



AIS Core Network ANL Assessment



TMF AN Core Network Assessment Questionnaire (2025H2)

Part 1: Core Network Stability

High-Value Scenario	Cognitive Activity	Service Capability	Weight
Core Network - Stability	Basic stability	Stable deployment architecture	10%
		Control plane disaster recovery	15%
		User-plane disaster recovery	15%
		Infrastructure disaster recovery	15%
		Anti-signaling surge capability	15%
	Intelligent stability	Risk prediction	15%
		Service degradation recovery	15%

Part 2: Fault Management

High-Value Scenario	Cognitive Activity (AADE)	Service Capability	Weight
Core Network - Fault Mgmt.	Awareness	Data collection Alarm correlation	10%
		Analysis	Fault identification
	Risk prediction		10%
	Demarcation		15%
	Locating		15%
	Decision	Failure recovery solution generation	10%
		Solution pre-verification	10%
	Executions	Solution implementation	10%
		Service verification	10%

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- 1. Core Network Stability Part Self-Assessment**
- 2. Fault Management Part Self-Assessment**

Core Network Fault Scenario Evaluation Criteria—Stability (Question 1 B)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Stable deployment architecture	10%	<p>Does the core network deployment architecture have a capability for redundancy modules to take over the services carried by faulty modules?</p> <p>NOTE 1: There are service processing modules, LB load sharing modules, and service data modules.</p> <p>Core network VNFs for assessment: core network VNFs (e.g., 5GC VNFs, EPC VNFs, IMS VNFs)</p>	<p>Yes. The system can deal with multiple-module faults within a VNF, which uses multiple types of module resources within this VNF. If M module experiences an abnormal situation, N backup module can take over all service loads, preventing a decrease in the VNF overall processing capacity.</p> <p>The communication service experiences minimal impacts during the service takeover of redundancy modules:</p> <ol style="list-style-type: none"> 1. Service connection context remains uninterrupted. 2. Service access can recover within minutes. 	<p>The system can deal with multiple-module faults within a VNF, which uses multiple types of module resources within this VNF. If M module experiences an abnormal situation, N backup module can take over all service loads, preventing a decrease in the overall processing capacity.</p> <p>The communication service experiences minimal impacts during the service takeover of redundancy modules:</p> <ol style="list-style-type: none"> 1. Service access can recover within minutes. 	<p>The system can deal with a single module fault and restore service loads.</p> <p>The communication service experiences minimal impacts during the service takeover of redundancy modules:</p> <ol style="list-style-type: none"> 1. Service access can recover within minutes. 	Not supported

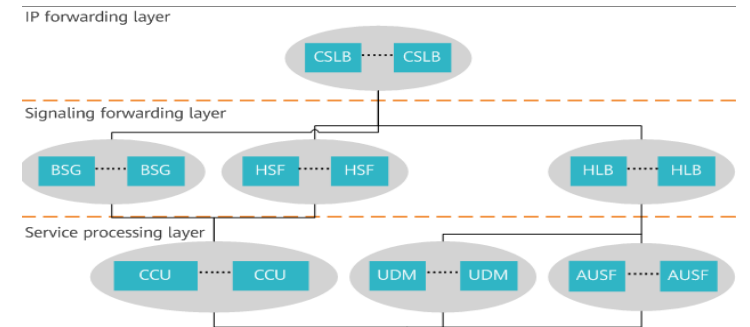
Thailand AIS Core network VNFs support Stable deployment architecture, including all scenarios of option B.

1. AIS Core network VNFs IP forwarding layer: The CSLB provides load balancing services for services. When a pod or process of the CSLB is faulty, the CSLB migrates the services on the faulty pod or process to a normal pod or process to ensure that services are not affected.
2. AIS Core network VNFs Signaling forwarding layer: The signaling forwarding modules are deployed in a distributed manner. After receiving signaling messages, each signaling forwarding module forwards the messages to the service processing layer based on the load balancing principle. If any signaling forwarding module is faulty, other signaling forwarding modules of the same type take over the signaling forwarding tasks of the faulty module.
3. AIS Core network VNFs Service processing layer: Each type of service processing is provided by multiple modules of the same type based on the load balancing principle. If any module is faulty, other modules of the same type take over the service processing tasks of the faulty module to ensure that the services provided by the system are not affected.

Why not reach option A: service migration between IMS VM have around 1S service affect, after change IMS to be microservice architecture of bare-metal container, service will no affect when migration between different VM, NER start deploy at Q4 of 2025

		5GC Dimensioning (UNC-AMF)		Configuration Rules			
Product	3GPP NE	VM	VM Description	Redundancy	Anti-affinity	Networking	
UNC	AMF		O&M	1+1	Yes	EVS	
			MME&AMF	N+M	No	EVS	
			Link	N+M	No	EVS	
			SBI Interface	N+M	No	EVS	
			CSDB	N+M	No	EVS	
			CSLB(IPU)	N+M	No	EVS	
			CHR	N+M	No	EVS	
			Platform Management	1+1+1	Yes	EVS	
					5GC Dimensioning (UDG-UPF/GW-U) without NAT		Configuration Rules
UDG 3		UPF/GW-U without NAT	VM	VM Description	Redundancy	Anti-affinity	Networking
			OMU	1+1	Yes	SRIOV-NP	
			Service Processing VM	N+M	No	SRIOV-NP	
			CSDB	N+M	No	SRIOV-NP	
			CSLB for Signaling	1+1+1	Yes	SRIOV-NP	
			Platform Management	1+1+1	Yes	SRIOV-NP	
			NAT Management	1+1	Yes	SRIOV-NP	
			NP Management	N+M	Yes	SRIOV-NP	
			NAT	N+M	No	SRIOV-NP	
			UFDR	N+M	No	SRIOV-NP	

Product Redundancy layer

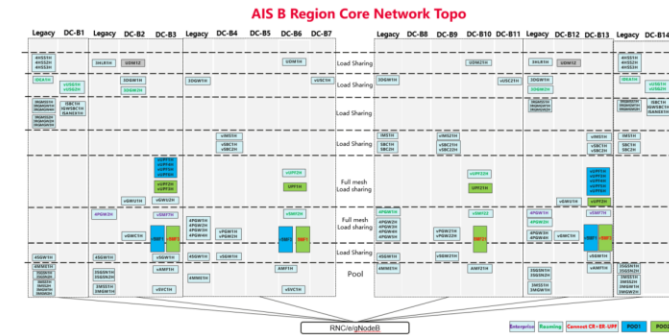


Core Network Fault Scenario Evaluation Criteria—Stability (Question 2 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Control-plane disaster recovery (DR)	15%	<p>Does your system support automatic control-plane DR for DR VNFs to take over communication services without service interruption?</p> <p>Core network VNFs for assessment: core network VNFs, e.g., 5GC control-plane VNFs (AMF, SMF, PCF, UDM, NRF, SCP etc.), EPC VNFs (S-GW, MME, etc.), IMS VNFs</p>	<p>Yes. The control-plane DR VNFs and DR DCs can take over all services based on the following DR scenarios in minutes and UEs remain connected.</p> <ol style="list-style-type: none"> When an accident or natural disaster occurs, core network VNFs can switch over services across DCs and the backup VNFs can take over all services successfully. When control-plane VNFs are faulty, backup VNFs can take over the services carried by faulty VNFs and UEs remain connected. In the case of control-plane VNF (UDM/HSS, PCF/PCRF, OCS/CHF, NRF, ENUM etc.) faults, control-plane VNFs, with data stored locally, can maintain subscribers' communication active for a period of time (hours or above). In the case of a management entity fault, control-plane VNFs can maintain subscribers' communication active for a period of time (hours or above). <p>During control-plane DR, control-plane VNFs are required to maintain data connections.</p>	<p>The control-plane DR VNFs and DR DCs can take over all services based on the following DR scenarios in minutes.</p> <ol style="list-style-type: none"> When an accident or natural disaster occurs, core network VNFs can switch over services across DCs and the backup VNFs can take over all services successfully. When control-plane VNFs are faulty, backup VNFs can take over the services carried by faulty VNFs. In the case of critical control-plane VNF (UDM/HSS and PCF/PCRF and OCS/CHF) faults, control-plane VNFs, with data stored locally, can maintain subscribers' communication active for a period of time (hours or above). In the case of a management entity fault, control-plane VNFs can maintain subscribers' communication active for a period of time (hours or above). 	<p>The control-plane DR VNFs and DR DCs can take over all services based on the following DR scenarios:</p> <ol style="list-style-type: none"> When an accident or natural disaster occurs, backup DCs can restore all service data and subscribers' data. When control-plane VNFs are faulty, backup VNFs can take over the services carried by faulty VNFs. <p>During control-plane DR, the control-plane VNFs can restore subscribers' data.</p>	No. The service switchover can be triggered manually.

Thailand AIS Core network VNFs support Control-plane disaster recovery, including all scenarios of option A.

- AIS Core network VNFs can switch over services across DCs and the backup VNFs can take over all services successfully. Right side is AIS BKK+CR+ER Core network DC redundancy, Multiple control plane VNF work as load share or pool mode. support cross DC redundancy
- AIS Core network VNFs support service switchover, if one control-plane VNFs fault, another backup VNFs which in same pool or load share mode VNFs will take over service
- AIS Core network VNFs support bypass critical VNFs fault. For example, if UDM/HSS and PCF fault, control-plane can bypass it and continue maintain service in short hours.
- AIS Core network VNFs support management VNFs redundancy, if one management-plane VNFs fault, the control-plane VNFs can continue maintain service in short hours



AIS B region DC Redundancy



MADF DC Redundancy

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
DR for control-plane VNFs						
Bypass for control-plane VNFs						

DR for control-plane VNFs

Bypass for control-plane VNFs

15	UNC	SFFD-010032 Service Continuity During a Management Plane Fault	This function is supported by default and does not need to be configured.
16	UDG	SFFD-010032 Service Continuity During a Management Plane Fault	This function is supported by default and does not need to be configured.
17	UDM	SFFD-010032 Service Continuity During a Management Plane Fault	This function is supported by default and does not need to be configured.
18	PCF	SFFD-010032 Service Continuity During a Management Plane Fault	This function is supported by default and does not need to be configured.
19	CloudSE280	SFFD-010032 Service Continuity During a Management Plane Fault	This function is supported by default and does not need to be configured.
20	CSC	SFFD-010032 Service Continuity During a Management Plane Fault	This function is supported by default and does not need to be configured.
21	ATS	SFFD-010032 Service Continuity During a Management Plane Fault	This function is supported by default and does not need to be configured.
22	SPS/USC	SFFD-010032 Service Continuity During a Management Plane Fault	This function is supported by default and does not need to be configured.
25	CloudDB	Supported (no feature)	This function is supported by default and does not need to be configured.
26	UPCC	SFFD-010032 Service Continuity During a Management Plane Fault	This function is supported by default and does not need to be configured.

Bypass for Management-plane VNFs

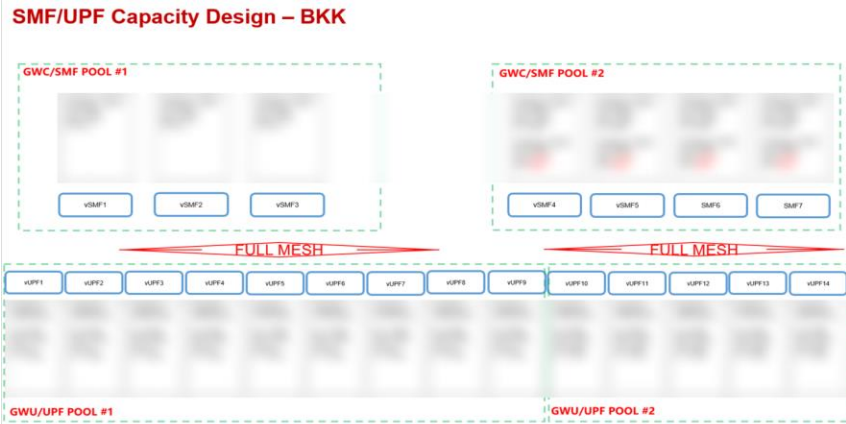
7. Essential services keep running when the management plane is faulty.

Core Network Fault Scenario Evaluation Criteria—Stability (Question 3 B)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
User-plane disaster recovery	15%	<p>Does your system support automatic user-plane DR to take over all services without service interruption?</p> <p>NOTE 1: The user-plane DR scenario indicates that the backup UP VNF (UPF) can take over the services in the fault scenario.</p> <p>Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs (UPF), EPC VNFs (PGW), IMS VNFs (SBC))</p>	<p>Yes. The user-plane DR VNFs and DR DCs can take over all services without service interruption:</p> <ol style="list-style-type: none"> When an accident or natural disaster occurs, user-plane VNF's pool-based deployment supports the switching of traffic among user-plane VNFs in minutes. In the case of a management entity fault, user-plane VNFs can maintain communication services for a period of time (hours or above). The data connection remains active. 	<p>The user-plane DR VNFs and DR DCs can take over all services in a short period of time:</p> <ol style="list-style-type: none"> User-plane VNFs can take over all traffic in minutes. The data connection can recover in minutes. 	<p>The user-plane DR VNFs and DR DCs can take over traffic of faulty user-plane VNFs.</p> <ol style="list-style-type: none"> User-plane VNFs can take over all traffic. 	Not supported

Thailand AIS Core network VNFs support User-plane disaster recovery , including all scenarios of option B.

- AIS Core network VNFs have more than 40 UPFs work as group pool on the user plane is supported on the live network. If an accident or natural disaster occurs, traffic can be switched within a few minutes.
- AIS Core network VNFs have Full-mesh networking for the UDG DR on the user plane is supported on the live network.



AIS B region Full mesh User-plane disaster recovery



DR in the VNF group pool on the user plane

Why not reach option A: Current UPF session don't have hot backup feature, when one UPF down, service will take some time switchover to redundancy UPF, and have service interruption, after deploy UPF hot back up data service will no affect.

Core Network Fault Scenario Evaluation Criteria—Stability (Question 4 B)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Infrastructure disaster recovery	15%	<p>Does your system support automatic disaster recovery on telecom cloud infrastructure to ensure uninterrupted communication services?</p> <p>NOTE: Telecom cloud infrastructure is considered to include the following elements: Cloud OS and hardware (server, storage, and IP Core). The faults may result from the IP backbone router, transmission faults, or the overall telecom cloud faults.</p> <p>Core network VNFs for assessment: core network VNFs (e.g., 5GC VNFs, EPC VNFs, and IMS VNFs)</p>	<p>Yes. The system can support service continuity in any possible disaster scenario related to telecom cloud infrastructure:</p> <ol style="list-style-type: none"> When DC transmission is faulty, the core network can provide local area (e.g., within a region) communication normally. When telecom cloud infrastructure experiences an abnormal situation (e.g., storage fault), the core network is capable to keep the VNFs in running status for a period of time, or trigger DR switchover to maintain the communication without interruption. In case of whole core network outage, at least VIP calls and emergency calls can proceed through the backup core network. Distributed user-plane VNF deployment can reduce the impacts of user-plane VNFs faults, and user-plane VNF switchover can minimize the affected region. When the core network subdomain or subsystem experiences faults, network can fallback without affecting other communication services (e.g., IMS fallback should not affect data connection). When the core network subdomain becomes faulty, network in the subdomain can fall back, keeping normal UE connection. (e.g., 5GC data connectivity can fall back to EPC network and EPC data connectivity can fall back to 3G PS services.) When a natural disaster occurs and affects two active DCs, additional third DC can take over service loads from the two active DCs and remain data connection alive. 	<p>The system can support service continuity in any possible disaster scenario related to telecom cloud infrastructure:</p> <ol style="list-style-type: none"> When DC transmission is faulty, the core network can provide local area (e.g., within a region) communication for a period of time. When telecom cloud infrastructure experiences an abnormal situation (e.g., storage fault), the core network is capable to keep the VNFs in running status for a period of time. Distributed user-plane VNF deployment can reduce the impacts of user-plane VNFs faults, and user-plane VNF switchover can minimize the affected region. When the core network subdomain experiences faults, network in the subdomain can fall back, keeping normal UE connection. (e.g., 5GC data connectivity can fall back to EPC network and EPC data connectivity can fall back to 3G PS services.) 	<p>The system can support service continuity in any possible disaster scenario related to telecom cloud infrastructure:</p> <ol style="list-style-type: none"> When telecom cloud infrastructure experiences an abnormal situation (e.g., storage fault), the core network is capable to keep the VNFs in running status for a period of time. 	Not supported

Thailand AIS Core network VNFs support infrastructure DR scenarios, including all scenarios of option B.

- AIS Core network VNFs can switch over services across DCs and the backup VNFs can take over all services successfully. For example, BKK+CR+ER Core network DC redundancy, Multiple control plane VNF work as load share or pool mode. Support cross DC redundancy if DC transmission is faulty.
- AIS Core network VNFs already enable storage bypass.
- AIS Core network VNFs Distributed user-plane VNF deployment can reduce the impacts of user-plane VNFs faults, and user-plane VNF switchover can minimize the affected region.
- AIS Core network VNFs support fallback.

AIS B Region Core Network Topo

Category	VNF	Feature	Pool Taking Method	Pool Example
I Storage and backup	SD-WAN	SD-WAN	1. The SD-WAN VNFs are deployed in a pool mode. 2. The SD-WAN VNFs are deployed in a pool mode. 3. The SD-WAN VNFs are deployed in a pool mode.	SD-WAN
	SD-WAN	SD-WAN	1. The SD-WAN VNFs are deployed in a pool mode. 2. The SD-WAN VNFs are deployed in a pool mode. 3. The SD-WAN VNFs are deployed in a pool mode.	SD-WAN
II Storage and backup	SD-WAN	SD-WAN	1. The SD-WAN VNFs are deployed in a pool mode. 2. The SD-WAN VNFs are deployed in a pool mode. 3. The SD-WAN VNFs are deployed in a pool mode.	SD-WAN
	SD-WAN	SD-WAN	1. The SD-WAN VNFs are deployed in a pool mode. 2. The SD-WAN VNFs are deployed in a pool mode. 3. The SD-WAN VNFs are deployed in a pool mode.	SD-WAN

SMF/UPF Capacity Design

```

SET SDRPTIMER=5
EPS Fallback Protection Timer (s)
5
Network data plan (configurations on other NFs need to be considered)

SET QOSGLOBAL:QOSPROFILENAME="globalqos", BINDPRESUBQOS=DISABLE, BINDEPSUBQOS=DISABLE, BINDSUBQOS5GC=DISABLE;
SET SDRPTIMER=LACTIMER=600, T3591=3, T3593=3, T3592=3, T3594=3, T3595=3, T3596=3, T3597=3, T3598=3, T3599=3;
SET QCI2ARP:QCI=1, ARPFIC=0, ARPF1=7, ARPFVI=0;

SET NGIMSVOPS:AMFHOME=SUPPORT, DCVOPS=SUPPORT, SRRLSCAUSE=NORMALCAUSE, UESIMODE=OFF;
MOD NGPEIPLCY:SUBRANGE=ALL_USER, GETPEIPLCY=NOGET;
    
```

Why not reach option A: The devices on the live network cannot meet functions 3 (under discussed on JIC meeting), 5, and 7 in option A.

Option optimization suggestion: in Option A item 3, AIS recommends that voice/data services of VIP users should be preferentially restored in case of network congestion or partial resource failure, ensuring zero service loss. AIS is willing to contribute practical cases to enrich TMF's high stability standards.

Core Network Fault Scenario Evaluation Criteria—Stability (Question 5 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Anti-signaling surge capability	15%	<p>Does your system support automatic signaling overload control to avoid core network service outage?</p> <p>NOTE: The terminal behaviors are affected by the software logic or server design. Since the terminal behaviors are highly consistent, wide-range signaling impact can occur.</p> <p>Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs)</p>	<p>Yes. The system can control signaling storm and maintain the end to end services:</p> <ol style="list-style-type: none"> When signaling storm occurs, VNFs are capable to protect its processing capability without service outage. In the signaling surge scenario, the front-end VNFs can evaluate and adaptively adjust subscribers' service requests delivered to back-end network elements, so the back-end elements can remain at the optimized workload without service congestion. When signaling storm occurs, core network VNFs are capable to evaluate and adjust traffic to avoid impact to other domains when services fall back. <p>The system can converge signaling storm in minutes.</p>	<p>The system can control signaling storm and maintain the end to end services:</p> <ol style="list-style-type: none"> When signaling storm occurs, VNFs are capable to protect its processing capability without service outage. In the signaling surge scenario, the front-end VNFs can reduce the service requests delivered to back-end network elements, so the back-end VNF faults can be avoided. <p>The system can converge signaling storm within 1 hour.</p>	VNFs are capable to protect its processing capability.	Not supported

Thailand AIS Core network VNFs support Anti-signaling surge capability, including all scenarios of option A.

- AIS Core network VNFs already deployed flow control. When signaling storm occurs, VNFs are capable to protect its processing capability without service outage.
- AIS Core network VNFs support front-end VNFs flow control. For example if BE flow control, can inform FE adjust flow control value
- AIS Core network have MDAF can support evaluate traffic. Simulation and provide recommendations for flow control parameters.

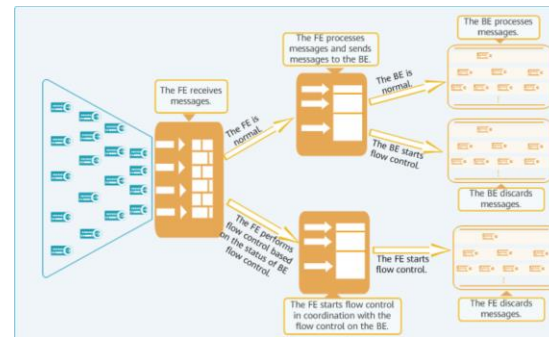
```

+++ UDM/#MEID:0 MENAME:AMF/ 2025-10-06 19:02:19:
O&M #8885
%LST UNIHTR::%
RETCODE = 0 Operation succeeded
The result is as follows:
-----
HTR Office Flow Control Switch = ON
Configuration Policy for Flow Control Rate = Specific value
Initial Flow Control Threshold (number/s) = 2000
Maximum Flow Control Threshold (number/s) = 2500
Flow Control Restore Threshold (%) = 85
(Number of results = 1)
  
```

AIS Core network VNFs already deployed flow control

```

+++ UDM/#MEID:252 MENAME:UDM/ 2025-10-06 22:28:17:00:
O&M #942
%/*1880520547 MEID:252*/LST DIAMPOL::%
RETCODE = 0 Operation succeeded
The result is as follows:
-----
Policy Name = dianfcs
Module type = CCU
Statistic period = 5s
Flow control policy = NO_HN
Peer Host Name = NULL
Message direction = IN
Maximum number of UAR messages sent over the Cx interface = 291
Maximum number of MAR messages sent over the Cx interface = 65535
Maximum number of SAR messages sent over the Cx interface = 145
Maximum number of LIR messages sent over the Cx interface = 65535
Maximum number of LDR messages sent over the Sh interface = 436
Maximum number of PUR messages sent over the Sh interface = 436
Maximum number of SNR messages sent over the Sh interface = 65535
Maximum number of ULR messages sent over the S6a/S6d interface = 242
Maximum number of AIR messages sent over the S6a/S6d interface = 242
  
```



UDM/USC BE inform FE adjust flow control



MAE-MDAF: Support simulation and provide recommendations for flow control parameters.

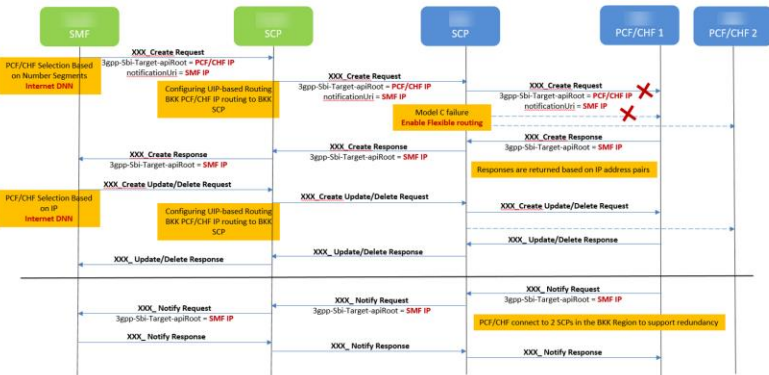
Core Network Fault Scenario Evaluation Criteria—Stability (Question 7 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Service degradation recovery	15%	<p>Does your system support automatic detection and recovery from service degradation related to core network VNFs/NFs?</p> <p>Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs)</p>	<p>Yes. When abnormal situations (for example, CPU overload, interconnection issues, and slight service damage) occur without any fault alarms generated (for example, the heartbeat is normal), the system supports automatic detection and diagnosis of service degradation, provides recovery recommendations, and enables autonomous execution without human intervention.</p>	<p>When abnormal situations (for example, CPU overload, interconnection issues, and slight service damage) occur without any fault alarms generated (for example, the heartbeat is normal), the system supports automatic detection and diagnosis of service degradation, provides recovery recommendations, and supports manual recovery.</p>	<p>When abnormal situations (for example, CPU overload, interconnection issues, and slight service damage) occur without any fault alarms generated (for example, the heartbeat is normal), the system supports automatic detection of service degradation.</p>	Not supported.

Thailand AIS Core network VNFs support Service degradation recovery , including all scenarios of option A.

1. AIS Core network VNFs USC have deploy redundance solution for service fast recovery
2. AIS Core network VNFs AMF/SMF/UPF have service fast recovery solution based on heartbeat, no need human run command
3. AIS Core network VNFs PCF support session hot back up feature
4. AIS Core network VNFs UDM/ RDA/ IMS work as active and standby model, when one node down, the back up node will take service based on link heartbeat, no need human intervention

Call Flow in the Cross-Region Roaming Scenario of Internet DNN

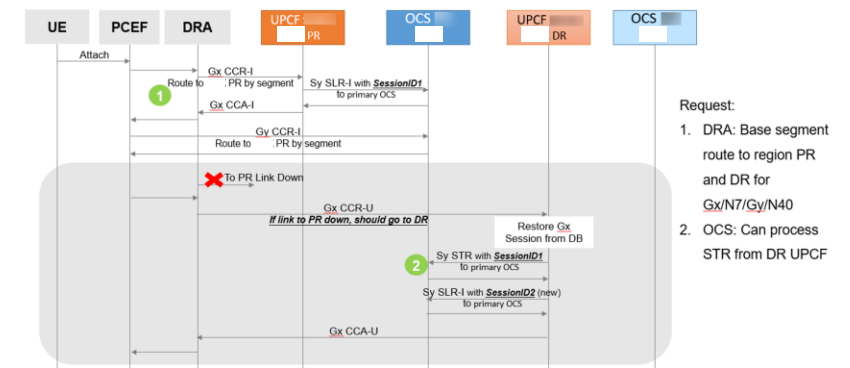


SCP redundance and backup solution

	AMF Failure or Restart Scenarios	SMF Failure or Restart Scenarios	UPF Failure or Restart Scenarios
Before feature deployed	<ul style="list-style-type: none"> MO VoLTE services can be successful only after a second attempt. MT VoLTE services can be restored only after the VoLTE UE is reattached to the network. 	<ul style="list-style-type: none"> MO VoLTE call can be connected only upon the second attempt (after AMF detect SMF fault). MO VoLTE call can't be connected (before AMF detect SMF fault). MT VoLTE services are interrupted, can't automatically recovery, only wait UE reattach network (max reach 56 mins). 	<ul style="list-style-type: none"> MO VoLTE call connected at the second attempt. MT VoLTE call can be restored only after another UPF is selected.
After deploy the feature	<ul style="list-style-type: none"> When an MME fails or restarts, both MO and MT VoLTE services can be restored after only one dial-up attempt. <p>Need MME chain backup feature</p>	<ul style="list-style-type: none"> MO VoLTE call can be connected only upon the second attempt (after AMF detect SMF fault). MO VoLTE call can't be connected (before AMF detect SMF fault). MT VoLTE call are interrupted, AMF and UPF will deactivate fault SMF user, user will reattach network and VoLTE service recovery.(15s) 	<ul style="list-style-type: none"> MO VoLTE call, second dial-up attempt succeed. MT VoLTE call, the second dial-up attempt succeed. (after first time around 15s later) For no message exchange user: SMF will start deactivate user after detect UPF fault around 900s later (ADD UPFPCPPARA) For message exchange user: SMF start deactivate after 15s later(SET T1N1PARA)

5GC redundance and service fast recovery solution

Gx Session Backup E2E Flow



Voice service session backup solution

Contents

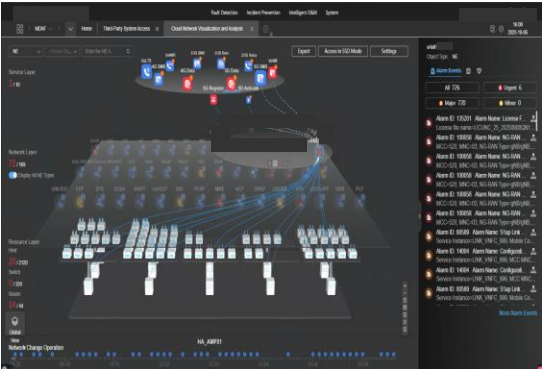
- 1. Core Network Stability Part Self-Assessment**
- 2. Fault Management Part Self-Assessment**

Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 1-1 A)

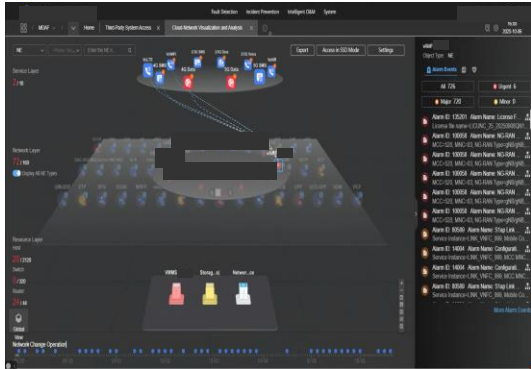
Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Data collection Alarm correlation	10%	Does your system automatically collect data? Assessment object: the core network management function Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs)	Yes. The system can automatically collect data (alarms, configuration data, and performance data etc.) and sort alarms. The data should be at the module level, including NF modules, cloud OS (VMs or pods), hardware (hosts and ports) , detected KPIs indicating slight service damage (e.g., service KPI deterioration < 5%) and infrastructure-layer hardware data (servers, storage devices, EOR/TOR devices and IP core).	The system can automatically collect data (alarms, configuration data, and performance data), associate alarms, and sort alarms. The data should be at the VNF level and cloud OS (VMs or pods).	No. The system supports manual data collection.	

Thailand AIS Core network can meet option A (support by MDAF, cover all the Equipment):

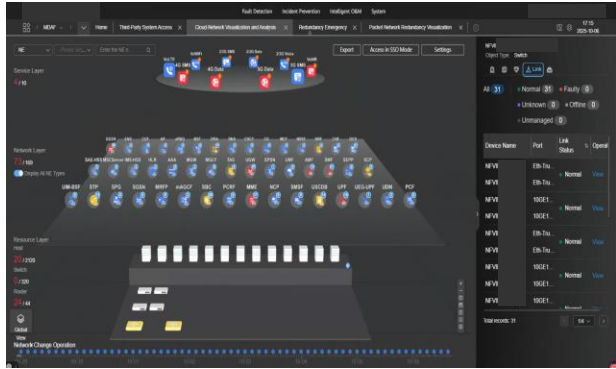
The AIS core network collects various types of data and builds a network visualization platform based on digital twin technology. This platform enables visualization of all core network elements (VM/Pod level) and hardware (Link/port level). Combined with information such as alarms and KPIs, it can display the status of the network.



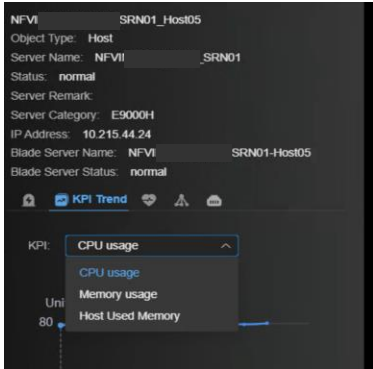
NF modules, cloud OS (Host, VMs or pods)



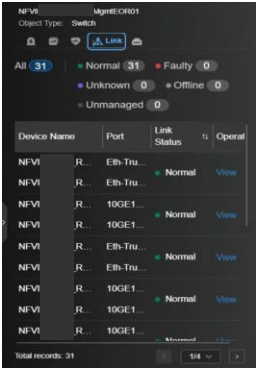
Server, Storage, Devices



EOR/TOR



KPI, alarm

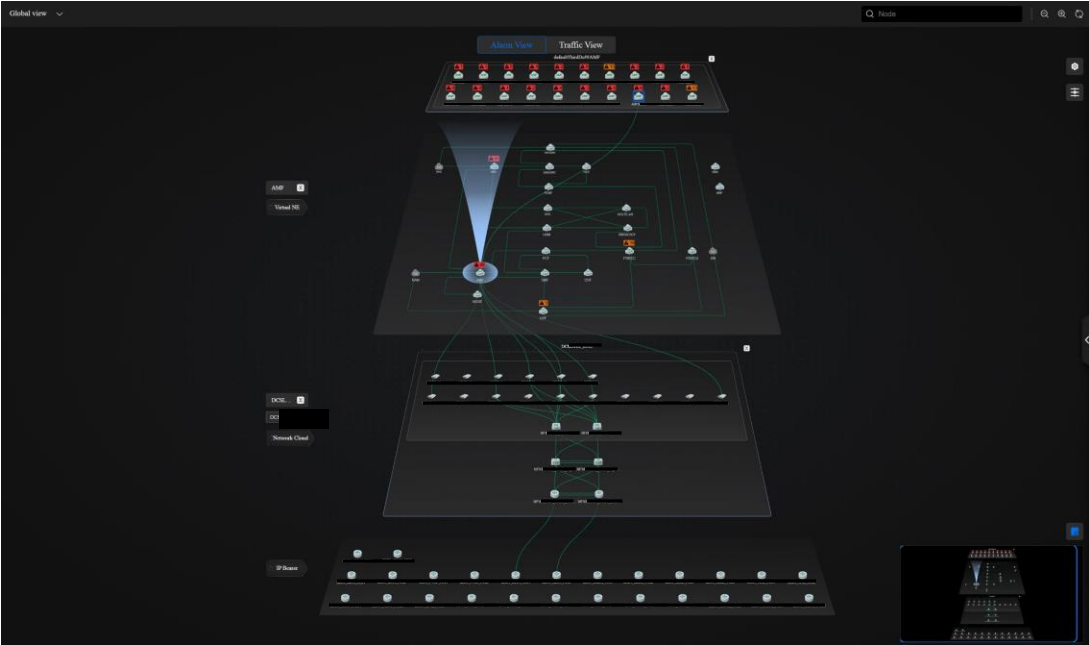


Link

Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 1-2 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Data collection Alarm correlation	10%	Does your system automatically collect data? Assessment object: the core network management function Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs)	Yes. The system can automatically collect data (alarms, configuration data, and performance data etc.) and sort alarms. The data should be at the module level, including NF modules, cloud OS (VMs or pods), hardware (hosts and ports), detected KPIs indicating slight service damage (e.g., service KPI deterioration < 5%) and infrastructure-layer hardware data (servers, storage devices, EOR/TOR devices and IP core).	The system can automatically collect data (alarms, configuration data, and performance data), associate alarms, and sort alarms. The data should be at the VNF level and cloud OS (VMs or pods).	No. The system supports manual data collection.	

Thailand AIS Core network can meet option A (support by OSS, cover the Communication and Quality of service):



Infra data (DCGW, TOR/EOR, Storage, Server, other), VM and VNF data

VNF alarm

Alarm ID	Alarm Name	Alarm Source	First Occurred On	Last Occurred On	Vendor	Probe ID	Clearance Status	First Processing Tim
40934	SBC_IP_QoS Exceeded Threshold	vMSSBC	2025-10-07 09:13:20	2025-10-07 09:13:20		Probe-0806	Major	2025-10-07 09:14:06
100058	NG-RAN Link Fault	vAMF	2025-10-07 09:13:19	2025-10-07 09:13:19		Probe-0806	Critical	2025-10-07 09:14:06

Host/VM alarm

Alarm Name	Vendor	Alarm Source	Probe ID	Raw Alarm Severity	First Occurred On	First Processing Tim	Last Occurred On
Faulty_VM_OS	HUAWEI	vSVCIMS_VDU_2	Probe-0806	Critical	2025-10-07 01:26:35	2025-10-07 01:27:28	2025-10-07 01:26:35
Host_Storage_Link_Failure	HUAWEI	NFVI_Host01	Probe-0806	Major	2025-10-07 00:45:49	2025-10-07 00:46:37	2025-10-07 00:45:49

EOR/TOR alarm

Alarm ID	Alarm Name	Alarm Source	First Occurred On	Last Occurred On	Vendor	Probe ID	Clearance Status	First Processing Tim
31410	Configuration File Changed	NFVI_MgmtTOR03	2025-10-03 10:54:09	2025-10-03 10:54:09		Probe-0806	Minor	2025-10-03 10:54:51
31410	Configuration File Changed	NFVI_EOR	2025-10-03 10:53:59	2025-10-03 10:53:59		Probe-0806	Minor	2025-10-03 10:54:40

DCGW alarm

Alarm ID	Alarm Name	Alarm Source	First Occurred On	Last Occurred On	Vendor	Probe ID	Clearance Status	First Processing Tim
34424	OSPF Packet Retransmitted	NFVI_DCGW01	2025-10-07 03:07:35	2025-10-07 03:07:35		Probe-0806	Information	2025-10-07 03:08:24
30004	BGP Status Changed	NFVI_DCGW01	2025-10-07 02:35:15	2025-10-07 02:35:15		Probe-0806	Major	2025-10-07 02:36:01

Storage alarm

Alarm ID	Alarm Name	Alarm Source	First Occurred On	Last Occurred On	Vendor	Probe ID	Clearance Status	First Processing Tim
20234	The Hard Disk Is Isolated	NFVSLAH_RN02_Steor_01	2025-10-04 19:09:01	2025-10-04 19:09:01	HUAWEI	Probe-0806	Major	2025-10-04 19:11:48
20234	The Hard Disk Is Isolated	NFVSLAH_RN02_Steor_01	2025-10-04 19:08:33	2025-10-04 19:08:33	HUAWEI	Probe-0806	Major	2025-10-04 19:11:18
24387	Disk Is About To Fail	NFVSLAH_RN02_Steor_01	2025-10-04 19:03:56	2025-10-04 19:03:56	HUAWEI	Probe-0806	Major	2025-10-04 19:04:42

Fault alarm and KPI alarm of different layers.

The AIS core network integrates information from other domains (such as transmission) to build end-to-end global visibility and service information display capabilities.

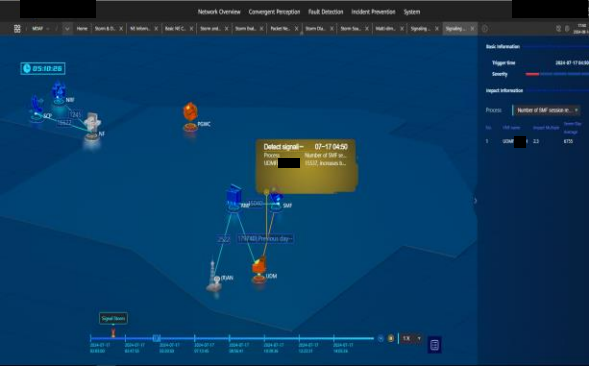
Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 2-1 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C
Fault identification	10%	<p>Does your system support fault identification and visualization related to the core network status? Assessment object: the core network management function</p> <p>Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs) NOTE 1: "Degraded" is an intermediate state indicating that the network functions are abnormal, but not completely faulty. The example causes of NF degradations include the following: Packet loss occurs on host NICs; packet loss occurs on TOR/EOR switches; faults occur on CPU and memory resources. NOTE 2: Fault identification is used to provide detected exception information related to the network and services based on multiple data sources.</p>	<p>The system supports automatic fault detection and identification and alarm aggregation in fault scenarios based on multiple data sources (alarms, KPIs, heartbeat messages, and identified issues etc.). The system can compress the number of alarm notifications and provide the aggregated alarms.</p> <p>Fault Mgmt. supports visualization of the following management capabilities in one view of VNFs/NFs and the telecom cloud.</p> <ol style="list-style-type: none"> 1. VNF object (5GC NFs and EPC VNFs) status (faulty or normal) visualization 2. VNF health status (degraded and overloaded) visualization 3. Visualized status (faulty or normal) of VMs and pods in the telecom cloud 4. Information of telecom cloud infrastructure, including server (CPU, memory, NIC) information, storage information, storage controller/storage port information, vNIC information and rack information 	<p>The system supports automatic fault detection and identification and alarm aggregation in fault scenarios based on alarms or KPIs. The system can identify and filter out redundant alarm notifications and related tickets based on pre-defined rules.</p> <p>Fault Mgmt. supports visualization of the following management capabilities:</p> <ol style="list-style-type: none"> 1. VNF object (5GC NFs and EPC VNFs) status (faulty or normal) visualization 2. VNF health status (degraded and overloaded) visualization 3. Visualized status (faulty or normal) of VMs and pods in the telecom cloud 	<p>No. The system supports manual fault detection based on the alarm notification and KPIs.</p>

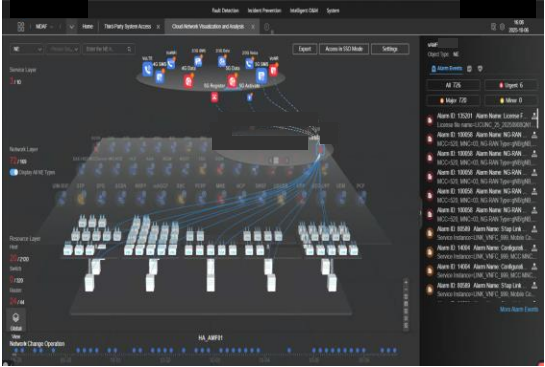
Thailand AIS Core network can meet option A (support by MDAF, cover all the Equipment and part of Communication and Quality of service):



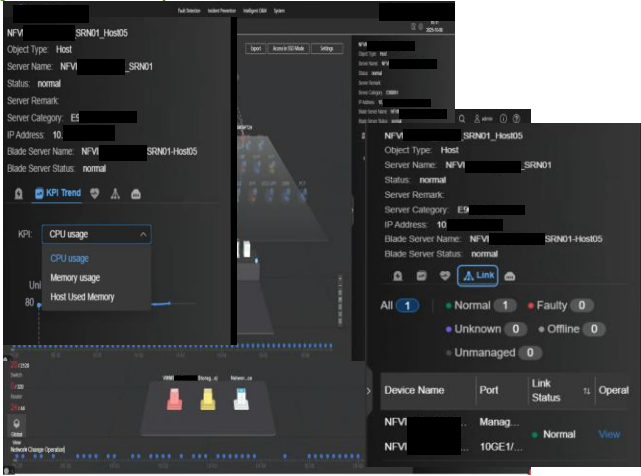
MAE-MDAF: VNF object (5GC NFs and EPC VNFs) status (faulty or normal) visualization — Support 1



MAE-MDAF: VNF health status (degraded and overloaded) visualization—Support 2



MAE-MDAF: Visualized status (faulty or normal) of VMs and pods in the telecom cloud.—Support 3



MAE-MDAF: Information of telecom cloud infrastructure, including server (CPU, memory, NIC) information, storage information, storage controller/storage port information. vNIC information and rack information.—Support 4

Fault information is mapped to the corresponding VNF or Hardware, enabling the system to detect and identify faults and display the device health status.

Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 2-2 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C
Fault identification	10%	<p>Does your system support fault identification and visualization related to the core network status? Assessment object: the core network management function</p> <p>Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs)</p> <p>NOTE 1: "Degraded" is an intermediate state indicating that the network functions are abnormal, but not completely faulty. The example causes of NF degradations include the following: Packet loss occurs on host NICs; packet loss occurs on TOR/EOR switches; faults occur on CPU and memory resources.</p> <p>NOTE 2: Fault identification is used to provide detected exception information related to the network and services based on multiple data sources.</p>	<p>The system supports automatic fault detection and identification and alarm aggregation in fault scenarios based on multiple data sources (alarms, KPIs, heartbeat messages, and identified issues etc.). The system can compress the number of alarm notifications and provide the aggregated alarms.</p> <p>Fault Mgmt. supports visualization of the following management capabilities in one view of VNFs/NFs and the telecom cloud.</p> <ol style="list-style-type: none"> VNF object (5GC NFs and EPC VNFs) status (faulty or normal) visualization VNF health status (degraded and overloaded) visualization Visualized status (faulty or normal) of VMs and pods in the telecom cloud Information of telecom cloud infrastructure, including server (CPU, memory, NIC) information, storage information, storage controller/storage port information, vNIC information and rack information 	<p>The system supports automatic fault detection and identification and alarm aggregation in fault scenarios based on alarms or KPIs. The system can identify and filter out redundant alarm notifications and related tickets based on pre-defined rules.</p> <p>Fault Mgmt. supports visualization of the following management capabilities:</p> <ol style="list-style-type: none"> VNF object (5GC NFs and EPC VNFs) status (faulty or normal) visualization VNF health status (degraded and overloaded) visualization Visualized status (faulty or normal) of VMs and pods in the telecom cloud 	<p>No. The system supports manual fault detection based on the alarm notification and KPIs.</p>

Thailand AIS Core network can meet option A (support by OSS, cover the Communication and Quality of service):

PC Rule

The screenshot shows a configuration page for a PC Rule. Under 'Basic Information', the Rule Name is 'pc_3l20000_CS_BKX_01' and the Domain is 'CORE'. Under 'Conditions and Parameters', there are sections for Parent Alarms (4 entries with AlertName 'MSS_2371') and Child Alarms (4 entries with AlertName 'MGW_2658'). The Association Interval is set to 1800.

PC alarms

manager	Alarm Source	PC Rule Result	AlertName	Alarm Name	First Occurred On	First Processing Time	AMONName	Description	Site Name	IN
VU0000	JRGAMSS	P	MSS_2371	Number of trunk group fault...	2025-09-28 22:59:03	2025-09-28 22:59:07	JRGAMSS	2371 Number of trunk group fault circuits ex...	JRGAMSS...	CI
VU0000	JRGAMGW	C	MGW_2658	SEH/STIM-1 path fault	2025-09-28 22:58:48	2025-09-28 22:59:07	JRGAMGW	2658 SEH/STIM-1 path fault Frame No.=3, SL...	JRGAMGW...	
VU0000	JRGAMGW	C	MGW_2658	SEH/STIM-1 path fault	2025-09-28 22:58:48	2025-09-28 22:59:07	JRGAMGW	2658 SEH/STIM-1 path fault Frame No.=3, SL...	JRGAMGW...	

DC Rule

The screenshot shows a configuration page for a DC Rule. Under 'Basic Information', the Rule ID is '2007074314000_9834rfd...', Rule name is 'M3UA Link Congestion', and Rule type is 'Delay Count'. Under 'Rule Code', there is a script defining the rule logic for M3UA link congestion.

DC alarms

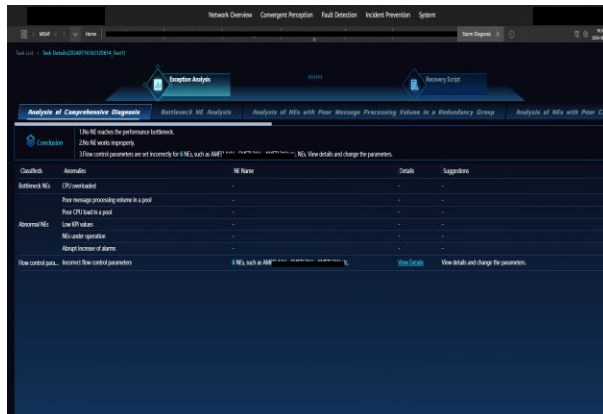
Alarm Source	Alarm Name	DC Rule Group ID	DC Rule Result	First Occurred On	First Processing Time	Site Name	JobID	Ticket ID	Description
VUSG	SCCPGW	M3UA Link Congestion	DC C	2025-10-07 01:12:21	2025-10-07 01:12:24	VUSG			20070 M3UA Link Congestion M3UA Link Name=VSCCPGW
VUSG	SCCPGW	M3UA Link Congestion	DC C	2025-10-07 01:12:03	2025-10-07 01:12:12	VUSG			20070 M3UA Link Congestion M3UA Link Name=VSCCPGW
VUSG	SCCPGW	M3UA Link Congestion	DC P	2025-10-07 01:11:54	2025-10-07 01:12:02	VUSG		TT25-1954335(Ac...	20070 M3UA Link Congestion M3UA Link Name=VSCCPGW

Based on certain rules, service-level fault status recognition can be supported.

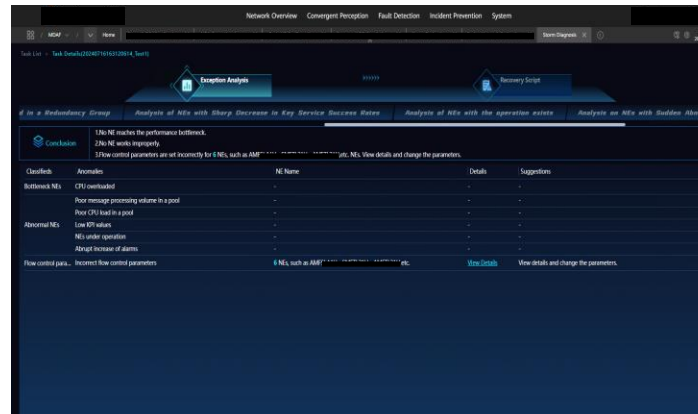
Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 3 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Risk prediction	10%	<p>Does your system automatically detect and prevent risks of VNF faults?</p> <p>Assessment object: management entities Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs)</p>	<p>Yes. The system can use intelligent risk identification to recognize potential faults and automatically prevent faults. It can:</p> <ol style="list-style-type: none"> 1. Prevent potential risks and analyze the risks involving capacity, links, signaling storms, DR, and hardware. 2. Analyze the cause of risks and provide recommended actions automatically. 	<p>The system can use automatic risk identification, which requires manual confirmation, to recognize potential faults and prevent faults. It can:</p> <ol style="list-style-type: none"> 1. Prevent potential risks and analyze the risks involving capacity and links. 	<p>The system can use risk identification to recognize potential faults and prevent faults by providing an automatic checklist which requires engineers to periodically confirm the potential risks in this checklist. It can:</p> <ol style="list-style-type: none"> 1. Prevent potential risks and analyze the risks involving capacity. 	<p>No. The system does not support risk prediction.</p>

Thailand AIS Core network can meet option A (support by MDAF, cover the Equipment and Communication and Quality of service):



MAE-MDAF: In the scenario of signaling storm prevention and control, through routine health assessment tasks, intelligent AI algorithms are used to analyze system capacity, links, signaling storms, DR, and hardware information. This approach can effectively identify potential risks in advance.—Support 1



MAE-MDAF: For identified bottleneck NEs, suggestions such as capacity expansion, optimization of flow control parameters, and switchover plans for drills can be provided to prevent risks in advance. —Support 1, 2

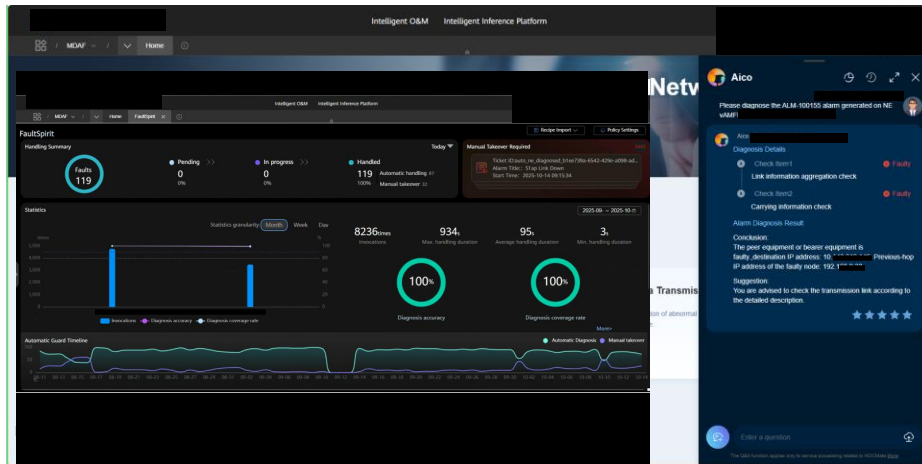


MAE-MDAF: Display Network Risk Evaluation, Network Risk Information, Simulation Evaluation Scenario, Flow Control Parameter Check and Network Change information by region.—Support 1

Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 4-1 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Demarcation	15%	<p>Does your system support automatic demarcation of core network faults?</p> <p>Assessment object: the core network management function Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs and IMS VNFs)</p>	<p>Yes. The intelligent system supports automatic fault demarcation without manual intervention (e.g., core network VNFs and managed objects in telecom cloud) covering 95% or higher of live network faults. The average accuracy per month is above 90%. The system supports demarcation of following scenarios:</p> <ol style="list-style-type: none"> Horizontal demarcation for VNFs in the core network domain Demarcation between VNFs and vertical demarcation for the telecom cloud 	<p>The system supports automatic fault demarcation covering 80% or higher of faults (only for the alarms after aggregation and alarms generated based on KPI monitoring). The average accuracy per month is above 90%. The system supports demarcation of following scenarios:</p> <ol style="list-style-type: none"> Horizontal demarcation for VNFs in the core network domain Demarcation between VNFs and vertical demarcation for the telecom cloud 	<p>The system supports automatic fault demarcation and provides one or multiple analysis results to assist fault demarcation.</p>	<p>No. The system does not support automatic fault demarcation.</p>

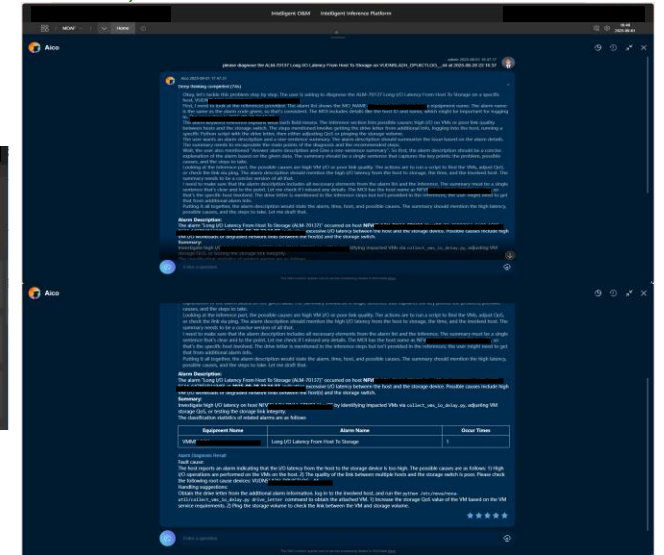
Thailand AIS Core network can meet option A (support by MDAF, cover the Equipment Layer and Communication and Quality of service):



MAE-MDAF: Supports automatic horizontal link demarcation between network elements, with a coverage rate exceeding 95% in the core network domain.— Support 1



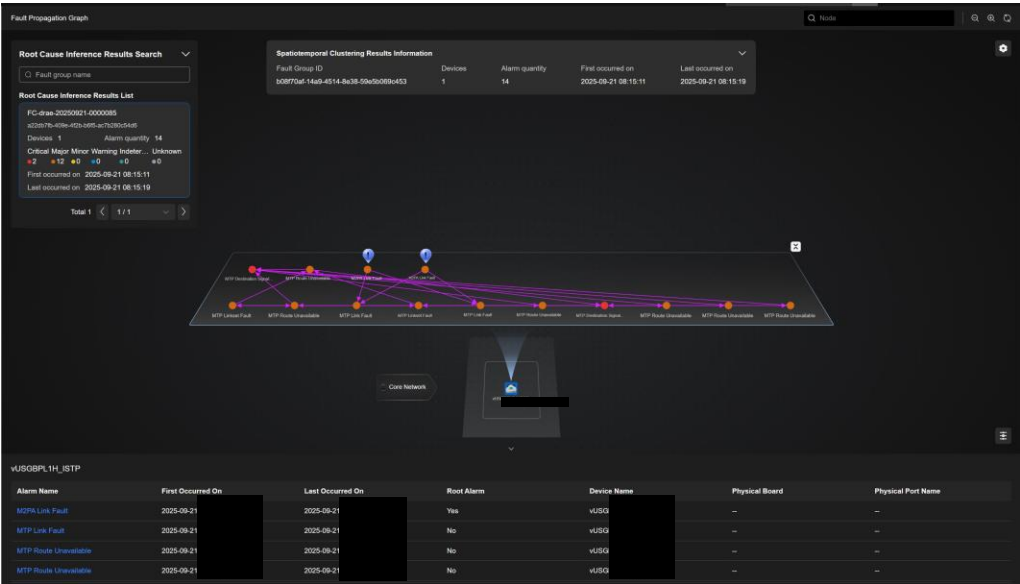
MAE-MDAF: Supports automatic vertical cross-layer demarcation for telecom cloud, with a coverage rate exceeding 95%.—Support 2



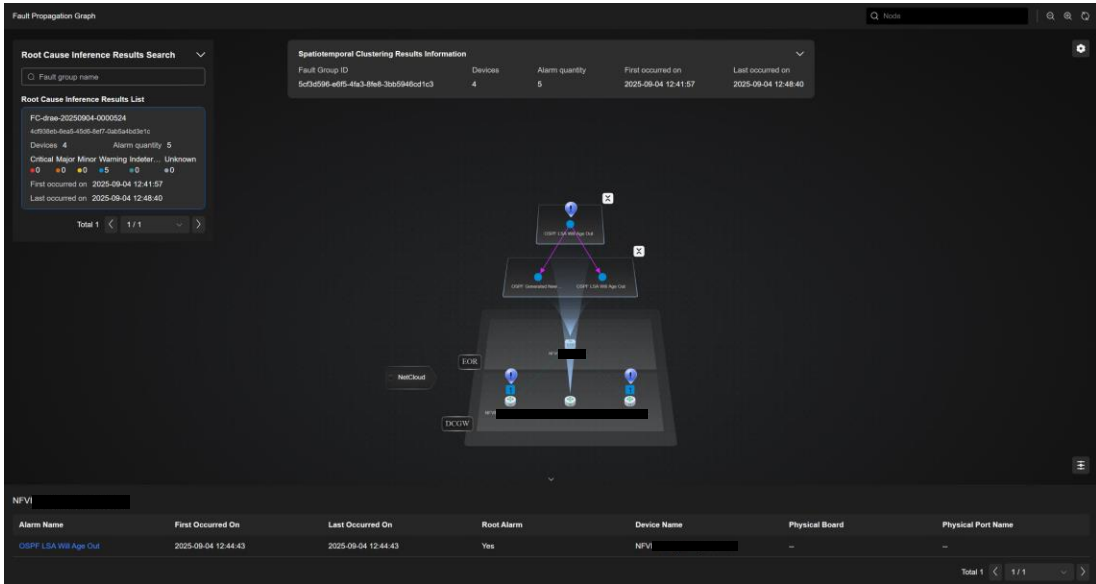
Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 4-2 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Demarcation	15%	<p>Does your system support automatic demarcation of core network faults?</p> <p>Assessment object: the core network management function Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs and IMS VNFs)</p>	<p>Yes. The intelligent system supports automatic fault demarcation without manual intervention (e.g., core network VNFs and managed objects in telecom cloud) covering 95% or higher of live network faults. The average accuracy per month is above 90%. The system supports demarcation of following scenarios:</p> <ol style="list-style-type: none"> Horizontal demarcation for VNFs in the core network domain Demarcation between VNFs and vertical demarcation for the telecom cloud 	<p>The system supports automatic fault demarcation covering 80% or higher of faults (only for the alarms after aggregation and alarms generated based on KPI monitoring). The average accuracy per month is above 90%. The system supports demarcation of following scenarios:</p> <ol style="list-style-type: none"> Horizontal demarcation for VNFs in the core network domain Demarcation between VNFs and vertical demarcation for the telecom cloud 	<p>The system supports automatic fault demarcation and provides one or multiple analysis results to assist fault demarcation.</p>	<p>No. The system does not support automatic fault demarcation.</p>

Thailand AIS Core network can meet option A (support by OSS, cover all the Equipment and Communication and Quality of service):



Horizontal demarcation for VNFs layer in core network

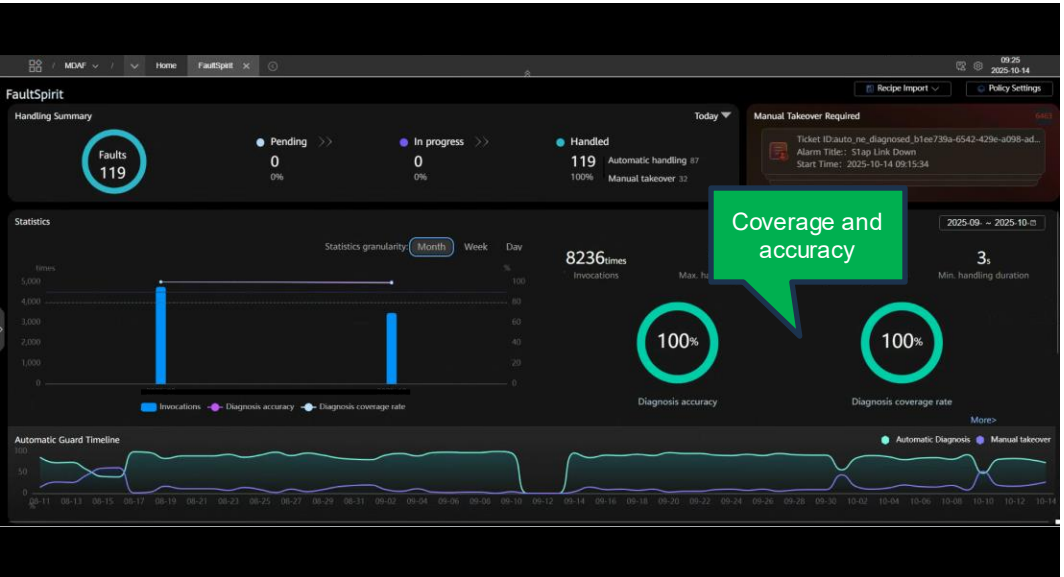


Vertical demarcation between VNF, VM and Infra of telecom cloud.

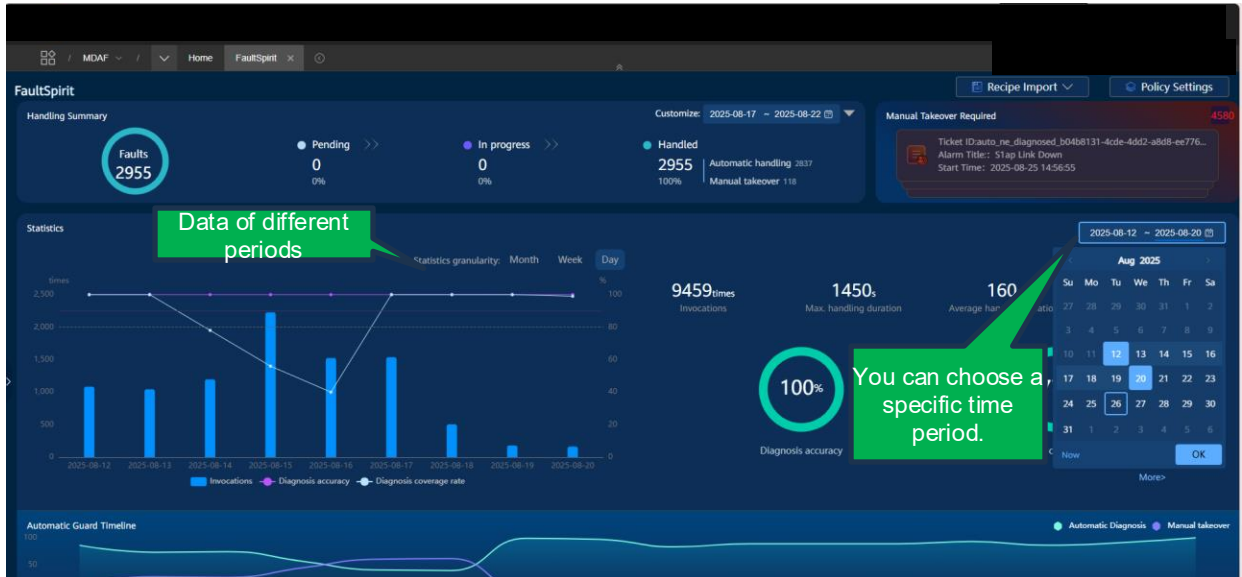
Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 4-1 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Demarcation	15%	<p>Does your system support automatic demarcation of core network faults?</p> <p>Assessment object: the core network management function Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs and IMS VNFs)</p>	<p>Yes. The intelligent system supports automatic fault demarcation without manual intervention (e.g., core network VNFs and managed objects in telecom cloud) covering 95% or higher of live network faults. The average accuracy per month is above 90%. The system supports demarcation of following scenarios:</p> <ol style="list-style-type: none"> 1. Horizontal demarcation for VNFs in the core network domain 2. Demarcation between VNFs and vertical demarcation for the telecom cloud 	<p>The system supports automatic fault demarcation covering 80% or higher of faults (only for the alarms after aggregation and alarms generated based on KPI monitoring). The average accuracy per month is above 90%. The system supports demarcation of following scenarios:</p> <ol style="list-style-type: none"> 1. Horizontal demarcation for VNFs in the core network domain 2. Demarcation between VNFs and vertical demarcation for the telecom cloud 	<p>The system supports automatic fault demarcation and provides one or multiple analysis results to assist fault demarcation.</p>	<p>No. The system does not support automatic fault demarcation.</p>

Thailand AIS Core network can meet option A (support by MDAF, cover the Equipment and Communication and Quality of service):



Coverage and accuracy



Data of different periods

You can choose a specific time period.

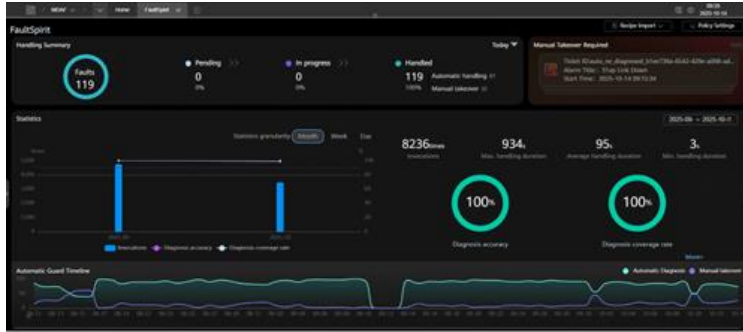
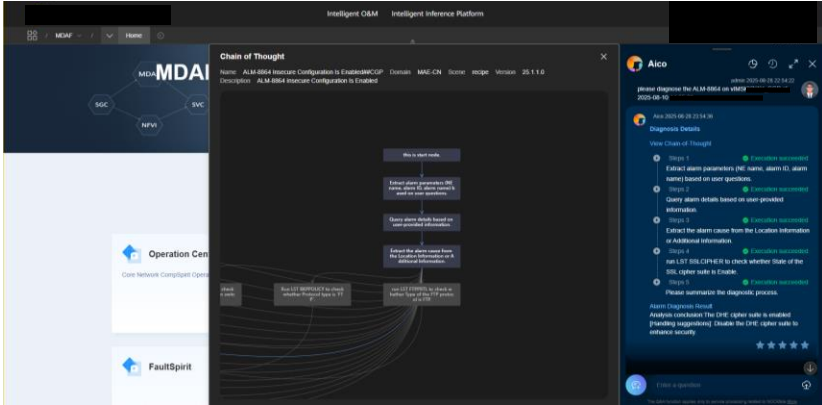
MAE-MDAF: The fault management scenarios of MDAF provide a statistical dashboard for job outcomes to monitor and evaluate business performance. It offers daily, weekly, and monthly statistics, primarily focusing on accuracy (based on user feedback results) and coverage (whether the system can automatically handle all possible alarms or fault scenarios). The chart displays metrics such as coverage and accuracy during operations, which exceed the required threshold of 95%.

Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 5-1 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Locating	15%	<p>Does your system support automatic locating related to core network Fault Mgmt. ?</p> <p>Assessment object: the core network management function and network function Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs)</p>	<p>Yes. Intelligent fault diagnosis is capable of automatically providing precise locating (e.g., detailed causes of identified faults, including minimum units, software modules, and ports) of faults, covering 95% or higher of live network faults without human intervention. The average accuracy per month is above 90%.</p>	<p>Automatic fault diagnosis is capable of providing root causes of faults, and providing precise fault locating, covering 80% or higher faults (only for the alarms after aggregation and alarms generated based on KPI monitoring). The average accuracy per month is above 90%.</p>	<p>The system supports automatic fault locating and provides one or multiple analysis results to assist fault locating.</p>	<p>No. The system does not support automatic fault locating.</p>

Thailand AIS Core network can meet option A (support by MDAF, cover all the Equipment and part of Communication and Quality of service):

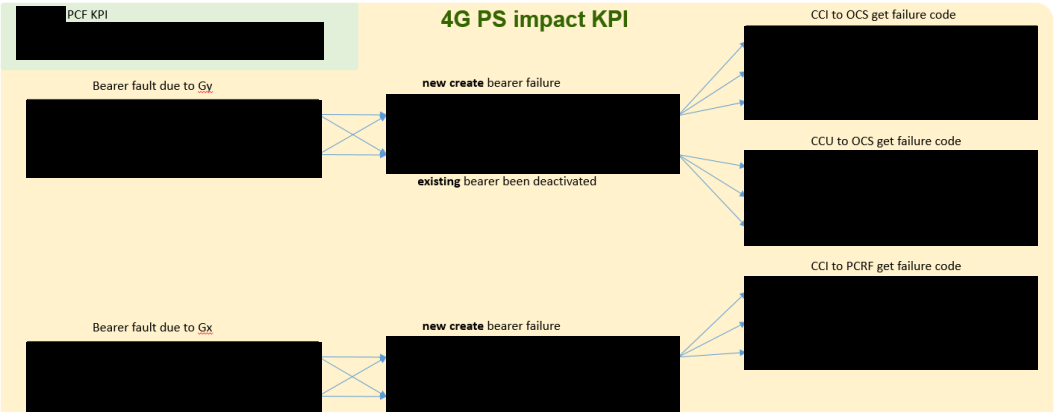
Intelligent fault diagnosis can automatically provide information about accurate fault locations faults (only for the alarms after aggregation and alarms generated based on KPI monitoring) (The average monthly accuracy exceeds 95%.)



Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 5-2 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Locating	15%	<p>Does your system support automatic locating related to core network Fault Mgmt. ?</p> <p>Assessment object: the core network management function and network function Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs)</p>	<p>Yes. Intelligent fault diagnosis is capable of automatically providing precise locating (e.g., detailed causes of identified faults, including minimum units, software modules, and ports) of faults, covering 95% or higher of live network faults without human intervention. The average accuracy per month is above 90%.</p>	<p>Automatic fault diagnosis is capable of providing root causes of faults, and providing precise fault locating, covering 80% or higher faults (only for the alarms after aggregation and alarms generated based on KPI monitoring). The average accuracy per month is above 90%.</p>	<p>The system supports automatic fault locating and provides one or multiple analysis results to assist fault locating.</p>	<p>No. The system does not support automatic fault locating.</p>

Thailand AIS Core network can meet option A (support by OSS, cover the Communication and Quality of service):



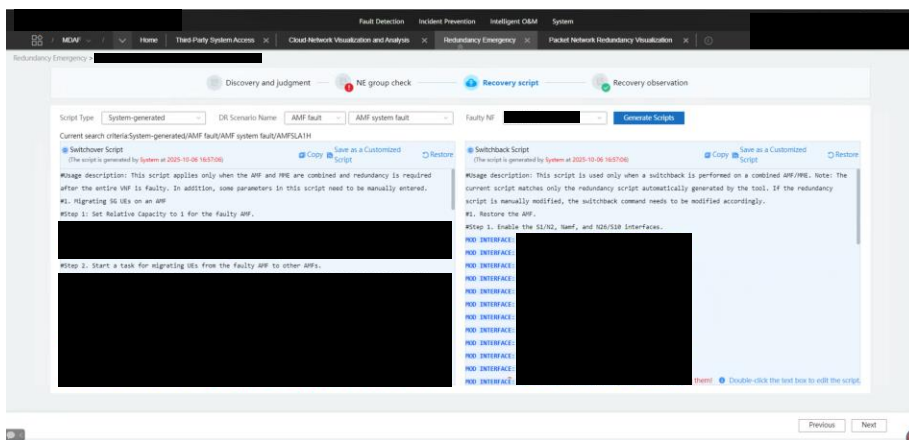
Logic of automation diagnosis based on alarm and PKI data.

Result of automation diagnosis to provide root cause in alarm detail.

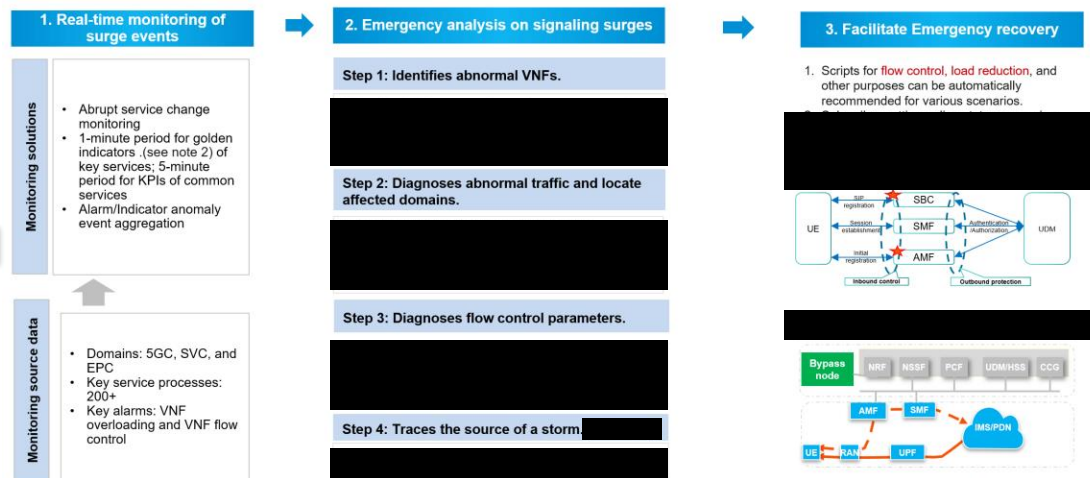
Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 6-1 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Fault rectification solution generation	10%	<p>Does your system automatically generate the fault rectification solution?</p> <p>Assessment object: the core network management function Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs)</p>	<p>Yes. The system can generate the optimal rectification solution (minimum impact scope and time). Fault rectification can cover but not be limited to the following scenarios:</p> <ol style="list-style-type: none"> 1. Generating an NF fault rectification solution automatically 2. Generating a solution to recover slight service losses 3. Providing a DR solution in case of accidents or natural disasters 4. System can generate optimization to network for failure (e.g., signaling storm, service outage etc.) automatically. 	<p>The system can generate a fault rectification solution (e.g., fault rectification scripts including operation objects and operation sequences). Fault rectification can cover the following scenarios:</p> <ol style="list-style-type: none"> 1. Providing a DR solution in case of accidents or natural disasters. 2. System can generate optimization to network for failure (e.g., signaling storm, service outage etc.) automatically. 	<p>The system can generate fault rectification recommendations based on specialized checklist, to determine the rectification operations and operation objects based on rectification decision rules (configuration). Fault rectification can cover the following scenarios:</p> <ol style="list-style-type: none"> 1. Providing a DR solution in case of accidents or natural disasters 	<p>No. The system supports fault rectification based on manual decisions.</p>

Thailand AIS Core network can meet option A (support by MDAF, cover all the Equipment and part of Communication and Quality of service):



MAE-MDAF. Generating an NF fault rectification solution automatically and a solution to recover slight service losses, also can provide a DR solution in case of accidents or natural disasters.—Support 1, 2, 3

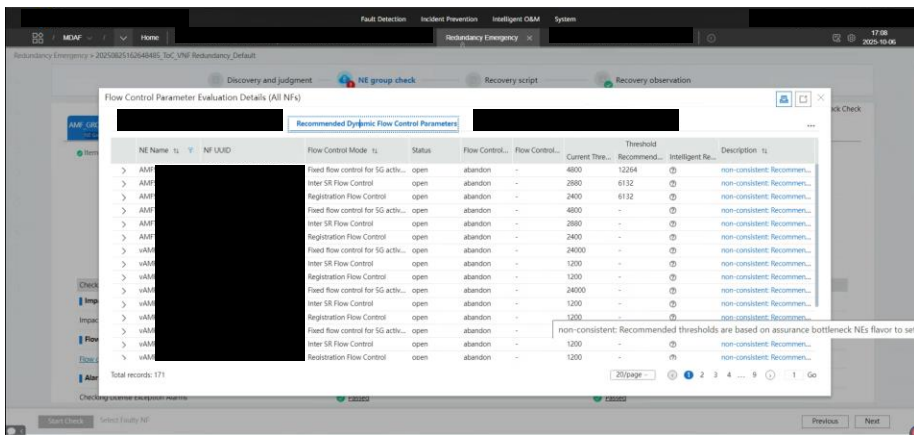


The logic fault rectification solution automatically

Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 6-1 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Fault rectification solution generation	10%	<p>Does your system automatically generate the fault rectification solution?</p> <p>Assessment object: the core network management function Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs)</p>	<p>Yes. The system can generate the optimal rectification solution (minimum impact scope and time). Fault rectification can cover but not be limited to the following scenarios:</p> <ol style="list-style-type: none"> 1. Generating an NF fault rectification solution automatically 2. Generating a solution to recover slight service losses 3. Providing a DR solution in case of accidents or natural disasters 4. System can generate optimization to network for failure (e.g., signaling storm, service outage etc.) automatically. 	<p>The system can generate a fault rectification solution (e.g., fault rectification scripts including operation objects and operation sequences). Fault rectification can cover the following scenarios:</p> <ol style="list-style-type: none"> 1. Providing a DR solution in case of accidents or natural disasters. 2. System can generate optimization to network for failure (e.g., signaling storm, service outage etc.) automatically. 	<p>The system can generate fault rectification recommendations based on specialized checklist, to determine the rectification operations and operation objects based on rectification decision rules (configuration). Fault rectification can cover the following scenarios:</p> <ol style="list-style-type: none"> 1. Providing a DR solution in case of accidents or natural disasters 	<p>No. The system supports fault rectification based on manual decisions.</p>

Thailand AIS Core network can meet option A(support by MDAF, cover all the Equipment and part of Communication and Quality of service):



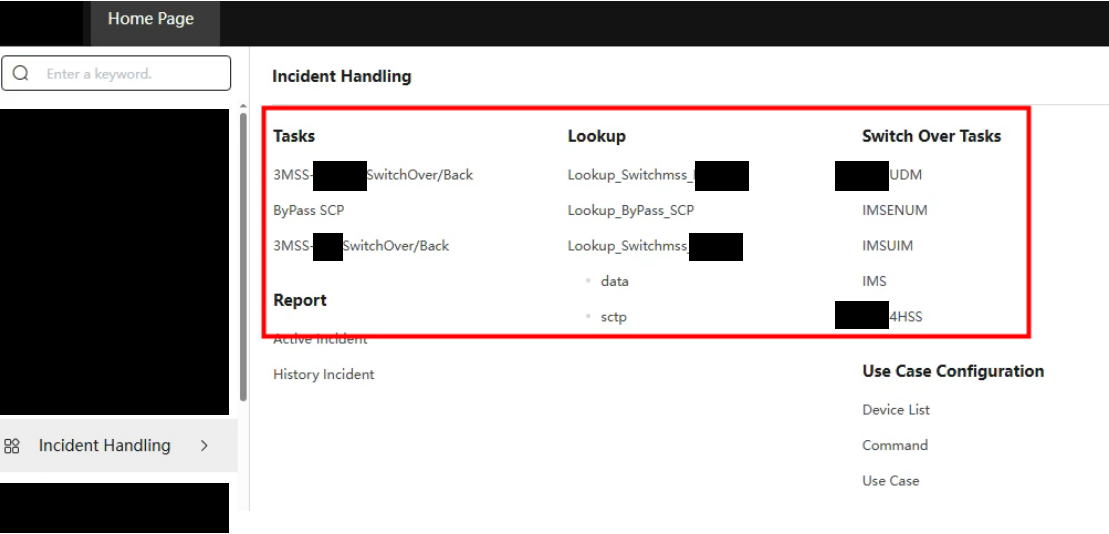
MAE-MDAF: System can generate optimization to network for failure (e.g., signaling storm etc.) automatically.—Support 4

The logic fault rectification solution automatically

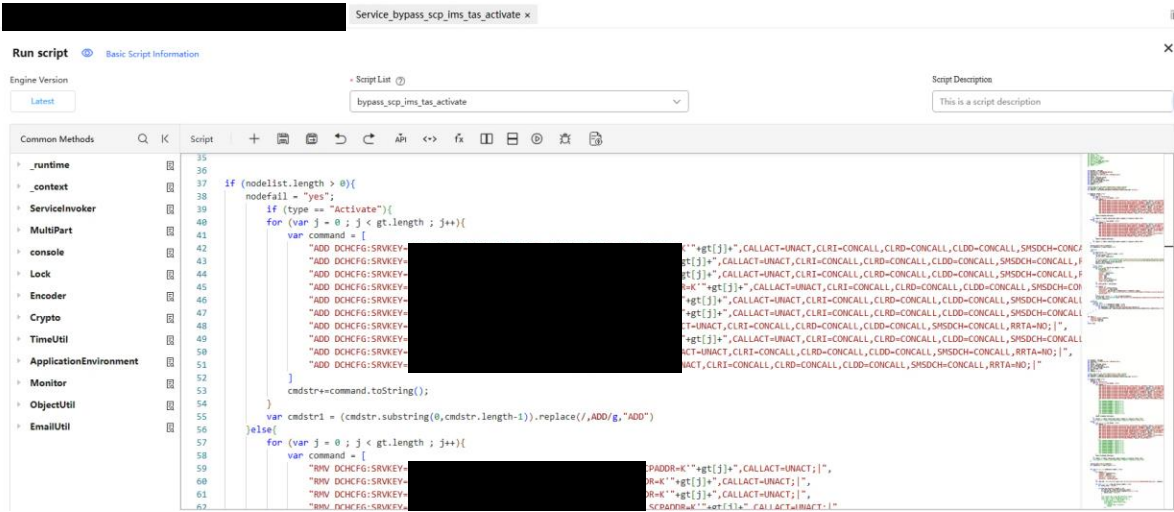
Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 6-2 A)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Fault rectification solution generation	10%	<p>Does your system automatically generate the fault rectification solution?</p> <p>Assessment object: the core network management function Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs)</p>	<p>Yes. The system can generate the optimal rectification solution (minimum impact scope and time). Fault rectification can cover but not be limited to the following scenarios:</p> <ol style="list-style-type: none"> 1. Generating an NF fault rectification solution automatically 2. Generating a solution to recover slight service losses 3. Providing a DR solution in case of accidents or natural disasters 4. System can generate optimization to network for failure (e.g., signaling storm, service outage etc.) automatically. 	<p>The system can generate a fault rectification solution (e.g., fault rectification scripts including operation objects and operation sequences). Fault rectification can cover the following scenarios:</p> <ol style="list-style-type: none"> 1. Providing a DR solution in case of accidents or natural disasters. 2. System can generate optimization to network for failure (e.g., signaling storm, service outage etc.) automatically. 	<p>The system can generate fault rectification recommendations based on specialized checklist, to determine the rectification operations and operation objects based on rectification decision rules (configuration). Fault rectification can cover the following scenarios:</p> <ol style="list-style-type: none"> 1. Providing a DR solution in case of accidents or natural disasters 	<p>No. The system supports fault rectification based on manual decisions.</p>

Thailand AIS Core network can meet option A(support by OSS, cover the Communication and Quality of service):



Solution generation of bypass and switchover for VNFs in core network



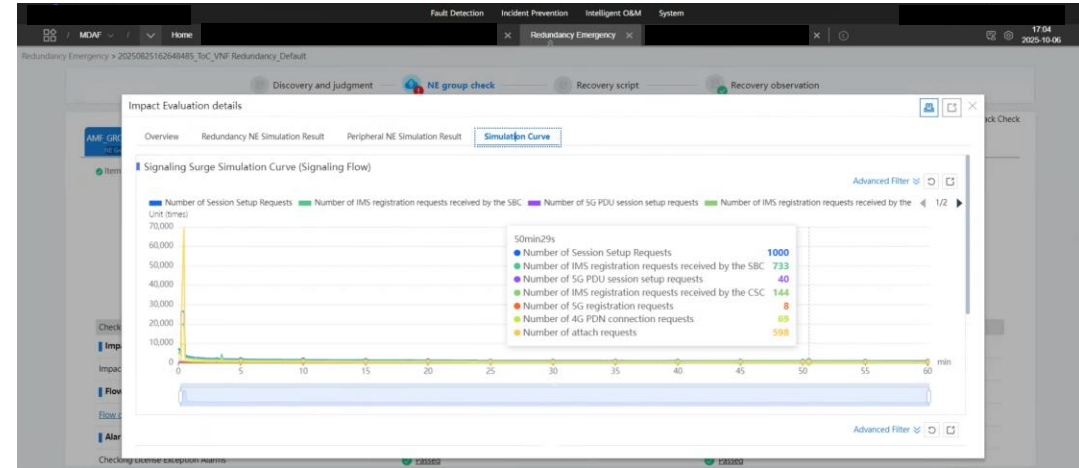
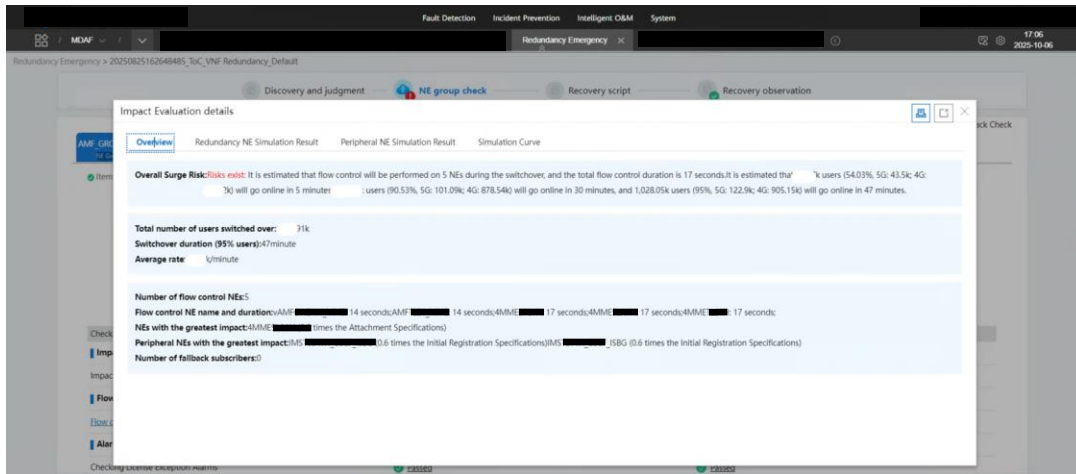
Sample of generated solution for bypass OCS

Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 7 B)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Solution pre-verification	10%	<p>Does your system support rectification solution evaluation and verification to support decisions in core network?</p> <p>NOTE: Fault rectification solution can be evaluated before implementation by being verified in a simulation or sandbox environment.</p> <p>Assessment object: the core network management function Core network VNFs or NFs for assessment: core network VNFs (e.g., 5G NFs, EPC VNFs, and IMS VNFs)</p>	<p>Yes. The system supports intelligent rectification solution evaluation for the core network to verify the feasibility of rectification solution and provides the visualization results of accuracy effect before implementation.</p> <p>The evaluation tasks can cover but not be limited to the following scenarios:</p> <ol style="list-style-type: none"> 1. Solution feasibility check and configuration verification 2. Emulation or simulation of rectification solution based on network digital twin <p>The system supports the decision.</p>	<p>The system supports automatic rectification solution evaluation for core network, to verify the feasibility of rectification solution before implementation.</p> <p>The evaluation tasks can cover the following scenarios:</p> <ol style="list-style-type: none"> 1. Solution feasibility check and configuration verification 2. DR rectification solution evaluation and verification <p>The system supports the simulation results for manual decisions made for rectification solution.</p>	<p>The system provides a checklist for manual evaluation to verify the feasibility of rectification solution before implementation.</p> <p>The checklist includes but is not limited to:</p> <ol style="list-style-type: none"> 1. NF healthy status check 2. Influence of rectification solution 	<p>No. The system verifies the rectification solution based on manual decisions.</p>

Thailand AIS Core network Only can meet option B (support by MDAF, cover the Equipment and part of Communication and Quality of service):

MAE-MDAF: The generated scripts or plans support system simulation and provide expected results, including simulation curves, to assist users in decision-making.—Support 1, 2



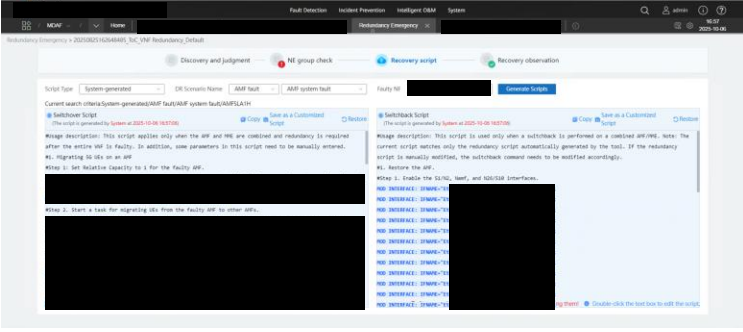
Why not meet optional A: The current system only provides evidence to assist decision-making; it does not make decisions automatically.

Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 8-1 A)

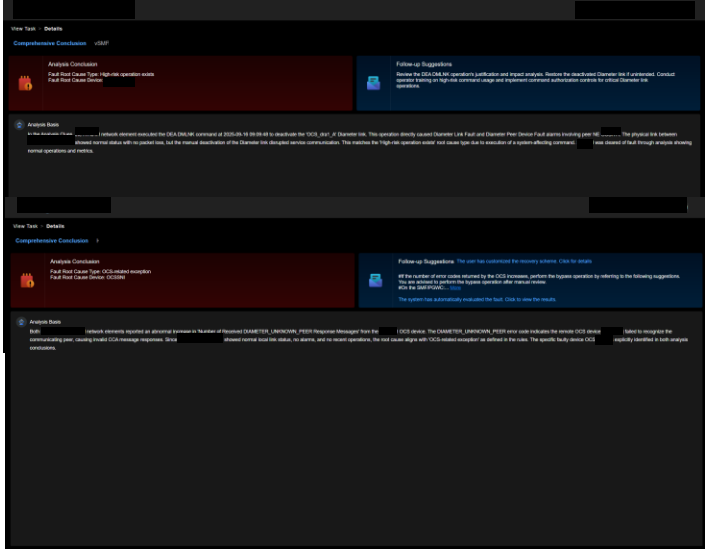
Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Solution implementation	10%	Does your system support automatic fault rectification? Assessment object: the core network management function and network element Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs).	Yes. The system can support automatic fault rectification in all fault rectification scenarios.	The system supports fault rectification after manual confirmation.		

Thailand AIS Core network can meet option A (support by MDAF, cover all the Equipment and part of Communication and Quality of service):

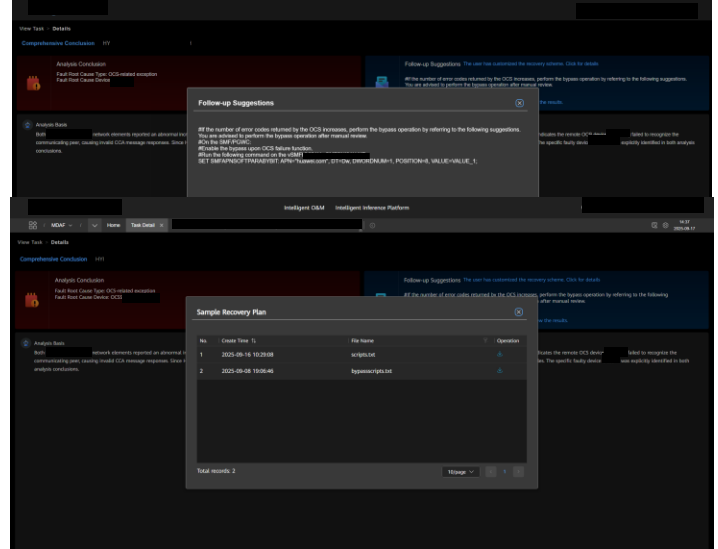
When the NE is faulty, the core network can start automatic bypass based on the preset automatic bypass script.



Automatically generate switchover script



Automatically generate bypass suggestion and script

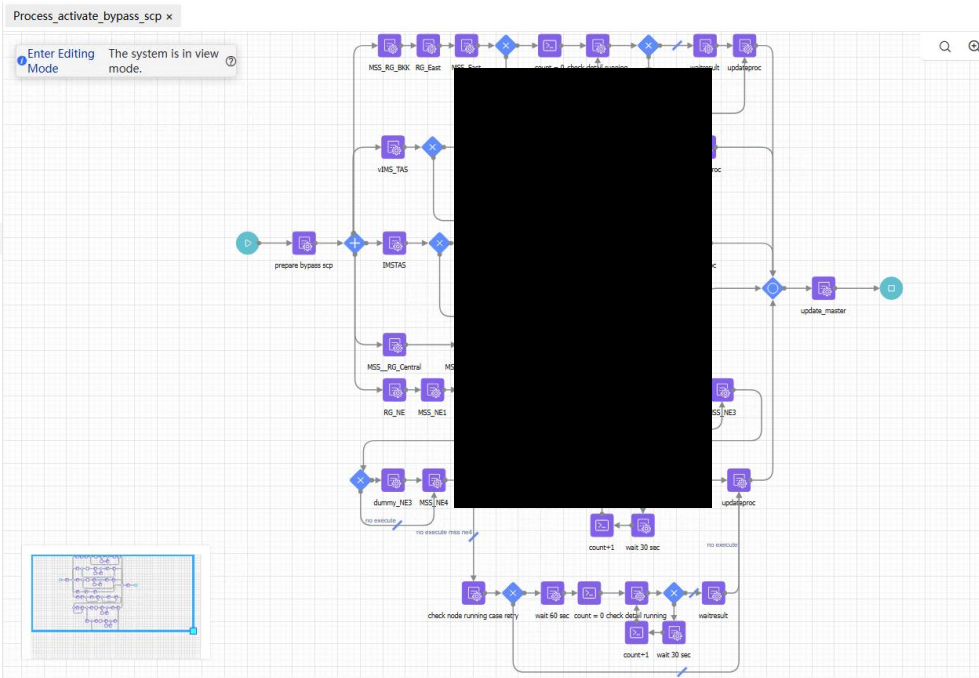


Automatically execute bypass script

Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 8-2 B)

Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Solution implementation	10%	<p>Does your system support automatic fault rectification?</p> <p>Assessment object: the core network management function and network element</p> <p>Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs).</p>	Yes. The system can support automatic fault rectification in all fault rectification scenarios.	The system supports fault rectification after manual confirmation.		

Thailand AIS Core network only can meet option B (support by OSS, cover the Communication and Quality of service):



BYPASS SCP

Work Instruction

Master Table

change_time	task	type	taskid	param	Action	status
2025-07-31 ...	Bypass SCP	Deactivate	182	TEST-SCPGT		success

SCP Name:

Procedure Table

taskid	type	step	detail	status
182	Deactivate	1	Prepare data for Bypass SCP	success
182	Deactivate	2	Deactivate Bypass SCP 3MSS	success
182	Deactivate	3	Deactivate Bypass SCP 3MSS	success
182	Deactivate	4	Deactivate Bypass SCP 3MSS	success
182	Deactivate	5	Deactivate Bypass SCP 3MSS	success
182	Deactivate	6	Deactivate Bypass SCP 3MSS	success
182	Deactivate	7	Deactivate Bypass SCP 3MSS	success
182	Deactivate	8	Deactivate Bypass SCP 3MSS	success
182	Deactivate	9	Deactivate Bypass SCP 3MSS	success

Detail Table

taskid	type	step	note	status	Log
182	Deactivate	2	SRGMSS	success	view
182	Deactivate	2	SRGMSS	success	view
182	Deactivate	2	SRGMSS	success	view

Why not reach option A: The system supports fault rectification after manual confirmation..

Core Network Fault Scenario Evaluation Criteria—Fault Mgmt. (Question 9-1 A)

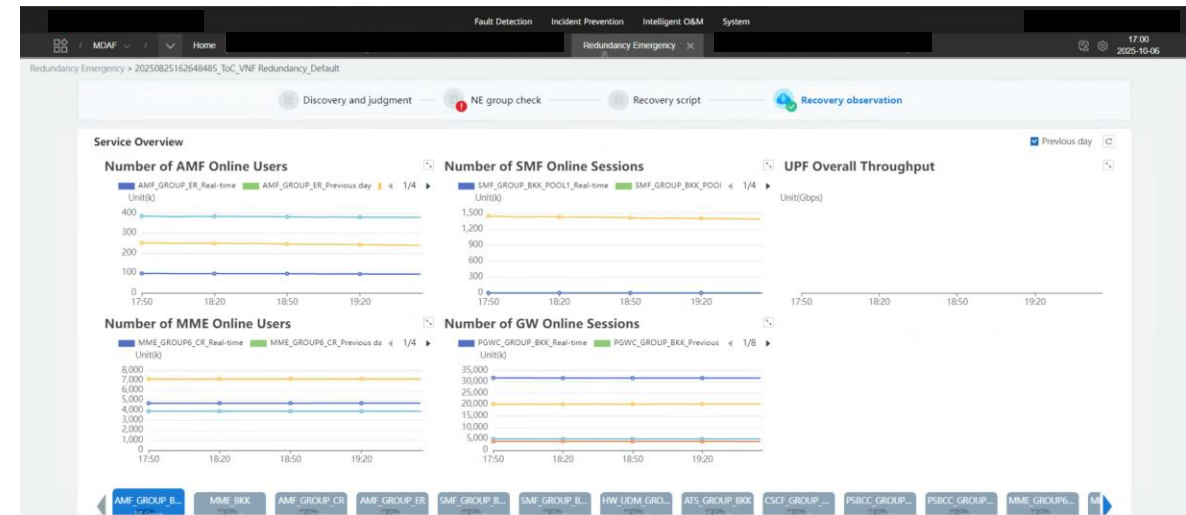
Capability or Task	Weight	Questions	Option A	Option B	Option C	Option D
Service verification	10%	<p>Does your system support automatic service verification after faults on core networks are rectified?</p> <p>Assessment object: the core network management function Core network VNFs or NFs for assessment: core network VNFs (e.g., 5GC NFs, EPC VNFs, and IMS VNFs)</p>	Yes. The system automatically verifies whether network services are recovered and faults are rectified successfully.	The system automatically verifies that the alarms are cleared and KPI data is successfully recovered.	No. The system does not support automatic service verification.	

Thailand AIS Core network can meet option A(support by MDAF, cover all the Equipment and part of Communication and Quality of service):

In the DR switchover scenario, real-time monitoring and service recovery curves are provided on a large screen. Combined with machine-assisted monitoring, an automatic switchover report is generated. Can help user check the service quickly.



MAE-MDAF: In the DR switchover scenario, real-time monitoring and service recovery curves are provided on a large screen.



MAE-MDAF: Recovery observation function.

Preliminary Evaluation and Analysis of Core Network TMF Stability (Oct. 2025)

1. High Stability Part:

				Evaluation
High-Value Scenario	Cognitive Activity	Service Capability	Weight	AIS
Core Network - Stability	Basic stability	Stable deployment architecture	10%	B
		Control plane disaster recovery	15%	A
		User-plane disaster recovery	15%	B
		Infrastructure disaster recovery	15%	B
		Anti-signaling surge capability	15%	A
	Intelligent stability	Risk prediction	15%	A
		Service degradation recovery	15%	A

2. Fault Mgmt. Part:

				Evaluation	
High-Value Scenario	Cognitive Activity (AADE)	Service Capability	Weight	Equipment	Communication and Quality of service
Core Network - Fault Mgmt.	Awareness	Data collection Alarm correlation	10%	A	A
		Analysis	Fault identification	10%	A
	Risk prediction		10%	A	A
	Demarcation		15%	A	A
	Locating		15%	A	A
	Decision	Failure recovery solution generation	10%	A	A
		Solution pre-verification	10%	B	B
	Executions	Solution implementation	10%	A	B
		Service verification	10%	A	A
					3.6 (3.57)

1. The score in **High stability is 3.6**. In the future, AIS needs to enhance its highly stable architecture and improve its disaster recovery level, such as the hot backup capability. Ensures that services are always online without interruption.
2. The score in **Fault Mgmt. is 3.6**. In the future, AIS will enhance the capabilities of prevention prediction and E2E automatic implementation.

Thank You