3GPP TSG CN Plenary Meeting #13 **NP-010500**
Beijing, China, 19th –21st September 2001

Source:	Ericsson
Title:	On the introduction of a Release Marker
Agenda item:	14
Document for:	DISCUSSION

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1. Introduction

At the TSG CN WG1 #17 meeting in Puerto Rico, the introduction of a release marker in the MS Radio Access capability IE, specified in the 3GPP TS 24.008, was proposed by TSG GERAN WG2 (Tdoc GP-010124, LS in Tdoc N1-010687). After discussion at the CN1 meeting, CN1 sent a response LS to GERAN saying that because of the general principle to not exchange release information across the air interface, CN1 could not endorse the introduction of a release marker in the MS Radio Access Capability IE (Tdoc N1-010798).

In the following response from GERAN (Tdoc N1-011068), TSG CN WG1 was asked to re-consider and a new proposal was given; to include release information both in Classmark 3 and MS Radio Access Capability IEs. This paper discusses a number of potential problems related to the GERAN proposal.

2. Discussion

In the LS from TSG GERAN (Tdoc N1-011068); the following statements can be found

"The purpose of the Revision Level Indicator2 will not be for release negotiation over the radio interface. It would be used by the GERAN only to work out what are the radio capabilities of the Mobile Station that provided that information. The existing Revision Level Indicator in the MS Radio Access Capability IE, as well as the Revision Level in the MS Classmark 1 IE are already providing information about the release supported by the MS"

"*… In fact, some features are mandatory, some are optional. The intention is to indicate the support of all mandatory features of a given release by simply including the release of the MS, instead of including one bit for each feature. Extra bits are then only needed for optional features. Additionally, the inclusion of such an information prevents some mobiles from implementing only part of the set of mandatory features for a given release, which ensures an MS behaviour consistent with the supported release.*"

The above statements from the LS from GERAN (N1-011068) gives the understanding that GERAN believes that the existing *Revision Level* is to indicate the support of features. GERAN's LS continues on to suggest that the introduction of a *Revision Level Indicator 2* - to indicate mandatory features of a given release - is merely an extension of the existing *Revision Level*

It must be first understood that the existing *Revision Level* in the MS Classmark is an indication of the support of a certain version of protocol. It is not an indication of the support of features of any versions of protocol or system phases. For instance, if the Revision Level is bit '10' it indicates that the MS supports R99 or later versions of the protocol. And if it is bit '01' it indicates that the MS is a GSM Phase 2 mobile station supporting GSM Phase 2 protocol. It does not indicate that the mobile supports the mandatory features of GSM Phase 2. If GERAN's intention is to introduce *Revision Level Indicator 2* to allow GERAN mobiles to indicate the support of versions of protocol pertaining to GERAN, than that would be somewhat understandable and agreeable.

However if the intention of GERAN is to introduce the Revision Level Indicator 2 to indicate support of mandatory features relating to certain releases of a system, then some potential problems can be foreseen:

1. A feature might be classified as 'mandatory' for several reasons. One obvious reason is if the feature is absolutely essential to the system, i.e. the system will not work without both sides either supporting or not supporting the feature. Another reason is if it can be proved to enhance the performance of parts of the system or even the whole system. Yet another reason could be if the feature is simply seen as 'good to have'. For various reasons mobile manufacturers may have to prioritise also among these 'mandatory' but in reality 'good-to-have' features. This prioritisation may be

carried out in various ways. If the release marker is introduced to indicate support of mandatory features, all non-essential, 'good-to-have' mandatory features have to be implemented from day one. The most likely effect from this is that there will be delayed terminals. If there are features that are truly valuable, there should be other means to encourage mobile manufacturers to support them than to put them down as 'mandatory'.

2. Some features, seen as essential at specification time and therefore put as mandatory, might in the end show up to result in less than optimal performance. With the described release marker, such features must still be implemented. This leads to unnecessary costs and delays, due to features that will never be used.

3. The use of a release marker to indicate support of all mandatory features in a certain release creates "artificial" dependencies between features. Those dependencies have no technical reason, but are just a result of the standardisation process as such (i.e., in which order they were introduced in the specification).

4. Today's principles of maintaining backwards compatibility and good error handling should be maintained. The introduction of the proposed release marker might lead to that these principles are not seen as being as important as before. This could lead to that new releases become increasingly incompatible with earlier ones. This could eventually lead to that terminals that must be able to operate also with earlier releases have to implement a number of parallel protocol stacks, one for each release.

5. Older releases of networks cannot possibly be forward compatible and support newer MSs that use a Release Marker to indicate mandatory feature capabilities. Thus in those older networks, the newer mobiles would still need to use a method of indicating feature capability understandable to the older networks

6. Although the terminal manufacturers may be able to implement the full set of mandatory features there are no guarantees that there will be live networks to test in, in time for planned product releases. Hence, in these cases products might be delayed until proper testing can be done in order to assure proper interoperability.

7. It is unclear how the proposed release marker is supposed to be related to the ICS version contained in the UE radio access capability (3GPP TS 25.306).

8. It will be rather difficult to settle what features that should be mandatory in e.g. Rel-4 and we could assume that all features have to be reviewed with regard to whether they should be 'optional' or 'mandatory' (and hence implied by the release marker). This process will most likely need a lot of effort and furthermore, it is unclear who would do the work.

An advantage of instead having indications per feature is that it allows for a more market driven development of the mobile stations. Features will be implemented because operators and/or subscribers want them, not because somebody at some point managed to put a certain requirement in the specifications.

3. Conclusion

Thus in conclusion we note that if the idea of the *Revision Level Indicator 2* is to indicate support of versions of protocol extending the existing *Revision* Level for GERAN, then we are of the opinion that that is acceptable. If however, GERAN's intention is to introduce the *Revision Level Indicator 2* to indicate *the support of all mandatory features of a given release* then we conclude that it will add to

- Unnecessary costs
- Complexity
- Delayed products
- Classification efforts/difficulties

Furthermore, having indications per feature allows for a more market driven development of the mobile stations.