

DATASHEET

High Speed Verifier (HSV)

Elevated security for air-gapped networks through hardware enforcement

High Speed Verifier (HSV) is Everfox's next-generation data verifier.

For customers that need to ensure data integrity and more secure two-way communication, Everfox HSV combines the best of data transfer solutions with the added benefits of dual one-way data transfer and built-in threat removal.

As a bi-directional data verifier, the way the HSV conveys information and hides the attack surface of the destination server makes it suitable for protecting Government, defense and Top-Secret systems.

Challenge

Global governments and industries operate in an increasingly interconnected world, where secure communication and data transfer are paramount for safeguarding classified information. The challenge to protect sensitive data and ensure effectiveness of operations is crucial in an ever-shifting landscape.

Solution

A hardsec device that connects two networks together. Implementing a protocol break and data break entirely in hardware logic.

Resulting in protection against software vulnerabilities that can undermine the control it imposes.

Benefits

- Assured network separation
- Two independent one way flows
- Supports non-stop operation
- Provides the strength of an air-gap with the convenience of a network connection
- Byte-level content inspection and sanitization
- Over-the-wire firmware updates
- Built in line with best practices as recommended by various governing bodies and the UK National Cyber Security Centre (NCSC)

Hardware logic protocol break

Data passes into and out of the HSV using TCP handled by protocol proxies running on network processors associated with each network interface.

The proxies communicate with the logic verifier using a simple protocol across raw Ethernet, thus, no TCP or IP protocols pass across the verifier giving a protocol break.

As the protocol is simple enough to be implemented in logic, this implementation is fully independent of the software implementation in the proxies, assuring the function of the protocol break.

- Protocol break enforced by hardware logic
- Protocol breaks enforced between all three networks – two data and one management

Hardware logic data break

The logic verifier inside the HSV deals with a simple protocol and a simple data format for structured data. Application protocols and data formats are converted by software, but the logic verifies that the simple protocol is followed, and the data meets the strong constraints defined by the application.

The data received is never delivered, giving an assured data break. This data break is built on top of the protocol break that comes from converting the application protocol into the simple protocol that's implemented by the logic.

- Semantic verification in hardware logic
- Byte stream operation at line speed for low-latency verification
- Data break enforced between all three networks – two data and one management

Device Management

Each HSV has a digital identity, used to allow the administrator to authenticate the device. The identity is managed by a dedicated micro-controller and is linked to the secure boot of the device. Administrators authenticate to the device using SSH.

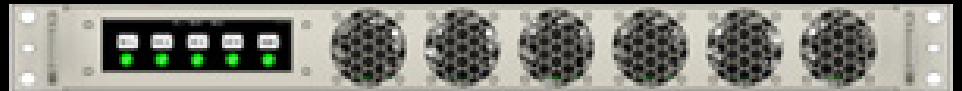
- Software and firmware authenticity checked on every boot
- Monitoring through SNMP, syslog and StatsD
- Chassis tamper detection

Physical

The HSV is a 1U chassis suitable for running in an air conditioned server room environment in a 19" rack. Up to 4 independent logic verifiers can be installed in a single chassis giving a small footprint. The chassis' LCD touch panel display can be used to identify and review the status of an installed device.

- Compact deployments, with 4 verifiers in 1U
- Dual redundant hot-swappable power supply
- SFP network interfaces

Front View



Back View



Software Development Kit (SDK)

To embed an HSV into custom cross domain applications, the HSV SDK is used by application developers to prepare data for passing through the verifier. The SDK provides or creates an interface that allows the application to serialise /de-serialise the data structures that are to be exchanged.

The data is passed through the HSV using standard networking protocols.

- Boolean, integer, float and binary coded decimal types
- Unicode character string and binary string types
- Arrays, lists and choice structures
- Constrained number ranges and string, array and list lengths

Note: A separate SDK is provided for transforming complex file formats into verifiable data structures, supporting common file formats such as internet imagery and Microsoft Office.

Non-bypassable verification

Using hardware-based data extraction and verification means that the verification process is non-bypassable: it cannot be circumvented. The HSV also supports non-stop operation, with built-in high availability and failover features.

Upgrade and enjoy unparalleled performance

Replace cumbersome and inflexible traditional data diodes with a disk-less solution that verifies threats are removed from data crossing the electronic air gaps at near line speed.

OPERATING ENVIRONMENT (SYSTEM)

Operating temperature range: 10 - 40°C (50° to 104°F)

Non-operating temperature range: -20 - 70°C (04° to 158°F)

Humidity range: 40 - 60% non-condensing

Non-operating/humidity range: 30 - 70% non-condensing

STORAGE (PER VERIFIER)

Type: Serial NOR Flash (for system images)

Number of Disks: N/A

RAID: N/A

Hot-swappable: N/A

Memory: 3 x 128 Mbyte

Disk MTBF: N/A

INTERFACES (PER VERIFIER)

Networking: 3 x 1000BASE-T copper Ethernet, or 3 x 1000BASE-SX multi-mode fiber, LC connector, 850nm

DVD-RW: N/A

USB ports: N/A

Serial: N/A

IPMI: N/A

DEPLOYMENT

Indicators: Tamper detection Verifier status, fault indicator, fan speeds on LCD

Warranty: 1-year warranty

Accessibility: N/A

Power supplies: 2 (redundant, hot-swappable)

Power supplies MTBF: 100,000 hours

Connectivity: HSV002 connects into standard network infrastructure

TECHNICAL SPECIFICATIONS

Chassis

Unit size: Height: 4.4cm (1.7in.) x Width: 48.2cm (19.0in.) x Depth: 36.9cm (14.5in.)

Unit weight: Up to 11.1kg (24.5 lbs)

System cooling: 6 x 40mm, 2,900 - 15,600 RPM axial fan, front to back air flow

Fan MTBF: 70,000 hours (@ +40°C)

Finish: Smooth finish powder coat in white and silver

Power (dual power supplies)

AC voltage: Minimum 90, Nominal 100-240, Maximum 264 VAC

Power: 25W

Processors & memory (per verifier)

Number of processors: 3 (one for each network interface)

Processor cores: 4

Processor: NXP QorIQ LS1043A

Processor MTBF: N/A

Memory: 3 x 4 Gbyte DDR4

DISPLAYS (PER CHASSIS)

Front panel LCD: Touchscreen

VGA: N/A

VERIFIER STATE MACHINE (PER VERIFIER)

Maximum states (2B): 65535

Maximum choices: 16384

Maximum number of ranges: 4096

Concurrent channels: 1024

State stack: 16

Counter stack: 16