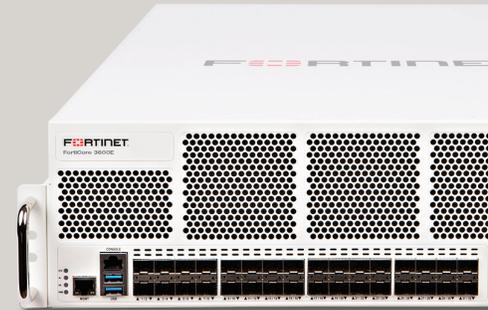




FortiCore™ E-Series  
SDN Security Appliances



## FortiCore E-Series

FortiCore 3600E, 3700E and 3800E

### SDN Security Appliances

The FortiCore E-Series of Software-Defined Networking (SDN) security appliances provide the ability to scale network-based security solutions to meet the performance demands of emerging cloud and data center architectures. Using programmable flow forwarding, the FortiCore can redirect and distribute traffic of interest to associated sets of network security devices, at link speeds up to 100G.

#### Securing Software Defined Networking (SDN) Architectures

Within SDN architectures, the separation of the control and data planes adds security challenges to protect SDN controllers and applications from data plane-based attacks. Additionally, as SDN architectures are multipath environments, connecting and scaling stateful network security devices, requires the ability to programmatically direct and distribute traffic through them.

The FortiCore as an SDN security appliance connects to SDN architectures, supporting both very large numbers of programmable flows and effective line-rate performance required to secure SDN architectures.

#### Key Features & Benefits

<b>Scalable Network-Based Security Solutions</b>	With all FortiCore models supporting 32x 10G interfaces, scalable stacks of security appliances can be programmatically attached to the network.
<b>Effective Line-Rate Performance</b>	Combining FortiCore's hardware-accelerated switching with its Cardinal Flow Processing (CFP) technology, no sacrifices are made in supporting large programmable flow tables with line-rate performance up to 800 Gbps.
<b>OpenFlow 1.3 Compatible</b>	Provides ease of integration in heterogeneous SDN environments, with support for a wide array of SDN controllers, including OpenDaylight and ONOS.

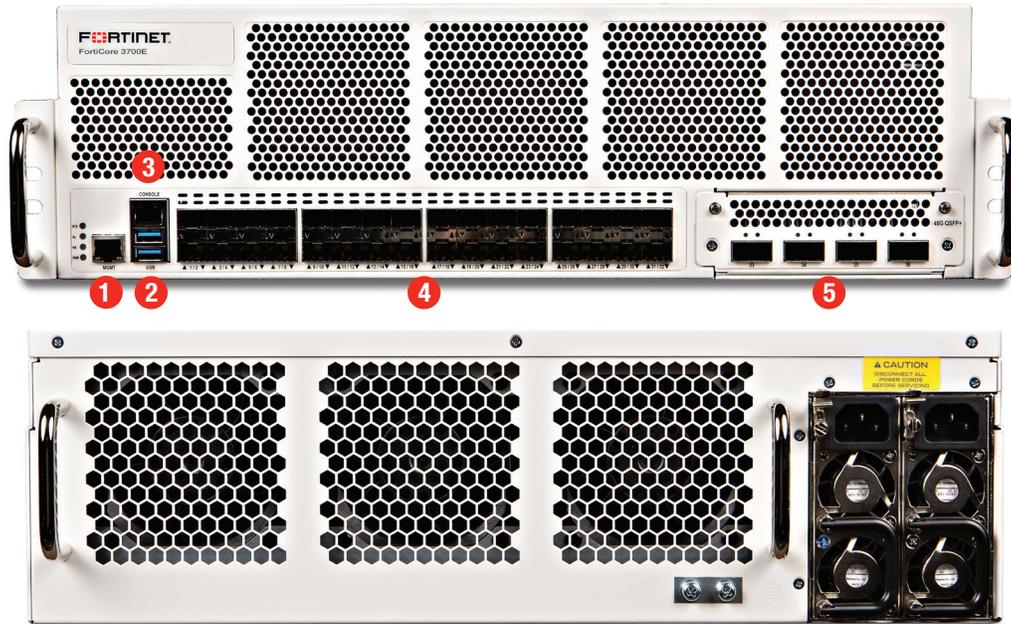
#### Highlights

- The FortiCore E-Series models: 3600E (10 GE), 3700E (40 GE), and 3800E (100 GE)
- Supports over 200K programmed flows in a single-table pipeline (REGEX)
- Supports over 2M programmed flows in a multi-table pipeline (Simple Match)
- Up to 1 Tbps aggregate low-latency throughput, needed to transect a 100 GE link and distribute traffic to a set of network security appliances
- Supports OpenFlow 1.3, with wide support with available SDN controllers
- Full control/data plane separation, with an internal 40 Gbps path in support of a robust new flow rate
- Cardinal Flow Processing (CFP) architecture, support large flow table sizes without sacrificing performance



# HARDWARE

## FortiCore 3700E



### Interfaces

- |   |  |
|---|--|
| <ol style="list-style-type: none"> <li>1. Console Port</li> <li>2. 2x USB Ports</li> <li>3. 10/100/1000 RJ45 Management Port</li> </ol> | <ol style="list-style-type: none"> <li>4. 32x 10 GE SFP+ Ports</li> <li>5. High-Speed Network Interfaces<br/>(none for 3600E, 4x 40G QSFP for 3700E, 2x 100 G QSFP28 for 3800E)</li> </ol> |
|---|--|

### Cardinal Flow Processing (CFP)

- The FortiCore architecture eliminates scaling limitations in SDN switching by distributing programmed flow across four independent CFP units
- Each interface is assigned to a CFP unit based cardinal direction (Northbound, Southbound, Eastbound, Westbound), analogous to data center design
- Cardinal Flow Processing units can support wildcard flows that are applied to all associated interfaces, providing greater flexibility in programming flows
- Each CFP unit can sustain up to 200 Gbps of aggregate traffic forwarding, with support for over 50K programmed REGEX flows per unit using a single-table pipeline, and an additional 500K simple-match programmed flows per unit when using a multi-table pipeline
- This results in an effective line-rate SDN forwarding appliance, with the exceptional programmed flow scalability needed for network-based security solutions

### SDN Data Plane Switching

The FortiCore's Local Switch Processor supports very high-performance and low-latency switching functions required for emerging core-routed and data center architectures:

- All models support 32x 10G interfaces
- The FortiCore 3700E includes an additional 4x 40G interfaces
- The FortiCore 3800E includes an additional 2x 100G interfaces

### Generous Control Plane Resources

The FortiCore's control plane was designed to support the current OpenFlow 1.3 protocol requirements at exceptional rates for new programmed flows, as well as future-proofing for emerging SDN protocol requirements:

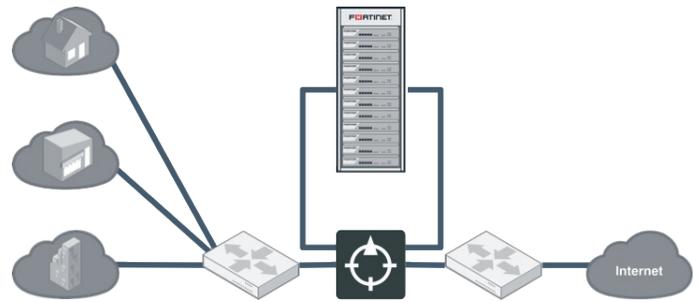
- Dual 8-core Intel CPUs
- 64 GB of RAM
- Internal 40 Gbps forwarding path between control/data planes

## DEPLOYMENT

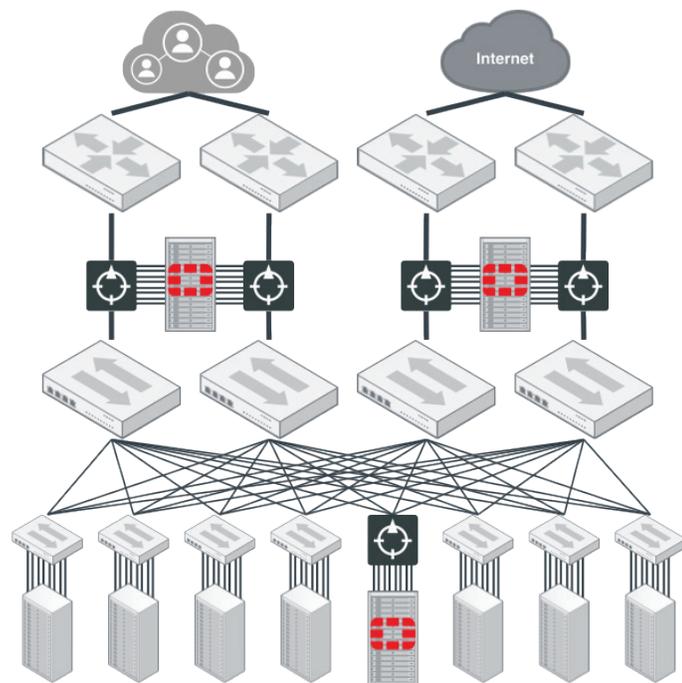
### Scaling Security Beyond Datasheet Limits

The principal goal of the FortiCore is the creation of scalable network-based security solutions that go well beyond the datasheet limits of an individual security appliance. FortiCore's massive performance and flow capacitance allow the creation of provision-able solutions using the programmable capabilities of software-defined networking (SDN).

Combined with an SDN controller and SDN applications, FortiCore solutions can be integrated into carrier/cloud programmable provisioning systems.



FortiCore using OpenFlow to shunt traffic-of-interest to network security appliances



FortiCore deployment within emerging SDN-based data center architectures

### Next Generation Data Center Security

The FortiCore deploys in a path-centric fashion, allowing you to connect an array of network security functions onto any given high-performance link within a core routed environment, including 100G links. The security devices associated with the FortiCore can be varied, based on traffic inspection requirements. Using the capabilities of SDN to program network flows onto the FortiCore, traffic-of-interest can be redirected through a variety of network security devices, while maintaining the symmetric traffic requirements of each device.

In leaf-spine data center architectures, where all leaf switches are connected to every spine switch, resulting in all hosts within a data center being one-hop from each other, the FortiCore as a security leaf allows the deployment of centralized traffic inspection to protect data center resources.

### Defending Programmable Networks

FortiCore supports very high numbers of programmed flows, allowing it to operate proactively, learning all required flows, thus allowing other SDN switches to forward unknown flows to the FortiCore, rather than up to the control plane. This defends the SDN control and applications planes from DoS and other attacks from the data plane.

## FEATURES

### OpenFlow 1.3 Compatible

- Support by all OpenFlow 1.3 compliant SDN controllers
- Flexible multi-table pipeline support, up to 256 tables
- Can support >200K flows in a single-table pipeline, at a flow modification rate >10,000 flow-mods/sec

### Cardinal Flow Processing

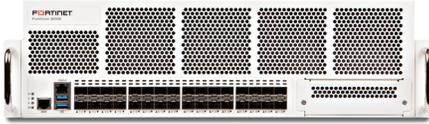
- Assignment of ports to cardinal direction (N,E,S,W), with dedicated flow processing hardware per direction
- Optimized for high-speed link transection, with support for 10G/40G/100G interfaces, depending on model

## SPECIFICATIONS

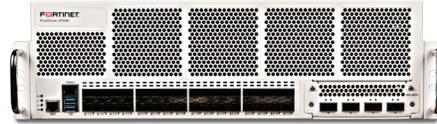
	FORTICORE 3600E	FORTICORE 3700E	FORTICORE 3800E
<b>Hardware Specifications</b>			
Packet Throughput	1 Tbps	1 Tbps	1 Tbps
Programmed Flows — Single-Table (REGEX Match)	200,000	200,000	200,000
Programmed Flows — Multi-Table (Exact Match)	2,000,000	2,000,000	2,000,000
Control Plane CPU	2x 8-core Intel CPU	2x 8-core Intel CPU	2x 8-core Intel CPU
Memory	64 GB	64 GB	64 GB
SDN Protocols	OpenFlow 1.3	OpenFlow 1.3	OpenFlow 1.3
Network Interfaces	32x 10 G SFP+	32x 10 G SFP+, 4x 40 G QSFP	32x 10 G SFP+, 2x 100 G QSFP28
10/100/1000 Management Interface	1	1	1
Storage	2x 480 GB (960 GB total)	2x 480 GB (960 GB total)	2x 480 GB (960 GB total)
Management	GUI, SSH CLI, Direct Console DB9 CLI, SNMP	GUI, SSH CLI, Direct Console DB9 CLI, SNMP	GUI, SSH CLI, Direct Console DB9 CLI, SNMP
Power Supply	Dual	Dual	Dual
<b>Environment</b>			
Form Factor	3U Appliance	3U Appliance	3U Appliance
Input Voltage	100–240V AC, 50–60 Hz	100–240V AC, 50–60 Hz	100–240V AC, 50–60 Hz
Power Consumption (Average / Maximum)	613 W / 834 W	633 W / 858 W	633 W / 858 W
Maximum Current	120V/12A, 240V/7A	120V/12A, 240V/7A	120V/12A, 240V/7A
Heat Dissipation	2847 BTU/h	2929 BTU/h	2929 BTU/h
Operating Temperature	32–104°F (0–40°C)	32–104°F (0–40°C)	32–104°F (0–40°C)
Storage Temperature	-13–158°F (-25–70°C)	-13–158°F (-25–70°C)	-13–158°F (-25–70°C)
Humidity	20–90% non-condensing	20–90% non-condensing	20–90% non-condensing
<b>Compliance</b>			
Regulatory Compliance	FCC Part 15 Class B, VCCI, CE, CB, UL/c	FCC Part 15 Class B, VCCI, CE, CB, UL/c	FCC Part 15 Class A, VCCI, CE, CB, UL/c
Safety	CSA, CE, UL	CSA, CE, UL	CSA, CE, UL
<b>Dimensions</b>			
Height x Width x Length (inches)	5.16 x 17.24 x 26.18	5.16 x 17.24 x 26.18	5.16 x 17.24 x 26.18
Height x Width x Length (mm)	131 x 438 x 665	131 x 438 x 665	131 x 438 x 665
Weight	55.98 lbs (25.39 kg)	57.25 lbs (25.97 kg)	57.17 lbs (25.93 kg)

## ORDER INFORMATION

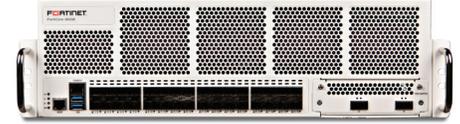
Product	SKU	Description
FortiCore 3600E	FCE-3600E	FortiCore 3600E, 32x 10 GE SFP+ ports.
FortiCore 3700E	FCE-3700E	FortiCore 3700E, 32x 10 GE SFP+ ports, 4x 40 GE QSFP ports.
FortiCore 3800E	FCE-3800E	FortiCore 3800E, 32x 10 GE SFP+ ports, 2x 100 GE QSFP28 ports.



FortiCore 3600E



FortiCore 3700E



FortiCore 3800E



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