SCHENECTADY CITY SCHOOL DISTRICT
108 Education Drive
Schenectady, NY 12303

April 17, 2007

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SEP 26 2007
Federal Communications Commission
Office of the Secretary
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Marlene H. Dortch, Secretary
Federal Communications Commission
Office of the Secretary
445 12th Street, SW
Washington, DC 20554

CC: 02-6

Re: **Letter of Appeal of Funding Commitment Decision Letter Issued March 1, 2006 & the Administrator's Decision on Appeal Issued October 18, 2006**
Applicant Schenectady City School District
Form 471 Application No. 464258
Funding Year 2005 (07/01/05 – 06/30/2006)
Billed Entity No. 124157
Funding Request No. 1276049

Dear Sir or Madam:

On March 1, 2006, the Schools and Libraries Division ("SLD") of the Universal Service Administrative Company ("USAC") issued the above-referenced Funding Commitment Decision Letter that denied Applicant Schenectady City School District's ("Schenectady CSD") request for universal service support funding for internal connections from New England Systems and Software Inc. ("NESS" or "Company"). The basis for denial of Schenectady CSD's funding request was explained in the Funding Commitment Decision Letter as follows:

> *30% or more of this FRN includes a request for UPS Network Management Card w/ Environmental Monitoring and ES 4400 switches which are ineligible product (s) / services (s) based on program rules.*

With this letter, NESS and Schenectady CSD hereby appeal the SLD's March 1, 2006 Funding Commitment Decision Letter. According to the SLD eligibility list, both the Network Hub and the Network Switch are eligible for E-rate funding.

The definition of a **Network Hub** according to the SLD eligibility list is as follows:
Description: *Hubs are central connection points for many types of local area networks, interconnecting cabling from many individual devices, such as computer workstations, printers, servers, and other hubs.*
Eligibility: *Hubs are eligible for discount.*

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List A B C D E

The definition of a **Network Switch** according to the SLD eligibility list is as follows:

> ***Description:*** *A switch is a mechanical or electronic device that completes or breaks an electrical path, or selects the paths for communication. More specifically, network switches provide capability similar to that described in the entry for Hub in this section, but additionally provide a dedicated bandwidth at each network port, rather than a shared bandwidth among all ports.*
> ***Eligibility:*** *Network switches are eligible for discount when used for an eligible purpose. Some products may have modules or features that are not eligible, (e.g. network management). If these ineligible components are available separately, or the applicant specifically seeks the ineligible functions, their cost must be subtracted from the amount eligible for discount. Please see the Special Eligibility Conditions below for further information.*

The Marconi 4400 switches as requested by SCSD match the description of a Network Switch EXACTLY. There are NO ancillary functions or separately available ancillary functions that would be cause for denial. A cut sheet for the 4400 series switch is attached for your reference.

We do agree with the determination by the SLD that the UPS network monitoring modules requested are not eligible under current program rules. There are 8 of these modules at $343.00 each for a total of $2,744.00. The associated installation for these products is estimated at $60.00 per module for a total of $480.00. The FRN Pre-Discount amount should be reduced by $3,224.00 to reflect the ineligible parts/labor. This reduction represents less than 2% of the total FRN pre-discount amount.

The Administrators Decision on appeal issued October 18, 2006 was sent directly to the school district and not the person identified as the point of contact on the original appeal submission. The SLD was specifically requested to include the district Erate consultant on all correspondence. The SLD did not do so, causing the district to miss the 60 day appeal window. Further, the SLD denial has no merit, the equipment requested is a network switch and eligible under program rules. Identical equipment has been applied for and approved prior to and subsequent this funding request.

Given that the denial of funding in this case was based on merely an administrative error by the SLD as to the eligible and ineligible functions of the Network Hub and Network Switch, the Parties respectfully request that the SLD expeditiously process this Letter of Appeal and immediately approve the funding commitment for Schenectady CSD. The denial of funding for an administrative error places a particular hardship on a school district such as Schenectady CSD that otherwise should have been approved for and received E-rate funding for it's application. Accordingly, your prompt attention to this appeal is appreciated.

Please direct any questions regarding this Letter of Appeal to the following:

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Respectfully submitted,

Dr. Michael San Angelo
Schenectady City School District
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Schenectady, NY 12303

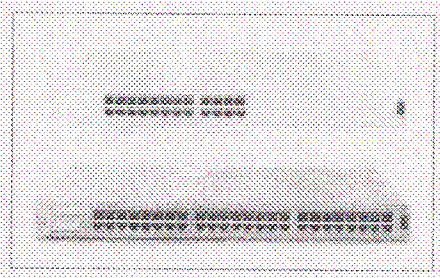
Enclosures: Data Sheet – ES 4400 Stackable Fast Ethernet Switch

cc: Mr. Brian Hogan (New England Systems and Software Inc.)
Ms. Shari Phillips (Erate Exchange, LLC)

Marconi

High-density desktop connectivity

Resilient, scalable Fast Ethernet solution minimizes CapEx and OpEx



The Marconi ES™4400 series is designed to provide high-density desktop connectivity for mid-size and large enterprise customers' wiring closets.

Stackable 10/100 Mbps ES4400 Ethernet Switches include two built-in GBIC (Gigabit interface converter) uplink ports and built-in stacking ports in a compact one rack-unit-high design. They provide high-density desktop connectivity for mid-size and large enterprise customers' wiring closets.

ES4400 switches' comprehensive Quality of Service (QoS) features are designed to ensure connectivity and network availability by managing and prioritizing data traffic for maximum performance. These switches offer a scalable, resilient solution that minimizes capital and operational expenses. Their robust security features offer protection against unauthorized access to data traffic. Marconi ES4400 switches are available in two models – the ES4400-48T switch and the ES4400-24T switch.

Key benefits

- High-density desktop connectivity up to 384 ports
- Cost-effective plug and play with built-in stacking ports
- Two built-in GBIC uplinks for highest uplink capacity
- Flexible stacking across multiple ES4400 switches – a stack is managed as a single entity with a single IP address
- Simple software upgrades with a single image for different switches
- Resilient connectivity for minimal network downtime
- Fail-safe stacking design assures continuous uptime
- Network availability with QoS features
- Secure access and data traffic protection
- Common look and feel minimizes training and installation costs

High-density, high-speed desktop switching

The Marconi ES4400-48T switch features 48 10/100BASE-TX RJ-45 ports for desktop switching and two built-in GBIC ports for uplink. Port 47 and Port 48 offer configuration flexibility by allowing the network administrator to configure each port as either 10/100BASE-TX or make use of the built-in GBIC. Up to eight ES4400-48T switches can be stacked to achieve up to 384 10/100 ports for high-density desktop switching.

The Marconi ES4400-24T Switch offers 24 10/100BASE-TX RJ-45 ports for desktop switching and two built-in GBIC ports for uplink. All 26 ports may be used simultaneously. Up to eight ES4400-24T and ES4400-48T switches may be combined in a single stack for maximum flexibility.

Two built-in GBIC ports

Marconi ES4400 switches have two built-in GBIC ports for dedicated uplink connectivity to network core switches such as the Marconi EXR™9300. This doubles the uplink bandwidth as GBIC ports are not required for stacking purposes. Using distributed multi-link trunking (DMLT), up to 16 GBIC ports are available for pure uplink connectivity in a full stack – the highest in the market.

Innovative built-in stacking ports

Marconi ES4400 switches have built-in stacking ports for simpler, quicker, and more cost-effective stacking, as cascade modules are not required. This unique stacking design frees up both of the uplink ports for dedicated connectivity to the backbone.

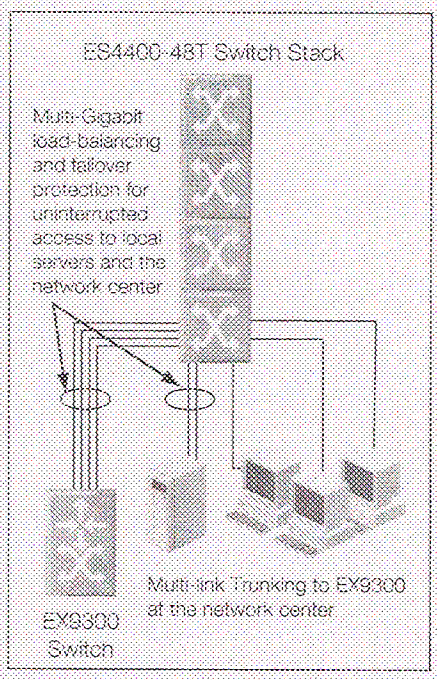


Figure 1. Distributed Multi-link Trunking across stack for higher bandwidth and fault tolerance

Multi-link trunking (MLT)

MLT enables grouping of links between the ES4400 and another switch or server to provide greater bandwidth with active redundant links. With the DMLT feature, trunked ports can span multiple units of the stack for fail-safe connectivity to mission-critical servers and the network center. This can provide greater bandwidth of up to 800 Mbps (when used with 10/100 ports) or up to 8 Gbps (when used with Gigabit uplink ports) with active redundant links in one trunk. Up to six trunks are supported per switch or stack. The ES4400's ability to have multiple connections to an EXR9300 network core using the split multi-link trunking (SMLT) feature of the EXR9300 allows customers to double their network bandwidth with no extra investment. The EXR9300 provides a self-healing network, which delivers the reliability and availability required by today's mission-critical applications. By combining the reliability of the EXR9300 with the resilient trunking features of the ES4400, such as DMLT and MLT, Marconi has created the next generation of flexible networking solutions. For example, an enterprise solution consisting of ES4400 switch stacks in the wiring closets, collapsing in to the network core switch (EXR9300), provides high-density desktop connectivity as well as fault-tolerant connections to core switch and mission-critical servers.

Enhanced security

ES4400 switches offer the highest level of security with features including Secure Shell (SSH), IEEE 802.1x based security (also known as Extensible Authentication Protocol – EAP), Simple Network Management Protocol (SNMPv3), IP Manager's list, MAC address-based security, and Remote Authentication Dial-In User Service (RADIUS) authentication.

SSHv2 supports strong authentication and encrypted communications. It allows a user to log into the switch from an SSH client and perform a secure Telnet session using CLI commands. This feature is ideal for security conscious customers such as federal governments.

For added security, ES4400 switches support the 802.1x-based security feature – EAP. Based on the IEEE 802.1x standard, EAP limits access to the network based on user credentials. A user is required to "login" to the network using a username/password; the user database is maintained on the authentication server (not the switch). EAP prevents network connectivity without password authorization for added security and control in physically non-secure areas. It is used where the network is not 100 percent physically secure or where physical security needs enhancement – for example, banks, trading rooms, or classroom training facilities. EAP supports client access to the network and interoperates with Microsoft Windows XP and other standards-based clients.

SNMPv3 provides user authentication and data encryption for higher security. It also offers secure configuration and monitoring. IP Manager List limits access to the management features of ES4400 switches by a defined list of IP addresses, providing greater network security and manageability.

The ES4400 switches feature MAC-address based security, which allows authentication of all access, not only to the switches for management and configurations but also access to the infrastructure through these switches. This software feature limits access to only network authorized and trusted personnel, including full tracking of network connections.

With MAC-address based security, network access is granted or denied via proper MAC address (up to a maximum of 448) identification. In addition, with the distributed access list security feature, network access is granted or denied on a per-port basis. ES4400 switches also provide RADIUS authentication for switch security management.

Fail-safe stacking

A key differentiator for ES4400 switches is their resilient stacking feature. ES4400 switches can stack up to eight units with a cascade stacking design, assuring continuous uptime even if a single switch in the stack should fail. A loop-back or cascade cable is used to seamlessly connect the entire stack to provide no single point of failure.

Common look and feel

ES4400 and E4500 switches have a common "look and feel" which minimizes training costs. This allows the switches to be managed in a similar fashion via a broad set of management tools. These tools include Web, Java-based device manager (JDM), command line interface (CLI), and Marconi ServiceOn® Data.

MAC addresses

Marconi ES4400 switches support up to 16,000 MAC addresses per switch or stack, for deployment of large-scale, enterprise networks with many attached devices and workgroups, allowing for scalability and cost-effectiveness.

VLAN support

Up to 256 port-based VLANs can be configured per individual switch or per stack to extend the broadcast domain and segment network traffic. The 256 VLANs can be spread among port-based and MAC source address-based VLANs (up to a maximum of 48 MAC source address based VLANs). The 256 VLANs can be on a standalone switch or across a stack.

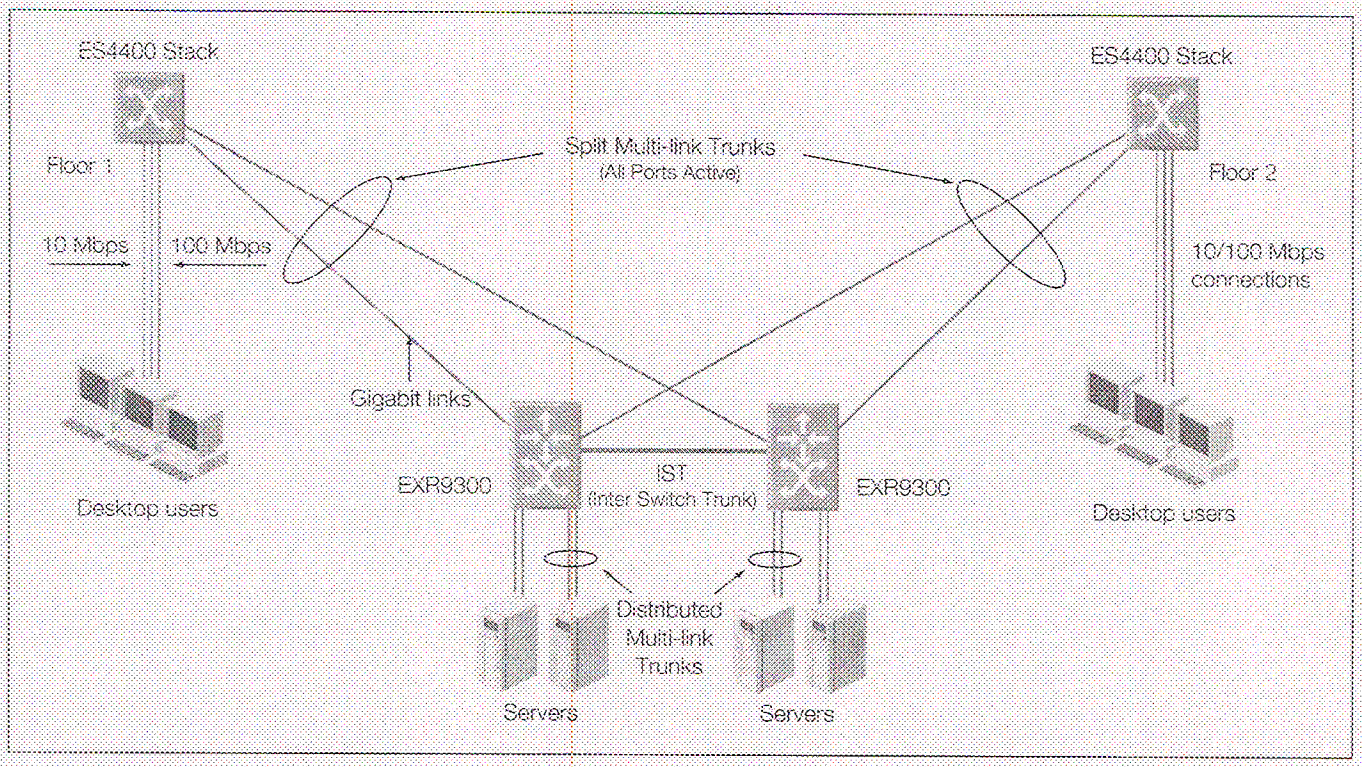


Figure 2. Enterprise solution

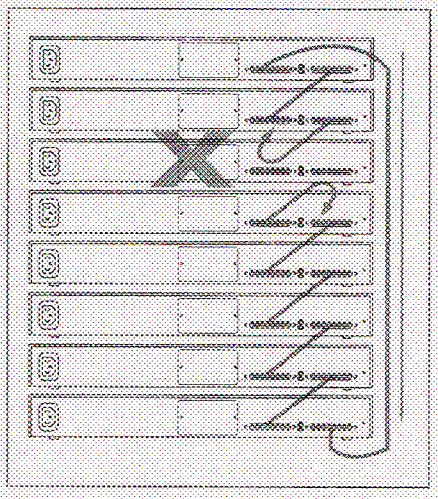


Figure 3. In the unlikely event of a switch failure, the stack integrity is maintained; cascade signals loop back at point of failure.

Protocol-based VLANs allow switch ports to be assigned to a broadcast domain based on the protocol information within the packet. These VLANs localize broadcast traffic and assure that the specified protocol type packets are sent only to the protocol-based VLAN ports.

Shared VLAN (SVL) and independent VLAN learning (IVL) is supported. With SVL support, all VLANs in the switch share the same forwarding database. IVL allows individual VLANs to have separate forwarding databases within the switch, and it allows the switch to handle duplicate MAC addresses if the addresses are in different VLANs.

IGMP snooping

ES4400 switches feature IP multicast support by examining ('snooping') all Internet Group Multicast Protocol (IGMP) traffic in hardware at line rate, and pruning unwanted data streams from affecting network or end-station performance.

Multiple Spanning Tree protocol groups

ES4400 switches support multiple spanning tree groups (STGs). They support a maximum of eight STGs, either all in one standalone switch or across a stack consisting solely of ES4400 switches. Multiple STGs provide multiple data paths, which can be used for load balancing and redundancy.

Command line interface

The CLI is used to automate general management and configuration of ES4400 switches. The CLI may be used through a Telnet/Secure Shell session or through the serial port on the console.

ASCII configuration file

ES4400 switches can download a user-editable ASCII configuration file from a Trivial File Transfer Protocol (TFTP) server. The ASCII configuration file can be loaded automatically at boot time or on-demand using the management systems (console menus or CLI). Once downloaded, the configuration file automatically configures the switch or stack according to the CLI commands in the file. This feature allows the flexibility of creating command configuration files that can be used on several switches or stacks with minor modifications.

Auto MDI/MDIX

Marconi ES4400 switches can be connected to a hub or another switch quickly and cost-effectively. Normally, a crossover cable is needed for this purpose, but with the ES4400 switch, an inexpensive straight-through cable or a crossover cable can be used. When a cable is connected to one of the 10/100 ports on the switch, the switch port automatically can detect the energy on the cable and configures itself. This feature makes configuration easier, as it eliminates the need for an MDI/MDIX port; any port may be used for connection to a hub or switch.

Web-based management

Web-based network management makes managing the ES4400 switch stack easy with a Web browser. Summary, configuration, fault, statistics, application, administration, and support pages can be provided for the entire stack. Traffic classification and prioritization can be set via the Web-based QoS wizard and advanced configuration tool. Real-time sampling provides up-to-date LED statistical information for stacked units. The Web interface also allows for static configuration of numerous parameters of the device.

Network management

On-box management

Network management begins with the device. ES4400 switches support four groups of remote monitoring (RMON) on all ports and are SNMPv3 compliant. RMON2 is supported via the port mirroring function using an external RMON2 probe. The SNMP agent software resides in the switch and uses the information it collects to provide management for all ports in the stack, providing comprehensive network monitoring capabilities. In addition, the agent also provides the ability to set up policy-based networks by supporting the Common Open Policy Support (COPS) protocol. The ES4400 is supported by ServiceOn Data.

Configuration management

The process of configuration begins with a single device but finishes across multiple devices. Java device manager (JDM) is the GUI device configuration tool for configuring a single device. It uses a common user interface and workflow that supports ES4400, ES4500, EXR9300 and EXR9100 switches. Furthermore, JDM also supports SNMPv3, allowing network managers to securely manage their network.

Quality of Service

Quality of Service (QoS) is becoming increasingly necessary as more of an organization's critical business runs over the network infrastructure. The ES4400 switch's QoS features allow you to utilize bandwidth more efficiently, optimizing existing network resources and capabilities. If the network is congested or down, if sales people cannot submit orders, if e-mail and intranet traffic threatens on-line Web transactions, or if new applications like voice and video fail, your business could be negatively impacted. By classifying, prioritizing, policing, and marking (DiffServ Code Point) LAN traffic, networks can offer reliable connectivity and required bandwidth for mission-critical applications like IP telephony to specific groups and users, and to individual devices.

For each of these applications, advanced QoS features support Internet Engineering Task Force (IETF) standard DiffServ QoS architecture – a packet classification based on the content of packet header fields (voice, video, data), traffic policing, and remote sniffing. As a result, optimal network performance and reliability may be attained while realizing significant cost savings. Customized service type and flow-based administrations through traffic shaping and policing may also be established, providing an opportunity for customer-specific service offerings, which can be implemented to address specific and unique customer requirements.

Queuing function

Marconi ES4400 switches provide network availability for mission-critical applications, devices, and users. This is done by classifying, prioritizing, and marking LAN IP traffic using up to eight hardware-based IP service class queues (on the Gigabit uplink ports) based on the following parameters:

- ToS/DSCP marking
- IP source address/destination address or subnets
- TCP/UDP source/destination port/port range
- 802.1p priority bits
- Ingress source port
- IP protocol ID (e.g. TCP, UDP, IGMP)
- EtherType (e.g. IP, IPX)
- VLAN ID

The switches have the ability to read packets that have been marked from other devices such as the Marconi EXR9300 switch. The switches support strict priority queuing as well as the weighted round robin method. Weighted round robin prevents normal priority traffic from being starved by expedited traffic (on a per packet basis).

QoS and policy management

QoS provides the ability to read, alter, prioritize, tag, or mark IP traffic based upon information imbedded in the Type of Service (ToS) field. Based on the IETF Committee's industry standards, ES4400 switches provide the ability to prioritize traffic based upon the required level of service for a given transaction. This level of service can be marked in the embedded information inside each IP packet's ToS field. DiffServ is based upon the ToS field.

ES4400 switches have application-specific integrated circuits (ASICs) to enable DiffServ Code points to be mapped to 802.1p. The QoS policies can be configured via the ES4400 switch's built-in Web-based management tools.

Traffic policing

Traffic policing enables provisioning of different levels of service by limiting traffic throughput at the ingress (incoming) port of the ES4400 switch. For example, if a port is set to a certain speed, such as 10 Mbps, all traffic above 10 Mbps will be dropped or re-marked with lower priority in the event of congestion. The bandwidth guarantee can be specified in increments as small as 1 Kbps. Service providers will find this especially useful to control bandwidth to their customers.

IP traffic shaping

IP traffic shaping offers the ability to smooth IP classified traffic from the Gigabit uplink ports of a single ES4400 switch. While traffic policing is needed to provide different levels of service to data streams on the ingress ports, traffic shaping is needed to smooth the traffic on the uplink connection from the ES4400 switch to the network core, yielding the most efficient bandwidth utilization. Service providers or carriers utilize this feature when they are selling Ethernet in place of the traditional Frame Relay, ISDN, or ATM WAN access solutions. Some enterprise customers use traffic shaping as a mechanism to limit bandwidth without having to swap out physical interfaces, leaving them room to grow.

Data summary

Network protocol and standards compatibility

- IEEE 802.3 10BASE-T (ISO/IEC 8802 3, Clause 14)
- IEEE 802.3u 100BASE-TX (ISO/IEC 8802-3, Clause 25)
- IEEE 802.3u Autonegotiation on Twisted Pair (ISO/IEC 8802-3, Clause 28)
- IEEE 802.3x (Flow Control on the Gigabit Uplink port)
- IEEE 802.3z 1000BASE-SX and 1000BASE-LX
- IEEE 802.1d MAC Bridges (ISO/IEC 10038)
- IEEE 802.1p (Prioritizing)
- IEEE 802.1Q (VLAN Tagging)
- IETF DiffServ

RFC support

- RFC 1213 (MIB-II)
- RFC 1493 (Bridge MIB)
- RFC 2863 (Interfaces Group MIB)
- RFC 2665 (Ethernet MIB)
- RFC 2737 (Entity MIBv2)
- RFC 2819 (RMON MIB)
- RFC 1757 (RMON)
- RFC 1271 (RMON)
- RFC 1157 (SNMP)
- RFC 2748 (COPS)
- RFC 2940 (COPS Clients)
- RFC 3084 (COPS Provisioning)
- RFC 2570 (SNMPv3)
- RFC 2571 (SNMP Frameworks)
- RFC 2573 (SNMPv3 Applications)
- RFC 2574 (SNMPv3 USM)
- RFC 2575 (SNMPv3 VACM)
- RFC 2576 (SNMPv3)
- RFC 2572 (SNMP Message Processing)

Performance specifications

Pkt forwarding/filtering performance for:	
10 Mbps	14,880 pps maximum (64-byte packets)
100 Mbps	148,810 pps maximum
1,000 Mbps	1,488,100 pps maximum
Address database size	16,000 entries at line rate (32,000 entries without flooding)
Addressing	48-bit MAC addresses
Frame length	64 to 1,518 bytes (IEEE 802.1Q Untagged); 64 to 1,522 bytes (IEEE 802.1Q Tagged)
Data rate	10 Mbps Manchester encoded or 100 Mbps 4MB - 5MB encoded

Interface options

- 10BASE-T/100BASE-TX RJ-45 (8-pin modular) with Auto MDI/MDIX.
- Marconi ES4400 switches support the following GBICs:
  - 1000BASE-SX uses short wavelength 850 nm fiber optic connectors to connect devices over multimode (550 m or 1,805 ft) fiber optic cable.
  - 1000BASE-LX uses long wavelength 1,300 nm fiber optic connectors to connect devices over single mode (5 km or 3.1 mi) or multimode (550 m or 1,805 ft) fiber optic cable.
  - 1000BASE-XD uses single mode fiber to connect devices over distances up to 40 km (31 mi), depending on the quality of the cable.
  - 1000BASE-ZX Uses single mode fiber to connect devices over distances up to 70 km (43 mi), depending on the quality of the cable. The ports on this GBIC operate only in full-duplex mode.

Data summary (continued)

General	
Dimensions	H: 1.72 in. (4.37 cm) W: 17.25 in. (43.82 cm) D: 13.39 in. (35.29 cm)
Electromagnetic emissions summary	
Meets the following standards	USA, FCC CFR47 Part 15, subpart B, Class A; Canada, ICES-003, Class A; Europe, EN55022, CISPR 22, Class A; Australia/New Zealand, AS/NZS 3548, Class A; Japan, VCCI-V-3/02.04, Class A; Taiwan, CNS 13438, Class A; CE
Electromagnetic immunity	Europe, EN55024, CISPR 24
Environmental	
Operating temperature	32°F to 104°F (0°C to 40°C)
Operating humidity	85% maximum relative humidity; noncondensing
Storage temperature	-13°F to 158°F (-25°C to 70°C)
Storage humidity	95% maximum relative humidity, noncondensing
Operating altitude	10,000 ft (3,024 m) maximum above sea level
Storage altitude	40,000 ft (12,096 m) maximum above sea level
Electrical specifications	
Input voltage	100-240 VAC @ 47 to 63 Hz
Input power consumption	90 W maximum
Input current	1.0 A @ 100 VAC, 0.5 A @ 240VAC
Safety agency approvals	USA, UL60950; Canada, CAN/CSA-22.2 No.60950; Europe, EN60950/IEC 60950, CB report with all national deviation; Australia/New Zealand, AS/NZS 60950; Mexico NOM-019
Weight	10.56 lbs (4.8 kg) for -24T; 11 lbs (5.0 kg) for -48T

Ordering information

ES4400 chassis, power and accessories	
ES4400-48T	ES4400 stackable switch, 48 10/100BaseTX ports plus 2 built-in GBIC slots and built-in stacking ports, 18 in. stacking cable included; includes North American power cord
ES4400-24T	ES4400 stackable switch, 24 10/100BaseTX ports plus 2 built-in GBIC slots and built-in stacking ports, 18 in. stacking cable included; includes North American power cord

ES4400 options	
SXGB	1-port 1000Base-SX Gigabit interface converter (GBIC)
LXGB	1-port 1000Base-LX Gigabit interface converter (GBIC)
XDGB	1-port 1000Base-XD Gigabit interface converter (GBIC) – 50km
ZXGB	1-port 1000Base-ZX Gigabit interface converter (GBIC) – 70km

ES4400 cascade cables	
ES4400-SRC-A	ES4400 Cascade return cable (1 m)
ES4400-SSC-B	ES4400 Spare cascade return cable (18")
ES4400-SRC-C	ES4400 Cascade return cable (3 m)

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Code: DS – ES4400/1104