IDENTIFICATION OF VOLATILE AND NON-VOLATILE STORAGE AND SANITIZATION OF SYSTEM COMPONENTS

JUNIPER NETWORKS SRX-SERIES SRX1500

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1   INTRODUCTION

1.1   Purpose

The purpose of this document is to provide direction to identify volatile and non-volatile storages and remove non-volatile (NV) storage from the Juniper Networks' Secure Services Gateway SRX1500 security platform.

1.2   Scope

This document only addresses the SRX1500 security platform. While other platforms offered by Juniper Networks may contain similar hardware components, this document only applies to the SRX1500. Furthermore, this document only provides direction for the identification and removal of NV storage components. It does not address destruction procedures for those components. As all of the NV storage components used in the SRX Series product family are commercial off-the-shelf (COTS) components, directions for destruction of those components are left to the governing Department, Agency, or Office.

2   EQUIPMENT OVERVIEW

2.1   Identification of Chassis

The SRX1500 is a 1U chassis with 12 fixed 10/100/1000 Mbps Ethernet ports, 8 fixed SFP(+) ports, two front-facing WAN Physical Interface Module (wPIM) slot for additional port capacity, One rear-facing SSD slot and two rear-facing 400W Power Supply Unit (either AC or DC, picture below shows one AC PSU). The chassis is fixed with system motherboard, with one front-facing Universal Serial Bus (USB) interfaces, internal Half-Slim Solid State Drives (MO-297 SSD), internal Dynamic Random Access Memory (DDR3 DIMM), Boot flash chip, IDEEPROM and Renesas Security chips, which are all soldered on the system motherboard except the SSD and DIMM. The volatile and non-volatile memories can not be accessed without removing the top cover of the chassis and these are soldered to the motherboard except the DIMM, SSD and the USB storage devices. Users are not advised to remove these storage devices unless they want to scrap the system. If the user wants to remove them, the user has to de-solder these chips.

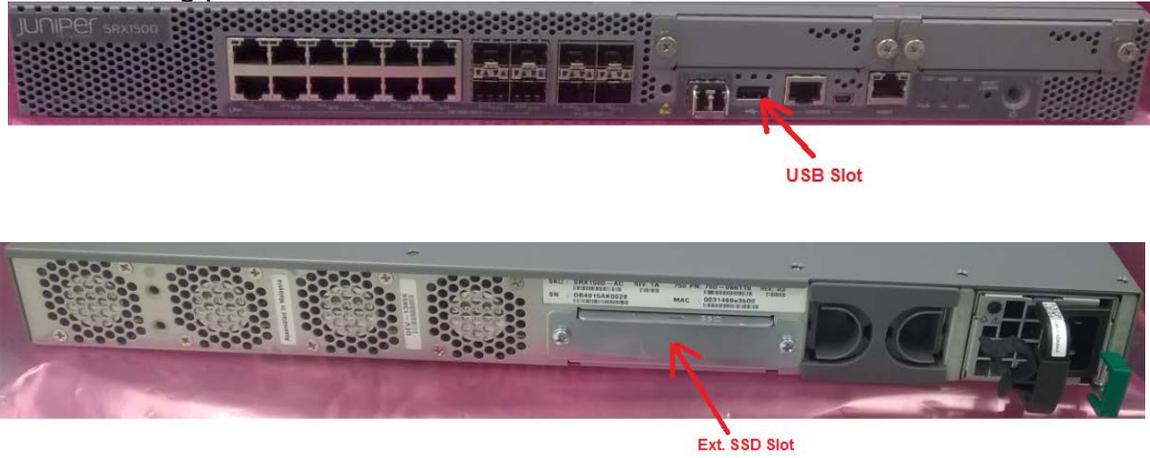The following pictures show the different views of the SRX1500 model:

Figure 2-1: SRX1500 Chassis different views

2.2   Description of Components

The following major components are installed in the SRX1500 chassis.

2.2.1   System Motherboard

The System Motherboard is the large printed circuit board located inside the chassis. The Flash, IDEEPROM, CPLD and Security Chip are soldered to the motherboard (refer to the figure below). The DDR3 DIMM and Half-Slim SSD are plugged in the socket on the Motherboard.

The SRX1500 has the following non-volatile memory devices:

- Anti-counterfeit security chip's internal EEPROM – stores the signature of the security chip. No user data is stored here.
- IDEEPROM– only used to store FRU identification data. No user data is stored here.
- Boot flash for Processor– stores the boot loader image for the Processor, no user data.
- Half-Slim SSD stores the JUNOS image and user data
- CPLD internal flash - stores CPLD image, no user data is stored.
- Image flash for FPGA - stores the image for the FPGA, no user data.
- EEPROM for x86 base Ethernet adapter.

In addition, the SRX1500 has one USB ports, into which the user can install an external USB disk device to store core dumps, system configuration, software images, etc. The system does not store any user data onto storage devices attached to these ports.

All other components of the SRX1500 are volatile, so they do not store any information after power is lost, following are the volatile memory present on SRX1500:
- DDR3 DIMM memory– stores User data here
- Processor Internal Cache memory and registers– stores operational data here
- FPGA Internal Cache memory and registers– stores operational data here

No other sub-components on the motherboard contain any storage elements, either volatile or non-volatile

2.2.2   Physical Interface Module Slot

The wPIM provides expanded input/output (I/O) capability for the SRX1500. Juniper will design and provide the wPIM for SRX1500 in the future.

2.2.3 External SSD Slot

The SRX1500 includes one external 100GB SSD, it stores log that is generated by JUNOS.

2.2.4 Power Supply Unit Slots

The SRX1500 includes two power supply slots, it can be powered with one or two power supplies, the power supply contains IDEEPROM and has no users information will be stored in it.

2.2.5 Cooling Subsystem

The Cooling Subsystem consists of 4 fans. The Cooling Subsystem contains no storage elements, either volatile or non-volatile.

3   POWER DOWN AND REMOVAL OF NON-VOLATILE STORAGE

In order to ensure that no data remains resident on an SRX1500 platform in volatile memory, power must be removed from the system to clear all volatile storage.

Normally, the user will not be able to destroy user data stored in non-volatile memory as some non-volatile memory chips are soldered on system motherboard. However, if the user wants to destroy such data, the user needs to follow the steps below, but it is not advised unless the user wants to scrap the system.

1. The internal Half-Slim SSD must be removed from the motherboard by pulling the Half-Slim SSD from the Half-Slim SSD housing.
2. All external USB storage devices must be removed from the chassis
3. The external SSD must be removed from the chassis.

A detailed process is included in the following sections.

3.1   System Power Down

The SRX1500 should be powered down gracefully if time exists to do so. A graceful power down takes less than a minute to complete. To perform a graceful power down of an SRX platform, complete the following steps:

1. Execute the "request system power-off" command from the command line. Wait for positive feedback that the shutdown is complete. If connected via the console, you will see the message "The operating system has halted. Please press any key to reboot." If connected via Telnet or SSH, your session will be disconnected before the SRX completes the power down process. You can verify via the console or observe the LED's on the front of the chassis. If monitoring the LED's, ensure the Power LED is off (not solid on or flashing).

2. The user can power off the system via pressing and releasing the power button on front panel. This is shuts down the system gracefully.
3. The user can power off the system by pressing the power button in front panel for 10sec, system will shut downs immediately. You can verify via observing the Power LED. Please ensure the power LED is off.
4. Unplug the power cord from the SRX1500 system.
5. The user can shut down the system by removing DC cables from source for SRX1500 DC system.

An emergency power down of a JUNOS system can be performed by omitting step 1 and 2, simply performing step 3, 4, and 5 in the process above. Note that an emergency power down could possibly corrupt the operating system and configurations stored on the Half-Slim SSD. Once the system has been powered down, all volatile storage is clear.

3.2 Removal of the Half-Slim SSD storage devices from the System Motherboard

Open the chassis top cover,
Locate the Half-Slim SSD, see picture below,
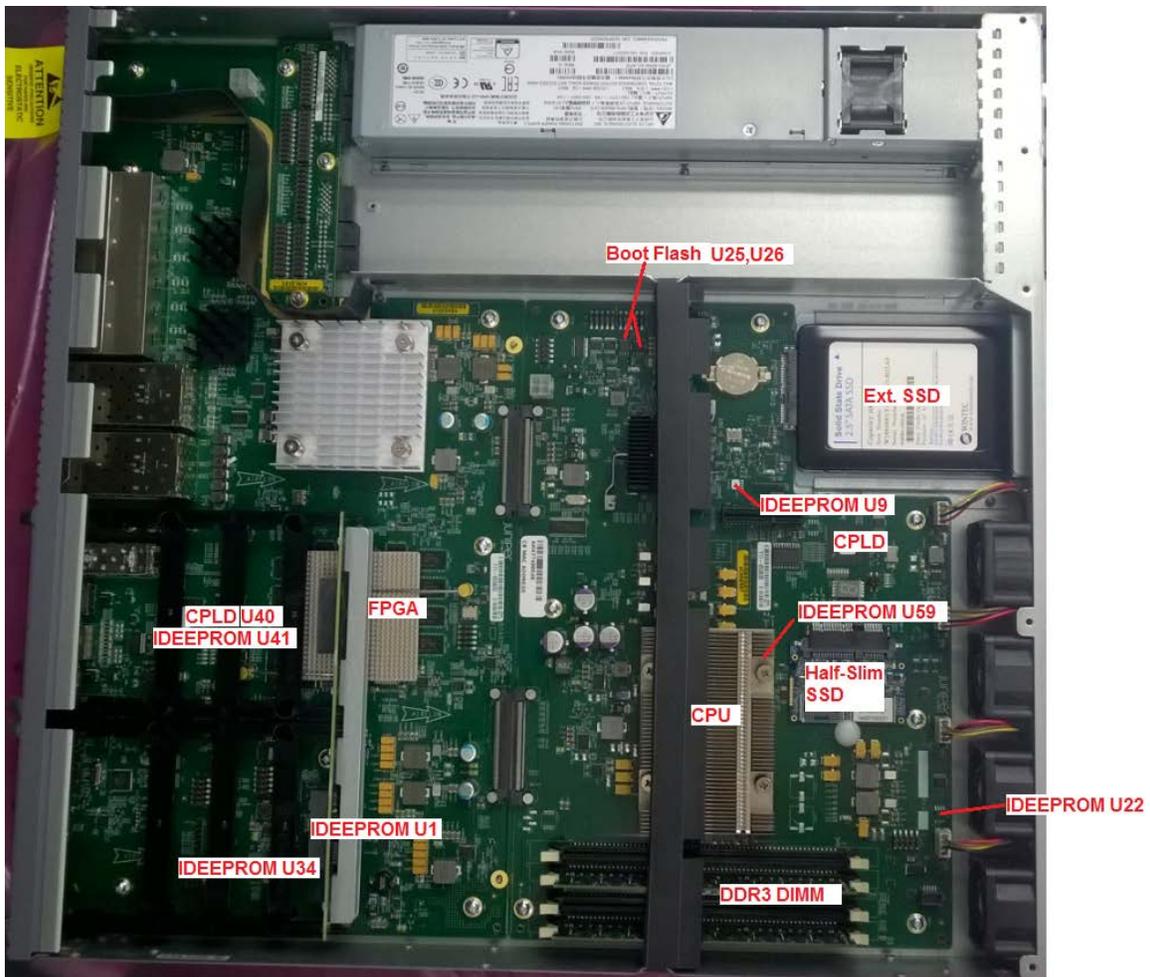Pull to remove the Half-Slim SSD.

Figure 3-1: Identification of storage devices

3.3 Removal of USB Storage from the Chassis

There are one USB interfaces on the front of the SRX1500 chassis. With the unit powered off, gently pull any attached media devices away from the SRX1500 chassis to remove them.

3.4 Removal of External SSD Storage from the Chassis

There are one SSD slot on the rear of the SRX1500 chassis. With the unit powered off, gently pull any attached media devices away from the SRX1500 chassis to remove them.

This completes the sanitization process for the SRX1500.

4   ENCRYPTION KEYS

The Encryption Keys are stored in DRAM, when system is running, and will be lost after the system is powered off.