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Source: Nokia

Agenda Item: M3UA/SUA

M3UA/SUA discussion paper

Background

It has been discussed extensively in TSG RAN WG3 whether to have M3UA or SUA as adaptation layer protocol with IP-Transport in Rel'5. This paper provided a brief recap on the pros and cons of using SUA as also discussed in the joint TSG RAN WG3/TSG CN WG4 Ad Hoc in Helsinki. The intention of this contribution is not to repeat the full story of the argumentation for SUA but only address the the pros and cons of SUA shortly to serve the audience not having the pleasure to participate the in the discussion earlier.

SUA Pros

+ With elimination of SCCP there is one protocol less to be implemented in the UMTS all-IP node. It reduces the complexity of the network node (implementation&management) and therefore is expected to bring cost savings.

+ With SCCP/M3UA, the Signalling Point (i.e., node) is required to support different variants of SCCP if it has to inter-operate with different national systems. This problem is greatly reduced with SUA as there is no SCCP nor MTP-3 involved there.

+ SUA allows the IP network to route the signalling messages. This is an advantage of SUA (routed) over M3UA (Point to Point), especially so in the all-IP scenario as M3UA needs to be routed on Point Codes, while SUA messages can be routed using IP addresses.

+ SUA allows the message routing using Global Titles without involvement of Point Codes, while still allowing the use of Point Codes if needed for some

reason. It is to be noted that the involved Application Protocols (SCCP Users) do not need Point Codes but PCs are there because of MTP-3.

+ SUA provides better scalability and flexibility for signalling network implementation in wide-scale deployments compared to M3UA. M3UA overlays a hop-by-hop, connectionless protocol mechanism over an end-to-end, connection-oriented protocol (SCTP/IP). The result of this leads to flexibility and scalability issues.

+ The powerful end-to-end addressing and routing capability of SUA reduces the signalling transfer latency.

+ The M3UA nodes need to be addressed by Point Codes at M3UA layer and by IP addresses at IP layer. With SUA each IP node may not consume scarce Point Code resources in all-IP case. Additionally, in the all-IP network, the network operators are not required to allocate, assign and administer Point Codes to network nodes. This is expected to bring cost savings.

+ There are some function redundancies in SCCP/M3UA/SCTP stack, e.g. message segmentation and reassembling mechanism are specified at both SCTP layer and SCCP layer. SUA removes some of the functional redundancies, thus better utilizing network and processing resources.

SUA Cons

- SUA does not support MTP3-User protocols such as BICC. It is to be noted that in UTRAN there are no MTP3-User protocols. In Rel5 CN there are at least two alternatives for BICC, one is to use M3UA/SCTP and the other is to use STC_{SCTP}/SCTP.

- Interworking between SUA and SCCP/M3UA needs to be introduced. Between an operator who has deployed an M3UA-only network and an operator who has deployed an SUA-only network, interworking can be done via the Signaling Gateways that are used to interwork with the legacy SS7 network (non-IP). Alternatively, the SUA operator should provide the means to interwork. Note: Generally a UTRAN is a single operator environment while in CN the multi-operator aspect needs to be taken into account.

- Some operators may wish to use common principles for network planning, network management and network operation as for the MTP network. However, it has yet to be shown that administering an M3UA/SCTP/IP network would be similar to an MTP3 network.

Neutral

+- For point-to-point links, M3UA allows for IP routing between the signalling endpoints, as does SUA.

Conclusion: SUA has a significant benefit (cost, efficiency and operability) over M3UA. In heterogenous environment the backwards compatibility of SUA towards interfaces based on earlier releases need to be provided in a Signalling Gateway which is needed in UMTS irrespective of SUA. Note that as the SG functionality of SUA towards SCCP has been defined as part of SUA, this aspect cannot be considered a significant drawback.

The conclusions are even stronger when considering the evolution aspect of IP transport in UMTS beyond Rel5.

To facilitate the compromise in case there are still strong requirements to go for M3UA for some reasons, then Nokia is willing to consider still the compromise proposal (both M3UA and SUA adopted) made in the Ad Hoc in Helsinki, but from pure technical point of view, SUA is prefered and could be adopted also as the only solution if reducing the number of options is the key requirement.

For further details please refer to the Ad Hoc contributions.