CTSG-RAN Working Group 1 meeting #7   TSGR1-D29/99
Hannover,Germany, 30 August-3September 1999

Agenda Item: AH10

Source: AH10 Chairman

Title: AdHoc 10 Report

Document for: Approval

1   Discussion Items at WG1#7

There are 6 items to be discussed at AH10 of WG1#7.

(1) Uplink channelization code allocation
>   R1-99828:Channelization code allocation in uplink multi-code transmissions(ETRI)
>   R1-99845:Uplink channelization code allocation in UTRA/FDD (Ericsson)
>   R1-99b20:Uplink channelization code allocation in UTRA/FDD, revised(Ericsson,ETRI)

(2) Multiple scrambling code generation method
>   R1-99915:Multiple-Scrambling Code (Samsung)
>   R1-99b87: A modified generator for Multiple-Scrambling Codes (Siemens)
>   R1-99b91: A Modified Mapping Rule for Multiple-Scrambling Codes (LGIC)

(3) Time Delay between primary scrambling code and secondary scrambling code
>   R1-99b53:Time Delay between Physical Channels of Different Scrambling Codes (LGIC)

(4) The maximal number of physical channels for multi-code transmission for one user related with SF on DL
>   R1-99C84: Discussion items in AH10 meeting (AH10 chairman)
>   R1-99C03: Additional open issues to be discussed in R1
(Fujitsu,Hitachi,JapanTelecom,Mitsubishi,NEC,NTT DoCoMo,Panasonic, TI)

(5) Whether scrambling code is common to all codes in DL multicode transmission for one user or not
>   R1-99C84: Discussion items in AH10 meeting (AH10 chairman)
>   R1-99C03: Additional open issues to be discussed in R1
(Fujitsu,Hitachi,JapanTelecom,Mitsubishi,NEC,NTT DoCoMo,Panasonic, TI)

(6) Whether assignment of channelization code for RACH and UL DPCCH and DPDCH is designated by signalling from higher layer or predetermined value of layer 1.
>   R1-99C84: Discussion items in AH10 meeting (AH10 chairman)
>   R1-99a62: Answer to Liaison statement on TS 25.302, 'Services provided by the Physical Layer' Section 10.3.3.6 (RAN WG1 to RAN WG2)

Section 10.3.3.6

In uplink, there is no "DPCH" physical channel defined, but "DPCCH" and "DPDCH" should be used instead. Moreover, the channelization codes to use on the DPCCH and DPDCH are not signalled from higher layer, but are determined within L1 only.

2   Discussions and conclusions

2.1 Uplink channelization code allocation

R1-99b20 cosourced by Ericsson and ETRI was presented and it was agreed without discussion.
R1-99b20 includes a text proposal for TS25.213.

2.2 Multiple scrambling code generation method

Three new schemes have been proposed. It was determined that the Samsung's Option2 scheme in R1-99915 becomes a new WA(Working Assumption) after discussion and indicative voting.
The new WA can offer the simpler second scrambling generator by using common masking functions.
E-mail discussion is to be continued until the next WG1 if members have some questions on this new WA.
Text proposal will be made by Samsung soon.

2.3 Time Delay between primary scrambling code and secondary scrambling code

R1-99b53 was presented by LGIC. Several questions and requests were raised as follows.
Evaluation under the multipath environment should be done in order to confirm the real gain in the reduction of total interference including intracell multipath interference and intercell interference.

Timing management for the primary scrambling code and the secondary scrambling code may genenate some issues for MS implementation and frame timing measurement function.
The constellation of modulatied signal at BTS may distort and modulation accuracy may be degraded when there is imbalance between PSC and SSC in terms of users.
It was agreed that this proposal is not introduced as WA at the current stage.
E-mail discussion is to be continued.

2.4 The maximal number of physical channels for multi-code transmission for one user related with SF on DL

The proposal stated in R1-C84 was presented and the folloing contents including Rule 1 to 4 were agreed.

If multi-code transmission is avoided as much as the highest SF of 4 can handle the rate, re-arrangement of codes in OVSF tree is needed among all DL users while the least number of demodulators are required for MS.
If free combination of SF and the number of codes, re-arrangement of codes is not needed but the number of demodulators required by MS is unallowablly large.

So some restriction should be set for the combination of SF and the maximal number of physical channels for multi-code transmission for one user.
The ristriction rules are proposed as follows.
Rule 1: For required total symbol rate equal or less than 120ksps, single code transmission shall be kept.
Rule 2: For required total symbol rate equal or less than 480ksps, at most two codes transmission shall be kept.
Rule 3: For required total symbol rate beyond 480ksps, maximal SF shall be 16.
Rule 4: SF is the same same for all codes of one user's DPCH in DL multicode transmission.

According to these rules, the concrete design for the combination of SF and the multi-code number are shown in tbe next table.
Though the receiver specification of UEs depends on UE class which may be discussed in TSG-T, this type of restriction should be specified by WG1 in order to optimize the total system.

required total symbol rate	combination of SF and the multi-code number N (SF,N)
15ksps	(256,1)
30ksps	(128,1)
60ksps	(64,1)
120ksps	(32,1)
240ksps	(16,1) or (32,2)
480ksps	(8,1) or (16,2)
720ksps (384kbps user)	(4,1) or (8,2) or (16,3)
2880ksps (2Mbps user)	(4,3) or (8,6) or (16,12)

Text proposal will be made by AH10 chairman soon.

2.5 Whether scrambling code is common to all codes in DL multicode transmission for one user or not

The proposal stated in R1-C84 was presented and the folloing contents were agreed.

If scrambling code is common, scrambling code re-arrangement may be needed when additional link comes into the system while MS despreading hardware is simple.
If primary scrambling code and secondary scrambling code are allowed to be mixed for one user, scrambling code re-arrangement is not needed while MS despreading hardware becomes more complicated.
It is proposed that mixture of primary scrambling code and secondary scrambling code shall be allowable setting the priority on code re-arrangement issue.

2.6 Whether assignment of channelization code for RACH and UL DPCCH and DPDCH is designated by signalling from higher layer or predetermined value of layer 1

We reached a consensus that the sentence of LS is correct. The channelization code for uplink is used to realize a multicode transmission and user identification is done not by channelization code but by scranbling code. So the number of channelization codes for uplink is at most the same nubmer of multi codes for one user. So is should be predetermined value of layer 1.