

LIAISON STATEMENT

To: TSG-T, TSG-SA, TSG-CN

Source: TSG T2

Title: Terminal Capabilities

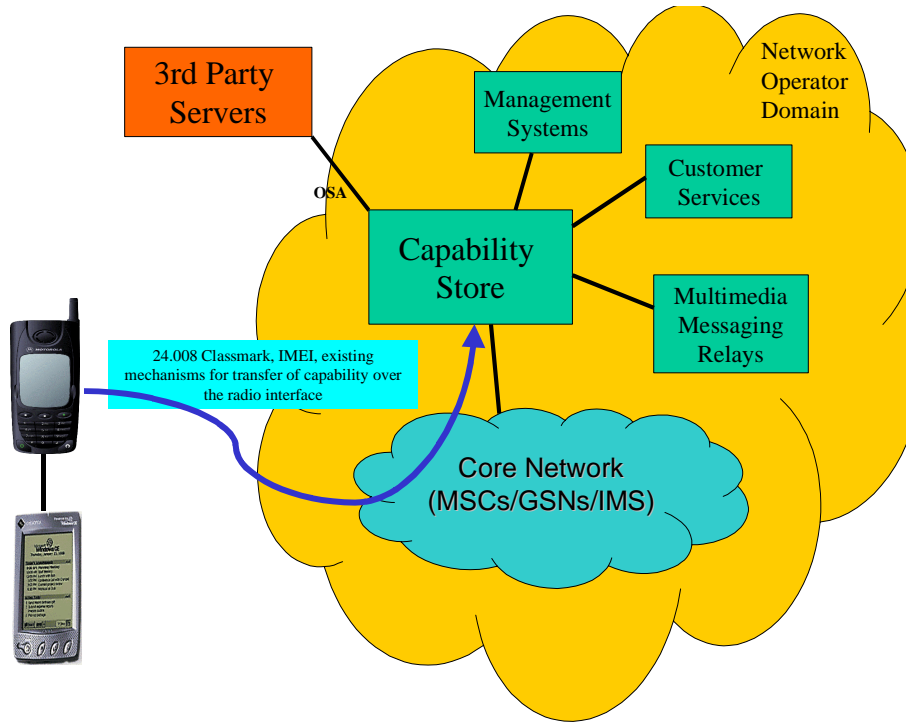
Document for: Discussion

1. Introduction

It is seen to be necessary to have an information store in the 3GPP core network which "knows" about the capabilities of a given terminal at any one time. This information store needs to be updated when the UE capabilities change, for example when a user changes ME, or when a user connected a TE to an MT. In this way, service delivery can be optimised to suit the user's current environment.

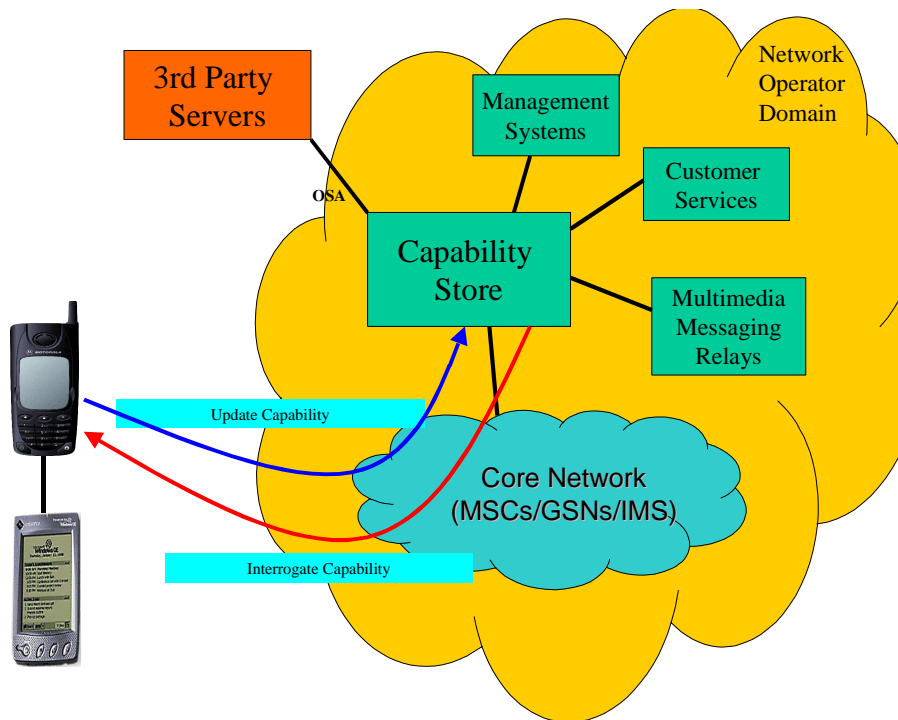
2. What can we do with today's information?

There are a number of things which can be achieved with information which is transferred over the radio interface today, information such as IMEI, 24.008 classmark, etc. already exists in the core network and if this information can be made available to a "capability store" inside the Network Operator's Domain then a Terminal Capability profile can already be built up to a certain extent..



3. What could we do to enhance today's information?

We could start by adding the capability for the ME to advise of a change in UE capability over the radio network to the Capability Store, and for the Capability Store to interrogate the current UE capabilities:



IMPORTANT CONSIDERATIONS

- **Network Loading and Bandwidth**
It is essential that the loading on the network, in particular, over the radio path is kept to a minimum. The existing IMSI ATTACH for indicating capability on registration and using or pre-empting the periodic location update timer mechanism to signal changes to capabilities whilst attached could be candidates for further discussion. Any additional 'over the air' messages - signalling the 'capabilities' should be avoided if at all possible as additional signalling will only add to congestion and consume valuable bandwidth. Polling the mobile for capabilities is a very inefficient mechanism as it introduces latency in addition to unnecessary network signalling traffic.
- **Charging**
Any additional signalling to indicate capabilities is likely to cause concern to network operators about charging.
- **Security**
It will be necessary to ensure that the transmission of capability information is secure. E.g encrypted
- **Privacy**
There may well be situations where a 'mobile user' or 'class of mobile user' may not wish their 'capabilities' to be made known to the network – even if there is some guarantee that such information in their case is confidential

4. What do we need to do to enable this in the standards?

For the first picture, we need a way to get the information already known to the Core Network nodes out of the Core Network and into the Operator Service Layer. There needs to be a standardised interface between the Core Network and the Capability Store, also OSA needs to be able to transport this information and consideration needs to be given to the MMS Relay and Management interfaces.

For the second picture we also need to touch the radio interface, to allow the ME to send information about changes in its capabilities through the Core Network to the Capability Store. Ideally, transport of this information

should be identified separately from normal user traffic so it can be charged at a different rate (e.g. free). The Capability Store should also be able to interrogate the ME should this be required.

The Capability Store should already know that the ME is switched on, in coverage and that it has updated the network about its location. The relevant radio interfaces by which the ME can be accessed should also be known (e.g. GPRS, CS data, SMS etc.). In fact, this is a part of the "current capability information".

5. What kinds of information should the Capability Store know about the UE?

The following is an example list and should not be taken to contain high-priority capabilities or be in any way complete.

- Screen capabilities (Colours, resolution, size)
- Memory / storage capacity (for downloading video/music/email attachments etc)
- Capability to stream / download video and still images
- Codec types (EFR, AMR, MPEG4, H.264, MP3 etc.)
- Device software/firmware release/version
- Calendar storage capacity
- Contacts storage capacity
- Notes storage capacity
- Devices' Operating System
- Browser type (WAP 1.2/2.0, HTML)
- MExE classmark
- USAT capabilities (release/version)
- Data rate capability
- SIP call control protocol
- Number of simultaneous PDP contexts supported
- Number of APN's supported

CAPABILITY DEFINITION

The definition of 'Capability' is likely to require considerable discussion. UE specifications and service specifications include many options. In SMS for example, many potentially useful features have been introduced over many years but many of them are still not implemented. Even if they had been implemented in mobile phones, it is still not possible for a network operator to take advantage of this because not all mobile phones will have implemented the same features. A good example of this is SMS SIM memory capacity available which if implemented would result in a considerable reduction in SM traffic because the number of retries in the SC for SIM SMS memory capacity exceeded could be significantly reduced. Clearly, had a 'capability signalling mechanism been in place then a network operator would have been able to take advantage of such optional features

The use of 'classmark' has also been discussed but a widely held view is that the classmark is not suitable because it conveys 'capabilities' of a category different from the capabilities being discussed here.

6. Other issues

Do we need profiling for different terminals?

- If a user has several "Capability Sets" each of which is in frequent use, e.g. ME+PDA, ME+carkit etc. should all of these be stored in the Capability Store and only the Capability Set index passed from ME to Capability Store, or should the delta between the previously-stored Capabilities and the current UE capabilities be sent every time there is a change of UE capability (e.g. user connects or disconnects PDA)?