TSG RAN WG 2#4　　　　　　　　　　　　　**TSGR2#4(99452**
Berlin, Germany
May 25-28, 1999

Agenda item:　　　**5**
Source:　　　　　　**Golden Bridge Technology**
Title:　　　　　　　**Summary of CPCH e-mail discussions**
Document for:　　　**Discussion**

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Abstract: This document is a summary of e-mail discussions on CPCH on WG2 exploder. There was 8 contributions from GBT addressing CPCH. There was a Q&A from GBT. Philips posted two e-mails on the kick-off topic. Silicon Automated Systems had some comments on GBT's proposed changes to S221 document which was noted by GBT.

Summary

There were a few interactions on issues on the reflector. GBT offered answers to some of the questions that have been raised in the past meetings and off-line.

There were two interactions: One between Philips and GBT and the other between GBT and Silicon Automated Systems.　The second one was some comments on GBT's proposed modifications to S221 which was noted. The first interaction lead to GBT providing some references on its previous contributions to WG1 and WG2 on the topic of comparison of Circuit mode and Packet modes for bursty traffic.

GBT developed the CPCH scheme further on the WG2 exploder during the past month. GBT has responded to the list of questions and proposed some modifications to four S documents. GBT has received some comments and will incorporate them into its modifications.

Total output:

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GBT1: CPCH e-mail discussion kick-off
GBT2: Response to Questions
GBT3: Overview of RRC based bw over CPCH
GBT4: Latest CPCH
GBT5: Firm handover over CPCH
GBT6: proposed modifications to S221
GBT7: proposed mod to S201
GBT8: proposed mod to S202
GBT9: Proposed mod to S203
SAS: comments on proposed mod to S221
Philips1-2: comments on e-mail discussions kick-off

GBT : response to comments by Philips
GBT: response to comments from SAS
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GBT posted a discussion kick-off e-mail as follows:

Subj: CPCH e-mail discussion kick off
Date: 4/30/99 2:39:55 AM Eastern Daylight Time
From: KPGBT@AOL.COM (Kourosh Parsa, Golden Bridge)
Sender: 3GPP_TSG_RAN_WG2@LIST.ETSI.FR (3GPP_TSG_RAN_WG2: TSG RAN Working Group 2)
Reply-to: KPGBT@AOL.COM
To: 3GPP_TSG_RAN_WG2@LIST.ETSI.FR

hi all,

I would like to start off the discussion on common Packet Channel by soliciting questions or any concerns on the subject as we plan to make a contribution addressing the outstanding questions. We will subsequently post the texts for various S documents on the reflector if possible. We are currently addressing the following questions:

1. The issue of the cell edge
2. The Call Admission issue and non-usage of L1 ACK
3. Is there any need for new transport channels for CPCH?
4. How can L23 signalling messages be sent over the DL-DCH channel?

We appreiciate your participation and help in collecting all the potential concerns so that we can methodically answer the questions. I remind everyone that as a result of our first presnetation in March 8 (WG2#2), the CPCH's further development and specification was conditioned on WG1's clearance on L1 feasibility of the CPCH scheme. We achieved this in the Yokoham meeting (liason letter from WG1 was sent by the chair). At the same time, there is a time pressure from RAN's perspective so that we are required to generate the inserts into the S documents in the next meeting to make the release'99. We will heavily rely on this thread to discuss the issues related to CPCH. The good news is that there is significant amount of commonality with RACH at higher layers as was identified by WG2 in the March 8-11 meeting so that we can safely say that CPCH is not so much "revolutionary" /"disruptive" at the higher layers. Having said that, I am looking forward to some comments and feedback on the topic. I will send an e-mail to provide some references. Another one with an overview flavor followed by a preliminary Q&A.

regards

Kourosh

GBT continued the discussion by posting a Q&A on outstanding issues on the CPCH. We expanded the question and concern set. The posting was as follows:

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Question number 1:

The first issue is a question from WG1, which wants WG2 opinion on whether the CPCH scheme requires a new or modified transport channel?

We think that there is a need for a new transport channel since the MAC is different from the RACH MAC (addition of the collision detection/resolution) and some other potential functions. So in that light we think the UL-CPCH is a new transport channel.

Question number 2:

WG2 (not officially) had asked WG1 on the need for providing means to transmit L23 messages and signaling information. I have brought this up on the ad-hoc 14 reflector and will inform the group of the results of the discussions, however, GBT's view is that the dedicated control channel (DCH) in the DL direction can carry the signaling information (L23) messages. This channel operates at 8 kbps and carries TPC; Pilot and signaling messages, which are, call admission and RLC messages.

Question 3: How much downlink signaling is required in conjunction with UL-CPCH?

We believe that CPCH does not make a lot of sense for lower rate transmissions such as 8 kbps in light of 8 kbps downlink dedicated signaling requirement. However, the scheme becomes advantageous at rates such as 64 kbps, 144 kbps, 384 kbps and 2 Mbps*.

* We think that 2 Mpbs makes sense for system deployments that only offer packet switched access and do not perceive offering any circuit switched based services.

Question 4: What are the advantages of CPCH?

1. Major savings in BS resources (Packet Switching versus Circuit Switching)
2. No SHO
3. Fast access

Question 4: What is the relationship between the preamble, the downlink dedicated channel and the uplink CPCH code?

Each preamble signature could be tied to an uplink code and downlink dedicated channel code.

Question 5: How is the Quality of Service issue as well as priority handled here?

The priority can be engrained in more or less aggressive power ramp-up method, less or more aggressive back-off, better or worse random number generation. The Bandwidth management overview document addresses this issue.

Question #6: How is the downlink code provisioned and reserved in the DL direction?

It is provisioned by RNC/RRC and managed by the Base Node. The RRC sets 16 codes (SF=512) for the downlink control channel purposes and sends it to the Base Node. This is a fixed assignment.

Question 7: Bandwidth management (Base Node or the RNC)?

Problem statement:

With the CPCH, the Node B has to provide an ACK in a few access slots (1.25-2.5 ms) and can thus not communicate with the RNC to give this ACK. The reaction time from the RNC is in the order of tens of ms, so some of these functions have to be performed in the MAC in the Base Node.

Solution: The document titled "An overview of RRC based bandwidth management for CPCH" will address this issue and contains GBT's positions on the subject.

Question number 8: Can L1 ACK be used to stop the UE from transmitting and be used for admission control?

This issue has been addressed in the document titled: "An overview of RRC based

Question 9: What about the mobiles on the cell edge?

A separate document was posted titled: "Firm handover over CPCH". That document addresses this issue completely.

GBT continued by posting three documents:

1. Latest CPCH (submitted to this meeting as contribution and contains the physical layer procedures associated with CPCH.
2. Firm Handover over CPCH (This was in response to one of the raised issues)
3. Overview of RRC-based bandwidth management

GBT proceeded by posting four documents which are proposed modifications to S documents. One posting was received on S221 which is shown below:

Posting from Nirav Parikh: Silicon Automated Systems:
Response by : GBT

<< Dear Kourosh,
>   Here are some comments about the changes.

> Small Comments :
> 1) page 11, bullet about MAC-sh :
> It should indicate that CPCH is also there on the UTRAN MAC-sh.

Noted.

> 2) page 16, UTRAN side MAC-d :
> Bullets about CPCH should be included (as it is done for UE side MAC-sh)

Noted.

> 3) page 21, bullet about DCCH (UL) connected to FAUSCH
> Since FAUSCH carries only single bit information, how can it support
 DCCH ?

CPCH and FAUSCH are separate proposals.

> Main comment :
> 4) The UE side MAC-sh performs scheduling/priority handling and packet
> building from the multiple logical channels provided through MAC-d, each
> having a direct connection to MAC-sh. Similarly the UTRAN side MAC-sh
> should have a block showing the breaking the packet contents into
> corresponding multiple logical channels.
> But the the interface between MAC-sh and MAC-d on UTRAN side has a
> single line (connection) according to present assumption. This is
> because multiple connections on Iur is not in scope of WG2.

We have recevied some comments regardign the use of MAC-c rather than MAC-sh,
we are evaluating that possibility. This might change the connections to some
extent. However, we would like to be able to service multiplex various

logical channels and build larger packets inside the MAC-c/MAC-sh. We will look into this further and provide an answer during the physical meeting since our e-mail discussion deadline is tonite.

You can send me private e-mail if you wish to continue this conversation.
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This is another e-mail discussion between GBT and Philips:
Philips: Christoph Hermann
GBT: Kourosh Parsa

Subj: Re: CPCH e-mail discussion kick off
Date: 5/19/99 2:36:20 PM Eastern Daylight Time
From: KPGBT@AOL.COM (Kourosh Parsa, Golden Bridge)
Sender: 3GPP_TSG_RAN_WG2@LIST.ETSI.FR (3GPP_TSG_RAN_WG2: TSG RAN Working Group 2)
Reply-to: KPGBT@AOL.COM
To: 3GPP_TSG_RAN_WG2@LIST.ETSI.FR

Hi Christoph,

Thanks for your comments. Please see my embedded comments:

<< am sorry to send around quite late a question on the CPCH, but in the
> past weeks I was extremely busy. Since the deadline for the email
> discussions elapses today, I take the opportunity to raise the following
> question:

> The usage of the CPCH - as I understood it from your presentation -
> looks very similar to the procedure of allocating a DCH by means of the
> RACH:
> Preamble power-ramping phase, sending a RACH message containing a random
> number (or the RNTI) and some DCH allocation directive and then
> transmitting data on the DCH. This is the very first procedure discussed
> for packet transmission in UMTS.

CPCH is a common resource and can be [picked up without going through the RACH process. There is no need for assignment. So, it is a fast access method. There is no need for releasing the resource either. It is like RACH, but it is a Common Traffic Channel (CTCH) rather than a Common control Channel (CCCH).

> I wonder what would be the benefit that would be brought in, if the CPCH
> were available in the system.

We have presented several contibtuions which address the perfromance of the

CPCH in terms of throughput delay. We have also shown comparison of circuit
mode (DCH) versus packet mode (CPCH) for packet transfer. These contributions
were made to WG1 and WG2. As a matter of fact, ad-hoc 14 concluded that
packet mode transfer is muich more efficient than circuit mode transfer for
bursty packet data. I would be more than glad to provide exact references.
But everything is in teh ad-hoc 14 (WG1) summary for the past two meetings.

A follow up e-mail was posted by Christoph, but was on Thursday May 20th which was
posted late. However, it is shown below with some deletions:

Subj: Re: CPCH e-mail discussion kick off
Date: 5/20/99 2:31:49 AM Eastern Daylight Time
From: herrmann@pfa.research.philips.com (Christoph Herrmann)
To: KPGBT@aol.com
CC: 3GPP_TSG_RAN_WG2@list.etsi.fr

>: Kourosh Parsa: GBT
Christoph Herrmann : Philips

> CPCH is a common resource and can be [picked up without going through the
> RACH process. There is no need for assignment. So, it is a fast access
> method. There is no need for releasing the resource either. It is like RACH,

This is only partly true: You have to allocate the DPCCH for
power-control on the CPCH and to release it after finishing transmission
on the CPCH. I can't see that this is going to be faster than
allocating/releasing an additional DPDCH, which
would be necessary if the DCH were allocated using the RACH as I
described above.

> We have presented several contributions which address the performance of the
> CPCH in terms of throughput delay. We have also shown comparison of circuit
> mode (DCH) versus packet mode (CPCH) for packet transfer. These contributions
> were made to WG1 and WG2. As a matter of fact, ad-hoc 14 concluded that
> packet mode transfer is much more efficient than circuit mode transfer for
> bursty packet data. I would be more than glad to provide exact references.
> But everything is in the ad-hoc 14 (WG1) summary for the past two meetings.

Can you please provide me with the summary texts in order to see what
ad-hoc 14 thinks. It would also help, if you could provide a Zip-File
with both the WG1 and WG2 contributions on this matter. I guess I have
only a few of your contributions available.

Conclusions:

There were a few interactions on issues on the reflector. GBT offered answers to some of the questions that have been raised in the past meetings and off-line.

There were two interactions: One between Philips and GBT and the other between GBT and Silicon Automated Systems. The second one was some comments on GBT's proposed modifications to S221 which was noted. The first interaction lead to GBT providing some references on its previous contributions to WG1 and WG2 on the topic of comparison of Circuit mode and Packet modes for bursty traffic.

GBT developed the CPCH scheme further on the WG2 exploder during the past month. GBT has responded to the list of questions and proposed some modifications to four S documents. GBT has received some comments and will incorporate them into its modifications.