

**Source:** TSG SA Chairman  
**Title:** TSG SA Management Report  
**Agenda:** 4.1

**Document for:**

Decision	
Discussion	
Information	X

## **1 Main events since last meeting**

In the period April 2001 (PCG#06) to October 2001 (PCG#07) TSG-SA have held two TSG-SA plenary meeting, TSG-SA#12 (Stockholm, 13 - 15 June 2001) and TSG T#13 (Beijing, 19 - 21 September 2001). Further to TSG-SA plenaries, a number of meetings of the TSG-SA working groups have taken place..

## **2 Technical work in TSG-SA**

The work of TSG-SA consists of three main parts: technical work within TSG-SA, technical co-ordination between the TSGs and project management. In the period TSG-SA have been working in all three areas. The technical work within TSG-SA is organised in 5 working groups dealing with the service aspects, architecture, security, codec aspects and telecom management.

In addition to the plenary meetings and the working group meetings TSG-SA has held one workshop on the subjects of "Text Telephony". The purpose of organising the workshop was to review the work related to text telephony in order to ensure that the work on functionalities and interfaces was progressed in a timely manner.

### **2.1 Work related to Service Aspects**

The service requirements and associated stage 1 documentation for release '99 and release 4 are now considered complete and the necessary adjustments and clarification caused by the stage 2 and stage 3 work done. Similarly the service requirements and associated stage 1 documentation for release 5 are considered complete and the only adjustments expected are those caused by the final decisions on the content of release 5 and detailed stage 2 and 3 work by other groups. TSG-SA WG1 (S1) can now therefore commence work on identifying functionalities and specifying the requirements for the next releases, where one of the key items is the further evolution of the IP Multimedia Subsystem beyond the its first phase expected to be completed in Release 5. Even though the overall process put in place by TSG-SA allow for medium to long term work and planning, to few contributions are received for TSG-SA WG1 (S1) to establish the requirements for longer term vision. It is the hope of TSG-SA that the 3GPP Future Evolution Workshop (see attached preliminary programme) will assist in encouraging more contributions on medium to long-term requirements and visions in form of specific work items etc. Also TSG SA approved a number of new work items for items such as; Interworking between 3GPP based systems and Wireless LANs, Distributed Speech Recognition and Digital Rights Management.

## **2.2 Architecture related work**

The architectural work related to the IP based network is proceeding well within TSG-SA WG2 (S2) and key decisions for the IM subsystem made, selecting of SIP as Call Control model and adopting IPv6 as working assumption. Already TSG-SA#11 the overall architecture specification for the IM subsystem was approved and is now considered stable. However, the work is delayed approximately 3 month compared to the original target.

The workload on TSG SA WG2 (S2) has in the past been significant and has been reason for concern. Therefore discussions was initiated with other groups, especially TSG-CN, to see if, e.g., some of the more detailed stage 2 work could be offloaded to other groups in order to better spread the work load. These discussions lead to some smaller adjustments of the work split between TSG-SA WG2 (S2) and TSG-CN. This together with the completion of the initial architectural work on the IP based network has created a situation where the workload of TSG-SA WG2 (S2) is no longer causing major concerns.

As reported earlier, in order to get a better cross project co-ordination an overall 3GPP project plan was established. The day to day handling of the project plan has successfully been transfer to the MCC. It is the understanding of TSG-SA that this transfer of the handling of the work plan have provided a more logical flow for updates from the Working Groups. It has further been clarified that it is the responsible TSG (and its working groups), which are responsible for the updating the project plan.

## **2.3 Security related work**

The introduction of IP Multimedia Subsystem introduces significant changes to the network architecture, these changes requires a substantial work effort in order to ensure that all security aspects are considered and handled correct. TSG SA WG3 has been working closely with TSG CN working groups in this process. However, it is clear that the security related work for IMS can first be completed in the June 2002 time frame. Therefore TSG-SA have already now accepted that an exception for completion and inclusion in Release 5 (March 2002) is to be granted for the security aspects.

## **2.4 Codec related work**

The codec work in TSG-SA WG4 (S4) for release 99 is found stable and no significant changes expected.

As earlier reported a wideband AMR codec was selected by December 2000. However, due to the required signalling support,s which was not complete by the TSG meetings in March, TSG SA decided to shift wideband AMR to Release 5, but functionally freeze the wideband AMR codec specification. TSG SA WG4 (S4) has then following been performing characterisation of the WB-AMR codec. The first phase of the characterisation, which was completed by TSG-SA #12, included performance without channel errors and performance in GSM FR GMSK channel. The second phase of the characterisation including performance in 3G WCDMA channel, is expected completed by end November. In order to speed up the payment of the host laboratory, TSG SA have decide to let TSG SA WG4 make the formal approval of the work performed by the host laboratory in this phase (1b) of the characterisation.

In relation to IP Multimedia Subsystem TSG SA WG4 is working on Multimedia Codecs and Protocols for Conversational PS Services. The work related to default codecs etc was already completed at TSG SA #12 and work has been started on Transport Protocols for PS conversational multimedia applications

## **2.5 Work related to telecom management**

The timing of release 99 and release 4 for the telecom management related specifications was reported to previous meetings of the PCG. It was noted that TSG-SA wished TSG-SA WG5 (S5) to complete the specifications at the same time as other parts of the release. However, it was understood that parts of the telecom management specifications builds on the core specifications and could

therefore not be fully completed before the core specifications were completed. On this background TSG-SA found it acceptable that a delay of 3 month compared to close of the release could occur for some telecom management specifications. This goal was not completely fulfilled, however the majority the specifications were completed at the requested point in time and remaining specifications within the time one additional meeting cycle (3 month). The telecom management specifications for release 99 and release 4 are considered stable. A similar situation is occurring for Release 5 where the telecom management related specifications first are expected to be fully ready in June 2002. But already now significant progress has been made for telecom management specifications related to the expected content of Release 5.

Also in the area of telecom management specifications some cooperation with the corresponding 3GPP2 groups has been established. According to information available to TSG-SA, 3GPP2 plans to build some of their telecom management specifications on basis of the 3GPP specifications as delta specifications. TSG-SA welcomes this harmonisation of telecom management specifications across standards. TSG-SA does not foresee any negative impact on the 3GPP timescales and workload due to this.

### **3 Technical co-ordination**

#### **3.1 Issues related TSG-CN**

For next release joint meetings related to the IP Multimedia Subsystem has been held between TSG SA Working Groups and TSG CN Working Groups to exchange information etc. Also TSG-CN has provided information about potential time scales for standardisation in the TSG-CN area. TSG-SA has taken note of TSG-CN time estimates and has reviewed the overall work plan.

Looking at work for release 5 and later releases TSG-SA have especially taken note of the potential delay caused of the late availability of requirement and architecture document, which are the prerequisites for the work of TSG-CN. In order to reduce this type of problem in the future, the work split between TSG-CN and the architectural work in TSG-SA is continuously being monitored in order to optimise this split.

#### **3.2 Issues related to TSG-RAN**

TSG-RAN's work creating and organising work items for future releases has been noted. TSG-SA has also taken note of the fact that TSG-RAN still needs to perform substantial work on error corrections for the Release 99 set of specifications. As this reduces the time available for work on the next releases TSG-SA notes that TSG-RAN has had need to prioritise the work for the next releases. TSG-SA has taken this into account in the review of the overall project plan.

TSG SA has also noted that TSG RAN work for Intra Domain Connection of RAN Nodes to Multiple CN Nodes has not yet started, because TSG RAN awaits input from TSG SA WG2.

#### **3.3 Co-ordination with TSG-T**

As reported to the previous PCG meetings, TSG SA received at TSG-SA#08 a liaison statement from TSG-T concerning the split of functionality in the UE between TE and MT and the possibility to run call control from, e.g., a PC physically separate from the "radio ME". TSG-SA discussed the matter and found reason for concern about the potential impact on the security, system performance, conformance testing and certification if this area is not properly handled. As result of the discussion TSG-SA sent a Liaison Statement informing relevant parties and requesting them to study requirements, architectural and security aspects of the TE-MT model. Replies from several 3GPP WGs was received, including TSG-T WG2, which indicated joint work is needed in 3GPP groups in order to achieve a secure way of connecting applications to external devices. It was agreed that input from bodies outside 3GPP such as MRPs is required in order to do this analysis in TSG-T WG2 and TSG-SA WG2. This could include possible scenarios endangering e.g. conformance testing validity. TSG SA has earlier reported that due to the complexity of the issue TSG-SA have had difficulties obtaining progress in the speed desired. However, the work is now progressing more steadily with a requirements report being drafted by TSG SA WG1, in close co-operation with TSG T WG2 and TSG SA WG3 for the security aspects.

### **3.4 Co-ordination with TSG-GERAN**

TSG-GERAN continues in a manner equal to that of the other TSGs to provide an overview of its activities and work plan. The work plan for TSG GERAN is now been integrated in the overall work plan for 3GPP. In the period the main areas of contact between TSG SA and TSG GERAN have been in the area of Architecture and security issues related to the introduction of GERAN support for the lu interface. These activities have involved mainly involved TSG SA WG2 and WG3.

## **4 Requirements for support in 2002**

As earlier reported TSG-SA does not see any major changes in its requirement for support in 2002 compared to 2001, and sees no reason to change the earlier given requirement that the same number of man month as for 2001 are budgeted for 2002. Currently no additional tasks requiring dedicated funding have been identified.

## **5 Release 99 and Release 4**

As indicated earlier in this report TSG-SA have reviewed the status of the project in co-operation with the other TSGs. Based on the status report provided, TSG-SA concludes that all release 99 and release 4 items have been completed and the release can be considered stable. However, TSG-SA foresees there still for a while will be a need for corrective changes to Release 99 especially in the area of the radio access network. These corrective changes might reach a second peak when larger scale of network deployment based on the specification starts.

## **6 Next Releases**

TSG-SA has in co-operation with the other TSGs reviewed the overall work plan and feasibility of different target dates for release 5 and the expected content. This work was based on the principles for a release agreed at TSG-SA#09 and confirmed by PCG#05. These principles are:

- A release shall consist of a well-defined, stable and internally consistent set of functions;
- A release shall be documented in a maintained, consistent stream of specifications;
- Essential corrections to a stable or frozen release shall be included in the applicable release;
- New or changed functionality shall be included in new (rather than retrospectively in old) releases.

As a part of these principles it was also agreed that the overall road map should be controlled by the 3GPP Project plan (i.e. a "3GPP Road Map") and not as in the past by the Releases. The content of the Release should be based upon the work plan with a well-defined closing time for the content of a Release (6 – 9 months before completion of a particular Release).

The review of the overall work plan and feasibility of different target dates made TSG SA agreed March 2002 as target date for release 5, with exception for some of the security work which will first be finished by June 2002. An overview of the tentative content of Release 5 is provided separately in Tdoc PCG#07(01)15. TSG SA will review the target date and content of release 5 at TSG SA #14.

Considering that release 5 will add substantial new functionality to the 3GPP set specification, TSG SA believes that a not insignificant amount of correctional changes is to be expected. On this background TSG SA have set the preliminary target date for Release 6 to June 2003.

## **7 General Management issues**

As reported earlier, when establishing the overall status for the release 1999 it was realised that it was been difficult to link together the work items of the different TSGs in order to understand whether or not all part of a service or functionality is being completed according to the target. To help overcoming this problem for future releases a working model was elaborated and agreed. This working model has now been in place for a while and allows the work items of the different TSGs to be linked into a

hierarchical structure, based on three levels feature, building block and work task. This process is no entering into be a routine within the work of 3GPP and is very useful in the discussions around the content and target dates for releases.

**ANNEX I****3GPP FUTURE EVOLUTION WORKSHOP – DRAFT PROGRAMME****Thursday 18<sup>th</sup> October 2001**

09.00 Opening of workshop

**1 Trends and Drivers**

09.00 – 09.25

**Title: Drivers for mobile network evolution - the vision and the strategy****Source: Orange****Abstract:**

This presentation identifies, from an operators perspective, three of the main drivers in evolving mobile networks; these being speed of deployment, reduction of costs and ubiquitous accessibility. In order to respond to these drivers, the presentation considers various strategic steps, including access diversity and mobility, that can be taken to respond to these drivers.

09.25 – 09.50

**Title: For a Sound and Stable Evolution of 3G Platform****Source: Joint Contribution of Members of the Vodafone Group****Abstract:**

Most operators just have deployed GPRS, first 3G license holders started to roll out 3G, many will follow next year. Whereas during early years of GSM customers were proud to own a GSM handset being able to telephone, expectations have grown tremendously. Nowadays the minimum level of quality to satisfy customers when launching new services is quite higher.

R99 and R4 constitutes the platform for launch of 3G. Operators who started limited operations still struggle with basic functionality's. IMS is considered as the major step towards a multitude of new service offerings. Stable and complete quality specifications, with minimum number of options ensuring multi-vendor interoperability and roaming are key to market success, comprising charging mechanism and support of respective level of security. The migration path to new technologies, allowing better degree of integration, may not be compromised by service degradations.

Prior to focus activities on major new concepts, 3GPP should endeavour to satisfy the basis quality requirements as described.

Key words: Quality, error corrections, option pruning, inter-operability, backwards compatibility, migration, QoS mechanism, GPRS, UMTS, IMS, end-to-end security, charging.

09.50 – 10.10

**Title: Beyond Release 5 – An Operator Perspective****Source: mmO2 (BT)****Abstract:**

The mmO2 presentation will address post Release 5 standards requirements, focusing upon the standardisation requirements for Releases 6 and 7, that will enable the full exploitation of the IMS, Location capabilities and RAN enhancements (HSPD) initially specified within Release 5. Additionally new technology developments such as Wireless LAN access and core network improvements will be addressed

10.10 – 10.40

**Title: AWS view beyond Release 5****Source: AT&T Wireless Services****Abstract:**

3GPP release 99 provided the baseline for UMTS; release 4 began the optimizations, and release 5 provides the firm foundation for the IMS. The IMS will be the basis for development of advanced services for an operator, which begs the question: where do we go from here? Certainly, 3GPP needs to complete the work on the existing IMS architecture, including further optimizations, interworking, and evolution to a PS-domain only network. Future releases will further converge the wireless network and the internet, especially the services and protocols. In addition to the W-CDMA and GERAN radio networks, an incorporation of Wireless LAN technologies as another radio access technology is essential, including the interworking between the UMTS and WLAN networks. A customer-oriented evolution of the terminal with a dynamic configuration and service environment should become the subscriber's personal access point to available services. Release 5 IMS provides a good base to evolve the future UMTS services.

10.40 – 11.00 **Coffee**

11.00 – 11.25

**Title: Trends in mobile industry affecting standardization****Source: Ericsson****Abstract:**

The questionable future of Internets ".com-business model" as the most important one and the advent of Mobile Internet businesses with attractive and profitable services convincingly demonstrates the strength of the mobile industry. 3GPP have taken a number of important steps towards more advanced 3G services truly benefiting users. With the new standardized multimedia functionality, from high quality media-types and efficient protocols to application frameworks and services, a wealth of new services will emerge.

For the mass-market, the mobile multimedia services begin with advanced messaging services, which enhance person-to-person communication. A standardized efficient content access (browsing) and media delivery solution is the basis for content consumption services. Conversational multimedia services which not only provides an enriched (high quality sound and video) communication channel but maybe more importantly focuses on end-user *simultaneous sharing* of experiences is the next important enhancement to mobile multimedia services. For the future, the mobile industry should further develop the basic technology, as well as applications and services which add value in the mobile environments.

While capabilities of mobile terminals increase, the spread between "low-end" and "high-end" devices increase as well. Capabilities differ in a way that requires even more efficient capability exchange mechanisms. Standardized interoperable rights management solutions tailored to the special requirements of mobile delivery is another area for the future. Furthermore, standardization should also to a larger extent take new business opportunities into account. An important aspects here is to be able to create businesses where multiple actors can combine their efforts to provide the most interesting services and share the revenue.

In standardization, we should consider the fact that the mobile penetration (for personal use) in many markets in the industrialized world is beginning to reach saturation. The development of new standards and ultimately new services should therefore focus even more on bringing clear end-user value. A technology driven approach no longer suffices in the mobile business.

11.25 – 11.50

**Title: System Co-Existence**

**Source: Nokia**

**Abstract:**

Mid-to-long term view on co-existence of different access systems, core network and service machinery. Look at the trends and needs that drive the system development and identification of the evolutionary potential and suggested development areas of each system component.

11.50 – 12.15

**Title: Long-Term Issues in Standardisation**

**Source: Siemens**

**Abstract:**

The presentation identifies areas of future work that might become necessary after Rel-5 to establish long term goals for standardisation. Specific issues include:

- Identifying future key evolution areas for 3G, analysis of the bonus points and shortcomings of UMTS, thus deriving long-term goals for the further progress and success of 3G.
- Introduction of AdHoc capabilities for networks like fleet net, gaming net, company net, personal/private networks, for range extension, efficient resource usage, billing, authentication etc for peer to peer calls. Re-use of 3G technology for license-exempt bands

12.15 – 12.40

**Title: Evolution of Services and Standardisation in an Technically Diverse Environment**

**Source: Nortel**

**Abstract:**

The UMTS standards provide a vast range of service capabilities based on different technical approaches and oriented towards particular types of applications. The success of UMTS will largely depend on whether these approaches can be combined to provide a user experience which is compelling and differentiated from the 2G service set. The UMTS operator must exploit their assets to obtain leadership over competitors such as web-portals and ISPs in the service space. This paper discusses how the framework available in UMTS release 5 can be applied to meet these challenges, and how this will effect 3GPP.

This paper briefly surveys at the existing range of service capabilities. The differences in



standardisation approaches (eg IETF vs 3GPP) are discussed. There are connections between the standardisation approach and the market expectations/technology profile. Ways this could be reflected in 3GPP are proposed. The elements that need to be common between the different service approaches are identified from the operator's and users' point of view. Actions in 3GPP to create the necessary linkages are identified. The importance of cross-capability enablers such as billing, location, QoS, OA&M and service advertising is explained. Future study areas related to these topics are elaborated.

12.40 – 13.40 **Lunch**

## **2 Services**

13.40 – 14.00

**Title: Know your subscriber**

**Source: One 2 One Personal Communications Limited**

### **Abstract**

The presentation focuses on capabilities that enable the network operator to provide a better service to the customer. Customer service is envisaged to become a more and more problematic area for network operators as the market evolves from a voice centric model to a data centric model and the mobile networks open to new types of internet-like services and advanced terminals.

In particular the presentation will discuss advanced capabilities required to identify the terminal type and to perform remote diagnostic routines; address the need of an MMI that simplifies the user experience and creates a personal service environment that can be ported between terminals and networks. As part of the push to simplify the user experience the presence of multiple options in the standards is discussed bringing the location services as a case study. Particular attention is given to the definition of a flexible user profile that enables basic customer management and which is aware of the terminal capabilities and user preferences.

In addition, the presentation will also discuss the problem of numbering and addressing in the new data centric environment.

14.00– 14.25

**Title: Data service requirements for the corporate user**

**Source: Research In Motion Limited (RIM)**

### **Abstract:**

In the data services world, the corporate IT department acts as a value added service provider for its customer base - the corporate data users. The required enablers to support this business model will be discussed based on experience of supplying data services wirelessly to over 10,000 corporate customers in North America. The contribution will be in a presentation form and will cover high level requirements.

14.25 – 14.50

**Title: Mobile Services evolution**

**Source: Nokia**

### **Abstract:**

The mobile phone evolves into the centre piece of personal life management, enabling complete personal connectivity. Imaging will fundamentally and forever change mobile communication by

enabling people to capture and share moments. Mobile services must comprise a natural migration path for fast market penetration and growth. Mobile service platforms must facilitate open competition and global deployment. Profitability throughout the value chain is best ensured by services that provide consumer delight.

When designing and delivering the mobile terminal services environment we are committed to

- Support next-generation WAP/XHTML mobile services
- Support legacy WML content
- Future-proof software and service roadmaps
- Maintain consistent user experience across handsets
- Maintain flexibility to meet market demands
- Solutions are developed for fast time-to-market
- Everything is billable - faster time-to-profit
- Based on open standards, API's, and protocols for
- Cost effective new services development and deployment
- Easy 3rd party product integration
- No license fees
- Early influence specifications
- Competition between suppliers

14.50 – 15.15

**Title: Evolution of the Services API**

**Source: Motorola**

**Abstract:**

In order to develop 3G services that are differentiated from 2G services it is going to be necessary to develop APIs that allow devices to be built that are extensible, supporting rich, dynamic, interactive content delivered by 3rd party content providers and developers. This presentation will examine software platforms suitable for meeting these objectives.

15.15 –15.40

**Title: Supporting QoS-enabled APIs in 3GPP UE**

**Source: Ericsson**

**Abstract:**

The current 3GPP Quality of Service (QoS) architecture identifies the User Equipment (UE), where the mobile application, the Internet Protocol bearer service manager (IP BSM) and the UMTS bearer service manager (UMTS BSM) reside. This layered architecture allows applications to request an IP bearer service from the underlying IP BS manager through an application programming interface (API).

It is expected that some wireless terminals will support open API's where the operating system provides an open interface through which applications may request a certain QoS. Such an open API must support a wide range of mobile applications in terms of traffic characteristics and requested QoS. Therefore, there is a need to define a set of API parameters that support the spectrum efficient operation of various applications in the wireless environment. For instance, applications running on a laptop equipped with a UMTS driver need to specify their QoS requirements such that QoS can be provided over the air interface in a spectrum efficient manner.

In this paper we study the QoS requirements of mobile applications and propose an initial set that is suitable for an open API.

15.40 – 16.05

**Title: IMS Evolution**

**Source: Ericsson**

**Abstract:**

Release 5 of IMS will provide the basic framework for packet based conversational services, where the SIP/SDP foundation is the basis from which a number of conversational multimedia services can be built. Since conversational multimedia is primarily about user experience, the evolution of IMS should clearly put user experience in focus. The fact that experiences are simultaneously shared - "in real-time" - is one of the features distinguishing it from other multimedia services, such as multimedia messaging and multimedia streaming. From a user's perspective, IMS should then provide natural extensions and enhancements to the multimedia services already offered.

For the 3GPP releases beyond R5, the studies and the work on basic services and on IMS should include the following two parts.

1. Enhancements and extensions to the basic services (e.g. browsing and streaming services). For the streaming service for example, this would include further enhancements to transport and new and enhanced media-types.
2. Extensions to IMS and to the basic services in order to make them useful in conversational IMS services. E.g. simultaneous sharing of a streaming session as part of a conversational multimedia session. The key aspects to address include those of sharing user experiences and data and maintaining session synchronization. The work should focus on making the basic services conversational without adversely impacting the efficiency or complexity of the individual services.

16.05 – 16.25 **Coffee**

### **3 Networks (RAN and CN)**

16.25 – 16.50

**Title: 3G Future Evolution and roadmap**

**Source: Hutchison 3G**

**Abstract:**

Whilst reviewing the existing 3GPP standards and considering the sort of service set that an operator may wish to offer now and in the future, it is clear that Release 5 offers a set of service capabilities that in some cases are isolated and that further releases should look closely at harmonising these service capabilities.

Release 5 has set the foundations for an all IP based mobile network but to offer the full set of capabilities offered from the PS and CS domain, the IMS must be enhanced to allow the eventual

phasing out of the CS domain whilst taking into account legacy issues.

The Hutchison3g presentation shows the broader 3G-service environment, looks at building upon existing service capabilities that will probably require architecture changes/improvements.

It is also noted that there are a number of complementary technologies that the standards may need to consider for integration within the 3GPP architecture. This presentation proposes an initial set of requirements for the Access and Core network and a vision for the long-term evolution of architectures and technologies for 3G mobiles.

These requirements are proposed for UMTS release 6 and beyond.

16.50 – 17.15

**Title: A Proposal for All IP End Architecture for UMTS**

**Source: Cisco Systems Inc**

**Abstract:**

In this presentation, Cisco Systems describes an evolutionary end architecture for the 3GPP UMTS Core Network and Radio Access Network. The architecture is based upon the following five fundamental principles:

1. All IP Radio Access and Core Networks
2. Separation of Control Planes and User Planes
3. Separation of Mobility and Call Control Functions
4. Distributed (Loosely Coupled) Architecture

5. Access Independent Core Network Many of these concepts have already been adopted at varying degrees into the existing UMTS Release 5 architecture. By adopting these principles to fullest extent, the UMTS architecture can be made universally adaptable and possibly future proof.

17.15 – 17.40

**Title: 3G Future Evolution and roadmap**

**Source: 3G.IP (presented by Frédéric Delmond, France Telecom)**

**Abstract:**

There are several ongoing efforts to define mobile network architectures that would enable fully IP based service delivery; i.e. data, voice and multimedia services over IP. 3GPP is currently specifying the UMTS Release 5, achieving migration from the initial 3G systems to enhanced IP-based capabilities in core network, with the introduction of the IMS (IP Multimedia Subsystem). These "All IP" network architectures are well positioned to converge with fixed internet standards defined at IETF, leading to an eventual network convergence between the various systems.

In this context, the 3G.IP has started the development of a roadmap for 3G evolution. Initially reusing the ITU concept of "family of systems", it is proposed to have a technology-inclusive approach, in order to allow the addition of new technologies, and to enable enhancements to the existing standards. The main benefit of such a roadmap is to understand and deal with the pace of technology change. The 3G roadmap is also opened to a wider context for 3G systems, showing how related access technologies can be complementary to 3G, rather than developed as a competitive option.

The 3G.IP presentation shows the broader 3G environment, the linking to complementary technologies and from this approach derives an initial set of requirements and a vision for the long

term evolution of architectures and technologies for 3G mobiles. These requirements are proposed for UMTS rel 6.

17.40 – 18.05

**Title: Evolution of the Network Infrastructure**

**Source: Motorola**

**Abstract:**

The current network thinking has evolved from the voice service dominant, circuit switched telecom networks of the past. As the networks have evolved the transport media within the network has embraced new packet based technologies ( e.g., ATM, IP) opening the way for improvements of capacity, efficiency, and availability.

While the transport media of the network has evolved, the manner in which this media is being utilized has not kept pace, basically retaining point to point approaches in an environment supportive of multi-point connectivity. There is great advantage possible in the future networks by making fuller use of the capabilities of the packet media, namely embracing IP networking capability throughout the network. This presentation shall highlight key issues for enabling the advantages of the IP network

18.05 – 18.30

**Title: NEC's vision on Evolution of CN and its New Interfaces**

**Source: NEC**

**Abstract:**

This presentation is intended to clarify the issues and limitations in packet services through current PS domain and propose a migration scenario to IMS based IP core network with new interfaces among the core network, RAN and external systems, such as ISPs or enterprise networks.

We consider that an introduction of solutions for the following two issues in the current PS domain promises to provide more attractive packet services to users;

- issue for transport performance
  - load concentration of GGSN
  - redundant route, especially between mobile terminals
  - unefficient multicast packet transfer
- architectural issue, that include barriers to introduce new features such as
  - radio interfaces to support new radio technologies and services, e.g. hot spot services with wireless LANs
  - service interfaces of cellular specific value-added information to the external systems.

In order to resolve the issues, we propose to define new core network architecture based on IMS and migration scenarios from the current PS domain to the new core network. The new core network can have IP based simple interfaces to support multiple radio systems such as UTRAN, GERAN, wireless LANs and so on. Moreover, we propose to define new service interfaces between the new core network and external systems to provide IP based services to users. Through the service interfaces, the cellular system operators can provide cellular specific value-added information, such as user locations, to the external systems. We believe that the service interfaces promise cellular system operators to enlarge their business chances.

18.30 – 18.55

**Title: Near-Term Issues in Standardisation after Rel-5**

**Source: Siemens**

**Abstract:**

The presentation identifies areas of future work that might become necessary after Rel-5 in order to improve the overall functionality, stability and performance of 3G networks. Specific issues include:

- improvements to the UMTS air-interface, including multiple antenna concepts,
- support of multimedia multicast and broadcast services,
- new functionalities in coding and transmission to improve multimedia services,
- improvements in 3G network's security infrastructure, including
  - End-to-end IP security for subscribers
  - Public Key Infrastructure for network elements.
- Automated Management for UMTS Based Networks via Policy Based Networks

18.55 – 19.20

**Title: RAN sharing**

**Source: Telia**

**Abstract:**

Many operators have spent a substantial amount of money on 3G licenses. In addition to that heavy investments are required to have the 3G networks installed. As a result of this the future success of 3G has been, to some extent, challenged. We believe that one instrument to alleviate the problem is to tear down the 2G concept of a one to one relation between core network and radio network. With standards that allows for many core networks to be connected to one UTRAN we open up for new ways of co operation in networks building that will largely lower the cost to be carried for each operator in building these networks.

Hence we think that continuation of the Iu-flex work in R5 towards a fully shared UTRAN is an important feature of R6.

**Friday 19<sup>th</sup> October 2001**

8.00 – 8.25

**Title: Future direction for the network architecture****Source: Nokia****Abstract:**

The cellular network faces more and more challenges all the time.

- The scarce spectrum should be utilized as efficiently as possible, which calls for a multiradio environment, including hot spot access utilizing unlicensed spectrum.
- Increasing traffic volume calls for optimization of the user plane in the packet core and RAN.
- Heterogeneous access technologies that users wish to use to access communication services may require a new approach in mobility management.
- This presentation discusses how the 3GPP System can evolve to meet these requirements.

8.25 – 8.50

**Title: Multi access****Source: Telia****Abstract:**

WLAN technology can supplement UMTS in deployment environments with high user density and demand for higher data rates. However, in order to provide flexible use of both technologies in these environments and to provide mobility of services between the two technologies it is important that some degree of interworking exists between the two technologies/systems.

Telia believe that we should, in R6, develop as far as possible the interworking between WLAN and UMTS. Such an interworking includes several pieces, e.g. security, mobility, QoS and charging. The interworking architecture should allow for different WLAN standards to interwork with UMTS.

08.50 – 09.15

**Title: Stand-alone data-cell for UMTS****Source: Nortel Networks****Abstract:**

In the development of new mobile systems, it is desirable to be able to deliver additional data service capacity economically in concentrated areas in a way that is compatible with the UTRA. The stand-alone data-cell concept is a means to allow operators to deliver data capacity as an increment to their existing Rel'99 networks. These stand-alone data-cells may be deployed where the "hot-spots" for advanced data services are desired (i.e. airport lounges, meeting rooms, convention centres, etc.). As a number of underlay cells may be placed within the main cell, the downlink capacity is multiplied by the number of added stand-alone data-cells.

These stand-alone data-cell can be based on different families of radio technologies so as to encompass a variety of operational and new spectrum allocation scenarios. All members of the family share inherent, cost-effective solutions for downlink data-intensive applications.

The first family member, called Node-S, homes in on existing (rel99) Node-B & RNC networks. No

frequency planning is necessary as the system provides automatic code/channel/sub-carrier assignment. The underlay cell supports downlink traffic only. This family member is particularly attractive if the data traffic flow is heavily biased toward the downlink.

Another family member adapts Wireless LAN technology, operated in licence or licence exempt spectrum, and is called Node-W. Economies of scale can be obtained by the re-use of popular WLAN standard (e.g. IEEE802.11), but with close integration with UTRA network and services. This family member is particularly attractive where flexibility for data traffic flows is desired.

This presentation outlines the Stand-Alone data-cell concept, its capabilities for advanced data services, the different architectures for its integration into the UMTS networks, and the advantages of such a system concept.

09.15 – 09.40

**Title: Evolution of Radio Networks and Technologies**

**Source: Joint Contribution of Members of the Vodafone Group**

**Abstract:**

A major step towards Mobile multimedia has been achieved by establishing UMTS into real live. Major effort has been spent on debugging and correcting the current UMTS Releases 99 and Release 4. UMTS Release 5 will be completed by March next year containing features improving the performance of UMTS.

Optimisation and evolution have to consider UMTS and GSM technologies. The goal is to reduce cost (operational as well as capital) and to increase revenues, while maintaining and improving the grade of service provided.

There is a need to focus on aligning the GSM and UMTS Radio Networks to provide the same services to the end users. There may be a need to examine and consider changes to the architecture although we favour enhancing current implementations. Open interfaces continue to be an important issue for operators.

An area of great interest is facilitation of common radio resource management. This is to allow an operator with GSM and UMTS Networks to utilise the available resource most efficiently. This may take into account the integration of Multiple Radio Access Technologies using common Layer 2 and 3 of the Air interface and may lead to Software Defined Radio.

In order to provide higher data rates with increased capacity while maintaining coverage higher chip rates like two times 3.84 Mcps or 4 times 3.84 Mcps are required in particular in the downlink when using UMTS extension band (2.5 – 2.69 GHz) in the future.

The aim of radio technology improvement shall be increasing bit rates (while maintaining coverage where possible) and reducing implementation and deployment costs. Furthermore roaming must continue to be facilitated.

Key words: Quality, inter-operability, radio resource management, multiple radio access technologies, software designed radio, higher chip rates, QoS mechanism, GPRS, UMTS.



09.40 – 10.00

**Title: Meeting the operators needs****Source: One 2 One Personal Communications Limited****Abstract**

It is envisaged that additional spectrum will be allocated for UMTS some time in the future to cater for the growth of traffic resulting from the take up of the innovative services that 3G will make available to the general public. Due to the uncertainties in forecasting the the traffic balance and the urgency of taking a decision on the use of the expansion spectrum it is felt beneficial to study as part of the UTRAN evolution mechanism that allow the maximum possible flexibility in allocating spectrum resources. Tools that make this possible may include (but are not limited to) dynamic modulation schemes, software defined radio techniques, variable duplexing capabilities.

In line with the principle of overcoming with technical solutions the constrains imposed by regulations on spectrum utilisation and allocation network sharing in all its aspects (including for example spectrum pooling) should be given high priority in the coming specification releases. An advanced network sharing, as well as the coexistence of multiple access networks and technologies is likely to bring to the surface all the problems with the current mobility management that will need radical improvements.

Finally, in a multiple access network the concept of load sharing becomes more and more important.

10.00 – 10.20 **Coffee****4 Radio Technologies**

10.20 – 10.45

**Title: Direction of Future Evolution****Source : Fujitsu****Abstract:**

There exists strong demands for more high speed communication under various circumstance. Candidate radio access technologies for this demand are OFDM technology and WLAN technonogy. In this presentation, we investigate how to incorporate new radio technology to the existing UMTS system.

10.45 – 11.10

**Title: 3GPP Radio Evolution - GERAN and UTRAN****Source: Nokia****Abstract:**

Both UTRAN and GERAN radio interface improvements are covered, concentrating on those elements that are common in UTRAN and GERAN. Common development requires common feature and release timing, specifically with features that impact e.g. number of antennas to be used. Also GERAN specific datarate improvements to allow the same service offering in GERAN downlink as with UTRAN is covered. For UTRAN specifically the further steps with packet data developments and UMTS new band, such as 2.5 GHz, are covered. Further potential steps for UTRAN TDD evolution are outlined.

11.10 – 11.35

**Title: Evolution of the WCDMA - High Speed Uplink Access****Source: Ericsson****Abstract:**

Presently release 99 and release 4 of WCDMA technology is designed to handle up to 384kbps wide area coverage for both uplink and downlink with competitive capacity. Furthermore, the flexibility of the radio interface makes it very well suited for simultaneous services and multimedia.

The release 5 work on high speed downlink packet access will improve the capacity of higher bitrates on the downlink. Furthermore, the round trip time will decrease due to the short transmission time interval and fast retransmissions from the Node B. This fact is important since the round trip time is an essential component of the internet congestion control mechanism. Hence, HSDPA will improve the end to end performance of applications running over internet.

However, it is not only the downlink that affects the round trip time, the uplink adds also significant delays, especially if RLC AM is used. Hence, it is essential to also look at improvements of the uplink in order to decrease delays, and at the same time and increase the bitrate and coverage.

Similar technologies as for HSDPA can be applied on the UL. E.g. higher order modulation, hybrid ARQ, and fast scheduling. Of course, the solution cannot be exactly the same since the UL have additional requirements compared to the downlink, e.g. soft handover situations need to be handled. Additionally, a faster access to the radio resources would decrease round trip times as well as increase capacity. Therefore it is important to study and develop a High Speed Uplink Access concept.

11.35 – 12.00

**Title: Spectrum efficiency****Source: Telia****Abstract:**

R6 and R7 features can be expected to be implemented and commercially available at the earliest around 2005, and it will take even more time before terminal modifications are spread throughout terminal fleets.

In the meanwhile we expect a very large growth of new 3G services. We also expect a very substantial growth in mobile voice telephony, at the expense of fixed telephony.

Further more, we note an increasing difficulty in finding new spectrum.

As a consequence, we foresee a lack of capacity in the not so far future.

It will therefore be necessary to introduce a new generation of more spectrum effective R6/R7 terminals on the market.

A number of different technologies are possible to this end, e.g.

- CPICH cancellation
- Dual receivers replacing compressed mode
- Low rate speech codec
- MIMO

- MUD

We propose that 3GPP take an overall view on this issue. 3GPP should set requirements on increased spectrum efficiency. Different technologies should be evaluated in terms of capacity gain, terminal complexity and network impacts, and new requirements on terminals should be defined.

12.00 – 13.00 **Lunch**

13.00 – 13.25

**Title: Optimization of IMS bearers in GERAN**

**Source: Ericsson**

**Abstract:**

With the introduction of the IP Multimedia Subsystem (IMS) in UMTS; multimedia services built on standard internet applications are enabled in 3G wireless networks. This is achieved by using service independent bearers and conforming to existing IETF standards as far as possible.

At the same time GERAN is being aligned to the UMTS way of handling bearers and quality of service in order to support the same type of IMS services as UTRAN.

However, since GERAN is not currently able to adopt its bearers with the same granularity as UTRAN, some IMS services may not be transported in the most efficient manner over the radio interface. As an example, Robust Header Compression (ROHC) is used to compress the overhead caused by the IP headers. Since the compressed IP header may vary in size it is not possible to use a tailored bearer designed for a specific service. Instead a generic bearer has to be used.

Two options exist in Rel-5 of the standard. Either a bearer using ECSD type of coding schemes (designed for streaming services by having long interleaving and low overhead) or a classical EGPRS type of bearer may be applied. Some services, typically in the conversational class, requires lower delay than the streaming services, therefore the ECSD type of channel coding may not be suitable. On the other hand, the EGPRS type of channel coding is not optimized for conversational services.

One service which has been studied in detail is speech. In [1] it is shown that carrying VoIP on a generic EGPRS bearer in GERAN can cost more than 5 dB in link performance compared to traditional circuit switched speech.

In view of the shortcomings of the existing bearers, all multimedia services that are expected within the scope of IMS (e.g. voice, video etc, see [2]) should be studied from a performance point of view in GERAN. If improvements are found that can be motivated in terms of gains and cost they could be considered for GERAN future releases.

References:

[1] ETSI SMG2, Tdoc 1656/99, "Link performance of GERAN bearers", Ericsson.

[2] 3GPP TR 22.941 v0.4.1 "IP Based Multimedia Services Framework, Stage 0", (Release 5).

13.25 – 13.50

**Title: Adaptive Antennas in Evolving IMT-2000 and Complementary Systems**

**Source: ArrayComm**

**Abstract:**

This presentation describes the status of adaptive antenna technology, showing that it offers now a

mature base that may advantageously be exploited for evolving mobile systems. The improved spectrum efficiencies are noteworthy for both FDD and TDD situations, although it is shown how there is greater affinity for the latter case. Examples of deployed systems are explained as applied to existing 2G systems, for which the demonstrated spectrum and performance advantages are obtained whilst maintaining strictest adherence to the corresponding standards. For the evolution of IMT-2000 and systems beyond, we describe those areas which need addressing to ensure that FDD and/or TDD standards may be further enhanced. The timescale to achieve this is significantly shorter than those involved in some aspects currently being studied for more advanced MIMO approaches. We describe how the next generation of terminals will incorporate adaptive technology, despite the non-trivial design restraints on size and cost. Finally we indicate how a somewhat more innovative but realistic adjustment to overall system architecture can lead to dramatically better capacity, speed and coverage improvements through use of the core adaptive antenna technology. This approach is particularly suited to accommodate asymmetric traffic at the level and greater speed now anticipated, but without changes to basic spectrum arrangements.

Key words: adaptive, antenna, spectrum

## **5 Summary**

14.00 – 15.55 Summary discussion

16.00 Close of workshop