# Symantec Corporation
# Security Analytics S500 Appliances

Models: SA-S500-10-CM, SA-S500-20-FA, SA-S500-30-FA, SA-S500-40-FA
Hardware Versions: 090-03645, 080-03938, 090-03646, 080-03939, 090-03648, 080-03940, 090-03649, and 080-03941
FIPS Security Kit Version: HW-KIT-FIPS-500
Firmware Version: 7.2.3

## FIPS 140-2 Non-Proprietary Security Policy

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# 1. Introduction

## 1.1 Purpose

This is a *Non-Proprietary Cryptographic Module Security Policy* for the Security Analytics S500 Appliance (090-03645, 080-03938, 090-03646, 080-03939, 090-03648, 080-03940, 090-03649, and 080-03941; 7.2.3) from Symantec Corporation. This *Non-Proprietary Security Policy* describes how the Security Analytics S500 Appliance meets the security requirements of Federal Information Processing Standards (FIPS) Publication 140-2, which details the U.S. and Canadian Government requirements for cryptographic modules. More information about the FIPS 140-2 standard and validation program is available on the National Institute of Standards and Technology (NIST) and the Communications Security Establishment (CSE) Cryptographic Module Validation Program (CMVP) website at http://csrc.nist.gov/groups/STM/cmvp.

This document also describes how to run the appliance in the Approved mode of operation. This policy was prepared as part of the 2 validation of the module. The Security Analytics S500 Appliance is referred to in this document as SA S500 Appliance, crypto module, or module.

## 1.2 References

This document deals only with operations and capabilities of the module in the technical terms of a FIPS 140-2 cryptographic module security policy. More information is available on the module from the following sources:

- The Symantec website (www.symantec.com) contains information on the full line of products from Symantec.
- The CMVP website (http://csrc.nist.gov/groups/STM/cmvp/documents/140-1/140val-all.htm) contains contact information for individuals to answer technical or sales-related questions for the module.

## 1.3 Document Organization

The *Non-Proprietary Security Policy* document is one document in a FIPS 140-2 Submission Package. In addition to this document, the Submission Package contains:

- *Vendor Evidence* document
- *Finite State Model* document
- *Submission Summary* document
- Other supporting documentation as additional references

With the exception of this *Non-Proprietary Security Policy*, the FIPS 140-2 Submission Package is proprietary to Symantec and is releasable only under appropriate non-disclosure agreements. For access to these documents, please contact Symantec.

# 2. Security Analytics S500 Appliance

## 2.1 Overview

The Security Analytics Appliances (SA-S500-10-CM, SA-S500-20-FA, SA-S500-30-FA, and SA-S500-40-FA) are part of Symantec's Security Platform's Incident Response and Forensics solutions. The turnkey, pre-configured appliances harness the Security Analytics software to capture, index and classify all network traffic (including full packets) in real time. This data is stored in an optimized file system for rapid analysis, instant retrieval and complete reconstruction to support all your incident response activities. The appliances can be deployed anywhere in the network: at the perimeter, in the core, in a 10 GbE backbone, or at a remote link to deliver clear, actionable intelligence for swift incident response and resolution and real-time network forensics.

Security Analytics helps you visualize and analyze network data and uncover specific network activity – without requiring specific knowledge of networking protocols and packet analysis methods. Its powerful features let you locate and reconstruct specific communication flows, as well as network and user activities, within seconds. The platform does this by classifying captured network traffic packets and identifying meaningful data flows. A flow is the collection of packets that comprises a single communication between two specific network entities. Within a particular data flow, you can then identify and examine network artifacts such as image files, Word documents, emails, and video, as well as executable files, HTML files, and more. Security Analytics also allows you to reconstruct HTML pages, emails, and instant messaging conversations.

Security Analytics also provides the ability to do real-time, policy-based artifact extraction, and is not limited to any specific operating system (OS) environment. Extracted artifacts can be automatically placed in centralized network repositories for analysis by superior forensics tools within Security Analytics. These artifacts are hashed and stored for future retrospection on newly discovered malware variants and provide a method to understand relatedness to preexisting hashes. The Central Manager Appliance (SA-S500-10-CM) facilitates federated queries on hundreds of Security Analytics Forensic Appliances (SA-S500-20-FA, SA-S500-30-FA, and SA-S500-40-FA) to provide a 360-degree view of activity across the entire enterprise network including perimeter, data centers, and remote offices.

In a typical deployment, the Security Analytics Forensic Appliance receives mirrored traffic from a SPAN port or network tap. The traffic enters the appliance through one or more Ethernet ports, also known as capture interfaces. The Forensic Appliances can be integrated with leading security network and endpoint solutions for a full network-to-endpoint view of any malicious activity, delivering prompt and precise attack resolution. The Central Manager Platform is a dedicated appliance that sits on the network alongside the Forensic Appliances to provide an aggregated view of data across multiple Forensic Appliances, an interface for Forensic Appliance management, and centralized Forensic Appliance software upgrades. Please see Figure 1 below for a typical deployment diagram of the Security Analytics appliances.

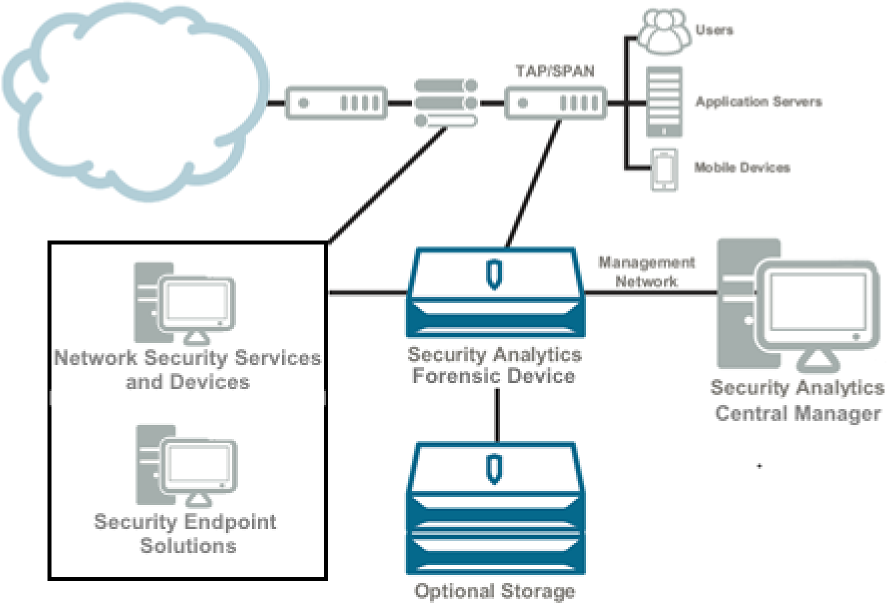

Users
TAP/SPAN
Application Servers
Mobile Devices
Management Network
Network Security Services and Devices
Security Analytics Forensic Device
Security Analytics Central Manager
Security Endpoint Solutions
Optional Storage

Figure 1 Typical Deployment Diagram

The Security Analytics S500 Appliances are validated at the following FIPS 140-2 Section levels in Table 1.

Table 1  Security Level per FIPS 140-2 Section

| Section | Section Title | Level |
|---|---|---|
| 1 | Cryptographic Module Specification | 2 |
| 2 | Cryptographic Module Ports and Interfaces | 2 |
| 3 | Roles, Services, and Authentication | 2 |
| 4 | Finite State Model | 2 |
| 5 | Physical Security | 2 |
| 6 | Operational Environment | N/A |
| 7 | Cryptographic Key Management | 2 |
| 8 | Electromagnetic Interference/Electromagnetic Compatibility | 2 |
| 9 | Self-tests | 2 |
| 10 | Design Assurance | 3 |
| 11 | Mitigation of Other Attacks | N/A |

## 2.2 Module Specification

For the FIPS 140-2 validation, the crypto module was tested on the following appliance types listed in Table 2 below.

**Table 2 Security Analytics S500 Appliance Tested Configurations**

| SA S500 Appliance Type | Hardware Version | SKU / Short Description |
|---|---|---|
| Cold Standby Appliance | 080-03938 | SA-S500-10-CM-CS |
| | 080-03939 | SA-S500-20-FA-CS |
| | 080-03940 | SA-S500-30-FA-CS |
| | 080-03941 | SA-S500-40-FA-CS |
| Standard Hardware Appliance | 090-03645 | SA-S500-10-CM |
| | 090-03646 | SA-S500-20-FA |
| | 090-03648 | SA-S500-30-FA |
| | 080-03649 | SA-S500-40-FA |

The hardware version numbers in Table 2 represent licensing options available. All appliance types and editions run on similar hardware and firmware and are the same from a cryptographic functionality and boundary perspective. The hardware differs only in the amount of storage, memory, network interfaces to the module. A Cold Standby appliance varies only in that firmware is not preinstalled. The four hardware configurations are the same between the Cold Standby and standard appliance types (e.g., The SA-S500-10-CM-CS shares the same hardware as the SA-S500-10-CM). The Crypto Officer and User services of the module are identical for all appliance types regardless whether it is a Cold Standby or standard appliance.

For the FIPS 140-2 validation, the module was tested on the following appliance configurations:

- SA-S500-10-CM
- SA-S500-20-FA
- SA-S500-30-FA
- SA-S500-40-FA

The module has a Multi-chip Standalone embodiment. The overall security level is 2. The cryptographic boundary of the module is defined by the tested platform, which surrounds all components. The module software 7.2.3, includes the following cryptographic libraries:

- SA Cryptographic Library v7.2.3

## 2.3 Module Interfaces

The module's physical ports can be categorized into the following logical interfaces defined by FIPS 140-2:

- Data input

- Data output
- Control input
- Status output

### 2.3.1 SA-S500-10-CM/20-FA/30-FA/40-FA Front Panel

The front panel of the SA S500 appliances (as shown below in Figure 2) have an LCD interface, two LEDs, a USB port, and six control buttons. The control buttons and USB port on the front panel are disabled once the module is configured for its Approved mode of operation.

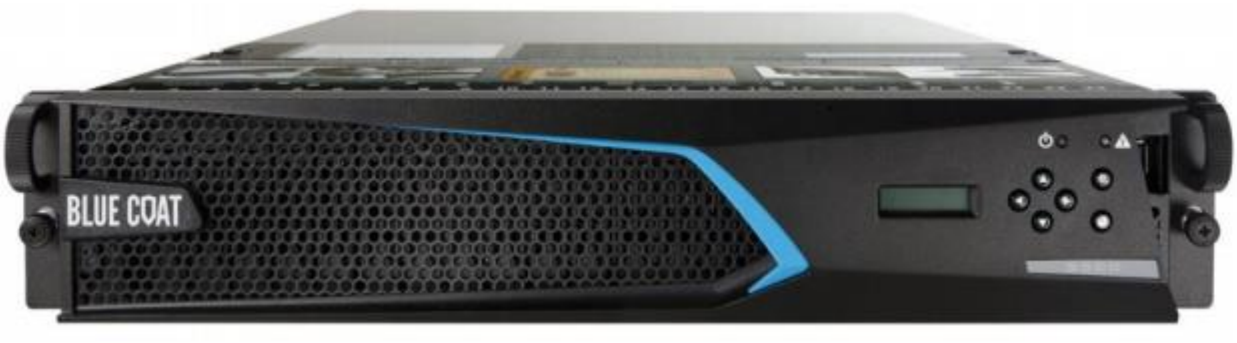


Figure 2 Connection Ports at the Front of the SA-S500 Appliances

The type and quantity of all ports present in the front panel of the SA-S500 appliances are given in Table 3.

Table 3 FIPS 140-2 Logical Interface Mappings for the front of the SA-S500 Appliances

| Physical Port/Interface | Quantity | FIPS 140-2 Interface |
|---|---|---|
| LEDs | 2 | Status Output |
| LCD | 1 | Status Output |
| Control Buttons | 6 | N/A (buttons are disabled) |
| USB 2.0 port | 1 | N/A (USB is disabled) |

The status indications provided by the LEDs is described in Table 4.

Table 4 Front Panel LED Status Indications for the SA-S500 Appliances

| LED | Color | Definition |
|---|---|---|
| Power LED | OFF | The appliance is powered off |
| | AMBER | The appliance is booting and the OS load is not yet complete. |
| | FLASHING GREEN TO AMBER | The OS has been loaded but has not been configured. |
| | GREEN | The OS has loaded and is properly configured. |
| System LED | OFF | The appliance has not determined the system status |
| | GREEN | Healthy |
| | AMBER | Warning |
| | FLASHING AMBER | Critical Warning |

## 2.3.2 SA-S500-10-CM Rear Panel

The rear panel of the –CM and -FA appliances slightly differ in the rear-facing port configurations.

The rear ports and interfaces available on the SA-S500 appliances are shown in Figure 3. Based on the specific model, slots 3-7 may be populated with additional copper or Fiber ports for storage and network traffic related needs.

The models/Part numbers listed include the following base configuration and were tested, as such.
SA-S500-10-CM (P/N 090-03645, P/N 080-03938)

- Slot 7 populated

SA-S500-20-FA (090-03646, 080-03939)

- Slots 5 and 7 populated

SA-S500-30-FA (090-03648, 080-03940)

- Slots 5, 6, and 7 populated

SA-S500-40-FA (090-03649, 080-03941)

- Slots 5, 6, and 7 populated

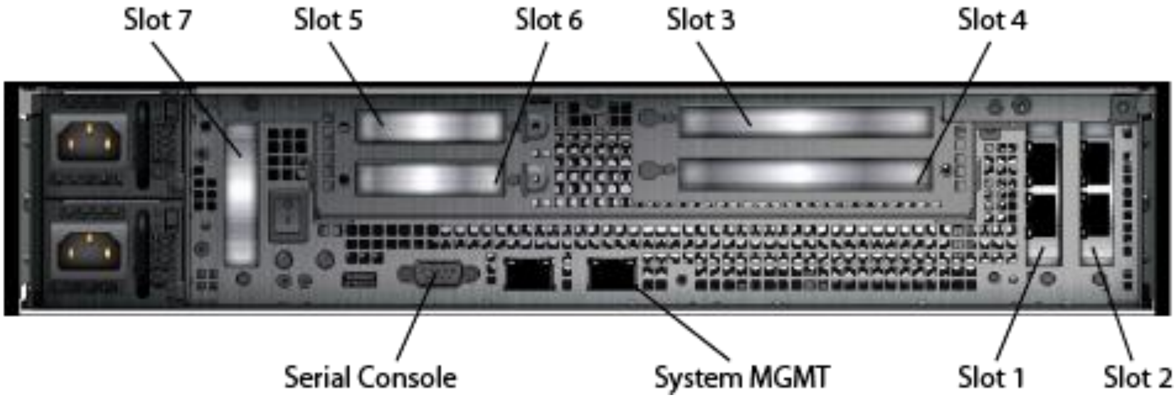


Figure 3 Rear of the SA-S500 Appliances

The type and quantity of all ports present on the rear panel of the SA-S500-10-CM appliance are provided below in Table 5. The LED status indicators, color, and definitions are provided below in Table 6.

Table 5 FIPS 140-2 Logical Interface Mappings for the rear of the SA-S500-10-CM Appliance

| Physical Port/Interface | Quantity | FIPS 140-2 Interface |
|---|---|---|
| Ethernet Ports | 4 | Data Input<br>Data Output<br>Control Input<br>Status Output |
| System MGMT Port | 1 | Data Input<br>Data Output<br>Control Input<br>Status Output |
| BMC[1] Management Port (Serial over Ethernet) | 1 | N/A (port is disabled) |
| Ethernet Interface – Speed LEDs | 6-8 | Status Output |
| Ethernet Interface – Activity LEDs | 6-8 | Status Output |
| Serial port | 1 | Control Input<br>Status Output |
| AC Power | 2 | Power Input |
| AC Power Connection LEDs | 2 | Status Output |
| Soft Power Switch | 1 | Control Input |
| USB 2.0 Port | 1 | N/A (port is disabled) |

Table 6 Rear Panel LED Status Indications for the SA-S500-10-CM Appliance

[1] BMC – Base Management Controller

| LED | Color | Definition |
|---|---|---|
| AC power connection LED | OFF | The module is not receiving power. |
| | GREEN | The module is receiving power. |
| Ethernet Interface – Activity LEDs | OFF | No link is present. |
| | GREEN | Link is present |
| | FLASHING GREEN | Link activity. |
| Ethernet Interface – Speed LEDs | OFF | 10 Mbps speed connection is present. |
| | GREEN | 100 Mbps speed connection is present. |
| | AMBER | 1000 Mbps speed connection is present. |

### 2.3.3 SA-S500-20-FA Rear Panel

The type and quantity of all ports present on the rear panel of the SA-S500-20-FA appliance are provided below in Table 7. The LED status indicators, color, and definitions are provided below in Table 8.

**Table 7 FIPS 140-2 Logical Interface Mappings for the rear of the SA-S500-20-FA Appliance**

| Physical Port/Interface | Quantity | FIPS 140-2 Interface |
|---|---|---|
| Ethernet Interface – 10GigE Copper | 2 | Data Input<br>Data Output |
| System Management Port | 1 | Data Input<br>Data Output<br>Control Input<br>Status Output |
| BMC Management Port | 1 | N/A (port is disabled) |
| 12Gbps SAS3 Port | 0-4 | Data Input<br>Data Output |
| 1/10 GigE SX/SR Fibre Channel Port | 2 | Data Input<br>Data Output |
| Ethernet Interface – Speed LEDs | 6-8 | Status Output |
| Ethernet Interface – Activity LEDs | 6-8 | Status Output |
| Serial ports | 1 | Control Input Status Output |
| AC Power | 2 | Power Input |
| AC Power Connection LEDs | 2 | Status Output |
| Soft Power Switch | 1 | Control Input |
| USB 2.0 Port | 1 | N/A (port is disabled) |

Table 8  Rear Panel LED Status Indications for the SA-S500-20-FA Appliance

| LED | Color | Definition |
|---|---|---|
| AC power connection LED | OFF | The module is not receiving power. |
| | GREEN | The module is receiving power. |
| Ethernet Interface – Activity LEDs | OFF | No link is present. |
| | GREEN | Link is present |
| | FLASHING GREEN | Link activity. |
| Ethernet Interface – Speed LEDs | OFF | 10 Mbps speed connection is present. |
| | GREEN | 100 Mbps speed connection is present. |
| | AMBER | 1000 Mbps speed connection is present. |

## 2.3.4 SA-S500-30-FA Rear Panel

The type and quantity of all ports present on the rear panel of the SA-S500-30-FA appliance are provided below in Table 9. The LED status indicators, color, and definitions are provided below in Table 10.

Table 9  FIPS 140-2 Logical Interface Mappings for the rear of the SA-S500-30-FA Appliance

| Physical Port/Interface | Quantity | FIPS 140-2 Interface |
|---|---|---|
| Ethernet Interface – 10GigE Copper | 2 | Data Input<br>Data Output |
| System Management Port | 1 | Data Input<br>Data Output<br>Control Input<br>Status Output |
| BMC Management Port | 1 | N/A (port is disabled) |
| Ethernet Ports | 4 | Data Input<br>Data Output<br>Control Input<br>Status Output |
| 12Gbps SAS3 Port | 0-2 | Data Input<br>Data Output |
| 1/10 GigE  SX/SR Fibre Channel Port | 0-4 | Data Input<br>Data Output |
| Ethernet Interface – Speed LEDs | 6-8 | Status Output |
| Ethernet Interface – Activity LEDs | 6-8 | Status Output |
| Serial ports | 1 | Control Input  Status Output |

| Physical Port/Interface | Quantity | FIPS 140-2 Interface |
|---|---|---|
| AC Power | 2 | Power Input |
| AC Power Connection LEDs | 2 | Status Output |
| Soft Power Switch | 1 | Control Input |
| USB 2.0 Port | 1 | N/A (port is disabled) |

**Table 10  Rear Panel LED Status Indications for the SA-S500-30-FA Appliance**

| LED | COLOR | DEFINITION |
|---|---|---|
| AC power connection LED | OFF | The module is not receiving power. |
| | GREEN | The module is receiving power. |
| Ethernet Interface – Activity LEDs | OFF | No link is present. |
| | GREEN | Link is present |
| | FLASHING GREEN | Link activity. |
| Ethernet Interface – Speed LEDs | OFF | 10 Mbps speed connection is present. |
| | GREEN | 100 Mbps speed connection is present. |
| | AMBER | 1000 Mbps speed connection is present. |

### 2.3.5 SA-S500-40-FA Rear Panel

The type and quantity of all ports present on the rear panel of the SA-S500-40-FA appliance are provided below in Table 9. The LED status indicators, color, and definitions are provided below in Table 10.

**Table 11  FIPS 140-2 Logical Interface Mappings for the rear of the SA-S500-40-FA Appliance**

| Physical Port/Interface | Quantity | FIPS 140-2 Interface |
|---|---|---|
| Ethernet Interface – 10GigE Copper | 2 | Data Input<br>Data Output |
| Ethernet Ports | 4 | Data Input<br>Data Output<br>Control Input<br>Status Output |
| System MGMT Port | 1 | Data Input<br>Data Output<br>Control Input<br>Status Output |
| BMC Management Port | 1 | N/A (port is disabled) |
| Ethernet Interface – Speed LEDs | 6-8 | Status Output |

| Physical Port/Interface | Quantity | FIPS 140-2 Interface |
|---|---|---|
| Ethernet Interface – Activity LEDs | 6-8 | Status Output |
| 12Gbps SAS3 Port | 0-2 | Data Input<br>Data Output |
| 1/10 GigE  SX/SR Fibre Channel Port | 0-4 | Data Input<br>Data Output |
| Serial port | 1 | Control Input<br>Status Output |
| AC Power | 2 | Power Input |
| AC Power Connection LEDs | 2 | Status Output |
| Soft Power Switch | 1 | Control Input |
| USB 2.0 Port | 1 | N/A (port is disabled) |

Table 12  Rear Panel LED Status Indications for the SA-S500-40-FA Appliance

| LED | COLOR | DEFINITION |
|---|---|---|
| AC power connection LED | OFF | The module is not receiving power. |
| | GREEN | The module is receiving power. |
| Ethernet Interface – Activity LEDs | OFF | No link is present. |
| | GREEN | Link is present |
| | FLASHING GREEN | Link activity. |
| Ethernet Interface – Speed LEDs | OFF | 10 Mbps speed connection is present. |
| | GREEN | 100 Mbps speed connection is present. |
| | AMBER | 1000 Mbps speed connection is present. |

## 2.4 Roles and Services

Before accessing the modules for any administrative services, COs and Users must authenticate to the module according to the methods specified in Table 16.

The modules offer the following management interfaces:

- Web UI (HTTPS/TLS)
- CLI (locally via serial port or remotely via SSH)
- Web Services API (HTTPS/TLS)

The CO and User details are found below in Table 13.

Table 13 FIPS and Security Analytics S500 Appliance Roles

| FIPS Roles | Security Analytics S500 Appliance Roles and Privileges |
|---|---|
| CO | Administrator, Security Administrator |
| User | User |

Descriptions of the services available to a Crypto Officer (CO) and User are described below in Table 14 and Table 15 respectively. For each service listed below, COs and Users are assumed to already have authenticated prior to attempting to execute the service, except for the services related to establishing a session with the module. Please note that the keys and CSPs listed in the table indicate the type of access required using the following notation:

- **R**: The CSP is read
- **W**: The CSP is established, generated, modified, or zeroized
- **X:** Execute: The CSP is used within an Approved or Allowed security function or authentication mechanism.

## 2.4.1 Crypto-Officer Role

Descriptions of the FIPS 140-2 relevant services available to the Crypto-Officer role are provided in the table below.

Table 14 Crypto Officer Role Services and CSP Access

| Service | Description | CSP And Access Required |
|---|---|---|
| Show Status | Displays the operational status of the module and if the module is operating in the Approved mode. | None |
| On-demand Self-Test | By rebooting the module, the power-up self-tests will be invoked | None |
| Initial Key Generation Service | As part of the module initialization process performed by the CO, the SSH and Web RSA key pairs are created during the initial boot cycle. | SSH RSA public key: W<br>SSH RSA private key: W<br>Web RSA public key: W<br>Web RSA private key: W |
| Change own password | COs can change their own password | CO Password: RW |
| Firmware Load | COs can initiate updates to the running firmware | Firmware Load Key: RX |

| Service | Description | CSP And Access Required |
|---|---|---|
| Create remote management session (CLI) | Manage the module through the CLI (SSH) remotely via Ethernet port. | SSH RSA public key: RX<br>SSH RSA private key: RX<br>SSH Session Key: WRX<br>SSH Authentication Key: WRX<br>DH public key: RX<br>DH private key: RX<br>ECDHE public key: RX<br>ECDHE private key: RX<br>HMAC DRBG Seed: RX<br>HMAC DRBG Entropy: RX<br>HMAC DRBG V: RX<br>HMAC DRBG Key: RX<br>CO Password: R |
| Create remote management session (Web UI) | Manage the module through the Web UI (TLS) remotely via Ethernet port. | Web RSA public key: RX<br>Web RSA private key: RX<br>ECDHE public key: RX<br>ECDHE private key: RX<br>DH public key: RX<br>DH private key: RX<br>TLS Session Key: WRX<br>TLS Authentication Key: WRX<br>TLS Master Secret: WRX<br>HMAC DRBG Seed: RX<br>HMAC DRBG Entropy: RX<br>HMAC DRBG V: RX<br>HMAC DRBG Key: RX<br>CO Password: R |
| Create remote management session (Web API) | Manage the module through the Web API (TLS) remotely via Ethernet port. | Web RSA public key: RX<br>Web RSA private key: RX<br>ECDHE public key: RX<br>ECDHE private key: RX<br>DH public key: RX<br>DH private key: RX<br>Web API Passphrase: RX<br>TLS Session Key: WRX<br>TLS Authentication Key: WRX<br>TLS Master Secret: WRX<br>HMAC DRBG Seed: RX<br>HMAC DRBG Entropy: RX<br>HMAC DRBG V: RX<br>HMAC DRBG Key: RX<br>CO Password: R |

| **Service** | **Description** | **CSP And Access Required** |
|---|---|---|
| Configure Module Settings | COs can modify the:<br>• network,<br>• date and time,<br>• license management,<br>• Web UI timeouts,<br>• log management,<br>• user accounts,<br>• geo-location settings | CO Password: W |
| Process Captured  Traffic | COs can:'<br>• Import traffic<br>• generate reports,<br>• apply filters<br>• perform searches and analysis on the captured traffic. | None |
| Zeroize keys | Zeroize keys by taking the module out of FIPS-mode.  This will zeroize all CSPs.  The zeroization occurs while the module is still in FIPS-mode. | SSH RSA public/private key: W<br>SSH Session Key: W<br>SSH Authentication Key: W<br>TLS Session Key: W<br>TLS Authentication Key: W<br>Web RSA public/private key: W<br>NTP RSA public/private key: W<br>ECDHE public key: W<br>ECDHE private key: W<br>DH public key: W<br>DH private key: W<br>VPN RSA public/private key pair: W<br>CO and User Password: W<br>Web API Passphrase: W<br>HMAC DRBG Seed: W<br>HMAC DRBG Entropy: W<br>HMAC DRBG V: W<br>HMAC DRBG Key: W |
| View Data Enrichment Results | View the results of the data-enrichment resources | None |
| Configure Data Retention Settings | COs can modify the data retention settings for the collected data | None |
| Reprocess/Replay Captured Network Traffic | COs can reprocess and replay captured traffic | None |

| Service | Description | CSP And Access Required |
|---|---|---|
| Configure encrypted NTP | COs can enable encryption for the NTP connection by generating an NTP Host Key | NTP RSA Public Key: W<br>NTP RSA Private Key: W |
| Configure and activate Data Enrichment providers | COs can configure external sources to analyze selected file types and data flows | None |
| Rule Configuration | Can set up rules/alerts/indicators that act on data and send it to one of the pre-defined Data enrichment providers | None |
| Add Remote Forensic Appliances for Management | COs may add one or more Forensic Appliances to CM so that central management can be performed via CM. The VPN configuration must be set up as a part of this step for secure CM to Forensic Appliance communication. | VPN RSA Public key: W<br>VPN RSA Private key: W<br>Web API Passphrase: W |
| Remotely Manage Forensic Appliances | COs may centrally manage multiple Forensic Appliances from a single instance of CM | Web RSA public key: RX<br>Web RSA private key: RX<br>TLS Session Key: WRX<br>TLS Authentication Key: WRX<br>TLS Master Secret: WRX<br>VPN RSA Public key: RX<br>VPN RSA Private key: RX<br>ECDHE public key: RX<br>ECDHE private key: RX<br>DH public key: RX<br>DH private key: RX<br>Web API Passphrase: R<br>HMAC DRBG Seed: RX<br>HMAC DRBG Entropy: RX<br>HMAC DRBG V: RX<br>HMAC DRBG Key: RX |
| Configure CM accounts | COs can configure local CM accounts, and can also configure what role each CM account will be mapped to during remote Forensic Appliance management from CM | CO or User Passowrd: W |

### 2.4.2 User Role

Descriptions of the FIPS 140-2 relevant services available to the User role are provided in the table below.

Table 15  User Services and CSP Access

| Service | Description | CSP And Access Required |
|---|---|---|
| Change own password | Users can change their own password | User Password – RW |
| Process Captured  Traffic | Users can:<br>• Import traffic<br>• generate reports,<br>• apply filters<br>• perform searches and analysis on the captured traffic. | None |
| Create remote management session (Web UI) | Manage the module through the Web UI (TLS) remotely via Ethernet port. | Web RSA public key: RX<br>Web RSA private key: RX<br>TLS Session Key: WRX<br>TLS Authentication Key: WRX<br>TLS Master Key: WRX<br>ECDHE public key: RX<br>ECDHE private key: RX<br>DH public key: RX<br>DH private key: RX<br>HMAC DRBG Seed: RX<br>HMAC DRBG Entropy: RX<br>HMAC DRBG V: RX<br>HMAC DRBG Key: RX<br>User Password: R |
| Create remote management session (Web API) | Manage the module through the Web API (TLS) remotely via Ethernet port. | Web RSA public key: RX<br>Web RSA private key: RX<br>TLS Session Key: WRX<br>TLS Authentication Key: WRX<br>TLS Master Key: WRX<br>TLS Master Key: WRX<br>ECDHE public key: RX<br>ECDHE private key: RX<br>DH public key: RX<br>DH private key: RX<br>HMAC DRBG Seed: RX<br>HMAC DRBG Entropy: RX<br>HMAC DRBG V: RX<br>HMAC DRBG Key: RX<br>User Password: R |
| Reprocess/Replay Captured Network Traffic | Users can reprocess and replay captured traffic | None |

| Service | Description | CSP And Access Required |
|---|---|---|
| Rule Configuration | Can set up rules/alerts/indicators that act on data and send it to one of the pre-defined Data enrichment providers | None |
| Remotely Manage Forensic Appliances | Users may centrally manage multiple Forensic Appliances from a single instance of CM. A 'User' in CM can be assigned the CO or User role when remotely managing a Forensic Appliance. | Web RSA public key: RX<br>Web RSA private key: RX<br>TLS Session Key: WRX<br>TLS Authentication Key: WRX<br>TLS Master Secret: WRX<br>VPN RSA Public key: RX<br>VPN RSA Private key: RX<br>ECDHE public key: RX<br>ECDHE private key: RX<br>DH public key: RX<br>DH private key: RX<br>Web API Passphrase: R<br>HMAC DRBG Seed: RX<br>HMAC DRBG Entropy: RX<br>HMAC DRBG V: RX<br>HMAC DRBG Key: RX |

### 2.4.3 Authentication Mechanism

The module supports role-based authentication. COs and Users must authenticate using a user ID and password, SSH client key (SSH only), or certificates associated with the correct protocol in order to set up the secure session. Secure sessions that authenticate Users have no interface available to access other services (such as CO services). Each CO or User SSH session remains active (logged in) and secured until the operator logs out. Each CO and User Web UI and Web API session remains active until the operator logs out or inactivity for a configurable amount of time has elapsed.

The authentication mechanisms used in the module are listed in Table 16.

Table 16  Authentication Mechanisms Used by Security Analytics S500 Appliance

| Role | Authentication Type | Authentication Strength |
|---|---|---|
| **CO** | Password | The modules support password authentication internally. For password authentication done by the modules, passwords are required to be at minimum 15 characters in length. A 15-character password allowing all printable American Standard Code for Information Interchange (ASCII) characters (95) with repetition equates to a 1: ($95^{15}$), or 1: 463,291,230,159,753,366,058,349,609,375 chance of false acceptance. This is less than the required 1:1,000,000. The CO may connect locally using the serial port or remotely after establishing a TLS or SSH session.<br>Successfully guessing the sequence in one minute would require the ability to make 7,721,520,502,662,556,100,972,493,489 guesses per second, which far exceeds the operational capabilities of the module. |
| | RSA Public-key based authentication | The module supports using RSA keys for authentication of COs during SSH.  Using conservative estimates and equating a 2048-bit RSA key to a 112-bit symmetric key, the probability for a random attempt to succeed is 1:$2^{112}$ or 1: 5.19 x $10^{33}$.<br>To exceed a one in 100,000 probability of a successful random key guess in one minute, an attacker would have to be capable of approximately 5.19x$10^{28}$ attempts per minute, which far exceeds the operational capabilities of the modules to support. |

| Role | Authentication Type | Authentication Strength |
|---|---|---|
| | Web API Passphrase | The module supports authentication via the Web API using an API passphrase. API passphrases are 50 characters in length. A 50-character API passphrase allowing all printable American Standard Code for Information Interchange (ASCII) characters (95) with repetition equates to a 1: ($95^{50}$), or 1: 7.69 X $10^{98}$ chance of false acceptance. This is less than the required 1:1,000,000. The CO may connect remotely after establishing a TLS session.<br>Successfully guessing the sequence in one minute would require the ability to make $95^{50}$ guesses per second, which far exceeds the operational capabilities of the module |

| Role | Authentication Type | Authentication Strength |
|---|---|---|
| **User** | Password | The modules support password authentication internally. For password authentication done by the modules, passwords are required to be at minimum 15 characters in length. A 15-character password allowing all printable American Standard Code for Information Interchange (ASCII) characters (95) with repetition equates to a 1: (95$^{15}$), or 1: 463,291,230,159,753,366,058,349,609,375 chance of false acceptance. This is less thant the required 1:1,000,000. The User may connect locally using the serial port or remotely after establishing a TLS or SSH session.<br>Successfully guessing the sequence in one minute would require the ability to make 7,721,520,502,662,556,100,972,493,489 guesses per second, which far exceeds the operational capabilities of the module. |
| | RSA Public-key based authentication | The module supports using RSA keys for authentication of Users during SSH. Using conservative estimates and equating a 2048-bit RSA key to a 112-bit symmetric key, the probability for a random attempt to succeed is 1:2$^{112}$ or 1: 5.19 x 10$^{33}$.<br>To exceed a one in 100,000 probability of a successful random key guess in one minute, an attacker would have to be capable of approximately 5.19x10$^{28}$ attempts per minute, which far exceeds the operational capabilities of the modules to support. |
| | Web API Passphrase | The module supports authentication via the Web API using an API Passphrase. API Passphrases are 50 characters in length. A 50-character API passphrase allowing all printable American Standard Code for Information Interchange (ASCII) characters (95) with repetition equates to a 1: (95$^{50}$), or 1: 7.69 X 10$^{98}$ chance of false acceptance. This is less than the required 1:1,000,000. The User may connect remotely after establishing a TLS session.<br>Successfully guessing the sequence in one minute would require the ability to make 95$^{50}$ guesses per second, which far exceeds the operational capabilities of the module |

## 2.5 Physical Security

The Security Analytics S500 Appliance is a multi-chip standalone cryptographic module and is enclosed in a hard, opaque metal case that completely encloses all of its internal components. There are only a limited set of vent holes provided in the case, and these holes obscure the view of the internal components of the module. Tamper-evident labels are applied to the case to provide physical evidence of attempts to remove the case of the module. The Crypto-Officer is responsible for the placement of tamper-evident labels and baffles and guidance can be found in section 3.1.1. The labels and baffles are part of the FIPS Security Kit (Part Number: HW-KIT-FIPS-500).

All of the module's components are production grade. The Security Analytics S500 Appliance (10-CM, 20-FA, 30-FA, and 40-FA-F) were tested and found conformant to the EMI/EMC requirements specified by 47 Code of Federal Regulations, Part 15, Subpart B, Unintentional Radiators, Digital Devices, Class A (i.e., for business use).

## 2.6 Non-Modifiable Operational Environment

The operational environment of the modules does not provide a general-purpose operating system (OS) to the user. The SA-S500 Appliances run Red Hat Fedora-based kernel in a non-modifiable operational environment. The operating system is not modifiable by the operator, and only the modules' signed image can be executed. All firmware upgrades are digitally-signed, and a conditional self-test (RSA signature verification) is performed during each upgrade.

**NOTE**: Only FIPS-validated firmware may be loaded to maintain the module's validation.

## 2.7 Cryptographic Key Management

The module implements the FIPS-Approved algorithms listed in Table 17 below.

**Table 17 FIPS-Approved Algorithm Implementations**

| CAVP Cert | Algorithm | Standard | Mode/ Method | Key Lengths, Curve or Moduli | Use |
|---|---|---|---|---|---|
| #4390 | AES | FIPS 197, SP800-38A, SP800-38D | CBC, GCM[2] | CBC-128, 256<br>GCM-256[3] | Data Encryption/Decryption |
| #2373 | RSA | FIPS 186-4 | FIPS 186-4 Key pair generation | 2048, 3072[4], 4096 | Key pair generation |
| #2373 | RSA | FIPS 186-4 | PKCS #1.5 | 2048, 3072, 4096 – signature generation[5] 1024[6], 2048, 3072[7], and 4096 signature verification | Signature generation and signature verification |

[2] AES-GCM and CBC - AES-CBC-192 and AES-GCM 128 were tested but not used in any FIPS services

[3] AES-GCM - The module used GCM in support of TLS compliant with SP 800-52 and is compatible with TLS version 1.2. The module generates new TLS keys if power is lost.

[4] FIPS 186-4 KPG was tested for 3072-bitkeys, but these are not used by any service.

[5] FIPS 186-2 Signature generation was tested; however, it was not used by any service.

[6] RSA 1024-bit keys were tested; however, they are not used by any service.

[7] RSA 3072-bit keys were tested; however, they are not used by any service.

| CAVP Cert | Algorithm | Standard | Mode/ Method | Key Lengths, Curve or Moduli | Use |
|---|---|---|---|---|---|
| #1108 | CVL ECDH | SP800-56A | ECC | NIST P curves 256, 384, 521 | Key Agreement |
| #1108 | CVL FFC | SP800-56A | FFC | 2048, 224 | Key Agreement |
| #3619 | SHS | FIPS 180-4 | SHA-1 | | Message Digest |
| #3619 | SHS | FIPS 180-4 | SHA-224[8]<br>SHA-256, SHA-384[9], SHA-512 | | Message Digest |
| #2917 | HMAC | FIPS 198-1 | HMAC-SHA-1 | | Message Authentication |
| #2917 | HMAC | FIPS 198-1 | HMAC-SHA-224[10]<br>SHA-256, SHA-384[11], SHA-512 | | Message Authentication |
| #1413 | DRBG | SP800-90A | HMAC-SHA-512 | | Deterministic Random Bit Generator |
| #1109 | CVL TLS 1.0, 1.1, 1.2, SSH | SP800-135rev1 | | | Key Deriviation |

The TLS and SSH protocols have not been reviewed or tested by the CAVP and CMVP.
The generated seeds for private keys are generated per SP 800-133 (unmodified output from a DRBG)

The module utilizes the following non-FIPS-Approved algorithms:

- RSA PKCS#1 wrap/unwrap (key-wrapping) – 2048, 3072, and 4096–bit sizes providing 112, 128, and 150-bits of security.
- MD5 used during TLS sessions
- Diffie-Hellman for key agreement during TLS and SSH: 2048-bit keys (provides 112 bits of security).
- EC Diffie-Hellman for key agreement during TLS (provides between 128 and 256 bits of encryption strength)
- Non-Deterministic RNG (NDRNG) for seeding the FIPS-Approved DRBG (SP 800-90 HMAC_DRBG)

The module supports the CSPs listed below in Table 18.

[8] SHA-224 was tested; however, it is not used by any service.

[9] SHA-384 was tested; however, it is not used by any service.

[10] HMAC-SHA-224 was tested; however, it is not used by any service.

[11] HMAC-SHA-384 was tested; however, it is not used by any service.

Table 18  List of Cryptographic Keys, Cryptographic Key Components, and CSPs

| Key Heading | Key Type | Generation / Input | Output | Storage | Zeroization | Use |
|---|---|---|---|---|---|---|
| Firmware Load Key | RSA public key 4096 bits | Preloaded at the factory. | Never exits the module | Stored in plaintext on non-volatile memory | Can be overwritten after upgrade by the key in the newly signed image | Verifying the integrity of the system image during upgrade or downgrade |
| Web RSA Public Key | 2048, 3072, 4096-bits | Modules’ public key is internally generated per the FIPS 186-4 standard (4096-bit only)<br>Externally generated 2048, 3072, and 4096 bit keys can be input into the module encrypted (over TLS) | Output during TLS negotiation in plaintext. | Modules’ public key is stored on non-volatile memory | Modules’ public key is zeroized by command | Negotiating TLS (Web UI, API) sessions |

| Key Heading | Key Type | Generation / Input | Output | Storage | Zeroization | Use |
|---|---|---|---|---|---|---|
| Web RSA Private Key | 2048, 3072, 4096-bits | Internally generated per the FIPS 186-4 standard (4096-bit only)<br>Externally generated 2048, 3072, and 4096 bit keys can be input into the module encrypted (over TLS) | Never exits the module | Stored in encrypted form on non-volatile memory | Modules' public key is zeroized by command | Negotiating TLS (Web UI, API) sessions |
| VPN RSA Public Key | 2048-bits | Public key is internally generated per the FIPS 186-4 standard | Output during TLS negotiation in plaintext. | Modules' public key is stored on non-volatile memory | Modules' public key is zeroized by command | Establishing TLS connection between CM and FA. |
| VPN RSA Private Key | 2048-bits | Internally generated per the FIPS 186-4 standard | Never exits the module | Stored in encrypted form on non-volatile memory | Modules' public key is zeroized by Command | Establishing TLS connection between CM and FA. |

| Key Heading | Key Type | Generation / Input | Output | Storage | Zeroization | Use |
|---|---|---|---|---|---|---|
| NTP RSA Public Key | 2048-bits | Public key is internally generated per the FIPS 186-4 standard | Output during NTP negotiation in plaintext. | Modules' public key is stored on non-volatile memory | Modules' public key is zeroized by command | Negotiating encrypted NTP |
| NTP RSA Private Key | 2048-bits | Internally generated per the FIPS 186-4 standard | Never exits the module | Stored in encrypted form on non-volatile memory | Modules' public key is zeroized by command | Negotiating encrypted NTP |
| SSH RSA Public Key | 2048-bits | Modules' public key is internally generated per the FIPS 186-4 standard | Output during SSH negotiation in plaintext. | Modules' public key is stored on non-volatile memory | Modules' public key is zeroized by command | Negotiating SSH sessions |
| SSH RSA Private Key | 2048-bits | Internally generated per the FIPS 186-4 standard | Never exits the module | Stored in encrypted form on non-volatile memory | Modules' public key is zeroized by command | Negotiating SSH sessions |

| Key Heading | Key Type | Generation / Input | Output | Storage | Zeroization | Use |
|---|---|---|---|---|---|---|
| DH public key | 2048-bits | Module's public key is internally generated via FIPS Approved DRBG<br>Public key of a peer enters the module in plaintext | The module's Public key exits the module in plaintext | Stored in plaintext on volatile memory | Rebooting the modules<br>Removing power | Negotiating TLS or SSH sessions |
| DH private key | 224-bits | Internally generated via FIPS-Approved DRBG | Never exits the module | Stored in plaintext on volatile memory | Rebooting the modules<br>Removing power | Negotiating TLS or SSH sessions |
| ECDHE[12] public key | NIST Curves: P-256, P-384, and P-521 | Module's public key is internally generated via FIPS Approved DRBG<br>Public key of a peer enters the module in plaintext | The module's Public key exits the module in plaintext | Stored in plaintext on volatile memory | Rebooting the modules<br>Removing power | Negotiating TLS sessions |
| ECDHE private key | NIST Curves: P-256, P-384, and P-521 | Internally generated via FIPS-Approved DRBG | Never exits the module | Stored in plaintext on volatile memory | Rebooting the modules<br>Removing power | Negotiating TLS sessions |

[12] Elliptic Curve Diffie-Hellman – Ephemeral

| Key Heading | Key Type | Generation / Input | Output | Storage | Zeroization | Use |
|---|---|---|---|---|---|---|
| SSH Session key | AES CBC 128-, or 256-bit key | Generated internally during session negotiation by the SSH KDF | Output in encrypted form during SSH protocol handshake | Stored in plaintext on volatile memory | Rebooting the modules<br>Removing power | Encrypting SSH data |
| SSH Session Authentication key | HMAC SHA-256 and 512 key | Generated internally during session negotiation | Never exits the module | Stored in plaintext on volatile memory | Rebooting the modules<br>Removing power | Data authentication for SSH sessions |
| TLS Master Secret | 384-bit key | Generated internally during session negotiation | Never exits the module | Stored in plaintext on volatile memory | Rebooting the modules<br>Removing power | Establishing the TLS Session Key |
| TLS Session key | AES CBC 128-, or 256-, or GCM 256-bit key | Generated internally during session negotiation by the TLS KDF | Output in encrypted form during TLS protocol handshake | Stored in plaintext on volatile memory | Rebooting the modules<br>Removing power | Encrypting TLS data |
| TLS Session Authentication key | 160-bit HMAC SHA-I key | Generated internally during session negotiation | Never exits the module | Stored in plaintext on volatile memory | Rebooting the modules<br>Removing power | Data authentication for TLS sessions |
| Web API Passphrase | 50 characters long | Internally generated via FIPS-Approved DRBG | Exits in encrypted form via a secure TLS | Stored in hashed form on non-volatile memory | Overwritten when resetting API Passphrase | Sent along with Web API commands for authentication |

| Key Heading | Key Type | Generation / Input | Output | Storage | Zeroization | Use |
|---|---|---|---|---|---|---|
| CO Password<br>User Password | Minimum of fifteen (15) characters long | Externally generated. Enters the module in encrypted form via a secure TLS or SSH session<br>Enters the module in plaintext via a directly attached cable to the serial port | Exits in encrypted form via a secure TLS session for external authentication | Stored in hashed form on non-volatile memory | Overwritten with a new password | Locally authenticating a CO or User for Web UI or CLI |
| SP 800-90A HMAC_DRBG Seed | 880-bit random number | Internally generated | Never exits the module | Plaintext in volatile memory | Rebooting the modules<br>Removing power | Seeding material for the SP800-90A HMAC_DRBG |
| SP 800-90A HMAC_DRBG Entropy[13] | 256-bit random number with derivation function<br>384-bit random number without derivation function | Internally generated | Never exits the module | Plaintext in volatile memory | Rebooting the modules<br>Removing power | Entropy material for the SP800-90A HMAC_DRBG |
| SP 800-90A HMAC_DRBG key value | Internal state value | Internally generated | Never | Plaintext in volatile memory | Rebooting the modules<br>Removing power | Used for the SP 800-90A HMAC_DRBG |

[13] The Entropy required by the FIPS-Approved SP 800-90 HMAC_DRBG (with SHA-512) is supplied by the NDRNG

| Key Heading | Key Type | Generation / Input | Output | Storage | Zeroization | Use |
|---|---|---|---|---|---|---|
| SP 800-90A HMAC_DRBG V value | Internal state value | Internally generated | Never exits the module | Plaintext in volatile memory | Rebooting the modules<br>Removing power | Used for the SP 800-90A HMAC_DRBG |

***NOTE:*** *that some algorithms may be classified as deprecated, restricted, or legacy-use. Please consult NIST SP 800-131A for details.*

## 2.8 Self-Tests

The module implement two types of self-tests: power-up self-tests and conditional self-tests. Upon a power-up self-test failure, the module halts operation and requires a reboot. Information as to which power-up self-test failed is displayed over the local console. Upon encountering a conditional self-test error, the module will suspend operation until the error is cleared. Power-up self-tests can also be performed on demand by cycling the power on the module.

The sections below describe the self-tests performed by the module.

### 2.8.1 Power-Up Self-Tests

The module performs the following power-up self-tests:

- Integrity check
- Known Answer Tests (KAT)s
    - AES CBC KAT for encryption
    - AES CBC KAT for decryption
    - AES GCM KAT for encryption
    - AES GCM KAT for decryption
    - RSA KAT for signature generation
    - RSA KAT for signature verification
    - RSA KAT for encrypt/decrypt (wrap/unwrap)
    - SHA-1 KAT
    - SHA-256 KAT
    - SHA-384 KAT
    - SHA-512 KAT
    - HMAC SHA-1 KAT
    - HMAC SHA-256 KAT
    - HMAC SHA-384 KAT
    - HMAC SHA-512 KAT
    - SP 800-90A DRBG KAT
    - SP 800-56A ECDH Primitive “Z” Computation KAT
    - SP 800-56A DH Primitive “Z” Computation KAT

- No data output occurs via the data output interface until all power-up self tests have completed.

### 2.8.2 Conditional Self-Tests

The module performs the conditional self-tests:

- Continuous RNG test (CRNGT) for the SP 800-90A DRBG
- Continuous RNG test (CRNGT) for the non-deterministic Random Number Generator (NDRNG)
- RSA pairwise consistency check upon key pair generation
- Firmware Load Test using RSA Signature Verification with SHA-512

### 2.8.3 Critical Function Tests

The module implements the SP800-90A HMAC_DRBG as its random number generator. The following critical function tests are implemented by the module:

- DRBG Instantiate Critical Function Test
- DRBG Reseed Critical Function Test

- DRBG Generate Critical Function Test
- DRBG Uninstantiate Critical Function Test

The module also performs a validity check on the installed license. If the license is not vaild, the module will not operate.

## 2.9 Mitigation of Other Attacks

This section is not applicable. The module does not claim to mitigate any attacks beyond the FIPS 140-2 Level 2 requirements for this validation.

# 3. Secure Operation

The module meets FIPS 140-2 Level 2 requirements. The sections below describe how to place and keep the module in FIPS-Approved mode of operation. The tamper seals and FIPS kit shall be installed for the module to operate in a FIPS Approved mode of operation

## 3.1 Initial Setup

Before powering-up the module, the CO must ensure that the required tamper-evident labels (included in the FIPS security kit) are correctly applied to the enclosure. The FIPS security kit (Part Number: 085-02870; HW-KIT-FIPS-500) consists of the following items as shown below in Figure 6.

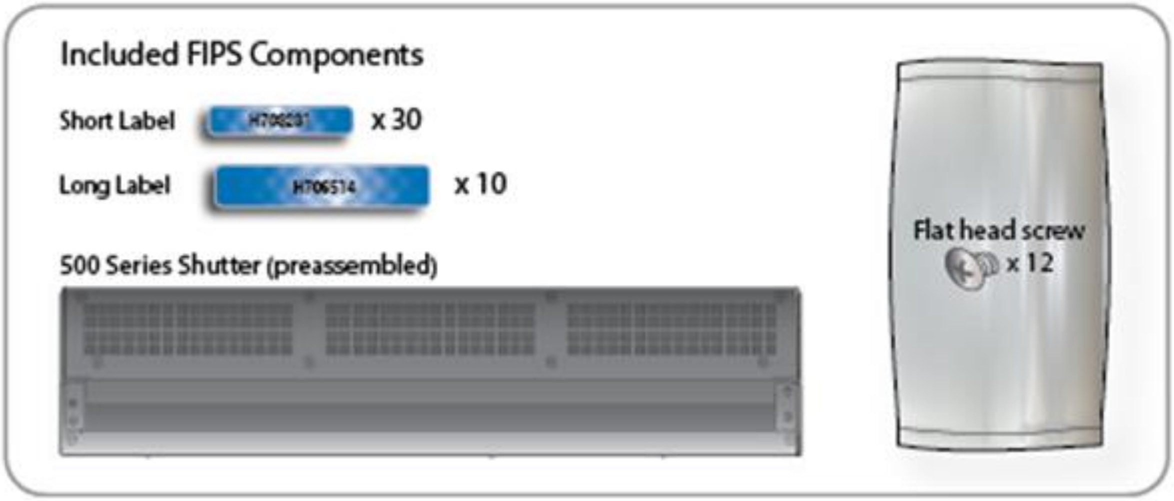


Figure 4 FIPS Security Kit Contents

**Note**: There are (30) 'Short Labels' and (10) 'Long labels' included with the FIPS kit; however, only (8) short labels and (2) long labels are required for FIPS compliance. Additional labels are provided for reapplication purposes.

### 3.1.1 Label and Baffle Installation Instructions

The Crypto-Officer is responsible for installing the baffle (security panel) and applying the tamper evident labels at the client's deployment site to ensure full FIPS 140-2 compliance. Once the seals have been applied, the Crypto Officer must develop an inspection schedule to verify that the external enclosure of the module and the tamper seals have not been damaged or tampered with in any way. The Crypto-Officer is responsible for securing and having control at all times of any unused labels. The Crypto-Officer is responsible for the direct control and observation of any changes to the module such as reconfigurations where the tamper-evident labels or security appliances are removed or installed to ensure the security of the module is maintained during such changes and the module is returned to a FIPS Approved state.

Crypto-Officers must adhere to the following when applying the tamper-evident labels:

- The minimum temperature of the environment must be 35-degrees Fahrenheit. After application, the labels' acceptable temperature in the operational environment is -5-degrees to 158-degrees Fahrenheit.

- Do not touch the adhesive side of the label. This disrupts the integrity of the adhesive. If a label is removed from a surface, the image is destroyed and the label shows tamper-evident text as evidence. If you accidently touch the adhesive side, discard that label and apply another one.

Label application tips:

- Apply skin moisturizer on your fingers before handling.
- Use a rubber fingertip to partially remove the label from its backing.
- After applying the labels, allow at least 24 hours for the label adhesive to cure.

### 3.1.2 Shutter Installation

The two piece rear shutter (500 Series Shutter as shown in Figure 4Figure 5) is designed to prevent unauthorized access to key system components by shielding the rear ventilation outlets, option cards, interfaces, and the soft power switch.

1. Remove the top shutter from the bottom shutter by removing two (2) screws and pulling directly rearward. Set the top shutter aside in a safe location.

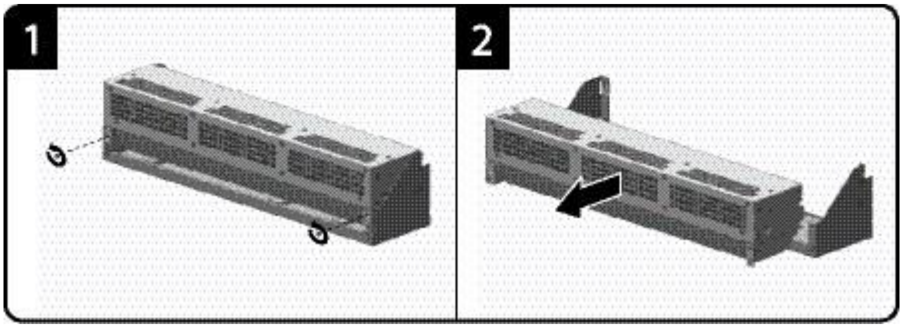


Figure 5 Shutter Disassembly

2. Align the bottom shutter mounting points against the screw locations and the alignment pins on the chassis and secure with three (3) flat-head screws. Be aware the FIPS kit includes (7) additional screws, in case some are misplaced or lost during installation.

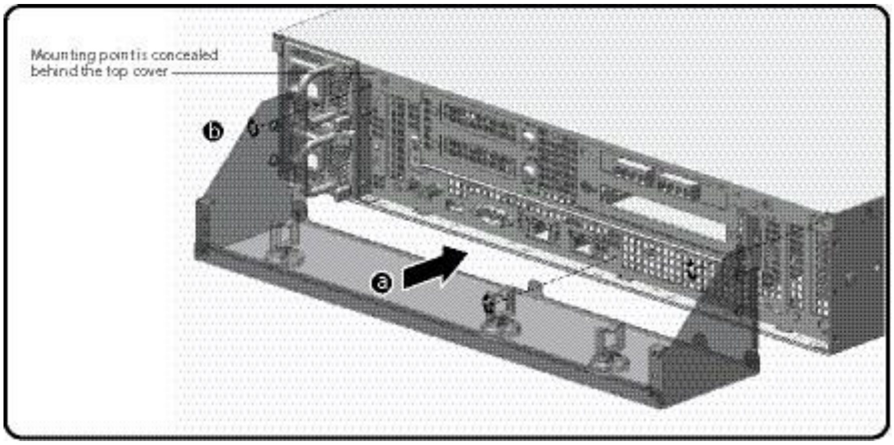


Figure 6 Lower Shutter Installation

3. Rack mount the appliance. Refer to the 500 Series Maintenance and Upgrade Guide for instructions and safety information on rack-mounting the appliance.

4. Reinstall the appliance network and other interconnect cables to their respective locations

   **Note**: All network and interconnect cables must installed at this time to prevent reopening of the shutters and subsequent reapplication of the security labels.

5. Route the network cables through the cable management anchors to prevent cables from obstructing airflow.

6. Install the top shutter by aligning the notches with the raised pins on the appliance and secure with two (2) flat-head screws. Be aware the FIPS kit includes (7) additional screws, in case some are misplaced or lost during installation.

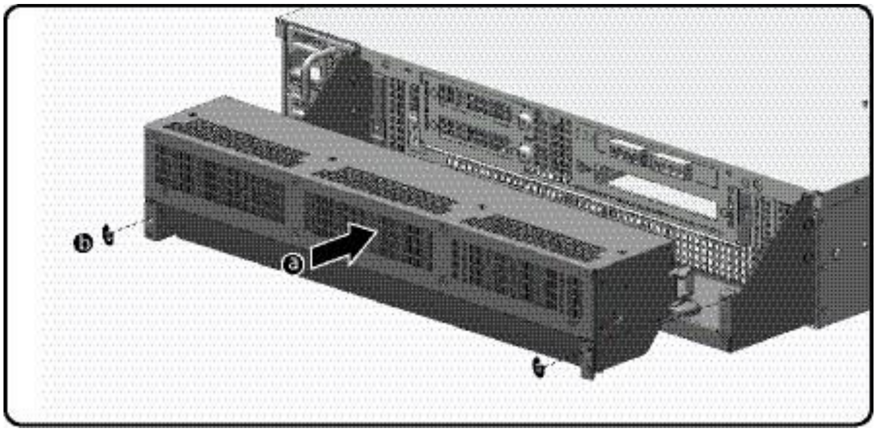


Figure 7 Upper Shutter Installation

### 3.1.3 Label Application

The FIPS compliant blue labels are applied over key areas of the chassis to provide tamper-evident security. If the labels are removed after being affixed to a surface, the image self-destructs and leaves a pattern of VOID markings on the label. The image below illustrates the tamper-evident features of the label. Figure 8 below illustrates the tamper-evident features of the blue labels.

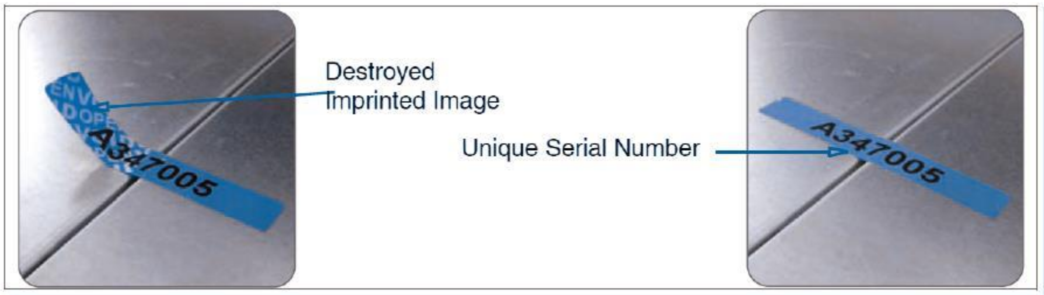
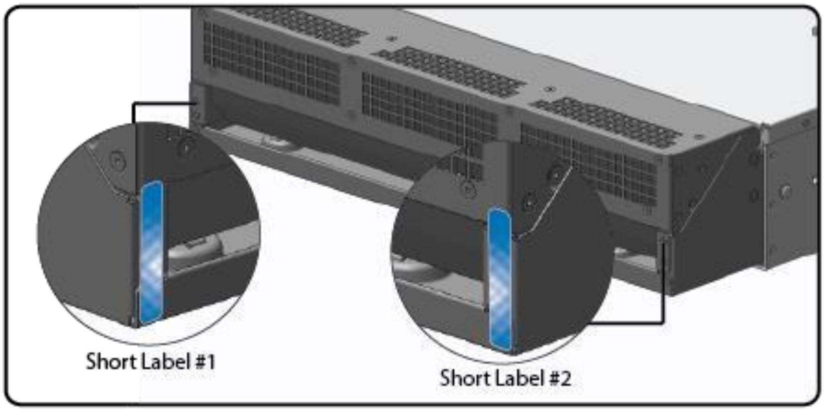


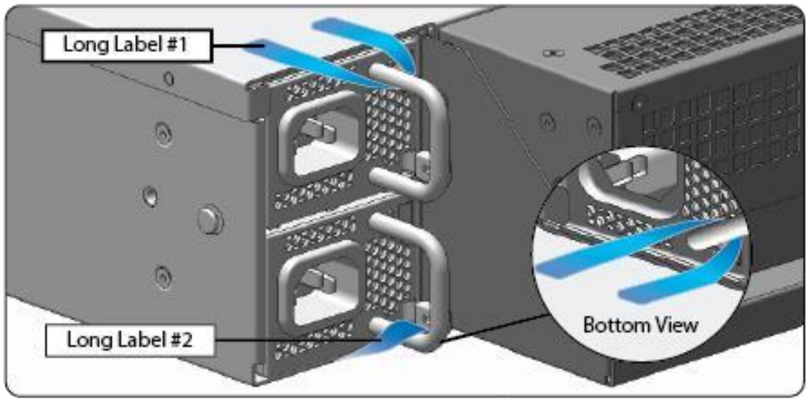
Figure 8 Labels Showing Tamper Evidence

Use alcohol swabs to clean the label location surface using Isopropyl Alcohol (99%); this ensures complete adhesion. Verify that all the surfaces are dry before applying the labels .

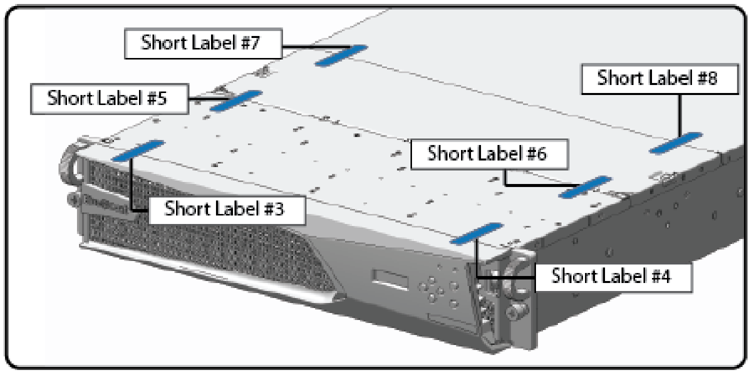
1. Set the appliance on a flat, slip-proof work space and make sure you have access to all sides of the appliance.
2. Apply two (2) blue short labels (short labels 1 and 2) over the exposed shutter screw heads. These labels extend slightly over the left and right edges of the shutter when properly applied.



3. Apply one (1) long  blue label through *each* power supply unit (long labels 1 and 2)  and/or dummy cover in a U-shape, making sure to route the label through the handle and to apply the ends of the label on the chassis top and bottom, as illustrated below. When applying the labels in, make sure there is enough material on both ends to properly secure the power supply. When you are applying these labels, it is imperative that you do not cover any of the vent holes.



4. Apply six (6) short blue labels (short labels 3, 4, 5, 6, 7, and 8) over the opposite ends of the bezel, center cover, and the rear cover panel to prevent unauthorized access to the system components. Each label should be placed on the opposite ends of the appliance, as shown below.



**Note**: The chassis-center cover labels are destroyed each time the center cover is opened. Be sure to re-secure the appliance after servicing!

5. Power-on the appliance by plugging in the power cords.

## 3.2 Secure Management

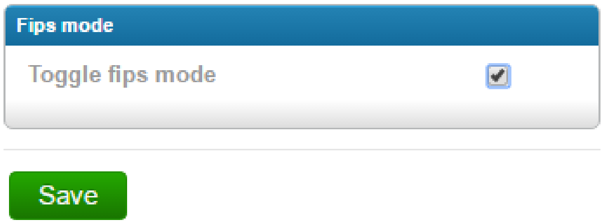
The Crypto-Officer is responsible for initialization and security-relevant configuration and management of the module. Please see the *Blue Coat Systems Security Analytics S500 Appliance Administration Guide, Version 7.2.3* for more information on configuring and maintaining the module.

### 3.2.1 Initialization

The module is delivered in an uninitialized factory state, and requires minimal first-time configuration to operate in FIPS-Approved mode and be accessed by a web browser via TLS or remotely via SSH. Physical access to the module shall be limited to the CO, and the CO shall be responsible for putting the module into the Approved mode. Note, these same steps in this section shall be followed after the zeroization command is entered.

The process of establishing the initial configuration is described below.

1. Connect to the serial interface with the **admin** account (admin | Solera).
2. Set the IP address and default gateway using `sudo ifconfig` and `sudo route`.
3. Login to the Web Interface with the **admin** account.
4. Re-enter the IP address, netmask, and gateway values.
5. Specify at least one DNS server.
6. Set the correct date, time, and zone for the appliance: MM/DD/YYYY hh:ii:ss.
7. Set the passwords for the **root** and **admin** accounts. The default password-strength requirements are: 14 characters, digit, uppercase, lowercase, other character. **NOTE:** After entering FIPS mode, the **root** account is disabled.
8. Click **Save.**
9. Enter the license key in the space provided, send the request, and then select the license for the appliance. The appliance automatically reboots.
10. When the appliance has rebooted, log in to the web interface using the **admin** account and the new password.
11. Select **Settings** -> **Security** and scroll down to *FIPS Mode*. Select **Toggle FIPS mode** and click **Save.**



12. The appliance will automatically restart.

Upon completion of these initialization steps, the module is considered to be operating in its Approved mode of operation.

## 3.2.2 Management

The CO is able to monitor and configure the module via the Web UI and Web API (HTTPS over TLS) and the CLI (SSH or serial).

The CO should monitor the module's status regularly. If any irregular activity is noticed or the module is consistently reporting errors, customers should consult Symantec Blue Touch Online (BTO) and the administrative guidance documents to resolve the issues. If the problems cannot be resolved through these resources, Symantec customer support should be contacted.

The CO password must be at least 15 characters in length.

## 3.2.3 Zeroization

The CO can zeroize the module's keys by disabling FIPS mode in the Web UI. This command will automatically reboot the module and zeroize the keys. The RSA private key for TLS, RSA private key used for SSH, RSA private key used for syslog over TLS, CO password, User password are all zeroized in this process.

In addition, rebooting the module causes all temporary keys stored in volatile memory (SSH Session key, TLS session key, DRBG entropy values, and NDRNG entropy values) to be zeroized. The CO must wait until the module has successfully rebooted in order to verify that zeroization has completed.

## 3.3 User Guidance

The User is only able to access the module remotely via SSH (CLI) or HTTPS (Web UI). The User must change his or her password at the initial login. The User must be diligent to pick strong passwords (alphanumeric with minimum 15 characters) that will not be easily guessed, and must not reveal their password to anyone. Additionally, the User should be careful to protect any secret/private keys in their possession, such as TLS or SSH session keys. The User should report to the CO if any irregular activity is noticed.

## 3.4 Non-Approved Mode

When initialized and configured according to the Crypto-Officer guidance in this *Non-Proprietary Security Policy*, the module does not support a non-Approved mode of operation.

# 4. Acronyms

This section describes the acronyms used throughout this document.

Table 19 Acronyms

| Acronym | Definition |
|---|---|
| AC | Alternating Current |
| AD | Active Directory |
| AES | Advanced Encryption Standard |
| BMC | Baseboard Management Controller |
| BTO | BlueTouch Online |
| CA | Certificate Authority |
| CBC | Cipher Block Chaining |
| CFB | Cipher Feedback |
| CIFS | Common Internet File System |
| CLI | Command Line Interface |
| CMVP | Cryptographic Module Validation Program |
| CO | Crypto-Officer |
| CRNGT | Continuous Random Number Generator Test |
| CSE | Communications Security Establishment |
| CSP | Critical Security Parameter |
| DH | Diffie Hellman |
| DNS | Domain Name System |
| DRBG | Deterministic Random Bit Generator |
| ECB | Electronic Codebook |
| ECDHE | Elliptic Curve Diffie-Hellman Ephemeral |
| EDC | Error Detection Code |
| EMC | Electromagnetic Compatibility |
| EMI | Electromagnetic Interference |
| FIPS | Federal Information Processing Standard |
| FTP | File Transfer Protocol |
| HMAC | Hash-Based Message Authentication Code |
| HTTP | Hypertext Transfer Protocol |
| HTTPS | Secure Hypertext Transfer Protocol |
| IP | Internet Protocol |
| KAT | Known Answer Test |
| LCD | Liquid Crystal Display |
| LED | Light Emitting Diode |
| MAC | Message Authentication Code |
| NIC | Network Interface Card |

| Acronym | Definition |
|---|---|
| **NIST** | National Institute of Standards and Technology |
| **RSA** | Rivest Shamir Adleman |
| **SAS3** | Serial Attached SCSI 3 |
| **SHA** | Secure Hash Algorithm |
| **SSH** | Secure Shell |
| **TLS** | Transport Layer Security |
| **USB** | Universal Serial Bus |
| **WAN** | Wide Area Network |