



Laying the Groundwork for UC Network Performance

Step by Step Planning Guide for UC Network Performance Success

Better Planning for Better Network Performance

This white paper shows you how to use Mitel Performance Analytics (MPA) tools to establish the best possible framework for unified communications (UC) network performance success.

Overview

Mitel Performance Analytics (MPA) is designed to make enterprise IT, channel partners, and managed service providers more proactive in detecting and addressing performance issues before they can become big, user-impacting problems. Preventing problems before they occur means less drain on IT resources and a better user experience. This application note looks at how to establish the best possible foundation for unified communications (UC) network performance success with MPA. In particular, we look at the following best practices to plan and prevent problems with MPA:

- Assessing Network Health Pre-Deployment
- Enabling Voice Quality Monitoring and Thresholds
- Configuring Probe Activity Thresholds
- Improve capacity planning and load balancing with trunk utilization monitoring

Pre-Deployment Network Assessment With UCScore

Onboarding is among the most critical success factors for a UC deployment. UCScore site qualification tests your network to confirm its fitness for UC deployment.

UCScore establishes a strong foundation for your UC network from the start, preventing problems resulting from overcapacity, such as echo, delay, or jitter. Unlike alternatives, UCScore tests what matters to UC, so you'll have a clear, accurate assessment of the impact a planned UC deployment will have on your network. Network fitness is no longer an unknown but clearly assessed and understood prior to deployment.

FEATURES

- Web-based – no software installation is required.
- Specialized specifically for UC.
- Tests network fitness for a UC deployment, testing what matters to voice performance.
- Know when more network capacity is needed for good performance.

HOW IT WORKS

UCScore tests the network's fitness for a UC deployment by sending packets (representing voice calls) between the customer and UCScore servers.

Visit UCScore.com to run a test. Enter your name and email address, and the number of required handsets for the deployment. Enter the estimated maximum number of concurrent calls.

Full Name: Full Name
Email Address: your@email.com
Number of required handsets: 100
Estimated maximum concurrent calls: 10
Need help estimating these values?
[START](#)

After starting the test, UCScore sends packets back and forth between your server and ours representing voice calls. Your score is based on how many packets make it intact to their destinations under the maximum concurrent call load.

RESULTS

When the test is complete, a summary of the test results is displayed as a series of scores based on the R-Factor scales, which are used to measure voice call quality.

These results indicate if a network needs more capacity in order to deliver good voice quality for a UC deployment.



Enabling Voice Quality Monitoring and Thresholds

Voice Quality is one of the most important aspects of UC. It is important to know if there is a degradation of voice quality, such as latency, jitter, or packet loss in your network, so issues can be identified and resolved quickly. Mitel Performance Analytics allows you to monitor the voice quality of your UC network 24/7. Monitoring voice quality allows you to:

- Detect problems at an early stage - often before users are impacted.
- Shift your support model from reactive to proactive.
- Resolve problems quickly and increase user satisfaction.

To take advantage of this feature, voice quality monitoring must be enabled for the communication platform in use: MiVoice Business, MX-ONE, or Border Gateway. Configuration for voice quality monitoring must be done on both the device side, and within Mitel Performance Analytics.

As well as being able to monitor voice quality, you can also set voice quality thresholds. By setting appropriate threshold values, you can detect and correct minor voice quality issues before they escalate into major issues.

MIVOICE BUSINESS VOICE QUALITY MONITORING CONFIGURATION

CONFIGURE VOICE QUALITY FOR MIVOICE BUSINESS

For Mitel Performance Analytics to collect Voice Quality statistics, Voice Quality Monitoring must be enabled in the MiVoice Business management web interface as follows:

1. Log into the MiVoice Business System Administration Tool as super user or admin.
2. Navigate to Maintenance and Diagnostics > Voice Quality and open the Voice Quality Configuration form.
3. Set Voice Quality Monitoring to True. Use the default Voice Quality SNMP Trap Latency Threshold value.

CONFIGURE MITEL PERFORMANCE ANALYTICS TO COLLECT VQ DATA FROM MIVOICE BUSINESS

You must also ensure that Mitel Performance Analytics is configured to collect voice quality statistics from MiVoice Business.

1. From the device dashboard, select Settings under the Settings icon.
2. Supply your email and password to enable administrative functions. The device properties sheet is displayed.
3. To enable the collection of Voice Quality statistics, select the Collect Voice Quality check box.
4. Click Save.

A Probe connectivity check is automatically run to verify the updated configuration.

For details on configuring MiVoice MX-ONE and MiVoice Border Gateway, refer to the Configuring MPA Devices section in the online help.

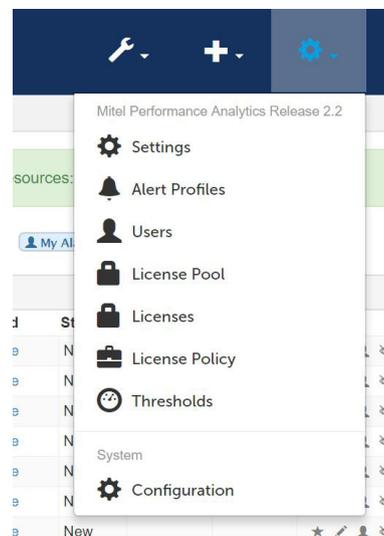
VOICE QUALITY THRESHOLD CONFIGURATION

Mitel Performance Analytics calculates an R value VQ rating based on measurements of the IP network performance. You can configure performance thresholds to generate alarms when the VQ R values thresholds are crossed. By setting the appropriate thresholds, you can detect and correct minor issues before they escalate into major issues. Threshold alarms can have different severities: warning, minor, major & critical.

CONFIGURE VOICE QUALITY THRESHOLD VALUES

To configure system thresholds, do the following:

1. Determine which Probe is monitoring the devices you want to set thresholds for.
2. Access the Probe's container dashboard or the dashboard of a parent container. Select Threshold under the Settings icon.



The Global Thresholds window is displayed, showing a table of all parameters with thresholds for all device types. The parameters are listed in the left. The device types make up the table columns. Hovering over a threshold icon provides more details on the thresholds defined for that particular parameter and device combination. There is only one threshold alarm configured for MiVoice Business Voice Quality:

	Avaya IP Office	Basic IP Device	ESX Server	Inline IP	MX-ONE Application Server Provision Center Business	MiVoice Office 200	MCollab	MiVoice Border Gateway	MiVoice Business	MiVoice MX-ONE	MiVoice Call Recording	Path Solutions	Probe	RedBox CR	Router	Server	Switch	UPS
CPU	-	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Disk Usage	-	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
IP SLA Latency	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
IP SLA Packet Loss	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Interface Availability	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
License Usage	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Memory Usage	-	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Missing IP Sets	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Ping Latency	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Ping Packet Loss	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Probe Check-in	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Process Inactivity	-	-	○	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
RX Bandwidth Utilization	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
SDS Error Rate	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Services Inactivity	-	-	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
TX Bandwidth Utilization	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Time Sync	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-	-
Uptime	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○	○
Voice Quality	-	-	-	-	-	-	-	-	△	△	-	-	-	-	-	-	-	-

3. Click the icon at the intersection of the parameter and device type. The Thresholds page is displayed.

Device Type	Threshold Type	Match	On	Off	On	Off	On	Off	On	Off	On	Off
MiVoice Business	Voice Quality	- - - -	- - - -	- - - -	70.0R-Factor	0m	70.0R-Factor	10m	- - - -	- - - -	- - - -	- - - -

The Thresholds page shows the thresholds settings for that parameter and device pair. In this example, a minor alarm is generated when the R value is ≤ 70 and cleared when it increases to > 70 for 10 minutes.

4. Click the Edit button on the Thresholds page to open the Edit page. The threshold Edit page allows you to set warning, minor, major and critical alarm severity threshold values for a specific parameter and device pair.

Match:
Lower is Worse?

warning minor major critical

70 R-Factor 70 70 R-Factor 70 50 R-Factor 50 50 R-Factor 50

110 110 110 110
104 104 104 104
98 98 98 98
92 92 92 92
86 86 86 86
80 80 80 80
74 74 74 74
68 68 68 68
62 62 62 62
56 56 56 56
50 50 50 50

activate: 0 m activate: 0 m activate: 5 m activate: 5 m
clear: 10 m clear: 10 m clear: 5 m clear: 5 m

Enabled Enabled Enabled Enabled

5. Ensure the Lower is Worse? setting is selected for VQ thresholds. The Lower is Worse? setting indicates that a lower value means a worse conditions. (For some other threshold parameters, such as utilization or noise, lower values mean a better condition.)

6. Set threshold values by dragging the slider for the selected alarm severity or by entering the value below the slider. The slider moves to the nearest valid values for which the threshold is being set.

For details on configuring voice quality thresholds for MiVoice MX-ONE and MiVoice Border Gateway, refer to the Configuring MPA Devices section in the online help.

Configuring Probe Activity Thresholds

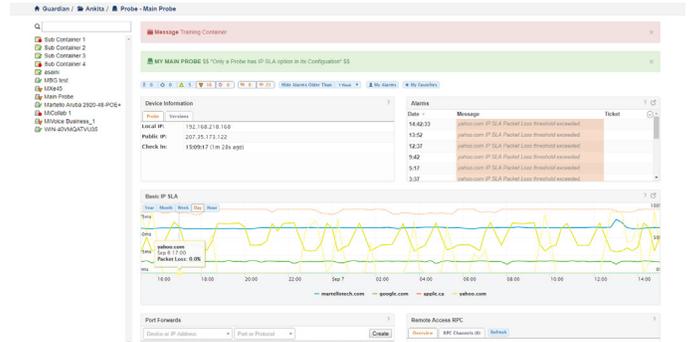
The agent-based monitoring strategy that your Mitel Performance Analytics system uses to collect performance data has several advantages, including dependable security and access to more detailed performance information about the devices on your network. In Mitel Performance Analytics, the probe is the hub for all data collection – without it, Mitel Performance Analytics can't report on the KPIs you need, like availability, utilization, and voice quality.

For most, probe installation is often a 'set it and forget it' exercise but once set up is complete, what type of attention should you really be paying to your probe? A properly installed probe is the driver for all the key features of Mitel Performance Analytics: network monitoring, alerts, and data that will keep your customers' network healthy. If your probe has gone down, it will no longer report the status of the devices it is monitoring to the Mitel Performance Analytics server.

Probes should 'check' into Mitel Performance Analytics periodically (default time, every 15 minutes), and if that isn't happening there can be a number of causes. Setting thresholds for your probe will ensure that you receive instant notifications when your probe has stalled. These thresholds can be configured either on a probe individually or apply to all probes that you manage at the Root container level and will apply to all probes at once. Once your thresholds are set, you don't need to wonder "Is my probe working". If it isn't, you will be the first to know with an alarm.

In the Alarm Analytics tab you can see the alarms that have been generated for inactive probes, among other alarms.

Below is the Probe's dashboard, where you can see if your probe is active. This is a screenshot of a 'healthy probe' that is checking in regularly. If the timespan to check in exceeds the set limit of fifteen minutes, an alarm will be generated.



In Mitel Performance Analytics there is a 'master view' of all the possible thresholds that you can set for monitored devices. Under "Probe Check-in" you can configure the threshold for your probe.



In the threshold configuration window you can set a threshold for your probe.



Without a functioning probe, you lose valuable report device data that is fed into Mitel Performance Analytics. Taking the easy step of setting up thresholds for your probes is the key step in monitoring your customers' network more efficiently.

Capacity Planning and Load Balancing with Trunk Utilization

Capacity planning and load balancing helps you maximize the trunks you have and know when you need to scale your system to prevent performance problems stemming from over capacity. MPA monitors SIP and digital trunk utilization to give you at-a-glance insight into trunk usage trends and performance.

By reviewing the utilization graphs for the devices that are configured in your network, you have an immediate view into areas where you might be over or under capacity at various points throughout the day. Below, the MiVoice SIP Trunk Utilization and Trunk Utilization panels are described. For details on the MiVoice Border Gateway Trunk Utilization Panel and the MX-ONE Gateway and Route Utilization panels, refer to the Dashboard Panels Section of the MPA online-help.

MIVOICE BUSINESS SIP TRUNK UTILIZATION PANEL

The SIP Trunk Utilization panel for MiVoice Business shows the performance of all SIP profiles in the MiVoice Business. There are two graphs in the SIP Trunk Utilization panel: Call Rate and Maximum Utilization per Profile.



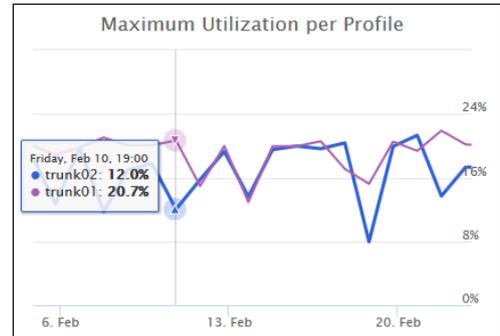
The trunk utilization metrics allow analysis of trunk capacity for actual traffic on the MiVoice Business. High numbers of busy outbound call attempts indicate that the trunk group is too small for the offered traffic. Low utilization shows that there is excess trunk capacity.

The Call Rate graph shows the call rate for all SIP profiles in the system in 1-hour intervals (CPH). To convert to the number of call events per 15-minute interval, divide the hourly call rates by 4.

The Maximum Utilization per Profile graph shows trunk utilization per SIP profile. Utilization is defined as the maximum number of trunks in use per SIP profile (high water mark), expressed as a percentage of the number of trunks in each SIP profile. SIP profiles are identified by their name.

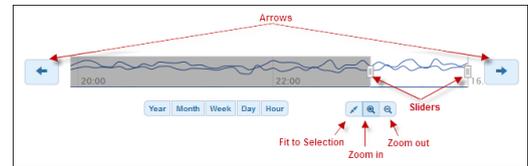
Click on the graph legend labels at the bottom of the panel to display or hide data.

Click or hover on a particular point on the graph to display the utilization data for that moment in time.



Use the timescale selector at the bottom of the panel to display the data for the desired period:

- You can select a fixed timescale for the last Hour, Day, Week, Month, and Year.
- You can create your timescale using the arrows, sliders, and the Zoom-in, Zoom-out and Fit to Selection buttons.



The expanded view provides more detailed, individual SIP profile metrics. Individual SIP profiles are listed to the left. Selecting a SIP profile displays its data on the right. Traffic usage is expressed in CCS (hundred call seconds). Note that 1 Erlang = 36 CCS.

Available metrics are:

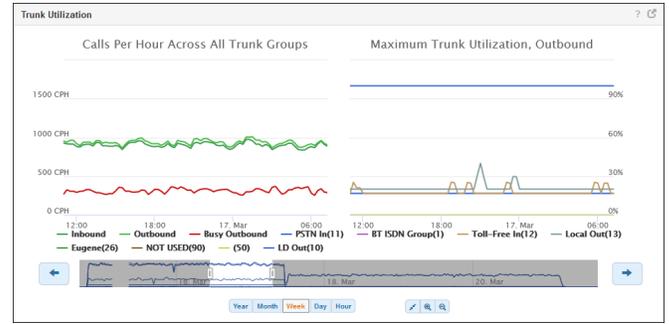
- Inbound, outbound and outbound busy call rates (calls per hour)
- Maximum number of trunks used (number)



MIVOICE BUSINESS TRUNK UTILIZATION PANEL

The Trunk Utilization panel for MiVoice Business shows the performance of all digital trunk groups in the MiVoice Business/3300 ICP system. There are two graphs in the Trunk Utilization panel: Call Rate and Maximum Trunk Utilization, Outbound.

The trunk utilization metrics allow analysis of trunk capacity for actual traffic on the MiVoice Business/3300 ICP. High numbers of busy outbound call attempts indicate that the trunk group is too small for the offered traffic. Low utilization shows that there is excess trunk capacity.



The Call Rate graph shows the call rate for all trunk group calls in the system in 1-hour intervals (CPH). To convert to the number of call events per 15-minute interval, divide the hourly call rates by 4.

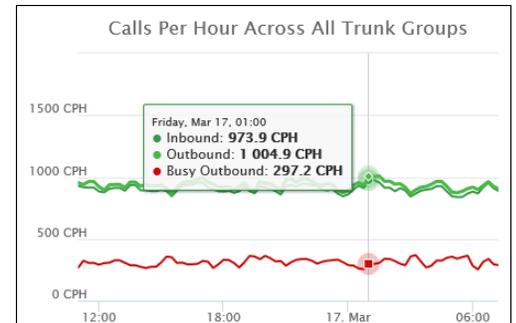
The Maximum Trunk Utilization, Outbound graph shows trunk utilization per trunk group. Utilization is defined as the maximum number of trunks in use per trunk group (high water mark), expressed as a percentage of the number of trunks in each trunk group. Trunk groups are identified by trunk group number and by trunk group label (if available).

Click on the graph legend labels at the bottom of the panel to display or hide data.

Click or hover on a particular point on the graph to display the utilization data for that moment in time.

Use the timescale selector at the bottom of the panel to display the data for the desired period:

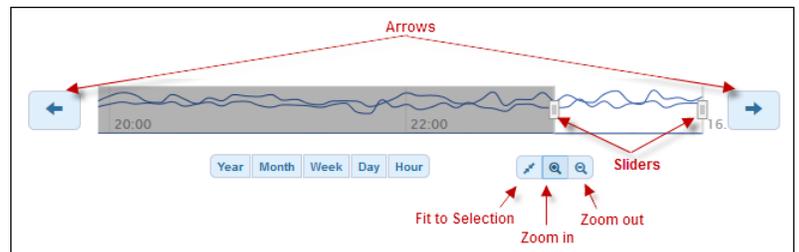
- You can select a fixed timescale for the last Hour, Day, Week, Month, and Year.
- You can create your timescale using the arrows, sliders, and the Zoom-in, Zoom-out and Fit to Selection buttons.



The expanded view provides more detailed, individual trunk group metrics. Individual trunk groups are listed to the left. Selecting a trunk group displays its data on the right. Traffic usage is expressed in CCS (hundred call seconds). Note that 1 Erlang = 36 CCS.

Available metrics are:

- Inbound, outbound and outbound busy call rates (calls per hour)
- Outbound and outbound traffic (CCS)
- Maximum number of outbound trunks available and used (number)



CONFIGURATION FOR TRUNK UTILIZATION MONITORING

To take advantage of the rich data in the various trunk utilization graphs to support your capacity planning, trunk utilization and traffic monitoring must be configured for the devices used in your network.

MIVOICE BUSINESS DIGITAL AND SIP TRUNK UTILIZATION MONITORING CONFIGURATION

To enable digital and SIP trunk utilization monitoring in MiVoice Business, Traffic Data Collection must be enabled using the Traffic Report Options form:

1. Log into the MiVoice Business System Administration Tool as super user or admin.
2. Navigate to System Properties > System Feature Settings and open the Traffic Report Options form
3. Click the Change button.
4. Scroll to the bottom of the dialog box and change the default settings to the following:
 - Time Slot 6
 - Active: Yes
 - Start Time (HH:MM): 00:00
 - Stop Time (HH:MM): 00:00
 - Period Length: 15
 - Usage Units: CCS
 - Maximum Number of Traffic Files: 10
 - Trunk Groups: Yes
 - Trunks: Yes
5. Click Save.
6. Ensure that CCS Trace is not running on the MiVoice Business.

The previous procedure shows recommended settings to enable digital and SIP trunk utilization monitoring. At a minimum, the following settings must be configured:

- Stop Time (HH:MM): 00:00 or 23:59 (to ensure time slot lasts 24 hours)
- Period Length: 15
- Maximum Number of Traffic Files: 10
- Trunk Groups: Yes
- Trunks: Yes

The Traffic Report Options form can contain additional settings.

CONFIGURE MITEL PERFORMANCE ANALYTICS TO COLLECT DIGITAL AND SIP TRUNK STATISTICS FROM MIVOICE BUSINESS

You must also ensure that Mitel Performance Analytics is configured to collect digital and SIP trunk statistics from MiVoice Business.

1. From the device dashboard, select Settings under the Settings icon.
2. Supply your email and password to enable administrative functions. The device properties sheet is displayed.
3. Select the Traffic Monitoring check box to enable digital trunk traffic collection.
4. Select the SIP Traffic Monitoring check box to enable digital trunk traffic collection.
5. Click Save. A Probe connectivity check is automatically run to verify the updated configuration.



NEXT STEPS

Ready to implement best practices that will lay the groundwork for stellar network performance?

We can help. Contact your Mitel Channel Partner or info@martellotech.com.



Learn More

The Mitel Performance Analytics (MPA) software suite helps administrators manage enterprise deployments with multiple network nodes, while allowing partners to proactively detect and address performance issues on customer networks. More information can be found at:

mitel.com/mitelperformanceanalytics