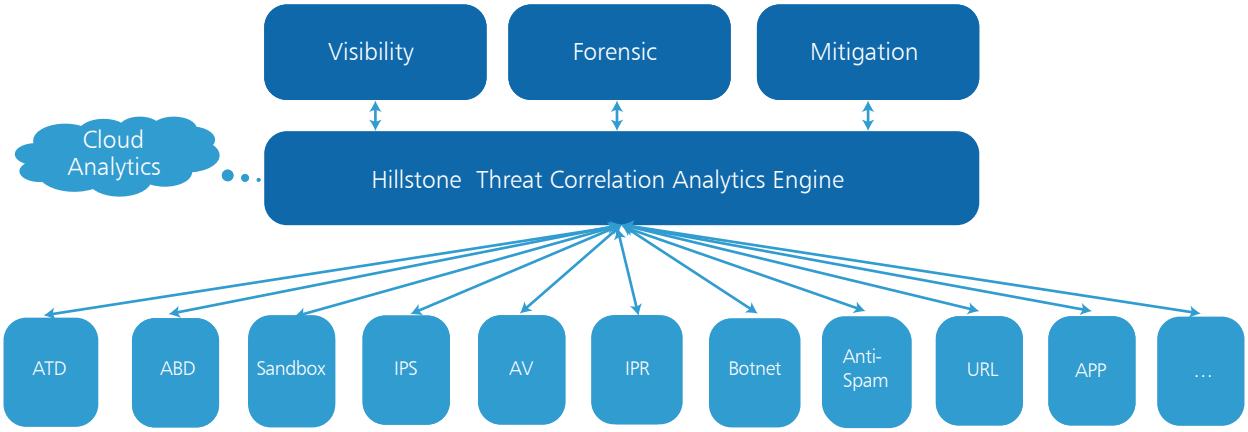
Hillstone T-Series

Intelligent Next-Generation Firewall

Hillstone's T-Series intelligent Next-Generation Firewall (iNGFW) uses three key technologies to detect advanced attacks and provide continuous threat defense for today's networks. First, it uses statistical clustering to detect unknown malware, leveraging the patented Hillstone Advanced Threat Detection engine (ATD). Second, it uses behavioral analytics to detect anomalous network behavior, which is based on the Hillstone Abnormal Behavior Detection engine (ABD). Finally, it leverages the Hillstone threat correlation analysis engine to correlate threat events detected by disparate engines – including ATD, ABD, Sandbox and other traditional signature-based threat detection technologies – along with context information to identify advanced threats.

With deep detection and threat analytics capabilities, Hillstone's iNGFW provides customers with comprehensive visibility of the network risk status, as well as threat details of each host. The Hillstone iNGFW provides administrators with forensic information from different tools and paths, in order to drill down to the root cause of an attack. In addition, the Hillstone iNGFW empowers the administrator with powerful mitigation functions, which can buy time for administrators to examine the forensic data, make an informed decision about the authenticity of the attack, and minimize the business damage.



Product Highlight

Unknown Malware Detection

Hillstone has built a proprietary engine that has analyzed close to a million "known" malware samples. Each sample has been classified and characterized based on multiple dimensions that describe its actions, assets and attributes. In a production environment, when new malware is encountered, it is also analyzed, characterized and classified. Then it is compared to the database of known malware samples that have already been analyzed. The closer the unknown sample matches a known sample - the higher the confidence level that it is a variant of a known malware sample. This process is called "statistical clustering" and provides an accurate method for identifying new malware.

Abnormal Behavior Detection

Hillstone's Abnormal Behavior engine continuously monitors the network to learn what normal network traffic looks like for that particular day, time, and month; providing alerts when network activity exceeds calculated thresholds. It uses a 50+ dimensional array to calculate normal network traffic from layer L4-L7, called "behavior modeling." In addition, it has been trained with real hacking tools to ensure that it will readily recognize malicious activity. These techniques limit false positives and provide the user with multiple opportunities to stop an attack.

Rich Forensic Analysis

The Hillstone E-6000 Series NGFW provides real-time protection for applications from network attacks including viruses, spyware, worms, botnets, ARP spoofing, DoS/DDoS, Trojans, buffer overflows, and SQL injections. It incorporates a unified threat detection engine that shares packet details with multiple security engines (AD, IPS, URL filtering, Anti-Virus, Sandbox etc.), which significantly enhances the protection efficiency and reduces network latency.

Preemptive Mitigation

In addition to the ability to make a policy change to prevent an attack, Hillstone has built-in several automatic mitigation features. These features consist of pre-defined templates that automatically slow-down or block an attack if suspicious behavior is detected. The administrator can modify the templates to limit the bandwidth or the number of sessions available to the attacker. He can also adjust the constraints he places on network resources based on the type of attack and the severity level. In cases where the attack is critical and the confidence level is high, mitigation can include a complete blockage of all network resources. And, if a template does not exist or is not active, the administrator can quickly set up a temporary mitigation for that event.

Features

Threat Correlation Analytics
- Correlation among unknown threats, abnormal behavior and application behavior to discover potential threat or attacks
- Multi-dimension correlation rules, automatic daily update from the cloud

Advanced Threat Detection
- Behavior-based advanced malware detection
- Detection of more than 2000 known and unknown malware families including Virus, Worm, Trojan, Overflow etc
- Real-time, online, malware behavior model database update

Abnormal Behavior Detection
- Behavior modeling based on L3-L7 baseline traffic to reveal anomalous network behavior, such as HTTP scanning, Spider, SPAM, SSH/FTP weak password
- Detection of DDoS including Flood, Sockstress, zip of death, reflect, DNS query, SSL DDos and application DDoS
- Supports inspection of encrypted tunneling traffic for unknown applications
- Detect C&C attack using Domain Generation Algorithm (DGA)
- Real-time, online, abnormal behavior model database update

Threat Visibility and Mitigation
- Network risk index, critical assets and host risk status, host and threat risk severity and certainty
- Kill chain mapping of threat events on each host
- Threat forensic including threat analysis, knowledge base, history and PCAP
- Predefined and customized mitigation rules
- Support threat whitelist

Network Services
- Dynamic routing (OSPF, BGP, RIPv2)
- Static and Policy routing
- Route controlled by application
- Built-in DHCP, NTP, DNS Server and DNS proxy
- Tap mode – connects to SPAN port
- Interface modes: sniffer, port aggregated, loopback, VLANS (802.1Q and Trunking)
- L2/L3 switching & routing
- Virtual wire (Layer 1) transparent inline deployment

Firewall
- Operating modes: NAT/route, transparent (bridge), and mixed mode
- Policy objects: predefined, custom, and object grouping
- Security policy based on application, role and geo-location
- Application Level Gateways and session support: MSRCP, PPTP, RAS, RSH, SIP, FTP, TFTP, HTTP, dcerpc, dns-tcp, dns-udp, H.245 0, H.245 1, H.323
- NAT and ALG support: NAT46, NAT64, NAT444, SNAT, DNAT, PAT, Full Cone NAT, STUN
- NAT configuration: per policy and central NAT table
- VoIP: SIP/H.323/SCCP NAT traversal, RTP pin holing
- Global policy management view
- Security policy redundancy inspection, policy group, policy configuration rollback
- Policy Assistant for easy detailed policy deployment
- Policy analyzing and invalid policy cleanup
- Comprehensive DNS policy
- Schedules: one-time and recurring

Intrusion Prevention
- Protocol anomaly detection, rate-based detection, custom signatures, manual, automatic push or pull signature updates, integrated threat encyclopedia
- IPS Actions: default, monitor, block, reset (attackers IP or victim IP, incoming interface) with expiry time
- Packet logging option
- Filter Based Selection: severity, target, OS, application or protocol
- IP exemption from specific IPS signatures
- IDS sniffer mode
- IPv4 and IPv6 rate based DoS protection with threshold settings against TCP Syn flood, TCP/UDP/SCTP port scan, ICMP sweep, TCP/UDP/SCIP/ICMP session flooding (source/destination)
- Active bypass with bypass interfaces
- Predefined prevention configuration

Anti-Virus
- Manual, automatic push or pull signature updates
- Flow-based Antivirus: protocols include HTTP, SMTP, POP3, IMAP, FTP/SFTP
- Compressed file virus scanning

Attack Defense
- Abnormal protocol attack defense
- Anti-DoS/DDoS, including SYN Flood, DNS Query Flood defense
- ARP attack defense

URL Filtering
- Flow-based web filtering inspection
- Manually defined web filtering based on URL, web content and MIME header
- Dynamic web filtering with cloud-based real-time categorization database: over 140 million URLs with 64 categories (8 of which are security related)
- Additional web filtering features:
  - Filter Java Applet, ActiveX or cookie
  - Block HTTP Post
  - Log search keywords
  - Exempt scanning encrypted connections on certain categories for privacy
- Web filtering profile override: allows administrator to temporarily assign different profiles to user/group/IP
- Web filter local categories and category rating override

Anti-Spam
- Real-time Spam Classification and Prevention
- Confirmed Spam, Suspected Spam, Bulk Spam, Valid Bulk
- Protection Regardless of the language, format, or content of the message
- Support both SMTP and POP3 email protocols
- Inbound and outbound detection
- White lists to allow emails from trusted domains

Cloud-Sandbox
- Upload malicious files to cloud sandbox for analysis
- Support protocols including HTTP/HTTPS, POP3, IMAP, SMTP and FTP
- Support file types including PE,ZIP, RAR, Office, PDF, APK, JAR and SWF
- File transfer direction and file size control
- Provide complete behavior analysis report for malicious files
- Global threat intelligence sharing, real-time threat blocking
- Support detection only mode without uploading files

Botnet C&C Prevention
- Discover intranet botnet host by monitoring C&C connections and block further advanced threats such as botnet and ransomware
- Regularly update the botnet server addresses
- Prevention for C&C IP and domain
- Support TCP, HTTP, and DNS traffic detection
- IP and domain whitelists

IP Reputation
- Identify and filter traffic from risky IPs such as botnet hosts, spammers, Tor nodes, breached hosts, and brute force attacks
- Logging, dropping packets, or blocking for different types of risky IP traffic
- Regular IP reputation signature database upgrade

SSL Decryption
- Application identification for SSL encrypted traffic
- IPS enablement for SSL encrypted traffic
- AV enablement for SSL encrypted traffic
- URL filter for SSL encrypted traffic
- SSL Encrypted traffic whitelist
- SSL proxy offload mode

Endpoint Identification and Control
- Support to identify endpoint IP, endpoint quantity, on-line time, off-line time, and on-line duration
- Support 10 operation systems including Windows, iOS, Android, etc.
- Support query based on IP, endpoint quantity, control policy and status etc.
- Support the identification of accessed endpoints quantity across layer 3, logging and interference on overrun IP
- Redirect page display after custom interference operation
- Supports blocking operations on overrun IP

Data Security
- File transfer control based on file type, size and name
- File protocol identification, including HTTP, FTP, SMTP and POP3
- File signature and suffix identification for over 100 file types
- IM identification and network behavior audit
- Filter files transmitted by HTTPS using SSL Proxy

Application Control
- Over 4,000 applications that can be filtered by name, category, subcategory, technology and risk
- Each application contains a description, risk

Features (Continued)

factors, dependencies, typical ports used, and URLs for additional reference
- Actions: block, reset session, monitor, traffic shaping
- Identify and control cloud applications in the cloud
- Provide multi-dimensional monitoring and statistics for cloud applications, including risk category and characteristics

Quality of Service (QoS)
- Max/guaranteed bandwidth tunnels or IP/user basis
- Tunnel allocation based on security domain, interface, address, user/user group, server/server group, application/app group, TOS, VLAN
- Bandwidth allocated by time, priority, or equal bandwidth sharing
- Type of Service (TOS) and Differentiated Services (DiffServ) support
- Prioritized allocation of remaining bandwidth
- Maximum concurrent connections per IP
- Bandwidth allocation based on URL category
- Bandwidth limit by delaying access for user or IP
- Automatic expiration cleanup and manual cleanup of user used traffic

Server Load Balancing
- Weighted hashing, weighted least-connection, and weighted round-robin
- Session protection, session persistence and session status monitoring
- Server health check, session monitoring and session protection

Link Load Balancing
- Bi-directional link load balancing
- Outbound link load balancing includes policy based routing, ECMP and weighted, embedded ISP routing and dynamic detection
- Inbound link load balancing supports SmartDNS and dynamic detection
- Automatic link switching based on bandwidth, latency, jitter, connectivity, application etc.
- Link health inspection with ARP, PING, and DNS

VPN
- IPSec VPN:
  - IPSEC Phase 1 mode: aggressive and main ID protection mode
  - Peer acceptance options: any ID, specific ID, ID in dialup user group
  - Supports IKEv1 and IKEv2 (RFC 4306)
  - Authentication method: certificate and pre-shared key
  - IKE mode configuration support (as server or client)
  - DHCP over IPSEC
  - Configurable IKE encryption key expiry, NAT traversal keep alive frequency
  - Phase 1/Phase 2 Proposal encryption: DES, 3DES, AES128, AES192, AES256
  - Phase 1/Phase 2 Proposal authentication: MD5, SHA1, SHA256, SHA384, SHA512
  - Phase 1/Phase 2 Diffie-Hellman support: 1,2,5
  - XAuth as server mode and for dialup users
  - Dead peer detection
  - Replay detection
  - Autokey keep-alive for Phase 2 SA
- IPSEC VPN realm support: allows multiple custom SSL VPN logins associated with user groups (URL paths, design)
- IPSEC VPN configuration options: route-based or policy based
- IPSEC VPN deployment modes: gateway-to-gateway, full mesh, hub-and-spoke, redundant tunnel, VPN termination in transparent mode
- One time login prevents concurrent logins with the same username
- SSL portal concurrent users limiting
- SSL VPN port forwarding module encrypts client data and sends the data to the application server
- Supports clients that run iOS, Android, and Windows XP/Vista including 64-bit Windows OS
- Host integrity checking and OS checking prior to SSL tunnel connections
- MAC host check per portal
- Cache cleaning option prior to ending SSL VPN session
- L2TP client and server mode, L2TP over IPSEC, and GRE over IPSEC
- View and manage IPSEC and SSL VPN connections
- PnPVPN

IPv6
- Management over IPv6, IPv6 logging and HA
- IPv6 tunneling, DNS64/NAT64 etc
- IPv6 routing including static routing, policy routing, ISIS, RIPng, OSPFv3 and BGP4+
- IPS, Application identification, Anti-Virus, Access control, ND attack defense, iQoS
- Track address detection

VSYS
- System resource allocation to each VSYS
- CPU virtualization
- Non-root VSYS support firewall, IPSec VPN, SSL VPN, IPS, URL filtering
- VSYS monitoring and statistic

High Availability
- Redundant heartbeat interfaces
- Active/Active and Active/Passive
- Standalone session synchronization
- HA reserved management interface
- Failover:
  - Port, local & remote link monitoring
  - Stateful failover
  - Sub-second failover
  - Failure notification
- Deployment options:
  - HA with link aggregation
  - Full mesh HA
  - Geographically dispersed HA

User and Device Identity
- Local user database
- Remote user authentication: TACACS+, LDAP, Radius, Active
- Single-sign-on: Windows AD
- 2-factor authentication: 3rd party support, integrated token server with physical and SMS
- User and device-based policies
- User group synchronization based on AD and LDAP
- Support for 802.1X, SSO Proxy
- WebAuth page customization
- Interface based Authentication
- Agentless ADSSO (AD Polling)
- Use authentication synchronization based on SSO-monitor
- Support MAC-based user authentication

Administration
- Management access: HTTP/HTTPS, SSH, telnet, console
- Central Management: Hillstone Security Manager (HSM), web service APIs
- System Integration: SNMP, syslog, alliance partnerships
- Rapid deployment: USB auto-install, local and remote script execution
- Dynamic real-time dashboard status and drill-in monitoring widgets
- Language support: English

Logs & Reporting
- Logging facilities: local memory and storage (if available), multiple syslog servers and multiple Hillstone Security Audit (HSA) platforms
- Encrypted logging and log integrity with HSA scheduled batch log uploading
- Reliable logging using TCP option (RFC 3195)
- Detailed traffic logs: forwarded, violated sessions, local traffic, invalid packets, URL etc.
- Comprehensive event logs: system and administrative activity audits, routing & networking, VPN, user authentications, WiFi related events
- IP and service port name resolution option
- Brief traffic log format option
- Three predefined reports: Security, Flow and network reports
- User defined reporting
- Reports can be exported in PDF, Word and HTML via Email and FTP

Statistics and Monitoring
- Application, URL, threat events statistic and monitoring
- Real-time traffic statistic and analytics
- System information such as concurrent session, CPU, Memory and temperature
- iQOS traffic statistic and monitoring, link status monitoring
- Support traffic information collection and forwarding via Netflow (v9.0)

CloudView
- Cloud-based security monitoring
- 7/24 access from web or mobile application
- Device status, traffic and Threat monitoring
- Cloud-based log retention and reporting

Specifications

	SG-6000-T1860	SG-6000-T2860	SG-6000-T3860	SG-6000-T5060	SG-6000-T5860
					
FW Throughput (1)	8 Gbps	10 Gbps	20 Gbps	25 Gbps	40 Gbps
IPS Throughput (2)	3 Gbps	4 Gbps	8 Gbps	12 Gbps	18 Gbps
AV Throughput (3)	1.6 Gbps	2 Gbps	6 Gbps	7 Gbps	10 Gbps
IPSec Throughput (4)	3 Gbps	3.8 Gbps	12 Gbps	15 Gbps	28 Gbps
IMIX Throughput (5)	1.6 Gbps	2.1 Gbps	8.2 Gbps	10.9 Gbps	17.4 Gbps
NGFW Throughput (6)	1 Gbps	1.5 Gbps	5 Gbps	8 Gbps	12 Gbps
Threat Protection Throughput (7)	600 Mbps	900 Mbps	2.5 Gbps	4 Gbps	6 Gbps
New Sessions/s (8)	80,000	100,000	250,000	300,000	450,000
Maximum Concurrent Sessions (Standard/Maximum)	1.5 Million	3 Million	4 Million	5 Million	6 Million
IPSec Tunnel Number	6,000	10,000	20,000	20,000	20,000
SSL VPN Users (Default/Max)	8 / 4,000	8 / 6,000	128 / 10,000	128 / 10,000	128 / 10,000
Virtual Systems (Default/Max)	1 / 50	1 / 50	1 / 100	1 / 250	1 / 250
Integrated I/O	6 × GE, 4 × SFP	6 × GE(1 pair bypass port), 4 × SFP, 2 × SFP+	2 × GE, 4 × SFP	2 × GE, 4 × SFP	2 × GE, 4 × SFP
Maximum I/O	26 × GE	26 × GE, 2 × 10GE	22 × GE, 4 × 10GE	38 × GE, 8 × 10GE	38 × GE, 16 × 10GE
Expansion Modules	2 × Generic Slot	2 × Generic Slot	2 × Generic Slot	4 × Generic Slot	4 × Generic Slot
Expansion Module Option	IOC-4GE-B-M, IOC-8GE-M, IOC-8SFP-M	IOC-4GE-B-M, IOC-8GE-M, IOC-8SFP-M	IOC-4GE-B-M, IOC-8GE-M, IOC-8SFP-M, IOC-2SFP+-Lite	IOC-8GE-M, IOC-8SFP-M, IOC-4GE-B-M, IOC-8SFP+, IOC-4SFP+, IOC-2SFP+-Lite	IOC-8GE-M, IOC-8SFP-M, IOC-4GE-B-M, IOC-8SFP+, IOC-4SFP+, IOC-2SFP+-Lite
Management Ports	1 × Concole Port, 1 × HA, 1 ×MGT, 1 × USB 2.0, 1 × AUX Port	1 × Concole Port, 1 × HA, 1 ×MGT, 1 × USB 2.0, 1 × AUX Port	1 × Console Port, 1 × AUX Port, 1 × USB 2.0 Port, 2 × HA, 1 × MGT	1 × Console Port, 1 × AUX Port, 1 × USB 2.0 Port, 2 × HA, 1 × MGT	1 × Console Port, 1 × AUX Port, 1 × USB 2.0 Port, 2 × HA, 1 × MGT
Maximum Power Consumption	1 × 150w Redundancy 1 + 1	1 × 150w Redundancy 1 + 1	2 × 450W Redundancy 1 + 1	2 × 450W Redundancy 1 + 1	2 × 450W Redundancy 1 + 1
Storage	480G SSD (960G SSD Optional)	480G SSD (960G SSD Optional)	Dual Storage: 120G (480G or 960G SSD Optional) +480G SSD (960G SSD Optional)	Dual Storage: 120G (480G or 960G SSD Optional) +480G SSD (960G SSD Optional)	Dual Storage: 120G (480G or 960G SSD Optional) +1T HDD (960G SSD Optional)
Power Supply	AC 100-240V 50/60Hz DC -40 ~ -60V	AC 100-240V 50/60Hz	AC 100-240V 50/60Hz DC -40 ~ -60V	AC 100-240V 50/60Hz DC -40 ~ -60V	AC 100-240V 50/60Hz
Dimension (W×D×H, mm)	1U 17.2 x 14.4 x 1.7 in (436 x 366 x 44 mm)	1U 17.2 x 14.4 x 1.7 in (436 x 366 x 44 mm)	2 U 17.3 × 20.5 × 3.5 in (440 × 520 × 88 mm)	2 U 17.3 × 20.5 × 3.5 in (440 × 520 × 88 mm)	2 U 17.3 × 20.5 × 3.5 in (440 × 520 × 88 mm)
Weight	12.3lb (5.6 kg)	12.3lb (5.6 kg)	34.2 lb (15.5 kg)	34.8 lb (15.8 kg)	34.8 lb (15.8 kg)
Temperature	32-104 F (0-40°C)	32-104 F (0-40°C)	32-104 F (0-40°C)	32-104 F (0-40°C)	32-104 F (0-40°C)
Relative Humidity	10-95% (no dew)	10-95% (no dew)	10-95% (no dew)	10-95% (no dew)	10-95% (no dew)
Compliance and Certificate	CE, CB, FCC, UL/cUL, ROHS, IEC/EN61000-4-5 Power Surge Protection, ISO 9001:2015, ISO 14001:2015, CVE Compatibility, IPv6 Ready, ICSA Firewalls				

Module Options

	IOC-8GE-M	IOC-8SFP-M	IOC-4GE-B-M	IOC-2SFP+-Lite	IOC-8SFP+	IOC-4SFP+
						
Names	8GE Extension Module	8SFP Extension Module	4GE Bypass Extension Module	2SFP+ Extension Module	8SFP+ Extension Module	4SFP+ Extension Module
I/O Ports	8 x GE	8 x SFP, SFP module not included	4 x GE Bypass (2 pair bypass ports)	2 x SFP+, SFP+ module not included	8 x SFP+, SFP+ module not included	4 x SFP+, SFP+ module not included
Dimension	½U (Occupies 1 generic slots)	½U (Occupies 1 generic slots)	½U(Occupies 1 generic slots)	½ U (Occupies 1 generic slot)	1 U (Occupies 2 generic slots)	1 U (Occupies 2 generic slots)
Weight	1.8 lb (0.8kg)	2.0 lb (0.9kg)	1.8 lb (0.8kg)	0.7 lb (0.3kg)	1.5 lb (0.7kg)	1.5 lb (0.7kg)

NOTES:

(1) FW throughput data is obtained under single-stack UDP traffic with 1518-byte packet size;
(2) IPS throughput data is obtained under bi-direction HTTP traffic detection with all IPS rules being turned on;
(3) AV throughput data is obtained under HTTP traffic with file attachment;
(4) IPSec throughput data is obtained under Preshare Key AES256+SHA-1 configuration and 1400-byte packet size packet;
(5) IMIX throughput data is obtained under UDP traffic mix (64 byte : 512 byte : 1518 byte =5:7:1);
(6) NGFW throughput data is obtained under 64 Kbytes HTTP traffic with application control and IPS enabled;
(7) Threat protection throughput data is obtained under 64 Kbytes HTTP traffic with application control, IPS, AV, URL filtering, ABD and ATD enabled;
(8) New Sessions/s is obtained under TCP traffic.
Unless specified otherwise, all performance, capacity and functionality are based on StoneOS5.5R7. Results may vary based on StoneOS® version and deployment.

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