

GB1059C IP Network Quality Optimization Questionnaire

August 2025

Autonomous network level evaluation - IP Network Quality Optimization(1/2)

High-Value Scenario	Cognitive Activities (IAADE)	Service capability	Weight	Question	Option A	Option B	Option C	Option D
IP Network - Quality Optimization	Intent	Quality optimization intent formulation	10%	<p>Does the system support the input of quality optimization intents</p> <p>Note:</p> <p>1) Quality optimization intent means target and requirement of quality optimization, e.g., decrease or avoid network congestion, assuring the end-to-end latency of VPN service, assuring the bandwidth of a specific application etc.</p> <p>2) Optimization policies include packet loss, bandwidth, latency, etc.</p> <p>3) Custom rules include but not limited to scenario specific rules made based on data analysis on alarms, logs, performance and OAM data, etc.</p>	The system supports the input of quality optimization intent by simplified human-system interaction (e.g., nature language user interface provided by system), system automatically translates the intent into optimization policies	The system supports manual configuration of optimization policies with customized rule-based templates (support combination of different optimization policies)	The system has built-in optimization predefined rules (support only one optimization policy) and converts to the optimization policies.	Manually configure optimization policies by tools.
	Awareness	Identification of network KPI degradation	15%	<p>Does the system support real-time collection of network KPI and identification of KPI degradation ?</p> <p>Note:</p> <p>1) Network KPI include NE KPIs (e.g, CPU usage, memory usage) and link KPIs (e.g., availability, latency, and packet loss)</p> <p>2) All the KPIs listed above should be covered when choosing a related option.</p>	The system supports collect and display network KPI in seconds, supporting real-time identification of network degradation and intelligent risk prediction based on historical data.	The system supports collect and display network KPI in seconds, supporting real-time identification of network degradation	The system supports collect and display network KPI in more than 1 minute (e.g., 15 minutes) . System identify KPI degradation by pre-defined threshold.	The system collects network quality information and manually identify KPI degradation.
		Identification of service (e.g., mobile backhaul, private line) degradation	15%	<p>Does the system support automatic identification of service and service flow degradation ?</p> <p>Note:</p> <p>1) service KPI includes packet loss, delay, jitter, etc. Flow KPI should include bandwidth, delay, etc.</p> <p>2) All the KPIs listed above should be covered when choosing a related option.</p> <p>3) Path-Congruent OAM: The OAM information follows the exact same path as the observed data traffic. This was sometimes referred to as "in-band".</p> <p>4) Non-Path-Congruent OAM: The OAM information does not follow the same path as the observed data traffic. This was sometimes referred to as "out-of-band".</p>	The system supports automatic path-congruent OAM mechanism (e.g., ifit, iOAM) to identify service degradation, supporting hop-by-hop demarcation, listing the impacted services. The system supports identification of degradation of different service flows(e.g., game, short video)	The system supports automatic non-path-congruent OAM mechanism (e.g., TWAMP, Y.1731) to identify service degradation.	Manually analyze service degradation based on system-collected performance data, logs, etc.	

High-Value Scenario	Cognitive Activities (IAADE)	Service capability	Weight	Question	Option A	Option B	Option C	Option D
IP Network - Quality Optimization	Analysis	Demarcation and locating	20%	Does the system support automatic and intelligent demarcation and locating of service degradation, supporting automatic and intelligent analysis of the cause? (intelligent means using methods such as AI algorithm, knowledge graph, etc)	1) The system automatically and intelligently demarcates specific node(s) or link(s) that lead to the service degradation; 2) The system automatically and intelligently locate the root cause of network degradation(e.g., interface congestion).	Manually demarcates and locates network degradation based on suggestions and network data provided by system.	Manually demarcates and locates network degradation based on suggestions and network data provided by system.	Manually demarcates and locates network degradation by CLI.
		Solution generation	15%	Does the system automatically generates optimization solutions for network and service degradation?	1) The system automatically computes routes and generates optimization solutions that meet more than 2 kinds of SLA requirements (e.g., bandwidth & delay & packet loss) . 2) The system automatically generates further precise capacity expansion suggestions and reasons(e.g., link between node A and node B needs capacity expansion)	The system automatically computes routes and generates optimization solutions that meet 1 specific SLA requirement (e.g., bandwidth or delay or packet loss).	The system generates optimization solution based on pre-defined rules, such as tunnel rerouting and VPN FRR(Fast reroute).	Manually analyze optimization solution based on expertise.
	Decision	Solution decision-making	15%	Does the system support automatic decision-making on path optimization solutions?	Through evaluating simulation results, the system automatically determines the solution that meets the SLA requirements .	The system automatically determines the solution that meet the SLA requirements based on pre-defined rules. Manually make decision.	Manually use tools to perform simulation, evaluate results and make decision.	Manually evaluate the optimization solution based on expertise and make decision.
	Execution	Solution execution and verification	10%	Does the system support automatic execution and visualized verification(e.g., supporting automatic replay of optimization records during a time period) of path optimization?	The system supports automatic execution and verification of the optimization solution, which supports visualized replay capabilities of optimization records.	The system supports automatic execution and verification of optimization solutions, but does not support visualized replay capabilities of optimization records.	Perform the optimization and verification manually.	

In the ratings of seven autonomous capability for IP Network Quality Optimization,China Mobile situation is as follows :

- Congestion Optimization: obtained 7“A”s,
- Path Down Optimization: obtained 7“A”s,
- Path Quality Optimization:obtained 7“A”s.

Service Capability	Weight	Answer			score		
		Congestion	Path Down	Path Quality	Congestion	Path Down	Path Quality
Quality optimization intent formulation	10%	B	B	B	3.85	3.85	3.85
Identification of network KPI degradation	15%	A	A	A			
Identification of service (e.g., mobile backhaul, private line) degradation	15%	A	A	A			
Demarcation and locating	20%	A	A	A			
Solution generation	20%	A	A	A			
Solution decision-making	10%	A	A	A			
Solution execution and verification	10%	A	A	A			
final score							

Question

- Does the system support the input of quality optimization intents
- Note: 1) Quality optimization intent means target and requirement of quality optimization, e.g., decrease or avoid network congestion, assuring the end-to-end latency of VPN service, assuring the bandwidth of a specific application etc; 2) Optimization policies include packet loss, bandwidth, latency, etc. 3) Custom rules include but not limited to scenario specific rules made based on data analysis on alarms, logs, performance and OAM data, etc.

Options

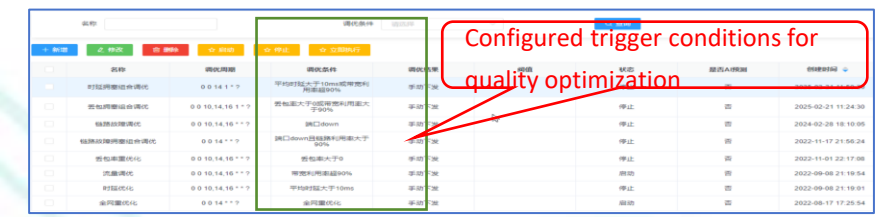
Option A	Option B	Option C	Option D
The system supports the input of quality optimization intent by simplified human-system interaction (e.g., nature language user interface provided by system), system automatically translates the intent into optimization policies.	The system supports manual configuration of optimization policies with customized rule-based templates (support combination of different optimization policies)	The system has built-in optimization predefined rules (support only one optimization policy) and converts to the optimization policies.	Manually configure optimization policies by tools.

Evidence

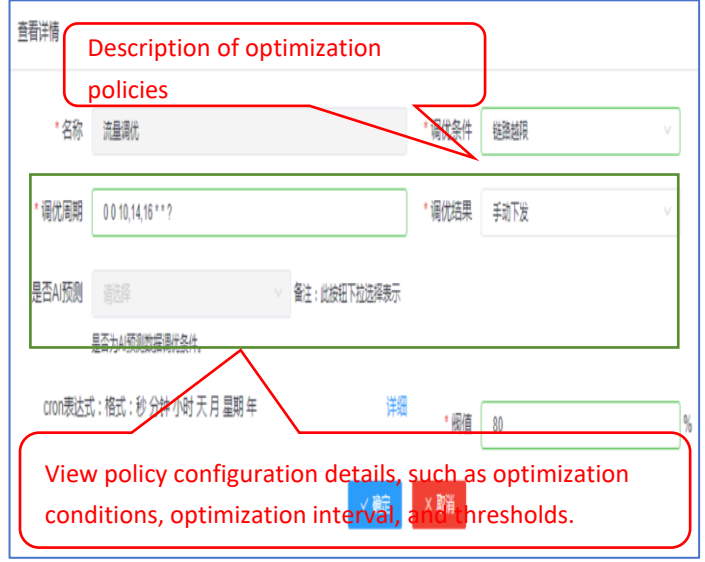
Our system supports manual configuration of optimization policies through customizable rule templates. Policy conditions include link down, latency degradation, and packet loss. The system also features a human-computer interaction function, which can understand the intent inputs and convert them into specific optimization requirements. Automatic intent analysis and then automatic optimization are also supported. Self-rated as Grade A.



1、 Supports the addition of new quality optimization policies. Policy conditions include link congestion, link down, latency degradation, and packet loss, allowing for the combination of different optimization strategies.

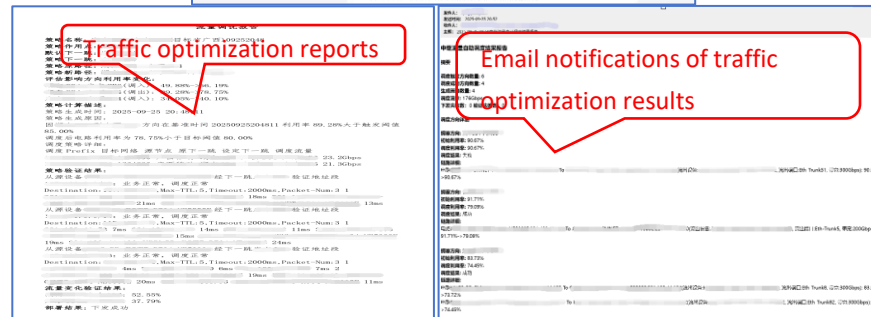


2、 Scenario-specific configured optimization policies: **Congestion**: Triggered when bandwidth utilization exceeds 80%; **Link down**: Triggered when a port is down and link utilization exceeds 90%; **Quality**: Triggered when average latency exceeds 10ms.



3、 Allows selection of any configured rule to query its policy details, such as optimization conditions, optimization interval, thresholds, and other relevant parameters.

Simplified human-computer interaction to optimize intent input and result notification



4、 When links encounter congestion, link down, or latency degradation, the optimization intent is converted into specific optimization requirements. We support both natural language intent input and automatic intent analysis. For automatic intent analysis, the entire optimization process is executed automatically, with log reports and email notifications generated and delivered

Identification of network KPI degradation-Congestion scenario

Question

- Does the system support real-time collection of network KPI and identification of KPI degradation ?
- Note: 1) Network KPI include NE KPIs (e.g, CPU usage, memory usage) and link KPIs (e.g., availability, latency, and packet loss); 2) All the KPIs listed above should be covered when choosing a related option.

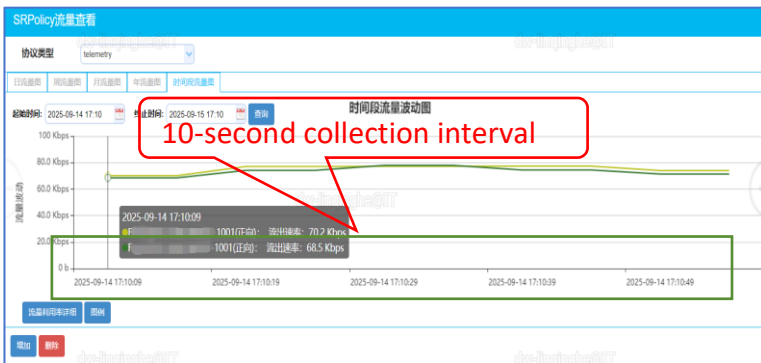
Options

√ Option A	Option B	Option C	Option D
The system supports collect and display network KPI in seconds, supporting real-time identification of network degradation and intelligent risk prediction based on historical data.	The system supports collect and display network KPI in seconds, supporting real-time identification of network degradation	The system supports collect and display network KPI in more than 1 minute (e.g., 15 minutes) . System identify KPI degradation by pre-defined threshold.	The system collects network quality information and manually identify KPI degradation.

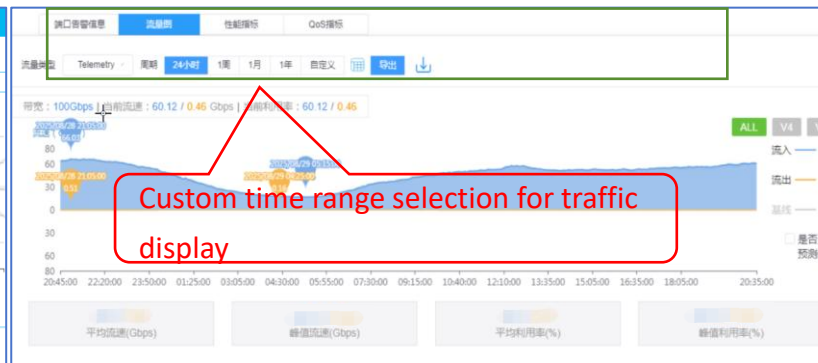
Evidence

Utilizing telemetry for second-level service tunnel traffic collection, the system displays traffic trend variations via line charts. It enables real-time identification of network degradation and intelligent prediction of congestion risks based on historical traffic data. Self-rated as Grade A.

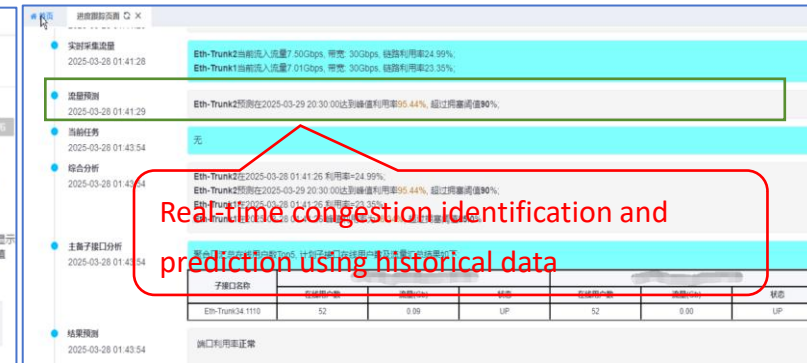
supports collect and display network KPI in seconds



supports collect and display network KPI in seconds



identification of network degradation and intelligent risk prediction



1、Telemetry is employed to collect service tunnel traffic data at a second-level granularity, with a reporting interval of 10 seconds.

2、The collected service tunnel traffic data is presented in line charts to visualize trend variations, supporting the display of data for specific time points within user-defined periods.

3、Leveraging historical traffic data, it enables real-time identification of network degradation and intelligent prediction of potential congestion risks.

Identification of network KPI degradation-Path Down scenario

Question

- Does the system support real-time collection of network KPI and identification of KPI degradation ?
- Note: 1) Network KPI include NE KPIs (e.g, CPU usage, memory usage) and link KPIs (e.g., availability, latency, and packet loss); 2) All the KPIs listed above should be covered when choosing a related option.

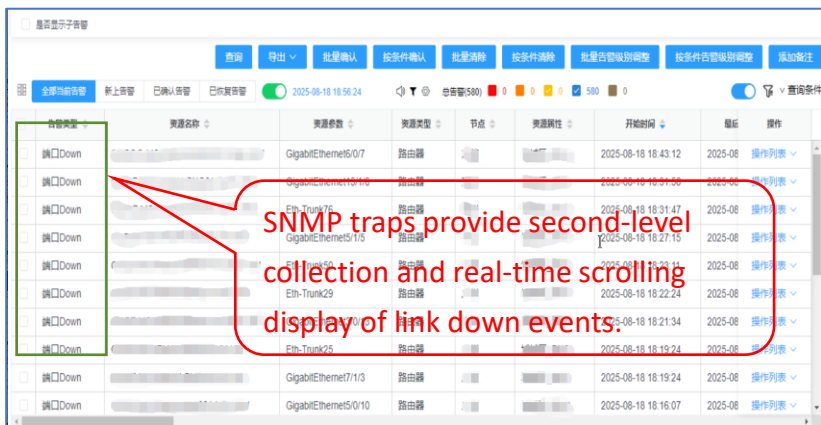
Options

Option A	Option B	Option C	Option D
The system supports collect and display network KPI in seconds, supporting real-time identification of network degradation and intelligent risk prediction based on historical data.	The system supports collect and display network KPI in seconds, supporting real-time identification of network degradation	The system supports collect and display network KPI in more than 1 minute (e.g., 15 minutes) . System identify KPI degradation by pre-defined threshold.	The system collects network quality information and manually identify KPI degradation.

Evidence

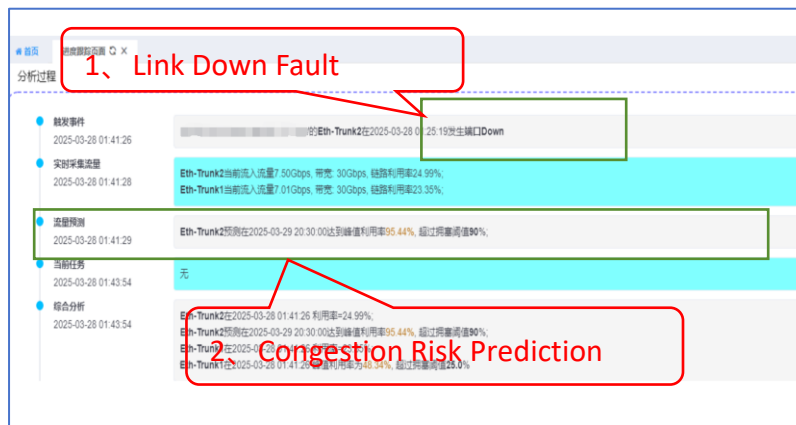
Link down information can be collected within seconds via SNMP Traps and Syslog, and displayed in real-time on a scrolling alarm panel. When a port fails, the system intelligently predicts congestion risks based on historical traffic data, while also determining the fault severity level by identifying the number of affected users. Self-rated as Grade A.

collect and display network KPI in seconds

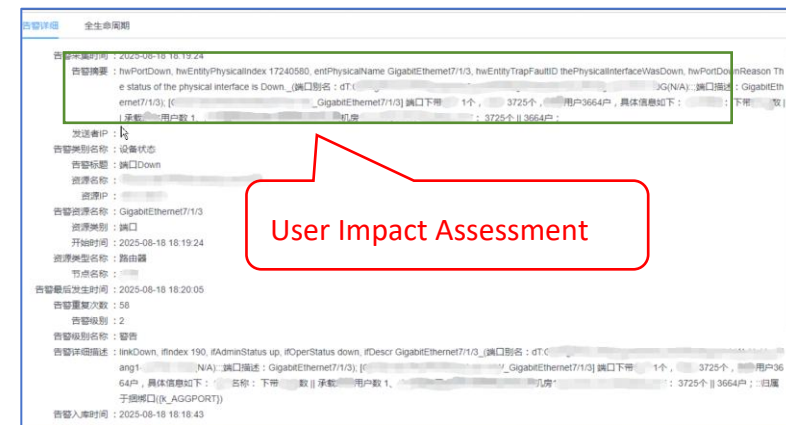


1、SNMP traps and Syslog messages enable second-level collection of link down information, which is displayed in real-time via a scrolling alarm panel.

identification of network degradation and intelligent risk prediction



2、When an IP link down occurs, the system leverages historical traffic data trends to predict future traffic patterns, enabling real-time identification of network degradation and intelligent prediction of congestion risks.



3、It correlates and analyzes the number of users impacted by the faulty link to automatically identify the fault level based on the scale of impact.

Identification of network KPI degradation-Path Quality scenario

Question

- Does the system support real-time collection of network KPI and identification of KPI degradation ?
- Note: 1) Network KPI include NE KPIs (e.g, CPU usage, memory usage) and link KPIs (e.g., availability, latency, and packet loss); 2) All the KPIs listed above should be covered when choosing a related option.

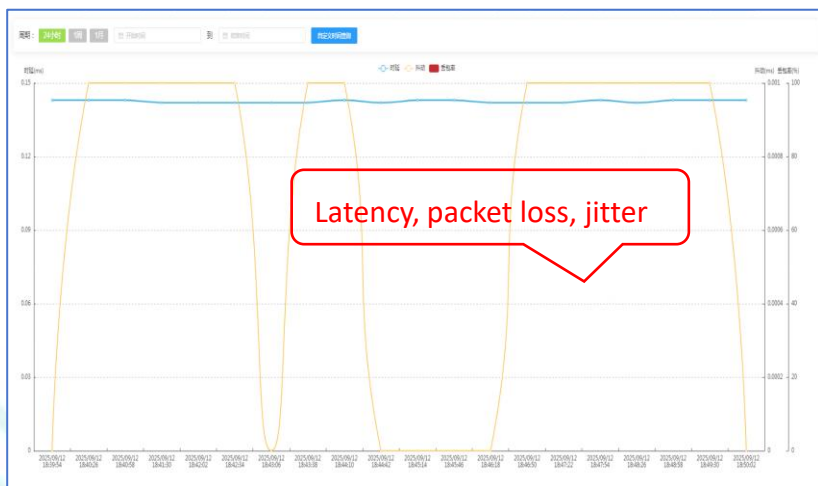
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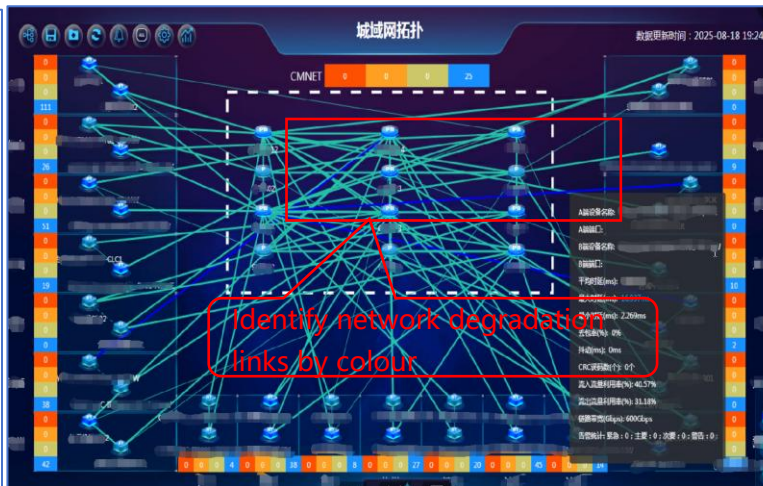
Evidence

The system uses telemetry to collect link latency, packet loss, and jitter data in seconds. It displays network quality trends in graphs, identifies degraded links in real time by coloring them differently on the network topology, and can make intelligent risk predictions based on historical data. Self-rated as Grade A.

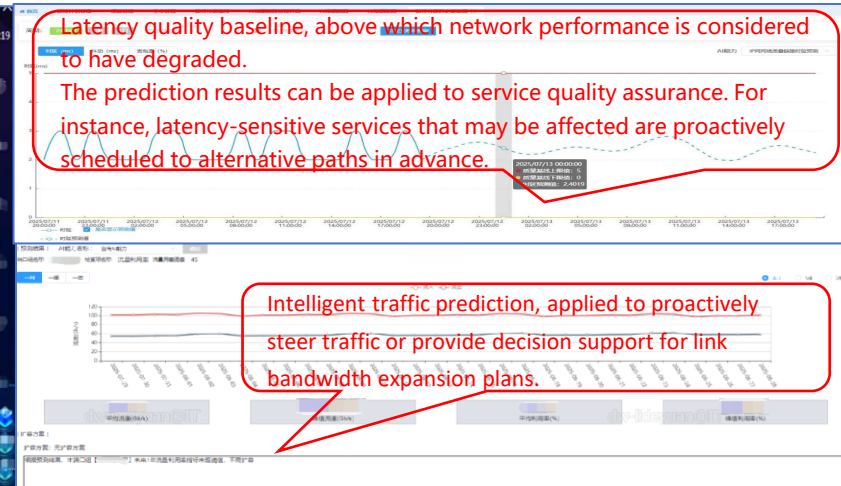
collect and display network KPI in seconds



identification of network degradation in real-time



intelligent risk prediction



1、 Latency, jitter, and packet loss data are measured by TWAMP at 100-millisecond intervals, collected via telemetry every 30 seconds, and then displayed as trend graphs.

2、 Degraded links are identified in real time with different colors on the topology map by setting link quality thresholds.

3、 Based on historical data, predicts link latency and traffic risks through AI algorithms, supports customised time periods for presenting link quality data.

Question

- Does the system support automatic identification of service and service flow degradation ?
- Note: 1) service KPI includes packet loss, delay, jitter, etc. Flow KPI should include bandwidth, delay, etc. ; 2) All the KPIs listed above should be covered when choosing a related option.3) Path-Congruent OAM: The OAM information follows the exact same path as the observed data traffic. This was sometimes referred to as "in-band".; 4) Non-Path-Congruent OAM: The OAM information does not follow the same path as the observed data traffic. This was sometimes referred to as "out-of-band".

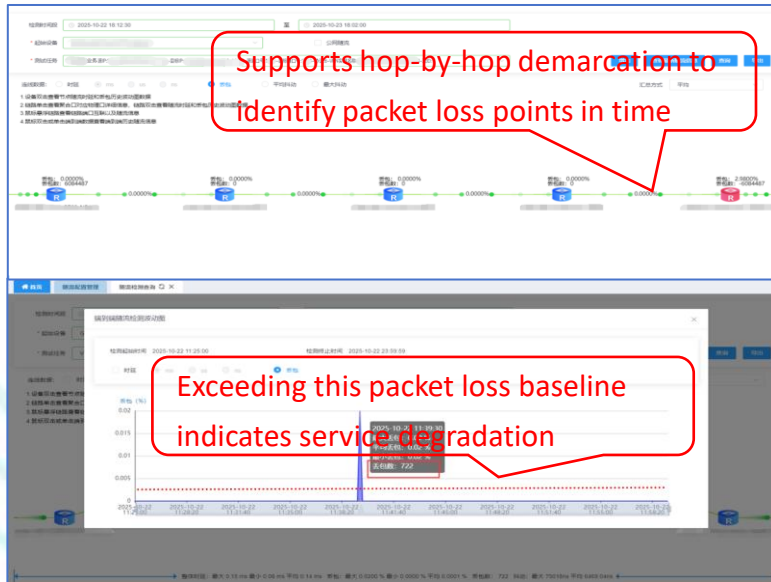
Options

Option A	Option B	Option C	Option D
The system supports automatic path-congruent OAM mechanism (e.g., ifit, iOAM) to identify service degradation, supporting hop-by-hop demarcation, listing the impacted services. The system supports identification of degradation of different service flows(e.g., game, short video)	The system supports automatic non-path-congruent OAM mechanism (e.g., TWAMP, Y.1731) to identify service degradation.	Manually analyze service degradation based on system-collected performance data, logs, etc.	

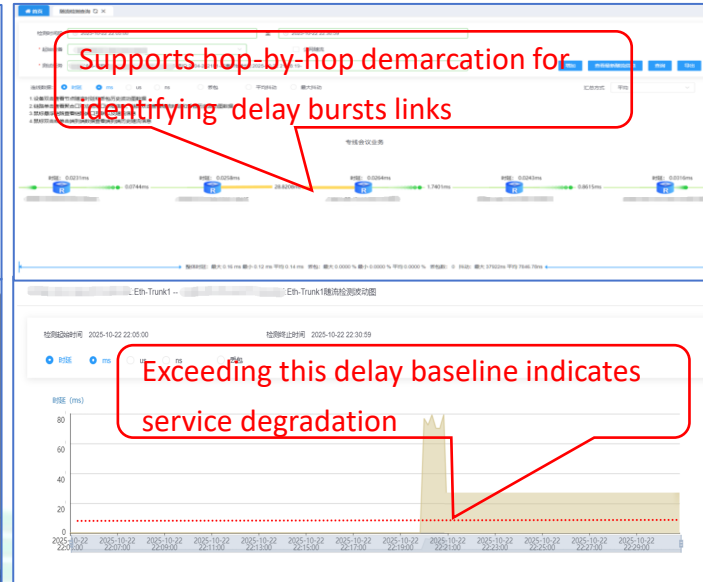
Evidence

The system supports IFIT to identify service degradation intelligently, including end-to-end mode and hop-by-hop demarcation to identify service degradation, comparative analysis of different service streams over the same period of time, and listing the affected services. Self-rated as Grade A.

automatic path-congruent OAM mechanism, identification of degradation of different service flows



automatic path-congruent OAM mechanism, identification of degradation of different service flows



listing the impacted services

业务名称	业务VPN信息	影响原因	影响开始时间	业务内容	业务级别	是否恢复
业务	VIP2222	丢包超阈值	2025-10-22 11:38:30	视频存储	二级	恢复
业务	VIP2640	时延超阈值	2025-10-22 22:19:30	会议, 办公OA	二级	恢复
业务	VIP2631	时延超阈值	2025-10-22 22:19:30	专线会议	二级	恢复
业务	VIP2312	时延超阈值	2025-10-22 22:19:30	办公网	二级	恢复

3. Support for identifying degradation of service flows for different services

1、 Support hop-by-hop demarcation to identify the packet loss situation and baseline of service degradation.

2、 Support hop-by-hop demarcation to identify delay bursts and baselines for service degradation.

Question

- Does the system support automatic and intelligent demarcation and locating of service degradation, supporting automatic and intelligent analysis of the cause? (intelligent means using methods such as AI algorithm, knowledge graph, etc)

Options

Option A	Option B	Option C	Option D
1) The system automatically and intelligently demarcates specific node(s) or link(s) that lead to the service degradation; 2) The system automatically and intelligently locate the root cause of network degradation(e.g., interface congestion).	Manually demarcates and locates network degradation based on suggestions and network data provided by system.	Manually demarcates and locates network degradation based on suggestions and network data provided by system.	Manually demarcates and locates network degradation by CLI.

Evidence

The system collects all link and service quality data in real time, automatically traces the path according to the service source and destination addresses, and uses the **Adtributor** algorithm to automatically and intelligently demarcate the links causing quality degradation. It then uses the **K-Sigma** algorithm to locate the root causes of quality degradation, such as congestion, bit errors, or packet loss. Self-rated as Grade A.

AI Degradation Analysis

AI Location Analysis

1、Through automatic and intelligent demarcation and localization, degraded links are highlighted with color coding, while the root cause—network congestion, as illustrated in this screenshot—is displayed in a popup window.

2、Through automatic and intelligent demarcation and localization, degraded links are highlighted with color coding, while the root cause—CRC errors, as illustrated in this screenshot—is displayed in a popup window.

3、Through automatic and intelligent demarcation and localization, degraded links are highlighted with color coding, while the root cause—packet loss, as illustrated in this screenshot—is displayed in a popup window.

Question

- Does the system automatically generate optimization solutions for network and service degradation?

Options

Option A	Option B	Option C	Option D
1) The system automatically computes routes and generates optimization solutions that meet more than 2 kinds of SLA requirements (e.g., bandwidth & delay & packet loss). 2) The system automatically generates further precise capacity expansion suggestions and reasons (e.g., link between node A and node B needs capacity expansion)	The system automatically computes routes and generates optimization solutions that meet 1 specific SLA requirement (e.g., bandwidth or delay or packet loss).	The system generates optimization solution based on pre-defined rules, such as tunnel rerouting and VPN FRR(Fast reroute).	Manually analyze optimization solution based on expertise.

Evidence

Upon detecting service degradation, the system automatically generates three SLA-compliant optimization strategies—Traffic Steering, Latency-Aware SRv6 Re-routing, and Loss-Aware SRv6 Re-routing—to meet all SLA requirements for bandwidth, latency, and packet loss. Enhanced by predictive analytics, the system also provides precise capacity expansion recommendations supported by causal reasoning. Self-rated as Grade A.

computes routes and generates optimization solutions

序号	地市	任务名称	任务类型	故障类型	操作设备名称	操作设备IP	任务来源	操作类型	子任务状态	任务状态	操作
1			流量调度	端口down			故障	处置	已归档	已归档	查看详情
2			流量调度	端口down			故障	处置	已归档	已归档	查看详情
3		时延SRv6重算路	质量劣化	质量巡检			质量巡检	优化	已归档	已归档	查看详情
4		流量调度	端口down	故障			故障	处置	已归档	已归档	查看详情
5		时延SRv6重算路	质量劣化	质量巡检			质量巡检	优化	已归档	已归档	查看详情
6		流量调度	端口down	故障			故障	处置	已归档	已归档	查看详情
7		流量调度	端口down	故障			故障	处置	已归档	已归档	查看详情
8		丢包SRv6重算路	质量劣化	质量巡检			质量巡检	优化	已归档	已归档	查看详情
9		流量调度	端口down	故障			故障	处置	已归档	已归档	查看详情

1、Link Congestion: Traffic Steering or Latency-aware SRv6 Re-routing
 2、Packet Loss: Loss-aware SRv6 Re-routing. Services traversing the degradation point are re-routed

optimization solutions that meet more than 2 kinds of SLA requirements

Query Optimization Details

Link Optimization Solution Details

Detailed Topology for Link Optimization Solution

- Detailed Analysis: Provides a detailed view with guaranteed bandwidth, latency, and loss metrics. generates further precise capacity expansion suggestions and reasons.

Predict traffic growth trends and provide reasons and recommendations for bandwidth expansion on that link

1、 Upon detecting service-degrading, it automatically computes routes and generates optimization solutions. All SLA requirements for bandwidth, latency, and packet loss can be consistently satisfied.

- Predictive Planning: Forecasts traffic trends and congestion thresholds to auto-generate precise capacity expansion recommendations with cause analysis.

Question

- Does the system support automatic decision-making on path optimization solutions?

Options

Option A	Option B	Option C	Option D
Through evaluating simulation results, the system automatically determines the solution that meets the SLA requirements.	The system automatically determines the solution that meet the SLA requirements based on pre-defined rules. Manually make decision.	Manually use tools to perform simulation, evaluate results and make decision.	Manually evaluate the optimization solution based on expertise and make decision.

Evidence

The system automatically generates steering optimization solutions according to SLA requirements, automatically executes simulation verification, and automatically confirms solutions that meet SLA requirements based on the simulation results. Self-rated as Grade A.

Through simulation analysis, the conclusion is drawn that network utilization will be reduced to the desired threshold following traffic steering.

Simulation comparison between the states before and after optimization.

2、The system automatically performs simulation based on the optimization solution and conducts a comparison between the states before and after optimization.

Simulation logs are generated. The system intelligently and automatically selects from multiple optimization solutions through simulation.

1、According to SLA requirements, the system automatically generates optimization policies, draws relevant post-steering conclusions based on the steering reasons and the expected values after steering, and selects the policies that meet SLA requirements for steering.

3、Here are the logs for the automatic network simulation before policy execution. The system automatically confirms solutions that meet SLA requirements based on the simulation results.

Question

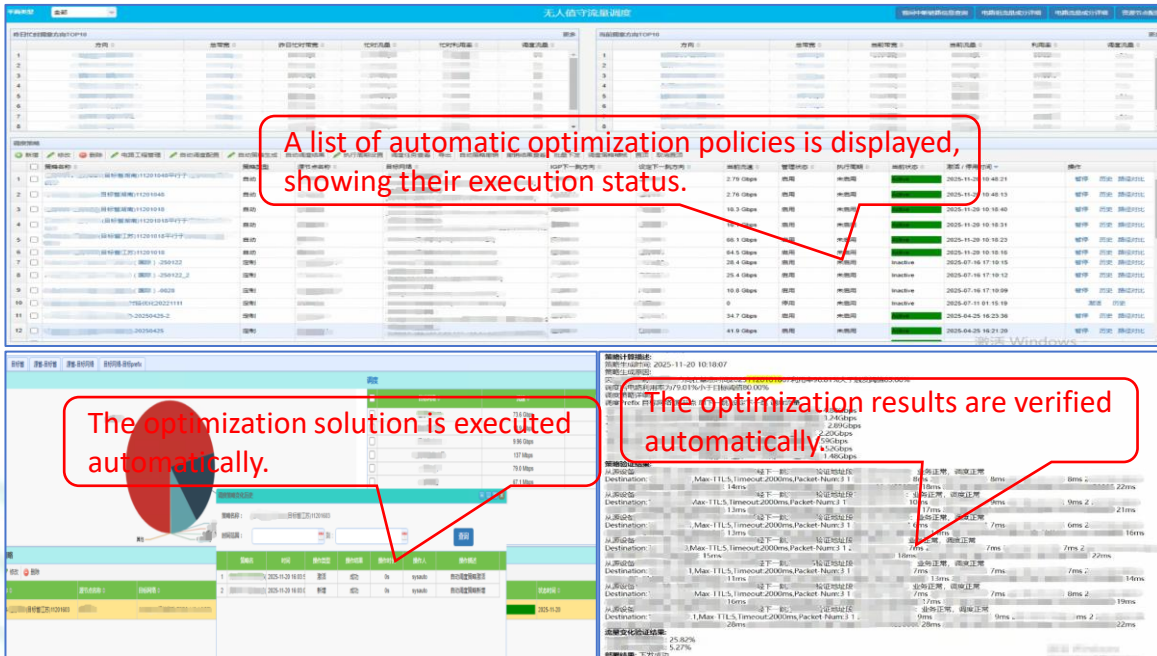
- Does the system support automatic execution and visualized verification(e.g., supporting automatic replay of optimization records during a time period) of path optimization?

Options

Option A	Option B	Option C	Option D
The system supports automatic execution and verification of the optimization solution, which supports visualized replay capabilities of optimization records.	The system supports automatic execution and verification of optimization solutions, but does not support visualized replay capabilities of optimization records.	Perform the optimization and verification manually.	

Evidence

The system automatically executes and validates optimization solutions, logs all operations, and allows historical query by time range or device. It also supports visual replay of optimization records. Self-rated as Grade A.



1、Automatically generate optimization policies, perform steering according to traffic composition, automatically execute the optimization policies, verify the steering results, and subsequently conduct loop prevention detection after the policies deployed to the network devices.

2、The replay of optimization policies can be viewed on the specially designed interface. The entire optimization process can be dynamically displayed on the interface.

Thank you