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1 Opening and Welcoming

Mr Gary Jones, Chairman of the workshop opened the meeting and explained that the Workshop had been set up by the TSG SA Plenary. There had been 2 solutions proposed for GTT, transcoder based and server-based. Advantages and disadvantages for each solution had been debated, and the TSG SA Plenary agreed that the Workshop should try to address the issues of both solutions in order to provide an early Rel-5 solution. Subsequent discussions provided a proposal that the Workshop investigate the priorities needed for developing the solutions for GTT/TTY support and conclude if there are common paths for the prioritisation of the work.

Delegates to the meeting then introduced themselves. The list of participants is provided in Annex A of this report.

2 Registration of Documents, Approval of Agenda and IPR Statement

The available documents were allocated to their respective agenda items. The agenda was provided in [TD GTT-010001](#) which was **approved** without change.

The chairman reminded delegates of their IPR obligations in 3GPP meetings.

3 TTY Requirements Overview

[TD GTT-010012](#): Operator Requirements and Issues - 3GPP Support of TTY (CTM). This was presented by Gary Jones, VoiceStream Wireless. It reports the North American regulatory requirements deadline for the provision of TTY support (end of December 2001), and the 6-month allowance for installation of the service in their equipment. Therefore the deadline of End June 2002 for implementation of the service is a requirement. He explained that the most critical requirement is for North American operators to be able to transmit E911 calls over the TTY device. GSM Technical Bodies have proposed the transcoder-based and server-based solutions. The SA Plenary had asked this workshop to develop sufficient technical information to allow operators to build a solution in good time. Both solutions would need some additions in specifications, but were considered mature enough to allow interoperable solutions to be built.

The contribution also proposed the issues to be addressed at the workshop in order to deliver an acceptable solution. Contribution [TD GTT-010015](#) (see below) contained **responses** on many of these issues, summarised below:

- 1) **E911 versus TTY support:** *The timescales for providing support of E911 only TTY calls and providing full feature support using CAMEL must be evaluated, bearing in mind that the time critical mandate in the US is for making our systems capable of transmitting E911 calls from TTY devices.*
Response: *The service node solution does not require CAMEL for E911 emergency calls.*

- 2) **Scalability:** *The scalability of a server solution to handle both E911 voice and TTY calls, along with non-emergency TTY calls is questionable. For example, if all E911 voice calls are routed to the server, then the number of servers grows in proportion to the E911 voice traffic and not to the TTY traffic.*
Response: *Same as with growing number of transcoders and other resources in a growing network.*
- 3) **Call Looping:** *In order to prevent infinite looping between the CAMEL server and the GMSC, the CAMEL Server solution proposes to modify the Calling Party Number to indicate that it has passed through the CAMEL server. This raises compatibility issues with Phase 1 Calling Number Presentation and also with the working of CALEA. We suggest that on a terminating call, any trunk to the CTM server could have IN suppression added, which will prevent looping. However, this would negate the use of any other CAMEL services the customer may have, and feature interaction needs to be studied.*
Response: *The design of the interaction between the CTM-SRF and the SCP has been modified according to the presented fear and is made clearly reliable. (Documented in TD GTT-010005: CR to 3GPP TS 23.002. New Annex)*
- 4) **Customer Provisioning:** *By FCC mandate, all E911 TTY calls will be supported by the network without any customer provisioning requirements. However, non-emergency TTY calls will not be supported unless the TTY customer has requested TTY service from the carrier. This provisioning requirement causes GSM TTY support via the network server solution to differ considerably from the automatic support of non-emergency TTY calls provided by TDMA and CDMA systems in the US. How can non-emergency TTY support be provided for pre-paid subscribers.*
Response: *There are benefits of the service node solution that may outweigh the inconvenience to activate Text support. The activation can be made by one call to a common number, .e.g. 711.*
- 5) **Single Point of Failure:** *All E911 calls (whether voice or TTY) are routed through the network server. In most implementations, redundancy of the server and its trunks will be required, adding to the server deployment costs.*
Response. *Yes, the node is a telecom network component with the same level of failsafe requirements as other core network components. It does not add to the cost, it should be calculated from the beginning.*
- 6) **Call back:** *The Phase 1 and Phase 2 E911 standards require that the PSAP is able to call back the E911 caller. In the network server implementation, the caller must be registered as a CAMEL subscriber to be given a CTM circuit. Any inter-working should be done utilizing generic digits in the ISUP messaging (GAP etc.) to store the original called number. The CTM could then reformat the IAM. In this scenario CALEA and CLIP etc. are not affected by the "Interim node".*
Response: *Yes. Call back for users without CTM activated subscription may either use the more error-prone basic Baudot transmission of the voice channel, or an application can be developed to automatically set up a temporary subscription. The ambition level can be selected between these levels without further standardisation.*
- 7) **Subscription Management:** *CAMEL server requires the TTY user to have a known subscription type. It is envisaged that some CTM implementations at the mobile may consist of direct connection to the audio jack, such that a TTY user could use any existing or new mobile subscription.*
Response. *Yes, a simple CTM activation is the only thing needed.*
- 8) **Carry-over:** *Support of E911, TTY Voice Carry-Over/Hearing Carry-Over, and 711 TRS services may require the user to switch from voice to CTM and back again within the call. It is unclear how this is to be supported in the CAMEL solution.*
Response: *All solutions follow CTM as in 26.226. There it is described how alternation text and voice is achieved in any solution.*
- 9) **CAMEL interaction:** *If TTY is provided via a CAMEL mechanism, the changes required to other already deployed CAMEL services such as pre-paid must be assessed.*
Response. *Yes, early CAMEL phases has this limitation. The two services need to be combined into one new service for the user of both. Another way to access one of the services needs to be provided.*

It was clarified that the E911 requirements include Call-back, when it is possible to do so (depending on available information and whether or not the user has a subscription/markings). It was noted that this could be provided using the transcoder-based solution and by the server node-based solution for subscribed users.

TD GTT-010015: Ericsson comments to TD GTT-010012. This contribution contained the Operator concerns and Issues with comments from Ericsson in the form of change marked additions. This was introduced by Ericsson, and reported that there was no mandate for TTY terminals as such to be provided, but only for Baudot-coding towards the fixed network and therefore specific terminal designs could be made to support higher level than Baudot and allow the network to make the required down-translation. The requirement for equal functionality and support for disabled users as is provided for non-disabled users lead to the conclusion that roaming should also be provided for TTY users.

The contribution provided comments on the issues outlined in TD GTT-010012, - items 1) to 9) which were discussed

in turn.

TD GTT-010017: Proposed changes to TS 22.226. These changes were proposed and introduced by Nortel Networks and intended to include the essential requirements for GTT. The proposed changes were discussed and was to be modified by the author in **TD GTT-010023**, but there was no time to produce this during the Workshop. It was agreed that the author would send this out to the Workshop participants for comment and agreement. **The author was asked to contribute this contribution, when agreed, directly to SA WG1, as a contribution endorsed by this Workshop.**

TD GTT-010019: Global Text Telephony Issues. This contribution was introduced by Vodafone, and had been submitted to TSG SA#11 as **TD SP-010174**. It was reported that many of the issues were addressed in **TD GTT-010002**.

TD GTT-010020: BT Text Telephony Service. This was provided for information on the BT service concepts, and was noted.

4 GTT Status Review

TD GTT-010025: 3GPP TS 26.226 v 5.0.0 - Cellular Text telephone Modem (CTM) (replacement of **TD GTT-010013**): This was provided for information and was noted.

TD GTT-010024: 3GPP TR 26.231 V5.0.0 (2001-03) (replacement of **TD GTT-010014**): This was provided for information and was noted.

TD GTT-010008 Approved CR to 22.101 on Text conversion for Global Text Telephony. This was provided for information by Ericsson and was noted.

TD GTT-010009: H.248 Annex F with latest corrections. This was provided for information by Ericsson and was noted.

TD GTT-010010: Global Text Telephony, Stage 1 description (22.226). This was provided for information by Ericsson and was noted. The change proposals in this document were provided in **TD GTT-010017** and further edited into **TD GTT-010023** (see agenda item 3).

TD GTT-010011 Global Text Telephony, Stage 2 (23.226). This was provided by Ericsson, requesting that the workshop should propose contents to it (the document was marked "for approval" in error and was provided for discussion). Comments were requested from the delegates after the Workshop and **Ericsson will input the updated contribution to SA WG2.**

TD GTT-010021 Clarifications on V.18 & Possible future evolutions of GTT/CTM. This contribution was provided by Nortel Networks for discussion and information and clarified the consequences of the CTM modem agreed in 3GPP on possible text telephony standards, and concluded that it can be used for all V.18 modes. It was reported that for Global Text Telephony, V.18, or any national specific sub-mode of V.18, is suitable.

It was concluded that to meet the FCC requirements, Baudot is all that is needed, but for requirements outside of North America then V.18 is needed.

TD GTT-010026 GTT Status. This contribution was provided for information by Ericsson. The document was presented and gave an overview of the GTT specifications' status. The USIM and testing aspects were not covered and some guidance will be needed on this.

The Chairman asked what the feeling on the creation of a specific stage 1, 2 and 3 to meet the FCC E911 requirements. This was thought unfeasible, as the E911 would need to be included in the complete GTT/TTY package. It was suggested that (but considered unfeasible) a first solution to allow E911 conformance and to follow with a complete GTT solution in a later phase. It was also suggested that the GTT solution could be provided for June 2001, as the lacking specifications were only in the architecture general descriptions. A further comment was that, irrespective of the choice of solution, specifications should be designed so that it is easy to extract the E911 requirements in order to build this as a minimum and include add-ons as necessary.

5 Analysis/Discussion of transcoder/server alternatives

Transcoder-based:

TD GTT-010006 Transcoder based CTM implementation. This was presented by Nokia. It proposed that the term "transcoder based" is somewhat misleading as the function also be placed external to the transcoder in the same transmission line. Although placing the function inside the transcoder has some benefits. It suggests that using the transcoder-based solution, that operators can offer basic text telephony to everybody and more advanced service to GTT subscribers (without explicit GTT subscription) and also that additional speech handling functions, like noise and echo suppression functions in the BSS would need extensive testing to ensure that GTT will pass through. These handlers can be switched out if implemented in the transcoder (with a software upgrade to existing networks). It also states that transcoder-based solution would be compatible with TFO and TrFO.

Summary (from contribution):

In this document it is proposed to implement CTM adaptor in the speech transcoder. However this solution allows it also to be placed in an external box in the same circuits as transcoder.

The main benefit of the solution is the possibility to use GTT without subscription. This will allow hearing impaired people to be treated equally with voice users and does not require any modifications to emergency call handling procedures and routing.

The solution can be further improved with GTT subscription in order to save transcoding resources and to reduce network upgrade costs.

The handover to GSM/UMTS was questioned. It was clarified that if two CTMs become active on the line, one will fail in its CTM handshake and deactivate itself. Apart from the character loss inherent in a handover where the CTM instance is changed, it would work for the Baudot case.

The use of dialled prefix, as in UK (see [TD GTT-010020](#)) was discussed, and it was clarified that this was not allowed in the FCC E911 requirements and not well-received for the US user calls.

[TD GTT-010007](#) Observations on CTM service node solution. This was presented by Nokia. It presented some ideas on the issues and challenges if GTT support is implemented in a separate service node with CAMEL routing procedures. The contribution finds many issues which need to be solved with the network-based solution, including the need to subscribe to the service and to verify that non-standard voice handling does not corrupt the text signal. For pure-FCC E911 compliance, only the "Emergency Centre Call-back" issues for non-subscribers and potential Lawful Interception (CALEA) issues were identified.

*It was **noted** that operators should make their Law Enforcement entities aware of the form of delivery of TTY/GTT content that can be expected.*

[TD GTT-010022](#): Transcoder based solutions for TDMA and CDMA. This was presented by Nortel Networks for information. TDMA as well as CDMA was found compatible with the FCC requirements. In case of GSM most of the time the change of transcoder occurs in inter-BSS handovers. These handovers are much less frequent than intra-BSS handovers. In case of UMTS the change of this should be even less frequent. The contribution was **noted**.

It was also noted that the choice of solution would need to take into account both the technical merits and the timing and cost issues.

Server-based:

[TD GTT-010003](#) Global Text Telephony BSS location issues. This contribution was introduced by Ericsson and provided some issues around the idea to place the CTM-to-Text Telephony conversion in, or close to, the BSS-located transcoder. A series of factors indicate that a location in the BSS is less favourable than the originally proposed Core Network location for this function, and details 7 potential problems.

Summary (from contribution):

- 1. A BSS location causes limitations in service level for text telephone users. Roaming will be limited to networks with physical installations of CTM.*
- 2. A BSS location causes character corruption and loss. CTM was designed to cover the A interface gap between CN and BSS. Characters will be corrupted and lost in handovers when CTM is not used over the A interface.*
- 3. A BSS location causes national fragmentation of the 3GPP solution. International text telephony support is not realistic to put in the BSS transcoders. National solutions create fragmentation of markets and services.*
- 4. A BSS location causes practical problems. The function must be implemented in every voice channel in the access network. That creates practical problems with version handling in many different transcoder models, resource conflicts, resource waste, verification in many different environments etc.*
- 5. A BSS location is not specified. No standards specification proposal exists specifying the solution and its characteristics.*
- 6. A BSS location does not cover the RNS network for UMTS. Additional standardisation is needed for that case, where the conversion must take place in the Core Network anyway.*
- 7. A BSS location creates service gaps if combined with a Core Network location. Applying both solutions for different networks or different parts of a network create service gaps, dropping of service at handover etc.*

Proposal: Standardise only the Core Network location of the CTM conversion for GTT.

This contribution was discussed and **noted**, and was taken into account in further discussions at the Workshop.

[TD GTT-010002](#) Global Text Telephony Architecture Discussion. This was presented by Ericsson and discusses the issues and how they can be addressed by transcoder and server-based solutions. Section 4 contained the major discussion text. Some discussion on the choice or range of Text call Emergency numbers to be standardised was made,

but no conclusions agreed (possibly a study should be done for a future recommendation on this). It also suggests that the CAMEL support option would be beneficial in order to offer roaming to Text-telephony users, but that Emergency Call support for this case would not be required. It was argued that the transcoder solution has no ongoing cost for new CAMEL services, whereas the CAMEL solution would have additional costs for new CAMEL services. However, there is a cost to the transcoder equipment to monitor calls for invocation of the CTM for a relatively low-percentage of overall traffic and costs for integrating CTM with every new voice coding feature to add, or for new transcoder models.

Another approach which could be investigated was to include the CTM transcoder in the list of available transcoders during call set-up, so that potential GTT calls could be directed towards a network-central pool of CTM transcoders, rather than having all transcoders in all BSSs. It was agreed that the pooling solution would bring the two solutions closer together. This path was considered suitable for the normal user-user text telephony calls, and this would also allow the operator to provide the capability in all transcoders (or allow a pool of service nodes to be provided) , if needed, to cope with Emergency calls, or to route all emergency calls to CTM-capable transcoders/service centres. It was reported that the code point solution was proposed already in GTT standardisation discussions and rejected, due to lack of time to implement and heavier network impact, in preference to the CAMEL solution, which also provided better roaming capabilities.

TD GTT-010004: CR to 23.002 : Introduction of GTT specific entities. This was a related CR to the proposals in **TD GTT-010003** and **TD GTT-010002** and was introduced by Ericsson. This was **noted** and taken into account in discussions of **TD GTT-010005** below.

TD GTT-010005: CR to 3GPP TS 23.002. New Annex: Routing of calls through the CTM-SRF for CTM/text telephone conversion. This was a related CR to the proposals in **TD GTT-010003** and **TD GTT-010002** and was introduced by Ericsson. *(Taken from text above figure 1: It is based on the fact that the network has no means to distinguish text emergency calls from voice emergency calls in areas where the same number is used for both types of call. It is also desired that even a phone borrowed for the purpose of making a text emergency call shall get the text service without any specific text subscription. Therefore, in order to meet these requirements, it shall be possible to configure the network to route all emergency calls through a CTM-SRF server).* The issues in this contribution were reviewed and discussed and Ericsson agreed to update the proposal with comments received before presenting to SA WG2 for consideration. The document was then **noted**.

TD GTT-010016: CTM Half Rate performance. This study result was presented by Ericsson for information and reports that there did not seem to be a problem with CTM over half-rate. It was noted that the tests had not been run over a number of different channel conditions. Nortel reported a more complete test on Half-Rate and made a summary that the performance was good and in line with performance for AMR-Half-Rate already documented. The report was **noted** and **Ericsson agreed to update 22.231 with information to be provided by Nortel**.

TD GTT-010018: Proposed modifications to the TS 23.226. This was presented by Nortel Networks and proposes modifications to the stage 2 description for Global Text Telephony, for transcoder-based operation. It was proposed that the discussions already held should be taken into account and Nortel agreed to meet off-line with interested parties and to draft a discussion paper to capture these ideas in an attempt to bring the agreements and understandings together, in 2 papers, a simple one for the E911 requirements and a second for the advanced solution.

Summary of results of off-line meeting:

The drafting group provided a set of solutions to cover the E911 requirements (**TD GTT-010027**) and for the user-to-user solution (**TD GTT-010028**). The solutions discussed in the workshop were discussed and the main issues of each approach were outlined.

TD GTT-0100027: E911 support of CTM. This was produced by the off-line drafting group and proposed 3 possible solutions to cover the FCC E911 requirements:

1. *All transcoder (GSM and UMTS)*
In this solution all the transcoders in a network are upgraded to support the CTM modem.

Issues:

All transcoders in the network will need to be upgraded to support CTM.

2. *Transcoder pooling*
In this solution, all emergency calls are routed via a CTM-capable Trau pool.

Issues:

Call back will need consideration in order that call-back from the emergency service centre is routed via the Trau pool

08.08 will need to be updated to show how this category of pool is supported

MSC needs to link the emergency call with access to the E911 Trau pool.

3. *CTM service node*

In this solution, all emergency calls are routed via a CTM service node before being routed to the emergency call centre

Issues:

Call back will need consideration in order that call-back from the emergency service centre is routed via the CTM service node
 Fault tolerant service node required since all emergency calls from the MSC(s) are being route via it
 It will be complicated to synchronise echo cancelling and speech enhancement in the Trau with CTM usage, if needed.

Standardisation issues for each option were discussed:

1. *08.02 and 23.002 will need to include a general description.
23.226 will need updating to introduce CTM in all Trau/transcoders.*
2. *08.02 and 23.002 will need to include a general description.
23.226 will need updating to specify the routing of all Emergency calls through the GTT Trau pool
08.08 will need to be updated to define a new circuit pool
24.008 will need updating to include CTM code points in the bearer capability IE for the Call back case.
The mechanism for linking the emergency centre call back with the GTT Trau pool requires further consideration
23.226 will need updating to include CLI detection for Call back from emergency centres for routing via the CTM Trau pool.*
3. *23.002 will need to specify the location of the CTM (general description).
23.226 will need updating to specify the routing of all Emergency calls through the CTM service node
23.226 will need updating to include CLI detection for Call back from emergency centres for routing via the CTM service node.*

Nortel Networks agreed to draft the necessary changes to solution 1. Nokia agreed to draft the changes required to solution 2. and Ericsson agreed to draft the changes required for option 3. It was agreed that the operator will be able to choose the solution which best suits it's situation.

These issues were included in the document which was provided in [TD GTT-010029](#), which provides the **agreed** options and issues.

[TD GTT-010028](#): user-to-user support of CTM. This was produced by the off-line drafting group and proposed 4 possible solutions to cover the user-to-user requirements:

1. *All transcoder (GSM and UMTS)
In this solution all the transcoders in a network are upgrade to support the CTM modem.*
- Issues:
- All transcoders in the network will need to be upgraded to support CTM
 Charging considerations need to be studied (capture of appropriate billing information)
 Roaming to networks which do not support CTM
 On inter-BSC handover, the Trau/CTM adaptor will change (impact needs to be studied).
2. *Pooling of CTM Trau resources (GSM and UMTS)
In this solution, all calls to/from mobiles sending the CTM bearer capability code point are routed via a CTM-capable Trau pool.*

Issues:

Bearer Capabilities (of CTM support in the mobile) need to be provided to the network, an additional bearer code point is required in the bearer capability
 08.08 will need to be updated to show how this category of pool is supported
 Charging considerations need to be studied (capture of appropriate billing information)
 CTM to Baudit/V.18 conversion will not be provided while roaming to a network that does not support CTM conversion functionality

3. *CTM service node
In this solution, all GTT calls are routed via a CTM service node*

Issues:

registration of subscribers requiring service
 CTM CAMEL service interaction with other CAMEL services
 It will be complicated to synchronise echo cancelling and speech enhancement in the Trau with CTM usage, if needed
 It will be complicated to synchronise TrFO and TFO with CTM usage
 CAMEL needs to be supported

Roaming CTM support only works for non-emergency calls in networks that support CAMEL

International transmission of CTM may be an issue (to be studied).

4. *CTM service node solution – Bearer Capability (GSM)*
In this solution bearer capability information is used to route calls to the CTM at call set up.

Issues:

Bearer capabilities (of CTM support in the mobile) need to be provided to the network, an additional bearer code point in the bearer capability is required.

MSC needs to link the call with access to the CTM service node.

CTM to Baudot/V.18 conversion will not be provided while roaming to networks that do not support any CTM conversion functionality

The mechanism for handling of terminating calls needs further study (CTM supplementary service may need to be defined). A mechanism will be required to detect a CTM mobile-terminating call.

Standardisation issues for each option were discussed:

1. *08.02 and 23.002 will need to include a general description.*
23.226 will need updating to introduce CTM in all Trau/transcoders.
2. *08.02 and 23.002 will need to include a general description.*
23.226 will need updating to specify the routing of all CTM calls through the GTT Trau pool
08.08 will need to be updated to define a new circuit pool
24.008 will need updating to include CTM code points in the bearer capability IE for the Call back case.
T WG2 specification for the MMI: either update existing specs (02.07, 22.007)
In order to receive calls, the CTM bearer capability needs to be activated in the terminal
The impact of change of Trau/CTM adaptor on Inter-BSC handover needs to be studied.
3. *23.002 will need to specify the location of the CTM (general description).*
23.226 will need updating to specify the routing of all CTM calls through the CTM service node
23.226 will need to include a detailed description CTM Service from the SCP perspective
23.226 will need to include a detailed description of the CTM Service Node behaviour (with enough detail to ensure interoperability of products).
4. *CTM supplementary service may need to be defined*
A mechanism is needed for detection of mobile terminating Text calls
This solution and the impact on standardisation requires further study.

Nortel Networks agreed to draft the necessary changes to solution 1. Nokia agreed to draft the changes required to solution 2. and Ericsson agreed to draft the changes required for option 3. It was agreed that the operator will be able to choose the solution which best suits its situation.

These issues were included in the document which was updated during the workshop and provided in [TD GTT-010030](#), which provides the **agreed** options and issues.

6 Path Forward

[TD GTT-010029](#) and [TD GTT-010030](#) provide the **agreed** options for solutions for E911 and user-to-user requirements, as agreed by the workshop. These are provided in Annex B of this report, for convenience.

7 Conclusions and Recommendations to SA2 and/or other WGs

The workshop concluded that a Phased approach was required, support of mandated FCC E911 requirements (emergency call) and then the full user-to-user features. It was also agreed that multiple options would be allowed. A detailed elaboration of the ways to realise the implementation of these options was needed.

In the study of the options in Phase 2, it is possible that not all options will be standardised and implemented.

In order for many of the options to work, support of CTM in the mobile is a requirement.

Contributions to the relevant 3GPP WGs would be provided by the individual solution proponents taking into account the agreements reached at the workshop.

T WG2 should take responsibility for the terminal aspects of GTT, including the provision of the capability to enable and disable CTM bearer capability information.

CN WG1 should take responsibility for the addition of the CTM bearer capability code point.

Groups to be contacted are: SA WG1, SA WG2, CN WG1, CN WG2, T WG2, TSG SA, T1P1, information to SA WG4 and CN WG4.

8 Closing

The Chairman thanked the host for the meeting facilities and the delegates for their hard work and spirit of co-operation and closed the meeting. Special thanks were given to the drafting group over the evening session.

[TDs GTT-010031, to GTT-010034](#) were provided by Ericsson for information and were **noted**.

Annex A: List of Participants

Name	Organization Represented	Phone/Fax	E-mail
Campbell, Sean	Cingular Wireless LLC	Phone : +1 925 227 4544 Fax : +1 925 227 3238	sean.campbell@cingular.com
Colombo, Giuseppe	SIEMENS Information and Communication Networks SpA	Phone : +39 2 2733 8020 Fax : +39 2 2733 3458	Giuseppe.Colombo@icn.siemens.it
Fuller, Jeremy	NORTEL NETWORKS (EUROPE)	Phone : +44 1628 434 679 Fax : +44 1628 434 034	jfuller@nortelnetworks.com
Gay, Frank	Siemens Information and Communications Networks Inc.	Phone : +1 858 521 3538 Fax : +1 858 521 3108	frank.gay@icn.siemens.com
Golos, Mietek	Telefon AB LM Ericsson	Phone : +44 208 964 0774 Fax : +44 208 964 0720	mietek_golos@dspg.co.uk
Hellstrom, Gunnar	Telefon AB LM Ericsson	Phone : +46 8 4046819 Fax : +46 8 448 27 51	gunnar.hellstrom@era.ericsson.se
Huang, Ying	E-PLUS Mobilfunk	Phone : +49 211 448 4786 Fax : +49 211 448 4046	huang@eplus.de
Jalonen, Tomi	SIEMENS AG	Phone : +49 89 722 54347 Fax :	tomi.jalonen@mch.siemens.de
Jones, Gary	Voicestream	Phone : +1 202.654.5950 Fax : +1 202.654.5963	Gary.Jones@voicestream.com
Krause, Goetz-Ulrich	SIEMENS AG	Phone : +49 89 722 25382 Fax : +49 89 722 61769	goetz-ulrich.krause@icn.siemens.de
Lindsten, Ulf	Telefon AB LM Ericsson	Phone : +46 8 59990190 Fax : +46 520 19336	lindsten@teligent.se
Lobley, Nigel	BT	Phone : +44 14 73 605 444 Fax : +44 1473 623 794	nigel.lobley@bt.com
Motolese, Valeria	SIEMENS Information and Communication Networks SpA	Phone : +390227337529 Fax : +390227337550	Valeria.Motolese@icn.siemens.it
Navarro, William	NORTEL NETWORKS (EUROPE)	Phone : +33 1 39 44 57 56 Fax : +33 1 39 44 50 12	navarro@nortelnetworks.com
Noldus, Rogier	Ericsson	Phone : +31 161 24 9400 Fax :	rogier.noldus@eln.ericsson.se
Pope, Maurice	ETSI	Phone : +33 4 92 94 42 59 Fax : +33 4 92 38 52 59	maurice.pope@etsi.fr
Prenatt, Dan	AirNet Communications Corp.	Phone : +1 561 792 1139 Fax :	dprenatt@aircom.com
Pudney, Chris	VODAFONE Group Plc	Phone : +44 1 635 673 397 Fax : +44 1 635 233 593	chris.pudney@vf.vodafone.co.uk
Uraizee, Nadeem	Ericsson	Phone : +1925-737-5886 Fax : +1925-225-0666	Nadeem.Uraizee@ericsson.com
Wood, Karin	Ericsson Incorporated	Phone : +1.972.563.0750 Fax : +1.972.583.2273	karin.wood@am1.ericsson.se
Ylinen, Pasi	NOKIA Corporation	Phone : +358 40 5686653 Fax :	pasi.ylinen@nokia.com

Annex B: Agreed solutions (TD GTT-010029 and TD GTT-010030)**B.1: TD GTT-010029**

Technical Specification Group Services and System Aspects

GTT(01)0029

Global Text Telephony Workshop, Dusseldorf, Germany, 18-19 April 2001

Source: Drafting Group (GTT ad hoc)

Title: E911 support of CTM

Document for: Discussion

Agenda Item: 5

This contribution focuses on the FCC requirements for the treatment of Baudot code Text Telephony for emergency 911 call. The solutions discussed in the contribution should be able to be migrated to meet the requirements for user-to-user GTT.

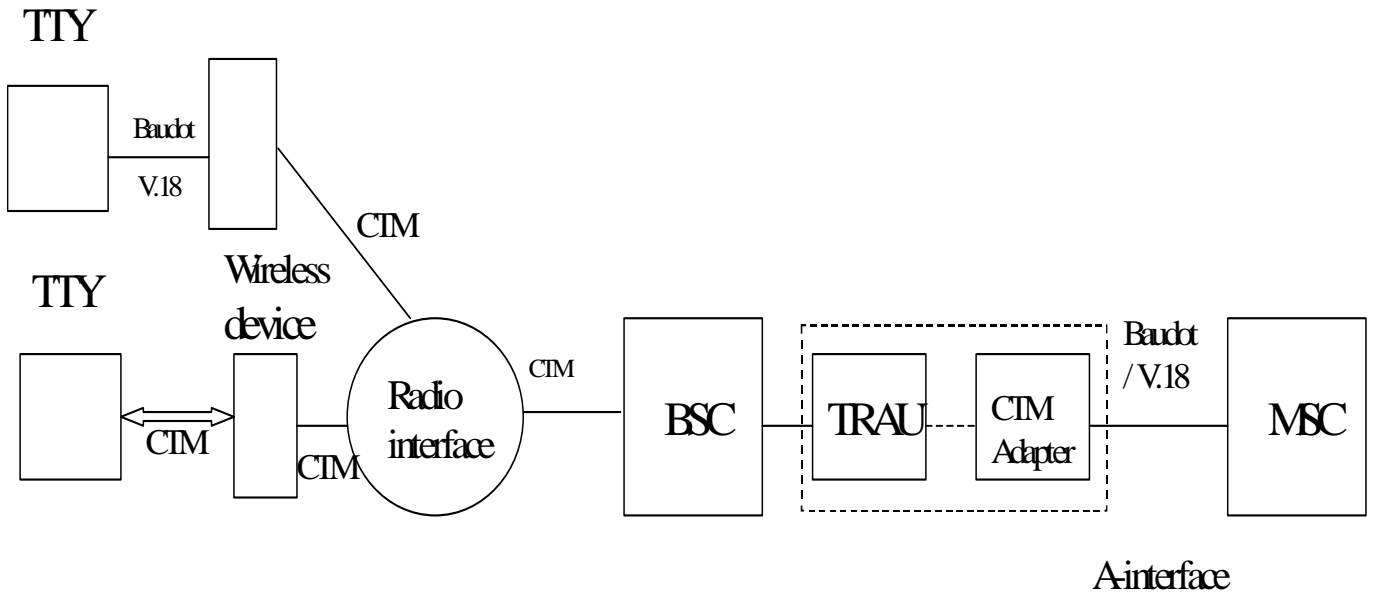
Possible solutions:

1. All transcoder (GSM and UMTS)
2. Transcoder pooling
3. CTM service node

1a - All transcoder solution (GSM)

Description

In this solution all the transcoders in a network are upgrade to support the CTM modem.



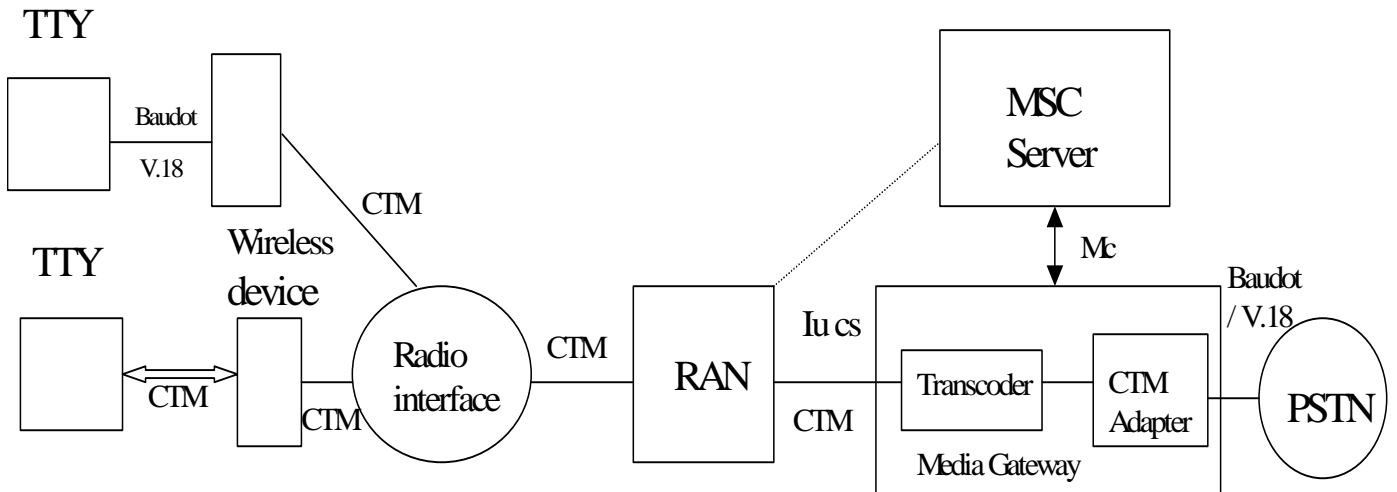
Main Issues

- Every transcoder in the network needs upgrading to support CTM

1b - All transcoder solution (UMTS)

Description

In this solution all the transcoders in a network are upgrade to support the CTM modem.



Main Issues

- Every transcoder in the network needs upgrading to support CTM

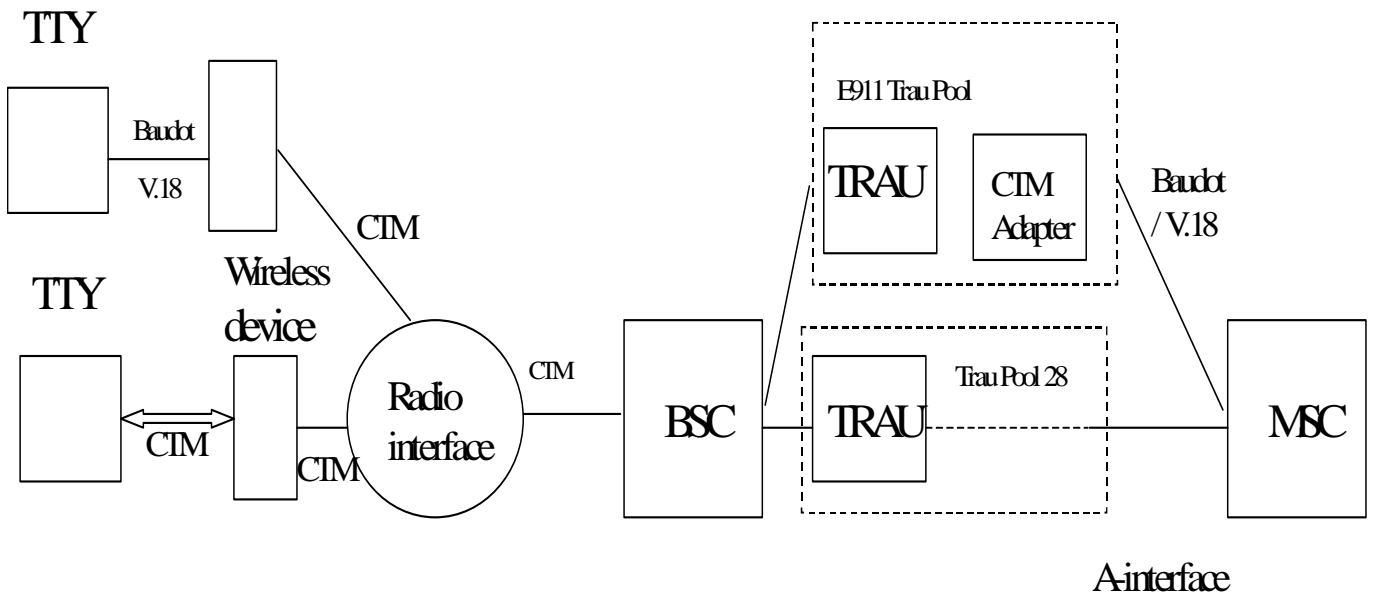
Specification Issues

- Update 08.02 and 23.002 with a general description
- Update 23.226 introducing CTM in all trau/transcoders

2 – Pooling of CTM Trau resources (GSM)

Description

In this solution a Trau pool is created which supports the CTM modem. All emergency calls are routed via a CTM (E911) Trau pool using standard techniques defined for trau pooling.



Main Issues

- Call Back – how to ensure that a return call from an emergency call centre is routed via the E911 trau pool - (possible solutions may be CLI identification of the emergency call centre in the MSC linking to the E911 trau pool or bearer capability information obtained from the mobile at call set up)
- 08.08 will need to be updated to show how this category of pool is supported.
- MSC needs to link the emergency call with access to the E911 trau pool.

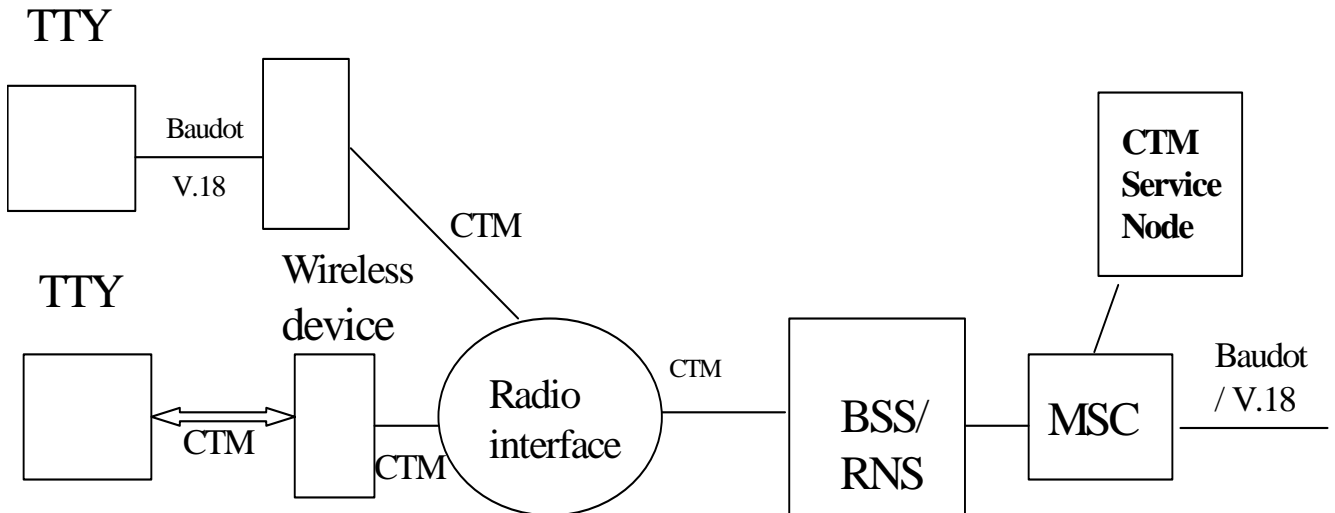
Specification Issues

- Update 08.02 and 23.002 with a general description
- Update 23.226 that all emergency calls are routed through the trau pool
- Update 08.08 defining a new circuit pool
- Update 24.008 putting in CTM code points in the bearer capability information elements for the call back case
- Update 23.226 CLI detection for call back from emergency centre for routing via CTM trau pooling

3 – CTM service node solution (GSM)

Description

In this solution all emergency calls are routed via a CTM service node before being routed to the emergency call centre.



Main Issues

- Call Back - how to ensure that a return call from a emergency call centre is routed via the CTM service node - (Possible solution may be CLI identification of the emergency call centre in the MSC linking to the call to CTM service node before call setup)
- Fault tolerant service node required since all emergency calls from the MSC(s) are being route via it.
- It will be complicated to synchronise echo cancelling, and speech enhancement, in the Trau with CTM usage, if needed.

Specification Issues

- Update 23.002 with a general description
- Update 23.226 that all emergency calls are routed through the CTM service node
- Update 23.226 CLI detection for call back at the GMSC or MSC for routing via the CTM Service Node

B.2 TD GTT-010030

Technical Specification Group Services and System Aspects

GTT(01)0030

Global Text Telephony Workshop, Dusseldorf, Germany, 18-19 April 2001

Source: Drafting Group (GTT ad hoc)

Title: User to User support of CTM

Document for: Discussion

Agenda Item: 5

This contribution focuses on the generic GTT requirements for user to user Text Telephony.

Possible solutions:

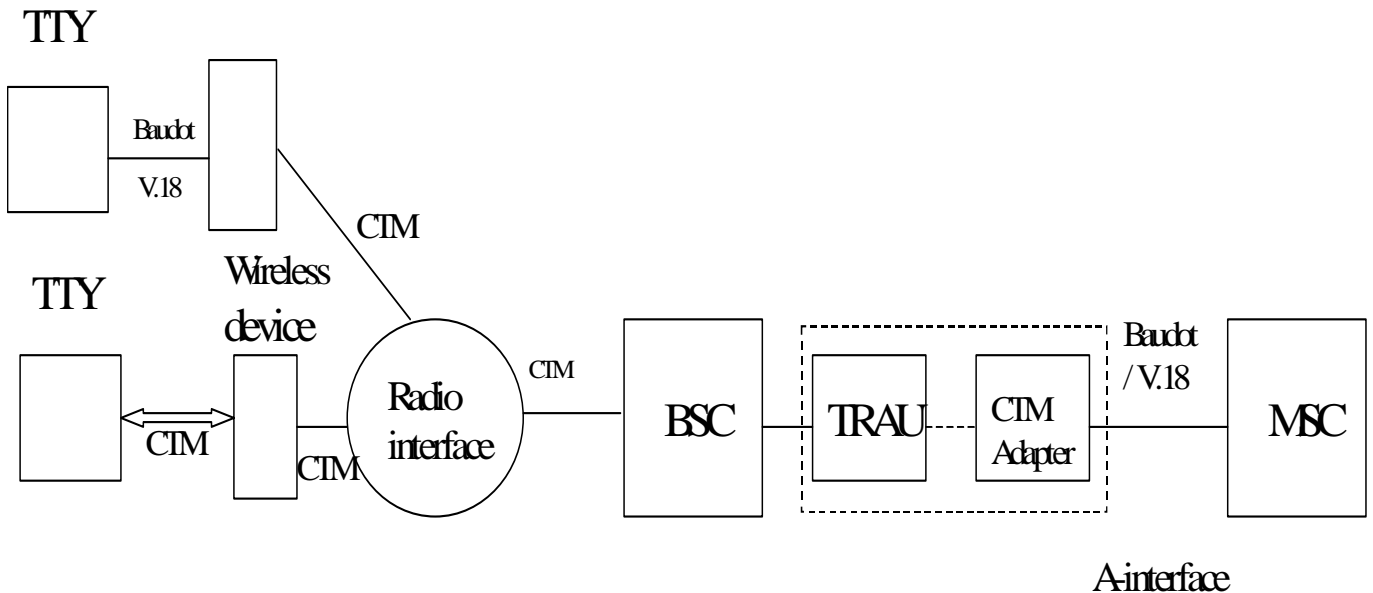
1. All transcoder (GSM and UMTS)
2. Transcoder pooling
3. CTM service node - CAMEL
4. CTM service node – Bearer Capability

Note: In this document the assumption has been taken that prefix/suffix dialling is not used. However, should prefix/suffix dialling be used then alternative mechanisms, such as using standard switch routing mechanisms to route calls via a CTM service node are likely to be possible.

1a – User to User - All transcoder solution (GSM)

Description

In this solution all the transcoders in a network are upgrade to support the CTM modem.



Main Issues

- Every Transcoder needs upgraded to support CTM
- At inter-BSC handover, the CTM adapter will change. The impact of this is for further study. Charging considerations, how is appropriate billing information captured?
- Roaming to networks which do not support CTM

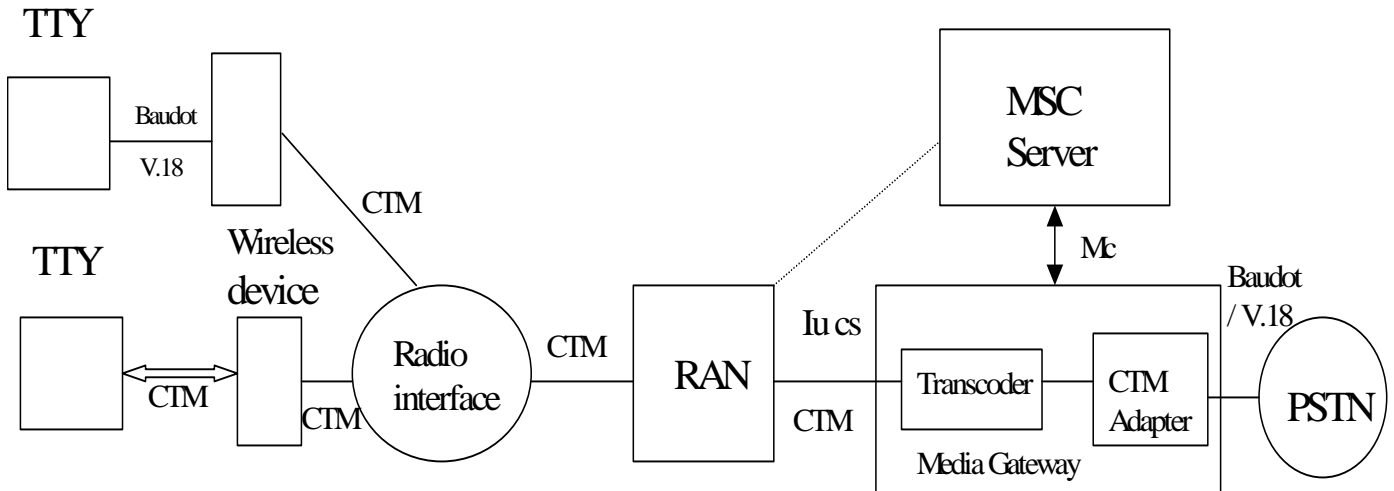
Specification Issues

- Update 08.02 and 23.002 with a general description
- Update 23.226 introducing CTM in all trau/transcoders

1b – User to User - All transcoder solution (UMTS)

Description

In this solution all the transcoders in a network are upgrade to support the CTM modem.



Main Issues

- Every Transcoder needs upgraded to support CTM
- Charging considerations, how is appropriate billing information captured (look more possible than GSM)?
- Roaming to networks which do not support CTM

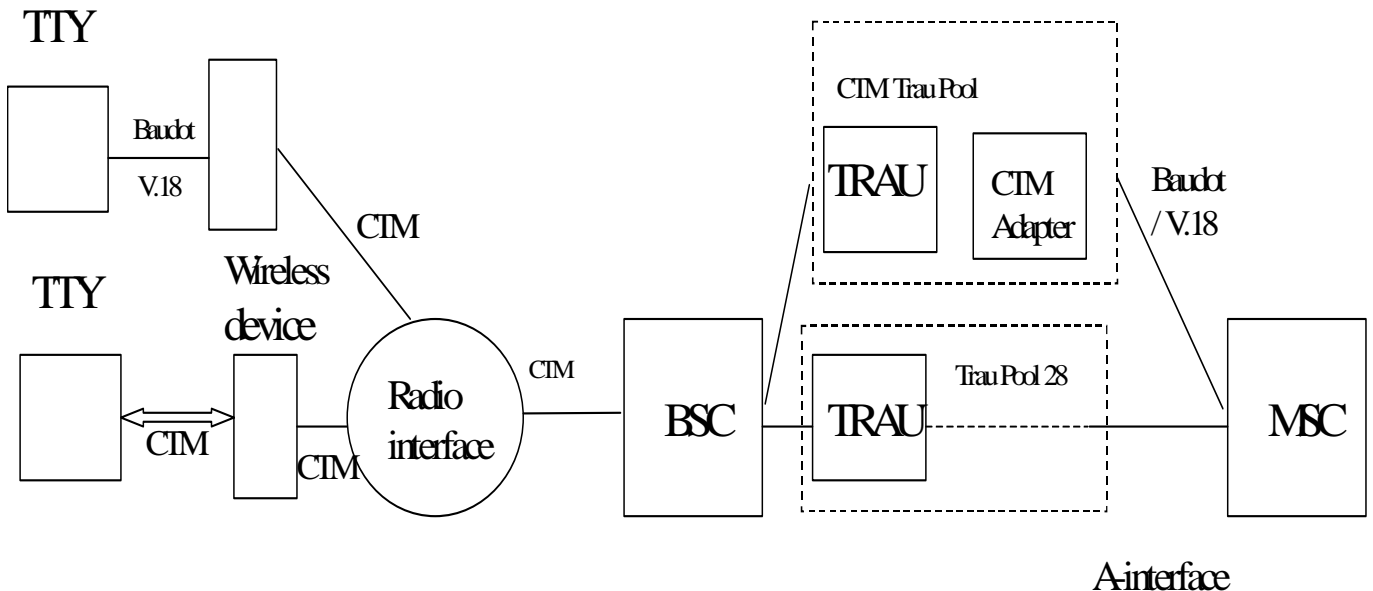
Specification Issues

- Update 23.002 with a general description
- Update 23.226 introducing CTM in all trau/transcoders

2a – User to User - Pooling of CTM Trau resources (GSM)

Description

In this solution a Trau pool is created which supports the CTM modem. All calls to/from mobiles sending CTM bearer capability code point are routed via a CTM Trau pool using standard techniques defined for trau pooling.



Main Issues

- Bearer capabilities (of CTM support in the mobile) need to be provided to the network, an additional bearer code point in the bearer capability is required.
- 08.08 will need to be updated to show how this category of pool is supported.
- MSC needs to link the call with access to the CTM trau pool.
- At inter-BSC handover, the CTM adapter will change. The impact of this is for further study. Charging considerations, how is appropriate billing information captured?
- CTM to Baudot/V.18 conversion will not be provided while roaming to a networks that does not support any CTM conversion functionality.
- In order to receive calls, the CTM bearer capability information needs to be activated in the terminal

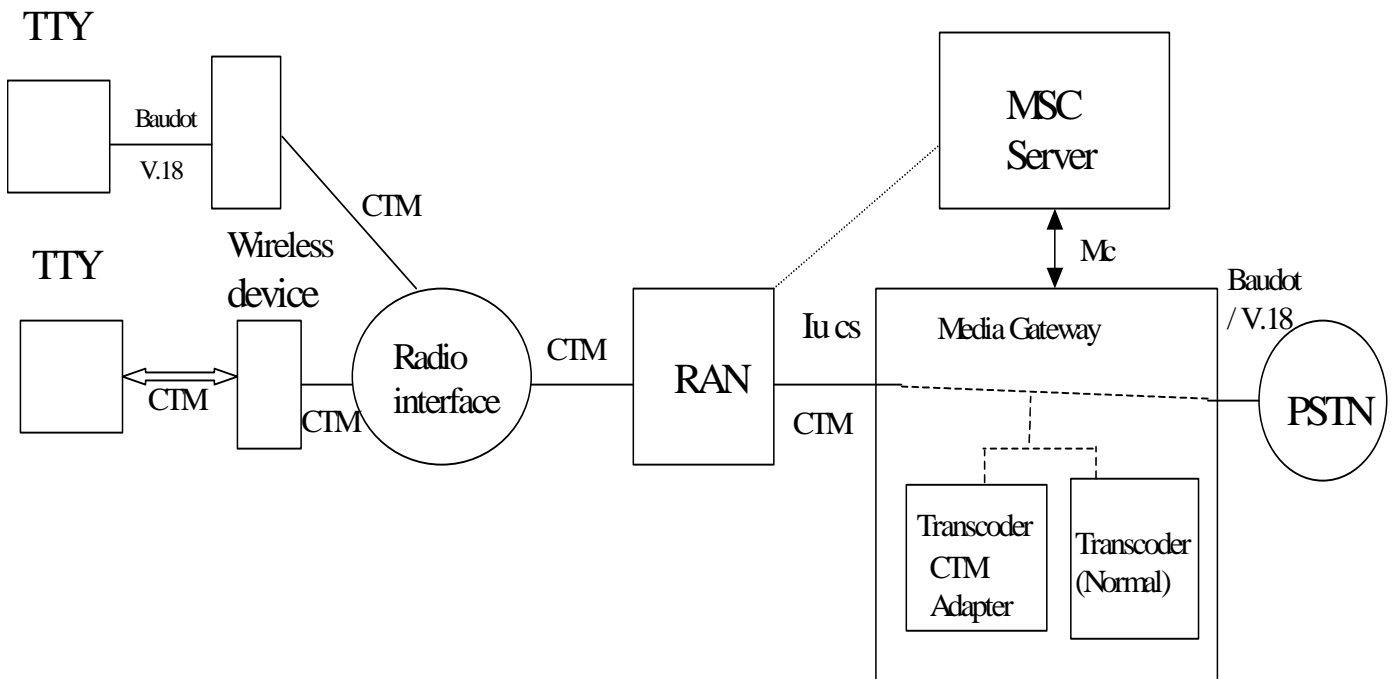
Specification Issues

- Update 08.02 and 23.002 with a general description
- Update 23.226 that all CTM calls are routed through the trau pool
- Update 08.08 defining a new circuit pool
- Update 24.008 putting in CTM code points in the bearer capability information elements for the call back case
- T2 specification for the MMI - update 02.07 and UMTS 22.007

2b – User to User - Transcoder pooling solution (UMTS R4)

Description

In this solution a CTM transcoder function is selected for text telephony calls.



Main Issues

- Bearer capabilities (of CTM support in the mobile) need to be provided to the network, an additional bearer code point in the bearer capability is required.
- MSC server needs to link the call to a CTM transcoder function.
- CTM to Baudot/V.18 conversion will not be provided while roaming to networks that does not support any CTM conversion functionality.

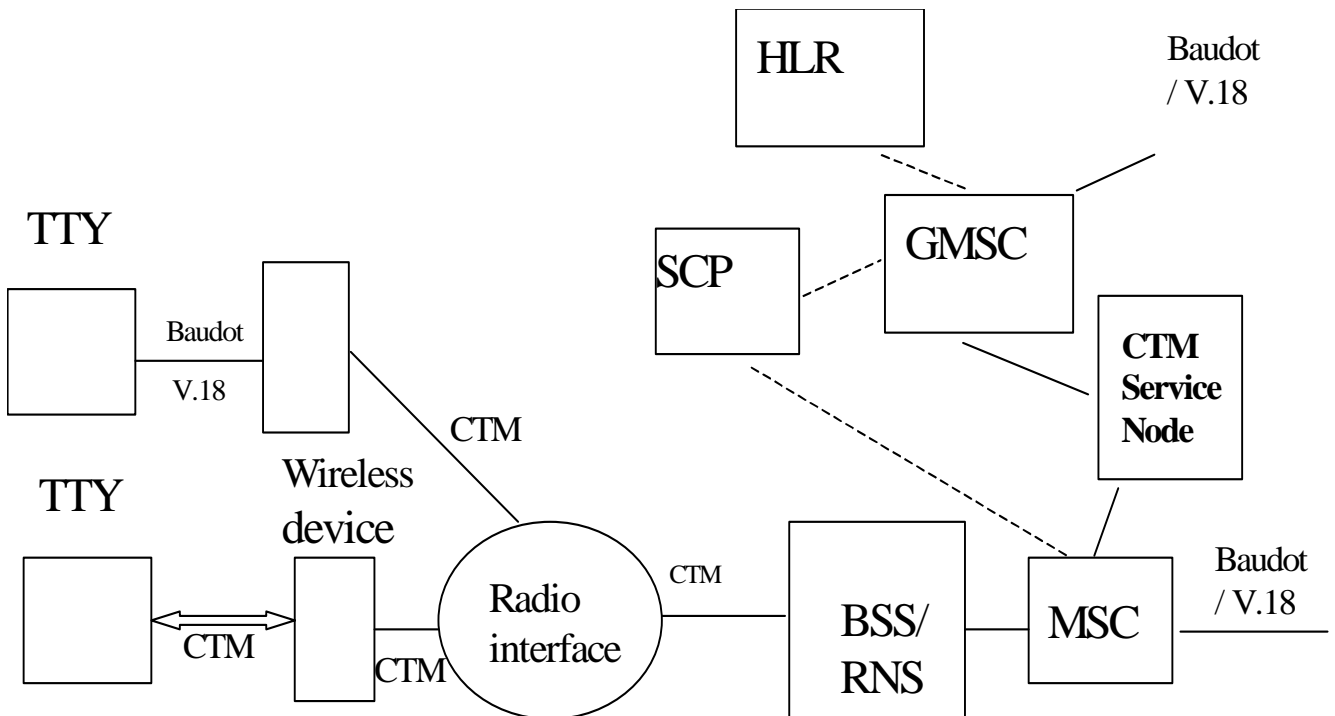
Specification Issues

- Update 23.002 with a general description
- Update 23.226 that all CTM calls are routed through the trau pool
- Additional field in H.248 is likely to be required for CTM (adding one new transport for TXC package)
- Update 24.008 putting in CTM code points in the bearer capability information elements for the call back case
- T2 specification for the MMI - update 02.07 and UMTS 22.007
- Further elaboration is required when the transcoder is located at the gateway MSC.

3 – User to user - CTM service node solution – CAMEL - (GSM)

Description

CAMEL is used to route calls via the CTM service node.



Main Issues

- Registration of subscribers requiring service
- CTM CAMEL service interaction with other CAMEL services
- It will be complicated to synchronise echo cancelling, and speech enhancement, if needed in the Trau with CTM usage. It will be complicated to synchronise TrFO and TFO with CTM usage.
- CAMEL needs to be supported
- Roaming CTM support only works for Non-emergency calls in networks that support CAMEL.
- International transmission of CTM, is this an issue?

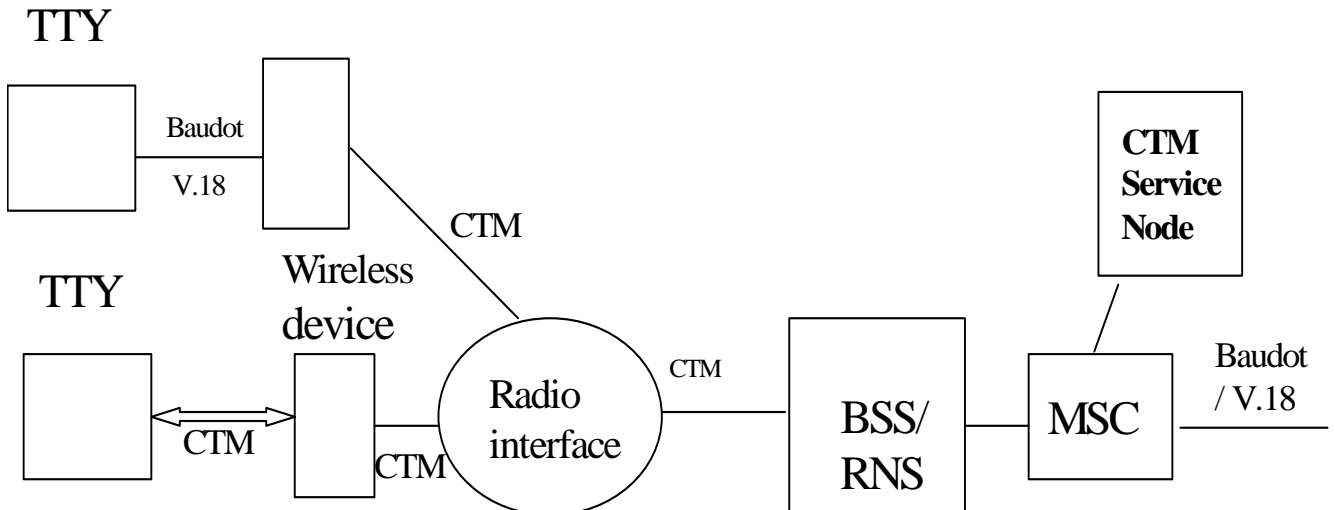
Specification Issues

- Update 23.002 with a general description
- Update 23.226 that all emergency calls are routed through the CTM service node
- Update 23.226 CLI detection for call back at the GMSC or MSC for routing via the CTM Service Node
- Detailed description of the CTM service from a SCP perspective in 23.226.
- Detailed description of the CTM Service Node and how it works (with sufficient detail to ensure interoperability) in 23.226

4 – User to User - CTM service node solution – Bearer Capability (GSM)

Description

In this solution bearer capability information is used to route calls to the CTM at call set up.



Main Issues

- Bearer capabilities (of CTM support in the mobile) need to be provided to the network, an additional bearer code point in the bearer capability is required.
- MSC needs to link the call with access to the CTM service node.
- CTM to Baudot/V.18 conversion will not be provided while roaming to networks that do not support any CTM conversion functionality.

Question: How are terminating calls handled? CTM supplementary service may have to be defined. There is nothing in the system that tells a mobile terminated call to route through a CTM server (needs subscription, detection, prefixing, etc.).

This solution is for further study.