

Performance Indicators

Virtual Multimedia Resource Function

Description

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1 Introduction

This document describes the performance indicators for the Virtual Multimedia Resource Function (vMRF).

1.1 Scope

This document describes how the vMRF counters can be used for network planning and dimensioning of resources.

The document describes vMRF measurements divided as follows:

- Key Performance Indicators (KPIs)
- Performance Indicators (PIs)

The indicators are grouped into the following categories:

- Accessibility
- Retainability
- Integrity
- Traffic and load
- Compute resource



2 vMRF Performance Management Overview

vMRF performance indicators are of the following types:

Key Performance Indicators (KPIs)

KPIs are the main measurement indicators, used to highlight the status of vital functionality.

Performance Indicators (PIs)

PIs are supporting measurement indicators that provide additional information for all functionality.

The indicators are grouped into the following categories:

| | |
|-------------------------|------------------------------------------------------------------------------------------------------------------|
| Accessibility | The ability to obtain requested services from the system to a GCP (H.248) termination |
| Retainability | The ability for a GCP (H.248) context to retain its requested services, once connected, for the desired duration |
| Integrity | The ability of an external connection to maintain the connection at desired quality |
| Traffic and load | This category provides information about the current status of a node, mainly from resource use point of view. |
| Compute resource | This category provides information about the current status of a node, from compute resource use point of view. |

For more information on measurement and performance management, see [Performance Management](#).

For more information on measurement report files, see [Performance Management Report File Format](#).

Other!

- vMRF does not support local time in PM files. All time stamps produced by the vMRF are in UTC time with offset, where the offset is always zero.
 - vMRF reduces the original limit (1000) for the maximum allowed PM files to 500 in order to keep the cluster level disk usage reasonable.
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3 Resource Service KPIs in vMRF

Table 1 shows the Resource Service Key Performance Indicators (R-KPIs) supported in vMRF.

Table 1 Service KPIs in vMRF

| Category | KPI Name | |
|---------------|--------------------------------------------------------|--|
| Accessibility | Session Setup Success Ratio (KPI) (%) | |
| Retainability | Session Completion Ratio KPI on page 4 | |

3.1 KPIs and PIs for Accessibility

3.1.1 Session Setup Success Ratio KPI

The Session Setup Success Ratio is used to measure the ratio of successful call setup initiations. Session setups are considered successful even if the call is not answered or is rejected by the terminating user or if a fault outside the IMS network arises.

Note: In the vMRF, Session Setup Success Ratio measures the session setup from receiving the H.248 Add request to sending the H.248 Add reply message.

Formula for the measurement: $(1 - ([\text{for all MrfH248Interface}].\text{terminationReqsRej} / [\text{for all MrfH248Interface}].\text{terminationReqs})) * 100$

Target value range: 99.7–100% (for long term measurement)

Possible reasons for falling below the target value range:

- Congestion in one or more MRF resources
- IPv4 connectivity is faulty. If the VM is configured exclusively for IPv4 sessions, all sessions are rejected. If the VM is configured for both IPv4 and IPv6 sessions, only IPv4 sessions are rejected.
- IPv6 connectivity is faulty. If the VM is configured exclusively for IPv6 sessions, all sessions are rejected. If the VM is configured for both IPv4 and IPv6 sessions, only IPv6 sessions are rejected.

Possible consequence of falling below the target value range:



- Increased traffic rejection rate

Recommended actions when falling below the target value range:

- Check the status of related resources and devices.

3.2 KPIs and PIs for Retainability

3.2.1 Session Completion Ratio KPI

The Session Completion Ratio shows the ability of the vMRF to successfully complete an active session in the IMS network. Sessions are considered successfully completed even if a fault arises outside the IMS network or when the session is terminated due to the lack of support for held SRVCC calls in the IMS.

Formula for the measurement: $(1 - ([\text{for all MrfH248Interface}].\text{abnormTermTerminations} / ([\text{for all MrfH248Interface}].\text{terminationReqs} - [\text{for all MrfH248Interface}].\text{terminationReqsRej}))) * 100$

Target value range: 99.6–100% (for long term measurement)

Possible reasons for falling below the target value range:

- Problems in the network
- Faults in MRF resources
- Forced locking of `MrfInstance` MOs

Possible consequence of falling below the target value range:

- Increased amount of dropped calls

Recommended action when falling below the target value range:

- Check the status of related resources and devices.



4 Service Level Agreement PIs in vMRF

[Table 2](#) shows the Service Level Agreement Performance Indicators (SLA-PIs) supported in vMRF. These PIs can be used to monitor if the minimum hardware requirements set by a VNF are fulfilled by the cloud environment. This information is needed for troubleshooting, to detect if the source of the problem lies in the VNF, in the cloud environment, or in the external network.

Table 2 Service Level Agreement PIs in vMRF

| Category | PI Name |
|------------------|-------------------------------------------|
| Compute resource | CPU Steal Time (%) |
| | Allocated Memory (per VM) |
| | Swap Memory (per VM) |
| | Allocated Disk (per VM) |

4.1 CPU Steal Time PI

The CPU Steal Time PI is used to monitor if CPU pinning is used. If the PM threshold value is exceeded, the Service Level Agreement Violation alarm is raised.

Formula for the measurement for all VMs: `ComputerResource.cpuLoadStealVm < 3%`

Threshold value: 3%.

Possible reasons for exceeding the threshold value:

- The compute host hosting the vMRF VM is also hosting other VMs.

Possible consequence of exceeding the threshold value:

- Negative impact on QoS related to vMRF services.

Recommended actions when exceeding the threshold value:

- Contact the Cloud Administrator to allocate the required amount of resources for the vMRF, as described in [vMRF Infrastructure Requirements](#).

4.2 Allocated Memory PI

The Allocated Memory PI is used to monitor if the minimum memory requirements for a VM are fulfilled.



Formula for the measurement for all VMs: `ComputerResource.memoryTotal` \geq `Min_mem_size_VNF`

Threshold value: Minimum allocated memory, refer to [vMRF Infrastructure Requirements](#)

Possible reasons for not reaching the threshold value:

- The memory allocated to the vMRF VM is too low.

Possible consequence of not reaching the threshold value:

- Call failures can occur if traffic volume is high.

Recommended action when not reaching the threshold value:

- Contact the Cloud Administrator to allocate the required amount of resources for the vMRF, as described in [vMRF Infrastructure Requirements](#).

4.3 Swap Memory PI

The Swap Memory PI is used to monitor if memory swap occurs. If the PM threshold value is not reached, the Service Level Agreement Violation alarm is raised.

Formula for the measurement for all VMs: `ComputerResource.swapMemoryUsed` $< 3\%$

Threshold value: 3%

Possible reasons for not reaching the threshold value:

- The memory allocated to the vMRF VM is too low.

Possible consequence of not reaching the threshold value:

- Negative impact on QoS related to vMRF services.

Recommended actions when not reaching the threshold value:

- Contact the Cloud Administrator to allocate the required amount of resources for the vMRF, as described in [vMRF Infrastructure Requirements](#).

4.4 Allocated Disk PI

The Allocated Disk PI is used to monitor if minimum disk requirements for a VM are fulfilled.

Formula for the measurement for all VMs: `ComputerResource.diskSize (kB)` \geq `Min_disk_size_VNF`



Threshold value: Minimum allocated disk space, refer to vMRF Infrastructure Requirements

Possible reasons for not reaching the threshold value:

- The disk space allocated to the vMRF VM is too low.

Possible consequence of not reaching the threshold value:

- No traffic impact, storage of new files on the disk might fail.

Recommended actions when not reaching the threshold value:

- Allocate more storage space to meet requirements, as described in vMRF Infrastructure Requirements.