Charging Requirements for UMTS Packet -Switched Data Services

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Abstract

Why do we need new charging mechanisms? Packet-Switched services do not require a dedicated path for the duration of the call. Instead, they rely on a virtual connection with the network setting up a real connection only when there is data to be sent/received, and then dropping the connection until more data is ready to be transmitted or received. As a result, network resources are used only when packets are in transmission, and there is thus no clear notion of "the duration of a call". Hence, users may no longer wish to be charged in the traditional duration-based manner. Besides, in contrast to today's dedicated networks, (e.g. PSTN, Frame Relay and even GSM) which carry a single application type at a fixed duration-based price, General Packet Radio Service (GPRS) and UMTS are **multi-service** networks. These require flexible pricing models, where price is a function of data volume, QoS provisioned, packet content, etc. For example, voice and video data is more or less continuous, thus requiring network resources more or less for the entire duration of its transfer. Consequently, we can expect voice and video to have a flat per-minute rate, whereas other services, such as, Resource (e.g. file) Access and fax/email applications may be charged on a volume basis, i.e. charged per MB of data transferred. Moreover, voice and video applications require bi-directional latency and bandwidth guarantees, whereas Resource Access and fax/email applications do not have the latency constraint, but may require significant bandwidth depending on the resource being accessed. Hence, QoS plays a significant role in most new charging mechanisms. In other words, a flexible charging mechanism capable of measuring and rating services under various usage-based metrics is paramount.

Due to the packet-based nature of the underlying network technology, these services require novel charging mechanisms, which in turn require extensive data-extraction from various network service elements. This document is not intended to be a technical specification sufficient for practical implementation of network-usage data extraction among service elements participating in the delivery of UMTS IP-based services. Such a technical specification is left to standards bodies and associations like 3GPP, IPDR.org GBA etc. Instead, it is intended to highlight the possible mechanisms that may be implemented for charging UMTS services. It also identifies the network requirements, the limitations and more importantly the possibilities these new charging schemes open up for Mobile Network Operators also known as PLMN operators. Some of these possibilities include additional revenue streams like acquisition of financial transactions, as opposed to solely being a voice/data 'carrier provider', as is the case with traditional PLMN operators. The project involved lots of information gathering from the Internet, technical papers, magazines and suppliers. It also required a need to work with people from across BT, Adastral Park to determine their views on how technology will affect the future user experience, and hence, future charging schemes for packet based services.

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