

# ANL Assessment and evidences of China Mobile Anhui on GB1059L\_RAN Network Quality Optimization

November 2025

# RAN Network Quality Optimization Questionnaire

High-Value Scenario	Cognitive Activity (IAADE) (IAADE)	Service Capability	Weight	Question	Option A	Option B	Option C	Option D
RAN-network quality optimization	Intent	Intent Translation & Fulfilment evaluation	10%	How does the system translate the RAN network optimization intent into the RAN network optimization related control information and evaluate the RAN network optimization intent fulfilment? Note: RAN network optimization intent includes multiple targets for specified areas.  RAN network optimization control information includes RAN network optimization policies (e.g. adjusting base station parameters, load balancing)	The system can automatically generate the network optimization related control information based on human defined intents. The system can automatically evaluate and generate the intent fulfilment report, including fulfillment status for targets.	The system can automatically generate the network optimization related control information based on predefined rules.  The system can automatically generate evaluation results. Human manually select the measurements for evaluation and confirm the evaluation result.	Manually define the RAN network optimization related control information based on expertise. Human manually evaluate the effect after the intention is implemented.	
	Awareness	RAN Network Information Collection	10%	How does the system collect data?  Note: Data includes network performance data (e.g., performance measurement, MR data, MDT data), service experience data if needed, network configuration data, and environment data (e.g., electronic map, site location).	The system can automatically collect and process data (e.g., data cleaning, missing data imputation) Note: the network performance data needs to be collected in the granularity of cell and UE. The service experience data needs to be collected in the granularity of service	The system can automatically collect and process data (e.g., data cleaning, missing data imputation) based on manually defined rules.	Manually select and use the system to collect and process data	People use the system to collect data and manually filter out invalid/redundant data.
	Analysis	RAN Network Issue Identification & Performance Deterioration Prediction	15%	How does the system identify RAN network performance / service experience issues (e.g., coverage-related issues, RAN UE throughput-related issues) or predict network performance / service experience deterioration?	The system can intelligently identify RAN network performance / service experience issues or predict network performance / service experience without human intervention.	The system can automatically identify network issues or predict network performance. Manual confirmation is required.	The system can identify network issues or predict network performance based on predefined rules.	Manually identify RAN network problems or predict network performance based on expertise.
		Issue Demarcation & Root Cause Analysis	20%	How does the system perform problem demarcation and root cause diagnosis?	The system intelligently demarcates issues and diagnoses root cause when the RAN network performance / service experience issue identified or performance deterioration predicted	The system can automatically demarcate network performance / service experience issues and diagnoses root cause, but requires human intervention to confirm the root causes.	The system can demarcate network issues and diagnoses root cause based on predefined rules.	Locating problems and analyzing the root causes of network problems based on expertise.
		Adjustment Solutions Generating	20%	How does the system generate the recommended network adjustment solutions (including a set of network adjusting actions) to solve the identified or predicted network performance / service experience issues? Note: network adjustment solutions including but not limited to L2/L3 configuration parameters, RF parameters, 5QI related service configuration parameters.	The system intelligently generates network optimization solutions (considering of the coordination of multiple network adjusting actions), adjusted to adapt to RAN Traffic & Performance changes in real time.	The system intelligently generates network optimization solutions (considering of the coordination of multiple network adjusting actions), adjusted to adapt to RAN Traffic & Performance changes in non-real time.	The System generates network optimization solutions based on predefined rules.	Network optimization solutions are manually proposed based on expertise.
	Decision	Solution Evaluation & Determination	15%	How does the RAN network optimization system have the capability of automatically evaluating network optimization solutions and determining the best solution to implement?	The system intelligently evaluates and determines the optimal network optimization solution when the recommended solutions are generated.	The System automatically evaluates network optimization solutions, but requires human intervention to confirm the optimal solution.	The System generates network optimization solutions based on predefined rules, but requires human intervention.	network optimization solutions are evaluated and decided based on manual expertise.
Execution	Solution implementation	10%	How does the RAN network optimization system have the capability of executing the network adjustment solutions (e.g., adjusting and configuring the network parameters)? Note: network parameters including but not limited to L2/L3 configuration parameters, RF parameters, 5QI related service configuration parameters.	The System implements network adjustment actions, without human intervention	Humans use the system to execute manual instructions remotely.	Solution implementation is entirely manual.		

In the 7 autonomous capability ratings for RAN quality optimization, China Mobile achieved 7A in self-assessment.

Service Capability	Weight	Capacity Answer	Capacity Score	Coverage Answer	Coverage Score	Interference Answer	Interference Score	Parameter and others Answer	Parameter and others Score
Intent Translation & Fulfilment evaluation	10%	B	3	A	4	A	4	A	4
RAN Network Information Collection	10%	A	3	A	3	A	3	A	3
RAN Network Issue Identification & Performance Deterioration Prediction	15%	A	4	A	4	A	4	A	4
Issue Demarcation & Root Cause Analysis	20%	A	4	A	4	A	4	A	4
Adjustment Solutions Generating	20%	A	4	B	3	A	4	A	4
Solution Evaluation & Determination	15%	A	4	A	4	A	4	A	4
Solution implementation	10%	A	2	A	2	A	2	A	2
Overall Score									3.89

## Question

- How does the system translate the RAN network optimization intent into the RAN network optimization related control information and evaluate the RAN network optimization intent fulfilment? Note: RAN network optimization intent includes multiple targets for specified areas.
- RAN network optimization control information includes RAN network optimization policies (e.g. adjusting base station parameters, load balancing)

## Options

Options	Option A	Option B	Option C	Option D
	The system can automatically generate the network optimization related control information based on human defined intents. The system can automatically evaluate and generate the intent fulfilment report, including fulfilment status for targets.	The system can automatically generate the network optimization related control information based on predefined rules. The system can automatically generate evaluation results. Human manually select the measurements for evaluation and confirm the evaluation result.	Manually define the RAN network optimization related control information based on expertise. Human manually evaluate the effect after the intention is implemented.	

## Evidence

Based on RAN complaint agents, the system can identify users' intentions of poor user experience, automatically analyze network coverage, capacity, interference, and parameters, generate control information related to network optimization, and automatically evaluate and generate intent achievement reports. This procedure uses the problem that users respond to slow Internet surfing as an example to describe how to make query and analysis. This procedure provides intention reports such as problem analysis and optimization suggestions, evaluates the optimization results, and outputs the evaluation results, so that front-line personnel can notify users to appease them.

### Coverage problems

#### Generation of Control Information Related to Intent Identification and Optimization



#### Automatic Problem Evaluation Result



### Capacity problems

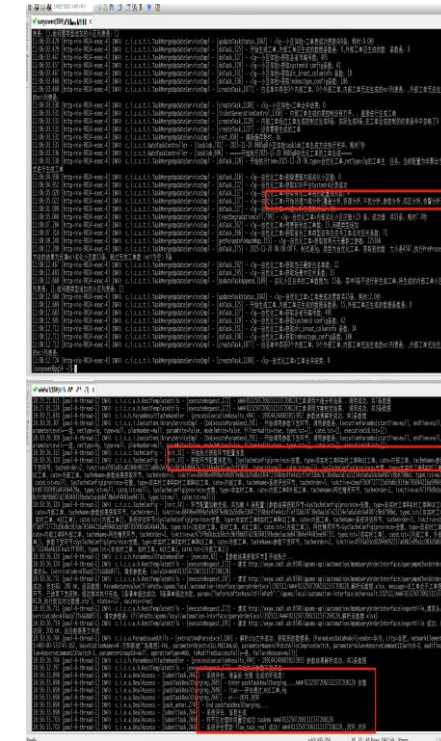
#### Generation of Control Information Related to Intent Identification and Optimization



#### Automatic Problem Evaluation Result



The system generates network optimization strategies automatically based on network optimization intentions derived from optimization objectives (coverage, capacity, interference, and parameters).



The system monitors network indicators and conducts six-dimensional analytical self-optimization for cells with abnormal indicators.

The system automatically generates solutions, distributes them to the parameter platform for execution, and conducts automatic evaluation on the achievement of optimization effects



## Question

How does the system identifies RAN network performance / service experience issues (e.g., coverage-related issues, RAN UE throughput-related issues) or predict network performance /service experience deterioration?

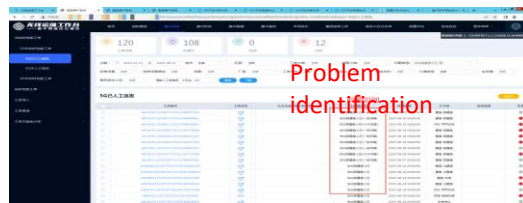
## Options

Option A	Option B	Option C	Option D
The system can intelligently identify RAN network performance / service experience issues or predict network performance /service experience without human intervention.	The system can automatically identify network issues or predict network performance. Manual confirmation is required.	The system can identify network issues or predict network performance based on predefined rules.	Manually identify RAN network problems or predict network performance based on expertise.

## Evidence

Intelligent identification of coverage, capacity, interference, and parameter problems through the wireless O&M workbench and provincial network optimization platform. The coverage prediction is implemented based on the digital twin simulation DTN platform, and the RSRP and other indicators around the coverage area of the simulation site are predicted. Through the 4/5 G capacity simulation and iterative analysis of the capacity module, the load can be predicted by hour and day. Waveguide interference exponent prediction is implemented based on waveguide simulation.

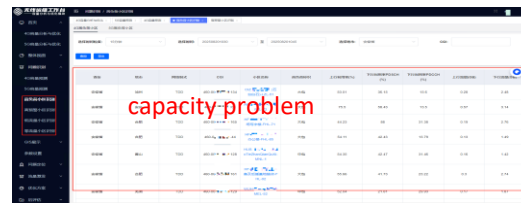
### Coverage Problem Identification



### Coverage prediction



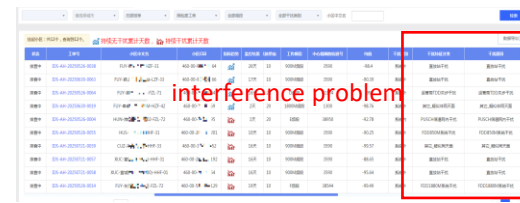
### Capacity Problem Identification



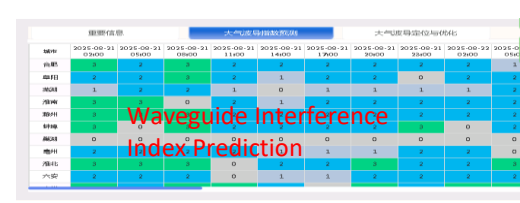
### Capacity prediction



### Interference Problem Identification



### Interference prediction



### Parameter Problem Identification

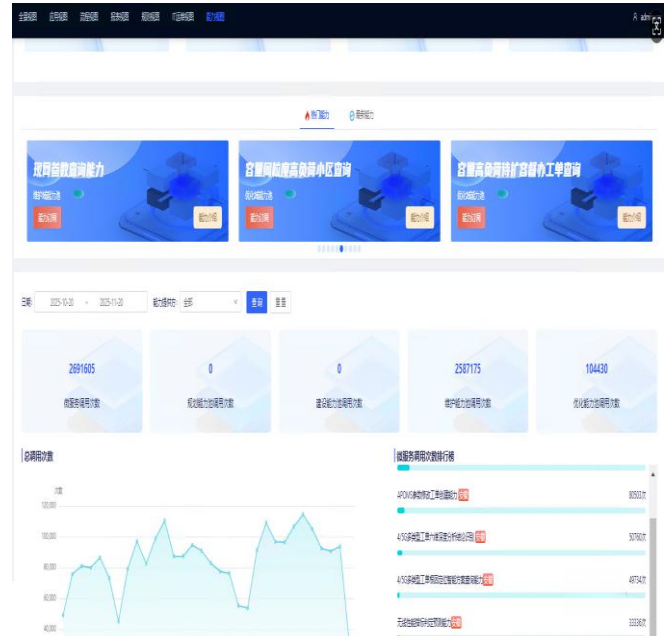


5G自优化处理

ID	ICSG工单编号	工单状态	能力问题识别	厂商名称	覆盖场景	优先级	合并数量	经度	纬度	预测优化指标	问题小类	外部系统链接
	AHC511251112505124470640	自优化闭环	5G低用户下行速率VIP站	中兴	高铁	3	3	*****	*****	200Mbps	质量	
	AHS205112511125051250474724	自优化闭环	5G低用户下行速率1.5G	华为	城区道路	1	2	*****	*****	200Mbps	质量	
	AHJUS1125111179051247850561	自优化闭环	SA终端速率一般场景	华为	乡镇	0	1	*****	*****	99.5%	TOP小区	
	AHANC51125111159051561052001	自优化闭环	VoNR业务覆盖场景5	中兴	村庄	0	1	*****	*****	0.02%	通信性能	
	AHHS1125111169051556140482	自优化闭环	5G低用户上行速率2.5G	华为	乡镇	1	3	*****	*****	200Mbps	数据感知	
	AHHS11251111690512411820042	自优化闭环	5G低用户上行速率4.5G	华为	城区道路	2	5	*****	*****	200Mbps	数据感知	
	AHTUS112511107451248873768	自优化闭环	高干校小区VIP场景1	中兴	城区道路	2	4	*****	*****	10	高干校小区	
	AHHS1125111079051241182882	自优化闭环	重要场景小区VIP场景	华为	工业园区	1	2	*****	*****	0.05%	TOP小区	
	AHC51125111059051244321762	自优化闭环	VoNR业务覆盖场景5	中兴	乡镇	1	2	*****	*****	0.01%	通信性能	
	AHNA51125111071251247367520	自优化闭环	5G终端LTE速率4.5G	中兴	乡镇	2	5	*****	*****	99.6%	TOP小区	

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The system invokes the six-dimensional in-depth analysis conclusion recognition capability for 4G/5G multi-type tickets on the workbench, perform 15min indicator monitoring. Automatically generates and dispatchs tickets. Identify problems, conducts drill-down classification, and output the prediction of optimization solution results.



Workbench Capability Invocation

## Question

■ How does the system perform problem demarcation and root cause diagnosis?

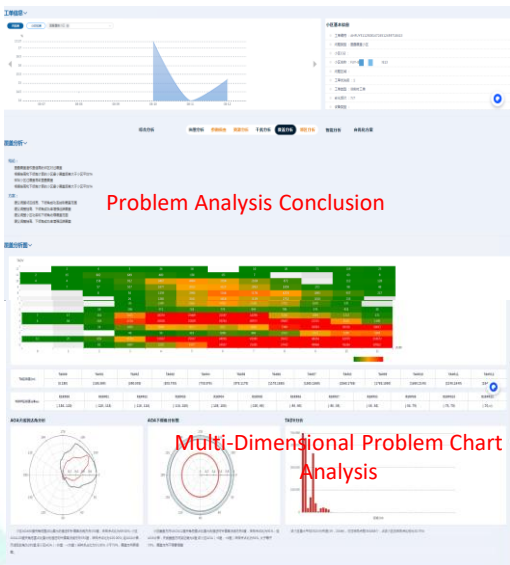
## Options

✓ Option A	Option B	Option C	Option D
The system intelligently demarcates issues and diagnoses root cause when the RAN network performance / service experience issue identified or performance deterioration predicted	The system can automatically demarcate network performance / service experience issues and diagnoses root cause, but requires human intervention to confirm the root causes.	The system can demarcate network issues and diagnoses root cause based on predefined rules.	Locating problems and analyzing the root causes of network problems based on expertise.

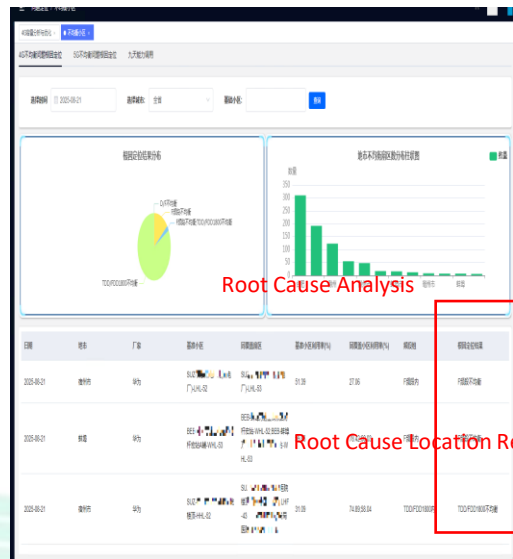
## Evidence

When a network performance problem is identified, the wireless O&M workbench implements problem demarcate and multi-dimensional root cause analysis, and intelligently outputs the results of poor-quality root causes.

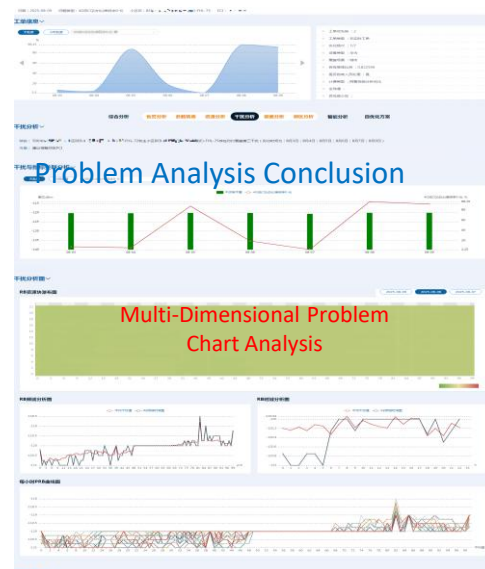
Coverage



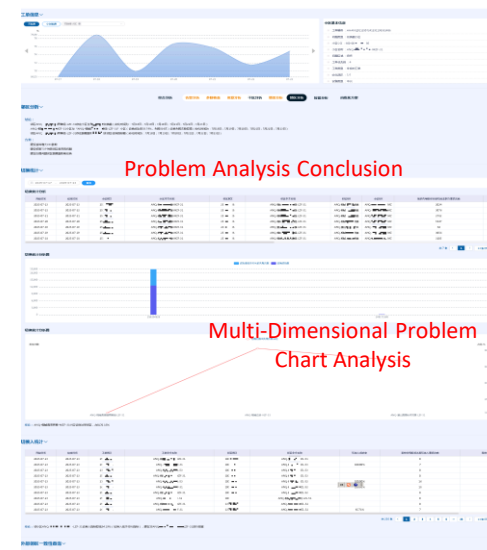
Capacity



Interference



Parameter



ID	ICD5工单编号	工单状态	主问题类型	处理期限	派	主问题	告警	源系统告警	告警	影响	干扰	覆盖	时延	工单大类
1	AHCH511011120012470400	已解决	5G业务下行速率(VIP降)	2025-11-20 00:00:00	信通-烟台信通	●	VIP降	●	●	●	●	●	●	网络工单
2	AHCH5110111200125047424	已解决	5G业务下行速率(VIP降)	2025-11-20 00:00:00	信通-烟台信通	●	VIP降	●	●	●	●	●	●	网络工单
3	AHCH51101117001247035561	已解决	5G网络质量-一般降	2025-11-20 00:00:00	信通-烟台信通	●	一般降	●	●	●	●	●	●	网络工单
4	AHCH51101115001561620001	已解决	5G网络质量-一般降	2025-11-20 00:00:00	信通-烟台信通	●	一般降	●	●	●	●	●	●	网络工单
5	AHCH51101118001350140402	已解决	5G业务上行速率(一般降)	2025-11-20 00:00:00	信通-烟台信通	●	一般降	●	●	●	●	●	●	网络工单
6	AHCH511011180013491820042	已解决	5G业务下行速率(VIP降)	2025-11-20 00:00:00	信通-烟台信通	●	VIP降	●	●	●	●	●	●	网络工单
7	AHCH511011107001348037368	已解决	5G网络质量-一般降	2025-11-20 00:00:00	信通-烟台信通	●	一般降	●	●	●	●	●	●	网络工单
8	AHCH51101110700134182082	已解决	5G网络质量-一般降	2025-11-20 00:00:00	信通-烟台信通	●	一般降	●	●	●	●	●	●	网络工单
9	AHCH511011102001344021762	已解决	5G网络质量-一般降	2025-11-20 00:00:00	信通-烟台信通	●	一般降	●	●	●	●	●	●	网络工单
10	AHCH511011107001347037520	已解决	5G网络质量-一般降	2025-11-20 00:00:00	信通-烟台信通	●	一般降	●	●	●	●	●	●	网络工单

When network performance/service experience issues are identified, or performance degradation is predicted, tickets are automatically issued. The system invokes the intelligent solution query capability for root cause analysis of 4G/5G multi-type tickets, conducting six-dimensional problem demarcation and primary/secondary cause analysis for problem cells.

```

16:49:31.963 [ICOS-Thread-9] INFO c.i.c.s.t.i.AutoFillRootConclutionImpl - [AutoFillConclution,145] - 根据程序时间参数: startCreateTime=2025-11-20 00:00:00, endCreateTime=2025-11-20 00:00:00
16:50:48.056 [http-mio-9014-exec-6] INFO c.i.c.s.t.i.AutoFillRootConclutionImpl - [AutoFillConclution,185] - 调用根因程序, 传入的日期是2025-11-20, 工单类型是自助化工单, 制式是4g, 基础数据准备完成
16:50:50.281 [http-mio-9014-exec-6] INFO c.i.c.s.t.i.AutoFillRootConclutionImpl - [AutoFillConclution,180] - 调用根因程序, 传入的日期是2025-11-20, 工单类型是自助化工单, 制式是4g, 获取到的结果数据大小是3681
16:50:50.383 [http-mio-9014-exec-6] INFO c.i.c.s.t.i.AutoFillRootConclutionImpl - [BackFillValueToTaskVerdce,375] - -----开始处理异常指令结论-----
16:50:50.384 [http-mio-9014-exec-6] INFO c.i.c.s.t.i.AutoFillRootConclutionImpl - [BackFillValueToTaskVerdce,378] - -----开始六维分析结论-----
16:50:50.386 [ICOS-Thread-9] INFO c.i.c.s.t.i.AutoFillRootConclutionImpl - [LambdaGetSiverdceData$2,410] - 开始处理第2次的六维智能根因数据
16:50:50.386 [ICOS-Thread-3] INFO c.i.c.s.t.i.AutoFillRootConclutionImpl - [LambdaGetSiverdceData$2,410] - 开始处理第1次的六维智能根因数据
16:50:50.388 [ICOS-Thread-9] INFO c.i.c.s.t.i.AutoFillRootConclutionImpl - [LambdaGetSiverdceData$3,431] - 处理第2次的六维智能根因数据
    
```

Process Log of Self-Optimization on Root Cause Analysis

## Question

- How does the system generate the recommended network adjustment solutions (including a set of network adjusting actions) to solve the identified or predicted network performance / service experience issues?
- Note: network adjustment solutions including but not limited to L2/L3 configuration parameters, RF parameters, 5QI related service configuration parameters.

## Options

Option A	Option B	Option C	Option D
The system intelligently generates network optimization solutions (considering of the coordination of multiple network adjusting actions), adjusted to adapt to RAN Traffic & Performance changes in real time.	The system intelligently generates network optimization solutions (considering of the coordination of multiple network adjusting actions), adjusted to adapt to RAN Traffic & Performance changes in non-real time.	The System generates network optimization solutions based on predefined rules.	Network optimization solutions are manually proposed based on expertise.

## Evidence

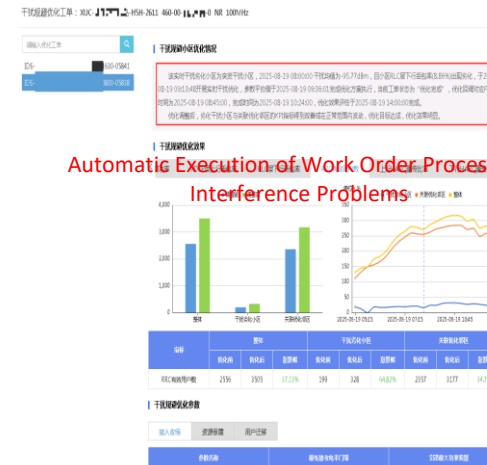
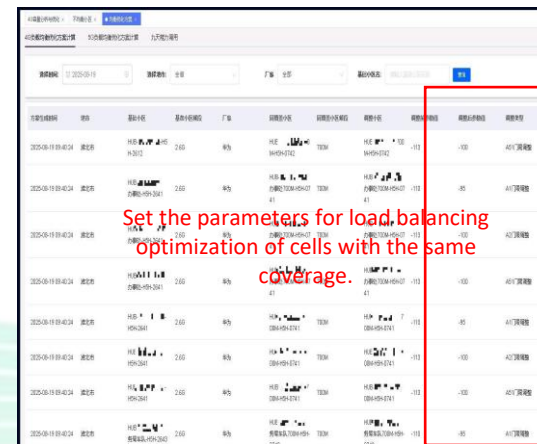
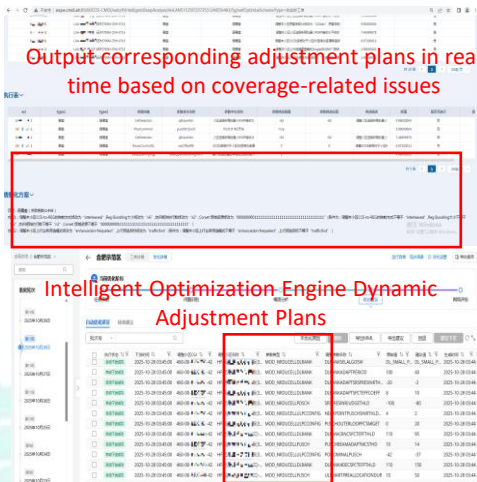
Leveraging the ICOS platform and intelligent optimization engine, flexible indicator simulation and multi-objective optimization are enabled. The automatically generated multi-dimensional optimization suggestions can be delivered via the centralized parameter platform. Additionally, it features real-time parameter adjustment capability; by introducing focus-tracking antennas, it achieves tidal dynamic optimization, ultimately reaching the level of end-to-end full-process self-optimization.

### Coverage

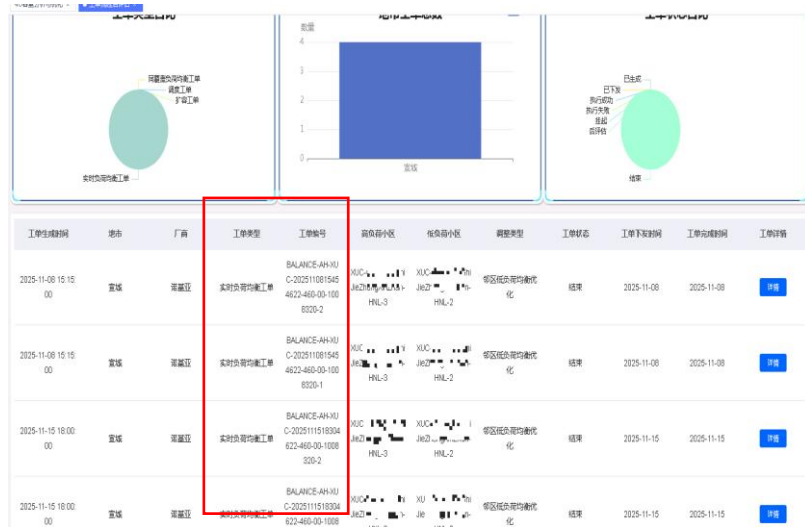
### Capacity

### Interference

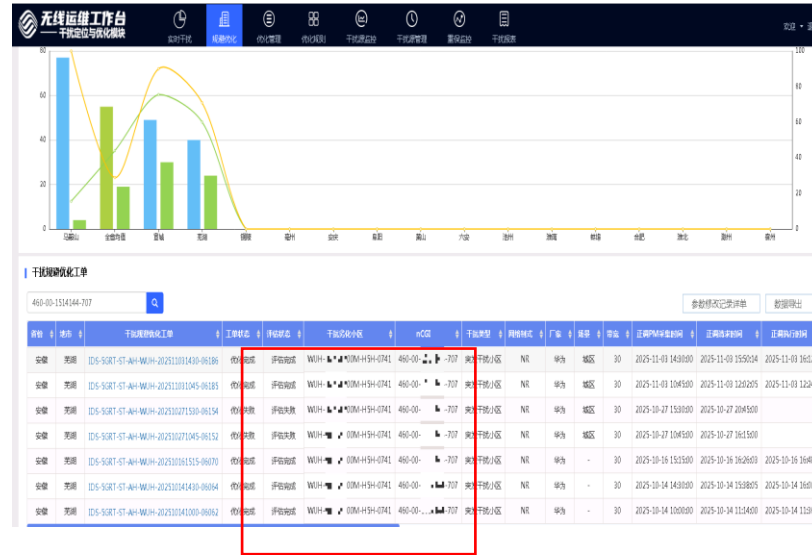
### Parameter



Dynamically issue load optimization adjustment strategies in real-time based on service changes.



Dynamically issue interference optimization adjustment parameters in real-time based on changes in performance indicators



Dynamically issue low data rate adjustment parameters in real-time



## Question

How does the RAN network optimization system have the capability of automatically evaluating network optimization solutions and determining the best solution to implement?

## Options

Option A	Option B	Option C	Option D
The system intelligently evaluates and determines the optimal network optimization solution when the recommended solutions are generated.	The System automatically evaluates network optimization solutions, but requires human intervention to confirm the optimal solution.	The System generates network optimization solutions based on predefined rules, but requires human intervention.	network optimization solutions are evaluated and decided based on manual expertise.

## Evidence

When a recommended solution is generated, iterative optimization is implemented and the best network optimization solution is determined. This procedure uses the capacity optimization solution as an example. The load balancing module of the inter-model capacity system is used to determine the optimal parameter adjustment solution based on different parameter combinations (the perception rate is the best).

### Coverage

### Capacity

Based on different parameter combinations, with the goal of optimal perceived rate, carry out interoperability balanced parameter actions to determine the optimal capacity adjustment scheme

### Interference

### Parameter

Parameter combination and iterative optimization

## Question

- How does the RAN network optimization system have the capability of executing the network adjustment solutions (e.g., adjusting and configuring the network parameters)?
- Note: network parameters including but not limited to L2/L3 configuration parameters, RF parameters, 5QI related service configuration parameters.

## Options

Option A	Option B	Option C	Option D
The System implements network adjustment actions, without human intervention	Humans use the system to execute manual instructions remotely.	Solution implementation is entirely manual.	

## Evidence

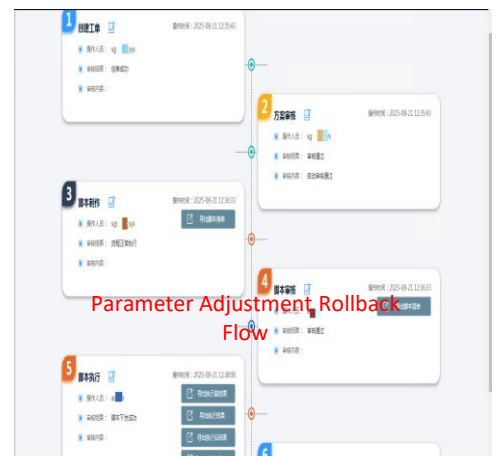
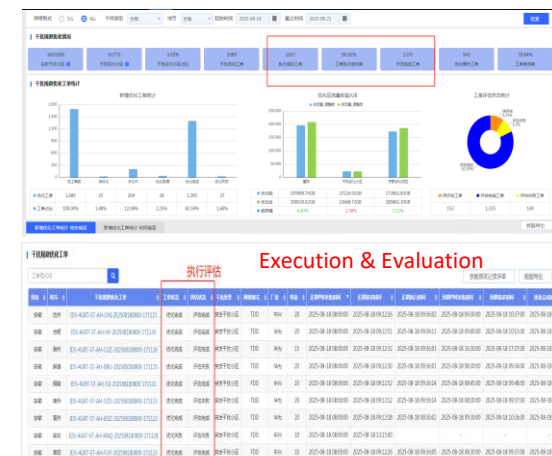
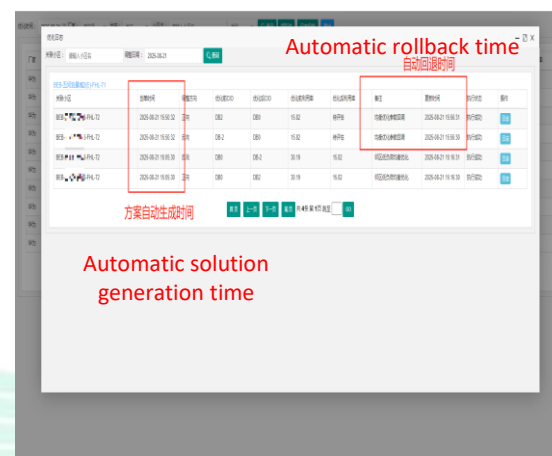
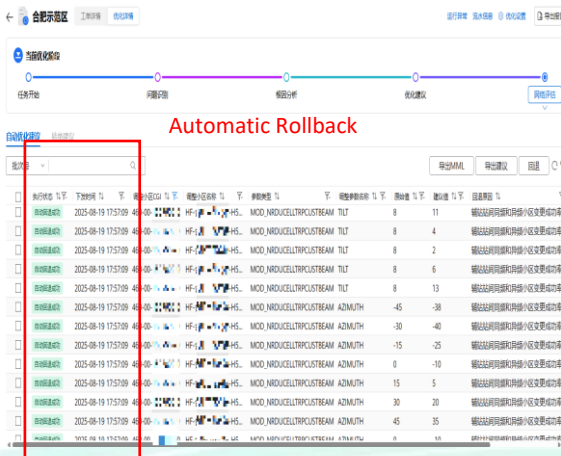
- The centralized parameter platform implements the automatic process of parameter adjustment for various problems without manual intervention. This procedure uses capacity load balancing parameter adjustment as an example. After the parameter adjustment solution is automatically generated and implemented, the system evaluates the effect and determines whether to perform automatic rollback in accordance with the optimization effect.

### Coverage

### Capacity

### Interference

### Parameter





中国移动  
China Mobile



**Thanks**