A MITEL
PRODUCT
GUIDE

Mitel OpenScape Fault Management

Mitel OpenScape Fault Management V14, OpenScape Voice Plugin

User Guide
10/2026

A31003-F30D0-U116-02-7619

Mitel

Notices

The information contained in this document is believed to be accurate in all respects but is not warranted by Mitel Europe Limited. The information is subject to change without notice and should not be construed in any way as a commitment by Mitel or any of its affiliates or subsidiaries. Mitel and its affiliates and subsidiaries assume no responsibility for any errors or omissions in this document. Revisions of this document or new editions of it may be issued to incorporate such changes. No part of this document can be reproduced or transmitted in any form or by any means - electronic or mechanical - for any purpose without written permission from Mitel Networks Corporation.

Trademarks

The trademarks, service marks, logos, and graphics (collectively “Trademarks”) appearing on Mitel’s Internet sites or in its publications are registered and unregistered trademarks of Mitel Networks Corporation (MNC) or its subsidiaries (collectively “Mitel), Unify Software and Solutions GmbH & Co. KG or its affiliates (collectively “Unify”) or others. Use of the Trademarks is prohibited without the express consent from Mitel and/or Unify. Please contact our legal department at iplegal@mitel.com for additional information. For a list of the worldwide Mitel and Unify registered trademarks, please refer to the website: http://www.mitel.com/trademarks.

© Copyright 2025, Mitel Networks Corporation

All rights reserved

Contents

1 Preface 5
1.1 Purpose 5
1.2 Audience 5
1.3 Terminology 5
1.4 Organization of This Guide 5
1.5 Conventions Used in This Manual 6

2 Introduction. 7
2.1 OpenScape Voice 7
2.1.1 OpenScape Voice Universe 7
2.1.2 OpenScape Voice Assistant 7
2.1.3 OpenScape Voice Cluster 8
2.1.4 OpenScape Voice Switch 9
2.2 OpenScape Branch / Session Border Controller 9
2.3 OpenScape Voice Plugin 10
2.4 OpenScape Accounting 12
2.5 OpenScape Enterprise Express 12

3 Getting Started 13
3.1 Starting the Client 13
3.2 Login 13
3.3 Initializing the OpenScape Voice plugin 13
3.4 Configuration of SNMP Parameters 14
3.5 License Installation 14
3.6 Main Menu 14

4 OpenScape Voice Discovery. 15
4.1 Adding OpenScape Voice Switches, Cluster and Assistants 15
4.2 Discovery of OpenScape Voice Switches. 15
4.3 Discovery of OpenScape Voice Assistants 15
4.4 Discovery of general Cluster Information 15
4.5 Discovery of OpenScape Branches / SBCs 16
4.6 Discovery of OpenScape Accounting Systems 17
4.7 OpenScape Enterprise Express 17

5 Symbols and Overviews. 19
5.1 OpenScape Voice Switch IP Node 19
5.2 OpenScape Voice SNMP MIB 19
5.3 HTTPS Server on Port 443 20
5.4 Assistant API 20
5.5 OpenScape Voice Assistant Network 20
5.6 OpenScape Voice Network 20
5.7 OpenScape Voice Universe 21
5.8 OpenScape Voice Assistant Container 21
5.9 OpenScape Voice Cluster 21
5.10 OpenScape Branch 22
5.11 Session Border Controller 22
5.12 OpenScape Voice Component 23
5.13 Overviews 24

6 OpenScape Voice Network Topology 25
6.1 The Automatically Discovered Network Topology 25
6.1.1 (Orphan) OpenScape Voice Assistant Network 25
6.1.2 OpenScape Voice Assistant 25
6.1.3 OpenScape Voice Network. 25
6.1.4 OpenScape Voice Universe and OpenScape Voice Cluster 26
6.1.5 OpenScape Voice Switch 28
6.1.6 OpenScape Branch / Session Border Controller 28
6.1.7 OpenScape Enterprise Express. 29
6.2 Network Configuration 31

7 Device-Specific Information 33
7.1 Operations for an OpenScape Voice Universe. 33
7.2 Operations for an OpenScape Voice Cluster 34
7.3 Operations for an OpenScape Voice Assistant 34
7.4 Operations for an OpenScape Voice Component. 34
7.5 Operations for an OpenScape Voice SNMP MIB Object 35
7.6 Operations for an OpenScape Voice Event 35
7.7 Operations for an OpenScape Branch or SBC Object 36

8 Fault Management 37
8.1 Alarm Handling 37
8.1.1 Info Browser 37
8.1.2 Central Event Search 37
8.1.3 Traps 38
8.1.4 Event Correlation (OpenScape Voice) 38
8.1.5 Event Correlation (OpenScape Branch / Fault Management) 39
8.1.6 Event Correlation (OpenScape Accounting) 40
8.1.7 Monitoring of Warning Events 40
8.1.8 Event Synchronization 41
8.1.9 Deletion of Alarms Via SNMP Set 42
8.1.10 Accessing OpenScape Voice Event Documentation 42
8.1.11 Access to Log-Files 43
8.2 Status of OpenScape Voice Objects 43
8.3 Split Brain Situation 44

9 System Management Monitoring 45
9.1 SIP Statistics 45
9.2 Bandwidth Usage for CAC Groups. 46
9.3 Registered Subscribers for OpenScape Branch 46
9.4 Mediatrix Used Ports. 47
9.5 Media Server Monitoring 48
9.6 Monitoring of UC Backend Cluster 48
9.7 Oracle (ACME) Session Border Controller (SBC) 49

10 Prerequisite Hardware and Software Environment 51

A OpenScape Voice Abbreviations 53

B OpenScape Voice Rights 55

1 Preface

This chapter discusses the following aspects:

- The purpose and readers of this manual
- The terminology used in this handbook
- The organization of this guide
- The conventions used in this manual

1.1 Purpose

This User Guide provides an introduction into the OpenScape Voice plugin for the OpenScape Fault Management. You should have some basic knowledge about network management and about the OpenScape Fault Management. Please refer to the *OpenScape FM Desktop User Guide* for the latter.

1.2 Audience

This guide is addressed to users who want to learn how to use the OpenScape Voice plugin for the OpenScape Fault Management. Since this is not a standalone application but a plugin to the OpenScape Fault Management, you should know how to work with this program before using the plugin. For several functionalities of the plugin which are based on Desktop features, we will base our explanations on those given in the Desktop Manual, so please read the *OpenScape FM Desktop User Guide* for a comprehensive introduction into the work with OpenScape Desktop.

1.3 Terminology

OpenScape FM means OpenScape Fault Management

Server means the OpenScape Server, i.e. the server where OpenScape FM Desktop with the OpenScape Voice plugin has been installed.

Client means the OpenScape Client, usually a web browser where OpenScape FM has been started.

Desktop means the OpenScape FM Desktop.

1.4 Organization of This Guide

This guide is organized as follows:

- *Chapter 1, “Preface”* explains the structure of the manual.

- *Chapter 2, “Introduction”* describes the basic concepts used by the OpenScape Voice plugin.
- *Chapter 3, “Getting Started”* tells you how to initialize the OpenScape Voice plugin and describes its basic functionalities.
- *Chapter 4, “OpenScape Voice Discovery”* explains how to add OpenScape Voice nodes and information to the system.
- *Chapter 5, “Symbols and Overviews”* introduces all symbols of the OpenScape Voice plugin.
- *Chapter 6, “OpenScape Voice Network Topology”* shows you how the automatically discovered network topology looks like and how to customize it.
- *Chapter 7, “Device-Specific Information”* shows you how to obtain specific information about OpenScape Voice objects. These functionalities are accessible via the icons’ context menus.
- *Chapter 8, “Fault Management”* explains the basic concepts of OpenScape Voice Fault Management.
- *Chapter 9, “System Management Monitoring”* describes System Management Profiles that collect data from OpenScape Voice devices.
- *Chapter 10, “Prerequisite Hardware and Software Environment”* provides a list of hardware and software you should have to run the OpenScape Voice plugin.

1.5 Conventions Used in This Manual

The following font conventions are used in this document:

Bold Font: Indicates that a word is a new or important term. Bold also used for Buttons, menu names and items

Example: **Proxy Agent** or **OK**.

Bold Computer Font: Indicates data to be entered by the user.

Example: **`java`**.

Computer Font: Indicates computer output, including UNIX prompts, an explicit directory or a file name.

Example: `prompt%`.

Italics: Indicates a reference to another manual or to a different section within the current manual.

Example: *see OpenScape Voice documentation.*

Italic type is also used for emphasis.

Example: *All* users will be affected.

2 Introduction

This chapter provides a high-level of overview of the OpenScape Voice solution and the OpenScape Voice plugin.

2.1 OpenScape Voice

The following section is taken from the document OpenScape Voice V3.1 R2, Reference Manual: Volume 2, System Overview and Description (A31003-H8031-Y113-2-7618, July 2008)

OpenScape Voice is a protocol-independent, carrier-grade switching and service delivery system capable of bridging legacy and next-generation networks. Its call model enables services that cross existing voice and data networks. It extends services to next-generation wireless networks, as well as to IP and circuitswitched networks. This design lends itself to the use of third-party, open platform hardware products.

OpenScape Voice can be deployed as either an enterprise solution or as a hosted service. It is scalable from a few hundred to 100,000 users per single system, and a virtually unlimited number of users per network. By ensuring that all functions and applications maintain constant, unrestricted availability, OpenScape Voice provides a new level of quality in IP communications.

In addition, OpenScape Voice is an important component of Unify's Vision LifeWorks, significantly increasing the productivity and effectiveness of business processes through the integration of communications solutions for enterprises. The core of the LifeWorks concept is the integration of home, business, and carrier networks, as well as wired and wireless networks.

By integrating communications among home offices, small offices, branch offices, regional offices, and headquarters, including Centrex-type solutions, and using innovative and integrated products such as the OpenScape Unified Communications (UC) Application, the solution thus creates a unified domain across the enterprise.

2.1.1 OpenScape Voice Universe

OpenScape Voice Universe means an OpenScape Voice Switch with all its related components.

2.1.2 OpenScape Voice Assistant

The following section is taken from the document OpenScape Voice V3.1 R2, Reference Manual: Volume 2, System Overview and Description (A31003-H8031-Y113-2-7618, July 2008)

The OpenScape Voice Assistant is a Web-enabled telecommunications service management center. It provides the ability to:

- Create, modify, and delete OpenScape Voice user accounts, business groups, and subscribers
- Subscribe to, activate, modify, and unsubscribe from services
- Create and manage endpoint profiles

- Add, modify, and remove intercepts
- Quickly and easily add business groups, PSTN gateways, and PABX gateways
- Define settings for reports, switches, and CDR
- Configure media servers
- Configure global translation and routing
- Import and export data of many types
- Configure SIP proxies associated with branch offices

On the integrated OpenScape Voice system, OpenScape Voice Assistant resides on the OpenScape Voice server. On larger systems, it resides on an external server.

2.1.3 OpenScape Voice Cluster

The following section is taken from the document OpenScape Voice V3.1 R2, Reference Manual: Volume 2, System Overview and Description (A31003-H8031-Y113-2-7618, July 2008)

Reliability is the primary goal of OpenScape Voice, and clustering is necessary to provide this reliability. A reliable component structure provides an effective base for cluster administration.

The OpenScape Voice hardware and software components work together to attain the following reliability goals:

- To provide faster data replication and better performance for peak traffic in normal operation by using a two-node active-active configuration, with each node acting as hot/standby for its partner. This configuration also protects against silent faults through continuous hardware/software monitoring and testing.
- To minimize node switchover, which reduces transient call loss and network connectivity outages. This is accomplished with redundant local disks, network connections for each node, and power supplies. Each node also contains duplicated Ethernet cards which ensure that the physical path for the external communication with one node is backed up by a second path—a second Ethernet port on a different Ethernet card, and a second LAN switch.
- To provide static load sharing for fast and reliable busy/idle handling, because only one node writes the busy/idle and call status for the subscriber or feature server.
- To provide effective component management through process configuration control using process and alias groups.

The OpenScape Voice redundant configuration can be deployed as follows:

- Geographically co-located node configuration
- Geographically separated node configuration in the same subnet
- Geographically separated node configuration in different subnets
- Geographically separated node configuration with layer-3 cluster interconnect

2.1.4 OpenScape Voice Switch

The OpenScape Voice Switch is one node in an OpenScape Voice Cluster. It is one data source for the management of OpenScape Voice Systems. The data of the OpenScape Voice Switch is used for the alarm and event management. Most of fault management relevant data can be retrieved via SNMP.

2.2 OpenScape Branch / Session Border Controller

The following section is taken from the document OpenScape Branch V1 R2, Administrator Documentation, Issue 11 (A31003-H8111-M100-11-76A9, Feb. 2010)

OpenScape Branch is a Session Initiation Protocol (SIP) based appliance used in Voice over IP enterprise communication environments for OpenScape Voice solutions to empower the remote branch office.

The OpenScape Branch solution provides the following additional functionalities:

- An integrated Media Server that provides local resources for tones, announcements, and conferencing during normal and survivable mode. This capability minimizes the WAN bandwidth requirements to the host OpenScape Voice.
- Full integration in OpenScape Voice management. In addition, a local GUI, which can be used for most tasks, continues to be available when the headquarters OpenScape Voice Assistant is not.
- SBC (Session Border Controller) functionality.
- PSTN (Public Switched Telephone Network) gateway support.
- Security functions, such as firewall and virtual private network (VPN).
- Additional billing/CDR (Call Detail Record) capabilities in survivability mode.
- Improved serviceability for installation, upgrades, and configuration.

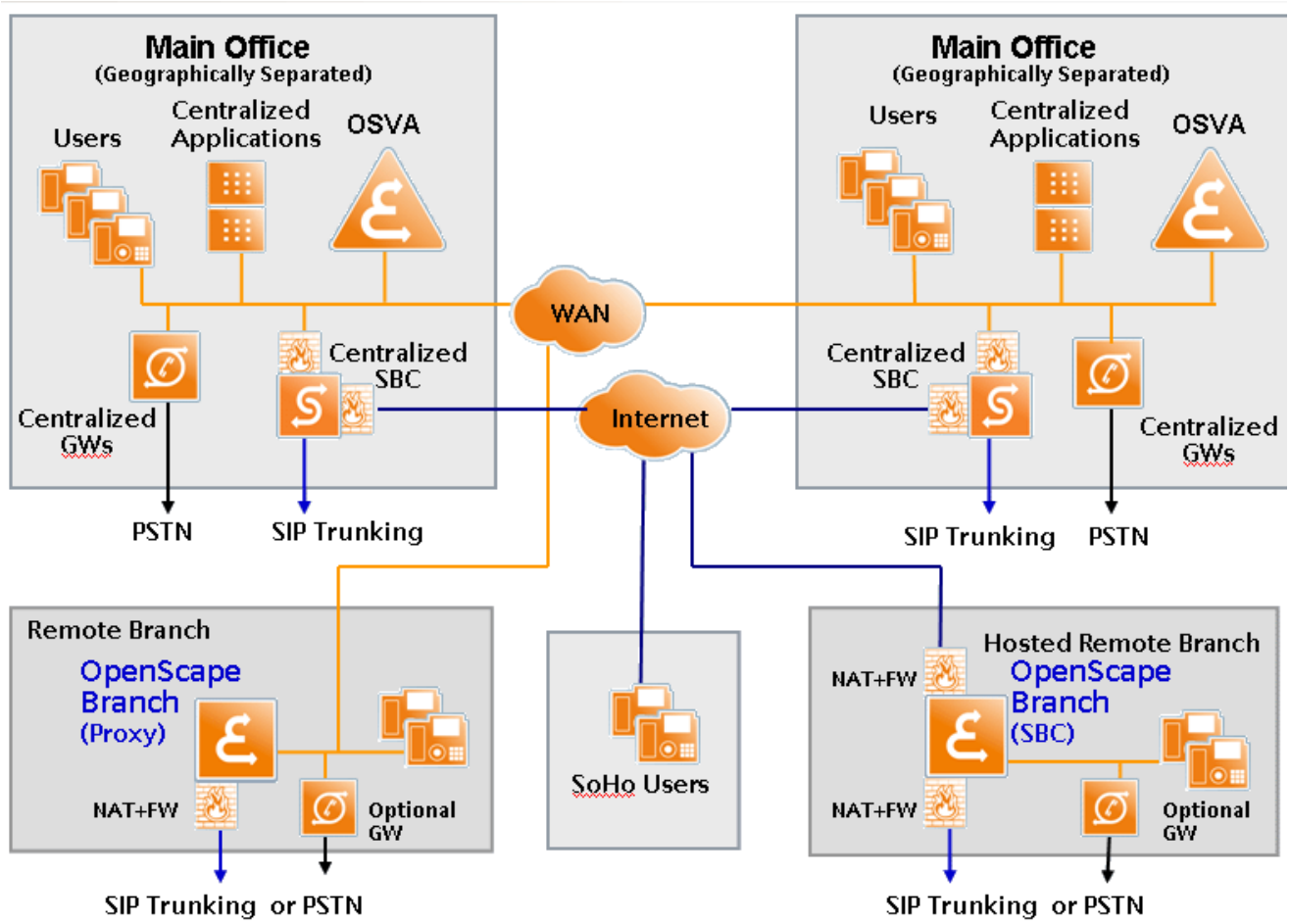


Figure 1 OpenScape Branch in the Network

2.3 OpenScape Voice Plugin

The OpenScape Voice Plugin is a tool to integrate the management of OpenScape Voice and related components (OpenScape Voice Universe) into OpenScape FM. Since OpenScape FM uses Java(TM) and XML/HTTP it can be integrated easily into intranet/internet environments. The OpenScape Voice is a plugin and cannot be run as a standalone application.

The OpenScape Voice plugin uses SNMP (Simple Network Management Protocol) to collect management information from OpenScape Voice Switches. A SNMP agent is an integral part of the OpenScape Voice Switch.

General information about an OpenScape Voice Cluster is retrieved via the OpenScape Voice Assistant API from a Common Management Portal with an installed OpenScape Voice Assistant.

In order to give the user a quick overview about the operational status of an OpenScape Voice Cluster, a graphical representation is needed. In the current release the OpenScape Voice plugin for OpenScape FM concentrates the topology display on the representation of the OpenScape Voice Cluster itself in the context of an OpenScape Voice Universe. It supports the following functionalities for OpenScape Voice systems:

- Representation of OpenScape Voice Cluster topology
- Alarm and fault management
- Active Alarm and Event information for OpenScape Voice components

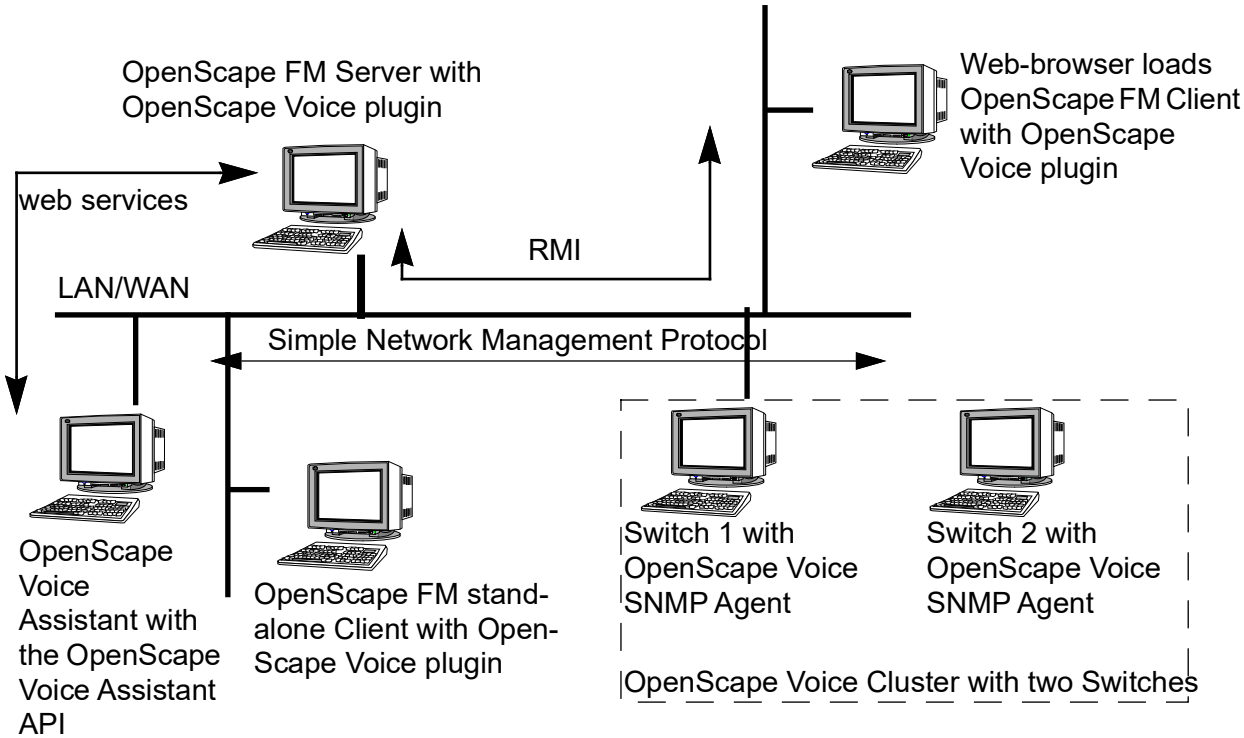


Figure 2 OpenScape FM OpenScape Voice Networks

Figure 2 shows an example scenario for the use of the OpenScape Fault Management in an OpenScape Voice environment:

The OpenScape Desktop consists of a server and a client component. The server collects and analyzes all network data whereas the client is the user interface – it doesn't do any network analysis itself but receives all information from the server. You can either use the client application or a standard web browser to access the server's data (see *Section 3.1, "Starting the Client"*).

The OpenScape FM server process communicates with the SNMP agent which is an integral part of the OpenScape Voice Switch to access the management information base (MIB). The management data is then analyzed and processed by the OpenScape Voice plugin.

The communication between OpenScape FM server and the OpenScape Voice Assistant is done by means of web services.

2.4 OpenScape Accounting

OpenScape Accounting provides a software for the collection, calculation, allocation and administratration of connection data of communication processes.

OpenScape Accounting allows for a transparent and flexible cost management for communication even for current server/gateway based VOIP technologies.

It provides the user an overview about all communication processes and their cost, about the organizational structures and about their correlation to cost tracking numbers.

OpenScape Accounting provides the following functions for call accounting and billing:

- Comparing different providers and rates.
- Calculation of Services.
- Statistical analysis and creation of central reports.
- Central data storage and access to subscriber, account and call number data.
- Analysis of the calling behavior.

2.5 OpenScape Enterprise Express

OpenScape Enterprise Express is a Voice and Unified Communications (UC) solution package. Its prepackaged suite of applications satisfies the typical requirements of a mid-sized enterprise by providing advanced Unified Communications capabilities.

The core applications are integrated into a single server and include:

- OpenScape Voice (central communication server)
- OpenScape UC Application (unified communication platform)
- OpenScape Xpressions (unified messaging)
- OpenScape Contact Center Enterprise (contact center)
- OpenScape Common Management Platform (common management interface)
- OpenScape Deployment Service (IP endpoint management)
- OpenScape User Management (user centric administration)

3 Getting Started

This chapter guides through the first steps with the OpenScape Voice plugin for OpenScape FM. Since the Fault Management for OpenScape Voice is a plugin for the OpenScape FM, you should already be familiar with the usage of this application. Please read the *OpenScape FM Desktop User Guide* for more information on this subject.

It is also assumed that the system already has been installed properly. For details about the installation process, also see the *OpenScape FM Desktop User Guide.*

3.1 Starting the Client

Working in an inter-/intranet environment, the typical way to start the OpenScape Desktop and OpenScape Fault Management for OpenScape Voice will be via a Web browser running on a Laptop, PC or Workstation. The user has to start the Web browser (e.g. MS Internet Explorer or Firefox) on his local machine and to enter the OpenScape FM server's URL:

```
http://<hostname/IP address of OpenScape FM server>:3043/
```

The OpenScape FM client is downloaded from the OpenScape FM server. Therefore you can be sure to work with the latest client version whenever you start your web browser and load OpenScape FM Client. The server URL and port number have to be set according to each system.

3.2 Login

Please, enter your username and password in the Client user interface to login to the OpenScape FM server. When you log in for the first time or when you password has expired, you might be asked to set a new password. Please read the *OpenScape FM Desktop User Guide* for details.

3.3 Initializing the OpenScape Voice plugin

You have to start the OpenScape Client (see *Section 3.1, "Starting the Client"*) and choose the menu item **Server->Plugins->Init OpenScape Voice Plugin** from the main menu bar. After the initialization the menu item **Init OpenScape Voice Plugin** will be removed from the menu **Server->Plugins**. A new menu item **Technologies->OpenScape Voice** will appear in the main menu bar. Additionally an object representing the OpenScape Voice plugin is added to the hierarchy with the path **Root->System->Plugins->Technologies**. The new object offers the same menu items as the OpenScape Voice main menu.

If the OpenScape Voice Plugin gets initialized, the three OpenScape Accounting MIBs (`OpenScapeAccounting` `OpenScapeAccountingSystemNSM`, `OpenScapeAccountingFinanceNSM`) for OpenScape Accounting will be automatically loaded.

3.4 Configuration of SNMP Parameters

A working SNMP communication between the OpenScape FM server and OpenScape Voice Switches is required. The corresponding ports must be accessible from the OpenScape FM and the OpenScape FM must be entered as a trap destination in the OpenScape Voice Switch. This can be done via the OpenScape Voice Assistant. The SNMP communities needed to access the OpenScape Voice Switch must be configured correctly in the OpenScape FM.

In OpenScape FM, “private: write” and “public: read” are the default values for the SNMP parameters. You can either change these communities or use the defaults. In either case you have to make sure that they are identical on the OpenScape FM server and on the OpenScape Voice Switch. Please refer to the *IP Manager Plugin User Guide* to learn how to change the SNMP parameters in OpenScape FM.

3.5 License Installation

To work with the OpenScape Voice plugin a valid OpenScape FM license is required. Please refer to the *OpenScape FM Desktop User Guide* to get information about how to license your system.

3.6 Main Menu

The menu item **OpenScape Voice** opens the main menu of the OpenScape Voice plugin with the following options:

- **List Universes...:** This menu item lists all OpenScape Universes currently known by the OpenScape Fault Management.
- **List Assistants...:** This menu item lists all OpenScape Assistants currently known by the OpenScape Fault Management.
- **List Switches...:** This menu item lists all OpenScape Switches currently known by the OpenScape Fault Management.
- **List Hosts...:** This menu item lists all Host objects generated by the OpenScape FM that relate to OpenScape OpenScape Voice elements like OpenScape Universes, OpenScape Assistants or Endpoints.

4 OpenScape Voice Discovery

4.1 Adding OpenScape Voice Switches, Cluster and Assistants

A management task depends on the tasks of efficient data retrieval. There are two distinct data sources for the management of OpenScape Voice systems. One data source is the OpenScape Voice Switch itself and the other data source is the OpenScape Voice Assistant. The data of the OpenScape Voice Switch is used for the alarm and event management. This data can be retrieved via SNMP. The data of the OpenScape Voice Assistant is used for the cluster representation. It is accessed via a web service which is provided by the OpenScape Voice Assistant.

Since OpenScape Voice systems are managed via the OpenScape Voice Assistant, you have to include the OpenScape Voice Assistant and the OpenScape Voice Switches into OpenScape FM. This can either be done via **IP Manager->New->Node...** or Autodiscovery. For more information about the IP Manager please refer to the *IP Manager Plugin User Guide*.

4.2 Discovery of OpenScape Voice Switches

A working SNMP communication between the OpenScape FM and the OpenScape Voice Switch is required (see *Section 3.4, "Configuration of SNMP Parameters"*). An OpenScape Voice Switch will be discovered by checking the existence of the MIB subtree `hiq8000Admin`. If the existence of this MIB is discovered on an IP node, it will be represented as an OpenScape Voice Switch.

4.3 Discovery of OpenScape Voice Assistants

The discovery of a OpenScape Voice Assistant is based on an existence check of the OpenScape Voice Assistant API. Currently, the following URL is used to check if that OpenScape Voice Assistant API is present.

`https://ip-address/HiPath8000AssistantAPIv310/services/ HiPath8000AssistantAPI`

If the check of this URL returns without an error, an OpenScape Voice Assistant API and therefore a Common Management Portal (CMP) with an installed OpenScape Voice Assistant has been discovered. Further access requires a valid username and password. The context menu of an OpenScape Voice Assistant object offers a menu item, by which the connection parameters for the OpenScape Voice Assistant can be entered (see *Section 7.3, "Operations for an OpenScape Voice Assistant"*). When this information has been entered, further information will be retrieved via the Assistant API.

4.4 Discovery of general Cluster Information

The following information is necessary for the OpenScape Voice plugin to recognize and display an OpenScape Cluster correctly. It is retrieved from the OpenScape Voice Assistant:

- Cluster name
- Cluster virtual IP address
- OpenScape Voice Switch 1 (Node 1) IP address
- OpenScape Voice Switch 2 (Node 2) IP address
- Cluster configuration simplex, duplex (co-located, geo-separated)

General information about an OpenScape Voice Cluster can be retrieved via the OpenScape Voice Assistant API from a Common Management Portal (CMP) with an installed OpenScape Voice Assistant. The `openSession` method of the OpenScape Voice Assistant API is used to establish a session. When the session has been established, the list of OpenScape Voice Switches managed by the assistant will be retrieved by calling the method `listSwitch`. The method `listSwitch` returns a list `ListSwitchResult` of switches managed by the OpenScape Voice Assistant. All switches in this list will be processed. The data for each switch is stored in a SwitchDTO. The data needed by the OpenScape Voice plugin is determined by calling corresponding methods in the SwitchDTO.

4.5 Discovery of OpenScape Branches / SBCs

Whenever a Configuration Poll is performed for an IP node for which an OpenScape Voice Assistant has been detected (e.g. if the IP node is created), the web interface of the OpenScape Voice Asssitant will be used to poll and update the list of OpenScape Branches and their IPs for this Assistant.

For each listed OpenScape Branch it will be tested if it's IP address is connected to an IP node already known within the OpenScape FM. If this is the case, an respective OpenScape Branch symbol will be added to the submap of this IP node.

If a OpenScape Branch is discovered as a Session Border Controller, the respective SBC symbol will be used. The distinction is done by evaluation the content of the field 'type' subfield
`BranchOffice/CommSystem/CommSystem IP/BusinessGroup/type.`
If its content is '`osb`' it is a OpenScape Branch, if the content is '`osbc`' it will be treated as a Session Border Controller.

If no matching IP node is found within the OpenScape FM, the OpenScape FM will automatically try to create this node. If the try is successfull, the OpenScape Branch symbol will also be added to the submap of this IP node. If the try is not successfull (e.g. if the netmask of the node's network could not be determined), a symbol for the OpenScape Branch will be placed on the submap of the respective OpenScape Branch Container below the OpenScape Cluster.

If an OpenScape Branch is discovered before it's OpenScape Voice Assistant has been discovered, the Branch will be placed within the net 'OpenScape Orphan'. Since SBCs can only be identified by connecting to their Assistant, they will be displayed with an OpenScape Branch symbol. If the Assistant will be discovered, the Branch will be removed from this net. SBCs will now be displayed with the respective symbol.

Below the OpenScape Voice Cluster Object the OpenScape Branch Container is located. The OpenScape Branch IP nodes will be placed into this container or the OpenScape Branch nodes, if the respective IP node could not be created.

4.6 Discovery of OpenScape Accounting Systems

Whether OpenScape Accounting is installed on a system will be decided by OpenScape FM on the fact whether the three OpenScape Accounting MIBs (`OpenScapeAccounting`, `OpenScapeAccountingSystemNSM`, `OpenScapeAccountingFinanceNSM`) are found on the system.

If this is the case, the recognized MIBs will be represented by respective MIB symbols which are placed in the IP node's submap. The labels of the MIB symbols are `OpenScape Accounting, OpenScape Accounting System NSM` and `OpenScape Accounting Finance NSM`.

4.7 OpenScape Enterprise Express

Similar to OpenScape Voice Simplex Clusters (see *Section 6.1.4*) OpenScape FM uses a single system as its representation of an OpenScape Enterprise Express installation. In this case the discovery and the following contacts are based on the SBC THIG's IP address.

In contrast to breaking it up into multiple IP nodes for the internal OSEE components, treating an OSEE like a single systems that provides multiple services has a number of advantages:

- It works mostly with the default port mappings of the OSEE. No additional IP address mappings have to be configured.
- The OpenScape FM also needs no IP address mappings, which makes it possible to work smoothly with multiple OSEE instances at the same time.
- The display of the OSEE topology within the OpenScape FM is more meaningful and intuitive.
- The efforts to configure both the OSEE and OpenScape FM are greatly reduced.

Discovery

If the OpenScape FM detects a Web Server running on port `446` that provides a CMP SOAP interface (WSDL check), it assumes a detected OpenScape Enterprise Express installation.

It then tries to detect the availability of the internal OSEE components by checking the discovered services by using SNMP for the OSV Nodes and HTTPS for CMP, DLS, OSTM etc. and arranges them within the OpenScape FM topology. More about the OSEE topology can be found in *Section 6.1.7*.

Monitoring

After the discovery, alarm and event information can then be sent by the internal services to the OpenScape FM to provide monitoring in a timely manner. The following components/MIBs are supported:

- **OSV**: `US-HIQ-TRAP-MIB` (bidirectional (traps, polling)
- **DLS**: `DLS-TRAP-MIB` (to OpenScape FM using traps)
- **OSCC**: `SEN-OSCC-MIB` (to OpenScape FM using traps)
- **Concierge**: `OSCCE-TRAP-MIB` (to OpenScape FM using traps)
- **Xpression**: `Xpression-MIB` (to OpenScape FM using traps)

Traps sent by the internal OSEE components carry the external IP address of the SBC THIG, therefore they will be automatically assigned to the respective and desired IP node within the OpenScape FM.

Advanced Monitoring

Some optional advanced monitoring functions require additional port mappings.

The following lists the target component for which the function is provided, the respective functions and the protocol/port that needs to be mapped:

- **OSV**: CAC load and bandwidth usage, registered subscribers (SOAP on port `8767`)
- **Media Server**: Number of connections, conference endpoints, G711 streams, G729 streams (JMX (TCP) on port `9999`)
- **Xpression**: Xpression Windows Services, System Parameters (CPU/Memory/Disk/Network usage,…) (WMI on port `135` and **random ports**)
- **All** (as required): System Parameters (CPU/Memory/Disk/Network usage,…) (WMI on port `135` and **random ports**)
- **All** (as required): As an alternative to remote monitoring via WMI, a System Management Agent can be installed locally on the internal component to avoid the usage of random ports. (RMI (TCP) on ports `3039` and `3051`)

Configuration

The communication between the OpenScape FM and the OSEE uses the SBC THIC as a connecting system.

To allow this communication some configuration has to be done on the SBC THIC system and on some of the internal component systems:

- To enable the components to directly sent traps to the OpenScape FM, the OpenScape FM Server system has to be added to their list of trap destinations.
- The firewalls of the affected systems have to allow access to the needed ports for the respective functions and methods.
- On the SBC THIC the port forwardings of the ports `1161` and `2161` must be configured to access port `161` of the internal OV nodes OSV1 and OSV2 respectively.

5 Symbols and Overviews

The OpenScape Fault Management for OpenScape Voice introduces some new symbols. A single managed object can be displayed by many symbols on different submaps. The managed object itself is the software-representation of a real resource to be managed, e.g. a system. Views (i.e. submaps and/or trees) are used to represent the object hierarchy on the graphical user interface. In addition to the default views, the user can create his/her own customized object hierarchies. Please read the detailed information about basic OpenScape FM concepts in the *OpenScape FM Desktop User Guide* to learn the maps/views concept.

Each symbol provides an object-specific context menu which can be invoked by a right-click. The submap context menu is opened by a right-click into the submap's background.

For more information of the OpenScape Topology refer to *Chapter 6, "OpenScape Voice Network Topology".*

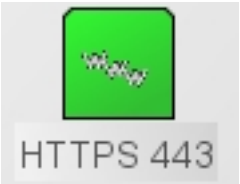
5.1 OpenScape Voice Switch IP Node

This icon represents an OpenScape Voice Switch IP Node. Please notice that the IP Node could also look different when there are running other applications on it that have been discovered first.

5.2 OpenScape Voice SNMP MIB

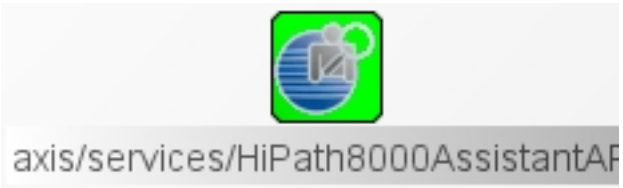
This icon symbolizes the OpenScape Voice SNMP Agent running on an OpenScape Voice Switch. It can be found on the submap of the IP node's SNMP Agent Icon. The context menu offers functionalities which are related to SNMP operations and are explained in detail in the chapter *Section 7.5, "Operations for an OpenScape Voice SNMP MIB Object"*.

5.3 HTTPS Server on Port 443



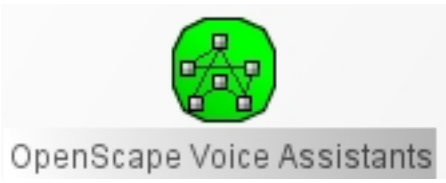
This symbol represents a web server on IP port 443. When the server is down, the icon changes its color to red.

5.4 Assistant API



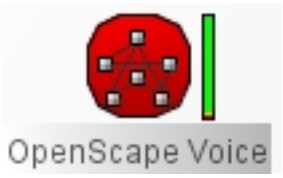
This symbol represents an OpenScape Voice Assistant API and therefore a Common Management Portal (CMP) with an installed OpenScape Voice Assistant. It can be found on the submap of the Http Server Icon on the IP node's submap.

5.5 OpenScape Voice Assistant Network



This icon represents an entrance to all discovered OpenScape Voice Assistants.

5.6 OpenScape Voice Network



This icon represents an entrance to all discovered OpenScape Voice Universes.

5.7 OpenScape Voice Universe

This symbol represents an OpenScape Voice Universe. It can be found on the submap of the OpenScape Voice Network.

5.8 OpenScape Voice Assistant Container

This icon represents an entrance to all discovered OpenScape Voice Assistants of a special OpenScape Voice Universe. It can be found on the submap of the OpenScape Voice Universe.

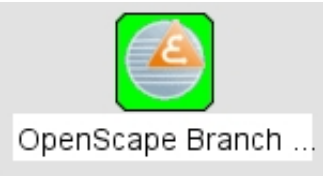
5.9 OpenScape Voice Cluster

Simplex

Duplex

These icons symbolize OpenScape Voice Cluster belonging to an OpenScape Voice Universe. They can be found on the submap of the OpenScape Voice Universe.

5.10 OpenScape Branch



This symbol will be used for objects representing OpenScape Branch Nodes or OpenScape Branch Web-Services.

In addition IP nodes for which an OpenScape Branch is detected will get this symbol.

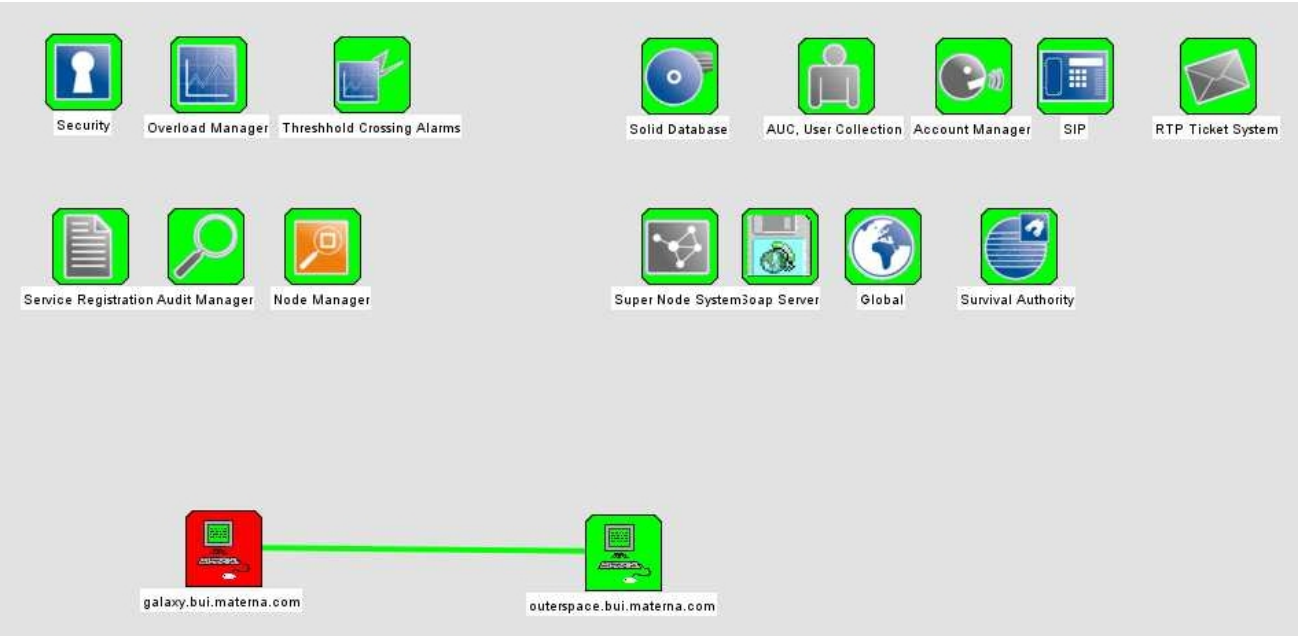
If a symbol for the respective IP node exists, the OpenScape Branch symbol will be placed in the submap of the IP node symbol. A symbol for the IP node itself will be added to the submap of the OpenScape Branch Container.

If no symbol for the respective IP node exists (if e.g. the respective network could not be generated), the OpenScape Branch symbol will be placed on the submap of the respective OpenScape Branch Container

5.11 Session Border Controller

This symbol will be used for OpenScape Branch Nodes vor which a Session Border Controller was discovered (see *Section 5.10, “OpenScape Branch”*).

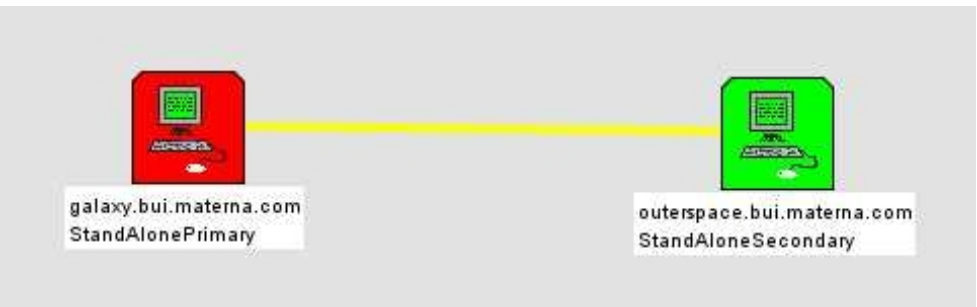
5.12 OpenScape Voice Component



The OpenScape Voice Components are not physical devices but logical units of an OpenScape Voice Cluster. A logical component represents an OpenScape Voice event set. OpenScape Voice Alarms will be sorted into a number of categories, called event sets. Active alarms are mapped to the component which represents the corresponding event set. Further information can be found in *Chapter 8, “Fault Management”*.

The view containing the OpenScape Voice Components also contains the corresponding OpenScape Voice Switches. If it is a Simplex configuration, only one switch will be displayed. In the case of a Duplex configuration (cluster) both switches will be represented on the view. They will be connected by a Connection symbol (see figure above).

The status of the Connection symbol will represent whether the switches a synchronized, or if they are in a split brain situation. The connection will be displayed in green if the cluster is working normally. It will be displayed in yellow otherwise. The operation mode of a split cluster will be displayed within the labels of the cluster nodes (see figure below).



5.13 Overviews

If the ControlCenter plugin has been initialized, a number of ControlCenter overviews are provided for OpenScape Voice objects.

The following overviews are provided:

- The last ten OpenScape Voice Clusters that changed to the status '*critical*' and that are still in that status.
- The ten OpenScape Voice Clusters with the most unacknowledged events.
- The ten recent events from category '*OpenScape Voice*' that have a worse status than '*normal*'.
- The distribution of the unacknowledged events within category '*OpenScape Voice*' by status.
- The distribution of events within category '*OpenScape Voice*' by time.

The overviews can be displayed by selecting the entry **ControlCenter - Overview** within the main menu **Technologies->OpenScape Voice**.

More about the ControlCenter can be found in the respective user guide.

6 OpenScape Voice Network Topology

6.1 The Automatically Discovered Network Topology

As soon as topology data is available, the OpenScape Voice plugin updates the network topology view and creates OpenScape Voice Universes, Networks, Clusters, etc..

6.1.1 (Orphan) OpenScape Voice Assistant Network

If a Common Management Portal (CMP) with an installed OpenScape Voice Assistant has been discovered, the IP node for the newly discovered CMP will be placed in a topology network called **Orphan OpenScape Voice Assistant**. When the connection parameters for the new discovered assistant have been entered correctly, further information could be retrieved via the Assistant API and the IP node for this newly discovered CMP will be placed in a topology network called **OpenScape Voice Assistants**.

6.1.2 OpenScape Voice Assistant

If a Common Management Portal (CMP) with an installed OpenScape Voice Assistant has been discovered, on the submap of this IP node an object will be created which will represent the discovered OpenScape Voice Assistant API (see *Figure 3*). The context menu of this OpenScape Voice Assistant API object will offer a menu item, by which the connection parameters for the OpenScape Voice Assistant can be entered (see *Section 7.3, “Operations for an OpenScape Voice Assistant”*).

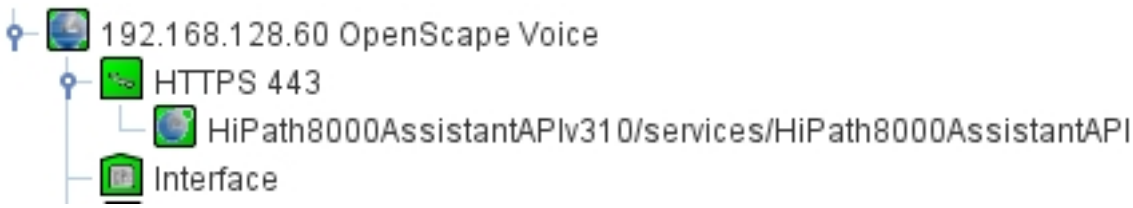


Figure 3 OpenScape Voice Assistant

6.1.3 OpenScape Voice Network

After the first OpenScape Voice Cluster information has been retrieved via an OpenScape Voice Assistant, a new network symbol is created that groups together all OpenScape Voice Universes. The network name is **OpenScape Voice**. On the submap of this network symbol, an icon is created for each OpenScape Voice Universe found.

Figure 4 OpenScape Voice network

6.1.4 OpenScape Voice Universe and OpenScape Voice Cluster

After a new OpenScape Voice Assistant has been discovered, a new OpenScape Universe icon will be created for every OpenScape Voice Cluster that is maintained by this assistant. An OpenScape Voice Universe icon groups together all systems for this cluster maintained by the corresponding assistant. The universe icon has the same name as the cluster it represents. The new universe is placed on the OpenScape Voice Network submap.

The Universe container submap contains a container symbol, called **Assistants**, with all assistants the cluster is maintained by. Furthermore, it contains an OpenScape Voice Cluster symbol. Here the logical OpenScape Voice Cluster Components and OpenScape Voice Switches of this cluster can be found (see *Figure 5*). Active alarms are mapped to the corresponding OpenScape Voice Component objects.

An OpenScape Voice Cluster submap may contain a container symbol called **Endpoints**. For the cluster, the Web Service function `listEndpoints` provides a list of SIP endpoints that are not phone devices. The OpenScape Voice plugin tries to create a respective IP node within this container for each entry of this list. The IP nodes have a label that represents their hostname and their endpoint type.

Each of the IP nodes added to the **Endpoints** container gets an additional symbol on its submap that can be used to monitor the registration state of the endpoint within the cluster. Its label consists of the endpoint and registration type. If the endpoint is registered, its status will be *Normal*. If it is not registered, the status will be *Critical*. In addition, registration changes will create an internal event of the type `OpenScapeVoiceSipRegistrationState`.and a respective status of either *Normal* or *Critical*.

This creation fails, if the related IP network has not already been created in OpenScape FM and the netmask cannot be determined from the IP configuration through SNMP.

Note:
To ensure that all endpoints can be added, all affected IP networks should be created manually and a configuration poll should be started on the OpenScape Voice Assistant. The synchronization of the endpoints will be done during the configuration poll of the OpenScape Voice Assistant.

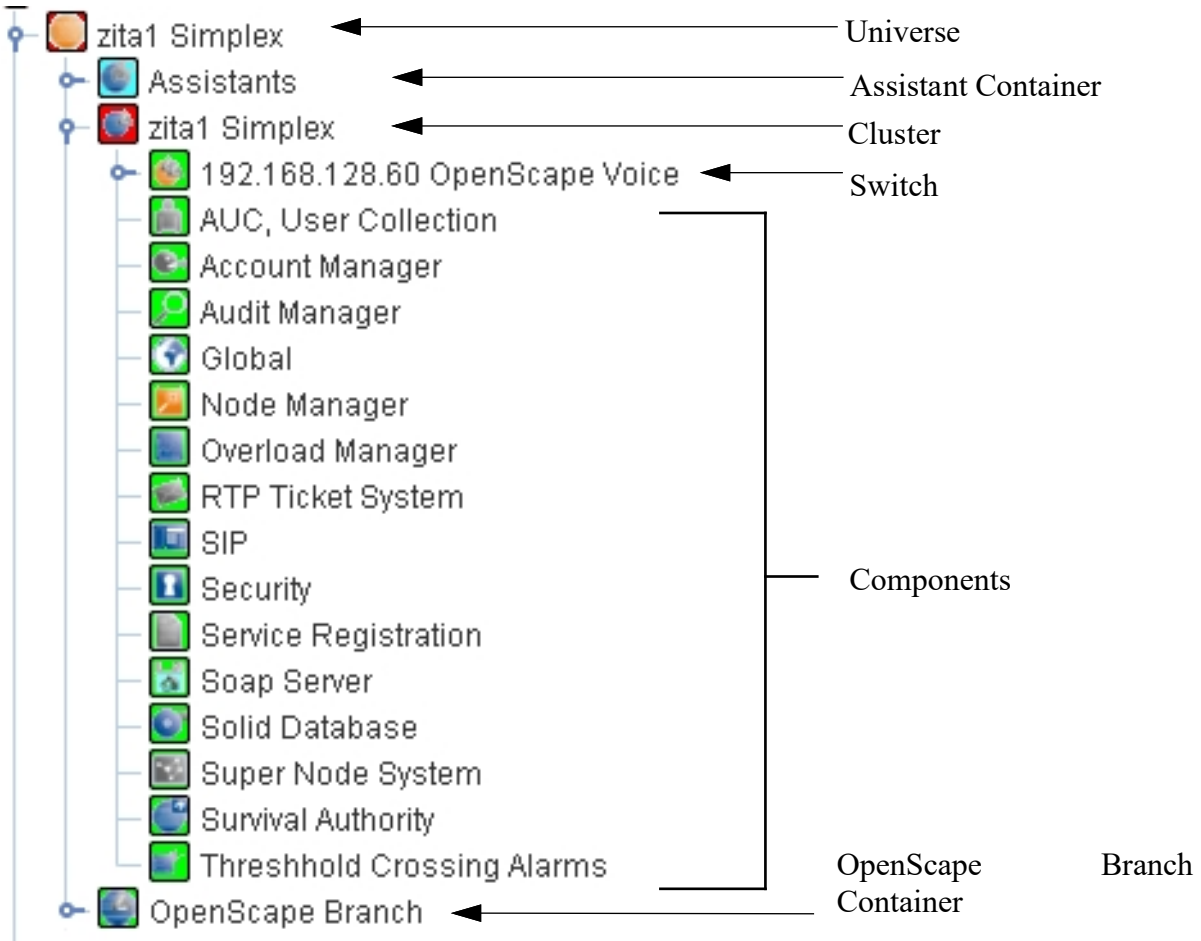


Figure 5 OpenScape Voice Universe and Cluster

OpenScape Voice supports three deployment modes. The OpenScape Voice plugin displays the deployment mode of a Cluster:

- Simplex-Integrated
- Duplex-Integrated
- Duplex-Non-Integrated

Furthermore it is identified if the OpenScape Voice is

- Co-located
- Geo-separated

The OpenScape Voice Assistant is used to retrieve the deployment model for a given OpenScape Voice Cluster. Currently, the Assistant API only supports the information if a Cluster is operating “Simplex” or “Duplex” but it does not offer the information if it is running “Integrated” or “Non-Integrated”. For further information about deployment models please refer to the *OpenScape Voice Documentation*.

The symbol icon of the OpenScape Voice Universe object and of the OpenScape Voice Cluster object represents the deployment model. The symbol label contains a text informing the user if the OpenScape Voice is operating “Simplex” or “Duplex”. If it is operating “Duplex”, the label will contain the information if it is “Co-located” or “geo-separated”.

6.1.5 OpenScape Voice Switch

On the OpenScape Voice Cluster submap you find all OpenScape Voice Switches for this Cluster.

On the submap of the IP node’s SNMP Agent Icon you can find the SNMP icon called **OpenScape Voice** that symbolizes the OpenScape Voice SNMP Agent running on this OpenScape Voice Switch (see *Figure 6*).

If there are switches belonging to a cluster without a working SNMP communication between the OpenScape FM server and OpenScape Voice Switch, no OpenScape Voice SNMP icon will be created on the IP Node’s submap. Please refer to *Section 3.4, “Configuration of SNMP Parameters”* for more information.

Figure 6 OpenScape Voice Switch IP node

The switches of an OpenScape Voice Cluster can operate in different modes, e.g. standalone-primary or standalone-secondary. To display the operational status at the OpenScape FM GUI, the web-service of the OpenScape Voice Assistant has to provide the operational status for a given switch name. Currently, the Assistant API does not support this functionality. If the OpenScape Voice Assistant provides such a web-service, the displayable string will be appended to the label of an OpenScape Voice Switch in OpenScape FM.

6.1.6 OpenScape Branch / Session Border Controller

OpenScape Branch symbols or Session Border Controller symbols are placed on the submaps of their IP nodes.

If a respective IP node couldn’t be added to the map, the symbol will be placed into the submap of the respective OpenScape Branch Container instead.

If a cluster structure is detected for an OpenScape Branch, it is automatically displayed as a cluster (see *IP Manager User Guide*).

The OpenScape FM detects such clusters by querying values of the OpenScape Branch Web Service. Specifically, the values for `node1LanIpAddr`, `node2LanIpAddr`, `virtualLanIpAddr` , `node1Status` and `node2Status` are determined.

If an IP address is returned for the first three values, the nodes are represented as a cluster. The virtual IP address is shown as an interface of the IP node whose node status is `Master`. For both nodes, the respective node status is also displayed in the symbol identifier.

6.1.7 OpenScape Enterprise Express

Within the OpenScape FM the topology of the OpenScape Enterprise Express corresponds to the representation of the Open Scape Voice Simplex Clusters (see *Section 6.1.4*).

The detected OSEE installations are placed within an OpenScape EE container as shown in *Figure 7* with one entry per detected cluster.

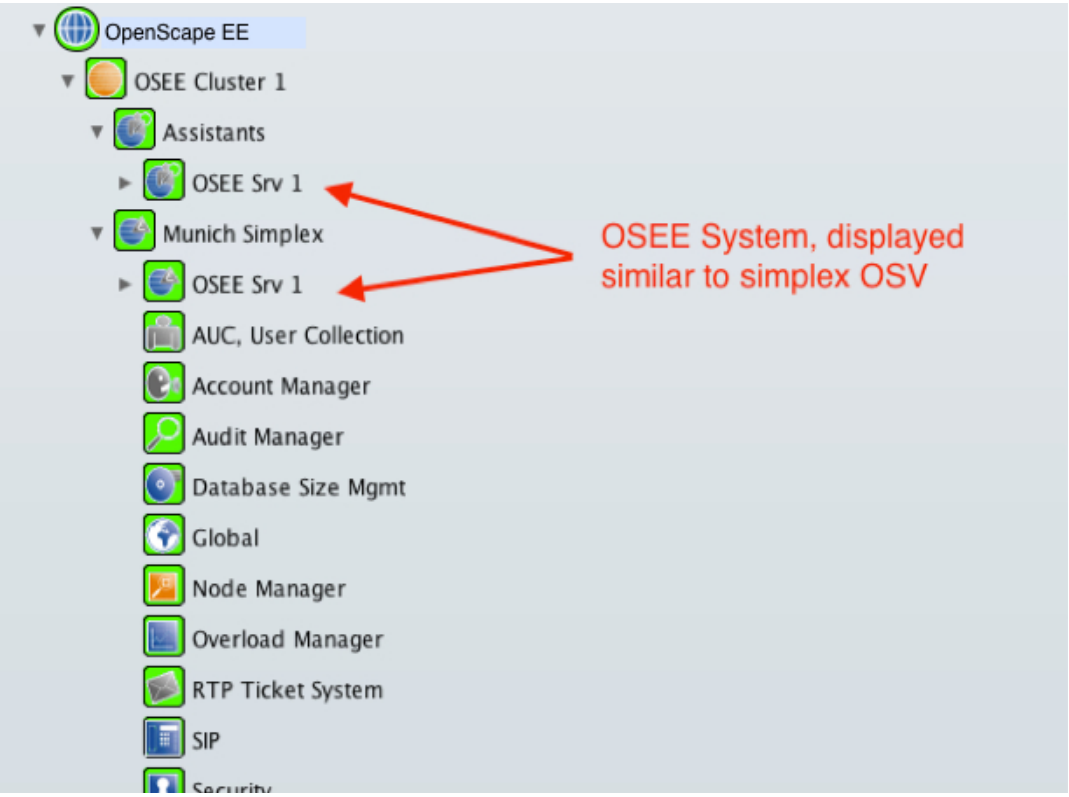


Figure 7 OpenScape Enterprise Express Cluster

The internal components of the OSEE System are represented on the submap of the symbol representing the respective OSEE System (see *Figure 8*).

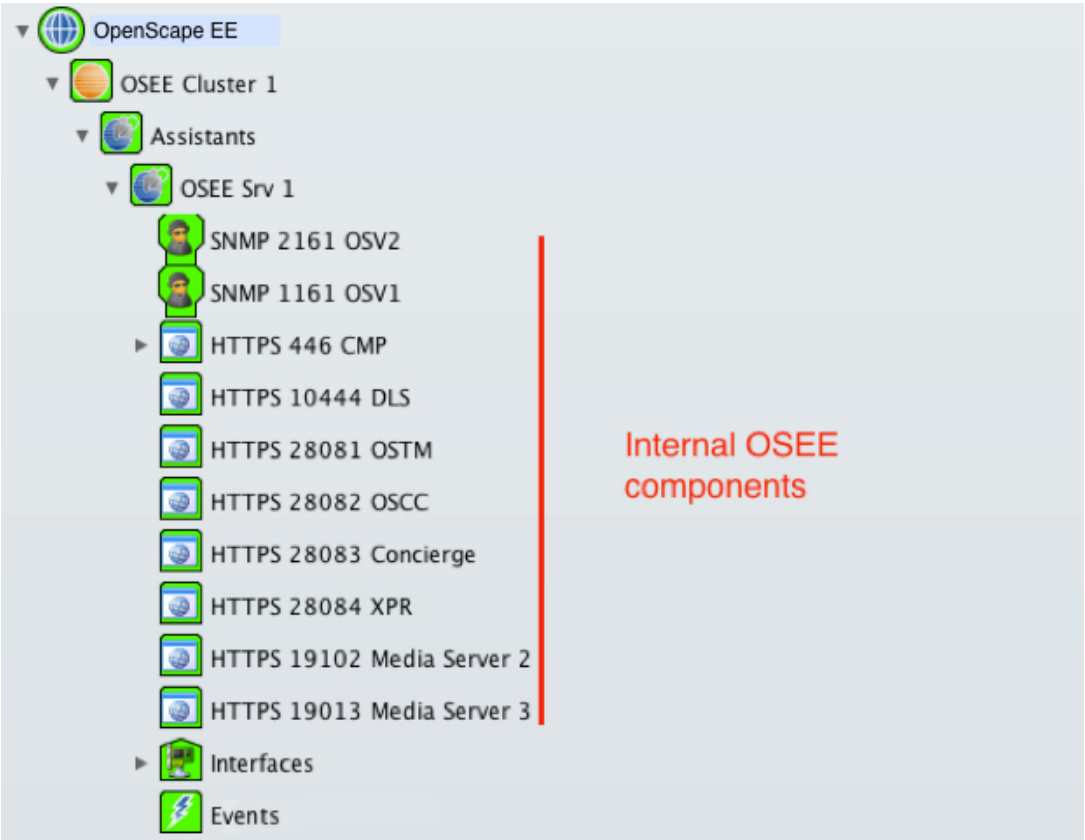


Figure 8 OpenScape Enterprise Express Internal Structure

External systems like SIP endpoints, OpenScape Branches, SBCs etc. are displayed in the same manner as for standard OpenScape Voice environments. They are placed within containers (e.g. labeled Endpoints or OpenScape Branch) located on the submap of the Clusters IP node (see *Figure 9*).

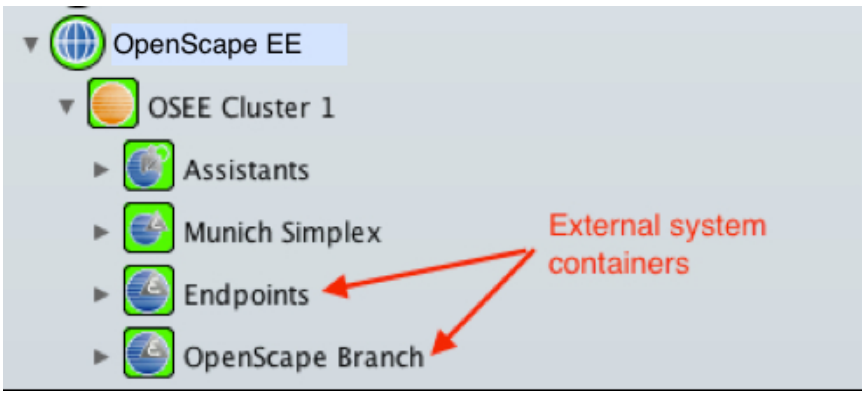


Figure 9 OpenScape Enterprise Express External Systems

6.2 Network Configuration

The Topology Manager in combination with the OpenScape Voice plugin allows you to customize the representation of the network topology.

You can divide OpenScape Voice systems into networks and subnetworks to match the geographical or structural realities of your network. Since the configuration of the network is a basic functionality of the OpenScape Desktop, you will find a detailed description of how to create network structures in the *OpenScape FM Desktop User Guide*.

7 Device-Specific Information

7.1 Operations for an OpenScape Voice Universe

The OpenScape Voice Universe context menu offers the following items:

- **Info... :** Here you open a two-column Info Browser which provides general information about the OpenScape Voice Cluster (e.g. Name, Operation Mode, IP Node1 and so on). Please refer to the *OpenScape Voice Documentation* for further information about the displayed data.
- **Event Table... :** Here you open an Info Browser which displays all events stored in the Event Table (`rtpEvtTable`) of the OpenScape Voice Switch. Please refer to the *OpenScape Voice Documentation* for further information about the displayed data. The events will be requested and displayed in reverse order of their creation date, so the latest event will be shown first. At most 1000 events will be shown. To show the next 1000 events, you have to press the button **Cont. Query**.
- The maximum number of 1000 requested events at a time can be configured via the OpenScape FM argument `osv.browser.maxevents` that has to be added in the OpenScape FM startup configuration file. Example for an entry in the OpenScape FM startup configuration file: `<argument>-Dosv.browser.maxevents=3000</argument>`.
- **Active Alarm Table... :** Here you open an Info Browser which displays all events stored in the Event Table for which exists a reference in the Active Alarm Table (`rtpArmAlarmTable`) of the OpenScape Voice Switch. Please refer to the *OpenScape Voice Documentation* for further information about the displayed data.

  This browser also enables the user to delete alarms in OpenScape Voice Switch database. Just select the alarms you want to delete and press the **Delete** button. This action is deleting the corresponding entry in the Active Alarm Table for this event from the OpenScape Voice database by performing an SNMP set operation. Please notice that the delete operation requires a correct SNMP set community string (see *Section 3.4, “Configuration of SNMP Parameters”*).
- **Connection Parameter... :** Here you open an interface where you can configure the connection parameters, i.e. a valid Login and Password for the communication of the OpenScape FM Server with the OpenScape Voice Assistant.

Important Note:
The menu items **Active Alarm Table...** and **Event Table...** described in this chapter will only be available when an OpenScape Voice SNMP Agent has been discovered on at least one of the OpenScape Voice Switches belonging to the OpenScape Voice Cluster.

Important Note:
Please notice that the requested information is always retrieved from one switch belonging to the cluster. If there is more than one switch belonging to this cluster, one switch is defined as the information data base. In the title of the info browsers you will find the name of the switch where the data has been requested from.

7.2 Operations for an OpenScape Voice Cluster

The OpenScape Voice Cluster context menu offers the following items:

- **Info... :** This menu item offers the same functionality as the **Info...** menu item in an OpenScape Voice Universe context (see *Section 7.1, "Operations for an OpenScape Voice Universe"*).
- **Event Table... :** This menu item offers the same functionality as the **Event Table...** menu item in an OpenScape Voice Universe context (see *Section 7.1, "Operations for an OpenScape Voice Universe"*).
- **Active Alarm Table... :** This menu item offers the same functionality as the **Active Alarm Table...** menu item in an OpenScape Voice Universe context (see *Section 7.1, "Operations for an OpenScape Voice Universe"*).
- **List Endpoints... :** The Web Service function `listEndpoints` provides a SIP endpoint list that contains SIP endpoints which are not phone devices.
  This menu item displays the list for the current OpenScape Voice Cluster within an info browser.
  For each endpoint, the browser shows the following information: Endpoint Name, Endpoint Type, IP Address, Accounting Type, Registration State, Registration Type, Last Modified Date.
  If the registration status should be monitored, this can be done elsewhere using a specific monitoring object located below the corresponding IP node (see *Section 6.1.4*).

The System Management monitors `SIP Statistics` (see *Section 9.1*) and `OSV - Call Admission Control` (see *Section 9.2*) can be used to collect additional data for OpenScape Voice Clusters.

Please consider the important Notes made in *Section 7.1, "Operations for an OpenScape Voice Universe".*

7.3 Operations for an OpenScape Voice Assistant

The OpenScape Voice Assistant context menu offers the following items:

- **Connection Parameter... :** This menu item offers the same functionality as the **Connection Parameter...** menu item in an OpenScape Voice Universe context (see *Section 7.1, "Operations for an OpenScape Voice Universe"*).
- **List OpenScape Branches... :** This menu item opens a window which contains a table that displays all OpenScape Branches / Session Border Controllers that are registered for the OpenScape Voice Assistant.
- **List Endpoints...:** This menu item opens a window containing a list of all endpoints registered on the Assistant. The list shows, among other things, the cluster, the name, the IP address and the date of the last modification of the endpoint.

7.4 Operations for an OpenScape Voice Component

Every logical OpenScape Voice Component represents an OpenScape Voice event set. The following operations can be performed via the context menu of a single OpenScape Voice Component icon.

- **Event Table... :** This menu item opens an Info Browser which displays all events stored in the Event Table (`rtpEvtTable`) of the OpenScape Voice Switch for this OpenScape Voice Component. Events are filtered by the Event Set (`rtpEvtSet`) in the Event Table. Since the event set is not an index of the Event Table, the operation can take some time. Further information about this Info Browser can be found in *Section 7.1, "Operations for an OpenScape Voice Universe"*, *" Event Table..."* .
- **Active Alarm Table... :** This menu item offers the same functionality as the **Event Table...** menu item on an OpenScape Voice Universe context (see *Section 7.1, "Operations for an OpenScape Voice Universe"*). To get only active alarms related to the selected component, events are filtered by the Event Set (`rtpEvtSet`) in the Event Table referenced by the active alarms in the Active Alarm Table.

  This browser also enables the user to delete alarms in OpenScape Voice Switch database (see *Section 7.1, "Operations for an OpenScape Voice Universe"*, *"Active Alarm Table..."*).

Please consider the important Notes made in *Section 7.1, "Operations for an OpenScape Voice Universe".*

7.5 Operations for an OpenScape Voice SNMP MIB Object

The OpenScape Voice SNMP MIB context menu offers the following items:

- **MIB Browser...:** Here you can open a MIB browser. In this browser the structure and variable values of the OpenScape Voice MIB can be viewed. More about MIB browsers can be found in the separate *Enterprise MIB Plugin User Guide*.
- **Event Table... :** This menu item offers the same functionality as the **Event Table...** menu item on an OpenScape Voice Universe context (see *Section 7.1, "Operations for an OpenScape Voice Universe"*).
- **Active Alarm Table... :** This menu item offers the same functionality as the **Active Alarm Table...** menu item on an OpenScape Voice Universe context (see *Section 7.1, "Operations for an OpenScape Voice Universe"*).

Important Note:
The menu items **Active Alarm Table...** and **Event Table...** described in this chapter will only be available when an OpenScape Voice SNMP Agent has been discovered on at least one of the OpenScape Voice Switches belonging to the OpenScape Voice Cluster.

7.6 Operations for an OpenScape Voice Event

The context menu of an OpenScape Voice SNMP Event in the OpenScape FM Event browser offers additionally to the source object's context menu the following items:

- **Show Event Description...:** Here you can access the OpenScape Voice event documentation. For further information please refer to *Section 8.1.10, "Accessing OpenScape Voice Event Documentation"*.

7.7 Operations for an OpenScape Branch or SBC Object

The OpenScape Branch or Session Border Controller context menu offers the following items:

The various menu items will each execute an action using the web-service of the OpenScape Branch.

- **System Info:** This menu item reads the system information from the OpenScape Branch. Within a table the CPU Usage, Hostname, Hardware Type, Internal Software Version, Memory Usage, Operation System Version, Software Version and the Uptime will be displayed.
- **System Status:** This menu item reads the System Status from the OpenScape Branch and displays it within a table. More about the displayed data can be found within the *OpenScape Branch Documentation*.
- **Service Status:** This menu item reads the Service Status from the OpenScape Branch and displays it within a table. More about the displayed data can be found within the *OpenScape Branch Documentation*.
- **Alarm Summary:** This menu item reads the number of *Critical*, *Major*, *Minor* and *Warning* Alarms from the OpenScape Branch and displays the number in a list.
- **Alarm Details:** This menu item reads the alarms from the OpenScape Branch and displays the alarms and their data within a table. The button **Clear Alarm** is located below the table. If it gets activated, then a function for each alarm currently selected in the table will be called on the OpenScape Branch. This function will remove the respective alarm from the alarm list. Please refer to the *OpenScape Branch Documentation* for further information about the displayed alarm data.
- **Clear All Alarms:** This menu item triggers the function ’Clear All Alarms’ on the OpenScape Branch. More about this function can be found in the *OpenScape Branch Documentation*.
- **Registered Subscribers:** This menu item reads the Registered Subscribers from the OpenScape Branch and displays them within a table. More about the displayed data can be found within the *OpenScape Branch Documentation*.
- **NTP Refresh:** This menu item triggers the function ’NTP Refresh’ on the OpenScape Branch. More about this function can be found in the *OpenScape Branch Documentation*.
- **Reset Password:** This menu item triggers the function ’Reset Password’ on the OpenScape Branch. More about this function can be found in the *OpenScape Branch Documentation*.
- **Restart:** This menu item triggers the function ’Restart’ on the OpenScape Branch. More about this function can be found in the *OpenScape Branch Documentation*.
- **Restart to Backup:** This menu item triggers the function ’Restart Backup’ on the OpenScape Branch. More about this function can be found in the *OpenScape Branch Documentation*.
- **Connection Parameters...:** This menu item opens a window which can be used to define the connection parameters for the OpenScape Branch Webservice.
  Usually this parameters will be set automatically by the OpenScape Voice Assistant.

The System Management monitor `OpenScape Branch` (see *Section 9.3*) can be used to get information about the number of registered users for OpenScape Voice Clusters.

8 Fault Management

8.1 Alarm Handling

The SNMP Agent of the OpenScape Voice supports alarm signaling via SNMP traps and the retrieval of current alarm- and event-information by several SNMP MIB tables. The OpenScape Voice plugin supports the display and correlation of SNMP traps as well as event / alarm synchronization by querying the SNMP MIB tables.

Please note that active alarms in the OpenScape Voice are events in the OpenScape Voice Event Table for which exists an entry in the Active Alarm Table referencing this event in the Event Table. Alarms are always events with severity *minor*, *major* or *critical*.

8.1.1 Info Browser

The OpenScape Voice plugin offers different Info Browsers to get information about the current alarm- and event-situation for specific OpenScape Voice devices. For further information please refer to *Chapter 7, “Device-Specific Information”*.

8.1.2 Central Event Search

The OpenScape FM allows a general search for events.After the OpenScape Voice Plugin is initialized, the event search will be expanded by search parameters specific for OpenScape Voice. This new parameters can be found on the page **OpenScape Voice** within the search browser.

The following search parameters can be additionally selected on this page:

1. The menu **Event Set** allows to narrow the search to a single event set. This set corresponds to the entry of the SNMP trap variable `rtpEvtSet`. The menu entries stand for the following event sets:

Menu Entry	Event Set	Event Set Id
All	all sets	---
Account Manager	hiQAccountMgmtFaultMgt	221
Audit Manager	hiQAudFaultMgmt	102
Global	hiQGlobalFaultMgt	217
Hardware	hiQHardwareFaultMgt	219
Licensing	hiQLicensingFaultMgt	220
Node Manager	hiQNmFaultMgt	107
Overload Manager	hiQOvlFaultMgt	190

Table 1 Event Type Selection

Menu Entry	Event Set	Event Set Id
Security	hiQSecurityFaultMgt	218
Service Registration	hiQAucUscFaultMgt	182
Sip Phone	hiQSipFaultMgt	230
Soap Server	hiQSoapServerFaultMgt	207
Solid Database	hiQSolidFaultMgt	141
Super Node System	hiQSnmFaultMgt	119
Survival Authority	hiQSurvivalAuthorityFaultMgt	223
Threshold Crossing Alarms	hiQTcaFaultMgt	216
Ticket System	hiQTicFaultMgt	111
User Control	hiQUceFaultMgt	193

Table 1 Event Type Selection

2. The menu **Alarm Type** reduces the search to a single alarm type. This corresponds to the entry of the SNMP trap variable `rtpEvtAlarmType`. Possible selections are the following alarm types (Id in round brackets): Communication (1), Service (2), Processing (3), Equipment (4), Database (6), Security (32), Indication (34), or All (no restriction).

3. The field **Faulty Object** reduces the search to faulty objects that match to the entry in this field. The entries can be fixed strings or regular expressions. The entry will be matched against the content of the trap variable `rtpEvtFetFaultyObject`.

4. The field **Short Text** reduces the search to events for which a matching short text has been assigned. This field may also contain fixed strings or regular expressions. The entry will be matched against the content of the trap variable `rtpEvtFetShortText`.

The other search pages are described within the general description of the search browser within the user documentation of the standard desktop.

8.1.3 Traps

The OpenScape Voice SNMP Agent belonging to an OpenScape Voice Switch sends alarms as SNMP Traps which are displayed by the OpenScape FM Event Browser with category set to **OpenScape Voice**. The SNMP Agent sends also traps if a problem is solved. For information about how these traps are processed by the OpenScape Voice plugin please refer to *Section 8.1.4, “Event Correlation (OpenScape Voice)”*.

8.1.4 Event Correlation (OpenScape Voice)

The OpenScape Voice SNMP Agent sends alarm traps to indicate problems and alarm clearing traps if a problem is solved. However, there is no one-to-one relationship between alarms and alarm clearance. For example, there can be one alarm clearing trap which relates to several alarm traps for specific subcomponents. To inform a management application which alarms are actually cleared by a clearing trap, the OpenScape Voice sends an alarm correlation trap in addition to the clearing trap(s).

The correlation trap contains a colon-separated list with the IDs of cleared alarms. The correlation trap will be evaluated by the OpenScape Voice plugin to acknowledge all OpenScape Voice Events in the OpenScape FM Event Browser with a matching alarm ID. The correlation trap also contains the ID of the related clearing trap. This information will be used to assign a clearing trap to a corresponding correlation trap. This adds useful information to an event since the clearing trap gives the reason why the alarm situation has been cleared.

Please note that the order in which correlation trap and clearing trap are received is not deterministic. It can also happen that clearing events are received for which no correlation trap is received at all (e.g. during startup of the OpenScape Voice). To handle those situations and get a clean view at the OpenScape FM Event Browser, the following actions are taken if a clearing or correlation trap is received:

- Clearing events are cached for five minutes. If a correlation event is received during this time interval, it will be combined with the clearing event. The clearing event will be displayed in the event browser. The correlation trap will not be displayed.
- If a clearing event is received for which the correlation event has already been processed, the clearing event will be added to the event browser and events cleared by the correlation event will be added to it. The entry for the correlation event is removed. Please note that this will only happen if the clearing event is received within a certain period of time. This period of time can be configured via the OpenScape FM argument `osv.clearing.timeout` that has to added in the OpenScape startup configuration file. The time is defined in seconds. By default it is set to five minutes. Clearing traps that will be received after that period of time will not be considered any more. In this case the correlation trap will reside in the OpenScape FM browser and the clearing trap will not be shown in the OpenScape FM Event Browser.
  Example for an entry in the OpenScape startup configuration file:
  `<argument>-Dosv.clearing.timeout=360</argument>`
- If no correlation event is received for a clearing event within a certain period of time, the clearing event will be dropped silently. By this way, large numbers of clearing traps during startup of the OpenScape Voice are suppressed. By default the period of time is set to five minutes. Please look above for further information how to change this value.

Important Note:
OpenScape Voice Events can also be acknowledged manually in the OpenScape FM Event Browser. Please note, that this has no effect on the event correlation in OpenScape FM Event Browser.

Important Note:
Please note, that traps can be sent from both OpenScape Voice Switches of a cluster. The correlation trap-based acknowledge mechanism takes this into account and looks for related traps from both IP addresses. In the OpenScape FM Event Browser only the OpenScape Voice Cluster and Component names will be displayed.

8.1.5 Event Correlation (OpenScape Branch / Fault Management)

If an OpenScape Branch or SBC is detected by the OpenScape FM, the OpenScape FM adds itself to the list of trap recipients of the OpenScape Branch. Based on the traps received afterwards, entries to the OpenScape FM event browser will be generated.

The state of an OpenScape Branch object will only be based on the unacknowledged events for the respective OpenScape Branch.

If an event with the state ’Normal’ is received, then automatically all previously generated events for the same OID and with the state ’*Warning*’, ’*Minor*’, ’*Major*’ or ’*Critical*’ will be acknowledged.

If a trap of the type ’Network Element Started’ is received, then all events for the IP of the sender will be acknowledged.

If the SOAP method *GetServiceStatusOSS* is available for an OpenScape Branch Web Service Node, it can be used to determine whether a service is intentionally inactive. In addition to availability ('*Running*' or '*Not Running*'), the desired status ('*Active*' or '*Not Used*') can also be retrieved. The state of such Web Services is calculated as follows:

- **Running**: state: ‚*Normal*‘.
- **Not Running** and **Active**: state: ‚*Critical*‘.
- **Not Running** and **Not Used**: state: ‚*Unknown*‘,

In addition, these service nodes are automatically added to the *Cluster Status Exception List* (see *IP Manager User Guide*).

If the SOAP method is not available, the state of an OpenScape Branch Web Service Node will only be determined by the reachability of the node’s Web Service. The state will be set to ’*Warning*’, if it could not be reached. It will be set to ’*Normal*’ otherwise.

8.1.6 Event Correlation (OpenScape Accounting)

If an OpenScape Accounting Trap (`moduleStateSystem`, `moduleStateFinanceNSM`) is received, a variable value which points to further information within the MIB, will be read from the trap. The information will then be read from the MIB and based on the data a OpenScape FM Log event will be generated. In addition a status poll for the respective MIB object will be triggered.

The status poll reads various variables and allows a status assignment for additional status objects. The variable `moduleState` (Module State) will be read from the MIB `OpenScapeAccountingFinanceNSM` and the variables `state` (Module State), `databaseServerState` (Database) and `apacheServerState` (Apache) from the MIB `OpenScapeAccountingSystemNSM`.

In addition the table `ctsState` (Transporter State Table) will be read from the MIB `OpenScapeAccountingSystemNSM`. The state will be set to Critical, when at least one cdr server will be recognized as *down*.

8.1.7 Monitoring of Warning Events

In some situations the OpenScape Voice sends warning events continuously (e.g. process up/down/restarting events). Each event for itself can be considered as harmless, and can therefore be ignored. But if such events appear in large numbers (e.g. if restarts fail in short succession) they may need some attention.

For this reason the OpenScape FM allows the monitoring of the frequency of OpenScape Voice warning events. If to many events appear within a time interval, automatically an additional monitoring event of higher status can be created, which will be noticed within the event list.

The configuration of the monitoring can be done, when at least one warning event occurred. In this case a new object of type `PDValueCollector` will be added to the submap of the respective OpenScape Voice Container. This object will represent the event type and has a matching label.

If the entry **Thresholds...** is selected from the context menu of the object, a configuration window will open.

Within this window, it can be defined how many events must appear within one minute (field: **Threshold**). If the number of events received within one minute is in the defined **Relation** to the Threshold, a new event of the priority defined in **Severity** will be created. The category **Threshold Monitoring** will be assigned to the new event.

By using the button **Create** additional thresholds can be defined. If more than one threshold matches at the same time, the highest matching status will be set to the monitoring event.

If no thresholds match within a monitored minute, the status of the monitoring event will be reset to ’normal’.

8.1.8 Event Synchronization

SNMP traps can be lost, for example because of network problems or downtime of the OpenScape FM server. To avoid the loss of important fault management information, the event database of OpenScape FM will be synchronized with the event database of the OpenScape Voice. This synchronization will be performed during the periodical status poll of the OpenScape Voice Switches. To keep the event databases of OpenScape FM and OpenScape Voice in sync, an alarm shadow table has been introduced which is maintained by OpenScape FM internally. It contains a list of alarm IDs which were already processed by OpenScape FM.

The event synchronization uses the following mechanism:

- Retrieve list of current alarms (alarm IDs) from Active Alarm Table.
- For each retrieved alarm ID which is not in the alarm shadow table of OpenScape FM, re-generate the event entry in the OpenScape FM Event Browser.
- For each event in OpenScape FM's alarm shadow table which cannot be found in the retrieved alarm ID list, generate the corresponding correlation trap (which was probably lost) to clear the event in the event browser. The event will not be deleted but acknowledged. The corresponding entry in the alarm shadow table will be deleted.

During startup of the OpenScape FM server the alarm shadow table will be created with all alarms in the OpenScape Voice event database. By default no events will be re-generated during this startup synchronization. By adding and setting the OpenScape FM argument `osv.events.generateOnStartup` to `true` in the OpenScape startup configuration file, you can change this. Please notice that in this case there will be generated an event in the OpenScape FM Event Browser for all active alarms found in the OpenScape Voice database regardless if there has been an event in the Event Browser for an alarm before.
Example for an entry in the OpenScape startup configuration file:

```
<argument>-Dosv.events.generateOnStartup=true</argument>
```

8.1.9 Deletion of Alarms Via SNMP Set

The entries in the Active Alarm Table of an OpenScape Voice Switch database can be deleted by an SNMP set operation out of the OpenScape FM. This means, the events are not longer regarded as active alarms. The events themselves will not be deleted and remain in the Event Table of the OpenScape Voice Switch database. For the sake of simplification we will talk of alarm deletion, even if this is not quite correct because only references to Events will be deleted out of the Active Alarm Table.

There are to possible ways to delete active alarms:

- The OpenScape FM Event Browser provides a comfortable way to delete active alarms. The OpenScape Voice plugin registers itself for event delete operations. If you delete an OpenScape Voice event out of the OpenScape FM Event Browser, the plugin tries to delete the alarm from the OpenScape Voice Switch database by performing an SNMP set operation.

  One situation needs special attention here. What happens with the event in OpenScape FM's Event Browser if the active alarm cannot be deleted from the OpenScape Voice database? This can happen, for example, because of a wrong SNMP set community or if the network connection to the OpenScape Voice Switch is temporarily down. The event will always be deleted out of the OpenScape FM Event Browser, regardless if the active alarm can be deleted out of the OpenScape Voice database or not. To prevent re-generation of alarms that have been deleted in the event browser of OpenScape FM but which could not be deleted from the OpenScape Voice database, the alarm shadow table is used. This alarm shadow table will not appear in the GUI of OpenScape FM. It will only be used internally to keep the alarm databases of OpenScape FM and OpenScape Voice in sync. If an event is deleted from the OpenScape FM Event Browser but cannot be deleted at the OpenScape Voice, it still remains in the alarm shadow table. Thus, no event is re-generated in the event browser during the next alarm polling, because the alarm is still found in the shadow table.

  In case the deletion of an active alarm out of the OpenScape Voice database has been successful, a correlation trap will be sent from the OpenScape Voice SNMP Agent. This will cause the deletion of the alarm out of the alarm shadow table.

  Please note that the mechanism described in this section is also valid for events deleted automatically out of the OpenScape FM Event Browser, in case the maximum number of events in the OpenScape FM Event Browser has been reached.

- Active alarms can be deleted via the Active Alarm Table Info Browser (see *Section 7.1, "Operations for an OpenScape Voice Universe")*. Has the deletion of an active alarm out of the OpenScape Voice database been successful, a correlation trap will be sent from the OpenScape Voice SNMP Agent and the corresponding event will be acknowledged in the OpenScape FM event browser. For further information please refer to *Section 8.1.4, "Event Correlation (OpenScape Voice)"*.

8.1.10 Accessing OpenScape Voice Event Documentation

The OpenScape Voice event documentation is easily accessible from an OpenScape Voice Event entry in the OpenScape FM Event Browser by invoking a context menu item (see *Section 7.6, "Operations for an OpenScape Voice Event"*). The event documentation is available in Web Works-HTML format and will be displayed by invoking a URL in the web browser where the OpenScape FM client is running. The same mechanism is used also for the documentation of OpenScape FM itself.

8.1.11 Access to Log-Files

Often it is necessary to access log-files to identify a problem.

To speed-up the trouble shooting process, the OpenScape FM provides a mechanism to easily retrieve OpenScape Voice log-files via FTP, SFTP or SCP.

To access the log files of an OpenScape Voice system, first the access account has to be configured once. This can be done by selecting the entry **SNMP->OpenScape Voice->Configure Logfile Access...** from the context menu of the OpenScape Voice object. This can also be started from the context menu of an OpenScape Voice event within the Event-Browser. For the access only the user account and the matching password has to be entered.

If the access has been configured, the menu entry **SNMP->OpenScape Voice->Browse Logfiles...** from the same context menu can be used to open a browser, that displays a list of the available log-files.

If a log-files is selected, the button **Open File** can be pressed. This will display the selected log-file within a standard browser, in which all the usual functions can be used. E.g. the key combination CTRL-F will start a string search. More abount this can be found in chapter 5 in the section 'Standard Info Browser' of the *OpenScape FM Desktop User Guide*.

8.2 Status of OpenScape Voice Objects

Logical OpenScape Voice Component objects represent the different OpenScape Voice event sets in the OpenScape FM GUI. Active alarms are mapped to the corresponding component objects.

Every OpenScape Voice trap has a OpenScape FM severity assigned. This is the severity which will be indicated in the Event Browser.

The OpenScape Voice Component objects always have the status of the most critical unacknowledged event for this object in the OpenScape FM Event Browser. When you have resolved the problem which has caused the trap and the corresponding entry in the OpenScape FM Event Browser is acknowledged or deleted, the status of the corresponding OpenScape Voice Component might change. Say, you have a component object with the status “major” (i.e. no “critical” traps have come in!). Now you delete an entry in the Event Browser for this component with the severity “major”. The component object’s status changes to the next lower severity level, if there are no other “major” entries. If there is an entry of the severity “minor”, this would be the component object’s new status. If there are no unacknowledged events for a component object in the OpenScape FM Event Browser, the object status of this component will be normal until the next event with a higher severity is received.

For OpenScape Voice Universes and Clusters the object status is always the most critical status of its child objects. You will have to open the object’s submap to identify the child object which actually caused the icon to turn into a specific status.

8.3 Split Brain Situation

A split brain situation can only occur for duplex deployments. For duplex deployment two cluster nodes are represented on the view of the cluster object. A connection will be drawn between these cluster nodes. A split brain situation occurs if both cluster nodes are running but do not have a direct network connection to each other. In this case, they try to contact a survival authority. If the survival authority is not reachable by at least one node, both nodes fall back to a standalone operation mode.

There is no special treatment implemented to handle split brain situations. The worst thing that can happen is that alarms are not cleared correctly during the split brain phase.

If the OpenScape Voice plugin receives two traps with the same sequence number or two traps with descending sequence numbers from different switches belonging to the same cluster, an event is added to the OpenScape FM Event Browser which states that there may be a split brain situation.

9 System Management Monitoring

This chapter describes functions that collect OpenScape Voice specific data by using the OpenScape FM System Management.

The monitors described in the following sections and their collected data can be viewed, queried and reported as every other System Management monitor (see *System Management User Guide*).

As usual, thresholds can be defined for the monitored parameters. If a threshold is exceeded, an event will be generated and displayed in the Event Browser.

Reports for the respective monitoring profiles can be generated by using the Report Manager (see *Report Manager User Guide*).

9.1 SIP Statistics

The System Management contains an OpenScape Voice specific **SIP Statistics** monitor, which - when activated - collects SIP Statistics in OpenScape Voice environments. The statistics values (SNMP Counter) are requested by the monitor from the MIBs `US-SRX-SIP-MIB`, `US-SRX-UCE-MIB` and `US-SRX-MGCP-MIB`. Once gathered the values are internally processed to calculate the results over time. The collected values can be accessed in monitor parameter charts.

The SIP Statistics monitor collects the following data:

- Invite Messages
- Bye Messages
- Cancel Messages
- Error Messages
- Registrations Messages
- Create and Delete Connections
- SIP to SIP Calls
- SIP to MGCP Calls
- Aborted Calls

The template of the *SIP Statistics* monitor can be found within the template container `Telephony`.

Within the OpenScape FM navigation tree the monitor is assigned to the OpenScape Voice IP Node or to the nodes in the cluster environment that were selected for monitoring.

The Report Center supports manual or scheduled reports for this parameter. The respective report is named `SIP Statistics`.

9.2 Bandwidth Usage for CAC Groups

The monitor **OpenScape Voice - Call Admission Control** provided by the System Management can be used to collect Call Admission Control data (CAC data).

The monitor uses the SOAP interface of OpenScape Voice systems to determine the bandwidth usage for CAC groups by performing the SOAP operation `QueryCACMonitoring` or alternatively `GetBandwidthUsageForCACPolicy`.

Important Note:
The respective CAC groups have to be defined and a CAC policy has to be assigned to the CAC group.

The Call Admission Control monitor collects the following two parameters for each CAC group:

- Number of concurrent calls
- Bandwidth used

The template of the *OpenScape Voice - Call Admission Control* monitor is located within the template container `Telephony`.

Within the OpenScape FM navigation tree the monitor is assigned to the OpenScape Voice IP Node or to the nodes in the cluster environment that were selected for monitoring.

The Report Center supports manual or scheduled reports for this parameter. The respective reports are named `OpenScape Voice CAC - Bandwidth Used` and `OpenScape Voice CAC - Number of Concurrent Calls`.

Important Note:
Manual configuration of credentials and access/firewall parameters for the OpenScape Voice SOAP interface may be required.

9.3 Registered Subscribers for OpenScape Branch

The monitor **OpenScape Branch - Registered Subscribers** provided by the System Management can be used to determine the number of registered subscribers for an OpenScape Branch.

The monitor uses the SOAP interface of OpenScape Branch systems to determine the number of registered subscribers by performing the SOAP operation `GetRegisteredSubscribers`.

The monitor creates the parameter `Registered Subscribers` within the container `OpenScape Branch` for each OpenScape Branch.

The template of the *OpenScape Branch - Registered Subscribers* monitor is located within the template container `Telephony`.

In the OpenScape FM navigation tree the monitor will be attached to the respective OpenScape Branch node.

The Report Center supports manual or scheduled reports for this parameter. The report is named `OpenScape Branch - Registered Subscribers`.

Important Note:
Manual configuration of credentials and access/firewall parameters for the OpenScape Voice SOAP interface may be required.

Important Note:
HTTPS certificates are needed by the external agents performing this monitor. The certificates have to be accepted within the OpenScape FM (see *SSL Certificates* within *Desktop User Guide*) and then the Java KeyStore has to be pushed to the external agents (see *Pushing KeyStores to External Agents* within *System Management User Guide*).

9.4 Mediatrix Used Ports

The System Management provides the profile `Mediatrix Monitoring` that contains two monitors to collect Mediatrix information:

- The monitor **Mediatrix - Gateway Ports** determines the number of used ports for a Mediatrix device.

  The monitor uses SNMP to query the table `autoRoutingTable` from the MIB `MX-CROUTMIB` and creates a parameter within the container `Mediatrix - Gateway Ports` for each Mediatrix device.

  The number of used ports is determined by scanning the `autoRoutingTable` which contains one entry per port. The fields `E164 number` and `SipUsername` within this table contain the subscriber number for the connected phone. If these fields are not empty the port is treated as a *used port*. All other ports are treated as *unused ports*.

  If e.g. the table has 16 entries and two of them have an `E164 number` *or* `SipUsername` configured, 2 of 16 ports are considered as in use.

  The information about the existing ports (channel id and status) is shown in the long message of the parameter. The parameter itself contains a numeric value that shows the number of currently used ports.

  The monitor distinguishes between Mediatrix devices with ISDN ports and Mediatrix devices with FXS ports. For ISDN ports one parameter per ISDN interface will be created and the number of Bearer Group Channels will be collected for each interface.
  For FXS ports the number of FXS ports will be shown in a single parameter.
  In both cases the total number and the number of used ports gets determined.

  The Report Center supports manual or scheduled reports for this monitor. The reports each concern one technology and are named `Mediatrix Gateway - Bearer Group Kanäle` (for ISDN ports) and `Mediatrix Gateway - FXS Ports` (for FXS ports).

- The monitor **Mediatrix - Overview** provides general information that is distributed on two parameters:
  - The parameter **Interfaces** provides a list of interfaces for the Mediatrix device.
  - The parameter **System Info** provides the product name, MAC address and serial number of the device.

The template `Mediatrix Monitoring` is located within the template container `Telephony`.

In the OpenScape FM navigation tree the monitor will be attached to the respective Mediatrix device nodes.

Important Note:
The monitored devices have to support SNMP and the MX-CROUT-MIB.

9.5 Media Server Monitoring

The System Management provides the monitor **MediaServer** to collect data from UC media servers.

The monitor uses the JMX-API to gather information about the current number of connections (parameter `CurrentNumberOfConnections`), the number of conference endpoints (parameter `NumberOfConferenceEndpoints`) and the number of G711- or G729-Streams (parameter `NumberOfG711Streams` or `NumberOfG729Streams`).

Important Note:
Within the UC the JMX-API has to be activated.

Important Note:
Since the *MediaServer* monitor can only gather data from its localhost, the System Management Agent that should provide the media server data has to be installed on the media server host.

The template of the *MediaServer* monitor is located within the template container `Telephony`.

In the OpenScape FM navigation tree the monitor will be attached to the IP node that represents the respective UC media server.

The Report Center supports manual or scheduled reports for the parameters. The respective reports are named:

```
MediaServer - CurrentNumberOfConnections
MediaServer - NumberOfConferenceEndpoints
MediaServer - NumberOfG711Streams
MediaServer - NumberOfG729Streams
```

9.6 Monitoring of UC Backend Cluster

A UC backend cluster is based on a standard high availability (HA) solution for Linux. OSFM provides a system management profile for such a Linux cluster. It can be found below „Templates / OS / Linux / Linux Cluster“. The profile provides information about cluster nodes, cluster resources and their status. For each resource, it is displayed on which node is it actually running.

Both UC backend nodes can be added as IP targets to this profile after they have been added as IP node to OSFM. Since the monitoring is based on SSH, a valid SSH account (user, password) has to be configured on each of the cluster nodes. This can be done via the popup menu of the corresponding IP node, menu item „Configure“, tab „System Management / Monitored Systems Accounts“.

9.7 Oracle (ACME) Session Border Controller (SBC)

There is a system management profile for the monitoring of an Oracle (ACME) Session Border Controller (SBC). It can be found below „Templates / Telephony / Oracle SBC“ in the system management configuration dialog for creating a new profile. One or more Oracle SBCs can be added as target node. Since the monitoring is based on SNMP, the correct SNMP read community has to be configured on the SBC’s IP node.

The information is retrieved from the SNMP MIBs ACMEPACKET-SMGMT-MIB and ACMEPACKET-ENVMON-MIB. Thresholds can be configured vie the configuration dialogue of the related monitor if required. The following values are retrieved from the SBC:

ACMEPACKET-ENVMON-MIB

- Temperatures
- CPU and memory load
- Cards

ACMEPACKET-SMGMT-MIB (comments according to MIB description)

- Global Concurrent Sessions
  The total instant number of Global Concurrent Sessions at the moment.
- Active Local Contacts
  Number of current cached registered contacts in the SD.
- Combined Answer to Seizure Ratio
  The answer-to-seizure ratio, expressed as a percentage. For example, a value of 90 would represent 90%, or .90
- NAT Capacity in CAM
  The percentage of NAT table (in CAM) utilization.
- ARP Capacity in CAM
  The percentage of ARP table (in CAM) utilization.
- Global calls per second
  The number of global call per second. This is an instant value.
- Licensed in use
  The percentage of licensed sessions currently in progress.
- Current active inbound sessions
  Number of current active inbound sessions
- Current active outbound sessions
  Number of current active outbound sessions

10 Prerequisite Hardware and Software Environment

Please refer to the *OpenScape FM Desktop User Guide* for a list of all hardware and software requirements for the OpenScape FM and its OpenScape Voice plugin module.

A OpenScape Voice Abbreviations

CMP - Common Management Portal

OAM&P - operation, administration, maintenance and provisioning

B OpenScape Voice Rights

The plugin's access rights are integrated into the general access management (*see OpenScape FM Desktop User Guide*).

The description of the individual rights can be found within the tooltipps for the corresponding right symbols (tree or submap).

The names of the rights for this plugin begin with the plugin designation *OpenScape Voice*.

Index

A
Abbreviations 53
Accessing Event Documentation 42
Accounting
    Discovery 17
Alarm Handling 37
Alarms
    Deletion 42
Assistant
    Adding 15
    Discovery 15
    Menu 34
    Topology 25
Assistant API
    Symbol 20
Assistant Container
    Symbol 21, 22
Assistant Network
    Symbol 20
    Topology 25
Audience 5

B
Bandwidth for CAC Groups 46
Branch
    Registered Subscribers 46
Branches 34
    Discovery 16

C
Client 5
    Login 13
    Starting 13
Client Start 13
Cluster
    Adding 15
    Bandwidth for CAC Groups 46
    Discovery of general Information 15
    Menu 34
    SIP Statistics 45
    Symbol 21
    Topology 26
Component
    Menu 34
Control Center 24

D
Deletion of Alarms 42
Desktop 5
Device-specific information 33
Discovery
    Assistants 15
    Cluster, general Information 15
    OpenScape Accounting System 17
    OpenScape Branch 16
    OpenScape Enterprise Express 17
    Switches 15

E
Endpoints 34
    Registration State 26
Enterprise Express
    Discovery 17
Event Correlation 38
Event Documentation 42
Events
    Correlation 38
    Documentation 42
    Synchronization 41
Event Synchronization 41

F
Fault Management 37
    Accessing Event Documentation 42
    Alarm Handling 37
    Deletion of Alarms 42
    Event Correlation 38
    Event Synchronization 41
    Info Browser 37
    Split Brain Situation 44
    Status of OpenScape Voice Objects 43
    Traps 38

H
Hardware
    Environment 51
HTTPS
    Symbol 20

I
Info Browser 37
Information
    Devices 33

IP Node
Symbol 19

L

License 14
Installation 14
List Assistants 14
List Branches 34
List Endpoints 34
List Hosts 14
List Switches 14
List Universes 14
Login 13

M

Main Menu 14
OpenScape Voice 14
Media Server
Monitoring 48
Mediatrix 47
Menu
OpenScape Branch 36
OpenScape Voice Assistant 34
OpenScape Voice Cluster 34
OpenScape Voice Component 34
OpenScape Voice SMMP MIB 35
OpenScape Voice Universe 33
Monitoring 45
Bandwidth for CAC Groups 46
Media Server 48
Mediatrix 47
Registered Subscribers 46
SIP Statistics 45

N

Network Configuration 31
Network Topology
Automatic discover 25
Managing 25

O

Object
Status 43
OpenScape Branch
Menu 36
Registered Subscribers 46
Symbol 22
Topology 28
OpenScape Enterprise Express 12
OpenScape FM 5
OpenScape Voice 7
Adding Assistant 15
Adding Cluster 15
Adding Switch 15
Assistant 7
Cluster 8
Discovery 15
Network Topology 25
Plug-in 10
Plug-in initialization 13
Plugin Rights 55
Switch 9
Universe 7
OpenScape Voice Assistant
Menu 34
Topology 25
OpenScape Voice Assistant API
Symbol 20
OpenScape Voice Assistant Container
Symbol 21, 22
OpenScape Voice Assistant Network
Symbol 20
Topology 25
OpenScape Voice Cluster
Bandwidth for CAC Groups 46
Menu 34
SIP Statistics 45
Symbol 21
Topology 26
OpenScape Voice Component
Menu 34
OpenScape Voice Network
Symbol 20
Topology 25
OpenScape Voice SNMP Agent
Symbol 19
OpenScape Voice SNMP MIB
Menu 35
Symbol 19
OpenScape Voice Switch
Topology 28
OpenScape Voice Universe
Menu 33
Symbol 21
Topology 26
Overview 24

P

Plugin
Rights 55
Preface 5
Purpose 5

R

Registered Subscribers 46

Rights 55

S

Server 5
SIP Statistics 45
SNMP Agent
    Configuration 14
    Symbol 19
SNMP MIB
    Menu 35
    Symbol 19
SNMP Parameters 14
Software
    Environment 51
Split Brain Situation 44
Status of OpenScape Voice Objects 43
Submap 25
Switch
    Adding 15
    Discovery 15
    Topology 28
Switch IP Node symbol 19
Symbol
    HTTPS 20
    OpenScape Branch 22
    OpenScape Voice Assistant API 20
    OpenScape Voice Assistant Container 21, 22
    OpenScape Voice Assistant Network 20
    OpenScape Voice Cluster 21
    OpenScape Voice Network 20
    OpenScape Voice Universe 21
    SNMP Agent 19
    SNMP MIB 19
    Switch IP Node 19
System Management
    Bandwidth for CAC Groups 46
    Media Server 48
    Mediatrix 47
    Monitoring 45
    Registered Subscribers 46
    SIP Statistics 45

T

Terminology 5
Terms 53
Topology
    OpenScape Branch 28
    OpenScape Enterprise Express 29
    OpenScape Voice Assistant 25
    OpenScape Voice Assistant Network 25
    OpenScape Voice Cluster 26
    OpenScape Voice Network 25
    OpenScape Voice Switch 28
    OpenScape Voice Universe 26
Traps 38

U

Universe
    Menu 33
    Symbol 21
    Topology 26

© 2025 Mitel Networks Corporation. All Rights Reserved. Mitel and the Mitel logo are trademark(s) of Mitel Networks Corporation. Unify and associated marks are trademarks of Unify Software and Solutions GmbH & Co. KG. All other trademarks herein are the property of their respective owners.