FUJITSU Server Options

Build your data center with the right mix of high-performing, reliable and scalable server components

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IT for a data-driven world

Today's enterprise is completely data-driven – the explosive growth of data and its strategic value is driving a transformation in IT infrastructure as never before. Modern IT is at the core of today's business, helping to empower a world where almost everyone and everything generates and shares data. One of the key challenges organizations face is defining how to use the right mix of cloud based services and infrastructure technologies to deliver both new digital solutions and to modernize their existing infrastructures. Whether on-premises or off-premises, bare-metal or a virtualized environment, today's IT must support the full range of hybrid IT capabilities that deliver resources faster than ever before.

With the word "IT", we are not just talking about server or storage technology but the whole infrastructure, including storage, networking, and governing software. The core server infrastructure needs to be supported by the right mix of components in order to tailor it to specific workloads and applications. Your server is the foundation of your data center, but there are several interconnecting components that keep it going. This requires the right set of server options to achieve one goal: for your future systems to integrate seamlessly and easily not only into the existing infrastructure but also into your digital business transformation trajectory. Having the right mix of components to support the core server infrastructure allows it to be tailored for specific workloads and applications.

Fujitsu provides a new compute experience with its latest generation of <u>PRIMERGY</u> and <u>PRIMEQUEST</u> servers – servers built using our latest generation of <u>FUJITSU Server Options</u>. Server Memory, Server Storage, Persistent Memory, Server Networking, and Power Supplies deliver the right mix of performance, flexibility and reliability to build your data center.

Fujitsu Server Options portfolio

Fujitsu offers a broad portfolio of tested and qualified components that support a wide range of IT environments from small to medium-sized businesses all the way through to large corporations. Our servers can be seamlessly configured with high-performing, reliable, and secure options that efficiently augment the range of applications and data in your IT environment.

Fujitsu server memory, storage, networking, and power supplies provide key technologies that provide the performance, reliability, and efficiency found in our latest-generation servers. Moreover, Fujitsu's latest-generation rack and power infrastructure provide the ideal platform that powers and protects Fujitsu servers, storage, and networking.

The Fujitsu Server Options portfolio spans several key components including:

Fujitsu Server Memory—Persistent memory technology bringing compute and data ever closer to turbo-charge your database and analytics applications

Fujitsu Server Based Storage—A broad portfolio of workload optimized solutions that includes: hard disk drives (HDDs), solid-state drives (SSDs), NVMe drives and SDS (Software Define Storage) – server based options that resolve storage complexity of your IT infrastructure.

Fujitsu Server Networking—With a wide variety of server networking offerings including Ethernet and Fiber Channel network controller cards and Top-of-Rack Switches to choose from – Fujitsu has your server networking covered.

Fujitsu Rack and Power Infrastructure—Includes FUJITSU rack enclosures and FUJITSU power management offerings that provide the right foundation infrastructure for your data center.

Fujitsu Power Supplies— Highly efficient modular power supplies to enable reliable and efficient operation of your servers

Fujitsu's broad portfolio of server components helps to expand <u>PRIMERGY</u> & <u>PRIMEQUEST</u> servers to cover a broad range of application scenarios, and will enable customers to build expandable, cost-efficient large-scale and versatile systems across a range of industries and applications.

Why choose Fujitsu Server Options

*Backed by the highest quality standards. Rely on FUJITSU
PRIMERGY & PRIMEQUEST server options*

When a comprehensive IT product portfolio is backed by the highest quality standards, it offers customers the best possible solution to take their businesses to the next level. Fujitsu's comprehensive portfolio of Servers and Server options are backed by one of the most rigorous quality standards in the industry. Fujitsu has a wide array of partnerships with the best vendors in the industry and sources only from tier-one suppliers that can pass our quality standards. Fujitsu enters into strategic agreements to safeguard supply and cost management and to secure consistent quality standards, process controls, and sub-supplier management.

Fujitsu's relentless focus on highest quality standards is an inherent across the four stages in the product development lifecycle:

1. A customer-centric approach to design
   - Fujitsu Engineers and product teams engage with customers around the globe to define the latest requirements for the next-generation of Fujitsu Servers and Fujitsu Server Options
   - Customer pain-points are analyzed via primary and secondary research
   - The latest market trends and competitive offerings are analyzed
   - The inputs are funneled in to Fujitsu Labs to enable fast, fluid transfer of advanced technologies into next generation products and solutions
   - Furthermore, the data collected from the technical support teams is also used to further improve design specifications from one generation to the next

2. A strong focus on sourcing only from the highest quality suppliers
   - Fujitsu has a wide array of partnerships with the best vendors in the industry and sources only from tier-one suppliers that can pass our quality standards
   - Strong process control and sub-supplier management
   - Enter into strategic agreements to regulate supply and cost management
   - Rigorous component testing and presence of Fujitsu experts on-site at supplier locations to ensure the highest quality

3. A world-class manufacturing process
   - World-class manufacturing facilities that maintain the most rigorous standards
   - Close coordination with R&D teams for design for manufacturing
   - Rigorous product testing to ensure the highest quality including server option reliability testing and test optimization

4. A comprehensive server management portfolio along with end-to-end support services
   - <u>FUJITSU Infrastructure Manager (ISM)</u> provides seamless, holistic management ensuring that IT infrastructures retain the dynamic flexibility required to support ever-changing business demands. ISM enables organizations to have centralized control over the entire data center that includes servers, storage, networking, cloud management software as well as power and cooling using a single user interface
   - <u>FUJITSU ServerView® Suite</u>   Automation of routine management tasks will increase efficiency and flexibility of your IT and free IT staff for new tasks supporting the digital transformation. Fujitsu ServerView Suite provides you with a well proven and comprehensive solution set to manage your servers throughout their lifecycle – from single systems up to large server pools
   - <u>Fujitsu's Managed Infrastructure Services</u> Fujitsu's global reach enables us to deliver IT services around the world and is underpinned by one of the largest global IT infrastructures. Global Delivery Centers support our customers in more than 41 languages and with a local presence in 70 countries. We manage infrastructure for customers around the world and provide the assurance that, with Fujitsu, their IT operations can receive the attention to service quality consistency and security they require, where ever they might be located

Fujitsu Server Memory

Bringing compute and data ever closer to turbo-charge your database and analytics applications

Today, not only are compute and data storage almost equally important, but much of the technology development in IT has been to bring compute and data ever closer. In an age where data analytics are used to make real-time or near real-time business and operational decisions, getting data in and out of processors faster can trigger significant business success.

A new class of memory technology
With memory bandwidth becoming a crucial bottleneck, a new class of memory has arrived to solve your business performance issues – Data Center Persistent Memory. Intel® Optane™ Persistent Memory (PMem) represents a groundbreaking innovation. The goal of persistent memory is to bring the data closer to the CPU and thus provide DRAM-like latency with memory-like persistence (non-volatility) and capacities. Non-volatile memory, or NVM, implemented in the form of NVDIMMs – memory modules that can be used in a computer – is the latest in a long series of technologies designed to bring data ever closer to the processor. With the new **PRIMERGY** and **PRIMEQUEST** servers using the second generation of Intel® Xeon® Scalable processors it is now possible to remove performance bottlenecks that hold back today's applications. The technology that dominates traditional main memory, DRAM, is fast to access, but small, expensive, and volatile. Storage is large, cheap, persistent, but is slow to access. There is a huge latency and bandwidth penalty as you jump from RAM based memory and disk based storage. The ever increasing amount of data and the need to access more of it quickly have further magnified the gap. Intel's breakthrough product, Intel® Optane™ Persistent Memory (PMem), is disrupting the traditional memory-storage hierarchy by creating a new tier to fill the memory-storage gap providing greater overall performance, efficiency, and affordability.
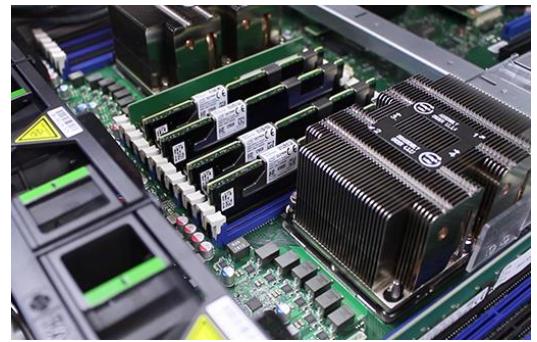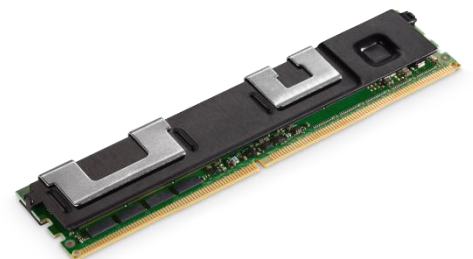
Why is NVM important?
First, organizations today generate ever-increasing amounts of data, and they want to process more and more of it, as quickly as possible. But they also want to do that without huge costs. Optane-based NVDIMMs can help here. A second factor is the consistency of storage performance that NVM can provide, which in turn makes application performance more predictable. This comes from the fact that, like SSDs but unlike hard disk storage, it uses silicon chips as its base, not a limited and mechanical system. Note that there are also NVM configurations which implement the NVM as a large, closely-coupled, block device (drive) with DRAM cache, but which is not 100% persistent. You may need to discuss with your supplier which configuration option is best for your needs.
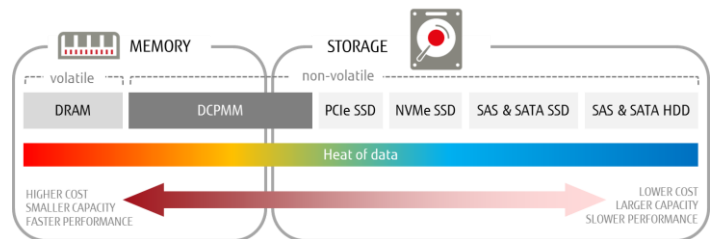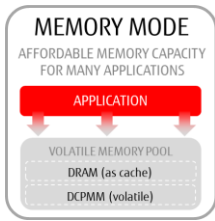
PMem Specifications
Intel® Optane™ Persistent Memory (PMem), uses the same form factor as traditional memory DIMMs (DRAM), but offers higher capacity, greater affordability, and data persistence. PMem modules are available in capacities of 128GB, 256GB, and 512GB. The module fits into standard DDR4 DIMM slots of servers equipped with selected 2nd Generation Intel® Xeon® Gold, Platinum and Silver processor SKUs.

- Pmem(s) are installed in standard memory slots in supported servers
- Supported on Gold, Platinum and selected Silver Cascade Lake-SP SKUs
- 2666 MT/s memory bus speed. Any 2933 MT/s DDR4 DIMMs installed will also operate at 2666 MT/s
- Optional data encryption using AES 256-bit encryption
- Double Device Data Correction (DDDC)

Operating Modes

The PMem modules operate in three different modes:

MEMORY MODE
AFFORDABLE MEMORY CAPACITY
FOR MANY APPLICATIONS
APPLICATION
VOLATILE MEMORY POOL
DRAM (as cache)
DCPMM (volatile)

Memory Mode (MM): PMem(s) act as volatile system memory, while DRAM DIMMs act as cache. Only PMem capacity is displayed as system memory in this mode. The total displayed volatile system memory in this mode is the sum of PMem capacity.

App Direct Mode: PMem(s) act as independent and persistent memory resources directly accessible by specific applications, and DRAM DIMMs act as system memory. The total displayed volatile system memory in this mode is the sum of DRAM DIMM capacity.

APP DIRECT MODE
PERSISTENT PERFORMANCE & MAXIMUM CAPACITY
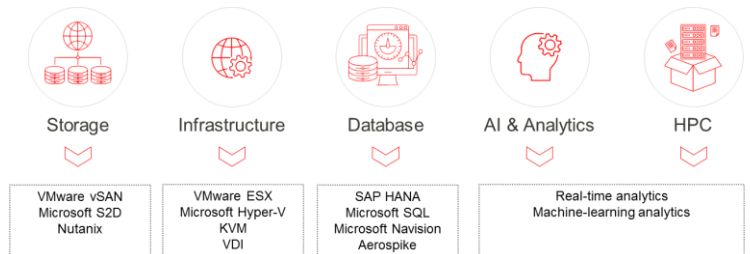APPLICATION
DCPMM   DRAM
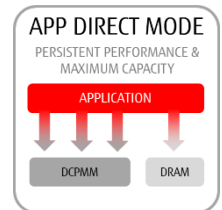
Mixed Mode: A sub-set of App Direct, can be provisioned so that some of the Intel® Optane™ Persistent Memory is in Memory Mode and the remaining is in App Direct Mode. In Mixed Mode, applications can take advantage of high performance storage without the latency of moving data to and from the I/O bus.

Power your expanding workloads

PMem offers advantages for a variety of applications:

- Memory Mode seamlessly brings large memory capacity at affordable cost points to legacy applications. Virtualized database deployments and big-data analytics applications are great candidates for Memory Mode.
- In-memory databases, in-memory analytics frameworks and ultrafast storage applications are good examples of workloads that greatly benefit from using App Direct Mode.

Storage	Infrastructure	Database	AI & Analytics	HPC
VMware vSAN Microsoft S2D Nutanix	VMware ESX Microsoft Hyper-V KVM VDI	SAP HANA Microsoft SQL Microsoft Navision Aerospike	Real-time analytics Machine-learning analytics	

Support for PRIMERGY and PRIMEQUEST servers

A maximum of 6 slots are available for PMem modules per CPU socket (please see relevant system configurator for details):

System	Memory Slots		PMem Slots	
	per CPU	per System	per CPU	per System
PRIMERGY TX2550 M5	6	12	2	4
PRIMERGY CX25x0 M5	8	16	2	4
PRIMERGY RX2530 M5	12	24	6	12
PRIMERGY RX2540 M5	12	24	6	12
PRIMERGY RX4770 M6	12	48	6	24
PRIMEQUEST 3800B2	12	96	6	48
PRIMEQUEST 3800E2	12	96	6	48

FUJITSU, PMem and NEXTGenIO Project

NEXTGenIO is an R&D project funded by the European Commission that is develop solutions to high performance computing's (HPC) I/O and data challenges. The consortium partners are EPCC, Intel, Fujitsu, Technische Universität Dresden, Barcelona Supercomputing Center, the European Centre for Medium-Range Weather Forecasts, Arm (formerly Allinea) and Arctur.

Using a requirements-driven co-design process involving all the stakeholders of the NEXTGenIO project, Fujitsu and Intel developed a prototype system using PMem memory. As key output of the project, a 34-node cluster has been delivered in June 2019 by Fujitsu and installed at the University of Edinburgh's Advanced Computing Facility, where it is now in the final the testing and integration phase before going into full production during the summer.

nextgenio

The new PRIMERGY and PRIMEQUEST servers configured with 2nd Generation Intel® Xeon® Scalable processors benefit from Fujitsu's pioneering work in the NEXTGenIO project. The success of this EU project made it possible for Fujitsu to introduce these unprecedented I/O capabilities to industry standard x86 PRIMERGY and PRIMEQUEST servers.

Fujitsu Server Based Storage (SBS)

*Reliable server based options that resolve storage complexity of
your IT infrastructure*

Data is important to almost everything your company does. With the explosive growth in unstructured data, organizations are struggling to nail down a storage method that is easy to implement and upgrade, and that allows them to maximize capacity utilization. Traditional enterprise storage systems that package storage controllers, disks, interfaces and firmware as proprietary storage arrays are often expensive, complex and lack openness. The right mix of speed and efficiency is imperative for your storage infrastructure.

Organizations need a cost-effective storage architecture that reduces complexity and is highly scalable – even on an enormous scale – as well as support demand-driven resource allocation. Server Based Storage, or SBS, is the most viable option.

Server Based Storage (SBS): Resolve storage complexity – optimize TCO

One key metric that you will need to constantly optimize/minimize is the TCO (Total Cost of Ownership) of your IT infrastructure. Today, even the smallest IT environments have several interrelated components (servers, networks, storage systems, management systems etc.). Complexity arises from the interdependencies among these components, making it increasingly difficult to maintain, manage, and scale. This often leads to underutilized assets that drive up the TCO. Therefore, a solution that supports TCO reduction initiatives is one that reduces complexity across your IT architecture. In this regard, TCO of your storage infrastructure plays a very important role in overall TCO minimization.

SBS solutions reduce cost and complexity by housing storage media inside servers rather than in dedicated and custom-engineered storage arrays. SBS uses open-standard, x86-based hardware directly attached disks – hard drives, solid-state drives with NVMe or even PCIe cards – to store data locally on the server. The software layered on top of this hardware transforms the server node into a fully-fledged storage array. The reduced cost and complexity has a direct impact on optimizing TCO.

Scale with ease – As data storage requirements become more critical, SBS helps companies grow storage capacity more efficiently by capitalizing on the ability of software defined-storage (SDS) and hyper-converged infrastructure (HCI) technology to reduce the costs and complexity of storage. As a result, this has a direct impact on TCO minimization of your storage and IT infrastructure.

Bottom-line – Using storage that is based within the server can significantly reduce the complexity of your IT infrastructure and, more importantly, its operational management. To learn more about SBS, please see the latest **analyst paper** from Freeform Dynamics.

Fujitsu's SBS portfolio

Fujitsu offers a broad Server Based Storage portfolio, perfectly suited for your IT infrastructure needs. Along with **PRIMERGY** and **PRIMEQUEST** server portfolios, Fujitsu's comprehensive portfolio of directly attached disks – hard drives, solid-state drives with NVMe or even PCIe cards – to store data locally on the server.

It may be better to find a vendor that offers greater configuration flexibility, both at initial acquisition and during the likely extended lifetime of the servers in your SBS pool.

This flexibility is offered by Fujitsu including:
• Both SAS and SATA hard disk drives in a range of capacities and rotation speeds
• PCIe based flash storage drives in a range of capacities
• NVMe based flash storage drives in a range of capacities
• Non-Volatile Memory (NVM) storage options
• Additional memory in a range of options
• Additional network cards in a range of options

Fujisu offers a broad portfolio of solutions for every server storage need – for a wide-array of workloads.

Fujitsu Hard Disk Drives (HDDs)

Fujitsu offers HDDs in various segments to suit your

- **Economic (ECO). The drives in this class have a low unit price.** However, their performance and reliability levels mean that they are only suitable for entry-level applications. They should be used in non-critical areas with low I/O traffic and moderate speed requirements as higher workloads can impair their reliability. ECO drives provide speeds of up to 5.4/7.2K rpm and have a SATA interface.

- **Business Critical (BC) or Nearline. The drives in this class offer the highest capacity with the lowest cost per GB; these drives are designed to provide good performance and suitable reliability.** Depending on the server implementation, BC drives can be equipped with an SAS or and SATA interface and offer a speed of 7.2K rpm. If top I/O throughput rates are required, then Enterprise HDDs or SSDs should be used.

- **Enterprise (EP). Drives in this class provide maximum performance and reliability.** They are designed to cope with maximum workloads and the highest throughputs. This class uses the SAS interface and the rotation speeds are 10/15 K.

Fujitsu Solid-State Drives (SSDs)

SSDs have a data throughput level that is much greater than that of HDDs but their performance varies which greatly depends on the type of access. Similar to HDDs, SSDs have several capacity points and interfaces like SAS, SATA and PCIe. Another important and SSD-specific criterion is their write endurance.

Fujitsu offers SSDs that can be roughly divided into three categories, which meet completely different requirements:

Endurance Class	DWPD*	Description/Suitability
Read-Intensive	<= approx. 1	SSDs of the lower price category. They are suited to load situations that are characterized by a low write intensity. DOM is in this class and best suited for Boot drive. Examples: Boot drive, streaming services
Mixed-Use	> approx. 1 and < approx. 10 usually approx. 3	SSDs of the medium price category. They are suited to load situations that are characterized by a moderate write intensity. Examples: File servers, web servers, mail servers
Write-Intensive	>= approx. 10	SSDs of the upper price category. They are suited to load situations that are characterized by a high write intensity. Examples: Virtualization servers, databases

*Drive Writes Per Day

Fujitsu NVMe SSDs

NVMe provides a standard access protocol for flash to leverage the PCIe bus to directly connect CPUs to attached storage, thereby reducing latency, increasing throughput and most importantly offering massive parallelization capabilities. So while mainstream Flash SSDs will continue to be available with SAS or SATA for price/performance scenarios, NVMe SSDs will be very attractive for usage scenarios that demand extreme performance. Fujitsu NVMe PCIe SSDs boost throughput, leverage in-memory access, reduce latency, and scale performance to meet aggressive processing requirements.

Fujitsu M.2 SSDs

Fujitsu has a strong portfolio of boot devices. By using M.2 SSDs for boot purpose, other server internal disks can be used for productive data or some other purpose.

Fujitsu RAID controllers

Fujitsu's latest line of enterprise-class RAID controllers help maximize performance, data availability, and storage capacity. Fujitsu offers a wide array of RAID controllers that combine Fujitsu's advanced technology and experience in order to ensure that business users benefit from all the advantages of the RAID concept and enjoy the unlimited amount of security and reliability in the event of an emergency.

The Fujitsu RAID Controller PRAID EPxxxx series with up to 4GB cache and16x12Gbit/s SAS ports improves performance for storage intensive workloads such as databases and sets new speed and data security standards for internal storage drives. The latest generation PRAID supports

up to 16 SAS/SATA drives, up to 4 NVMe PCIe drives or a mixture of SAS/SATA and NVMe drives. NVMe is an interface with lower overhead, lower latency and drastically increased bandwidth and IOP's. The RAID stack is based on the Broadcom MegaRAID® and offers high data throughput, a comprehensive fault tolerance function and user-friendly management options. Moreover, the Controller management is integrated seamlessly into the Fujitsu server management concept. All controller functions are supported by the Fujitsu ServerView RAID Manager.

Fujitsu RAID Controllers support 3, 6 and 12Gbit/s SAS as well as for 3 and 6Gbit/s SATA drives. Regardless of the drive speed, it delivers significant performance improvements in both read and write applications. The controller firmware also supports FastPath® without an additional license. FastPath® accelerates the use of SSD only configurations. The RAID controller supports all of the important RAID levels including RAID 6 and 60. The optional flash battery backup (FBU) combined with the already included TFM module ensures the integrity of the data stored in the cache on the RAID controller in case of a power outage. In this event, the data will be copied to a non-volatile flash memory (TFM). The TFM module is bundled with the controller, the FBU is optional.

All in all, the Fujitsu RAID controllers combine FUJITSU's advanced technology and experience in order to ensure that business users will benefit from all the advantages of redundant disk arrays. At the same time, they set new speed and data security standards for the operation of RAIDs. to discuss with your supplier which configuration option is best for your needs.

Why storage drives from Fujitsu?

Fujitsu offers the highest quality...*Whether you are buying hard disks or SSDs or NVMe drives, Fujitsu provides you with tested quality as well as the additional benefits from the knowledge gained by our experts over many years regarding storage technology and system integration.*

Starting with the initial certification of new drives, the fine adjustment of the firmware and up to the quality control of individual deliveries and supplies, Fujitsu does everything possible to guarantee you the best performance and highest fail-safety.

Furthermore, with FUJITSU Integrated System *PRIMEFLEX, you can choose from all the leading HCI (hyper-converged infrastructure) offerings from* Microsoft, VMware *and* Nutanix *to optimize your server-based storage infrastructure according to your needs.*

Fujitsu Server Networking

Get the best network performance out of your IT with high-performing, reliable & scalable Server Networking options

While your server is the foundation of your data center, your server networking is crucial to the performance of your network. Server Networking includes all the important infrastructure that connects a server to your network and keeps data flowing through your compute and rest of the data center. With growth of machine learning, big data, hybrid cloud, mobile data and streaming video, IT professionals are constantly under pressure to deliver reliable server networking performance within their data center. For this, the right mix of performance, flexibility and reliability are paramount.

To suitably streamline your data center and get the best network performance out of your IT, Fujitsu Server Networking delivers:

Options Tailored to Optimize your Workloads – To improve network performance and lower latency, you need to choose the right Server Networking Options. **Fujitsu server networking** offers the industry latest options to address all your data center networking requirements.

Flexibility and scalability that your network needs – With Fujitsu DynamicLoM technology, you now have the ability to individually adapt your current server network and further change and meet future requirements without giving your infrastructure a general overhaul!

Reliability and security – At Fujitsu, we understand that the reliability and security of your network is paramount. Fujitsu does everything possible to guarantee you the best performance and highest fail-safety – starting with the initial certification of new network cards, the firmware fine adjustment, and up to the quality control of individual deliveries and supplies.

With a wide array of Ethernet and Fiber Channel network controller cards to choose from along with Top-of-Rack Switches, Fujitsu has your server networking covered.

FUJITSU Top-of-Rack Switches

FUJITSU Server PSWITCH 2048P & 4032P

- Deliver innovative switch technology to enhance and simplify networks

- Provide flexible connectivity for agile server provisioning the data center

- Manage network connection for virtual machines and physical servers

- The combination of PSWITCH 2048, PRIMERGY CX400 and Fujitsu Infrastructure Manager is the ideal foundation for virtualization, hyper-converged   IT and cloud computing

Networking technology for agile infrastructures: SDDC, HCI, Virtualization, Cloud Infrastructure

FUJITSU Infrastructure Manager (ISM)

PSWITCH 2048P

PSWITCH 4032P

PRIMERGY CX400

Fujitsu Ethernet controller cards

Fujitsu's Ethernet Controllers address virtualized infrastructure challenges, delivering best-in-class and highest performance to various demanding markets and applications. Various speeds including 100Gb Ethernet (100GbE) enables network bandwidth to be cost-effectively scaled in support of next-generation server and storage solutions residing in Cloud and Web-scale data center environments. Fujitsu offers a wide array of Ethernet controller cards including the X710 adapter family. The X710 adapter family addresses the demanding needs of the next-generation agile data center by providing unmatched features for both server and network virtualization, flexibility for LAN and SAN networks and proven, reliable performance.

Fujitsu Fibre Channel controller cards

Fujitsu's latest generation of Fibre Channel controller cards for PRIMERGY & PRIMEQUEST servers are ideal for virtualized environments and transaction intensive applications. The adapters support the latest PCIe 3.0 standard for lower cooling and power costs and improved resiliency while addressing the needs of IT organizations that require reliability, integrated management, and guaranteed network performance.

Fujitsu Converged Network Adapter (CNA) cards

A Converged Network Adapter (CNA) is a Network Adapter that supports both the Ethernet and Fibre Channel standards. It provides connectivity at various transfer rates to Ethernet networks and also connects to Fibre Channel storage area networks (SANs) using Fibre Channel over Ethernet (FCoE) and Data Center Bridging (DCB). Fujitsu's Converged Network Adapter (CNA) 14000 family offers enhanced support for virtualization, cloud and hyperscale cluster deployments.

Fujitsu Dynamic LOM technology

In addition to Fujitsu's comprehensive portfolio of Network adapter cards, the Fujitsu DynamicLoM technology offers the much needed flexibility and scalability opportunities for your future server networking requirements. When servers are provided with network adapters aligned to the current infrastructure, this offers less flexibility and scalability opportunities for future requirements. The Fujitsu DynamicLoM technology delivers a perfect solution against these limitation barriers. Through seamless configuration and integration in existing infrastructures, the solution represents the direct opposite to inflexible LoM (LAN on motherboard) architectures. The diversity in the market, the need and demand for more flexibility in a continuously changing world required a change of thinking. This is why Fujitsu sets new standards for its systems. FUJITSU DynamicLoM technology based on the latest OCP v3 standards gives IT-Admins the chance to configure their Ethernet network connectivity the way it needs to be – seamlessly integrated and ready for future changes.

Fujitsu Rack and Power Infrastructure

The right foundation infrastructure for your data center

Your data center provides the foundation and compute power for your IT in order to enable your business and customers. With growth of machine learning, big data, hybrid cloud, mobile data and streaming video, IT professionals need to choose the right foundation infrastructure within their data center to drive better business.

Fujitsu understands the challenges involved, and we have you covered with state-of-the-art rack and power infrastructure. Fujitsu Rack and Power Infrastructure provides the right support infrastructure for your data center with configurable Racks, Power Distribution Units (PDU) and Uninterruptible Power Supplies (UPS) to meet the needs of businesses of all sizes, now and in the future.

FUJITSU PRIMECENTER M2 19-inch Racks

The Fujitsu PRIMECENTER M2 family meets 19-inch rack standards, while offering a suitable platform for rack configurations. Accurate fitting is ensured via the various rails for Fujitsu servers, storage systems and server products from other manufacturers. An elaborated inner zone management generates maximum space utilization and flexibility for all kinds of rack components, for example the operating controls, uninterruptible power supplies (UPS) and power distribution units (PDUs). With the M2 racks, Fujitsu also offers innovative PDUs with a basic, metered and managed feature set - from easy cabling to the notification of current measurements and full management of each electrical socket.

The PRIMECENTER M2 Racks are available in four different symmetric structures with up to 6 vertical 19-inch slots on the front left and right with enough space for cabling options and switch installations. This includes two 42 U units with 1200 mm depth in 600 mm width for perfect use of space in datacenters and a 800 mm width version for more cable space and vertical slot options. Moreover a 47 U rack version with 800 mm wide and 1200 mm deep design for even more capacity and a smaller 24 U version at 600 mm width and 1100 mm depth for better space allocation in office environments are obtainable. High level safety and security is ensured by comprehensive test scenarios in grounding (DIN EN60950) and IP20 (DIN 40 050 and IEC 529), protection against hazardous parts, compliance with EIA310-D, DIN41494, IEC 297 and a mechanical door lock with up to 200 combinations on request.

A wide range of accessories is directly available and can be configured via FUJITSU SystemArchitect® or can be retrofitted on demand. An additional security environment for the new M2 Rack is the Managed Rack Solution (MRS) which is based on Fujitsu PalmSecure ID Match, a MLR1000 electronic door lock and different rack shock and door sensors. This biometric solution is characterized through its more reliable hand vein scan technology in contrast to fingerprint or iris scanner solutions. Another optional but helpful add-on is the tilting protection which prevents the rack from tipping over while heavy servers are pulled out during maintenance. Approximately 83% perforation ensures an optimized air flow for cooling and high heat dissipation. This - combined with a tool-free design for easy service and simple maintenance plus high scalability serves – is an ideal solution for all types of infrastructures.

FUJITSU Power Distribution Unit

The Power Distribution Unit (PDU) models are multiple socket bars which are installed in our 19" racks. A PDU has several power supply sockets to which the various devices, such as servers or switches, can be connected. We offer three different types of PDUs. The basic models (MPE™) – they only differ from normal multiple sockets in their special 19" construction form and the various types of socket. The Metered PDU (MPHB™) models can already measure and display electrical parameters per phase and group measurement.

The last group are the Managed PDUs (MPHR™); they measure the electrical parameters per phase, per group and per output. The task of Managed PDUs is remote monitoring and management of IT devices in the 19" rack. The MPH2™ supports simple integration in the rack and management architecture as well as highest availability and energy efficiency. The individual outputs can also be addressed via remote functions. Settable threshold values with alerts increase the availability of the connected devices. The PDUs all have an integrated display; an external display module can be added as an option and easily secured to the rack cabinet. The PDUs can be installed in PRIMECENTER M2 racks or other housing systems with the corresponding mountings; with tool-less mounting options.

FUJITSU Uninterruptible Online Power Supply (UPS)

Fujitsu VFI (Voltage and Frequency Independent) online UPS devices from APC are the only UPS devices to offer protection against all kinds of faults, such as power failures, frequency fluctuations, voltage swings and peaks as well as low voltage and surges. They also have precise frequency and voltage regulation as well as the Smart Slot interface for integration into SNMPbased network management. Another outstanding feature is the ability to replace used or faulty batteries during ongoing operation without any interruption. All these APC UPS devices can be converted for installation in racks / towers.

Fujitsu offers customers a 3-year manufacturer's warranty (door to door) on the UPS and the batteries, but also optimal integration of the control software into the network management solution ServerView Suite. Support of Windows / Linux and SOLARIS operating systems as well as virtualization layers is provided. In contrast to the VI (Voltage Independent) line interactive and VFD (Voltage and Frequency Dependent) offline versions, the output frequency of the VFI UPS devices is totally independent of any mains, voltage and frequency changes. The mains voltage is permanently rectified in order to then be inverted back to alternating voltage. Hence the rectifier inverter combination, which achieves a constant power supply and a high filter effect. The VFI UPS devices also have a parallel bypass switch which compensates for overloads in problem situations.

Fujitsu Power Supplies

Highly efficient modular power supplies to enable reliable and efficient operation of your servers

The Fujitsu modular power supplies (modular PSUs)are available in a space-saving 1U power supply unit (185 mm x 73.5 mm x 40 mm) footprint and are available in different versions. Fujitsu introduced a 3rd generation of power supply units which support the "cold standby mode" of the latest systems.

- 500 W, 80 PLUS platinum level
- 900 W 80 PLUS platinum level
- 900 W 80 PLUS titanium level
- 1600 W 80 PLUS platinum level
- 2200 W 80 PLUS platinum level

The specification of the modular PSUs are as follows:

PRIMERGY	500 W Platinum	900 W Platinum	900 W Titanium	1600 W Platinum	2200 W Platinum
Nominal Input Voltage Range	100V - 240V	100V - 240V	200V - 240V	100V - 240V	100V - 240V
Efficiency (50% Load, 230VAC/50Hz)	94%	94%	96%	94%	94%
Frequency Range	50/60Hz				
Output Rail	12VDC and 12VSB				
Inrush Current	< 30A (spike of 10ms or less)				
Power Factor	0.95				
Input power undervoltage application (steady)	Normal operation is possible with +/- 10% of the rated input voltage.				
Input power supply undervoltage application (Instantaneous power failure)	Operates up to 10ms with a voltage drop of 100%				
Input power supply frequency error	Allow + 3Hz/-3Hz frequency variation for 50/60 Hz				
Input side component short circuit (overcurrent calculation)	Fast blow type fuse protects and does not interrupt inrush current.				
Output side component short circuit (overcurrent calculation)	Output is stopped by the protection circuit.				

The modular PSU is available for a range of PRIMERGY servers:

PRIMERGY	500 W Platinum	900 W Platinum	900 W Titanium	1600 W Platinum	2200 W Platinum
RX2530 M6	✓	✓	✓	✓	
RX2540 M6	✓	✓	✓	✓	✓
RX4770 M6				✓	✓

For The latest support matrix, please refer to the <u>PRIMERGY</u> site.

To learn more about Fujtsu Server Options, please visit:
<u>https://www.fujitsu.com/global/products/computing/servers/primergy/racks/</u>