NETSCOUT®

nGenius 2200 Series Packet Flow Switch

Hardware-accelerated Packet Optimization for Performance Monitoring and Security Systems on 10G Networks

HIGHLIGHTS

- 2 Rackmount Unit (RU) chassis with hot-swappable architecture
- 240 Gbps unidirectional (480 Gbps bidirectional) throughput and non-blocking switching fabric
- Up to 4 swappable chassis modules
- Up to 24 non-blocking ports of 1GE and/or 10GE per chassis
- Line rate performance on all features, including rate conversion, aggregation, replication, filtering, load balancing, port tagging, time stamping, protocol stripping & de-encapsulation, conditional slicing, and encapsulated filtering & balancing
- IP Tunnel termination (e.g. ERSPAN, NVGRE)
- Reliable and secure WAN tunneling
- Active inline traffic forwarding and tool chaining with fail-safety
- Intelligent fully meshed stacking/interconnect (vMesh)
- Management via command line, XML API, and graphical user interfaces for local and remote access
- NEBS III Compliant

Product Description

The nGenius® 2200 series packet flow switch (PFS) is a NEBS level III compliant, highly scalable modular system that bridges the gap between 1G and 10G Ethernet networks and tools.

The nGenius 2204 packet flow switch model consists of a 2RU chassis that supports up to four chassis modules, with each module supporting up to 40 Gbps throughput – for a chassis total of 240 Gbps of unidirectional (or 480 Gbps of bidirectional) throughput and up to 24 ports. All ports on each chassis module are enabled by default, with each port configurable as a network traffic, intermediate (service), or monitoring tool port.

With vMesh, a self-organizing architecture, traffic capture devices can be deployed in a redundant, low-latency meshed architecture for dynamic and fault-tolerant visibility that can scale to over 4000[1] ports across LAN and WAN environments, including tunneling.

Delivery Optimization

Beyond scalable aggregation, replication, and speed conversion, nGenius 2200 series packet flow switch supports line rate hardware-based packet filtering and session-based load balancing of packets to tools.

User-independent filtering allows traffic to be distinguished according to source and/or destination MAC address, IP address, SCTP/TCP/UDP port, as well as by specific protocols, such as HTTP, VoIP (SIP, RTP), and others. A custom filter enables more granularity, specifically within the payload of a packet. Filters can be ingress, egress, and overlapping.

Session-based, flow-aware load balancing provides user control of traffic distribution to monitoring tools, increasing output capacity while maintaining session integrity. For example, a 10G network can be captured and automatically balanced across multiple 1G monitoring tool ports based on user-defined session criteria. The load balancing can operate in tandem with hardware-based filtering or independently.

[1] Total number of ports in a single vMesh is dependent on quantity and complexity of filtering.

nGenius 2204 packet flow switch | Up to 24 Port 1/10 GE

Packet Optimization

In addition to delivering the right traffic to the right tools, nGenius 2200 series packet flow switch optimizes the packets themselves to improve the efficiency and effectiveness of the monitoring applications.

The nGenius 2200 series packet flow switch advanced hardware-acceleration enables packets to be optimized at line-rate, with minimal latency and negligible jitter, for a broad range of functions, which include removal of tunneling or encapsulation protocol headers, removal of undesired (or authorized) payload, addition of a timestamp, and others.

Security Optimization

To take action as offenders and bad actors are detected, the active inline security tools need to see and handle all the traffic that must be inspected.

nGenius 2200 series packet flow switch, with active inline forwarding and tool chaining, allows aggregation, filtering, and load-balancing of real-time network traffic toward multiple inline security applications while maintaining only a single intrusion into each network link. The integration of PowerSafe chassis modules ensures that the security policies are maintained during power failure, and the deployment of application-specific health checks (not just heartbeats) in conjunction with policy-based triggering facilitates automatic failure scenarios including high availability.

Management

nGenius 2200 series packet flow switch can be locally managed via a serial console and remotely managed via a Web GUI, CLI, XML API, and the Management Center (vMC™) using HTTP, HTTPS, SSH, or Telnet. Users can monitor the system via use of Syslog and SNMP.

All PFS devices support field software updates for additional features and performance enhancements. The vMC supports full management and configuration of nGenius 2200 series packet flow switch, as well as nGenius 4200 series packet flow switch and nGenius 6000 series packet flow switch products.

The nGenius packet flow switch series, including nGenius 2204 packet flow switch, provides automated event-driven monitor output traffic direction and responses (Syslog messages, SNMP traps, light front LED, deactivate ports) with a variety of user-definable trigger event types.

Power and Compliance

nGenius 2200 series packet flow switch is NEBS III compliant; it is available with hot-swappable power supplies, fans, air filters, and chassis modules. Redundant power supplies allow seamless transitions between power systems to ensure uptime.

Features and Benefits

Features	Benefits
Up to 24 line-rate ports in 2RU · 24 x 1G/10G · Advanced ports are either 1G or 10G, depending on image Compatible with SFP, SFP+ MSA compliant transceivers including direct attach copper and active fiber cables	**Highly scalable and modular system:** · Reduces per-port cost and increases flexibility · Condenses footprint (rack space) · Reduces power consumption · Simplifies management
I/O configurable · Full flexibility in selecting ports for network access, intermediate service, interconnect, or monitor output · IP tunnel (e.g. ERSPAN, GRE, NVGRE/L2GRE) termination	· Enables agile response to monitoring infrastructure changes · Allows virtualized traffic to be forwarded over an IP network to PFS ingress ports, and then forwarded onto monitoring devices as is, or de-encapsulated[2]
Selective aggregation · Fully flexible any-to-any port mapping	· Enables scalable aggregation to maximize agility and tool visibility · Addresses asymmetrical routing issues
Hardware-based filtering · User-independent · OSI Layers 2-7 · Custom offset · Ingress · Egress · Overlapping	· Forwards only traffic of interest to each tool, which increases tool efficiency and reduces the number of required tool interfaces
Session-based/flow-aware load balancing · Distributes traffic load across multiple instances of a tool or tool port · Maintains session stickiness for full conversations · Up to 8 ports per group	· Prevents oversubscription of monitoring tools and security systems – eliminating blind spots without sacrificing session integrity · 10G copied traffic can be easily distributed across multiple lower speed tool ports, allowing users to preserve existing tool investments

Monitor traffic port tagging
 	
 · Provides identification of traffic based on source network/link using:
   – VLAN tagging, or
   – Port stamping
	· Users can quickly pinpoint where an issue, such as latency or security event, is occurring in the network
	 · Provides options for different tools to access port identification

Microburst mitigation · High Data Burst Buffering[2]	· Prevents packet loss resulting from aggregation or speed conversion of bursty traffic (microbursts)
Microburst measurement · vCapacity™ measurement	· Provides capacity planning data to analyze traffic profiles and burstiness
Hardware-based advanced packet optimization[2] · Accurate time stamping (from 4.5ns) for latency analysis · Protocol (Fabric Path, GRE, GTP, MAC-in-MAC, MPLS, NVGRE, TRILL, VLAN, VN-tag, VXLAN) header removal for broader tool support · Conditional packet slicing (vSlice™) for selective payload removal · Adaptive load balancing of GTP, MPLS, and multi-VLAN encapsulated traffic · Adaptive filtering of GRE, GTP, MPLS, and multi-VLAN encapsulated traffic	· Provides time-of-capture data, as well as greater granularity in selecting traffic for tools, enabling tools to perform faster, more effective analysis · Minimizes amount of traffic volume to backhaul · Ensures coherent forwarding of traffic to tools
vStack+ · Enables vMesh architecture for local and remote of up to 256 PFS devices[3] as a single redundant system · Works over LAN and WAN connections · Tunneling packets over TCP/IP, optionally with encryption	· Ensures highly available monitoring · Scales visibility with network infrastructure and new tools · Ensures delivery of traffic across LAN or WAN to tools

[2] Requires advanced chassis module.

[3] Total number of packet flow switches in a single vMesh is dependent on device sizes, number of ports, and complexity of filtering.

Features	Benefits
Policy-based event triggering and actions • Dynamic traffic redirection based on occurrence of events • Send alerts when specific events occur	• Policy-based automation reduces management overhead and enables faster response times to incidents
Active inline access and forwarding • Failsafe access using PowerSafe • Aggregation towards any tool, including AIA translation • Filtering and load balancing • Efficient inline tool chaining • Customizable health check packets and triggering	• Maintains network uptime • Removes multiple points of failure • Gains visibility for a single inline security tool, e.g. security proxy, IPS • Easy deployment of layered security • Removes multiple points of failure including "positive" and "negative" checks
Local and remote management • XML API • CLI (Telnet/SSH) • GUI (HTTP/HTTPS) • vMC (HTTP/HTTPS) • SNMP (v1, v2, v3) • Syslog	• Easy to use via graphical interfaces or via CLI for users already familiar with using CLIs • Easy integration with applications using CLI or XML API • Alerts can be sent to any Syslog server or SNMP manager
Role-based access • Multiple user support • Flexible per-user privileges and access control	• Conforms to security policy needs of IT organizations
AAA security (RADIUS and/or TACACS+) and Local authentication	• Meets authentication policy needs of IT organizations
Network activity	• Packet statistics provided per port, for both Rx and Tx packet counts, throughput (bps), utilization (%), bad/errored packets, and packet drops
Warm swappable chassis modules	• Maintains high availability for 99.999% uptime (five-9s) or better • Scales to meet changing needs
Redundant, universal power supply units • AC and DC hot-swappable options	• Maintains high availability for 99.999% uptime (five-9s) or better

Chassis and Modules

nGenius 2200 Series PFS Components	Description
Base Chassis	Base 4-slot nGenius 2204 packet flow switch chassis, including: • 8 x 10G/1G SFP+ standard ports • 2 x Management port • 1 x Serial console port • 1 x GPS port • 1 x PTP port • 1 x 1PPS port • 2 x Power supply units (redundant) • 1 x Fan tray
1G/10G standard chassis module	4 x 10G/1G SFP+ standard edition chassis module for nGenius 2204 packet flow switch: • Allows up to 24 x 10G/1G ports with base feature set
1G/10G Advanced chassis module	4 x 10G/1G SFP+ Advanced edition chassis module for nGenius 2204 packet flow switch: • Allows up to 16 x 10G/1G ports with advanced feature set, and • 8 x 10G/1G ports with base feature set
1G/10G PowerSafe chassis modules	4 x LC Standard edition PowerSafe chassis modules for nGenius 2204 packet flow switch: • Allows up to 16 x 10G/1G ports with active Bypass or active TAP and base feature set, and • 8 x 10G/1G ports with base feature set • Multimode OM1 & OM4 and Singlemode OS2 variants
1G/10G Advanced PowerSafe chassis modules	4 x LC standard edition PowerSafe chassis modules for nGenius 2204 packet flow switch: • Allows up to 16 x 10G/1G ports with active Bypass or active TAP and advanced feature set, and • 8 x 10G/1G ports with base feature set • Multimode OM1 & OM4 and Singlemode OS2 variants
AC Power Supply Unit	100 to 240V, 50/60 Hz AC Power Supply Unit (included in base chassis)
DC Power Supply Unit	-48V DC Power Supply Unit (included in base chassis)
Rear Fan Tray	Hot-swappable Rear Fan Tray

Product Specifications

Physical Characteristics

nGenius 2200 Series PFS Components	Height	Width	Depth	Weight
Base Chassis (w/o PSU)	2RU (3.5 in. / 89 mm)	17.35 in. / 441 mm	27.5 in. / 699 mm	20.7 lb. / 9.4 kg
1G/10G standard chassis module	3.1 in. / 78 mm	3.4 in. / 86 mm	16.2 in. / 411 m	2.6 lb. / 1.2 kg
1G/10G Advanced chassis module	3.1 in. / 78 mm	3.4 in. / 86 mm	16.2 in. / 411 m	3.5 lb. / 1.6 kg
1G/10G PowerSafe chassis modules	3.1 in. / 78 mm	3.4 in. / 86 mm	16.2 in. / 411 m	3.1 lb. / 1.4 kg
1G/10G Advanced PowerSafe chassis modules	3.1 in. / 78 mm	3.4 in. / 86 mm	16.2 in. / 411 m	4.0 lb. / 1.8 kg
AC Power Supply Unit	3.3 in. / 85 mm	4.2 in / 106 mm	9.2 in. / 234 mm	3.3 lb. / 1.5 kg
DC Power Supply Unit	3.3 in. / 85 mm	4.2 in / 106 mm	9.4 in. / 239 mm	2.9 lb. / 1.3 kg
Rear Fan Tray	3.3 in. / 85 mm	6.3 in / 159 mm	5.1 in. / 129 mm	1.3 lb. / 0.6 kg

Power Specifications

nGenius 2200 Series PFS Components	Specifications
Base chassis	100 to 240 V AC, 140 W. Fully loaded: 450 W, 5.0 A -48 V DC, 140 W. Fully loaded: 450 W, 11.3 A
1G/10G standard chassis module[4]	15 W
1G/10G Advanced chassis module[4]	72 W
1G/10G PowerSafe chassis modules[4]	18 W
1G/10G Advanced PowerSafe chassis modules[4]	75 W
AC Power Supply Unit	720 W, 8.0 A
DC Power Supply Unit	600 W, 15.0 A
Rear Fan Tray	(included as part of the base chassis)

[4] Chassis modules running at full line rate, loaded with the described transceivers if applicable.

Environmental Specifications

Temperature	Operating: 32 to +113 ºF / 0 to +45 ºC, Storage: -4 to +212 ºF / -20 to +100 ºC
Humidity	Operating: 20% - 80%, non-condensing, Storage: 5% – 95%, non-condensing

Electrical and Optical Characteristics

Aspect	
Data rates:	1Gbps, 10Gbps
Interface types:	Ethernet: 1000 Base-T, 1000 Base-SX, 1000 Base-LX, 1000 Base-ZX, 10G Base-LR, 10G Base-ER, 10G Base-ZR, 10G Base-SR, 10G SFPwire
Propagation delay:	< 3.2µs for 10G, <13.2µs for 1G

Standards and Compliance

Standard	Specification(s)
Ethernet	IEEE 802.3, IEEE 802.3u, IEEE 802.3ab, IEEE 802.3ae, IEEE 802.3z
VLAN	IEEE 802.1Q, IEEE 802.1ad
PTP	IEEE 1588-2008
NTP	IETF RFC 5905
ARP	IETF RFC 826
IP	IETF RFC 791, 2460
UDP	IETF RFC 768
TCP	IETF RFC 793
FTP	IETF RFC 959, 2228
Telnet	IETF RFC 854
SSH	IETF RFC 4251, 4252, 4253
HTTP	IETF RFC 2616, 2817
TLS (SSL)	IETF RFC 4492, 5246
SNMP	IETF RFC 1157, 3411-3418
Syslog	IETF RFC 5424
RADIUS	IETF RFC 2865, 2866
TACACS+	IETF RFC 1492
EMC	FCC Part 15 Class A, VCCI Class A, EN55022/CISPR-22 Class A, Australia/New Zealand AS/ NZS CISPR-22 Class A, CE Mark EN 55022 Class A, ETSI EN300 386 V1.3.2, EN61000-4-2, EN 61000-4-3, 61000-4-4, EN 61000-4-5, EN 61000-4-6, EN 61000-3-2
Safety	UL 60950-1, CSA C22.2 EN 60950-1, IEC-60950-1
NEBS Level 3	GR-63, GR-1089
RoHS	RoHS 6, EU directive 2002/95/EC

Ordering Information

Part Numbers	Description
2204NA0L0000	nGenius 2200 series packet flow switch – 2204 chassis (4-slot), AC power
2204ND0L0000	nGenius 2200 series packet flow switch – 2204 chassis (4-slot), DC power
2200NMGM2000	2200 Series – 1/10G chassis module with 4 x 1Gb/10Gb SFP+ Ports
2200NMGM2H0A	2200 Series – 1/10G Advanced chassis module with 4 x 1Gb/10Gb SFP+ ports and 4 x FPGA ports
2200NMGM2JBC	2200 Series – 1/10G PowerSafe chassis module with 4 x 1Gb/10Gb LC SX/SR MM 50micron ports and 2 x Bypass pairs
2200NMGM2G0A	2200 Series – 1/10G Advanced chassis module with 4 x 1Gb/10Gb SFP+ ports and 2 x FPGA ports
2200NMGM2JAC	2200 Series – 1/10G PowerSafe chassis module with 4 x 1Gb/10Gb LC SX/SR MM 62.5micron ports and 2 x Bypass pairs
[5]	2200 Series – 1/10G Advanced PowerSafe chassis module with 4 x 1Gb/10Gb LC SX/SR MM 62.5micron ports and 2 x Bypass & FPGA pairs
[5]	2200 Series – 1/10G Advanced PowerSafe chassis module with 4 x 1Gb/10Gb LC SX/SR MM 50micron ports and 2 x Bypass & FPGA pairs
2200NMGM2JCC	2200 Series – 1/10G PowerSafe chassis module with 4 x 1Gb/10Gb LC LX/LR SM ports and 2 x Bypass pairs
2200NMGM2HCD-SP	2200 Series – 1/10G Advanced PowerSafe chassis module with 4 x 1Gb/10Gb LC LX/LR SM ports and 2 x Bypass & FPGA pairs

For transceivers, please refer to list of SFP and SFP+ transceivers offered by NETSCOUT®.

[5] These parts are not main price list items. Please contact a NETSCOUT representative for correct part numbers.

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