TSG RAN WG1 Meeting #18 ***TSGR1-010058***
Boston, USA, 15th – 18th January 2001

Agenda Item: Plenary

Source: Panasonic

Title: Clarification to the Blind transport format detection

Document for: Discussion and decision

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1. Introduction

We further checked limitation to the blind transport format detection. We think some limitation still seems lack and want to discuss these following issues.

1. The relation between "explicitly detectable TrCH" and "TrCH that can be used as the guiding transport channel"

2. The number of transport format of TrCH

3. TTI length relation

4. Higher layer signalling and explicitly detectable TrCH

2. Discussion

1. The relation between "explicitly detectable TrCH" and "TrCH that can be used as the guiding transport channel".

In TS25.212 section 4.3.1, three types of TrCHs are defined.

a) explicitly detectable TrCHs

b) TrCH that can be used as the guiding transport channel

c) transport channels using guided detection

In the limitation 11, channel type a) and channel type b) are same or not is unclear. From our understanding, channel type a) and channel type b) are same. So we propose to modify text following way.

11. there is at least one explicitly detectable TrCH that can be used as the guiding transport channel for all transport channels using guided detection.

Above text does not exclude to the possibility using more than one TrCH as blind transport format detection.

2. The number of transport format of TrCH

In blind transport format detection, if "the number of transport format of TrCH using guided detection" are bigger than "the number of transport format of explicitly detectable TrCH", blind transport format detection cannot be carried out because to detect explicitly TrCH format makes to detect the transport format of TrCH using guided detection.

We propose to add the limitation that the number of transport format of TrCH using guided detection is less than the number of transport format of guiding transport channel. This limitation can be shown following way.

12. the number of transport format of TrCH using guided detection is less than the number of transport format of explicitly detectable channel;

3. TTI length relation

If the TTI length of TrCH using guided detection and the TTI length of explicitly detectable TrCH are different, we cannot specify transport format of TrCH using guided detection without the combinational information.

In the case of TTI of explicitly detectable TrCH are longer than TTI of TrCH using guided detection, figure 1 explain this.

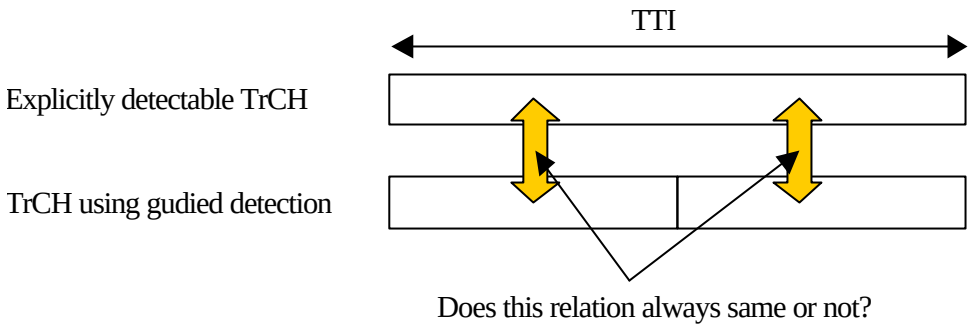

Figure 1

In the case of TTI of explicitly detectable TrCH are shorter than TTI of TrCH using guided detection, figure 2 explain this.

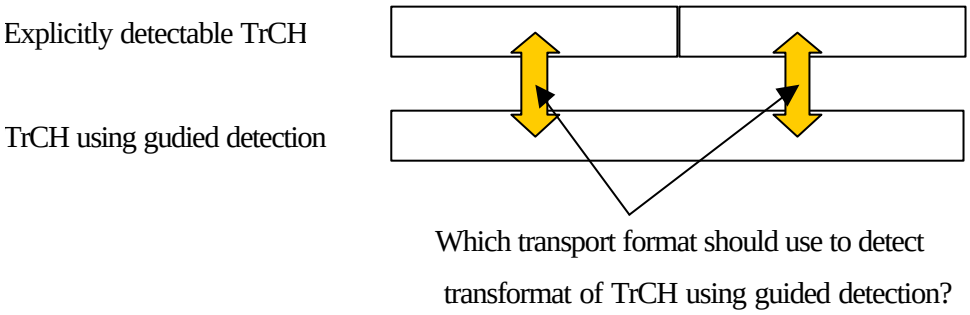

Figure 2

We think to limit that "explicitly detectable TrCH" and "TrCH using guided detection" have same TTI is good solution to solve above issue without additional modification.

4. Higher layer signalling and explicitly detectable TrCH

From our understanding, AMR class A, class B and class C are transferred by RAB sub-flows. In TS 25.415 section 3.1, RAB sub-flows are defined in following way.

RAB sub-flows characteristics:

1) *the sub-flows of a RAB are established and released together at the RAB establishment and release, respectively;*
2) *the sub-flows of a RAB are submitted and delivered together at the RAB SAP;*
3) *the sub-flows of a RAB are carried over the same Iu transmission connection;*
4) *the sub-flows of a RAB are organised in a predefined manner at the RAB SAP and over the Iu interface. The organisation is imposed by the NAS as part of its co-ordination responsibility.*

RAB sub-flows numbering (applies to support mode for predefined SDU size only):

1) *RAB sub-flows are numbered from 1 to N (N is the number of sub-flows);*

2) *RAB sub-flow number 1 corresponds to the highest reliability class and the RAB sub-flow number N corresponds to the lowest reliability class;*

3) *RAB sub-flows order inside the Iu frame is predefined so that RAB sub-flow number one comes first and the RAB sub-flow number N comes last.*

TS 25.415 specifies Iu Interface user plane protocols. From our understanding, RRC assigns same relation RAB and RAB sub-flow. Hence, we think following relation can assure at UE from higher layer specification.

a) the transport channels using guided detection and corresponding explicitly detectable TrCH are same RAB.

b) RAB sub-flow number 1 corresponds to the explicitly detectable TrCH.

So we propose to modify the text following way:

11. there is at least one explicitly detectable TrCH that can be used as the guiding transport channel for all transport channels using guided detection. These relations between the transport channels using guided detection and corresponding explicitly detectable TrCH are signalled from higher layers;

3. Conclusion

We propose attached CR to the section 4.3.1 in TS 25.212.

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CR-Form-v3

CHANGE REQUEST

25.212	CR	103	rev	0	Current version:	3.5.0

*For **HELP** on using this form, see bottom of this page or look at the pop-up text over the ✍ symbols.*

Proposed change affects: ✍ (U)SIM ☐ ME/UE ☒ Radio Access Network ☒ Core Network ☐

Title: ✍	Clarification to the Blind transport format detection	
Source: ✍	Panasonic (Matsushita Communication Co. Ltd)	
Work item code: ✍		***Date:*** ✍ 12, January, 2001
Category: ✍	**F**	***Release:*** ✍ R99

Use one of the following categories:	*Use one of the following releases:*	
F *(essential correction)*	*2*	*(GSM Phase 2)*
A *(corresponds to a correction in an earlier release)*	*R96*	*(Release 1996)*
B *(Addition of feature),*	*R97*	*(Release 1997)*
C *(Functional modification of feature)*	*R98*	*(Release 1998)*
D *(Editorial modification)*	*R99*	*(Release 1999)*
Detailed explanations of the above categories can be found in 3GPP TR 21.900.	*REL-4*	*(Release 4)*
	REL-5	*(Release 5)*

Reason for change: ✍	Blind transport format detection limitation has ambiguity.
Summary of change: ✍	1. The relation between "explicitly detectable TrCH" and "TrCH that can used as the guiding transport channel" are clarified. 2. The number of transport format of TrCH are clarified. 3. TTI length relation are clarified. 4. Higher layer signalling and explicit detectable TrCH are clarified.
Consequences if not approved: ✍	1. At least the explicitly detectable TrCH are exist or not is unclear. 2. Transport format detection by guided detection has ambiguity. 3. Transport format detection by guided detection has ambiguity. 4. Layer 1 in UE should detect the transport format **relation** blindly between explicitly detectable TrCH and transport channels using guided detection before transport format detection. This makes UE complexity more and possibility to false detect of the transport format **relation**.

Clauses affected: ✍	4.3.1		
Other specs affected: ✍	☐ Other core specifications ☐ Test specifications ☐ O&M Specifications	✍	
Other comments: ✍			

How to create CRs using this form:
Comprehensive information and tips about how to create CRs can be found at: http://www.3gpp.org/3G_Specs/CRs.htm. Below is a brief summary:

1) Fill out the above form. The symbols above marked ✍ contain pop-up help information about the field that they are closest to.

2) Obtain the latest version for the release of the specification to which the change is proposed. Use the MS Word "revision marks" feature (also known as "track changes") when making the changes. All 3GPP specifications can be downloaded from the 3GPP server under ftp://www.3gpp.org/specs/ For the latest version, look for the directory name with the latest date e.g. 2000-09 contains the specifications resulting from the September 2000 TSG meetings.

3) With "track changes" disabled, paste the entire CR form (use CTRL-A to select it) into the specification just in front of the clause containing the first piece of changed text. Delete those parts of the specification which are not relevant to the change request.

4.3 Transport format detection

If the transport format set of a TrCH *i* contains more than one transport format, the transport format can be detected according to one of the following methods:

- TFCI based detection: This method is applicable when the transport format combination is signalled using the TFCI field;
- explicit blind detection: This method typically consists of detecting the TF of TrCH *i* by use of channel decoding and CRC check;
- guided detection: This method is applicable when there is at least one other TrCH *i'*, hereafter called guiding TrCH, such that:
  - the guiding TrCH has the same TTI duration as the TrCH under consideration, i.e. $F_{i'} = F_i$;
  - different TFs of the TrCH under consideration correspond to different TFs of the guiding TrCH;
  - explicit blind detection is used on the guiding TrCH.

If the transport format set for a TrCH *i* contains one transport format only, no transport format detection needs to be performed for this TrCH.

For uplink, blind transport format detection is a network controlled option. For downlink, the UE shall be capable of performing blind transport format detection, if certain restrictions on the configured transport channels are fulfilled.

For a DPCH associated with a PDSCH, the DPCCH shall include TFCI.

4.3.1 Blind transport format detection

When no TFCI is available then explicit blind detection or guided detection shall be performed on all TrCHs within the CCTrCH that have more than one transport format. The UE shall only be required to support blind transport format detection if all of the following restrictions are fulfilled:

1. only one CCTrCH is received by the UE;
2. the number of CCTrCH bits received per radio frame is 600 or less;
3. the number of transport format combinations of the CCTrCH is 64 or less;
4. fixed positions of the transport channels is used on the CCTrCH to be detectable;
5. convolutional coding is used on all explicitly detectable TrCHs;
6. CRC with non-zero length is appended to all transport blocks on all explicitly detectable TrCHs;
7. at least one transport block shall be transmitted per TTI on each explicitly detectable TrCH;
8. the number of explicitly detectable TrCHs is 3 or less;
9. for all explicitly detectable TrCHs *i*, the number of code blocks in one TTI (C_i) shall not exceed 1;
10. the sum of the transport format set sizes of all explicitly detectable TrCHs, is 16 or less. The transport format set size is defined as the number of transport formats within the transport format set;
11. there is at least one explicitly detectable TrCH that can be used as the guiding transport channel for all transport channels using guided detection. These relations between the transport channels using guided detection and corresponding explicitly detectable TrCH are signalled from higher layers;
12. the number of transport format of TrCH using guided detection is less than the number of transport format of explicitly detectable channel;
13. the transport channels using guided detection and corresponding explicitly detectable TrCH have same TTI length.

Examples of blind transport format detection methods are given in annex A.

4.3.2 Transport format detection based on TFCI

If a TFCI is available, then TFCI based detection shall be applicable to all TrCHs within the CCTrCH. The TFCI informs the receiver about the transport format combination of the CCTrCHs. As soon as the TFCI is detected, the transport format combination, and hence the transport formats of the individual transport channels are known.