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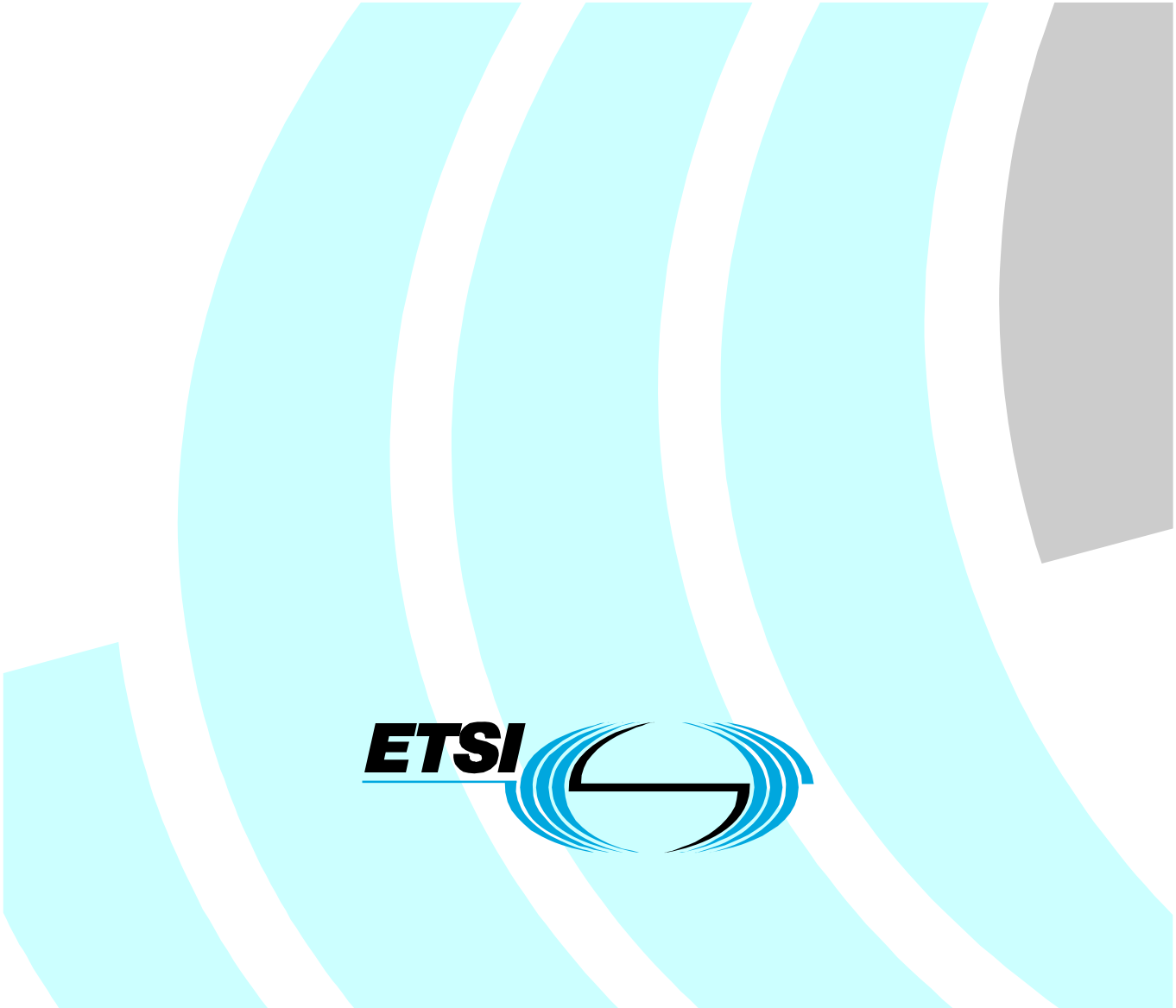
Technical Specification

Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); Voice Call Continuity (VCC); Stage 2

[3GPP TS 23.206 Release 7, modified]



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Contents

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Foreword

This Technical Specification (TS) has been produced by ETSI Technical Committee Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN), and is now submitted for the ETSI standards Membership Approval Procedure.

Introduction

The present document describes Voice Call Continuity functionalities for TISPAN Release 2. Scope of the work is to endorse the current 3GPP Release 7 stage 2 solution of VCC (described in 3GPP TS 23.206).

1 Scope

The present document provides the ETSI TISPAN endorsement of 3GPP TS 23.206 [2] "Voice Call Continuity (VCC) between Circuit Switched (CS) and IP Multimedia Subsystem (IMS); Stage 2: Release 7".

The current VCC solution explained in 3GPP TS.23.206 is essentially defined for a core IMS provider that is a mobile operator (that has also CS domain). In annex ZA there is a possible scenario showing how the solution can be extended to a generic IMS operator (e.g. when fixed network operator and CS mobile network operator are separate organizations).

2 References

References are either specific (identified by date of publication and/or edition number or version number) or non-specific.

- For a specific reference, subsequent revisions do not apply.
- Non-specific reference may be made only to a complete document or a part thereof and only in the following cases:
  - if it is accepted that it will be possible to use all future changes of the referenced document for the purposes of the referring document;
  - for informative references.

Referenced documents which are not found to be publicly available in the expected location might be found at http://docbox.etsi.org/Reference.

For online referenced documents, information sufficient to identify and locate the source shall be provided. Preferably, the primary source of the referenced document should be cited, in order to ensure traceability. Furthermore, the reference should, as far as possible, remain valid for the expected life of the document. The reference shall include the method of access to the referenced document and the full network address, with the same punctuation and use of upper case and lower case letters.

NOTE: While any hyperlinks included in this clause were valid at the time of publication ETSI cannot guarantee their long term validity.

2.1 Normative references

The following referenced documents are indispensable for the application of the present document. For dated references, only the edition cited applies. For non-specific references, the latest edition of the referenced document (including any amendments) applies.

[1] ETSI TS 181 005: "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); Services and Capabilities Requirements".

[2] 3GPP TS 23.206: "Voice Call Continuity (VCC) between Circuit Switched (CS) and IP Multimedia Subsystem (IMS); Stage 2 (Release 7)".

[3] ETSI ES 282 007: "Telecommunications and Internet Converged Services and Protocols for Advanced Networks (TISPAN) IP Multimedia Subsystem (IMS) Functional architecture".

[4] ETSI ES 282 004: "NGN Functional Architecture; Network Attachment Subsystem".

[5] ETSI TS 183 019: "Telecommunications and Internet converged Services and Protocols for Advanced Networking (TISPAN); Network Attachment; Network Access xDSL and WLAN Access Networks; Interface Protocol Definitions".

2.2 Informative references

[6] ETSI TR 181 011: "Telecommunications and Internet Converged Services and Protocols for Advanced Networking (TISPAN); Fixed Mobile Convergence; Requirements analysis".

3 Abbreviations

HSS Home Subscriber Server
UPSF User Profile Server Function

Endorsement notice

The present document, in conjunction with 3GPP TS 23.206 [2], provides the specifications for the stage 2 of the Voice Call Continuity for NGNs. TR 181 011 [6] and TS 181 005 [1] contain service descriptions.

The elements of 3GPP TS 23.206 [2] apply, with the following modifications.

NOTE: Underlining and/or strike-out are used to highlight detailed modifications where necessary.

Global modifications to 3GPP 23.206

2 References

Replace references as shown in table 1.

Table 1

References in 3GPP TS 23.206 [2]	Replaced references
3GPP TS 33.203 [6]	ETSI TS 187 003
3GPP TS 22.173[9]	ETSI TS 181 002
3GPP TS 23.002[11]	ETSI ES 282 007
3GPP TS 23.167[13]	ETSI TS 182 009

6 Information flows and procedures

The text in clause 6 of [2] applies, with the following modifications.

6.5.2 Supplementary services behaviour

The text in clause 6.5.2 of [2] applies.

Add at the end of clause 6.5.2 of [2] the following two new clauses:

6.5.2.7 IMS: Explicit call transfer (ECT), CS: Call Transfer/ECT

There is no impact on the ECT service when remaining in a particular domain. It is not possible to perform ECT and Domain Transfer in parallel.

6.5.2.8 IMS: Call Completion on Busy Subscriber (CCBS), CS: CCBS

There is no impact on the CCBS service when remaining in a particular domain. It may not be possible to recall the originating VCC user in a different domain than the one in which the CCBS service was originally invoked.

Annex ZA (informative): A possible scenario to adapt 3GPP VCC to multi-operator scenario

ZA.1 Introduction

The present annex defines additional concepts of VCC service provisioning in order to support **VCC multi -operator scenario** where IMS and CS domain belong to different operators; i.e. when the user's IMS services and the user's CS services are under the control of different home operators.

For the purposes of the present annex, the concepts given in 3GPP TS 23.206 [2] and the ones defined in the main body of the present document are still to be applied.

ZA.2 Definitions, symbols and abbreviations

The text in clause 3 of [2] applies, with the following modifications.

ZA.2.1 Definitions

The text in clause 3.1 of [2] applies with the following additons.

VCC single-operator scenario: VCC scenario where IMS and CS domain belong to the same operator

VCC multi -operator scenario: VCC scenario where IMS and CS domain belong to different operators; i.e. when the user's IMS services and the user's CS services are under the control of different home operators

ZA.3 VCC Concepts

ZA.3.1 General

The description enhances the VCC general concepts specified in clause 4.1 of [2].

Two operators providing CS and IMS access respectively may co-operate to provide VCC together for their subscribers. 3GPP VCC can be applied in this kind of scenario under appropriate conditions. However there are a number of issues to be agreed between the parties starting from the ownership of the subscriber (and SIM card). One thing to agree is if the subscriber can have IMS services also in the CS operator network. Two simultaneous or just different types of IMS registrations may not be supported by terminals.

The HSS depicted in the VCC architecture can be split into HLR and IMS part of HSS. CS operator manages the CS subscription and the HLR data and is responsible for the related authentication. IMS operator manages the IMS subscription and the IMS part of HSS as well as authentication to IMS. The operators may agree that MAP protocol is used towards HLR e.g. to query the user status.

CAMEL control is made by the CS operator as agreed with the IMS operator to route originating calls to IMS for anchoring and chosen services. The operators need to agree on the way the address information is carried so that CS Adaptation function of the VCC Application is able to restore the originally provided called party address. Otherwise inter-operator interface would be needed between CAMEL gsmSCF and VCC Application. No change is needed to TS 23.206.

The applied subscriber addressing and routing scheme shall be designed. It may be required to use two different public addresses for CS and IMS respectively. It should be decided if single address is wished and if that is the case, which operator holds those addresses i.e. whether IMS or CS operator network gets the incoming traffic. All VCC enabled calls shall be routed via IMS operator network even if they would first enter the CS operator network. VCC Domain Selection Function in the IMS operator network decides if the IMS or CS domain is used for the terminating call. VCC Application shall be aware of subscriber's addresses in CS and IMS.

If single subscriber address is wished to be shown as calling party address, a particular service is needed in IMS operator network to achieve this. This is outside the scope of VCC. It should be noted that the regulatory requirements may prohibit changing the actual calling party address carried in signalling.

VCC Application may contain different type of policies regarding CS and IMS use but all details of those are out of scope of standardization. VCC Application may store the policy to the terminal by device management means as specified for 3GPP VCC.

The VCC service model is distributed and e.g. call forwarding services may be provided in both CS and in IMS. These settings are separate by default in VCC. If any synchronization of supplementary service settings is wished, an inter-operator interface is required in this deployment case.

If domain transfers are required only to one direction e.g. IMS to CS, appropriate policy may be used to e.g. skip routing CS originated calls via IMS. However if single number service should be required, then the CS operator service (e.g. IN/CAMEL) shall cater for it.

Charging is generated on both CS and IMS operator networks for the subscriber. The common charging scheme shall be developed by the operators. One possible way is to centralize charging to the IMS operator and then the CS operator records only the connection time for inter-operator charging purposes.

ZA.3.2 Radio environments

The description enhances the VCC concepts specified in clause 4.2 of [2].
Out of scope for TISPAN.

ZA.3.3 Domain Selection

The text in clause 4.3 of [2] applies without changes.

ZA.3.4 Anchoring in IMS of VCC subscriber calls

The text in clause 4.4 of [2] applies, with the following modifications.

Anchoring of IMS multimedia telephony sessions are controlled by the operator policy. The default policy is all IMS multimedia telephony sessions originated by VCC subscribers in the IMS are anchored in the IMS in order to facilitate domain transfer of the voice component to the CS domain.

Voice calls originated by VCC subscribers in the CS domain may or may not be anchored in the IMS, subject to operator policy. A CS originated call has to be anchored in IMS to allow domain transfer to occur.

Voice calls which IMS cannot route are not anchored in IMS. Considering a voice call originated by a roaming VCC subscriber, using a called party number not in the international format and for which the home IMS network has no means to translate (e.g. a local number), IMS has no way to determine the intended local destination and cannot anchor the call. CAMEL processing in the CS domain may solve this problem by translating dialled numbers into the international number format according the following guidelines:

- If the VCC UE is in the Home Network~~HPLMN~~, no translation is required, the call is anchored.
- If the VCC UE is not in the Home Network~~HPLMN~~ but located in a Visited Network~~VPLMN~~ with known translation rules for that number, translation is performed and the call is anchored.
- If the VCC UE is not in the Home Network~~HPLMN~~ but located in a Visited Network~~VPLMN~~ with no known translation rules for that number, no translation is performed and the call is not anchored.

If a call from a VCC subscriber is not anchored in the IMS, domain transfer is not supported for that call.

Priority call handling is not preserved if a priority call, originated by VCC subscribers in the CS domain, is anchored in IMS.

NOTE: See TR 22.952 [7] for information on priority subscriber and priority call handling.

ZA.3.5 Domain transfer procedures

The text in clause 4.5 of [2] applies without changes.

ZA.3.6 Regulatory aspects

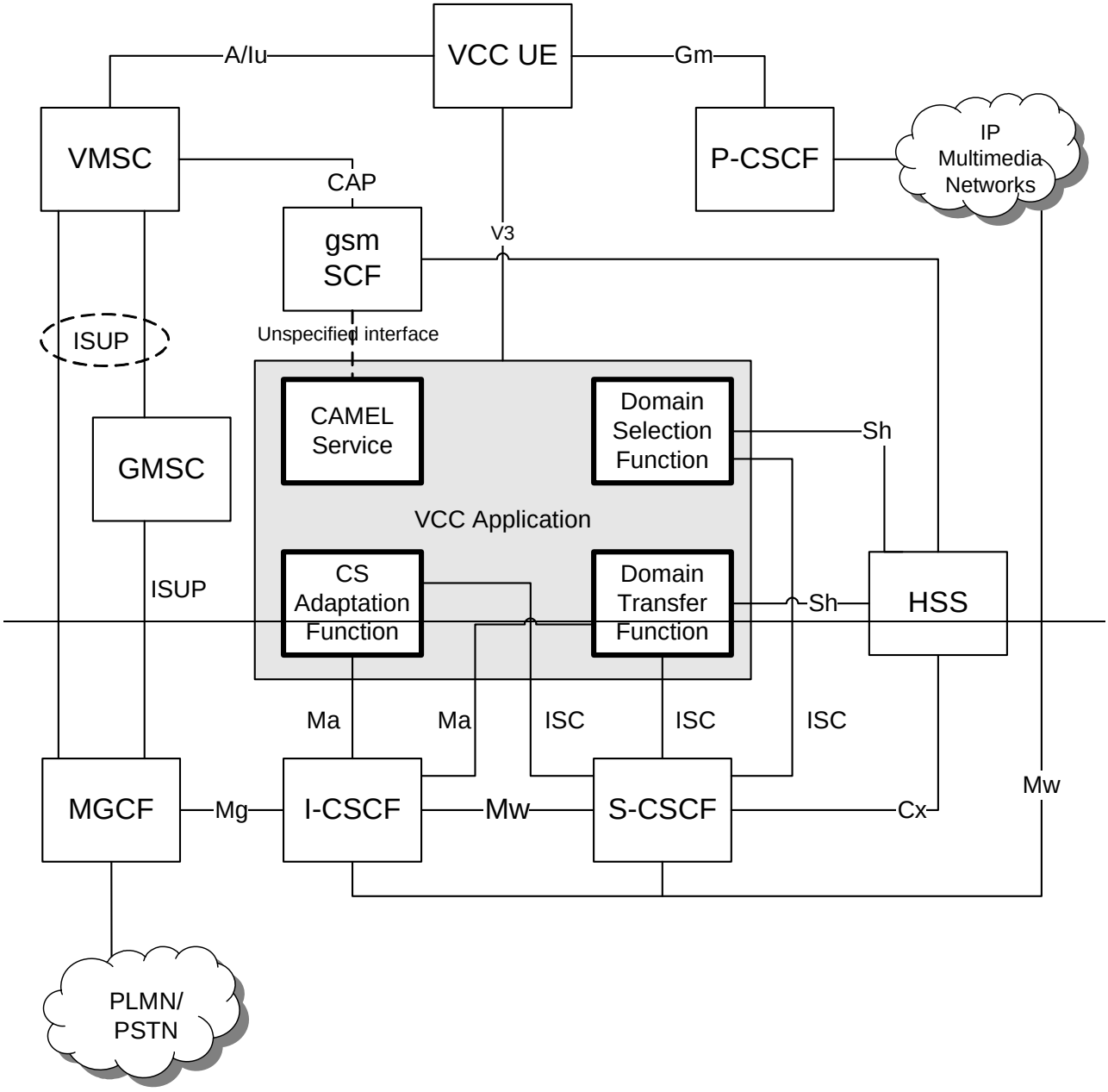
The text in clause 4.6 of [2] applies without changes.

ZA.4 Architecture

The text in clause 5 of [2] applies, with the following modifications.

ZA.4.1 Reference Model

Figure ZA.1~~5.1~~ depicts the VCC reference architecture.


VCC UE
A/Iu
Gm
VMSC
P-CSCF
IP Multimedia Networks
CAP
gsm SCF
V3
ISUP
Unspecified interface
CAMEL Service
Domain Selection Function
Sh
GMSC
VCC Application
ISUP
CS Adaptation Function
Domain Transfer Function
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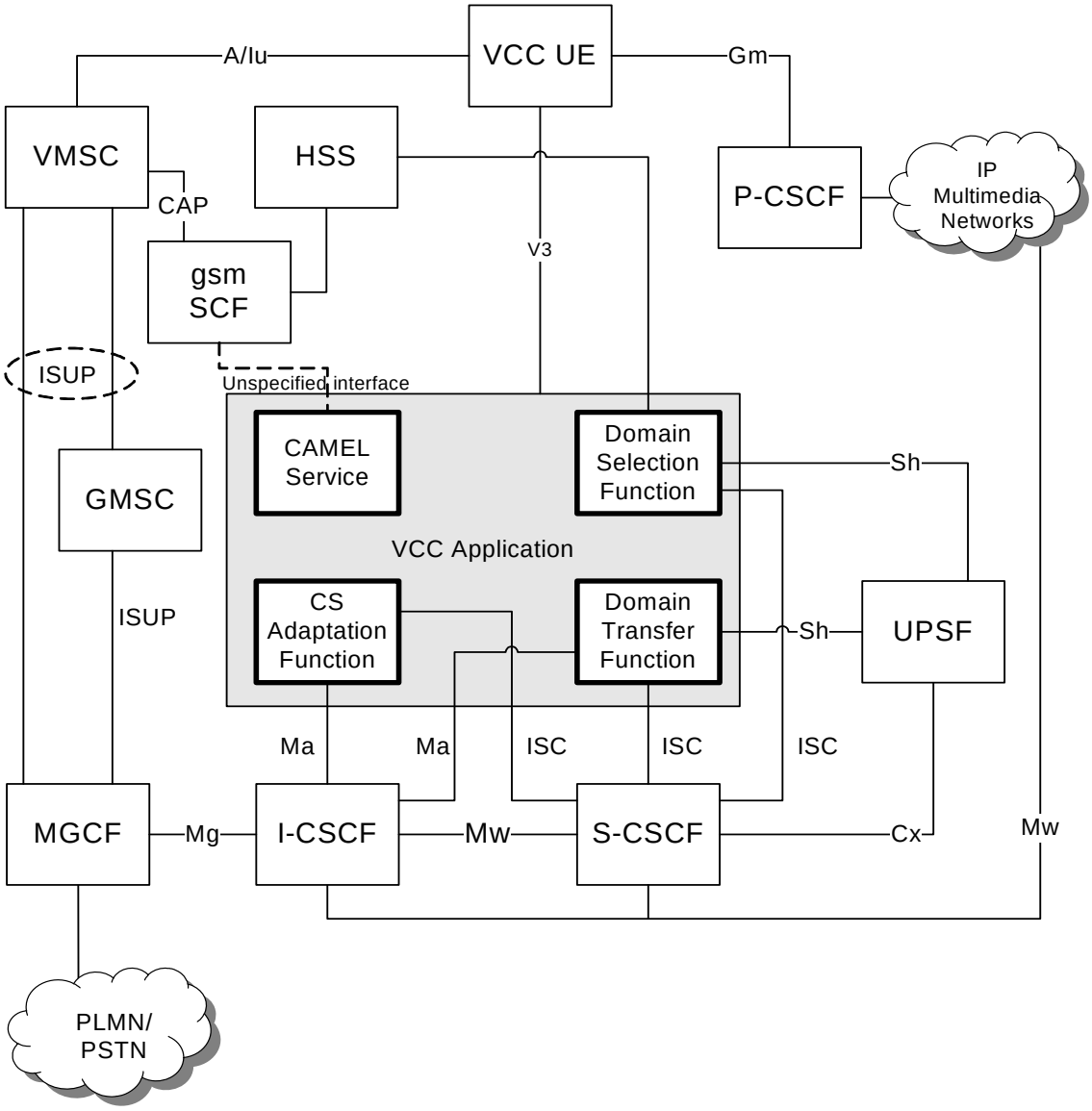

NOTE: Not all standard GSM interfaces are depicted in the architecture. Connection between the elements (VMSC, GMSC, MGCF) may be via a transit network. CS domain termination may bypass the GMSC.

Figure ZA.1~~5.1~~: VCC Reference Architecture for multi-operator scenario

ZA.4.2 VCC entities

ZA.4.2.1 VCC application

The text in clause 5.3.1 of [2] applies without changes.

ZA.4.2.2 VCC UE

The text in clause 5.3.2 of [2] applies, with the following modifications.

The VCC UE is a VCC capable User Equipment with an active VCC subscription. It supports voice over both IMS and CS domains. The VCC UE performs the following functions: -

- Stores and applies domain selection policies for both originating calls and Domain Transfers.
- Selects which domain to use for originating calls; it does so based on domain selection policies.
- Communicates the user preferences in order to indicate which domain is preferred for terminating calls.

- Applies the received VCC operator policy prior to process VCC call request (e.g. Call origination, Domain Transfer request).
- Stores VDN/VDI for domain transfer execution.
- Allows the stored VDN/VDI values to be updated.

NOTE: TISPAN requirements should be:

- supports ISIM/USIM/SIM

- authenticates with NGN network when roams into any access belonging to that network

ZA.4.3 Reference points

ZA.4.3.1 DTF – S-CSCF, CSAF – S-CSCF, DSF – S-CSCF reference point (ISC)

The text in clause 5.4.1 of [2] applies, with the following modification.

The ISC reference point between Serving CSCF and the Application Servers is described in ES 282 007 [3] ~~TS 23.002 [11]~~.

ZA.4.3.2 CSAF – I-CSCF, DTF – I-CSCF reference point (Ma)

The text in clause 5.4.2 of [2] applies, with the following modification.

This reference point may be used by the CSAF to route messages to the DTF function via the Ma reference point. The Ma reference point between Interrogating CSCF and the Application Servers is described in ES 282 007 [3] ~~TS 23.002 [11]~~.

ZA.4.3.3 Functional entity – UPSF reference point

The text in clause 5.4.3 of [2] applies, with the following modifications.

This reference point is used by the functional entities (DTF, CSAF, DSF) to retrieve information from the ~~HSS~~ UPSF of the Core IMS provider. This reference point includes Sh; Sh is found between the Application Servers and the ~~HSS~~ UPSF and is described in ES 282 007 [3] ~~TS 23.002 [11]~~.

ZA.4.3.4 gsmSCF – VMSC reference point

This reference point is used by the gsmSCF to provide routing of CS origination calls and CS legs established for Domain Transfer to CS. This reference point uses the gsmSCF to gsmSSF interface as specified in TS 23.078 [4]. The information from the trigger messages are used on the unspecified interface to the CAMEL Service.

ZA.4.3.5 gsmSCF – HSS reference point

The text in clause 5.4.5 of [2] applies, with the following modifications.

This interface is used by the gsmSCF to request information from the HLR. The reference point between the gsmSCF and the HSS of the CS provider is described in TS 23.078 [4].

ZA.4.3.6 VCC Application – VCC UE reference point (V3)

The text n clause 5.4.6 of [2] applies with the following modification.

V3 is a reference point between VCC UE and the VCC Application.

This reference point may be realized by using Ut interface as described in ES 282 007 [3] ~~TS 23.002 [11]~~.

ZA.4.3.7 DSF – HSS reference point

This reference point is used by the DSF to retrieve information from the HLR of the CS provider. MAP implementation option shall be used for this reference point.

ZA.6 Security

The text in clause 7 of [2] applies, with the additional elements described in the present clause.

ZA.6.1 General

There are no impacts on existing security mechanisms for the CS Domain, other IP-CAN domain or for IMS as a result of Domain Transfers.

ZA.6.2 IP-CAN Access security

NOTE: For TISPAN-NGN access authentication is described in [4] and [5].

History

Document history		
V2.0.0	December 2007	Publication