

Extreme Networks® 4th Generation Networking Silicon System (4GNSS)



The networking industry is changing at a tremendous rate. Wireless networks are going mainstream, the number of network devices is increasing exponentially, and new applications such as storage area networks (SANs), network attached storage (NAS) and voice-over-IP (VoIP) are dramatically altering the networking landscape. Extreme Networks' vision of Ethernet and IP everywhere is extended even further with the new, offering of Extreme's 4th Generation Networking Silicon System (4GNSS). Extreme's 4GNSS provides a flexible, cost-efficient architecture designed to support these rapidly evolving networks of today and tomorrow.

Future networks must not only deal with computing devices such as personal computers and PDAs, but also with Internet-ready cell phones, inventory items such as coffee mugs Radio Frequency (RF) tagged for inventory control, and other network-connected devices we haven't even thought of yet. How will networks deal with the onslaught? IPv6? Network Address Translation? MPLS? New protocols or applications? Since the answer is not altogether clear, core switching devices must be ready for anything.

Extreme's 4GNSS was "built ready for anything". It has an integrated programmable packet processor, and ingress and egress microcode engines, which can classify on any field and write-out any encapsulation. Incorporating changes into this programmable processor means a 3-month software cycle rather than a 2-year ASIC re-spin. And since Extreme Networks® realizes the network must always be connected, the 4GNSS is built for hitless failover and reliability to ensure the network never, ever fails.

Extreme's 4GNSS Features

Integrated Security

- SNMPv3, SSH2, SCP
- MAC-based VLAN, access profiles
- RADIUS/TACACS support
- Denial of service (DoS) attack prevention, mitigation and detection

Non-stop Operation

- Fully modular, self-healing operating system
- Error correction code (ECC) memory to detect and correct packet errors
- Chipset support for hitless failover and hitless upgrades
- Self-healing hardware with memory auto-remap

Industry Leading Performance

- Scalability from 40 gigabits to over 2 terabits
- Wire-rate packet processing for dense 10 Gigabit Ethernet and future 40 Gigabit Ethernet
- Low Sub 10 microsecond latency

Massive Scalability

- Purpose-built for dense 10 Gigabit and 40 Gigabit Ethernet

Support for:

- 2M / port IPv4 route table entries
- 1M / port IPv6 routing table entries
- 2M / port MAC addresses and counters
- 1M / port Access Control Lists (ACLs)

PoS and ATM

T-Flex programmable engine on ingress and egress

- Line rate policy based network address translation (PB-NAT)
- Line rate tunneling support for:
 - IPv4 in IPv6
 - IPv6 in IPv4
 - IPv4 in IPv4
 - IPv6 in IPv6
 - MPLS
 - GRE
 - L2TP
- Traffic translation support for:
 - IPv4-to-IPv4
 - IPv4-to-IPv6
 - IPv6-to-IPv6
 - IPv6-to-IPv4
- Programmable counters and sampling for advanced statistics collection
- Full instruction sets in hardware for IPv4, IPv6, encapsulation, de-encapsulation, Layer 2 bridging, and MPLS, which permit wire rate forwarding
- Flexible, micro-code instruction set for examining new types of packets or protocols
 - Dramatically reduced timeframe for adding new, wire-rate services in hardware

Multi-layer programmable QoS

- Classification: Multiple sequential lookups and highly flexible
- Metering: Committed and peak rates, 1 kbps granularity
- Shaping: Ingress/Egress shaping on up to 128 queues / port
- Marking: Full support for ToS/DiffServ (including expedited forwarding and assured forwarding)

Adaptive Queuing:

- Up to 128 independent hardware queues per port
- Random Early Detection (RED)/Weighted Random Early Detection (WRED)
- Strict Priority Queuing (SPQ)
- Weighted Fair Queuing (WFQ)

T-Stat for Flexible Statistics Gathering:

- Full Netflow and SFlow support, with hardware-based sampling
- Statistics Collection:
 - Programmable per-VLAN statistics, based on any combination of:
 - o Physical Port Number
 - o MAC Source or MAC Destination
 - o 802.1p QoS settings
 - o Cast Type (Unicast, Multicast, Broadcast)
 - Queuing Statistics
 - o CIR (Committed Information Rate) conforming bytes and packets
 - o PR (Peak Rate) conforming bytes and packets
 - o Discards
 - Programmable Packet Statistics, based on any combination of:
 - o Layer 2 (Source MAC, Destination MAC)
 - o Layer 3 (Source IP, Destination IP, IP Protocol)
 - o Layer 4 (Source Port, Destination Port)
 - o QoS (DiffServ, ToS, or 802.1p)
 - o MPLS label