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Title: **On Features and Releases**

Document for: **discussion**

1 Reminder – what is a "Feature"?

- You can't be bothered to read all this guff, skip straight to the recommendations at the end.
- You can't remember what a Feature is, so persevere.

The enhancement of the GSM specifications over several years resulted in the concept of the "work item" – a written description of functionality which it was desired to add to the overall system specification for the next Release. On its creation, 3GPP followed the methodology inherited from ETSI TC SMG, but it was soon agreed that, in view of the enormous amount of work required over short timescales, a more structured system of managing evolution was required, to give form to the otherwise amorphous soup of work items being handled by all the TSGs and their working groups.

Thus was born the multi-tiered approach to work items which is in use today. At the top level is the "feature", which describes some functionality to be added to the system to meet an existing market need or to stimulate market growth by providing new services easily understood by users. At the next level is the "building block" which is a technically more profound examination of the functionality, and at the lowest level there is the "work task" which describes the fine detail and results in new technical specifications and change requests to existing specs. In practice, a combination of top-down and bottom-up description is used.

Formal definitions of the terms "feature", "building block" and "work task" were introduced at the Madrid TSG meetings in March 2000. A subsequent CR introduced the terms into TS 21.900; in particular:

> ***feature****: :new or substantially enhanced functionality which represents added value to the existing system*

and it was agreed that "**A feature should normally embody an improved service to the customer and / or increased revenue generation potential to the supplier**." The intention was that features should be described using text that was meaningful to an end user (who could be expected to want to use the feature) or to senior company management (who could be expected to agree the budgets to develop firstly the necessary technical specifications and secondly the products themselves).

That is, the features have to be described in non-technical language than can be understood by the layman and perceived as a "must-have" element for his next mobile phone purchase. In fact, the language should be so non-technical that even managing directors and CEOs of equipment suppliers and network operators can understand it and can appreciate that introduction of the new feature will either save them production costs or bring added revenue to their products and services.

The *technical* element of the description comes in the lower-level descriptions of the building blocks and work tasks. It was agreed that every feature would be described using a (standardized) "Work Item Description Sheet" (WIDS). But it was also agreed that, to avoid unnecessary bureaucracy, simple building blocks might not need individual WIDSs if their contents were adequately described by the WIDS of the parent feature, and that simple work tasks could dispense with their own WIDS if their contents were clear from the description of their parent building blocks.

Here endeth the history lesson.

2 Some typical features in the work programme for Rel-6

The following descriptions are taken from the information available on the 3GPP web site at:
http://www.3gpp.org/ftp/Specs/html-info/GanttChart-Level-1.htm
where the informal feature descriptions are based upon the work item descriptions officially approved by the responsible TSGs.

Take, for example, the feature "Generic User Profile". The description is concisely contained in a few lines:

> The 3GPP Generic User Profile is the collection of data which is stored and managed by different entities such as the UE, the Home Environment, the Visited Network and Value Added Service Providers, which affects the way in which an individual user experiences services. The GUP is composed of a number of User Profile Components, and an individual service may make use of a subset of the available User Profile Components.
>
> The fact of having several domains within the 3GPP mobile system (i.e. circuit-switched, packet-switched, IP multimedia subsystem and the service / application domains) introduces a wide distribution of data associated with the user. Several 3GPP working groups already specify some parts of the GUP in their own descriptive methods. This distributed responsibility could lead to duplication and incompatibility amongst the GUP User Profile Components, so active coordination of the description methods is required.
>
> The work item will address the following aspects:
>
> - Definitions and scope of Components, and their storage, ownership, access methods, and distribution.
> - Some obvious common objects
> - The principles of a User Profile Policy (e.g. privacy aspects)
> - Protocols for transfer of User Profile data between cooperating elements of the 3GPP system.

This is a description which a standards manager and a product development manager can easily get their teeth into (and which an intelligent end-user could grasp the gist of).

Again, the feature "Presence capability" is described thus:

> "Presence" is the concept whereby users make themselves "visible" or "invisible" to other parties of their choice, allowing services to be offered. The concept of presence will enable other multimedia services to exploit this key enabler to support other advanced multimedia services. Examples of multimedia services that could potentially exploit the presence capability include "chat", e-mail, multimedia messaging, instant messaging, etc.
>
> The objectives of this work item are to define and develop the support of the concept of presence information to facilitate multimedia services in a wireless network.

which immediately appeals to a would-be user of the new services described.

3 And what are the new features that TSG RAN is introducing into Rel-6?

According to the current work plan, TSG RAN is responsible for just three features out of the one hundred and forty or so in the entire programme:

- Evolutions of the transport in the UTRAN
- Improvements of Radio Interface
- RAN improvements

Unlike the other TSGs, RAN keeps all its WIDSs in a single document, whose name (and URL) never changes. On the one hand, this makes the WIDSs easier to find, but on the other, it potentially makes it more difficult to track the history of changes to the WIDSs.

Here is a brief discussion of each RAN Feature in the current work plan.

3.1 Evolutions of the transport in the UTRAN

> In order to cope with new requirement coming from new service definition, it is necessary to introduce mechanism to support new transport mechanisms or to improve the existing ones. Typical examples of such mechanisms are the following: introduction of an IP transport inside the RNS and AAL2 QoS optimisation
>
> The main objective for this building block [sic] is to ensure that adequate mechanism are provided to handle the different type of traffic (i.e. signalling and user flow) inside the RNS to ensure that requirements in terms of QoS and delay are taken into account.
>
> This shall be valid also for efficient O&M transport of the different interfaces inside the RNS. This includes the Iub, Iur and any protocol suites at the Iu reference point.

This description is verbose and obtuse. The other problem is that the note against it in the work plan shows that no progress has been made and that it is to be abandoned after RAN#18 [sic] unless there are contributions. The inference is thus that the feature is not to be specified for Rel-6.

3.2 Improvements of Radio Interface

> (No WIDS exists.)

To find out what this feature really introduces, the reader must examine all of its building blocks.

3.3 RAN improvements

> This work item intends to introduce new mechanisms allowing improvements on all aspects dealing with the radio network subsystem internal interfaces, as well as the interface towards the core network. This includes transport of user and signalling plane as well as protocols over all interfaces of the radio network subsystem.

This is vague in the extreme, and is hardly likely to sell the feature to any one.

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4 An analogy

- OK, so you get the picture without an analogy, so skip to the conclusions.
- No, you like parables, so read on.

Imagine a car manufacturer trying to keep pace with its rivals by introducing an updated spec for an already-established model. The marketing department decides that in order to improve the model's perception in the marketplace, it needs to have extra added features, and thus increase its appeal to potential buyers compared to last year's model – and , with luck, compared to competitors' comparative models.

Such added features might be:

- Wider wheels
- Leather trim on steering wheel and gear lever
- More powerful engine
- More rear-seat passenger leg room
- An extra pair of loudspeakers for rear-seat passengers
- Electrically operated rear-view mirrors
- Illuminated glove-box
- Etc.

Each of these items impacts:

- Customer appeal

- Production costs

And each of these features has a design time and cost, which can be estimated at the outset; and thus the manufacturer can decide which features to reject and which to adopt, and for those to be adopted, whether they are for next year's model or for the year after's. Of course, each new feature has to be defined in sufficient detail to make that choice possible.

Here are two possible approaches:

One way	**Another way**
Evolution of the transmission In order to cope with new requirement coming from new service definition, it is necessary to introduce mechanism to support new transmission mechanisms or to improve the existing ones. Typical examples of such mechanisms are the following: introduction of a modular transport inside the central thrust bearing and outer flange MTBF optimization. The main objective for this building block is to ensure that adequate mechanism are provided to handle the different type of traffic (i.e. signalling and rush-hour flow) inside bus lanes to ensure that requirements in terms of MTBF and delay are taken into account. This shall be valid also for efficient HR transport of the different categories inside the potential passenger subset. This includes the commuter, his wife, and any necessary offspring communication at the parent-child reference point. We will introduce the new gearbox if our engineers have got round to designing it in time for the new model.	Evolution of the transmission The new fully-automatic gearbox provides four ratios in place of three, thus ensuring that power transfer from engine to driveshaft is always optimum. This gives a smoother ride, lower transmission noise, and lower fuel consumption. The new model will have a more rigid, yet lighter front subframe, with twice the number of anchor points to the bodywork. Each anchor point will exploit the flexibility of a specially developed silicone cushion, designed to eliminate over 90% of all low frequency vibration. This, coupled with the new gas-strut independent suspension results in a substantially smoother ride with less roll, more positive steering, and hence lower driver fatigue.
Improvements in on-board entertainment system (No additional information available.)	Improvements in on-board entertainment system The new model will have an integral control console combining auto-seeking 3-band RDS radio / cassette with dash-mounted multiple CD cartridge. The same console handles the on-board computer and the satellite navigation system. To avoid the driver having to take his eyes off the road, a head-up display is available as an optional extra.
Seat improvements This feature intends to introduce new mechanisms allowing improvements on all aspects relating to the subframe, as well as its connection to the rest of the car. This includes transport of the driver and passengers as well as the transfer of forces at each connection point to the monocoque.	Seat improvements The driver of next year's model will find the soft-sprung, leather-upholstered seat even more luxurious than in the old model. New wrap-around sides give extra support in cornering, and an electrically-adjustable lumbar support can be tailored to give just the right amount of resistance for the lower back. On cold mornings, the new electrically-heated front seats are switched on automatically at the same time as the demister. The inertia-reel seat belt has strengthened fixing points for even more safety in the case of a crash,

	and a pre-tensioner which adjusts to your preferred driving position so that you will hardly know the belt is fastened.

Probably no further comment is necessary.

4 The corollary of the analogy

The features added to the 3GPP system should be viewed in a similar light. Each feature should do at least one of the following:

- Offer enhanced user appeal (downloadable games, faster e-mail access, clearer speech, …);
- Offer reduced costs to network operators (standardized interfaces allowing competition amongst equipment vendors, more efficient use of resources e.g. by using packet mode rather than circuit-switched mode), …);
- Offer improved revenue-generating potential to network operators (new services capabilities such as real-time video streaming, improved codec efficiency allowing higher data rates, …);
- Offer new opportunities to equipment vendors (network management equipment, value-added services requiring "edge-of-network" equipment, …).

Within the radio access network, examples of features which add value to the existing UTRAN are:

- MIMO antennas
- Remote control electrically tiltable antennas
- Terminal power-saving techniques
- Extension to different frequency bands
- Improved beamforming techniques
- Network-assisted cell change

Looking at the current 3GPP work plan, it can be seen that whilst some of these are indeed classified as "features", several are classified as "building blocks" under RAN "features".

5 What were in previous Releases?

A glance at the Release 5 work programme shows that TSG RAN was directly responsible for features entitled:

- Improvements of Radio Interface
- RAN improvements

In Release 4, RAN had features entitled:

- Evolutions of the transport in the UTRAN
- Improvements of Radio Interface
- RAN improvements

The approach is at least consistent.

Whilst these umbrella titles are perhaps useful for grouping the work done within TSG RAN, they are so vague as to hardly qualify for the title of "feature": they are open-ended in scope (and therefore in time scale) and therefore unusable

for project management purposes. On the other hand, the work items listed earlier (MIMO etc), although classified as building blocks of one of these vague clouds, have all the attributes of 3GPP features.

6 Suggested improvements in TSG RAN's approach to Feature definition

Great care needs to be taken when defining work items that the correct choice of level is made. The RAN activities currently shown as Features are not really "features" within the accepted definition of the term. They are vague topics which define the scope of the work carried out by TSG RAN. Yes, undoubtedly they could lead to new functionality which would be appreciated by users and which could result in additional revenue for network operators and additional sales for equipment vendors; but not directly. No CEO worth his salt would agree to fund such ill-defined activity.

Recommendation 1: Ensure that there is a WIDS for each feature, and that the objective is very precise.

A test which can usefully be applied is that of open-endedness. So far, all RAN's "features" have had no discernable target end date. They just carry on for ever – witness their appearance in each of the last three Releases! A feature must be defined sufficiently precisely that at some point a decision can be taken as to whether it can be completed in time for the next Release or must be held over to a subsequent Release.

Recommendation 2: Ensure that a feature's scope is sufficiently restricted that it will be possible to give a reasonable estimate of its expected completion date.

One benefit which would accrue from a better circumscribed scope for each feature would be that it would no longer be necessary to cater for so-called "splittable" work items: ones which are so eclectic that they carry on from Release to Release. Indeed, it is recommended that the concept of "splittable" work items be eliminated, forcing TSGs (not just RAN) to write better work item descriptions, which can be accomplished in bite-sized portions.

Recommendation 3: Eliminate "splittability" of features.

A good practice within RAN has been – and continues to be – to do feasibility studies prior to embarking on any actual standardization work. This habit is to be encouraged, with the results of the feasibility study being published usually either as xx.8xx series TRs, or as WG-internal studies. Occasionally it might be appropriate to publish the results as a concrete project plan in a 30.xxx series TR.

However, it does not make sense to publish the results of a feasibility study as a Release N document if the actual standardization work cannot also be achieved within the timescales for the same Release. Normally the standardization work (stage 1, stage 2, stage 3 as appropriate, plus test specifications, associated O&M specs, etc) will turn out to be candidates for Release N+1; in this case, the feasibility study should also be produced as a Release N+1 document. In this way, all the elements for a given feature are grouped together in the same feature, and all pertain to a single Release. This will also help eliminate the need for "splittable" work items.

Recommendation 4: Group a feasibility study into the same Release as the resulting standardization work.

Such a change of approach could only have positive effects on the Project as a whole. Who knows, even the press might understand what we are doing.