IP Multimedia Subsystem Billing

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Abstract - **In this paper is given the way of working of IMS Billing.**

Keywords - **IMS, charging, billing.**

I. INTRODUCTION

IMS has stimulated shifts in operational modes. The single tier, relatively simple voice service operation mode has gradually evolved into a complex multi-service system that is centralized around data services and is moving increasingly toward multimedia, multi-operations and customization. Consequently, the impact on billing systems has been significant.

II. THE IMS BILLING SYSTEM

Integrated voice, data and video services increase demands on charging modes. The IMS billing system for real-time charging should support both online (OCS) and offline charging. OCS requires real-time interaction between IMS entities and the billing system, and the OCS interacts with users' accounts in real-time to control or monitor service-related charges. Offline charging collects charging information after a session has been completed, which does not affect the service process.

Online charging can be classified into two modes: IEC (Immediate Event Charging) and ECUR (Event Charging with Unit Reservation). If individual event rates can be clearly defined, IEC is adopted. In case when you download music, the system directly deducts charges from user's account and authorizes the MRFC (Media Resource Function Controller) and AS to provide the given user with requested services. During charging or traffic sessions, the ECUR mode is always adopted, and the same charging authorization process is adopted as with IEC. If the cost of communicating a particular service exceeds monies deducted, the system deducts the balance. After communication is completed, the system immediately credits any surplus monies to the user's account.

According to the particular charging mode, online charging can be further classified into 3 modes Fig. 1: ECF, SCF and BCF. These work in the following ways:

ECF (Event Charging Function): AS and MGFC transmit a charging request to the ECF via Ro interface with Diameter protocol. The ECF deducts a given amount from the user's account and sends a charging response.

SCF (Session Charging Function): the request flows from the S-CSCF to the ISC interface with SIP protocol, reserves a certain amount in the user's account, sends the charging response and controls session establishment.

BCF (Bearer Charging Function): SGSN and GGSN use CAP (unified to Diameter in R7) to send a charging request to the BCF. The BCF reserves a certain amount in a user's account, sends the charging response and controls the establishment of IP flows.

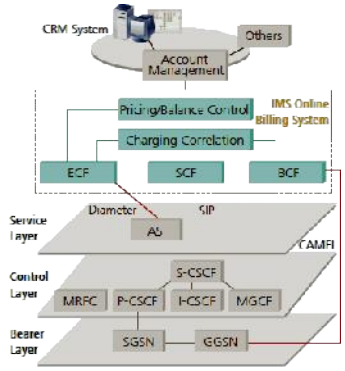

Fig.1 Online charging

The core of the offline billing system Fig. 2 includes CCF (Charging Collection Function) and CGF (Charging Gateway Function). The CCF receives charging information from IMS entities, which it pre-processes. For example, it correlates, combines and filters unnecessary CDRs and adds carrier information to received charging information. Then it builds up the real CDR and sends it to the billing system in text format. The CCF provides the CDR cache function. The CGF possesses the same functions as the CCF, but the CGF only receives valid CDRs from the SGSN and GGSN. Offline billing executes CDR pricing, account processing and account management.

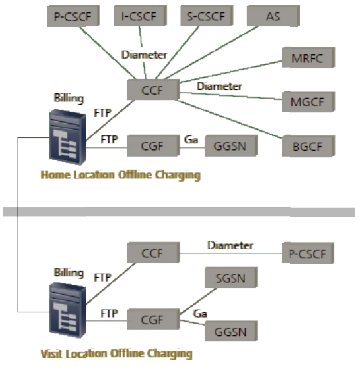

Fig.2 Offline charging

III. CONCLUSION

With online or offline charging, the most complex issues relate to charging correlation, checks and reductions.

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