

DATA SHEET

Carrier-Grade NAT Solutions

IPv4 and IPv6 Addresses Management and Security for Seamless Operations.

Given the co-existence of IPv4 and IPv6 infrastructures for years to come, coupled with the explosion of connected devices and the migration to 5G, service providers must extend the life of IPv4 network infrastructures and ensure a transparent and scalable IP address translation for their customers.

Fortinet Carrier-Grade NAT (CG-NAT) solutions offer a broad, scalable, and flexible set of tools, consumption models, and form factors to empower service providers to connect IPv4 and IPv6 devices and support the current exponential traffic growth.

Fortinet CG-NAT is natively secured with stateful L4 firewalling and continuous threat intelligence powered by FortiGuard Labs.

Network Address Translation

- Implements key CG-NAT functions defined by 3GPP specifications that protect 5G and 4G mobile networks
- Fortinet CG-NAT solutions allow operators to conserve the public IPv4 space assigned to them
- Carrier-grade scalability with ultra-high number of IP address translations and connection setup rates, high throughput, and high-speed logging
- Comprehensive Application Layer Gateway (ALG) support
- Comprehensive Carrier-Grade NAT and IPv6 migration options including: NAT44, NAT444, NAT64/DNS64, NAT46, and DS-lite

Security

- Provides a powerful and stateful L4 firewall for the N6 and SGi/Gi interfaces that blocks attacks coming from Internet
- Known attack detection and prevention using continuous threat intelligence from AI-powered FortiGuard Labs security services
- IP mapping logging in compliance with national regulations

Performance

- Specialized hardware acceleration architecture with carrier-grade connections per second (CPS) for processing massive signaling surges
- Fortinet's NP7 purpose-built security processor units (SPU) deliver the industry's best performance and ultra-low latency
- Virtual CG-NAT appliances feature advanced virtual security processing units (vSPU) to provide top performance

Management

- Includes a centralized management console that is effective and simple to use, which provides comprehensive network automation and visibility
- Zero-touch provisioning with single-pane-of-glass management powered by the Fabric Management Center
- Application programming interfaces (APIs) and connectors for operations and management integration

TCO Reduction

- High performance, low-footprint physical and virtual appliances, coupled with flexible licensing
- Lower TCO through efficient space and power consumption and efficient management and operations tools

Certification

- Independently tested and validated best security effectiveness and performance

Form Factors

- FortiGate physical appliances: 1800F, 2600F, 3500F, 4200F, 4400F
- FortiGate virtual appliances: VM04, VM08, VM16, VM32, VMUL
- FortiFirewall series: 1800F, 2600F, 4200F, 4400F, VMUL
- Public cloud support: AWS, MS Azure, Google Cloud, Oracle Cloud

Key Benefits

- Proven high performance
- Flexible solutions
- Licensing options
- Seamless deployment

FEATURE HIGHLIGHTS

Proven, High Performance, and Flexible CG-NAT Platforms and Solution

Fortinet's FortiGate and FortiOS have long provided iron-clad security services in many service provider and large enterprise networks. Our Carrier-Grade IPv4/v6 Network services are based on the same familiar interface and proven carrier-grade reliability of the FortiOS.

Fortinet CG-NAT solutions deliver high predictability and service-level consistency to environments that generate massive amounts of connection set-ups and teardowns. With Fortinet's powerful Security Processing Units (SPUs), we provide a high level of performance supporting up to 10 Million new connections per second, 700 Million concurrent sessions and 1.14 Tbps of throughput in a single CG-NAT appliance with hardware acceleration, ensuring consistent high performance.

- Comprehensive Carrier-Grade NAT and IPv6 migration option including: NAT44, NAT444, NAT64/DNS64, NAT46, DS-Lite
- Predictable high performance for centralized and regional sites with security processing units (SPU and vSPU) for offload and acceleration, including hardware-generated NAT logs and IP fragment handling in the SPUs
- Native multitenancy support with virtual domains (VDMs) enables separate CG-NAT policies per network slice or APN/DNN
- Compact form factor is ideal for space-constraint applications and lowers colocation cost for service providers
- The most efficient, smallest footprint CG-NAT VNF enables energy efficiency and is a good fit for environments with limited resources, such as Private 5G or Multi-access Edge Computing (MEC)
- A rich ecosystem of application programming interfaces (APIs) and connectors for ease of onboarding and integration to the MNO's ecosystem such as operation and management, orchestration, and business support system (BSS)

MODEL	4400F	4200F	3500F	2600F	1800F	VMUL	VM32	VM16	VM08	VM04
CG-NAT (with hyperscale license for physical appliances)	1.15 Tbps	800 Gbps	595 Gbps	198 Gbps	198 Gbps	NA*	50 Gbps	36 Gbps	33 Gbps	28 Gbps
Concurrent sessions (TCP)	700M	450M	348M	40M	40M	NA**				
New sessions per second (TCP)	10M	7M	5M	2M	2M	NA*	850K	680K	520K	290K

* will depend on the characteristics of the underlying platform

** will depend on the amount of available memory

Flexible Licensing Models

Carrier-Grade NAT (CG-NAT) functionality can be delivered via three different pricing models described as follows.

CAPEX Pricing Model

- In this pricing model, the platform, physical and/or virtual FortiGate, is paid in advance, covering the full capacity that the platform can deliver

Bandwidth-Based Pricing Model

This pricing model consists of two components:

- The barebone platform, physical and/or virtual FortiFirewall, paid in advance.
- Perpetual and stackable bandwidth licenses of 10 Gbps and 100 Gbps. This is a network-wide bandwidth license that allows for short, rare bursts of traffic exceeding the licensed capacity.

This bandwidth-based pricing model allows operators to better align their costs with revenues from their customers, with flexibility of adding a network-wide peak bandwidth license based on traffic usage.

Flex VM Pricing Model

The VM-only model allows service providers to purchase prepaid points in advance in units of 10,000 consumption points. Points are deducted daily, based on resource consumption. Unused points can be rolled over annually, provided additional terms and conditions are satisfied. This model simplifies license management and provides predictable OpEx.



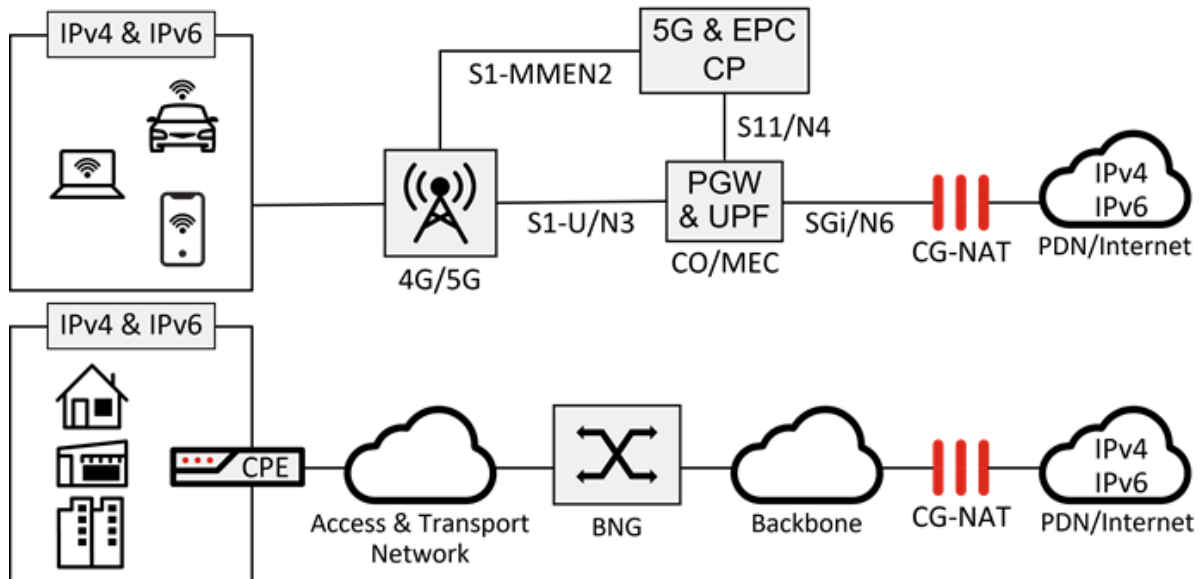
FEATURE HIGHLIGHTS

Hyperscale Firewall License

The hyperscale license enables ultra-high scalability and performance by unlocking further performance boosts and is applicable to both the FortiGate and the FortiFirewall CG-NAT physical platforms. The Hyperscale Firewall License will enable the hardware acceleration of CG-NAT features by utilizing the latest SPU NP7. These features include session setup, session logging, and NAT—all performed in hardware at market-leading speeds.

Seamless IPv4/IPv6 CG-NAT Deployment (ISP, 4G, 5G)

Fortinet CG-NAT platforms can either be in a physical appliance form factor or in a virtual form factor. Physical FortiGates and FortiFirewalls are suitable for centralized CG-NAT architectures requiring high performance. FortiGates and FortiFirewalls VMs are suitable for more distributed CG-NAT architectures where PDN breakout points are distributed over regional data centers and Multiaccess Edge Compute (MEC) sites. Using a mix of Fortinet CG-NAT platforms, operators can build a high-performance, cost-effective solution for hybrid architectures in ISP, 4G, and 5G networks.



CG-NAT DEPLOYMENT

FEATURE	SUPPORTED MODES
NAT Modes	NAT44, NAT444, NAT64, DNS64, NAT46, NAT 66, 464 XLAT, MAP-E, MAP-T, DS-lite, EIM, EIF
Address-Port Allocation Policies	Port Block Allocation (PBA), Overload PBA, Single Port Allocation (SPA), Overload SPA, Fixed Allocation/Deterministic, Overload, One-to-One, Fixed Port Range
Application Layer Gateway (ALG)	FTP, TFTP, SIP, MGCP, H.323, PPTP, L2TP, ICMP Error/IP-options, PMAP, DCE-RPC, RAS, RSH, TNS
Subscriber category	PFCP (N4, Sxa, Sxb), RADIUS Accounting
High availability mechanism	VRRP + eBGP, ECMP, FGCP, FGSP
High availability mode	Active/active, active/passive
IP fragment handling in hardware	Yes
Dynamic routing	Yes
NAT log format in hardware	Syslog, NetFlow/IPFIX
HW based traffic distribution	Source IP, 5 tuple
Hardware log generation	Per session, per session ending, per NAT mapping
Hardware log server targets	Up to 16



SPECIFICATIONS

CATEGORY	4400F	4200F	3500F	2600F	1800F
Interfaces and Modules					
40/100 GE QSFP+/QSFP28 Slots	12	8	6	4	4 ⁵
25 GE SFP28 /10 GE SFP+ /GE SFP Slots	16	16	32	16	12
25 GE SFP28 /10 GE SFP+ /GE SFP HA Slots	2	2			
25 GE SFP28 /10 GE SFP+ /GE SFP AUX Slots	2	2			
1/10 GE SFP/SFP+ Slots				2	8 ⁴
1/10 GE RJ45 Slots				16	16 ⁴
GE RJ45 Management Ports	2	2	2	2	2
USB Ports	1	1	1	1	1
Console Port	1	1	1	1	1
Internal Storage	4 TB (4401F)	4 TB (4201F)	4 TB (3501F)	2 TB (2601F)	2 TB (1801F)
Included Transceivers	2x SFP+ (SR 10 GE)	2x SFP+ (SR 10 GE)	2x SFP+ (SR 10GE)	2x SFP+ (SR 10GE)	2x SFP+ (SR 10GE)
Performance and Capacity - CG-NAT					
CG-NAT & Firewall Throughput (1518/512/64 byte, UDP)	1.15/1.14/0.50 Tbps	800/788/400 Gbps	595/590 /420 Gbps	198/196/120 Gbps	198/197/140 Gbps
Latency (64 byte, UDP)	2.98 µs	3.02 µs	2.98 µs	3.41 µs	3.22 µs
Concurrent Sessions (TCP)	210 Million/700 Million ²	210 Million/450 Million ²	140 Million/348 Million ²	24 Million/40 Million ²	12 Million/40 Million ²
New Sessions/Second (TCP)	1 Million/10 Million ²	1 Million/7 Million ²	1 Million/5 Million ²	1 Million/2 Million ²	750,000/2 Million ²
High Availability Configurations	Active/Active, Active/Passive, Clustering	Active/Active, Active/Passive, Clustering	Active/Active, Active/Passive, Clustering	Active/Active, Active/Passive, Clustering	Active/Active, Active/Passive, Clustering
Dimensions and Power					
Height x Width x Length (inches)	6.97 × 17.20 × 26.17	5.22 × 17.20 × 26.17	3.5 × 17.4 × 21.9	3.5 × 17.25 × 21.1	3.5 × 17.25 × 21.1
Height x Width x Length (mm)	177 × 437 × 665	132.5 × 437 × 664.8	89 × 443 × 556	88.4 × 438 × 536	88.4 × 438 × 536
Weight ³	81.8 lbs (37.1 kg)	59.75 lbs (27.1 kg)	43.8 lbs (19.9 kg)	30.6 lbs (13.9 kg)	30.2 lbs (13.7 kg)
Form Factor (supports EIA/non-EIA standards)	Rack Mount, 4 RU	Rack Mount, 3 RU	Rack Mount, 2 RU	Rack Mount, 2 RU	Rack Mount, 2 RU
AC Power Supply	100-240V AC, 50/60 Hz	100-240V AC, 50/60 Hz	100-240V AC, 50/60 Hz	100-240V AC, 47/63 Hz	100-240V AC, 50/60 Hz
Power Consumption ³ (Average / Maximum)	1533W/1875W	931 W/1291 W	760 W/1174 W	416 W/510 W	388.3 W/543.6 W
AC Current (Maximum)	20A@100V, 9A@240V	13.5A@120V, 5.5A@240V	12A@120V, 9A@240V	6A	7A@100VAC, 3A@240VAC
Heat Dissipation ³	6397.77 BTU/h	4405 BTU/h	4006 BTU/h	1740 BTU/h	1854.84 BTU/h
DC Power Input Range	-48V to -60V DC	-48V to -60V DC		-48VDC to -60VDC	-48V to -60V DC
DC Current (Maximum)	32A/100Apk	20A/100Apk		15A	20A
Redundant Power Supplies	Yes, Hot Swappable, 2+2 (AC), 1+1 (DC)	Yes, Hot Swappable	Yes, Hot Swappable	Yes, Hot Swappable	Yes, Hot Swappable
Operating Environment and Certifications					
Operating Temperature	32-104°F (0-40°C)	32-104°F (0-40°C)	32-104°F (0-40°C)	32-104°F (0-40°C)	32-104°F (0-40°C)
Storage Temperature	-31-158°F (-35-70°C)	-31-158°F (-35-70°C)	-31-158°F (-35-70°C)	-31-158°F (-35-70°C)	-31-158°F (-35-70°C)
Humidity	20-90% non-condensing	20-90% non-condensing	20-90% non-condensing	10-90% non-condensing	10-90% non-condensing
Noise Level	68.9 dBA	57 dBA	53.5 dBA	71.72 dBA	62.74 dBA
Operating Altitude	Up to 7400 ft (2250 m)	Up to 7400 ft (2250 m)	Up to 7400 ft (2250 m)	Up to 7400 ft (2250 m)	Up to 7400 ft (2250 m)
Compliance	FCC Part 15 Class A, RCM, VCCI, CE, UL/cUL, CB	FCC Part 15 Class A, RCM, VCCI, CE, UL/cUL, CB	FCC Part 15 Class A, RCM, VCCI, CE, UL/cUL, CB	FCC Part 15 Class A, RCM, VCCI, CE, UL/cUL, CB	FCC Part 15 Class A, RCM, VCCI, CE, UL/cUL, CB

1 Without Hyperscale Firewall License
2 With Hyperscale Firewall License

3 Version without storage
4 GE only

5 40 GE QSFP+ only

CATEGORY	VM-UL	VM-32	VM-16	VM-08	VM-04
Performance and Capacity - CG-NAT					
vCPU Support (minimum/Maximum)	1/unlimited	1/32	1/16	1/08	1/04
Storage Support (Minimum/ Maximum)	32 GB/2 TB	32 GB/2 TB	32 GB/2 TB	32 GB/2 TB	32 GB/2 TB
Concurrent Sessions (TCP)	NA*	NA	NA	NA	NA
New Sessions/Second (TCP)	NA*	850K	680K	520K	290K

*Will depend on the characteristics of the underlying platform



ORDER INFORMATION

CG-NAT PHYSICAL PLATFORMS		
Model	FortiGate SKU	FortiFirewall SKU
4400F	FG-4400F	FFW-4400F
FortiCare Support for 4400F	FC-10-F44HF-247-02-DD	FC-10-B440F-247-02-DD
4200F	FG-4200F	FFW-4200F
FortiCare 24x7 Support for 4200F	FC-10-F42HF-247-02-DD	FC-10-B420F-247-02-DD
3500F	FG-3500F	
FortiCare 24x7 Support for 3500F	FC-10-F3K5F-247-02-DD	
2600F	FG-2600F	FFW-2600F
FortiCare 24x7 Support for 2600F	FC-10-FD26F-247-02-DD	FC-10-BD26F-247-02-DD
1800F	FG-1800F	FFW-1801F*
FortiCare 24x7 Support for 1800F	FC-10-F18F1-247-02-DD	FC-10-B18F1-247-02-DD*
Hyperscale Firewall License (3500F, 4200F, and 4400F)	LIC-FGT-HYPSC	LIC-FGT-HYPSC
Hyperscale Firewall License (1800F and 2600F)	LIC-FGT-HYPSC-1K2K	LIC-FGT-HYPSC-1K2K
CG-NAT VIRTUAL PLATFORMS		
Model	FortiGate SKU	FortiFirewall SKU
VM-UL	FG-VMUL	FF-VMBB
FortiCare 24x7 Support for FortiGate VM-UL	FC-10-FVMUL-248-02-DD	FC-10-FVMBB-248-02-DD
VM-32	FG-VM32	
FortiCare 24x7 Support for FortiGate VM-32	FC-10-FVM32-248-02-DD	
VM-16	FG-VM16	
FortiCare 24x7 Support for FortiGate VM-16	FC-10-FVM16-248-02-DD	
VM-08	FG-VM08	
FortiCare 24x7 Support for FortiGate VM-08	FC-10-FVM08-248-02-DD	
VM-04 Virtual Appliance	FG-VM04	
FortiCare 24x7 Support for FortiGate VM-04	FC-10-FVM04-248-02-DD	
CG-NAT FORTIFIREWALL BANDWIDTH LICENSES		
Product	FortiGate SKU	FortiFirewall SKU
10 Gbps CG-NAT Bandwidth License for FortiFirewall (stackable)	N/A (Included in Platform)	FG-PBC-10G
FortiCare Support for 10 Gbps CG-NAT Bandwidth License for FortiFirewall	N/A (Included in Platform)	FC1-10-FGPBC-248-01-12
100 Gbps CG-NAT Bandwidth License for FortiFirewall (stackable)	N/A (Included in Platform)	FG-PBC-100G
FortiCare Support for 100 Gbps CG-NAT Bandwidth License for FortiFirewall	N/A (Included in Platform)	FC2-10-FGPBC-248-01-12

* Available in Q3 2022



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