3GPP TSG_CN **Tdoc NP-000502**
Plenary Meeting #9, Oahu, Hawaii
20th – 22nd September 2000

Source: **TSG_N WG4**

Title: **All Liaison Statements sent out by N4**

Agenda item:

Document for: **INFORMATION**

Introduction:

This document contains **"15"** LSs that have been agreed by **TSG_N WG4,** and are forwarded to **TSG_N Plenary** meeting #9 for information.

Tdoc No. N4-000	*Title*	Destination
507	***Liaison statement on appointment of people to maintain liaison with IGC***	S2
515	***LS on request for response to N4 LS(N4-000340)***	S2, N1
520	***Response LIAISON STATEMENT ON TERMINOLOGY OF TRFO/TFO AND POSSIBLE INTERWORKING SCENARIOS***	S2
524	***Liaison statement ON SYNRONISATION ISSUES DURING CODEC TYPE CHANGE***	R2, R3, S4, N1
537	***Liaison statement on the modified lengths of parameters AUTN and AUTS***	N1
549	***LS on Architectural Impact of Combined MAP Signaling for Mobility Management***	S2
550	***LS on Bearer Independent Circuit-Switched Core Network Work Split***	N3
551	***LS, RAB ASSIGNMENT FOR TRFO***	N1, S4
701	***Response Liaison Statement on MS Network Capability IE Conflict***	S2, N1
731	***Response LS to "LS back on Race conditions avoidance"***	N1
739	***LS, Sending of NSI without modification to RAB***	R3
740	***LS, Support of SDU's for TrFO***	N1, S4, S2
741	***LS, SRNS relocation based on global title***	S2
752	***Response to LS on RAB Assignment QoS Negotiation***	R3, S2, N1
789	***Liaison statement on Positive Authentication Reporting***	S3, CN

3GPP TSG-CN WG4 **Tdoc N4-000507**
Meeting #3, Helsinki, Finland
17th – 21st June 2000.

Source: **3GPP TSG CN WG4**[1]

Title: **Liaison statement on appointment of people to maintain liaison with IGC**

To: **TSG-SA WG2**

cc: **TSG-CN, TSG-SA**

TSG-CN WG4 are pleased to inform TSG-SA WG2 that TSG-CN WG4 have appointed people to maintain liaison with the Inter-Group Co-ordinators for those work areas which are relevant to the work of TSG-CN WG4, as indicated in the table below.

IGC	TSG-CN WG4 liaison person	Email address
Bearer and access stratum	Kevin Gorey (Nortel Networks)	kgorey@nortelnetworks.com
QoS	John Menard (Lucent)	jmenard@lucent.com
Call control & roaming	Ian Park (Vodafone)	ian.park@vf.vodafone.co.uk
Codecs	Phil Hodges (Ericsson)	phil.hodges@eed.ericsson.se
Messaging	Not needed	
Terminal local features	Not needed	
Service platforms	Yun-Chao Hu (Ericsson)	yun-chao.hu@era.ericsson.se
Security	Ian Park (Vodafone)	ian.park@vf.vodafone.co.uk
Billing, charging & management	Not needed	
Testing	Not needed	
Location-related issues	Ahti Muhonen (Nokia)	ahti.muhonen@nokia.com

TSG-SA WG2 are asked to note the above contact details, and to direct any communication with TSG-N WG4 to the appropriate liaison person for the work area.

[1] Contact: Ian Park, Vodafone, tel +44 1635 673 527, email ian.park@vf.vodafone.co.uk

T-doc N4-000515

3GPP TSG-CN4
Helsinki, Finland
17-21 July 2000

Title: **LS on request for response to N4 LS(N4-000340)**

From: **N4**

To: **S2 and N1**

Contact Person:

Name: **NEC, Toshiyuki Tamura (+81-471-85-6954)**
E-mail Address: **tamurato@e1sf.ncos.nec.co.jp**

At the last CN plenary meeting, the CR N4-000258 (29.060CR105 Race Conditions Avoidance) was postponed to be approved since the LS related to this CR has been sent to both N1 and S2 but no response has been received in N4.

In order to approve this CR in the next CN plenary meeting in September, our next N4 meeting 28th August – 1st September will be the last chance to confirm that this CR does not have any impacts to the responsible area in both N1 and S2.

Therefore, N4 would like to request both N1 and S2 to review the original LS (N4-000340) during the N1 and S2 SIP joint meeting and provide the response to N4.

The original LS and CR are attached.

3GPP TSG CN WG4#03 **Tdoc N4-000520**
Helsinki, Finland
17-21 July 2000

TITLE: RESPONSE Liaison statement on Terminology of TrFO/TFO and possible interworking scenarios

TO: SA WG2

FROM: TrFO/TFO JOINT WORKSHOP

CC: SA WG4, CN WG1, RAN WG3

Contact: alexander.vesely@siemens.at

TSG CN WG4 thanks TSG SA WG2 for their LS on "Terminology of TrFO/TFO and possible interworking scenarios", which was discussed during the 2nd workshop on TrFO/TFO issues held on July 18th 2000 during the regular TSG CN WG4 meeting.

We would like to inform TSG SA WG2, that the majority of the workshop participants expressed their ~~oppinion~~concern that the LS addressed terminology descriptions, that were not requested by the LS from the 1st TrFO/TFO Workshop.

The workshop would like to have an appropriate term and description of~~, that the answers given were not felt satisfactory, as~~ possible cascading scenarios of TrFO & TFO. The workshop participants expressed also their concerns that the interworking scenarios used only GSM codecs as an example. This is considered confusing since TrFO is targeting the 3G networks only~~were missing and the interworking scenarios outlined focuse too much on GSM issues~~.

TSG SA WG2 is kindly requested to rediscuss the relevant Action Point of the first TrFO/TFO workshop (May 8th 2000):

- A new term seems necessary for cascading Transcoder Free and Tandem Free operations. The term TrFO should be applicable only when there is no transcoder involved in the connection.
- Further it needs to be indicated, in which scenarios cascading of TrFO and TFO will happen.
- Appropriate examples of the scenarios need to be provided.

The TrFO/TFO workshop would appreciate a response at S2's earliest convenience. The next workshop is scheduled for 29-30 August (Seattle, USA).

3GPP TSG CN WG4#03 **Tdoc N4-000524**
Helsinki, Finland
17 - 21 July 2000

TITLE: LIAISON STATEMENT on SYNRONISATION ISSUES DURING CODEC TYPE CHANGE

TO: SA WG4, CN WG1, RAN WG2, RAN WG3

FROM: TrFO/TFO JOINT WORKSHOP

~~**CC: RAN WG2, RAN WG3**~~

Contact: alexander.vesely@siemens.at

~~TSG CN WG4~~The TrFO/TFO workshop discussed N4-000474 (attached), presented during the 2nd workshop on TrFO/TFO issues held on July 18th 2000 during the regular TSG CN WG4 meeting. Based on this document two issues were raised:

1. Implicit detection of codec mode and codec type

During meeting #12, TSG CN WG1 (see attached N1-00079502) decided on a synchronisation mechanism, that requires RRC and RANAP protocol to transport transparent codec information during setup or modification of RBs/RABs. Further it was asked for the possibility to send this codec information "... without really changing the SDU formats and therefore not re-initializing the radio access bearer and radio bearer."

Given the case, two different codecs exist with equal SDU formats, it is difficult both for the UE and the network to synchronise the signalling which commands the change of the codec type in the control plane with the actual change of the codec type in the user plane, as for the codec modes of the UMTS AMR codec, we have the principle that the receiver can derive the codec **mode** just from the size of the SDU.

~~**CN WG4 would like to request from SA WG4** quest from S4~~ **The TrFO/TFO Workshop kindly asks S4** experts to evaluate how the new codec type's SDU can be identified in the case described above.~~to specify future codecs in such a way that this principle can be extended to codec **types**, i.e. that the receiver is able to derive the codec type just from the size of the SDU. In this case the synchronization problem described above could not occur.~~

The TrFO/TFO Workshop kindly asks RAN WG 2 and RAN WG3 experts to comment~~**CN WG4 would like to (re-)request from RAN WG2 and RAN WG3**~~ whether any possibility is given in the relevant protocols to support the requested functionality.

The TrFO/TFO Workshop whould like to inform~~**CN WG4 would like to request from**~~ **CN WG1** experts that~~to~~ ongoing discussions~~reconsider~~ may have impact on the requirement to support codec change without RB/RAB re-initialisation.

2. Specifying the size of RAB subflows for UMTS AMR codec modes

Furthermore, during discussions it came to our attention, that TSs 26.101/26.102 do~~es~~ not specify the exact sizes of RAB subflows for UMTS AMR codec modes but leave it to the operators choice. Only the total sizes of bits per AMR mode are specified as mandatory values.

The TrFO/TFO workshop kindly asks~~**CN WG4 would like to request from**~~ **SA WG4** experts to consider interworking scenarios in the context of TrFO/TFO, e.g. if a CN node, assigning vendor-specific RAB subflow sizes during RAB Assignment procedure, has to interwork with a transcoder placed at the

border of the PLMN, which would imply – possibly unnecessary – effort for implementations as well as for related network configuration issues.

In addition, SA WG4 is kindly asked~~requested~~ to specify the class division in TS 26.101 mandatory (and reword relevant statments in other TSs), if nothing else is to be gained from having this level of flexibility.

The TrFO/TFO Workshop would appreciate a response at earliest convienence of the addressed WGs (i.e. S4, N1, R2 and R3). The next workshop is scheduled for 29-30 August (Seattle, USA).

Attach:

[redacted] N4-000474.DOC [redacted] N1-000702.doc [redacted] N1-000795.doc

3GPP TSG CN Working Group 4 **N4-000537**
CN4#03 Meeting,
Helsinki, Finland
17 - 21 July 2000

Source: **TSG CN WG4**[1]

To: **CN WG1**

CC: **SA WG3**

Title: **Liaison statement on the modified lengths of parameters AUTN and AUTS**

CN4 noticed, serendipitously, that TSG SA approved CR 33.103-009, which modifies the AUTN and AUTS parameter lengths from variable to fixed. This change has an impact on TS 29.002, which has been properly addressed in CR 29.002-151.

CN1 are kindly asked to review the above mentioned CR against TS 33.103, to see if there is a similar impact on TS 24.008

[1] Contact: Luis López-Soria, Ericsson L.M.; tel. +34 91 339 2656; email: luis.lopez-soria@ece.ericsson.se

3GPP TSG CN WG4, Meeting #3
Helsinki, Finland, 17-21 July 2000

Tdoc N4-000549

Source: **3GPP TSG CN WG4**[1]

To: **3GPP TSG SA WG2**

CC: **3GPP TSG CN**

Title: **LS on Architectural Impact of Combined MAP Signaling for Mobility Management**

During the N4 meeting in Helsinki, 17-21 July 2000, a new WI on "Optimisation of Signalling: Combined MAP Operations between HLR and Serving Node" was proposed (please see attached Tdoc N4-000463 for information).

N4 has agreed to start a feasibility study for this WI. The results of this study shall be incorporated in the justification section of the WI description. Based on the outcome of this study, N4 plans to decide during their next meeting, 28 Aug – 01 Sep 2000, whether to start the implementation of this WI for R00.

Since the integration of SGSN and MSC/VLR implies architectural impacts, N4 asks S2 for advice and guidance on this matter. In particular, feedback is needed on whether the option of a combined SGSN / MSC/VLR node is acceptable for R00 from S2's point of view.

N4 would appreciate a response at S2's earliest convenience. The next meetings of N4 are scheduled for 28 Aug – 01 Sep 2000 (Seattle, USA) and 13 – 17 Nov 2000 (Paris, France).

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3GPP TSG CN WG4, Meeting #3
Helsinki, Finland, 17-21 July 2000

Tdoc N4-000550

WI / Topic: **Bearer Independent Circuit-Switched Core Network**

Source: **3GPP TSG CN WG4**[1]

To: **3GPP TSG CN WG3, 3GPP TSG CN**

Title: **LS on Bearer Independent Circuit-Switched Core Network Work Split**

During the N4 meeting in Helsinki, 17-21 July 2000, the 3GPP Project Plan for R00 v1.3 (attached in Tdoc N4-000469 for your information) was presented to N4.

In the course of the discussion of this document, N4 has identified areas in which the Project Plan diverts - according to the notes of the N4 chairman - from the agreements made in the last N plenary, 21-23 June 2000 in Düsseldorf.

N4 has gathered the additions and corrections to the Project Plan in Tdoc N4-000547 (attached for your information).

In the same meeting, a new WI on "Bearer Independent Circuit-Switched Core Network" was proposed (attached in Tdoc N4-000548 for your information). The work for this WI is split between N3 and N4 along the lines described in the additions and corrections to the Project Plan and in the spirit of the agreements reached within the joint N/S2#03 meeting and N#08 plenary meeting. N4 understands that N3 is responsible for the parameter values for the media gateway control protocol. N4 asks N3 for guidance on how these parameter values shall be documented and where these will be specified.

N4 asks N3 to review the proposed work split and to relay their comments and/or agreement to the additions and corrections to the Project Plan, as well as to the WI, back to N4. In addition, N plenary is requested to update the Project Plan accordingly.

N4 would appreciate a response at N3's earliest convenience. The next meetings of N4 are scheduled for 28 Aug – 01 Sep 2000 (Seattle, USA) and 13 – 17 Nov 2000 (Paris, France).

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3GPP TSG CN WG4#03 **Tdoc N4-000551**
Helsinki, Finland
17 - 21 July 2000

TITLE: LS, RAB ASSIGNMENT FOR TRFO

TO: RAN WG3

FROM: TRFO/TFO JOINT WORKSHOP

CC: CN WG1, SA WG4

Contact: phil.hodges@eed.ericsson.se

INTRODUCTION

In order to complete the WI for Out Of Band Transcoder Control for R00, we need to solve one major problem for the out of band codec negotiation which cannot be solved by the CN alone: the handling of RAB subflow combination initialisation by the RNC.

In the R99 standards for RANAP (25.413) and Iu User Plane (25.415) the SDU formats requested by the MSC in the RAB Assignment Request do not all have to be initialised by the RNC. This can mean that if an end to end TrFO connection exists to another RNC, this RNC has the freedom to initialise a different subset of the negotiated Common Active Set of modes to those which the originating RNC chooses to initialise. This would then result in no speech connection.

In R99 there is no requirement for the support of TrFO in the CN and therefore a TRAU is inserted. The TRAU in the CN must then support all modes and therefore no empty set would result.

The requirements of the CN for TrFO are that the UTRAN is configured to support, as a minimum, all SDU formats required for UMTS AMR. This is to avoid the requirement for re-negotiation due to intra-UTRAN RNC relocation and to allow Iur soft handover for TrFO.

It has been considered that the MSC could have prior knowledge of the subset capabilities of its UTRAN. It could then only negotiate those modes. The dependancy on such administration in the MSC for TrFO should not be mandatory, the OoBTC procedures allow the negotiation of subsets but the support of this by the MSC should not be mandatory.

CONCLUSION

The TrFO/TFO workshop requests RAN WG3 to accept, and describe in the appropriate specifications, the following:

1. For R00, RNCs shall support, as a minimum, the SDU formats required for UMTS AMR as specified by 3G TS 26.101.
2. For R00, all the SDU formats which the MSC has requested the RNC to initialise, shall be initialised by the RNC. No reduction of this set shall be performed by the RNC. The RAB Assignment Acknowledgement shall confirm this.
3. Any Subflow combinations that cannot be used during the active phase of the call due to load in the RNC shall be controlled by inband rate control procedures on Iu UP protocol.

3GPP TSG CN WG4#04 **Tdoc N4-000701**
Seattle, Washington, US
28 August - 1 September 2000

Title: **Response Liaison Statement on MS Network Capability IE Conflict**

Source: **3GPP TSG-CN WG4**

TO: **3GPP TSG-SA WG2, 3GPP TSG-CN WG1**

WI: **GPRS**

Contact Person:
Name: Alessio Casati, Lucent Technologies
E-mail Address: acasati@lucent.com

Date: **29th August 2000**

N4 would like to thank N1 for their LS (attached tdoc *N1-001010*) on network capability IE conflict. N4 have determined that 29.060 is unaffected by what described in the LS, and only stage 2 level revisions may occur, since only node behaviour aspects seem to be involved.

3GPP TSG CN WG4#04 **Tdoc N4-000731**
Seattle, Washington, US
28 August - 1 September 2000

Source: **TSG-CN WG4**

To: **TSG-CN WG1**

Title: **Response LS to "LS back on Race conditions avoidance"**

Contact: Alessio Casati, acasati@lucent.com

TSG-CN WG4 thank TSG-CN WG1 for the response liaison on race conditions avoidance (attached *N1-001027/* N4-000632*)*.

CN4 do not share CN1 opinion that no standard solution has to be provided, and, further, they have determined that the serialisation of procedures as a possible solution is not suitable since that would imply impacting negatively the performance of the system for error conditions that happen only with a relatively low probability.

Also, CN4 would like to inform N1 that CN4 have determined to pursue solutions that do not impact the MS and protocols handled by CN1.

3GPP TSG CN WG4_TrFO/TFO #3 **Tdoc N4-000739**
Seattle, USA
29 - 30 August 2000

TITLE: LS, SENDING OF NSI WITHOUT MODIFICATION TO RAB

TO: RAN WG3

FROM: TRFO/TFO JOINT WORKSHOP

CC: CN WG1, SA WG4

Contact: phil.hodges@eed.ericsson.se

The TrFO/TFO workshop thanks RAN3 for their LS (R3-002306/N4-000703). An example where a change to codec type (sending of NAS Synchronisation Indicator required) is needed but the RAB re-establishment is not required is when changing from UMTS AMR to GSM AMR. In this case the SDU formats are the same and so also is the speech encoding, only the rate control periodicity is changed. In such a special case there is no synchronisation problems perceived.

This is a requirement for R99 because we can have R00 mobiles which support both GSM AMR and UMTS AMR and need the NSI support is R99. This request was made along with the initial request to support NSI for R99. The modification with RAB re-assignment is required when a TRAU exists also, in fact this is the more common case for the support of TFO between UMTS and GSM (i.e. the far end performs a relocation from UMTS to GSM).

In other cases there could be synchronisation problems and CN4_TrFO/TFO understands that solutions to this should be considered by our WG. It would then be up to the MSC to determine if a RAB modification is needed.

One solution would be to allow the RNC to not re-initialise the RAB when the RAB parameters in the RAB Assignment (modify) have not changed – i.e. only NSI is applicable. The solution preferred by the TrFO/TFO Workshop would be to make the RAB parameters optional, and add the RAB Assignment type for NSI only.

A timely reply from R3 on this issue will be appreciated.

3GPP ~~TSG CN WG4~~ TrFO/TFO Workshop #3 **Tdoc N4-000740~~708~~**
Seattle, USA
29 - 30 August 2000

TITLE: LS, SUPPORT OF SDU'S FOR TRFO

TO: RAN WG3

FROM: TRFO/TFO JOINT WORKSHOP

CC: CN WG1, SA WG4, SA WG2

Contact: phil.hodges@eed.ericsson.se

INTRODUCTION

~~CN4~~ The TrFO/TFO W~~w~~orkshop thanks RAN WG3 for their reply to our N4-000551, R3-002351.

The following answers to RAN3's questions are provided:

1. The TrFO/TFO Workshop's~~N4's~~ requirements for TrFO are assumed to be mutual with R00, i.e. the requirements are valid for all R00 RNC's. N4 does not expect to have a to determine whether a RNC supports TrFO or not, in addition to determining the release version. Furthermore, the requirements are valid even if the call results in transcoder at the edge or TFO connections.

2. The TrFO/TFO Workshop ~~N4~~ has considered fallback mechanisms when no common set results. The problem is that the MSC must know in advance of the OoBTC procedures what can be supported. If this knowledge is obtained after the set-up of the call then inserting a transcoder means end to end modification, which is considered unacceptable.

PROBLEM

It is understood by the TrFO/TFO Workshop ~~N4~~ that provided the MSC has knowledge of the fixed (static) capabilities of the RNC then it shall not request SDU formats that the RNC cannot support and then (point 2 in N4-000551) the RNC shall initialise all formats requested. What is not clearly understood by N4 is whether the static limitation is specific SDU formats or simply the total number of Sub-flow combinations.

RAN3 did not comment or confirm point 3 in the TrFO/TFO Workshop~~N4~~'s LS regarding the handling or rate control if there is a dynamic limitation to the active subflow combinations. The TrFO/TFO Workshop ~~CN4~~ again requests confirmation that only rate control procedures shall be used to reduce the dynamic set of subflows and not the initialisation procedure.

The TrFO/TFO Workshop ~~CN4~~ further asks RAN3 to clarify if (and if so why) the RNC can re-initialise the Iu UP for reasons other than RAB assignment modification requested from the MSC.

The TrFO/TFO Workshop ~~CN4~~ assumes that the limitations to number of subflow combinations that can be active during a call at a given time can have impact on the other the other traffic configurations. However for TrFO to work the procedures must have a guaranteed support of a minimum number of SDU's, i.e. supported by all RNCs.

CONCLUSION

The TrFO/TFO Workshop~~CN4~~ requests that (as a compromise) for R00, all RNC's can always accept a RAB assignment request for 6 subflow combinations. Less than 6 is unacceptable to maintain current speech quality requirements and TrFO interworking (4 speech modes, 1 SID, 1 ~~silence~~zero data).

A timely response on this issue will be appreciated

3GPP TSG_TrFO/TFO #3 **Tdoc N4-000741**
Seattle, USA
29 - 30 August 2000

TITLE: LS, SRNS RELOCATION BASED ON GLOBAL TITLE

TO: SA2

FROM: TRFO/TFO JOINT WORKSHOP

CC: CN WG1, SA WG4

Contact: phil.hodges@eed.ericsson.se

INTRODUCTION

A contribution was presented at the TrFO/TFO workshop discussing SRNS Relocation with respect to TrFO connections (N4-000624, attached). Reference was made to a S2 contribution (S2-000976) which proposes that inter serving area relocation can be performed without performing inter-MSC relocation. This might have advantages for TrFO calls, but will be further investigated by the workshop. It can be seen from the last S2 meeting report that the status of this discussion in S2 is not complete.

CONCLUSION

The TrFo/TFO workshop kindly asks SA2 to take note of our interest in this matter and inform us of the progress of this disussion and any final outcome.

A timely response on this issue will be appreciated.

3GPP TSG CN WG4#04 **Tdoc N4-000752**
Seattle, USA
28 August – 1 September 2000

Source: **3GPP TSG CN WG4**
Title: **Response to LS on RAB Assignment QoS Negotiation**
To: **3GPP TSG RAN WG3, 3GPP TSG SA WG2, 3GPP TSG CN WG1**

Contact: **kgorey@nortelnetworks.com**

CN4 thank RAN3 for their Liaison Statement on RAB Assignment QoS Negotiation.

CN4 are aware that SA2 are currently discussing the mechanism for QoS Negotiation from a system architecture perspective. Therefore, CN4 are not currently in a position to comment on detailed aspects of proposed QoS Negotiation solutions and will be happy to assist RAN3, and other relevant work groups once a clear view of the QoS Negotiation mechanism is available from SA2.

3GPP TSG-CN WG4 **Tdoc 3GPP N4-000789**
Seattle (WA), USA
28 August – 1 September 2000
Source: **TSG-CN4**[1]
Title: **Liaison statement on Positive Authentication Reporting**
To: **TSG-SA WG3, TSG-CN**

TSG CN WG4 thanks TSG SA WG3 for their liaison statement (S3-000499) on Positive Authentication Reporting.

N4 does not have a clear view on whether this functionality is required for R99 or for R00. Because this is clearly a major functional change, N4 assumes that this will be part of R00.

The following questions were raised during the N4 meeting:

- What protocol would be used between 3GPP VLR/SGSNs and 3GPP2 HLRs? Currently the protocol is not defined in the specifications
- S3 advises that positive authentication report is mandatory during the first location updating for 3GPP2 subscribers roaming to the 3GPP networks. In this case how does the VLR/SGSN know that the subscriber is a 3GPP2 subscriber? This information is needed if the VLR/SGSN does not want to report positive authentication for subscribers not from the 3GPP2 networks.
- How can the HLR request authentication report from the VLR/SGSN?

S3 liaison also included a proposal for modification of TS 33.102 to reflect generic authentication reporting mechanism. N4 recommends the separation of the Authentication Failure and Positive Authentication Reporting because Authentication Failure Report is already implemented in the N4 specification.

Regarding the question about the impact on network performance, N4 would also like to point out that

1. The requirement to perform authentication reporting only at the first registration as a means to save signalling is not applicable to 3GPP networks, since there is no distinction between first and subsequent location updates
2. Roaming subscribers normally change their serving network quite often and that will noticeably increase the signalling traffic if the Positive Authentication Reporting is used.

N4 ask advise from CN as to which work item this standardisation belongs.

1 Contact: Teemu Mäkinen, email: teemu.makinen@nokia.com