



# Cisco Wireless Mesh Networking Solution and Selling Strategy to Partners

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# Latest Trend - Wireless Mesh Networking



**The proliferation of Wi-Fi clients is driving broader 802.11-based application adoption**

**Unlicensed bandwidth + wireless routing allow “micro-cells” to interconnect over wireless backhaul links, reducing costs**

# Cisco Value Proposition

- **Market Leader in Indoor/Outdoor Wi-Fi Solution**
  - 45,000+ AP installations
  - \$50M in Outdoor Wi-Fi in FY05
- **Ease of Deployment and “Best-in-Class” Management reduces OPEX**
- **Unified Wired+Wireless Networks**
- **New Solution : Cisco Wireless Mesh Networking  
.....launched in November, 2005**

# Cisco Wireless Mesh Launch - Analyst Accolades...

**“The mesh networking solution looks strong.” Ken Dulaney, VP/Distinguished Analyst, *Gartner***

**“Looks good. Really on track. More than I expected from the Cisco enterprise angle to get this out the door.” Joel Conover, Principal Analyst, IT Infrastructure, *Current Analysis***

**“Cisco’s ability to tie it into a full system, the same management capabilities inside and out is done correctly.” Bill Terrill, Senior Analyst, *Burton Group***

# Notable Quotes in the Press

The networking giant moves into the growing citywide wireless market, making startups already in the field uneasy. – ***Red Herring***

‘Cisco will no doubt become a major player.’  
– ***Craig Mathias,  
Farpoint Group***

“The interest [in mesh networking] is high and it makes mayors look great.” ... “I’m surprised it has taken [Cisco] this long, though Cisco likes to go to market with rock-solid products.” – ***Julie Ask, Jupiter Research***

# Market Overview for Wireless Mesh



# Market Update

- **U.S. Cities and Counties will spend \$700M on outdoor wireless in the next 3 years (134% CAGR)**
- **169% growth in Wi-Fi consumer products this year**
- **49% growth in Wi-Fi enterprise products this year**
- **18 Million Wi-Fi NICs and 19 Million APs sold in 2004 (including imbedded NICs)**
- **22 Million Wi-Fi NICs** (Sources: IDC-June 2004; Microcast-Sept 2005)

“The potential market is made up roughly of 40,000 municipalities, with projects that are often very large in scope and scale.”

Julie Ask, Jupiter Research, June 05

**Wi-Fi Client Wave is still growing**

# Key Trends in the Outdoor Wireless Market

## Tier 1 & 2 Cities/Municipalities

- **Service Providers are becoming more involved (Managed Services).**  
Cable, Mobility and Competitive SPs/WISPs
- **Most if not all will require RFP process..**
- **Application-driven Networks have appeared**  
Google and Location-based Advertising  
Nintendo and WiFi Gaming Network

## Mid-Tier 2 to 3 Cities/Municipalities are the “sweet spot” for integrators and small – medium WISP

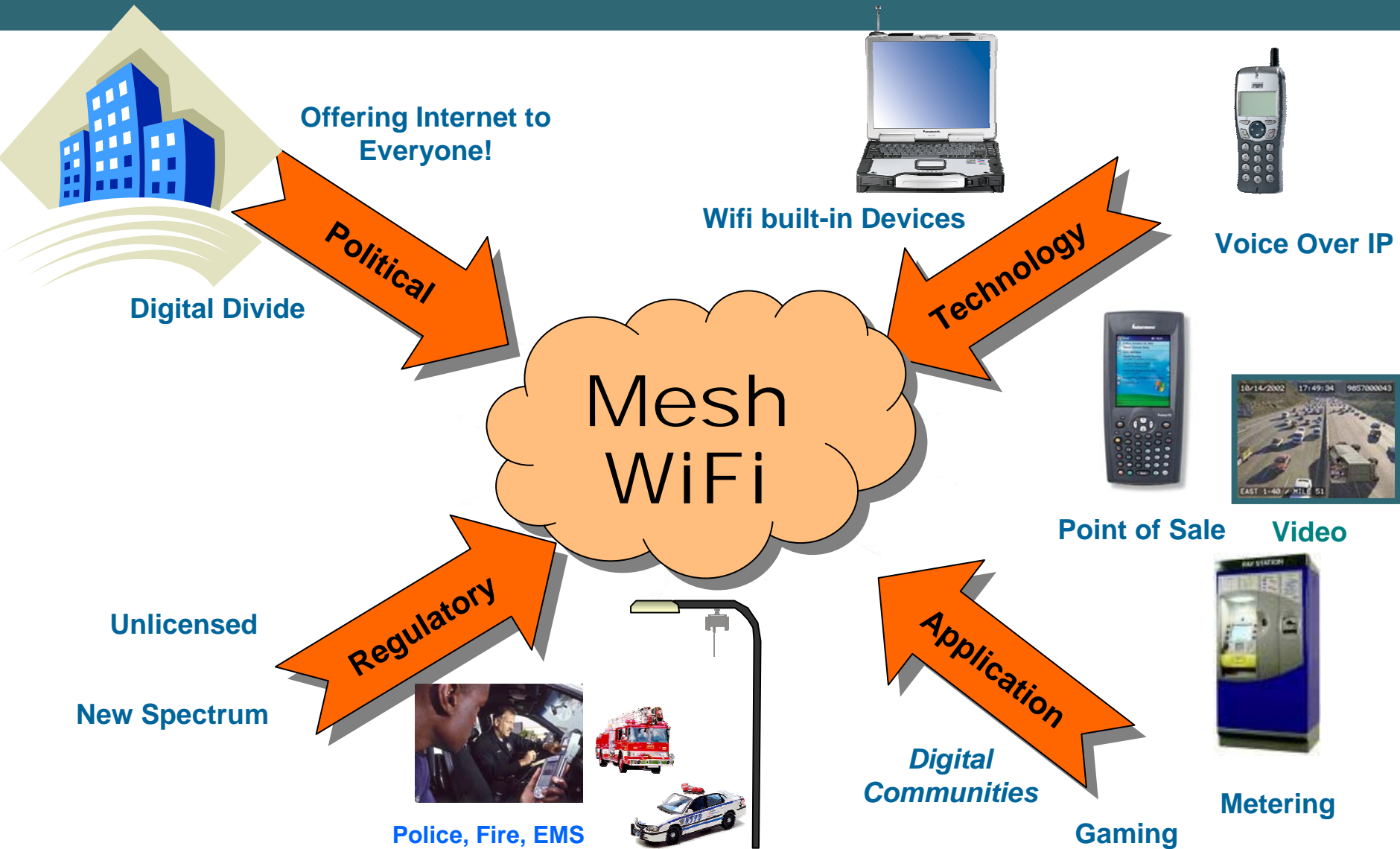
- **City/Municipal funded projects.**
- **Advertiser Sponsored**
- **Less competition**
- **Digital Divide**
- **Application driven - Metering, voice, field data communications, public.**
- **Potentially no RFP**

## 4.9GHz is a real requirement – Public Safety

- **Quite a few cities have requested or received their 4.9GHz licenses**
- **Homeland Defense grant money is helping fund these city networks**
- **4.9GHz reserved for Public Safety traffic only.**
- **Application Examples: Uploading arrest reports, Fugitive Watch, DMV, Federal or Amber Alert picture downloads.**



# MESH WiFi Drivers



# Key Market Segments for Outdoor Wireless

## Enterprise Outdoor *Moving Indoor Wi-Fi Outside*

- **Universities & Healthcare**  
Extending Wi-Fi coverage throughout the entire campus
- **Hospitality**  
Indoor/Outdoor mesh can open up new hospitality markets (EMEA)
- **Manufacturing - Shipping & Receiving**  
Inventory applications, handheld scanner, RFID, etc.
- **Large Corporate Campuses**  
Creating “blanket” coverage for access and asset tracking
- **Utilities**  
Vehicle Fleets and Sensor Networks

## Public Sector *State, County & City*

- **Public Safety/Homeland Security**  
Police, fire and 1st responders  
Licensed and Unlicensed Wireless Infrastructure, Vehicles & Clients
- **Wireless Access for Fixed Applications**  
Video Surveillance, Sensors
- **Public Service**  
Hot Spot access for city workers, utilities, inspectors
- **Digital Divide & Economic Development**  
Wi-Fi Broadband Access in under-served communities

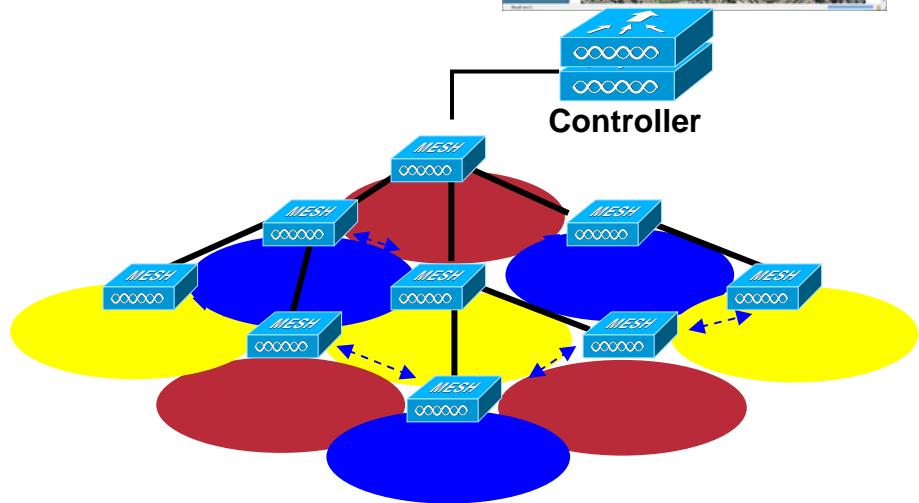
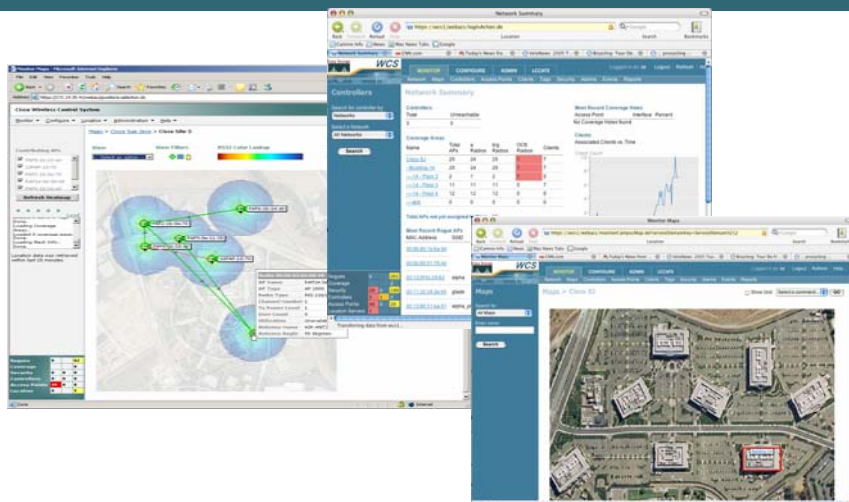
## Service Provider *Managed Wi-Fi Services*

- **“Hot Zones”**  
Expanding the concept of Hot Spot coverage into Hot Zone coverage
- **Wireless ISPs**  
Competitive Last-mile access providers using Wi-Fi for Broadband service
- **Cable & Wireline Operators**  
Extend the network offering beyond the cable and wireline plant

# Cisco Wireless Mesh Product Overview



# The Industry's 1st Intelligent Wireless Mesh Solution



- **Engineered with Ease of Deployment & Management as Top-of-Mind**

**Identical Indoor/Outdoor Management**

**Based on LWAPP**

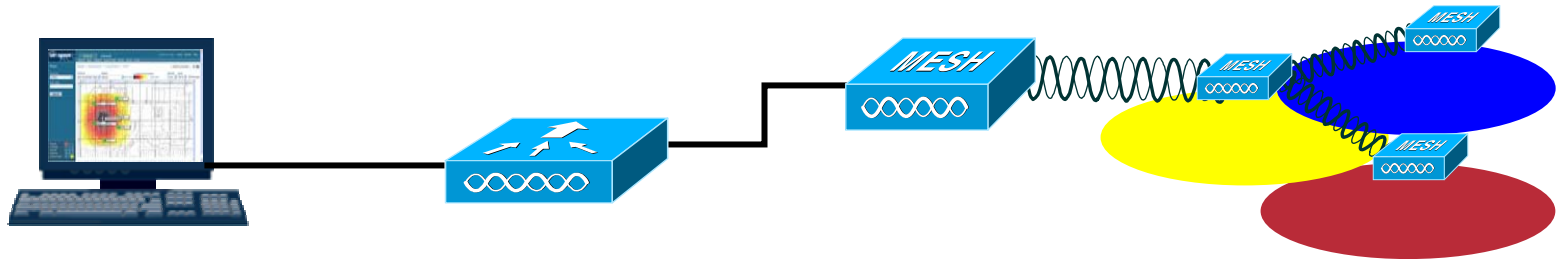
- **Self-Configuring, Self-Healing Mesh**

**Zero-Touch Configuration**

**Cisco's new Adaptive Wireless Path (AWP) Protocol**

- **Robust Embedded Security**
- **Provides Seamless L3 Mobility**

# Outdoor Wireless Mesh Solution Components



## Cisco Wireless Control Systems

- Wireless Mesh Management System
- Enables network-wide policy configuration and device management
- Supports SNMP and Syslog

## Cisco Wireless LAN Controller

- Links the Wireless Mesh APs to the wired network
- Handles RF algorithms and optimization
- Seamless L3 Mobility
- Provides Security and Mobility Mgt

## Roof-top Access Point

- Serves as “Root” or “Gateway” AP to the wired network
- Typically located on roof-tops or towers
- Connects up to 32 “Pole-top” APs using 802.11a

## Pole-top Access Point

- Provides 802.11b/g client access
- Connects to Root AP via 802.11a
- Takes AC or DC power; PoE capable
- Ethernet port for connecting peripheral devices

**Reliable  
Hardware**

**Industry Proven Devices at Every Layer**

# Cisco Aironet 1500 Lightweight Mesh AP

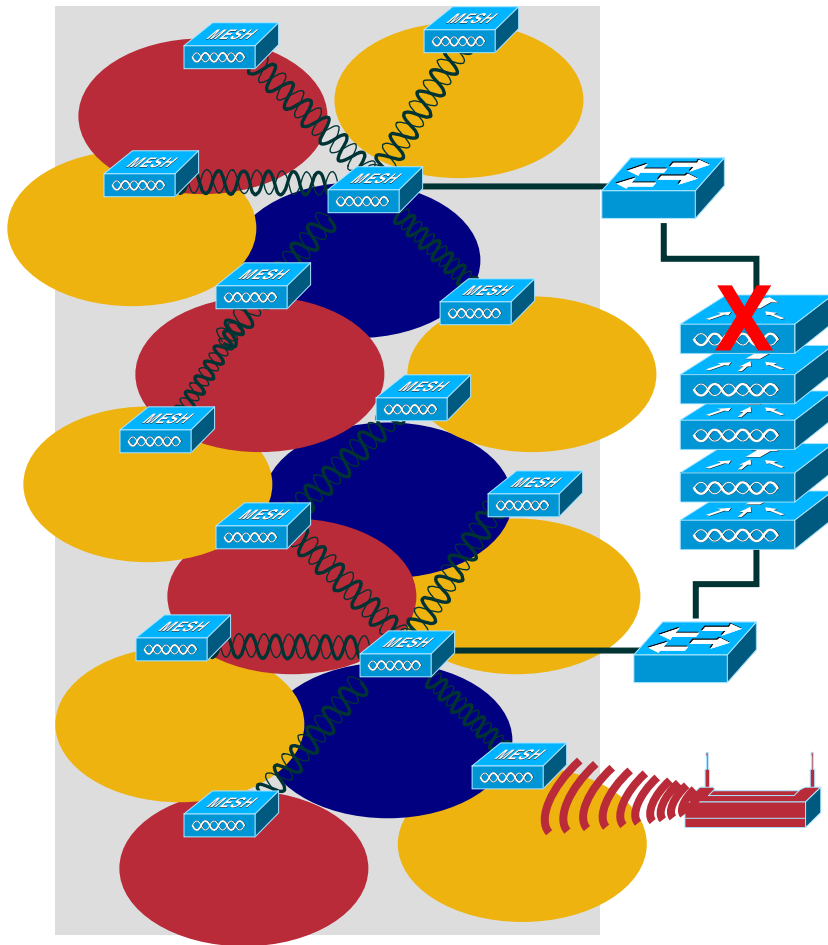
- **Fixed Configuration, Dual-Radio Outdoor AP**  
802.11b/g - access; 802.11a - backhaul
- **NEMA-4/IP66 Enclosure**  
Dimensions 13" x 6" x 8"  
Weight < 12 lbs  
Horizontal/Vertical swivel mounting brackets
- **Industrial Grade Power Supply**  
Local AC Power (95 – 260 VAC, 47 to 63 Hz)  
Street Light Power Tap  
DC Power over CAT5 (48 VDC)
- **Wind Loads**  
Sustaining: 100 Mph  
Gusts: 165 Mph
- **Temperature ranges -40C to +55C**



**Reliable  
Hardware**

***Cisco's Intensive MDVT and EDVT Standards***

# Adding Controller Intelligence to Outdoor Networks

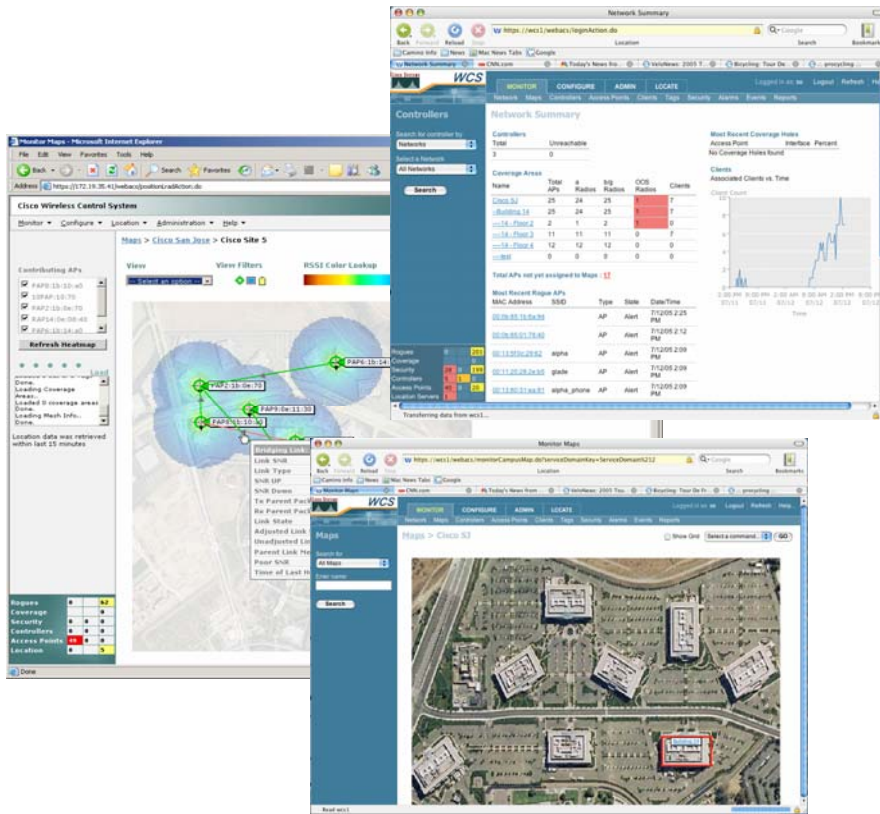


- **Automatic Service load-balancing across Wireless LAN Controllers**
  - LWAPP communicates controller load to APs
- **Dynamic RF Optimization**
  - Adaptive Channel Assignment
  - Intelligent TX\_Pwr Levels
- **Integrated Wireless IDS**
- **Per User/VLAN Traffic Rate Limiting**

**Secure  
Control**

***Delivering Mission-Critical Wi-Fi Access***

# Cisco's Award Winning Management Solution



- **Identical Management Software and RM Features as Indoor Solution**
- **SOAP/XML interfaces for NMS integration**
- **Detailed AP, Radio information including**
  - **Noise and Interference by Channel**
  - **Neighbors lists and RSSI detail**
  - **Link Metrics, PER, Tx/Rx detail**
- **Link Tests Tools for RAP-to-PAP troubleshooting**
- **SNR and Noise Floor Histograms**

**Best-in-Class Management**

**Easy to Deploy, Easy to Manage**



# Mesh Enhancements in Wireless Control System (WCS)

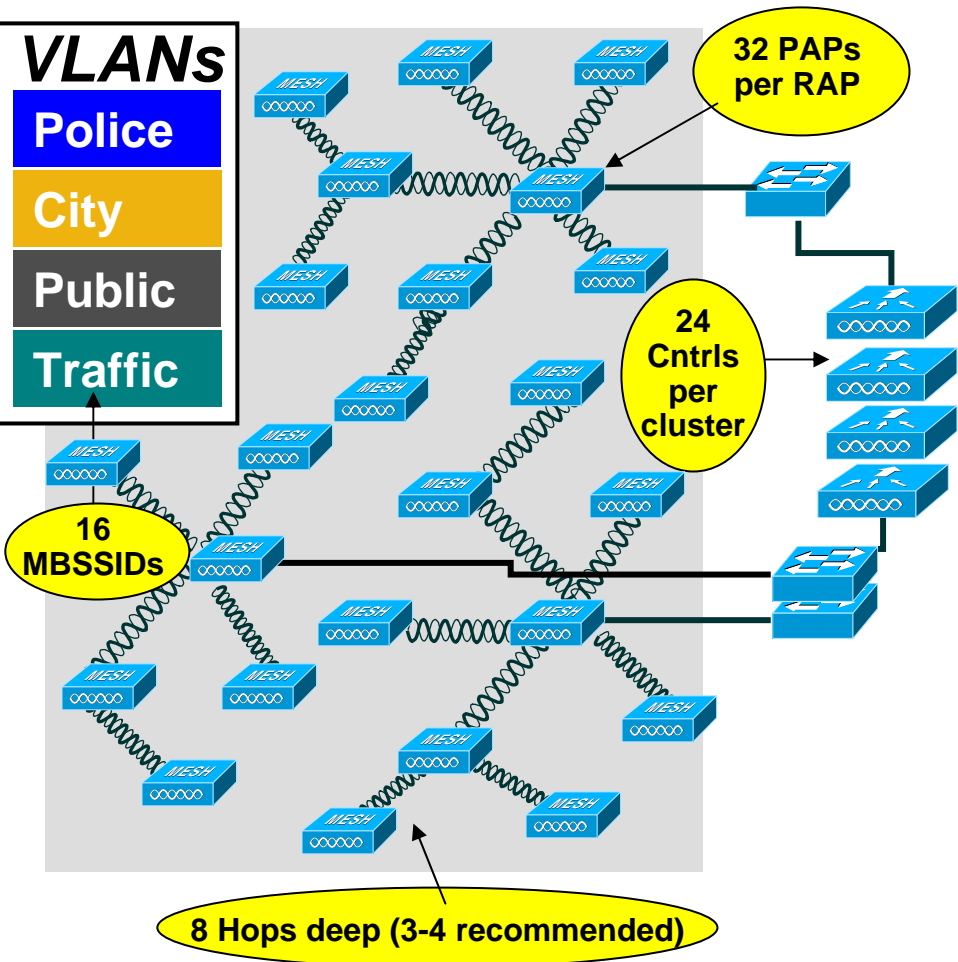
The screenshot displays the WCS interface with several key features highlighted by yellow starburst graphics labeled 'NEW':

- Mesh Topology Map:** Located at the top left, showing a network map with nodes and connections.
- Access Points Detail:** A panel showing details for AP PAPI:0e:14:00, including General, Versions, and Inventory Information.
- Mesh Network SNR Graphs:** Two line graphs showing Link SNR and Adjusted Link Metric over time.
- Mesh Network Link Graphs:** A bar chart showing Unadjusted Link Metric over time.
- Mesh Client Link Test:** A table listing clients with their MAC addresses, AP names, and status. A pop-up window shows test results for client 00:40:96:a8:f7:79.

Client MAC Addr	AP Name	AP MAC Addr	WLAN	Type	Status	Auth	Port
00:12:43:b8:c4:30	poletop-78-90			802.11b	Probing	No	1
00:40:96:a0:37:38	poletop-78-90			802.11b	Probing	No	1
00:40:96:a4:ea:10	poletop-78-90			802.11b	Probing	No	1
00:40:96:a8:f7:79	poletop-78-90	00:0e:05:1b:78:90	navdeep	802.11g	Associated	Yes	1

- **Mesh Topology Map**  
Coverage Areas/Maps, Mesh Link Detail, Mesh AP Detail,
- **Mesh Statistics**  
Parent, Child, Neighbor Relationships
- **Mesh Network SNR Graphs**  
Link Details, SNR Uplink, SNR Downlink
- **Mesh Network Link Graphs**  
Link SNR, Unadjusted Link, Adjusted Link, Parent Link Metric
- **Mesh Client Link Test**  
Packets, Error Rates, Signal Strengths, Noise, etc

# Easily Adding Capacity and Services



- Increase AP Density
- Add Root/Gateway APs
  - Pole-top APs will join new RAPs with better path metrics
- Easily add Controllers
  - Up to 24 controllers can be part of an N+1 cluster
- 802.11e QoS Capable + Traffic Rate-limiting for “hog” mitigation
- Architecture is ready for additional radios when extra capacity is required

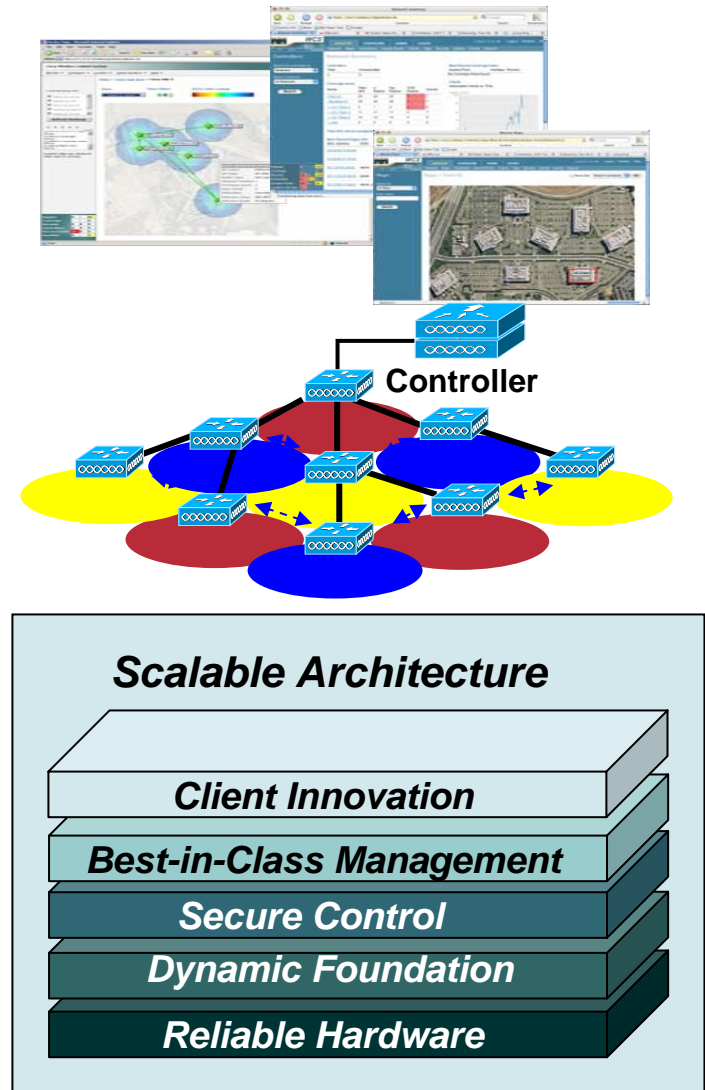
**Scalable  
Architecture**

**Reliable, Secure, Manageable, Service-Ready  
Architecture**

# Wireless Mesh Networking

## Summary

- The explosion of *standards-based Wi-Fi clients* is redefining the “network edge”
- Cisco’s *Best-in-Class Indoor/Outdoor Wireless Solution* changes the game
- Wired+Wireless Integration enables *unified policy definition and management*
- Cisco’s *Wireless Mesh Networking Architecture* is secure, reliable, scalable and easy to deploy and manage !



# Successful Customer Deployments



# Successful Customer Deployments

- **Dayton, OH – Increasing quality of life and attracting a younger technical crowd.**
- **Lebanon, OR – Providing the city with limited free Internet access and full access with paid subscription.**
- **Berkeley University Campus – Extending the indoor network to the outdoor campus.**
- **Many new undocumented wins including a major Utility company, railroad and high profile public safety networks! More press to come.**

# City of Dayton and HarborLink Networks

- **HarborLink Networks/City of Dayton Video**  
<http://newsroom.cisco.com/Newsroom/flash/evp/?vidid=98480470086B7C979ECC506612B16DF3&topic=Technologies&subtopic=Wireless>
- **HarborLink Networks/City of Dayton Success Story**  
[http://www.cisco.com/en/US/products/ps6548/products\\_customer\\_success\\_story0900aecd803664bf.html](http://www.cisco.com/en/US/products/ps6548/products_customer_success_story0900aecd803664bf.html)

# Wireless Mesh Advanced Technology Partner (ATP) Program



# Advanced Technology Partner (ATP) Program

**Cisco Aironet 1500 Series Access Point is a restricted product.**

## ***Why?***

- **Protects Cisco, the partner and the end-user.**
- **Allows partners who have invested resources in outdoor deployments to reap the rewards.**

## ***Good News!!***

- **Open Door Policy – ALL QUALIFIED PARTNERS WELCOME!**
- **ATP governs the pre-requisites of any partner wishing to represent a restricted Cisco product**



# New Outdoor Wireless Mesh ATP program

## *Top Level Requirements*

- **Full Service WLAN Specialized Partner (3 Day Cisco LWAPP Course).**
- **Previous outdoor wireless experience.**
- **Provide all path and interference related RF support (level 1 & 2).**
- **Attended required training (1/SE - 1 Day Cisco 1500 Mesh Course)**
- **Purchase/lease all required lab equipment. Working Lab consists of 3 (min) Aironet 1510 mesh access points, antennas, accessories and one WLAN Controller.**
- **Partner required to have lab equipment and create a lab for development and customer fault replication. RF spectrum analyzer, site survey tools and associated outdoor RF test equipment required.**
- **Personnel Requirements (min)**
  - Account Manager: Presales, Cisco Wireless LAN Sales Specialist**
  - Systems Engineer: Presales. Cisco Wireless LAN Design Specialist**
  - Field Engineer: Post-sales, Cisco Wireless LAN Support Specialist**

# 1500 Series ATP Not For Resale

SKU	List Price	Disc	Discounted Price	Qty	Extended Price
AIR-LAP1510AG-A-K9	\$ 3,999	70%	\$ 1,200	3	\$ 3,599
AIR-ACCPMK1500=	\$ 129	70%	\$ 39	3	\$ 116
AIR-PWRINJ1500=	\$ 149	70%	\$ 45	3	\$ 134
AIR-ETH1500-150=	\$ 299	70%	\$ 90	3	\$ 269
AIR-ANT2455V-N=	\$ 159	70%	\$ 48	3	\$ 143
AIR-ANT5175V-N=	\$ 209	70%	\$ 63	3	\$ 188
AIR-WLC2006-K9	\$ 3,250	70%	\$ 975	1	\$ 975
AIR-WCS-WL-1.0-K9	\$ 5,995	98%	\$ 100	1	\$ 100
					\$ 5,525

# Sales Engagement Model

- **Cisco Partners – Contact your regional Cisco Wireless Channel Account Manager**
- **Non-Cisco Partners – Contact Kevin Cordell, [kcordell@cisco.com](mailto:kcordell@cisco.com)**

# How do I enroll my company in the Cisco ATP program??

Contact your local  
U.S. Wireless Channel Account  
Manager



# U.S. Wireless Channels Contact List

<b><u>Managers</u></b>		
Denny Trevett, Dir.	<a href="mailto:dtrevett@cisco.com">dtrevett@cisco.com</a>	781.249.4982
Mark Tyre, BDM	<a href="mailto:mtyre@cisco.com">mtyre@cisco.com</a>	813.765.9947
<b><u>Wireless CAMS</u></b>		
Chris Calvert	<a href="mailto:chcalver@cisco.com">chcalver@cisco.com</a>	918.691.9819
Mike Glew	<a href="mailto:miglew@cisco.com">miglew@cisco.com</a>	617.513.2349
Kevin Cordell	<a href="mailto:kcordell@cisco.com">kcordell@cisco.com</a>	443.398.6693
Bruce Alexander	<a href="mailto:brucea@cisco.com">brucea@cisco.com</a>	330.289.3329
Phillip Carter	<a href="mailto:pcarter@cisco.com">pcarter@cisco.com</a>	201.563.9651
Pete Dehr	<a href="mailto:pdehr@cisco.com">pdehr@cisco.com</a>	630.240.5127
Dave Solomon	<a href="mailto:dasolomo@cisco.com">dasolomo@cisco.com</a>	650.678.8360
<b><u>Field SE team</u></b>		
Matt Jonson	<a href="mailto:mjonson@cisco.com">mjonson@cisco.com</a>	781 402-6541
Tony Schultz	<a href="mailto:tschultz@cisco.com">tschultz@cisco.com</a>	408.832.9551

# Web Resources

- **GovTech Digital Communities Program web site:**  
<http://www.govtech.net/digitalcommunities>

**Cisco Partner Central is the place to find more information on all Advanced Technologies**

- **Content has been refreshed and has new look and feel**
- **Partner Central home page:**  
<http://www.cisco.com/en/US/partner/partners/index.html>
- **Wireless home page:**  
<http://www.cisco.com/en/US/partner/partners/pr61/pr158/pr172/wireless.html>

# Digital Communities Solution Starter Kit: Cisco Components



# Starter Kit - Things to Consider

- **Each city is different**
- **Metro layout, city environment, buildings etc. can alter the requirements of the Starter Kit**
- **Business application requirements of each local government can alter the components of the Starter Kit**
- **Starter Kit should be use as a reference point and selling tool for partners to engage potential customers**



# Proposed Bundle Equipment Packages

- **20 Users Configuration ( < 1 sq mi )**
  - 3 to 10 Locations ( Hotspots / Hotzones )
  - Expandable coverage to much wider areas with more mesh access points
  - Support wired and/or wireless backhaul
- **50 Users Configuration ( 1 sq mi )**
  - 1 square mile coverage ( Hotzones )
  - Expandable to cover most of the metro areas with more mesh access points
  - Support wired and/or wireless backhaul

# 20 Users Configuration ( < 1 sq mi )

- **1 Cisco 4400 Series WLAN Controller (w/ GBIC)**
- **10 Cisco 1500 Series Mesh AP, Pole Top Kit**
- **2 Power over Ethernet ( for root node )**
- **2 150ft Ethernet cable ( for root node )**
  
- **Total List Price = \$57,736.00**

# 50 Users Configuration ( 1 sq mi )

- **1 Cisco 4400 Series WLAN Controller (w/ GBIC)**
- **20 Cisco 1500 Series Mesh AP, Pole Top Kit**
- **4 Power over Ethernet ( for root node )**
- **4 150ft Ethernet cable ( for root node )**
  
- **Total List Price = \$109,482.00**

# Q & A



