

Troubleshooting Aids

Certain troubleshooting aids of the Cisco ASR 920 Router enable you to perform these tasks that assist the troubleshooting process:

- Verify Pinout, on page 1
- Check Optical Fiber Specifications, on page 5
- Check Alarm Conditions, on page 5
- Check LED Indicators, on page 5

Verify Pinout

Pinouts provide input signal (to the device) and output signal (from the device) information. Bits (BITS) port, GPS Port (1PPS and 10MHz), USB Console (CONSOLE) port, Time-of-Day (TOD) port, Alarm (ALARM) port, USB (USB CON and USB MEM) port, and Management Ethernet (MGMT) port pinout information is provided in the following sections.

BITS Port Pinouts

The following table summarizes the BITS port pinouts.

Table 1: BITS Port Pinouts

Pin	Signal Name	Direction	Description
1	RX Ring	Input	Receive Ring
2	RX Tip	Input	Receive Tip
3	—	—	Not used
4	TX Ring	Output	TX Ring
5	TX Tip	Output	TX Tip
6	—	—	Not used

Pin	Signal Name	Direction	Description
7	—	—	Not used
8	—	—	Not used

GPS Port Pinouts

The following table summarizes the GPS port pinouts.

Note The 10 Mhz and 1 PPS interfaces can be configured as input or output using Cisco IOS CLI commands. For more information, see the *Cisco ASR 920 Series Aggregation Services Router Configuration Guide*.

Table 2: GPS Port Pinout

	10 Mhz (input and output)	1PPS (input and output)
Waveform	Input—Sine wave Output—Sine or square wave	Input—Pulse shape Output—Pulse shape
Amplitude	Input— > 1.7 volt p-p (+8 to +10 dBm) Output— > 2.4 volts TTL compatible	Input— > 2.4 volts TTL compatible Output— > 2.4 volts TTL compatible
Impedance	50 ohms	50 ohms
Pulse Width	50% duty cycle	26 microseconds
Rise Time	Input—AC coupled Output—5 nanoseconds	40 nanoseconds

Time-of-Day Port Pinouts

The following table summarizes the ToD/1-PPS port pinouts.

Table 3: RJ-45 1PPS/ToD Port Pinouts

Pin	Signal Name	Direction	Description
1	RESERVED	Output	Do Not Connect
2	RESERVED	Input	Do Not Connect
3	1PPS_N	Output or Input	1PPS RS422 signal

Pin	Signal Name	Direction	Description
4	GND	—	—
5	GND	—	—
6	1PPS_P	Output or Input	1PPS RS422 signal
7	TOD_N	Output or Input	Time-of-Day character
8	TOD_P	Output or Input	Time-of-Day character

Alarm Port Pinouts

The following table summarizes the external alarm input pinouts.

Table 4: External Alarm Input Pinouts

Pin	Signal Name	Description
1	ALARM0_IN	Alarm input 0
2	ALARM1_IN	Alarm input 1
3	—	No connect
4	ALARM2_IN	Alarm input 2
5	ALARM3_IN	Alarm input 3
6	—	No connect
7	—	No connect
8	COMMON	Alarm common

Management Ethernet Port Pinouts

The following table summarizes the Management Ethernet port pinouts.

Table 5: Fan Alarm Port Pinout

Pin	Signal Name
1	TRP0+

Pin	Signal Name
2	TRP0-
3	TRP1+
4	TRP2+
5	TRP2-
6	TRP1-
7	TRP3+
8	TRP3-

USB Console Port Pinouts

The following table summarizes the USB console port pinouts.

Table 6: Single USB Console Port Pinouts

Pin	Signal Name	Description
A1	Vcc	+5VDC
A2	D-	Data -
A3	D+	Data +
A4	Gnd	Ground



Note The USB console port +5VDC is input, and operates as an USB peripheral device.

USB MEM Port Pinouts

The following table summarizes the USB MEM port pinouts.

Table 7: Single USB MEM Port Pinouts

Pin	Signal Name	Description
A1	Vcc	+5VDC (500mA)
A2	D-	Data -

Pin	Signal Name	Description
A3	D+	Data +
A4	Gnd	Ground

Note USB TYPE-A receptacle is used.

Note The USB MEM port +5VDC is output. Cisco ASR 920 Router provides power for USB MEM port. This port operates as a USB host device.

Check Optical Fiber Specifications

The specification for optical fiber transmission defines two types of fiber: single mode and multimode. Within the single-mode category, three transmission types are defined: short reach, intermediate reach, and long reach. Within the multimode category, only short reach is available. For information about optical SFP modules, see the documentation for the SFP module at:

http://www.cisco.com/en/US/partner/products/hw/modules/ps5455/prod_installation_guides_list.html .

Check Alarm Conditions

The following table summarizes the meaning of the alarm conditions on the Cisco ASR 920 Router.

Table 8: Alarm Condition Summary

Alarm Type	Alarm Meaning
Critical	Port in down state. Environmental sensor threshold exceeded critical level (voltage, temperature)
Major	Environmental sensor threshold exceeded major level (voltage, temperature)
Info	Port administratively shut down.

Check LED Indicators

This section describes the different types of front panel LEDs and their behavior.

PWR and STAT LEDs

The PWR and STAT LEDs are available on the front panel. These LEDs provide power on the board (PWR) and overall router health (STAT) status. During power up state, these LEDs provide booting status and report errors.

Note The digital code signing functionality validates the integrity and authenticity of the ROMMON image before booting it.

Table 9: PWR and STAT LED Indications

PWR LED State	STAT LED state	Indication	Comment
Amber	Off	Power in the system is all right and FPGA configuration is taking place.	Permanent Amber/Off indicates FPGA configuration failure.
Amber	Red	FPGA Image Validation Error.	System is in unresponsive state. No console messages.
Flashing Amber and Green alternatively	Amber	Upgrade FPGA image error, continuing with Golden FPGA image.	—
Flashing Amber and Green alternatively	Off	FPGA configuration successful and Digital code signing successfully validated FPGA image. Digital code signing passed the control to Microloader to boot ROMMON.	—
Flashing Amber and Green alternatively	Red	Digital code signing reported failure in ROMMON image validation.	System is in unresponsive state. No console messages.
Green	Flashing Amber	ZTP process has begun.	Both LEDs turn Green once provisioning is complete.
Green	Off	IOS-XE image is booting.	
Green	Green	Successfully booted and system is operating normally.	—
Green	Amber	A minor alarm or synchronization is in Holdover or free-running mode	—
Green	Red	A major or critical alarm (high temperature reported for any sensor) or multiple fan failure.	—

CPU Management Port LEDs

The LED for the 10/100/1000 Management port is integrated on the connector itself. There are two LEDs in the connector to indicate the Link or Activity status.

Table 10: CPU Management Port LED Indication

LED	LED State	Indication
Left	Green	Link up in 1000 Mbps
	Blinking Green	Activity in 1000 Mbps
	Amber	Link up in 100 Mbps
	Blinking Amber	Activity in 100 Mbps
	Off	Link down
Right	Green	Link up in full duplex with 1000 Mbps speed
	Green	Link up in full duplex with 100 Mbps speed
	Off	Link up in half duplex with 100 Mbps speed

SFP LEDs

Each SFP port has an LED indicator. The LED is configured such that the up arrow indicates the port on the upside and the down arrow indicates the port on the downside.

Table 11: SFP Port LED Indication

LED	LED State	Indication
Labeled same as the SFP port number	Green	Link up in 1000Base-X/100Base-FX
	Blinking Green	Activity in 1000 Base-X/100Base-FX
	Yellow	Fault/Error
	Off	Link down

SFP+ LEDs

Each SFP+ port has an LED indicator.

Table 12: SFP+ Port LED Indication

LED	LED State	Indication
Labeled same as the SFP port number	Green	Link up in 10G
	Blinking Green	Activity in 10G
	Yellow	Fault/Error
	Off	Link down

RJ-45 LEDs

Each RJ-45 port has two LED indicators. Left LED indicates the Link status; right LED indicates the status of the duplex LED.

Table 13: RJ-45 LED Indication

LED	LED State	Indication
Left	Green	Link up in 10/100/1000Base-T
	Blinking Green	Activity in 10/100/1000Base-T
	Yellow	Fault/Error/Link down
	Off	Administratively down
Right	Green	Link up in full duplex
	Off	Link up in half duplex

Power Supply Unit LEDs

Each power supply unit has a corresponding LED on the front panel.

Table 14: PSU LED Indication

LED	LED State	Indication
OK	Green	Power Supply is working and 12V output is alright.
	Red	12V output failure (Either input not present or fault in the power supply unit).

System–Interface LED Behavior

Table 15: 1G Copper and 1G SFP LED Indication

Event	1G Copper Port LEDs (Link/Duplex)	1G SFP Port LEDs
ROMMON	Off/Off	Off
IOS Shut	Off/Off	Off
IOS No shut (cable disconnect)	Yellow/Off	Yellow
IOS No shut (cable connect) (media-type RJ-45)	Green/Green	Off
IOS No shut (cable connect) (media-type SFP)	Off/Off	Green
IOS No shut (cable connect) (media-type auto)	Off/Off	Green

Table 16: Management Port LED Indication

Event	10G Port LEDs	Management Port LEDs (Link/Duplex)
ROMMON (cable connect)	Off	Green/Green (1000 Mbps, Full Duplex) Orange/Green (100/10 Mbps, Full Duplex)
ROMMON (cable disconnect)	Off	Off/Off
IOS Shut	Off	Off/Off
IOS No shut (cable disconnect)	Orange	Off/Off
IOS No shut (cable connect)	Green	Green/Green in 1G mode Orange/Green in 100/10M mode