



**Rich Communication Suite Release 3 Service
Definition
Version 2.0
14 February 2011**

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1 Foreword

This document outlines the Service Definition for Rich Communication Suite (RCS) Release 3. The Service Definition of Rich Communication Release 2 is described in [2].

In this document, the RCS Release 3 service and the associated service use cases are explained. It is the top level description of RCS Release 3 and clearly describes the fundamentals of the RCS service. Within the use case chapter every end-user service is explained and the related network architecture is shown without going into details. That chapter covers all main use cases of RCS Release 1, 2 & 3.

The content of this document and the detail level is aligned with the other documents of RCS Release 3. The goal is to avoid overlap with these documents, to have a well-structured documentation set for RCS Release 3.

For more details, this document must be read in conjunction with the Functional Description [5] and Technical Realisation Document [6] of RCS Release 3 describing in detail the new functional and technical solution for the Release 3 use cases. In these documents all the references to the used specifications from GSMA, TTC RCSS (Telecommunication Technology Committee RCS Service Group, Japan), 3GPP & OMA can be found.

The intended audience of this document is the GSMA Working Groups and operators intending to deploy RCS services.

1.1 References

Reference	Description
1	RCS Release 1 Functional Description http://www.gsmworld.com
2	RCS Release 2 Service Definition http://www.gsmworld.com
3	RCS Release 2 Functional description http://www.gsmworld.com
4	RCS Release 2 Technical Realisation http://www.gsmworld.com
5	RCS Release 3 Functional description http://www.gsmworld.com
6	RCS Release 3 Technical Realisation http://www.gsmworld.com
7	IR.90: RCS Interworking Guidelines http://www.gsmworld.com

2 Background

RCS is a suite of rich communication services that can be launched from a capability enhanced address book (EAB). The awareness of the supported capabilities together with availability and other presence information will improve the user experience and will promote the usage of the rich communication services. The RCS initiative has chosen an approach where no new services are defined, but through efficient bundling and profiling of existing standardized services a balanced offering can be made. The main components of the RCS services are the EAB enriched call and enhanced messaging. In the EAB the contact information is extended with capability and presence information. The enriched call features

allow sharing information during or outside an ongoing voice call, and the enhanced messaging offers conversation experience.

The goal of the RCS service is to provide a common framework for a service that is interoperable among mobile operators and devices.

This Service Definition document in conjunction with the Functional Description [5] and Technical Realisation document [6] describe the RCS service concept in sufficient detail to enable the various GSMA expert groups to provide necessary support to the project.

This Service Definition document will be reviewed by the Working Groups responsible for interoperability and interworking, to identify what if any changes are to be made to their PRDs to ensure commercial interoperability.

This Service Definition will be reviewed by Working Groups responsible for Fraud (Fraud Forum) and Security (Security Group) to identify any possible security and fraud issues and resolve them.

This Service Definition will be reviewed by Working Groups responsible for Devices (DG, SCaG) to identify and estimate any impact on devices or SIM cards.

3 Overview of the Service

3.1 Project Information

Reference: 343
Project Sponsor: Orange
Project Leader: Aude Pichelin, Orange
Project Manager: Mark Hogan, GSM Association
Supporting Companies: see www.gsmworld.com/rcs

3.2 Fundamentals of RCS Release 3 Service

RCS has not defined its own specifications but is profiling existing standardized specifications from 3GPP, OMA, TTC RCSS and documents from the GSMA. See [2] and [3] for more details.

The RCS Release 3 service is built around the capability EAB as defined in RCS Release 1 and Release 2, but the service is enhanced in different areas.

The social presence is extended with new valuable information like geo-location, content sharing is now possible outside voice calls and with this release it becomes possible to create new user experience via network based services. Finally a client using broadband access (BA) can be used as single client without the need for a mobile device.

The different features with RCS Release 3 can be grouped as follows:

- Social presence information enhancements
- Enhanced messaging
- Network value added services (NVAS)
- Content sharing enhancement
- Broadband access (BA) enhancement

3.2.1 Social Presence Enhancements

With this enhancement two RCS users are able to see where they are located and share this information with each other.

Different mechanisms are foreseen how location information can be updated. Details can be found in [5].

In RCS Release 3, the RCS invitation experience is improved with a personalized invitation. For easy identification of invitations coming from contacts not yet registered in the user's address book, it is possible to define a nickname to be used in presence invitations.

3.2.2 Enhanced messaging

In RCS Release 3 the multi-party chat is enhanced with the capability to see the list of invited participants in a Chat.

3.2.3 Network value added services (NVAS)

In RCS Release 3 it becomes possible to invoke a network service that delivers extra end-user value.

This network service can be invoked during image sharing and during chat services. The use cases in Chapter 4 give clear examples of NVAS. The use cases are examples of the possibilities with NVAS. RCS has defined the network architecture that can be used to offer such operator specific NVAS.

3.2.4 Content sharing enhancement

In RCS Release 3 the video sharing service is extended. The limitation that video sharing is only allowed within a voice call is now removed. Now it is possible to share a video without a voice call, or to continue a video share even when the voice call is terminated.

Additionally the video share between an RCS user and a non-RCS user is supported. The non-RCS user is now able to see a live video stream that is shared. Details can be found in [5] or in chapter 4 where the use case is described.

3.2.5 Broadband Access Enhancement

In RCS Release 3 the limitation that a BA device only can be used as a secondary device is removed. Now a BA device can be also the primary device. When BA is a primary device, it is also the only device. Therefore the BA client is extended to have SMS and MMS sending and receiving capabilities, including delivery notifications.

3.3 RCS Specifications

RCS has not defined its own specifications but is profiling existing standardized specifications from 3rd Generation Partnership Project (3GPP), Open Mobile Alliance (OMA), Telecommunication Technology Committee RCS group (TTC RCSS) and documents from the GSMA. See [2] and [3] for more details.

The RCS initiative has agreed on the underlying specifications and is organizing structured interoperability testing (IOT) events to do early end to end verifications of terminals and network infrastructure.

RCS has given priority to interoperability both between terminals but also between networks from the beginning. Only through such an approach can full interoperability among networks be assured. Deployment of interoperable RCS services in a country and between countries is a key factor for service take-off. Only then can the full consumer benefits of the RCS be realized. A consistent service definition of these services will create a global market for RCS terminals.

The RCS services use the standardized IP Multimedia Subsystem (IMS) Core infrastructure to transmit the signalling and media traffic. IP Packet Exchange (IPX) proxies may be part of this infrastructure to allow interconnection between operators and to provide a collection point for session accounting records used for inter-operator traffic charging. Equally operators may use other inter-connection networks.

The support for BA is creating a new user-network-interface (UNI) which is defined in the technical realisation [4].

These new services are completely handled within the network of the operator offering broadband access and multiple devices. The only change on the network-network-interface (NNI) between operators introduced with RCS Release 2 is the usage of the subject header in the INVITE to get the first message through for multi device user experience. More details can be found in the technical realisation [4] of Release 2.

The RCS project builds on the technical work done within the GSMA sharing services and on the OMA work for Presence, XML Document Management (XDM) and Messaging.

Details can be found in the RCS Functional description: [2] of Release 1.

3.4 RCS Service Target

This service will likely be targeted at all mobile and fixed market segments and include various charging models, such as pay-per-use, pre-pay, and subscription-based. Operators may deploy this service to enhance 3G sign-up rates, to drive voice-call revenue or to add to bottom line revenue figures as a service in its own right.

3.5 RCS Network Architecture

When two operators offer RCS, they are exchanging traffic with each other using standard NNI mechanisms as documented in RCS Interworking Guidelines [7].

Obviously RCS can be also offered as an intra-operator service.

RCS can be deployed using many types of access networks. Thus deploying the RCS service does not mean you need to have a 3G network deployed. The cornerstone of RCS is IMS architecture.

As an example RCS can be deployed in a 2G General Packet Radio Service (GPRS) or Enhanced Data for GSM Evolution (EDGE) network.

There are certain consequences as far as the RCS services are concerned for a Class B (circuit switched (CS) or packet switched (PS), one at the time) RCS device located under GPRS/EDGE coverage. For such devices, RCS video or image share will not work during a voice-call. However, all non-call related services will work, for example, RCS presence, chat, file-transfer, and video share outside of a voice call.

Whilst using RCS chat for example, the subscriber might receive a CS call. If such a call is answered, the PS activity is suspended until the CS call is torn down and the device resumes the PS data activity again. A pure 2G operator wishing to launch RCS should be aware of these consequences. And so should 3G operators wishing to offer RCS services in their GPRS/EDGE coverage areas.

These limitations can be solved by introducing DTM (dual transfer mode) technology in radio network and devices.

Major RCS services (for example EAB, Chat) can also be deployed on Long Term Evolution (LTE) networks.

3.6 RCS Next Phase

In a next phase improved interworking for messaging with non RCS (legacy) devices will be considered. Also it is planned to bring RCS closer to social networks by combining the RCS platform and technology with social network content and services.

Enhancement of the service coverage for new radio access technologies (for example LTE) will be also considered.

4 Service Description

4.1 Use Cases

The use cases are explained on a visual presentation showing the different actors, involved network entities and indicate the logical flows between the different actors. The different steps in the use cases are described in the figures.

In the Functional Description documents [3] and [5], these use cases are worked out more in detail.

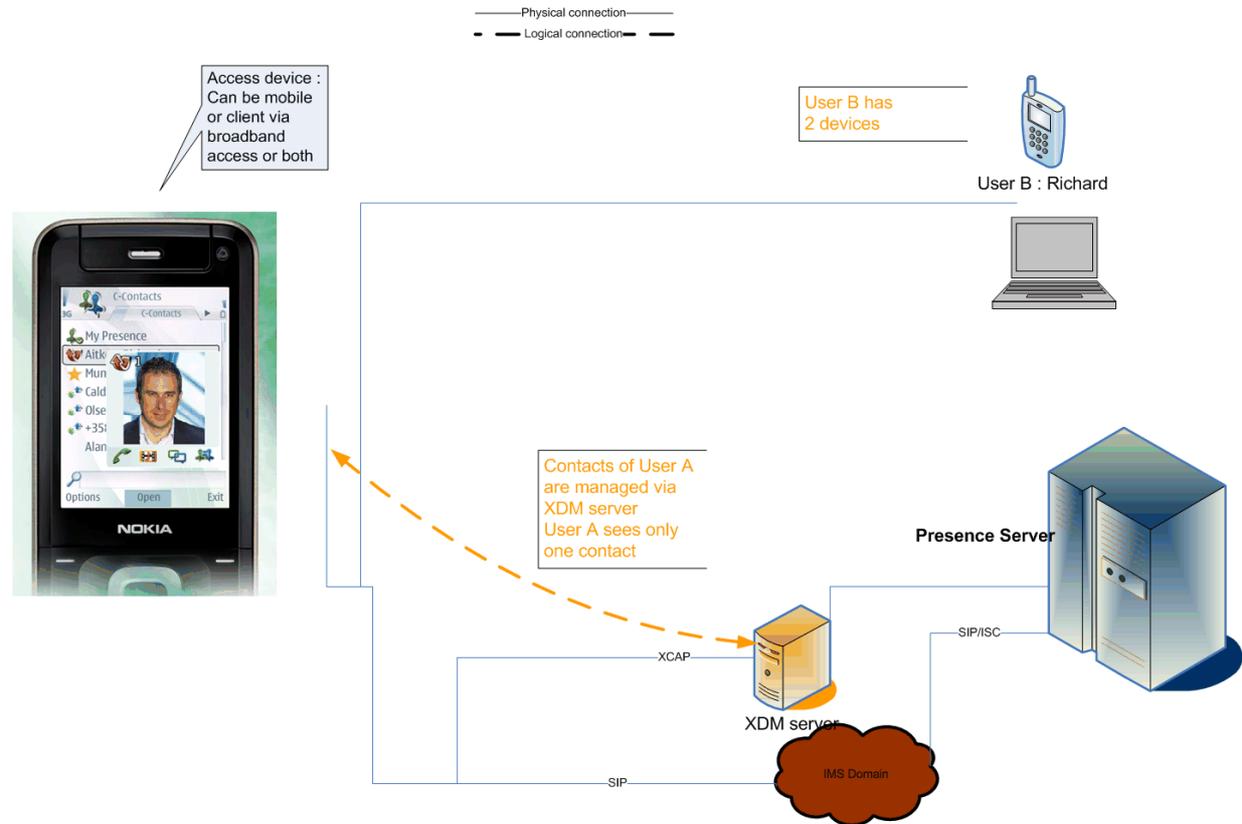
For a user with a broadband access device the service experience is the same as for a mobile device. Having a larger screen and keyboard can make some use cases more convenient using a BA client.

Therefore in the figures the User A is “access” agnostic, it can be mobile or broadband or both.

In the examples the user B has 2 devices (mobile and a PC client) to explain the RCS user experience.

4.1.1 Enhanced Address Book

4.1.1.1 Invite Contacts to Share Social Presence

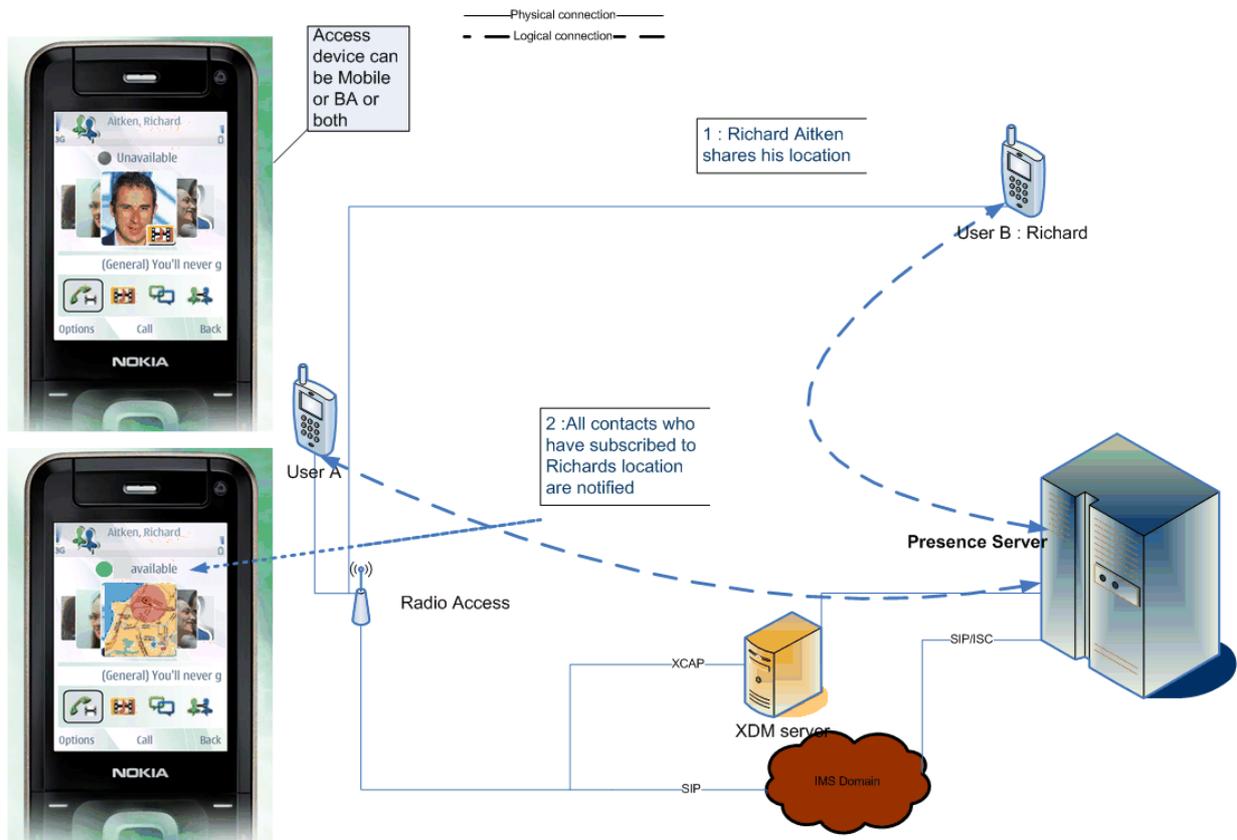


Authorization to share social presence is based on the symmetry principle.

If sharing of social presence is accepted after invitation, both parties will see each other's presence attributes. If social presence sharing is terminated by one of both parties, both parties will end seeing each other's social presence attributes.

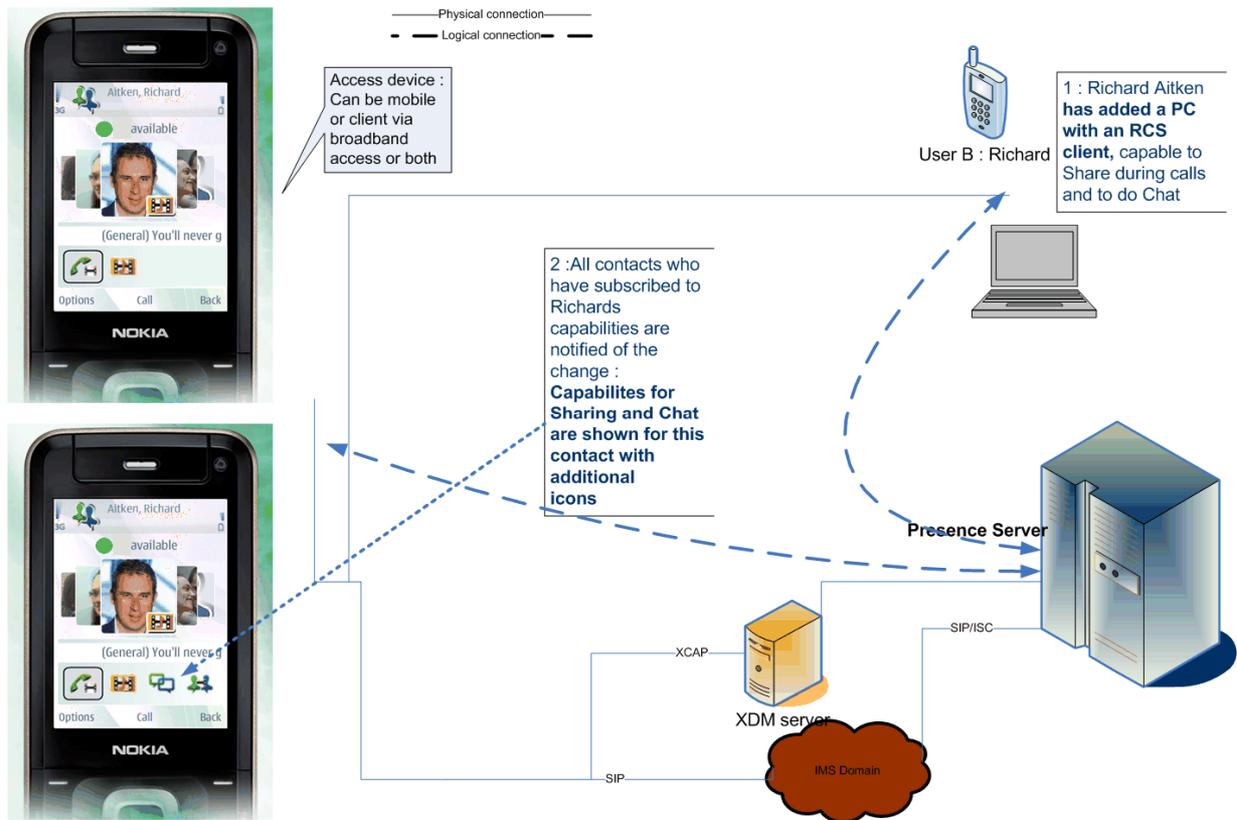
With Release 3 it becomes possible to send a personal invitation sentence once someone is invited to share social presence. Additionally with an invitation for social presence a nickname can be shared in case the invited party doesn't have the inviting party phone number in the handset

4.1.1.2 Invite Contacts to Share Location

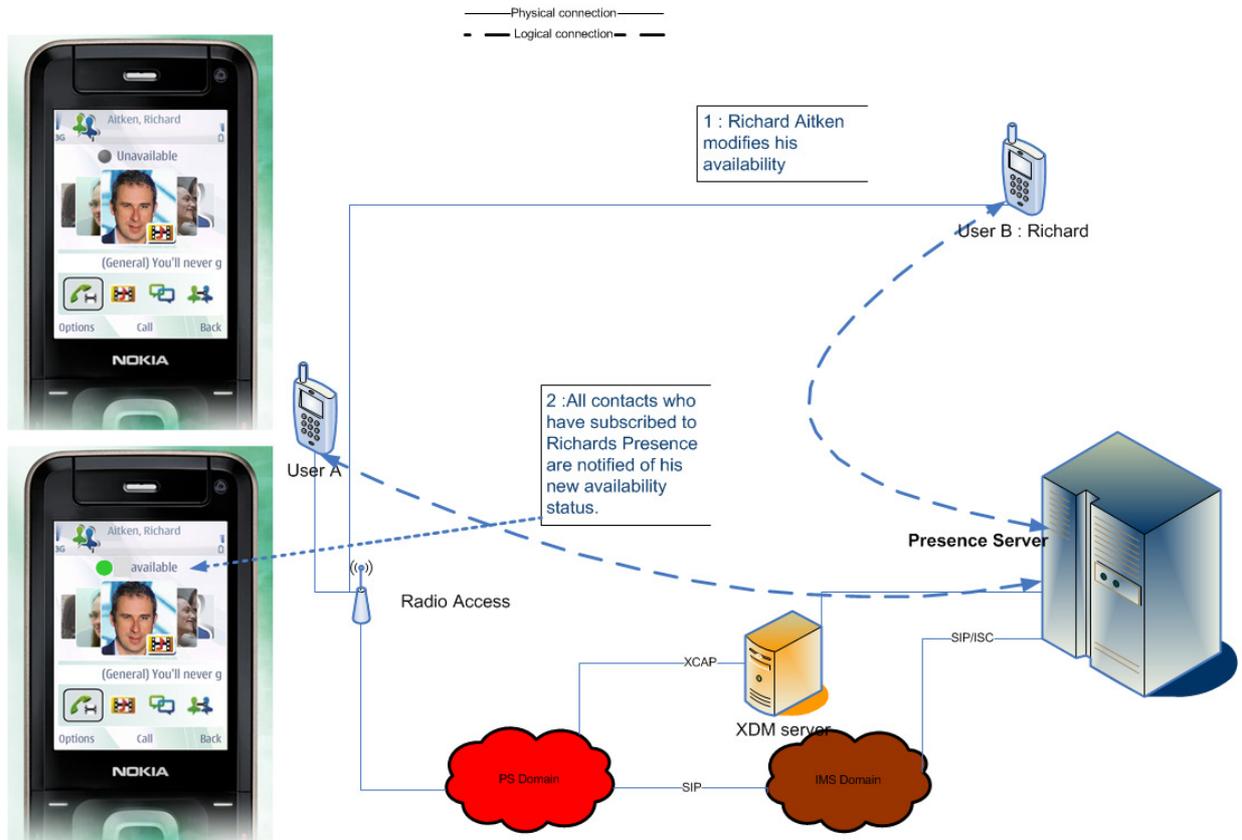


This service allows users to show where they are through the RCS EAB and view where their friends are as free text and/or on a map.

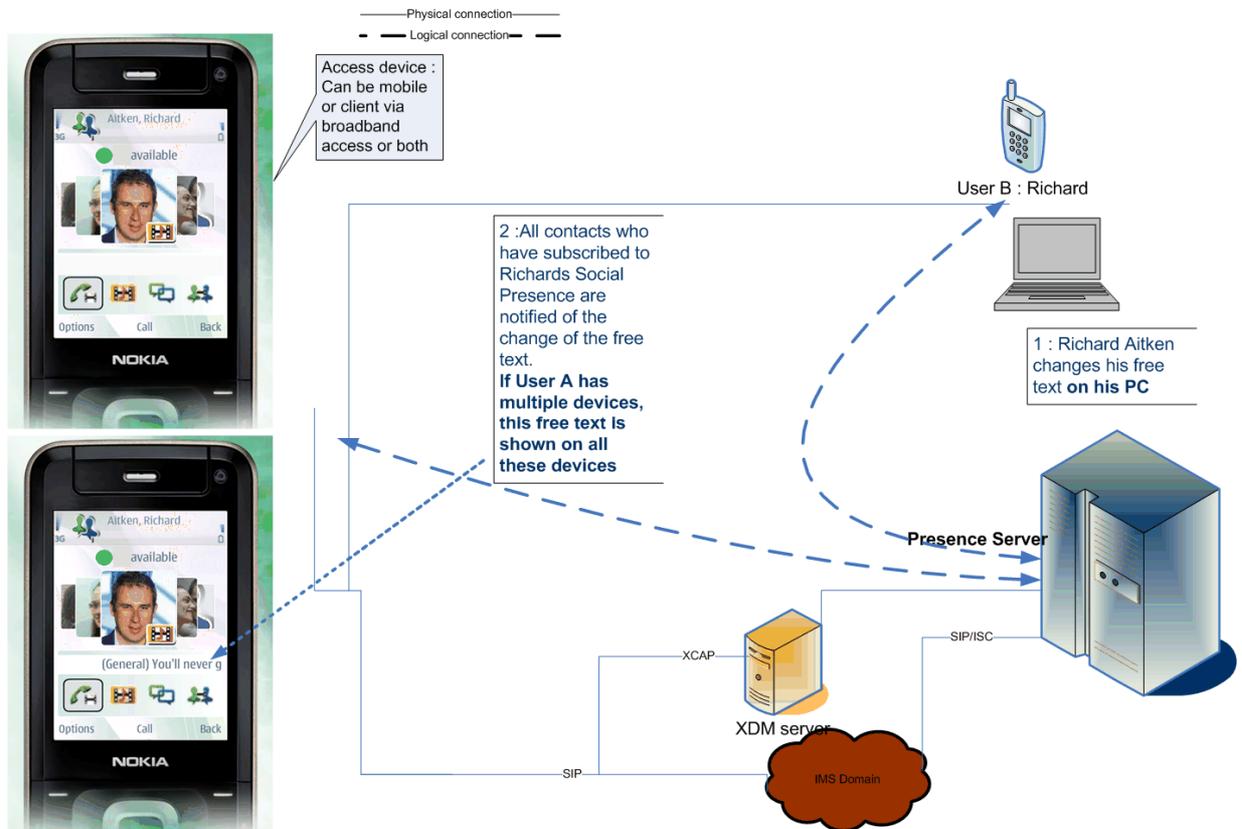
4.1.1.3 Capability Exchange



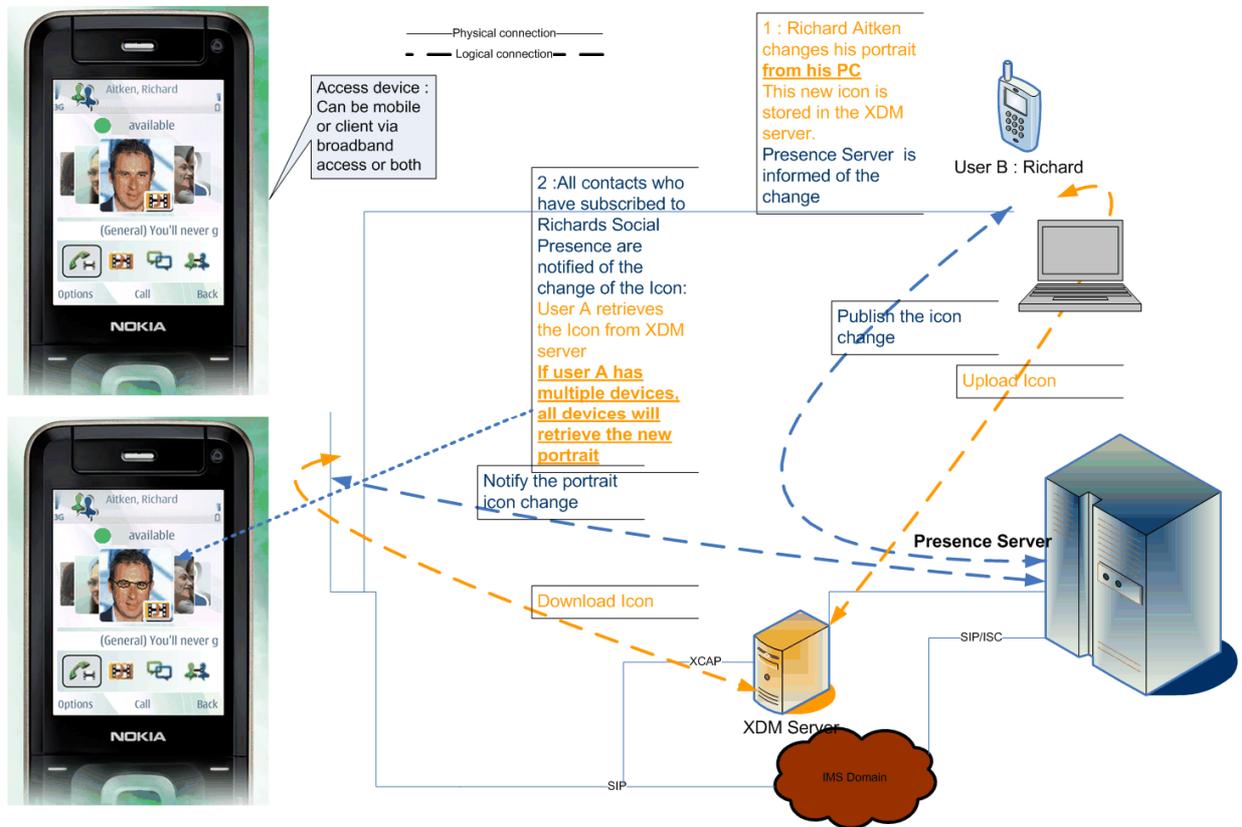
4.1.1.4 Availability



4.1.1.5 Free Text

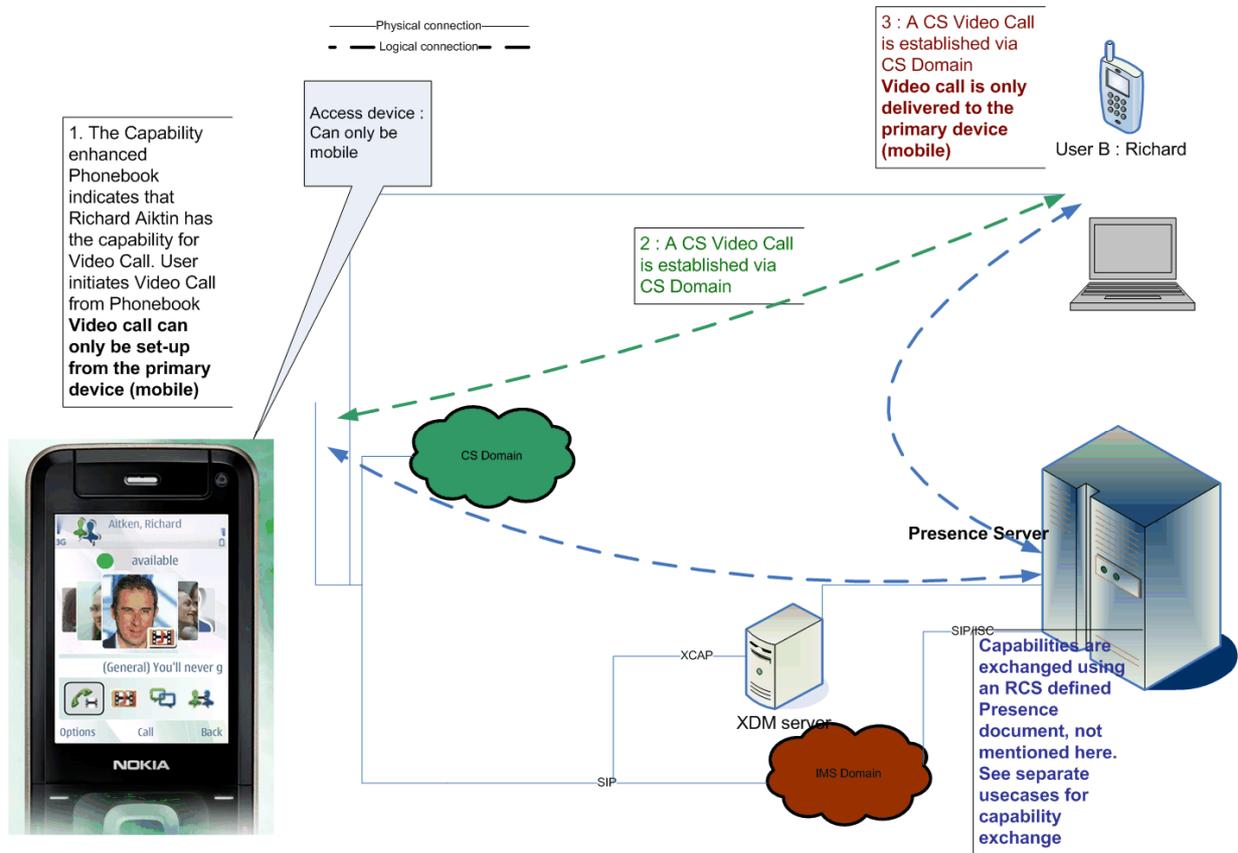


4.1.1.6 Portrait Icon Exchange



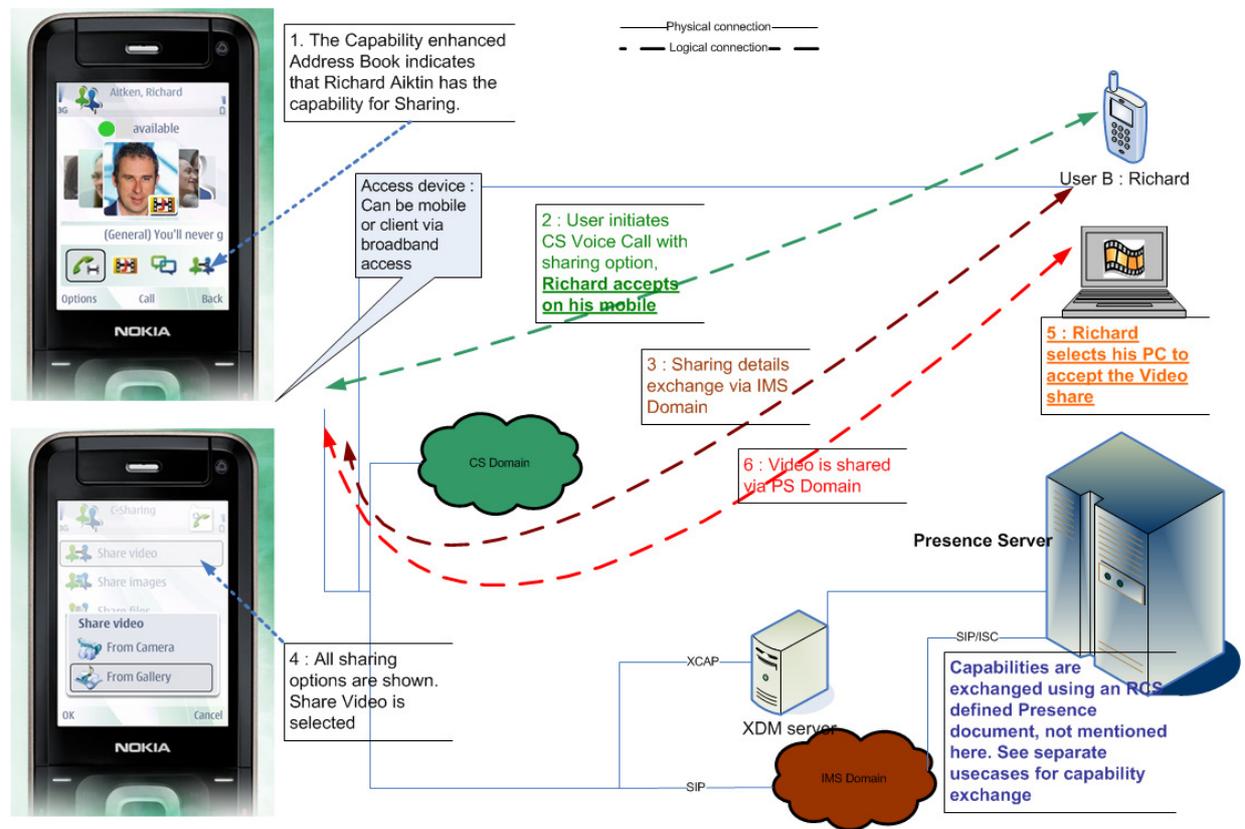
4.1.2 Enriched Call

4.1.2.1 Video Call



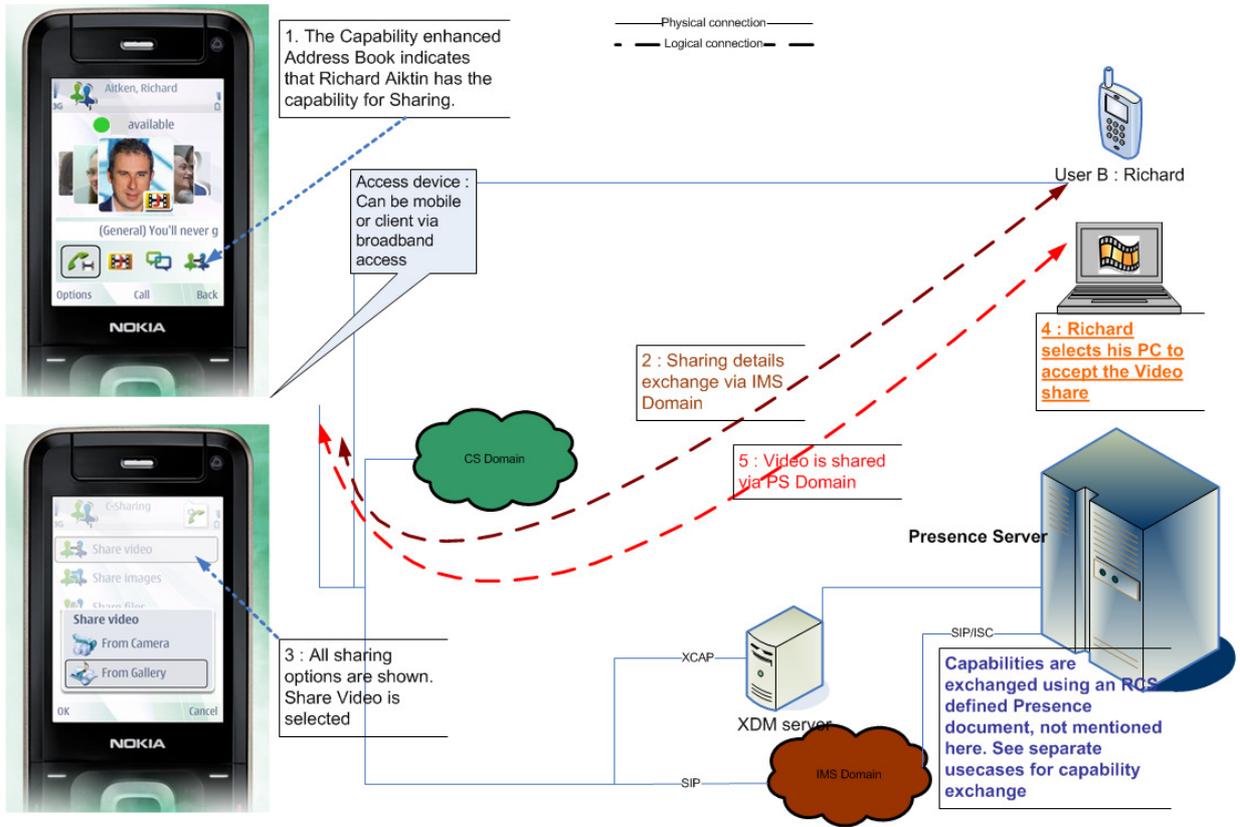
Video call is only possible between 2 mobile devices.

4.1.2.2 Share Video

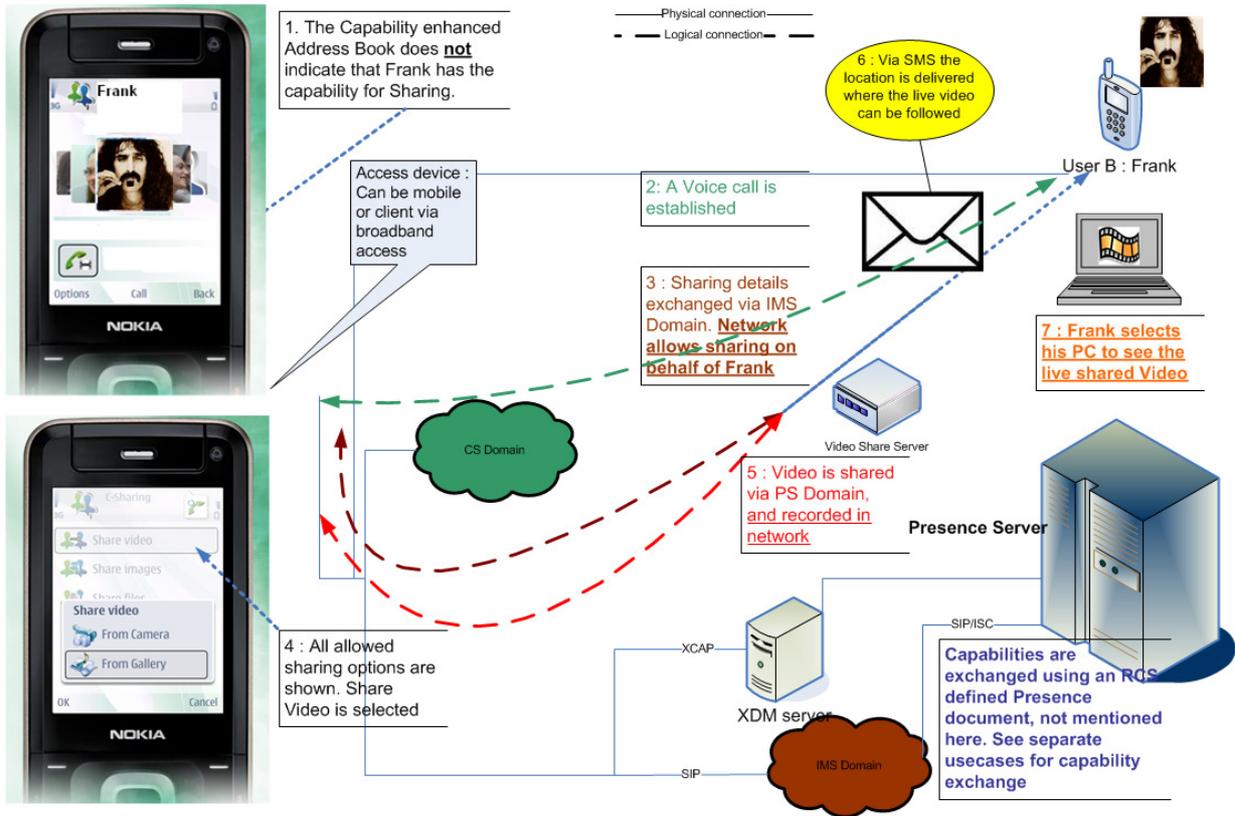


With RCS Release 3 the sharing of the video can continue when the voice call is terminated.

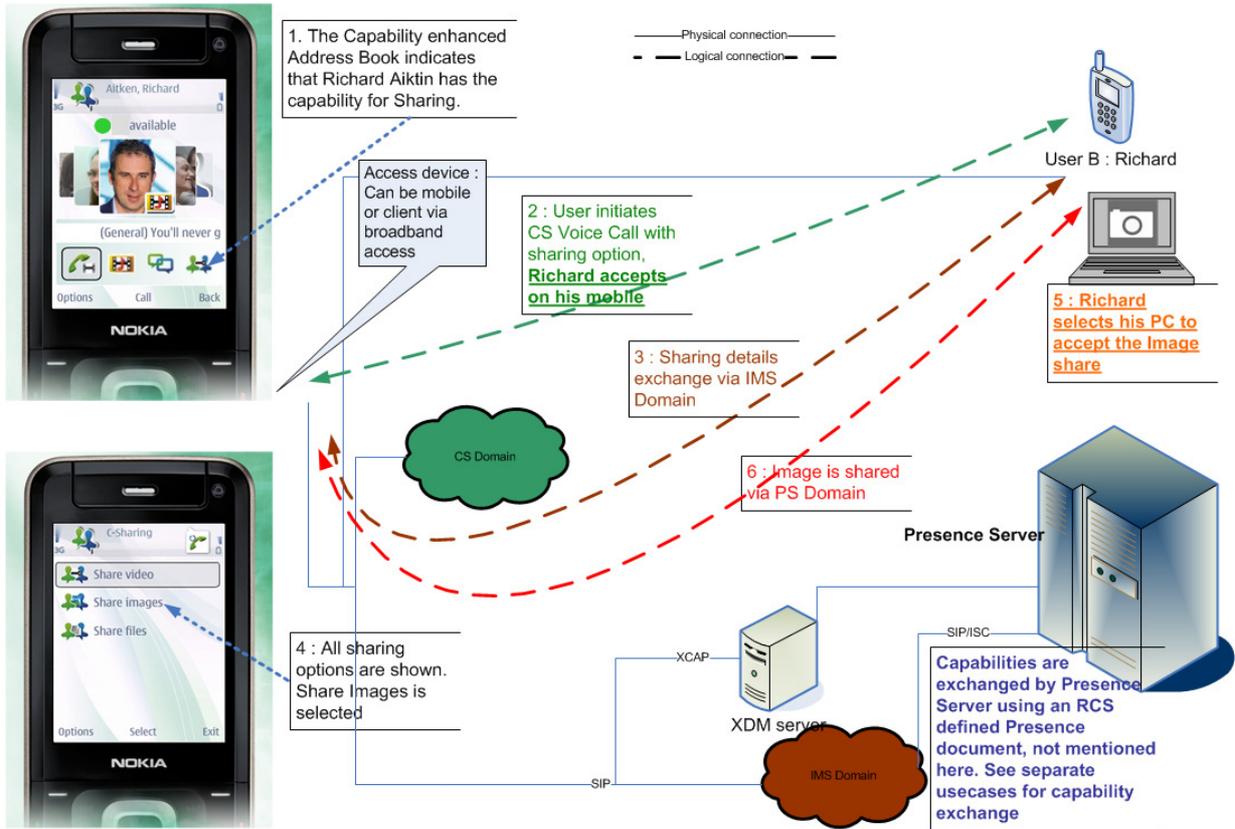
4.1.2.3 Share Video Outside of a Voice Call



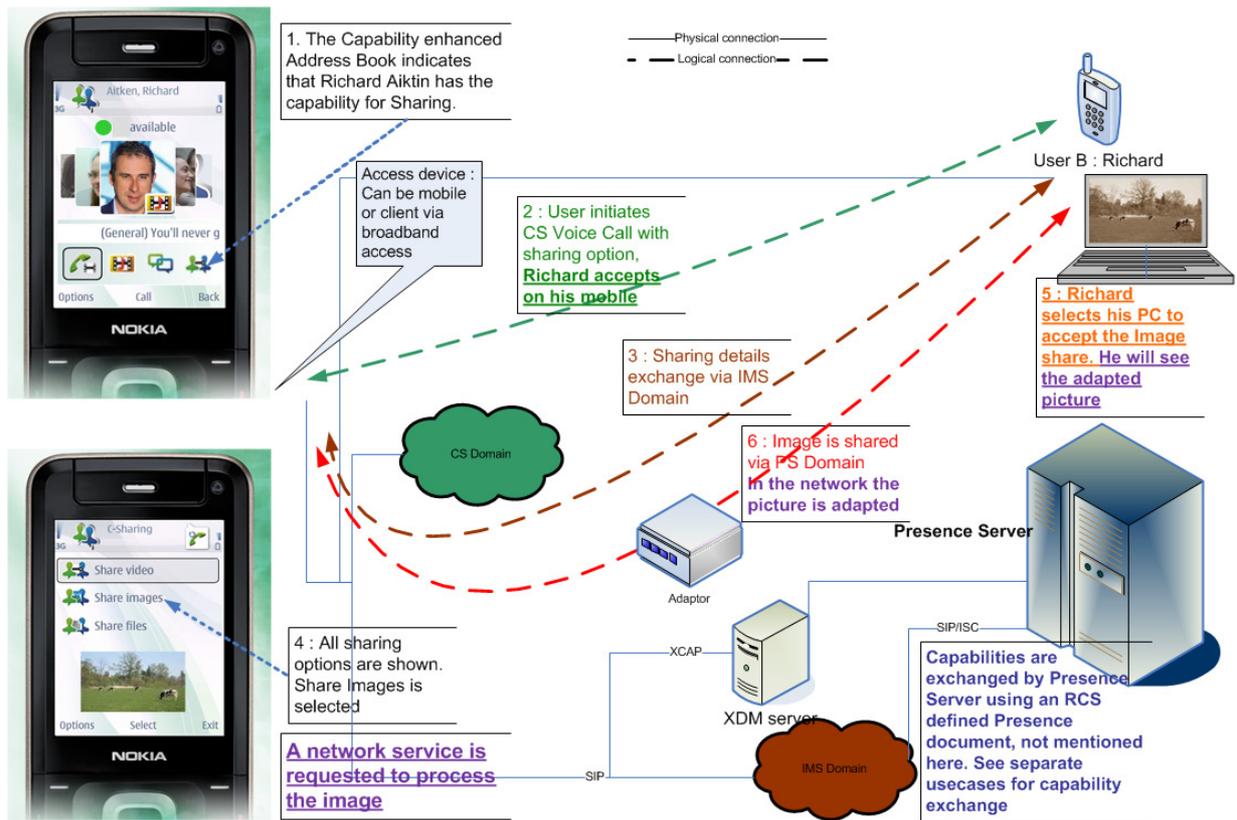
4.1.2.4 Share Video with a Non-RCS User



4.1.2.5 Share Image

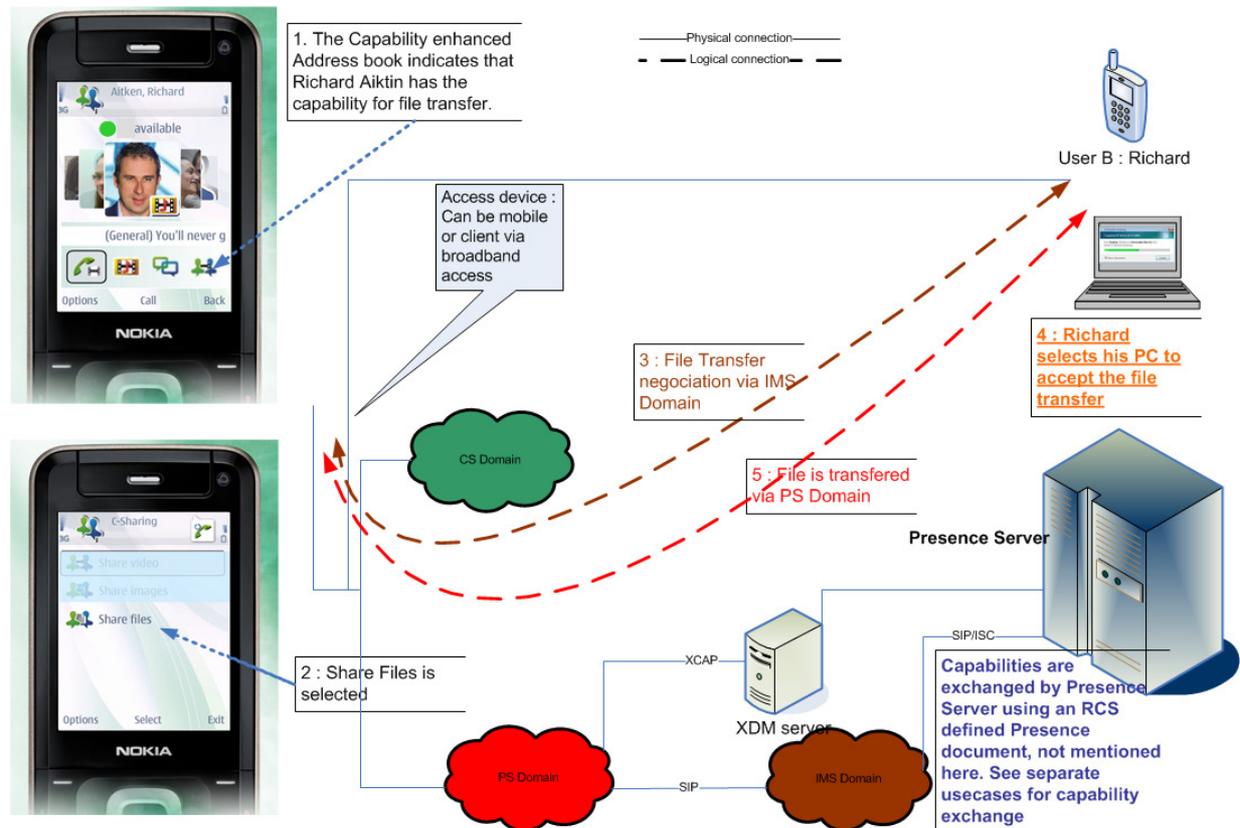


4.1.2.6 Share Image with Network Based Adaption Service



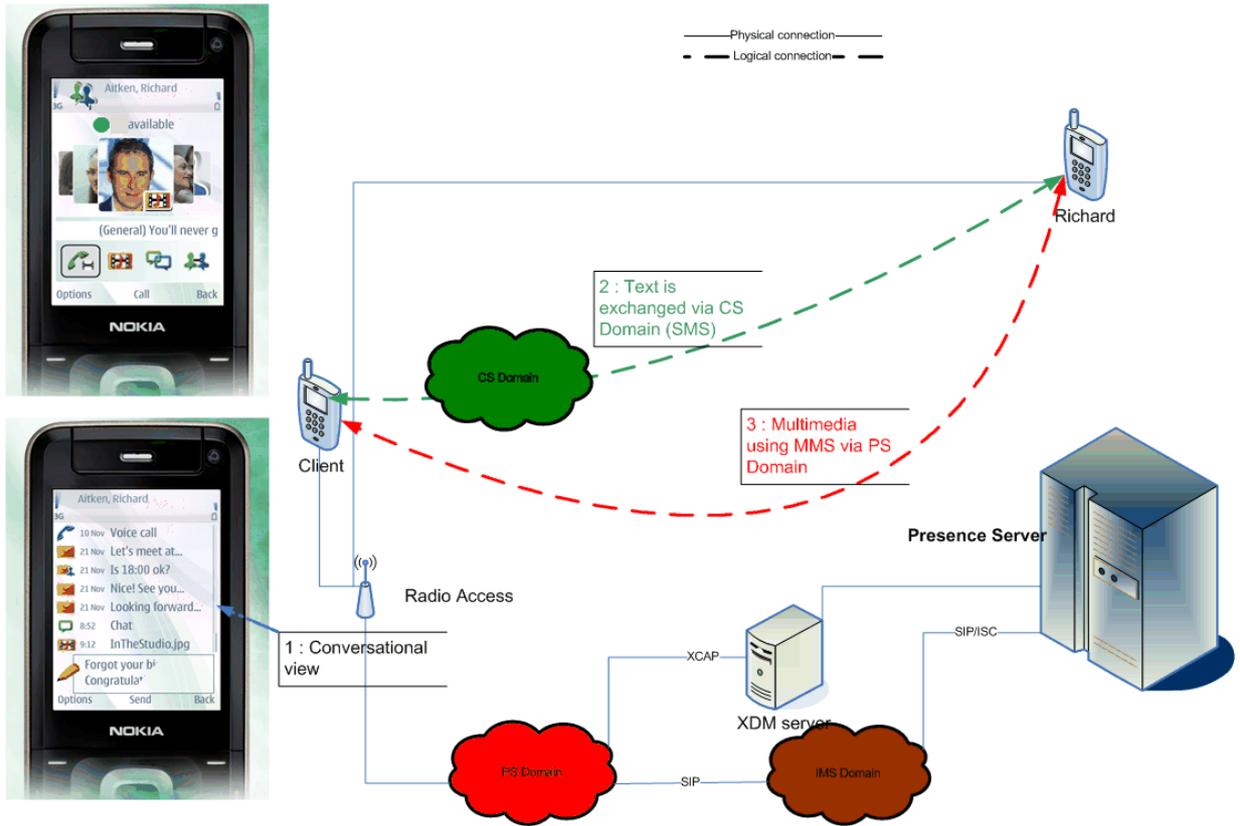
A possible adaptation example can be conversion to sepia (old photo impression), as presented in this use case. This sample use case comes under the general category of NVAS.

4.1.2.7 File Transfer

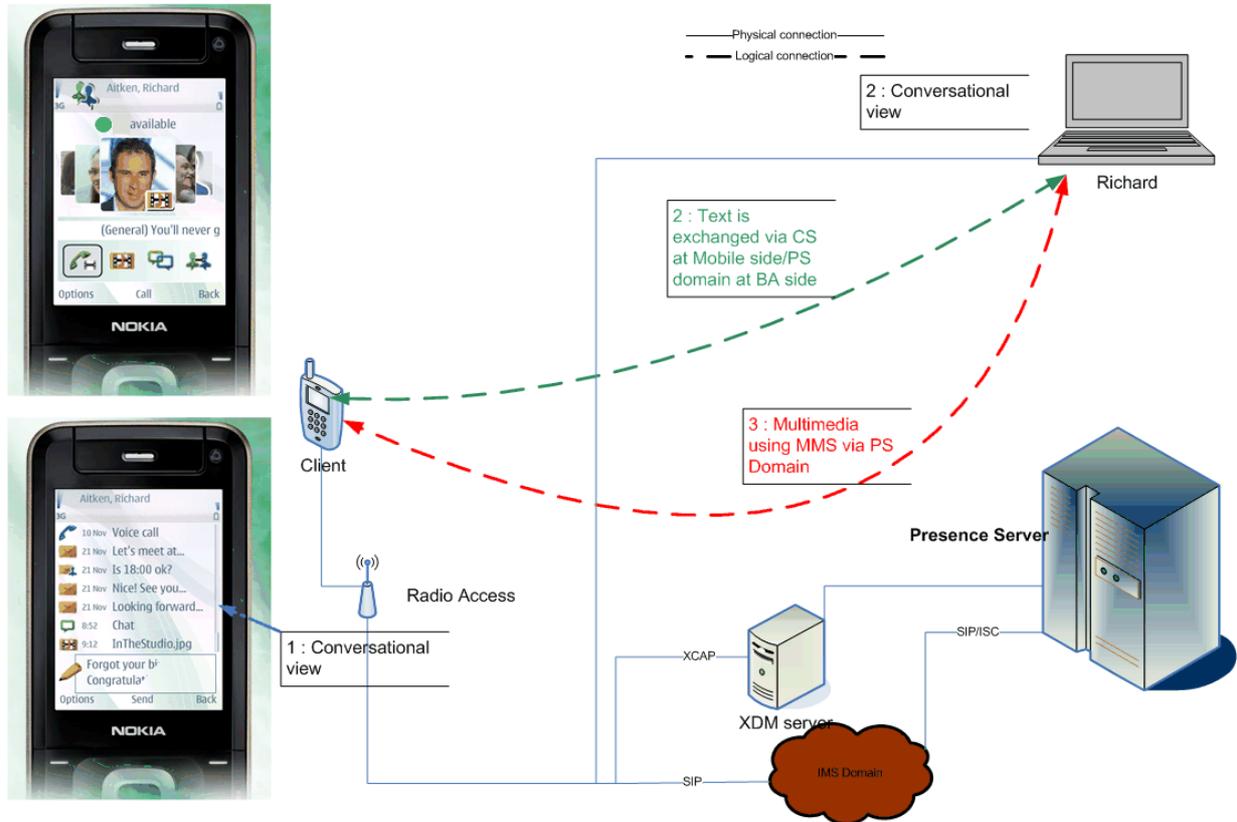


4.1.3 Enhanced Messaging

4.1.3.1 Enhanced SMS/MMS with Conversational View



4.1.3.2 Enhanced SMS/MMS with Conversational View, BA as Primary Device

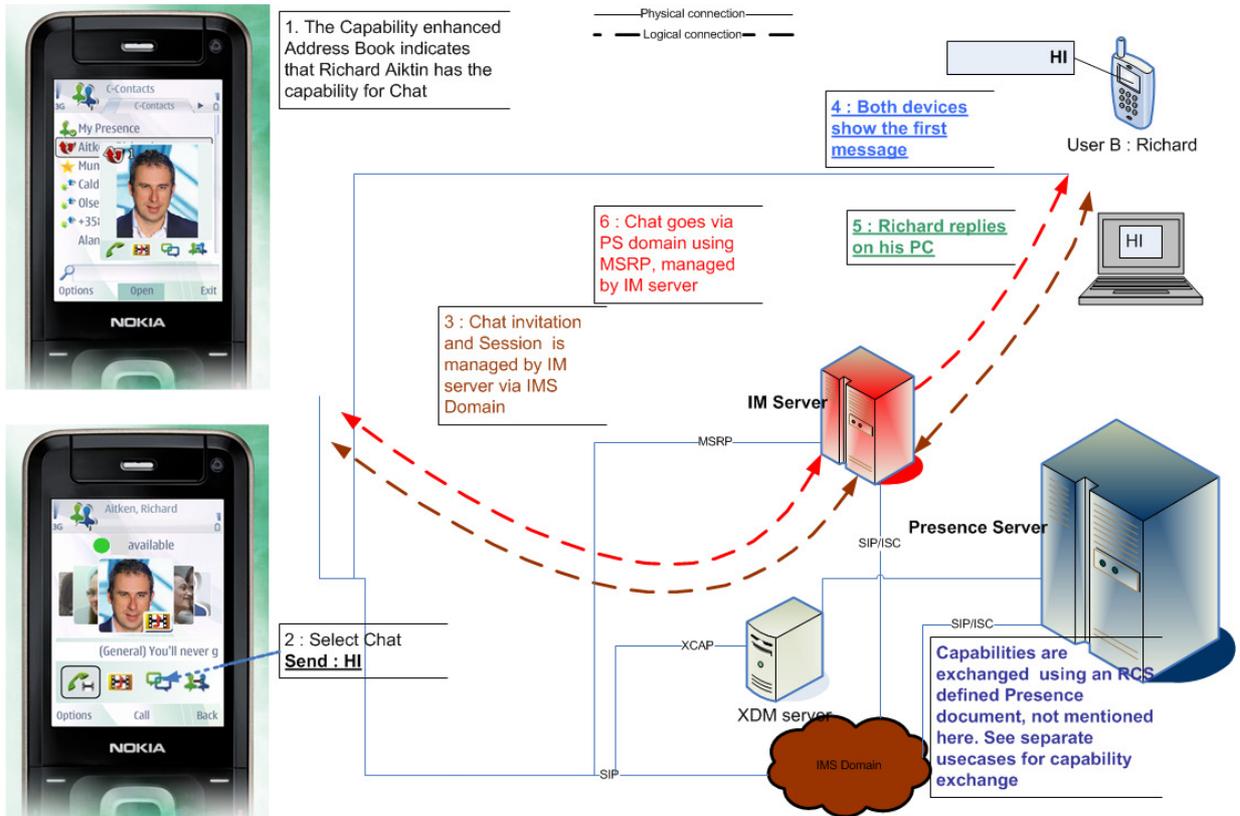


When the BA device is primary device and by that also the only device, full legacy messaging is supported for SMS and MMS (sending and receiving).

In case the BA device is not the single primary device, SMS & MMS can be sent with a Release 3 BA device; with a Release 2 BA device SMS only can be sent.

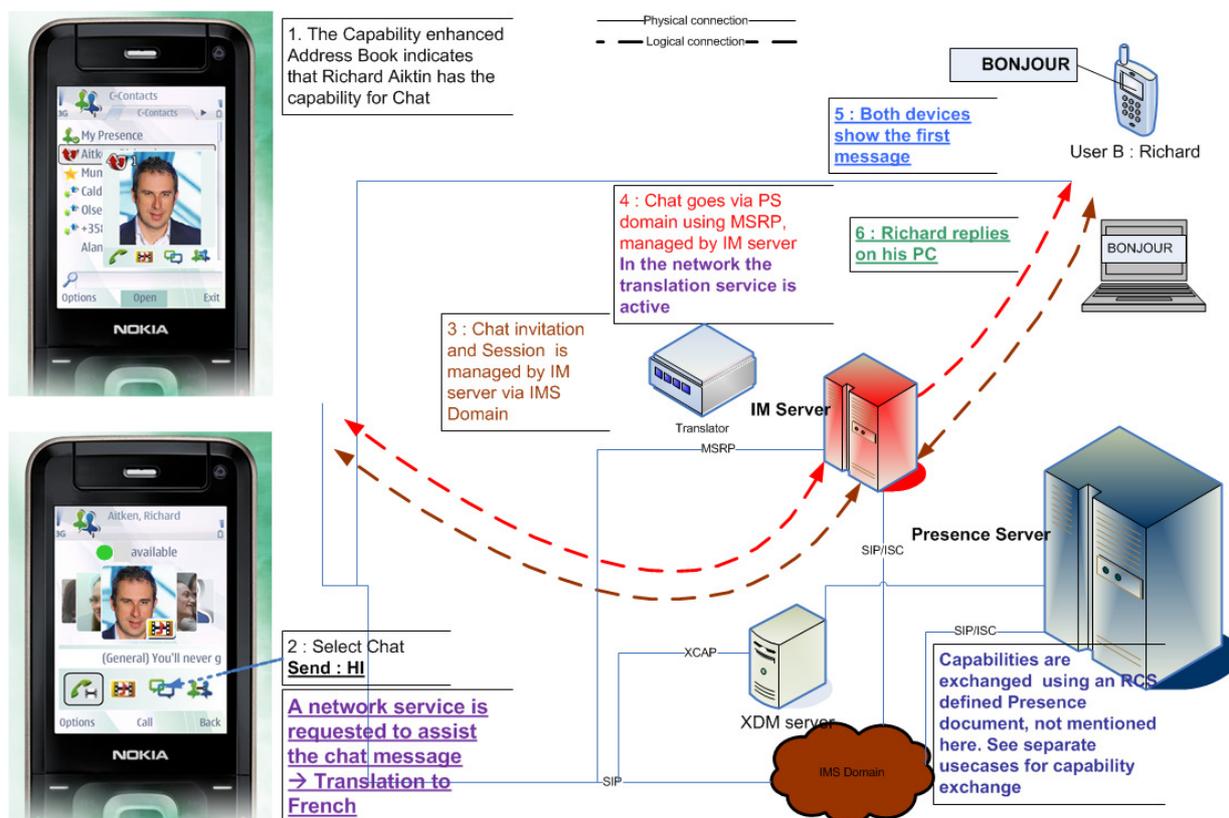
The receiving SMS and MMS are delivered on the mobile device (primary device).

4.1.3.3 One-to-One Chat



This chat session is started with 2 participants, but can be extended with additional participants. Furthermore every participant can request a list of all participants in a group chat.

4.1.3.4 One-to-One Chat with Network Based Adaptation Service



4.2 Roaming:

No Changes for Release3.

4.3 Service Interworking

The only change on the NNI between operators introduced with RCS Release 2 is the usage of the subject header in the INVITE to get the first message through for multi device user experience. More details can be found in the technical realisation [4]

No changes for Release 3.

4.4 Usability Studies

No RCS usability studies have been executed by the GSM Association.

5 Service Requirements and Enablers

5.1 Goals/Requirements

RCS is not defining new QoS requirements.

5.2 Enablers

The RCS service is envisaged to work in Wideband CDMA networks with IMS core infrastructure. IMS authentication will be assumed, using either the early IMS Security, IMS AKA using ISIM or USIM, or HTTP Digest.

From RCS Release 2 on also BA is supported. Details of the authentication method can be found in [4].

RCS is however not limited to Wideband CDMA networks as described in chapter 3.5.

PDP *Always-On* can be used to make the capability exchange possible. *Always-On* also decreases the set-up time of different sessions needed for sharing, file transfer or chatting. The shorter the session set-up time, the better the end-users rate the service.

The GPRS Exchange (GRX) architecture will be used as the interconnect network. The service is envisaged to be deployed via bilateral interconnect until such time as IPX becomes available. This Service Definition and supporting documents are written with transfer to IPX in mind.

RCS enabling services re-use existing standards and specifications. No RCS specific services requirements are defined for the used enablers.

5.3 Service and Application Inter-Dependencies

The individual services like presence, content sharing, file transfer and chatting do not depend on other services. The capability EAB based on capability exchange is the driving element for service promotion and usage.

IMS is seen as infrastructure and not as a service interdependency.

6 Device Requirements

Authentication and authorization for the RCS service is implicit in IMS authentication. Thus it is assumed that RCS-compliant mobile devices contain an ISIM/USIM properly provisioned with public and private identities and access credentials. A user's subscription has to be bound to their smart card (ISIM/USIM) such that the RCS service is portable in the sense that the user may be able to use the service on any capable handset.

When a device is 3G or EDGE compliant (supporting DTM), all RCS services can be used as described in chapter 3.5

For BA authentication and authorization with xSIM and without xSIM, the username and password is supported.

6.1 Recommendations for Functional Requirements

6.1.1 Usability

- Usability of the underlying services applies.
- Additionally RCS has specified its own User Experience requirements. The main requirements have been included in the RCS Release 1.
- For Release 2 & 3 the Functional Description [3] & [5] cover the user experience requirements.

7 System Requirements Specifications

No special SIM/USIM provisioning (assumes ISIM or derivation of public identity from IMSI).

From a user perspective when the RCS application is available on the device, there should be no provisioning operation done by the customer. The service should be available without any specific end user action.

Infrastructure assumptions are:

- IMS core
- Envisaged to work via bilateral interconnect, bilateral IPX interconnect and/or multi-lateral IPX interconnect.
- Data network (for example 3G or other technologies)
- SIP stack/client in phone
- Broadband Access (BA)

8 Other Considerations

8.1 International Lawful Interception and Privacy

No Changes for Release 3.

8.2 Security Review of Service Requirements

RCS welcomes specific feedback from the Security Group.

8.3 Fraud Considerations and Requirements

The Fraud Forum is requested to evaluate possible fraud risks introduced in RCS Release 3.

9 Gap Analysis to Existing Standards

RCS is reusing existing standards and specifications. Specific RCS requirements have been included in the standards. This is done by using the appropriate processes in the standardization bodies to request changes.

Document Management

Document History

Version	Date	Brief Description of Change	Approval Authority	Editor / Company
0.1	23 November 2009	First Version	RCS Programme	Dirk Raeymaekers/ NSN
0.2	24 November 2009	CR 2009-SD0100 Add LTE in chapters 3.5 & 3.6	RCS Programme	Dirk Raeymaekers/ NSN
0.3	1 December 2009	Editorial updates	RCS Programme	Dirk Raeymaekers/ NSN
0.4	11 December 2009	Update 0.4 (Approved at Plenary 3/12/09) with front pages for DAG approval. No review comments received during consistency review See SPEC DOC RCS SPEC R3_006 in https://infocentre.gsm.org/cgi-bin/docindex.cgi?34307	RCS Programme	Dirk Raeymaekers/ NSN
1.0	25 February 2010	Approved by DAG/EMC, removal DAG review sheet	DAG/EMC	Dirk Raeymaekers/ NSN
1.0.1	01 December 2010	Removal of Hyper-availability was replaced by availability	RCS Programme	Tom Van Pelt/Nokia Siemens Networks
1.0.2	13 December 2010	Corrections after editorial consistency review	RCS Programme	Tom Van Pelt/Nokia Siemens Networks
2.0	14 Feb 2011	Submitted to DAG and EMC for approval	DAG/EMC	Tom Van Pelt/Nokia Siemens Networks

Other Information

Type	Description
Document Owner	RCS
Revision Control	Annual
Document editor/company	Tom Van Pelt/Nokia Siemens Networks