

UNCLASSIFIED

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

**JUNIPER NETWORKS
MX240/MX480/MX960**

**REVISION 3.1
November 23, 2020**

UNCLASSIFIED
Juniper Public

Table of Contents

1	INTRODUCTION	1
1.1	Purpose.....	1
1.2	Scope	1
2	EQUIPMENT OVERVIEW.....	1
2.1	Identification of Chassis	1
2.1.1	MX240.....	1
2.1.2	MX480.....	2
2.1.3	MX960.....	3
2.2	Description of Components.....	3
2.2.1	Host Subsystem.....	3
2.2.2	Craft Interface.....	4
2.2.3	Dense Port Concentrators, Modular Port Concentrators, and Services Port Concentrators.....	4
2.2.4	Power Entry Modules.....	4
2.2.5	Cooling Subsystem	4
3	POWER DOWN AND REMOVAL OF NON-VOLATILE STORAGE.....	5
3.1	System Power Down	5
3.2	Removal of the RE from the Host Subsystem.....	5
3.3	Removal of the FLASH Disk from the RE	7
3.4	Removal of the Disk Drive from the RE.....	8
3.4.1	REs Equipped with Rotating Media Hard Drives	8
3.4.2	RE RE-1800 Equipped with Solid State Hard Drives	10
3.5	Removing the SSD from MX-SPC3	11

1 INTRODUCTION

1.1 Purpose

The purpose of this document is to provide direction to identify and remove all non-volatile (NV) storage from the Juniper Networks MX240, MX480, and MX960 routing platforms.

1.2 Scope

This document only addresses the MX240, MX480, and MX960 routing platforms. While other platforms offered by Juniper Networks may contain similar hardware components, this document only applies to the MX240, MX480, and MX960 routing platforms. 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 the NV storage components used in the MX 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 physical characteristics of each device are described in the following sections.

2.1.1 MX240

The MX240 is a four-slot chassis capable of holding a single Routing Engine (RE) and up to three Dense Port Concentrators (DPCs), Modular Port Concentrators (MPCs), or Services Port Concentrators (SPCs) or two REs and up to two DPC/MPC/SPCs. The chassis provides horizontal mounting of RE and DPC components. The bottom slot is reserved for the Host Subsystem, which includes the RE and corresponding System Control Board (SCB). The second slot from the bottom of the chassis can contain either a redundant Host Subsystem or a DPC/MPC/SPC. The top two slots can contain DPC/MPC/SPCs only. A minimum of one RE and SCB must be installed in the chassis for operation.



Figure 2-1: MX240 Chassis

2.1.2 MX480

The MX480 is an eight-slot chassis capable of holding one or two REs and up to six DPCs, MPCs, or SPCs. The chassis provides horizontal mounting of RE and DPC/MPC/SPC components. The bottom two slots are reserved for the Host Subsystem. A minimum of one RE and SCB must be installed in the chassis for operation. The remaining four slots can contain DPC/MPC/SPCs only.



Figure 2-2: MX480 Chassis

2.1.3 MX960

The MX960 is a 14-slot chassis capable of holding one, two, or three REs and up to 12 DPC/MPC/SPCs. The chassis provides vertical mounting of RE and DPC/MPC components. The two center slots (0 and 1) are reserved for the Host Subsystem. A third SCB can be installed in slot 2/6, directly to the right of the dedicated Host Subsystem slots. If an RE is installed in slot 2/6, it will receive power but will not participate in the control operations on the router. A minimum of one RE and SCB must be installed in the chassis for operation. The remaining 12 slots can contain DPC/MPC/SPCs only.



Figure 2-3: MX960 Chassis

2.2 Description of Components

The following major components are installed in the MX chassis. Information about the included components applies to all members of the MX product family.

2.2.1 Host Subsystem

The Host Subsystem consists of an RE and corresponding SCB. Both components fit into a common card carrier that then fits into a Host Subsystem slot in the MX chassis. For horizontal-mount platforms (MX240 and MX480), the RE sits to the right of the SCB when the Host Subsystem is installed in the chassis. For vertical mount platforms (MX960), the RE sits below the SCB.

Two models of RE are available for the MX family, the RE-S-1300 and a higher performance RE-S-2000. Either RE can be installed in any member of the MX family. Both models of RE contain the following storage elements: Synchronous Dynamic Random Access Memory (SDRAM) in either 2GB (RE-1300) or 4GB (RE-2000) configurations, on-board FLASH disk, and on-board hard disk drive. The SDRAM is volatile storage; the contents are cleared when power is removed from the system. The FLASH disk and hard disk drive provide non-volatile (NV) storage. These components must be removed to ensure that no data remains on the system.

The SCB is permanently fixed to the Host Subsystem card carrier. It contains no storage elements, either volatile or non-volatile.

2.2.2 Craft Interface

The Craft Interface provides system control and monitoring from the front of the chassis. It is installed at the top of the chassis, directly above the DPC card cage. It contains no storage elements, either volatile or non-volatile.

2.2.3 Dense Port Concentrators, Modular Port Concentrators, and Services Port Concentrators

DPCs, MPCs, and SPCs install directly in the MX chassis and provide the necessary electronics to support network interfaces. DPCs and MPCs contain SDRAM (volatile storage), the contents of which are cleared when power is removed from the system. DPCs, MPCs, and SPCs also contain a small amount of non-volatile storage used to hold device/board configuration data and boot information. No user-specified router configuration data is stored on these cards.

2.2.4 Power Entry Modules

The Power Entry Modules (PEMs) are in the rear of the chassis. They are available in low-line (110V) AC, high-line (220V) AC, and -48VDC varieties. Up to four like-model PEMs can be installed in an MX chassis. The PEMs contain no storage elements, either volatile or non-volatile.

2.2.5 Cooling Subsystem

The Cooling Subsystem consists of one or more fan trays and an air filter. The Cooling Subsystem contain no storage elements, either volatile or non-volatile.

3 POWER DOWN AND REMOVAL OF NON-VOLATILE STORAGE

To ensure that no data remains resident on an MX platform, the following steps must be performed:

1. Power must be removed from the system to clear all volatile storage
2. The FLASH disk and hard disk drive must be removed from any installed REs to eliminate points of NV storage

A detailed process is included in the following sections.

3.1 System Power Down

The MX should be powered down gracefully if time exists to do so. A graceful power down takes approximately five minutes to complete. To perform a graceful power down of an MX platform, complete the following steps:

1. From the router CLI, execute the “request system power-off” command.
2. Wait for positive feedback that the shutdown is complete. If connected via the router 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 router completes the power down process. You can verify via the console or observe the LED's on the Craft Interface and verify that neither RE is online or master.
3. For a system with AC PEMs, set the on/off switch on each PEM to the off position and remove the corresponding electrical cable. For a system with DC PEMs, flip the breaker to the open position. **DO NOT ATTEMPT TO REMOVE POWER CONNECTIONS FROM A DC PEM! SERIOUS INJURY OR DEATH MAY RESULT!**

An emergency power down can be performed by omitting steps 1 and 2, and simply performing step 3 in the process above. Note that an emergency power down could possibly corrupt the operating system and configurations stored on the NV media. Once the system has been powered down, all volatile storage is clear.

3.2 Removal of the RE from the Host Subsystem

NOTE: As stated in Section 2.2.1 of this document, there are three models of RE for the MX family, the RE-S-1300, RE-S-1800 and the RE-S-2000. The following process applies to all models of RE.

Once the MX has been powered down, the next step is to remove all REs from the Host Subsystem. Recall that an MX platform may have one, two, or three REs installed. If multiple REs are installed, the process defined here and in

subsequent sections should be performed for all routing engines. To remove the RE from the Host Subsystem in MX platform, complete the following steps:

1. Place an electrostatic bag or antistatic mat on a flat, stable surface.
2. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist and connect the strap to one of the ESD points on the chassis. Make sure the router is attached to a proper earth ground.
3. Loosen the captive screws at each end of the Routing Engine.
4. Flip the ejector handles outward to unseat the Routing Engine.
5. Grasp the Routing Engine by the ejector handles and slide it about halfway out of the chassis.
6. Place one hand underneath the Routing Engine to support it and slide it completely out of the chassis.
7. Place the Routing Engine on the antistatic mat.

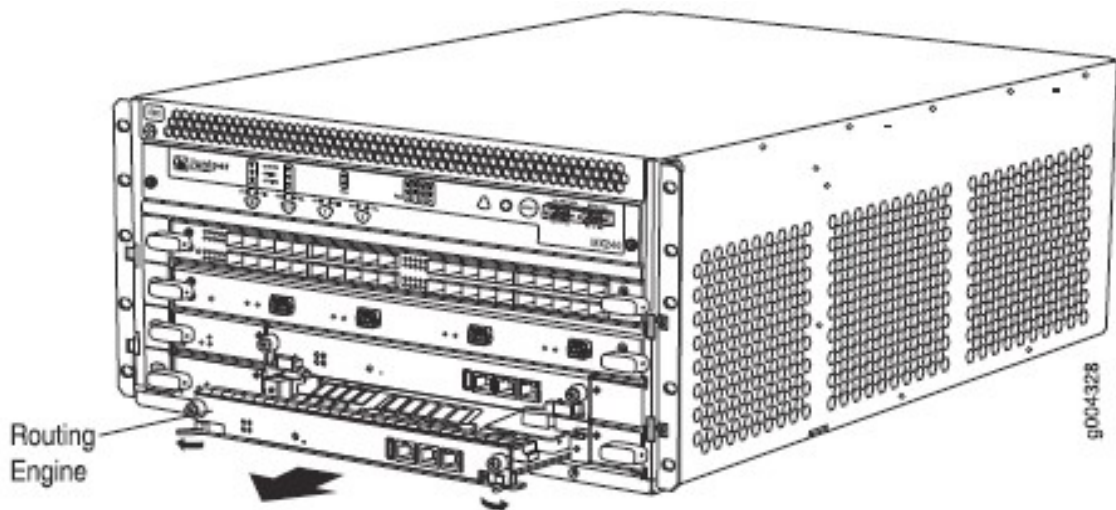


Figure 3-1: Removal of RE from an MX240

Once the RE has been removed from the Host Subsystem, locate the compact FLASH and hard disk drive on the top side of the RE. The following example is from the RE-S-2000. The RE-S-1300 is similar.

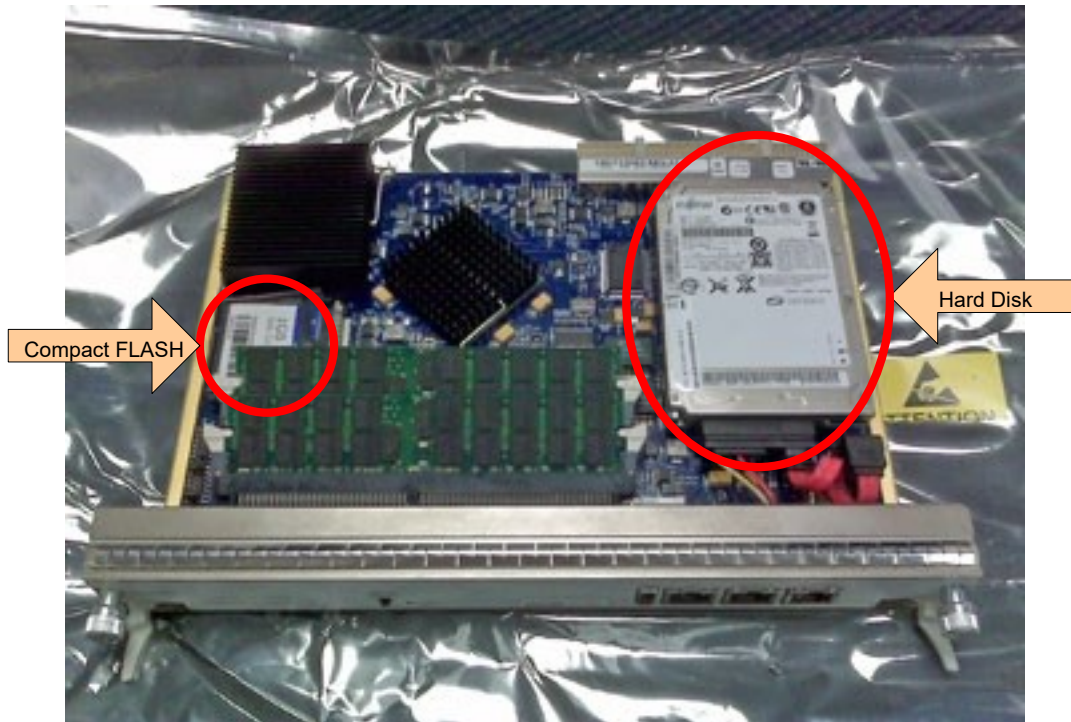


Figure 3-2: Locate RE-1300 and RE1800 Compact FLASH Disk and Hard Disk Drive

3.3 Removal of the FLASH Disk from the RE

NOTE: As stated in Section 2.2.1 of this document, there are three models of RE available for the MX family, the RE-S-1300, RE-S-1800 and the RE-S-2000. The following process applies to all models of RE.

The FLASH disk is a 1GB compact FLASH module. It is located on the left side of the RE when viewing the card from overhead, with the face plate of the RE facing you. It is secured in place by either a plastic or wire retaining clip. Refer to the figure below:



Figure 3-3: FLASH Disk Retaining Clip

To remove the FLASH disk from the RE, complete the following steps:

1. Use needlenose pliers with grooved jaws to pull the retaining clip out from under the compact FLASH disk and lift it up.
2. Use the needlenose pliers to gently grasp the compact FLASH disk and slide it out of the connector.
3. Place the FLASH disk on the antistatic mat.

3.4 Removal of the Disk Drive from the RE

3.4.1 REs Equipped with Rotating Media Hard Drives

NOTE: As stated in Section 2.2.1 of this document, there are three models of RE available for the MX family, the RE-S-1300, RE-S-1800, and the RE-S-2000. The following process applies to the RE-E-1300 and RE-S-2000 models of RE. These REs are distinguished by the use of rotating media hard drives.

The hard disk drive is located on the right side of the RE when viewing the card from overhead, with the faceplate facing you. It is secured in place by four screws which can be removed from the underside of the RE. Refer to the figure below for the location of the mounting screws:

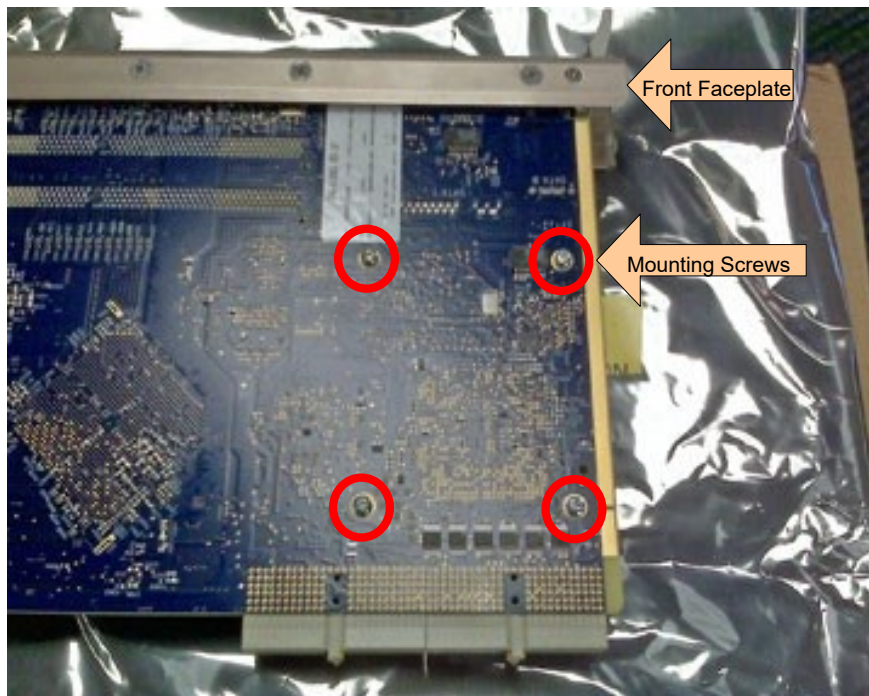


Figure 3-4: Location of Hard Disk Drive Mounting Screws

In addition, a power cable and SATA data cable connect the hard disk drive to the circuitry on the RE. These cables connect to the side of hard disk drive nearest the front faceplate of the RE. Refer to the figure below:

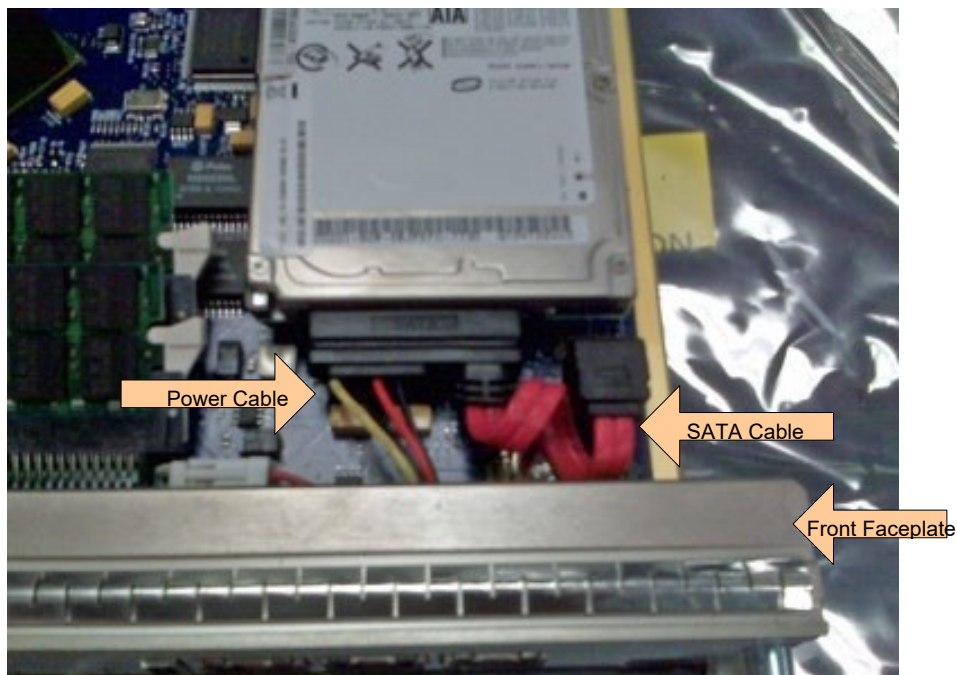


Figure 3-5: Location of Power and SATA Cables

To remove the FLASH disk from the RE, complete the following steps:

1. The power and SATA cables are connected to the hard disk drive by a common plastic clip. Use needle nose pliers or a small flat blade screwdriver to gently pry the clip from the hard disk drive.
2. Turn the RE upside down and remove the four hard disk mounting screws with a small Philip's head screwdriver. Use caution as the last mounting screw is removed, as there is nothing else to secure the hard disk drive to the RE.
3. Place the hard disk drive on the antistatic mat.

This completes the sanitization process for the RE. Repeat the process defined in Section 3 for each RE installed in the chassis.

3.4.2 RE RE-1800 Equipped with Solid State Hard Drives

NOTE: As stated in Section 2.2.1 of this document, there are three models of RE available for the MX family, the RE-S-1300, RE-S-1800, and the RE-S-2000. The following process applies to the RE-S-1800 model, which is distinguished by the use of solid-state hard drives (SSD).

The SSD is located on the right side of the RE when viewing the card from overhead, with the faceplate facing you. One or two are installed and are usually accessed through a small door fastened with a thumbscrew, as shown in the figure below.

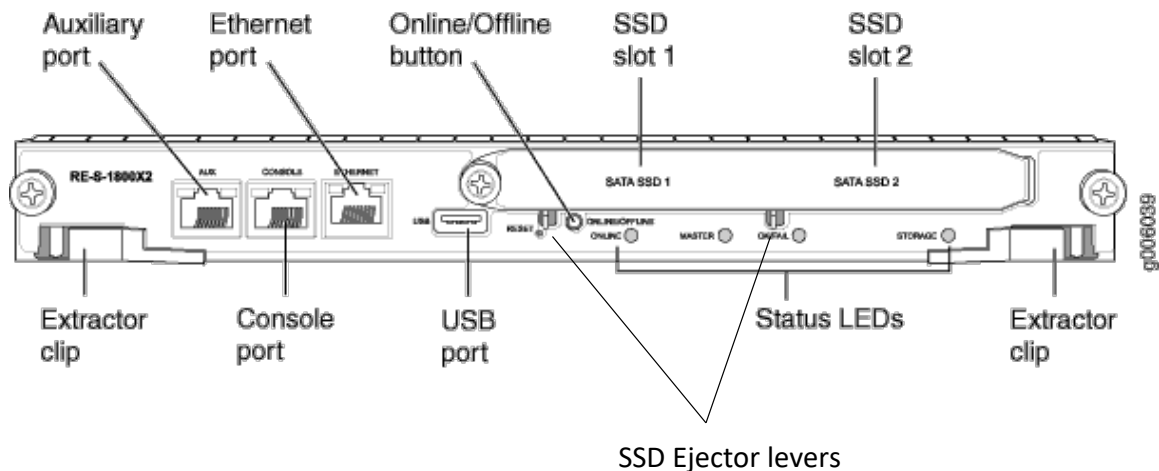


Figure 3-6: RE-S-1800 Front Panel with SSD Access Door

In addition, a compact flash (CF) card is installed under the SSD bay. The RE must be removed from the router chassis to access the CF card.

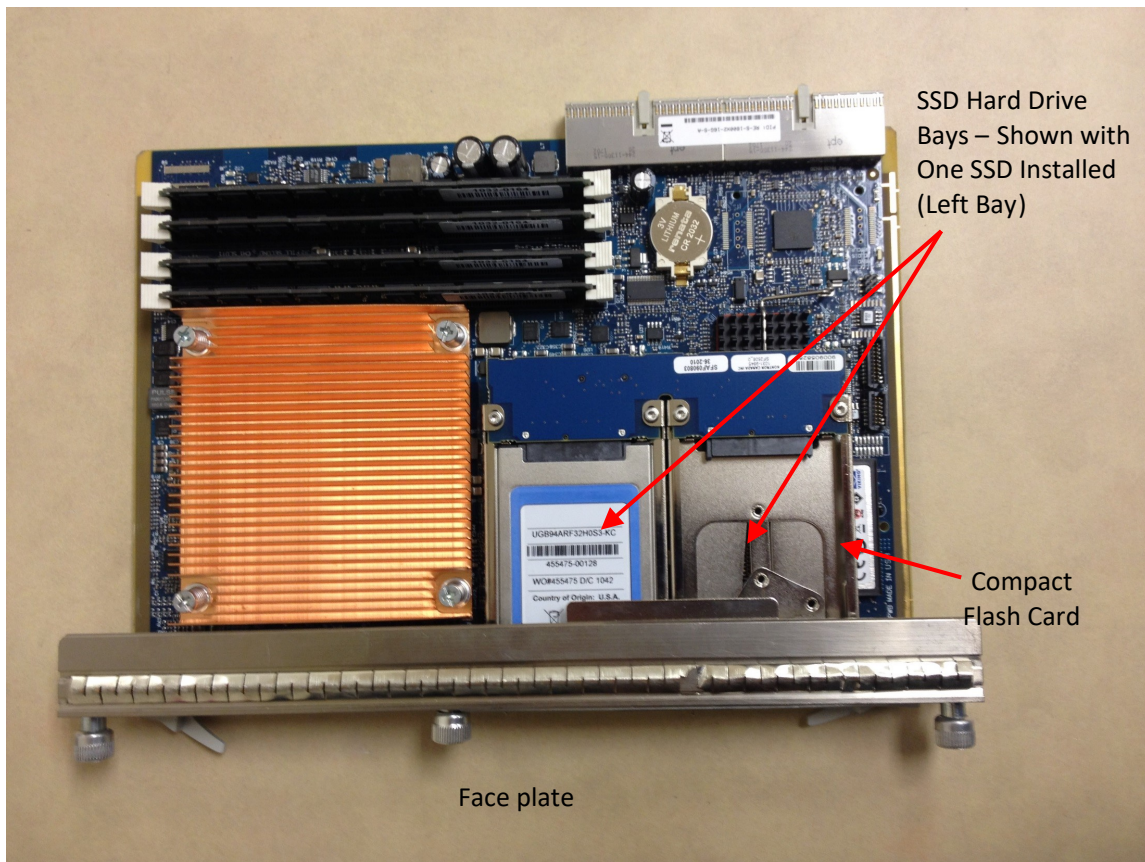


Figure 3-7: RE-S-1800 Top View Showing SSD Bays and Compact Flash

This completes the sanitization process for the RE. Repeat the process defined in Section 3 for each RE installed in the chassis.

3.5 Removing the SSD from MX-SPC3

This procedure explains how to remove the solid-state drive (SSD) that is located on the top right corner of the MX-SPC3.

1. Place an electrostatic bag or antistatic mat on a flat, stable surface to receive the SSD.
2. Attach an electrostatic discharge (ESD) grounding strap to your bare wrist, and connect the strap to the ESD point on the chassis.
3. Remove the three screws securing the SSD cover plate by using the Phillips (+) screwdriver.

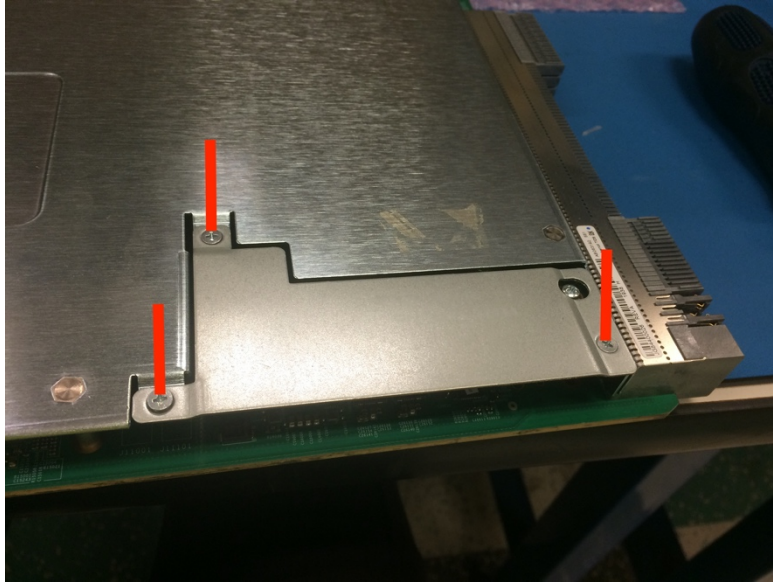


Figure 3-8: MX-SPC3 Top View Showing SSD Cover Plate

4. Remove the two screws holding the SSD in place to the SPC3 and gently remove the SSD.

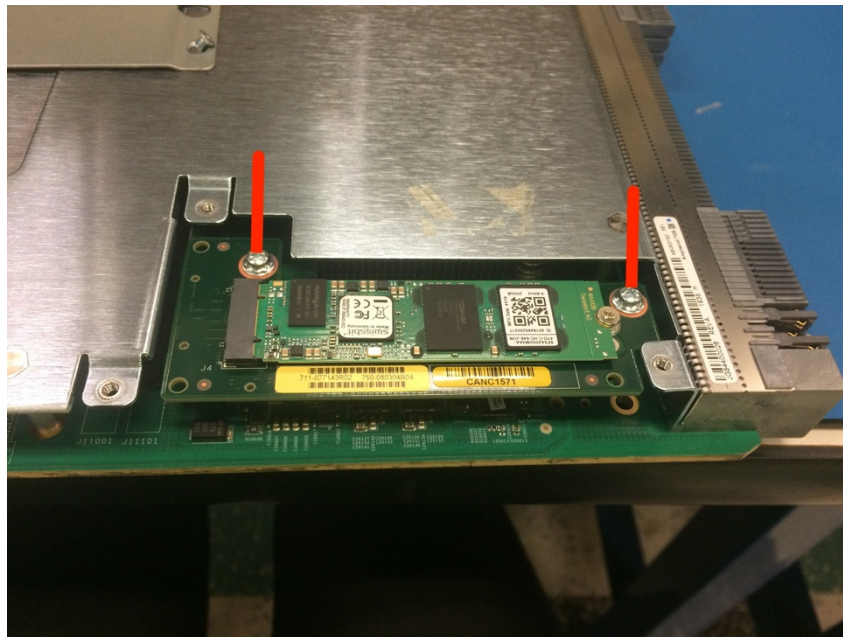


Figure 3-9: RE-S-1800 Top View Showing SSD Bays and Compact Flash

5. Place the SSD on the antistatic mat or in the electrostatic bag.
6. Place the SSD cover plate back on the SPC3 and tighten the three screws securing the SSD cover plate.