

CALLUP SCE

Product Description



CALLUP
ONE1 TELECOM DIVISION

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CALLUP CanVAS SCE Product Description

1. Overview

1.1. About CALLUP

CALLUP net is a subsidiary of the One1 Group, headquartered in Israel and traded in the Tel-Aviv Stock Exchange TASE (Symbol: ONE). Founded in 1999 and has been a leading reliable provider of Value Added Services and Mobile Device Management Solutions for the telecom industry for over a decade.

1.2. About CanVAS

The CALLUP CanVAS platform offers a complete messaging and voice solution that inter-connects Mobile, Land Line and Internet subscribers composing any Value Added Service an operator requires. This document describes the CALLUP CanVAS SCE component of this platform.

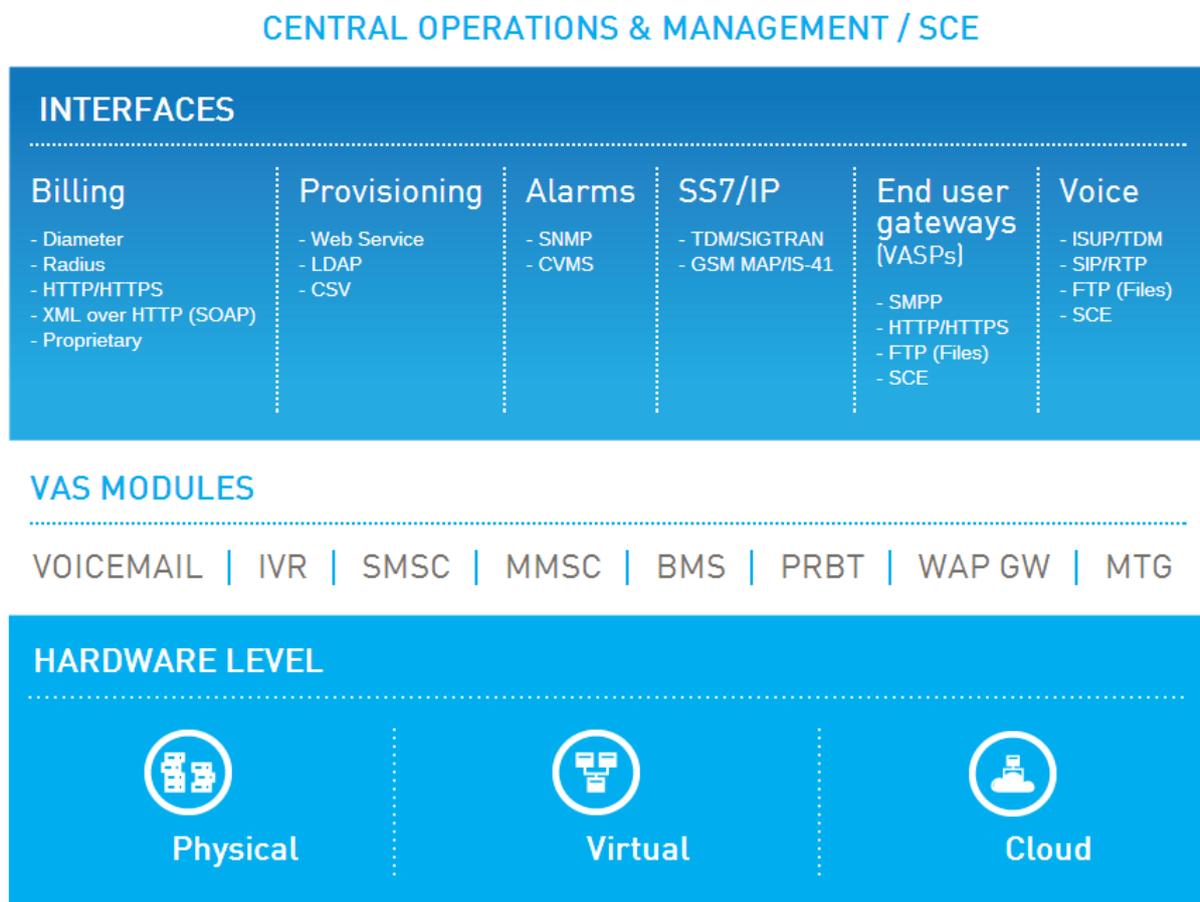


Figure 1 – CanVAS Platform

1.3. About SCE

Callup SCE - Service Creation Environment - is the new way for creating and delivering VAS services. SCE is a wrapper for all the telephony interfaces, voice, SMS and USSD - and enables easy creation and maintenance of new services and service flows utilizing the NW infrastructure.

Examples can be USSD top up/balance query application, voting or donation application, or even full voice mail solutions. The sky is the limit with SCE - simply use your imagination and focus on what matters, CALLUP's SCE will take care of the rest.

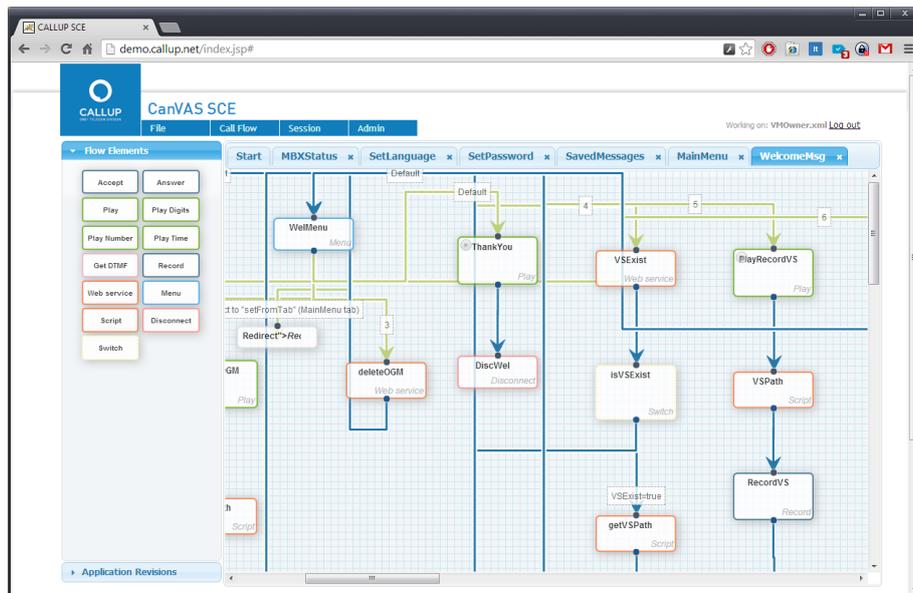


Figure 2 - Complex application view on SCE application designer

SCE provides a modern HTML5 web based GUI, with drag and drop functionality, to easily create new call flows, for SMS, USSD or Voice applications. Application developers can integrate any 3rd party application using web service technology - simply drag in a WSDL file, and you can have any functionality desired.

1.4. SCE High Level Features

Feature	Description
Application Designer	Easily drag and drop building blocks using an HTML5 web interface, to create VAS applications in minutes!
Voice Interface	Build voice menus (IVRs) using drag and drop building blocks such as "play", "record", logical elements (if/switch etc.), scripts
SMS Interface	Build SMS applications, routing based on destination number/short codes/text inside message, and send back SMS including session maintenance.
USSD Interface	Build USSD menus and applications. Routing based on destination codes and prefixes. Send back menus and response to user selections.

Admin Interface	Control panel with status, application routing configuration, logs, user management etc.
Auto Save and Staging	Applications are always saved, including its history of changes. Staging makes testing and going to production easy and manageable.
Web Service Integration	Import a WSDL file and instantly include its functionality into your application. Provides endless possibilities to build any application desired!
Media Manager	Manage all your media files using an internal easy to use content management platform
Variables System	In-app session variable system makes development easy and ready to tackle any development challenge.
Tabbed Interface	Manage large applications using tabs, to easily manage lots of logic
Auto Language Adaptation	Built on years of experience, sentences, dates, times, number, currencies - are all adapted to the desired application language and built accordingly.
Application Router	Chooses the right application based on various parameters, like called/destination address, sender address, text in message etc.
CDR Generation	Detailed CDRs on every incoming and outgoing message/call which passes through the server.
Statistics and Reports	Detailed usage reports, usage statistics, available from CVMS - the web management console.
Detailed Logger	Detailed logger which enables troubleshooting and problem investigation easily.
SNMP Alarms	Alarms on various hardware and software events, sent to NOC over SNMP

2. Solution Architecture

2.1. Diagram

The following is a block diagram that describes in high level the various elements of the solution:

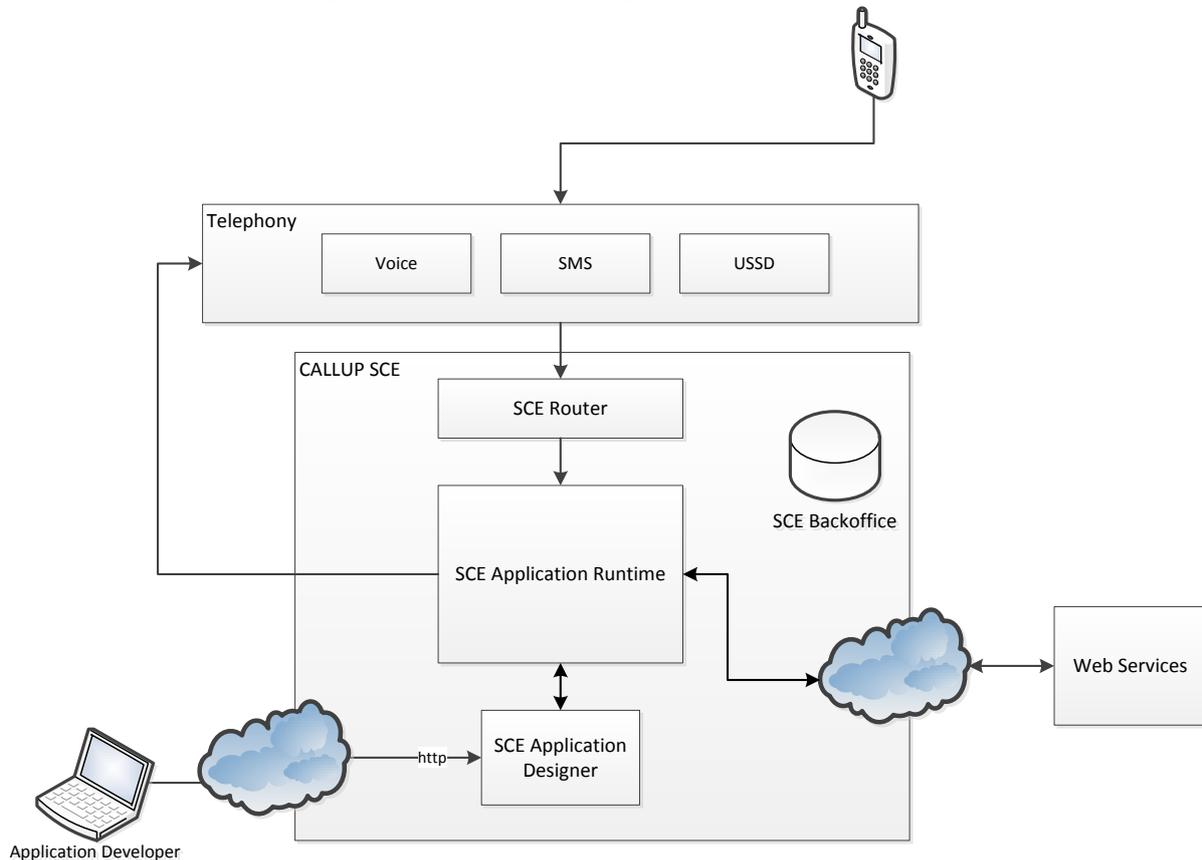


Figure 3 - High Level Block Diagram

- Telephony interface elements (such as SMSC, USSD GW, Voice IVR machines) can be provided by CALLUP if required.

2.2. Installation Options

2.2.1. Physical

The system can be provided as a physical installation at the customer's premises. CALLUP can provide the hardware itself, or a list of required hardware that the customer can purchase. CALLUP uses standard servers primarily from HP. For load balancer CALLUP usually provides F5.

A typical installation consists of:

- 2 HP servers
- Load balancers
- Rack mount, IP switches and other peripherals are optional. CALLUP can provide if required.

2.2.2.Virtual

The system can be deployed on an already existing virtualization farm that the operator maintains. CALLUP can provide its solution as a preconfigured virtual machine, ready to be installed on the existing infrastructure. Supported hypervisors include VMWare and Hyper-V.

2.2.3.Cloud (Private Cloud)

CALLUP can provide the computing and networking services using cloud computing companies, such as Amazon Web Services. A VPN is created between the private cloud network and the customer's network. This essentially creates servers which are virtually in the operator's network, even though physically they are located at a datacentre in the region.

This method eliminates the hassle of working with physical hardware, taking care of hardware failures, support contracts and SLAs, power consumption etc.

Amongst other benefits of a cloud solution:

- Managed service
- Solution resources aren't dictated by peaks
- Gradual growth

3. Solution Overview

3.1. Telephony Interface

The SCE's north bound interfaces have connections to the classic VAS infrastructure:

- Voice links (either TDM or VoIP) towards MSC/MGW
- SMPP links with SMSC
- SMPP links towards USSD GW - or direct GSM MAP links with HLR for USSD
- MM7 links with MMSC

This enables SCE to create all kinds of applications, and even mix two or more technologies. For example, you can create a voice application that includes an SMS confirmation in the end. Or you can trigger an application with SMS or USSD and make the system call back the user or other users.

The SCE effectively wraps all of the VAS services, and provides an easy development tool for the creation of those VAS services easily.

3.2. SCE Application Router

The application router is a sub system of SCE, which routes incoming traffic of various types and sources, to the correct application. This system is fully manageable from the admin web interface. Users with the relevant administrative rights can add, edit or delete routes.

An example for some routes:

- All calls to the number *22 will be diverted to the application "Channel 2 News"
- All incoming SMS sent to the number 1414, from the range of numbers 2430000-2439999, will be diverted to the application "Election Voting"

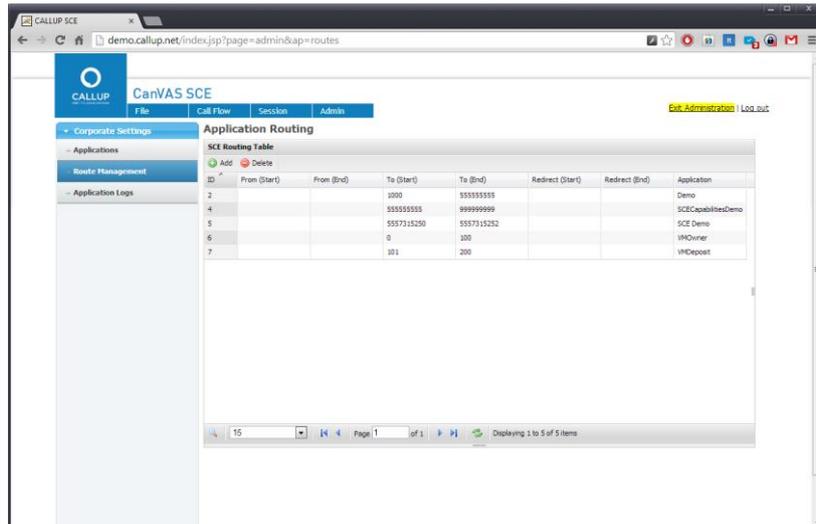


Figure 4 - SCE Application Router

A range of numbers should be assigned to SCE. The SCE router can only route within this pre-defined range. This goes for SMS, MMS, Voice and USSD.

3.3. SCE Application Runtime

Once an incoming event is reaching the intended application, the SCE application runtime starts executing this application.

The application is a nested call flow logic, which was pre-programmed with the SCE application designer. It tells the runtime how to respond to inputs, how to interact with 3rd party elements, and how to provide feedback to the user.

The runtime can accept and execute various tasks which are called “objects”. The runtime support of objects constantly grows, with each new version. Some few examples for such objects are:

- “Play” object, which plays a media file
- “Send SMS” object, which sends SMS to a given number
- “Conference” object, which connects several parties on the line
- “Text To Speech” object, which speaks a given word or sentence
- “Say Date” object, which creates a date phrase in the current language
- “Switch” object, which selects the next path of the application based on logical conditions
- “Execute Web Service Method” object, which calls a function on a 3rd party external web service

The runtime executes these objects, one by one, in the order and logic that was defined and designed in the application. Once the last object is executed, the application is terminated.

Logs about each object execution, and the outcome of that execution, are kept in the SCE database. These logs can later on be searched, helping the development and troubleshoot process, as well as checking potential customer complaints.

3.4. SCE Application Designer

The SCE application designer is a GUI tool which enables building VAS applications. It does so by providing a menu of building blocks, called objects, which can be dropped on the application sheet and connected to other objects using arrows and logical conditions.

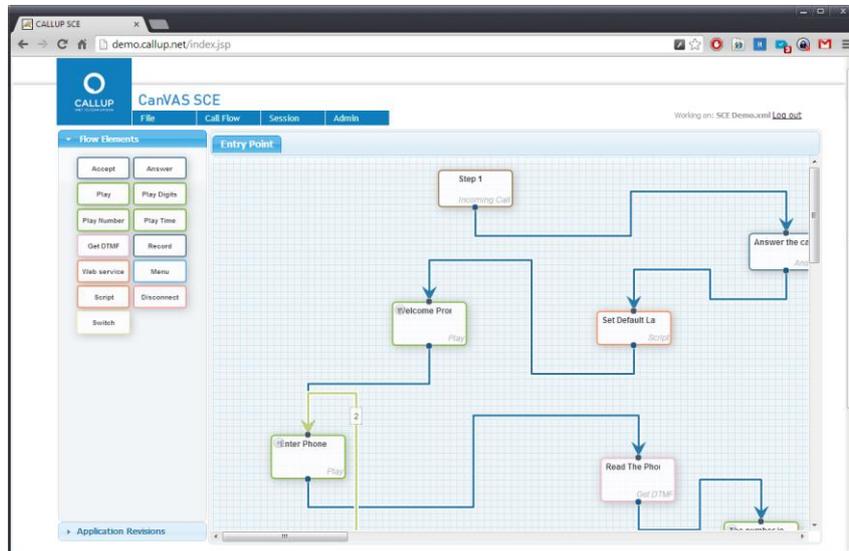


Figure 5 - SCE Application Designer

The objects available are the same objects, obviously, that the SCE runtime can interpret and execute. The two most common ways to control the relation/connection between objects are:

1. Directly connecting one object to another. For example, after we play a welcome prompt, go ahead and play another prompt asking for some DTMF input from the user.
2. Connect using a “Switch” object. A “Switch” object is a set of rules which define how the application should progress, based on some conditions. For example, if the user input is empty, go to “Step 5”. If the user input length is OK and valid, go to “Step 6”. A switch rule also includes a “default next step”, which tells the SCE application runtime how to proceed in case none of the logical conditions are true.

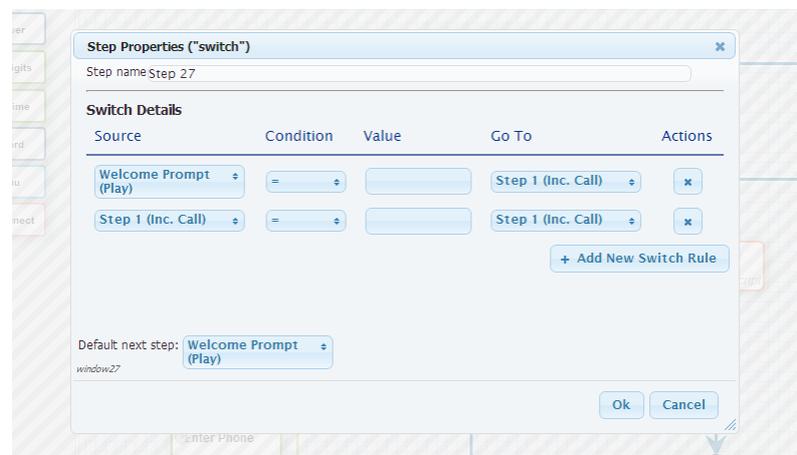


Figure 6 - Logical "Switch" object

3.5. External Web Services

A major feature of the SCE system is its ability to easily connect with 3rd party services, using the standard web service mechanism. If someone wants to create a meaningful application, which uses a database, calls external services, and basically contains more advanced application capabilities besides the VAS interfaces - he can expose these capabilities using a standard web service, and connect the VAS interface to his application.

The system accepts standard WSDL file to import the web service functions and methods into the SCE application designer. Once that is done - the functions from the WSDL are immediately available for use in the application.

For example, let's say there's a ticket office that wants to sell its tickets using a voice IVR interface. This ticket office already has a web site and other interfaces which connect to its IT systems, for purchasing tickets. All it needs to do is to expose a web service, with the functionality required to create the IVR ticket purchasing flow. That web service's WSDL can now be imported into SCE, drag and drop some playing of prompts and logic on inputs - and you have an IVR in no time!

The great thing about it is that you don't need to invent the wheel for every simple application. Aspects like bugs, logging, concurrency and high loads, advanced features like conferencing and text to speech/speech to text - are already implemented. You just need to take care for the logic of the VAS application, nothing else.

4. Interfaces

4.1. Network

Callup's VAS products can be deployed and used as the server that actually provides the voice, SMS, MMS and USSD services. However, Callup's SCE can interconnect with existing VAS infrastructure using the following interfaces:

Node Name	Protocol	Description	Physical Connectivity
Voice	ISUP/E1 PRI SIP/RTP	Allow incoming and outgoing voice calls	TDM or Ethernet
SMSC	SMPP v3.4	Allow incoming and outgoing SMS traffic	Ethernet
USSD GW	SMPP/Other	Allow USSD communication with handsets	Ethernet
MMSC	MM7	Allow incoming and outgoing MMS traffic	Ethernet
Billing (Optional)	CDR over FTP/ Diameter/Any	CDRs for post-paid/online charging for prepaid.	Ethernet

4.2. Provisioning

No provisioning is required for the service. Clients can call to the access numbers, and will be served according to the logic of the application.

5. Scalability

The SCE platform is fully scalable, which means it can be scaled to any number of volumes required. CALLUP's solution is built to be scaled up, and SCE is no exception. Each of the interfaces can be scaled, and the application runtime as well as the web services that provide the application design and administration. The application servers run in active-active mode, and are planned with N+1 redundancy scheme (see redundancy chapter).

Generally speaking, for the application runtime server, an 8 CPU cores machine with 32 GB of RAM can handle up to 800 concurrent applications. This figure should be used as a rule of thumb for the calculation on the hardware required, when designing the hardware for the solution.

** This number represents a typical application of various types, and may vary for specific installations*

6. Redundancy

SCE is designed to be robust, with redundancy in every module with no single point of failure, both hardware and software wise.

The typical physical installation includes 2 load balancers and 2 servers. The 2 servers work together in active-active manner. The solution is planned with N+1 redundancy scheme. This means, that if N servers are required for capacity X, then N + 1 servers will be used. For example, let's say you need a 500 TPS system. Two servers can handle this load, but the system will be deployed with 3 servers - to allow the backup in case one server fails.

7. Standard Compliancy

The system is compliant* with the following standards:

- Hypertext Transfer Protocol - HTTP/1.1
- Hypertext Transfer Protocol Secure (HTTPS)
- SOAP Web Services
- TLS / SSL (RFC5246, RFC 2246)
- SMPP v3.4
- Call Control Interfaces
 - SIP (RFC3261)
 - SIP Transport Layer Security (SIP TLS)
 - 3G-324M for TDM(E1/T1) and IP (NbUP)
 - SS7
- Media Streaming over IP
 - IPv4
 - IPv6
 - RTP, RTCP, RTCP-XR, RTCP-HR

- Secure RTP (SRTP)
- NbUP over IP (H.223/3G-324M, G.711 5ms/20ms, AMR-NB, AMR-WB)
- Audio
 - Voice & HD Voice play/record
 - Tone generation/detection (DTMF, RFC2833/RFC4733)
 - Call progress analysis
 - Positive Voice Detection (PVD) and Positive Answering Machine Detection (PAMD) for outbound calling scenarios
 - Audio Codecs
 - Narrowband codecs: G.711u/a, G.723, G.726, G.729a, G.729b, AMR-NB
 - Wideband codecs: G.722, AMR-WB (G.722.2) – see “Obtaining Third Party Licensing” below
 - Voice activity detection, silence suppression, comfort noise generation
 - Echo cancellation
- Video
 - Play/record
 - Video transcoding, transrating, and transizing
 - Video overlays
 - Video Codecs H.263, H.263+, H.263++ (Baseline profile up to level 30)
 - MPEG 4 (Simple Profile levels 0, 1, 2, 3)
 - H.264 Baseline Profile (Baseline profile levels 1, 1b, 1.1, 1.2, 1.3, 2.0, 2.1, 2.2, 3.0, 3.1)
 - Image sizes: HD720p, 4CIF, VGA, CIF, QVGA, QCIF
 - Frame rates: Up to 30 FPS
 - Bit rates: Up to 2Mbps
 - Video Fast Update (VFU): Configurable responses to I-Frame Update requests
- GSM MAP Rev. 1/2/3
- 3GPP TS 23.140 (MM7)

** The relevant parts of the standard which are required for the operation of the server*

8. O&M

8.1. System Administration

The SCE service is administered via a rich web based GUI tool called CVMS. CVMS enables for example service start and stop, status view, host machine information, log file view, configuration parameter changes, configuration file editing and much more.

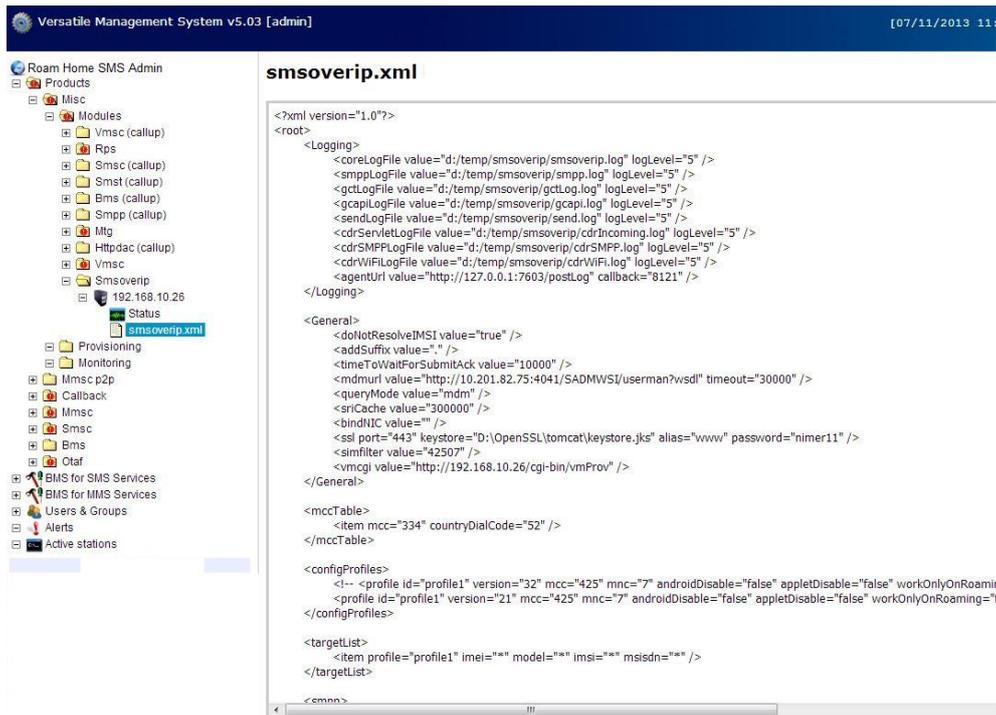


Figure 7 - Editing Configuration File from CVMS

The SCE also contains a rich admin GUI for provisioning various parts, like user management, application route management etc.

8.2. Monitoring

CVMS is also utilized for system monitoring. All alerts, with all severities, are collected by CVMS and can be viewed, filtered, and in general provide a quick understanding of the system status. The nodes with the various modules are highlighted with different colours, until the alarm is cleared by the operator.

9. Licensing options

Feature	Standard	Advanced
Application Designer	x	
Voice Interface	x	
SMS Interface	x	
USSD Interface	x	
Admin Interface	x	
Auto Save and Staging	x	
Web Service Integration	x	
Media Manager	x	
Variables System	x	
Tabbed Interface	x	
Auto Language Adaptation	x	
Application Router	x	
CDR Generation	x	
Statistics and Reports	x	
Detailed Logger	x	
SNMP Alarms	x	
SMSC		x
USSD GW		x
MMSC		x