Agenda Item: 6.2.9

Source: SMG1 VHE adhoc

Title: Provision of Services in UMTS - The Virtual Home Environment
                     UMTS TS 22.21 V0.4.0

Document for: Information

_____

Virtual Home Environment (VHE) is defined as a concept for personalised service portability across network boundaries and between terminals. The concept of the VHE is such that users are consistently presented with the same personalised features, User Interface customisation and services in whatever network and whatever terminal (within the capabilities of the terminal), where ever the user may be located.

This TS specifies the content of the stage one requirement for realisation of VHE.

Tdoc /98

TS 22.21 V0.4.0 (1999-01)

Technical Specification

Universal Mobile Telecommunications System (UMTS);
Provision of Services in UMTS - The Virtual Home Environment
(Including Release 99 requirements)

UMTS

Universal Mobile

Telecommunications System

ETSI

European Telecommunications Standards Institute

Reference
DTR/SMG-0122.80U (l400100s.PDF)

Keywords
UMTS, VHE, IMT-2000, GSM

ETSI Secretariat

Postal address
F-06921 Sophia Antipolis Cedex - FRANCE

Office address
650 Route des Lucioles - Sophia Antipolis
Valbonne - FRANCE
Tel.: +33 4 92 94 42 00   Fax: +33 4 93 65 47 16
Siret N° 348 623 562 00017 - NAF 742 C
Association à but non lucratif enregistrée à la
Sous-Préfecture de Grasse (06) N° 7803/88

X.400
c= fr; a=atlas; p=etsi; s=secretariat

Internet
secretariat@etsi.fr
http://www.etsi.fr

Contents

Intellectual Property Rights

IPRs essential or potentially essential to the present document may have been declared to ETSI. The information pertaining to these essential IPRs, if any, is publicly available for **ETSI members and non-members**, and can be found in ETR 314: *"Intellectual Property Rights (IPRs); Essential, or potentially Essential, IPRs notified to ETSI in respect of ETSI standards"*, which is available **free of charge** from the ETSI Secretariat. Latest updates are available on the ETSI Web server (http://www.etsi.fr/ipr).

Pursuant to the ETSI Interim IPR Policy, no investigation, including IPR searches, has been carried out by ETSI. No guarantee can be given as to the existence of other IPRs not referenced in ETR 314 (or the updates on http://www.etsi.fr/ipr) which are, or may be, or may become, essential to the present document.

Foreword

This draft ETSI Technical Specification has been produced by Special Mobile Group (SMG) of the European Telecommunications Standards Institute (ETSI). The purpose of this ETS is to describe the how services will be provided in UMTS by means of the Virtual Home Environment.

1   Scope

This document specifies the content of the stage one requirement for realisation of VHE.

This ETSI Technical Specification defines the stage one description of the Virtual Home Environment (VHE). Stage one is an overall service description, primarily from the point of view of the User in her~~its~~ Home Environment.

Virtual Home Environment (VHE) is defined as a concept for personalised service portability across network boundaries and between terminals. The concept of the VHE is such that users are consistently presented with the same personalised features, User Interface customisation and services in whatever network and whatever terminal (within the capabilities of the terminal), ~~where ever~~wherever the user may be located.

Release 99 requirements have been highlighted for the purpose of this document.

2   References

References may be made to:
   a) Specific versions of publications (identified by date of publication, edition number, version number, etc.), in which case, subsequent revisions to the referenced document do not apply; or
   b) All versions up to and including the identified version (identified by "up to and including" before the version identity); or
   c) All versions subsequent to and including the identified version (identified by "onwards" following the version identity); or
   d) Publications without mention of a specific version, in which case the latest version applies.
A non-specific reference to an ETS shall also be taken to refer to later versions published as an EN with the same number.

~~2.1~~   ~~2.1~~ Normative references

   [1~~*~~]   GSM 01.04 (ETR 350): "Digital cellular telecommunication system (Phase 2+); Abbreviations and acronyms"
   [2~~*~~]   GSM 02.57: "Digital cellular telecommunication system (Phase 2+); Mobile Station Application Execution Environment (MExE); Service description"
   [3~~*~~]   GSM 02.78: "Digital cellular telecommunication system (Phase 2+); Customised Applications for Mobile network Enhanced Logic (CAMEL); Service definition - Stage 1"
   [4~~*~~]   GSM 11.14: "Digital cellular telecommunication system (Phase 2+); Specification of the SIM Application Toolkit for the Subscriber Identity Module - Mobile Equipment; (SIM - ME) interface"
   [5~~*~~]   UMTS TS 22.01: "Universal Mobile Telecommunications System (UMTS): Service Aspects; Service Principles"
   [~~x~~6~~]~~   UMTS TS 22.05: "Universal Mobile Telecommunications System (UMTS); Services and Service Capabilities"
   [7~~*~~]   ITU-T Recommendation Q.1701, Framework for IMT-2000 networks
   [8~~*~~]   ITU-T Recommendation Q.1711, Network Functional Model for IMT-

2.2   Informative references

   [1~~y~~]   UMTS TR 22.70: "Universal Mobile Telecommunications System (UMTS); Virtual Home Environment"

3   Definitions and abbreviations

3.1   Definitions

For the purposes of this~~ese~~ TS, the following definitions apply:

HE-VASP: Home Environment Value Added Service Provided. This is a VASP that has an agreement with the Home Environment to provide services.

Local Service: A service exclusively provided in the current serving network by local service provider or current network operator.

~~**Service Provider:** responsible for overall provision of services to users~~

~~**Value Added Service Provider:** provides services other than basic telecommunications service for which additional charges may be incurred.~~

~~**Virtual Home Environment:** A concept for personalised service portability across network boundaries and between terminals.~~

Service Capabilities: Bearers defined by QoS parameters and mechanisms needed to realise services.

Service Feature: Functionality that a UMTS system shall offer to enable provision of services. Services, is made up of different service features

~~**Local Service:** A service exclusively provided in the current serving network by local service provider or current network operator.~~

Service Personalisation: Modification and behaviour that may involve the service feature or data of a service, within the limitations set by the provider of the service.

Service Provider: responsible for overall provision of services to users

User Interface Personalisation: Modification of the user interface within the capabilities of the terminal and serving network.

Value Added Service Provider: provides services other than basic telecommunications service for which additional charges may be incurred.

Virtual Home Environment: ~~A concept~~A concept for personalised service portability across network boundaries and between terminals.

~~**HE -VASP:** Home Environment Value Added Service Provided. This is a VASP that has an agreement with the Home Environment to provide services.~~

Further UMTS related definitions are given in UMTS TS 22.01.

3.2   Abbreviations

For the purposes of this TS the following abbreviations apply:

API	Application Programming Interface
CAMEL	Customised Application For Mobile Network Enhanced Logic
CORBA	Common Object Request Broker Architecture
DAT	Service Profile/Data
EXE	Service Execution Environment
FFS	For Further Study
IN	Intelligent Network
ME	Mobile Equipment
MExE	Mobile Station (Application) Execution Environment
MMI	Man Machine Interface
MMIC	MMI Control
MS	Mobile Station
PLMN	Public Land Mobile Network
PRG	Service Program
SAT	SIM Application Tool-Kit
SIM	Subscriber Identity Module
SMS	Short Message Service
USIM	User Service Identity Module
USSD	Unstructured Supplementary Service Data
VASP	Value Added Service Provider
VHE	Virtual Home Environment

Further GSM related abbreviations are given in GSM 01.04. Further UMTS related abbreviations are given in UMTS TS 22.01.

4   General Description of the VHE

Virtual Home Environment (VHE) is defined as a concept for personalised service portability across network boundaries and between terminals. The concept of the VHE is such that users are consistently presented with the same personalised features, User Interface customisation and services in whatever network and whatever terminal (within the capabilities of the terminal), where ever the user may be located.

Roles and components involved in realisation of VHE consist of the following also see fig 1:

- Home Environment

- One or more unique Identifiers ~~(e.g. USIM, IC Card)~~

- One User

- One or more terminals (simultaneous activation of terminal providing the same service is not allowed)

- One or more Serving Network Operator

- One Subscription

- Possibly ~~O~~one or more Value added service providers.

The key ~~attributes which characterise a VHE~~attributes, which characterise a VHE, may be summarised as:

- Service offering independent of network and terminal type;
- A portfolio of services offered by a Home Environment and a service profile which may be managed by the user;
- ~~A capability to access Value Added Services from any VASP, possibly subject~~Capabilities to access Value Added Services from any VASP, possibly subject to ~~approprite~~appropriate agreements with the Home Environment.

```
┌──────────────┐        ┌──────────────┐  - - - - - ┌──────────────┐
│              │        │   Virtual    │            │ Value Added  │
│     User     │────────│     Home     │            │   Service    │
│              │        │ Environment  │            │   Provider   │
└──────────────┘        └──────────────┘    1:N     └──────────────┘
         Provided              │
         by                   1:1
                        ┌──────────────┐
                        │     Home     │
                        │ Environment  │
                        └──────────────┘
         Contains              │
                              1:N
                        ┌──────────────┐
                        │     User     │
                        │   Profile    │
                        └──────────────┘
         Contains              │
                              1:N
                        ┌──────────────┐    1:N     ┌──────────────┐
                        │              │            │ HE Value Added│
                        │   Service    │────────────│   Service    │
                        │              │            │   Provider   │
                        └──────────────┘            └──────────────┘
         Contains         │          │
                         1:N        1:N
                  ┌──────────────┐ ┌──────────────┐
                  │   Service    │ │   Service    │
                  │   Feature    │─│ capabilities │
                  └──────────────┘ └──────────────┘
                          1:N
```
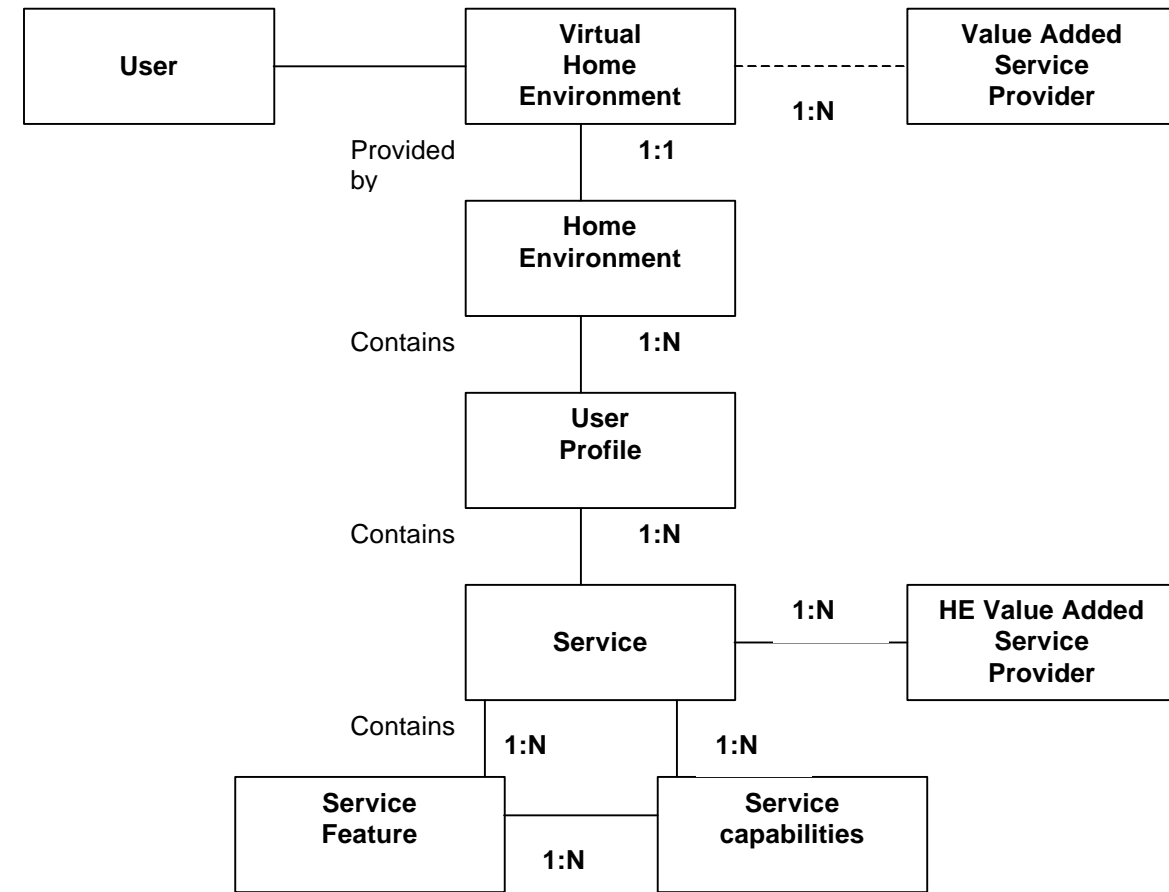
Fig 1: Role of Components involved in Realisation of VHE

The Home Environment is responsible for providing services to the user in a consistent manner. The user may have a number of user profiles which enable her to manage communications according to different situations or needs, for example being at work, in the car or at home. A combination of services, profiles and personalisation information forms the user's personal service environment or "VHE". The Home Environment provides services to the user in a managed way, possibly by collaborating with HE-VASPs, but this is transparent to the user.

AdditionalyAdditionally, but not subject to standadisationstandardisation,- the user may access services directly from Value Added Service Providers. Services obtained directly from VASPs are not managed by the Home Environment and therefore are not part of the VHE offeredprovided by the Home Environment. A mechanism should be provided which allows the user to automate access to those services obtained directly from VASPs and personalise those services. However such a mechamismmechanism is outside of the scope of this specification.

5. Framework for Services

The goal of standardisation in UMTS with respect to services is to provide a framework within which services can be created based on standardised service features. UMTS services will generally not rely on the traditional detailed serviceprotocol engineering (evident for supplementary services in second-generation systems), but instead provides services using generic toolkits.

Services are realised based on a number of service features (see figure 2, for relationship) and service features in turn are realised based on service capabilities, with standardised interfaces between each stage.- ████████████████
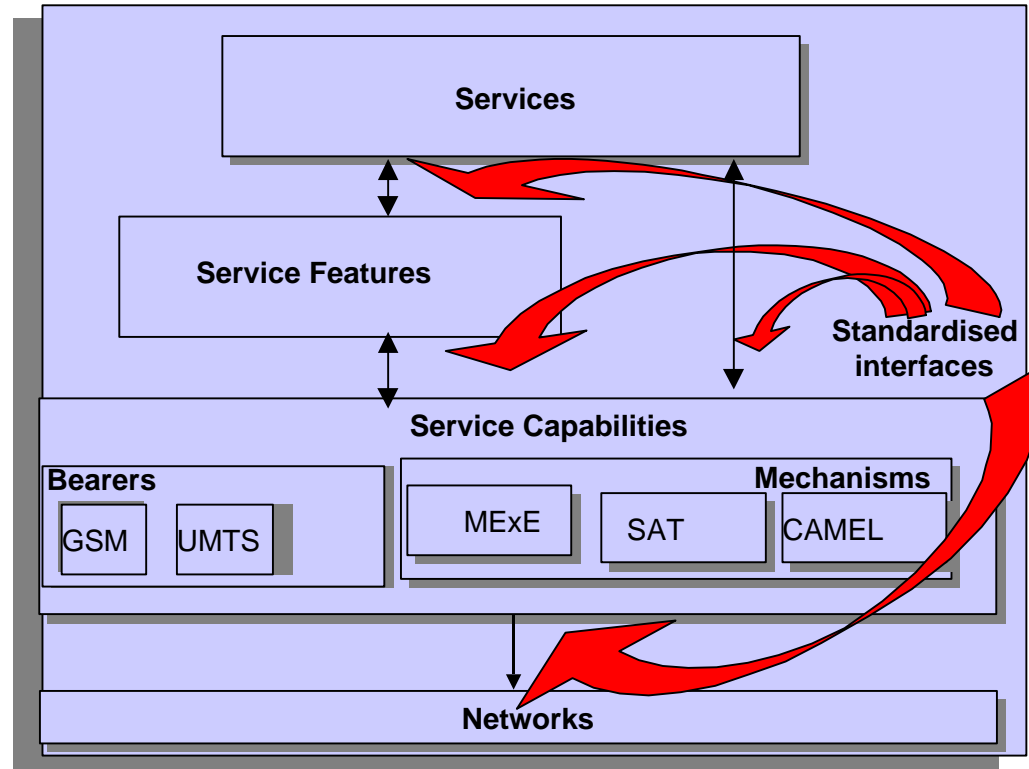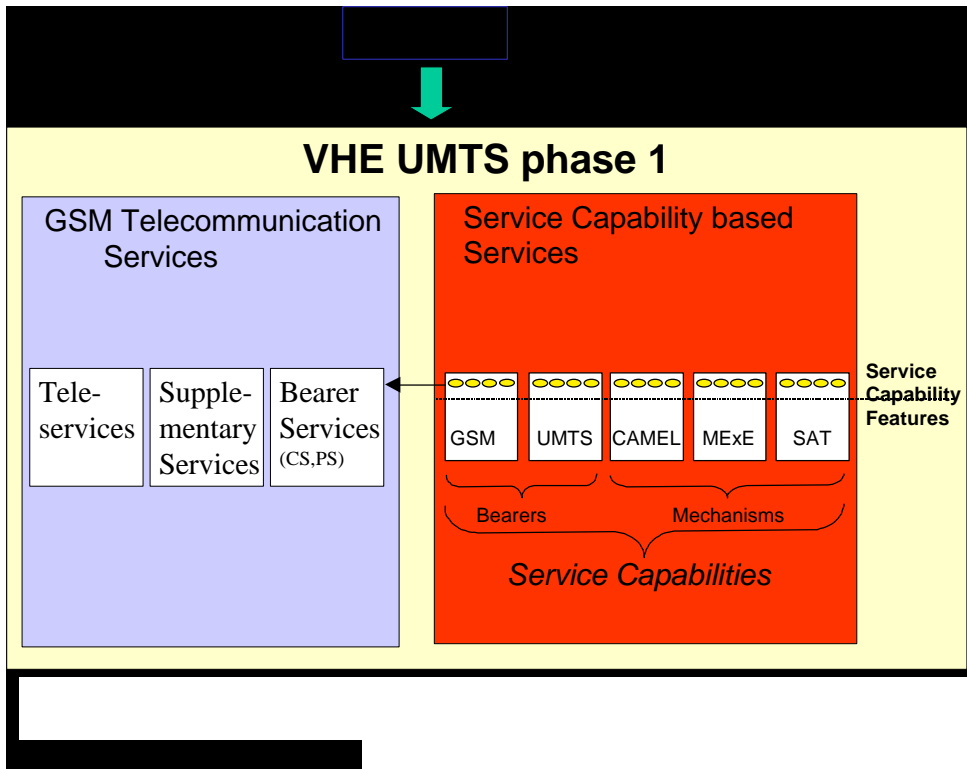███

Fig. 2: Relationships between Service Features, Service Capabilities, Bearers and Mechanisms

This framework will also provide the scope for the users of these services to personalise to some degree the way in which the services operate.

This Ppersonalisation of services will be supported across network and terminal boundaries by providing the services to users with the same "look and feel" irrespective of the network type and within the limitations of the terminal.

The key requirementsobjectives of the VHE are to provide to a user with are::

- Personalised services;
- Personalised User Interface (within the capabilities of terminals);
- Consistent set of services from the user's perspective irrespective of access e.g. (fixed, mobile, cordless etc. ▉▉▉▉▉▉▉▉▉▉▉▉▉▉);
- Global service availability▉▉▉▉▉▉▉;

The standards- supporting VHE requirementsobjectives should be flexible enough- such that VHEit can be applicable to all types of future networks as well as providing a framework for the evolution of existing networks. Additionally the standardsy should have global significance so thatose user's can avail of their services irrespective of their geographical location. -This implies that VHE standards should:

- provide a common framework for accessing services in future networks;
- represent a common development for all types of network (i.e. not form part of a specific network development);
- be supported by future networks.

65 User Requirements of VHE

The user shall have the possibility to manage services as well as the appearance of the services. It shall be possible for the user to:

- Personalise services.
- -Access services from any network or terminal subject to network capabilities, terminal capabilities and any restrictions imposed by the home environment.

- -Use services in a consistent manner irrespective of serving network and terminal, within the technical limitations.
- Access new services in the Home Environment.
- Modify a user profile(for example to include new services) from any location
- Activate or deactivate user services through their VHE.
- Discover which local services are available
- Access local services in a secure manner, if allowed by the Home Environment.
- Interrogate current~~VHE~~ service settings~~s~~
- Be aware of limitations of services, which may result from different terminals and or serving network capabilities.

5<u>6</u>.1   User Profiles

This section describes the function of the user profile and lists some typical profile information.

For definition of user profile see UMTS 22.01.

Information within each user profile <u>provides for</u>~~allows~~:
- Identification of subscribed/<u>provisioned</u> services
- Service personalisation.
- User Interface personalisation

UMTS 22.01 identifies that the user can select and activate/~~ and ~~deactivate (directly or indirectly) user profiles. All aspects of the VHE from the user's perspective shall be supported by the<u> use of</u> UMTS user profiles.

The home environment shall be able to update the user profile to reflect any user or home environment modification of the user's VHE.

The characteristics of the VHE which require to be maintained, as part of the user profile will be identified by the VHE stage 2.

<u>7 </u>Home Environment Requirements on VHE

It shall be possible for the home environment to:

- Control access to services depending on the location of the user, and serving network.
- Control access to services on a per user basis.
- Control access to services depending on available service capabilities in the serving network, and terminals
- Manage service delivery based on for example end to end capabilities<u> and/or user preferences</u>
- Request~~ existing~~ version of specific~~ ~~services supported in serving network and terminal
- <u>   </u>Request details <u>(e.g. protocol versions and API versions) </u>of <u>available </u>service capabilities supported on the serving network, and terminals.~~ ~~
- ~~Identify available capabilities.~~
- ~~Authenticate the user and services.~~
- Define the <u>scope for </u>management of ~~the~~ services<u> </u>by the user<u>, for services provided by the HE</u>.
- Handle charging for services (as defined in clause 11)
- Deploy services to users or groups of users
- Manage provision of services to users or groups of user

8~7~ Requirements of the Serving Network ~Requirements on~ to Support the VHE

The serving network should not need to be aware of the services offered via the home environment.

The user/home environment may request capabilities, which are necessary to support, home environment services.

It shall be possible for the serving network to perform the following:

- The serving network shall support user access to~, and creation of,~ services in the home environment;~.~
- The serving network shall provide the necessary service capabilities to support the services from the home environment as far as possible;~.~
- Dynamically provide information on the available service capabilities in the serving network;
- Provide ~a~ transparent communication ~channel~ between clients and servers in terminals and networks;~.~
- Provide information on, and access to, local services, which are available in the serving network ~to the user~.

9~8~ VASP Requirements on VHE

~Editors Note: This is a new section created~

~Services obtained directly from VASPs are not managed by the Home Environment and therefore are not part of the VHE offered by the Home Environment.~
The user may access services directly from Value Added Service Providers. Services obtained directly from VASPs are not managed by the Home Environment and therefore are not part of the VHE offered by the Home Environment. A mechanism should be provided which allows the user to automate access to those services obtained directly from VASPs and personalise those services. However such a ~mechanism~mechanism is outside of the scope of this specification.
~VASPs which are not HE-VASPs~VASPs, which are not HE-VASPs, do not generate requirements for VHE.

There may be some information, which is shared between the Home Environment and the HE-VASP (for example current capabilities).
The Home Environment may grant the HE-VASP access to standardised service features and service capabilities in order to allow the development and deployment of services on behalf of the Home Environment.

10~9~ Service Features

~Editor's note: Refer to UMTS 22.05 section 8. To be reviewed.~

███████████████████████

The purpose of service features is to provide a service capability independent set of functionality which can be used by application developers to create services.

The following functionality is required
As in UMTS 22.05 clause 8: Service Features (to be reviewed).
Others.~.~

~Service features are building blocks which can be used to create/control/delete services. Service features are associated with call/session control, bearer control, mobility management. The term calls is used to encompass not only circuit switched (e.g. voice) calls, but also virtual circuit sessions set up to handle packet data traffic.~

~The following service features are required;~
~security/privacy;~

- ~~access control;~~
- ~~address translation;~~
- ~~call/session/bearer control;~~
- ~~location;~~
- ~~messaging;~~
- ~~service control;~~
- ~~user interaction.~~

~~10 VHE Standardisation RequirementsEditors Note: The following list is obtained from UMTS 22.70 and should be used as a guideline to check if all requirements are met. This section might not be needed after review.~~

~~The following standards are needed to realise VHE:~~
- ~~Standardised execution environment for terminal, IC card and Network~~
- ~~Standardised APIs.~~
- ~~Network Architecture. The following interfaces are required for standardisation, for downloading VHE profile:~~
  - ~~Service Provider/Network Operator for service emulation.~~
  - ~~Service Provider/Network Operator for remote service execution.~~
  - ~~Network/Mobile Terminal Interface.~~
  - ~~Service Provider/Mobile Terminal Interface.~~
  - ~~Service Provider/USIM Interface.~~
  - ~~Mobile Terminal/USIM interface.~~

11   VHE execution environment

The following service execution environments shall be standardised and could be used to provide a VHE for the user:

- User equipment execution environment
- IC card execution environment
- Network execution environment ███████████

███

- █████
- █████████████
- █████

12   Charging requirements

Services, which are provided as part of the VHE, may be subject to charge at the discretion of the home environment

There are several forms of charging which shall be available to the home environment. It shall be possible for the home environment to charge in the following instances:-
- Subscription;
  - the user's~~subscriber's~~ registration to use services may be subject to charge;
- Service transfer;
  - the transfer of services and/or information to the serving network, the subscriber's MS or USIM may be subject to charge;
- Service upgrading;
  - the upgrading of previously transferred services to the serving network, the user's~~subscriber's~~ MS or USIM may be subject to charge (automated upgrading of services may be subject to a different charge);

- Service usage;
  the usage of services by a subscriber's may be subject to a charge;
- Roaming
  t~~The~~ usage of VHE services when roaming may be subject to additional charges;

~~A standardised means of transferring (indicative and/or final) charging information (for the use of VHE services) from the home environment to the user shall be defined.~~
~~The usage of the bearer service may be subject to charge (i.e. possibly time-based, volume-based, event-based etc.) by the network operator.~~

Other charging requirements may be identified and are for FFS.

13   Security requirements

~~Editor's note: contribution invited.~~

~~The home environment shall maintain security of subscribers' personal data and network data, with all aspects relating to UMTS security being centred on the USIM.~~
The specific security requirements are FFS.

History

Document history		
Date	**Version**	**Comment**
Sep 1998	0.0.0	Initial Draft at Ipswich
Oct 1998	0.1.0	Initial Draft at Uxbridge Meeting
Nov 1998	0.2.0	Draft at Newbury Meeting
Jan 1999	0.3.0	Draft after Stockholm meeting
Jan 1999	0.4.0	Draft to include requirement for R99
Rapporteur: Jumoke Ogunbekun Fujitsu Europe Telecom		
Email: j.ogunbekun.co.uk Telephone: +44-181-606-4671		