## **Ethernet Network Connectivity Testing**

This quick card describes how to set up the OneAdvisor 800 to verify Layer 2 and Layer 3 Network Connectivity. The quick card documents a procedure to set up the OneAdvisor on a 1GigE Optical Interface utilizing IPv4 addressing, but the same workflow may be applied to other data rates and IPv6.

## EQUIPMENT REQUIREMENTS

- OneAdvisor 800 equipped with the following:
  - RAxxMA-O Radio Analysis Module, SPA06MA-O Spectrum Analyzer Module, TM400GB-QQ 400G Module, or TM400GB-QO 400G Module.
  - Transport software release V5.1.0 or greater
  - CA10M1GE or ONA-SP-10M1GE 1 Gigabit Ethernet option
- Optical Transceiver supporting the Ethernet data rate to be tested (SFP, SFP+, SFP28, or QSFP28)
- Cables to match the optical transceiver and the line under test
- Fiber optic inspection microscope (P5000i, FiberChek Probe, or INX-760)
- Fiber optic cleaning supplies

### LAUNCH TEST

- 1. Press the Power button on the ONA-800 base top panel to turn on the OneAdvisor.
- 2. Tap from to display the Home Screen.
- 3. Tap 🕂 Tests to display the Tests menu.
- Tap Radio Analysis Transport > or
   400G Transport > to show the Transport test application.
- 5. Tap the **Transport** icon.
- If the Select Test menu is not displayed, tap
   All Tests in the lower left screen corner.
- 7. Using the Select Test menu or favorite test list, launch the Ethernet Layer 3 Traffic test for the desired data rate and port (P1 or P2). For example: Ethernet ►1GigE Optical ► Layer 3 Traffic ► IPv4 ► P1 Terminate.
- If the current configuration is unknown, tap to open the **Tools** Panel and select
   Reset Test to Defaults.
- 9. Press **Yok** to continue.

OneAdvisor 800 Transport and Wireless Platforms



#### Figure 2: Transport Launch screen

🔒 Home 💽 Tin	ning RA Transport X	i 🔜 💦 📣 (🕨 🛃
Select v Port 1: 1	IOGigE LAN Layer 3 Traffic Term 🗙	What's This?
CPRI  Add Test CRI Control Con	10/100/1000 • TGigE Coptical • Optics Self-Test • 10GigE LAN • 5 G R Discovery • 2SGigE • QuickCheck • 10GigE • RFC 254 (RFC 5180) • 2008 IPv6 Slave • • 11GigE • • 11GigE • • 11GigE • • 11GigE • • 11GigE •	
	Layer 3 Traffic   IPs6   Its Cerminate Layer 3 Multiple Streams  IPv6   IPv6	

Figure 3: Select Test



Figure 1: Equipment Requirements





### CONFIGURE TEST

- ► The following info is needed to configure the test:
  - Type of Optical Transceiver (10/100/1000 Copper SFP, 1G/10G Multimode SFP+, 10G/25G Single mode SFP+, 100G LR4 QSFP28, etc.)
  - Auto Negotiation settings of the port under test.
  - IP Address settings (DHCP or Static, Source IP, Default Gateway, Subnet Mask, and Destination IP)
- For 1GigE Optical or 10/100/1000 Copper tests, tap the Ethernet tab of the Quick Configuration menu and set Auto Neg. to the same value as the Ethernet port under test (On or Off).
- For 10/100/1000 Copper tests, tap the Setup soft key on the top right side of the screen and proceed to page 3.
- ► For Optical Interfaces:
  - 1. Tap the **Setup** soft key on the top right side of the screen.
  - 2. Select the Interface/Connector folder.
  - Insert desired Optical Transceiver into the Port 1 SFP or QSFP slot on the top of the OneAdvisor.
  - 4. Review SFP information:
    - Verify that the SFP operates on the required wavelength (850nm, 1310nm or 1550nm).
    - Verify that the SFP supports the required data rate (10G LAN, 25G, etc.)
    - Note the Min and Max Tx Levels (dBm) and Max Rx Level (dBm) to assess if optical attenuators are required.



Figure 4: Work Order

Select - Port 1: 1GigE	aver 3 Traffic Te	erm 🗙			What's This?	
Running 1m:3	Ethernet		Setup			
evel (dBm) -0.3	On + T Auto Neg.	affic   192.168.1.2 est Mode Destination IP	Ping 46 Pag	¢ ket Size		
red per ppini ana	Summary	Status	0	Summary	\$ SLA / KPI	
Consulty Consult Construction Constructio	Link Active	5	OFF 95 b	Throughput, Current Rex Mops, 11 Trx Mops, 12 Rex Mops, 12 Trx Mops, 12 Trx Mops, 13 Trx Mops, 13 Trame Loss - FLR Frame Loss - FLR Frame Loss Ratio Round Trip Delay - FD (us) Average Current Maximum Packet jitter - FDV (us)	Unavailat O Unavailat Unavailat Unavailat Unavailat Unavailat Unavailat	Ile SAM- Complete Enhance
	<u> </u>			Average Max Average Peak Instantaneous	Unavailab Unavailab Unavailab Unavailab	ile ile ile QuickCh Toolis
	Caser Ad	ctions Peak IFG Erro	rs Capture			
ports Tools View Help	Laser Int Off	ernal + -1 + Clock Source Fri	1 -10	+10		

Figure 5: Quick Config, Auto Neg.

Test v Port 1: 1Gi	gE Layer 3 Traffic Term 🗙 📒	+		What's This?	19	
terface	Connector Signal Physic	al Layer Network Visibilit	y LLDP			
	SFP SFP Expert I2C					
affic	NOTE: Information on this	page is obtained from real	ding the management interface of	contents of the SFP and m	ay	
pture	Wavelength (nm) 1310.00					
lters						
imed Test	Recommended Rates		Ethernet 1G, 10G L Fibre Channel 1G, 8G, 1	AN 0G		
			CPRI 1228.8M,	2457.6M, 3072.0M, 4915.	2M,	
			OBSAI 1536M, 3	072M, 6144M		
	Vendor	FINISAR CORP.	Nominal Rate (Mbits/sec)	10,300		
	Vendor PN	FTLX1475D3BTL	Min Rate (Mbits/sec)			
	Vendor SN	N7DCD8L	Max Rate (Mbits/sec)			
	Vendor Rev	A	Power Level Type	Average Power		
	🤣 Min Rx Level (dBm)	-21.0237	🤣 Max Rx Level (dBm)	0.9999		
	🥝 Min Tx Level (dBm)	-7.9997	🥝 Max Tx Level (dBm)	0.9999		
	Diagnostic Monitoring	1	Diagnostic Byte	104		
	The second state of the second					

Figure 6: Setup, Interface/Connector/SFP



### CONFIGURE TEST (CONTINUED)

 If you are testing a VLAN, select the Ethernet settings tab, set
 Encapsulation to VLAN, tap the
 VLAN field and enter your VLAN ID.



Figure 7: Setup, Ethernet/VLAN

- ► Select the **IP** settings tab:
  - Tab the Source/Destination Addresses filed and configure Source IP Type, Source IP Address, Default Gateway, and Subnet Mask.
- ► Tap the **Results** soft key.

Test	ige Layer 5 france ferm 👗			what's thisr			
nterface	Length Type	Packet Length	Calc. Frame Size (Byte	s) 64			
olemet P	Packet Length (Bytes)	46	•				
	Version	IPH Length	TOS/DSCP	Packet Length			
Capture	Iden	dification	Flags	Fragment Offset			
ilters	TTI Protocol Hosder Cher						
imed Test	Source/Destination Addresses						
	Options						
	Data						
	Source IP Type	Static	Source IP	192.168.1.9			
	Default Gateway	192.168.1.1	Subnet Mask	255.255.255.0			
	Destination IP	192.168.1.2	Ping				

Figure 8: Setup, IP



### CONNECT TO LINE UNDER TEST

#### For Optical Interfaces:

- Use the VIAVI P5000i or FiberChek Probe microscope to inspect both sides of every connection being used (SFP, attenuators, patch cables, bulkheads)
  - Focus the fiber on the screen.
  - If it appears dirty, clean the fiber end-face and re-inspect.
  - If it appears clean, run the inspection test.
  - If it fails, clean the fiber and re-run inspection test. Repeat until it passes.
- 2. If necessary, insert optical attenuators into the SFP TX and/or RX ports.
- Connect the optical transceiver to the port under test using a jumper cable compatible with the line under test.
- 4. Select the **Laser** tab in the **Actions** panel.
- 5. Press Laser off . The button will turn yellow and be relabeled Laser .
- 6. Press the **Restart** soft key.
- 7. Verify the following:
  - Summary LED is yellow.
  - Signal Present LED is green.
  - Sync Acquired LED is green.
  - Link Active LED is green.

#### ► For 10/100/1000M Copper Interfaces:

- 1. Connect the copper SFP to the port under test using CAT5e or better cable.
- 2. Press the **Restart** soft key.
- 3. Verify the following:
  - Summary LED is yellow.
  - Sync Acquired LED is green.
  - Link Active LED is green.



Figure 9: Inspect Before You Connect

ding ARP request fo d (dBm) -3.1 Drv (ppm) 23.1	On + Traffic +	0 (lowert)				
Dev (ppm) 23.1	Auto Neg. Test Mode V	LAN ID Priority	<ul> <li>192.168.1.</li> <li>Destination</li> </ul>	11 Ping 46	¢ Packet Size	
	Summary	Status	:	Summary	÷ SLA / KPI	
summary	Acterna Test Parket Detect		OFF	Throughout Current	-	Re
Signal Present	receive restruction percet		. OII	Rx Mbns L1	1.07	0.0
Sync Acquired				Tx Mbps, L1		0.0
Frame Detect				Rx Mbps, L2		0.0
IP Packet Detect				Tx Mbps, L2		0.0
SVLAN Frame Detect				Rx Mbps, L3		0.0
Il Stacked VLAN Detect				Tx Mbps, L3		0.0
				Frame Loss - FLR 🖃		
				Lost Frames		Unavailable
				Prame Loss Ratio	(ur) 🖂	Onavailable
				Average	(03) 🖻	Unavailable
				Current		Unavailable
				Maximum		Unavailable
				Packet Jitter - FDV (us)	8	Enh
				Average		Unavailable RFC
				Max Average		Unavailable
				Peak		Unavailable
				Instantaneous		Unavailable
				* 1 8 1 8		

Figure 10: Optical Interface Results



#### VERIFY NETWORK CONNECTIVITY

- 1. Autonegotiation Status: If you are testing a 10/100/1000BASE-T or 1GigE Optical Interface with Autonegotiation enabled, Select Ethernet / AutoNeg Status for the left result windows using the drop-down menu above the window. The selection is at the bottom of the list.
  - Verify that Link Advt. Status = Done and Link Config ACK = Yes. Otherwise, set Auto Neg. to Off in the Ethernet settings above the left results window.
  - Note: Autonegotiation may be used by Ethernet devices that are capable of more than one transmission rate (10/100/1000 Mbps), duplex mode (half duplex and full duplex), flow control mode, or other capabilities. Devices share their capabilities and choose the highest performance mode they both support. Autonegotiation can be disabled, but a frame loss may occur if it is enabled on one device and disabled on the other.
- 2. Link Layer Discovery Protocol (LLDP): Select Ethernet / LLDP Stats for the left result windows using the drop-down menu above the window.
  - LLDP is allows devices to advertise device information to directly connected devices. Although it can be disabled, most switches and routers will advertise System Names, Port IDs, VLAN IDs, and IP Management Adresses as shown in Figure 12.
- 3. Layer 3 Configuration Status: If you are using DHCP for IP Address Assignment, select Ethernet / L3 Config Status for the left result windows using the drop-down menu above the window to verify address assignement.
- 4. Ping: Enter a Destination IP Address and tap Ping to test connectivity to any IP host address. A green checkmark  $\checkmark$  indicates the host is reachable.



Figure 11: AutoNeg Status



Figure 12: LLDP Stats



Figure 13: L3 Config Status

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