



## SUMMIT 7i

**The high-density Summit®7i stackable switch delivers non-blocking wire-speed IP/IPX routing and switching to server farms, aggregated switches and network backbones. Available with 28 100/1000BASE-T or 1000BASE-SX ports plus four GBIC-based 1000BASE-X ports, Summit7i provides 32 ports of non-blocking Gigabit Ethernet with full routing protocol support in a compact 4U package. It also comes with optional redundant power supplies for increased fault tolerance.**

**Switching Co-location and Switching** In server farms and data centers, the Summit7i maximizes server availability and performance by combining server load-balancing with wire-speed switching. Auto-negotiating 100/1000BASE-T ports extend the simplicity of Ethernet's scalable speed from Fast Ethernet to Gigabit Ethernet. The low 7-inch height of the Summit7i also makes it ideal in server farms and data centers where rack space is limited.

**Scalable Backbone Bandwidth** The high port-density of the Summit7i makes it easy and cost-effective to scale backbone bandwidth and aggregate multiple switches. As a "mid-tier" switching solution, Summit7i can aggregate multiple Summit access switches, while providing high-speed gigabit links to BlackDiamond® chassis switches in the core.

Utilizing link aggregation, Summit7i can trunk multiple Gigabit Ethernet connections into one high-bandwidth pipe. Capable of scaling backbone bandwidth well into the future, the Summit7i can aggregate up to eight Gigabit Ethernet links into one logical link.

**Resilient Aggregation** Supporting critical redundant link resiliency at layers 2 and 3, the Summit7i is an ideal high performance aggregation switch. At layer two, Extreme Automatic Protection Switching (EAPS) provides sub-second resiliency necessary to support converged services such as Voice over IP. Additional resiliency options at layer 2 include Spanning Tree Protocol (STP), IEEE 802.1w Rapid Spanning Tree (RSTP), Per-VLAN Spanning Tree Plus (PVST+), and Extreme Multiple Instance Spanning Tree (EMISTP) to optimize layer 2 resiliency and availability. The Summit7i also provides the option for full-bandwidth non-blocking layer 3 resiliency using OSPF Equal Cost Multi-Path.

Pre-installed on every Extreme Networks® switch, the ExtremeWare® software suite combines industry standard protocols to ensure interoperability with legacy switches and routers, plus Policy-Based

Quality of Service (QoS) for bandwidth management and traffic prioritization in today's networks. Every switch includes Extreme Automatic Protection Switching (EAPS) for layer 2 resiliency which provides very rapid failover necessary to properly support converged services. Optional on Summit7i is a Full Layer 3 ExtremeWare license which provides a complete set of routing protocols that deliver the layer 3 routing and resiliency required for aggregation or core deployment.

### Summit7i Feature Set

- Non-stop reliability of critical enterprise applications through EAPS resiliency
- 64 Gbps non-blocking switch fabric bandwidth
- Wire-speed IP/IPX routing at 48 million packets per second
- Wire-speed RIP v1 and v2, OSPF, BGP4, DVMRP and PIM routing, essential for core or aggregation deployment
- 32 Gigabit Ethernet ports: 28 auto-negotiating 100/1000BASE-T or 1000BASE-SX ports, plus four GBIC-based 1000BASE-X ports supporting short to long reach Gigabit optics
- Policy-Based Quality of Service, including bandwidth management and prioritization
- Access policies for network control and security
- Server load balancing and web cache redirection
- Fault tolerant: multiple load-sharing trunks; multiple spanning trees; Extreme Standby Router Protocol; and redundant, load-sharing power supplies
- Extensive management through HTTP, SNMP, RMON, and command line interface
- ESRP provides resiliency at both 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

### SUMMIT7i PRODUCT SPECIFICATIONS

#### General

- True QoS via ExtremeWare and Policy-Based Bandwidth control and application prioritization
- Eight queues per port
- Built-in PCMCIA interface
- Auto-negotiating 100/1000BASE-T



- Up to 262,000 Layer 2 addresses
- Up to 262,000 Layer 3 addresses
- 4,096 VLANs

## Protocols and Standards

### 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
- PVST+, Per VLAN STP (802.1Q interoperable)
- Extreme Standby Router Protocol (ESRP)
- Static Unicast Routes
- 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
- Bi-directional Rate Shaping
- 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

### 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 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 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 2737 Entity MIB v2
- RFC 2233 Interface MIB
- RFC 1354 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
- 999 Local Messages (criticals stored across reboots)

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.

<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 2138 RADIUS Authentication
- RFC 2139 RADIUS Accounting
- RADIUS Per-command Authentication
- 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)

## Denial of Service Protection

- RFC 2267 Network Ingress Filtering
- RPF (Unicast Reverse Path Forwarding) Control via ACLs
- Wire-speed ACLs
- Rate Limiting / 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 ratelimiting to management CPU / Enhanced DoS Protect
- 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	fraggle	Latierra
boink	papasmurf	Winnuke
opentear	synk4	Simping
jolt2	raped	Sping
newtear	winfreeze	Ascend
nestea	ping -f	Stream
syndrop	ping of death	Land
smurf	pepsi5	Octopus

## Physical and Environmental

- Dimensions:
  - (H) 7.0 in x (W) 17.25 in x (D) 19.0 in
  - (H) 17.8 cm x (W) 43.87 cm x (D) 48.31 cm
- Weight:
  - single power system 45 lbs (20.25 Kg)
  - dual power system 55 lbs (24.75 Kg)
- Operating Temperature: -40° C to 40° C (32° F to 104° F)
- Storage Temperature: -10° C to 70° C (14° F to 158° F)
- Humidity: 10% to 95% non-condensing
- Power: 90-264 VAC, 47-63 Hz, 10 A max.
- Heat Dissipation: 1,298 BTU/hr (380 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



# DATA SHEET - SUMMIT7i

## Environmental

- EN60068 to Extreme IEC68 schedule

## Reliability

- Summit7i TX 1 PSU: 86,956 hrs calculated MTBF with 1 PSU to Mil HDBK 217F Notice 1, Parts Stress Method
- Summit7i TX 2 PSU: 90,039 hrs calculated MTBF with 1 PSU to Mil HDBK 217F Notice 1, Parts Stress Method
- Summit7i SX 1 PSU: 93,457 hrs calculated MTBF with 1 PSU to Mil HDBK 217F Notice 1, Parts Stress Method
- Summit7i SX 2 PSU: 100,757 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

## Ordering Information

Part Number	Description
11701	Summit7i with 28 fixed 100/1000BASE-T (RJ-45) ports and four unpopulated GBIC-based 1000BASE-X ports (SC), Basic Layer 3 software license, single power supply
11702	Summit7i with 28 fixed 100/1000BASE-T ports and four unpopulated GBIC-based 1000BASE-X ports (SC), Basic Layer 3 software license, dual power supply
11703	Summit7i with 28 fixed 1000BASE-SX (MT-RJ) ports and four unpopulated GBIC-based 1000BASE-X ports (SC), Basic Layer 3 software license, single power supply
11704	Summit7i with 28 fixed 1000BASE-SX (MT-RJ) ports and four unpopulated GBIC-based 1000BASE-X ports (SC), Basic Layer 3 Software License, dual power supply
11708	Summit7i Full Layer 3 upgrade voucher (for upgrade in the field from Basic Layer 3 to Full Layer 3)
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 for 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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