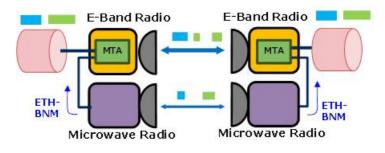




iPASOLINK EX Advanced

MTA ANNEXURE MANUAL



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Printed in Japan

GGS-000559-02E

iPASOLINK EX Advanced MTA ANNEXURE MANUAL

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- 1. The information in this document is subject to change without prior notice.
- **2.** Screenshots of WebLCT provided in this document are examples. Screenshot samples in this document should be the latest as of issuing time, however, their appearances may vary according to configurations, operation modes and specified parameters of the equipment, WebLCT application's release version, etc.
- **3.** This document is provided on the assumption that the targeted users have skills and knowledge of restrictions and precautions to operate the equivalent equipment. Refer to the equipment manual for details.

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1. OVERVIEW

1.1 About this Document

This document is created to describe the MTA feature of iPASOLINK EX Advanced Dual (hereinafter iPASOLINK EX/AD) and the interoperability of MTA feature with other features and other iPASOLINK variants.

1.2 Understanding Multi Traffic Aggregation (MTA)

1.2.1 Need for Multi Traffic Aggregation (MTA)

The iPASOLINK EX Advanced Dual realizes various network expansion demands with flexibility, agility, and lower cost compared to optical fibres, with high reliability that satisfies demanding customers and supports their business with 20Gbps link by two RF channel capacity features on single box with a lightweight, compact squared enclosure.

With the increasing demand for Bandwidth extension up to 25 Gbps, iPASOLINK EX Advanced Dual provides solution with MTA.

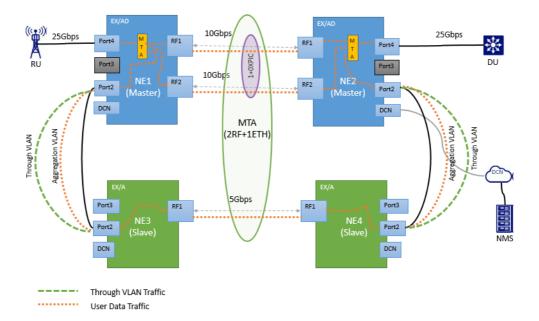
1.2.2 Multi Traffic Aggregation (MTA)

Previously, iPASOLINK introduced Radio Traffic Aggregation (RTA) function to achieve bandwidth extension and redundancy by aggregating wireless links collectively as a single logical interface.

Multi Traffic Aggregation (MTA) function is an extended RTA function to achieve bandwidth extension by aggregating wireless and wired link as a single logical interface. MTA function supports following configurations.

- **1.** Aggregation of two Wireless links.
- 2. Aggregation of one Wireless and one Wired link.
- **3.** Aggregation of two Wireless and one Wired link.





Above figure represent Multi Traffic Aggregation [MTA] of two Wireless and one Wired link. Here, the data traffic of 25 Gbps [from RU to DU or vice versa] flows through the MTA link between NE1-NE3 [Master – Slave] and NE2- NE4 [Master - Slave] Nodes. The MTA member ports [MODEMs RF1, RF2 and Ethernet port Port2] are linked by two methods, *Direct Link* or *Relay Link*. The 20 Gbps data traffic is communicated directly through Direct link and the remaining 5 Gbps traffic is communicated using the *Aggregation VLAN* over the *Relay Link*. The *Through VLAN* is used for Master-Slave Management data communication.

MTA Terminologies:

Direct Link: Direct Link is connecting to MTA opposite node with wireless link.

Relay Link: Relay Link is connecting to MTA opposite node through MTA slave node.

Aggregation VLAN: VLAN used for encapsulating the traffic between MTA Master and Slave node.

Through VLAN: VLAN used for ETH-BN (Rx) function and In-band management communication to MTA Slave node.

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2. Getting started with MTA on iPASOLINK EX/A Dual

2.1 Prerequisites for MTA Configuration

- Minimum one MODEM should be available.
- The MAX frame size of both master and slave node should be set to maximum size (9600 byte) as the aggregated frame size of MTA are up to 9600 bytes. Refer *Condition 3-1*.
- ETH Port should be link up by 1 Gbps or 10 Gbps. Because the frame length of the encapsulated frame may be over 2000 Byte, ETH link of 10 Mbps or 100 Mbps (Fast Ethernet) is not suitable to be used.

2.2 Operational Conditions for MTA Configuration

- The MTA setting is applicable for iPASOLINK EX/A Dual equipment only.
- Only one MTA Group is allowed per equipment.
- Only MODEM port should be configured in MTA Direct Link. Refer Condition 3-1.
- Only ETH port should be configured in MTA Relay Link. Refer Condition 3-1.
- In case of setting MTA with one MODEM and ETH port, other MODEM should be set to "Not Used". Refer *Figure 3-54*.
- In case of setting MTA with ETH port, only ETH Port2 is allowed as member of MTA group. Refer •Condition 3-2.
- In case of setting MTA with ETH port2 (Aggregation VLAN).
 - Aggregation VLAN should not be already registered in VLAN list. Refer Condition 3-2.
 - *Aggregation VLAN* cannot be assigned for user traffic or other service. Refer *Condition 3-3*.
 - MTA *Aggregation VLAN* should be used only for slave connection, not be used for user traffic.
 - The ETH port should be assigned MEP with ETH-BN (Rx) using MTA Through VLAN. [In EX/A, MEP for ETH-CCM on MTA Through VLAN is not supported.]
 - The output rate of ETH Port2 is fixed to ETH-BN (Rx) BW. Link Speed and Manual shaper rate are not supported.
 - Only Sync-E/ LLDP can be set to ETH Port2 interface.
- At the time of creating MTA setting, Multi group logical interface will take over the configuration of VLAN, ETH-OAM, QoS, Static FDB, RSTP / MSTP, LLF and PTP-BC of the least MODEM port associated in the MTA group. Refer .
- At the time on deleting MTA setting, the least MODEM Port associated in the MTA group will take over the configuration of VLAN, ETH-OAM, QoS, Static FDB, RSTP / MSTP, LLF and PTP-BC of the Multi group logical interface. The remaining ports (MODEM and ETH Port2) will be configured with default setting. Refer *Condition 3-5*.
- After configuring MTA group, Header compression is fixed to disable on MODEM interface. Refer Condition 3-3.
- When Port02 is member port of other LAG, it cannot be configured as the member port of Multi Group. Refer *Condition 3-2*.
- QoS Shaper rate for MTA link is calculated based on below condition. Refer *Condition 3-4*.

- i) MTA setting with ETH-BN (Rx) enabled on MTA GRP:
 - MTA link Shaper rate = MTA Master wireless link bandwidth + value received by ETH-BN (Rx) on Port2 from MTA slave
- ii) MTA setting without ETH-BN (Rx) enabled on MTA GRP:

MTA link Shaper rate = MTA Master wireless link bandwidth

• In Transparent Mode, only below two MTA Configuration are allowed.

i) MTA GRP with only two MODEM

ii) MTA GRP with only two MODEM and one ETH Port (Port2)

- In case of setting MTA with only two MODEM in Transparent Mode, ETH-OAM settings are not recommended though LCT will not guard ETH-OAM configuration.
- If the ETH connection between Master and Slave fails, the MTA member reduction control will not work properly in the opposite site and all MTA traffic will be stopped. By setting LLF between Slave nodes, line failures can be detected by the opposite Slave node, avoiding the above problems.

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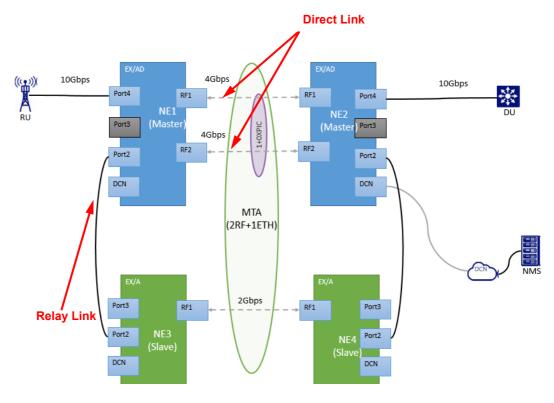
3. Use Cases for MTA

3.1 Use case 1 - MTA [2 MODEM (XPIC) and 1 ETH port] without PTP

3.1.1 Scenario briefing

This section explains a typical user scenario to bring up a MTA topology without PTP. Below topology represent Multi Traffic Aggregation of two Wireless and one Wired link. Data Traffic of 10 Gbps flows between the RU and DU through the MTA link.

3.1.2 Topology



NOTE: The Slave Nodes can be other VR series iPASOLINK Equipment also (3.9 Other Example Topologies). This Manual demonstrates Use cases with EX/A as Slave Nodes

Condition 3-1

- Only MODEM port should be configured in MTA Direct Link as shown in **3.1.2 Topology**.
- Only ETH port should be configured in MTA Relay Link as shown in **3.1.2** Topology.
- The MAX frame size of both master and slave node should be set to maximum size (9600 bytes) as shown below. Refer 9.2.2 Max Frame Size Setting in Set Network and System Provisioning for details.

ridge Setting		7
'LAN Mode	802.1Q	
efault VLAN ID	1	
efault VLAN TPID (C-Tag)	0x8100	
efault VLAN TPID (S-Tag)	0x88A8	
0GbE / GbE MAX Frame Size [byte]	9600	
ouse / use materialle size [syte]	2000	
E MAX Frame Size [byte]		
E MAX Frame Size [byte]		7
	On	

3.1.3 Step by step Configuration

This section contains the step by step procedure to bring up the above topology.

3.1.3.1 Steps Summary - NE1 and NE2

- 1. Register MODEM RF1, RF2 and enable XPIC configuration.
- 2. Configure CS/Reference Modulation for the MODEM RF1, RF2.
- 3. Configure ETH ports Port2 and Port4 as 10G port.
- 4. Create user traffic VLAN (VLAN X) and Through VLAN (VLAN Y).
- 5. Associate user traffic VLAN to ETH Port4 and MODEM Ports RF1 and RF2, Through VLAN to ETH Port2 and MODEM Port RF1.
- 6. Create MEG with ETH-CCM enable, ETH-BN Rx-enable.
- 7. Create MEP on MODEM Port RF1 [Least Port] using Through VLAN.
- Create MTA GRP with MODEM Ports RF1, RF2 and ETH Port2, assign Aggregation VLAN (VLAN Z), Through VLAN and choose MEP Index created in Step 7 from drop-down menu.

3.1.3.2 Steps Summary - NE3 and NE4

- 1. Register MODEM RF1.
- 2. Configure CS/Reference Modulation for the MODEM RF1.
- 3. Configure ETH port Port2 to as 10G port.
- 4. Create VLAN IDs same as Through VLAN (VLAN Y) and Aggregation VLAN (VLAN Z) in Master (NE1 and NE2).
- 5. Associate VLAN Y and VLAN Z to ETH Port2 and VLAN Z to MODEM Port RF1.
- 6. Create MEG with ETH-CCM enable, ETH-BN Tx-enable, BNM Server MEP as MODEM RF1.
- 7. Create MEP on ETH Port2 using Through VLAN.

3.1.3.3 Detailed Configuration steps – NE1 and NE2

Procedure 3-1

1. Register MODEM RF1, RF2 and enable XPIC configuration. Refer 4.2 *Equipment Configuration in Set Network and System Provisioning* for details.

Figure 3-1 Equipment Configuration Window

IE Name			
No.001			
MODEM			
10DEM / XPI	IC Configurat	tion	
MODEM / XPI Slot No.	IC Configurat	tion 2	

 Configure CS/Reference Modulation for the MODEM RF1,RF2. Refer 4.3 Radio Configuration in Set Network and System Provisioning for details.

Current Status			
	(MC	C GRP1 DDEM) :01/02)	
	1+() XPIC	
	No.1	No.2	
Channel Spacing	75	OMHz	
Reference Modulation	128QAM		
ETH Bandwidth [Mbps]	4075	4075	MTA Master wireless
TX Frequency [MHz]	71125.000		
RX Frequency [MHz]	811	25.000	
Frame ID	1	18	
TX Power Control	MTPC		
TX Start Frequency [MHz]	711	25.000	
TX Stop Frequency [MHz]	758	75.000	
Frequency Step [MHz]	1.	.250	
Shift Frequency [MHz]	100	00.000	
Upper / Lower	Lo	ower	
Sub Band		с	
RF Frequency Type	TX	& RX	
Polarization	Vertical	Horizontal	

Figure 3-2 Radio Configuration Window

3. Configure ETH ports Port2 and Port4 as 10G port. Refer *4.3 ETH Port Setting in Set Network and System Provisioning* for details.

Port Usage:	Enable	Disable
Port Name:	Port02 - Relay link	
l0GbE Usage:	Enable	O Disable
Media Type:	Electrical	Optical
Speed:	10 [Gbps]	~
Duplex:	Full	
MDI / MDI-X:	MDI	MDI-X
low Control:	Enable	Oisable
Sync ETH:	Enable	Oisable
LDP Usage:	Enable	Oisable
LDP Mode:	Standard	Proprietary MAC
LDP Port ID Subtype:	MAC Address	🔘 Interface Name
ALS Usage:	Enable	Oisable
ALS Interval:	60 [s]	*

Figure 3-3 ETH Port Setting (Main - Port02) Window



Port Usage:	Enable	O Disable
Port Name:	Port04 - Data Link	×
10GbE Usage:	Enable	Oisable
Media Type:	Electrical	Optical
Speed:	10 [Gbps]	*
Duplex:	Full	
MDI / MDI-X:	MDI	C MDI-X
Flow Control:	Enable	Oisable
Sync ETH:	Enable	Oisable
LLDP Usage:	Enable	Oisable
LLDP Mode:	Standard	Proprietary MAC
LLDP Port ID Subtype:	MAC Address	Interface Name
ALS Usage:	Enable	Oisable
ALS Interval:	60 [s]	~

Figure 3-5	ETH Port Setting Window (1/2: on the leftmost)
------------	--

ovisioning -	ETH Functi	on Setting -	ETH Port Set	ing						
Refresh										
*****	club	Det	D. d Harris	Port Name		Status				
Item	Item Slot Port Port Usage	Port Name	Port Name SFP	Link	Speed	Duplex	10GbE Usage	Media Typ		
		Port02	Enable	Port02 - Relay link	10G BASE-SR	Link Up	10 [Gbps]	Full	Enable	Optical
Main		Port03	Disable							
		Port04	Enable	Port04 - Data Link	10G BASE-SR	Link Up	10 [Gbps]	Full	Enable	Optical

Figure 3-6 ETH Port Setting Window (2/2: on the rightmost)

nction Setting	- ETH Port Sett	ting								
	(2)日 (単)(日)(単)				Setting					
Media Type	Speed	Duplex	MDI / MDI-X	Flow Control	Sync ETH	LLDP Usage	LLDP Mode	LLDP Port ID Subtype	ALS Usage	ALS Interval
Optical	10 [Gbps]	Full		Disable	Disable	Disable			Disable	
Optical	10 [Gbps]	Full		Disable	Disable	Disable			Disable	

4. Create user traffic VLAN (VLAN X) and Through VLAN (VLAN Y). Refer 9.4.1 Add VLAN/S-VLAN ID in Set Network and System Provisioning for details.

Figure 3-7 VLAN Setting Window

Provisioning - ETH Function Set	ting - VLAN Setting					
🧬 Refresh						
VLAN Setting VLAN List	AN ID					
VLAN Mode: 802.1Q Filter VLAN ID:	(1 - 4094)					
Number of items per page:	(1 - 256)	Search				
VLAN ID		VLAN Service Name				
1	(Undefined)					
100	User Traffic VLAN					
200	MTA Through VLAN					

 Associate user traffic VLAN to ETH Port4 and MODEM Ports RF1 and RF2, Through VLAN to ETH Port2 and MODEM Port RF1. Refer *9.4.4 VLAN Setting* (802.1Q Mode) in Set Network and System Provisioning for details.

visioning -	ETH Functi	on Setting -	VLAN Setting					
Refresh								
/LAN Settir	VLAN	List						
/LAN Mode:	802.	1Q						
Filter								
VLAN ID:				(1 - 4094)				
Item:			×					
Port:			~]				
Number o	f items per	page:		(1 - 256)	Search			
Item	Slot	Port	Port Nam	e	VLAN ID	VLAN Port Type	VLAN Service Name	External Used VLAN
Main		Port02	Port02- Relay Link		200	Trunk	MTA Through VLAN	
Main		Port03			1	Access	(Undefined)	
Main		Port04	Port04 - Data Link		100	Trunk	User Traffic VLAN	
MODEM	Slot01	Port01			100	Trunk	User Traffic VLAN	
MODEM	Slot01	Port01			200	Trunk	MTA Through VLAN	
MODEM	Slot02	Port01			100	Trunk	User Traffic VLAN	

Figure 3-8 VLAN Setting Window

6. Create MEG with ETH-CCM enable, ETH-BN Rx-enable. Refer 9.6.1.1 Add MEG Index in Set Network and System Provisioning for details.

Figure 3-9 OAM MEG Setting (Add) Window

OAM MEG Setting (Add)		
MEG Index:		1 (1 - 128)
Maintenance Domain Name:	MTA-MEG	
Short MA Name:	MEG-01	
MEG Level:	1	¥
CCM:	Enable	Disable
ETH-CC Period:	10 [s]	*
CCM Priority:	0	*
BNM (TX):	Enable	Oisable
BNM Server MEP:		*
ETH-BN (TX) Period:	1[s]	*
BNM Priority:	7	~
BNM Hold Time:	1[s]	~
ETH-BN (RX)		
BNM (RX):	Enable	Disable
ETH-BN (RX) Period:	10 [s]	~
		OK Cancel

Figure 3-10 ETH OAM Setting Window

visioning - E	TH Function Setting - ETH OA	M Setting											
Refresh													
AM MEP	OAM MIP OAM MEG Link	OAM											
Add MEG	Delete MEG								ETH-BN (TX)			FTH-	BN (RX)
) Add MEG MEG Index	Delete MEG Maintenance Domain Name	Short MA Name	MEG Level	ССМ	ETH-CC Period	CCM Priority	BNM	BNM Server MEP	ETH-BN (TX) ETH-BN Period	BNM Priority	BNM Hold Time	ETH- BNM	BN (RX) ETH-B Perio

7. Create MEP on MODEM Port RF1 [Least Port] using Through VLAN. Refer 9.6.2.1 Add MEP Index in Set Network and System Provisioning for details.

EP Confi	guration –			MEG	Configura	ation —		
EP Inde	c		1 (1 - 128)		able MEG	G Index	Maintenance Domain Name	Short MA Nan
EP ID:			1 (1 - 8191)	En	able MEG	a Index	Maintenance Domain Name	Short MA Nan
em:	1	MODEM (Slot01)	~	(•	1	MTA-MEG	MEG-01
ort:	2	Port01	~					
'h oam	Source MA	C Address: D4:92	:34:31:0F:04					
irection:		🔘 Up MEP	Own MEP					
Enable	VLAN ID	V	/LAN Service Name					
\bigcirc	100	User_Traffic_VL	AN		(_		>
۲	200	MTA_Through_\	VLAN		•			
				Peer	MEP Conf	figuratio	n	
					Add Peer N	MEP		
					able		Peer MEP ID	
				5	J		2	

Figure 3-11 OAM MEP Setting (Add) Window



OAM MEP		OAM MEG											
MEP Index	MEP ID	MEG Index	Maintenance Domain Name	Short MA Name	MEG Level	ССМ	Direction	VLAN ID	VLAN Service Name	Item	Slot	Port	Peer MEP I
1	1	1	MTA-MEG	MEG-01	1	Enable	Down MEP	200	MTA_Through_VLAN	MODEM	Slot01	Port01	2

8. Create MTA GRP with MODEM Ports RF1, RF2 and ETH Port2, assign Aggregation VLAN (VLAN Z), Through VLAN and choose MEP Index created in Step 7 from drop-down menu. Refer 8.2.3 Add Multi LAG in Set Network and System Provisioning for details.

	gregation (A 197		
LAG:		Multi G	RP1		~		
LAG Nar	ne:	MTA-G	₹₽.				
VLAN IC):	100,20	D				
Link Ago	gregation I	Port					
	Item	Slot	Port	LAG	Aggregation VLAN	Through VLAN	ETH-BN MEP
V	MODEM	Slot01	Port01				
V	MODEM	Slot02	Port01				
	Main		Port02		300	200	

Condition 3-2

- In case of setting MTA with ETH port, Only ETH Port2 is allowed as member of MTA group as shown in above Figure 3-13.
- When Port02 is member port of other LAG, it cannot be configured as the member port of Multi Group as shown below.

		ggregation						
	LAG:		Multi G	RP1		Y		
	LAG N	ame:						
	VLAN	ID:	100,20	0,400				
	Link A	ggregation	Port					
		Item	Slot	Port	LAG	Aggregation VLAN	Through VLAN	ETH-BN MEP
	V	MODEM	Slot01	Port01				~
box ed	\checkmark	MODEM	Slot02	Port01				~
		Main		Port02	ETH GRP1			~

• Aggregation VLAN should not be already registered in VLAN list. Using Aggregation VLAN from VLAN List throws below error.

AN Apprepation VLAN can't be assigned, because VLAN ID is already used. AN ID: 000 OK OK A Apprepation Port Them Site Port LAG Apprepation VLAN Through VLAN ETH-BN HEP 9 HODOM SiteD Port93	AG:		Hulti G					
AN ID: 000 OK	AG N	amec	HTA_G	29	Error			ж
Teen Slot Port LAG Aggregation VLAN Through VLAN ETH-BN HEP 9 HODEM Slot01 Port01					X Ago	regation VLAN can't be as		ID is already used.
				Port	LAG	Apprepation VLAN	Through VLAN	ETH-BN MEP
		MODEM	Slot01	Port01				
MODEH Sket02 Pert01		MODEN	510802	Port01				
V Main Port02 100 200	121	Main		Port02		100	200	-



nk Aggreg	ation Gro												
LAG		oup	LAG Name	LAG Link Status	Mode	TX Interval	Revertive Mode	Distributio	n Rule				
Multi G		MTA-GRP		Link Up	Static			L1 Ba					
nk Aggreg Item			Port Name	Media	Type	Sneed	Dunlex	VIANID	LAG	LAG Port Status	Port Role	Aggregation VLAN	Through VI A
Item	gation Por Slot	Port	Port Name Portfi2- Relay Link	Media		Speed	Duplex	VLAN ID 100.200	LAG Multi GRP1	LAG Port Status	Port Role	Aggregation VLAN	Through VLA
Item Main		Port Port02	Port Name Port02- Relay Link	Media Opti		Speed 10 [Gbps]	Duplex Full	100,200	LAG Multi GRP1	LAG Port Status Active	Port Role	Aggregation VLAN 300	Through VLA 200
Item		Port			al	10 [Gbps]					Port Role		
Item Main Main		Port Port02 Port03	Port02- Relay Link	Opti	al		Full	100,200 1			Port Role		

Condition 3-3

• Aggregation VLAN cannot be assigned for user traffic or other service. Throws below Error.

Item	Slot	Fort		Port Name			la Type	Speed		
Hain		Port04	Port04 - Data Link			0	ptical	10 [Gbps]		
/LAN Ass	ignment -									
VLAN Mo	de: 80	12.1Q								
Port Type	c Access		~							
× VLAN	Assignment	Clear			Error		2			
Enable	VLAN ID			VLAN Ser	🔀 Par	ameter Errori		Untag Frame Assignme (Access Port)	nt Swap Enable	External Used VLAN
	1	(Undefined)				OK				
	100	User Traffic						0		
	200	MTA Throug						0		
	300	MTA YLAN-3	100							

• After configuring MTA group, Header compression is fixed to disable on MODEM Interface.



3.1.3.4 Detailed Configuration steps – NE3 and NE4

Procedure 3-2

1. Register MODEM RF1. Refer **4.2 Equipment Configuration in Set Network** and System Provisioning for details.

Figure 3-15 Radio Configuration Window

Equipment	Setup - Equi	pment Con	figuration			
🤁 Refresh	🌼 Setup					
NE Name	1					
No.001						

NOTE: Slave node used is EX/A, hence MODEM registration is not required.

2. Configure CS/Reference Modulation for the MODEM RF1. Refer 4.3 Radio Configuration in Set Network and System Provisioning for details.

Refresh 🦃 Setup	
urrent Status	
	MODEM (Slot01)
	1+0
	-
Channel Spacing	750MHz
Reference Modulation	16QAM
ETH Bandwidth [Mbps]	2328
TX Frequency [MHz]	83375.000
RX Frequency [MHz]	73375.000
Frame ID	1
TX Power Control	MTPC
TX Start Frequency [MHz]	83375.000
TX Stop Frequency [MHz]	85875.000
Frequency Step [MHz]	1.250
Shift Frequency [MHz]	10000.000
Upper / Lower	Upper
Sub Band	В
RF Frequency Type	TX & RX

Figure 3-16 Radio Configuration Window

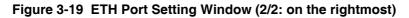
3. Configure ETH port Port2 as 10G port. Refer **4.3 ETH Port Setting in Set** *Network and System Provisioning* for details.

ETH Port Setting (Main -	Port02)		(
Port Usage:	Enable	Disable	
Port Name:	Port02 - Relay Link		
10GbE Usage:	enable	Disable	
Media Type:	Electrical	Optical	
Speed:	10 [Gbps]	*	
Duplex:	Full		
MDI / MDI-X:	MDI	MDI-X	
Flow Control:	Enable	Oisable	
Sync ETH:	Enable	Oisable	
LLDP Usage:	Enable	Oisable	
LLDP Mode:	Standard	Proprietary MAC	
LLDP Port ID Subtype:	MAC Address	Interface Name	
ALS Usage:	Enable	Oisable	
ALS Interval:	60 [s]	*	
		OK Cancel	

Figure 3-17 ETH Port Setting (Main - Port02) Window

Figure 3-18 ETH Port Setting Window (1/2: on the leftmost)

visioning ·	- ETH Functi	on Setting -	ETH Port Set	ling						
Refresh										
							Status			
Item	Slot	Port	Port Usage	Port Name	SFP	Link	Speed	Duplex	10GbE Usage	Media T
Main		Port02	Enable	Port02 - Relay Link	10G BASE-SR	Link Up	10 [Gbps]	Full	Enable	Optica
		Port03	Disable							1



g - ETH Port Se	tting										
						Setting					
10GbE Usage	Media Type	Speed	Duplex	MDI / MDI-X	Flow Control	Sync ETH	LLDP Usage	LLDP Mode	LLDP Port ID Subtype	ALS Usage	ALS Interva
Enable	Optical	10 [Gbps]	Full		Disable	Disable	Disable			Disable	
cnaple	Optical	TO [GDD2]	ruli		Disable	Disable	Disable			Disable	

4. Create VLAN IDs same as Through VLAN (VLAN Y) and Aggregation VLAN (VLAN Z) in Master (NE1 and NE2). Refer 9.4.1 Add VLAN/S-VLAN ID in Set Network and System Provisioning for details.

tefresh				
AN Setting VLAN List				
Add VLAN ID 🥥 Delete V	LAN ID			
AN Mode: 802.1Q				
Filter				
VLAN ID:		(1 - 4094)		
	:	(1 - 4094) (1 - 256)	Search	
	· · · · · · · · · · · · · · · · · · ·		Search	VLAN Service Name
Number of items per page	: (Undefined)		Search	VLAN Service Name
			Search	VLAN Service Name

Figure 3-20 ETH Function Setting - VLAN Setting Window

5. Associate VLAN Y and VLAN Z to ETH Port2 and VLAN Z to MODEM Port RF1. Refer 9.4.4 VLAN Setting (802.1Q Mode) in Set Network and System Provisioning for details.

Figure 3-21 ETH Function Setting - VLAN Setting Wir	ndow
---	------

	LIIIIuncu	on setting -	VLAN Setting					
Refresh								
/LAN Settin /LAN Mode:								
Filter	0 00000							
VLAN ID:				(1 - 4094)				
Item:			*					
Port:			~					
i ore.		<u> </u>						
	f items per	page:		(1 - 256)	Search			
	f items per Slot	page: Port	Port Name		Search VLAN ID	VLAN Port Type	VLAN Service Name	External Used VLAN
Number of						VLAN Port Type Trunk	VLAN Service Name	
Number of		Port	Port Name		VLAN ID			
Number of Item Main		Port Port02	Port Name Port02 - Relay Link		VLAN ID 200	Trunk	MTA Through VLAN	
Number of Item Main Main		Port Port02 Port02	Port Name Port02 - Relay Link		VLAN ID 200 300	Trunk Trunk	MTA Through VLAN Aggregation VLAN	

6. Create MEG with ETH-CCM enable, ETH-BN Tx-enable, BNM Server MEP as MODEM RF1. Refer *9.6.1.1 Add MEG Index in Set Network and System Provisioning* for details.

AM MEG Setting (Modify)			
MEG Index:	1		
Maintenance Domain Name:	MTA-MEG		
Short MA Name:	MEG-01		
MEG Level:	1	~	
CCM:	Enable	Disable	
ETH-CC Period:	10 [s]	~	
CCM Priority:	0	~	
ETH-BN (TX)			
BNM (TX):	Enable	Disable	
BNM Server MEP:	MODEM (Slot01)	×	
ETH-BN (TX) Period:	10 [s]	*	
BNM Priority:	7	~	
BNM Hold Time:	1 [s]	*	
ETH-BN (RX)			
BNM (RX):	Enable	Oisable	
ETH-BN (RX) Period:	1 [s]	~	
		ОК Са	incel

Figure 3-22 OAM MEG Setting (Modify) Window

Figure 3-23 ETH OAM Setting Window (1/2: on the leftmost)

Refresh						
Add MEG	OAM MIP OAM MEG Link	OAM				
MEG Index	Maintenance Domain Name	Short MA Name	MEG Level	ССМ	ETH-CC Period	CCM Priorit

			ETH-BN (TX)			ETH-	BN (RX)
CCM Priority	BNM	BNM Server MEP	ETH-BN Period	BNM Priority	BNM Hold Time	BNM	ETH-BN Period
0	Enable	MODEM (Slot01)	10 [s]	7	1 [s]	Disable	

Figure 3-24 ETH OAM Setting Window (2/2: on the rightmost)

7. Create MEP on ETH Port2 using Through VLAN. Refer 9.6.2.1 Add MEP Index in Set Network and System Provisioning for details.

IEP Sett	ing (Add)						
P Index P ID:	: [1 (1 - 128) 2 (1 - 8191)	Enable	MEG Index	Maintenance Domain Name	Short MA Nan
em:		Main	*	۲	1	MTA-MEG	MEG-01
rt:		Port02	*				
		AC Address: 02:E2					
ection:		O Up MEP	Own MEP				
nable	VLAN ID	v	LAN Service Name				
۲	200	MTA_Through_	/LAN	<			>
					P Configuration	Peer MEP ID	
						1	
							ОК

Figure 3-25 OAM MEP Setting (Add) Window

Figure 3-26 ETH OAM Setting Window (1/3: on the leftmost)

Refresh						
DAM MEP	OAM MIP	OAM MEG	Link OAM			
Add MEP	🔵 Delete Mi	ΞP				
MEP Index	MEP ID	MEG Index	Maintenance Domain Name	Short MA Name	MEG Level	ССМ

Figure 3-27 ETH OAM Setting Window (2/3: on the middle)

Direction VLAN ID VLAN Service Name Item Slot	Por

Figure 3-28 ETH OAM Setting Window (3/3: on the rightmost)

				EII	H-BN (TX)			ETH-6	SN (R)
Port	Peer MEP ID	BNM Server MEP	ETH-BN Period	BNM Priority	ETH-BN Nominal Bandwidth	ETH-BN Current Bandwidth	BNM Hold Time	ETH-BN Period Setting Value	ET
Port02	1	MODEM (Slot01)	10 [s]	7	2328 [Mbps]	2328 [Mbps]	1 [s]		
					TH-BN (Tx) sho ave MODEM co				

3.1.4 Alarm and Troubleshooting:

Once the topology configuration is complete, check for below possible alarms.

- 1. ETH-BN LOC
- 2. ETH LOS
- **3.** Multi Traffic Aggregation Link
- 4. Multi Traffic Aggregation Setting Mismatch

To Clear the Alarms, refer to **5.5 Trouble Clearing in Operation and** *Maintenance* for details.

3.1.5 Use Case Verification

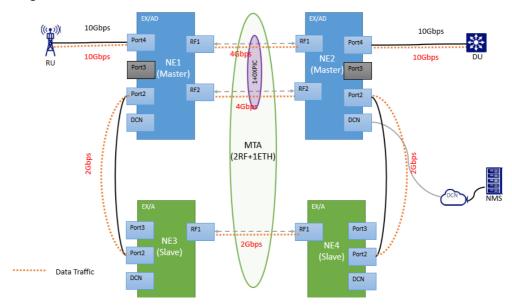


Figure 3-29 Data Traffic Flow

1. Verify ETH-BN (Rx) on Master Node shows the ETH-BN received from MTA slave.

				H-BN (TX)				BN (RX)					
eer MEP ID	BNM Server MEP	ETH-BN Period	BNM Priority	ETH-BN Nominal Bandwidth	ETH-BN Current Bandwidth	BNM Hold Time	ETH-BN Period Setting Value	ETH-BN Current Bandwidth					
2							10 [s] 2328 [Mbps]						

ETH-BN received from MTA slave

- Verify the counters in ETH RMON Report on Slave [NE3 and NE4] Port02 for traffic taken through relay link. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.
- **3.** Verify the counters in ETH RMON Report on receiving end Master [NE2] Port04 for the entire traffic aggregated back from MTA ports. Refer **3.3.3 ETH** *RMON Report in Operation and Maintenance* for details.

Condition 3-4

• *QoS Shaper rate for MTA link is calculated based on below condition.*

i) MTA setting with ETH-BN (Rx) enabled on MTA GRP:

MTA link Shaper rate = MTA Master wireless link bandwidth + value received by ETH-BN (Rx) on Port2 from MTA slave

NOTE: When ETH bandwidth is not received from port2 value "0" is used for calculation.

lassify Setting Po	licer Settin	g Shaper Sett	ting										
Edit Profile													
oS Shaper Setti	ing List												
Number of Queue		8 Classes Qo	s	VLAN Sha	per	0	visable						
Item	Slot		Port Shaper						Priority Shape	r			
rem	3100	Port	Shaper Rate[bps]	Profile	Drop Mode	Priority0	Priority1	Priority2	Priority3	Priority4	Priority5	Priority6	Priority
Main		Port03	1000M	1Gbps Default	WTD	SP	SP	SP	SP	SP	SP	SP	SP
Main		Port04	10000M	10Gbps Default	WTD	SP	SP	SP	SP	SP	SP	SP	SP
LAG		Multi GRP1	10000M	10Gbps Default	WTD	SP	SP	SP	SP	SP	SP	SP	SP

ii) MTA setting without ETH-BN (Rx) enabled on MTA GRP: MTA link Shaper rate = MTA Master wireless link bandwidth

 Perform TX mute on MODEM RF1 and MODEM RF2 on sender end Master [NE1].

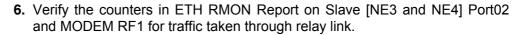
Figure 3-31 MODEM Maintenance Control Window

Refresh		
	(MO	GRP1 DEM))1/02)
	1+0	XPIC
	No.1	No.2
ATPC Manual Control [dBm]		
TX Mute Control	<u>On</u>	<u>On</u>
CW Control	Off	Off
Carrier Search	Off	Off
(PIC Reset	A	ito

5. Verify the QOS shaper on Master got updated with Slave Modem Bandwidth received via ETH-BNM.

Classify Setting P	olicer Setting	Shaper Sett	ing										
edit Profile													
QoS Shaper Set	ting List												
Number of Queue		8 Classes Qo	5	VLAN Sha	per	0	Disable						
					1								
Item	Slot		Port Shaper	Priority Shaper									
	5100	Port	Shaper Rate[bps]	Profile	Drop Mode	Priority0	Priority1	Priority2	Priority3	Priority4	Priority5	Priority6	Priority
Main		Port03	1000M	1Gbps Default	WTD	SP	SP						
Main		Port04	10000M	10Gbps Default	WTD	SP	SP						
LAG		Multi GRP1	2300.296M	10Gbps Default	WTD	SP	SP						

Figure 3-32 QoS / Classification Setting Window



Debugging:

- 1. When the RX rate is not as per the TX rate, check below settings
 - a. MTA Direct link is up.

Slave Modem Bandwidth

- b. MTA Relay link is up.
- c. Max Frame size in Master and Slave is set to 9600 bytes.
- d. ETH-BN (Rx) is updated in Master from Slave.

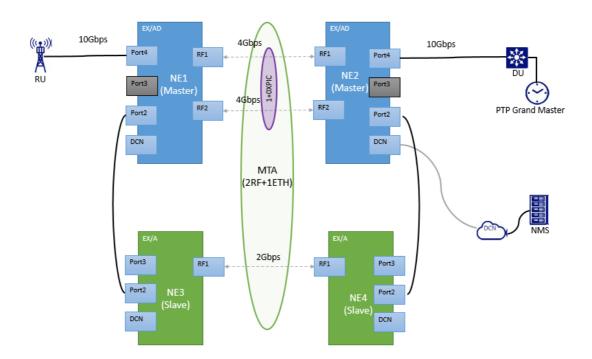
e. Sender traffic TX rate = ETH Bandwidth in Master + ETH Bandwidth in Slave.

f. QOS Shaper setting for MTA GRP matches sender traffic TX rate.

3.2 Use case 2 - MTA [2 MODEM (XPIC) and 1 ETH port] with PTP

3.2.1 Scenario briefing

This section explains a typical user scenario to bring up a MTA topology with PTP. Below topology represent Multi Traffic Aggregation of two Wireless and one Wired link. Data Traffic of 10 Gbps flows between the RU and DU through the MTA link with the PTP Packets from the RU.



3.2.2 Topology

3.2.3 Step by Step Configuration

This section contains the step by step procedure to bring up the above topology.

3.2.3.1 Steps Summary - NE1 and NE2

- 1. Follow steps 1 to 8 in 3.1.3.1 Steps Summary NE1 and NE2.
- 2. Configure PTP Mode to Boundary Clock (BC).
- 3. Configure Sync ETH on ETH Port 02.
- 4. Configure Equipment Clock mode to Slave and below timing sources.
 - a. Timing Source as PTP Line CLK in NE1
 - b. Timing Sources as Line CLK (MODEM) with MODEM RF1 and GbE line CLK1 with ETH Port02 in NE2
- 5. Create PTP VLAN to transmit PTP Packets in 'VLAN List'.
- 6. Associate the PTP VLAN to MTA GRP.
- 7. Create below PTP Logical interfaces
 - a. ETH Port04 with user traffic VLAN [Act as PTP slave, create only on NE1]
 - b. MTA GRP with PTP VLAN [Act as PTP Master]

c. MTA GRP with MTA Through VLAN [Act as PTP Master when MTA Direct link is down]

3.2.3.2 Steps Summary - NE3 and NE4

- 1. Follow steps 1 to 7 in 3.1.3.2 Steps Summary NE3 and NE4.
- 2. Configure PTP Mode to Transparent Clock (TC).
- 3. Configure Sync ETH on ETH Port02.
- 4. Configure Equipment Clock mode to Slave and below timing sources
 - a. Timing Source as GbE Line CLK1 with ETH Port02 in NE3
 - b. Timing Source as Line CLK(MODEM) with MODEM RF1 in NE4

3.2.3.3 Detailed Configuration steps - NE1 and NE2

Procedure 3-3

- 1. Follow steps 1 to 8 in 3.1.3.3 Detailed Configuration steps NE1 and NE2.
- Configure PTP Mode to Boundary Clock (BC). Refer to 10.2.2 Modify PTP Mode in Set Network and System Provisioning for details.

Figure 3-33 Radio Configuration Window

rovisioning - E	quipment Clock / S	synchronization Setting	g - PTP Mode Setting					
👌 Refresh 🛛 🍪	Modify PTP Mode	🤤 Delete PTP Logical In	terface					
PTP Paramet	ers							
PTP Paramet PTP Mode	PTP Profile	Clock Model	Transport Mode	Communication Mode	Domain Number	Priority1	Priority2	Local Priorit

 Configure Sync ETH on ETH Port02. Refer to 9.3 ETH Port Setting in Set Network and System Provisioning for details.

ETH Port Setting (Main -	Port02)		×
Port Usage:	Enable	Disable	
Port Name:	Port02 - Relay link		
10GbE Usage:	Enable	Disable	
Media Type:	Electrical	Optical	
Speed:	10 [Gbps]	~	
Duplex:	Full		
MDI / MDI-X:	MDI	MDI-X	
Flow Control:	Enable	Oisable	
Sync ETH:	Enable	Disable	
LLDP Usage:	Enable	Oisable	
LLDP Mode:	Standard	Proprietary MAC	
LLDP Port ID Subtype:	MAC Address	Interface Name	
ALS Usage:	Enable	Oisable	
ALS Interval:	60 [s]	~	
		OK Cancel	

Figure 3-34 ETH Port Setting (Main - Port02) Window

- **4.** Configure Equipment Clock mode to Slave and below timing sources.
 - a. Timing Source as PTP Line CLK1 in NE1
 - b. Timing Sources as Line CLK (MODEM) with MODEM RF1 and GbE line CLK1 with ETH Port02 in NE2

Refer to 10.1.1 Specify/Modify Equipment Clock Setting in Set Network and System Provisioning for details.

Defrech	🏀 Modify								
Refresh	- Houry								
Equipmen	t CLK Mode	Slave							
Equipmen	t CLK Status	Locked							
Selected (LK Source	REF1 : PTP Line C	CLK						
Clock Sou	rce Selective Mode	QL Mode							
		derione							
		42.1000							
No.	Timing Source	Slot	Port	Port Name	Priority Level	SSM Usage	Line SSM / Forced SSM Value	WTR Timer	Stat
No.	Timing Source PTP Line CLK		Port	Port Name	Priority Level	SSM Usage Used	Line SSM / Forced SSM Value QL-SEC	WTR Timer	
No. 1 2	-	Slot	Port	Port Name				WTR Timer 10 [s]	Stat Norn

Figure 3-35 Equipment Clock Setting Window [In NE1]



ovisionii	ng - Equipment Clock	k / Synchronizatio	n Setting - Eq	uipment Clock Setting					
Refresh	🌼 Modify								
Equipme	nt CLK Mode	Slave							
Equipme	nt CLK Status	Locked							
Selected	CLK Source	REF1 : Line CLK (MODEM)						
Clock So	urce Selective Mode	QL Mode							
No.	Timing Source	Slot	Port	Port Name	Priority Level	SSM Usage	Line SSM / Forced SSM Value	WTR Timer	Statu
1	Line CLK (MODEM) Slot01	Port01		1	Used	QL-SEC		Norm
2	GbE Line CLK1	Main	Port02	Port02- Relay Link	2	Used	QL-SEC	10 [s]	Norm
3	Not Entry						1	í í	

 Create PTP VLAN to transmit PTP Packets in 'VLAN List'. Refer to 9.4.1 Add VLAN/S-VLAN ID in Set Network and System Provisioning for details.

Figure 3-37 VLAN Setting Window

wisioning - ETH Function Se	tting - VLAN Setting			
Refresh				
VLAN Setting VLAN List				
🔾 Add VLAN ID 🛛 🤤 Delete VL	AN ID			
VLAN Mode: 802.1Q				
VLAN ID:		(1 - 4094)		
Number of items per page:		(1 - 256)	Search	
VLAN ID				VLAN Service Name
1	(Undefined)			
100	User Traffic VLAN			
111	(Undefined)			
200	MTA Through VLAN			
300	MTA VLAN-300			
400	PTP VLAN			

6. Associate the PTP VLAN to MTA GRP. Refer to 9.4.4 VLAN Setting (802.1Q Mode) in Set Network and System Provisioning for details.

Provisioning - El	TH Funct	ion Setting - \	/LAN Setting						
<i> Refresh</i>									
VLAN Setting	U								
VLAN Mode:	802.	1Q							
Filter VLAN ID: Item: Port: Number of it	tems per	page:	v	(1 - 4094) (1 - 256)	Search				
Item	Slot	Port	Port Name / LAG	6 Name	VLAN ID	VLAN Port Type	VLAN Service Name	External Used VLAN	
Main		Port03			1	Access	(Undefined)		
Main		Port04	Port04 - Data Link		100	Trunk	User Traffic VLAN		
LAG		Multi GRP1			100	Trunk	User Traffic VLAN		
LAG		Multi GRP1			200	Trunk	MTA Through VLAN		
LAG		Multi GRP1			400	Trunk	PTP VLAN		
14 4 Pag	e 1	of 1 🕨 🕅							Displaying 1 - 8 of 8

Figure 3-38 VLAN Setting Window

- 7. Create below PTP Logical interfaces.
 - a. ETH Port04 with user traffic VLAN [Act as PTP slave, create only on NE1]
 - b. MTA GRP with PTP VLAN [Act as PTP Master]

c. MTA GRP with MTA Through VLAN [Act as PTP Master when MTA Direct link is down]

Refer to 10.2.3 Add/Modify PTP Logical Interface in Set Network and System *Provisioning* for details.

Figure 3-39 PTP Mode Setting Window [In NE1]

Refrest	n 🍪 Modify PTP Mode	Delete PTP Logical In	terface									
TP Par	rameters											
PTP M	ode PTP Profile	Clock Model	Transport	t Mode	Communication Mode	C	Domain Number	Priority1	Priority2	Local Priority		
BC	IEEE 1588v2	PTP Only	PTP over Et	thernet	Multicast		0	128	128			
P LOG	jical Interface										Packet Rate Setting	fnsl
		face Name		IP Address	Subnet Mask	Local Priority	VLAN ID	Mapped P	hysical Port	Sync	Packet Rate Setting [Delay_Req	fps] Announce
10.		face Name		IP Address	Subnet Mask		VLAN ID 100		hysical Port 04 (Main)	Sync 16		1.5
10.	, Inter	face Name		IP Address	Subnet Mask			ETH Port			Delay_Req	Announce
No. 01 02	, Inter PTP_Slave_Port	face Name		IP Address	Subnet Mask		100	ETH Port Multi	04 (Main)	16	Delay_Req 16	Announce 1
No.	Inter PTP_Slave_Port PTP_Traffic_VLAN	face Name		IP Address	Subnet Mask		100 400	ETH Port Multi	04 (Main) GRP1	16 16	Delay_Req 16 16	Announc 1 1

Figure 3-40 PTP Mode Setting Window [In NE2]

				Local				Packet Rate Setting [fp	s]
No.	Interface Name	IP Address	Subnet Mask	Local Priority	VLAN ID	Mapped Physical Port	Sync	Delay_Req	Announce
<u>01</u>	PTP_Slave_Traffic_VLAN				400	Multi GRP1	16	16	1
<u>02</u>	PTP_Slave_Through_VLAN				200	Multi GRP1	16	16	1
<u>03</u>									
<u>04</u>									
05									

11

3.2.3.4 Detailed Configuration steps - NE3 and NE4

Procedure 3-4

- 1. Follow steps 1 to 7 in 3.1.3.4 Detailed Configuration steps NE3 and NE4.
- 2. Configure PTP Mode to Transparent Clock (TC). Refer to 10.2.2 Modify PTP Mode in Set Network and System Provisioning for details.

Figure 3-41	PTP	Mode	Setting	Window
-------------	-----	------	---------	--------

, Kellesii 🦦	Modify PTP Mode 🛛 🤤	Delete PTP Logical In							
PTP Parame							The second s		
PTP Mode	PTP Profile	Clock Model	Transport Mode	Communication Mode	Domain Number	Priority1	Priority2	Local Priority	
TC	IEEE 1588v2								
No.	Interf	ace Name	IP Addres	s Subnet Mask	Local Priority VLAN ID	Mapped P	hysical Port	Sync	Delay_Req
01									
01 02									
02									
02 03									

3. Configure Sync ETH on ETH Port02. Refer to 9.3 ETH Port Setting in Set Network and System Provisioning for details.

Figure 3-42 ETH Port Setting (Main - Port02) Window

ETH Port Setting (Main -	Port02)	×	0
Port Usage:	Enable	Disable	
Port Name:	Port02 - Relay Link		
10GbE Usage:	Enable	Disable	
Media Type:	Electrical	Optical	
Speed:	10 [Gbps]	*	
Duplex:	Full		
MDI / MDI-X:	MDI	MDI-X	
Flow Control:	Enable	Oisable	
Sync ETH:	Enable	Disable	
LLDP Usage:	Enable	Oisable	
LLDP Mode:	Standard	Proprietary MAC	
LLDP Port ID Subtype:	MAC Address	Interface Name	
ALS Usage:	Enable	Oisable	
ALS Interval:	60 [s]	*	
		OK Cancel	

- 4. Configure Equipment Clock mode to Slave and below timing sources
 - a. Timing Source as GbE Line CLK1 with ETH Port02 in NE3

b. Timing Source as Line CLK (MODEM) with MODEM RF1 in NE4

Refer to 10.1.1 Specify/Modify Equipment Clock Setting in Set Network and System Provisioning for details.

Figure 3-43 Equipment Clock Setting Window [In NE3]

Refresh	🍪 Modify								
quipmer	it CLK Mode	Slave							
quipmer	t CLK Status	Locked							
elected	CLK Source	REF1 : GbE Line C	LK1						
ock Sou	rce Selective Mode	QL Mode							
No.	Timing Source	Slot	Port	Port Name	Priority Level	SSM Usage	Line SSM / Forced SSM Value	WTR Timer	Status
	Timing Source GbE Line CLK1	Slot Main	Port Port02	Port Name Port02 - Relay Link	Priority Level	SSM Usage Used	Line SSM / Forced SSM Value QL-SEC	WTR Timer	Status Normal
No. 1 2								WTR Timer	

Figure 3-44 Equipment Clock Setting Window [In NE4]

Refresh	🎲 Modify								
Equipme	nt CLK Mode	Slave							
Equipme	nt CLK Status	Locked							
Selected	CLK Source	REF1 : Line CLK (MC	DDEM)						
Clock So	urce Selective Mode	QL Mode							
No	Timing Source	Slat	Port	Port Name	Priority Level	encall M22	Line SSM / Forred SSM Value	WTP Timer	Statue
No.	Timing Source	Slot	Port Port01	Port Name	Priority Level	SSM Usage Used	Line SSM / Forced SSM Value OL-SEC	WTR Timer	Status Normal
	-			Port Name		-		WTR Timer	

3.2.4 Alarm and Troubleshooting:

Once the topology configuration is complete, check for below possible alarms.

- 1. ETH-BN LOC
- 2. ETH LOS
- 3. Multi Traffic Aggregation Link
- 4. Multi Traffic Aggregation Setting Mismatch
- 5. PTP Mode Setting Mismatch

To Clear the Alarms, refer to **5.5 Trouble Clearing in Operation and** *Maintenance* for details.

3.2.5 Use Case Verification

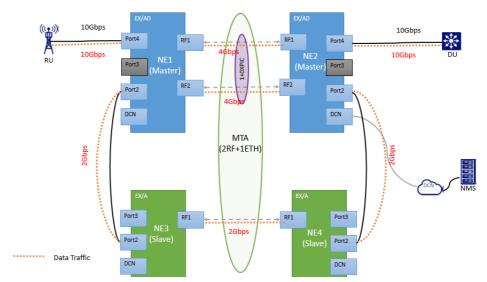
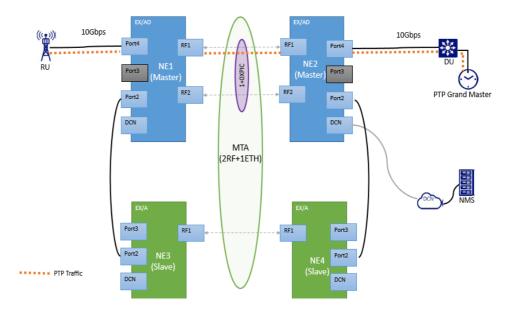


Figure 3-45 Data Traffic Flow

Figure 3-46 PTP Traffic Flow



- Verify the counters in ETH RMON Report on Slave [NE3 and NE4] Port02 for traffic taken through relay link. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.
- Verify the counters in ETH RMON Report on receiving end Master [NE2] Port04 for the entire traffic aggregated back from MTA ports. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.
- 3. Check PTP synchronization status in PTP Domain Setting.
 - a. PTP Clock Quality Level should be QL-SEC

P Refresh	Delete PTP Master Entry										
PTP Node	Information										
	PTP Data/Time	PTP Clock ID	PTP Cloc	k Quality Le	vel	PTP Clock Status					
2	2021/08/12 19:24:08	D4:92:34:FF:FE:31:0E:E	(QL-SEC							
Grandmas	ster Information										
No.	Master Name	Clock ID	Clock Class	Priority1	Priorit	y2 Clock Accura	TY				
1		AC:DE:48:00:00:00:00:0	6	128	128	100 [ns]					
PTP Maste	or List										
No.	Master Name	Logical Interface No.	Clock ID		Clock Class	PTP Source Status	PTP Alarm	Local Priority	PTP Master IP Address	PTP SW Control	Lock Ou
1		No.1	C:DE:48:00:00:00	:00:00	6	Selected					
2					i i						
3											
4											

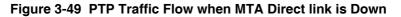
Figure 3-47 PTP Domain Setting Window [In NE1]

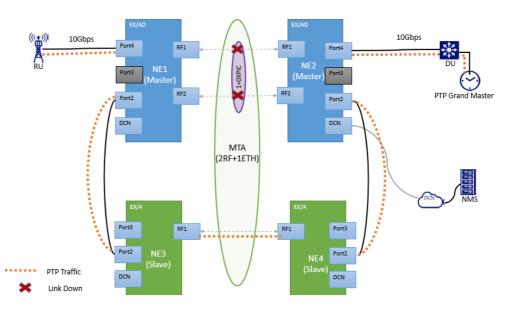
b. PTP Source Status should be Selected for PTP logical interface 1

Figure 3-48 PTP Domain Setting Window [In NE2]

Refresh	Delete PTP Master Entry										
TP Node	Information										
	PTP Data/Time	PTP Clock ID	PTP Clos	k Quality Le	evel	PTP Clock Status					
2	021/08/12 19:56:47	D4:92:34:FF:FE:31:0F:0	0	QL-SEC							
irandmas No.	ster Information Master Name	Clock ID	Clock Class	Priority1	Priorit	ty2 Clock Accurac	-y				
1	Master Name	AC:DE:48:00:00:00:00:00:0		128	128	-	-y				
TP Maste	er List										
No.	Master Name	Logical Interface No.	Clock ID		Clock Class	PTP Source Status	PTP Alarm	Local Priority	PTP Master IP Address	PTP SW Control	Lock O
1		No.1	D4:92:34:FF:FE:31	:0E:E0	6	Selected					
2		No.2	D4:92:34:FF:FE:31	:0E:E0	6	Not Selected					
3											
4											

c. When the MODEM Link [MTA direct link] is down, PTP Logical interface 2 should be Selected as PTP Source [In NE2]





rovisionin	ng - Equipment Clock / Syno	chronization Setting - PTP Do	main Setting									
Refresh	\ominus Delete PTP Master Entry											
TP Nod	e Information											
	PTP Data/Time	PTP Clock ID	PTP Cloc	k Quality Le	evel	F	PTP Clock Status					
	2021/08/13 12:26:05	D4:92:34:FF:FE:31:0F:0) (L-SEC								
	aster Information							-				
No.	Master Name	Clock ID	Clock Class	Priority1	Prior	rity2	Clock Accuracy					
1		AC:DE:48:00:00:00:00:0	0 6	128	12	28	100 [ns]					
PTP Mas	ter List											
No.	Master Name	Logical Interface No.	Clock ID		Clock Class	PTP	Source Status	PTP Alarm	Local Priority	PTP Master IP Address	PTP SW Control	Lock O
1		No.2	D4:92:34:FF:FE:31	:0E:E0	6		Selected					
2												
3												
4												

Figure 3-50 PTP Domain Setting Window [In NE2]

Condition 3-5

• At the time on deleting MTA setting, the least MODEM Port associated in the MTA group will take over the configuration of VLAN, ETH-OAM, QOS, Static FDB, RSTP/MSTP, LLF and PTP-BC of the Multi group logical interface. The remaining ports (MODEM and ETH Port2) will be configured with default setting.

Example 1:

Refer Figure 3-38 VLAN Setting Window for MTA GRP VLAN Setting. Below figure shows MODEM RF1 taking over the configuration of VLAN and port2 configured to default setting after MTA GRP is deleted.

efresh									
AN Settin	ng VLAN	List							
AN Mode	: 802.	10							
Filter	. 002.	10							
				(
VLAN ID:				(1 - 4094)					
Item:			*						
Port:			~						
Number o	f items per	nade:		(1 - 256)	Search				
				(,					
Item	Slot	Port	Port Name	8	VLAN ID	VLAN Port Type	VLAN Service Name	External Used VLAN	
Main		Port02	Port02 - Relay link		1	Access	(Undefined)		
Main		Port03			1	Access	(Undefined)		
Main		Port04	Port04 - Data Link		100	Trunk	User Traffic VLAN		
MODEM	Slot01	Port01			100	Trunk	User Traffic VLAN		
MODEM	Slot01	Port01			200	Trunk	MTA Through VLAN		
MODEM	Slot01	Port01			400	Trunk	PTP VLAN		
MODEM	Slot02	Port01			1	Trunk	(Undefined)		
PTP					100	Trunk	User Traffic VLAN		
PTP					200	Trunk	MTA Through VLAN		
					400	Trunk	PTP VLAN		

Example 2:

Refer **Figure 3-39 PTP Mode Setting Window [In NE1]** for PTP Logical *interfaces with MTA GRP.*

Below figure shows MODEM RF1 taking over the configuration of PTP Logical interfaces after MTA GRP is deleted.

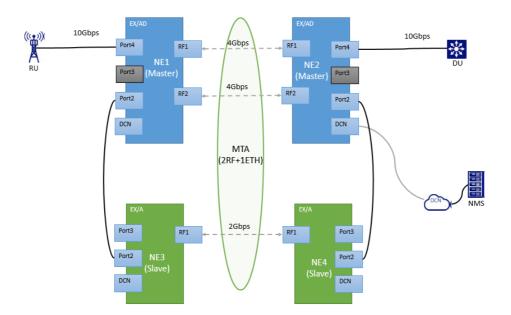
Refre	esh 🛛 🎲 Modify PTP	1ode 🤤	Delete PTP Logical Ir	nterface								
ТР Р	arameters											
PTP	Mode PTP Pro	ile	Clock Model	Trans	port Mode	Communication Mode	C	Domain Number	Priority1	Priority2	Local Priority	
E	C IEEE 158	Bv2	PTP Only	PTP ov	er Ethernet	Multicast		0	128	128		
IP L	ogical Interface											
	ogical Interface	Interfa	ce Name		IP Address	Subnet Mask	Local Priority	VLAN ID	Mapped P	nysical Port	Sime	Packet Rate Setting [
No.		Interfa	ce Name		IP Address	Subnet Mask	Local Priority				Sync 16	Delay_Req
	PTP_Slave_Port PTP_Traffic_VLAN	Interfa	ce Name		IP Address	Subnet Mask		VLAN ID 100 400	ETH Port	nysical Port 04 (Main) (Slot01)	Sync 16 16	
No. <u>01</u>	PTP_Slave_Port		ce Name		IP Address	Subnet Mask		100	ETH Port MODEM	04 (Main)	16	Delay_Req 16
No. 01 02	PTP_Slave_Port PTP_Traffic_VLAN		ce Name		IP Address	Subnet Mask		100 400	ETH Port MODEM	04 (Main) (Slot01)	16 16	Delay_Req 16 16

3.3 Use case 3 - MTA with 2 MODEM (not XPIC) and 1 ETH port

3.3.1 Scenario briefing

This section explains a typical user scenario to bring up a MTA topology with modems without XPIC. Below topology represent Multi Traffic Aggregation of two Wireless and one Wired link. Data Traffic of 10 Gbps flows between the RU and DU through the MTA link.

3.3.2 Topology



3.3.3 Step by Step Configuration

This section contains the step by step procedure to bring up the above topology.

3.3.3.1 Steps Summary - NE1 and NE2

- 1. Register MODEM RF1, RF2.
- 2. Configure CS/Reference Modulation for the MODEM RF1, RF2.
- 3. Follow steps 3 to 8 in 3.1.3.1 Steps Summary NE1 and NE2.

3.3.3.2 Steps Summary - NE3 and NE4

1. Follow steps 1 to 7 in 3.1.3.2 Steps Summary - NE3 and NE4.

3.3.3.3 Detailed Configuration steps - NE1 and NE2

Procedure 3-5

1. Register MODEM RF1, RF2. Refer 4.2 Equipment Configuration in Set Network and System Provisioning for details.

NE Name No.001 Equipment Co	figuration	
	figuration	
Equipment Co	figuration	
MODEM		
MODEM / XPI	C Configurat	tion 2
XPIC GRP		

Figure 3-51 Equipment Configuration Window

2. Configure CS/Reference Modulation for the MODEM RF1, RF2. Refer 4.3 Radio Configuration in Set Network and System Provisioning for details.

urrent Status			
	MODEM (Slot01)	MODEM (Slot02)	
	1+0	1+0	
	-	-	
Channel Spacing	750MHz	750MHz	
Reference Modulation	128QAM	128QAM	
ETH Bandwidth [Mbps]	4075	4075	
TX Frequency [MHz]	71125.000	0.000	
X Frequency [MHz]	81125.000	0.000	
Frame ID	1	18	
TX Power Control	MTPC	MTPC	
TX Start Frequency [MHz]	71125.000	71125.000	
TX Stop Frequency [MHz]	75875.000	75875.000	
Frequency Step [MHz]	1.250	1.250	
Shift Frequency [MHz]	10000.000	10000.000	
Jpper / Lower	Lower	Lower	
Sub Band	с	с	
RF Frequency Type	TX & RX	TX & RX	
Polarization	Vertical	Horizontal	

Figure 3-52 Radio Configuration Window

3. Follow steps 3 to 8 in 3.1.3.3 Detailed Configuration steps - NE1 and NE2.

3.3.3.4 Detailed Configuration steps - NE3 and NE4

Procedure 3-6

1. Follow steps 1 to 7 in 3.1.3.4 Detailed Configuration steps - NE3 and NE4

3.3.4 Alarm and Troubleshooting:

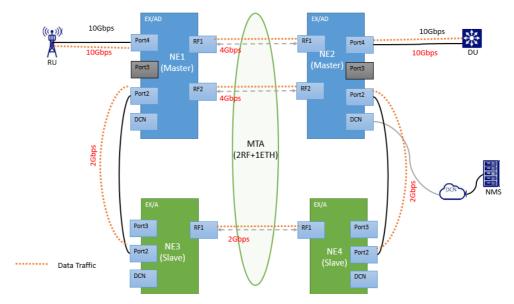
Once the topology configuration is complete, check for below possible alarms.

- 1. ETH-BN LOC
- 2. ETH LOS
- 3. Multi Traffic Aggregation Link
- 4. Multi Traffic Aggregation Setting Mismatch
- 5. PTP Mode Setting Mismatch

To Clear the Alarms, refer to **5.5 Trouble Clearing in Operation and** *Maintenance* for details.

3.3.5 Use Case Verification

Figure 3-53 Data Traffic Flow



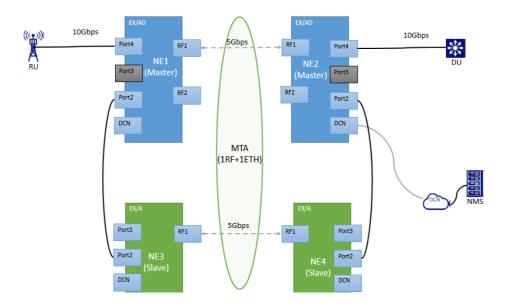
- Verify the counters in ETH RMON Report on Slave [NE3 and NE4] Port02 for traffic taken through relay link. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.
- Verify the counters in ETH RMON Report on receiving end Master [NE2] Port04 for the entire traffic aggregated back from MTA ports. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.

3.4 Use case 4 - MTA with 1 MODEM and 1 ETH port

3.4.1 Scenario briefing

This section explains a typical user scenario to bring up a MTA topology with 1 MODEM and 1 ETH port. Below topology represent Multi Traffic Aggregation of one Wireless and one Wirel link. Data Traffic of 10 Gbps flows between the RU and DU through the MTA link.

3.4.2 Topology



3.4.3 Step by Step Configuration

This section contains the step by step procedure to bring up the above topology.

3.4.3.1 Steps Summary - NE1 and NE2

- 1. Register MODEM RF1.
- 2. Configure CS/Reference Modulation for the MODEM RF1.
- 3. Follow steps 3 to 8 in 3.1.3.1 Steps Summary NE1 and NE2.

3.4.3.2 Steps Summary - NE3 and NE4

- 1. Register MODEM RF1.
- 2. Configure CS/Reference Modulation for the MODEM RF1.
- 3. Follow steps 3 to 7 in 3.1.3.2 Steps Summary NE3 and NE4.

3-37

3.4.3.3 Detailed Configuration steps - NE1 and NE2

Procedure 3-7

1. Register MODEM RF1. Refer **4.2 Equipment Configuration in Set Network** and System Provisioning for details.

Figure 3-54 Equipment Configuration Window

Equipment Setup	- Equipment	Configuration	
🕑 Refresh 🛛 🌼 🤅	Setup		
NE Name			
No.001			
MODEM Not Used		when no	l set to not used ot used in MTA
MODEM / XPI	C Configura		
MODEM / XPI Slot No.	1	2	

Condition 3-6

- In case of setting MTA with one MODEM and ETH port, other MODEM should be set to "Not Used" as shown in Figure 3-54 Equipment Configuration Window.
- It is recommended to change the Equipment Configuration before creating MTA GRP as the Configuration cannot be changed when MTA GRP is created as shown below.

Current Setting		New Setting
NE Name		NE Name
No.001		No.001
Equipment Configuration		Equipment Configuration
MODEM		MODEM 🛩
MODEM		MODEM 🛩
MODEM / XPIC Configuration		MODEM / XPIC Configuration
Slot No. 1	2	XPIC GRP1 (Slot01/02)
XPIC GRP		~

- **Equipment Setup Radio Configuration** 🍣 Refresh 🛛 🌼 Setup **Current Status** MODEM (Slot01) 1+0 -Channel Spacing 1000MHz 128QAM Reference Modulation ETH Bandwidth [Mbps] 5496 71125.000 TX Frequency [MHz] 81125.000 RX Frequency [MHz] 1 Frame ID MTPC TX Power Control TX Start Frequency [MHz] 71125.000 75875.000 TX Stop Frequency [MHz] Frequency Step [MHz] 1.250 Shift Frequency [MHz] 10000.000 Upper / Lower Lower С Sub Band **RF Frequency Type** TX & RX Polarization Vertical
- Configure CS/Reference Modulation for the MODEM RF1. Refer 4.3 Radio Configuration in Set Network and System Provisioning for details.

Figure 3-55 Radio Configuration Window

3. Follow steps 3 to 8 in 3.1.3.3 Detailed Configuration steps - NE1 and NE2.

3.4.3.4 Detailed Configuration steps - NE3 and NE4

Procedure 3-8

- 1. Follow step 1 in 3.1.3.4 Detailed Configuration steps NE3 and NE4.
- Configure CS/Reference Modulation for the MODEM RF1. Refer 4.3 Radio Configuration in Set Network and System Provisioning for details.

Refresh 🤹 🥋 Setup	
urrent Status	
	MODEM (Slot01)
	1+0
Channel Spacing	750MHz
Reference Modulation	256QAM
ETH Bandwidth [Mbps]	4657
TX Frequency [MHz]	83375.000
X Frequency [MHz]	73375.000
Frame ID	1
TX Power Control	MTPC
TX Start Frequency [MHz]	83375.000
TX Stop Frequency [MHz]	85875.000
Frequency Step [MHz]	1.250
Shift Frequency [MHz]	10000.000
Jpper / Lower	Upper
Sub Band	В
RF Frequency Type	TX & RX

Figure 3-56 Radio Configuration Window

3. Follow steps 3 to 7 in 3.1.3.4 Detailed Configuration steps – NE3 and NE4.

3.4.4 Alarm and Troubleshooting:

Once the topology configuration is complete, check for below possible alarms.

- 1. ETH-BN LOC
- 2. ETH LOS
- 3. Multi Traffic Aggregation Link
- 4. Multi Traffic Aggregation Setting Mismatch

To Clear the Alarms, refer to **5.5 Trouble Clearing in Operation and Maintenance** for details.

3.4.5 Use Case Verification

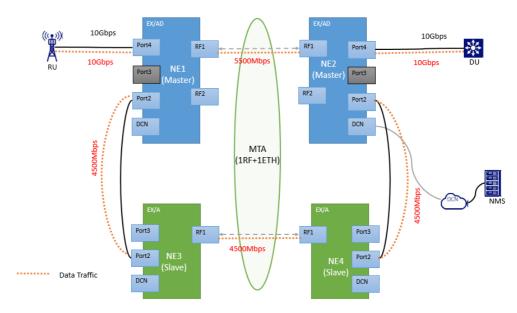


Figure 3-57 Data Traffic Flow

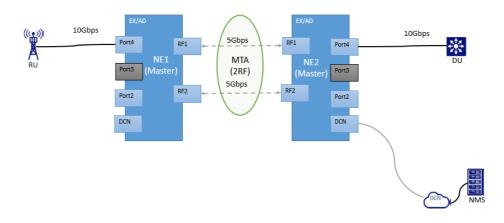
- Verify the counters in ETH RMON Report on Slave [NE3 and NE4] Port02 for traffic taken through relay link. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.
- Verify the counters in ETH RMON Report on receiving end Master [NE2] Port04 for the entire traffic aggregated back from MTA ports. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.

3.5 Use case 5 - MTA with 2 MODEMs only

3.5.1 Scenario briefing

This section explains a typical user scenario to bring up a MTA topology with 2 MODEMs only. Below topology represent Multi Traffic Aggregation of two Wireless link only. Data Traffic of 10 Gbps flows between the RU and DU through the MTA link.

3.5.2 Topology



3.5.3 Step by Step Configuration

This section contains the step by step procedure to bring up the above topology.

3.5.3.1 Steps Summary - NE1 and NE2

- 1. Register MODEM RF1, RF2.
- 2. Configure CS/Reference Modulation for the MODEM RF1, RF2.
- 3. Configure ETH port Port4 as 10G port.
- 4. Create user traffic VLAN (VLAN X).
- 5. Associate user traffic VLAN to ETH Port4 and MODEM Ports RF1 and RF2.
- 6. Create MTA GRP with MODEM Ports RF1, RF2.

3.5.3.2 Detailed Configuration steps - NE1 and NE2

Procedure 3-9

1. Register MODEM RF1, RF2. Refer 4.2 Equipment Configuration in Set Network and System Provisioning for details.

Figure 3-58 Equipment Configuration Window

P Refresh	Setup			
NE Name				
No.001				
MODEM MODEM				
MODEM / XPI	C Configurat	ion	1	
MODEM / XPI Slot No.	C Configurat	ion 2		

 Configure CS/Reference Modulation for the MODEM RF1, RF2. Refer 4.3 Radio Configuration in Set Network and System Provisioning for details.

Refresh 🤯 Setup		
urrent Status		
	MODEM (Slot01)	MODEM (Slot02)
	1+0	1+0
	-	-
Channel Spacing	1000MHz	1000MHz
Reference Modulation	128QAM	128QAM
ETH Bandwidth [Mbps]	5496	5496
TX Frequency [MHz]	71125.000	71125.000
RX Frequency [MHz]	81125.000	81125.000
Frame ID	1	1
TX Power Control	MTPC	MTPC
TX Start Frequency [MHz]	71125.000	71125.000
TX Stop Frequency [MHz]	75875.000	75875.000
Frequency Step [MHz]	1.250	1.250
Shift Frequency [MHz]	10000.000	10000.000
Upper / Lower	Lower	Lower
Sub Band	с	с
RF Frequency Type	TX & RX	TX & RX
Polarization	Vertical	Horizontal

Figure 3-59 Radio Configuration Window

3. Configure ETH port Port4 as 10G port. Refer **4.3 ETH Port Setting in Set** *Network and System Provisioning* for details.

TH Port Setting (Main -	Port04)	
Port Usage:	Enable	Oisable
Port Name:	Port04 - Data Link	×
10GbE Usage:	enable	Disable
Media Type:	Electrical	Optical
Speed:	10 [Gbps]	*
Duplex:	Full	
MDI / MDI-X:	MDI	MDI-X
Flow Control:	Enable	Oisable
Sync ETH:	Enable	Oisable
LLDP Usage:	Enable	Oisable
LLDP Mode:	Standard	Proprietary MAC
LLDP Port ID Subtype:	MAC Address	Interface Name
ALS Usage:	Enable	Oisable
ALS Interval:	60 [s]	*
		OK Cance

Figure 3-60 ETH Port Setting (Main - Port04) Window

Figure 3-61 ETH Port Setting Window (1/2: on the leftmost)

Provisioning -	- ETH Functi	on Setting ·	ETH Port Sett	ing							
ಿ Refresh											
Item	Slot	Port	Dest Hanna	Port Name	SFP		Status				
Item	SIOC	Port	Port Usage	Port Name	264	Link	Speed	Duplex	10GbE Usage	Media Type	Speed
1		Port02	Disable	Port02 - Relay link							
Main		Port03	Disable								
		Port04	Enable	Port04 - Data Link	10G BASE-SR	Link Up	10 [Gbps]	Full	Enable	Optical	10 [Gbps]

Figure 3-62 ETH Port Setting Window (2/2: on the rightmost)

Speed Duplex MDI / MDI-X Flow Control Sync ETH LLDP Usage LLDP Mode LLDP Port ID Subtype	ALS Usage ALS Inter

4. Create user traffic VLAN (VLAN X). Refer *9.4.1 Add VLAN/S-VLAN ID in Set Network and System Provisioning* for details.

Provisioning - ETH Function Se	tting - VLAN Setting			
🐉 Refresh				
VLAN Setting VLAN List	AN ID			
VLAN Mode: 802.1Q Filter VLAN ID: Number of items per page:		(1 - 4094) (1 - 256)	Search	
VLAN ID 1	(Undefined)			VLAN Service Name
100	User Traffic VLAN			

5. Associate user traffic VLAN to ETH Port4 and MODEM Ports RF1 and RF2. Refer 9.4.4 VLAN Setting (802.1Q Mode) in Set Network and System Provisioning for details.

Figure 3-64 VLAN Setting Window

	ETH Functi						
Refresh							
VLAN Settir	ng VLAN	List					
VLAN Mode	802.	1Q					
Filter							
VLAN ID:			(1 - 409	94)			
Item:			*				
Port:			•				
	f items per	page:	v (1 - 256	5) Search			
	f items per	page:		5) Search			
	f items per Slot	page:		5) Search VLAN ID	VLAN Port Type	VLAN Service Name	External Used VLAN
Number o			(1 - 256		VLAN Port Type Access	VLAN Service Name	
Number o Item		Port	(1 - 256 Port Name	VLAN ID			
Number o Item Main		Port Port02	(1 - 256 Port Name	VLAN ID 1	Access	(Undefined)	
Number o Item Main Main		Port Port02 Port03	Port Name Port02 - Relay link	VLAN ID 1 1	Access	(Undefined) (Undefined)	

6. Create MTA GRP with MODEM Ports RF1, RF2. Refer *8.2.3 Add Multi LAG in Set Network and System Provisioning* for details.

Multi L

IR A	ggregation	Group —					
\G:		Multi G	RP1		~		
AG N	ame:	MTA-GF	₽₽				
LAN	ID:	100					
	ID: ggregation I Item		Port	LAG	Aggregation VLAN	Through VLAN	ETH-BN MEP
	ggregation I	Port	Port Port01	LAG Multi GRP1	Aggregation VLAN	Through VLAN	ETH-BN MEP
nk A	ggregation I Item	Port			Aggregation VLAN	Through VLAN	

Figure 3-65 Multi LAG Setting Window

Figure 3-66 Link Aggregation Setting Window

k Agara	gation Gr	TOUR .											
		roup						12 22					
LAG	3		LAG Name	LAG Link Status	Mode	TX Interval	Revertive Mode						
Multi G	RP1	MTA-GRP		Link Up	Static			L1 Ba	se				
	egation Po		Port Name	Media	Тупе	Sneed	Dunley	VIANTD		LAC Port Status	Port Role	Angrenation VI AN	Through VI A
Item	egation Po Slot	Port	Port Name Port/2 - Pelav link	Media	Туре	Speed	Duplex	VLAN ID	LAG	LAG Port Status	Port Role	Aggregation VLAN	Through VLA
Item Main		Port Port02	Port Name Port02 - Relay link	Media	Туре	Speed	Duplex	1	LAG	LAG Port Status	Port Role	Aggregation VLAN	Through VLA
Item Main Main		Port Port02 Port03	Port02 - Relay link					1	LAG	LAG Port Status	Port Role	Aggregation VLAN	Through VLA
Item Main		Port Port02 Port03 Port04		Media		Speed 10 [Gbps]	Duplex	1	LAG	LAG Port Status	Port Role	Aggregation VLAN	Through VLA

3.5.4 Alarm and Troubleshooting:

Once the topology configuration is complete, check for below possible alarms.

- 1. ETH LOS
- 2. Multi Traffic Aggregation Link
- 3. Multi Traffic Aggregation Setting Mismatch

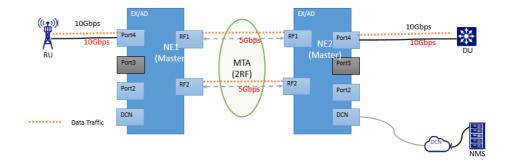
To Clear the Alarms, refer to 5.5 Trouble Clearing in Operation and Maintenance for details.

OK

Cancel

3.5.5 Use Case Verification

Figure 3-67 Data Traffic Flow



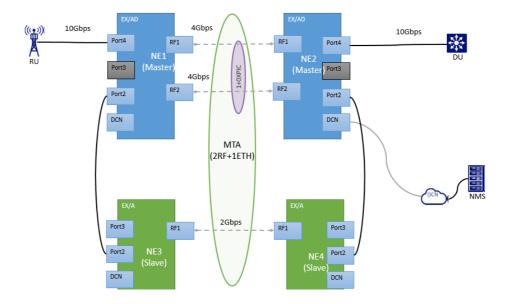
- Verify the counters in ETH RMON Report on sending end Master [NE1] for traffic taken through Wireless link [Multi GRP]. Refer to 3.3.3 ETH RMON Report in Operation and Maintenance.
- 2. Verify the counters in ETH RMON Report on receiving end Master [NE4] Port04 for the entire traffic received through Wireless link [Multi GRP] and transmitted to DU. Refer to 3.3.3 ETH RMON Report in Operation and Maintenance.

3.6 Use case 6 - MTA Slave Node Reset during FW upgrade

3.6.1 Scenario briefing

This section explains a typical user scenario of MTA topology with 2 MODEM (with XPIC) and 1 ETH port and the traffic flow when the Slave node is reset with TX mute enabled on the Slave MODEM. Below topology represent Multi Traffic Aggregation of two Wireless and one Wired link. Data Traffic of 10 Gbps flows between the RU and DU through the MTA link.

3.6.2 Topology



3.6.3 Step by Step Configuration

This section contains the step by step procedure to bring up the above topology.

3.6.3.1 Steps Summary - NE1 and NE2

1. Follow steps 1 to 8 in 3.1.3.1 Steps Summary - NE1 and NE2.

3.6.3.2 Steps Summary - NE3 and NE4

1. Follow steps 1 to 7 in 3.1.3.2 Steps Summary - NE3 and NE4.

3.6.3.3 Detailed Configuration steps - NE1 and NE2

Procedure 3-10

1. Follow steps 1 to 8 in 3.1.3.3 Detailed Configuration steps – NE1 and NE2.

3.6.3.4 Detailed Configuration steps - NE3 and NE4

Procedure 3-11

1. Follow steps 1 to 7 in 3.1.3.4 Detailed Configuration steps - NE3 and NE4.

3.6.4 Alarm and Troubleshooting:

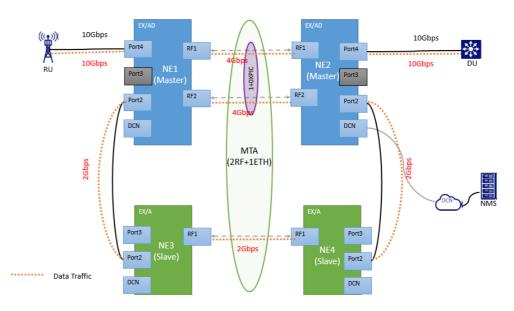
Once the topology configuration is complete, check for below possible alarms.

- 1. ETH-BN LOC
- 2. ETH LOS
- 3. Multi Traffic Aggregation Link
- 4. Multi Traffic Aggregation Setting Mismatch

To Clear the Alarms, refer to **5.5 Trouble Clearing in Operation and** *Maintenance* for details.

3.6.5 Use Case Verification

Figure 3-68 Data Traffic Flow



- Verify the counters in ETH RMON Report on Slave [NE3 and NE4] Port02 for traffic taken through relay link. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.
- Verify the counters in ETH RMON Report on receiving end Master [NE2] Port04 for the entire traffic aggregated back from MTA ports. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.
- 3. Enable TX Mute on NE3 MODEM RF1. Refer 4.5.2 TX Mute Control in Operation and Maintenance for details.

Figure 3-69 MODEM Maintenance Control Window

MODEM Maintenance	Control (MODE	M (Slot01) - 1+0)	1
TX Mute Control:	On	Off	
Release Time:	No Limit	~	

 Maintenance Control - MODEM Maintenance Control

 Refresh

 MODEM (Slot01)

 1+0

 ATPC Manual Control [dBm]

 TX Mute Control

 On

 CW Control
 Off

 Carrier Search
 Off

Figure 3-70 MODEM Maintenance Control Window

- 4. Perform FW Upgrade on the Slave Node NE3. Refer to 4.9.2.1 Update Program File - BB Firmware in Operation and Maintenance for details.
- Verify the counters in ETH RMON Report on receiving end Masters [NE2] that traffic is received only from the MTA Direct Link. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.

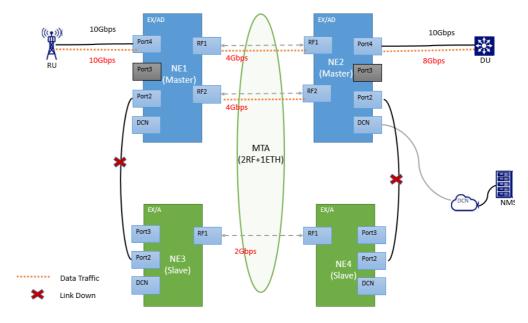


Figure 3-71 Data Traffic Flow when Slave Node NE3 is Reset

6. Verify the ETH-BN (RX) in MEP is "0" during NE3 is down for FW upgrade.

Figure 3-72 ETH OAM Setting Window (1/2: on the leftmost)

P Refresh						
OAM MEP OAM MIP OAM MEG	Link OAM					
🗿 Add MEP 🥥 Delete MEP						
VLAN Service Name	Item	Slot	Port	Peer MEP ID	BNM Server MEP	ETH-BN Period

Figure 3-73 ETH OAM Setting Window (2/2: on the rightmost)

	ET	ETH-E	BN (RX)			
ETH-BN Period	BNM Priority	ETH-BN Nominal Bandwidth	ETH-BN Current Bandwidth	BNM Hold Time	ETH-BN Period Setting Value	ETH-BN Current Bandwidth
					10 [s]	0 [Mbps]

7. Verify the QOS Shaper Rate of the MTA GRP is updated with Wireless link ETH Bandwidth only as NE3 is down for FW upgrade.

Figure 3-74 QoS / Classification Setting Window

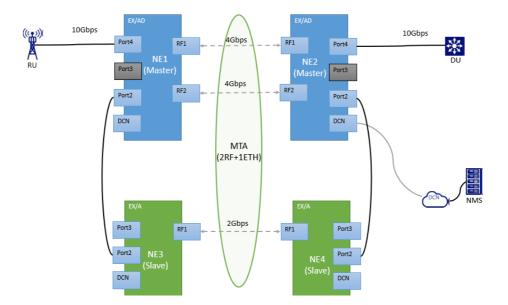
Refresh													
lassify Setting Po	licer Setting	g Shaper Sett	ing										
Edit Profile													
oS Shaper Sett	ing List												
Number of Queue		8 Classes Qos	5	VLAN Shaper Disable									
			D. I. Cl.										
Item	Slot		Port Shaper			0		1	Priority Shape	r			T
		Port	Port Shaper Shaper Rate[bps]	Profile	Drop Mode	Priority0	Priority1	Priority2	Priority Shape Priority3	r Priority4	Priority5	Priority6	Priorit
Item		Port Port03		Profile <u>1Gbps Default</u>	Drop Mode WTD	Priority0 SP	Priority1 SP				Priority5 SP	Priority6 SP	Priority
			Shaper Rate[bps]					Priority2	Priority3	Priority4			

3.7 Use case 7 - MTA with LLF

3.7.1 Scenario briefing

This section explains a typical user scenario of MTA topology with 2 MODEM and 1 ETH port and the traffic flow when LLF configured on MTA GRP. Below topology represent Multi Traffic Aggregation of two Wireless and one Wired link. Data Traffic of 10 Gbps flows between the RU and DU through the MTA link.

3.7.2 Topology



3.7.3 Step by Step Configuration

This section contains the step by step procedure to bring up the above topology.

3.7.3.1 Steps Summary - NE1 and NE2

- 1. Follow steps 1 to 7 in 3.1.3.1 Steps Summary NE1 and NE2.
- 2. Create LLF Group with Trunk port as MODEM RF1 and Edge port as Port4.
- Create MTA GRP with MODEM Ports RF1, RF2 and ETH Port2, assign Aggregation VLAN, Through VLAN and choose MEP Index created in Step 7 from drop-down menu.

3.7.3.2 Steps Summary - NE3 and NE4

1. Follow steps 1 to 7 in 3.1.3.2 Steps Summary - NE3 and NE4.

3.7.3.3 Detailed Configuration steps - NE1 and NE2

Procedure 3-12

- 1. Follow steps 1 to 7 in 3.1.3.3 Detailed Configuration steps NE1 and NE2.
- 2. Create LLF Group with Trunk port as MODEM RF1 and Edge port as Port4. Refer 9.15.1 Add LLF Group in Set Network and System Provisioning for details.

Figure 3-75 LLF Setting Window

Provisioning	- ETH Function	Setting - LLF	Setting				
2 Refresh	🗿 Add LLF 🛛 🥥	Delete LLF					
LLF GRP ID	LLF Port Type	Item	Slot	Port	Port Name	Send LLF Signal	Ignore Received LLF Signal
1	Trunk	MODEM	Slot01	Port01		Enable	Disable
1	Edge	Main		Port04	Port04 - Data Link		

3. Create MTA GRP with MODEM Ports RF1, RF2 and ETH Port2, assign Aggregation VLAN, Through VLAN and choose MEP Index created in Step 7 from drop-down menu. Refer *8.2.3 Add Multi LAG in Set Network and System Provisioning* for details.

Figure 3-76 Link Aggregation Setting Window

		roup											
LAG			LAG Name	LAG Link Status	Mode	TX Interval	Revertive Mode	Distributio	on Rule				
Multi GRP1 MTA-GRI		MTA-GRP		Link Up	Static			L1 Ba	ise				
ink Aggreg	vation Pr	ort											
ink Aggre Item	egation Po	Port	Port Name	Media	а Туре	Speed	Duplex	VLAN ID	LAG	LAG Port Status	Port Role	Aggregation VLAN	Through VLA
	-		Port Name Port02- Relay Link		ı Type tical	Speed 10 [Gbps]	Duplex Full	VLAN ID 100,200	LAG Multi GRP1	LAG Port Status Active	Port Role	Aggregation VLAN 300	Through VLA 200
Item	-	Port									Port Role		
Item Main	-	Port Port02 Port03 Port04		Op				100,200			Port Role		Through VLA 200

Condition 3-7

• At the time of creating MTA setting, Multi group logical interface will take over the configuration of VLAN, ETH-OAM, QOS, Static FDB, RSTP/MSTP, LLF and PTP-BC of the least MODEM port associated in the MTA group as shown below.

The LLF created with MODEM RF1 in **Figure 3-85 Equipment Mode Setting Window** is taken over by MTA GRP in below figure.

Refresh	😳 Add LLF 🤤 I	Delete LLF					
LLF GRP ID	LLF Port Type	Item	Slot	Port	Port Name / LAG Name	Send LLF Signal	Ignore Received LLF Sign
1	Trunk	LAG		Multi GRP1	MTA-GRP	Enable	Disable
11	Edge	Main		Port04	Port04 - Data Link		

NOTE: MTA operates with other features like ETH-OAM, QOS, FDB, RSTP/MSTP, PTP-BC in the same way.

3.7.3.4 Detailed Configuration steps - NE3 and NE4

Procedure 3-13

1. Follow steps 1 to 7 in 3.1.3.4 Detailed Configuration steps - NE3 and NE4.

3.7.4 Use Case Verification

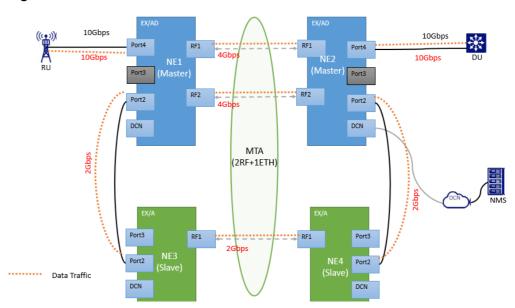


Figure 3-77 Data Traffic Flow

 Verify the counters in ETH RMON Report on Slave [NE2 and NE4] Port02 for traffic taken through relay link. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.

- Verify the counters in ETH RMON Report on receiving end Master [NE2] Port04 for the entire traffic aggregated back from MTA ports. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.
- 3. Enable TX Mute on MODEM RF1 and MODEM RF2 on NE1. Refer 4.5.2 TX Mute Control in Operation and Maintenance for details.

Figure 3-78 MODEM Maintenance Control Window

10DEM Maintenance	Control (MODE	M (Slot01) - 1+0)		2
TX Mute Control:	On	Off		
Release Time:	No Limit	~		
			ОК	Cancel

Figure 3-79 MODEM Maintenance Control Window

Refresh		
	MODEM (Slot01)	MODEM (Slot02)
	1+0	1+0
	-	-
ATPC Manual Control [dBm]		
TX Mute Control	<u>On</u>	<u>On</u>
CW Control	Off	Off
Carrier Search	Off	Off
XPIC Reset		

4. Verify the edge port Port4 [LLF GRP] link is still up as the MTA Member port Port2 is still up and traffic flows end to end through the Relay Link [through Slave Nodes].

Figure 3-80 ETH Port Setting Window

rovisioning -	ETH Functi	on Setting -	ETH Port Sett	ing					
P Refresh									
Item	Clat	Port	Port Usage	Port Name	SFP	Status			
item	em Slot Port	Port Usage	Port Name	364	Link	Speed	Duplex	10GbE Usage	
		Port02	Enable	Port02 - Relay link	10G BASE-SR	Link Up	10 [Gbps]	Full	Enable
Main		Port03	Disable						
		Port04	Enable	Port04 - Data Link	10G BASE-SR	Link Up	10 [Gbps]	Full	Enable

5. Disable port Port2 on Slave node NE3.

Figure 3-81 ETH Port Setting Window

Provisioning	- ETH Functi	on Setting -	ETH Port Sett	ing						
🤁 Refresh										
Item	Slot	Port	Port Usage	Port Name	SFP	Status				
nem	3100	FUIL	For Osage	Fort Manie	317	Link	Speed	Duplex	10GbE Usage	Ą
Main		Port02	Disable	Port02 - Relay Link						
riain		Port03	Disable							

6. Verify Edge port Port4 is down on both Master Nodes [NE1 and NE2] and there is no traffic flow end to end as all the MTA members are down now.

Figure 3-82 ETH Port Setting Window [In NE1]

tefresh									
Them Clab	Slot Port Po	Port Usage	t Usage Port Name	SEP	Status				
Item	Item Slot Port	FOIL	Full Usage	ge Port Wante	SIF	Link	Speed	Duplex	10GbE Usag
		Port02	Enable	Port02 - Relay link	10G BASE-SR	Link Down			Enable
Main		Port03	Disable						
		Port04	Enable	Port04 - Data Link	10G BASE-SR	Link Down			Enable

Figure 3-83 ETH Port Setting Window [In NE2]

				ing					
efresh									
	Slot Port Port	Port Usage	Port Name	SFP	Status				
Item	Item Slot	Slot Port Port Usage	Port Name		Link	Speed	Duplex	10GbE Usage	
		Port02	Enable	Port02- Relay Link	10G BASE-SR	Link Up	10 [Gbps]	Full	Enable
Main		Port03	Disable						
		Port04	Enable	Port04 - Data Link	10G BASE-SR	Link Down			Enable

Figure 3-84 Alarm on NE1 and NE2 due to MTA link down

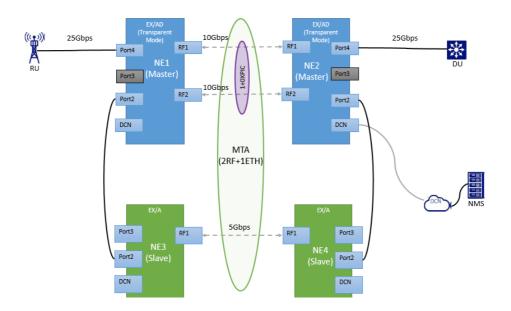
r ent Status Refresh 🔲 Auto M	lode 📃 Hide NR								
Active Alarm Ev	ent Log Equipn	ent ETH							
🛃 Save									
Date	Module	Block	Group / Slot	Port / Index	Туре	Severity	Interface Name	Items	Status
0/02/29 22:37:15	BB	MODEM	Slot01			WR		RDI	Alarm
0/02/29 22:37:37	BB	MODEM	Slot02			WR		RDI	Alarm
0/02/29 22:37:38	BB	Main		Port4		LTM CM	Port04 - Data Link	ETH RF	Alarm
0/02/29 22:37:38	BB		LAG	Multi GRP1		MJ		Multi Traffic Aggregation Link	Alarm

3.8 Use case 8 - MTA [2 MODEM (XPIC) and 1 ETH port] in Transparent Mode

3.8.1 Scenario briefing

This section explains a typical user scenario to bring up a MTA topology with Equipment in Transparent Mode. Below topology represent Multi Traffic Aggregation of two Wireless and one Wired link. Data Traffic of 25 Gbps flows between the RU and DU through the MTA link.

3.8.2 Topology



3.8.3 Step by Step Configuration

This section contains the step by step procedure to bring up the above topology.

3.8.3.1 Steps Summary - NE1 and NE2

- 1. Configure Equipment Forwarding Mode as Transparent Mode.
- 2. Register MODEM RF1, RF2 and enable XPIC configuration.
- 3. Configure Radio (XPIC) to set CS/Reference Modulation for the MODEM RF1, RF2.
- 4. Configure ETH port Port2 as 10G port and Port4 as 25G port.

- 5. Create MTA GRP with MODEM Ports RF1, RF2 and ETH Port2, assign Aggregation VLAN (VLAN X).
- 6. Create Through VLAN (VLAN Y) in 'VLAN List'.
- 7. Associate Through VLAN to MTA GRP in 'VLAN Setting'.
- 8. Create MEG with ETH-CCM enable, ETH-BN Rx-enable.
- 9. Create MEP on MTA GRP using Through VLAN.
- 10. Associate MEP Index created in Step 9 and Through VLAN created in step 6 in Link Aggregation Setting.

3.8.3.2 Steps Summary - NE3 and NE4

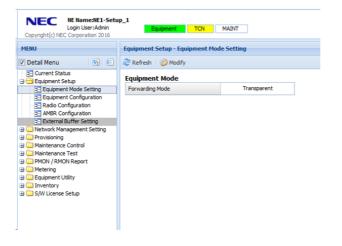
- 1. Register MODEM RF1.
- 2. Configure Radio to set CS/Reference Modulation for the MODEM RF1.
- 3. Configure ETH port Port2 as 10G port.
- 4. Create VLAN IDs same as Through VLAN (VLAN Y) and Aggregation VLAN (VLAN X) in Master (NE1 and NE2).
- 5. Associate VLAN X and VLAN Y to ETH Port2 and VLAN X to MODEM Port RF1".
- Create MEG with ETH-CCM enable, ETH-BN Tx-enable, BNM Server MEP as MODEM RF1.
- 7. Create MEP on ETH Port2 using Through VLAN.

3.8.3.3 Detailed Configuration steps - NE1 and NE2

Procedure 3-14

1. Configure Equipment Forwarding Mode as Transparent Mode. Refer 4.2.2 Set Equipment Mode in Set Network and System Provisioning for details.

Figure 3-85 Equipment Mode Setting Window



 Register MODEM RF1, RF2 and enable XPIC configuration. Refer 4.3 Equipment Configuration in Set Network and System Provisioning for details.

Equipment Setup IIE Name Image: Sequipment Mode Setting Image: Sequipment Mode Setting Image: Sequipment Mode Setting Image: Sequipment Setting Image: AMBR Configuration Image: Setting Image: Setting Image: Setting Image: Network Management Setting MODEM Image: Network Management Setting MODEM
Compared Setup Setupment Setup Setupment Configuration Setupment Configuration Setupment Configuration Setupment Configuration Setupment Seturg Provisioning Maintenance Control Maintenance Test PMCN / RNO Report
Image: Setting No.001 Image: Setting No.001 Image: Setting No.001 Image: Setting Setting Image: Network Management Setting MODEM
Adda Configuration Adda Configuration Adda Configuration Advork Maragement Setting Provisionig Maintenance Control Maintenance Test PMON / RMON Report
MODEM / XPIC Configuration
Modem / XPIC Configuration Slot No. 1 2
inventory
S/W License Setup XPIC GRP XPIC GRP1

Figure 3-86 Equipment Configuration Window

 Configure Radio (XPIC) to set CS/Reference Modulation for the MODEM RF1, RF2. Refer 4.4 Radio Configuration in Set Network and System Provisioning for details.

Figure 3-87 Radio Configuration Window

Login User:Admin Copyright(c) NEC Corporation 2016	Equipment TON	- Marti		 Maintenance
MENU	Equipment Setup - Radio Config	puration		
🛛 Detail Menu 🛛 😨 🗉	2 Refresh 🔤 Setup			
Current Status	Current Status			
 Equipment Mode Setting Equipment Configuration Radio Configuration 		(MOI	GRP 1 DEM) 01/02)	
AMBR Configuration		1+0	XPIC	
External Buffer Setting		No.1	No.2	
Provisioning Maintenance Control	Channel Spacing	750	MHz	
🗉 🦳 Maintenance Test	Reference Modulation	320	MAG	
PMON / RMON Report Metering	ETH Bandwidth [Mbps]	2910	2910	
🗉 🦳 Equipment Utility	TX Frequency [MHz]	7112	5.000	
Inventory S/W License Setup	RX Frequency [MHz]	8112	5.000	
	Frame ID	1	18	
	TX Power Control	M	TPC	
	TX Power Up Key	Not	Used	
	TX Start Frequency [MHz]	7112	5.000	
	TX Stop Frequency [MHz]	7587	5.000	
	Frequency Step [MHz]	1.3	250	
	Shift Frequency [MHz]	1000	0.000	
	Upper / Lower	Lou	ver	
	Sub Band		c	
	RF Frequency Type	TX I	& RX	
	Polarization	Vertical	Horizontal	

 Configure ETH port Port2 as 10G port and Port4 as 25G port. Refer 9.3 ETH Port Setting in Set Network and System Provisioning for details.

TH Port Setting (Main -	Port02)	
Port Usage:	enable	Disable
Port Name:		
10GbE Usage:	Enable	Disable
Media Type:	Electrical	Optical
Speed:	10 [Gbps]	~
Duplex:	Full	
MDI / MDI-X:	MDI	MDI-X
Flow Control:	Enable	Oisable
Sync ETH:	Enable	Disable
LLDP Usage:	Enable	Oisable
LLDP Mode:	Standard	Proprietary MAC
LLDP Port ID Subtype:	MAC Address	Interface Name
ALS Usage:	Enable	Oisable
ALS Interval:	60 [s]	~
		OK Cance

Figure 3-88 ETH Port Setting (Main - Port02) Window

Figure 3-89 ETH Port Setting (Main - Port04) Window

ETH Port Setting (Main -	Port04)	×
Port Usage:	Enable	O Disable
Port Name:	STC-4/13	
10GbE Usage:	Enable	Disable
25GbE Usage:	Enable	Disable
Media Type:	Electrical	Optical
Speed:	25 [Gbps]	*
Duplex:	Full	
MDI / MDI-X:	MDI	MDI-X
Flow Control:	Enable	Oisable
Sync ETH:	Enable	Disable
LLDP Usage:	Enable	Oisable
LLDP Mode:	Standard	Proprietary MAC
LLDP Port ID Subtype:	MAC Address	Interface Name
ALS Usage:	Enable	Oisable
ALS Interval:	60 [s]	~
		OK Cancel



efresh								
-	ci.u	Deut	Destillance	Port Name SFP Status				
ttem	Item Slot		Port Name	SPP	Link	Speed	Duples	
		Port02	Enable		10G BASE-SR	Link Up	10 [Gbps]	Full
Main		Port04	Enable	STC-4/13	10G BASE-SR	Link Up	25 [Gbps]	Ful

Provision	ning - ETH Functio	n Setting - ETH Po	ort Setting									
2 Refres	sh											
	Setting											
Duplex	10GbE Usage	25GbE Usage	Media Type	Speed	Duplex	MDI / MDI-X	Flow Control	Sync ETH	LLDP Usage	LLDP Mode	LLDP Port ID Subtype	
Full	Enable		Optical	10 [Gbps]	Full		Disable	Enable	Disable			
Ful	Enable	Enable	Optical	25 [Gbps]	Ful		Disable	Enable	Disable			

Figure 3-91 ETH Port Setting Window (2/3: on the middle)

Figure 3-92 ETH Port Setting Window (3/3: on the rightmost)

Refresh										
Renear										
				Sett	ting					
Media Type	Speed	Duplex	MDI / MDI-X	Flow Control	Sync ETH	LLDP Usage	LLDP Mode	LLDP Port ID Subtype	ALS Usage	ALS Interval
Optical	10 [Gbps]	Ful		Disable	Enable	Disable			Disable	
				Disable	Enable	Disable			Disable	

 Create MTA GRP with MODEM Ports RF1, RF2 and ETH Port2, assign Aggregation VLAN (VLAN X). Refer 8.2.3 Add Multi LAG in Set Network and System Provisioning for details.



AG:		Multi G	RP1		~			
AG N	ame:							
I.AN I	D:							
ink A	ggregation							1
V	Item MODEM	Slot Slot01	Port Port01	LAG Multi GRP1	Aggregation VLAN	Through VLAN	ETH-BN MEP	
V	MODEM	Slot02	Port01	Multi GRP1				
V	Main		Port02	Multi GRP1	300			

Copyright(c) NEC Corporation 2016	Equipment	TCN	MAINT			Opposite	Ste Links	Maintenance	Logou	Auto-Lo	ogout			
MENU	Provisioning -	Link Agg	regation Set	ting										
Detail Menu 🗕 🕕	2 Refresh	Add ET		Add Multi LAG 😔 Delet	te LAG									
Current Status Equipment Setup	Link Aggre	gation Gr	oup											
Network Management Setting Provisioning	LAG		LAG Name	LAG Link Status	Mode	TX Interval	Revertive Mo	Distribution Rule	Shaper Ra	te[Mbps]				
MODEM Function Setting	Multi GR	P1		Link Up	Static			L1 Base	5820	416				
I Link Aggregation Setting		-												
ETH Function Setting														
ETH Port Setting														
VLAN Setting														
1 FDB Setting														
ETH OAM Setting														
RSTP / MSTP Setting														
ERP Setting														
= QoS / Classification Setting														
1 Service Switch Setting														
Service Switch Setting Filter Setting														
Service Switch Setting Filter Setting L2CP Transparent Setting														
Service Switch Setting Fiter Setting L2CP Transparent Setting Mirroring Setting	Link Aggre	jation Po	rt											
Service Switch Setting Filter Setting UCP Transparent Setting Mirroring Setting Mirroring Setting ULF Solate Setting ULF Setting	Link Aggrey	gation Po Slot	Port	Port Name		Media Type	Speed	Duplex	VLAN ID	LAG	LAG Port Sta	Port Role	Aggregation VLAN	Through VLAN
Service Switch Setting Filter Setting Filter Setting Filter Charapsent Setting Filter Setting F				Port Name		Media Type Ootical		Duplex Full	VLAN ID	LAG Multi GRP1	LAG Port Sta	Port Role	Aggregation VLAN	Through VLAN
Service Switch Setting Filter Setting Filter Setting Microing Setting Microing Setting Filter S	Item		Port Port02	Port Name			10 [Gbps]					Port Role		and the second second second
Service Switch Setting Setting LCD Transparent Setting LCD Transparent Setting LCF Setting LLF Setting Setting Filler Setting	Item Main Main	Slot	Port Port02 Port04 ST			Optical		Ful	100 1	Multi GRP1	Active	Port Role		and the second second second
Service Switch Setting Fairvise Switch Setting Monoring Setting Monoring Setting Monoring Setting UCP Setting Set Setting SetSet Setting SetSet Setting SetSet Setting SetSet Setting SetSet Setting SetSetSetSetSetSetSetSetSetSetSetSetSetS	Item Main Main MODEM	Slot	Port02 Port04 ST Port01			Optical	10 [Gbps]	Ful	100 1 100	Multi GRP1 Multi GRP1	Active	Port Role		100 C 100 C 100 C 100 C
Service Switch Setting Filter Setting LCCP Transparent Setting Mirroring Setting Port Isolate Setting LLF Setting LLF Setting	Item Main Main	Slot	Port Port02 Port04 ST			Optical	10 [Gbps]	Ful	100 1	Multi GRP1	Active	Port Role		and the second second second

Figure 3-94 Link Aggregation Setting Window

 Create Through VLAN (VLAN Y) in 'VLAN List'. Refer 9.4.1 Add VLAN/S-VLAN ID in Set Network and System Provisioning for details.

Figure 3-95 VLAN Setting Window

Login User:Admin Copyright(c) NEC Corporation 2016	Equipment TCN MAIN				~	Maintenance	Logout	Auto-Logout	
HENU	Provisioning - ETH Function Se	etting - VLAN Setting							
🛚 Detal Menu 🛛 🔞 📋	2 Refresh								
Current Status	VLAN Setting VLAN List								
) C Network Management Setting	O Add VLAN ID ODelete VL	AN ID							
MODEM Function Setting Link Aggregation Setting ETH Function Setting	VLAN Mode: 802.1Q								
= Equipment Setting	Filter		10000000000000						
ETH Port Setting	VLAN ID:		(1 - 4094)						
VLAN Setting	Number of items per page		(1 - 256) 5	iearch					
 FDB Setting ETH OAM Setting 									
RSTP / MSTP Setting									
ERP Setting	VLAN ID					ALAN Service Nam	e		
= QoS / Classification Setting	1	(Undefined)							
Service Switch Setting	300	(Undefined)							
Elter Setting	200	(Undefined)							
L2CP Transparent Setting Mirroring Setting	300	MTA VLAN-300							
= Port Isolate Setting		and the second s							
LLF Setting									
Broadcast Storm Control Setting									
Equipment Clock / Synchronization Setting									
Alarm Setting									
PMON / RMON Setting									
Maintenance Control									

7. Associate Through VLAN to MTA GRP in 'VLAN Setting'. Refer 9.4.4 VLAN Setting (802.1Q Mode) in Set Network and System Provisioning for details.

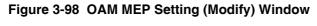
Figure 3-96 VLAN Setting Window

Copyright(c) NEC Corporation 2016	Provisioning	FTH Fund	tion Setting -	VI AN Setting						
			on second							
🗹 Detail Menu 🛛 🚯 🗉	Refresh									
Current Status Capanet Statu Capanet Statu Charlen Kanagenett Status Charlen Kanagenett Status Charlen Kanagenett Status Charlen Kanagenett Status Charlen Kanagenett Status Charlen Status Charlen Status Charlen Status Charlen Status Charlen Status Charlen Status Charlen Status Charlen Status Charlen Status	VLAN Setting VLAN Link VLAN Mode: 802.1Q Filter VLAN 3D: Benr: VLAN 3D: Port: VLAN 3D: Number of terms per page:				(1 - 4094) (1 - 256)	Search				
RSTP / MSTP Setting										
ERP Setting QoS / Classification Setting Service Switch Setting	Item	Slot	Port Port Name /LA		Name	VLAN ID	VLAN Port Type	VLAN Service Name	External Used VLAN	
Filter Setting	Main		Port04	STC-4/13		1	Access	(Undefined)		
Mirroring Setting	LAG		Mult GRP1			500	Trunk	(Undefined)		
Port Booke Setting Port Booke Setting Brandcast Stem Control Setting Brandcast Stem Control Setting Abem Setting Montenance Control Mantenance Control Mantenance Centrol Montenance Text Montenance Setting										

AM MEG Setting (Modify)			
MEG Index:	1		
Maintenance Domain Name:	NEC		
Short MA Name:	NEC		
MEG Level:	5	~	
CCM:	Enable	Oisable	
ETH-CC Period:	1 [s]	~	
CCM Priority:	0	~	
— ETH-BN (TX) ————			
BNM (TX):	Enable	Oisable	
BNM Server MEP:	Multi GRP1	*	
ETH-BN (TX) Period:	1 [s]	~	
BNM Priority:	7	*	
BNM Hold Time:	1 [s]	¥	
ETH-BN (RX)			
BNM (RX):	Enable	Disable	
ETH-BN (RX) Period:	1 [s]	~	
		ОК	Cancel

Figure 3-97 OAM MEG Setting (Modify) Window

9. Create MEP on MTA GRP using Through VLAN. Refer 9.6.2.1 Add MEP Index in Set Network and System Provisioning for details.



	iguration				MEG Con	figuration		
4EP Inde	x:	1			Enable	MEG Index	Maintenance Domain Name	Short MA Na
MEP ID:				(1 - 8191)				
tem:		LAG	~		۲	1	NEC	NEC
Port:		Multi GRP1	~					
		AC Address: D4:	92:34:31:0	E:E4				
Direction:		O Up MEP		Down MEP				
Enable	VLAN ID)	VLAN Serv	ice Name				
۲	100				<	_		>
					Enable	Peer Pice	Peer MEP ID	
					Contraction of the local division of the loc	Peer MEP		
					[V]		33	

Figure 3-99 ETH OAM Setting Window

OAM MI														
Add N	MEP 🤤 De	lete MEP												
Index	MEP ID	MEG Index	Maintenance Domain Na	Short MA Name	MEG Level	сом	Direction	VLAN ID	VLAN Service Name	Item	Slot	Port	Peer MEP ID	BNM Se MEP
1	11	1	NEC	NEC	5	Enable	Down MEP	100		LAG		Multi GRP1	33	

 Associate MEP Index created in Step 9 and Through VLAN created in step 6 in Link Aggregation Setting. Refer 8.2.4 Modify Multi LAG in Set Network and System Provisioning for details.

Figure 3-100 Multi LAG Setting Window

AG:		Multi G	RP1		~			
AG N	ame:							
LAN I	ID:	100						
ink A	Item MODEM	Slot Slot01	Port Port01	LAG Multi GRP1	Aggregation VLAN	Through VLAN	ETH-BN MEP	*
	MODEM	Slot02	Port01	Multi GRP1				v
7	Main		Port02	Multi GRP1	300	100	1	~

3.8.3.4 Detailed Configuration steps - NE3 and NE4

Procedure 3-15

1. Register MODEM RF1. Refer **4.2 Equipment Configuration in Set Network** and System Provisioning for details.

Figure 3-101 Equipment Configuration Window

NEC NEC NEC Nec Corporation 2016	Equipment TCN MAINT Opposite Site
MENU	Equipment Setup - Equipment Configuration
🔽 Detail Menu 🛛 🔄 🗉	2 Refresh 💮 Setup
Current Status Current Status Sequent Setup Reductonfiguration Annumber Setup Setup Setup Setup Setup Setup Setup Setup Setup Setup Setup Setup Setup Setup Setup Setup Setup Setup Se	NE Name No.001

NOTE: Slave node used is EX/A, hence MODEM registration is not required.

 Configure Radio to set CS/Reference Modulation for the MODEM RF1. Refer 4.3 Equipment Configuration and 4.4 AMBR Configuration in Set Network and System Provisioning for details.

MENU	Equipment Setup - Radio Confi	ouration	
🗸 Detail Menu 🔤 🗉		guiddon	
Current Status	C Refresh War Setup		
Equipment Setup	Current Status		
Equipment Configuration Radio Configuration		MODEM (Slot01)	
AMBR Configuration		1+0	
Contract Management Setting Determine Management Setting Determine Management Setting			
Maintenance Control Maintenance Test	Channel Spacing	1000MHz	
🗉 🧰 PMON / RMON Report	Reference Modulation	64QAM	
Metering Equipment Utility	ETH Bandwidth [Mbps]	4710	
B 🛄 Inventory	TX Frequency [MHz]	73375.000	
S/W License Setup	RX Frequency [MHz]	83375.000	
	Frame ID	1	
	TX Power Control	MTPC	
	TX Power Up Key	Not Used	
	TX Start Frequency [MHz]	73375.000	
	TX Stop Frequency [MHz]	75875.000	
	Frequency Step [MHz]	1.250	
	Shift Frequency [MHz]	10000.000	
	Upper / Lower	Lower	
	Sub Band	В	
	RF Frequency Type	TX & RX	

3. Configure ETH port Port2 as 10G port. Refer **9.3 ETH Port Setting in Set** *Network and System Provisioning* for details.

H Port Setting (Main -	Port02)	
Port Usage:	Enable	Disable
Port Name:		
10GbE Usage:	Enable	Disable
Media Type:	Electrical	Optical
Speed:	10 [Gbps]	~
Duplex:	Full	
1DI / MDI-X:	MDI	O MDI-X
Flow Control:	Enable	Oisable
Sync ETH:	Enable	Disable
LDP Usage:	Enable	Oisable
LDP Mode:	Standard	Proprietary MAC
LDP Port ID Subtype:	MAC Address	Interface Name
ALS Usage:	Enable	Oisable
ALS Interval:	60 [s]	~
		OK Cance

Figure 3-103 ETH Port Setting (Main - Port02) Window



MENU	Provisioning - ETH	H Function Setting	ETH Port Setting						
🛛 Detal Menu 🛛 🔞 📋	2 Refresh								
Current Status	Item	Slot Port	PortUsage	Port Name	979		Status		
I) Detwork Management Setting (Contemport Setting)	1.4Em	and care	Forsosage	Forthane	ar	Link	Speed	Duplex	10GbE Usage
B CMODEM Function Setting		Port02	Enable		10G BASE-SR	Link Up	30 [Gbps]	Full	Enable
Link Aggregation Setting ETH Function Setting	Main	Part03	Disable						
FDB Setting ETH OAM Setting ETH OAM Setting RSTD / MSTD Setting BP2 Setting QoS / Classification Setting Service Setting Service Setting Filer Setting									

Figure 3-105 ETH Port Setting Window (2/2: on the rightmost)

C R	efresh											
							Setting					
x	10GbE Usage	Media Type	Speed	Duplex	MDI / MDI-X	Flow Control	Sync ETH	LLDP Usage	LLDP Mode	LLDP Port ID Subtype	ALS Usage	ALS Interva
	Enable	Optical	10 [Gbps]	Ful		Disable	Enable	Disable			Disable	

4. Create VLAN IDs same as Through VLAN (VLAN Y) and Aggregation VLAN (VLAN X) in Master (NE1 and NE2). Refer 9.4.1 Add VLAN/S-VLAN ID in Set Network and System Provisioning for details.

NEC NE Name:No.001 Login User: Admin Copyright(c) NEC Corporation 2016 Opposite Site Links Equipment TCN MAINT Copyright(c) NEC Cor
 HERU
 Provisioning

 2 Detail Menu
 (b) 1

 3 Ourrent Status
 (c) Refresh

 4 Department Seturg
 (c) MOCDM Function Seturg

 5 Dirkhook Management Seturg
 (c) MOCDM Function Seturg

 6 Dirkhook Management Seturg
 (c) MoCDM Function Seturg

 7 De Seturg
 (c) MoCDM Function Seturg

 8 Dirk Approximation Seturg
 (c) MoCDM Function Seturg

 9 De Seturg
 (c) Motom Seturg

 9 De Seturg
 (c) Coefficiation Seturg

 9 De Seturg
 (c) Coefficiation Seturg

 9 De Seturg
 (c) Destrug

 9 De Dout MeMON Seturg
 (c) Destrug

 9 De MoN MeN Seturg
 (c) Destrug
 oning - ETH Function Setting - VLAN Setting MENU Provi Detail Menu VLAN Setting VLAN List O Add VLAN ID ODelete VLAN ID VLAN Mode: 802.1Q VLAN ID: (1 - 4094) Number of items per page: (1 - 256) Search VLAN Service Nan VLAN ID (Undefin 100 (Undefined) 200 Inband 300 Undefin Alarm Setting
 PMON / RMON Setting Maintenance Control
 Maintenance Test

Figure 3-106 VLAN Setting Window

5. Associate VLAN X and VLAN Y to ETH Port2 and VLAN X to MODEM Port RF1. Refer 9.4.4 VLAN Setting (802.1Q Mode) in Set Network and System Provisioning for details.

Figure 3-107 VLAN Setting Window

Login User:Admin Copyright(c) NEC Corporation 2016	Equ	menit	TON MAINT				oposite Site Units	 Maintenance 	Logout A	uto-Logou
1ENU	Provisioning -	ETH Functi	on Setting - VLA	Setting						
Detai Menu 🚯 📘	2 Refresh									
Current Status Cupment Setup Setup Network Management Setting Provisioning Composition Setting Compositio	VLAN Settie VLAN Mode	A Laboration	.1Q				-12			
ETH Function Setting	VLAN ID:				(1 - 4094)					
Equipment Setting	Item:			-						
VLAN Setting	Port:			~						
ETH OAM Setting RSTP / MSTP Setting ETH PAM Setting ETP Setting		f items per	page:		(1 - 256)	Search				
QoS / Classification Setting Service Switch Setting	Item	Slot	Port	Port Name		VLAN ID	VLAN Port Type	VLAN Service Name	Exte	
Filter Setting	Main		Port02			100	Trunk	(Undefined)		
Mirroring Setting	Main		Port02			300	Trunk	(Undefined)		
Port Isolate Setting	Main		Port03			1	Access	(Undefined)	2	
LLF Setting	MODEM	Slot01	Port01			100	Trunk	(Undefined)		
Broadcast Storm Control Se Guipment Clock / Synchroniza	MODEM	Slot01	Port01			300	Trunk	(Undefined)	12	

6. Create MEG with ETH-CCM enable, ETH-BN Tx-enable, BNM Server MEP as MODEM RF1. Refer 9.6.1.1 Add MEG Index in Set Network and System *Provisioning* for details.

OAM MEG Setting (Modify)		×
MEG Index:	1	
Maintenance Domain Name:	NEC	
Short MA Name:	NEC	
MEG Level:	7	
CCM:	Inable	
ETH-CC Period:	1 [s] 👻	
CCM Priority:	0	
ETH-BN (TX)		
BNM (TX):	Enable Disable	
BNM Server MEP:	MODEM (Slot01)	
ETH-BN (TX) Period:	1 [s] 💌	
BNM Priority:	7 💌	
BNM Hold Time:	1 [s] 👻	
ETH-BN (RX)		
BNM (RX):	Enable Isable	
ETH-BN (RX) Period:	1 [s] 👻	
	ОК	Cancel

Figure 3-108 OAM MEG Setting (Modify) Window

Figure 3-109 VLAN Setting Window

	From	niceing -	ETH Funct	tion Setting -	ETH OAM Set	ting									
E Detail Menu 🚯 🚺	210	fresh													
Current Status Current Setup Equipment Setup	OR	ммер	CAM MP	OAM MEG	LFR DAH										
Provisioning	0	Add MEG	Delete	MEG											
HOOEH Function Setting Link Apprepation Setting										,	THEN (TO)			ETH	6N (RX)
Equipment Setting			Short MA	Nane	MEGLevel	COM	ETH-CC Period	COM/Priority	BINH.	BM Server MEP	ETH-BN Period	Biel Priority	Brat Hold Time	-	ETH-BN Period
ETH Port Setting		NEC			7	Enable	10	8	Enable	MODEM (Sideo 1)	100	7	100	Deable	
E FOB Setting															
RSTP / MSTP Setting RSTP / MSTP Setting Set / Classification Setting Service Setting Service Setting Norman Setting Norman Setting Norman Setting Setting Setting Setting Setting Setting Setting															

7. Create MEP on ETH Port2 using Through VLAN. Refer *9.6.2.1 Add MEP Index in Set Network and System Provisioning* for details.

EP Confi	guration				MEG Conf	iguration		
IEP Inde	x:	1						
IEP ID:			33	(1 - 8191)	Enable	MEG Index	Maintenance Domain Name	Short MA Nan
tem:		Main	*		۲	1	NEC	NEC
ort:		Port02	*					
TH OAM	Source M	AC Address: 02:E	2:00:10:	97:02				
irection:		O Up MEP	(2)	Down MEP				
Enable	VLAN ID	1	/LAN Servi	ce Name				
۲	100							
0	300				<			>
					Peer MEP	Configuratio	n	
					🔾 Add	Peer MEP		
					Enable		Peer MEP ID	
							11	

Figure 3-110 OAM MEP Setting (Modify) Window



MONU	Provisioning - ETH Fu	nction Set	tting - ETH	OAH Settin	0								
🛛 Detail Menu 🛛 😥 🛍	2 Aefresh												
Current Status Current Status		e pa	N MEG	LINK CAM									
a 🛄 Network Management Setting a 🔁 Provisioning	O Add MEP O Del	ete MEP											
MODEM Function Setting Link Appropriation Setting								67	H-BN (TX)			ETH	en (KX)
ETH Function Setting Equipment Setting ETH Part Setting	4.4N Service Name	2en	Set	Part	Feer HEP ID	BIRI Server MEP	ETH-6N Period	BVH Priority	ETH-BS Rommal Bandwatth	ETH-Bi-Current Bandwidth	Bref Hold Time	ETH-EN Period Setting Value	ETH-BI Current Bandwidth
VLAN Setting FD8 Setting		Man		Port02	11	MODEM (SHIDI)	1.00	7	4710 (Mpcs)	4710 [Mbps]	1 [4]		
Ethi CAM Setting S RUTP / MUTP Setting S RUTP / MUTP Setting C QUS / Classification Setting S Service Switch Setting S Fiber Setting S LICP Transport Setting						۷	erify I		N (Tx) sh e slave N		H-Ban	dwidth	

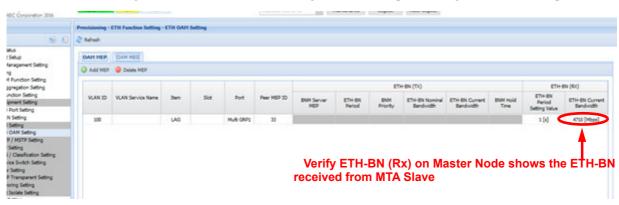


Figure 3-112 ETH OAM Setting - OAM MEP [on the rightmost on NE1]

Figure 3-113 Link Aggregation Setting

110.00	Presidenting - Links	Automation Section	2						
/ Detail Menu	and the second se			m LAG					
Current Status Boyonant Satup Naturni, Managamant Satting	Link Appropriation	Group							Vorify chaper rate on Maste
- Provisioning	LAG	LAG Name	LAG Link Status	Mode	TX Interval	Revertive Ho	Databation Rule	Shaper Rate(Hbps)	Verify shaper rate on Maste
I COMPANY Function Setting	Multi ORPS		Link Up	Static			L1 flam	10405.204	Node [Modem ETH BNW
Eink Apprepation Setting The Punction Setting Tabulariset Setting Ein Punct Setting Ein Punct Setting									ETH-BN received]
VLAN Setting									
ETH OAM Setting									
KSTP / MSTP Sating KSTP / MSTP Sating QoS / Clasification Sating Service Solids Fair Sating Fair Sating									

3.8.4 Alarm and Troubleshooting:

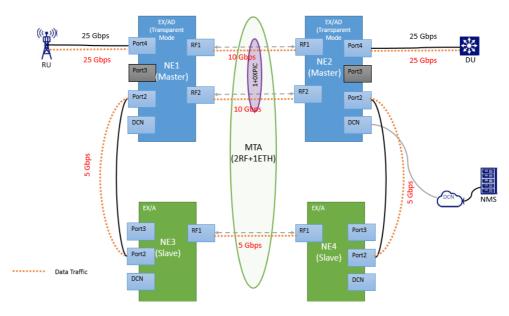
Once the topology configuration is complete, check for below possible alarms.

- 1. ETH-BN LOC
- 2. ETH LOS
- 3. Multi Traffic Aggregation Link
- 4. Multi Traffic Aggregation Setting Mismatch
- 5. Forwarding Mode Setting Mismatch

To Clear the Alarms, refer to **5.5 Trouble Clearing in Operation and** *Maintenance* for details.

3.8.5 Use Case Verification

Figure 3-114 Data Traffic Flow



- Verify the counters in ETH RMON Report on Slave [NE2 and NE4] Port02 for traffic taken through relay link. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.
- Verify the counters in ETH RMON Report on receiving end Master [NE4] Port04 for the entire traffic aggregated back from MTA ports. Refer 3.3.3 ETH RMON Report in Operation and Maintenance for details.
- **3.** Perform TX Mute on MODEM RF1 and MODEM RF2 on sender end Master [NE1].

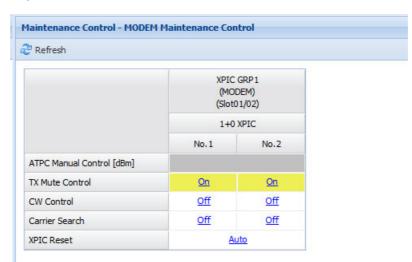


Figure 3-115 MODEM Maintenance Control Window

4. Verify the QOS shaper on Master got updated with Slave Modem Bandwidth received via ETH-BNM.

Figure 3-116 Link Aggregation Setting Window

LAG LAG Nav Mult GRP1	e LAG Link Status Link Up	Mode Static	TX Interval	Revertive Mode	Distribution Rule	Shaper Rate[Mbps]	Shaper rate on Mast
MAIN GRP1	Link Up	Static					
					L1 Base	4653.951	updated with Slave
							Modem Bandwidth

5. Verify the counters in ETH RMON Report on Slave [NE3 and NE4] Port02 and MODEM RF1 for traffic taken through relay link.

3-74/END

3.9 Other Example Topologies

Figure 3-117 MTA Topology with VR4 as Slave

