

## SUMMIT® 400-24t SWITCH



The Summit® 400-24t stackable switch delivers non-blocking full 10/100/1000BASE-T Gigabit Ethernet connectivity to the desktop with Layer 3 intelligence to provide secure access to the LAN with maximum resiliency and throughput. With its implementation of Extreme Networks® Unified Access Architecture™ (UAA), the Summit 400-24t is an industry-leading solution that offers tri-speed Ethernet connectivity to the desktop, 4 ports of fiber per switch, and high-performance UniStack™ stacking.

### TARGET APPLICATIONS

- Provide support for high bandwidth desktop connectivity
- Technology refresh with focus on future proofing and preparation for converged services
- Technology refresh boosting resiliency through high-performance stacking

#### DESIGNED FOR CONVERGED SERVICES

- Resiliency to Support Convergence
- Performance to Support Converged Services
- Security to Support Converged LAN

#### SCALABLE PERFORMANCE

- Support for Evolving Desktop
- Excellent Availability
- Scalability, Deployment Simplicity

#### SIMPLIFIED MANAGEMENT

- UniStack Stacking  
Reduces Complexity
- Common Management  
User Interface and Commands
- Unified Management

The convergence of traditionally non-LAN services on top of growing enterprise applications brings greater demands, responsibilities, and threats to the network infrastructure. The Summit 400-24t, designed for convergence, provides the mandatory resiliency to keep applications available, delivers the features and performance to support converged services, and provides unique protection from security threats.

### RESILIENCY TO SUPPORT CONVERGENCE

#### Link Redundancy

Proper support for converged services requires link resiliency, which the Summit 400-24t provides through an extensive set of Layer 1 through Layer 3 link redundancy options, for example:

- Layer 1: Software redundant port—so simple and easy to deploy that it requires no supporting protocols or timers to configure.
- Layer 2: Standard Spanning Tree and Rapid Spanning Tree, plus the extremely fast convergence of EAPS, which is capable of preserving sessions of latency sensitive applications such as voice-over-IP (VoIP) through link failure.
- Layer 3: OSPF Equal Cost Multi-Path (ECMP) which doubles the throughput of redundant links, VRRP for Layer 3 dual homing, and ESRP which supports dual homing at both Layer 2 and Layer 3.

#### Rapid Convergence Resiliency

The Summit 400-24t provides Ethernet Automatic Protection Switching (EAPS), the RFC 3619 link layer resiliency protocol pioneered by Extreme Networks. Since EAPS fails over in less than 50 milliseconds in most deployments, the Summit 400-24t recovers from faults without disrupting latency-sensitive sessions such as VoIP calls. This ensures toll-quality voice and picture-perfect video.

#### Highly Resilient Stacking

UniStack stacking assures continuing availability of converged services. Redundant paths between every switch and 100% master redundancy protect the stack. The aggregation of links on multiple switches and creation of redundant uplinks on multiple switches enhances link redundancy

### PERFORMANCE TO SUPPORT CONVERGED SERVICES

#### Quality of Service (QoS)

Extreme Networks pioneered quality of service (QoS) over local area networks, with every switch from Extreme Networks having been built from the ground up to deliver superior QoS. The Summit 400-24t is no exception, with its eight hardware QoS queues for finest granularity of prioritized traffic forwarding. Utilizing the power of eight QoS queues is ExtremeWare® packet intelligence, which is able to examine packets from Layer 2 to Layer 4 in the process of classifying traffic. With a powerful classification engine and fine queue granularity, Summit 400-24t provides consistent and timely packet delivery required to support converged services.

#### Minimized Latency

Latency and jitter can be lethal to real-time applications such as voice and video. The Summit 400-24t was designed around a low latency and low jitter architecture in spite of the wealth of services it delivers. In particular, the UniStack stacking architecture was designed so that forwarding is always performed locally when the destination port is known, and when packets have to pass through the stack they always take the shortest path.

#### Non-Blocking Forwarding

High-performance starts with a non-blocking architecture as delivered by the Summit 400-24t. Since any access switch that properly supports converged services must also examine every packet for QoS and security, even more important is the ability to apply these features without degrading switch performance. The Summit 400-24t supports all security, QoS, and management features at full line rate with no negative effect on applications.

### SECURITY TO PROTECT CONVERGED LAN

#### Line Rate Access Control Lists (ACLs)

ACLs are one of the most powerful tools to control network resource utilization and to secure and protect the network. Summit 400-24t supports up to 1,512 ACLs based on Layer 2, 3 or 4-header information such as the MAC address, IP source/destination address, or protocol.

#### Intelligent Network Access

Summit 400-24t supports a comprehensive range of Network Login options by providing an 802.1x agent-based approach, a web-based (agent-less) login capability for guests, and a MAC-based authentication model for devices. With these modes of Network Login, only authorized users and devices can connect to the network and be assigned to the appropriate VLAN.

#### Multiple Supplicant Support

Multiple supplicant support secures IP telephony and wireless access. Converged network designs often involve the use of shared ports. Shared ports represent a potential vulnerability in a network. Multiple supplicant capability on the Summit 400-24t switch allows it to uniquely recognize and apply the appropriate policies for each user or device on a shared port.

#### Media Access Control (MAC)

MAC lockdown secures IP telephones, wireless access points (APs) and servers. The MAC address security/lockdown feature enables Summit 400-24t to block access to any Ethernet port when the MAC address of a station attempting to access the port is different from the configured MAC address. This feature is used to “lock down” a device like an IP telephone, an AP or a server to a specific port.

#### Host Integrity Checking

Host integrity checking helps keep infected or non-compliant machines off the network. Summit 400-24t supports a host integrity or end point integrity solution that is based on the Trusted Computing Group model.

#### Denial of Service (DoS) Protection

If a Summit 400-24t switch detects an unusually large number of packets in the CPU input queue, it will assemble ACLs that automatically stop these packets from reaching the CPU. After a period of time, the ACLs are removed. If the attack continues, they are reinstalled.

## COST-EFFECTIVE NETWORK DESIGN USING THE SUMMIT 400 SERIES

The Summit 400 series of switches allows the traditional edge layer and aggregation layer of the network to be collapsed into a single access layer. A two-tier network that consists of an access layer and a core layer can reduce the number of switches required and hence reduce the network acquisition costs and network management costs. Depending on the size and geographic reach of the network, a two-tier network can be the most cost-effective design for a corporate network. The Summit 400 series of switches are also designed to reduce CapEx and OpEx as demonstrated by the following features:

- All Summit 200s, 300s, and 400s share the same operating system and network management software thereby simplifying the management of the access layer
- The stackable Summit 400 family provides the convenience of a chassis at the price point of stackable switches
- Summit 400 switches with the exception of Summit 400-24p Power-over-Ethernet (PoE) switch, share common redundant external power systems thereby reducing sparing requirements

Networks are undergoing a transition from simple Fast Ethernet data connectivity to converged services and new applications over LAN which demand new infrastructure services: streaming media, VoIP, data analysis and simulations, all of which require expanded bandwidth, rapid resiliency, and precise quality of service. The Summit 400-24t provides these services in one multi-featured platform.

### SUPPORT FOR EVOLVING DESKTOP

#### Legacy Support

With plug-and-play auto-sense on every port, attaching legacy devices is a breeze. With the Summit 400-24t, existing 10 Mbps or 100 Mbps devices are transparently supported, and new security and management benefits become immediately available.

#### Gigabit Evolution

Gigabit Ethernet is a stable, mature technology that provides the highest available bandwidth to the desktop. The combination of low-cost Gigabit Ethernet NICs and embedded gigabit interfaces and increasingly bandwidth hungry Enterprise applications is driving the demand for gigabit to the desktop, for which the Summit 400-24t is the perfect switch, with its line-rate Layer 2 and Layer 3 gigabit forwarding, QoS and resiliency to support demanding applications.

#### Future Applications

The Summit 400-24t already provides low latency and jitter plus the ability to prioritize based on an extensive set of packet header information that the most challenging of future applications is likely to require. This combination of performance plus packet intelligence, coupled with line rate forwarding and extensive resiliency options, makes the Summit 400-24t an obvious choice to future-proof the LAN access layer for future converged applications such as desktop training, video conferencing and IP telephony.

### EXCELLENT AVAILABILITY

#### Link Redundancy

To assure constant availability of wireless access, the Summit 400-24t provides a plethora of redundancy features including the spanning tree and rapid spanning tree that are commonly provided, and much more. For example, Software Redundant Port makes one link redundant to another very simply, with no protocol overhead. For latency sensitive applications, EAPS is capable of failing over in 50 milliseconds, fast enough to sustain a VoIP session. At Layer 3 there are three more options: OSPF ECMP, VRRP, and ESRP, for incredibly scalable deployment of link resiliency.

#### Power Redundancy - External Power System

An important component of the continuous service capability of the Summit 400-24t is its External Power System that provides immediate backup power in the unlikely event that the internal AC power supply fails, or in case the primary AC power input source has problems. The External Power System for Summit 400-24t is comprised of two components, a compact 1 rack unit (RU) tray which accepts up to two power modules, and a 160 watt power module that provide 1:1 power redundancy for 100% backup power, together ensuring uninterrupted LAN access and continuous service availability.

#### Forwarding Performance

When management or security applications are enabled, some switches bog down and become network bottlenecks. Not so the Summit 400-24t, with line-rate packet processing and forwarding performance, even when complex ACLs, Network Login, or other Layer 2, 3, or 4 features are enabled. This is because all packet processing is done in packet processing ASICs and not in software—the benefit is unimpeded traffic flow and LAN availability.

### SCALABILITY, DEPLOYMENT SIMPLICITY

#### Installation Flexibility

With its compact 1 RU footprint, finding rack space to deploy the Summit 400-24t is trivial. A deployment of 192 gigabit ports only requires 14 inches of space. Further enhancing its deployment flexibility is the convenience of UniStack stacking that can link all these ports into a highly redundant, easily managed unit that, unlike a chassis, does not require contiguous allocation of rack space.

#### Voice Grade Service Everywhere

Granular QoS, low latency, and low jitter enable voice quality connections. Summit 400-24t supports a range of QoS technologies that can prioritize and predictably handle high priority traffic – policing or rate limiting on ingress, 802.1q tagging and DiffServ marking, and shaping on egress with eight queues per port. Traditionally, Extreme Networks has built products with low latency and jitter and this tradition continues with the Summit 400-24t – allowing network managers to build networks with low end-to-end latency and jitter.

#### Plug and Play

Summit 400-24t includes several quick install features that simplify its deployment into legacy locations as technology upgrades or into brand new installations. Every copper gigabit port is auto-sense and tri-speed to easily conform to the attached device. Every port auto-senses the polarity of the attached cable and adapts automatically, so there is no need to worry about crossover versus straight-through cables. Every copper port can optionally test a cable connection for faults to accelerate deployment of new LANs. And every port supports Link Layer Discovery Protocol (LLDP) to sense and configure to LLDP compliant attached devices.

### BENEFITS OF UNISTACK STACKING

Access switches are deployed using either chassis or fixed format switches. A chassis has the advantage of simplifying management, but the disadvantage of requiring allocation of more space than initial port counts may require. Fixed format switches have the advantage of being less expensive and easier to fit into open rack slots, but the disadvantage that each new addition of access ports brings with it another device to manage. Stacking can reduce the management overhead of fixed format switches, but often at a cost in overall performance and reliability. A stacking architecture that lacks adequate bandwidth or incurs forwarding penalties results in a serious loss of performance, making it unsuitable to support new converged applications.

The Summit 400 family with UniStack stacking architecture was designed to support converged services. The significant throughput provided by UniStack stacking, up to 160 gigabits per second (Gbps) per stack, and the distributed, shortest path forwarding provide performance competitive with some chassis switches. Resiliency is of key importance for these applications. Availability is assured by redundant bi-directional ring architecture and n-1 master redundancy, distributed Layer 2 and Layer 3 link aggregation and link redundancy, and distributed uplinks.

UniStack stacking on the Summit 400 family delivers the best of both worlds: the benefits of a chassis at the cost of a stackable, in an architecture designed to support today's evolving LAN applications. The resulting network simplification results in lower management and maintenance costs, while enhancing overall availability.

Network management and maintenance can be challenging, especially for IT departments managing complex converged networks while under the pressure to reduce staff and expenses. For all organizations, any repetitive management operation taxes skilled resources, draining valuable productivity. The Summit 400-24t offers relief through the management simplification provided by UniStack stacking. By making a stack of switches appear to be a virtual modular switch, the ExtremeWare UniStack architecture allows all ports in the stack of switches to be configured in one management session.

### UNISTACK STACKING REDUCES COMPLEXITY

#### Single Point of Management

With UniStack stacking, up to eight Extreme Networks Summit switches, including the Summit 400 and Summit 200 families and the Summit 300-24, appear as a single network element managed through a single IP address, with the stack representing a single managed object inside an enterprise management tool such as EPICenter® management suite from Extreme Networks. Having a single IP address for configuration, changes and upgrades yields dividends in saved time.

#### Easy Adds/Drops

UniStack stacking also simplifies network expansions or changes. Adding new access ports to the LAN is as simple as turning on stacking in a new Summit 400-24t and adding it to an existing stack, similar to adding a new module to a modular switch, except that no space-consuming chassis is required. Similarly, moving the Summit 400-24t to a new location is convenient, since the transferred switch can stand alone or become part of another stack.

#### Simple Redundancy Enhancement

Because a stack of Summit 400-24ts represents an n-times replication of traffic processors, management processors, memory and power supplies, the net resiliency of a UniStack stack is greater than the sum of its parts. Add to this the ability to distribute redundant uplinks on different switches and availability goes up even more, compared to a standalone switch.

#### Highly Reliable Architecture

UniStack stacking on Summit 400s is a highly resilient, bi-directional full-duplex ring architecture

with n-1 stack master redundancy designed to survive the failure of a stacking link or switch in the stack. With a nominal transfer rate of 20 Gbps and instantaneous transfers of 40 Gbps per switch, a stack of eight switches can transfer up to 160 Gbps through the stack with highly reliable, completely distributed, shortest path forwarding.

### COMMON MANAGEMENT INTERFACE

#### Common Command Line Interface (CLI) Edge to Core

The Summit 400-24t operates with the award-winning ExtremeWare software from Extreme Networks. ExtremeWare gives the Summit 400-24t the same administrative interface as any ExtremeWare switch running in the network. This common interface reduces training time, time to configure or update, and management overhead.

#### Common Feature Set

The common feature set that the Summit 400-24t shares with other switches from Extreme Networks that are controlled by license levels, simplifies and reduces the cost of managing an Extreme Networks powered LAN. The Summit 400-24t delivers a rich suite of features spanning the range of protocols to intelligently overseeing traffic, consistent and simple to deploy, enabling efficient, productive LAN management.

#### Common Management

EPICenter Enterprise LAN manager supports the Summit 400-24t, either individually or in UniStack stacks, providing a global view to enhance IT staff productivity. Whether the LAN is managed via serial port, web, telnet or a network manager like EPICenter, ExtremeWare included with the Summit 400-24t provides a uniform interface for common management, thus reducing the cost of management.

#### Link Layer Discovery Protocol

By incorporating LLDP, the Summit 400-24t reduces networking expenses by enabling plug and play installation of network devices, simplifying maintenance and reducing troubleshooting time. With its support of IEEE 802.1ab, LLDP simplifies deployment of VoIP phones, wireless access points, cameras, and any device that supports this vendor independent protocol.

#### Secure Management

Security of management is of primary importance, especially for remotely managed LANs. The Summit 400-24t provides essential secure management features to protect these critical resources. All administrative access is protected via very secure authentication using TACACS or RADIUS access control. Secure Shell (SSHv2) is available to protect management sessions from snooping; Secure Copy (SCP) protects configuration file downloads; and SNMPv3 protects management sessions using enterprise management tools such as EPICenter. With its full management security, Summit 400-24t simplifies safe remote management.

#### Desktop Access Management

Using ACLs to examine Layer 2, 3, and 4 packet header information for security and traffic classification, establishes the Summit 400-24t as a premier access switch. Its ability authenticate users essential at the LAN edge, separates the Summit 400-24t from the pack. These features and more, available in the ExtremeWare operating system shipped with the Summit 400-24t, provide the full and robust access management that sets Summit 400-24t apart from others.

### UNISTACK STACKING ARCHITECTURE

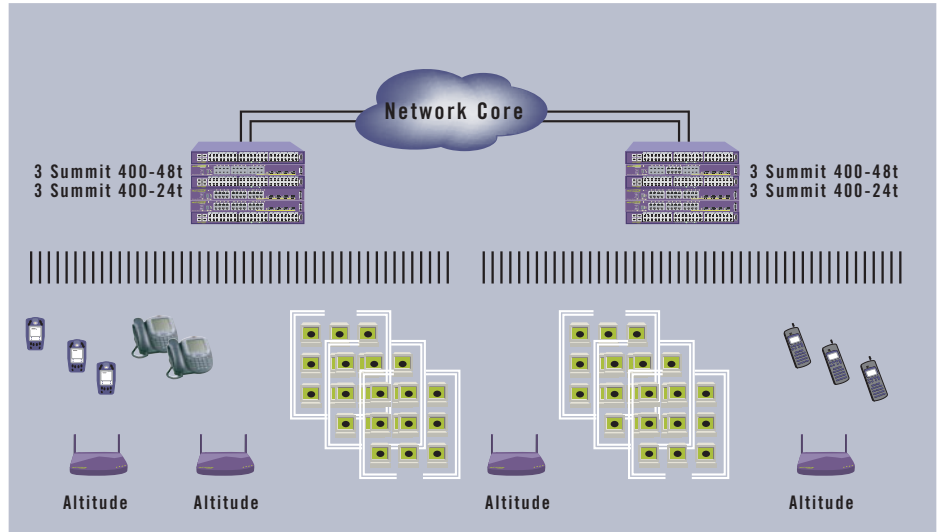
- High throughput
- High resiliency
- Single management point

Figure 1:  
Summit 400-24t UniStack  
Cabling Illustration



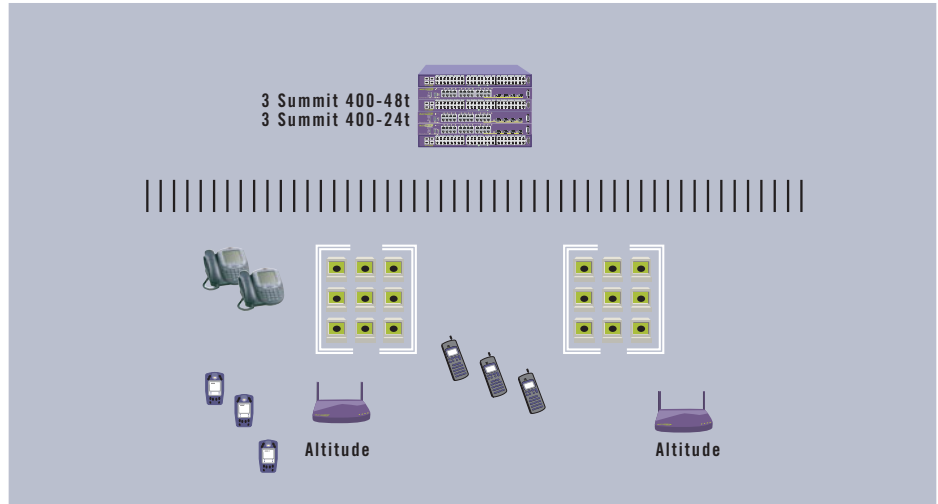
## UPGRADE TO UNIFIED ACCESS EDGE

The Summit 400 family delivers high-performance and cost-effective connectivity driven by networking trends such as the increasing number of IP telephones, wireless access points and other devices at the edge of the network, Gigabit Ethernet connections to the desktop, and the use of gigabit and 10 Gigabit Ethernet as an interconnect technology. The stackable Summit 400 family allows the traditional edge layer and aggregation layer of the network to be collapsed into a single Unified Access layer.



## TECHNOLOGY REFRESH

Summit 400-24t offers a great opportunity to upgrade existing infrastructure to introduce higher performance and support for evolving LAN services. With its rich feature set and competitive price, the Summit 400-24t covers all the emerging technology bases for foolproof future-proofing.



## PHYSICAL

### Ports

- 24 ports 10/100/1000BASE-T with auto-config and auto-polarity
- 4 ports SFP (mini-GBIC, shared PHY with 4 10/100/1000BASE-T ports)
- 1 port Serial (control port)
- 2 UniStack stacking ports, 10 Gbps full duplex each

### Dimensions

**Height** Inches/Cm: 1.73 Inches / 4.4 Cm

**Width** Inches/Cm: 17.4 Inches / 44 Cm

**Depth** Inches/Cm: 15.25 Inches / 38.8 Cm

**Weight** Lbs/Kg: 11.5 lbs / 5.2 Kg

### EPS Dimensions

#### EPS-T

**Height** Inches/Cm: 1.75 Inches / 4.4 Cm

**Width** Inches/Cm: 17.4 Inches / 44 Cm

**Depth** Inches/Cm: 7.6 Inches / 19.3 Cm

#### EPS-160

**Height** Inches/Cm: 1.7 Inches / 4.3 Cm

**Width** Inches/Cm: 7.4 Inches / 18.8 Cm

**Depth** Inches/Cm: 7.9 Inches / 20 Cm

**Power Cable Length:** 1 Meter

### Indicators

- Per port status LED including power status
- Stacking 7-segment display
- System Status LEDs: management, fan and power

### Temperature

- Operating Temperature Range, Degrees Celsius/ Fahrenheit: 0 to 40 °C (32 to 104 °F)
- Operating Humidity Range (worst case, not for extended duration): 10-95% (RH) non-condensing
- Storage and Transportation Temperature Range (worst case), Celsius/Fahrenheit: -40 to +70 °C (-40 to 158 °F)

### Shock

- Operational Shock in Rack (worst case, not for extended duration): 3G, 11 ms, 18 shocks

### Power

- Auto-ranging 90-240VAC, 50-60 Hz
- Line Frequency: 50-60 Hz
- Min Voltage/Associated Current: 100VAC / 1.1A
- Max Voltage/Associated Current: 240VAC / 0.46A
- Heat Dissipation, Watts/BTU: 80W / 273BTU/hr
- External Power System connector
- External Power System EPS-160 module:
  - Heat Dissipation, Watts/BTU: 80W / 273BTU/hr
  - Current 100-240VAC: 1.1A-0.46A

### Forwarding Tables

- Layer 2/MAC Addresses: 16K
- Layer 3 Addresses: 2K
- Layer 3 Static Routes: 1K
- Layer 3 Interfaces: 128
- Layer 3 routing table size: No limit to number of routes

## PERFORMANCE

- 80 Gbps switch fabric bandwidth
- 35.7 Mpps frame forwarding rate
- 9216 Byte maximum packet size (Jumbo Frame)
- 25 load sharing trunks, up to 8 members per trunk
- 8 QoS queues/port
- 4096 VLANs (Port, IEEE 802.1Q, MAC-based)
- 1512 total number of ACL Rules/lines
- 63 rules per port
- ACL rules can be applied to ingress

### Rate Limiting

- Central flow based bandwidth policing/rate limiting: packets are classified after ingress into flows using ACLs and a rate limiter is assigned to a given flow
- Rate Limiting Granularity: 1Mb/s
- Available Rate Limiters: 63 per port

### Acoustic

- 44dBA Sound Pressure

## REGULATORY COMPLIANCE

- North American Safety of ITE
  - UL 60950-1, Listed Device (US Safety)
  - CSA 22.2#60950-00 (Canada Safety)
  - Complies with FCC 21CFR1040.10 & 1040.11, LN#50 7/2001 (US Laser Safety)
  - CDRH Letter of Approval (US FDA Approval)
  - NOM/NYCE (Mexico)
- European Safety of ITE
  - EN60950-1:2000
  - EN 60825-1+A2:2001 (Lasers Safety)
  - 73/23/EEC Low Voltage Directive
- International Safety of ITE
  - CB Scheme IEC 60950-1:2000+All Country Deviations
  - AS/NZX 3260 (Australia /New Zealand)
  - GOST (Russia)

### EMV/EMC

- North America EMC for ITE
  - FCC CFR 47 part 15 Class A (USA)
  - ICES-003 Class A (Canada)
- European EMC standards
  - EN 55022:1998 Class A
  - EN 55024:1998 Class A includes IEC 61000-4-2, 3, 4, 5, 6, 8, 11
  - EN 61000-3-2,3 (Harmonics & Flicker)
  - ETSI EN 300 386:2001 (EMC Telecommunications)
  - 89/336/EEC EMC Directive
- International EMC Certifications
  - CISPR 22:1997 Class A (International Emissions)
  - CISPR 24:1997 Class A (International Immunity)
  - IEC/EN 61000-4-2 Electrostatic Discharge
  - IEC/EN 61000-4-3 Radiated Immunity
  - IEC/EN 61000-4-4 Transient Burst

- IEC/EN 61000-4-5 Surge
- IEC/EN 61000-4-6 Conducted Immunity
- IEC/EN 61000-4-11 Power Dips & Interruptions
- Country Specific
  - VCCI Class A (Japan Emissions)
  - AS/NZS 3548 ACA (Australia Emissions)
  - NOM/NYCE (Mexico)
  - CNS 13438:1997 Class A (BSMI-Taiwan)
  - MIC Mark, EMC Approval (Korea)
  - GOST (Russian Federation)

### Environmental

- EN/ETSI 300 019-2-1 v2.1.2 - Class 1.2 Storage
- EN/ETSI 300 019-2-2 v2.1.2 - Class 2.3 Transportation
- EN/ETSI 300 019-2-3 v2.1.2 - Class 3.1e Operational
- EN/ETSI 300 753 (1997-10) - Acoustic Noise
- ASTM D3580 Random Vibration Packaged

## SOFTWARE

- ExtremeWare 7.4e Supported Protocols

### General Routing and Switching

- RFC 1812 Requirements for IP Version 4 Routers
- RFC 1519 CIDR
- RFC 1256 IPv4 ICMP Router Discovery (IRDP)
- RFC 1122 Host Requirements
- RFC 768 UDP
- RFC 791 IP
- RFC 792 ICMP
- RFC 793 TCP
- RFC 826 ARP
- RFC 894 IP over Ethernet
- RFC 1027 Proxy ARP
- RFC 2338 VRRP
- RFC 3619 Ethernet Automatic Protection Switching (EAPS) and EAPsv2
- IEEE 802.1D - 1998 Spanning Tree Protocol (STP)
- IEEE 802.1w - 2001 Rapid Reconfiguration for STP, RSTP
- IEEE 802.1Q - 1998 Virtual Bridged Local Area Networks
- EMISTP, Extreme Multiple Instances of Spanning Tree Protocol (one domain per port)
- PVST+, Per VLAN STP (802.1Q interoperable) compatibility mode (one domain / VLAN per port)
- Extreme Standby Router Protocol (ESRP)
- Static Unicast Routes
- Software Redundant Ports
- IEEE 802.3ae Link Fault Signaling (LFS) for S400

### VLANs

- IEEE 802.1Q VLAN Tagging
- IEEE 802.3ad Static configuration and dynamic (LACP) for server attached
- IEEE 802.1v: VLAN classification by Protocol and Port
- Port-based VLANs
- MAC-based VLANs
- Protocol-based VLANs

## Quality of Service and Policies

- IEEE 802.1D -1998 (802.1p) Packet Priority
- RFC 2474 DiffServ Precedence, including 8 queues/port (4 queues/port on S200/300)
- RFC 2598 DiffServ Expedited Forwarding (EF)
- RFC 2597 DiffServ Assured Forwarding (AF)
- RFC 2475 DiffServ Core and Edge Router Functions
- Layer 1-4, Layer 7 (user name) Policy-Based Mapping
- Policy-Based Mapping/Overwriting of DiffServ code points, .1p priority
- Network Login/802.1x and DLCS (Dynamic Link Context System, WINS snooping) based integration with EPICenter Policy Manager for dynamic user/device based policies

## RIP

- RFC 1058 RIP v1
- RFC 2453 RIP v2

## OSPF

- RFC 2328 OSPF v2 (including MD5 authentication)
  - RFC 1587 OSPF NSSA Option
  - RFC 1765 OSPF Database Overflow
  - RFC 2370 OSPF Opaque LSA Option
- Note: OSPF Edge includes 2 active interfaces, router priority 0

## IP Multicast:

- RFC 2362 PIM-SM (2 active interfaces as a first hop router, no RP / BSR role)
- RFC 1112 IGMP v1
- RFC 2236 IGMP v2
- IGMP Snooping with Configurable Router Registration Forwarding
- IGMP Filters
- Static IGMP Membership
- Static Multicast Routes
- Mtrace, draft-ietf-idmr-traceroute-ipm-07
- Mrinfo

## Management and Traffic Analysis

- RFC 2030 SNMP, Simple Network Time Protocol v4
- RFC 1866 HTML – web-based device management and Network Login
- RFC 2068 HTTP server
- RFC 854 Telnet client and server
- RFC 783 TFTP Protocol (revision 2)
- RFC 951, 1542 BootP
- RFC 2131 BOOTP/DHCP relay agent and DHCP server
- RFC 1591 DNS (client operation)
- RFC 1155 Structure of Mgmt Information (SMIv1)
- RFC 1157 SNMPv1
- RFC 1212, RFC 1213, RFC 1215 MIB-II, Ethernet-Like MIB & TRAPS
- RFC 1573 Evolution of Interface
- RFC 1650 Ethernet-Like MIB (update of RFC 1213 for SNMPv2)
- RFC 1901 – 1908 SNMP Version 2c, SMIv2 and Revised MIB-II
- RFC 2570 – 2575 SNMPv3, user based security, encryption and authentication
- RFC 2576 Coexistence between SNMP Version 1, Version 2 and Version 3
- RFC 2665 Ethernet-Like-MIB
- RFC 1757 RMON 4 groups: Stats, History, Alarms and Events
- RFC 2021 RMON2 (probe configuration)
- RFC 2668 802.3 MAU MIB
- RFC 1643 Ethernet MIB

- RFC 1493 Bridge MIB
- RFC 2737 Entity MIB, Version 2
- RFC 2674 802.1p / 802.1Q MIBs
- RFC 1354 IPv4 Forwarding Table MIB
- RFC 2737 Entity MIB v2
- RFC 2233 Interface MIB
- RFC 2096 IP Forwarding Table MIB
- RFC 1724 RIPv2 MIB
- RFC 1850 OSPFv2 MIB
- RFC 2787 VRRP MIB
- RFC 2925 Ping / Traceroute / NSLOOKUP MIB
- Draft-ietf-bridge-rstpmb-03.txt – Definitions of Managed Objects for Bridges with Rapid Spanning Tree Protocol draft-ietf-bridge-8021x-01.txt (IEEE8021-PAE-MIB)
- IEEE 802.1x – 2001 MIB
- Extreme extensions to 802.1x-MIB
- Secure Shell (SSHv2) clients and servers
- Secure Copy (SCPv2) client and server
- Secure FTP (SFTP) server
- Configuration logging
- Multiple Images, Multiple Configs
- BSD System Logging Protocol (SYSLOG), with Multiple Syslog Servers
- IEEE 802.1ab Link Layer Discovery Protocol (LLDP)

ExtremeWare vendor MIBs: includes ACL, MAC FDB, IP FDB, MAC Address Security, Software Redundant Port, NetFlow, DoS-Protect MIB, QoS policy, Cable Diagnostics, VLAN config, vMAN, VLAN Translation and VLAN Aggregation MIBs.(not uniform across products)

<http://www.extremenetworks.com/services/documentation>

## Security

- Routing protocol MD5 authentication (see above)
- Secure Shell (SSHv2), Secure Copy (SCPv2) and SFTP with encryption/authentication
- SNMPv3 user based security, with encryption/authentication (see above)
- RFC 1492 TACACS+
- RFC 2865 RADIUS Authentication
- RFC 2866 RADIUS Accounting
- RFC 3579 RADIUS Support for Extensible Authentication Protocol (EAP)
- RFC 3580 802.1X RADIUS
- RADIUS Per-command Authentication
- MAC based Network Login using Radius
- Access Profiles on All Routing Protocols
- Access Profiles on All Management Methods
- Network Login (web-based DHCP / HTTP/ RADIUS mechanism)
- RFC 2246 TLS 1.0 + SSL v2/v3 encryption for web-based Network Login
- IEEE 802.1x – 2001 Port-Based Network Access Control for Network Login
- Multiple supplicants for Network Login (web-based and 802.1x modes)
- MAC Address Security - Lockdown and Limit
- IP Address Security with DHCP Option 82, DHCP Enforce / Duplicate IP Protection via ARP Learning Disable
- Network Address Translation (NAT)
- Layer 2/3/4/7 Access Control Lists (ACLs)
- IP Source Lockdown - Dynamic filtering against invalidly sourced traffic

## Denial of Service Protection

- RFC 2267 Network Ingress Filtering
- RPF (Unicast Reverse Path Forwarding) Control via ACLs
- Wire-speed ACLs
- Rate Limiting ACLs
- IP Broadcast Forwarding Control
- ICMP and IP-Option Response Control
- SYN attack protection
- CPU DOS protection with ACL integration: Identifies packet floods to CPU and sets an ACL automatically, configurable
- Uni-directional Session Control

## Robust Against Common Network Attacks:

- CERT (<http://www.cert.org>)
  - CA-2003-04: "SQL Slammer"
  - CA-2002-36: "SSHredder"
  - CA-2002-03: SNMP vulnerabilities
  - CA-98-13: tcp-denial-of-service
  - CA-98.01: smurf
  - CA-97.28:Teardrop\_Land -Teardrop and "LAND " attack
  - CA-96.26: ping
  - CA-96.21: tcp\_syn\_flooding
  - CA-96.01: UDP\_service\_denial
  - CA-95.01: IP\_Spoofing\_Attacks\_and\_Hijacked\_Terminal\_Connections
  - IP Options Attack

## Host Attacks

- Teardrop, boink, opentear, jolt2, newtear, nestea, syndrop, smurf, fraggle, papasmurf, synk4, raped, winfreeze, ping -f, ping of death, pepsi5, Latierra, Winnuke, Sipping, Sping, Ascend, Stream, Land, Octopus

## WARRANTY

- Limited Lifetime Hardware Warranty
- 90-day Warranty on Software

## ORDERING INFORMATION

Part Number	Part Name	Description
16131	Summit 400-24t	24 10/100/1000BASE-T, 4 unpopulated mini-GBIC ports, 2 UniStack stacking ports, 1 AC PSU, Edge ExtremeWare license, connector for EPS-160 external redundant PSU
16132	S400-24t Advanced Edge License	ExtremeWare Advanced Edge License for Summit 400-24t
16106	Stacking Cable, 0.5M	Summit UniStack Stacking cable, 0.5M
16107	Stacking Cable, 1.5M	Summit UniStack Stacking cable, 1.5M
16108	Stacking Cable, 3.0M	Summit UniStack Stacking cable, 3.0M
10906	EPS-T	External Power System power tray, accepts up to two EPS-160 power modules
10907	EPS-160	External Power System power module, 160 Watts
10051	SX mini-GBIC	Mini-GBIC, SFP, 1000Base-SX, LC connector
10052	LX mini-GBIC	Mini-GBIC, SFP, 1000Base-LX, LC connector
10053	ZX mini-GBIC	Mini-GBIC, SFP, 1000Base-ZX, LC connector



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