TECHNICAL SPECIFICATIONS

Haltdos Falcon : Anti-DDoS Appliance

Fast . Scalable . Reliable

Haltdos hardware appliances deliver a hardened and scalable, reliable platform to power Haltdos solutions. Haltdos Hardware Appliances offer exceptional performance, allowing organizations to consolidate device management and address future bandwidth requirements. Haltdos appliances can manage heavy traffic loads without impacting application or network performance.

Fault Tolerant Hardware Design

With multi-gigabit throughput, fail open interfaces, secure out-of-band management, and low latency, Haltdos appliances are high assurance, fast and easy to manage. To maximize system uptime, Haltdos appliances offer redundant, hot-swappable components including redundant power supplies and hard drives. In the event of a hardware failure, the redundant component will automatically take over, providing continuous system operations.

Support

- 24 x 7 x 365 Support
- On-Site Warranty Support
- Twice a Year Site Visit Assurance
- Centralised Helpdesk

CONNECT WITH HALTDOS

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Flexible Expansion Options to Address Unique Business Needs

The appliances are built on a common hardware platform with flexibility in mind. Haltdos appliances can be extended to provide remote, out-of-band management and monitoring, performance acceleration, and more with expansion modules. Expansion modules include:

- Network Cards (copper or optical)
- Hardware Security Module (HSM) (non-FIPS and FIPS-140-2)
- SSL acceleration card
- Disk Space & RAM

Product Specifications

MITIGATION PERFORMANCE		HD-FAL-4120	HD-FAL-4620	HD-FAL-5120	HD-FAL-5420	HD-FAL-6220	HD-FAL-6700
1.1	**Throughput Range (bps)**	4 Gbps	24 Gbps	48 Gbps	64 Gbps	120 Gbps	150 Gbps
1.2	**Supported TCP Sessions**	Unlimited					
1.3	**DDoS Attack Flood Prevention Rate (Mpps)**	1M - 5M	5M - 20M	10M - 30M	25M - 50M	50M - 80M	50M - 80M
1.4	**SSL Throughput**	4 Gbps	20 Gbps	40 Gbps	50 Gbps	100 Gbps	100 Gbps
1.5	**TCP Connection Tracking**	1M - 4M	4M - 10M	10M - 15M	15M - 25M	25M - 40M	25M - 40M
1.6	**SSL/TLS RSA 2K Rate (tps)**	22K	100K	100K	100K	100K	100K
1.7	**SSL/TLS ECC Rate (tps)**	15K	50K	50K	50K	50K	50K
1.8	**L4 Connection per second**	600 K	1.5 M	1.5 M	2 M	4 M	4.2 M
1.9	**L7 Request per second**	1 M	3 M	7 M	10 M	15 M	18 M
1.10	**Latency**	< 50 micro second					
1.11	**Attack Detection Time**	< 18 second					
1.12	**Attack Mitigation Time**	< 10 second					
HARDWARE SPECS							
2.1	**Processor**	Intel Xeon					
2.2	**CPU Cores**	12	24	32	40	48	48
2.3	**Memory***	32 GB	64 GB	64 GB	96 GB	128	128 GB
2.4	**Hard Disk***	256 GB SSD	512 GB SSD	1 TB SSD	1 TB SSD	2 TB SSD	2 TB SSD
2.5		Option available for RAID or dual partition					
2.6	**Additional Specs**	Built-in TPM Chip and Hardware HSM for SSL offloading & compression optimization Option available for FIPS-140-2 (additional charge) or Non-FIPS compliant HSM					
2.7	**Form Factor**	1U/2U Rack Mount Server (19 inch mounting)					
2.8	**Operating Temperature & Humidity**	0 - 40 C with 8%-95% humidity (non-condensing)					
2.9	**Power Supply and Fans**	Redundant Power Supply (Hot Swappable)AC 170-240V,50 Hz and Redundant fans.					
2.10	**Inspection Ports***						
	1 GE Ports	8	8	-	-	-	-
	10 GE Ports	-	2	4	8	8	8
	25 GE Ports	-	-	-	-	-	-
	40 GE Ports	-	-	2	2	4	-
	100 GE Ports	-	-	-	-	-	2
2.11	**Out Of Band Ports**						
	1 GE (RJ-45) Ports	2	2	2	2	2	2
	Console (RS232/RJ45) Ports	1	1	1	1	1	1
	HA Ports (RJ45/SFP/SFP+)	1	1	1	1	1	1
	Input/Output (USB)	2	2	2	2	2	2

Centralized Management

Depending upon the chosen deployment as standalone or cluster, Haltdos also offers a centralized management solution for management of Haltdos products. The centralized management is API first solution that comes in the following flavors:

- HD-MGT-ST: This model is a single tenant centralized management solution that supports only one license dedicated to a single customer.
- HD-MGT-MT: This model is a multi-tenant centralized management solution that supports multiple licenses that can be used by one or more customers.

Like the products, Haltdos Centralized Management solution can be deployed in Hardware or virtual form factor.

Virtual Appliances

All Haltdos products are built on top of Haltdos Platform. This allows the platform to be installed in various flavors - SaaS, Hardware, or virtual form factor. Regardless of the form factor chosen, the product have same technical capabilities.

Standalone Virtual Models	Cluster Virtual Model	Throughput (Mbps)
HD-VS-100	HD-VM-100	100
HD-VS-200	HD-VM-200	200
HD-VS-500	HD-VM-500	500
HD-VS-750	HD-VM-750	750
HD-VS-1000	HD-VM-1000	1000
HD-VS-2500	HD-VM-2500	2500
HD-VS-5000	HD-VM-5000	5000
HD-VS-7500	HD-VM-7500	7500
HD-VS-10000	HD-VM-10000	10000

TECHNOLOGY & CERTIFICATION

3.1	**Platform & Technology**	Haltdos Platform (certified) with signature from Threat Intelligence & Machine Learning
3.2	**License**	Bandwidth capped license. Upgrade possible without hardware replacement up to max supported hardware bandwidth
3.3	**Additional Licenses**	Optional license for GSLB, WAF, LLB, SSL VPN, SLB and DNS Firewall
3.4	**Certifications**	FCC, ROHS, CE compliant, Common Criteria EAL 2+, IPv6 Ready Gold certifications
3.5	**Support**	24x7 via Online, Email, Telephone and Dedicated Account Manager
3.6	**Warranty**	1 year warranty for software and hardware maintenance. Additional charges for extended warranty
3.7	**TAC Support**	TAC support in India

INTEGRATION FEATURES

4.1	**Security Tools Integration**	Support for integration with SAST/DAST/IAST tools. Integration with 3rd party Threat Intelligence (TI) feeds
4.2	**Storage and Export**	Local retention of logs, reports and events. Support for export to 3rd party storage
4.3	**NIMS Integration**	Support for SNMP, NTP / SNTP, DNS, Web Proxy integration
4.4	**3rd Party Integration**	Notification & Logging via SNMP, SMTP, SMS Gateway, and 3rd party integration via API hooks, CI/CD, Kubernetes
4.5	**SIEM Integration**	Support for integration with SIEM and Syslog services
4.6	**AAA Integration**	Support for integration via RADIUS and TACACS+
4.7	**Identity Management**	Inbuilt with support for integration with AD / SAML / LDAP
4.8	**Hybrid DDoS Integration**	Support for integration with Haltdos Cloud Scrubbing or ISP clean pipe services
4.9	**Export IOCs**	Support for exporting attacking IOCs via STIX / TAXII

OPERATION MODE

5.1	**Network Operations**	Transparent L2 or Inline L3
5.2	**Stateful Mode**	Stateful (Symmetric) or Stateless (Asymmetric) mode
5.3	**Supported Flow Ingestion**	Netflow v5, Netflow v9, sFlow, IPFIX
5.4	**Deployment Modes**	Offline (SPA port of Flow), Inline, Out-of-path
5.5	**IP Stack**	Dual IPv4 & IPv6 stack
5.6	**IP Fragmentation**	IP Defragmentation & TCP Stream assembly
5.7	**Jumbo Frames**	Yes
5.8	**Mitigation Modes**	Bypass, Record (Report Only), Learning, Mitigation (Block & Report)
5.9	**Networking**	VLAN, VXLAN, Link Aggregation & Trunking (LACP), Multiple Routing Tables, ARP Table etc
5.10	**Dynamic Routing**	BGP, OSFP, RIPv1/v2
5.11	**Link Aggregation**	Support for link bundling via LACP
5.12	**Tunnelling Protocols**	VLAN, MPLS, GRE, L2TP, GTP, IPinIP
5.13	**Block Action**	Drop Packet, Terminate Connection (RST), Blacklist (temporary or permanent), Send Challenge (TCP, HTTP, DNS), Rate Limiting

HIGH AVAILABILITY		
6.1	Hardware Bypass	Internal or External
6.2	Software Bypass	Yes
6.3	Multiple Appliances	N + 1 Active - Active or Active – Passive (VRRP) with floating MAC
6.4	Management Modes	Standalone / Centralized Management (VM or appliance)
6.5	Secure Communication	Secure communication between centralized management and HA appliances for full state synchronization
MANAGEMENT FEATURES		
7.1	Graphical User Interface (GUI)	Secure web interface over HTTPs with support for all modern browsers
7.2	Command Line Interface (CLI)	Command Line Interface over SSH or console port
7.3	System Management	IPMI 2.0 Compliant
7.4	Audit Trail, Logging & Recovery	Centralized logging of system, services, MIS, incidents. Built-in MIS with policy recovery
7.5	RBAC Administration	Configurable user profiles with role based access control
7.6	Policy Management	On the fly configuration updates on mitigation appliances
7.7	Dashboards & Reporting	Real-Time & historical dashboards with custom duration. Support for custom dashboards. Status dashboard for 1-click health check. Periodic daily, weekly or monthly reports in PDF or Excel
7.8	API integration	Yes (XML or JSON)
7.9	Events / Alerts	Detailed event and alert reporting on attack, health, etc.
7.10	Backup, Restore & Snapshots	Automatic or manual backup and restore. CLI tool for pushing current snapshot to Haltdos Cloud for diagnostics
7.11	Certificate Management	SSL/TLS certificate management with support for Let's Encrypt certificate generation
7.12	Network Forensics	Network forensic with packet capture and traceroute. Built-in utilities for investigating attacks, payloads and managing false positives
7.13	Updates	Periodic threat intel updates (Signatures, Geo IP, Bad IP, TOR IP, Anon Proxy, etc.) from Haltdos. Update and upgrade management on version releases and patch updates from Haltdos. Support for multiple OS Templates
ANTI-DDOS FEATURES		
8.1	Comprehensive Security	Layer 3 to Layer 7 protection covering Network, Protocol, Application, Reflection / Amplification and 0-day DDoS attacks
8.2	Bi-Directional	Support for both inbound and outbound traffic protection
8.3	Deep Packet Inspection	Protection against malformed packets (TCP, UDP, ICMP, Ping of death, DNS, HTTP, SIP, SNMP, IPv4, IPv6, Fragmented packets, etc.)
8.4	Enforce RFC Compliance	Protection against misbehaving clients sending invalid or out of state packets
8.5	Bot Protection	Automatic detection and blocking of bot traffic with support for manual bot policy
8.6	SSLI	Supports TLS 1.2 and TLS 1.3 with Perfect Forward Secrecy.

8.7	Behavior Analysis	Network behavior analysis for anomaly detection and packet scoring technology
8.8	Multiple Security Profiles	Support for multiple security profiles for enforcing different policy for different sub -networks (Src, Dst IP Prefix, VLAN). Default Global security profile
8.9	Rate Limit & QoS Management	Rate limit capability for bandwidth and QoS management with option for rate limit of specific traffic (based on proto, src, dst, etc.)
8.10	Blacklist / Whitelist	Support for temporary or permanent Blacklisting and Whitelisting based on IP, IP prefix, domain, country, etc
8.11	Malicious Source Protection	Protection against TOR IP, Bad Reputation IP, dark IP, known Bots, proxies, spammers provided by Haltdos or user defined threat intel
8.12	Custom Signatures	Support for user defined custom rules with support for REGEX and byte matching
8.13	DDos Detection & Mitigation	Attack detection & mitigation in less than 18s and 10s respectively
8.14	SYN Flood Protection	TCP SYN flood protection with SYN Proxy and connection aging
8.15	Hybrid DDoS Integration	Support for integration with Haltdos Cloud Scrubbing or ISP clean pipe services
8.16	Block Actions	Drop Packet, Terminate Connection (RST), Blacklist (temporary or permanent), Send Challenge (TCP, HTTP, DNS), Rate Limiting
8.17	Challenge & Response	Support for TCP, HTTP, DNS challenge and response for validation of traffic from suspicious sources
8.18	Connection Based Protection	Protection against TCP connection DDoS attacks such as sockstress, connection / src, zombie flood, SSL renegotiations, etc
8.19	DNS Protection	Built-in DNS firewall capability for protecting DNS infrastructure against DNS DDoS attacks (Water Torture, NXDomain, etc.)
8.20	L7 DDoS Protection	Protection against low & slow attacks such as Slowloris, R.U.D.Y., slow HTTP GET / POST, etc
8.21	Machine Learning Protection	Automatic learning counter measures and dynamic signature creation upon attack detection
8.22	Signatures for Known Vulnerabilities	Built-in rules for known vulnerabilities (server, web, mail, FTP, SIP, SQL, DNS, etc.)

LLB FEATURES (ADDITIONAL LICENCING)

9.1	NAT Rules	Support for static NAT, dynamic NAT, SNAT, DNAT, PAT, Full NAT
9.2	Health Monitoring	Link monitoring with instant failover (<1s). Support for TCP, HTTP, DNS, ICMP or script based monitoring
9.3	Routing Rules	Custom rules for Static and Policy based routing
9.4	Dual Stack Lite	Support for NAT 46 / 64 and DNS 46 / 64 with DNS Proxy
9.5	Traffic Shaping	Traffic shaping and QoS on inbound and outbound links
9.6	Load Balancing & Path Selection	Round robin (RR), weighted round robin, minimum packet loss, persistent hash, tuneable hash, least connections, least response time, least bandwidth, etc. Path selection based on jitter, packet loss, latency, etc.

GSLB FEATURES (ADDITIONAL LICENSING)

10.1	Global Load Balancing	Routing traffic across multiple data centers based on health checks
10.2	WAN load Balancing	Outbound WAN link selection based on link health
10.3	Operation Mode	Option for Authoritative or Recursive operational modes
10.4	Routing Rules	Custom rules for Static and Policy based routing
10.5	Network Mode	Support DNS over HTTP, UDP, TCP & SSL as well as DNSSEC
10.6	DNS Firewall	Protecting DNS infrastructure from bot attacks
10.7	Load Balancing Algorithm	Outbound WAN link selection based on link health
10.8	Blacklist / Whitelist	Support for permanent Blacklisting and Whitelisting based on IP, IP prefix, domain, country, etc
10.9	Custom Signature	Support for user defined custom rules with support for pattern, suffix, domain, etc.

HARDWARE FLEXIBILITY

Haltdos appliances are built on a common hardware platform with flexibility in mind. The appliances can be extended to provide remote, out-of-band management and monitoring, performance acceleration, and more with expansion modules

Expansion Module includes:

- Network Cards (copper or optical)
- Hardware Security Module (HSM) (non-FIPS and FIPS-140-2)
- SSL acceleration card
- Hard Disk & RAM

Hard Disk		
11.1	HD-DSK-128G-SSD	128 GB SSD Hard Disk
11.2	HD-DSK-256G-SSD	256 GB SSD Hard Disk
11.3	HD-DSK-512G-SSD	512 GB SSD Hard Disk
11.4	HD-DSK-1T-SSD	1 TB SSD Hard Disk
11.5	HD-DSK-1T-HDD	1 TB HDD Hard Disk
11.6	HD-DSK-2T-HDD	2 TB HDD Hard Disk
11.7	HD-DSK-4T-HDD	4 TBHDD Hard Disk

SSL Cards

	Part Code	Throughput			SSL TPS
12.1	HD-SSL-25G	SSL	25 Gbps	RSA	40
		Compression	20 Gbps	ECC	25K
12.2	HD-SSL-50G	SSL	50 Gbps	RSA	95K
		Compression	37 Gbps	ECC	48K

NIC Cards

	Part Code	Description	Copper/Fiber	Hardware Bypass
13.1				
13.2	HD-NIC-1x4C	Quad Port 1 Gbps	Copper	No
13.3	HD-NIC-1x4CB	Quad Port 1 Gbps	Copper	Yes
13.4	HD-NIC-1x4F	Quad Port 1 Gbps	Fiber (Single / Multi-Mode)	No
13.5	HD-NIC-10x2C	Dual Port 10 Gbps	Copper	No
13.6	HD-NIC-10x2CB	Dual Port 10 Gbps	Copper	Yes
13.7	HD-NIC-10x2F	Dual Port 10 Gbps	Fiber (Single / Multi-Mode)	No
13.8	HD-NIC-10x2FB	Dual Port 10 Gbps	Fiber (Single / Multi-Mode)	Yes
13.9	HD-NIC-10x4F	Quad Port 10 Gbps	Fiber (Single / Multi-Mode)	No
13.10	HD-NIC-10x4FB	Quad Port 10 Gbps	Fiber (Single / Multi-Mode)	Yes
13.11	HD-NIC-25x2F	Dual Port 25 Gbps	Fiber (Single / Multi-Mode)	No
13.12	HD-NIC-25x2FB	Dual Port 25 Gbps	Fiber (Single / Multi-Mode)	Yes
13.13	HD-NIC-25x4F	Quad Port 25 Gbps	Fiber (Single / Multi-Mode)	No
13.14	HD-NIC-25x4FB	Quad Port 25 Gbps	Fiber (Single / Multi-Mode)	Yes
13.15	HD-NIC-40x2F	Dual Port 40 Gbps	Fiber (Single / Multi-Mode)	No
13.16	HD-NIC-40x2FB	Dual Port 40 Gbps	Fiber (Single / Multi-Mode)	Yes
13.17	HD-NIC-40x4F	Quad Port 40 Gbps	Fiber (Single / Multi-Mode)	No
13.18	HD-NIC-40x4FB	Quad Port 40 Gbps	Fiber (Single / Multi-Mode)	Yes
13.19	HD-NIC-100x2F	Dual Port 100 Gbps	Fiber (Single / Multi-Mode)	No
13.20	HD-NIC-100x2FB	Dual Port 100 Gbps	Fiber (Single / Multi-Mode)	Yes
13.21	HD-NIC-100x4F	Quad Port 100 Gbps	Fiber (Single / Multi-Mode)	No
13.22	HD-NIC-100x4FB	Quad Port 100 Gbps	Fiber (Single / Multi-Mode)	Yes

RAM

14.1	HD-RAM-8G	8 GB DDR4 RAM
14.2	HD-RAM-16G	16 GB DDR4 RAM
14.3	HD-RAM-32G	32 GB DDR4 RAM
14.4	HD-RAM-64G	64 GB DDR4 RAM