients allowing them to build and strengthen long-term relationships.
<b>Managed Services / Cloud Computing</b> <ul style="list-style-type: none"> <li>MSP aggregation and integration for VARs</li> <li>Managed Security Services</li> <li>Managed Infrastructure Services</li> <li>Software as a Service (SaaS)</li> <li>Disaster Recovery and Business Continuity</li> </ul>	VARs that need to offer their clients alternative solutions while building or expanding a monthly recurring revenue stream.	By acting as a managed services aggregator, we streamline and accelerate the selection, engagement, integration, and management process for VARs building or expanding their managed services portfolio.

### CREDENTIALS/EXPERIENCE:

When you contract with us, you can be confident of the high level of knowledge and expertise you are extending to your client's projects. Staffed with experts on multiple products and technologies, each member of our professional services team has years of real-world experience as well, ensuring that your client's project will be a success in any environment.

### PROFESSIONAL SERVICES ENGAGEMENT PROCESS

We make it easy to partner with us and leverage our broad portfolio of professional services. We offer complete turnkey solutions including presales support, available project planning and management, and the technical expertise to ensure the job is done right from start to finish. All you have to do is contact your Arrow ECS sales representative and we'll do the rest.

### COMPETITIVE DIFFERENTIATORS

- Arrow ECS will NEVER compete against our VARs for their client's business.
- Pre-determined deliverables, timelines, and costs are based on a Statement of Work (SOW).
- "No strings attached": VAR has the flexibility to decide when and how to combine additional products, solutions, or services with each project.
- Streamlined yet flexible engagement model accelerates the sales cycle while preserving your client relationships.
- Available project management resources ensure each engagement goes as smoothly as possible.
- One-stop-shopping: Our engineers and consultants are experts in multiple products and technologies and can leverage our extensive line card for solution recommendations.

**For more information, contact professional services at 877.558.6677 or visit [http://ecs.arrow.com/services/professional\\_services.html](http://ecs.arrow.com/services/professional_services.html)**



# Arrow Fusion<sup>SM</sup> Professional Services

## One Call Support

In today's fast-paced business environment, don't let your customers suffer from inefficient support and unnecessary downtime.

A little insurance can go a long way toward protecting the bottom line. With Arrow ECS support services, you and your customers get instant access to our highly trained team of experts and timely solutions across multiple platforms. Our support contracts enhance your customer's existing vendor maintenance contracts by providing a single support contract that covers virtually every product in your customer's data center, thereby eliminating the hassle and frustration of single vendor / single product support.

## One Call Support

Our telephone-based technical support services are available around the clock, providing expert troubleshooting assistance whenever it's needed. We provide a one-stop shop support solution; the customer is never told to call someone else.

### Features and Benefits

One Call support reduces system downtime and increases overall reliability and productivity.

- Industry and vendor certified engineers that have years of real-world experience. Certifications include MSCE, CCA, CNE, CCNA, VCP, and many others.
- Personalized Service – The phone is ALWAYS answered by a person, you never have to deal with voicemail or automated menu systems!

- A single point of contact for all your support needs - we troubleshoot across multiple products and platforms so you never have to call someone else to get your issue resolved.
- Escalation support - we escalate to vendors as needed on your behalf to resolve the most complex of issues at no additional charge.
- Extensive knowledge base - developed over years of solving complex problems, our knowledge base lets us quickly diagnose and resolve commonly reported issues or any issue that has been reported in the past.

### Options

One Call support contracts are telephone-based, incident-based, and good for 12 months. You pay for only the amount of coverage you think you will need in a year. Options include:

- Standard business day support, 8:00A.M. – 5:00P.M. in the customer's local time zone
- 24x7x365 support
- Incidents are purchased in increments of five



## Support Services

Whether you are focusing on growing your business, entering new markets, building your pipeline, or closing more opportunities, Arrow ECS professional services provides the necessary tools, resources, and support to accelerate your efforts and ensure your success.

SERVICE	NEED	SOLUTION
<b>Consulting Services</b> <ul style="list-style-type: none"> <li>• Vendor / Industry-certified experts</li> <li>• Specializing in Data Center, Storage, Servers, Security, and Software</li> <li>• Assessment, Design, Planning, Migration, Implementation</li> <li>• Project Management</li> </ul>	VARs that need to grow their business faster than the market and faster than the competition but lack the technical staff and/or resources to address all of their clients needs.	We act as an extension to a VAR's services team providing rapid scalability and expertise needed to address virtually any professional services opportunity. Our Subject Matter Experts (SMEs) can help deliver product and services solutions that fill the critical business needs of our reseller's clients.
<b>Education Services</b> <ul style="list-style-type: none"> <li>• Vendor authorized training</li> <li>• Open enrollment, Private / VAR-hosted, Online</li> <li>• Microsoft, VMware, Novell, Blue Coat, Fortinet, SonicWALL</li> </ul>	VARs that need to gain engineering certifications or capture additional revenue and profit by training their clients on new technology.	We provide Vendor-authorized training as a turnkey service to VARs and their clients. We enable the VAR to expand their vendor/product portfolio through increased engineering certifications and to enable the VAR's clients to maximize their technology investments.
<b>Support Services</b> <ul style="list-style-type: none"> <li>• 24x7 telephone-based help desk</li> <li>• OneCall incident-based support</li> <li>• Elite / Managed support</li> <li>• Multi-vendor / Multi-product</li> </ul>	VARs that need to improve their ability to provide technical support after the sale but have limited resources to build or expand their own help desk.	We enable VARs to offer a wide range of post-sales technical support services to their clients allowing them to build and strengthen long-term relationships.
<b>Managed Services / Cloud Computing</b> <ul style="list-style-type: none"> <li>• MSP aggregation and integration for VARs</li> <li>• Managed Security Services</li> <li>• Managed Infrastructure Services</li> <li>• Software as a Service (SaaS)</li> <li>• Disaster Recovery and Business Continuity</li> </ul>	VARs that need to offer their clients alternative solutions while building or expanding a monthly recurring revenue stream.	By acting as a managed services aggregator, we streamline and accelerate the selection, engagement, integration, and management process for VARs building or expanding their managed services portfolio.

### CREDENTIALS/EXPERIENCE:

When you contract with us, you can be confident of the high level of knowledge and expertise you are extending to your client's projects. Staffed with experts on multiple products and technologies, each member of our professional services team has years of real-world experience as well, ensuring that your client's project will be a success in any environment.

### PROFESSIONAL SERVICES ENGAGEMENT PROCESS

We make it easy to partner with us and leverage our broad portfolio of professional services. We offer complete turnkey solutions including presales support, available project planning and management, and the technical expertise to ensure the job is done right from start to finish. All you have to do is contact your Arrow ECS sales representative and we'll do the rest.

### COMPETITIVE DIFFERENTIATORS

- Arrow ECS will NEVER compete against our VARs for their client's business.
- Pre-determined deliverables, timelines, and costs are based on a Statement of Work (SOW).
- "No strings attached": VAR has the flexibility to decide when and how to combine additional products, solutions, or services with each project.
- Streamlined yet flexible engagement model accelerates the sales cycle while preserving your client relationships.
- Available project management resources ensure each engagement goes as smoothly as possible.
- One-stop-shopping: Our engineers and consultants are experts in multiple products and technologies and can leverage our extensive line card for solution recommendations.

**For more information, contact professional services at 877.558.6677 or visit [http://ecs.arrow.com/services/professional\\_services.html](http://ecs.arrow.com/services/professional_services.html)**

# Arrow Fusion<sup>SM</sup> One Call Support Line Card



ARROW ENTERPRISE COMPUTING SOLUTIONS

All One Call support contracts offered by Arrow Fusion<sup>SM</sup> Professional Services cover the following suppliers:


**Microsoft**  
GOLD CERTIFIED  
Partner  
Business Productivity Solutions  
Communications, E-mail, Mobile  
Portals and Collaboration  
Unified Communications

**Microsoft**  
Small Business  
Specialist

**vmware** | authorized  
TRAINING CENTER

**vmware**  
AUTHORIZED  
CONSULTANT

**Blue Coat**  
BLUETOOTH<sup>SM</sup> CERTIFIED PARTNER

**Microsoft**  
GOLD CERTIFIED  
Partner  
Small Business Specialist Community  
Virtualization  
Systems Management  
Identity and Security

**Microsoft**  
GOLD CERTIFIED  
Partner  
Midmarket Solution Provider  
Network Solutions

Additional support for suppliers not shown above may be available.  
For more information, contact Arrow Fusion Professional Services at 877.558.6677 or  
visit [http://esc.arrow.com/services/professional\\_services.html](http://esc.arrow.com/services/professional_services.html)

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