



ORAN ODU Emulation OneAdvisor 800

Table of Contents

Scope	e	. 2
OneA	dvisor Overview	. 2
2.1	ORAN ODU Emulation	2
2.1.1	Initial Setup	.3
2.1.2	ORAN ODU Emulation Testing – M-Plane RU Query	.4
2.1.3	ORAN ODU Emulation Testing – S and CU-Plane RU Transmit	.9
Techr	nical Support	14
	Scope OneA 2.1 2.1.1 2.1.2 2.1.3 Techi	Scope OneAdvisor Overview 2.1 ORAN ODU Emulation 2.1.1 Initial Setup 2.1.2 ORAN ODU Emulation Testing – M-Plane RU Query 2.1.3 ORAN ODU Emulation Testing – S and CU-Plane RU Transmit Technical Support



1. Scope

This document describes how to configure the OneAdvisor for ORAN ODU Emulation, including:

- O-RU Connectivity
- M-Plane Results
- S-Plane Results
- VSWR Results

The required products and parts to complete this procedure are as follows:

	Description	Diagram
OneAdvisor wit - ONA-8 module 0 0 0	th the following functions: 00 mainframe equipped with the following e/Firmware/Licenses: SPA06MA-O: SPA Module with Optical Board Firmware version 4.2.1 ODU-E Licenses	ONA Front View.
SFP+ for 10GBPS		SM SFP+
Duplex Singlem cable that conr	node Fiber cable (potentially using the existing nects to the RU)	Duplex SM Fiber

2. OneAdvisor Overview

The OneAdvisor is a portable instrument for Cell Site installation and maintenance, the main test functions of OneAdvisor for cell site installation include:

- Cable and antenna analysis up to 6GHz
- Fiber Inspection verification and Fiber validation (OTDR)
- Ethernet/VLAN testing
- ODU Emulation

2.1 ORAN ODU Emulation

The following procedure describes the steps to perform ORAN ODU Emulation analysis with OneAdvisor800. Successful results of this test prove that the radio is powered, connected, and ready to communicate with the actual DU. If this process fails to reach that end, one can troubleshoot based on what phase the process could/could not achieve.



2.1.1 Initial Setup

The following procedure describes the initial setup of ODU Emulation analysis, including turn-up and connectivity.

Step	Action	Description
1	Power ON OneAdvisor	Press and hold the ON/OFF button for 3 seconds to power on the One Advisor
2	 Connectivity: Insert the SFP+ into Port 1 on the optical board Inspect, Clean, and connect a duplex fiber between the ONA and the RU under test 	Image: Constrained state stat
3	 Enable GPS: Connect the GPS antenna to the SMA port Select {Home}, {System}, {GNSS} Set Antenna Power to: ON Ensure the OneAdvisor gets a lock and displays Lat/Long 	Image: Constraint of the second s



Step	Action	Description
4	ORAN ODU Emulation mode: - Select {Home}, {Tests}, {Radio Analysis}, {O-DU Emulation}	Image: A Home Image: A Home Image: A Home ODUB Image: A Home Image: A Home<
		▲ Home ▲ Radio/nalysis % ●
		Primary (1) NETCONF DHCP PTP SyncE SyncE te 10312.5 Mbps Password o-ran-password IP Address 192.168.2.20 Clock Accuracy Within 100 ns SSM Code QL.PRC
		Summary Ethernet - 12 Link O O O O O • Signal Present Total Transmitted Frames 0 • Signal Areased 0 124 • Link Active Total Transmitted Prames 124 • Link Active Total Transmitted Prames 0 • HI BER Total Transmitted Prames Last Second 0 • Toto Sync Total Transmitted Frames Last Second 0 • 1PPS Sync Total Arease Last Second 0 • NPlane S-Plane CU-Plane
		ORAN ODU Emulation Measurement Screen

2.1.2 ORAN ODU Emulation Testing – M-Plane RU Query

The following procedure describes the steps to perform ODU Emulation tests with OneAdvisor.

Step	Action	Description
1	 ODU Emulation Link Rate: Set the Optical Link Rate to 10312.5 Mbps. Note: If testing a 25Gbps RU, use an SFP28 and set the link rate to 25781.5 Mbps 	Port 1 Rx Optic Link Rate 10312.5 Mbps Link Rate 10312.5 Mbps 25781.5 Mbps 25781.5 Mbps
2	 Set the Master (ONA) IP Address and VLAN ID : Select the DHCP field and set the IP Address to 192.168.2.20 Set the VLAN to a value between than 200 and 210 (i.e., 205) Verify the Encapsulation is set to Tagged 	DHCP MAC Address 98:03:9b:9 IP Address 192.168.2.20 Top bar DHCP group Side-bar configuration icon



Step	Action	Description
	- Verify the O-RU Address Mode is set to DHCP	MAC Address 98:03:9b:98:7e: Encapsulation Tagged Untagged VLAN ID 205 VLAN Pri 0 (lowest) 1P Address 192.168.2.20 O-RU Address Mode Static DHCP O-RU Address 192.168.1.26 Co-RU Address and VLAN Information
3	 Start the ODU Emulation Process: Turn ON the ONA Laser Select the M-Plane tab If the RU is powered and connected there will be green lights on the Summary area of the screen 	Laser M-Plane Laser Laser Laser Laser Laser Laser Laser Laser Laser Colder Post 10 colder Post 10 colder <t< td=""></t<>
4	Connect to the RU: Press the O-RU Connect button to start the communications with the RU 	O-RU Connect



Step	Action	Description			
5	Reading the RU Data: - If operating properly, the	The User Int desired. Clic	erface has two results ck in the header to cha	screens that can be chai nge either screen.	nged as
	 radio should be attempting to communicate through VLAN IDs 201 to 210. Once the radio wraps around to the VLAN set on the OneAdvisor (205), the initial connection will be made. This could take up to 3 minutes. The following screens are available from the O-RU M-Plane 	Ethernet - Summary Sync Loss Seconds Rx Local Fault Second Rx Remote Fault Second LOCMWS Seconds	r - Ca o Is 0 Is 0 o O O Results Categories a Result C Category	O-RU General - Device Info and Sub-Categories	- D
				Ethernet O-RU General O-RU S-Plane O-RU U-Plane O-RU General > D	Device Info Software SFP O evice Info (below)
			O-RU General - Device Info	- []	
			Serial Number	3LFJC00048B	
			Software Version	3009 FI	
			MAC Address	68:84:7e:e5:0b:c2	
			IP Address	192.168.2.37	
			Supported M Plane Version	2.0.0	
			Supported C, U, S, Plane Version	2.0.0	
		(O-RU General > Softwa	re Information (below)	



 otion	
O-RU General - Software	* E
Slot 1	slot0
Status 1	0
Product Code 1	N712926R
Vendor Code 1	FJ
Build ID 1	5021
Build Name 1 FJ-RL	-RTB3009.FGF
Build Revision 1	3009
Slot 2	slot1
Status 2	o
Product Code 2	N712926R
Vendor Code 2	FJ
O-RU General - SFP SFP 1 Interface Name	← []
O-RU General - SFP	* 🖸
SFP 1 Port Number	0
SFP 1 Vendor Name	000000SFP-10GS
SFP 1 Rx Power (dBm)	-5.2
SFP 1 Tx Power (dBm)	-1.8
SEP 1 Bias Current (mA)	64
SEP 1 Voltage (mV)	3 340 8
SFP 1 Voltage (IIV)	5,540.6
O PULM Plane & Canabili	ty (bolow)
O-RU M-Plane > Capabili	ty (below)
O-RU M-Plane > Capabili O-RU M-Plane - Capability Supported Category	ty (below) - I Category A
O-RU M-Plane > Capabili O-RU M-Plane - Capability Supported Category Supported Number of Ports	ty (below) TI Category A 8
O-RU M-Plane > Capability O-RU M-Plane - Capability Supported Category Supported Number of Ports	ty (below) Category A 8
O-RU M-Plane > Capability O-RU M-Plane - Capability Supported Category Supported Number of Ports Number of Spatial Streams Max Bewer per 84 decemes (dB=)	ty (below) - [] Category A 8 4
O-RU M-Plane > Capabilit O-RU M-Plane - Capability Supported Category Supported Number of Ports Number of Spatial Streams Max Power per PA Antenna (dBm)	ty (below) Category A 8 4 49.0
O-RU M-Plane > Capabilit O-RU M-Plane - Capability Supported Category Supported Number of Ports Number of Spatial Streams Max Power per PA Antenna (dBm) Min Power per PA Antenna (dBm)	ty (below) - [] Category A 8 4 49.0 37.0
O-RU M-Plane > Capabilit O-RU M-Plane - Capability Supported Category Supported Number of Ports Number of Spatial Streams Max Power per PA Antenna (dBm) Min Power per PA Antenna (dBm) IQ Sample Dynamic Compression Supported	ty (below) Category A 8 4 49.0 37.0 false
O-RU M-Plane > Capabilit O-RU M-Plane - Capability Supported Category Supported Number of Ports Supported Number of Ports Number of Spatial Streams Max Power per PA Antenna (dBm) Min Power per PA Antenna (dBm) IQ Sample Dynamic Compression Supported	ty (below) Category A 8 4 49.0 37.0 false d false
O-RU M-Plane > Capabilit O-RU M-Plane - Capability Supported Category Supported Number of Ports Number of Spatial Streams Max Power per PA Antenna (dBm) Min Power per PA Antenna (dBm) IQ Sample Dynamic Compression Supported IQ Sample Realtime Variable Bitwidth Supported	ty (below) Category A 8 4 4 4 5 6 6 6 6 6 6 6 6 6 6 6 6 6
O-RU M-Plane > Capabilit O-RU M-Plane - Capability Supported Category Supported Number of Ports Supported Number of Ports Number of Spatial Streams Max Power per PA Antenna (dBm) Min Power per PA Antenna (dBm) IQ Sample Dynamic Compression Supported Antenna IQ Sample Count of Supported Compression M	ty (below) Category A 8 4 49,0 7,10 false d false ethods 1 9
O-RU M-Plane > Capabilit O-RU M-Plane - Capability Supported Category Supported Number of Ports Supported Number of Ports Number of Spatial Streams Max Power per PA Antenna (dBm) Min Power per PA Antenna (dBm) IQ Sample Dynamic Compression Supported IQ Sample Realtime Variable Bitwidth Supported IQ Sample Count of Supported Compression Method 1 IQ Bitwidth	ty (below) Category A 8 4 49.0 37.0 false d false ethods 1 9 Static



Description		
O-RU M-Plane > Bands (below)		
_		
	O-RU M-Plane - Bands	* C
	Band 1 Band Number	71
	Band 1 Max Supported Freq DL (MHz)	652.0
	Band 1 Min Supported Freq DL (MHz)	617.0
	Band 1 Max Supported BW DL (MHz)	35.0
	Band 1 Max Num Carriers DL	4
	Band 1 Max Carrier BW DL (MHz)	20.0
	Band 1 Min Carrier BW DL (MHz)	0.2
	Band 1 Max Supported Freq UL (MHz)	698.0
	Band 1 Min Supported Freq UL (MHz)	663.0
	Band 1 Max Supported BW UL (MHz)	35.0
	Band 1 Max Num Carriers UL	4
O	D-RU M-Plane > Delay Profile (be O-RU M-Plane - Delay Profile	low) - II
	T2A Min UP 1 (us)	132.0
	T2A Min UP 1 (us)	452.0
	T2A Min CP Downlink 1 (us)	257.0
	T2A Max CP Downlink 1 (us)	577.0
	T2A Min CP Uplink 1 (us)	125.0
	T2A Max CP Uplink 1 (us)	70.0
	TCP Adv DL 1 (us)	232.0
	TA3 Min 1 (us)	410.0
	TA3 Max 1 (us)	0.0
	T2A Min UP 2 (us)	132.0
	T2A Min UP 2 (us)	452.0



2.1.3 ORAN ODU Emulation Testing – S and CU-Plane RU Transmit

The following procedure describes the steps to perform O-DU Emulation tests with OneAdvisor.

Step	Action	Description
1	 Reading the RU Data: After about 3 minutes the RU will respond to the ONA The PTP and SyncE buttons will activate when the RU is ready 	Wait for the Configuration Buttons to become Active
2	Configuring PTP, and CU Plane - Set the Domain Number to 24 for BOTH the ONA AND the O-RU!	PTP Clock Class Understand Address Delay Agreements of the per second of the per sec
3	 CU-Plane Settings Duplex = FDD Numerology = 15 kHz Bandwidth = RU Band Dependent Compression = BFP Set the PCI to 104 	CU-Plane Duplex Mode Numerology Bandwidth VLAN ID Compression Test Model SSB 100 TOD SCS 15 KHz 10 MHz 4000 BFP Nines NR-FR1-TM1.1 Clashled Cambled 55B PCI Alpha Beta T1A Max Up NR-FR1-TM1.1 Clashled Cambled 70 0 0 345000 Carrier Tx Band Number Tx Rede Band (MXr) Tx Antennas TX selection 1 Tx Center Frequency (Mir. Tx Power (Bibm) To 0 60 Compression 60 Compression Frequency (Mir. Tx Power (Bibm) Compression
4	RU Carrier Settings - Select the Tx Band Number (this will depend on the radio's capabilities) - Enter the Center	CU-Plane Duplex Mode Numerology Tx Band Number Vex Model SS CS 15 KHz Tx Band Number Vex Model Carrier Tx Band Number Tx Band Number Tx Bower (dBm) 1095.00 - 2020.00 1 Tx 1 2000 56
	Frequency of the Band (the available range will depend on the radio's	



Step	Action	Description
	capabilities. Always transmit in Dish owned spectrum)	Image: to center Frequency (MHz) Image: to center Frequency (MHz) <td< td=""></td<>
5	 RU TX POWER Set TX Power to lowest allowed by the RU Press the menu button to exit 	Center Frequency of Carrier
6	 Push Configurations to the RU Press the PTP button to push the config to the RU Press the SyncE button to push the config to the RU Press the Configure Carrier button to push the config to the RU NOTE – The Configure Carrier configuration takes several seconds to finish 	Configure Configure Configure Configure Configure Configure Configure Configure Configure Carriers Synce Carriers Carrie
7	 Turn on PTP Press the SyncE and the PTP buttons NOTE - PTP takes 2 minutes to connect and turn green 	S-Plane Synce PTP Synce PTP Timing Buttons



Step	Action	Description					
		PTP Clock Class Primary (6 Clock Accuracy Within 100 ns PTP Sync Status					
8	Turning on the Carrier - When you have your measurements Turn Off the carrier		0	CU-Plane	Start DL Test Vector Gen TX OFF TX	P DL /ector en	
9	- The following screens are available from the		ORA	N Results Categor	ies and Sub-Categorie	s	
	RU		Result Category				
			Category		Sub-Category		
			Ethernet		Capability		
			O-RU Gene	eral	Bands		
			O-RU M-PI	ane >	Interfaces		
			O-RU S-Pla	ine	DHCP		
			O-RU U-PI	ane	Performance Config		
					Performance Stats		
					Delay Profile		
					-		
				O-RU S-Plane -	– SyncE (Below)		
				O-RU S-Plane - SyncE	÷ []		
				SyncE Lock	LOCKED		
				SyncE Reporting Period	10		
				SyncE Sources Count	1		
				SyncE Source 1 Local Port Numbe	er O		
				SyncE Source 1 State	0		
				SyncE Source 1 Quality Level	2		
				Solid Inflectic (5)			
				O-RU S-Plane	– PTP (Below)		
				O-RU S-Plane - PTP	* 🛙		
				PTP Lock	LOCKED		
				Protile Domain Number	G.8275.1		
				Accepted Clock Classes	Primary		
				G.8275.1 Delay Asymmetry (ns)	0		
				G.8275.1 Multicast MAC Address	Forwardable (01-1B-19-00-00-00)		
			0-	RU U-Plane > Tx A	array Carriers (below)		



Step Action	on	Description				
]	O-RU U-Plane - Tx Array Carriers	+ 8		
			Tx Array Carrier 1 Name	txarraycarrier0		
			Tx Array Carrier 1 Gain (dB)	37.0		
			Tx Array Carrier 1 Abs Radio Freq Cha	annel 422000		
			Tx Array Carrier 1 Center Freq of Char	nnel (MHz) 2,110.0		
			Tx Array Carrier 1 Carrier Channel BW	V (MHz) 10.0		
			Tx Array Carrier 1 Active Type ACTIVE			
			Tx Array Carrier 1 Carrier State	READY		
			O-RU Specific > \	/SWR (below)		
			O-RU Specific - VSWR	+ C		
			Tx 1 TSSI (dBm)	17.7		
			Tx 1 Return Loss (dB)	22.7		
			Tx 2 TSSI (dBm)	17.6		
			Tx 2 Return Loss (dB)	20.1		
			Tx 3 TSSI (dBm)	17.6		
			Tx 3 Return Loss (dB)	22.9		
			Tx 4 TSSI (dBm)	17.6		
10 Save a - Pri - En - Se Ty Re - Ac de to he - Cli - Th - Ho an - Fri co	a Report ress Save nter a file name elect Report as the File ype and then click on eport Set-up dd any additional escriptive information o the fields available ere lick Apply hen Click Save lome > System > Files nd open the report rom here you can also opy to a USB Drive		Save Event Save Save File same clRDU00560A Image: Save File Type Result Result as JSON Image: Save Screen Image: Save In Q Capture Image: Save Color Inversions Report Close	Luick Create Save Favorite		



Step	Action	Description						
		A Home Acadeohaalysis X 🎽 Fiber X		<u>[</u>] •) ≈ <mark>% ⊠</mark> ♀]				
			O-RAN O-DU Em	O-RAN_ODU Emulation				
			Curtomer	Site Location	Impage to attach			
				CLRDU00560A	Insert current screen at the beginning of the report			
				Site Information	+			
			Customer Name	Site Information Here	+			
			Technician	Test Purpose	+			
			Your Name Here	Test Purpose Here				
			Work Order ID		+			
			here	Test Result	+			
				Result Here	+			
					6			
					Cancel Apply			
				A	9 35.74487257-78.87948633			
		Lama Lama	adioAnaburic 🗙 😿 ri	har V		70 10:58 AM		
		in nome and a		CLRDU00560A pr		······································		
		Measurement Data		erineeosonih				
		Radio Inform	mation	n				
		Serial Numbe	er	2MFJD51343J				
		MAC Address	5	34:fe:9e:3a:27:7d				
		Software Ver	sion	3009				
		VSWR						
		Tx 1 Return L	.oss (dB)	22.7				
		Tx 2 Return L	.oss (dB)	20.1				
		Tx 3 Return L	.oss (dB)	22.9	、			
		Tx 4 Return L	.oss (dB)	22.7				
		Tx 1 TSSI (dB	m)	17.7				
		Tx 2 TSSI (dB	m)	17.6				
		Tx 3 TSSI (dB	m)	17.6				
		1x 4 1551 (dB		17.0				
		H		🚺 🔇 2 of 2 🚺		Original 🗧		
				€Exit				



3. Technical Support

Technical support is provided by:

- Phone: 1-844-GO-VIAVI (1-844-468-4284) options 3-2-3
- Email: <u>diagnostics.tac@viavisolutions.com</u>

Regularly new firmware updates for the CellAdvisor 5G are released and it is recommended to keep the instrument in the latest firmware to provide all the enhancements and bug fixes.

 For additional information of cell site test go to: <u>http://www.viavisolutions.com/en/products/network-test-and-certification/cell-site-test</u>