
Source: SA1
Title: CRs to 22.951 on Network sharing (Rel-6)
Document for: Approval
Agenda Item: 7.1.3

SA Doc	Spec	CR	Rev	Phase	Cat	Subject	Old Vers	New Vers	SA1 Doc
SP-030034	22.951	001	-	Rel-6	C	Implementing Network Sharing Requirements in Rel-6	6.0.0	6.1.0	S1-030203
SP-030034	22.951	002	-	Rel-6	B	CR to 22.951 (Network Sharing) Dynamic sharing of inbound roaming subscribers in a shared network	6.0.0	6.1.0	S1-030235

CR-Form-v7

CHANGE REQUEST

⌘ **22.951 CR 001** ⌘ rev **-** ⌘ Current version: **6.0.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Network Sharing Requirements in Rel-6		
Source:	⌘ SA1 (Telia AB)		
Work item code:	⌘ NTshar	Date:	⌘ 21/01/2003
Category:	⌘ C	Release:	⌘ REL-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
	F (correction)		2 (GSM Phase 2)
	A (corresponds to a correction in an earlier release)		R96 (Release 1996)
	B (addition of feature),		R97 (Release 1997)
	C (functional modification of feature)		R98 (Release 1998)
	D (editorial modification)		R99 (Release 1999)
	Detailed explanations of the above categories can be found in 3GPP TR 21.900 .		Rel-4 (Release 4)
			Rel-5 (Release 5)
			Rel-6 (Release 6)

Reason for change:	⌘ Clarification of scenario 4 and 2. Editorial modifications to chapter 8 for network requirements.
Summary of change:	⌘ Different possibilities are discussed in different network sharing scenarios in the TR and the choice of which, should be due to decision of the operator.
Consequences if not approved:	⌘ Proposed possibilities for work on network sharing in REI-6 might be considered mandatory

Clauses affected:	⌘ 5.2, 5.4 and 8						
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
	Y	N					
	<input type="checkbox"/>	<input checked="" type="checkbox"/>					
	<input checked="" type="checkbox"/>	Test specifications	⌘				
<input checked="" type="checkbox"/>	O&M Specifications	⌘					
Other comments:	⌘						

How to create CRs using this form:

Comprehensive information and tips about how to create CRs can be found at <http://www.3gpp.org/specs/CR.htm>. Below is a brief summary:

- 1) Fill out the above form. The symbols above marked ⌘ contain pop-up help information about the field that they are closest to.
- 2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be

downloaded from the 3GPP server under <ftp://ftp.3gpp.org/specs/> For the latest version, look for the directory name with the latest date e.g. 2001-03 contains the specifications resulting from the March 2001 TSG meetings.

- 3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

***** **First Modified Section** *****

5.2 Scenario 2: Geographically split networks sharing

In this scenario, two (or more) operators with individual 3G licenses will with their respective radio access networks cover different parts of a country but together provide coverage of the entire country.

This scenario can be divided into following cases:

- 1) When two (or more operators) employ national roaming for the users, which implies that only one core network will be associated with each radio access network. Care is obviously needed when coverage regions overlap, which makes this a valid shared-networks scenario. This case is shown in Figure 3.
- 2) The operators can have their individual core networks connected to both radio access networks throughout the entire coverage area, but utilizing the different operator’s allocated spectrum in different parts of the coverage area. There will thus be multiple core network operators in each of the shared radio access networks. The connection of the core networks to the radio access networks can either be done by connecting the radio network controllers to both operators' core network elements or by sharing parts of the core network, e.g. SGSNs and/or MSCs. The work on shared networks in Rel-6 should not make any of these possibilities mandatory and it should be the choice of the operator which one is implemented. Additionally it should, be possible to introduce Iu-flex functionality between the common core network parts and the radio access network for purely load-sharing purposes.

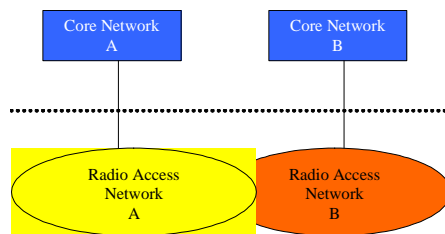


Figure 3: Geographically split network using national roaming between operators.

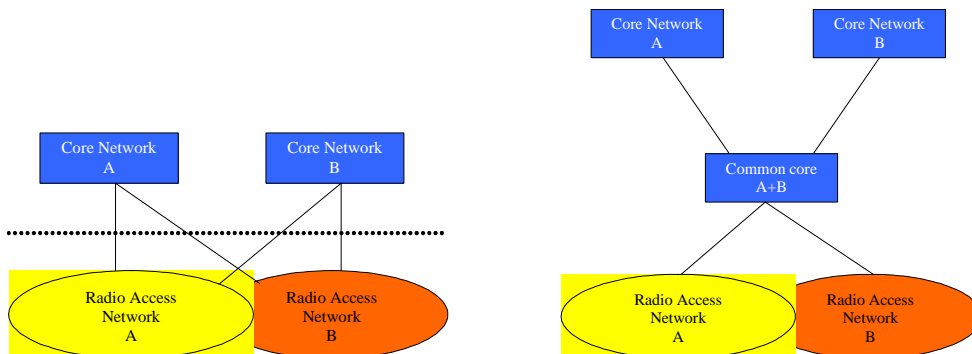


Figure 4: Geographically split shared radio networks scenarios with dedicated or common core networks

The national roaming scenario and the common core network scenario in Figure 4 can be deployed already today using R99 functionality and are therefore important in the future work of 3GPP. The scenario with dedicated core networks in Figure 4 is not supported by Rel-5 specifications.

In areas where more than one of the operators provide coverage, it should be possible to restrict the access rights so that the users are only allowed to use the radio access network provided by their home operator.

******* Next Modified Section *******

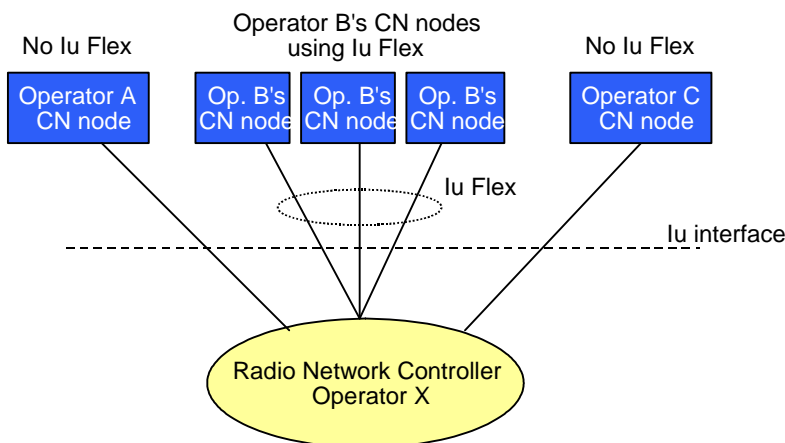
5.4 Scenario 4: Common spectrum network sharing

Common spectrum network sharing is applicable when

- one operator has a 3G license and shares the allocated spectrum with other operators.
- a number of operators decide to pool their allocated spectrums and share the total spectrum (operators without allocated spectrum may also share this pooled spectrum).

The scenario can be realized as follows.

1. Connecting each operator’s core networks and to the shared radio access network(s), see case 1 in Figure 5 below (only 1 radio network controller for simplicity). In this case it should be possible that one or more of the core network operators use Iu Flex between their core network and the shared radio access network. The technical realisation of this scenario may reuse some of the mechanisms already specified in REL-5 Iu Flex. Described in the figure below are three network operators, A, B and C. Operators A and C are not using multiple core network nodes (CN) and therefore may not need to use Iu-Flex. Operator B is using multiple CNs and has decided to use Ie-Flex to enable the intra-domain sharing of CNs
2. The core network entities connected to radio access network can be shared, see case 2 in Figure 5 below.



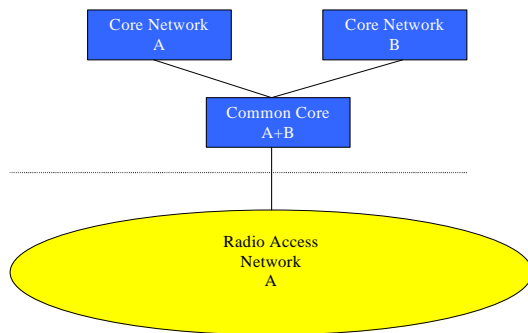


Figure 5: Two different cases of common spectrum network sharing

The work on shared networks in Rel-6 should not make any of these possibilities mandatory and it should be the choice of the operator which one is implemented.

******* Last Modified Section *******

8 Network requirements

The provision of services and service capabilities that is possible to offer in a network should not be restricted by the existence of the network sharing It should be possible for a core network operator to differentiate its service offering from other core network operators within the shared network.

It should be possible to control the access to service capabilities offered by a shared network according to the core network operator the user is subscribed to.

******* End of Modifications*******

CR-Form-v7

CHANGE REQUEST

⌘ **22.951 CR 002** ⌘ rev **-** ⌘ Current version: **6.0.0** ⌘

For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ⌘ symbols.

Proposed change affects: UICC apps ME Radio Access Network Core Network

Title:	⌘ Dynamic sharing of inbound roaming subscribers in a shared network		
Source:	⌘ SA1 (T-Mobile)		
Work item code:	⌘ NTShar	Date:	⌘ 13/01/2003
Category:	⌘ B	Release:	⌘ REL-6
	Use <u>one</u> of the following categories:		Use <u>one</u> of the following releases:
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			Rel-5 (Release 5)
			Rel-6 (Release 6)

Reason for change:	⌘ At the moment the facility to allocate inbound international roaming subscribers to one or the other core network operator so that a predetermined share between the sharing partners is achieved is only applied when the subscribers perform the initial registration to the shared network. It is instead more useful to trace regularly this share moving, if necessary, subscribers from one core network operator to another. Some text has been added to section 9.3 to reflect this thinking.
Summary of change:	⌘ It is clarified that the balancing of roaming subscribers may be performed also after the subscriber has registered with one of the networks thus allowing dynamic reallocation of users to a particular core network operator and maintaining the agreed shares of subscribers.
Consequences if not approved:	⌘ The balancing of inbound international roaming subscribers between two or more network sharing partners will be limited to the initial registration.

Clauses affected:	⌘ 9.3										
Other specs affected:	<table border="1" style="display: inline-table; border-collapse: collapse;"> <tr> <td style="padding: 2px;">Y</td> <td style="padding: 2px;">N</td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> <tr> <td style="padding: 2px;"><input type="checkbox"/></td> <td style="padding: 2px;"><input checked="" type="checkbox"/></td> </tr> </table>	Y	N	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	<input type="checkbox"/>	<input checked="" type="checkbox"/>	Other core specifications	⌘
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9.3 Roaming

When the user is registered on a shared network, the control of the PLMN and radio access technology (e.g. UTRA, GERAN) employed within that shared network is under the sole control of the network operator. This does not imply any limitation on the manual or automatic selection of a PLMN that does not belong to the shared network where the user is registered.

The standards should specify mechanisms necessary to enable flexible allocation of inbound roamers among core network operators that have roaming agreements with the same roaming partners. The core network operators should be able to pre-define their relative share of inbound roamers and the network should distribute the inbound roamers that apply automatic network selection to different core networks connected to the radio access network accordingly. [It should also be possible for the core network operator to allow or force the subscribers to reselect to another part of the shared network so that the relative share of inbound roamers is maintained.](#)

In case the mobility in the shared network is controlled by the UE (e.g. cell reselection) the operator should be able to set parameters, other than radio parameters that determine the most appropriate candidate. Examples of these parameters are: subscription information, requested service, network load and so on.