

# Arbor Threat Mitigation System (TMS)

## Proven, Comprehensive Threat Protection and Service Enablement

### KEY FEATURES & BENEFITS

#### Surgical Mitigation

Automatically remove only the attack traffic without interrupting the flow of non-attack business traffic.

#### Full Portfolio of Mitigation Platforms and Capacities

Choose from a variety of mitigation platforms and capacities including: 2U appliances, 6U chassis, virtualized in Cisco ASR 9000 Router, KVM & VMware hypervisor, and baremetal.

#### Unified Command and Control of Eight Tbps of Mitigation

Scale DDoS defenses to an unprecedented level. Deploy up to 40 Tbps of aggregate, centrally-managed mitigation capacity per deployment.

#### Managed Services Enabler

Meet rapidly growing demand for DDoS protection services. Use Arbor TMS to deliver profitable in-cloud DDoS protection services.

#### Comprehensive List of Attack Countermeasures

Protect your infrastructure and/or your customers from the largest and most complex volumetric, TCP-state exhaustion and application-layer DDoS attacks.

#### Flexible Deployment

Deploy application-layer intelligence, threat detection and surgical mitigation in different portions of your network for infrastructure protection and more profitable managed DDoS protection services.

Internet Service Providers (ISPs), Cloud Providers and Enterprises face a common problem. Distributed Denial of Service (DDoS) attacks are a major risk to service availability. The power, sophistication and frequency of DDoS attacks continue to increase. Data center operators and network providers need a defense that is effective, cost-efficient and easily managed. Arbor Threat Mitigation System™ (TMS) is the acknowledged leader in DDoS protection. More Service Providers, Cloud Providers and large Enterprises use Arbor TMS for DDoS mitigation than any other solution.

### Arbor TMS DDoS Defense Specifications

<b>Simultaneous Sessions</b>	Not session limited	
<b>Deployment Modes</b>	Inline Active, Inline Monitoring, SPAN port, Diversion/Reinjection	
<b>Block Actions</b>	Source blocking/source suspend; per packet blocking; combination of source, header and rate based blocking; Automated BGP Flowspec Source/Destination Blocking	
<b>Attack Protections</b>	Reflection Amplification Flood Attacks (TCP, UDP, ICMP, DNS, mDNS, Memcached, SSDP, NTP, NetBIOS, RIPv1, rpcbnd, SNMP, SQL RS, Chargen, L2TP, Microsoft SQL Resolution Service); Fragmentation Attacks (Teardrop, Targa3, Jolt2, Nestea); TCP Stack Attacks (SYN, FIN, RST, ACK, SYN-ACK, URG-PSH, other combinations of TCP Flags, slow TCP attacks); Application Attacks (HTTP GET/POST Floods, slow HTTP Attacks, SIP Invite Floods, DNS Attacks, HTTPS Protocol Attacks); SSL/TLS Attacks (Malformed SSL Floods, SSL Renegotiation, SSL Session Floods); DNS Cache Poisoning; Vulnerability Attacks; Resource Exhaustion Attacks (Slowloris, Pyloris, LOIC, etc.); Flash Crowd Protection; Attacks on Gaming Protocols	
<b>DDoS Countermeasure</b>	<b>Volumetric-Only Countermeasures</b>	<b>Full Set of Countermeasures</b>
	Invalid Packets, IP Address Filter Lists, Black/White Filter Lists, Packet Header Filtering, IP Location Filter Lists, Zombie Detection, UDP Reflection/Amplification Protection, Per Connection Flood Protection, Spoofed TCP SYN Flood, TCP SYN Authentication, TCP Connection Limiting, TCP Connection Reset, Payload Regular Expression Filter, Shaping, IP Location Policing, Inline Filter, Blacklist Fingerprints, Protocol Baselines	HTTP Authentication, HTTP Malformed, HTTP Scoping, HTTP Rate Limiting, HTTP/URL Regular Expression, DNS Authentication, DNS Malformed, DNS Scoping, DNS Rate Limiting, DNS Regular Expression, SIP Malformed, SIP Request Limiting, SSL Negotiation, ATLAS Intelligence Feed (AIF)



## Arbor TMS Appliances

	2600	2800
<b>Throughput and Mitigation</b>	Licenses for 1 Gbps, 2 Gbps, 5 Gbps, 10 Gbps (add-on to 20 Gbps), all up to 15 Mpps	Licenses for 10 Gbps, 20 Gbps, 30 Gbps, 40 Gbps, all up to 30 Mpps
<b>Average Latency</b>	< 80µs	
<b>Power Requirements</b>	Redundant Power Supplies <b>AC:</b> 100-240 VAC, 50/60 Hz, 12/6 A max.; <b>DC:</b> -40 to -72 Vdc, 28/14 A max.	Redundant Power Supplies <b>AC:</b> 100-240 VAC, 50/60 Hz, 12/6 A max.; <b>DC:</b> -40 to -72 Vdc, 28/14 A max.
<b>Power Requirements and Heat</b>	325 Watts (max.), 280 Watts (nom.): @ 280 Watts, 955 BTU/hr	325 Watts (max.), 280 Watts (nom.): @ 280 Watts, 955 BTU/hr
<b>Dimensions</b>	<b>Chassis:</b> 2U rack height <b>Weight:</b> 36.95 lbs (17.76 kg) <b>Height:</b> 3.45 in (8.76 cm) <b>Width:</b> 17.14 in (43.53 cm) <b>Depth:</b> 20 in (50.8 cm)	<b>Chassis:</b> 2U rack height <b>Weight:</b> 39 lbs (17.7 kg) <b>Height:</b> 3.45 in (8.76 cm) <b>Width:</b> 17.14 in (43.53 cm) <b>Depth:</b> 20 in (50.8 cm)
<b>Network Interfaces</b>	4 x 10 GigE (SFP+) + 8 x 1 GigE (SFP) ports	8 x 10 GigE (SFP+ for SR or LR or mixed fiber)
<b>Storage</b>	2 x 150GB SSD drives, RAID 1	2 x 240GB SSD drives, RAID 1
<b>Environmental</b>	<b>Operating temperature:</b> 41° to 104°F (5° to 40°C) <b>Relative humidity (operating):</b> 5 to 85% non-condensing	<b>Operating temperature:</b> 41° to 104°F (5° to 40°C) <b>Relative humidity (operating):</b> 5 to 85% non-condensing
<b>Regulatory</b>	UL60950-1/CSA 60950-1 (USA/Canada); EN60950-1 (Europe); IE60950 (International), CB Certificate & Report including all international deviations; GS Certificate (Germany); EAC-R Approval (Russia); CE – Low Voltage Directive 73/23/EEE (Europe); BSMI CNS 13436 (Taiwan); KCC (South Korea); RoHS Directive 2002/95/EC (Europe), Moroccan Conformity Mark	UL 60950-1 2nd edition/CSA C22.2 No. 60950-1-07 2nd Edition, Low Voltage Directive 2006/95/EC, Safety Directive 2001/95/EC, CB Certificate and Report to IEC60950-1, 2nd edition and all international deviations, FCC 47CFR Parts 15, Verified Class A limit, ICES-003 Class A Limit, EMC Directive, 2004/108/EC, EN55022, EN55024, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000-4-11, EN61000-3-2, EN61000-3-3, VCCI Class A ITE (CISPR 22, Class A Limit), BSMI Approval, CNS 13438, Class A and CNS13436 Safety, KCC Approval, Gost Approval, CISPR 22 Class A Limit, CISPR 24 Immunity, RoHS (recast) Directive 2011/65/EU, Moroccan Conformity Mark
<b>Hardware Bypass</b>	External	

Arbor TMS Appliances (continued)

	8100	HD1000
<b>Throughput and Mitigation</b>	Licenses for 1 Gbps, 2 Gbps, 5 Gbps, 10 Gbps, 20 Gbps, 30 Gbps & 40 Gbps, up to 37 Mpps	Up to eight Packet Processing Modules (PPMs); Any combination of 20 Gbps (up to 14 Mpps) or 50 Gbps (up to 25 Mpps) of mitigation throughput, up to 400 Gbps, 198 Mpps
<b>Average Latency</b>	< 80µs	
<b>Power Requirements</b>	<b>AC:</b> 2 x AC redundant, hot swap capable power supplies; AC Power Ratings: 100 to 240 VAC, 50 to 60 Hz 12/6 A max; <b>DC:</b> 2 x DC redundant, hot swap capable power supplies; DC Power Ratings: -40 to -72 Vdc, 28/14 A max (per DC input).	<b>AC:</b> Two 1500-watt redundant power supplies; 100-240V AC, 15-10 A, 50-60 Hz (x2); <b>DC:</b> Two 1500-watt redundant power supplies; -48 to -60 V dc, 44 A (x2)
<b>Power Requirements and Heat</b>	400 Watts (max.) and 350 Watts (nom.) Heat at 1195 BTU/hr @ 350 Watts	(1) MM, (5) fans, (2) QSFP+, (4) QSFP28; (x1) PPM: @ 327 Watts, 1116 BTU/ hr; (x4) PPM: @ 569 Watts, 1940 BTU/ hr ; (x8) PPM: @ 932 Watts, 3180 BTU/ hr
<b>Dimensions</b>	<b>Chassis:</b> 2U rack height <b>Weight:</b> 36.95 lbs. (17.76 kg) <b>Height:</b> 3.45 in (8.67 cm) <b>Width:</b> 17.14 in (43.53 cm) <b>Depth:</b> 20 in (50.8 cm)	<b>Chassis:</b> 2U rack height <b>Weight:</b> 45.2 lbs (20.5 kg) with 1 PPM, add 1.6 lb (.73 kg) per PPM (up to eight) <b>Height:</b> 3.5 in (8.89 cm) <b>Width:</b> 17.6 in (44.70 cm) <b>Depth:</b> 21 in (53.34 cm)
<b>Network Interfaces</b>	8 x 10GE SFP+ and 8 x 1 GE SFP 2 x 1GE copper management ports Note: 10GE copper ports present, but not supported yet.	4 x 100 GigE + 8x 10 GigE = One to four 100 GbE QSFP28 (LR) optical transceivers + One or two 4 x 10 GbE QSFP+ (SR or LR Lite) optical transceivers with one 4 x 10 GbE breakout cable on each transceiver  16 x 10 GigE = One to eight 10 GbE SFP+ (SR or LR) optical transceivers + One or two 4 x 10 GbE QSFP+ (SR or LR Lite) optical transceivers with one 4 x 10 GbE breakout cable on each transceiver
<b>Storage</b>	2 x 240GB SSD drives, RAID 1	2 x 480GB SSD drives, RAID 1
<b>Environmental</b>	<b>Operating temperature:</b> 41°F to 104°F (5° to 40°C) <b>Relative humidity (operating):</b> 5 to 85% non-condensing <b>Non-Operating: Temperature:</b> -40° to 158°F (-40° to 70°C); Humidity 95%	<b>Operating temperature:</b> 41° to 104°F (5° to 40°C) <b>Relative humidity (operating):</b> 5 to 93%, non-condensing
<b>Regulatory</b>	UL 60950-1 2nd edition/CSA C22.2 No.60950-1-07 2nd Edition, EMC Directive 2014/30/EU, Low Voltage Directive 2014/35/EU, CB Certificate and Report to IEC62368-1 and IEC60950-1, 2nd edition and all international deviations, FCC 47CFR Parts 15, Verified Class A limit, ICES-003 Class A Limit, EMC Directive, 2004/108/EC, EN55032, EN55035, EN61000-4-2, EN61000-4-3, EN61000-4-4, EN61000-4-5, EN61000-4-6, EN61000-4-8, EN61000- 4-11, EN61000-3-2, EN61000-3-3, VCCI Class A ITE, RoHS (recast) Directive 2011/65/EU, Moroccan Conformity Mark, KC (Korea) Approval, RCM (Australia) Approval, EAC (Russia)	RoHS 6/6, IEC/EN/UL/CSA 60950-1, FCC Part 15 Subpart B Class A, EN 55022, EN55024, ETSI EN 300 386, cCSAus Mark, CE Mark, KN22, KN24, RCM Mark, KCC Mark, EAC Mark, BIS, CCC Mark, Moroccan Conformity Mark
<b>Hardware Bypass</b>	External	

## Software TMS

Deployment	VMWare ESXi or Linux KVM, x86_64	Bare metal
CPU Cores	3-128 virtual CPU cores	4-64 physical CPUs with hyperthreading enabled
RAM	9.5-197 GB	14-194 GB
Storage	100 GB minimum	100 GB minimum
Management Interfaces	1-2	1-2
Mitigation Interfaces	1-16	1-16
Mitigation Throughput	50 Mbps up to 55 Gbps Up to 11 Mpps	50 Mbps up to 110 Gbps or more based on hardware performance Up to 29 Mpps
Average Latency	<3ms	<1ms
Supported NFV Management and Orchestration	OpenStack (Heat, Tacker), Ansible, Cisco NSO/ESC, Nokia CloudBand, AWS CloudFormation	



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