Alcatel-Lucent

INTERNET PROTOCOL MULTIMEDIA SUBSYSTEM (IMS) SOLUTION MAINTENANCE RELEASE 07.00.05 AND CONTROLLED INTRODUCTION RELEASE 07.01.00

EXTERNAL RELEASE NOTES

275-100-
004R07.01.00
APRIL 2009
ISSUE 1

Contents

About this document

Purpose

The purpose of this document is to provide a general overview of IP Multimedia Subsystem (IMS) Releases 07.00.05 and 07.01.00 (Controlled Introduction), including a list of the network element load versions, IMS network level test results, and known issues to assist service providers with field deployments of IMS Releases 07.00.05 and 07.01.00.

Reason for reissue

This is the first issue of the IMS Release 07.00.05 and 07.01.00 Release Notes.

Intended audience

The intended audience for this document includes all personnel who need information about the IMS 07.00.05 and 07.01.00 releases, its functions, and network elements.

This document can be used by the following audiences:

- Planning and design personnel
- Maintenance personnel
- Management personnel
- System installation and integration personnel

Supported systems

See Chapter 7, System Requirements, for information on systems supported in Releases 07.00.05 and 07.01.00.

Conventions used

There are no special typographical conventions used in this document.

Technical support

For technical support, contact your local Alcatel-Lucent customer support team. See the Alcatel-Lucent Support web site (http://alcatel-lucent.com/support/) for contact information.

How to order

This document is available on the Online Customer Support Site (OLCS). To order this document and other Alcatel-Lucent documents, contact your local sales representative or use the Online Customer Support Site (OLCS) web site (https://support.lucent.com).

How to comment

To comment on this document, go to the Online Comment Form (http://www.lucent-info.com/comments/) or e-mail your comments to the Comments Hotline (comments@alcatel-lucent.com).

1 Release components

Overview

Purpose

This chapter describes the loads that comprise Releases 07.00.05 and 07.01.00 and the documentation deliverables included in this release.

Software deliverables

Table 1-1 lists the loads that comprise Releases 07.00.05 and 07.01.00. New or changed load names are shown in bold-face type.

Table 1-1 Software release identification

Network Element/Application	Load Name in IMS Release 07.00.04	Load Name in IMS Release		Load Changed Since IMS Release 07.00.04?
		7.00.05 CORE NE Maintenance Load	7.01.00 Controlled Introduction (CI) APPs NE Load	
1300 Cross Management Center (XMC)	R6.2.2.2	**R6.2.2.5**	**R6.2.2.5**	**Yes**
1357 Unified Lawful Intercept Suite (ULIS)	12.3.2	12.3.2	12.3.2	No
1440 USDS (includes MAS/AHE)	USDS-7.2.n05.01 MAS ltmasr27-p0006	**USDS-7.2.n05.01** **Patch USDS : USDS_HSS_R7.2_Patch03** **MAS Patch : ltmasr27-p0011**	**USDS-7.2.n05.01** **Patch USDS : USDS_HSS_R7.2_Patch03** **MAS Patch : ltmasr27-p0011**	**Yes**
5020 MGC-8	LGP 6-3-1-2-SP-7-2	LGP 6-3-1-2-SP-7-2	LGP 6-3-1-2-SP-7-2	No
5020 MGC-12	RMGCSX30	RMGCSX30	RMGCSX30	No
5060 MGC-10	R1.1.4.1	R1.1.4.1	R1.1.4.1	No
5100 CMS	CMS-1000.1.5.3	CMS-1000.1.5.3	CMS-1000.1.5.3	No
5400 IMS Application Server (IAS) (Presence, XDMS) **5410 PS** **5410 XDMS**	Not Applicable	**Not Applicable**	**XDMS41_SP4 PS_41_SP4** **Platform:** **- 5400 R1.2** **Patch:** **- 5400 R1.2.2.3**	**No, new for IMS 7.1 CI only**
5420 Converged Telephony Server (CTS)	R15.33.00.00 then apply R15.33.00.02	**R15.36.00.00** **then apply** **R15.36.00.02**	**R15.36.00.00** **then apply** **R15.36.00.02**	**Yes**

Network Element/Application	Load Name in IMS Release 07.00.04	Load Name in IMS Release		Load Changed Since IMS Release 07.00.04?
		7.00.05 CORE NE Maintenance Load	7.01.00 Controlled Introduction (CI) APPs NE Load	
5420 Personal Communication Manager (PCM)	PCM_R1_0_1_559	**PCM_R1_0_1_588** **Platform - 5400 R1.2** **Patch - 5400 R1.2.2.1** **TP: 3.1.0.6**	**PCM_R1_0_1_588** **Platform - 5400 R1.2** **Patch - 5400 R1.2.2.1** **TP: 3.1.0.6**	**Yes**
5420 Voice Call Continuity Server (VCC)	Not Applicable	**Not Applicable**	**VCC 8.0.209** **Platform - 5400 R1.2** **Patch - 5400 R1.3.1.2**	**No, new for IMS 7.1 CI only**
5430 MultiMedia Instant Messaging (MMIM)	Not Applicable	**Not Applicable**	**MMIM4.0 SP1 seventh delivery on HP**	**No, new for IMS 7.1 CI only**
5440 IMS – PC Client	Not Applicable	**Not Applicable**	**5440_PCC_r3.1.0.2269 (without PCM)**	**No, new for IMS 7.1 CI only**
5440 Windows Mobile Client	SPE-R6.0 V8.1.6.11	SPE-R6.0 V8.1.6.11	SPE-R6.0 V8.1.6.11	No
5450 AGCF	AGCF-5-1-0R1S3P1	AGCF-5-1-0R1S3P1	AGCF-5-1-0R1S3P1	No
5450 IP Session Control (ISC)	R15.33.00.00 then apply R15.33.00.02	**R15.36.00.00** **then apply** **R15.36.00.02**	**R15.36.00.00** **then apply** **R15.36.00.02**	**Yes**
5620 Services Activation Manager (SAM)	R5.0R9	R5.0R9	R5.0R9	No
5750 Subscriber Services Controller (SSC)	SSC 3.1R5 and SAC/CLF 3.1R5	SSC 3.1R5 and SAC/CLF 3.1R5	SSC 3.1R5 and SAC/CLF 3.1R5	No
5900 Media Resource Function (MRF)	R6.3.1 Plus patches 6245, 6299, 6430, 6441, 7881	**R6.3.2**	**R6.3.2**	**Yes**

Network Element/Application	Load Name in IMS Release 07.00.04	Load Name in IMS Release		Load Changed Since IMS Release 07.00.04?
		7.00.05 CORE NE Maintenance Load	7.01.00 Controlled Introduction (CI) APPs NE Load	
7302 ISAM-V	ISAM-V-R36.112	ISAM-V-R36.112	ISAM-V-R36.112	No
7510 Media Gateway (MGW)	7510 R3.0 B11b	7510 R3.0 B11b	7510 R3.0 B11b	No
7515 Media Gateway (MGW)	R2.4	R2.4	R2.4	No
7520 Media Gateway (MGW) (was Lucent Network Gateway)	LGP 6-3-1-2-SP-7-2	LGP 6-3-1-2-SP-7-2	LGP 6-3-1-2-SP-7-2	No
7750 Service Router	R5.0R11	R5.0R11	R5.0R11	No
8610 Instant Convergent Charging (ICC)	4.5.2-02, HFRs label ICCGENR452-02-EWS-HF810	4.5.2-02, HFRs label ICCGENR452-02-EWS-HF810	4.5.2-02, HFRs label ICCGENR452-02-EWS-HF810	No
8615 Instant enhanced Charging Collection Function (IeCCF)	N440 Hardware: IeCCF R26SU8 and hotslide 0101 MAS-R26SU8 and patch0809 T2000 Hardware: IeCCF 27.3 and hotslide0101 MAS R27SU2-p0209	**N440 Hardware:** **IeCCF R26SU8 and hotslide 0102** **MAS-R26SU8 and patch0809** **T2000 Hardware:** **IeCCF 27.3 and hotslide0102** **MAS R27SU2-p0209**	**N440 Hardware:** **IeCCF R26SU8 and hotslide 0102** **MAS-R26SU8 and patch0809** **T2000 Hardware:** **IeCCF 27.3 and hotslide0102** **MAS R27SU2-p0209**	**Yes**
8670 GUP	GUP-5_0_1R1S3A2	**5.01R1S4**	**5.01R1S4**	**Yes**
8950 Vital AAA[1]	R5.2.5	R5.2.5	R5.2.5	No
Acme Packet Net-Net	R6.0.0p1	R6.0.0p1	R6.0.0p1	No

[1] 8950 Vial AAA was part of the WiMAX business unit lab environment, but not specifically tested as part of IMS 07.00.00.

Network Element/Application	**Load Name in IMS Release 07.00.04**	**Load Name in IMS Release**		**Load Changed Since IMS Release 07.00.04?**
		7.00.05 CORE NE Maintenance Load	**7.01.00 Controlled Introduction (CI) APPs NE Load**	
EMS				
Acme Packet Session Director (4250)	C5.1.1p10	**C5.1.1p23**	**C5.1.1p23**	**Yes**
Audiocodes – IPM5K	Audio-Codes-AC_IPM5K_R5.0.50-1.1a	Audio-Codes-AC_IPM5K_R5.0.50-1.1a	Audio-Codes-AC_IPM5K_R5.0.50-1.1a	No
eSM	R26SU8 P2	R26SU8 P2	R26SU8 P2	No
Fortinet Fortigate Firewall	FGT_5005FA2-v300-build153-FORTINET	FGT_5005FA2-v300-build8094-FORTINET	FGT_5005FA2-v300-build8094-FORTINET	**Yes**
Lucent Control Platform (LCP) **includes:** - **5420 Converged Telephony Server (CTS)** - **Lucent Feature Server 2500** - **5450 IP Session Control (ISC)**	R15.33.00.00 then apply R15.33.00.02	**R15.36.00.00** **then apply** **R15.36.00.02**	**R15.36.00.00** **then apply** **R15.36.00.02**	**Yes**
Lucent Gateway Platform (LGP) Includes: - 5020 MGC-8 - 7520 MGW	LGP 6-3-1-2-SP-7-2	LGP 6-3-1-2-SP-7-2	LGP 6-3-1-2-SP-7-2	No
Lucent VPN Firewall (LVF)	9.2.184	9.2.184	9.2.184	No
OMC-P	OMC-P-13.00.01.00	**OMC-P-13.00.02.02**	**OMC-P-13.00.02.02**	**Yes**
Plexus BTS	BTS 6.3.2.0.3	BTS 6.3.2.0.3	BTS 6.3.2.0.3	No

Network Element/Application	Load Name in IMS Release 07.00.04	Load Name in IMS Release		Load Changed Since IMS Release 07.00.04?
		7.00.05 CORE NE Maintenance Load	7.01.00 Controlled Introduction (CI) APPs NE Load	
Security Management Software	R9.2.184	R9.2.184	R9.2.184	No
VitalQIP	VitalQIP 7.1 ENUM R1.2	**VitalQIP 7.1 (patch B158)** **ENUM R1.2**	**VitalQIP 7.1 (patch B158)** **ENUM R1.2**	**Yes**
WDDF	WDDF-R3.7.1SU2	WDDF-R3.7.1SU2	WDDF-R3.7.1SU2	No
Westell TriLink™ IMS Gateway Model 6358	Westell_RGBW-02.00.03.02, SW2.0055.17	Westell_RGBW-02.00.03.02, SW2.0055.17	Westell_RGBW-02.00.03.02, SW2.0055.17	No

How to obtain software

Please contact your Alcatel-Lucent representative to obtain software.

Document deliverables

For Releases 07.00.05 and 07.01.00, this document is the only solution document that is being published. The following solution document is impacted by 07.01.00 features:

- *IMS Solution Technical Description,* 275-100-000

See Appendix A for the impacted sections of this solution document.

For all other solution documents, please use the latest version (Release 07.00.00).

See the next section, “To obtain documentation”, for detailed information on how to obtain IMS Solution documentation.

To obtain documentation

IMS Solution and product documentation is available to IMS solution customers through OnLine Customer Support (OLCS).

To navigate OLCS, do the following:

1. Go to (https://support.lucent.com/portal/productIndexByCat.do).
2. After a successful login, select **Services Collaboration** from the list on the left side of the page.
3. Select **IMS Solutions** from the list in the middle of the page.

From here, you can access the documentation through either the **IMS Solution Level Documentation** section or by selecting a network element from the **Links to network elements in the IMS Solution** section.

2 New features

Overview

Purpose

This chapter lists the features included in Releases 07.00.05 and 07.01.00.

New features

Table 2-1 shows the new features in Releases 07.00.05 and 07.01.00.

Table 2-1 New features

Feature Number	Feature Title
13983.3	Support for 5350 IMR subscriber provisioning towards the USDS
13987.10	Interoperability between PC client and 5430 for Instant Messaging Services
13987.23	Integration testing of Phase 1 MIM 4.0 SP1
10928.367	Provisioning Flow-Through Performance Testing For Subscriber Provisioning Flows
33333.3	Solution: Early IMS security
33333.40	E2E regression testing of GSM/UMTS VCC *(Controlled Introduction)*
33333.44	E2E reliability for context aware solution (*Controlled Introduction*)

Feature Number	Feature Title
33333.57	RCS integration Phase 1
33333.59	VCC 8.0 dual mode service with CME *(Controlled Introduction)*
33333.65	E2E support for MMIM sessions using MSRP for endpoints beyond NAT/Firewall
33333.66	Interworking between XMPP and SIP/SIMPLE for Presence and IM
33333.69	E2E capacity and performance testing for IMS 7.1 - ECS
33333.70	Hosted NAT transversal for ECS
33333.165	E2E Testing VCC 8.0.2 for IMS 7.1 *(Controlled Introduction)*
33333.166	CPRS testing for VCC 8.0.2 in IMS 7.1 (*Controlled Introduction*)
55555.17	E2E support for ETSI ES 201 671 lawful intercept in IMS

Functionality

See the specific NE documentation for configuration information.

Enhancements

There are no non-feature enhancements in this release.

3 Test results

Overview

Purpose

This chapter provides information on test execution and pass rates.

Test results/exit criteria

The following table shows the results of the IMS 07.00.05 and 07.01.00 test program. See Table 6-1 for exceptions.

Table 3-1 NLT Test Results

Solution	Progress Rate	Quality (Pass Rate)	Exit Criteria Status (Reached/Not Reached)
Core Regression Test on IMS7.0.4	100%	98%	Reached
total	100%	98%	

Solution	Progress Rate	Quality (Pass Rate)	Exit Criteria Status (Reached/Not Reached)
ECS-Context Aware Feature test	100%	98.6%	Reached
ECS-Context Aware CPRS	100%	95%	Reached
ECS-VCC Feature test	100%	98.3%	Reached
ECS-VCC CPRS	83%	60%	Not Reached (See Table 6-1)

4 Changes to interfaces, alarms, and messages

Overview

Purpose

This chapter describes changes to interfaces, alarms, and messages in this release.

Interface changes

Changes to Northbound Interfaces

The following solution-level document describes the interface changes for IMS 07.00.00 Network Elements:

- *IP Multimedia Subsystem Release 7.0 Solution Interface Changes Specifications*, 275-100-050R7.0

Changes to Southbound Interfaces

There are no Southbound Interface changes in this release.

Alarm changes

See the 1300 XMC product documentation for alarm changes in this release.

Message changes

There are no new messages or changes to messages in this release.

5 Resolved issues

Overview

Purpose

This chapter describes customer-reported ARs and NLT-reported problems resolved in this release.

Resolved issues

This section lists resolved issues that were previously reported as *Known Issues* in Chapter 6.

There are no customer-reported ARs in this release. NLT-reported severity 1 and severity 2 issues that were reported open in IMS Release 07.00.03 have been closed in IMS Release 07.01.00.

6 Known issues

Overview

Purpose

This chapter describes NLT-reported issues that remain open in Releases 07.00.05 and 07.01.00.

Known issues and workarounds

Table 6-1 lists the severity 1 and 2 issues that were not resolved in the loads that are part of this release.

Table 6-1 NLT-Reported severity 1 and 2 open issues from IMS 07.00.03

NE to Lead	Resolve Rls	Fixed in Load	Current Status	Solution(s)	Exception Description	Impact Statement / Workaround
5450 AGCF	Under Investigation	AGCF511R1S3	Will validate in IMS7.4	pstn	Agcf rp server core dumps seen during unassignment of agw with 2000 lines	AGCF provisioning issue. AGCF can not unassign blocks of lines. Workaround = Must delete one line at a time or core dumps are seen.
5420 VCC	Under Investigation	JP1.4	On track	gsm/umts_vcc	MAS alarms are cleared after 5s even if problem remains	Alarms management inconsistent. Workaround will be introduced for IMS7.4

Table 6-2 NLT-Reported severity 1 and 2 open issues from IMS 07.01.00

NE to Lead	Resolve Rls	Fixed in Load	Current Status	Solution(s)	Exception Description	Impact Statement / Workaround
5420 VCC	IMS7.5	JP1.3.3	On track	gsm/umts_vcc	missing AVP session-id in ACR resent by the charging client	When disconnecting and reconnecting eCCF - VCC link, ACR resent are wrong (session Id) so not usable
5420 VCC	IMS7.5	JP1.3.3	On track	gsm/umts_vcc	Vendor-Specific-Application-Id AVP is not needed in charging client ACR	When disconnecting and reconnecting eCCF - VCC link, ACR resent are wrong (session Id) so not usable
5420 VCC	IMS7.5	VCC8.0.2	On track	gsm/umts_vcc	Call not maintained after switch over (481 for the BYE message)	Stable calls are dropped at non pilot blade switchover
MMIM	IMS8.4	MMIM5.0	On track	Planned for MMIM5.0	Routing Subscribe in NNI: PSI sent by MMIM doesn't comply with USDS requirement	User subscribing to the conference is not notified when a contact of an other domain is leaving the conference
5410 PS	IMS8.4	PS5.0	On track	ca_apps	Pb on fastcache : the agent doesn't have link to be connected to fast cache slave	Problem on the switchover of the non pilot blade K
5420 VCC	IMS7.5	VCC8.0.2	Under Investigation	ca_apps	Switchover of pilot blade doesn't work : agents are restarting => contexts lost	Switchover of pilot blade doesn't work => agents are restarting, registration context is lost
5410 PS	IMS8.4	JP1.3.5	On track	ca_apps	No alarm of overload on 5410-IAS-JP1.2.X	Workaround: Counters related to the overload must be monitored closely in customer networks. RDS 11060b
5410 PS	IMS8.4	JP1.3.5	On track	ca_apps	Incoming traffic rejected during switchover of the pilot blade JP1.2.1 (90s)	Switchover takes around 90 seconds, target is 15 seconds in JP1.3.3

7 System requirements

Overview

Purpose

This chapter describes IMS GUI Java dependencies and compatibility restrictions.

Software requirements

IMS GUIs JAVA Dependency

Table 7-1 shows IMS GUIs with Java installation dependencies (listed in order of installation sequence).

Table 7-1 IMS GUIs with Java installation dependencies

LCP MI GUI	Java installed per link provided during initial start of MI GUI (Java 1.5.0_06)
XMC GUI	Java installed per link provided during initial start of MI GUI (Java 1.5.0_15)
ICC GUI	Java installed per link provided during initial start of MI GUI (Java 1.5.0_15)

The following NE GUIs do not have Java dependencies: FS GUI (5420 CTS, 5450 ISC), OMC-P (Plexview), 8670 GUP, 5450 AGCF, 5900 MRF, 5420 PCM Platform.

SUN Operating System Patch Level for Non-Integrated Components

Table 7-2 shows the SUN OS patch level for non-integrated components

Table 7-2 SUN OS system patch level for non-integrated components

Network Element	OS Level
LSMS	Solaris 10 Generic_127111-09
5450 AGCF	Solaris 10 Generic_125101-10
VitalQIP Enterprise	Solaris 10 Generic_127111-09
VitalQIP DNS	Solaris 10 Generic_127111-09
OMC-P	Solaris 10 Generic_127111-09
BTS	Solaris 10 Generic_127111-09

Hardware requirements

There are no specific hardware requirements for this release.

Compatibility restrictions

Backward compatibility is supported for the IMS solution software upgrade sequence from IMS 06.01 to IMS 07.00.03. See the *Alcatel-Lucent Internet Protocol Multimedia Subsystem (IMS) Solution 07.00.00 Software Upgrade* document, 275-100-035R07.00.00, and specific NE documentation for more information. The specific upgrade path must be provided by each NE.

8 Installation and upgrade notes

Overview

Purpose

This chapter provides information on installation, upgrade procedures and security hardening.

Performing first-time installation

Contact your Alcatel-Lucent representative for first-time installation assistance.

5400 platform installation may vary depending on your system. Please contact your Alcatel-Lucent customer support team for more information and assistance.

Performing upgrades/paths

The following solution-level document describes the recommended installation and upgrade sequence for the IMS network elements:

- *Alcatel-Lucent Internet Protocol Multimedia Subsystem (IMS) Solution 07.00.00 Software Upgrade* 275-100-035R07.00.00

Security hardening

Security hardening procedures and information for IMS Release 07.00.00 NEs are on OLCS. Go to: https://services.support.lucent.com/services/, click on IMS Solutions, then

click on Security Hardening IMS Release 07.00.00. From this page, you can click on each NE for security hardening details.

A Release 07.01.00 Solution Document Impacts

Purpose

This appendix includes the Release 07.01.00-impacted sections of the *IMS Solution Technical Description* document.

The following features impact this solution document:

- 10928.367 - Provisioning Flow-Through Performance Testing For Subscriber Provisioning Flows (located on attached pages 3-18 - 3-20, 3-33 - 3-36, 3-38 - 3-39)
- 33333.57 - RCS integration Phase 1 (located on attached pages 3-43 - 3-44)
- 33333.59 - VCC 8.0 dual mode service with CME (located on attached pages 3-38 – 3-39)
- 33333.65 - E2E support for MMIM sessions using MSRP for endpoints beyond NAT/Firewall (located on attached pages 6-141- 6-142)
- 33333.66 - Interworking between XMPP and SIP/SIMPLE for Presence and IM (located on attached pages 6-143 – 6-146)
- 33333.70 - Hosted NAT transversal for ECS (located on attached pages 6-133 - 6-136)
- 33333.73 - VCC 8.0.1 service with CME (located on attached pages 2-25 – 2-26, 3-38 – 3-39, 9-2 – 9-4)
- 33333.165 - E2E Testing VCC 8.0.2 for IMS 7.1 (located on attached pages 6-111 – 6-127)

- 55555.17 - E2E support for ETSI ES 201 671 lawful intercept in IMS (located on attached pages 3-46 – 3-47)

eSM

Purpose

This topic describes the Enhanced Services Manager (eSM).

Important! This topic describes the eSM in the IMS context. Products and functions that are supported by the eSM outside the IMS context are not described.

Functions

The eSM is an operations, administration, management, data manipulation, and provisioning platform for multiple products.

The eSM is the provisioning system for 1440 USDS, 5400 ISG, 8615 IeCCF, and VitalQIP service data.

The eSM provides a central staging environment for collecting, managing, and distributing service data to network elements.

The eSM offers the following functionality:

- Configuration management
  Configure service data on the supported network elements and for the supported services.
- Performance management
  View performance monitoring and operational statistics for provisioning that occurs through the eSM.
- Security management
  User authentication and authorization.

Supported hardware platforms

The eSM is supported on the following hardware platforms:

- RX6600
- RX8640

Rich Communication Suite

What is RCS?

Starting with IMS Release 7.1, the Alcatel-Lucent IMS architecture is compatible with Rich Communication Suite (RCS) 1.0.

RCS is an industry effort focused on the use of IMS for enabling mobile phones with rich communication.

Services

RCS phase 1.0 provides the following services:

- Enhanced Address Book: Presence information integrated into the phonebook interface.
- File transfer as in Open Mobile Alliance (OMA) Instant Messaging (IM) SIMPLE 1.0.
- Converged Messaging:
  - Messaging functionality based on OMA IM SIMPLE 1.0. Pager Mode with client-based legacy interworking.
  - Use of Large Message Mode peer-to-peer as in OMA IM SIP SIMPLE 1.0.
  - Ad hoc group messaging session as in OMA IM SIP SIMPLE 1.0
- Content Sharing:
  - Video Share
  - Image Share

Capabilities

RCS provides the following capabilities:

- Wide and large-scale IMS deployment
- Inter-operability between different terminal vendor RCS clients
- RCS service inter-working between operators

Supported application servers

The Alcatel-Lucent RCS is supported by the following application servers:

- 5410 PS
- 5410 XDMS
- 5430 MMIM

Supported clients and terminals

The Alcatel-Lucent RCS is supported by the 5440 PC Client.

The Alcatel-Lucent RCS solution is inter-operable with RCS phase 1.0 compliant terminals.

References

Refer to the 5410 PS, 5410 XDMS, 5430 MMIM, and 5440 PC Client product descriptions.

Supported interfaces

The eSM supports the following interfaces:

Interface	between...	and...
CORBA (service data provisioning)	eSM	Southbound MiLife Application Server elements: • 1440 USDS • 5400 ISG • 8615 IeCCF
SOAP/XML	eSM	VitalQIP ENUM (southbound)
CORBA or SOAP/XML	eSM	• Northbound upstream provisioning clients • 8950 SAM (northbound)

Supported northbound systems

The 8950 SAM supports the eSM for subscriber and interface provisioning.

Supported southbound network elements

The eSM supports the following southbound products:

- MiLife Server-based products:
  - 1440 USDS
  - 5400 ISG

    In IMS 6.1 and 7.1, the eSM provides configuration management (subscriber data provisioning) functionality for the 5400 ISG. In IMS 7.0, the 5400 ISG non-subscriber data was provisioned locally.
  - 8615 IeCCF
- 5420 VCC
  The eSM supported 5420 VCC (via the 1440 USDS) in IMS release 6.x. The 8670 GUP supported 5420 VCC (via the 1440 USDS) in IMS release 7.0. The eSM supports 5420 VCC via the 1440 USDS for IMS release 7.1.
- VitalQIP ENUM
  The eSM supported VitalQIP ENUM in IMS release 6.x and prior. The eSM supports VitalQIP ENUM for IMS release 7.1.

Charging

The eSM does not perform charging.

Product documentation

For details on the eSM, refer to *Enhanced Services Manager (eSM) Introduction,* 270-720-330.

5420 VCC

Purpose

This topic describes the 5420 Voice Call Continuity (5420 VCC).

Functions

The 5420 VCC is an application server that provides Voice Call Continuity services. Voice Call Continuity allows a user to roam between an IMS (Wifi) network and a GSM network using a single handset. The handset is capable of connecting to both networks.

The 5420 VCC provides the following functions:

- Deliver calls depending on presence
  When the user has WiFi coverage, an incoming call is delivered to the IMS network.
- Handover calls between GSM network and WiFi network
  When the users moves from a GSM network into WiFi coverage, the call is handed over from GSM to IMS.

The 5420 VCC also supports the following functionality:

Call anchoring functionality

Regardless of the network that the user is connected to, the IMS controls the call. Control by IMS is provided by “anchoring”. Anchoring forces GSM originating and GSM terminating calls through the IMS.

In IMS 7.1, the anchoring decision also takes into account the emergency number and the call type. The 5420 VCC also offers the possibility of rerouting the call in case of non-availability of the IMS domain. As an option, location information can be provided to an AS in the operator network.

Fixed mobile convergence functionality

The 5420 VCC in IMS 7.1 provided capabilities supporting fixed mobile convergence. Users can roam freely between a broadband fixed network in an office or residence and a mobile network using one mobile phone number. A wireline phone (business desk phone in a centrex group or a home phone) or a PC on the broadband fixed network is treated as an extension of the mobile phone and is accessed through extension dialing.

This is an important added value that allows service providers to compete aggressively against free internet calling services which requires a second number to be assigned to the PC. The fixed mobile convergence capabilities of the 5420 VCC enable users to make and receive calls on their mobile phone or PC using the same phone number.

Supported hardware platforms

The 5420 VCC runs on an ATCA-based platform, the 5400 IAS.

Supported interfaces

The 5420 VCC supports the following interfaces:

Interface	between...	and...
FTP (performance management)	5400 IAS/5420 VCC	northbound systems
ISC	5420 VCC	S-CSCF
Ma	5420 VCC	I-CSCF
Rf	5400 IAS/5420 VCC	8615 IeCCF
Rp	5420 VCC	1440 USDS
Sh	5420 VCC	8650 SDM
SNMP (fault management)	5400 IAS/5420 VCC	northbound systems

Supported northbound network elements

An SNMP northbound interface is provided by the 5400 IAS platform. The 5400 IAS also stores measurements for the 5420 VCC application.

The 5400 IAS stores records that are retrieved using FTP or transferred using the Rf interface.

In IMS 7.x and 6.x, the user profile data for 5420 VCC was stored in the 1440 USDS and therefore the 5420 VCC was not provisioned with per subscriber data. The per subscriber data needed by the 5420 VCC was provisioned on the 1440 USDS. The eSM supported 5420 VCC (via the 1440 USDS) in IMS release 6.x. For IMS 7.0, the 8690 GUP had an Rp interface to 1440 USDS for subscriber provisioning. For IMS 7.1, the eSM supports 5420 VCC via the 1440 USDS.

Charging

Records are stored on the 5400 IAS and can be retrieved by an external system using FTP.

The 5420 VCC has an Rf interface to 8615 IeCCF for offline charging.

Product documentation

For details on the 5420 VCC, refer to *Alcatel-Lucent 5420 Voice Call Continuity Reference Guide,* 270-705-002.

5410 PS

Purpose

This topic describes the 5410 Presence Server (PS).

Functions

The 5410 PS is a SIP application server in the IMS reference model.

The following services are provided by the 5410 PS:

- Presence services in accordance with the Open Mobile Alliance Presence Model
- Interoperability between servers and devices for managing user presence information
- Service enabler for other services which can retrieve presence information to enhance a service

The 5410 PS provides the following functions:

Functions	Description
PS	Collects presence information from presentities and notifies watchers. A presentity is a person, service, or device that publishes presence information to a presence server. A watcher requests presence information from a presence server, it provides requested information to watcher
Resource List Server	Manages subscriptions to presence lists (resource-lists), which enables a watcher application to subscribe to the presence information of multiple presentities using a single subscription transaction.
Access control	Applies presence rules. Presence rules define access policies for subscriptions.
Presence Network Agent (PNA)	Collects presence information from network equipment.
Presence User Agent (PUA)	Collects presence information about presentity.

Supported hardware platforms

The 5410 PS runs on the 5400 Advanced Telecommunications Computing Architecture (ATCA) platform and HP DL380.

Supported interfaces

The 5410 PS supports the following interfaces:

Interface	between...	and...
ISC	S-CSCF	5410 PS
Ma	I-CSCF	5410 PS
Pen (SIP)	PNA	5410 PS
Peu (SIP)	PS	PUA
SNMP (fault management, performance management)	5410 PS	1300 XMC

Supported northbound systems

The 1300 XMC provides fault management and performance management functionality for the 5410 PS.

The 5410 PS is managed using a GUI. This interface is based on the 5400 IAS GUI. The 5410 PS provides an additional GUI, which is integrated in the 5400 IAS GUI.

Charging

The 5410 PS does not support charging.

Product documentation

For details on the product and a full list of Presence-related specifications, refer to *Alcatel-Lucent 5410 Presence Server Reference Guide,* 3BL 76751 0401 RKZZA.

1357 ULIS

Purpose

This topic describes the 1357 Unified Lawful Interception Suite (ULIS).

Functions

The 1357 ULIS supports lawful interception of telecommunication networks. It provides government authorities or law enforcement agencies (LEAs) and service providers with a complete system for transparently intercepting and extracting real-time information from voice, data, and multimedia communications over virtually any type of network.

The 1357 ULIS performs the interception mediation function between a service provider's network and LEAs. The 1357 ULIS is compliant with lawful interception standards worldwide.

The 1357 ULIS provides LEAs with:

- Intercept-related information (IRI) – signaling information that provides the source and destination of a call, as well as supplementary data, such as date and time of events and the interception reference.
- Content of communication - voice, fax, data, video or message contents carried on a speech channel, or information exchanged on a high-speed Internet access link.

The 1357 ULIS provides the following features:

- A unique interception management center (IMC), which handles the lawful interception administration function
- Centralizes the management of all lawful interception (IRI) orders, particularly warrants activation or deactivation
- Single management across all network domains

The 1357 ULIS performs the following functions:

- Warrant handling
- Interception related information mediation function
- CC triggering function
- CC mediation function
- Multi-administration to allow flexible configuration deployment options

The 1357 ULIS supports the following ETSI standards towards legal agencies:

- 102232.5
- 201671 (IMS 7.1 and later)

Supported hardware platforms

The 1357 ULIS runs on the IMC server on the Red Hat Linux platform.

Supported interfaces

The 1357 ULIS supports the following interfaces.

Interface	between...	and...
X1	1357 ULIS (IMC)	5450 ISC
SNMP	1357 ULIS (IMC & LIG)	northbound system trap manager
X2	1357 ULIS (LIG)	5450 ISC
X3-Bearer	1357 ULIS (LIG)	5900 MRF

Supported northbound systems

The workstation LIG Manager provides fault management, configuration management, and performance management functionality.

Supported products

The 1357 ULIS supports the 5450 ISC along with several equipments in different intercepted networks such as NGN, IMS, and IP.

Charging

The 1357 ULIS does not perform charging functions.

Product documentation

For details on the 1357 ULIS, refer to *Feature Description 1357 ULIS Lawful Interception - 1357 IP Access LI Solution,* 3BW37730LLAAFDZZA.

5420 VCC call flows

Overview

Purpose

This section provides message flows for 5420 VCC call scenarios.

Contents

5420 VCC - Originating call anchoring scenario for a registered user

Purpose

This topic describes an originating call anchoring scenario for a registered user.

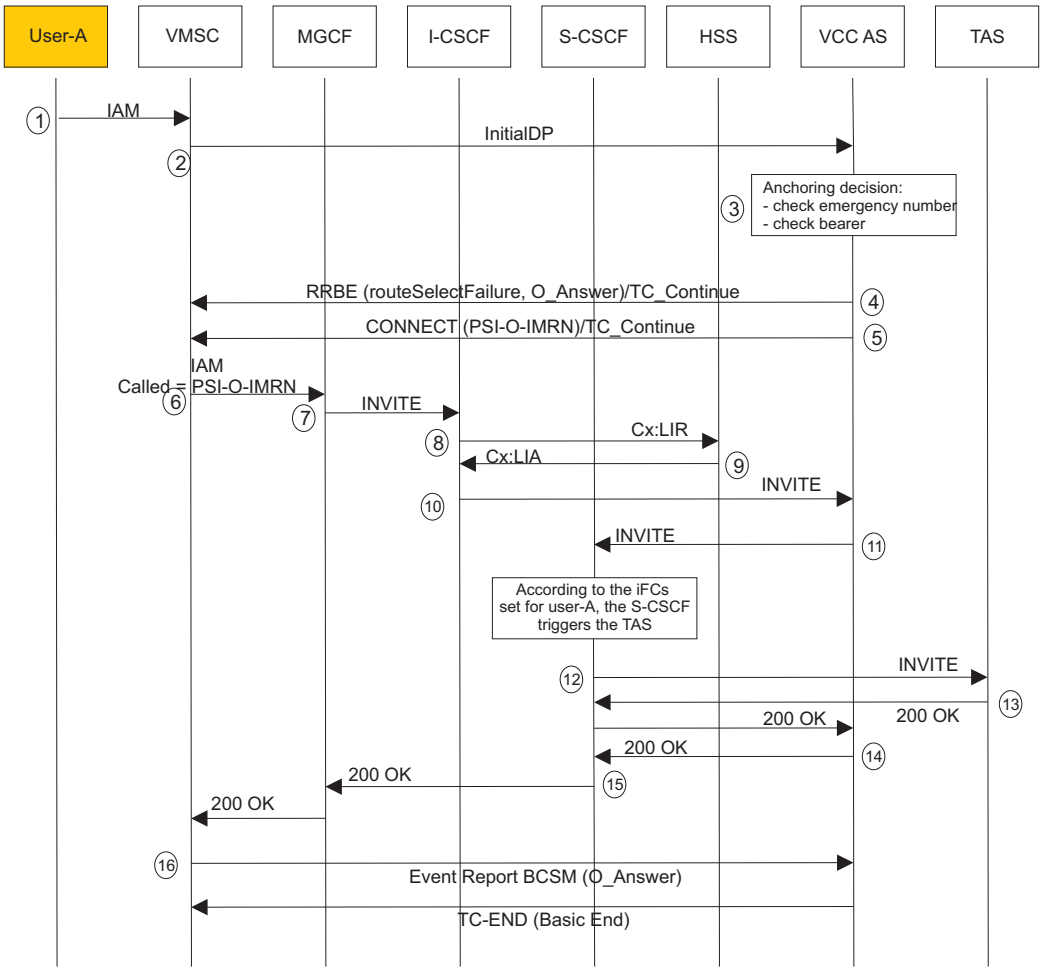
Prerequisites

The following parameters are set for an originating call anchoring scenario for a registered user:

- "No forced routing to IMS for emergency number" parameter is set to **`true`**, and "a pre-defined list of emergency numbers" is configured.
- "A list of bearers not routed to IMS domain for originating call" is configured.
- "CAP location information retrieval and forward" parameter is set to **`true`**.
- "Dynamic rerouting in case of non-availability of the IMS domain for originating calls" parameter is set to **`true`**.

Registration message flow

The following message flow describes an originating call anchoring scenario for a registered user:



Registration message flow description

The following description provides the stages for an originating call anchoring scenario for a registered user:

1 An **`initial address message`** (IAM) from user-A to user-B is sent to the visited master switching center (VMSC).

The IAM is sent via MSISDNs of the user equipments (UE).

2 The VMSC forwards the **`InitialDP`** (IDP) message to the VCC AS.

3 The VCC AS retrieves user-A's profile and compares the mscAddress parameter with the following parameters:

If...	then...
the user-A is not located in the home public land mobile network (HPLMN)	the emergency number check is not performed, as the emergency call is treated only in the HPLMN of the user.
the user-A is located in the HPLMN	the VCC AS compares the destination number and does not recognize the number as an emergency number, as the parameter "No forced routing to IMS for emergency numbers" is set to **true**.

The VCC-AS then compares the bearer and the bearer type should not match with none of the values in the list related to the originating call as the parameter "A list of bearers not routed to IMS domain for originating call" is set.

The call is anchored by the VCC AS. The VCC AS allocates an IP Multimedia Routing Number (IMRN) and associates the MSISDN-A and MSISDN-B with this IMRN. The VCC AS stores the location information and the MSC (multiple switching center) address.

4 The VCC-AS forwards the **RRBE (routeSelectFailure_O_Answer)** message to the VMSC to detect the IMS domain dynamically.

5 The VCC AS then sends the **CONNECT (PSI-O-IMRN/TC-CONTINUE)** message to the VMSC.

6 The VMSC forwards the IAM with **IMRN (PSI-O-IMRN)** message to the MGCF.

7 The MGCF forwards the **INVITE** message to the I-CSCF.

8 Using a **Cx:LIR** message, the I-CSCF sends a query to the HSS.

9 The HSS sends a reply to the I-CSCF with the address of the VCC AS through the **Cx:LIA** message.

10 The I-CSCF forwards the **INVITE** message to the VCC-AS.

11 The VCC-AS retrieves the stored MSISDN of user-A according to the received **PSI-O-IMRN** message. The VCC-AS also retrieves the location information and MSC address parameters and sends an **INVITE** message to the S-CSCF.

12 The S-CSCF checks the iFCs of user A and forwards the **INVITE** message to the TAS.

13 The TAS forwards a `200 OK` to the S-CSCF.

14 The S-CSCF forwards a `200 OK` to the VCC-AS.

15 The MGCF forwards the `ANM` (ISUP message) from the S-CSCF to the VMSC

16 The VMSC generates an **Event Report BSCM (O_Answer)** message and forwards the message to the VCC-AS. The VCC AS sends a `TC-End (Basic End)` message.

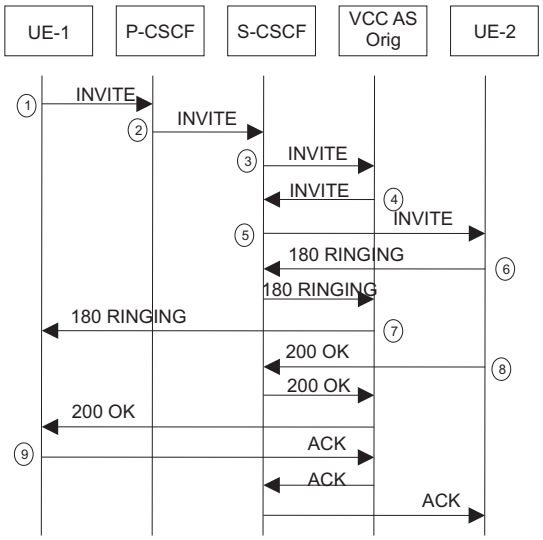
5420 VCC - Call setup originating (WiFi)

Purpose

This topic describes an originating call over a WiFi network between a UE and a 5420 VCC AS.

Originating message flow

The following flow describes an originating call over a WiFi network:



Originating message flow description

The following description provides the stages in the call origination from a UE to a 5420 VCC AS over a WiFi network:

1 UE-1 sends an **INVITE** message to the P-CSCF.

2 The P-CSCF forwards the **INVITE** message to the S-CSCF.

3 The S-CSCF forwards the **INVITE** message to the 5420 VCC AS.

4 The 5420 VCC AS checks for the following criteria:

If...	then...
UE-1 is allowed to originate the call over the WiFi connection	An **INVITE** message is sent to the S-CSCF.
UE-1 is not allowed to originate the call over the WiFi connection	A **REJECT** message is sent to the S-CSCF to terminate the call.

5 The S-CSCF sends an **INVITE** message to UE-2.

6 If UE-2 is available, it responds with a `180 RINGING` message.

7 The `180 RINGING` message is forwarded to the UE-1.

8 A `200 OK` message is forwarded from UE-2 to UE-1, once the call is received by UE-2.

9 An `ACK` message is sent from UE-1 to UE-2, to acknowledge the receipt of the call by UE-2.

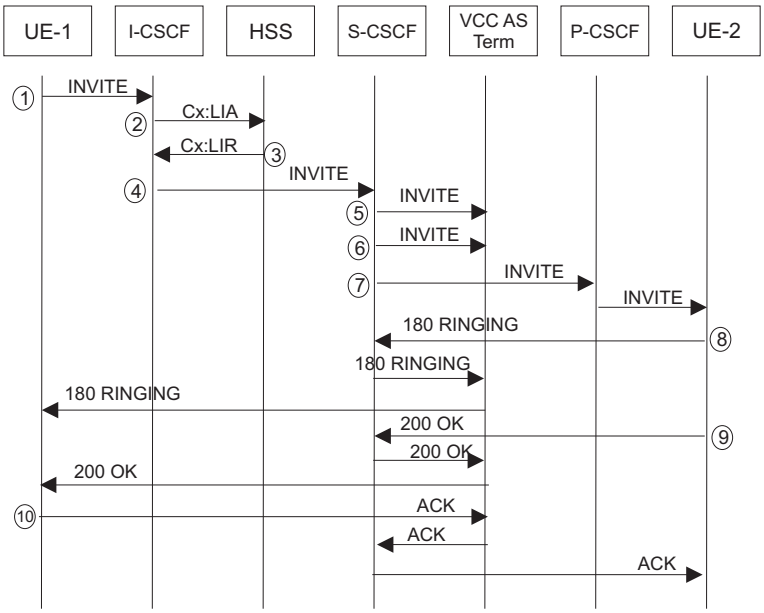
5420 VCC - Call setup terminating (Wifi)

Purpose

This topic describes a terminating call in a WiFi network between a 5420 VCC AS and an IMS UE

Terminating message flow

The following flow describes a terminating call in a WiFi network:



Terminating message flow description

Note: It is assumed that the call has been initiated.

The following description provides the stages of the call terminating from a 5420 VCC AS to an IMS UE in a WiFi network:

1 UE-1 forwards the **`INVITE`** message to the I-CSCF

2 Using a **`Cx:LIR`** message, the I-CSCF sends a query to the HSS to find the S-CSCF of the terminating subscriber.

3 The HSS sends a reply to the I-CSCF with the terminating subscriber's information through the **`Cx:LIA`** message.

4 The I-CSCF forwards the **INVITE** message to the S-CSCF.

5 The S-CSCF determines the 5420 VCC AS (Term) of UE-1 and forwards the **INVITE** message to the 5420 VCC AS (Term).

6 The 5420 VCC AS performs the following:

If...	then...
UE-2 is registered	An **INVITE** message is sent to the VCC ID of UE-1.
UE-2 is not registered	A **REJECT** message is sent to UE-1 terminating the call.

7 The **INVITE** message is forwarded to UE-2 through the P-CSCF

8 UE-2 responds with a `180 RINGING` message

9 The `180 RINGING` message is sent to UE-1 to alert it.

10 A `200 OK` message is forwarded from UE-2 to UE-1, once the call is received by UE-2

11 An `ACK` message is sent from UE-1 to UE-2 , to acknowledge the receipt of the call by UE-2.

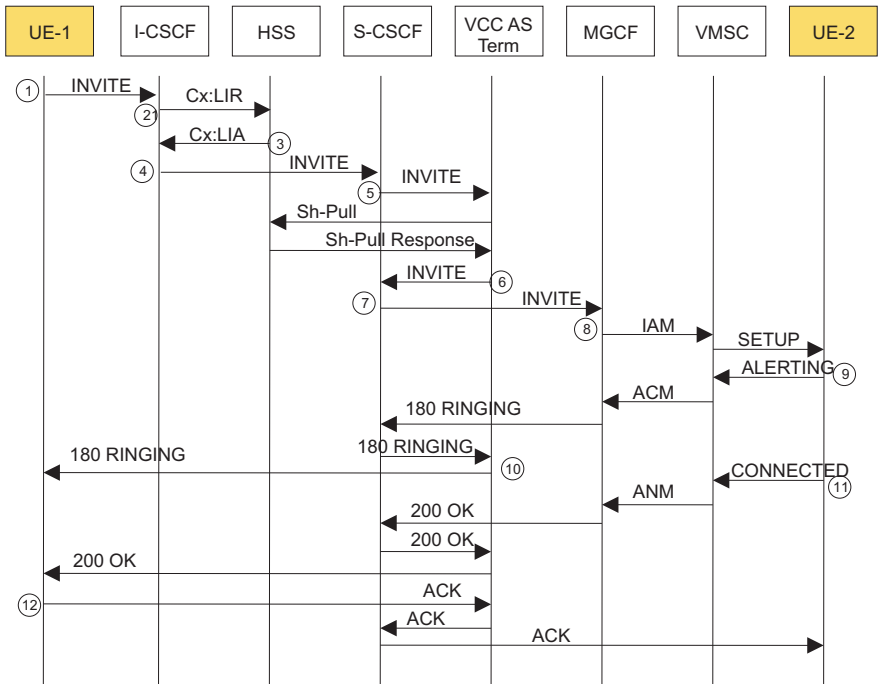
5420 VCC - Call setup terminating for an unregistered user (GSM)

Purpose

This topic describes a call terminating in a GSM UE for an unregistered WiFi user.

Terminating message flow

The following flow describes a terminating call in a GSM UE for an unregistered WiFi user:



Terminating message flow description

Note: It is assumed that the call has been initiated.

The following description provides the stages for a call terminating on a GSM UE for an unregistered WiFi user:

1 An **INVITE** message is forwarded to the I-CSCF by UE-1.

2 Using a **Cx:LIR** message, the I-CSCF sends a query to the HSS to find the S-CSCF of the terminating subscriber.

3 The HSS sends a reply to the I-CSCF with the terminating subscriber's information through the **Cx:LIA** message.

4 The I-CSCF forwards the **INVITE** message to the S-CSCF.

5 The S-CSCF determines the 5420 VCC AS (Term) of UE-1 and forwards the **INVITE** message to the 5420 VCC-AS (Term).

6 The 5420 VCC AS performs the following:

If...	then...
UE-2 is registered	An **INVITE** message is sent to the S-CSCF.
UE-2 is not registered	A **REJECT** message is sent to UE-1 terminating the call.

7 The S-CSCF forwards the **INVITE** message to the MGCF in the GSM network.

8 The MGCF translates the **INVITE** message to a **IAM** GSM message. The **IAM** GSM message is forwarded to UE-2 through VMSC.

9 UE-2 responds with a `180 RINGING` message.

10 The `180 RINGING` message is forwarded to the UE-1.

11 A `200 OK` message is forwarded from UE-2 to UE-1, once the call is received by UE-2.

12 An `ACK` message is sent from UE-1 to UE-2 , to acknowledge the receipt of the call by UE-2.

5420 VCC - Handover WiFi to GSM (inward)

Purpose

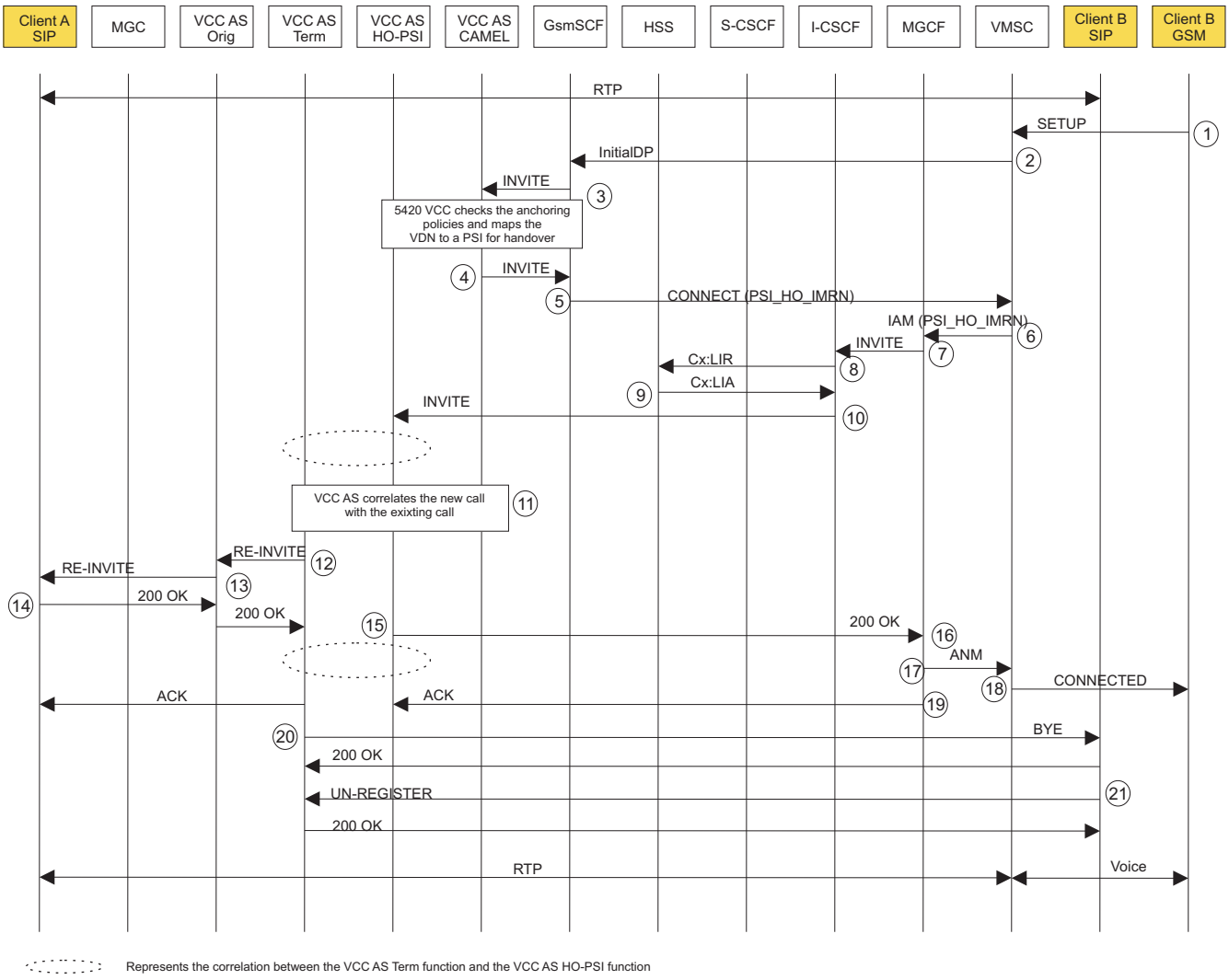
This topic describes a handover of an ongoing call from a WiFi network to a GSM network.

Description

The handover of an ongoing call from a WiFi network to a GSM network is called an inward scenario as the UE initiates a WiFi call to a preconfigured 5420 VCC domain transfer number (VDN).

Handover GSM to WiFi (inward) call flow

The following flow describes a handover WiFi to GSM (inward call):



Handover WiFi to GSM (inward) call flow description

The following description provides the stages for handover WiFi to GSM (inward) call flow:

1 When the WiFi signal strength crosses a certain threshold value, UE-2 initiates a call to a pre-configured alternative subscriber-specific number.

2 The VMSC forwards the **`InitialDP`** message with the VDN and the calling party number parameter to the gsmSCF.

3 The gsmSCF forwards the **INVITE** message to the 5420 VCC AS with the called party number, calling party number, call type and number types parameters.

4 The 5420 VCC AS (CAMEL) checks the anchoring policies and identifies the calling number as a VDN and returns an IMRN. This IMRN is used to route the call to the correct 5420 VCC AS. The 5420 VCC AS (CAMEL) forwards the **INVITE** message to the gsmSCF.

5 The gsmSCF forwards the **CONNECT (PSI_HO_IMRN)** message to the VMSC.

6 On receipt of the IMRN number, the VMSC initiates a call and forwards the **IAM (PSI_HO_IMRN)** message to the MGCF.

7 The MGCF forwards the **INVITE** message to the I-CSCF.

8 Using a **Cx:LIR** message, the I-CSCF sends a query to the HSS to find the S-CSCF of the terminating subscriber.

9 The HSS sends a reply to the I-CSCF with the terminating subscriber's information through the **Cx:LIA** message.

10 The I-CSCF forwards the **INVITE** message to the 5420 VCC AS (HO-PSI).

11 The 5420 VCC AS (HO-PSI) determines that there is an ongoing call and correlates the new call with this ongoing call.

12 A **RE-INVITE** message is sent to the 5420 VCC AS (Orig) when the two calls are correlated.

13 The **RE-INVITE** message is forwarded to UE-1.

14 UE-1 responds with a `200 OK` message which is forwarded to 5420 VCC-AS (Orig).

15 The `200 OK` message is forwarded to the MGCF within the GSM network through the 5420 VCC AS (HO-PSI).

16 The GSM connection is confirmed when the MGCF receives the `200 OK` message from the 5420 VCC AS (HO-PSI).

17 The MGCF forwards an **ANM** message to the VMSC.

18 The VMSC forwards a GSM **CONNECTED** message to UE-2.

19 The MGCF forwards an **ACK** message to UE-1 through 5420 VCC AS (HO-PSI) and 5420 VCC AS (Orig).

20 When the 5420 VCC AS (HO-PSI) of UE-2 receives the `ACK` message, it releases the call by sending a `BYE` to the SIP soft client part of UE-2.

21 UE-2 responds with an `UN-REGISTER` request to the 5420 VCC-AS to stop the handover.

5420 VCC - Handover GSM to WiFi (inward)

Purpose

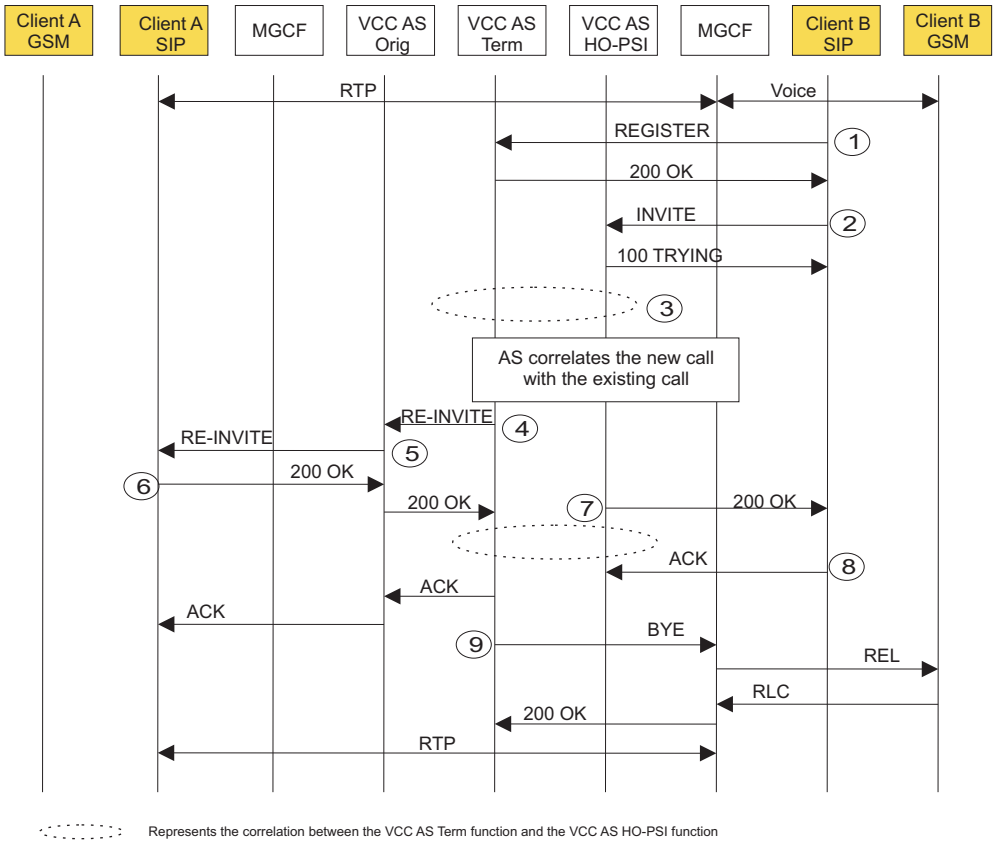
This topic describes a handover of an ongoing call from a GSM network to a WiFi network.

Description

The handover of an ongoing call from a GSM network to a WiFi network is called an inward scenario when the UE initiates a GSM call to a preconfigured 5420 VCC domain transfer number (VDN).

Handover GSM to WiFi (inward) message flow

The following flow describes a handover GSM to WiFi (inward call):



Handover GSM to WiFi (inward) message flow description

The following description provides the stages for handover GSM to WiFi (inward) message flow:

1 When the WiFi signal strength crosses a certain threshold value, the UE-1 registers in the IMS network by sending a **REGISTER** to the 5420 VCC AS (Term).

2 After registration, the UE-1 initiates a call to a preconfigured alternative subscriber-specific number. The **INVITE** message is forwarded to the 5420 VCC AS (HO-PSI).

3 The 5420 VCC-AS (HO-PSI) determines that there is an ongoing call and co-relates the new call with this ongoing call.

4 After the calls are correlated, a **RE-INVITE** message is sent to the 5420 VCC AS (Orig) from 5420 VCC AS (Term).

5 The 5420 VCC AS (Orig) forwards the **RE-INVITE** message to UE-1.

6 UE-1 responds with a `200 OK` message to the 5420 VCC AS (Orig).

7 The 5420 VCC AS (Orig) forwards the `200 OK` response to the UE-2 through the 5420 VCC AS (HO-PSI).

8 UE-2 forwards an `ACK` message to the 5420 VCC AS (HO-PSI).

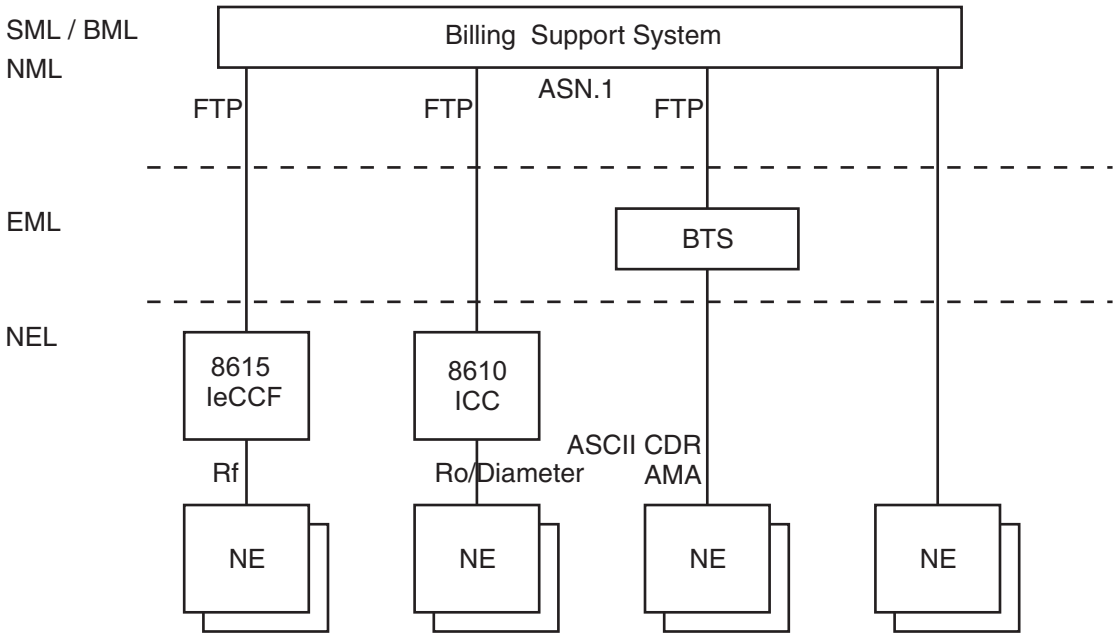
9 The 5420 VCC AS (HO-PSI) forwards the `BYE` message to UE-2.

Accounting management overview

Purpose

This topic provides an overview of the accounting management systems and network elements in the IMS solutions.

Accounting management architecture



Supported accounting management systems

The supported accounting management systems are shown in the following table:

EMS	Supported network elements	Supported southbound interfaces (EMS-NE)	Supported northbound interfaces (EMS-BSS)
8610 ICC (online charging)	IMS - Gateway Function (5450 ISC/IRC) 5430 PtX	Ro/Diameter	FTP

EMS	Supported network elements	Supported southbound interfaces (EMS-NE)	Supported northbound interfaces (EMS-BSS)
8615 IeCCF (off line charging)	5420 CTS	Rf (ACR/Diameter)	FTP
	5420 VCC		
	5430 PtX		
	5450 ISC		
BTS	5020 MGC-8	Rf (Diameter)	FTP

The following products send charging information directly to the Billing Mediation System:

- 5020 MGC-12 - Q.825 (ASN.1)/sFTP
- 5060 MGC-10 - Q.825 (TLV)/sFTP
- 5100 CMS - ASCII/FTP
- Acme Net Net Session Director

5420 VCC

Purpose

This topic describes the 5420 Voice Call Continuity (5420 VCC).

Functions

The 5420 VCC is an application server that provides Voice Call Continuity services. Voice Call Continuity allows a user to roam between an IMS (Wifi) network and a GSM network using a single handset. The handset is capable of connecting to both networks.

The 5420 VCC provides the following functions:

- Deliver calls depending on presence
  When the user has WiFi coverage, an incoming call is delivered to the IMS network.
- Handover calls between GSM network and WiFi network
  When the users moves from a GSM network into WiFi coverage, the call is handed over from GSM to IMS.

The 5420 VCC also supports the following functionality:

Call anchoring functionality

Regardless of the network that the user is connected to, the IMS controls the call. Control by IMS is provided by “anchoring”. Anchoring forces GSM originating and GSM terminating calls through the IMS.

In IMS 7.1, the anchoring decision also takes into account the emergency number and the call type. The 5420 VCC also offers the possibility of rerouting the call in case of non-availability of the IMS domain. As an option, location information can be provided to an AS in the operator network.

Fixed mobile convergence functionality

The 5420 VCC in IMS 7.1 provided capabilities supporting fixed mobile convergence. Users can roam freely between a broadband fixed network in an office or residence and a mobile network using one mobile phone number. A wireline phone (business desk phone in a centrex group or a home phone) or a PC on the broadband fixed network is treated as an extension of the mobile phone and is accessed through extension dialing.

This is an important added value that allows service providers to compete aggressively against free internet calling services which requires a second number to be assigned to the PC. The fixed mobile convergence capabilities of the 5420 VCC enable users to make and receive calls on their mobile phone or PC using the same phone number.

Supported hardware platforms

The 5420 VCC runs on an ATCA-based platform, the 5400 IAS.

Supported interfaces

The 5420 VCC supports the following interfaces:

Interface	between...	and...
FTP (performance management)	5400 IAS/5420 VCC	northbound systems
ISC	5420 VCC	S-CSCF
Ma	5420 VCC	I-CSCF
Rf	5400 IAS/5420 VCC	8615 IeCCF
Rp	5420 VCC	1440 USDS
Sh	5420 VCC	8650 SDM
SNMP (fault management)	5400 IAS/5420 VCC	northbound systems

Supported northbound network elements

An SNMP northbound interface is provided by the 5400 IAS platform. The 5400 IAS also stores measurements for the 5420 VCC application.

The 5400 IAS stores records that are retrieved using FTP or transferred using the Rf interface.

In IMS 7.x and 6.x, the user profile data for 5420 VCC was stored in the 1440 USDS and therefore the 5420 VCC was not provisioned with per subscriber data. The per subscriber data needed by the 5420 VCC was provisioned on the 1440 USDS. The eSM supported 5420 VCC (via the 1440 USDS) in IMS release 6.x. For IMS 7.0, the 8690 GUP had an Rp interface to 1440 USDS for subscriber provisioning. For IMS 7.1, the eSM supports 5420 VCC via the 1440 USDS.

Charging

Records are stored on the 5400 IAS and can be retrieved by an external system using FTP.

The 5420 VCC has an Rf interface to 8615 IeCCF for offline charging.

Product documentation

For details on the 5420 VCC, refer to *Alcatel-Lucent 5420 Voice Call Continuity Reference Guide,* 270-705-002.

Charging in IMS

Purpose

This topic describes general charging principles in IMS.

Introduction to IMS charging

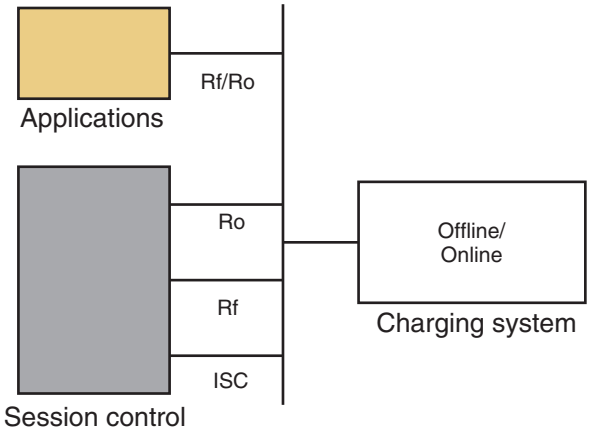
The IMS charging architecture provides interfaces and components needed to support online and offline charging for these elements.

In the IMS architecture, the following network elements generate charging information:

- P-CSCF
- I-CSCF
- S-CSCF
- MGCF
- BGCF
- Third-party application servers
- 5420 CTS
- 5420 VCC

Reference diagram

The IMS charging architecture:



Types of charging

The following types of charging are used in IMS:

- Offline charging
- Online charging

Offline charging

For offline charging, the IMS charging architecture provides the Charging Collection Function (CCF) and Charging Gateway Function (CGF). CCF and CGF collect session charging information from the various network elements using the Diameter Rf protocol.

Online charging

For online charging, the Diameter Ro interface provides the interface between the IMS network elements and the Online Charging System (OCS).

General CCF functions

The CCF provides the following functions in an IMS network:

- Collection of charging information from the IMS network elements using the Rf interface
- Encoding of charging detail records (CDRs)
  A CCF generates CDRs for the call and session information received from the IMS network elements. A CCF creates ASN.1-based CDRs per 3GPP standards.
- Support for FTP
  FTP is the primary protocol used by billing systems to pull CDRs from a CCF.
- Storage of CDRs
- Interfaces to various billing systems such as the Billing Mediation Device (BMD) using FTP

Off-line charging in IMS

Purpose

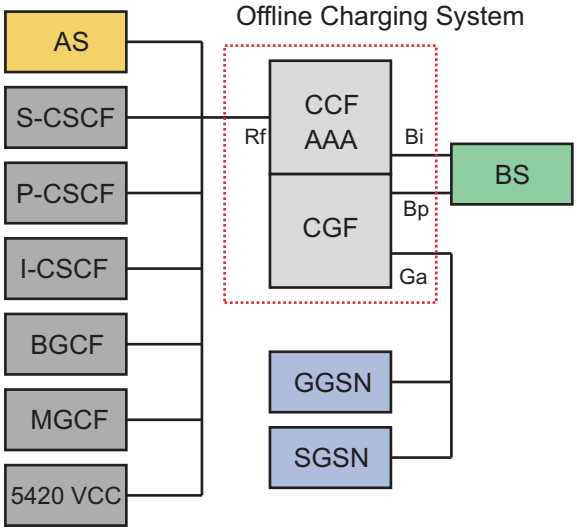
This topic describes off-line charging principles in IMS.

Off-line charging

For off-line charging, the IMS charging architecture provides the Charging Collection Function (CCF) that collects session charging information from the various network elements via the Diameter Rf protocol.

Reference diagram

The Alcatel-Lucent IMS off-line charging architecture is shown in the following diagram:



Product mapping

Products for off-line charging are shown in the following table:

Product	Function
8615 IeCCF	Instant Charging Collection Function
BTS	Billing Mediation Device (BMD) for 5020 MGC-8
5450 ISC	Provides charging information to CCF

Hosted NAT traversal for ECS

Purpose

This topic describes the hosted network address translation (NAT) traversal and the hosted NAT traversal for Enhanced Conversational Services (ECS).

Introduction

Hosted Network address translator (NAT) traversal is an application which functions with the support of 5450 ISC/IRC. The hosted NAT traversal helps to deliver VOIP services without territorial boundaries. The application resides at the point of demarcation between the user's private domain and the public broadband domain. The application supports the IP address preservation and the security functions by assigning private addresses for end points and devices on the private domain, and a single public IP address to the firewall.

Access border configurations for hosted NAT traversal

Following are the two access border configurations for hosted NAT traversal:

1. Alcatel-Lucent decomposed border solution comprised of Fortinet as firewall, 5450 ISC/IRC containing the SPDF, I-CSCF, P-CSCF, S-CSCF, and the 7510 BGF
2. ACME integrating firewall, SPDF, and BGF

Support for hosted NAT traversal

The P-CSCF provides the required features to support the hosted NAT traversal.

During the far-end NAT traversal, the P-CSCF recognizes the far-end NAT, and adds the required **`received`** and **`rport`** parameters to the source IP address and the port of the packet header. When using TCP, the SIP opens a TCP connection to send a transactional request and reuses the same TCP connection to send responses. Upon detecting the presence of far-end NAT on the signaling path, the P-CSCF allows all SIP requests and responses over the single TCP connection established by the UE.

The NAT policy states that the TCP connections should be closed after a period of inactivity. SIP signaling cannot be relied upon to keep alive connections as the SIP entities can sometimes have no signaling traffic for long periods of time. In such cases, the P-CSCF can modify the registration timer between the UE and the P-CSCF to an interval shorter than NAT's inactivity period. This change in registration timer forces the UE to re-register more frequently, keeping the TCP connection alive. In addition to keeping the TCP connection alive, the **`PUBLISH`** refresh timer in the UE can also be modified to an interval shorter than NAT's inactivity period.

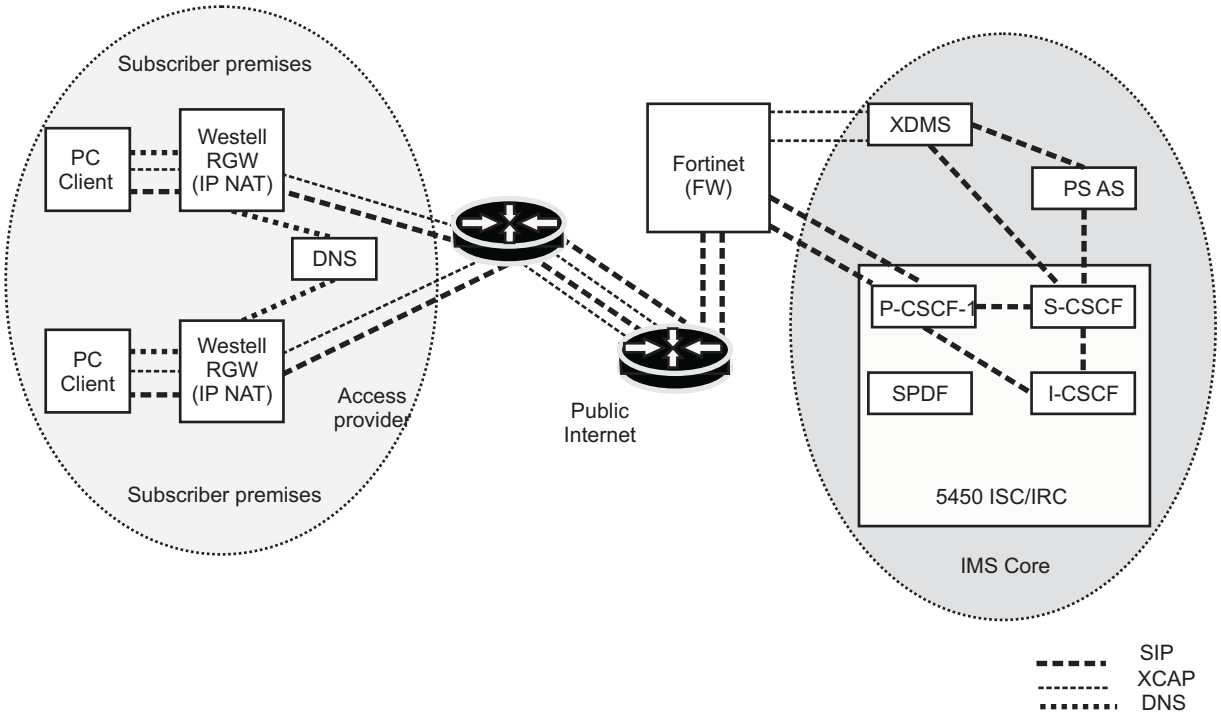
Hosted NAT traversal for ECS

The NAT traversal for ECS requires the client to initiate and maintain a symmetric TCP connection. The P-CSCF detects the presence of the far-end NAT on the signaling path and reuses the same TCP connection established by the UE to send all SIP requests and responses.

The network configuration of the hosted NAT traversal for 5410 PS/XDMS is dependent on the 5450 ISC which supports reuse of the TCP connection on detecting the NAT between the UE and the P-CSCF.

Hosted NAT traversal - network configuration

The following figure shows the network configuration of the hosted NAT traversal for 5410 PS/XDMS:



The 5440 PC Client can be configured to open the TCP connection at registration and use the same connection to send all SIP messages. Since the P-CSCF detects the far-end NAT, it then uses the existing TCP connection opened by the 5440 PC Client to send all SIP messages and responses.

Strategies to maintain the TCP connection

According to the NAT policy, the TCP connection will be closed after a period of inactivity.

To maintain the TCP connection, the following two strategies can be used:

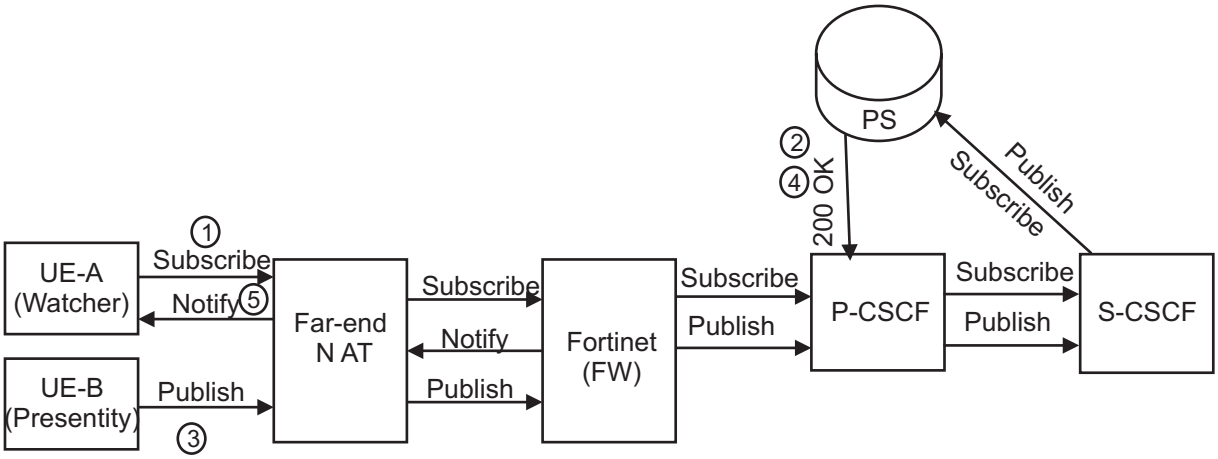
1. Modify the registration timer between the UE and the P-CSCF.
   The P-CSCF modifies the registration timer between the UE and the P-CSCF to an interval shorter than the NAT's inactivity period. This modification in the registration timer forces the UE to re-register more frequently in order to keep the NAT binding with the far-end NAT. As these frequent registrations are performed only between the UE and the P-CSCF, the SIP signaling traffic in the IMS core network is not impacted.
2. Modify the **`SIP Publish`** refresh timer in the `200 OK` message sent by the 5410 PS. The UE sends **`PUBLISH`** messages at regular intervals with its current presence status. The Publish refresh timer in the 5410 PS is modified to an interval shorter than the NAT's inactivity period.

Hosted NAT traversal scenario

This section describes a hosted NAT traversal scenario in which one user (watcher) obtains the presence information of another user (presentity) behind the same far-end NAT.

One presentity and one watcher behind a far-end NAT message flow

The following message flow describes how one user (watcher) obtains the presence information of another user (presentity) behind the same far-end NAT:



Note: Not all the `NOTIFY` messages are shown as `200 OK`

One presentity and one watcher behind a far-end NAT message flow description

The following description provides the stages on how one user (watcher) obtains the presence information of another user (presentity) behind the same far-end NAT:

1. User A (watcher) sends a **SUBSCRIBE** message to the 5410 PS to watch the presence status of User B. The **SUBSCRIBE** message is sent via the far-end NAT, the Fortinet, the P-CSCF, and the S-CSCF to the 5410 PS.

2. The 5410 PS authorizes User A to watch the presence status of User B and sends a NOTIFY message containing the presence information of User B to User A. The NOTIFY message is sent via the P-CSCF, the Fortinet, and the far-end NAT. User A adds the presence status of User B to its network address book (NAB).

3. User B changes its presence state and sends a **PUBLISH** message to the 5410 PS indicating the change in its status. The **PUBLISH** message is sent via the Far-End NAT, the Fortinet, the P-CSCF, and the S-CCF to the 5410 PS.

4. The 5410 PS sends a NOTIFY message to User A indicating the change in User B's presence status.

5. User A updates its NAB with the new presence status of User B.

5430 MMIM Server: Interworking with XMPP server

Purpose

This topic describes the process involved in the exchange of instant messages between the Session Initiation Protocol (SIP) and the Extensible Messaging and Presence Protocol (XMPP).

Interoperability between SIP and XMPP

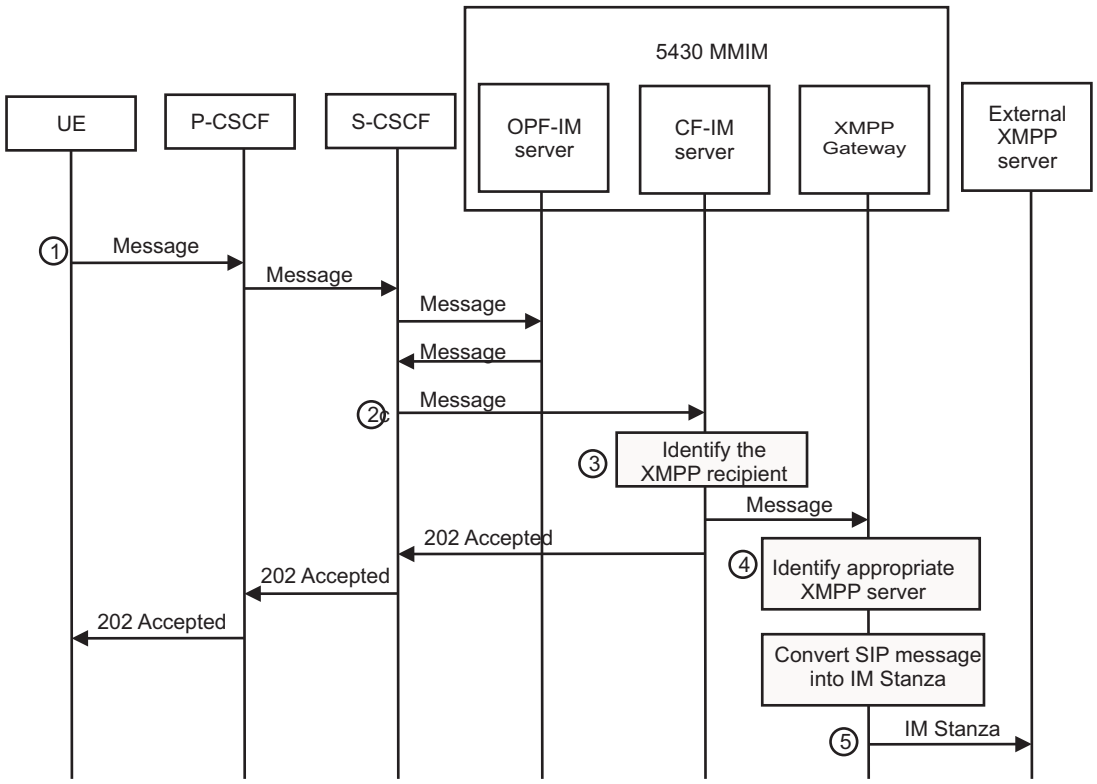
The interoperability between the SIP users and other instant messaging systems such as XMPP for google talk users requires protocol mappings between both the messaging systems.

The XMPP is an open technology for real-time communication which powers instant messaging, presence, multi-party chat and so on. The XMPP consists of a formalization of the core XML streaming protocols for basic presence and instant messaging extensions.

In XMPP protocol, the messages are carried in the form of XML message stanzas which are primarily used to deliver chat messages. These message stanzas are sent over an XML stream. The XMPP gateway is a gateway between the SIP user and the XMPP user. The XMPP server interacts with the XMPP gateway in sending and receiving the message stanzas to the XMPP user. The Originating participating function (OPF) and the Terminating participating function (TPF) act in between the S-CSCF and the Controlling function (CF) to route all the originating and terminating requests. The CF is configured to support different types of instant messages. The CF treats the requests destined to a shared group or a conference list.

SIP message sent to an XMPP user message flow

The following message flow describes how an instant message sent by a SIP user reaches an XMPP recipient:



SIP message sent to an XMPP user message flow description

1 The **SIP message** sent by the UE is passed on to the S-CSCF via the P-CSCF.

2 The S-CSCF forwards the **SIP message** to the Control Function (CF) via the OPF.

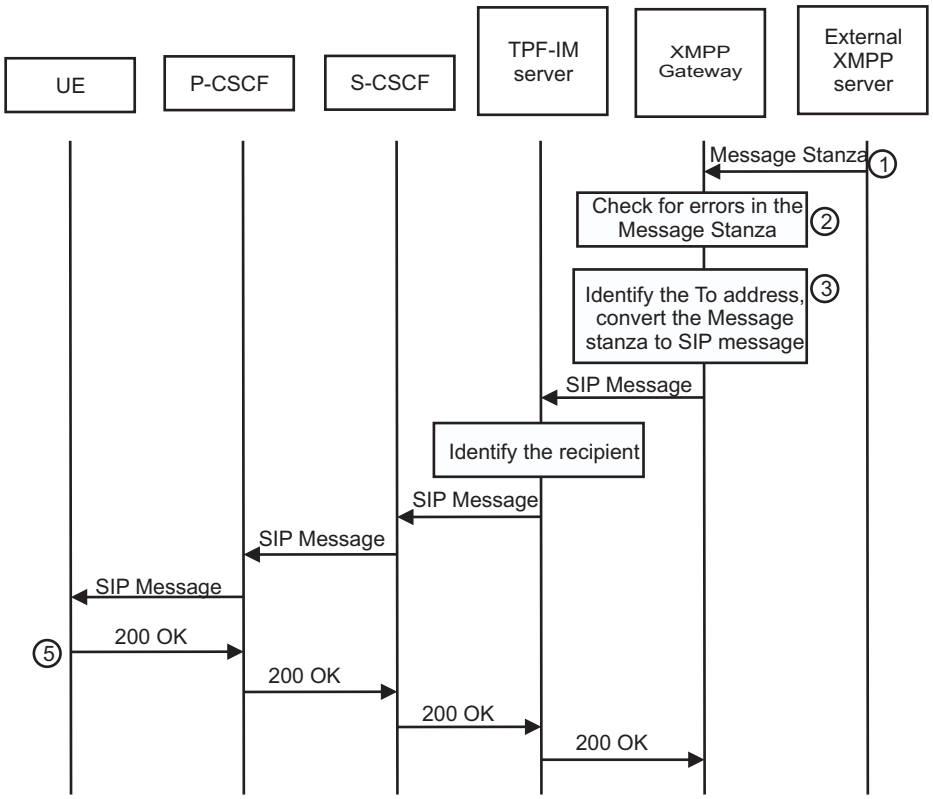
3 The CF identifies the XMPP recipient and validates the message type. Then it forwards the message to the XMPP gateway and sends a `202 Accepted` message to the UE via the S-CSCF and P-CSCF.

4 The XMPP gateway checks for the recipient's domain in the XMPP server list. It interacts with the DNS to resolve the address of the external XMPP server.

5 The XMPP gateway converts the SIP message into the **Message stanza** and sends the **Message stanza** to the respective XMPP server.

Instant message sent by an XMPP user message flow

The following message flow describes how an instant message sent by an XMPP user reaches a SIP user:



Instant message sent by an XMPP user message flow description

1 The XMPP gateway receives the **`Message stanza`** from an external XMPP server.

2 The XMPP gateway checks for any errors in the **`Message stanza`**.

3 The XMPP gateway identifies the To address, converts the **`Message stanza`** to SIP message and forwards the SIP message to the TPF.

4 The TPF identifies the recipient, checks if the recipient is online or not, and sends the message to the UE via the S-CSCF and P-CSCF.

5 When receiving the message, the UE sends a `200 OK` message to the XMPP gateway.

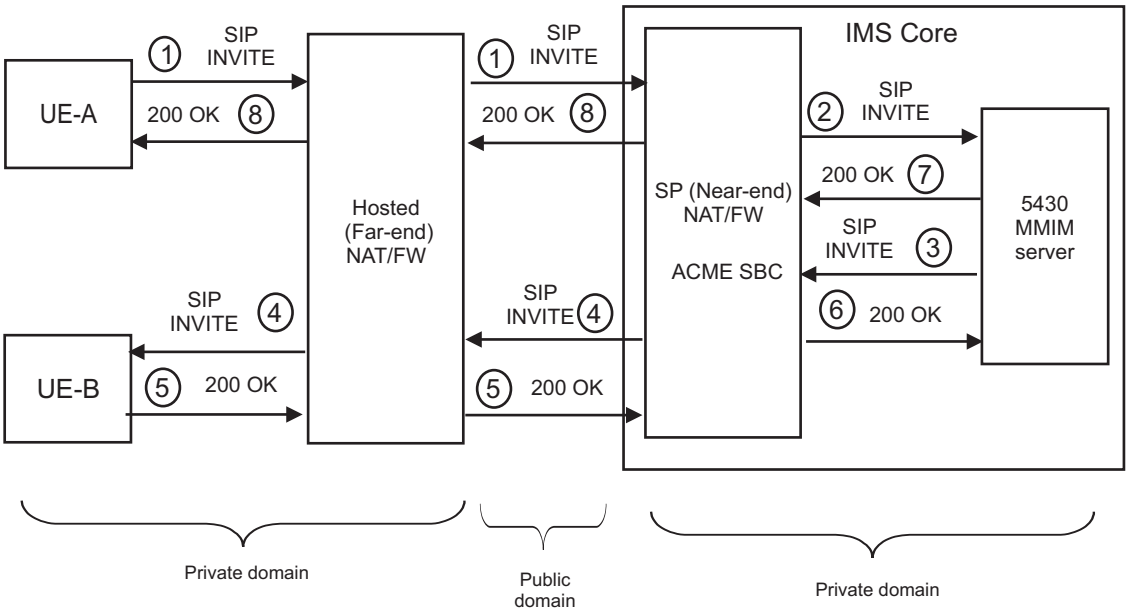
5430 MMIM Server: 1-to-many chat session establishment in a NAT/firewall configuration

Purpose

This section describes end-to-end support for 5430 MMIM chat sessions using Message Session Relay Protocol (MSRP) for end points behind NAT/firewall using ACME-based solution.

TCP/MSRP connection message flow

The following message flow explains how a user establishes a chat session with one or more users:



TCP/MSRP connection message flow description

The following description provides the stages of a TCP/MSRP connection establishment process:

1. User A sends a **SIP INVITE** message containing MSRP parameters in the SDP part of the message to initiate a chat session. User A uses **unNATed** address in the MSRP parameters.
2. The Acme SBC modifies the connection-line and the media-line parameters in the SDP part of the **SIP INVITE** message to stay in the media path. The Acme SBC puts its network IP address in the connection-line parameter and its port number in the media-line parameter and forwards the message to the 5430 MMIM server.

3. The 5430 MMIM server initiates the chat session by inserting its private IP address in the connection-line parameter and its TCP port number in the media-line parameter in the SDP part of the **SIP INVITE** message. The server also puts *setup* attribute to *"actpass"* indicating that it can either open the TCP connection (active) or accept the TCP connection (passive). The server returns the message to the Acme SBC.
4. The Acme SBC modifies the SDP parameters by inserting its access IP address in the connection-line parameter and its port number in the media-line parameter and forwards the message to User B.
5. User B acknowledges the chat session invitation and replies back to Acme SBC with a 200 OK message. Also, User B puts the *setup* attribute to *"active"* to open the TCP connection.
6. The Acme SBC again modifies the values in the SDP part of the 200 OK message by putting its IP address in the connection-line parameter and its port number in the media-line parameter and forwards the message to the 5430 MMIM server.
7. The 5430 MMIM server creates a new 200 OK message and puts its access IP address in the connection-line parameter and its port number in the media-line parameter. The server sends the message to the Acme SBC.
8. The Acme SBC inserts its network IP address in the connection-line and its port number in the media-line parameters in the SDP part of the 200 OK message and forwards the message to User A.
9. User A and User B open TCP connections to the Acme SBC using the connection-line and media-line parameters in the message received from the Acme SBC.
10. The Acme SBC opens the TCP connection to the 5430 MMIM server using the connection-line and media-line parameters in the message received from the 5430 MMIM server. With this connection, a chat session is established between the two users.

5420 VCC

Purpose

This topic describes the 5420 Voice Call Continuity (5420 VCC).

Functions

The 5420 VCC is an application server that provides Voice Call Continuity services. Voice Call Continuity allows a user to roam between an IMS (Wifi) network and a GSM network using a single handset. The handset is capable of connecting to both networks.

The 5420 VCC provides the following functions:

- Deliver calls depending on presence
  When the user has WiFi coverage, an incoming call is delivered to the IMS network.
- Handover calls between GSM network and WiFi network
  When the users moves from a GSM network into WiFi coverage, the call is handed over from GSM to IMS.

The 5420 VCC also supports the following functionality:

Call anchoring functionality

Regardless of the network that the user is connected to, the IMS controls the call. Control by IMS is provided by “anchoring”. Anchoring forces GSM originating and GSM terminating calls through the IMS.

In IMS 7.1, the anchoring decision also takes into account the emergency number and the call type. The 5420 VCC also offers the possibility of rerouting the call in case of non-availability of the IMS domain. As an option, location information can be provided to an AS in the operator network.

Fixed mobile convergence functionality

The 5420 VCC in IMS 7.1 provided capabilities supporting fixed mobile convergence. Users can roam freely between a broadband fixed network in an office or residence and a mobile network using one mobile phone number. A wireline phone (business desk phone in a centrex group or a home phone) or a PC on the broadband fixed network is treated as an extension of the mobile phone and is accessed through extension dialing.

This is an important added value that allows service providers to compete aggressively against free internet calling services which requires a second number to be assigned to the PC. The fixed mobile convergence capabilities of the 5420 VCC enable users to make and receive calls on their mobile phone or PC using the same phone number.

Supported hardware platforms

The 5420 VCC runs on an ATCA-based platform, the 5400 IAS.

Supported interfaces

The 5420 VCC supports the following interfaces:

Interface	between...	and...
FTP (performance management)	5400 IAS/5420 VCC	northbound systems
ISC	5420 VCC	S-CSCF
Ma	5420 VCC	I-CSCF
Rf	5400 IAS/5420 VCC	8615 IeCCF
Rp	5420 VCC	1440 USDS
Sh	5420 VCC	8650 SDM
SNMP (fault management)	5400 IAS/5420 VCC	northbound systems

Supported northbound network elements

An SNMP northbound interface is provided by the 5400 IAS platform. The 5400 IAS also stores measurements for the 5420 VCC application.

The 5400 IAS stores records that are retrieved using FTP or transferred using the Rf interface.

In IMS 7.x and 6.x, the user profile data for 5420 VCC was stored in the 1440 USDS and therefore the 5420 VCC was not provisioned with per subscriber data. The per subscriber data needed by the 5420 VCC was provisioned on the 1440 USDS. The eSM supported 5420 VCC (via the 1440 USDS) in IMS release 6.x. For IMS 7.0, the 8690 GUP had an Rp interface to 1440 USDS for subscriber provisioning. For IMS 7.1, the eSM supports 5420 VCC via the 1440 USDS.

Charging

Records are stored on the 5400 IAS and can be retrieved by an external system using FTP.

The 5420 VCC has an Rf interface to 8615 IeCCF for offline charging.

Product documentation

For details on the 5420 VCC, refer to *Alcatel-Lucent 5420 Voice Call Continuity Reference Guide,* 270-705-002.

Acronym List

A

AAA
Authentication, Authorization, Accounting

ABN
Access Border Node

AGCF
Access Gateway Control Function

ATCA
Advanced Telecommunications Computing Architecture

AGW
Access Gateway

AHE
Application Hosting Environment

AR
Action Register

B

BTS
Billing and Traffic System

C

CALEA
Communications Assistance for Law Enforcement Agency

CCF
Charging Collection Function

CDMA
Code Division Multiple Access

CDR
Call Detail Record

CGF
Charging Gateway Function

CI
Controlled Introduction

CME

Circuit Mobile Extension

CMS
Change Management System

CPE
Call Processing Equipment

CSCF
Call Session Control Function

CTS
Converged Telephony Server

CVoIP
Consumer Voice over IP

CW
Call Waiting

D

DNS
Domain Name System

DSL
Digital Subscriber Line

E

E2E
End to End

eCCF
enhanced Charging Collection Function

EMS
Element Management System

ENUM
Telephone Numbering Mapping

eSM
Enhanced Services Manager

F

FS2500
Feature Server 2500

FS5000
Feature Server 5000 (FS5K)

G

GPRS
General Packet Radio Service

GSM
Global System for Mobile Communications

GUI
Graphical User Interface

GUP
Generic User Profile

I

IAS
IMS Application Server

ICC
Instant Convergent Charging

IeCCF
Instant enhanced Charging Collection Function

IMS
IP Multimedia System

ISC
IP Session Control

ISAM-V
Intelligent Services Access Manager - V

ISDN
Integrated Service Digital Network

ISG
Intelligent Services Gateway

IWMC
IMS Windows Mobile Client

L

LCP
Lucent Control Platform

LIG
Lawful Intercept Gateway

LNC
Lucent Network Controller

LVF
Lucent Virtual private network Firewall

LSM
Lucent Session Manager

M

MAS
MiLife Application Server

MGC
Media Gateway Controller

MGCF
Media Gateway Control Function

MGW
Media Gateway

MMIM
MultiMedia Instant Messaging

MRF
Media Resource Function

N

NE
Network Element

NLT
Network Level Test

O

OAM
Operations, Administration, Maintenance

OLCS
OnLine Customer Support

OMC-CN
Operations and Maintenance Center – Core Network

OMC-H
Operations and Maintenance Center – Home Location Register and Home Subscriber Service

OMC-P
Operations and Maintenance Center – Plexus

P

PCM
Personal Communication Manager

PNA
Private Network Access

PS
Presence Server

PSTN
Public Switched Telephony Network

PSI
Public Service Identity

S

SAM
Service Activation Manager

SIP
Session Internet Protocol

SMS
Security Management Server

SOAP
Simple Object Access Protocol

SSC
Subscriber Services Controller

T

TISPAN
Telecom Internet converged Service & Protocols for Advanced Networks

U

ULIS
Unified Lawful Intercept Suite

UMTS
Universal Mobile Telecommunications System

USDS
Unified Subscriber Data System

V

VCC
Voice Call Continuity

VitalAAA
Vital Authentication Authorization Accounting

VoIP
Voice over Internet Protocol

VPN
Virtual Private Network

W

WDDF
Wireless Data Delivery Function

WiMAX
Worldwide Interoperability of Microwave Access

WM
Windows Mobile

X

XDMS
XML Document Management Services

XMC
Cross-domain Management Center