

Thunder TPS Physical Appliance Specifications

Performance	Thunder 1040 <small>TPS</small>		Thunder 3350-E <small>TPS</small>	Thunder 5845-40G <small>TPS</small>	Thunder 5845 <small>TPS</small>
Throughput (software scrubbing) ^{*1}	5 Gbps		10 Gbps	40 Gbps	100 Gbps
Hardware Blocking	N/A		N/A	250 Gbps	250 Gbps
Packets Rate (pps) ^{*1}	2.2 Million		6 Million	12 Million	25 Million
Software-based - SYN Authentication (pps)	2.2 Million		6 Million	12 Million	25 Million
Hardware-based - Anomaly Flood Blocking (pps)	N/A		N/A	125 Million	125 Million
Maximum Concurrent Sessions (asymmetric deployment)	8 Million		8 Million	32 Million	48 Million
Average Latency	10 μs		20 μs	50 μs	50 μs
Minimum Rate Enforcement Interval	100 ms		100 ms	100 ms	100 ms
Flow Detection Performance					
Flows Per Second (fps)	N/A		1 Million	3 Million	3 Million
DNS Authoritative Cache Performance					
DNS Queries Per Second (qps)	N/A		N/A	10 Million	18 Million
Network Interface			Hardware Bypass Model		
1 GE Copper	5	1 + 4 (Bypass)	6	0	0
1 GE Fiber (SFP)	0	0	2	0	0
1/10 GE Fiber (SFP+)	4 ^{*3}	4 ^{*3}	8 + 4 ^{*3}	48	48
1/10 GE Fiber (Fixed)	0	2 (Optical bypass) ^{*5}	0	0	0
100 GE Fiber	0	0	0	4 (QSFP28)	4 (QSFP28)
Management Ports			Ethernet Mgmt Port, RJ-45 Console Port		
Hardware Specifications					
Processor	Intel Communications Processor		Intel Xeon 8-core	Intel Xeon 18-core ^{*6}	Intel Xeon 18-core
Memory (ECC RAM)	16 GB		16 GB	64 GB ^{*6}	64 GB
Storage	SSD		SSD	SSD	SSD
Hardware Acceleration	Software		Software	2 x FTA-4, 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 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	14 lbs 16 lbs (RPS)		18 lbs	34.3 lbs	34.3 lbs
Power Supply (DC option available)	Single 750W ^{*4}		Dual 750W RPS	Dual 1500W RPS	Dual 1500W RPS
	80 Plus Platinum efficiency, 100-240 VAC, 50-60 Hz				
Power Consumption (typical/max) ^{*2}	80W / 110W		151W / 205W	585W / 921W	585W / 921W
Heat in BTU/Hour (typical/max) ^{*2}	273 / 376		516 / 700	1,997 / 3,143	1,997 / 3,143
Cooling Fan (front-to-back airflow)	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, 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	FCC Class A, UL, CE, UKCA, CB, VCCI, KCC, BSMI, RCM RoHS
Standard Warranty			90-day Hardware and Software		

Thunder TPS Physical Appliance (cont.)

Performance	Thunder 7445 <small>TPS</small>	Thunder 14045 <small>TPS</small> Single-Module	Thunder 14045 <small>TPS</small> Dual-Module	Thunder 7655S <small>TPS</small>
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}	50 Million	50 Million	100 Million	110 Million
Software-based - SYN Authentication (pps)	50 Million	50 Million	100 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	60 μs	60 μs	60 μs	60 μs
Minimum Rate Enforcement Interval	100 ms	100 ms	100 ms	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	N/A
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 Mgmt 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 28-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	1,121W / 1,300W
Heat in BTU/Hour (typical/max) ^{*2}	2,676 / 3,679	3,412 / 4,095	5,801 / 6,825	3,826 / 4,436
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, CQC, KCC, BSMI, RCM RoHS	FCC Class A, UL, CE, UKCA, CB, VCCI, CQC, KCC, BSMI, RCM RoHS	FCC Class A, UL, CE, UKCA, CB, VCCI, 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 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) | *⁶ Active CPU core counts and memory size may vary depending on the modular license | ^ Certification in process | + Thunder 14045 comes with a splitter cable for console to provide access to both modules

Thunder TPS Virtual Appliance Specifications

vThunder TPS

Supported Hypervisors	VMware ESXi 6.7 or higher (SR-IOV)
Hardware Requirements	See Installation Guide
Standard Warranty	90-day Software

vThunder TPS License and Sizing Recommendations

Throughput	Lab/1/2/5 Gbps	40 Gbps* ¹	100 Gbps* ¹
vCPU	6	8	24
vRAM	16 GB	32 GB	64 GB
vDisk	60 GB	60 GB	100 GB
Licence Types	Bandwidth license (per instance)	FlexPool	FlexPool
Hypervisors	ESXi	ESXi	ESXi

*¹ Available in ACOS 6.0 and above. Tested with vThunder TPS running on ESXi 7.0 with NVIDIA Mellanox ConnectX-6 NIC (SR-IOV enabled)

vThunder TPS Detector Flow Detection Performance

Flows per Second (fps)	150K	500K	1.5M
vCPU	6	8	24
vRAM	16 GB	32 GB	64 GB
vDisk	40 GB	40 GB	40 GB

Thunder TPS for Cloud

	Microsoft Azure
Throughput per instance	Up to 5 Gbps
Image Format	Microsoft VHD
Licenses	30-day Trial License BYOL FlexPool License

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