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**Intelligent Network (IN);
IN Capability Set 2 (CS2);
Scoping of Intelligent Network Application Protocol (INAP)**

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Foreword

This ETSI Technical Report (ETR) has been produced by the Signalling Protocols and Switching (SPS) Technical Committee of the European Telecommunications Standards Institute (ETSI).

ETRs are informative documents resulting from ETSI studies which are not appropriate for European Telecommunication Standard (ETS) or Interim European Telecommunication Standard (I-ETS) status. An ETR may be used to publish material which is either of an informative nature, relating to the use or the application of ETSs or I-ETSs, or which is immature and not yet suitable for formal adoption as an ETS or an I-ETS.

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1 Scope

This ETSI Technical Report (ETR) identifies the exact scope of Intelligent Network (IN) Capability Set 2 (CS2), especially in relation to the ongoing standardization work in ITU-T, and identifies the milestones for the further development of ETSI work item DE/SPS-03038-1 [1].

The outline of this ETR is as follows: clause 6 is related to the CS2 service drivers, whereas clause 7 is dedicated to the network aspects (e.g. for Cordless Terminal Mobility (CTM) it was identified that non-call related user interaction and Service Control Function (SCF)-Service Data Function (SDF) communication are the two main network capabilities that are required).

For each service driver, a number of network aspects are identified that are required to support the service. This allows to identify and to communicate which services and network aspects will be supported.

2 References

[1] DE/SPS 03038-1: "Intelligent Network (IN); IN Capability Set 2 (CS2); Intelligent Network Application Protocol (INAP); Part 1: Protocol Specification".

[2] TCR-TR 027: "Intelligent Networks; Vocabulary of Terms and Abbreviations".

NOTE: TCR-TR 027 is only available to ETSI members.

[3] ITU-T Recommendation Q.1224: "Distributed functional plane for intelligent network CS2".

[4] ITU-T Recommendation Q.1228: "Interface Recommendation for intelligent network CS2".

[5] ISO/IEC DIS 11571: "Information technology - Telecommunications and information exchange between systems - Numbering and sub-addressing in private integrated services networks".

3 Definitions and abbreviations

3.1 Definitions

The definitions given in TCR-TR 027 [2] also apply to this ETR.

3.2 Abbreviations

For the purposes of this ETR, the following abbreviations apply, together with those given in TCR-TR 027 [2]:

IN	Intelligent Network
CS2	Capability Set 2
CC	Call Configuration
CN	Corporate Network
CTM	Cordless Terminal Mobility
GVNS	Global Virtual Network Services
NCAUI	Non Call Associated User Interaction
OCCAUI	Out of Channel Call Associated User Interaction
SCF	Service Control Function
SDF	Service Data Function
VPN	Virtual Private Network

4 Time schedule

Based on the work plans of ITU-T 11/4, ETSI SPS 3 and ETSI NA 6, the following target dates can be identified:

ITU-T 11/4:

July-August 1995	Last meeting were technical input is accepted for CS2
Nov 1995	All text of CS2 to reach stable state
Jan/Feb 1996	Frozen state for CS2 recommendations
2Q96	Strictly editorial changes for CS2 recommendations
1Q97	Resolution 1 approval for CS2 recommendations

ETSI SPS 3:

30/06/1995	Completion of detailed scope text
31/03/1996	Completion of first draft of ETS DE/SPS-03038-1
30/06/1996	STC approval
30/09/1996	TC approval

ETSI NA 6:

Document	Title	STC Approval Date
DI/NA-061202	Intelligent Network (IN); Security architecture and security management for global IN CS1 and CS2 systems	30/12/1996
DE/NA-064006	Universal Personal Telecommunication (UPT); UPT Phase 2; Realization of the security architecture	30/03/1996
DE/NA-064007	UPT Phase 2; Conformance test suite for realization of security architecture	30/06/1996
DTR/NA 061302 (TCR-TR)	IN Architecture and Functionality for the support of CTM	30/03/1996
MI/NA-61401	Support of VPN services using IN techniques	31/12/1997 (completion)
DTR/NA-064004 (TCR-TR)	UPT Phase 2; Architecture and Functionalities for Interworking	28/06/1996
DTR/NA-064003 (TCR-TR)	UPT Phase 2; Requirements on information Flows and Protocols	30/06/1996
TC-TR 020	Intelligent Network (IN); IN Capability Set 2 (CS2); Interworking between IN-structured networks for CS2	29/04/94 (achieved)

ETR 121	Universal Personal Telecommunication (UPT); Architecture and functionalities for interworking	21/02/1994 (published)
TC-TR 021	Intelligent Network (IN); Interworking between private networks (IN-structured and non-IN-structured) and public IN-structured networks	26/08/1996 (achieved)
ETS 300 391-1	Universal Personal Telecommunication (UPT); Specification of the security architecture for UPT phase 1; Part 1: Specification	08/08/1995 (published)
ETS 300 391-2	Universal Personal Telecommunication (UPT); Specification of the security architecture for UPT phase 1; Part 2: Implementation Conformance Statement (ICS) proformas	08/08/1995 (published)
ETS 300 391-3	Universal Personal Telecommunication (UPT); Specification of the security architecture for UPT phase 1; Part 3: Conformance Test Specification (CTS)	08/08/1995 (published)
ETR 096	Human Factors (HF); Phone Based Interfaces (PBI) Human factors guidelines for the design of minimum phone based user interface to computer services	06/09/93 (published)
TCR-TR 040	Universal Personal Telecommunication (UPT); Phase 1; Requirements on Information Flows (IFs) and protocols	07/09/1995 (published)
TCR-TR 036	Universal Personal Telecommunication (UPT); Phase 2; User procedures and user states	31/08/1995 (published)

NOTE: All TCR-TRs listed above are only available to ETSI members.

5 Overview

In tables 1 and 2, the network aspects and the service aspects to be supported or studied within the CS2 time frame are listed. The following notations are used:

- in the second column, the sub-aspects for the CS2 protocol specification within ITU-T are given;
- in the third column and sub-aspects of CS2 within ITU-T that are only covered to the functional level are given: *no* in this columns means that no aspects are only covered up to the functional level;
- in the fourth column, the aspects that are covered up to the protocol level within SPS 3 are listed: *idem as in ITU-T* means they are exactly the same as in ITU-T; *yes* means that they are certainly covered while in ITU-T they are only conditionally covered; *more* means that more is covered than in ITU-T;
- in the fifth column, the aspects that are covered by NA 6 are listed: *no* means there is no specific work item to support SPS 3.

Table 1: Network aspects to be studied within the CS2 time frame

Network Aspects	ITU support		ETSI support	
	Sub-aspects for CS2 protocol specification	Sub-aspects for CS2 functional study	SPS 3	NA 6
Service Interaction (Service Processing)	study only one single interaction SLP (CS2 capability) and the detailed specification relating to service interaction indicator (CS1 capability but completion work is disposed to CS2)	no	idem as in ITU-T	direct contributions to the ITU
Internetworking between IN structured network (Service Processing)	only relationships SCF-SDF and SCF-SCF (SDF-SDF?)	no	idem as in ITU-T	TC-TR 020 ETR 121
Interworking with non IN structured networks (public)	yes	no	idem as in ITU-T	no
Interworking with non IN structured networks (private)	no	IAF	idem as in ITU-T	DTR/NA-061302 (Part C) TC-TR 021
Enhanced SRF	new resource for message storage and retrieval, mini-scripts	other capabilities and resources	idem as in ITU-T	ETR 199
Security within/across IN structured Network	interworking security and protocol underlying INAP	no	idem as in ITU-T	NA6/SEG: DI/NA-061202 DE/NA-064006, DE/NA-064007, ETS 300 391-1, ETS 300 391-2, ETS 300 391-3, ETR 096
Security between the user and an IN structured Network	Q.29	no	idem as in ITU-T	NA6/SEG: DI/NA-061202, DE/NA-064006, DE/NA-064007
Call Party Handling	conditional ¹ yes	no	yes	no
Mid Call Interruption	yes	no	idem as in ITU-T	TCR-TR 040
Non-Call associated Interaction between users and service processing	conditional ¹ yes	open	yes	DTR/NA-061302, MI/NA-061401, DTR/NA-064004, TCR-TR 040
Personal Mobility	yes	no	more	DTR/NA-064004, TCR-TR 036, TCR-TR 040
Out-Channel Call associated interaction between users and service processing	yes	open	yes	DTR/NA-061302, MI/NA-061401, DTR/NA-064004, DTR/NA-064003, TCR-TR 040

¹ Only if possible to reach a stable state within the CS2 timeframe.

Table 2: Service aspects to be studied within the CS2 time frame

Service Aspects	ITU support		ETSI support	
	Sub-aspects for CS2 protocol specification	Sub-aspects for CS2 functional study	SPS 3	NA 6 (Functional Architecture + Information Flows)
Cordless Terminal Mobility	no	no	yes	DTR/NA-061302
Corporate Telecommunication Network	no	no	yes	MI/NA-061401
Global Virtual Network Services	no	no	yes	MI/NA-061401
Universal Personal Telecommunications	yes	no	yes	DTR/NA-064004, DTR/NA-064003, TCR-TR 040, ETR 121

6 Service drivers

Only those service drivers within the ETSI CS2 scope that are not covered by ITU-T are described here.

6.1 Cordless Terminal Mobility (CTM)

contact person: Guido Marx (marxg@se.bel.alcatel.be)

Work Items:

- analysis of DE/NA-010039 on the CTM service description phase 1;
- analysis of DTR/NA-061302 on the functional model and the information flows for the support of CTM;
- analysis of annex C of DTR/NA-061302 on "CTM Public IN - Private Network Interworking Aspects".

Network Capability Requirements:

- non call associated user interaction;
- SCF-SCF communication.

Worksplit between the different STCs:

To carry out the CTM protocol definition activity, the following worksplit is agreed:

- NA 6 :
- definition of the CTM flows;
 - definition of the functional model to be used for CTM.

Basis is the document IN Architecture and Functionality for the support of CTM - DTR/NA-061302.

- SPS 3 : Overall responsibility for the evolution of IN Core INAP to cover the CTM requirements in a service independent way. Implementation of the CTM requirements in the Core INAP should be compatible with the CS2, CS3 evolution.

- SPS 2 : Publication of the application specification of INAP as defined by SPS 3 for the implementation of CTM.

To elaborate a little more on the work split it is proposed that the different involved STCs should focus on:

- SPS 3:
- protocol definition for the "b" relationship (NCSF-SCF);
 - definition of a generic protocol for the "c" relationship (SCFmm-SCFsI);
 - suitability of the existing "a" relationship (Core INAP) to cover the CTM requirements.

- SPS 2:
- CTM data model;
 - Protocol definition for the "c" relationship in the context of the CTM application.

The work on the interfaces is dependent on the availability of a stable functional model to be produced by STC NA 6.

6.2 Corporate Telecommunication Network (CN)

*contact persons: Emmanuel Goulean (emmanuel.goulean@issy.cnet.fr),
Huw Weatherhead (huw.weatherhead@att.com)*

Work Items:

- analysis of the STC NA1 service description;
- analysis of MI/NA-61401 on the information flows and the service requirements at the a1, a2, a3 and b service entry points;
- analysis of ETR 172, clause 10, on the functional model of IN based VPNs.

Network Capability Requirements:

- the need for a detection point when entering the O-Alerting state;
- the transfer of VPN specific information to the service logic when reaching the O-Alerting state;
- dynamic arming/disarming of DPs.

6.3 Global Virtual Network Services (GVNS)

contact person: Huw Weatherhead (huw.weatherhead@att.com)

Work Items:

- analysis of the ITU-T Recommendations F.16 (GVNS stage 1 description) and Q.85.6 (generic stage 2 description);
- analysis of annex A of ITU-T Recommendation Q.85.6 (GVNS), describing procedures and information flows for GVNS based on IN CS1 and an enhancement of this document to CS2.

Network Capability Requirements:

- SDF-SDF communication;
- handling of terminating overflow (triggering in terminating exchange);
- follow-on calls.

6.4 Universal Personal Telecommunications (UPT)

contact person: François Gallant (francois.gallant@issy.cnet.fr)

Work Items:

- analysis of the ITU-T Q.7/11 baseline document on requirements for UPT base on CS1 refinements;
- analysis of DTR/NA-064004 on the phase 2 architecture and functionalities for interworking for UPT;
- analysis of the information flows and the service requirements for UPT (user registration, user authentication via OCCAUI).

Network Capability Requirements:

- non call associated user interaction (User Registration (UR));
- out-channel call associated user interaction (User Authentication (UAUT));
- dynamic arming of DPs;
- SDF-SDF communication;
- need for a secured SCF-SCF communication;
- chain searches;
- call party handling:
 - 1) allow the B party and eventually the A party to be connected to the SRF upon secure answering of incoming calls;
 - 2) allow the A and the B party to be joined in case of call pick-up.

7 Network aspects

7.1 Out-Channel Call Associated User Interaction (OCCAUI) during active state

contact person: Emmanuel Gouleau (emmanuel.gouleau@issy.cnet.fr)

Requirements:

- end-to-end;
- transparent at SSF-level;
- service independent;
- impact on DSS1, ISUP and INAP;
- additional SSF processing.

Work Items:

- the definition of the requirements for signalling systems to convey the OCCAUI information;
- the definition of INAP messages to convey the OCCAUI information;
- the routing of the signalling messages with OCCAUI information at the SSF level (pass information to SCF or forward to user?).

EXAMPLES:

- User Registration (UR)
- User Authentication (UAUT)
- User Service Interaction (USI)

7.2 Non-Call Associated Interaction (NCAUI) between users and service processing

contact person: Stefan Unger (stefan.unger@mch.scn.de)

Requirements:

- end-to-end;
- transparent at SSF-level;
- service independent;
- impact on DSS1, ISUP and INAP;
- additional SSF processing;
- need for a new state machine.

Work Items:

- the definition of the requirements for signalling systems to convey the NCAUI information;
- the definition of INAP messages to convey the NCAUI information;
- the routing of the signalling messages with OCCAUI information at the SSF level (pass information to SCF or forward to user?);
- development of a state model for the NCSF;
- enhancement of the triggering.

Examples:

- Call Forwarding (CR)
- User Registration (UR)

7.3 Call party handling

contact person: Bart Jellema (etmbaje@crosby.ericsson.se)

Work Items:

- identifying the actual set of Call Configurations (CCs) needed for the targeted CS1 and CS2 services and features (including CTM). Already two additional CCs were identified:
 - 1) one CC that shows a joined incoming leg without any outgoing legs. This CC could be the result of a call not yet having reached the Routing PIC or a stable two party call on which a disconnection event occurs or by an InitiateCallAttempt operation received from SCF. This CC is needed for features like Wake Up Call and Follow On Call;
 - 2) The other additional CC is similar as above but with an associated Call Segment. This CC could be the result of a Call not yet having reached the Routing PIC followed by reception of an InitiateCallAttempt operation for the same CSA or by receiving a "SplitLeg"/"HoldCallPartyConnection" IF for a stable two party Call. This CC is needed for features such as Automated Collect Call, Secure Answering and Call Disposition (credit limit),

- definition of the IFs to be used. Possible input may come from Q.1218 Appendix I or from the related T1S1 contributions. Special attention shall be paid to Core INAP compatibility (e.g. use of DP-generic operations);
- preparation of SDL diagrams from the call party handling objects in order to provide an unambiguous and consistent description that can be validated, to work from and contribute against;
- relationship to BCSM and FSM models and signalling procedures for multiparty (disconnection, U-U) needs to be further clarified;
- evolvability of models and services (e.g. call/connection separation, point to multipoint connections, multiconnections, handover) needs to be assessed.

7.4 Enhanced SRF

contact person: Emmanuel Gouleau (emmanuel.gouleau@issy.cnet.fr)

Work Items:

- analysis of ETR 199 dealing with SRF (SCF, SSF, SRF) system architecture, SCF-SRF relationship and corresponding operations, enhanced function concept;
- definition of both a physical protocol and ASN.1 description of this new SCF-SRF relationship.

7.5 Internetworking

contact person: François Gallant (francois.gallant@issy.cnet.fr)

7.5.1 SCF-SCF

Work Items:

- creation of the protocols on this interface according to the information flows and elements defined in NA 6;
- identify other needs on the SCF-SCF interface by looking at the service needs (e.g. roaming numbers);
- study distribution of service logics.

7.5.2 SDF-SDF

Work Items:

- creation of the protocols on this interface according to the information flows and elements defined in NA 6;
- identify other needs on the SDF-SDF interface by analysing the service needs (e.g. transfer of service profiles);
- analyse distribution of service data and the transparency to the access.

7.6 Interworking with supplementary services

contact person: Thomas Streichhahn (thomas.streichhahn@mch.scn.de)

Work Items:

- to define an encoding for the ServiceInteractionIndicators;
- to analyse a number of ETSI defined supplementary services not yet addressed (CCBS, MCI).

With respect to this subject, the following remarks were made within the ITU-T:

- bit string encoding has lower tagging requirements;
- consideration should be given to the synchronising encoding with ISUP parameters (e.g. ISUP has an extensible format for parameters to be supported over the ISUP: this capability cannot be supported if the bit string and Boolean methods are used);
- should INAP follow ISUP encoding as much as possible?
- two parameters should be indicated (one for IN to IN and another for IN to network).

7.7 IN-IN Interworking

contact person: Thomas Streichhahn (thomas.streichhahn@mch.scn.de)

Work Items:

- to develop basic principles for IN-IN interworking (e.g. FIM, DP processing rules, impact on the triggering table).

7.8 Miscellaneous

- dynamic arming/disarming of DPs.

8 SDL diagrams

contact person: Darren Kaye, Luc Cools (p82502@vnet.atea.be)

Work Items:

- the generation and the validation of SDLs, covering the IN CS2 INAP protocol.

9 Conformance test specifications

Work Items:

- generation of PICS proforma;
- generation of TSS and TP;
- generation of TC;
- generation of partial PIXIT proforma.

History

Document history	
March 1996	First Edition