

OOREDOO KUWAIT WIRELESS NETWORK ASSESSMENT - FAULT MANAGEMENT

05 February 2026

Technology/Access Network & Rollout



Overall Score

Cognitive Activity (IAADE)	Service Capability	Weight	Question	Answer	Overall Score
Intent	Intent-driven	10%	Does the wireless network fault management system have the capability of automatically generating fault management task targets , policies and evaluating the implementation effect based on intent? Note: Based on the specified fault management intent (such as the out-of-service duration), the system determine the fault management targets (such as the proportion of pre-event trouble tickets and fault locating duration) and fault management policy (such as redundancy backup). Fault scenarios include NE disconnection or out-of-service, cell faults, and fronthaul network faults.	B	3.49
Awareness	Data collection & Alarm filtering	10%	Does the wireless network fault management system support automatic data collection & alarm filtering in various fault scenarios? Fault scenarios include NE disconnection or out-of-service, cell faults, and fronthaul network faults.	A	
	Fault Prediction	15%	Does the wireless network fault management system support fault prediction in various fault scenarios? Fault scenarios include NE disconnection or out-of-service, cell faults, and fronthaul network faults.	A	
Analysis	Fault identification & Impact analysis	20%	Does the wireless network fault management system support fault identification & fault impact analysis in various fault scenarios? Fault scenarios include NE disconnection or out-of-service, cell faults, and fronthaul network faults.	A	
	Demarcation & Locating	20%	Does the wireless network fault management system support root cause diagnosis and fault locating in various fault scenarios? Fault scenarios include NE disconnection or out-of-service, cell faults, and fronthaul network faults.	A	
	Solution generation	10%	Does the wireless network fault management system support generation of fault recovery solutions in various scenarios? Fault scenarios include NE disconnection or out-of-service, cell faults, and fronthaul network faults.	B	
Decision	Evaluation and decision-making	10%	Does the wireless network fault management system support evaluation and decision-making in various scenarios? Fault scenarios include NE disconnection or out-of-service, cell faults, and fronthaul network faults.	B	
Execution	Solution implementation	5%	Does the wireless network fault management system support automatic execution of troubleshooting solutions in various scenarios? Fault scenarios include NE disconnection or out-of-service, cell faults, and fronthaul network faults.	A	

Summary of Evidence

Cognitive Activity (IAADE)	Service Capability	Answer	Evidence for Sub-scenarios		
			NE disconnection or out-of-service	cell faults	fronthaul network faults
Intent	Answer-driven	B		√	
Awareness	Data collection & Alarm filtering	A	√	√	√
	Fault Prediction	A	√	√	√
Analysis	Fault identification & Impact analysis	A	√	√	√
	Demarcation & Locating	A	√	√	√
	Solution generation	B	√	√	√
Decision	Evaluation and decision-making	B	√	√	√
Execution	Solution implementation	A	√	√	√

Intent-driven

Question:

Does the wireless network fault management system have the capability of automatically generating fault management task targets, policies and evaluating the implementation effect based on intent?

Note:

Based on the specified fault management intent (such as the out-of-service duration), the system determine the fault management targets (such as the proportion of pre-event trouble tickets and fault locating duration) and fault management policy (such as redundancy backup).

Fault scenarios include NE disconnection or out-of-service, cell faults, and fronthaul network faults.

Options:

Option A	Option B	Option C	Option D
The system automatically generates fault management task targets and policies based on intent. Fault management targets and policies need to be manually confirmed. The system automatically evaluates the implementation effect.	The system automatically generates fault management task targets based on predefined rules. Fault management targets and policies need to be manually defined. The effect is manually evaluated after the intent is implemented.	Fault management task targets and policies are manually defined based on expertise. Manually evaluate the effect after the intention is implemented.	

Evidence:

Auto TT Rule Management

Automatic TT dispatching rules: TTs are automatically dispatched for alarms that meet the rules. The corresponding TT dispatching template is used for dispatching TTs. If the TT dispatching alarm meets the alarm exception conditions or site exception conditions, the TT dispatching is canceled. When a TT is dispatched for a main alarm, the system automatically associates the sub-alarms whose Planned TT Dispatch Time is within 2 minutes after the TT is dispatched for the main alarm.

70 Total Rules | 70 Enabled | 0 Disabled

Rule ID	Rule Name	Domain	Vendor	Status	Priority	Operation
2504230003	CISCO_DCIM_Minor_Alarms	Data	CISCO	Enabled	Middle	[Icons]
2504230002	CISCO_DCIM_Major_Alarms	Data	CISCO	Enabled	Middle	[Icons]

Automation Rules Statistics (Yesterday (00:00:00-23:59:59))

Alarm Compression Rate	Auto TT Rate	Auto Diagnose Rate	Success Diagnose Rate
92.30%	93.88%	100.00%	94.18%

Alarm Compress Rule

Active/Total:		
PC: 58/58	Delay Count: 90/98	TransientRule: 154/154
Filtering: 145/207	SyntheticV2: 0/3	

Data collection & Alarm filtering

Question:

Does the wireless network fault management system support automatic data collection & alarm filtering in various fault scenarios?

Options:

Option A	Option B	Option C	Option D
The system can automatically collect data (alarm, configuration, and performance data etc.), associate alarms, and filter alarms.	The system can automatically collect data (alarm, configuration, and performance data etc.), associate alarms, and filter alarms based on manually defined rules	Manually select and use the system to collect data and filter out invalid/redundant alarms.	People use the system to collect data and manually filter out invalid/redundant alarms.

Evidence:

NE is Disconnected

	Alarm Severity	Alarm Name	Alarm Source	First Occurred On	Site ID	Network Type	Tag	Planned Ticket Creation
<input type="checkbox"/>	Critical	NE Is Disconnected	[REDACTED]	2025-06-11 14:04:38	[REDACTED]	5G	P	2025-06-11 14:09:38
<input type="checkbox"/>	Critical	NE Is Disconnected	[REDACTED]	2025-06-11 14:04:20	[REDACTED]	2G	P	2025-06-11 14:09:20
<input type="checkbox"/>	Critical	NE Is Disconnected	[REDACTED]	2025-06-11 14:04:14	[REDACTED]	2G	P	2025-06-11 14:09:14

BBU CPRI Interface Error

	Tag	PC Rule Res	Alarm Severity	Alarm Name	Planned Ticket Creation	Alarm ID	First Processing Time	Site Name	Alarm Source	Device Type	First Occurred On
<input type="checkbox"/>		Normal	Major	BBU CPRI Interface Error	2025-06-04 08:33:21	26234	2025-06-04 08:15:54	[REDACTED]	[REDACTED]	eNodeB	2025-06-04 08:13:21
<input type="checkbox"/>		Normal	Major	BBU CPRI Interface Error	2025-06-04 08:33:21	26234	2025-06-04 08:15:54	[REDACTED]	[REDACTED]	eNodeB	2025-06-04 08:13:21

Out Of Service

	Alarm Severity	Alarm Name	Alarm Source	First Occurred On	Site ID	Network Type	Tag	Planned Ticket Creation
<input type="checkbox"/>	Major	gNodeB Out of Service	[REDACTED]	2025-05-12 20:30:42	[REDACTED]	4G		2025-05-12 20:37:42
<input type="checkbox"/>	Major	GSM Cell out of Service	[REDACTED]	2025-05-03 03:00:55	[REDACTED]	2G	P	2025-05-03 03:10:03

Cell fault

	Alarm Severity	Alarm Name	Alarm Source	First Occurred On	Site ID	Network Type	Tag	Planned Ticket Creation
<input type="checkbox"/>	Major	NR Cell Unavailable	[REDACTED]	2025-06-11 12:44:44	[REDACTED]	5G	C	2025-06-11 12:55:22
<input type="checkbox"/>	Major	Cell Unavailable	[REDACTED]	2025-06-11 12:40:59	[REDACTED]	4G	P	2025-06-11 12:47:59

Data collection & Alarm filtering

Alarm Filtering

Evidence:

Top 5 Most Efficient Compress Rules(Yesterday)

No.	Rule Name	Rule Type	Compressed Alarm Count
1	SCTP_Link_Fault_aabd	Transient	4531
2	HCC	PC	3881
3	HCC NE	PC	3878
4	ODU_SNCP_STA_INDI	Transient	3494
5	vtv_Exceed	Transient	3113

Alarm Compression Statistic(Yesterday)

No.	Domain	Alarm C...	Compre...	Filtering	PC-C	Synthetic...
1	RF_KPI_...	823	51.40%	51.40%	0.00%	0.00%
2	Transmis...	3631	97.82%	0.00%	0.00%	0.00%
3	Data	7453	81.18%	23.31%	2.67%	0.00%
4	RAN	16222	96.58%	81.09%	7.09%	0.00%
5	MW	305	98.69%	1.64%	0.00%	0.00%
6	CORE_IMS	2985	92.73%	92.60%	0.00%	0.00%
7	Default	329	21.28%	0.00%	0.00%	0.00%
8	CORE_PS	35966	96.19%	96.10%	0.00%	0.00%
9	Ericsson...	13955	70.76%	19.23%	0.19%	0.00%
10	RAN_IN...	2796	82.58%	0.00%	5.04%	0.00%
11	ALL	84465	89.52%	65.51%	1.80%	0.00%

Fault Rules

Configure Alarm (450/525)

Filtering

Delay Count

Transient

PC

Shielding

Fault Rules

Configure Alarm (450/525)

Filtering

Delay Count

Transient

PC

Shielding

Synthetic

Fault Rules

Configure Alarm (450/525)

Filtering

Delay Count

Transient

PC

Shielding

Synthetic

Flooding

Filtering

207 Total Rules
145 Enabled 62 Disabled

Alarm filtering rules define the alarms that O&M personnel consider to be filtered, for example, low-severity alarms that do not require attention. After a rule takes effect, the system assigns a filtering suppression value (dictionary value 5) to the filtering result field of the alarms that meet the rule. This helps O&M personnel filter these alarms in the alarm list, improving monitoring efficiency.

Enter a rule ID or rule name, or select an attribute for filtering.

Rule ID	Rule Name	Rule Type	Domain	Vendor	Operation
2503230002	Temp_Activity	Filtering	Core		

Transient

154 Total Rules
154 Enabled 0 Disabled

The flashing alarm rule defines the alarms that occur within a specified period and are cleared within that period. After the rules come into effect, the system will assign flash suppression (dictionary value 2) to alarms that comply with the rules in the flash rule result field, assign flash normal (dictionary value 1) to alarms that are marked but not processed successfully, or assign normal (dictionary value 0) to alarms that are not marked, making it easier for operation and maintenance personnel to filter these alarms in the alarm list and improve monitoring efficiency.

Enter a rule ID or rule name, or select an attribute for filtering.

Rule ID	Rule Name	Rule Type	Domain	Vendor	Operation
2502060001	Radio_Link_Co...	Transient	Ericsson TX		

Shielding

5 Total Rules
3 Enabled 2 Disabled

Alarm masking rules define alarms that O&M personnel consider to be masked and do not need to be concerned or processed by the system. After a rule takes effect, the alarms that meet the rule are discarded or archived on the Historical Alarms page by the collection probe and are not displayed on the Active Alarms page. This reduces the number of alarms to be monitored.

Enter a rule ID or rule name, or select an attribute for filtering.

Rule ID	Rule Name	Rule Type	Type	Domain	Operation
1902190002	NE_Software_...	Shielding		Transmission	
1902190001	Resync	Shielding		CS	
1811130001	Site_Entry_Shi...	Shielding		RAN-3G	
1704190004	swap_X2_Inter...	Shielding		RAN-4G	

Fault Rules

Configure Alarm (450/525)

Filtering

Delay Count

Transient

PC

Fault Rules

Configure Alarm (450/525)

Filtering

Delay Count

Transient

PC

Shielding

Fault Rules

Configure Alarm (450/525)

Filtering

Delay Count

Transient

PC

Shielding

Synthetic

Flooding

Delay Count

98 Total Rules
90 Enabled 8 Disabled

A delay counting rule defines the number of alarms that occur repeatedly in a period exceeds the threshold. After the rule takes effect, the system assigns DC rule parent alarm (dictionary value 1), DC rule child alarm (dictionary value 2), and common (dictionary value 0) to alarms that meet the rule. O&M personnel can filter these alarms in the alarm list to improve monitoring efficiency.

Enter a rule ID or rule name, or select an attribute for filtering.

Rule ID	Rule Name	Rule Type	Domain	Vendor	Operation
2410270006	CHAN_LOS	Delay_Count	Transmission	HUAWEI	

PC

58 Total Rules
58 Enabled 0 Disabled

PC alarm rules define the alarms that occur in a specific period and have correlation and causality relationships. After the rules take effect, the system adds a rule flag (ResultFlag: 1=P, 2=P&C, 3=C) to the alarms that meet the rules. O&M personnel easily filter these alarms in the alarm list, thereby improving monitoring efficiency. O&M personnel can filter these alarms in the alarm list to improve monitoring efficiency. For details, see [PC Rule Description](#).

Enter a rule ID or rule name, or select an attribute for filtering.

Rule ID	Rule Name	Rule Group	Domain	Vendor	Operation
2412290001	OSC_LOS		Transmission	HUAWEI	
2410290001	NE Is Disconn...		RAN	HUAWEI	

Synthetic

3 Total Rules
0 Enabled 3 Disabled

A synthetic alarm rule can correlate multiple alarms that occur in a period and have no obvious causal relationship. After the rule takes effect, the system assigns the combination rule parent alarm (dictionary value 1), combination rule child alarm (dictionary value 2), and common (dictionary value 0) to the alarms that meet the rule. O&M personnel can filter these alarms in the alarm list to improve monitoring efficiency.

Enter a rule ID or rule name, or select an attribute for filtering.

Rule ID	Rule Name	Rule Type	Domain	Vendor	Operation
2012245806	SY-TRX_Manu...	SyntheticV2	RAN-2G	HUAWEI	
2012245805	GSM_Site_Do...	SyntheticV2	RAN-2G	HUAWEI	
2012245804	Module_Fault_...	SyntheticV2	PS	HUAWEI	

Data collection & Alarm filtering

Performance data

Evidence:

	EMS Name	Alarm Severity	Alarm Name	Alarm Source	First Occurred On
<input type="checkbox"/>	MAE_Taishan	Major	GSM KPI Exceed Threshold	BSCSH3	2025-06-11 15:16:21
<input type="checkbox"/>	Core_OSS	Critical	KPI Change Exceeding Threshold	SBA_UIMAAA	2025-05-23 03:20:12
<input type="checkbox"/>	Core_OSS	Critical	KPI Change Exceeding Threshold	SBA_UIMAAA	2025-05-23 03:20:12
<input type="checkbox"/>	Core_OSS	Critical	Decline of KPI Entity Exceeds Threshold	SBA_SE2980	2025-05-16 01:07:58
<input type="checkbox"/>	Core_OSS	Critical	Decline of KPI Entity Exceeds Threshold	OHQ_SE2980	2025-05-16 01:07:43
<input type="checkbox"/>	Core_OSS	Critical	KPI Change Exceeding Threshold	SBA_UIMAAA	2025-05-06 15:15:12
<input type="checkbox"/>	NetBoss	Critical	ntrKPIULThreshold	SBA-Mobelium-App1	2025-04-11 02:40:48
<input type="checkbox"/>	NetBoss	Critical	ntrKPIULThreshold	HQ-Mobelium-App1	2025-04-11 02:40:45

Topology data collection

Evidence:

Task Name | | | | |

<input type="checkbox"/>	Task Name	Task ID	Execution Type	Task Type	Task Status	Create Time	Start Time	End Time	Duration (min)	Task Heartbeat (Refresh Period:180s)	Operation
<input checked="" type="checkbox"/>	topo restore1749589...	31	period executi...	topo restore	Complete	2025-06-11 00:00:04	2025-06-11 00:00:04	2025-06-11 00:07:28	7.29	2025-06-11 00:07:23:...	

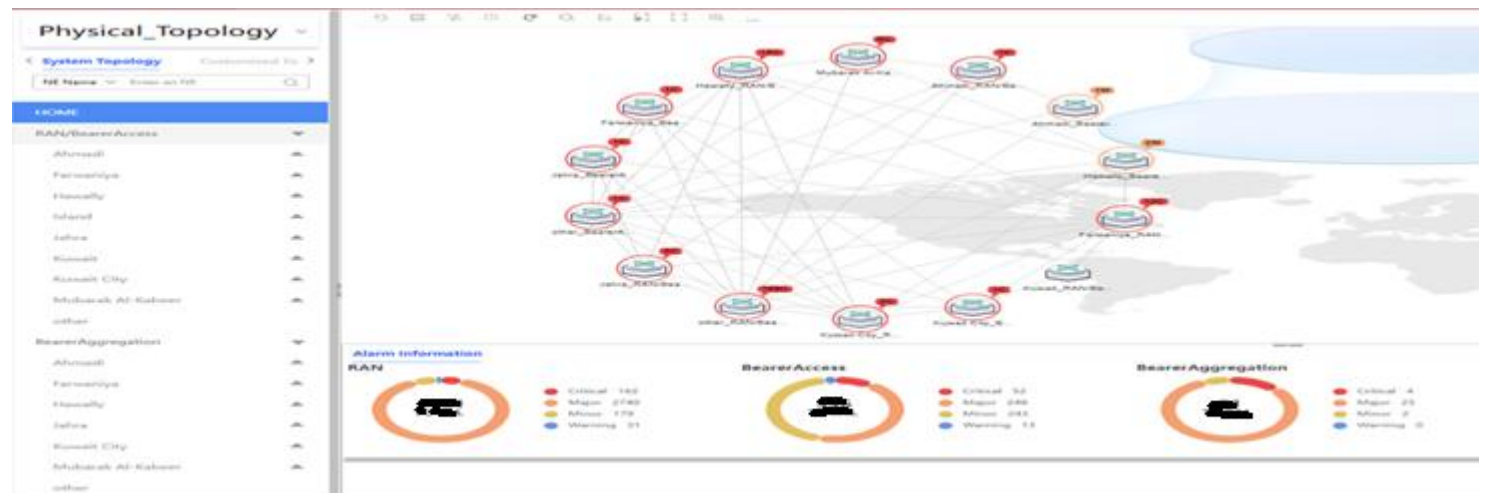
Task Details | **Restoration Report** | Statistical Analysis

Service Path Restoration Rate | Service Path Coverage Rate | Physical Topology Coverage Rate

Wireless Service Path Restoration Rate

No.	Scenario	Denomin...	Numerator	Restoration ...	Statistical Analysis
1	Total Base Stations	12018	11240	93.53%	
2	Physical Base Stations	3526	3296	93.48%	
3	Logical Base Stations	8492	7944	93.55%	
4	Physical Base Stations(Wireles...	3288	3288	100.00%	
5	Physical Base Stations(Wireles...	813	596	73.31%	

Total 5 | 10/page | | Go to



Fault Prediction

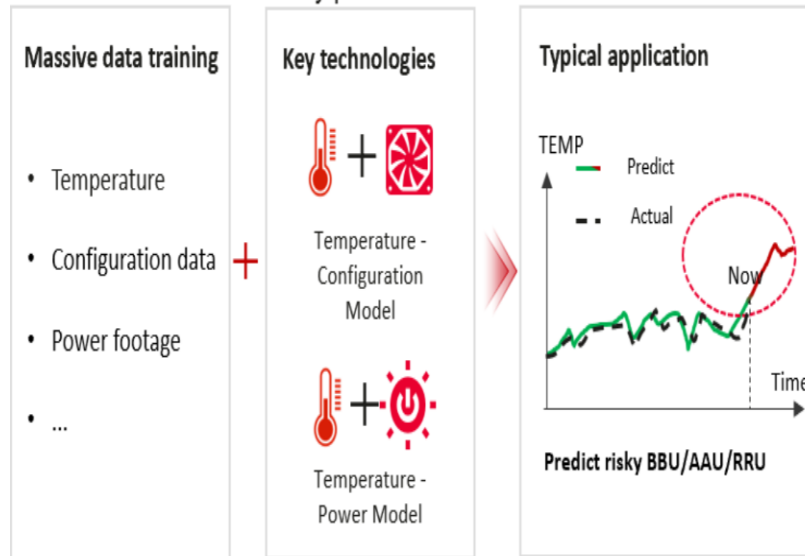
Question:

Does the wireless network fault management system support fault prediction in various fault scenarios?

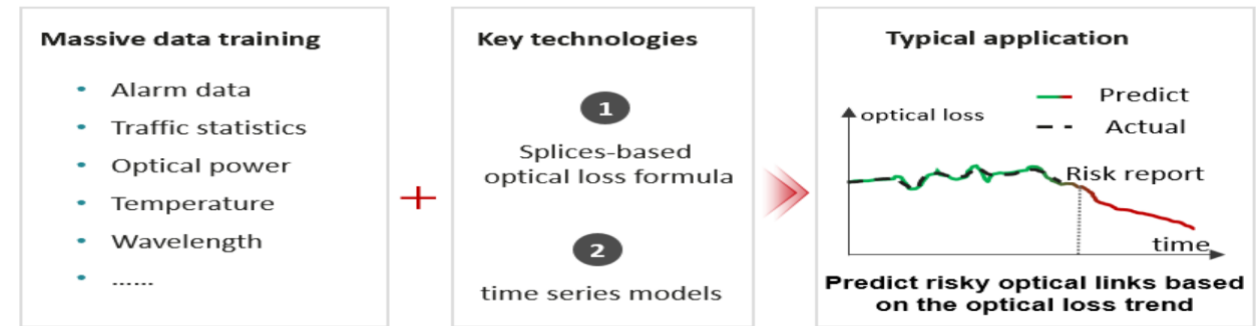
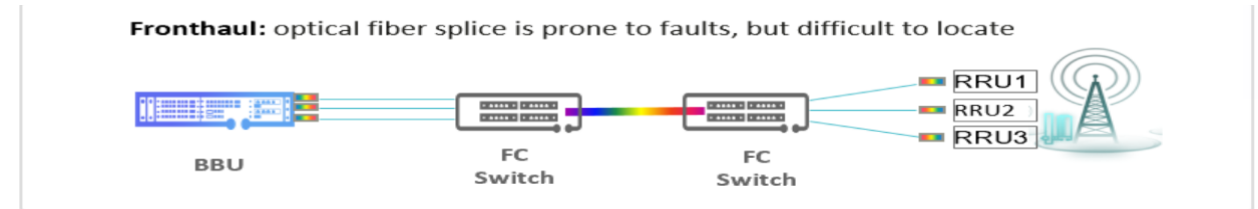
Options:

√ Option A	Option B	Option C	Option D
The system can automatically identify potential risks and predict the fault occurrence time based on intelligent models. For example, the system can predict that the fronthaul optical module will be faulty within XX days.	The system can automatically identify potential risks based on intelligent models (intelligent rules), but cannot predict the fault occurrence time.	The system can identify potential risks based on manually defined rules. For example, the system can identify potential risks of fronthaul optical modules based on preset optical power thresholds.	Potential risks need to be manually identified based on expertise.

Evidence:



Temperature Risk Prediction



Optical Link Risk Prediction

Fault Prediction

Evidence

The screenshot displays the MasterMAE FaultCare interface. The main window shows a detailed view of an incident titled "High Temperature Risks - BBU High Temperature Fault Prediction". The incident details are as follows:

Field	Value
Category	ancillary facilities
Incident Name	High Temperature Risks - BBU High Temperature Fault Prediction
NE Type	BT55000
NE Name	[REDACTED]
Descriptions	[builds high temperature(The USBP(0-0-1) board may have a high temperature risk,1. The air conditioner in the equipment room is faulty 2. Electrical faults occur 3. The fan board in the BBU is faulty 4. The board is faulty
Handling Suggestions	"Check the equipment room environment. For example check whether the air conditioner is running properly whether the equipment room door is closed, and whether there are too many BBUs stacked."
Occurred On	2025-07-16 16:30:00
Clearance Status	Uncleared
Created On	2025-07-16 17:04:15
Arrive On	2025-07-16 17:04:15
Acknowledgment Status	Unacknowledged
Acknowledged On	
Cleared On	
Serial Number	1466648376027392
Business Impact Analysis	
Priority	High
Domain	RAN
Updated On	2025-07-16 18:04:09
Last Appended On	2025-07-16 17:00:00
Cleared By	
Occurrences	2

The interface also shows a list of other incidents on the left and a table of incident logs on the right.

The screenshot displays the MasterMAE FaultCare interface. The main window shows a detailed view of an incident titled "CPRI Link Risk - Fronthaul Link Fault Prediction". The incident details are as follows:

Field	Value
Category	link
Incident Name	CPRI Link Risk - Fronthaul Link Fault Prediction
NE Type	BT55000
NE Name	[REDACTED]
Descriptions	NE name=MDN6019-NNN_SFRAN, upper-level node: cabinet number=0, subrack number=0, slot number=0, Port No=1, Port Type=CPRI, Bom Code=34060987, lower-level node: cabinet number=0, subrack number=123, slot number = 0, Port No=1, Port Type=CPRI, Bom Code=34060713, direction:UP, Benefits of troubleshooting=7db, Upper-level Node Tx(db)=-2.13, Upper-level Node Rx(db)=-14.41, Lower-level Node Tx(db)=-3.49, Lower-level Node Rx(db)=-3.75.
Handling Suggestions	Check the fiber optic cable. Troubleshoot improper fiber optic cable connections, such as cable bending, deformation, or optical transmission equipment failure.
Occurred On	2025-07-08 00:00:00
Clearance Status	Cleared
Created On	2025-07-08 18:15:37
Arrive On	2025-07-08 18:15:37
Acknowledgment Status	Acknowledged
Acknowledged On	2025-07-16 17:15:35
Cleared On	2025-07-15 17:15:34
Serial Number	1461610860728448
Business Impact Analysis	
Priority	High
Domain	RAN
Updated On	2025-07-16 17:15:35
Last Appended On	2025-07-10 00:00:00

The interface also shows a list of other incidents on the left and a table of incident logs on the right.

Fault Prediction

Evidence

There is clock alarm in BTS Rule base and handle the problem onsite in advance to prevent service interruption after the clock out of sync → case Network impact, out of service

Dispatch Parameters

- Parameters for automatic TT dispatch:
 - Delay (s) and Abnormal delay (s): These two parameters determine (s) and uses the later time as the planned TT dispatch time.
 - Max. retries: When an exception occurs during TT dispatch, the TT dispatch fails.
 - Priority: Processing priority of the TT dispatch rule. When multiple processed first.
 - TT template: If you configure a template for automatic TT dispatch.

* Delay (s)
600

Fault level
-

TT Association Parameters

- Parameters for automatic association:
 - TT group: Association parameter for automatic TT association. A TT is associated with different alarms during TT dispatch based on this parameter. That is, different alarms have the same TT ID. When multiple TT groups are configured:
 - The priority of TT Group by Condition is higher than that of TT Group in Fixed Format.
 - The configuration of multiple TT groups in TT Group by Condition takes effect based on the priority from top to bottom. If none of the conditions is met, the default TT group is used.
 - TT association interval and Interval unit: Association time range parameters for automatic TT association, which determines that the TT is associated with alarms only within the valid time range during TT dispatch.
 - Ticket priority: Priority of TT association. The value is an integer ranging from 1 to 3. A smaller value indicates a higher priority.

Ticket group
Select Add Delete

Ran_Hardware_S(Site Name) 25/2000

TT association interval

Interval unit
Seconds

Ticket priority
3

- 1. Auto TT rule defines the alarms that require automatic TT dispatching. The TT is automatically dispatched with the specific TT dispatching template for the alarms that meet the rule.
- 2. When a ticket is being dispatched for an alarm, if other alarms at the same site meet the alarm exclusion condition, the dispatch is cancelled. If the alarm for which a ticket is dispatched meets the site exclusive condition, the dispatch is cancelled.
- 3. When a trouble ticket is dispatched for a main alarm, the system automatically associates the child alarms within 2 minutes after the trouble ticket is dispatched for the main alarm.

Basic Information

- Configure parameters in the Basic Information area for an automatic TT dispatch rule (Domain and Vendor are used only for rule classification). Set Rule start time and Rule end time as required. The TT dispatch rule takes effect in the configured time period. If they are not set, the TT dispatch rule takes effect in the entire time period.

* Rule name: RAN_BO_Auto-TT

Domain: RAN

Vendor: -

Rule start time: -

Rule end time: -

Comments: 0/4000

Conditional Configuration

- Configure condition expressions for triggering an automatic TT dispatch rule based on the actual TT dispatch requirements.

Expression

Simple Mode Condition Mode

-Select- -Select- Enter a value.

and or ()

"Alarm Name" In ("GNSS Locked Satellites Insufficient","External Clock Reference Problem")

Fault Prediction

Evidence

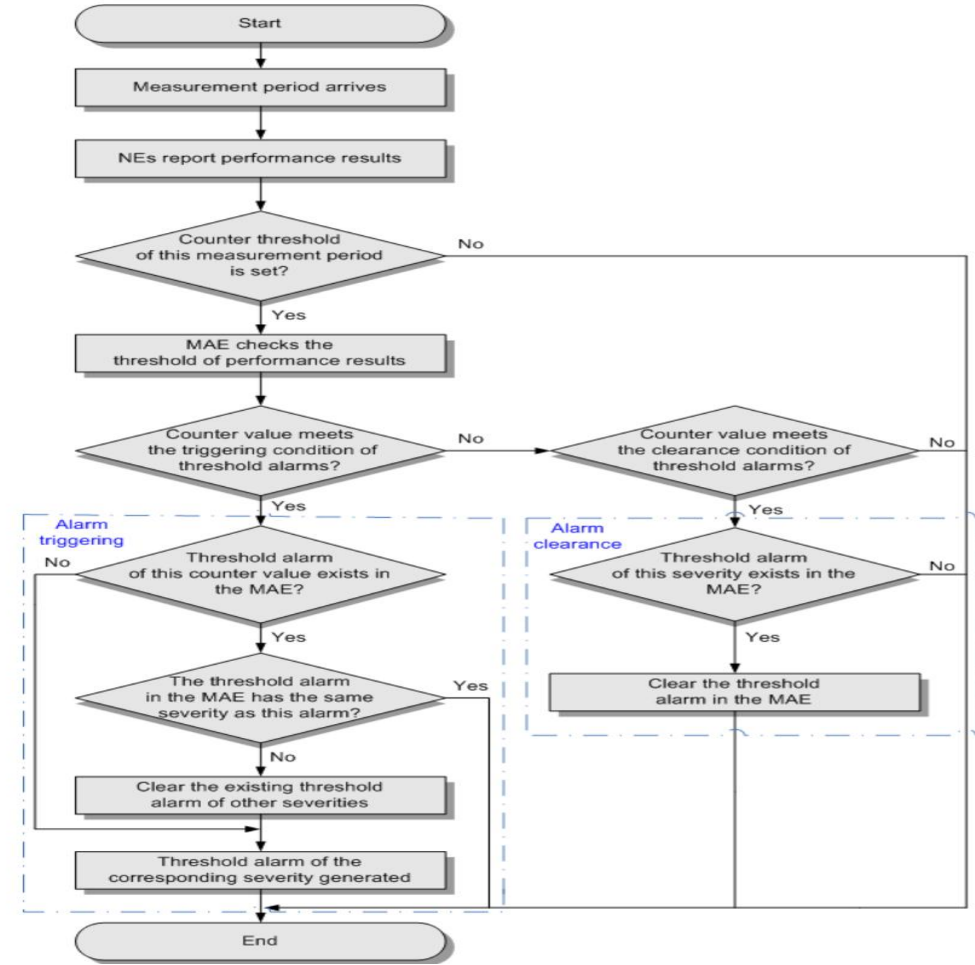
Alarm is reported when the operating temperature of an RF unit is out of the normal range

Operation	Category To	Incident Name To	RF Name To	Occurred On	Diagnosis Status	Self Healing St.	Business L.	Self Heal.	Description
RF Unit Fault	RF Unit Temperature Abnormal	RF Unit Temperature Abnormal		2025-07-27 13:47:08	Diagnosis succeeded	Unrepairable	-	-	AFFECTED_RAT_L, RF Unit Temperature Abnormal RF Unit Temper...
RF Unit Fault	RF Unit Temperature Abnormal	RF Unit Temperature Abnormal		2025-07-25 13:39:23	Diagnosis succeeded	Unrepairable	-	-	AFFECTED_RAT_L, RF Unit Temperature Abnormal RF Unit Temper...
RF Unit Fault	RF Unit Temperature Abnormal	RF Unit Temperature Abnormal		2025-07-25 12:09:57	Diagnosis succeeded	Unrepairable	-	-	AFFECTED_RAT_L, RF Unit Temperature Abnormal RF Unit Temper...
RF Unit Fault	RF Unit Temperature Abnormal	RF Unit Temperature Abnormal		2025-07-23 21:40:52	Diagnosis succeeded	Unrepairable	-	-	AFFECTED_RAT_L, RF Unit Temperature Abnormal RF Unit Temper...

Comment	Severity To	Alarm Source	Alarm ID	Name	First Occurred (NT)	Last Occurred (NT)	Details On (NT)	Occurrence Times	Alarm ID	Alarm Name	Alarm Information
	Minor		26525	RF Unit Temperature Unacceptable	2025-07-28 22:53:32	2025-07-28 22:53:32	2025-07-28 22:53:32	1	26525	RF Unit Temperature Unacceptable	ROOT/5G_Sites
	Minor		26525	RF Unit Temperature Unacceptable	2025-07-28 17:34:13	2025-07-28 17:34:13	2025-07-28 17:34:13	1	26525	RF Unit Temperature Unacceptable	ROOT/5G_Sites
	Minor		26525	RF Unit Temperature Unacceptable	2025-07-28 17:09:58	2025-07-28 17:09:58	2025-07-28 17:09:58	1	26525	RF Unit Temperature Unacceptable	ROOT/5G_Sites
	Minor		26525	RF Unit Temperature Unacceptable	2025-07-28 17:07:06	2025-07-28 17:07:06	2025-07-28 17:07:06	1	26525	RF Unit Temperature Unacceptable	ROOT/5G_Sites

Alarm Details and Handling Procedure	Experience	Handling Records In Last 2 Months
Maintenance Region:		ROOT/5G_Sites
Last Occurred (NT):	2025-07-28 22:53:32	Alarm Duration: 0 hours 33 minutes 32 seconds
Occurrence Times:	1	Alarm ID: 26525
Severity:	Minor	Type: Hardware system
Occurrence Notify Time (h...):	2025-07-28 22:53:32	Virtual Mark: No
Additional Information:	RAT_INFO=G-L-N, AFFECTED_RAT=L, DID=AUTOID0_20210503_d8f9f62-ac1d-11eb-8000-fa163aact, RF Site Name=NULL, RF Unit Name=0-70-df8153aact, RF Unit Name=0-70-df8153aact, ESN=, eNodeBID=42949, gNodeBID=32949	Location Information: Cabinet No.=0, Subrack No.=0, Slot No.=0, Board Type=MRRLL, RA Temperature (C/F)=96/205, Board Temperature(C/F)=78/172, Output Power (0.1 dBm)=524
Causes:	This alarm is reported when the operating temperature of an RF unit is out of the normal range. The rated operating temperature range is a hardware specification of RF units. This range varies depending on the type of the RF unit.	

The performance threshold management function helps users monitor counter values of NEs. If a counter value exceeds a threshold, a corresponding threshold alarm is generated.



Fault Prediction

Evidence

Preset rules and thresholds to identify optical performance degraded

The screenshot shows the iMaster MAE Rule Management interface. A rule with ID 3 is selected, named "Cell Out of Service - Optical Port". The rule is enabled and its description is "Cell Out of Service - Optical Port". The conditions are set to an alarm group containing various equipment models. The alarm list shows several instances of "RF Unit Optical Module Fault" (ID 26507) and "RF Unit Optical Interface Performance Degraded" (ID 26506), both highlighted with red boxes. Other alarms include "RF Unit IR Interface Error" (ID 26508) and "RF Unit CPRI Interface Error" (ID 26504).

Alarm ID	Name
26525	RF Unit Temperature Unacceptable
26508	RF Unit IR Interface Error
26507	RF Unit Optical Module Fault
26506	RF Unit Optical Interface Performance Degraded
26504	RF Unit CPRI Interface Error
26503	RF Unit Optical Module Transmit/Receive Fault

The screenshot shows the Command Editor interface with a script for monitoring optical power. The script defines thresholds for receive and transmit power and compares actual records against these thresholds.

```
Receive Power Lower Threshold(R.3Microwatt) = 363  
Transmit Power Upper Threshold(R.3Microwatt) = 11208  
Transmit Power Lower Threshold(R.3Microwatt) = 3345  
TX optical power(R.0100e) = -248  
RX optical power(R.0100e) = -178  
RECEIVE Power Upper Threshold(R.0100e) = 49  
Receive Power Lower Threshold(R.0100e) = -1640  
Transmit Power Upper Threshold(R.0100e) = 49  
Transmit Power Lower Threshold(R.0100e) = -323  
FUNCTION SUPPORT = SW_FUNCTION_NOTSUPPORT  
= OPTICAL_PATH_QUALITY_DETECTION_NOTSUPPORT  
SW(R.0100) = NULL
```

The screenshot shows the Alarm Log interface displaying a list of "Transmission Optical Interface Error" alarms. The table includes columns for Operation, Severity, Alarm ID, Name, NE Type, Alarm Source, MO N., Location Information, Occurred On, Cleared On, and Acknowledged On.

Operation	Severity	Ala. ID	Name	NE Type	Alarm Source	MO N.	Location Information	Occurred On (NT)	Cleared On (NT)	Acknowledged On (S)
	Major	26222	Transmission Optical Interface Error	BT53900			Cabinet... Cabinet No=0, Subrack No=0, Slot No=7, Port No=1, Board Typ...	2025-07-26 16:34:47	2025-07-26 16:36:35	2025-07-28 01:00...
	Major	26222	Transmission Optical Interface Error	BT53900			Cabinet... Cabinet No=0, Subrack No=0, Slot No=7, Port No=1, Board Typ...	2025-07-26 16:42:20	2025-07-26 16:44:42	2025-07-28 01:00...
	Major	26222	Transmission Optical Interface Error	BT53900			Cabinet... Cabinet No=0, Subrack No=0, Slot No=7, Port No=1, Board Typ...	2025-07-26 16:50:14	2025-07-26 16:52:41	2025-07-28 01:00...
	Major	26222	Transmission Optical Interface Error	BT53900			Cabinet... Cabinet No=0, Subrack No=0, Slot No=7, Port No=1, Board Typ...	2025-07-26 16:57:26	2025-07-26 16:59:51	2025-07-28 01:00...
	Major	26222	Transmission Optical Interface Error	BT53900			Cabinet... Cabinet No=0, Subrack No=0, Slot No=7, Port No=1, Board Typ...	2025-07-26 17:19:14	2025-07-26 17:21:39	2025-07-28 01:00...
	Major	26222	Transmission Optical Interface Error	BT53900			Cabinet... Cabinet No=0, Subrack No=0, Slot No=7, Port No=1, Board Typ...	2025-07-26 17:26:35	2025-07-26 17:29:03	2025-07-28 01:00...
	Major	26222	Transmission Optical Interface Error	BT53900			Cabinet... Cabinet No=0, Subrack No=0, Slot No=7, Port No=1, Board Typ...	2025-07-26 17:41:39	2025-07-26 17:44:07	2025-07-28 01:00...
	Major	26222	Transmission Optical Interface Error	BT53900			Cabinet... Cabinet No=0, Subrack No=0, Slot No=7, Port No=1, Board Typ...	2025-07-26 18:03:01	2025-07-26 18:05:23	2025-07-28 01:00...

Fault identification & Impact analysis

Question:

Does the wireless network fault management system support fault identification & fault impact analysis in various fault scenarios?

Options:

Option A	Option B	Option C	Option D
The system automatically identifies faults and subsequent impact based on intelligent rules.	The system can automatically identify faults and subsequent impact based on manually defined rules , for example, identifying intermittent faults based on a frequency experience threshold and aggregating periodic alarms based on a period threshold.	Faults and impact need to be manually identified based on expertise.	

Evidence:

When many alarms from different domain occur during centralized alarm monitoring, AABD pro can analyze the root cause of these faults based on the resource topology and alarm information, helping FO/BO quickly locate the root alarms. Also, explore the propagation relationship between alarms based on topology resource, historical alarms

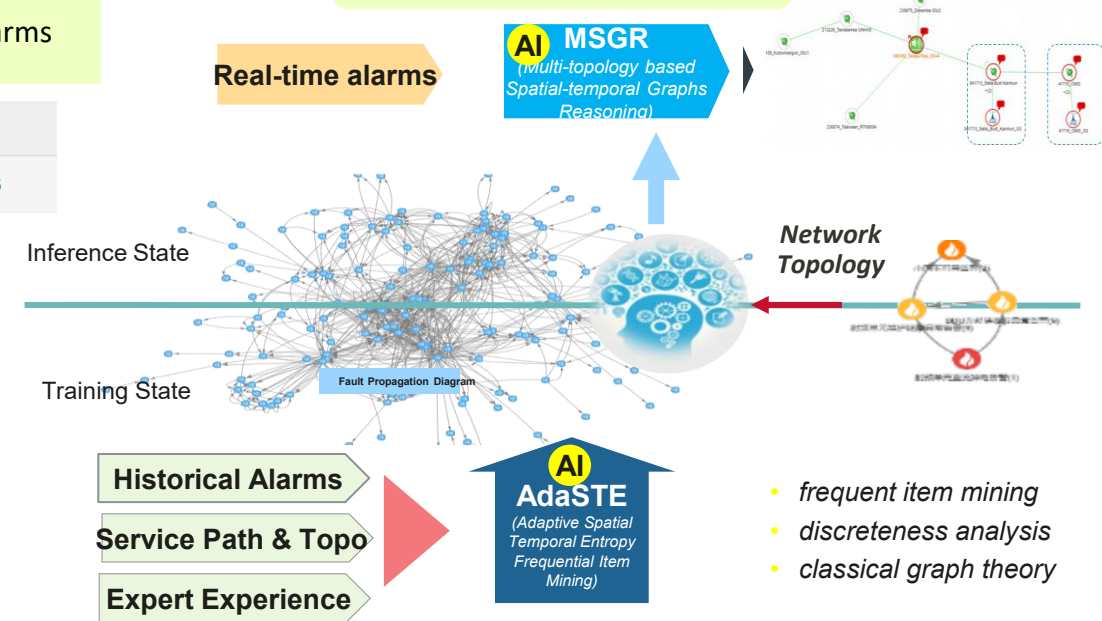
AABD Pro Mining rules and AI algorithms.

Task ID	Task Type	Task Status	Analysis Start Time	Analysis End Time	Task Details
periodMining	Incremental mi...	Successful	2025-09-23 08:26:53	2025-10-27 08:34:31	period: 2 days, start time: 2025-09-23 08:31:26

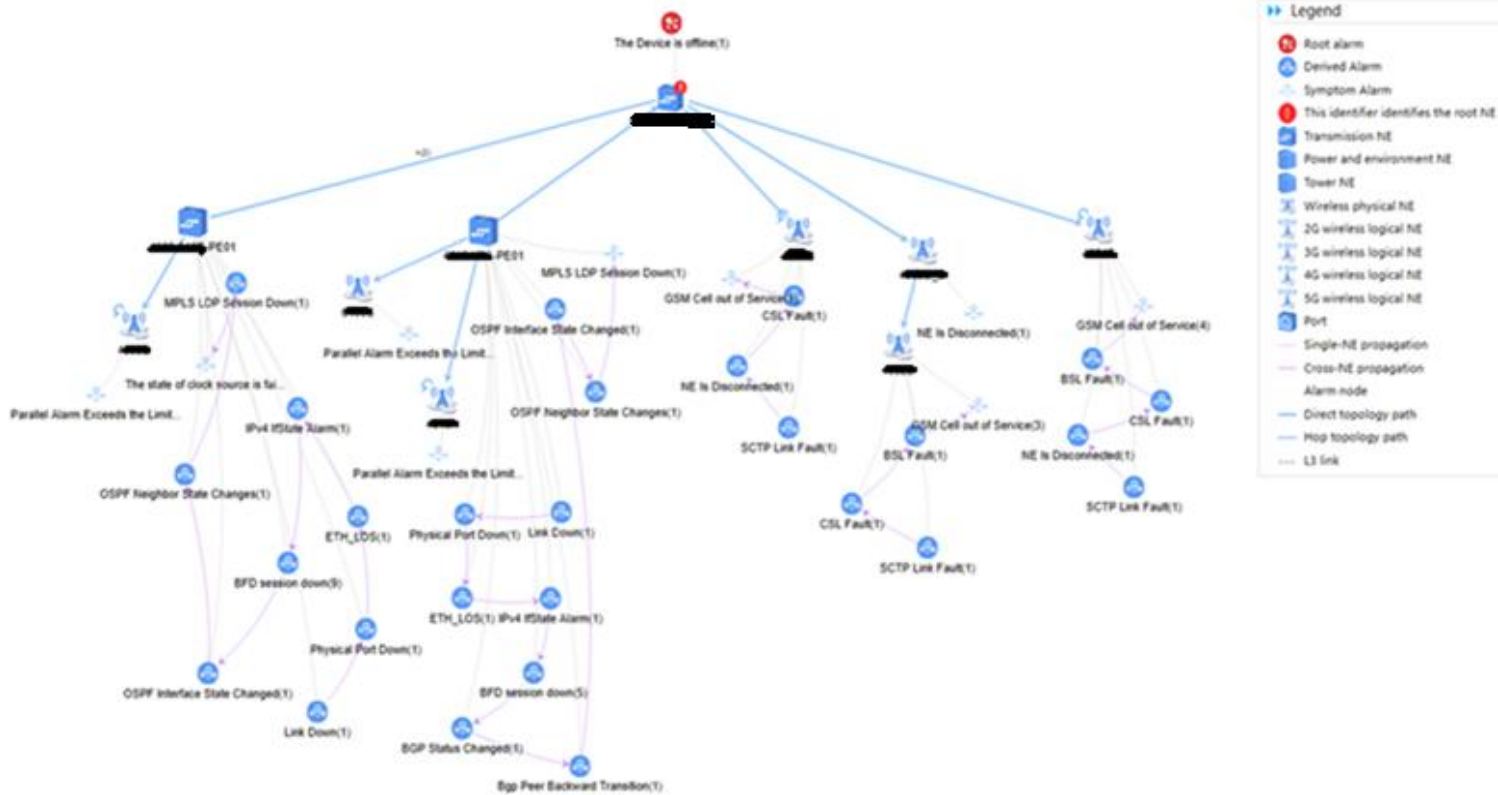
- + Expert Experience Task
- + Historical Alarm Mining Task**
- + Incremental Mining Task
- + Topology and Equipment Room Import Task Settings

AABD Pro Auto Alarm Behavior Discovery

1. Root Cause Alarm
2. Root Cause NE



Fault identification & Impact analysis



Domain	Alarm Propagation	Netes	Alarm Severity	Alarm Name	Alarm Source	First Occurred On
RAN	Derived alarm	2G	Critical	NE Is Disconnected		2025-10-27 15:34:48
RAN	Symptom alarm		Critical	NE Is Disconnected		2025-10-27 15:34:47
RAN	Derived alarm	2G	Critical	NE Is Disconnected		2025-10-27 15:34:47
RAN	Derived alarm	2G	Major	CSL Fault		2025-10-27 15:31:35
RAN	Symptom alarm	2G	Major	GSM Cell out of Service		2025-10-27 15:31:35
RAN	Symptom alarm	2G	Major	GSM Cell out of Service		2025-10-27 15:31:35
RAN	Derived alarm	2G	Major	CSL Fault		2025-10-27 15:31:35
RAN	Symptom alarm	2G	Major	GSM Cell out of Service		2025-10-27 15:31:35
RAN	Symptom alarm	2G	Major	GSM Cell out of Service		2025-10-27 15:31:35
Data	Root alarm	IP	Critical	The Device is offline		2025-10-27 15:31:35
RAN	Symptom alarm	2G	Major	GSM Cell out of Service		2025-10-27 15:31:35
RAN	Derived alarm	2G	Major	BSL Fault		2025-10-27 15:31:30
RAN	Symptom alarm	2G	Major	GSM Cell out of Service		2025-10-27 15:31:30
RAN	Symptom alarm	2G	Major	GSM Cell out of Service		2025-10-27 15:31:29
RAN	Derived alarm	2G	Major	CSL Fault		2025-10-27 15:31:29
RAN	Symptom alarm	2G	Major	GSM Cell out of Service		2025-10-27 15:31:29
RAN	Symptom alarm	2G	Major	GSM Cell out of Service		2025-10-27 15:31:29
RAN	Derived alarm	2G	Major	BSL Fault		2025-10-27 15:31:19
Data	Derived alarm	IP	Major	Bgp Peer Backward Tra...		2025-10-27 15:30:04
Data	Derived alarm	IP	Major	BGP Status Changed		2025-10-27 15:30:01
RAN	Derived alarm	2G	Minor	SCTP Link Fault		2025-10-27 15:29:57
RAN	Derived alarm	2G	Minor	SCTP Link Fault		2025-10-27 15:29:54
RAN	Derived alarm	2G	Minor	SCTP Link Fault		2025-10-27 15:29:49
Data	Derived alarm	IP	Major	MPLS LDP Session Do...		2025-10-27 15:29:46
Data	Symptom alarm	IP	Major	MPLS LDP Session Do...		2025-10-27 15:29:46
Data	Derived alarm	IP	Critical	ETH_LDS		2025-10-27 15:29:43

Total 37 records

- ❑ **Case Description:**
Router 4824 is offline, then cause other routers offline which go through the 4824 router, the sites connect to these offline routers report site down alarms.
- ❑ **Normal situation:**
 - **tickets:** Create a ticket for each base station and each router
- ❑ **With AABD Pro:**
 - **1 Fault Cluster group:** Normally, all these alarms will be involved into a AABDPro Fault Cluster, **The Device is offline** alarm will be marked as Root Alarm, other alarms will be marked as Derived Alarm or Symptom Alarm.
 - **1 ticket:** Only create 1 ticket for it, other alarms will be related to the ticket.

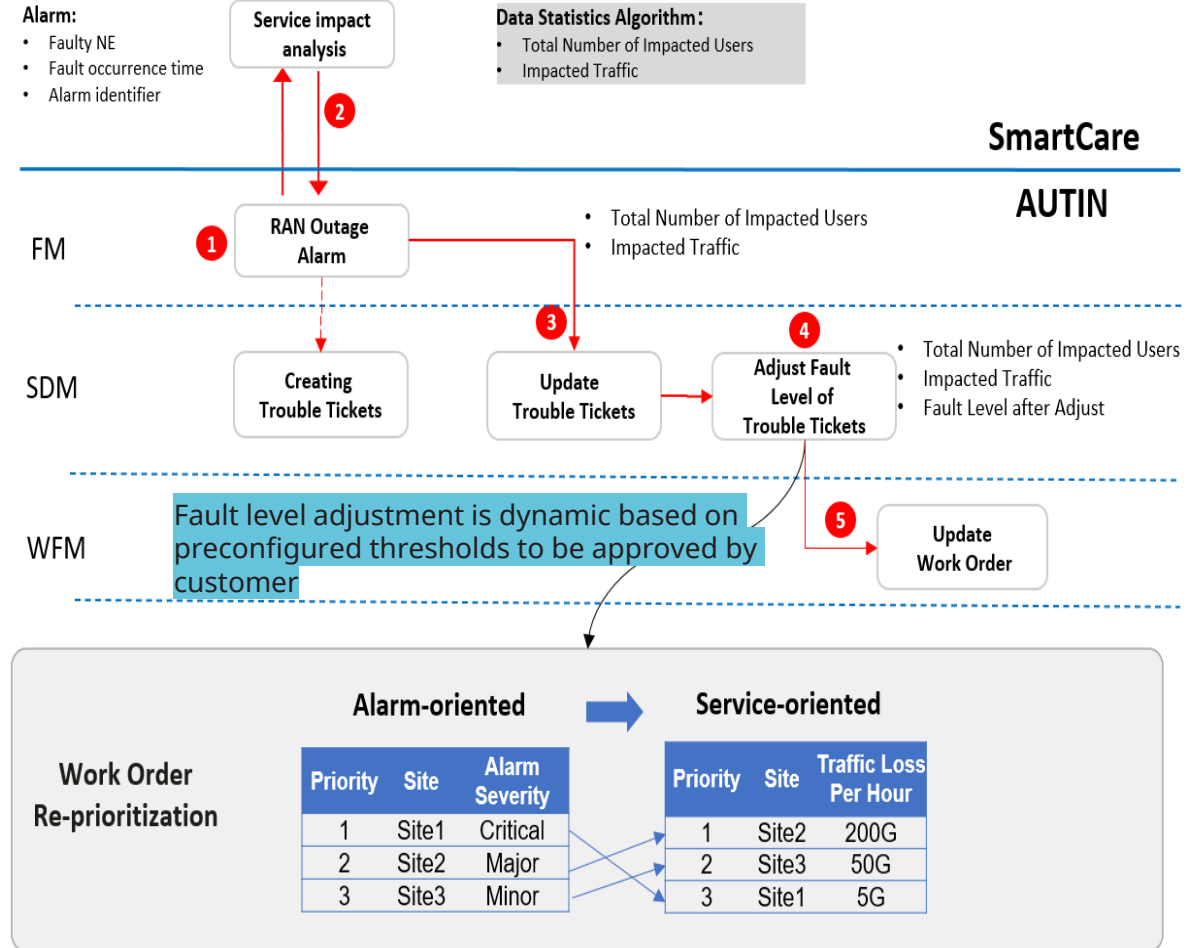
Fault identification & Impact analysis

Alarm Query Page

Scenario description: The basic data of service loss reduction management comes from SmartCare and iSDM. OWS (iFM) reports to SmartCare through NBIs and automatically creates trouble tickets based on existing TT diswireless out-of-service alarms patch rules.

Alarm Name	Ticket ID	NE Name	Total Impacted	Impacted Traffic	Impacted Subscribers 4G	Impacted Subscribers	First Occurred On
CSL Fault	INC-20251027-0000000169		75	0.05	0	75	2025-10-27 15:31:29
GSM Cell out of Service	INC-20251022-0000000178		62	0.02	0	62	2025-10-22 17:15:33
GSM Cell out of Service	INC-20251021-0000000111		54	0.5	0	54	2025-10-21 00:55:00
NE Is Disconnected	INC-20251020-0000000109		264	8.75	264	0	2025-10-20 12:58:53
NE Is Disconnected	INC-20251012-0000000119		60	0.42	60	0	2025-10-12 11:51:19
NE Is Disconnected	INC-20251005-0000000161		65	1.0	65	0	2025-10-05 14:35:55
NE Is Disconnected	INC-20251005-0000000161		75	10.21	75	0	2025-10-05 12:58:23
Cell Unavailable	INC-20251002-0000000207		435	39.57	435	0	2025-10-02 19:09:34
Cell Unavailable	INC-20251002-0000000155		54	0.61	54	0	2025-10-02 15:33:59
GSM Cell out of Service	INC-20250924-0000000085		69	0.0	0	69	2025-09-24 08:14:18
CSL Fault	INC-20250922-0000000144		85	0.04	0	85	2025-09-22 14:35:45
Cell Unavailable	INC-20250908-0000000062		254	12.48	254	0	2025-09-08 07:59:18
Cell Unavailable	INC-20250907-0000000289		324	34.99	324	0	2025-09-07 23:27:49
Cell Unavailable	INC-20250907-0000000192		121	10.95	121	0	2025-09-07 16:16:57
Cell Unavailable	INC-20250907-0000000073		469	25.77	469	0	2025-09-07 07:45:31
Cell Unavailable	INC-20250906-0000000342		133	9.95	133	0	2025-09-06 22:39:14
Cell Unavailable	INC-20250906-0000000314		319	24.48	319	0	2025-09-06 19:37:42
Cell Unavailable	INC-20250906-0000000140		151	10.48	151	0	2025-09-06 09:35:44
Cell Unavailable	INC-20250906-0000000120		61	6.8	61	0	2025-09-06 08:31:16
Cell Unavailable	INC-20250906-0000000053		210	4.93	210	0	2025-09-06 04:12:21
Cell Unavailable	INC-20250905-0000000226		190	21.02	190	0	2025-09-05 20:02:28
Cell Unavailable	INC-20250905-0000000191		211	25.08	211	0	2025-09-05 17:06:29
Cell Unavailable	INC-20250905-0000000124		184	16.68	184	0	2025-09-05 10:38:26
Cell Unavailable	INC-20250905-0000000124		194	19.9	194	0	2025-09-05 10:19:35
Cell Unavailable	INC-20250905-0000000102		118	8.57	118	0	2025-09-05 10:17:21

In the screen shoots you can see the sample from alarms and tickets that have successfully enriched with impact analysis by SOC-NOC collaboration integration



Fault identification & Impact analysis

Evidence:



Service Quality Degradation

Major

Degradation Event

Service Degradation

1010000

Creation Time
2025-07-15 12:42:56

Event Continue Time
7 day 0 hours 2 minutes

Status
Cleared

Task Status
Processed

Summary **Event Dash...** Correlativ... Characteri... Topo & GIS Performanc...

80

Board View

Operation

Operation Log

Major Cleared Service Quality Degradation

Service Quality Degradation Event Process 2025-07-15 12:43:00

Demarcation And Location

Warn And Dispatch Ticket

Device Alarm Association

Result: Service experience issue are associated with 1 wireless NEs, 0 core network NEs.
For wireless NEs, 1 NEs have associated wireless device alarms.

2025-07-16 13:28:32

system

Ticket Association

Result: The ticket is successfully associated
Work order association1: INC-20250715-0000000122

2025-07-16 13:28:34

system

Demarcation And Location

Result: There are 1 faults in total, and the main cause is Other.

- (1) Power causes: NA
- (2) Transmission causes: NA
- (3) Wireless causes: NA
- (4) Core causes: NA
- (5) Other causes

Fault point 1:
Faulty NEs: 2920M. Fault alarm "Cell Unavailable, 2025-07-15 11:21:09, Cleared, NE name: 2920M". Fault ca
locating.

2025-07-16 13:28:32

INC-20250715-0000000122 Incident Ticket # 2920_Cells Down

SLA

Last Update Time: 2025-07-15 21:50:04

General

Alarm Info.

Network Resources

Service Impact

Diagnose Details

Solution

Time

Auto Enriched By System

Total Impacted Sub...

78

Impacted Traffic(GB...

5.50703

Associated service ...

Service Quality Degradation

We now receiving Service Alarms and system identify it as an event and do the analysis and demarcation and associate it with the SQDT and TT if exist

Demarcation & Locating

Question:

Does the wireless network fault management system support root cause diagnosis and fault locating in various fault scenarios?

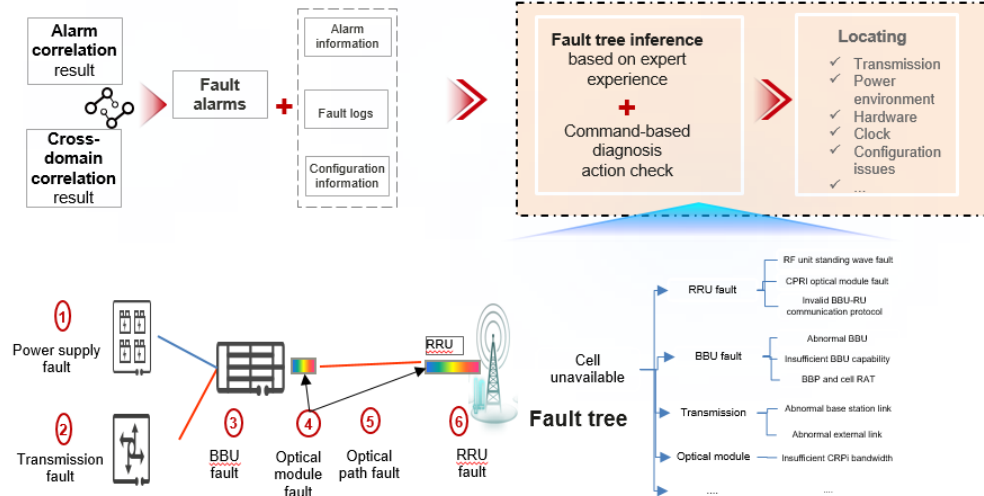
Note: **Fault scenarios include NE disconnection or out-of-service, cell faults, and fronthaul network faults.**

The root cause diagnosis and fault locating should require the ability to locate smallest field replaceable unit, upgradable software modules and connectors so that a repair solution can be quickly determined. e.g, Optical module, fiber optic cable and optical connectors.

Options:

Option A	Option B	Option C	Option D
The system automatically demarcates and locates faults based on intelligent models	The system automatically demarcates the fault or locates multiple causes based on intelligent diagnosis models. Manual confirmation is required.	The system can demarcate and locate faults based on manually defined rules, such as experience-based fault trees and troubleshooting processes.	Fault diagnosis needs to be manually performed based on expertise.

Evidence:



Cell out-of-service cases: Accurately locate six types of fault root causes and provide rectification suggestions.

	RCA Result	Diagnosis Status	Root Cause	Diagnosis Summary	Alarm Severity	Alarm Name	Alarm Source	Network Ty	Device Type	First Occurred On
<input type="checkbox"/>	C	Diagnosis is successful	Power	The Base Station disconnected is caused by ...	Critical	NE Is Disconnected		2G	BTS	2025-06-11 16:01:10
<input type="checkbox"/>	C	Diagnosis is successful	Power	The BTS fault is caused by power supply sys...	Major	CSL Fault		2G	eG BTS	2025-06-11 15:57:41
<input type="checkbox"/>	C	Diagnosis is successful	Transmissi...	The Base Station disconnected is caused by ...	Critical	NE Is Disconnected		5G	gNodeB	2025-06-11 15:42:10
<input type="checkbox"/>	P	Diagnosis is successful	Power	The Cell fault is caused by powered issue	Critical	The Device is offline		IP	Router	2025-06-11 13:48:23
<input type="checkbox"/>	C	Diagnosis is successful	Power	The Base Station disconnected is caused by ...	Critical	NE Is Disconnected		5G	gNodeB	2025-06-11 13:34:10
<input type="checkbox"/>	P	Diagnosis is successful	Power	The recommended root cause for site out-of...	Critical	SV 2		2G	eG BTS	2025-06-11 11:50:40
<input type="checkbox"/>	P	Diagnosis is successful	Power	The recommended root cause for Link Dow...	Critical	Link Down		IP	Router	2025-06-11 10:32:56
<input type="checkbox"/>	P	Diagnosis is successful	Power	The recommended root cause for Link Dow...	Critical	Link Down		IP	Router	2025-06-11 10:32:55
<input type="checkbox"/>	P	Diagnosis is successful	Power	The recommended root cause for Link Dow...	Critical	Link Down		IP	Router	2025-06-11 07:45:01
<input type="checkbox"/>	P	Diagnosis is successful	Power	The recommended root cause for Link Dow...	Critical	Link Down		IP	Router	2025-06-11 07:45:01
<input type="checkbox"/>	P	Diagnosis is successful	Power	The recommended root cause for Link Dow...	Critical	Link Down		IP	Router	2025-06-11 07:43:21
<input type="checkbox"/>	C	Diagnosis is successful	Power	The Base Station disconnected is caused by ...	Critical	NE Is Disconnected		2G	BTS	2025-06-11 07:35:34
<input type="checkbox"/>	C	Diagnosis is successful	Power	The BTS fault is caused by power supply sys...	Major	CSL Fault		2G	eG BTS	2025-06-11 07:32:25
<input type="checkbox"/>	P	Diagnosis is successful	Power	The recommended root cause for site out-of...	Critical	SV 2		2G	eG BTS	2025-06-11 06:43:49
<input type="checkbox"/>	P	Diagnosis is successful	Power	The recommended root cause for Link Dow...	Critical	Link Down		IP	Router	2025-06-11 06:17:19
<input type="checkbox"/>	P	Diagnosis is successful	Power	The recommended root cause for Link Dow...	Critical	Link Down	Link Down	IP	Router	2025-06-11 01:08:25
<input type="checkbox"/>	P	Diagnosis is successful	Power	The recommended root cause for Link Dow...	Critical	Link Down		IP	Router	2025-06-11 01:08:24
<input type="checkbox"/>	P	Diagnosis is successful	Power	The Cell fault is caused by powered issue	Critical	The Device is offline				2025-06-09 16:51:14

Demarcation & Locating

Evidence:

NE Is Disconnected

Diagnosis Summary

Diagnosis Scheduled Time	Diagnosis Rule ID	Diagnosis Status	Diagnosis Type
2025-06-09 08:05:14	2310110018	Diagnosis is successful	Automatic diagnosis

Diagnosis Result Details

Diagnosis Reason: Power

Recommended Reason: --

Diagnosis Summary (Complete): The Base Station disconnected is caused by power supply system fault

301 NE Is Disconnected

- 1 Power
- 2 Transmission
- 3 Power
- 4 Temperature
- 5 Hardware
- 6 Transmission
- 7 Recovery
- 8 AI Recommendation Cause

Auto Diagnose Rules used to trigger the Alarm and TT enrich with root cause and summary info based on predefined fault tree

Cell Fault

Diagnosis Summary

Diagnosis Scheduled Time	Diagnosis Rule ID	Diagnosis Status	Diagnosis Type
2025-06-11 07:32:25	2305050004	Diagnosis is successful	Automatic diagnosis

Diagnosis Result Details

Diagnosis Reason: Power

Recommended Reason: --

Diagnosis Summary (Complete): The BTS fault is caused by power supply system fault

21825 CSL Fault

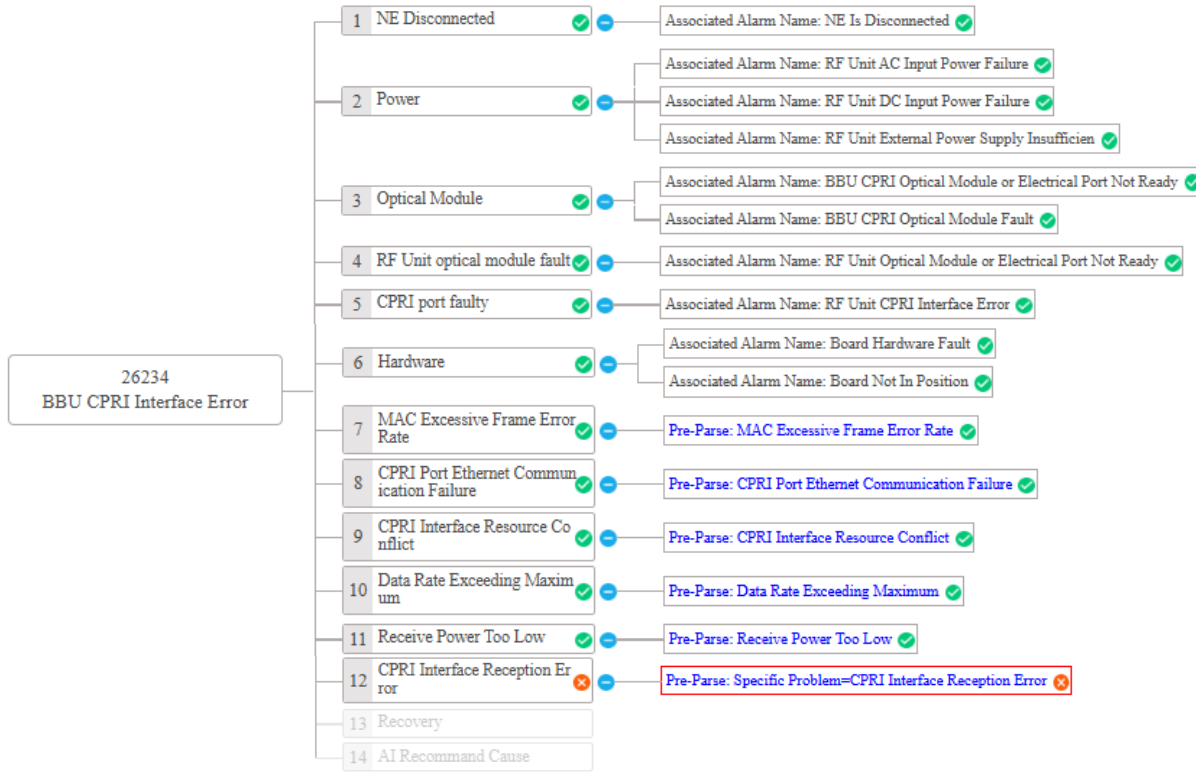
- 1 NE Disconnected
- 2 Power
- 3 Transmission
- 4 Fan
- 5 Temperature
- 6 Hardware
- 7 Board
- 8 Operation
- 9 Recovery
- 10 AI Recommendation Cause

Demarcation & Locating

Evidence:

BBU CPRI Interface Error

Diagnosis Status	Root Cause	Diagnosis Summary	Alarm Severity	Alarm Name	Alarm Source	Network Ty	Device Type	First Occurred On
Diagnosis is successful	Optical Module	The eNodeB BBU CPRI Interface Error is caused by...	Major	BBU CPRI Interface Error	[Redacted]	4G	eNodeB	2025-05-03 03:00:19
Diagnosis is successful	CPRI Interface Reception Error	CPRI Interface Reception Error	Major	BBU CPRI Interface Error	[Redacted]	2G	eG8TS	2025-06-11 07:34:14
Diagnosis is successful	CPRI Interface Reception Error	CPRI Interface Reception Error	Major	BBU CPRI Interface Error	[Redacted]	4G	eNodeB	2025-06-08 07:52:12
Diagnosis is successful	CPRI port faulty	The BBU CPRI Interface Error is caused by R...	Major	BBU CPRI Interface Error	[Redacted]	4G	eNodeB	2025-06-08 05:36:52



BBU CPRI Interface Error Major

🕒 2025-06-11 07:34:14 | 🗑️



Overview Associated ... **Diagnosis ...** Lifecycle Alarm Rema... IVR Result ... RCA Process...

Diagnosis Summary

Diagnosis Scheduled Time	Diagnosis Rule ID	Diagnosis Status	Diagnosis Type
2025-06-11 07:36:14	2305160004	Diagnosis is successful	Automatic diagnosis
Root Cause	Diagnosis Summary	Is Root Ne	Alarm Propagation Type
CPRI Interface Reception Error	CPRI Interface Reception Error	Yes	Root alarm
Fault Cluster ID	Affected wireless sites	AABD Pro Association Time	Diagnosis Suppression Pa...
FC-aabdpro-100f-20250611-010694	1	2025-06-11 07:43:34	--
Affected sites			
1			

Diagnosis Result Details

Diagnosis Reason	Recommended Reason	Diagnosis Summary (Com...
CPRI Interface Reception Error	--	CPRI Interface Reception Error
Suggestion		

Diagnosis Summary

Diagnosis Result Details

Demarcation & Locating

Evidence:

NE Disconnection & out of service auto locating

Incident Details:

- Operation: NE Disconnection & Out of Service
- Category: NE Disconnection & Out of Service
- Incident Name: gNodeB Out of Service-gNodeB Out of Service
- NE Name: [REDACTED]
- Occurred On: 2025-10-18 16:24:41
- Diagnosis Status: Diagnosis succeeded
- Self-Healing Status: Unrepairable

Description: AFFECTED_RAT: G-L-N, gNodeB Out of Service-gNodeB Out of Service: gNodeB Function Name=LN3512A, Duplex Mode=TDD, Frequency Range=FR1, Specific Problem=The NR DU cells bound to the NR cell are unavailable

Root Causes:

- Power and environment - Power supply:AAU/RRU/RHUB power failure

Handling Suggestions:

For root cause 1: 1. Check whether the mains supply is interrupted. If yes, consider dispatching a diesel generator. 2. If the mains supply is not interrupted, check the power supply circuit onsite.

Incident Details:

- Operation: Cell Fault
- Category: Cell Fault
- Incident Name: Fronthaul Optical Path Abnormal-RF Unit CPRI Interface Error
- NE Name: [REDACTED]
- Occurred On: 2025-10-18 11:37:12
- Diagnosis Status: Diagnosis succeeded
- Self-Healing Status: Unr

Description: AFFECTED_RAT: L, Fronthaul Optical Path Abnormal-RF Unit Maintenance Link Failure: Cabinet No.=0, Subrack No.=68, Slot No.=0, Board Type=MRRU, Specific Problem=Other

Root Causes:

- Fronthaul link:RRU/RHUB/ppRU cascading optical fiber fault

Handling Suggestions:

For root cause 1: 1. Take the corresponding

Cell Fault & Fronthaul network fault auto locating

Solution generation

Question:

Does the wireless network fault management system support generation of fault recovery solutions in various scenarios? **Fault scenarios include NE disconnection or out-of-service, cell faults, and fronthaul network faults.**

Options:

Option A	✓ Option B	Option C	Option D
The system automatically generates the optimal recovery or fault rectification solution through intelligent analysis, such as the neighboring cell RF compensation recovery solution.	The system automatically generates multiple possible recovery or rectification solutions, such as the remote recovery solution, neighboring cell RF compensation service recovery solution. Manual confirmation is required.	The recovery solution needs to be manually identified.	

Evidence:

Alarm data and TT data will be enriched with the suggested solution info, alarm will be pending in manual confirmation page for BO to execute recovery from system or do recovery onsite by field team.

Cell Unavailable Major
 2025-05-23 02:56:52 | P

Overview Associated ... Diagnosis ... Lifecycle Alarm Rema... IVR Result ... RCA Process... >

Diagnosis Reason	Recommended Reason
Hardware-Other	--

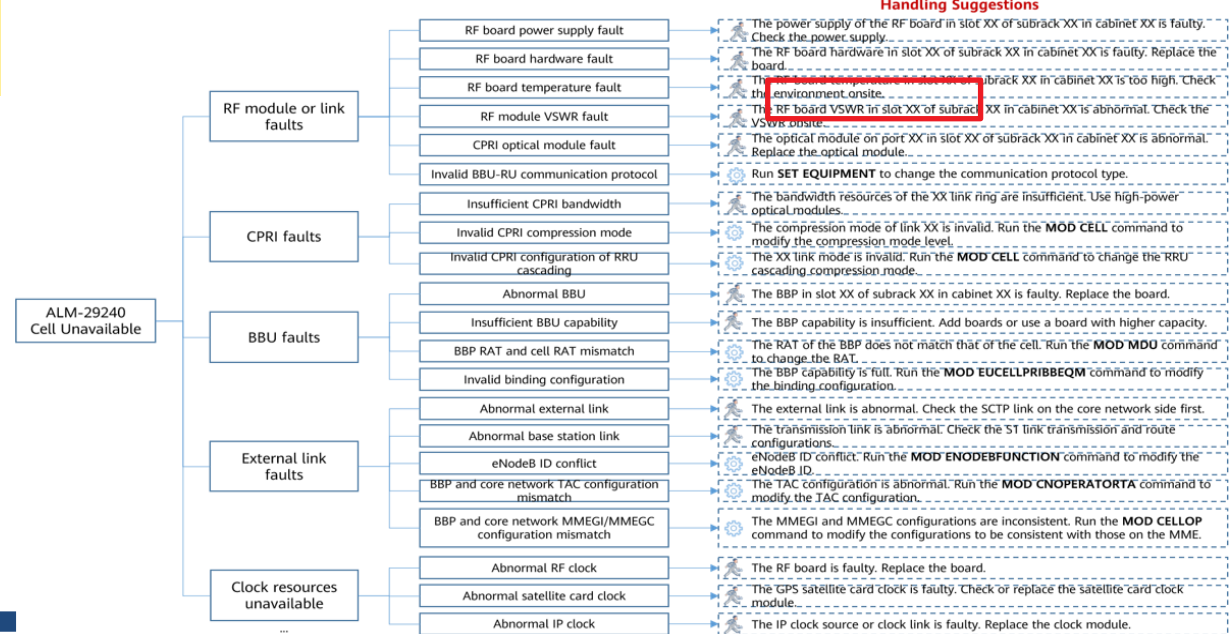
Diagnosis Summary (Complete)

The cell out of service is caused by Hardware issue. Location: Cabinet 0 Subrack 61 Slot 0, Board Type = MRRU.
 Disgnose Method: Alarm Association Matched Alarm: RF Unit Maintenance Link Failure.

Suggestion

Suggest to take the spare part to the site and Reset/Reinsert the board first. If the alarm not cleared, replace the board.

Wireless Fault Diagnosis Tree Example



Evaluation and decision-making continues evidence with solution generation, Same function

Question:

Does the wireless network fault management system support evaluation and decision-making in various scenarios? **Fault scenarios include NE disconnection or out-of-service, cell faults, and fronthaul network faults**

Options:

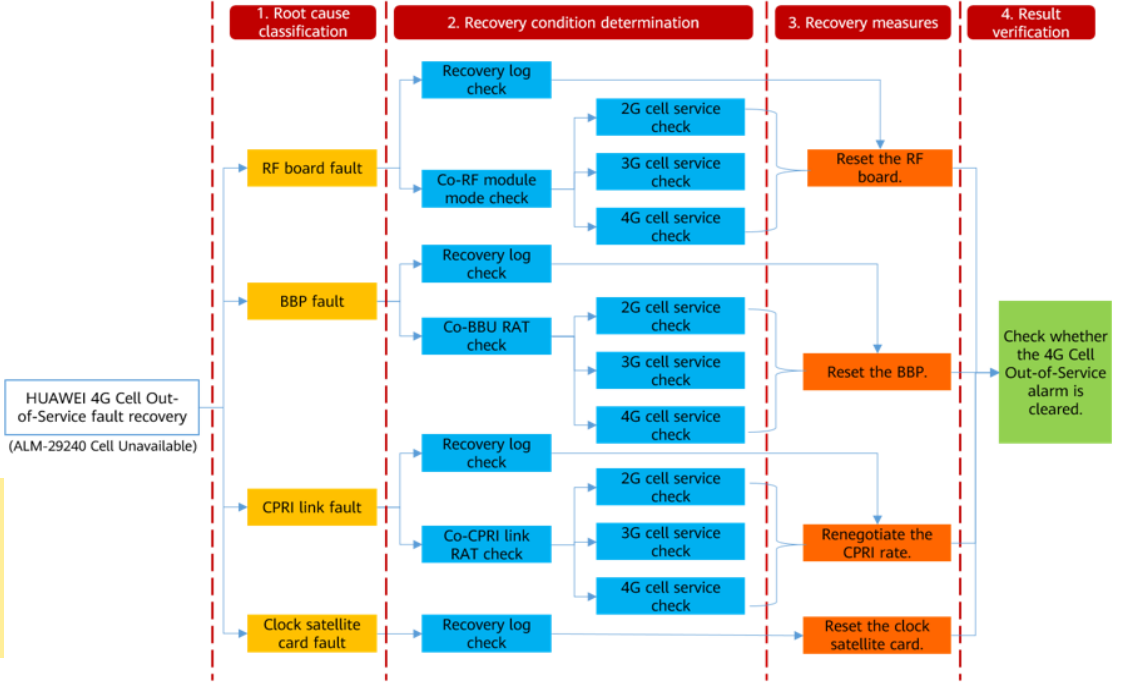
Option A	✓ Option B	Option C	Option D
The system automatically evaluates and determines the optimal recovery or fault rectification solution through intelligent analysis, such as the neighboring cell RF compensation recovery solution.	The system automatically evaluates multiple possible recovery or rectification solutions , such as the remote recovery solution, neighboring cell RF compensation service recovery solution Manual confirmation is required	The recovery solution needs to be manually evaluated and decided.	

Evidence:

No.	Task ID	Alarm Name	Recovery type	Confirm...	Wait for Manual Confirmation From	Manual Confirmation Timeout	Waiting Duration	Confirm Message	API Executed To	Operation
11	ATE-202...	GSM Local Cell Unusable	Manual		2025-06-...	3600	300	RST BRDPWROFF:CN=0,SRN=0,SN=0	2025-06-09 15:10:06	
12	ATE-202...	GSM Local Cell Unusable	Manual		2025-06-...	3600	300	RST BRDPWROFF:CN=0,SRN=0,SN=0	2025-06-09 14:55:06	
13	ATE-202...	GSM Cell out of Service	Manual		2025-06-...	3600	300	RST GCELL: IDTYPE=BYNAME, CELLNAME=...	2025-06-09 12:10:08	
14	ATE-202...	GSM Cell out of Service	Manual		2025-06-...	3600	300	RST GCELL: IDTYPE=BYNAME, CELLNAME=...	2025-06-09 12:10:07	
15	ATE-202...	ALD Maintenance Link Failure	Manual		2025-06-...	3600	300	RST ALDPWRSW: CN=, SRN=, SN=, PN=	2025-06-09 11:55:06	

ADX recovery function is enabled for manual confirmation, and also enabled the auto recovery method now.

Fault Recovery Example (Wireless)



HUAWEI 4G Cell Out-of-Service fault recovery (ALM-29240 Cell Unavailable)

Solution implementation

Continues evidence with solution generation and Evaluation and decision-making, Same function

Question:

Does the wireless network fault management system support automatic execution of troubleshooting solutions in various scenarios? **Fault scenarios include NE disconnection or out-of-service, cell faults, and fronthaul network faults.**

Options:

Option A	Option B	Option C	Option D
The system can automatically execute instructions.	Humans use the system to execute instructions.	The recovery solution needs to be manually implemented	

Evidence:

Basic Information

* Fault name: Cell Unavailable

Type ID: Select

Alarm ID: 29240

Diagnosis trigger condition: Trigger diagnosis for child alarms

Root cause alarm:

Diagnosis result output: Select

Associate alarms based on parent device: No

Associated alarm dimension: Site Name, Site ID, Equipment Room, Alarm Source, Device Name

Field of associated alarm time period: Select

Pre-parse Alarm

* Pre-parse alarm(Diagnosis alarm): Yes

* Pre-parsed field: alertkey

Regular expression: Select

Verification (Double Click)

ADX API

Diagnosis type: Select

Self Recovery

* Self recovery switch: ON

* Self recovery mode: Automatic Confirmation

* Self recovery API: REC_SCAPI_HW_CELL_MAIN_PROCESS

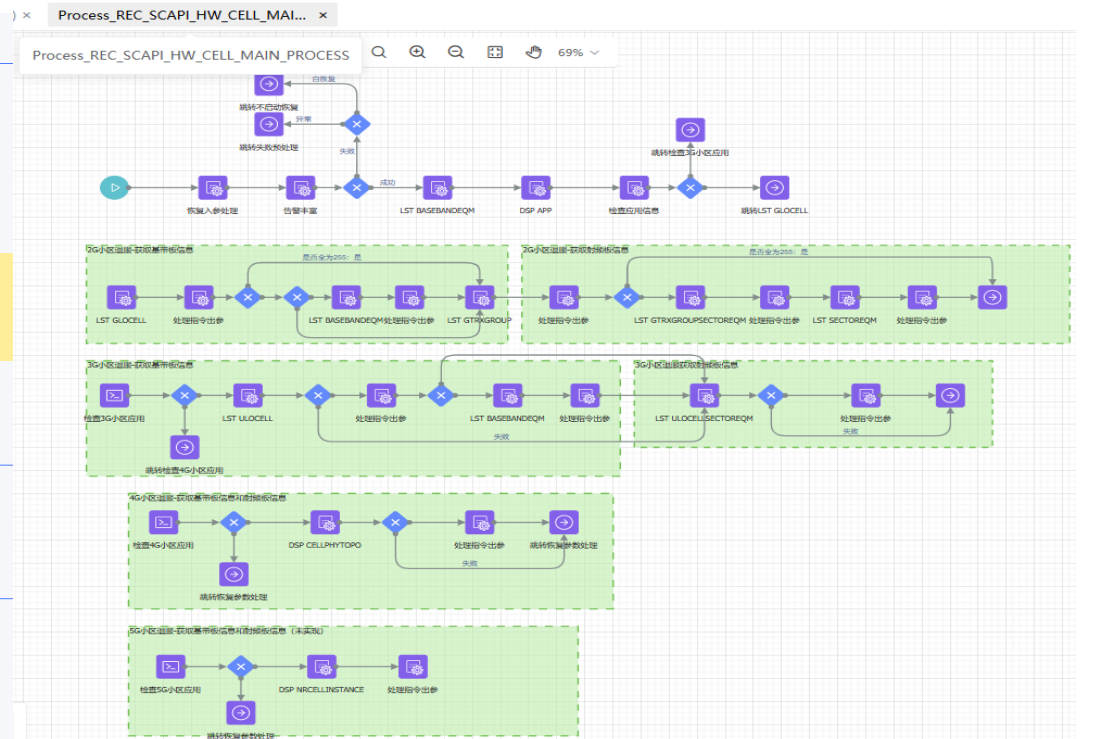
* Recovery result check timer (Second): 300

* Repeated operation inhibit timer (Min): 60

Self Recovery Execution Time: Any time point

Self Recovery Execution Hours:

ADX recovery function enabled for Automatic Recovery Execution



Solution implementation

Evidence:

Scenarios such as Cell Unavailable, Cell out of Service for 3 technologies (2G,4G,5G), Limiting repeated execution to reduce the risk, and used the root cause mapping method to execute commands based on related root cause, giving us much control over system.

<input type="checkbox"/>	Fault Name	Self Recovery API	Status
<input type="checkbox"/>	Cell Unavailable	REC_SCAPI_HW_CELL_MAIN_PROCESS	Enabled
<input type="checkbox"/>	NR Cell Unavailable	REC_SCAPI_HW_CELL_MAIN_PROCESS	Enabled
<input type="checkbox"/>	gNodeB Out of Service	REC_SCAPI_HW_SITE_MAIN_PROCESS	Enabled
<input type="checkbox"/>	GSM Local Cell Unusable	REC_SCAPI_HW_CELL_MAIN_PROCESS	Enabled
<input type="checkbox"/>	GSM Cell out of Service	REC_SCAPI_HW_CELL_MAIN_PROCESS	Enabled

Self Recovery

* Self recovery switch Do not perform the same self-recovery operation on the object within the specified time period since the last restoration operation.

ON

* Repeated operation inhibit timer (Min) ? Self R

360 Any 1

Diagnosis Table

<input type="checkbox"/>	Priority	Root Cause	Diagnosis Mode	Group Name	Alarm ID	Alarm Name	Associated Alarm Time Region (Min)	Pre-parsed Matching Value(Diagnosis Alarm)	Require recovery	Recovery method	Enabled	Operation
					26507	RF Unit Optical Module...	5					
					26501	RF Unit Optical Module...	5					
<input type="checkbox"/>	4	Optical Module-RF	Alarm A...		26503	RF Unit Optical Module...	5	NA	Yes	Reset RF Board	Yes	🔍 🗑
					26502	RF Unit Optical Module...	5					
					26506	RF Unit Optical Interfac...	60					
					26504	RF Unit CPRI Interface ...	60					
<input type="checkbox"/>	5	Hardware-RF	Pre-Parse		29240	Cell Unavailable	NA	Specific Proble... Specific Proble...	Yes	Rest Baseband ... Reset RF Board	Yes	🔍 🗑

Solution implementation

Evidence:

Device Type	Parent Node	Alarm Type	Root Cause	Alarm Name	First Occurred On	Diagnosis Time	Cleared On	Duration(hh:mm:ss)	Clearance Status
eGBTS	[REDACTED]	Diagnosis Alarm	Hardware-RF	GSM Local Cell Unusable	2025-07-25 13:23:23	2025-07-25 13:25:03	2025-07-25 13:29:03	00:05:40	Cleared

Diagnosis Table

+ Add ▲ Up ▼ Down Delete

Priority	Root Cause	Diagnosis Mode	Group Name	Alarm ID	Alarm Name	Associated Alarm Time Region (Min)	Pre-parsed Matching Value(Diagnosis Alarm)	Require recovery	Recovery method	Enabled	Operation
3	Hardware-Main Co...	Alarm A...		26200	Board Hardware Fault	5					
				26104	Board Temperature ...	5	NA	Yes	Reset Main Control Bo...	Yes	🔍 🗑
				26216	Board Not Securely ...	5					
4	Hardware-Baseband	Alarm A...		26200	Board Hardware Fault	5					
				26104	Board Temperature ...	5	NA	Yes	Rest Baseband Board	Yes	🔍 🗑
				26216	Board Not Securely ...	5					
5	Hardware-Baseband	Pre-Parse		NA	GSM Local Cell Unu...	NA	Baseband Re...	Yes	Rest Baseband Board	Yes	🔍 🗑
6	Hardware-RF	Alarm A...		26538	RF Unit Clock Probl...	60					
				26527	RF Unit Input Power...	10	NA	Yes	Reset RF Board	Yes	🔍 🗑
				26532	RF Unit Hardware F...	5					
				28018	RF Unit Baseband R...	10					
7	Hardware-RF	Pre-Parse		NA	GSM Local Cell Unu...	NA	RF Resource ...	Yes	Reset RF Board	Yes	🔍 🗑
				26230	BBU CPRI Optical M...	5					
				26231	BBU CPRI Optical M...	5					
				26232	BBU Optical Modul...	5	NA	Yes	Rest Baseband Board	Yes	🔍 🗑
				26233	BBU CPRI Optical In...	5					
				26320	BBU IR Optical Mod...	5					
				26234	BBU CPRI Interface ...	60					

Execution Log Details

Execution ID: mcp-ba8eb26f-6941-11f0-8050-0255ac120993 Device ID: MAE-Taishan:MBB_Virtual_Device Command: CMD_HW_RAN_NODEB_RST_BRDPWROFF_CN...

Executed By: System

Delivery Result: {"result_code":0,"result_message":"Success","result":{"result_type":"success"}}

Execution Result

```

Preview
{
  "indicatorKey": "CMD_HW_RAN_NODEB_RST_BRDPWROFF_CN_SRN_SN_CHN",
  "resultValues": {
    "params": {
      "mmiCode": 0,
      "result": "****",
      "data": {
        "COMMAND": "RST BRDPWROFF: CN=0, SRN=60, SN=0;"
      }
    },
    "log": [
      {
        "logDesc": "Start to Login NE: [REG NE:NAME=\"5690A\"];",
        "stageName": "",
        "logLevel": "info",
        "resultType": "",
        "keyword": "",
        "logTime": "2025-07-25 13:25:48"
      }
    ]
  }
}

```

**THANK
YOU**

ooredoo^o