



# *IOS-XR Troubleshooting*

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# Agenda

- XR Installation Guide & Troubleshooting
- Forwarding Path Introduction
- Service Link Fault Detection
- Router System Review
- Environment Monitor
- Operation & Maintenance

# XR Installation Guide & Troubleshooting

## Scope:

Any type router which run IOS-XR, including XR12000/CRS-1/CRS-3/ASR9K/ASR9001

## Method:

TURBOBOOT/Install Mode

## Advantage:

1. Most Clean Installation: TURBOBOOT, we can format installation disk and install XR system in it
2. Min Service Impact: Install Mode, Install .pie packet
3. Most of Users choose PIE installation method

# XR Installation Guide & Troubleshooting

## TURBOBOOT

### Demo:

```
TURBOBOOT=on,disk0,format  
IP_ADDRESS=10.1.1.1  
IP_SUBNET_MASK=255.255.255.0  
DEFAULT_GATEWAY=10.1.1.2  
TFTP_BLKSIZE=1024  
rommon 35 > boot tftp://10.1.1.2/hfr-mini-px.vm-4.1.2  
USB: boot usb://xxxx.vm-4.1.2
```

## Install Mode

1. RP/0/RSP0/CPU0:ASR-1(admin)#install add source tftp://124.74.212.29 asr9k-mini-p.pie-4.2.1 asr9k-k9sec-p.pie-4.2.1 asr9k-mcast-p.pie-4.2.1 asr9k-mgbl-p.pie-4.2.1 asr9k-doc-p.pie-4.2.1 asr9k-mpls-p.pie-4.2.1 sync (this can be done before Upgrade)
2. RP/0/RSP0/CPU0:ASR-1(admin)#install activate disk0:\*4.2.1\* sync
3. After system reload, Install SMU and Upgrade FPD

# Installation Troubleshooting

## TURBOBOOT Mode:

- ✓ Rommon Setting: set
- ✓ USB File format
- ✓ TFTP Setting
- ✓ Install File Hash

## Install Mode:

- ✓ Console Logs & Operation Logs
- ✓ Admin show install log/show install events/show install trace instdir
- ✓ Show install active summary/Admin show platform
- ✓ Dir disk0:/harddisk:
- ✓ Show configuration failed
- ✓ Show logging
- ✓ Process:Instdir

**Questions/Demo: SMU Installation and Reload & Hitless SMU Bundle Installation**

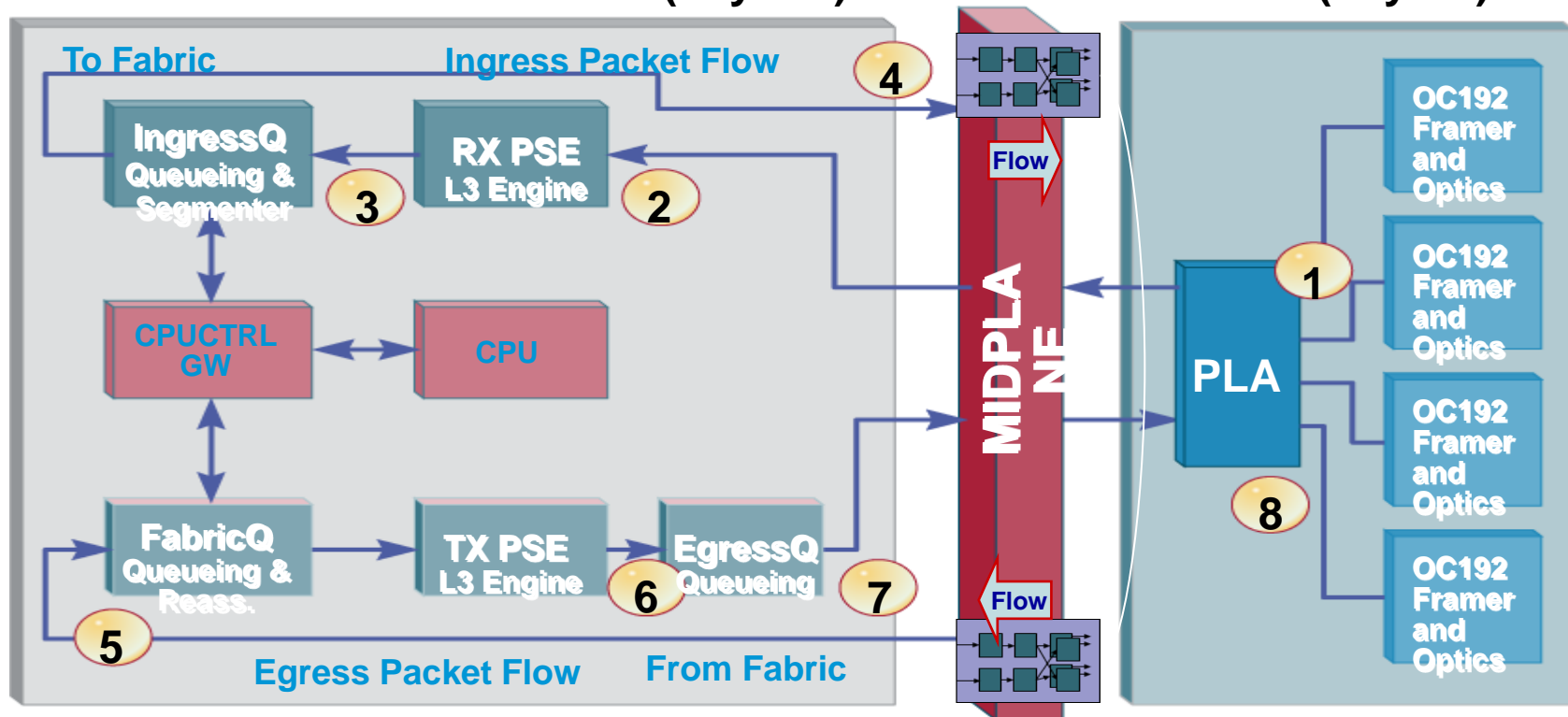
# Good Installation Proposal

- Detail Operation Plan
- Prepare for some files and send to Router Disk0/harddisk
- Interface Shutdown/Router Process Shutdown/Leave one direct-Connect Link
- Operation
- FPD and other HW version Upgrade
- SNMP and interfaces checked
- Rubbish file removed
- Test Service

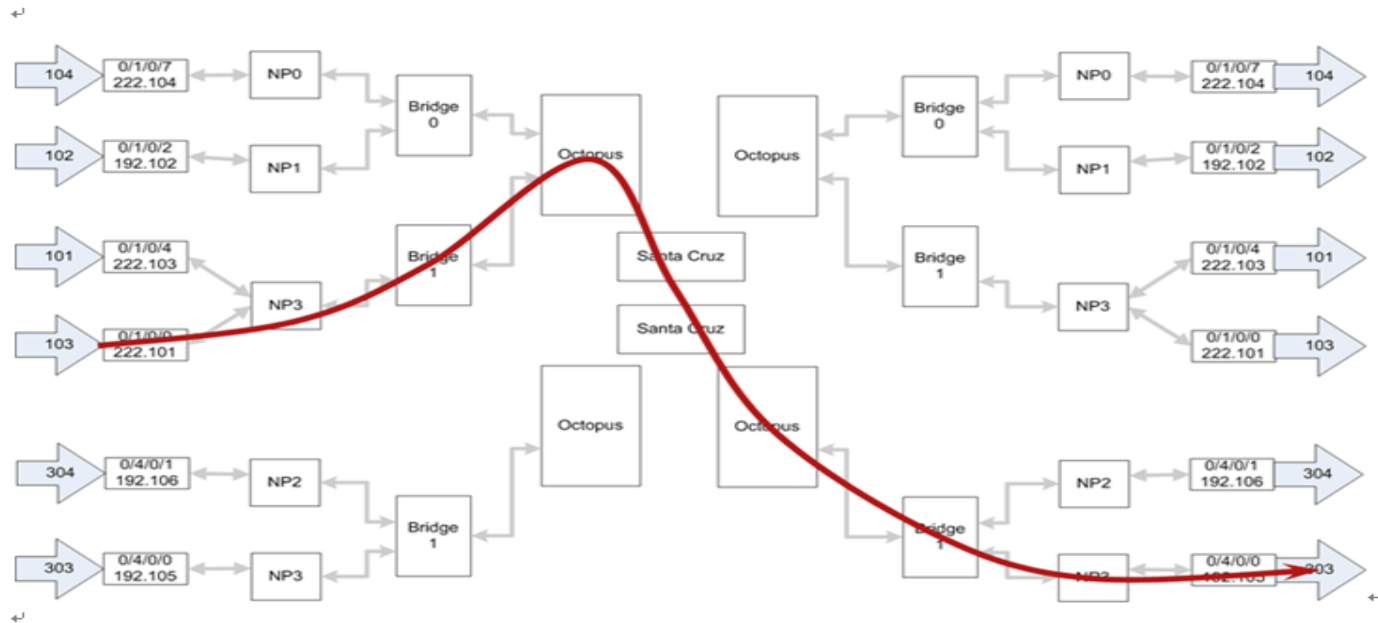
# Forwarding Path Introduction-CRS-1

## MODULAR SERVICES CARD (Layer 3)

## PLIM (Layer2)



# Forwarding Path Introduction-ASR9K





# Troubleshooting Commands & Check Counter

## Interface:

```
RP/0/RSP0/CPU0:ASR9K-RSP#sh controllers tengigE 0/0/0/2 stats
```

## NPU:

```
RP/0/RSP0/CPU0:ASR9K-RSP#sh controllers np ports all location 0/0/CPU0
```

```
RP/0/RSP0/CPU0:ASR9K-RSP#sh controllers np counters all location 0/0/CPU0
```

## Bridge:

```
RP/0/RSP0/CPU0:ASR9K-RSP#sh controllers fabric fia bridge stats location 0/0/CPU0
```

## FIA:

```
RP/0/RSP0/CPU0:ASR9K-RSP#sh controllers fabric fia stats location 0/0/CPU0
```

## Fabric:

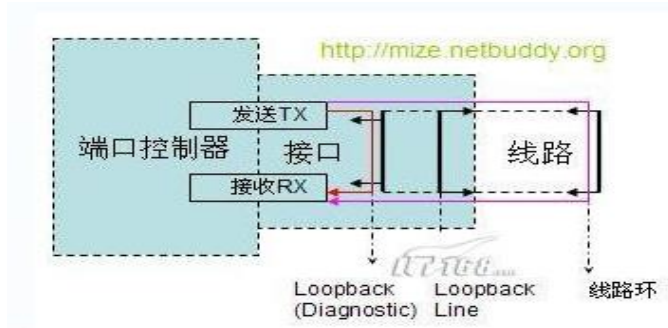
```
RP/0/RSP0/CPU0:ASR9K-RSP#sh controllers fabric crossbar statistics instance 0 location 0/0/CPU0
```

```
RP/0/RSP0/CPU0:ASR9K-RSP#sh controllers fabric crossbar statistics instance 1 location 0/0/CPU0
```

**From Ingress LC and RP-Fabric to Egress LC    Demo: ASR 9K Packet Forwarding**

# Service Link Fault Detection

- 10 G Link:



Soft-Loop:

```
RP/0/RSP0/CPU0:ASR9K-RSP# sh run interface tengigE 0/0/0/0
```

```
Sun Apr 7 08:10:21.147 UTC
```

```
interface TenGigE0/0/0/0
```

```
loopback internal
```

```
!
```

```
RP/0/RSP0/CPU0:ASR9K-RSP#sh interfaces tengigE 0/0/0/0
```

```
Sun Apr 7 08:10:27.060 UTC
```

```
TenGigE0/0/0/0 is up, line protocol is up
```

Hard-loop:

? Used link connect to interface is OK or not ? (loopback external)

# Service Link Fault Detection

- POS Port  
Soft-Loop:

```
RP/0/RP1/CPU0:CRS-3#sh run controller sonET 0/15/5/0
Mon Apr  8 03:20:06.268 UTC
controller SONET0/15/5/0
```

```
loopback internal
```

(When interface encapsulation to PPP, how to do soft-loop):

```
RP/0/RP1/CPU0:CRS-3(config-if)#ppp loopback ignore
RP/0/RP1/CPU0:CRS-3#sh interfaces pos 0/15/5/0
```

```
Mon Apr  8 03:40:41.822 UTC
```

```
POS0/15/5/0 is up, line protocol is up (looped)
```

```
(APS not Configured )
```

Hard-loop:

Used Direct-link Connect

# Link Fault Analyze Commands

## Check Lists

- ✓ Show interface Teng X/X/X/X
- ✓ Show controller Teng X/X/X/X all
- ✓ Check XR Version: show install active summary
- ✓ Check LC/MPA card State: admin show platform
- ✓ Check Suspect logging: show logging
- ✓ Interface soft-loop and Hard loop
- ✓ Swap XFP or MPA/MOD card

**Demo: TenG Soft-loop and Hard Loop Test**

# Router System Review

## LC:

- ✓ Multi-times reboot or crash
- ✓ LC Parity Error
- ✓ MPA card disable/Failed issue
- ✓ Reset Again and Again(ASR 9K)

## RP:

- ✓ Redundancy Mode (NSR Sync)
- ✓ RP Not-Ready issue
- ✓ A/S RP(RP-LC) Heart Beat issue
- ✓ Process Hang issue

# System Monitor Commands

## LC:

- ✓ run attachCon X/X/CPU0---Get Boot information from LC
- ✓ admin sh hw-module fpd location all –LC Failed or Disable part
- ✓ Show logging/show install active summary/admin show platform
- ✓ Dir harddisk: dumper or dir harddisk: dumper location X/X/CPU0
- ✓ Admin show inventory
- ✓ show processes cpu | exclude 0% 0% 0%
- ✓ Show context/sh dll jobid XXX
- ✓ Show run

## RP:

- ✓ show redundancy location all
- ✓ Show processes blocked/follow process XXX/dumpcore running XXX

**Explain the boot sequence in detail (ASR 9K LC)**

# Environment Monitor

## Explain High Temperature/High Fan Speed/Power-Supply

- ✓ Defined what is High Standard
- ✓ Compare and get result
- ✓ Temperature Sensor Explain
- ✓ Explain process envmon
- ✓ How to adjust FAN speed in ASR 9922

## Commands Capture and Analyze

- ✓ admin show environment all
- ✓ admin show environment table
- ✓ Show logging/show install active summary/admin show platform
- ✓ Admin show inventory

**Demo: ASR 9010/ASR 9022's show environment all**

# Operation & Maintenance

## SNMP

- ✓ Check SNMP Configuration
- ✓ Better to install MGBL Package
- ✓ Local NET-SNMP Install and Test
- ✓ Show tech snmp
- ✓ sh snmp **trace**
- ✓ show run
- ✓ Interface: snmpd/mibd\_interface/mibd\_entity

## Configuration

- ✓ show configuration failed/Operation logs
- ✓ sh configuration commit list/sh configuration commit change

**PC: Demo: snmpwalk and snmp TS steps**



Thank you.

