

Thunder CFW Physical Appliance Specifications

Performance	Thunder 940 CFW	Thunder 1040 CFW	Thunder 3350-E CFW
Throughput	5 Gbps	20 Gbps	30 Gbps
Layer 4 CPS	240K	450K	550K
Concurrent Sessions	8 Million	24 Million	32 Million
FW Rules	8K	12K	16K
Secure Web Gateway Performance^{1 2}			
SSLi Throughput	0.5 Gbps	1.5 Gbps	3 Gbps
SSLi CPS	RSA: 500 ECDHE: 300	RSA: 4K ECDHE: 3K	RSA: 8K ECDHE: 4.5K
IPsec VPN Performance²			
IPsec Throughput	3 Gbps	8 Gbps	10 Gbps
IPsec Tunnels	2K	2K / 5K ²	5K
IKE Gateways	2K	2K / 5K ²	5K
Network Interfaces			
			Hardware Bypass Model
1 GE (BASE-T)	5	5	1 + 4 (Bypass)
1 GE Fiber (SFP)	0	0	0
1/10 GE Fiber (SFP+)	4 ⁵	4 ⁵	4 ⁵ + 2 (Bypass) ⁶
25 GE Fiber (SFP28)	0	0	0
40 GE Fiber (QSFP+)	0	0	0
100 GE Fiber (QSFP28)	0	0	0
Management Ports	Ethernet Mgmt Port, RJ-45 Console Port		
Hardware Specifications			
Processor	Intel Communications Processor	Intel Communications Processor	Intel Xeon 8-core
Memory (ECC RAM)	8 GB	8 GB ³ / 16 GB	16 GB
Storage	SSD	SSD	SSD
Hardware Acceleration	Software	Software	Software
TLS/SSL Security Acceleration	Software	Hardware on S models (2 options) ⁷	Hardware
Dimensions (inches)	1.75 (H) x 17.5 (W) x 17.25 (D)	1.75 (H) x 17.5 (W) x 17.25 (D)	1.75 (H) x 17.5 (W) x 18(D)
Rack Units (mountable)	1U	1U	1U
Unit Weight	14 lbs / 16lbs (RPS)	15 lbs / 17 lbs (RPS)	18 lbs
Power Supply (DC option available)	Single 750W ⁴	Single 750W ⁴	Dual 750W RPS
	80 Plus Platinum Efficiency, 100 - 240 VAC, 50 - 60 Hz		
Power Consumption (typical/max) ³	60W / 80W	80W / 110W	151W / 205W
Heat in BTU/hour (typical/max) ³	205 / 273	205 / 273	516 / 700
Cooling Fan (front-to-back airflow)	Removable Fans	Removable Fans	Hot Swap Smart Fans
Operating Ranges	Temperature 0° - 40° C Humidity 5% - 95%		
Regulatory Certifications	FCC Class A, UL, CE, UKCA, CB, VCCI, KCC, BSMI, RCM RoHS	FCC Class A, UL, CE, UKCA, CB, VCCI, KCC ⁷ , BSMI, RCM ⁷ RoHS, FIPS 140-2 ¹	FCC Class A, UL, CE, UKCA, CB, VCCI, BSMI, RCM RoHS
Standard Warranty	90-day Hardware and Software		

Thunder CFW Physical Appliance (cont.)

Performance	Thunder 3350 CFW	Thunder 3350S CFW	Thunder 4440 CFW	Thunder 5440 CFW
Throughput	40 Gbps	50 Gbps	70 Gbps	90 Gbps
Layer 4 CPS	750K	1.4 Million	1.5 Million	2 Million
Concurrent Sessions	40 Million	64 Million	64 Million	128 Million
FW Rules	32K	64K	32K	64K
Secure Web Gateway Performance^{1†2}				
SSLi Throughput	3 Gbps	5.5 Gbps	8 Gbps	15 Gbps
SSLi CPS	RSA: 8K ECDHE: 4.5K	RSA: 20K ECDHE: 10K	RSA: 22K ECDHE: 10K	RSA: 35K ECDHE: 20K
IPsec VPN Performance²				
IPsec Throughput	15 Gbps	24 Gbps	30 Gbps	35 Gbps
IPsec Tunnels	10K	20K	10K	20K
IKE Gateways	10K	20K	10K	20K
Network Interfaces				
1 GE (BASE-T)	6	6	0	0
1 GE Fiber (SFP)	2	2	0	0
1/10 GE Fiber (SFP+)	4 ⁵	8 + 4 ⁵	24	24
25 GE Fiber (SFP28)	4	0	0	0
40 GE Fiber (QSFP+)	4	0	4	4
100 GE Fiber (QSFP28)	0	0	0	0
Management Ports	Ethernet Mgmt Port, RJ-45 Console Port		Ethernet Mgmt Port, RJ-45 Console Port, Lights Out Management	
Hardware Specifications				
Processor	Intel Xeon 8-core	Intel Xeon 14-core	Intel Xeon 6-core	Intel Xeon 12-core
Memory (ECC RAM)	32 GB	64 GB	32 GB	64 GB
Storage	SSD	SSD	SSD	SSD
Hardware Acceleration	Software	Software	2 x FTA-4	2 x FTA-4
TLS/SSL Security Acceleration	Hardware	Hardware	Hardware on S model	Hardware on S model
Dimensions (inches)	1.75 (H) x 17.5 (W) x 18(D)	1.75 (H) x 17.5 (W) x 18(D)	1.75 (H) x 17.5 (W) x 30 (D)	1.75 (H) x 17.5 (W) x 30 (D)
Rack Units (mountable)	1U	1U	1U	1U
Unit Weight	18 lbs	18 lbs	32.5 lbs	32.5 lbs
Power Supply (DC option available)	Dual 750W RPS	Dual 750W RPS	Dual 1100W RPS	Dual 1100W RPS
	80 Plus Platinum Efficiency, 100 - 240 VAC, 50 - 60 Hz			
Power Consumption (typical/max) ³	165W / 238W	175W / 222W	360W / 445W	360W / 445W
Heat in BTU/hour (typical/max) ³	564 / 831	598 / 758	1,229 / 1,519	1,229 / 1,519
Cooling Fan (front-to-back airflow)	Hot Swap Smart Fans			
Operating Ranges	Temperature 0° - 40° C Humidity 5% - 95%			
Regulatory Certifications	FCC Class A, UL, CE, UKCA, CB, VCCI, KCC, BSMI, RCM RoHS	FCC Class A, UL, CE, UKCA, CB, VCCI, KCC, BSMI, RCM RoHS, FIPS 140-2 [†]	FCC Class A, UL, CE, UKCA, CB, VCCI, KCC, BSMI, RCM RoHS	FCC Class A, UL, CE, UKCA, CB, VCCI, KCC, BSMI, RCM RoHS, FIPS 140-2 [†]
Standard Warranty	90-day Hardware and Software			

Thunder CFW Physical Appliance (cont.)

Performance	Thunder 5840 CFW	Thunder 5840-11 CFW	Thunder 5960 CFW	Thunder 6440 CFW
Throughput	100 Gbps	100 Gbps	300 Gbps	150 Gbps
Layer 4 CPS	3 Million	3 Million	1.9 Million	3 Million
Concurrent Sessions	128 Million	128 Million	256 Million	256 Million
FW Rules	64K	64K / 128K ²	128K	128K
Secure Web Gateway Performance^{1,2}				
SSLi Throughput	20 Gbps	25 Gbps	- ³	22 Gbps
SSLi CPS	RSA: 50K ECDHE: 25K	RSA: 50K ECDHE: 28K	- ³	RSA: 40K ECDHE: 15K
IPsec VPN Performance²				
IPsec Throughput	50 Gbps	55 Gbps	- ³	65 Gbps
IPsec Tunnels	20K	20K / 64K ²	- ³	64K
IKE Gateways	20K	20K / 64K ²	- ³	64K
Network Interfaces				
1 GE (BASE-T)	0	0	0	0
1 GE Fiber (SFP)	0	0	0	0
1/10 GE Fiber (SFP+)	24	48	0	48
25 GE Fiber (SFP28)	0	0	4	0
40 GE Fiber (QSFP+)	4	0	0	4
100 GE Fiber (QSFP28)	0	4	4	0
Management Ports	Ethernet Mgmt Port, RJ-45 Console Port, Lights Out Management		Ethernet Mgmt Port, RJ-45 Console Port	Ethernet Mgmt Port, RJ-45 Console Port, Lights Out Management
Hardware Specifications				
Processor	Intel Xeon 18-core	Intel Xeon 18-core	Intel Xeon 36-core	2 x Intel Xeon 10-core
Memory (ECC RAM)	64 GB	64 GB / 128 GB ²	128 GB	128 GB
Storage	SSD	SSD	SSD	SSD
Hardware Acceleration	2 x FTA-4	2 x FTA-4	Software	3 x FTA-4
TLS/SSL Security Acceleration	Hardware on S model	Hardware on S model	Hardware	Hardware on S model
Dimensions (inches)	1.75 (H) x 17.5 (W) x 30 (D)	1.75 (H) x 17.5 (W) x 30 (D)	1.75 (H) x 17 (W) x 24 (D)	1.75 (H) x 17.5 (W) x 30 (D)
Rack Units (mountable)	1U	1U	1U	1U
Unit Weight	32.5 lbs	34.3 lbs	25.1 lbs	36 lbs
Power Supply (DC option available)	Dual 1100W RPS	Dual 1500W RPS	Dual 550W RPS	Dual 1100W RPS
	80 Plus Platinum Efficiency, 100 - 240 VAC, 50 - 60 Hz			
Power Consumption (typical/max) ³	375W / 470W	550W / 760W	361W / 451W	480W / 550W
Heat in BTU/hour (typical/max) ³	1,280 / 1,604	1,877 / 2,594	1,232 / 1,539	1,638 / 1,877
Cooling Fan (front-to-back airflow)	Hot Swap Smart Fans			
Operating Ranges	Temperature 0° - 40° C Humidity 5% - 95%			
Regulatory Certifications	FCC Class A, UL, CE, UKCA, CB, VCCI, KCC, BSMI, RCM RoHS, FIPS 140-2 ⁺	FCC Class A, UL, CE, UKCA, CB, VCCI, BSMI, RCM RoHS	FCC Class A, UL, CE, UKCA, CB, VCCI, BSMI ⁺ , RCM RoHS	FCC Class A, UL, CE, UKCA, CB, VCCI, KCC, BSMI, RCM RoHS
Standard Warranty	90-day Hardware and Software			

Thunder CFW Physical Appliance (cont.)

Performance	Thunder 7440 CFW	Thunder 7440-11 CFW	Thunder 7650 CFW
Throughput	220 Gbps	220 Gbps	370 Gbps
Layer 4 CPS	5 Million	5 Million	8 Million
Concurrent Sessions	256 Million	256 Million	768 Million ⁸
FW Rules	128K	128K	128K
Secure Web Gateway Performance^{1,2}			
SSLi Throughput	25 Gbps	25 Gbps	- ⁹
SSLi CPS	RSA: 45K ECDHE: 20K	RSA: 45K ECDHE: 20K	- ⁹
IPsec VPN Performance²			
IPsec Throughput	70 Gbps	70 Gbps	- ⁹
IPsec Tunnels	64K	64K	- ⁹
IKE Gateways	64K	64K	- ⁹
Network Interfaces			
1 GE (BASE-T)	0	0	0
1 GE Fiber (SFP)	0	0	0
1/10 GE Fiber (SFP+)	48	48	0
25 GE Fiber (SFP28)	0	0	0
40 GE Fiber (QSFP+)	4	0	0
100 GE Fiber (QSFP28)	0	4	16
Management Ports	Ethernet Mgmt Port, RJ-45 Console Port, Lights Out Management		
Hardware Specifications			
Processor	Intel Xeon 18-core	Intel Xeon 18-core	2 x Intel Xeon 24-core
Memory (ECC RAM)	128 GB	128 GB	192 GB
Storage	SSD	SSD	SSD
Hardware Acceleration	3 x FTA-4	3 x FTA-4	2 x FTA-5
TLS/SSL Security Acceleration	Hardware on S model	Hardware on S model	No
Dimensions (inches)	1.75 (H) x 17.5 (W) x 30 (D)	1.75 (H) x 17.5 (W) x 30 (D)	2.625 (H) x 17.5 (W) x 30 (D)
Rack Units (mountable)	1U	1U	1.5U
Unit Weight	35.7 lbs	35.7 lbs	41.5 lbs
Power Supply (DC option available)	Dual 1100W RPS	Dual 1500W RPS	Dual 1500W RPS
	80 Plus Platinum Efficiency, 100 - 240 VAC, 50 - 60 Hz		
Power Consumption (typical/max) ³	690W / 820W	784W / 950W	864W / 1,091W
Heat in BTU/hour (typical/max) ³	2,355 / 2,798	2,676 / 3,242	2,949 / 3,722
Cooling Fan (front-to-back airflow)	Hot Swap Smart Fans		
Operating Ranges	Temperature 0° - 40° C Humidity 5% - 95%		
Regulatory Certifications	FCC Class A, UL, CE, UKCA, CB, VCCI, KCC, BSMI, RCM RoHS	FCC Class A, UL, CE, UKCA, CB, VCCI, BSMI, RCM RoHS, FIPS 140-2*	FCC Class A, UL, CE, UKCA, CB, VCCI, KCC, BSMI, RCM RoHS
Standard Warranty	90-day Hardware and Software		

Hardware specifications and performance numbers are subject to change without notice, and may vary depending on configuration and environmental conditions. As for network interface, it's highly recommended to use A10 Networks qualified optics/transceivers to ensure network reliability and stability.

*1 Tested in single appliance SSLi deployment with maximum SSL option. Cipher "TLS_RSA_WITH_AES_256_CBC_SHA" with RSA 2K keys are used for RSA cases, "TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256" with EC P-256 and RSA 2K keys are used for PFS case. | *2 With maximum SSL | *3 With base model | *4 Optional RPS available | *5 10Gbps speed only | *6 Fixed SFP+ optical ports with dual rate (10GBASE-SR and 1000BASE-SX) | *7 Hardware Bypass model comes equipped with the hardware TLS acceleration | ^ Certification in process | + FIPS model must be purchased | *8 Doubled the capacity from ACOS 5.2.1-P7/ 6.0.1 onward | *9 Not supported on non-S models

Thunder CFW SPE Physical Appliance Specifications

Performance	Thunder 5845 ^{CFW}	Thunder 7445 ^{CFW}	Thunder 7655S ^{CFW}	Thunder 14045 ^{CFW} Dual Modules
Throughput	100 Gbps	220 Gbps	370 Gbps	300 Gbps
Layer 4 CPS	3 Million	5 Million	8 Million	8 Million
Concurrent Sessions	128 Million	256 Million	768 Million ^{*4}	512 Million
FW Rules	64K / 128K ^{*2}	128K	128K	128K
Secure Web Gateway Performance^{*1/2}				
SSLi Throughput	- ^{*5}	- ^{*5}	72 Gbps	- ^{*5}
SSLi CPS	- ^{*5}	- ^{*5}	RSA: 100K ECDHE: 70K	- ^{*5}
IPsec VPN Performance^{*2}				
IPsec Throughput	- ^{*5}	- ^{*5}	100 Gbps	- ^{*5}
IPsec Tunnels	- ^{*5}	- ^{*5}	100K	- ^{*5}
IKE Gateways	- ^{*5}	- ^{*5}	100K	- ^{*5}
Network Interfaces				
1/10 GE Fiber (SFP+)	48	48	0	0
40 GE Fiber (QSFP+)	0	0	0	4
100 GE Fiber	4 (QSFP28)	4 (QSFP28)	16 (QSFP28)	4 (CFP2 or QSFP28)
Management Ports	Ethernet Mgmt Port, RJ-45 Console Port ^{**} , Lights Out Management			
Hardware Specifications				
Processor	Intel Xeon 18-core	2 x Intel Xeon 18-core	2 x Intel Xeon 28-core	4 x Intel Xeon 18-core
Memory (ECC RAM)	64 GB / 128GB ^{*2}	128 GB	384 GB	512 GB
Storage	SSD	SSD	SSD	Yes
Hardware Acceleration	2 x FTA-4, SPE	3 x FTA-4, SPE	2 x FTA-5, SPE	8 x FTA-3, SPE
TLS/SSL Security Acceleration	Software	Software	Hardware	Software
Dimensions (inches)	1.75 (H) x 17.5 (W) x 30 (D)	1.75 (H) x 17.5 (W) x 30 (D)	2.625 (H) x 17.5 (W) x 30 (D)	5.3 (H) x 16.9 (W) x 30 (D)
Rack Units (mountable)	1U	1U	1.5U	3U
Unit Weight	34.3 lbs	35.7 lbs	44.2 lbs	102 lb
Power Supply (DC option available)	Dual 1500W RPS	Dual 1500W RPS	Dual 1500W RPS	2+2 1100W RPS
	80 Plus Platinum Efficiency, 100 - 240 VAC, 50 - 60 Hz			
Power Consumption (typical/max) ^{*3}	585W / 921W	784W / 1,078W	1,121W / 1,300W	1,700W / 2,000W
Heat in BTU/hour (typical/max) ^{*3}	1,997 / 3,143	2,676 / 3,679	3,826 / 4,436	5,801 / 6,825
Cooling Fan (front-to-back airflow)	Hot Swap Smart Fans			
Operating Ranges	Temperature 0° - 40° C Humidity 5% - 95%			
Regulatory Certifications	FCC Class A, UL, CE, UKCA, CB, VCCI, BSMI, RCM RoHS	FCC Class A, UL, CE, UKCA, CB, VCCI, BSMI, RCM RoHS	FCC Class A, UL, CE, UKCA, CB, VCCI, KCC, BSMI, RCM RoHS, FIPS 140-2 ¹⁺	FCC Class A, UL, CE, UKCA, CB, VCCI, CQC, KCC, BSMI, RCM RoHS
Standard Warranty	90-day Hardware and Software			

Hardware specifications and performance numbers are subject to change without notice, and may vary depending on configuration and environmental conditions. As for network interface, it's highly recommended to use A10 Networks qualified optics/transceivers to ensure network reliability and stability.

*1 Tested in single appliance SSLi deployment with maximum SSL option. Cipher "TLS_RSA_WITH_AES_128_CBC_SHA256" with RSA 2K keys are used for RSA cases, "TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA256" with EC P-256 and RSA 2K keys are used for ECDHE case. | *2 With maximum SSL | *3 With base model. Number varies by SSL model | *4 Doubled the capacity from ACOS 5.2.1-P7/ 6.0.1 onward | *5 Not supported on non-S models

** Thunder 14045 comes with a splitter cable for console to provide access to both modules. | ⁺ Certification in process | ⁺ FIPS model must be purchased

Thunder CFW Software Appliance Specifications

vThunder CFW										
Supported Hypervisors	VMware ESXi (VMXNET3, SR-IOV, PCI Passthrough), KVM QEMU (VirtIO, OvS with DPDK, SR-IOV, PCI Passthrough), Microsoft Hyper-V ³									
Hardware Requirements	See Installation Guide									
Standard Warranty	90-day Software									
Bandwidth Licenses	Lab	200 Mbps	1 Gbps	4 Gbps	8 Gbps	10 Gbps	20 Gbps	40 Gbps	100 Gbps	FlexPool
VMware ESXi	●	●	●	●	●	●	● ^{*1}	● ^{*1 *2}	● ^{*2}	●
KVM	●	●	●	●	●	●	● ^{*1}	● ^{*1 *2}	● ^{*2}	●
Microsoft Hyper-V ³	●	●	●	●	●					●
Feature basis Throughput Guideline	ADC/CGN/FW: 200 Mbps-100 Gbps IPsec/SSL Insight (SWG) without hardware SSL/TLS acceleration: 200 Mbps – 8 Gbps									

*1 SR-IOV | *2 PCI Passthrough | *3 Hyper-V is supported in ACOS 4.x and 5.x release. 8 Gbps license is not recommended.

Thunder CFW Containers*	
Image Format	Docker
Operating System	Reference Operating System: - Ubuntu 16.04.3 LTS (Xenial Xerus) - RedHat Enterprise Linux version 7.6
System Requirements	Minimum requirement: - 1 or more data interface - 1 vCPU and 4GB memory
Licenses	BYOL Bandwidth License FlexPool License
Performance Reference**	Maximum throughput on a single Thunder container (24 vCPUs, shared polling mode off) 1510B: 180 Gbps 512B: 103 Gbps IMIX : 75 Gbps
Standard Warranty	90-day Software

* Carrier-class firewall along with CGNAT and data-center firewall with ADC are the common use cases. SSL Insight (SWG) and IPsec are not adequate use cases.
** Supermicro 7049GP-TRT with Intel Xeon Platinum 8160 CPU @ 2.10GHz and 2x NVIDIA Mellanox Connect X-5 NICs. Tested with UDP traffic for CGNAT use case.

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