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1 Introduction



Everyday.mp3

CN4 have had two meetings since the last CN plenary meeting: CN4 #13 was held in Fort Lauderdale, Florida, USA, on 8 – 12 April, kindly hosted by the North American Friends of 3GPP, and CN4 #14 was held in Budapest, Hungary, on 13 – 17 May, kindly hosted by Ericsson (the CN chairman is evidently a man of many hats, because he welcomed us to both venues on behalf of the hosts!). In both these meetings the vice chairmen, [Peter Schmitt](#) (Siemens) and [Toshiyuki Tamura](#) (NEC), earned their keep; we had to have several parallel sessions to deal with the large number of input documents, and the vice-chairmen looked after one of the series of parallel sessions. [Andrijana Jurisic](#) and [Kimmo Kymäläinen](#) (MCC) provided the competent support we expect. The contributors were very active; give or take a few withdrawals, there were **224** documents tabled for CN4 #13, and **241** for CN4 #14. In CN4 #13 we agreed **45** change requests and **9** output liaison statements; this was supplemented in CN4 #14 by a further **55** CRs (plus **5** more CRs approved by email correspondence after the meeting), **7** liaison statements, **3** technical specifications (plus **1** more technical specification approved by email correspondence after the meeting) and **1** work item description. There were **33** participants representing **24** companies in CN4 #13 and **37** participants representing **27** companies in CN4 #14.

The draft meeting reports of CN4 #13 and CN4 #14 were distributed to the CN4 email list (3GPP_TSG_CN_WG4@list.etsi.fr) for approval; the report of CN4 #13 was approved at CN4 #14, and the report of CN4 #14 is still under review. The CN4 #13 & CN4 #14 meeting reports are provided in Tdoc NP-020245 for information. The outgoing liaison statements from CN4 are provided in Tdoc NP-020246 for information.

2 Management summary

I am pleased to report that we are presenting for approval the protocol specifications for the Cx interface (HSS - S-CSCF) and the Sh interface (HSS – SIP application server). This simple statement does not reflect the long discussions and hard work by many delegates in CN4; I was very impressed by the way in which delegations were prepared to accept decisions which went against their initial company position, in the interests of making progress. We also agreed changes to 23.008 to reflect the requirements for data storage in the HSS for IMS.

Still on the subject of IMS, we agreed changes to 23.003, including an important one to allow the use of R99 or Rel-4 UICCs to access IMS services.

We have also completed the work in CN4 for the protocol on the Si interface (HSS – IM-SSF, for CAMEL control of IMS services). However these changes are linked to the work being done in CN2, and I believe that CN2 have not been able to complete their work on this topic; **CN need to decide whether to postpone approval of the CN4 changes until the linked CN2 specification work is complete.**

We agreed a number of minor corrections and enhancements for CAMEL phase 4, including the changes to reflect the possibility of CAMEL phase 4 being implemented in a small number of functional subsets.

As was noted at CN #15, SA3 have asked CN4 to define the protocol for the Ze interface. This protocol is used for the secure transport of secret keys and security policy information for MAP signalling security. A group of SA3 experts joined us for one session in CN4 #13 and provided some useful clarification on the requirements. Unfortunately we were not able to complete our work on the design of the protocol for the Ze interface; CN are asked to give guidance on whether this work should continue to be treated as part of Release 5. Still on the subject of network security, we **did** complete the work on protection of control plane signalling in GTP.

With the approval of a CR to 23.153, the work on AMR Wideband is now complete in CN4.

CN #14 approved a change request to 29.060 for Release 4 to transfer the Operator Identifier part of the Access Point Name in the signalling for an inter-SGSN Routing Area Update. When this subject was studied further, CN4 decided that it was necessary to apply this correction to all releases back to R97, because without it, correct charging of GPRS traffic is not possible. Accordingly, we have agreed the CRs to 09.60 and 29.060 for R97, R98 and R99.

CN4 #13 and CN4 #14 discussed at length the possible methods for ensuring interworking between GSNs in a network which uses a mixture of IPv4 and IPv6, but we were not able to reach consensus on a change to 29.060 to define the interworking. However we have decided to forward for approval a CR which was accepted by all companies except one; that company will decide whether to present its competing proposal here.

We discussed CRs to 24.080 and 29.002 to bring them up to date for the current version of the ASN.1 definitions from ITU-T. Both 24.080 and 29.002 refer to ASN.1 specifications which will be withdrawn in the near future. Unfortunately it was not possible to complete our review of the proposed changes, so they will be discussed further in the next CN4 meeting, when we hope to put them to bed.

The CN4 work needed to support GERAN lu mode is now complete.

The level of corrections against UMTS Release 4 and earlier remains (mostly) at an acceptably low level (the large number of CRs presented here is the result of the need for mirror CRs for Release 4 and Release 5 when a CR for R99 is approved); this reflects a stricter approach by many companies to accepting non-critical corrections. This time, location services has the doubtful distinction of attracting the largest number of CRs, even after allowing for the inflationary effect of mirrors! Just so that GSM doesn't feel neglected, we are presenting one CR to GSM Release 97 with mirror CRs to all later releases, and a further CR to GSM Release 97 with mirror CRs to Release 98 and Release 99; the corresponding CR to Rel-4 has already been approved in CN.

3 Questions for advice and decision

None

4 Change Requests

CN4 produced **104** Change Requests which are submitted for ratification (yes, this is one less than the total in section 1; one of the CRs which we agreed in CN4 #13 was later revised, and the revised version was agreed in CN4 #14!). An overview of the CR packages is provided in Table 1. Corrective CRs to Release 4 and earlier were agreed by consensus, unless there is an indication to the contrary.

Table 1: CRs submitted by CN4 for approval at CN #13 (sorted by work item)

Tdoc	Agenda item	Subject
NP-020250	7.3	4 CRs on GTP Enhancements
NO-020254	7.4	19 CRs on LCS
NP-020251	7.5	5 CRs on Handover
NP-020249	7.8	4 CRs on CSSPLIT
NP-020256	7.9	3 CRs on Multicall
NP-020258	7.11	21 CRs on TEI
NP-020259	7.11	5 CRs on TEI4
NP-020268	7.11	1 CR on TEI4
NP-020252	8.1	8 CRs on IMS
NP-020253	8.1	3 CRs on IMS-CAMEL
NP-020248	8.3	10 CRs on CAMEL4
NP-020255	8.4	6 CRs on LCS1
NP-020257	8.6	1 CR on SEC1
NP-020260	8.8	11 CRs on TEI5
NP-020261	8.8	1 CR on TEI5
NP-020247	8.9	1 CR on AMR-WB
NP-020267	8.9	1 CR on IUFLEX

4.1 Release 4 (and earlier) CRs

4.1.1 GTP enhancements (NP-020250)

NP-020250 contains two corrective CRs to the GTP specification: one to Release 97, with mirror CRs for Release 98 & Release 99, and the other to Release 99.

CR 09.60-A111 (R97, with R98 mirror in CR 09.60-A112 & R99 mirror in CR 29.060-341) adds the APN Operator Identifier to the information which is transferred on inter-SGSN Routing Area Update. **This CR is classed as a critical correction.** Before you ask, the Rel-4 equivalent of these CRs has already been approved in CN #14!

CR 29.060-313 (R99) corrects an inconsistency between R99 and later releases in the definition of the handling of the sequence number field.

4.1.2 Location services (NP-020254)

NP-020254 contains nine corrective CRs, with mirror CRs as needed, to location services.

CR 23.016-024 (Rel-4, with Rel-5 mirror in CR 23.016-025) clarifies the applicability of privacy classes to both CS calls and PS sessions.

CR 24.080-017 (Rel-4, with Rel-5 mirror in CR 24.080-018) clarifies the error handling if an MS requests MO location services which are not supported by the type of radio access currently in use.

CR 24.080-021 (R99, with Rel-4 mirror in CR 24.080-022 & Rel-5 mirror in CR 24.080-023) clarifies the error handling if the network returns location information using a Geographic Area Description shape which the MS does not support.

CR 29.002-419 (Rel-4, with Rel-5 mirror in CR 29.002-420) clarifies the applicability of privacy classes to both CS calls and PS sessions.

CR 29.002-424 (Rel-4, with Rel-5 mirror in CR 29.002-425) clarifies the conditions for restarting the MTLR-deferred procedure.

CR 29.002-426 (R99, with Rel-4 mirror in CR 29.002-427 & Rel-5 mirror in CR 29.002-428) defines the error handling for the case where the location estimate available to the serving node uses a Geographic Area Description shape which the GMLC does not support.

CR 29.002-429 (Rel-4, with Rel-5 mirror in CR 29.002-430) adds the possibility of location services signalling between the SGSN and the GMLC.

CR 29.010-048 (Rel-4) defines the mapping between BSSAP and RANAP signalling for a request of assistance data over the E-interface.

CR 29.010-050 (R99, with Rel-4 mirror in CR 29.010-051) corrects errors in the procedure descriptions for location acquisition after handover.

4.1.3 Handover (NP-020251)

NP-020251 contains two corrective CRs, with their Release 4 & Release 5 mirrors, to the definition of handover signalling.

CR 29.002-444 (R99, with Rel-4 mirror in CR 29.002-445 & Rel-5 mirror in CR 29.002-446) adds the necessary parameters to the signalling for inter-MSC handover to allow service-based handover after an inter-MSC handover.

CR 29.010-053 (R99, with Rel-4 mirror in CR 29.010-054) is the linked CR to the specification for interworking between MAP signalling and access signalling. There is as yet no Rel-5 version of 29.010.

4.1.4 Bearer independent CS architecture (NP-020249)

NP-020249 contains two corrective CRs, with their Release 5 mirrors, to the bearer independent CS architecture specifications.

CR 23.205-027 (Rel-4, with Rel-5 mirror in CR 23.205-028) corrects a wrong reference in subclause 8.3.3.2.

CR 29.232-035 (Rel-4, with Rel-5 mirror in CR 29.232-036) corrects an error in the definition of the message for (G)MSC server ordered re-register.

4.1.5 Multicall (NP-020256)

NP-020256 contains one corrective CR, with Release 4 & Release 5 mirrors, for multicall.

CR 29.002-451 (R99, with Rel-4 mirror in CR 29.002-452 & Rel-5 mirror in CR 29.002-453) adds the radio resource list to the data which can be transferred in the Forward Access Signalling operation. **This is a remedy for a previously approved CR which was not correctly implemented.**

4.1.6 Technical Enhancements and Improvements (NP-020258)

NP-020258 contains seven corrective CRs for Release 99 and earlier, with mirror CRs as necessary, in the "catch-all" category of Technical Enhancements and improvements.

CR 03.03-A055 (R97, with R98 mirror in CR 03.03-A056, R99 mirror in CR 23.003-042, Rel-4 mirror in CR 23.003-043 & Rel-5 mirror in CR 23.003-044) implements the agreement between 3GPP and 3GPP2 to combine the Type Allocation Code and Final Assembly Code fields of the IMEI into a Type Allocation Code. **This CR is classed as a critical correction.**

CR 23.007-006 (R99, with Rel-4 mirror in CR 23.007-007) removes the (impossible) recovery action of paging the MS in the entire service area of the SGSN if the SGSN receives a tunnel PDU for which no PDP context exists. **This CR is classed as a critical correction.**

CR 23.008-049 (R99, with Rel-4 mirror in CR 23.008-050 & Rel-5 mirror in CR 23.008-053) removes the reference to the non-existent PDP type X.25. **This CR is classed as a critical correction.**

CR 23.079-017 (R99, with Rel-4 mirror in CR 23.079-018 & Rel-5 mirror in CR 23.079-019) removes from the Optimal Routing stage 2 the CAMEL-specific handling which is defined in 23.078. This CR is linked to CR 29.002-458 (R99, with Rel-4 mirror in CR 29.002-459 & Rel-5 mirror in 29.002-460).

CR 23.082-013 (R99, with Rel-4 mirror in CR 23.082-014) adds the requirement for the serving MSC/VLR to include in the Restore Data message an indication of whether it supports long forwarded-to numbers.

CR 29.002-438 (R99, with Rel-4 mirror in CR 29.002-439 & Rel-5 mirror in CR 29.002-440) clarifies the dialogue structure for the retrieval of authentication information.

4.1.7 Technical Enhancements and Improvements for Release 4 (NP-020259 & NP-020268)

NP-020259 & NP-020268 contain four CRs for Release 4, with mirror CRs as necessary, in the "catch-all" category of Technical Enhancements and improvements.

CR 29.002-409 (Rel-4, with Rel-5 mirror in CR 29-002-410) corrects some errors in the handling of the Mobile Not Reachable Reason indicator in the HLR and SMS-GMSC.

CR 29.002-447 (Rel-4, with Rel-5 mirror in CR 29-002-448) corrects a wrong reference in the definition of the SS-code parameter.

CR 29.002-397 (Rel-4), which is linked to CR 29.010-052 (Rel-4, no Rel-5 mirror needed) add the possibility to reject a request for authentication information because the subscriber is not entitled to service via the node which requests the authentication information, rather than returning authentication information and then rejecting the location update request which follows. **This is a functional enhancement, not a correction; it was accepted in CN4, but CN should consider whether it is acceptable.**

4.2 Release 5 CRs

4.2.1 IMS (NP-020252)

NP-020252 contains six CRs (one to R99, with Release 4 & Release 5 mirrors) to support IMS call control and roaming.

CR 23.003-039 (R99, with Rel-4 mirror in CR 23.003-040 & Rel-5 mirror in CR 23.003-038) aligns with the GPRS stage 2 by defining a unique prefix for IPv6 terminals.

CR 23.003-041 defines the way in which a home domain name, private user identity and public user identity can be derived from the IMSI of a subscriber who uses a pre-Release 5 UICC.

CR 23.008-041 updates the filter criteria used to decide when the S-CSCF contacts an application server.

CR 23.008-043 adds the definitions of the names of charging functions.

CR 23.008-047 adds the definition of the service indication.

CR 23.008-048 defines the format of charging function names by reference to 29.229 rather than directly.

4.2.2 CAMEL control of IMS services (NP-020253)

NP-020253 contains three CRs to support CAMEL control of IMS services.

CR 23.003-046 defines the SCCP subsystem number to be used for MAP signalling to the IM-SSF.

CR 29.002-415 defines the adaptations of the signalling for Any Time Subscription Interrogation and Note Subscriber Data Modified for use on the Si (IM-SSF to HSS) interface.

CR 29.002-443 defines the extensions to the Any Time Modification signalling to allow the gsmSCF to modify the CAMEL Subscription Information for IMS services.

These three CRs are linked to the two new specifications on which CN2 have been working: 23.278 (stage 2) and 29.278 (CAP stage 3) for CAMEL control of IMS services. CN2 have not been able to complete their work on 29.278; CN are asked to decide whether to postpone approval of these CRs until 29.278 is offered for approval.

4.2.3 CAMEL phase 4 (NP-020248)

NP-020248 contains ten CRs providing corrections and enhancements for CAMEL phase 4, which were developed in collaboration with our colleagues in CN2.

CR 23.008-044 corrects the DP criteria table for T-CSI and VT-CSI.

CR 23.008-045 and the linked CR 29.002-436 define the possibility of splitting CAMEL phase 4 into functionally independent subsets.

CR 23.008-051 corrects errors which were introduced in the collective CAMEL phase 4 CR to 23.008, approved in CN #15.

CR 29.002-408 adds the possibility to transfer the IMEI and classmark information in the Any Time Interrogation and Provide Subscriber Info results.

CR 29.002-414 corrects errors in the definition of the messages for retrieval of subscriber information in the PS domain.

CR 29.002-422 corrects errors in the definition of the procedure for triggering CAMEL handling in the processing of MT short messages.

CR 29.002-423 clarifies the exception handling for CAMEL control of MT short message delivery.

CR 29.002-435 is an editorial CR (this is for Release 5...) to change the name "PS-Connected" to "PS-PDP-Active", to avoid confusion with the 3G state "PMM Connected".

CR 29.002-454 adds the possibility to transfer GPRS location information in the report of a mobility management event.

4.2.4 Location services (NP-020255)

NP-020255 contains six CRs for enhancements to location services.

CR 23.008-052, with the linked CR 23.016-026, CR 24.030-013, CR 24.080-016 & 29.002-421, introduce the service type and codeword handling for location services privacy control.

CR 29.002-450 defines the possibility for an SGSN to indicate that it supports only part of the LCS capability set 2.

4.2.5 Network domain security (NP-020257)

NP-020257 contains one CR to define the protection of GTP control plane signalling.

CR 29.060-319 adds a reference to TS 33.210 for the protection of GTP control plane signalling.

4.2.6 Technical Enhancements and Improvements for Release 5 (NP-020260 & NP-020261)

NP-020260 & NP-020261 contain twelve CRs for Release 5 in the "catch-all" category of Technical Enhancements and improvements.

CR 23.003-045 defines the use of part of the TLLI codespace for GERAN Iu mode.

CR 23.205-024 and the linked CR 29.232-030 and CR 29.232-033 define enhancements to the bearer independent CS architecture specifications to support Global Text Telephony.

CR 23.205-025 updates the terminology to reflect the introduction of GERAN Iu mode.

CR 24.080-020 updates the ASN.1 module identifiers to ensure that they have distinct values for Release 5.

CR 29.002-398 adds the possibility to reject a request for authentication information because the subscriber is not entitled to service via the node which requests the authentication information, rather than returning authentication information and then rejecting the location update request which follows. This is not a mirror of CR 29.002-397

(see section 4.1.7); CR 29.002-397 shows the capability as an HLR option, but CR 29.002-398 makes the support of this capability mandatory.

CR 29.002-441 updates the ASN.1 module identifiers to ensure that they have distinct values for Release 5.

CR 29.060-311 clarifies the handling of a create PDP context request for a context which is already active.

CR 29.232-032 replaces the reference to ITU-T Q.765.5 (which in turn refers to 26.103) for the definitions of 3GPP speech codecs with a direct reference to 26.103.

CR 29.232-034 adds the possibility to use logical ports.

CR 29.060-318 defines the way in which IPv4 and IPv6 addresses are supported in a network with a mixture of IPv4 and IPv6 capabilities. **Despite extensive discussions in CN4, it was not possible to reach consensus on this CR. The only dissenting company accepted that this CR should be forwarded for approval in CN, whilst reserving the right to object at CN plenary.**

4.2.7 AMR wideband (NP-020247)

NP-020247 contains one CR to the stage 2 for Transcoder-free operation (TrFO) to add an annex describing the specific handling for AMR-wideband speech codecs.

4.2.8 Intra-domain connection of RAN nodes to multiple CN nodes (NP-020267)

NP-020267 contains one CR to 23.003 for the support of intra-domain connection of RAN nodes to multiple CN nodes (lu-Flex is less of a mouthful...).

CR 23.003-037 defines the Network Resource Identifier, which allows the new SGSN to communicate directly with the old SGSN from a pool at inter-SGSN routeing area update.

5 Draft Technical specifications and reports

We have four technical specifications for approval:

3GPP TS 29.228: IP Multimedia (IM) Subsystem Cx and Dx Interfaces; Signalling flows and message contents in NP-020264;

3GPP TS 29.229: Cx and Dx Interfaces based on the Diameter protocol; Protocol details in NP-020265;

29.228 and 29.229 have previously been presented to CN for information; CN4 believe that they are now ready to be put under change control.

3GPP TS 29.328: IP Multimedia (IM) Subsystem Sh Interface; Signalling flows and message contents in NP-020277;

3GPP TS 29.329: Sh Interface based on the Diameter protocol; Protocol details in NP-020266

29.328 and 29.329 have **not** previously been presented to CN for information, but CN4 believe that they are now ready to be put under change control, so we are bringing them to CN for the first time at version 2.

6 Work organisation

6.1 Work Item descriptions

We have one work item description for approval, which is in NP-020269: Interworking of CS user plane between 3GPP and external PLMN/PSTN/ISDN.

6.2 Review of the work plan

We have reviewed the progress on activities in CN4 against the work plan (version of 9 April 2002). The updated information in table 2 below was drafted in CN4 #14 and has been sent to the MCC for incorporation in the updated

work plan. The table does not include information on work plan items which were shown as complete in the status report to CN #15.

Table 2: Updates to the work plan from CN4

Unique ID	Description	Updated status
1292	Call control & Roaming for the IMS; addressing, identities; impact on HSS	This is covered by the protocol work on the Cx interface; 100% complete
1286	Stage 3 description of IMS interfaces: CSCF-HSS (Cx)	100% complete
14001	Mc interface (IM-MGW-MGCF) enhancements	This will be handled as part of Rel-6
14003	Dx interface (I-CSCF-SLF)	Incorporated in 29.229; now complete
14006	Sh interface (HSS-Application server)	100% complete
14004	Subscriber data management issues from CAMEL control of IMS	CN4 work complete, but linked to work in CN2
14999	Introduction of AMR-WB	100% complete
14005	Support of AMR-WB in GERAN: N4 work	100% complete
1179	Location services enhancements; event based and periodic LCS; impacts on MAP	No stage 2 input for event based and periodic LCS. Current stage 2 is fully reflected in MAP.
1579	Network domain security; control plane protection; integration of GTP signalling security architecture	100% complete
1582	Network domain security; user plane protection; integration of GTP signalling security architecture	SA3 have indicated that there is no requirement for user plane protection of GTP traffic
2028	Enhanced HE control of security; FS on network impacts	We await input from SA3. This work cannot be completed for Release 5 unless an exception is granted.
33005	MAP application layer security; stage 3 for key distribution	Requirements analysis ongoing in CN4; end date not yet determined.

7 CN4 meeting calendar

We have a calendar of meetings agreed to the end of 2002; hosts have come forward for all the meetings. As was the case for 2001, we expect that meetings of CN1, CN2, CN3 and CN4 will be collocated. For next year, CN4 has reviewed the calendar of collocated WG meetings proposed by the CN chairman, and has voiced its preferences where there is a choice to be made between two different weeks.

Table 3: CN4 meeting calendar to the end of 2002

Date	Meeting	Venue	Host
29 July – 2 August 2002	CN4 #15	Helsinki, FINLAND	Sonera, Nokia, Elisa, FICORA
23 – 27 September 2002	CN4 #16	West coast USA	North American Friends of 3GPP
11 – 15 November 2002	CN4 #17	Penang, MALAYSIA	Japanese Friends of 3GPP

10 – 14 February 2003 or 17 – 21 February 2003	CN4 #19		Opinions are divided on whether the earlier or the later date is better
7 – 11 April 2003	CN4 #20		
12 – 16 May 2003 or 19 – 23 May 2003 ¹	CN4 #21		
11 – 15 August 2003 or 18 – 22 August 2003 ²	CN4 #22		
27 – 31 October 2003 or 3 – 7 November 2003	CN4 #23		The only preference expressed is for the late October date

8 Acknowledgments

First, I have to thank Andrijana Jurisic and Kimmo Kymäläinen for providing the excellent support which we have come to expect from the MCC. Kimmo's wife gave birth to a son (both doing well, I am assured by Kimmo) in April, so CN2 and CN4 did some MCC-swapping for their meetings in April. Andrijana assured me that she didn't find CN4's work style any more lunatic than she was used to in CN2...

The two vice-chairmen, Peter Schmitt and Toshiyuki Tamura, have again been busy chairing sessions in both CN4 #13 and CN4 #14, which has allowed us to deal with (almost) all of the documents which were submitted; I am sure that CN4 will be in good hands when I retire!

The CN4 participants have been prolific in producing documents (although the numbers were slightly down on our January meeting): based on the number which we have had so far, we will very likely break the barrier of 1500 documents during the year. We have worked some long days – however we did manage to have a social event during our meeting in Budapest (and no, I didn't have a hangover on the Thursday morning, despite having had large volumes of wine poured down my throat by other WG chairmen...).

Finally, I would like to thank the hosts of our meetings. The North American Friends laid on typical Florida weather for us in April (though when I stayed on over the weekend after the meeting, there was a serious April shower in the Keys...), and we had a very interesting visit to Budapest in May, hosted by Ericsson. I also have to thank Nokia's local branch in Budapest for making the local arrangements for the social event there.

¹ 12 – 16 May is the preferred week; it leaves more time between CN4 #21 and CN #20

² 18 – 22 August is the preferred week; it leaves more time for summer holidays!