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MOP for Ceragon Radio Excessive BER Alarm Fault management

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B	Pre-check
C	Procedure
D	Post Activity Health check
E	Fall Back Procedure

A. Introduction

This document outlines the step-by-step process involved in Ceragon Radio Excessive BER Alarm Fault management.

B. PRE-CHECK

- *If both the nodes are reachable then need to proceed to the next step else need to arrange field support with spare hardware such as RMC card, ODU, IF cable and tested login accessories.*
- *PCM path or end to end media path along with V-LAN & port details should be available.*
- *Keep configured Radio parameters like- Link frequency, TX power, MRMC snapshot backup before performing any activity.*

❖ *Please note that the method of procedure is prepared as the current scenario, available devices, and deployed software version. So activity steps and impact can vary depending upon the scenario.*

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Current Alarms before activity

IP20:-

#	Time	Severity	Description	User Text	Origin
1	14-01-2020 13:11:12	Red	Remote communication failure		Radio: Slot 5, Port 1
2	14-01-2020 13:11:05	Red	Radio loss of frame		Radio: Slot 5, Port 1
3	10-01-2020 15:55:02	Red	Loss-of-frames alarm on TDM service		STM-1/OC-3: Slot 10, Port 1, Instance 55
4	10-01-2020 15:55:02	Red	Loss-of-frames alarm on TDM service		STM-1/OC-3: Slot 10, Port 1, Instance 34
5	10-01-2020 15:55:02	Red	Loss-of-frames alarm on TDM service		STM-1/OC-3: Slot 10, Port 1, Instance 13
6	10-01-2020 15:53:49	Red	Loss Of Signal (LOS) on TDM-LIC TDM port		E1/T1: Slot 3, Port 3
7	10-01-2020 15:53:49	Red	Loss Of Signal (LOS) on TDM-LIC TDM port		E1/T1: Slot 3, Port 2
8	10-01-2020 15:53:49	Red	Loss Of Signal (LOS) on TDM-LIC TDM port		E1/T1: Slot 3, Port 1
9	10-01-2020 15:54:58	Yellow	Remote Defect Indication (RDI) received on TDM-LIC VC12/VC11		STM-1/OC-3: Slot 10, Port 1, Instance 55
10	10-01-2020 15:54:58	Yellow	Remote Defect Indication (RDI) received on TDM-LIC VC12/VC11		STM-1/OC-3: Slot 10, Port 1, Instance 34
11	10-01-2020 15:54:57	Yellow	Remote Defect Indication (RDI) received on TDM-LIC VC12/VC11		STM-1/OC-3: Slot 10, Port 1, Instance 13
12	15-01-2020 09:50:34	Yellow	RFU RX level out of range		Radio: Slot 5, Port 1
13	10-01-2020 15:53:51	Yellow	E1/DS1 Unexpected signal on TDM-LIC TDM port		E1/T1: Slot 3, Port 7
14	10-01-2020 15:53:51	Yellow	E1/DS1 Unexpected signal on TDM-LIC TDM port		E1/T1: Slot 3, Port 6
15	10-01-2020 15:53:51	Yellow	E1/DS1 Unexpected signal on TDM-LIC TDM port		E1/T1: Slot 3, Port 5

IP10:-

Date & Time	Severity	Module	Description
03-Jan-20 01:47:50	Red	IDU	Radio loss of frame
14-Dec-19 16:44:01	Red	IDU	Remote communication failure
03-Jan-20 01:47:50	Red	IDU	Gigabit Ethernet loss of carrier on port #1
30-Oct-19 11:57:41	Red	IDU	Fan failure
14-Dec-19 16:43:49	Yellow	RFU	Tx mute
14-Jan-20 08:10:10	Yellow	RFU	Rx level out of range
15-Jan-20 09:20:12	Yellow	IDU	IDU extreme temperature conditions

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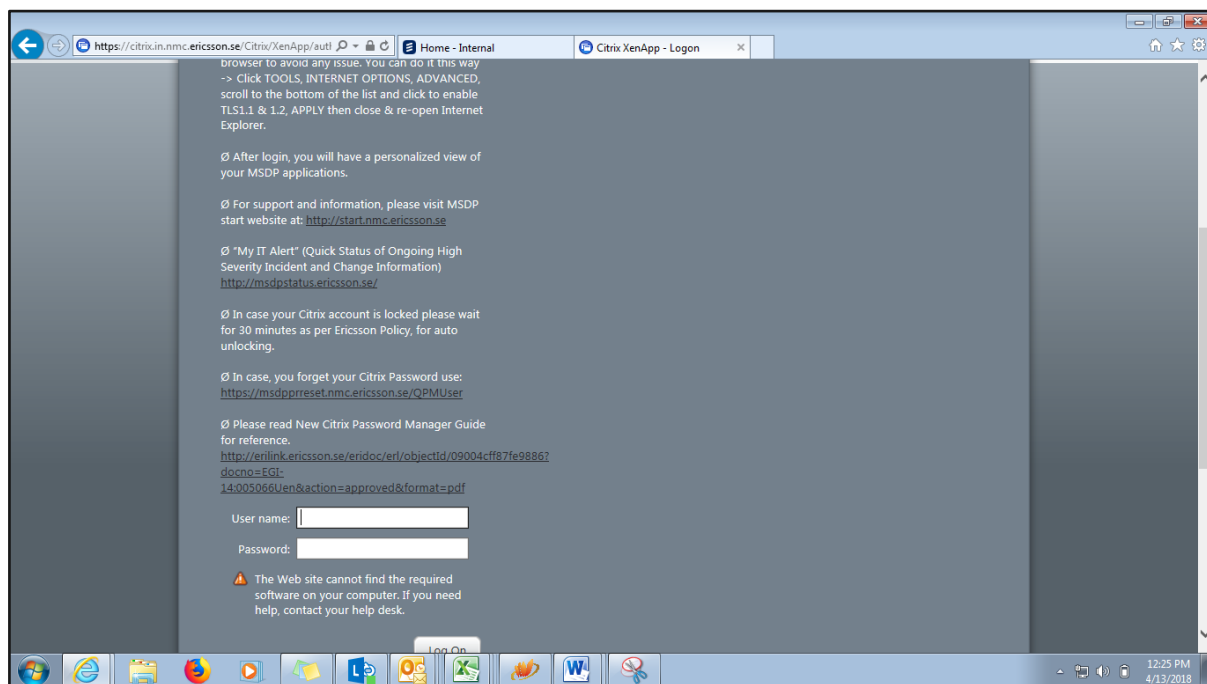


C. Procedure:

STEPS FOR Ceragon Radio loss of frame alarm clearance

1. Login MSDP through below mentioned link.
<https://citrix.in.nmc.ericsson.se/>

2. Provide CITRIX username and password.

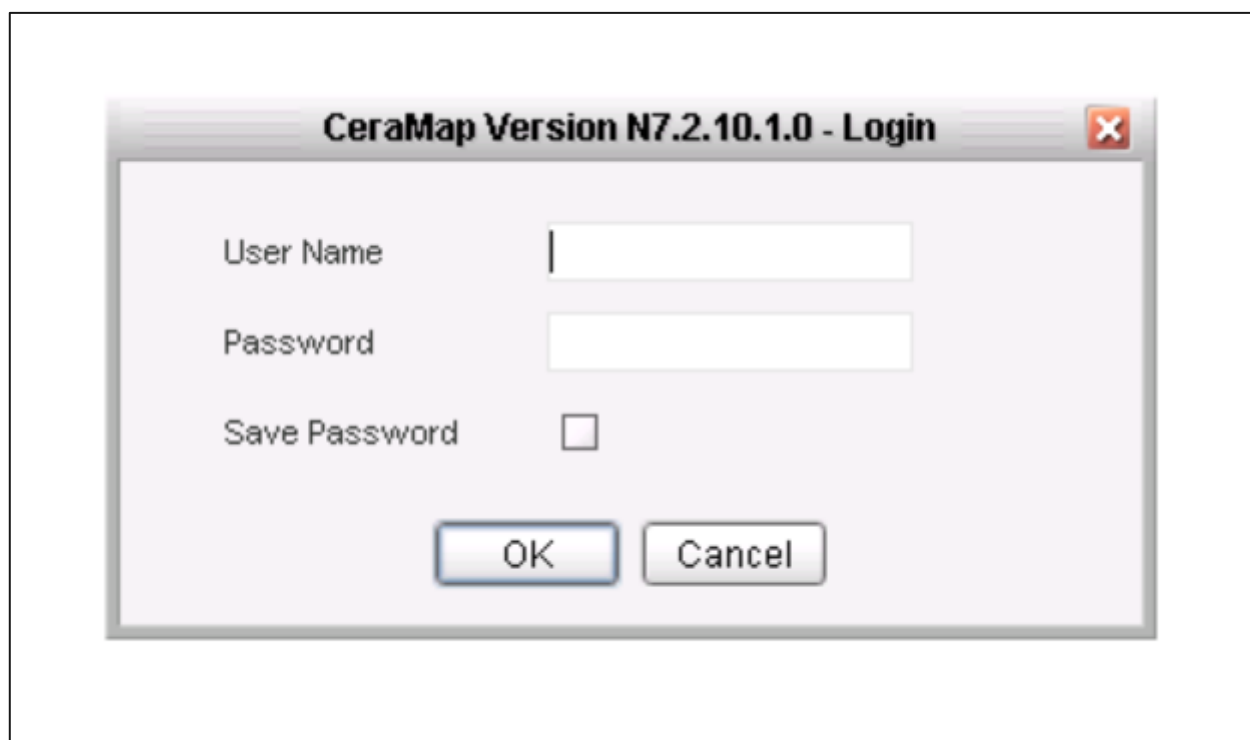


3. Click on Main > Xenapp6.5 > Bharti Noida > Bharti INNO Remote Desktop Client.

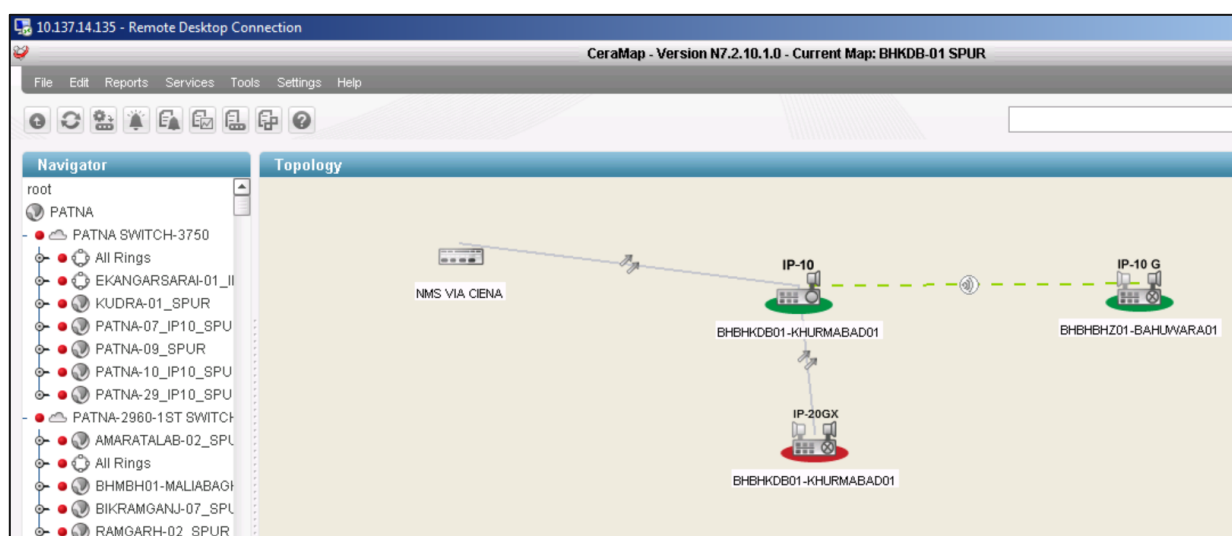
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4. Now login the RDP with RDP IP & credentials.
5. Launch the Cera map & login with credentials.



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6. Search the required Node ID in Cera Map & open the node by clicking on Open Node GUI.
7. Login Ceragon IP20 NODE locally via web browser through IP.
8. Provide IDU username and password.

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Principle:

The Radio Excessive BER alarm indicates MW Link is down.

Traffic Impact:

When the Radio Excessive BER alarm occurs, the services that travel along the faulty BOARD are interrupted.

Possible Causes:

1. Fade in the link.
2. Defective IF cable.
3. Fault in RFU.
4. Fault in RMC (Radio Modem Card).

Steps for IP20:-

- 1. Match all the radio parameters at both end.**

Check Frequency, TX power, Mute TX must be off.

Go to Radio>Radio parameters



Check Modulation script, same script must be running on both ends

Go to Radio>MRMC>MRMC status

Radio location	Configured MRMC Script	TX profile	TX QAM	TX bit-rate (Mbps)	RX profile
Radio: Slot 5, Port 1 (RMC-B)	mdN_A5656N_156_1003 (1003)	6	256	371.103	6
Radio: Slot 6, Port 1 (RMC-B)	mdN_A5656N_156_1003 (1003)	6	256	371.103	6

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2. Interference to be checked.

A :- In case of link down and no interference RSL should be -99 on both ends. If not, then take snapshot and inform to circle team to consult with planning team. if required, change the link frequency/modulation after discussion with circle team shared by planning team. Interference should be checked on one end at a time after muting tx on another end. if far-end is not visible, FE required at site to perform the same.

Go to Radio>Radio parameters

Radio Location	Type	TX Frequency (MHz)	RX Frequency (MHz)	Operational TX Level (dBm)	RX Level (dBm)	Modem MSE (dB)	Defective Blocks
Radio: Slot 5, Port 1	RFU-C	14851.000	15271.000	12	-86	-99.00	0
Radio: Slot 6, Port 1	RFU-C	14809.000	15229.000	15	-44	-38.67	0

B:- go to next step if interference not observed.

3. Perform RF/IF Loopback to check HW and connectivity between IDU to ODU.

Before performing IF/RF loopback, impacted radio S-TAG service point should be removed from MNG service.so that MNG VLAN will not get loop and node visibility will not hamper.

Go to Ethernet>Services



CERAGON

Logout Connection Admin

Filter

Unit Summary
Radio Summary

Platform
Faults
TDM
Radio
Ethernet
General Configuration
Services
Interfaces
PM & Statistics
QOS
Protocols
Groups
Cascading
Sync
Quick Configuration
Utilities

JHBBH01: Ethernet Services

Ethernet Services

Service ID	Service Type	EVC ID	EVC description	Admin
1	MP	N.A.	4G TD TRAFFIC	Operational
2	MP	N.A.	3g traffic	Operational
3	MP	N.A.	b176	Operational
4	MP	N.A.	oam	Operational
5	MP	N.A.	N.A.	Operational
6	MP	N.A.	3G JHBBH-01	Operational
7	P2P	N.A.	JHTDG01	Operational
8	P2P	BHBLH01	V-1000	Operational
9	MP	N.A.	POABIS	Operational
10	P2P	N.A.	JKTAP-01 TRX ADD	Operational
11	MP	IVAN	P2MP	Operational
1025	MNG	N.A.	N.A.	Operational

Add Edit Delete Service Details Service Points

Multiple Selection Operation
Admin Reserved Apply

Page Refresh Interval (Seconds) None Last Loaded: 11:28:17 Refresh

CERAGON

Logout Connection Admin

Filter

Radio
Radio Parameters
Remote Radio Parameters
Radio BER Thresholds
ATPC
Payload Encryption
Ethernet Interface
MRMC
Symmetrical Scripts
ETSI
FCC
MRMC Status
PM & Statistics
Diagnostics
Logback
Groups
Ethernet
General Configuration
Services
Interfaces
PM & Statistics
QOS
Protocols
Groups

JHBBH01: Ethernet Service Points (Service ID - 1025)

Back to Services table

Select Service Point Attribute

General
Ingress
Egress

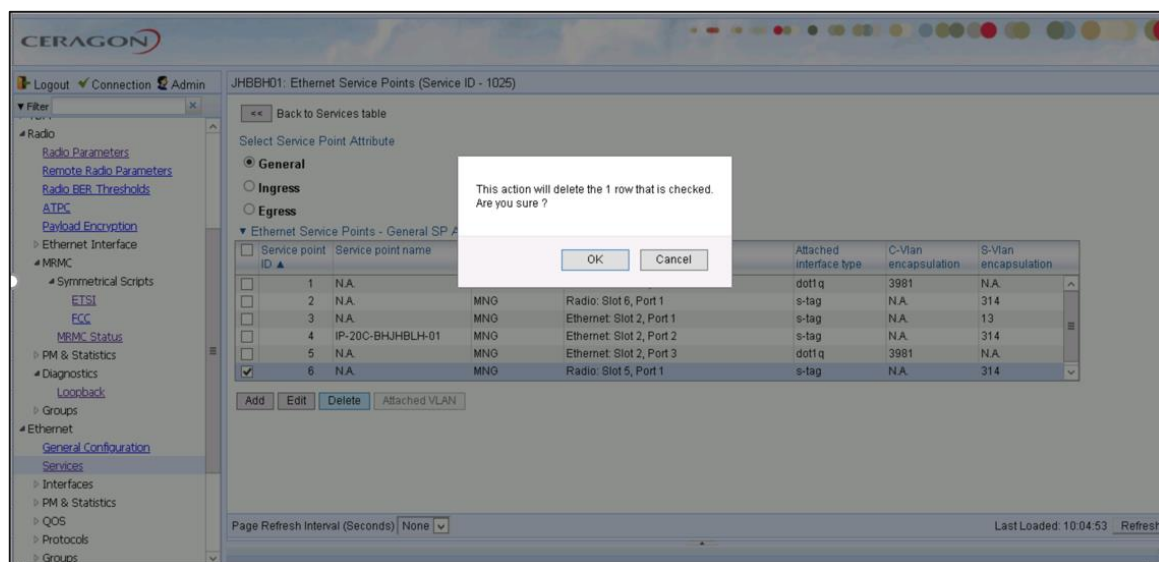
Ethernet Service Points - General SP Attributes

Service point ID	Service point name	Service point type	Interface location	Attached interface type	C-Vlan encapsulation	S-Vlan encapsulation
1	N.A.	MNG	Ethernet: Slot 12, Port 2	dot1q	3981	N.A.
2	N.A.	MNG	Radio: Slot 6, Port 1	s-tag	N.A.	314
3	N.A.	MNG	Ethernet: Slot 2, Port 1	s-tag	N.A.	13
4	IP-20C-BHJHBLH-01	MNG	Ethernet: Slot 2, Port 2	s-tag	N.A.	314
5	N.A.	MNG	Ethernet: Slot 2, Port 3	dot1q	3981	N.A.
6	N.A.	MNG	Radio: Slot 5, Port 1	s-tag	N.A.	314

Add Edit Delete Attached VLAN

Page Refresh Interval (Seconds) None Last Loaded: 10:04:53 Refresh

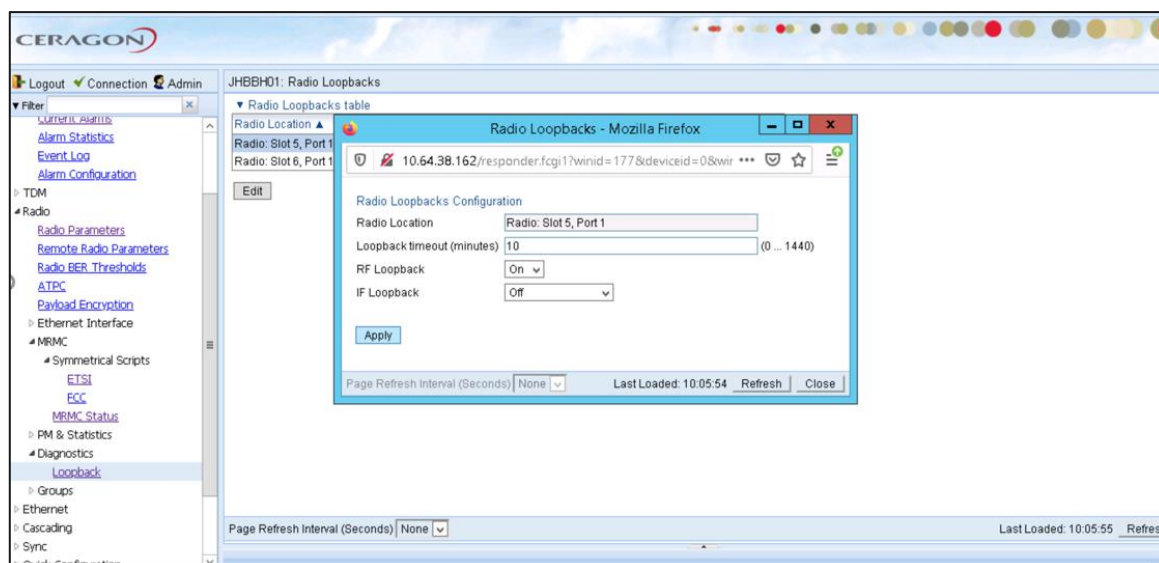
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After deleting radio port from Eth services.

Go to Radio>Diagnostic>Loopback

Set Loopback timeout and enable RF loop back and click on Apply. Far-end Radio TX should be mute before performing loopback.



After enabling RF loopback, RSL as per configured modulation. (recommended MSE value table according to modulation attached). and defective blocks should not increase. if not then replace ODU or check IF connectivity.



Recommended MSE value as per Configured Modulation script.

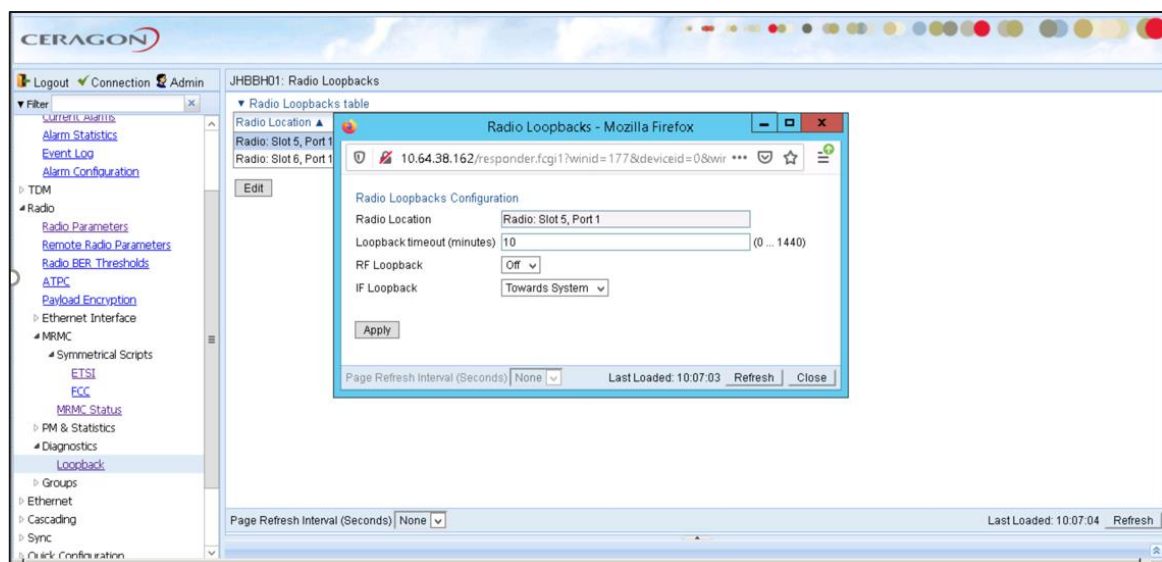
Profile	Mod	MSE Down-Threshold	MSE Up-Threshold
0	QPSK		-18
1	8PSK	-16	-19
2	16QAM	-17	-23
3	32QAM	-21	-26
4	64QAM	-24	-29
5	128QAM	-27	-32
6	256QAM	-30	-34
7	512QAM	-32	-37
8	1024 QAM SFEC	-35	-38
9	1024 QAM WFEC	-36	-41
10	2048QAM	-39	

Go to Radio>Radio parameters

Go to Radio>Diagnostic>Loopback

Set Loopback timeout and enable IF loop back and click on Apply. Far-end Radio TX should be mute before performing loopback.

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After enabling IF loopback, MSE should be OK, as per configured modulation. (recommended MSE value table according to modulation attached). and defective blocks should not increase if not then replace RMC.

Go to Radio>Radio parameters

Radio Location	Type	TX Frequency (MHz)	RX Frequency (MHz)	Operational TX Level (dBm)	RX Level (dBm)	Modem MSE (dB)	Defective Blocks
Radio: Slot 5, Port 1	RFU-C	14851.000	15271.000	12	-86	-39.35	0
Radio: Slot 6, Port 1	RFU-C	14809.000	15229.000	15	-44	-38.58	0

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4. Link is misaligned

If the IF and RF loopback is OK, need to check the RSL level at both the ends.

If the RSL is degraded, then need to align the field support for link alignment and adjustment. IF connector also should be checked from Field end.

Microwave Feedhorn also need to be checked by FE physically, no any damage or water seepage inside Feedhorn should be there.

If the node is not managed, then need to perform the above-mentioned steps locally through web login or provide remote desktop to BO-TXN Engg.

If link is still down after following all the steps mentioned above, check infra related points- power supply, Equipment earthing, site grounding etc.

Steps for IP10:-

1. Match all the radio parameters at both ends.

Check Frequency, TX power, Mute TX must be disable.

Go to Configuration>Radio>Radio parameters

CERAGON

Logout Connection **Radio Parameters - Slot 2**

Search for page Go

Main View - Slot 2

Faults

Current Alarms

Event Log

PM & Counters

Configuration

General

Ethernet Switch

Radio

Radio Parameters

Remote Radio

Radio Thresholds

MRMC

Traffic Priority

ATPC

Compression

Interfaces

Protection

Service OAM

Diagnostics & Maintenance

Security

Status Parameters

RFU type RFU-C

RFU grade Grade-2

Tx Rx frequency separation (MHz) 420.000

Tx level (dBm) 14

Rx level (dBm) -99

MSE (dB) -99.99

Defected blocks 0

Frequency Control

Tx frequency (MHz) 15243.000 15130.000..15328.000

Rx frequency (MHz) 14823.000 14710.000..14908.000

☐ Set also remote unit

Configuration Parameters

Radio IF interface Enable

Radio IF operational status Up

Mute Tx Enable

Max Tx level (dBm) 14 (-7..20)

Link ID 1 (1..65535)

MAC header compression Disable

Check Modulation script, same script must be running on both ends

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Go to Configuration>Radio>MRMC

CERAGON

Logout Connection **MRMC - Slot 2**

Search for page Go

MRMC Configuration

MRMC script ACM_181Mbps-25MHz-256QAM-Grade-1

Occupied bandwidth (MHz) 26.000

Operation mode ACM Adaptive Mode

Min adaptive ACM profile Profile 0

Max adaptive ACM profile Profile 7

Alarm generation on MRMC profile degrade Disable

Adaptive Tx power admin Disable adaptive power

Current TX

ACM adaptive profile Profile 7

QAM 256

Bitrate (Mbps) 181.500

Number of TDM channels 78

Current RX

ACM adaptive profile Profile 7

QAM 256

Bitrate (Mbps) 181.500

Number of TDM channels 78

Apply Refresh

2. Interference to be checked.

A :- In case of link down and no interference RSL should be -99 on both ends. If not, then take snapshot and inform to circle team to consult with planning team. if required, change the link frequency/modulation after discussion with circle team shared by planning team. Interference should be checked on one end at a time after muting tx on another end. if far-end is not visible, FE required at site to perform the same.

Go to Configuration>Radio>Radio parameters

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CERAGON

Logout Connection **Radio Parameters - Slot 2**

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 - Event Log
- PM & Counters
- Configuration
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 - Radio
 - Radio Parameters
 - Remote Radio
 - Radio Thresholds
 - MRMC
 - Traffic Priority
 - ATPC
 - Compression
- Interfaces
- Protection
- Service OAM
- Diagnostics & Maintenance
- Security

Status Parameters

RFU type RFU-C

RFU grade Grade-2

Tx Rx frequency separation (MHz) 420.000

Tx level (dBm) 14

Rx level (dBm) -99

MSE (dB) -99.99

Defected blocks 0

Frequency Control

Tx frequency (MHz) 15243.000 15130.000..15328.000

Rx frequency (MHz) 14823.000 14710.000..14908.000

☐ Set also remote unit

Configuration Parameters

Radio IF interface Enable

Radio IF operational status Up

Mute Tx Enable

Max Tx level (dBm) 14 (-7..20)

Link ID 1 (1..65535)

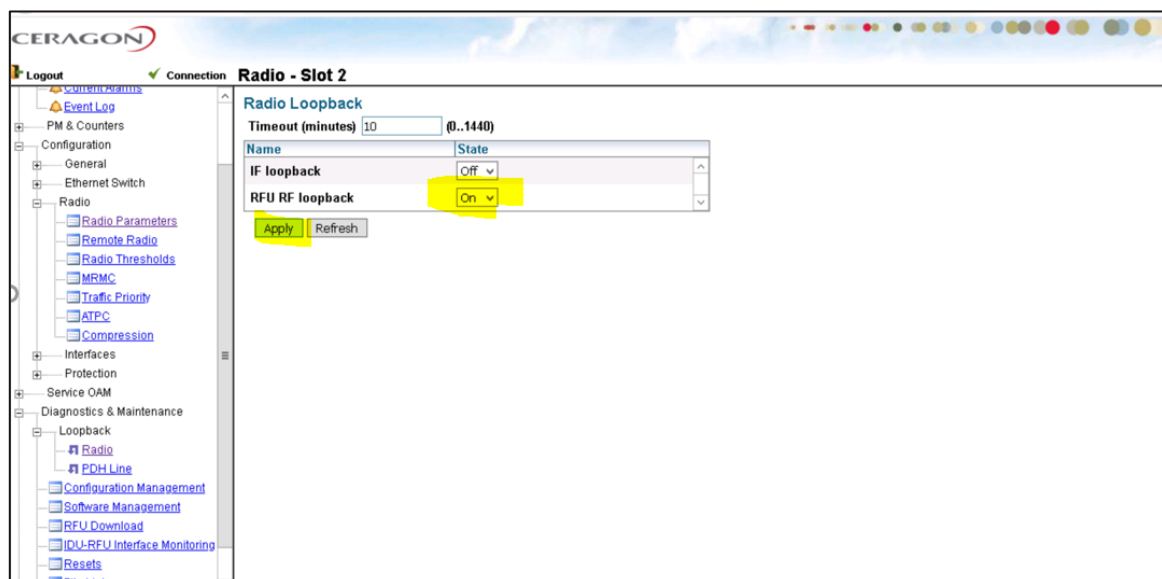
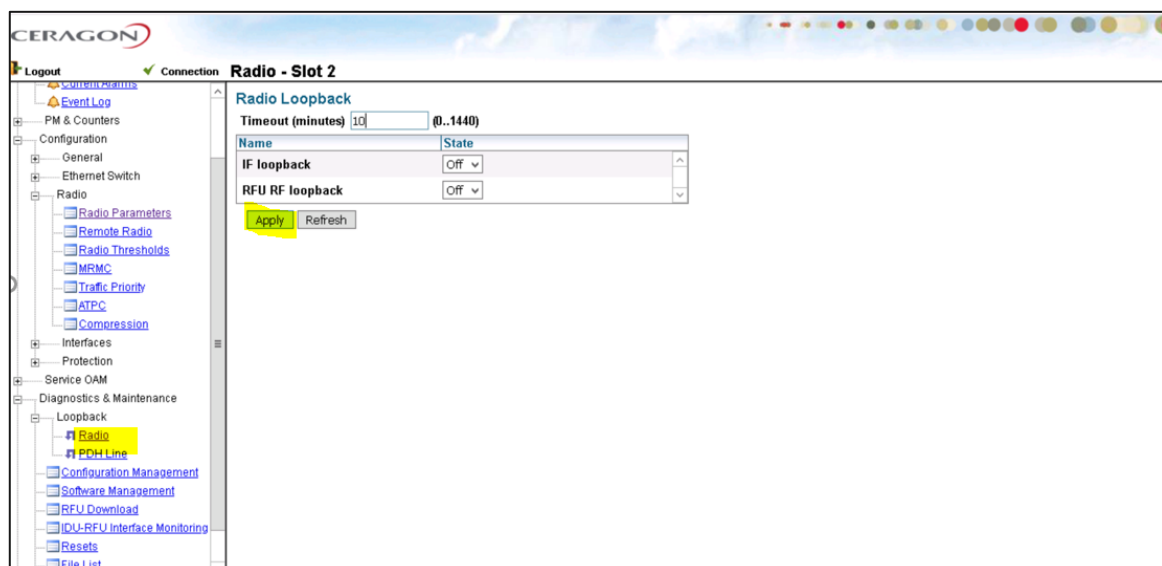
MAC header compression Disable

B:- go to next step if interference not observed.

3. Perform RF/IF Loopback to check HW and connectivity between IDU/ODU.

Go to Diagnostic and maintenance>Loopback>Radio

Set Loopback timeout and enable RF loop back and click on Apply. Far-end Radio TX should be mute before performing loopback.



After enabling RF loopback, RSL and MSE should be OK, as per configured modulation. (recommended MSE value table according to modulation attached). and defective blocks should not increase. if not then replace ODU or check IF connectivity.

Go to Configuration>Radio>Radio parameters

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CERAGON

Logout Connection **Radio Parameters - Slot 2**

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 - MRMC
 - Traffic Priority
 - ATPC
 - Compression
 - Interfaces
 - Protection
 - Service OAM
 - Diagnostics & Maintenance
 - Security

Status Parameters

RFU type RFU-C

RFU grade Grade-2

Tx Rx frequency separation (MHz) 0.000

Tx level (dBm) 14

Rx level (dBm) -67

MSE (dB) -31.50

Defected blocks 0

Frequency Control

Tx frequency (MHz) 15243.000 15130.000..15328.000

Rx frequency (MHz) 15243.000 14710.000..14908.000

☐ Set also remote unit

Configuration Parameters

Radio IF interface Enable

Radio IF operational status Up

Mute Tx Disable

Max Tx level (dBm) 14 (-7..20)

Link ID 1 (1..65535)

MAC header compression Disable

Go to Diagnostic and maintenance>Loopback>Radio

Set Loopback timeout and enable IF loop back and click on Apply. Far-end Radio TX should be mute before performing loopback.

CERAGON

Logout Connection **Radio - Slot 2**

Search for page Go

Main View - Slot 2

- Faults
- PM & Counters
- Configuration
 - General
 - Ethernet Switch
 - Radio
 - Radio Parameters
 - Remote Radio
 - Radio Thresholds
 - MRMC
 - Traffic Priority
 - ATPC
 - Compression
 - Interfaces
 - Protection
 - Service OAM
 - Diagnostics & Maintenance
 - Loopback
 - Radio
 - PDH Line
 - Configuration Management
 - Software Management
 - RFU Download
 - IDU-RFU Interface Monitoring

Radio Loopback

Timeout (minutes) 10 (0..1440)

Name State

IF loopback On

RFU RF loopback Off

Apply Refresh

After enabling IF loopback, MSE should be OK, as per configured modulation. (recommended MSE value table according to modulation attached). and defective blocks should not increase. if not then replace IP10 IDU.

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Go to Configuration>Radio>Radio parameters

CERAGON

Logout Connection Radio Parameters - Slot 2

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Main View - Slot 2

- Faults
- PM & Counters
- Configuration
 - General
 - Ethernet Switch
 - Radio
 - Radio Parameters
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 - Radio Thresholds
 - MRMC
 - Traffic Priority
 - ATPC
 - Compression
 - Interfaces
 - Protection
 - Service OAM
 - Diagnostics & Maintenance
 - Loopback
 - Radio
 - PDH Line
 - Configuration Management
 - Software Management
 - RFU Download
 - RFU RFU Interface Monitoring

Status Parameters

RFU type	RFU-C
RFU grade	Grade-2
Tx Rx frequency separation (MHz)	420.000
Tx level (dBm)	14
Rx level (dBm)	-99
MSE (dB)	-39.70
Defected blocks	605

Frequency Control

Tx frequency (MHz)	15243.000	15130.000..15328.000
Rx frequency (MHz)	14823.000	14710.000..14908.000

☐ Set also remote unit

Configuration Parameters

Radio IF interface	Enable
Radio IF operational status	Up
Mute Tx	Disable
Max Tx level (dBm)	14 (-7..20)
Link ID	1 (1..65535)
MAC header compression	Disable

4. Link is misaligned

If the IF and RF loopback is OK, need to check the RSL level at both the ends.

If the RSL is degraded, then need to align the field support for link alignment and adjustment. IF connector also should be checked from Field end.

Microwave Feedhorn also need to be checked by FE physically, no any damage or water seepage inside Feedhorn should be there.

If the node is not managed, then need to perform the above-mentioned steps locally through web login or provide remote desktop to BO-TXN Engg.

If link is still down after following all the steps mentioned above, check infra related points- power supply, Equipment earthing, site grounding etc.

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D. Post Activity Health Check:

Need to Check alarm will be clear and services also restored after confirmation from all stakeholders. If alarm not cleared and link is still down after following all procedure, raise care case to OEM Ceragon.

E. Fall Back Procedure: -

Need to shift the board to another free slot and configure the services manually.