

# Statement of Volatility for MX304

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## Introduction

### Purpose

The purpose of this document is to provide direction to identify volatile and non-volatile storages and removal of all non-volatile (NV) storage from the Juniper Networks' *MX304 Platform*

### Scope

This document provides directions for the identification, sanitization and removal of NV storage components. It does not address destruction procedures for those components. As all the NV storage components used in the MX304 are commercial off-the-shelf (COTS) components, directions for destruction of those components are left to the customer's governing department, agency, or office.

## Chassis (MX304) Overview

MX304 Chassis has built-in #6 boards –

1. Control Board
2. Fabric Board
3. Timing Interface Board
4. PMB (Processor Mezzanine Board) and
5. Power Adaptor Board (Quantity #2)

MX304 Chassis has below FRU –

1. JNP304-RE
2. MX304-LMIC16-BASE
3. JNP-FAN-2RU



## Control Board

The table below identifies all the memory locations on the Control Board which is built-in card within MX304 Chassis.

Control Board – 750-122721						
Type of Memory	Size	Reference Designator	Volatile/Non-Volatile	Removable Memory	Function	Sanitization Procedure
ID EEPROM	2Kb	U5502	Non-Volatile	No	Board Information	NA
BITS Frammer with RAM	NA	U3000	Volatile	No	Packet Memory	Remove Power
Ethernet Switch with RAM	NA	U501	Volatile	No	Packet Memory	Remove Power
Clock Jitter attenuator with NVRAM	NA	U4612	Non-Volatile	No	Clock Config	NA
Clock Jitter attenuator with NVRAM	NA	U4604	Non-Volatile	No	Clock Config	NA
Clock Synchronizer with NVRAM	NA	U4801	Non-Volatile	No	Clock Config	NA
Clock Jitter attenuator with NVRAM	NA	U4603	Non-Volatile	No	Clock Config	NA
Clock Jitter attenuator with NVRAM	NA	U4618	Non-Volatile	No	Clock Config	NA
EEPROM	8 KB	U504	Non-Volatile	No	Gigabit Ethernet Switch BOOTROM	NA
EEPROM	32 KB	U5507	Non-Volatile	No	BIOS Parameters	NA
SPI Flash	128 Mb	U500	Non-Volatile	No	Gigabit Ethernet Switch Microinit	NA
SPI Flash	64 Mb	U1112	Non-Volatile	No	FPGA Config	NA
SPI Flash	64 Mb	U2110	Non-Volatile	No	FPGA Config	NA
EEPROM	16KB	U101	Non-Volatile	No	PCIe SW Config	NA

## Fabric Board

The table below identifies all the memory locations on the Fabric Board which is built-in card within MX304 Chassis.

Fabric Board – 750-122847						
Type of Memory	Size	Reference Designator	Volatile/Non-Volatile	Removable Memory	Function	Sanitization Procedure
ID EEPROM	2KBits	U4101	Non-Volatile	No	Board Information	NA
Clock Jitter attenuator with NVRAM	NA	U4001	Non-Volatile	No	Clock Config	NA
CPLD with Flash	NA	U7306	Non-Volatile	No	CPLD Config Memory	NA
SPI Flash	512 KB	U7305	Non-Volatile	No	CPLD Config Memory	NA

## Timing Interface Board

The table below identifies all the memory locations on the Timing Interface Board which is built-in card within MX304 Chassis.

Timing Interface Board – 750-126514						
Type of Memory	Size	Reference Designator	Volatile/Non-Volatile	Removable Memory	Function	Sanitization Procedure
ID EEPROM	2Kb	U5	Non-Volatile	No	Board Information	NA

## Processor Mezzanine Board

The table below identifies all the memory locations on the Processor Mezzanine Board which is built-in card within MX304 Chassis.

Processor Mezzanine Board – 750-122877						
Type of Memory	Size	Reference Designator	Volatile/Non-Volatile	Removable Memory	Function	Sanitization Procedure
ID EEPROM	2Kb	U22	Non-Volatile	No	Board Information	NA
NVRAM	4Mb	U37	Non-Volatile	No	Processor/System Logs	Write all ZEROs
Microcontroller with RAM	NA	U6509	Non-Volatile	No	TPM	NA
CPLD with Flash	NA	U39	Non-Volatile	No	CPLD Config Memory	NA
SPI Flash	128Mb	U18	Non-Volatile	No	Primary BIOS	NA
SPI Flash	128Mb	U19	Non-Volatile	No	Golden BIOS	NA

Processor Mezzanine Board – 750-122877						
Type of Memory	Size	Reference Designator	Volatile/N on-Volatile	Removable Memory	Function	Sanitization Procedure
DDR4 Memory	16GB each	J1, J3	Volatile	Yes	Processor Main Memory	Remove Power
Power Device with NV RAM	NA	U11	Non-Volatile	No	Power Config	NA

### Power Adaptor Board

Power Adaptor board which is built-in card within MX304 Chassis doesn't have any component with memory.

**JNP304-RE**

The table below identifies all the memory locations on the JNP304-RE

<b>JNP304-RE – 750-123749</b>						
<b>Type of Memory</b>	<b>Size</b>	<b>Reference Designator</b>	<b>Volatile/Non-Volatile</b>	<b>Removable Memory</b>	<b>Function</b>	<b>Sanitization Procedure</b>
ID EEPROM	2Kb	U66	Non-Volatile	No	Board Information	NA
Microcontroller with RAM	NA	U2501	Non-Volatile	No	TPM	NA
CPLD with Flash	NA	U91	Non-Volatile	No	CPLD Config Memory	NA
SPI Flash	512KB	U92	Non-Volatile	No	CPLD Config Memory - Golden	NA
SPI Flash	512Mb	U2001	Non-Volatile	No	Primary BIOS	NA
SPI Flash	512Mb	U2002	Non-Volatile	No	Golden BIOS	NA
DDR4 Memory	32GB each	J1001, J1051, J1101, J1151	Volatile	Yes	Processor Main Memory	Remove Power or can also remove device
SSD M.2	200GB each	J2310, J2340	Non-Volatile	Yes	Processor Disk Drive	Secure Erase or can also remove device
SPI Flash	16Mb	U12001	Non-Volatile	No	NIC Device config	NA
Power Device with NV RAM	NA	U117, U118, U802	Non-Volatile	No	Power Config	NA
Power Device with NV RAM	NA	U7509	Non-Volatile	No	Power Config	NA

## MX304-LMIC16-BASE

The table below identifies all the memory locations on the MX304-LMIC16-BASE

MX304-LMIC16-BASE – 750-122718						
Type of Memory	Size	Reference Designator	Volatile/Non-Volatile	Removable Memory	Function	Sanitization Procedure
ID EEPROM	2Kb	U21502	Non-Volatile	No	Board Information	NA
Packet Forwarding ASIC with Memory	NA	U3	Volatile	No	Packet Forwarding	Remove power
Clock Jitter attenuator with NVRAM	NA	U20002	Non-Volatile	No	Clock Config	NA
Clock Jitter attenuator with NVRAM	NA	U20004	Non-Volatile	No	Clock Config	NA
Clock Freq Gen with NVRAM	NA	U20003	Non-Volatile	No	Clock Config	NA
Timing Device with OTP Memory	NA	U20008	Non-Volatile	No	Clock Config	NA
SPI Flash	128 Mb	U21006	Non-Volatile	No	FPGA Config	NA
Power Device with NVM	NA	U14001	Non-Volatile	No	Power Config	NA
Power Device with NVM	NA	U17501, U18001	Non-Volatile	No	Power Config	NA
Ethernet PHY with uC	NA	U2001, U2501, U3001, U3501, U4001, U4501	Volatile	No	Device Config	Remove Power

## JNP-FAN-2RU

The table below identifies all the memory locations on the JNP-FAN-2RU

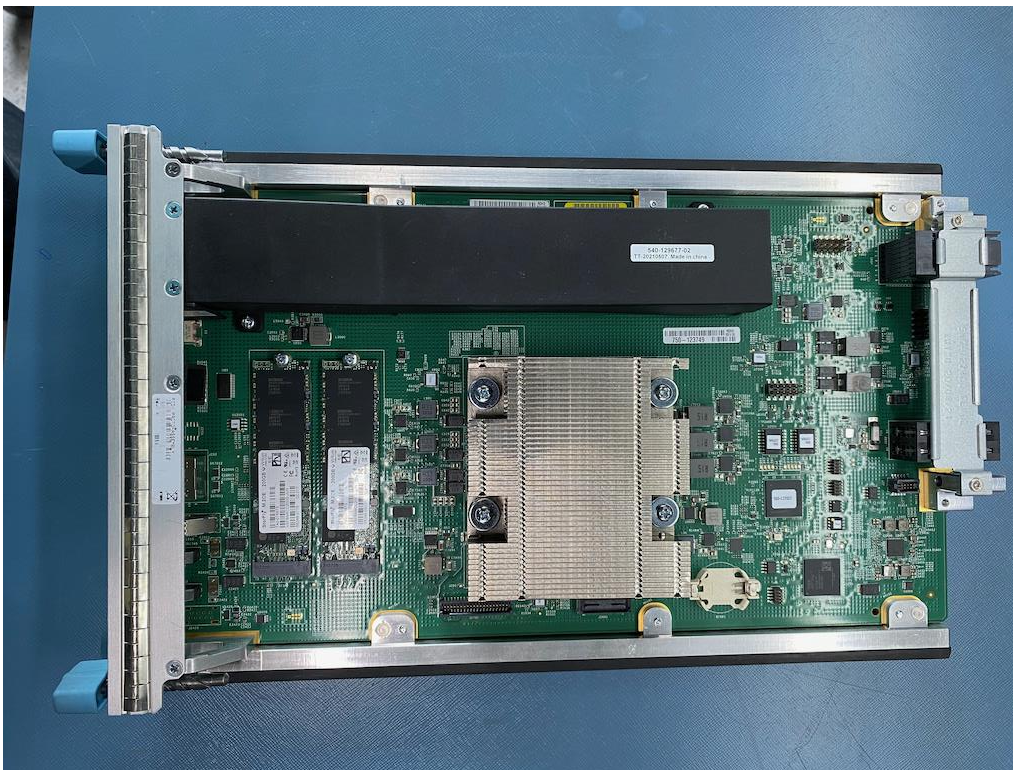
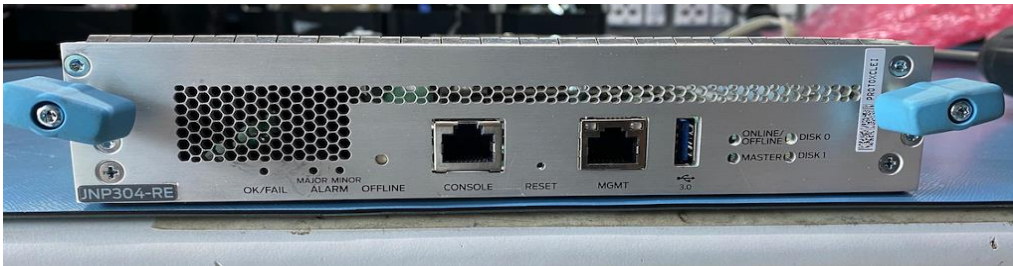
JNP-FAN-2RU – 750-126744						
Type of Memory	Size	Reference Designator	Volatile/Non-Volatile	Removable Memory	Function	Sanitization Procedure
ID EEPROM	2Kb	U1	Non-Volatile	No	Board Information	NA

## Removal of SSD on JNP304-RE

On-board SSDs on JNP304-RE are the *only* components in a MX304 system that store customer-specific information such as system configuration. In order to ensure that no user data or system configuration information resides in the system, the system must be powered down, and *all* SSDs must be removed from the system. If the system includes primary and redundant RE FRUs, the SSDs on both the cards must be extracted to ensure complete data removal. This section describes how to remove the SSD components from a JNP304-RE.

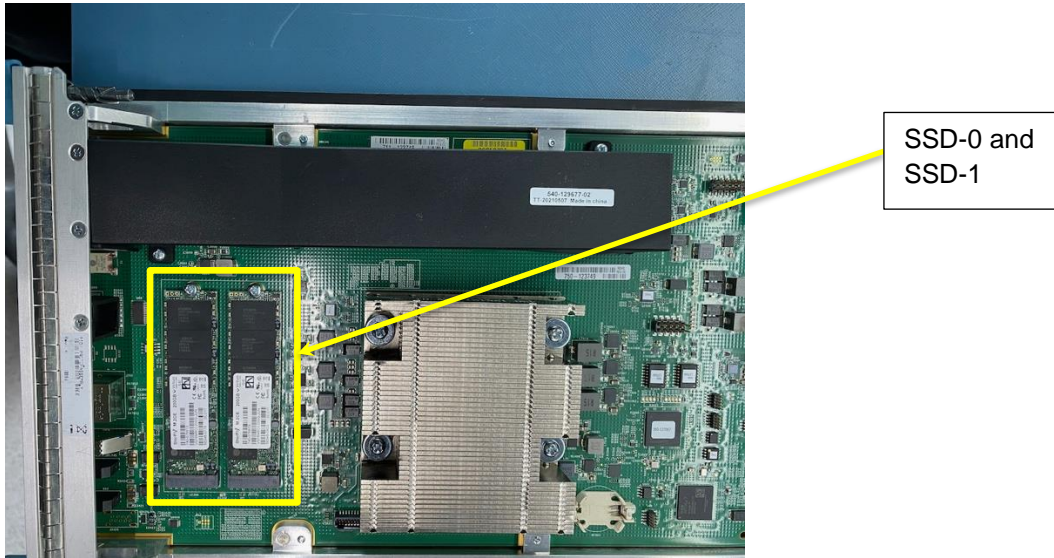
Follow these steps to remove the SSDs from the FRU. Please be aware that removing this SSD makes the JNP304-RE FRU completely unusable.

1. Before removing the SSD, ensure that J-TAC and appropriate Juniper account team has been notified of your intention.
2. Power-down the system containing the JNP304-RE FRU.
3. Remove JNP304-RE FRU from the system and place it on a flat surface, as shown in the first picture below.

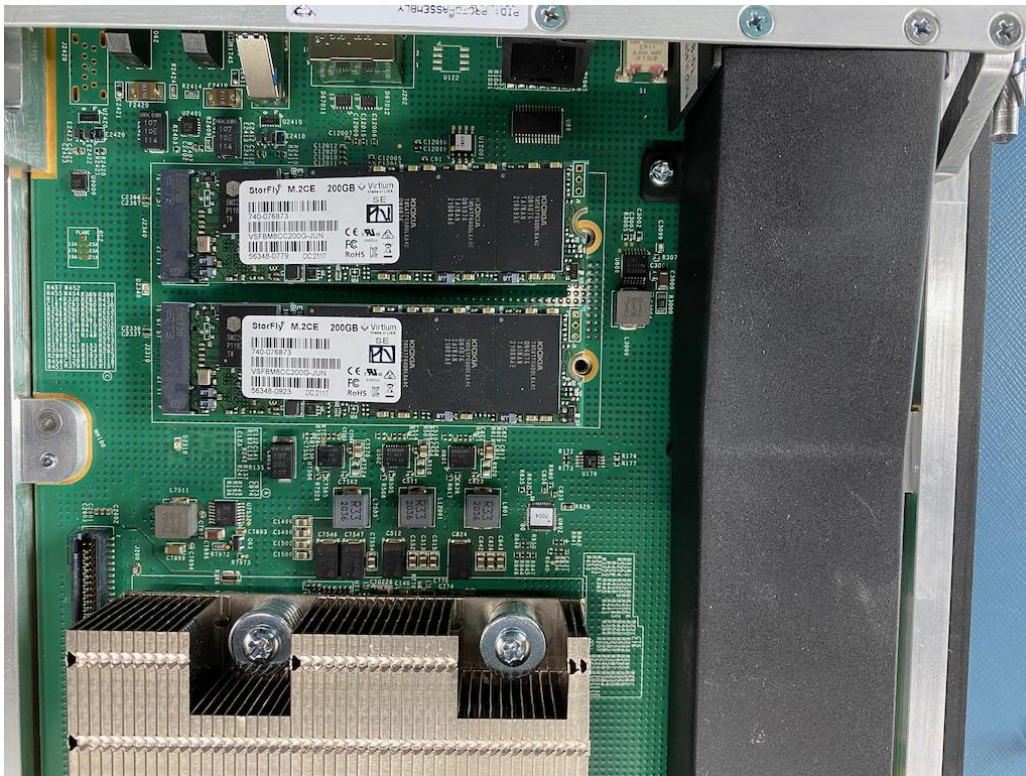




4. Locate the SSD module, as shown in the following picture, marked with yellow rectangle.

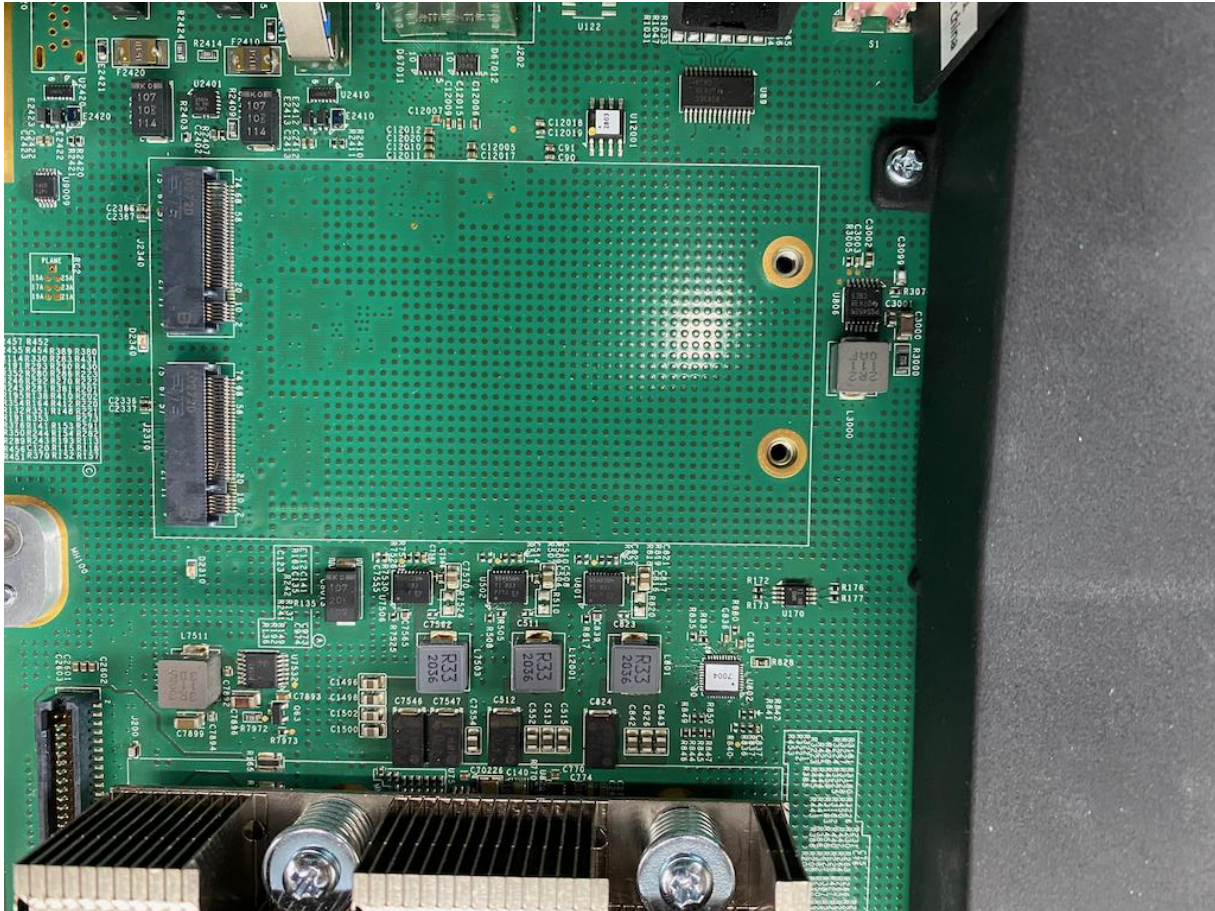


5. Using a screwdriver, remove the screw close to the edge of the SSD module. When this screw is completely removed, the edge of the SSD module will rise from the original position, and the SSD module will look as shown in the following picture.





6. Take the SSD out from its connector. When the SSD is removed, the board will look as shown below:



7. Destroy the SSD.

## Chassis Power Down

Use standard CLI commands and procedure to offline and power down the Chassis MX304.

## Sanitization process and associated JUNOS commands

### SATA Drive

Use SW secure erase as specified in table above.

Here is the required sequence of cli commands -

- request vmhost zeroize – from primary disk (removes configs and other sensitive data)
- request vmhost snapshot partition – from primary disk (secure erase & partitions the secondary and snapshots the primary contents to secondary)
- request vmhost reboot disk2 - Reboot with secondary disk
- request vmhost snapshot recovery partition – from secondary disk (secure erase & partitions the primary and snapshots the secondary contents to primary)

### NVRAM

Method to clear the NVRAM, is to perform an erase command, to load all locations with 000's as described in table above.

```
root@sw-bugatti-l-fpc0:/# pmb_nvram_log.py -e -m ""
```

Below command can also be used –

Exampe:

```
root@sw-bugatti-l-fpc0:/# cat /proc/mtd
dev:   size  erasesize  name
mtd0: 002d0000 00001000 "bugatti-main-primary"
mtd1: 00520000 00001000 "bugatti-main-golden"
mtd2: 00480000 00010000 "pic0-fpga-primary"
mtd3: 00480000 00010000 "pic0-fpga-golden"
mtd4: 00480000 00010000 "pic2-fpga-primary"
mtd5: 00480000 00010000 "pic2-fpga-golden"
mtd6: 00480000 00010000 "pic1-fpga-primary"
mtd7: 00480000 00010000 "pic1-fpga-golden"
mtd8: 00008000 00002000 "fc808000.nvram" >>> NVRAM
```

### **#Simulating data in nvram**

```
root@sw-bugatti-l-fpc0:/# sudo dd if=/dev/random of=/dev/mtd8 bs=256 count=1
1+0 records in
1+0 records out
256 bytes copied, 0.00017256 s, 1.5 MB/s
```

```
root@sw-bugatti-l-fpc0:/# hexdump /dev/mtd8
00000000 2c0d fac7 d798 8926 f8ad be66 6b42 73ec
00000100 8156 8ef4 779e 0d63 678d 5687 90f3 996b
00000200 dc37 6feb b0d4 5dad 44ec fc2f a342 6842
00000300 056e c724 b55f 922e 7609 b1dc 2daf 0fbe
```

```
0000040 244d f994 bbd7 7b2e 8adb 5855 1f4f b19a
0000050 d1b1 592a 3d3f b686 6dc2 59fe 6337 cadd
0000060 db13 daa8 fe0e c2c9 11f8 d17a e7aa a48a
0000070 7a8e 7d93 416f e768 eb88 8060 54b8 eb46
0000080 9736 865b 1eeb 8a43 e970 bd6a df67 55dd
0000090 aa2a aa5a dac1 e925 3899 d126 1ee4 4240
00000a0 28dd 4e5b 0113 19b5 30a9 10bf ddfa 6a4f
00000b0 528a 9d7c a754 1888 969e 5aba 33aa 1a0f
00000c0 97ba 42aa 79c1 c1a9 919e 9275 5375 0e09
00000d0 9eaf 8c8a aed3 e976 51a9 b6e1 bb4f 81dd
00000e0 e759 9b84 6c8c fc93 c500 a0e4 4a65 7ad1
00000f0 b0c6 b7ee d980 f75f 8723 f328 d32d e2bc
0000100 ffff ffff ffff ffff ffff ffff ffff ffff
*
0008000
```

### #Erasing NVRAM

```
root@sw-bugatti-1-fpc0:/# flash_erase /dev/mtd8 0 0
```

```
Erasing 8 Kibyte @ 6000 -- 100 % complete
```

```
root@sw-bugatti-1-fpc0:/# hexdump /dev/mtd8
```

```
0000000 ffff ffff ffff ffff ffff ffff ffff ffff
*
00080
```

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