

**Agenda Item:** 8.3 - Iu interface  
**Source:** Telia  
**Title:** A fully IP based Iu interface for the packet domain  
**Document for:** ZZ.11 "Description of Iu interface"

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## 1. Introduction

The realisation of the Iu reference point using 2 Iu instances, one for the circuit switched domain and one for the packet domain, has been discussed elsewhere, see e.g. [1]. This contribution discusses the Iu for the packet domain, and proposes an Iu protocol architecture, which could be used for further refinements.

## 2. The Iu for the packet domain

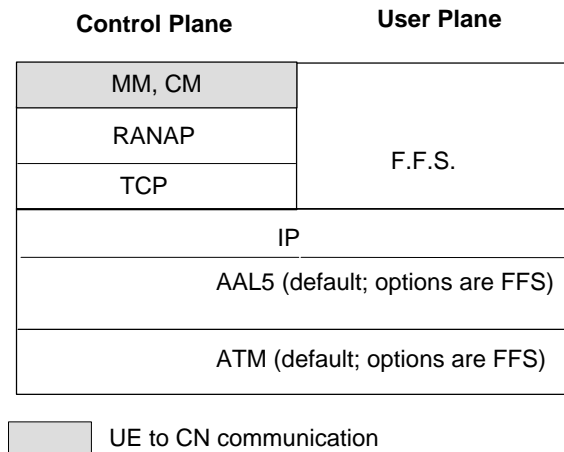
UMTS shall be used in many years ahead, during a time frame when many advances in datacom technologies will be introduced. Therefore, a future proof design of Iu is imperative. The IP protocol suite has gained an overall acceptance and is the main technology today and in the future for the provision of services, both realtime and non-realtime. Several contributions in SMG12 and SMG2 have also proposed to use IP as a transport layer over the Iu interface.

One of the advantages with IP is its ability to be transported by many different technologies (e.g. ATM, Frame Relay etc.). In order to benefit from the rapid development of transport technologies, there is no need to specify the lower layers (L1 and L2) when IP is used. IETF specifications already exist for the mapping of IP to transport layers such as ATM, Frame Relay, Ethernet, PPP, and the development continues in a fast pace. This will allow the operator to choose L1-L2 technology freely, depending on the requirement from the operator itself and its customers.

If IP is selected as a bearer for the user plane, also the control plane should use IP as a bearer, otherwise no major gains are achieved. If e.g. ATM is standardised as L1 and L2 for the control plane, in practice the L1-L2 for the user plane is then also standardised since using two different transport technologies on the same interface is not feasible. See e.g. [2] for a detailed discussion on the suitability of IP in the control plane.

Using IP as a bearer for both the user and control planes may also be beneficial in relation to company UMTS access. The company may use off-the-shelf IP equipment, and the attachment to the core network is much simplified.

RANAP needs to be specified with a generic interface to the lower layers in order to support TCP (or UDP) transport for packet domain and perhaps SS7 transport for the circuit domain.



**Figure 1:** Proposed Iu protocol stack for the packet domain: Control Plane (left), and User Plane (right).

The proposed architecture is summarised in Figure 1. The protocols above the IP layer in the user plane is for further study.

To conclude, IP is seen as the basic building block for the Iu in the packet domain. Using IP, there is no need to freeze the choices of L1 and L2. Instead, one can benefit from the rapid development of transport technologies, at least for future UMTS releases (beyond phase I). This requires however that IP is used both in the user and control planes, which may also simplify the deployment, e.g. in business environments.

### 3. Proposal

1. The current “working assumption” to use SS7 as the signalling bearer for RANAP is abandoned. The figure and text on SS7 in 9.3.3 in ZZ.11 ‘Description of Iu interface’ is removed. A figure corresponding to the left hand part of Figure 1 above is inserted instead. The appropriate text on TCP, IP, AAL5, and ATM is added accordingly (see e.g. previous SMG2-ARC contributions). The text in paragraph 9.3.3 should include the following:
  - Signalling in the control plane shall not depend on the specific choice of transport layers, e.g. ATM and AAL5, below the IP layer.
  - ATM and AAL5 shall be supported as the default L1 and L2 transport layers. Other transport layers are allowed as options in the standard.
2. A figure for the user plane in the packet domain corresponding to the right hand part of Fig. 1 is included in ZZ.11 ‘Description of Iu interface’, ch. 11. (Text also to be inserted; not provided here.)

### References

- [1] SMG12 Tdoc C-99-145 “Iu Reference Point Realisation (23.20)”
- [2] SMG2-ARC Tdoc 359/98 “Some Facts About TCP/IP relating to Iu, Iur and Iub”, Motorola.