

nGenius 5000 Series Packet Flow Switches

Software-Driven and Cost-Effective Performance

HIGHLIGHTS

- 1- or 2-RU (Rackmount Unit) space-efficient, fixed configuration devices
- 720 Gbps to 6400 Gbps throughput with non-blocking switching fabrics
- 1GbE, 10GbE, 25GbE, 40GbE, and 100GbE port options
- Network packet broker functionality including rate conversion, aggregation, replication, filtering, load balancing, and source port tagging
- Protocol stripping & de-encapsulation (e.g. VLAN, VN-tag, VXLAN)
- IP Tunnel termination (e.g. ERSPAN)
- Intelligent fully meshed stacking / interconnect (pfsMesh)
- Flexible policy defined triggers for event handling and high availability scenarios
- Management via command line, NETCONF, and graphical user interfaces for local and remote access
- Software-driven and powered by the NETSCOUT® Packet Flow Operating System (PFOS)

Product Description

The nGenius® 5000 Series Packet Flow Switches (PFS) are dense, 1G to 100G models designed for dense 1 GbE to 100 GbE deployments and bridge the gaps between 1GbE, 10GbE, 25GbE, 40GbE, and 100GbE networks and tools.

The nGenius 5000 Series Packet Flow Switches offer SFP+, SFP28, QSFP+, and QSFP28 ports in various 1RU and 2RU fixed configuration form factors. All ports are enabled by default, with each port configurable as an input port, intermediate (service) port, or output port. With the NETSCOUT pfsMesh, a self-organizing architecture, the nGenius 5000 Series Packet Flow Switch can be deployed in a redundant, low-latency meshed architecture for dynamic and fault-tolerant visibility that can scale to over 4000¹ ports across LAN and WAN environments.

Cost-Effective Feature Set

Providing a lot of interfaces into a compact form factor, the nGenius 5000 Series Packet Flow Switches support core network packet broker features including filtering, load balancing, replication, and aggregation. With an expansive feature set, the nGenius 5000 Series Packet Flow Switches are capable of managing a monitoring network independently. Connect the HD Fiber TAPs and any number of tools, including NETSCOUT's Service Assurance and Security Assurance products, to an nGenius 5000 Series Packet Flow Switch and easily manage a diverse and complex monitoring network.

Flow-aware load balancing enables intelligent control of traffic distribution to the monitoring tools, increasing output capacity while maintaining session integrity. For example, packets from a 40GbE TAP can be captured and automatically load-balanced across multiple 1GbE or 10GbE monitoring tool ports based on user-defined session criteria. Flow-aware load balancing can operate in tandem with hardware-based filtering or independently.

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



Model shown: nGenius 5100 packet flow switch.

Management

The nGenius 5000 Series Packet Flow Switches can be managed via a Web UI, CLI, and NETCONF XML API using HTTP, HTTPS, or SSH and the system can be monitored via Syslog and SNMP. Each device ships with an intuitive and easy to use graphical element management system (EMS) out of the box. Simply point a web browser at the nGenius 5000 Series Packet Flow Switch and let the web-based user interface (WebUI) power the packet flow system. Management IP addresses can be manually assigned or obtained via DHCP.

Virtual Access

For accessing traffic that is completely virtualized and never makes it onto a physical network, traffic can be mirrored and forwarded from the virtual network to the physical network using tunneling protocols such as NVGRE (L2GRE) or ERSPAN which encapsulate the traffic of interest. The nGenius 5000 Series Packet Flow Switches can terminate these tunnels so the traffic can then be forwarded on to monitoring applications.

Power and Cooling

Each of the nGenius 5000 Series Packet Flow Switches supports two redundant, hot-swappable power supplies. Redundant, hot-swappable fan modules (in an N+1 configuration) supply ample cooling in a front-to-back air flow configuration.

Features and Benefits

Features	Benefits
32 to 128 ports in 1RU or 2RU, Fixed Configurations Compatible with SFP, SFP+, SFP28, QSFP+, and QSFP28 MSA compliant transceivers – for complete details, please refer to the list of transceivers offered by NETSCOUT	High Density Systems <ul style="list-style-type: none"> • Drives cost-effectiveness by reducing per-port cost and increasing flexibility • Condenses the nGenius PFS footprint (rack space) into compact 1RU or 2RU of space in a fixed configuration • Reduces power consumption • Software-driven, simplifies management
Configurable I/O <ul style="list-style-type: none"> • Full flexibility in selecting ports for network access, intermediate service, interconnect, or monitor output • Dual network access & monitor output port class • IP tunnel (e.g. NVGRE, ERSPAN) termination 	<ul style="list-style-type: none"> • Enables agile response to monitoring infrastructure changes • Facilitates effectively doubled capacity for input and output • Allows virtualized traffic to be forwarded over an IP network to PFS ingress ports, and then forwarded onto monitoring devices as is, or de-encapsulated²
Selective Aggregation <ul style="list-style-type: none"> • Fully flexible any-to-any port mapping 	<ul style="list-style-type: none"> • Enables large scale aggregation to maximize tool visibility • Addresses asymmetrical routing issues
Flexible and Powerful Filtering <ul style="list-style-type: none"> • OSI Layers 2 - 7 • Ingress • Overlapping 	<ul style="list-style-type: none"> • Allows only traffic of interest to be forwarded to each tool, increasing tool efficiency and reduces the number of required tool interfaces
Session-Based/Flow-Aware Load Balancing <ul style="list-style-type: none"> • Distributes traffic load across multiple instances of a tool or tool port • Maintains session stickiness for full conversations 	<ul style="list-style-type: none"> • Prevents oversubscription of monitoring tools and security systems – eliminating blind spots without sacrificing session integrity • Copied traffic can be easily distributed across multiple lower speed tool ports, allowing users to preserve existing tool investments

² De-encapsulation may require a PFX or advanced PFS.

Features	Benefits
Monitor Traffic Port Tagging <ul style="list-style-type: none"> Provides identification of traffic based on source network/link using VLAN tagging 	<ul style="list-style-type: none"> Users can quickly and precisely pinpoint where an issue, such as latency or security event, is occurring in the network Allows different tools to access port identification
Intelligent Stacking (pStack) <ul style="list-style-type: none"> Enables pfsMesh architecture for local and remote of up to 256³ Total PFS devices as a single redundant system 	<ul style="list-style-type: none"> Ensures highly available monitoring Scales visibility with network infrastructure and new tools Ensures delivery of traffic across LAN or WAN to tools
Line-Rate Header Stripping <ul style="list-style-type: none"> VLAN VxLAN VN-tag 	<ul style="list-style-type: none"> Preserve tool resources (bandwidth and processing) by eliminating unnecessary headers Re-use legacy tools that may not understand newer protocol headers Enable native filtering and load balancing on inner packet fields
Policy-Based Event Triggering and Actions <ul style="list-style-type: none"> Dynamic traffic redirection based on occurrence of events Send alerts when specific events occur 	<ul style="list-style-type: none"> Reduces management overhead and enables faster response times to incidents
Local and Remote Management <ul style="list-style-type: none"> NETCONF XML API CLI (SSH) GUI (HTTP/HTTPS) SNMP Syslog (transport over UDP, TCP, or TLS) 	<ul style="list-style-type: none"> Easy to use via graphical interfaces or via CLI Easy integration with applications using CLI or NETCONF XML API Alerts can be received by any Syslog server or SNMP manager, with option for sending securely
Role-Based Access <ul style="list-style-type: none"> Multiple user and user role support Flexible user/role defined privileges, unique screen views, and access control 	<ul style="list-style-type: none"> Conforms to security policy needs of IT organizations
AAA Security with Remote (RADIUS and/or TACACS+)	<ul style="list-style-type: none"> Meets authentication policy needs of IT organizations and Local authentication
Redundant Power Supplies <ul style="list-style-type: none"> AC and DC hot-swappable options 	<ul style="list-style-type: none"> Maintains high availability for the device
Traffic Statistics <ul style="list-style-type: none"> Port-level packet and throughput metrics, including overflow drops, bad packets, etc. Flow level packet and throughput metrics 	<ul style="list-style-type: none"> Visibility into network and tool port activity Visibility into traffic type activity

³ Total number of ports in a single pfsMesh is dependent on quantity and complexity of filtering.

Standards and Compliance

Standard	Specification(s)
Ethernet	IEEE 802.3, IEEE 802.3ab, IEEE 802.3ae, IEEE 802.3ba, IEEE 802.3by, IEEE 802.3z
VLAN	IEEE 802.1Q, IEEE 802.1ad
ARP	IETF RFC 826
IP	IETF RFC 791, 2460
UDP	IETF RFC 768
TCP	IETF RFC 793
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, 5425
NTP	IETF RFC 5905
RADIUS	IETF RFC 2865, 2866
TACACS+	IETF RFC 1492
EMC	FCC Part 15 Subpart B/ICES-003 Class A, EN 55032 Class A, VCCI Class A, AS/NZS CISPR 32 Class A, EN 61000, EN 300 386 Class A, CNS 13138 Class A, KCC Class A, TUV-GS (PFS 5010 and 5100 only)
Safety	IEC 60950-1:2005 (Second Edition) + Am 1:2009 + Am 2:2013, UL 60950-1, CAN/CSA-C22.2 No. 60950-1, UL/CUL

Ordering Information

Part Numbers	Description
50FCNANQH0J0	5010 Switch with 48 x 1/10Gb SFP+ and 6 x 40Gb QSFP+ or up to 72 x 10Gb Ports, AC Power
50FCNDNQH0J0	5010 Switch with 48 x 1/10Gb SFP+ and 6 x 40Gb QSFP+ or up to 72 x 10Gb Ports, DC Power
51FCNANQK000	5110 Switch with 48 x 1/10/25Gb SFP28 and 6 x 40/100Gb QSFP28 or 72 x 10/25Gb Ports, AC Power
51FCNDNQK000	5110 Switch with 48 x 1/10/25Gb SFP28 and 6 x 40/100Gb QSFP28 or 72 x 10/25Gb Ports, DC Power
51FCNANBB0H0	5100 Switch with 32 x 40/100Gb QSFP28 Ports or up to 128 x 10/25Gb Ports, AC Power
51FCNDNBB0H0	5100 Switch with 32 x 40/100Gb QSFP28 Ports or up to 128 x 10/25Gb Ports, DC Power
51FCNANRE000	5120 Switch with 64 x 40/100Gb QSFP28 or up to 80 x 10/25Gb and 44 x 40/100Gb Ports, AC Power
51FCNDNRE000	5120 Switch with 64 x 40/100Gb QSFP28 or up to 80 x 10/25Gb and 44 x 40/100Gb Ports, DC Power

SPECIFICATIONS

	nGenius 5010 PFS	nGenius 5110 PFS	nGenius 5100 PFS	nGenius 5120 PFS
Physical Switching Ports				
SFP/SFP+	48			
SFP28		48		
QSFP+	6			
QSFP28		6	32	64
Switching Port Speeds				
1G Ports	48	48 ⁴		
10G Ports	48 (72 with QSFP+ breakout)	48 (72 with QSFP+ breakout)	0 (128 with QSFP+ breakout)	0 (80 with QSFP+ breakout)
25G Ports		48 (72 with QSFP28 breakout)	0 (128 with QSFP28 breakout)	0 (80 with QSFP28 breakout)
40G Ports	6	6	32	64
100G Ports		6	32	64
Management Ports	1 RJ45 100/1000BASE-T 1 RJ45 serial console			
Rack Unit	1 Rack Unit (1RU)			2 Rack Units (2RU)
Height	1.71 in (43 mm)	1.73 in (44 mm)	1.75 in (44 mm)	3.5 in (88 mm)
Width	17.4 in (443 mm)	17.3 in (438 mm)	17.3 in (438 mm)	17.2 in (438 mm)
Depth	18.6 in (473 mm)	18.6 in (473 mm)	20.3 in (515 mm)	22.8 in (580 mm)
Weight (with PSUs)	19.73 lbs. (8.95 kg)	20.78 lbs. (9.43 kg)	23 lbs. (10 kg)	31.1 lbs. (14.1 kg)
Power Supplies	Dual redundant, hot swappable PSUs			
Power Input (AC)	100 to 240VAC/50-60Hz	90 to 240VAC/50-60Hz	100-240VAC, 50-60Hz	90 to 240VAC/50-60Hz
Power Input (DC)	-48 to -72VDC	-36 to -72VDC	-36 to -72VDC	-36 to -72VDC
Power Consumption	282W (962 BTU/hr) max (without transceivers) 400W (1365 BTU/hr) max (with transceivers)	583W (1989 BTU/hr) max	350W (1194 BTU/hr) max (without transceivers) 650W max (2218 BTU/hr) max (with transceivers)	760W (2593 BTU/hr) max
Fans	5 redundant (4+1), hot-swap fan modules		6 redundant (5+1), hot-swap fan modules	4 redundant (3+1), hot-swap fan modules
Airflow	Front-to-back			
Operating Temperature	32° to 104°F (0° to 40°C)	32° to 113°F (0° to 45°C)		
Storage Temperature	-40° to 158°F (-40° to 70°C)			
Operating Humidity	5% - 95% (non-condensing)			

⁴ 1GbE fiber (IEEE Clause 37) auto-negotiation is not supported by the PFS 5110 so use of 1GbE fiber should be limited to use with TAPs. 1GbE copper does not have this restriction.



Corporate Headquarters
NETSCOUT Systems, Inc.
Westford, MA 01886-4105
Phone: +1 978-614-4000
www.netscout.com

Sales Information
Toll Free US: 800-309-4804
(International numbers below)

Product Support
Toll Free US: 888-357-7667
(International numbers below)

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