Summit®5i

Summit 5i is versatile switch that delivers high-performance and advanced features in a compact form factor.

Voice-Class Availability

- ExtremeWare™ hardened Real Time operating system
- Ethernet Automatic Protection Switching (EAPS) resiliency-protocol
- Resilient system design with redundant power supplies

Advanced Features Enable Versatile Deployment

- High-performance non-blocking architecture to enable a multi-gigabit distribution layer
- Advanced routing protocols such as OSPF, BGP and multicast for an efficient and productive small network core
- Exceptional Policy-Based Quality of Service (QoS) and traffic management for metro Ethernet services aggregation

Comprehensive Security to Ward Off Attacks

- User policy and host integrity enforcement
- Instrumentation to react to network intrusion
- Hardened against attacks

The Summit®5i is the ideal switch for mid-tier aggregation in enterprise, building a small enterprise core, basement Customer Premise Equipment (CPE) for metro area networks, or for server load balancing/web cache redirection in server co-location and hosting environments. With a compact 2RU factor, the Summit5i switch integrates non-blocking wire-speed IP/IPX routing and Layer 2 switching with advanced capabilities like Policy-Based QoS, Server Load Balancing (SLB), web cache redirection and Access Control Lists (ACLs) all at wire-speed on every port.

Target Applications

- Broadband Access Point of Presence (POP) as an integrated platform for providing transport and service termination at the CPE location with wire-speed switching and routing, filtering, virtual metropolitan area networks (vMANs), and bidirectional bandwidth controls
- Mid-Tier Aggregation in Enterprise Networks for non-blocking wire-speed IP/IPX routing and Layer 2 switching with advanced capabilities like Policy-Based QoS and ACLs
- Broadband Services POP as a single aggregation point for basic service delivery mechanisms in an Internet data center providing server load balancing/web cache redirection in server co-location and hosting environments

Scalable Performance

The Summit5iSX and Summit 5iTX switches fit the small and medium Gigabit Ethernet aggregation spaces in the Extreme Networks® portfolio. These switches can be used for mid-tier aggregation in enterprise, basement CPE for metro area networks and as server load balancing/web cache redirection boxes in server co-location and hosting environments.

Summit5i

Available in two configurations with twelve 100/1000BASE-T or 1000BASE-SX ports plus four GBIC-based 1000BASE-X ports, the Summit5i also comes with built in redundant power supplies for increased fault tolerance.

Enterprise Aggregation and Core

The Summit5i can terminate a BGP or OSPF domain, route multicast traffic to assure high availability of media streams, and deliver hardware resiliency through redundant power supplies and fiber uplinks. The Summit5i delivers all of these and more with an optimal set of security features and full line-rate forwarding in a compact 2RU package. Traditional chassis core switches may exceed the needs and the budget of the small enterprise. A highly resilient pair of Summit5i switches provides every feature you expect of a core router for small enterprises, at a price that enables hot local sparing for high availability and maximized productivity.

Point of Presence (POP)

The shift from narrowband technologies to gigabit level services has dramatically changed the networking requirements of the customer premise equipment portion of metro area networks (MANs), as well as Internet data centers fed by high capacity connections. The Summit5i provides an ideal integrated platform to meet these new requirements, with wire-speed switching and routing, access controls, vMANs, and bidirectional bandwidth controls.

Pre-installed on every Extreme Networks switch, the ExtremeWare® software suite features industry standard protocols to ensure interoperability with legacy switches and routers, plus Policy-Based QoS for bandwidth management and traffic prioritization. ExtremeWare scales performance and increases availability by combining Policy-Based QoS with fully integrated SLB, web cache redirection, ACLs, VLAN switching and routing, IETF DiffServ and IEEE 802.1p. Every Summit5i includes EAPS for Layer 2 resiliency which provides extremely rapid failover necessary to properly support converged services. Optional on Summit5i is a full Layer 3 ExtremeWare license that provides a complete set of routing protocols that deliver the Layer 3 routing and resiliency required for aggregation or core deployment.

Summit5i Feature Set

- SONET-like reliability through EAPS resiliency for non-stop operation
- Bandwidth by the slice for incremental service provisioning
- Usage-based billing to recoup the service provider's investment
- vMAN services for virtual private networks over a single MAN
- BGP4 for Internet peering
- Short, medium and long-reach optics for campus, metro and regional area networks
- Non-blocking 32 Gbps switch fabrics yields 24 million packets per second
- Wire-Speed IP/IPX routing at Layer 3 with wire-speed Layer 2 switching
- Policy-Based QoS with bandwidth management and prioritization
- Bandwidth provisioning per port
- Advanced resiliency and fault tolerance; fully redundant, load-sharing power supplies
- Redundant switch configuration files and ExtremeWare images
- Extreme Standby Router Protocol (ESRP) for ultra-fast failover function at Layer 2 and Layer 3
- VRRP for standards-compliant dual homing
- Full OSPF, and OSPF Equal Cost Multi-Path routing
- 4,096 IEEE 802.1Q VLANs
- IEEE 802.1ad compatible link aggregation
- Switch and route jumbo frames

Features	Summit5iSX	Summit5iTX
Max. auto-negotiating 10/100/1000BASE-T ports	N/A	12
Max. Gigabit Ethernet fiber ports	16 (12 MTRJ, 4GBIC)	4 GBIC
Form factor	Fixed/2RU	Fixed/2RU
Total switching capacity	32Gbps	32Gbps
Policy-based routing	Yes	Yes
Wire-speed IP/IPX routing and switching	Yes	Yes
Routing (BGP4, OSPF, DVMRP, RIPv1/v2, PIM)	Yes	Yes
vMANs (802.1ad)	Yes	Yes
Link aggregation	Yes	Yes
Integrated server load balancing	Yes	Yes
Access Control Lists (ACLs)	Yes	Yes

Technical Specifications

ExtremeWare v7.6 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
- FC 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 802.1s – 2004 Multiple Instances of STP, MSTP
- Extreme Multiple Instances of Spanning Tree Protocol (EMISTP)
- PVST+, Per VLAN STP (802.1Q interoperable)
- Extreme Standby Router Protocol (ESRP)
- IEEE 802.1Q – 2003 Virtual Bridged Local Area Networks
- Extreme Discovery Protocol (EDP)
- Static Unicast Routes
- Extreme Loop Recovery Protocol (ELRP)
- Software Redundant Ports
- IPX RIP/SAP Router specification

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
- Multiple STP domains per VLAN
- RFC-3069 VLAN Aggregation for Efficient IP Address Allocation
- Virtual MANs (vMANs)
- VLAN Translation

Quality of Service and Policies
- IEEE 802.1D – 1998 (802.1p) Packet Priority
- RFC 2474 DiffServ Precedence, including 8 queues/port
- RFC 2598 DiffServ Expedited Forwarding (EF)
- RFC 2597 DiffServ Assured Forwarding (AF)
- RFC 2475 DiffServ Core and Edge Router Functions
- RED as described in "Random Early Detection Gateways for Congestion Avoidance, Sally Floyd and Van Jacobson"
- RED as recommended in RFC 2309
- Bidirectional Rate Shaping
- Ingress Rate Limiting
- 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 License includes 2 active interfaces, router priority 0)

IS-IS
- RFC 1142 (ISO 10589), IS-IS protocol
- RFC 1195, Use of OSI IS-IS for routing in TCP/IP and dual environments
- RFC 2104, HMAC: Keyed-Hashing for Message Authentication, IS-IS HMAC-MD5 Authentication
- RFC 2763 (Dynamic Host Name Exchange for IS-IS)

BGP4
- RFC 1771 Border Gateway Protocol 4
- RFC 1965 Autonomous System Confederations for BGP
- RFC 2796 BGP Route Reflection (supersedes RFC 1966)
- RFC 1997 BGP Communities Attribute
- RFC 1745 BGP4/IDRP for IP-OSPF Interaction
- RFC 2385 TCP MD5 Authentication for BGPv4
- RFC 2439 BGP Route Flap Damping

IP Multicast
- RFC 2362 PIM-SM
- PIM-DM Draft IETF PIM Dense Mode v2-dm-03
- PIM Snooping
- DVMRP v3 draft IETF DVMRP v3-07
- 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 SNTP, 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 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 2613 SMON MIB
- 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 2233 Interface MIB
- RFC 2096 IP Forwarding Table MIB
- RFC 1724 RIPv2 MIB
- RFC 1850 OSPFv2 MIB
- RFC 1657 BGPv4 MIB
- RFC 2787 VRRP MIB
- RFC 2925 Ping/Traceroute/NSLOOKUP MIB
- Draft-ietf-bridge-rstpmib-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
- sFlow version 5
- NetFlow version 1 export
- Configuration logging
- Multiple Images, Multiple Configs
- BSD System Logging Protocol (SYSLOG), with Multiple Syslog Servers
- Local Messages (criticals stored across reboots)
- 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

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)
- Guest VLAN for 802.1x
- MAC Address Security – Lockdown, limit and aging
- 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 ACLs
- Source IP Lockdown – Dynamic filtering against invalidly sourced traffic

Technical Specifications

Denial of Service Protection
- RFC 2267 Network Ingress Filtering
- RPF (Unicast Reverse Path Forwarding) Control via ACLs
- Wire-speed ACLs
- Rate Limiting ACLs
- Rate Shaping by ACLs
- IP Broadcast Forwarding Control
- ICMP and IP-Option Response Control
- Server Load Balancing with Layer 3, 4 Protection of Servers
- SYN attack protection
- FDB table resource protection via IPDA Subnet Lookup
- CPU DOS protection with ACL integration: Identifies packet floods to CPU and sets an ACL automatically, configurable traffic rate limiting to management CPU/enhanced DoS Protect
- Unidirectional 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, Simping, Sping, Ascend, Stream, Land, Octopus

Summit5i Product Specifications

General Specifications
- True QoS via ExtremeWare and policy-based bandwidth control and application prioritization
- Eight queues per port
- Auto-negotiating 100/1000BASE-T
- Up to 131,000 Layer 2 addresses
- Up to 131,000 Layer 3 addresses
- 4,096 VLANs

Physical and Environmental
- Dimensions:
  - (H) 3.50 in x (W) 17.25 in x (D) 19.0 in
  - (H) 8.90 cm x (W) 43.87 cm x (D) 48.31 cm
- Weight:
  - with single power system 21.7 lbs (9.90 Kg)
  - with dual power system 27.4 lbs (12.86 Kg)
- Operating Temperature: -40° C to 40° C (-40° F to 104° F)
- Storage Temperature: -10° C to 70° C (14° F to 158° F)
- Humidity: 10% to 95% non-condensing
- Power: 100-240 VAC, 50-60 Hz, 2.6 A max.
- Heat Dissipation: 1051 BTU/hr (308 watts)

Regulatory

Safety
- -UL 1950 3rd Edition, Listed
- TUV/GS and GOST to EN60825-1 and EN60950:
- 1992/A3:1995+ZB/ZC Deviations
- cUL Listed to CSA 22.2#950-95

EMI/EMC
- FCC Part 15 Class A
- ICES-0003 Class A
- VCCI Class 1
- EN55022 Class A
- CISPR 22 Class A
- EN55024

Environmental
- EN60068 to Extreme IEC68 schedule

Reliability
- Summit5i TX 1 PSU: 90,133 hrs calculated MTBF with 1 PSU to Mil
- HDBK 217F Notice 1, Parts Stress Method
- Summit5i TX 2 PSU: 106,066 hrs calculated MTBF with 1 PSU to Mil
- HDBK 217F Notice 1, Parts Stress Method
- Summit5i SX 1 PSU: 94,194 hrs calculated MTBF with 1 PSU to Mil
- HDBK 217F Notice 1, Parts Stress Method
- Summit5i SX 2 PSU: 111,735 hrs calculated MTBF with 1 PSU to Mil
- HDBK 217F Notice 1, Parts Stress Method

Acoustic
- 58 dB/pW Weighted Sound Power Level to EN27779 and EN29295

Warranty
- 12 months limited warranty on hardware
- 90-days on software

Ordering Information

Part Number	Description
11502	Summit5i with 12 fixed 100/1000BASE-T ports (RJ-45) and four unpopulated GBIC-based 1000BASE-X ports (SC), Basic Layer 3 Software License, dual power supply
11503	Summit5i with 12 fixed 1000BASE-SX ports (MT-RJ) and four unpopulated GBIC-based 1000BASE-X ports (SC), Basic Layer 3 Software License, single power supply
11510	Summit5i Full Layer 3 Software License
10011	1000BASE-SX GBIC-based transceiver, SC connector, for use with multimode fiber with distances up to 550 meters
10013	1000BASE-LX GBIC-based transceiver fro distances up to 10Km; Sc connector, for use with single mode fiber
10017	1000BASE-ZX GBIC-based transceiver, extra long distance single mode fiber, 70Km/21db budget SC connector
10018	UTP GBIC, 1000BASE-T GBIC-based transceiver, RJ-45 connector, 80 meter range over CAT5 copper cable
10019	LX100 GBIC 100 Kilometer range over single mode fiber, SC connector 1000BASE-ZX compatible

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