Technical Specification Group Services and System Aspects   *TSGS#19(03)0035*
Meeting #19, Birmingham, UK, 17-20 March 2003

Source:	**SA1**
Title:	**CR to TS 22.011, 22.101, 22.115 and 22.129 on Network Sharing Requirements in 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-030035	22.011	050	-	Rel-6	B	Netshare CR to TS 22.011	5.1.0	6.0.0	S1-030236
SP-030035	22.101	115	-	Rel-6	B	Requirements for Network Sharing in Rel-6	6.2.0	6.3.0	S1-030269
SP-030035	22.115	009	-	Rel-6	B	Requirements for Network Shairng in Rel-6	5.2.0	5.3.0	S1-030270
SP-030035	22.129	027	-	Rel-6	B	Netshare CR to TS 22.129 on Requirements for Network Sharing in Rel-6	5.2.0	5.3.0	S1-030271

CR-Form-v7

CHANGE REQUEST

| ⌘ | **22.011** CR **050** | ⌘**rev** | **-** | ⌘ | Current version: | **5.1.0** | ⌘ |

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Proposed change affects: UICC apps⌘ ☐   ME **X** Radio Access Network **X** Core Network **X**

Title: ⌘	Network Sharing Requirements in Rel-6	
Source: ⌘	SA1 (Telia AB)	
Work item code:⌘	Ntshar-CR	***Date:*** ⌘ 22/01/2003
Category: ⌘ **B**	*Use one of the following categories:* ***F*** *(correction)* ***A*** *(corresponds to a correction in an earlier release)* ***B*** *(addition of feature),* ***C*** *(functional modification of feature)* ***D*** *(editorial modification)* Detailed explanations of the above categories can be found in 3GPP TR 21.900.	***Release:*** ⌘ Rel-6 *Use one of the following releases:* *2 (GSM Phase 2)* *R96 (Release 1996)* *R97 (Release 1997)* *R98 (Release 1998)* *R99 (Release 1999)* *Rel-4 (Release 4)* *Rel-5 (Release 5)* *Rel-6 (Release 6)*

Reason for change: ⌘	Inclusion of the requirements for network sharing from TR 22.951
Summary of change:⌘	The CR proposes new requirements for handling of roaming issues and selection of core network operator related to network sharing
Consequences if not approved: ⌘	Stage 1 requirements for network sharing will not be fully supported

Clauses affected: ⌘	2.4 (new chapter) and 3.2

	Y	N		
Other specs affected: ⌘		X	Other core specifications ⌘	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘	

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********** Modified Sections *************

2 Roaming

2.1 General requirements

A UE with a valid IMSI may roam and access service in the area authorized by the entitlement of the subscription.

If a communication has been established, the UE will in principle not suffer an interruption within the PLMN area (provided the entitlement of the subscription allows it). Exceptions are possible if no network resources or radio coverage are available locally.

However, if the UE leaves the PLMN area, an established communication may terminate. If the user then wants to continue, another network providing service has to be selected and a new communication has to be established (see clause 3).

2.2 International roaming

International roaming is a service whereby an UE of a given PLMN is able to obtain service from a PLMN of another country.

The availability of International Roaming is subject to inter-PLMN agreements.

2.3 National roaming

National Roaming is a service whereby an UE of a given PLMN is able to obtain service from another PLMN of the same country, anywhere, or on a regional basis.

The availability of National Roaming depends on the home PLMN of the requesting UE and the visited PLMN; it does not depend on subscription arrangements.

2.4 Roaming in shared networks

Mechanisms shall be specified to enable flexible allocation of visiting roamers among core network operators that have roaming agreements with the same roaming partners. The core network operators shall be able to pre-define their relative share of visiting roamers and distribute the visiting roamers that apply automatic network selection to different core networks connected to the radio access network accordingly.

When network sharing exists between different operators and a user roams into the shared network it shall be possible for that user to register with a core network operator (among the network sharing partners) that the user's home operator has a roaming agreement with, even if the operator is not operating a radio access network in that area.

The selection of a core network operator among those connected to the shared radio access network can either be manual (i.e. performed by the user after receiving a list of available core network operators) or automatic (i.e. performed by the UE according to user and operator preferred settings). For further information see subclause 3.2.

3 Provisions for providing continuity of service

3.1 Location registration

 PLMNs shall provide a location registration function with the main purpose of providing continuity of service to UEs over the whole system area. The location registration function shall be such as to allow:

-   Fixed subscribers to call a UE by only using the directory number of the UE irrespective of where the UE is located in the system area at the time of the call.

-   UEs to access the system irrespective of the location of the UE.

-   UEs to identify when a change in location area has taken place in order to initiate automatic location updating procedures.

3.2   Network selection

NOTE: Implications on shared network on this chapter is FFS.

3.2.1   General

The UE shall support both manual and automatic network selection mechanisms (modes). The UE shall select the last mode used, as the default mode, at every switch-on.

NOTE: By defaulting to the last mode used, e.g. manual network selection, the undesired automatic selection of an adjacent PLMN instead of the desired HPLMN in border areas, can be avoided at switch-on.

The user shall be given the opportunity to change mode at any time.

Except as defined below, the MMI shall be at the discretion of the UE manufacturer.

The UE shall contain display functions by which Available PLMNs and the Selected PLMN can be indicated.

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

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CHANGE REQUEST

⌘ **22.101 CR 115** ⌘**rev** **-** ⌘ Current version: **6.2.0** ⌘

*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 **X** Radio Access Network **X** Core Network **X**

Title: ⌘	Requirements for Network Sharing in Rel-6	
Source: ⌘	SA1 (Telia AB)	
Work item code:⌘	Ntshar-CR	***Date:*** ⌘ 22/01/2003

Category: ⌘ **B** ***Release:*** ⌘ REL-6

Use one of the following categories:
   F *(correction)*
   A *(corresponds to a correction in an earlier release)*
   B *(addition of feature),*
   C *(functional modification of feature)*
   D *(editorial modification)*
Detailed explanations of the above categories can
be found in 3GPP TR 21.900.

Use one of the following releases:
  2   *(GSM Phase 2)*
  R96 *(Release 1996)*
  R97 *(Release 1997)*
  R98 *(Release 1998)*
  R99 *(Release 1999)*
  Rel-4 *(Release 4)*
  Rel-5 *(Release 5)*
  Rel-6 *(Release 6)*

Reason for change: ⌘	Inclusion of the requirements for network sharing from TR 22.951
Summary of change:⌘	Service and service capabilities shall not be restricted when network sharing exist. General requirements such as the transparancy to the user when operators sharing networks, which CN operator the user is connected to in a shared network area, charging requirements and network name display requirements are proposed in this CR.
Consequences if not approved: ⌘	Stage 1 requirements for network sharing will not be fully supported

Clauses affected: ⌘	4.2.1, 4.9, 16, AnnexA (new section A.4a)

	Y	N		
Other specs affected: ⌘		X	Other core specifications ⌘	
		X	Test specifications	
		X	O&M Specifications	

Other comments: ⌘	

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

4.2 Standardisation of Service Capabilities

Existing systems have largely standardised the complete sets of teleservices, applications and supplementary services which they provide. As a consequence, substantial re-engineering is often required to enable new services to be provided and the market for services is largely determined by operators and standardisation. This makes it more difficult for operators to differentiate their services.

3GPP shall therefore standardise service capabilities and not the services themselves. Service capabilities consist of bearers defined by QoS parameters and the mechanisms needed to realise services. These mechanisms include the functionality provided by various network elements, the communication between them and the storage of associated data. This TS provides a conceptual description of a service architecture and architecture requirements which aim to provide service capabilities. It is intended that these standardised capabilities should provide a defined platform which will enable the support of speech, video, multi-media, messaging, data, other teleservices, user applications and supplementary services and enable the market for services to be determined by users and home environments.

4.2.1 Provision of service capabilities in shared networks

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

It shall 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.

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

4.9 Network Sharing

Network sharing shall be transparent to the user.

The specifications shall support both the sharing of:

    (i)   radio access network only;

    (ii)   radio access network and core network entities connected to radio access network

    NOTE: in a normal deployment scenario only one or the other option will be implemented.

It shall be possible to support different mobility management rules, service capabilities and access rights as a function of the home PLMN of the subscribers.

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

16 Charging principles

The cost of the call may cover the cost of sending, transporting, delivery and storage. The cost of call related signalling may also be included. Provision shall be made for charging based on time, destination, location, volume, bandwidth and quality. Charges may also be levied as a result of the use of value added services.

It shall be possible for information relating to chargeable events to be made available to the home environment at short notice. The requirements shall include:

- Immediately after a chargeable event is completed;

- At regular intervals of time, volume or charge during a chargeable event.

Standardised mechanisms of transferring charging information are required to make these requirements possible.

It should be possible for multiple leg calls (e.g. forwarded, conference or roamed) to be charged to each party as if each leg was separately initiated. However, in certain types of call, the originating party may wish/be obliged to pay for other legs (e.g. SMS MO may also pay for the MT leg.).

Provision shall be made for the chargeable party to be changed during the life of the call. There shall be a flexible billing mechanism which may include the use of stored value cards, credit cards or similar devices.

The chargeable party (normally the calling party) shall be provided with an indication of the charges to be levied (e.g. via the called number automatically or the Advice of Charge supplementary service) for the duration of the call (even though the user may change service environment)The user shall be able to make decisions about the acceptable level of accumulated charge dynamically or through their service profile.

If a user is to be charged for accepting a call then their consent should be obtained. This may be done dynamically or through their service profile.

Charging in the 3GPP system shall not be compromised when access is via an I-WLAN.

Charging and accounting solutions shall support the shared network architecture so that end users can be appropriately charged for their usage of the shared network, and network sharing partners can be allocated their share of the costs of the shared network resources.

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

Annex A (normative):
Description of optional user equipment features

....

A.4a   Core Network Operator Name indication

It shall be possible for the UE to display the name of the core network operator the user has selected.

NOTE: The display of the core network name in relation to the display of PLMN name and service provider name is FFS.

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

CR-Form-v7

CHANGE REQUEST

| ⌘ | **22.115** CR **009** | ⌘**rev** | **-** | ⌘ | Current version: | **5.2.0** | ⌘ |

*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 **X**   Core Network **X**

Title: ⌘	Requirements for Network Shairng in Rel-6	
Source: ⌘	SA1 (Telia AB)	
Work item code:⌘	Ntshar-CR	***Date:*** ⌘ 22/01/2003
Category: ⌘ **B**	Use <u>one</u> of the following categories: **F** (correction) **A** (corresponds to a correction in an earlier release) **B** (addition of feature), **C** (functional modification of feature) **D** (editorial modification) Detailed explanations of the above categories can be found in 3GPP TR 21.900.	***Release:*** ⌘ REL-6 Use <u>one</u> of the following releases: 2 (GSM Phase 2) R96 (Release 1996) R97 (Release 1997) R98 (Release 1998) R99 (Release 1999) Rel-4 (Release 4) Rel-5 (Release 5) Rel-6 (Release 6)

Reason for change: ⌘	Inclusion of requirement for charging and accounting for network sharing
Summary of change:⌘	Supporting the shared network architecture so that both end user and network sharing partners can be appropriately charged
Consequences if not approved: ⌘	Stage 1 requirements for network sharing will not be complete and fully supported

Clauses affected: ⌘	4

		Y	N		
Other specs affected:	⌘		X	Other core specifications ⌘	
			X	Test specifications	
			X	O&M Specifications	

Other comments: ⌘	

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*********** **Modified Section** ************

4   Main Requirements and High Level Principles

The main new requirements for 3GPP system charging and accounting are:

- to provide a call detail record for all charges incurred and requiring settlement between the different commercial roles;

- to allow fraud control by the Home Environment and the Serving network;

- to allow cost control by the charged party;

- to provide at the beginning of a chargeable event an indication to the charged party (if involved in the chargeable event) of the charges to be levied for this event;

- to allow itemised billing for all services charged to each subscription, including voice and data calls, and services offered by home environments.

- to enable the Home environment to provide a Prepay Service and to enable the serving network to support that Prepay Service for the Home environment's subscribers.

- to allow interconnect (inter-operator) charging including mobile operator to mobile operator and mobile operator to fixed operator (circuit switched & IP) and mobile operator to IP network provider;

- to allow Network operator to 3rd party supplier (eg Value Added Service Provider) charging;

- to provide details required for Customer Care purposes

- to support the shared network architecture so that end users can be appropriately charged for their usage of the shared network, and network sharing partners can be allocated their share of the costs of the shared network resources.

The high level principles that will guide the charging requirements are summarised as follows:

- It must be possible to charge separately for each type of medium used (eg voice, video, data) in a session and for each service used (eg voice call, streaming video, file download);

- It must be possible to charge for different levels of QoS applied for and/or allocated during a session for each type of medium or service used;

- It must be possible to charge each "leg" of a session separately. This includes the incoming and outgoing legs and any forwarded/redirected legs. (Note: The legs mentioned here are logical legs, i.e. not necessarily identical to actual signal and traffic flow. Even though tromboning may be avoided by optimal routing, the operator should still be able to charge for the 'virtual legs' of the call)

- The user can be charged according to the service used irrespective of the technology used to deliver it. (That is, the charge is not derived from whether 2G or 3G is used);

- The user can be charged according to the technology used to deliver a service. (That is, different charges can be applied on 2G and 3G);

- It must be possible to charge a user according to the network resources used. For example, if a large bandwidth is required to use high quality video, the user could be charged accordingly. This is related to charging by QoS;

- It must be possible to charge users flexibly for the use of extra resources (in at least the same network) for all legs of the call. For example, if a video component is added to a voice call the use of extra radio resource at both ends of the call could be paid for by each user in the call or totally by the initiating user.

- It must be possible to suppress charging for certain types of connection e.g. when a customer receives tones or network announcements or during sessions such as automated pre-pay top-up.

- It must be possible for the home network to charge its customers while roaming in the same ways as when they are at home. For example, if duration based charging is used for charging for streaming music in the home network, then it must be possible to apply the same principle when the user is roaming.

- It must be possible for operators to have the option to apply charging mechanisms that are used in GSM/GPRS. For example for duration of a voice call, for the amount of data transmitted (eg for streaming, file download, browsing) and for an event (one-off charge).

- It must be possible for charging to be applied based on location, presence, push services etc

- It must be possible to charge using pre-pay, post-pay, advice of charge, 3rd party charging techniques.

These new requirements and principles will allow users more freedom to obtain service when roaming, whilst providing effective cost and credit control for the Home Environment and User.

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

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CHANGE REQUEST

⌘ **22.129** CR **027** ⌘ **rev** **-** ⌘ Current version: **5.2.0** ⌘

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Proposed change affects: UICC apps⌘ ☐   ME ☐ Radio Access Network **X** Core Network **X**

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Source: ⌘	SA1 (Telia AB)	
Work item code:⌘	Ntshar-CR	***Date:*** ⌘ 22/01/2003
Category: ⌘ **B**		***Release:*** ⌘ REL-6

Use one of the following categories:
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Rel-4   (Release 4)
Rel-5   (Release 5)
Rel-6   (Release 6)

Reason for change: ⌘	Inclusion of the requirements for network sharing from TR 22.951
Summary of change:⌘	Service continiuty and handover requirements between and within the shared networks are proposed in this CR
Consequences if not approved: ⌘	Stage 1 requirements for network sharing will not be fully supported

Clauses affected: ⌘	4.2, 5.7 (new chapter)

	Y	N	
Other specs Affected: ⌘		X	Other core specifications ⌘
		X	Test specifications
		X	O&M Specifications

Other comments: ⌘	

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

4.2   Service Continuity requirements

For all scenarios, the specifications shall cover both service continuity within the same PLMN (intra-PLMN) and between PLMNs (inter-PLMN) including the case where the PLMNs involved are operated by different network operators.

It shall be possible for a user to roam between the different parts of a shared network without requiring any user intervention. The user experience while roaming in a shared network shall be comparable to the user experience while roaming in a non-shared network.

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

5.7   Handover for shared networks

Handover shall be supported within a shared network and between a shared network and a non-shared network.

The requirements that apply to inter PLMN handover between non-shared networks shall equally apply to inter PLMN handover between shared networks as well as between a shared and a non-shared network.

The network shall be able to make the decision on the most appropriate candidate for handover based on any combination of the following information:

-    type of subscription (e.g. prepay / postpay)

-    home network of the subscriber

-    access rights

-    connected core network

NOTE: access rights describe which of the candidates for handover a subscriber is allowed to access. The access rights are granted by the home PLMN on a subscriber by subscriber basis.

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