

Thunder TPS Physical Appliance Specifications

Performance	Thunder 1040 TPS	Thunder 3040 TPS	Thunder 4435 TPS	Thunder 5845 TPS
Throughput (Software Scrubbing) ¹	5 Gbps	10 Gbps	38 Gbps	100 Gbps
Hardware Blocking	N/A	N/A	N/A	250 Gbps
Packets Rate (pps) ¹	2.5 Million	4.5 Million	20 Million	28 Million
Software-based - SYN Authentication (pps)	2.5 Million	4.5 Million	20 Million	28 Million
Hardware-based - Anomaly Flood Blocking (pps)	N/A	N/A	55 Million	125 Million
Maximum Concurrent Sessions (Asymmetric Deployment)	8 Million	8 Million	32 Million	48 Million
Average Latency	10 µs	10 µs	35 µs	50 µs
Minimum Rate Enforcement Interval	100 ms			
Flow Detection Performance				
Flows Per Second (fps)	N/A	1 Million	3 Million	3 Million
Network Interface				
	Hardware Bypass Model			
1 GE Copper	5	1 + 4 (Bypass)	6	0
1 GE Fiber (SFP)	0	0	2	0
1/10 GE Fiber (SFP+)	4 ²³	4 ²³	4	16
1/10 GE Fiber (Fixed)	0	2 (Optical Bypass) ²⁵	0	0
100 GE Fiber	0	0	0	4 (QSFP28)
Management Ports	Ethernet Management Port, RJ-45 Console Port			
Hardware Specifications				
Processor	Intel Communications Processor	Intel Xeon 4-core	Intel Xeon 10-core	Intel Xeon 18-core
Memory (ECC RAM)	16 GB	16 GB	64 GB	64 GB
Storage	SSD	SSD	SSD	SSD
Hardware Acceleration	Software	Software	FTA-3, SPE	2 x FTA-4, SPE
Dimensions (Inches)	1.75 (H) x 17.5 (W) x 17.25 (D)	1.75 (H) x 17.5 (W) x 17.45 (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	14 lbs 16 lbs (RPS)	20.6 lbs	34.5 lbs	34.3 lbs
Power Supply (DC option available)	Single 750W ⁴	Dual 600W RPS	Dual 1100W RPS	Dual 1500W RPS
	80 Plus Platinum efficiency, 100-240 VAC, 50-60 Hz			
Power Consumption (Typical/Max) ²	80W / 110W	180W / 240W	350W / 420W	585W / 921W
Heat in BTU/Hour (Typical/Max) ²	273 / 376	615 / 819	1,195 / 1,433	1,997 / 3,143
Cooling Fan	Removable Fans	Hot Swap Smart Fans		
Operating Ranges	Temperature 0° - 40° C Humidity 5% - 95%			
Regulatory Certifications	FCC Class A, UL, CE, TUV, CB, VCCI, CCC*, BSMI*, RCM* RoHS	FCC Class A, UL, CE, GS, CB, VCCI, CCC, KCC, BSMI, RCM RoHS	FCC Class A, UL, CE, TUV, CB, VCCI, CCC, MSIP, BSMI, RCM, EAC, NEBS CC EAL2+, RoHS	FCC Class A, UL, CE, GS, CB, VCCI, CCC*, BSMI, RCM RoHS*
Standard Warranty	90-Day Hardware and Software			

Thunder TPS Physical Appliance Specifications (Cont.)

	Thunder 7445 TPS	Thunder 14045 TPS Single-Module	Thunder 14045 TPS Dual-Module	Thunder 7655 TPS [†]
Performance				
Throughput (Software Scrubbing) ^{*1}	220 Gbps	150 Gbps	300 Gbps	380 Gbps
Hardware Blocking	500 Gbps	500 Gbps	500 Gbps	1.2 Tbps
Packets Rate (pps) ^{*1}	60 Million	60 Million	110 Million	110 Million
Software-based - SYN Authentication (pps)	60 Million	60 Million	110 Million	110 Million
Hardware-based - Anomaly Flood Blocking (pps)	250 Million	220 Million	440 Million	500 Million
Maximum Concurrent Sessions (Asymmetric Deployment)	64 Million	128 Million	256 Million	256 Million
Average Latency	50 µs	60 µs	60 µs	70 µs
Minimum Rate Enforcement Interval	100 ms			
Flow Detection Performance				
Flows Per Second (fps)	6 Million	N/A	N/A	N/A
DNS Authoritative Cache Performance				
DNS Queries Per Second (qps)	35 Million	35 Million	N/A	70 Million
Network Interface				
1/10 GE Fiber (SFP+)	48	0	0	0
40 GE Fiber (QSFP+)	0	4	4	0
100 GE Fiber	4 (QSFP28)	4 (CFP2 or QSFP28)	4 (CFP2 or QSFP28)	16 (QSFP28)
Management Ports	Ethernet Management Port, RJ-45 Console Port [‡]			
Hardware Specifications				
Processor	2 x Intel Xeon 18-core	2 x Intel Xeon 18-core	4 x Intel Xeon 18-core	2 x Intel Xeon 24-core
Memory (ECC RAM)	128 GB	256 GB	512 GB	384 GB
Storage	SSD	SSD	SSD	SSD
Hardware Acceleration	3 x FTA-4, SPE	4 x FTA-3, SPE	8 x FTA-3, SPE	2 x FTA-5, SPE
Dimensions (Inches)	1.75 (H) x 17.5 (W) x 30 (D)	5.3 (H) x 16.9 (W) x 30 (D)	5.3 (H) x 16.9 (W) x 30 (D)	2.625 (H) x 17.5 (W) x 30 (D)
Rack Units (Mountable)	1U	3U	3U	1.5U
Unit Weight	35.7 lbs	80 lb	102 lbs	44.2 lbs
Power Supply (DC option available)	Dual 1500W RPS	2+2 1100W RPS	2+2 1100W RPS	Dual 1500W RPS
	80 Plus Platinum efficiency, 100-240 VAC, 50-60 Hz			
Power Consumption (Typical/Max) ^{*2}	784W / 1,078W	1,000W / 1,200W	1,700W / 2,000W	965W / 1,222W
Heat in BTU/Hour (Typical/Max) ^{*2}	2,676 / 3,679	3,412 / 4,095	5,801 / 6,825	3,293 / 4,170
Cooling Fan	Hot Swap Smart Fans			
Operating Ranges	Temperature 0° - 40° C Humidity 5% - 95%			
Regulatory Certifications	FCC Class A, UL, CE, GS, CB, VCCI, CCC [†] , BSMI, RCM RoHS [†]	FCC Class A, UL, CE, GS, CB, VCCI, CQC, CCC [†] , KCC, BSMI, RCM RoHS	FCC Class A, UL, CE, GS, CB, VCCI, CQC, CCC [†] , KCC, BSMI, RCM RoHS	FCC Class A [†] , UL [†] , CE [†] , GS [†] , CB [†] , VCCI [†] , CCC [†] , BSMI [†] , RCM [†] RoHS [†]
Standard Warranty	90-Day Hardware and Software			

The specifications and performance numbers are subject to change without notice, and 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 Throughput performances are traffic-forwarding capacity and measured with legitimate traffic with DDoS protection enabled.

*2 With base model | *3 10Gbps speed only | *4 Optional RPS available | *5 Fixed SFP+ optical ports with dual rate (10GBASE-SR and 1000BASE-SX)

† Certification in process | ‡ Thunder 14045 comes with a splitter cable for console to provide access to both modules | § Available in Q3 2020

Thunder TPS Virtual Appliance Specifications

vThunder TPS

Supported Hypervisors	VMware ESXi 5.5 or higher KVM QEMU 2.5 or higher (SR-IOV) Microsoft Hyper-V on Windows Server 2008 R2 or higher
Hardware Requirements	See Installation Guide
Standard Warranty	90-Day Software

Bandwidth Licenses	1 Gbps	2 Gbps	5 Gbps	FlexPool (40Gbps/100Gbps)
KVM	●	●	●	●
VMware ESXi	●	●	●	●
Microsoft Hyper-V	●	●	●*	●

Lab license is also available | * 5 Gbps license not recommended for Microsoft Hyper-V

vThunder TPS Sizing Recommendations

Performance License	1/2/5 Gbps	40 Gbps [^]	100 Gbps [^]
vCPU	6	8	24
vRAM	16 GB	16 GB	64 GB
vDisk	60 GB	60 GB	100 GB

[^]Available in Q3 2020. Requires vThunder TPS running on KVM with SR-IOV enabled. For 100 Gbps, Mellanox Connect X-5 NIC is recommended.

vThunder TPS Detector Flow Detection Performance*

Flows per Second (fps)	150K	500K	1.5M
vCPU	2	3	5
vRAM	16 GB	32 GB	64 GB
vDisk	40 GB	40 GB	40 GB

*Using vThunder TPS Standalone Detector image.

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Part Number: A10-DS-15111-EN-19 JUNE 2020