Need for Federated Accounting

The increasing reliance of commercial activities on Internet-based services highlights a greater emphasis on the need for comprehensive, correct and prompt billing. Service Providers currently operate in a highly competitive environment.

Only by billing promptly and profitably will they be able to generate revenues to survive in the future environment. Customers require billing to be correct, informative to the level of detail that they desire and delivered in the format that they have requested. Customers also require consolidated billing whereby charging information for multiple services are aggregated into a single bill.

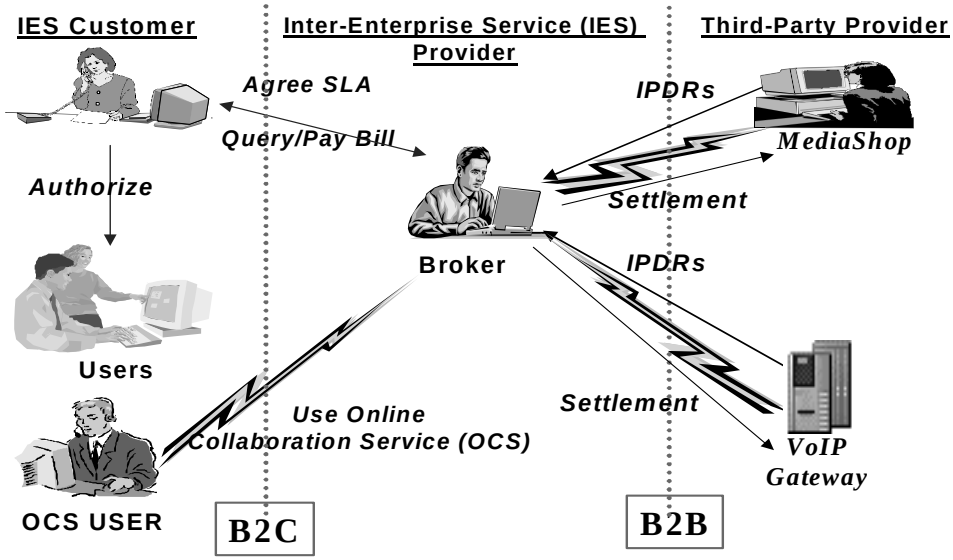
The proliferation of new services and service providers exposes the requirement for new relationships between service providers, who often need to cooperate in providing services to customers. Cooperating service providers in any one value chain need to exchange accurate charging information so that they can obtain the revenues due from the end customers, who provide the economic justification for the whole value chain. The accounting and billing system must provide service providers with a mechanism for sharing accounting information, generating and auditing revenues.

Objectives

The main objective is to build an architecture for a federated accounting management system that:

- Addresses a viable business model of customer support and inter-service-provider charge settlements.
- Addresses the essential management business processes and scenarios in which customers and service providers engage.
- Uses best practice development methodology.
- Is based on key industry and international standards.

Business Activities



Federated Accounting Management in FORM

The diagram above shows the business environment for which FORM is developing solutions. The Inter-Enterprise Service Provider (IESP) ensures that the customer has access to a variety of services that it needs and that are provided by a variety of service providers.

The IESP, as the customer-facing service provider, is responsible for the order handling, SLA and tariff negotiation, customer care and accounting aspects of the services offered to the customer by the IESP's partners in the value chain.

The service providers in the FORM scenario must be able to account for service usage and charge accordingly.

These details are then sent to the IESP, who incorporates the various inputs by means of rating processes and provides a consolidated bill to the end customer. In order for interaction to occur between the service providers, a standard information schema and a set of standard interfaces, that all parties can support, are required. FORM has adopted the IPDR Master schema as the basis for its information model and has enhanced it to meet accounting management requirements.

Key Functionality Requirements

The federated accounting work addresses the following functionality requirements:

- Capability to deal with complexity in usage-based charging and real-time response levels.
- Support for convergence of services.
- Adaptable federated service mediation facility.
- Support for a variety of OSS and service value chain.
- Charge aggregation of composed services.
- Automated inter SP domain accounting and settlement.
- Interaction with legacy billing systems.
- Increased demand for guaranteed QoS and related discounting.
- Rapid service deployment.

FORM Open Development Framework (ODF)

The federated accounting management is based on the following **FORM ODF** guidelines:

Logical Architecture: Used for an abstract description of the Framework users and a meta-model integrating various structural elements.

Development Methodology Guidelines: Used for the construction of Billing management components (called Building Blocks in FORM) and for the implementation of Billing management business processes.

Technology Architecture: As a guide to bind technologies to the elements of the Billing logical architecture.

Reusable elements: These are specification and software items that conform to the logical and technology architecture, and methodology.

Federated Accounting (FOKUS&WIT)

FORM

Key Technologies

The following technologies have been used for the implementation.

- **Java and EJB** make architecture components highly portable.
- **XML/WSDL** allows service providers to deploy accounting components as Web-services and seamlessly exchange accounting information.
- **Oracle** enables direct mapping of IPDR structures (XML documents) onto database tables.
- **SOAP** enables tighter binding of IPDR documents and HTTP when exchanging them over the internet.
- **OSP** is a service subscription and access management. It is based on TSAS (Telecommunications Service Access and Subscription).

Achievements

Billing Management Business Process

- Based on industry guidelines (TMForum and IPDR).
- Specified using technology-neutral methodology and UML.
- Orientated towards eBusiness service market.

Information Model

- An extended accounting information model, harnessing the power of XML (based on IPDR organisation specification).

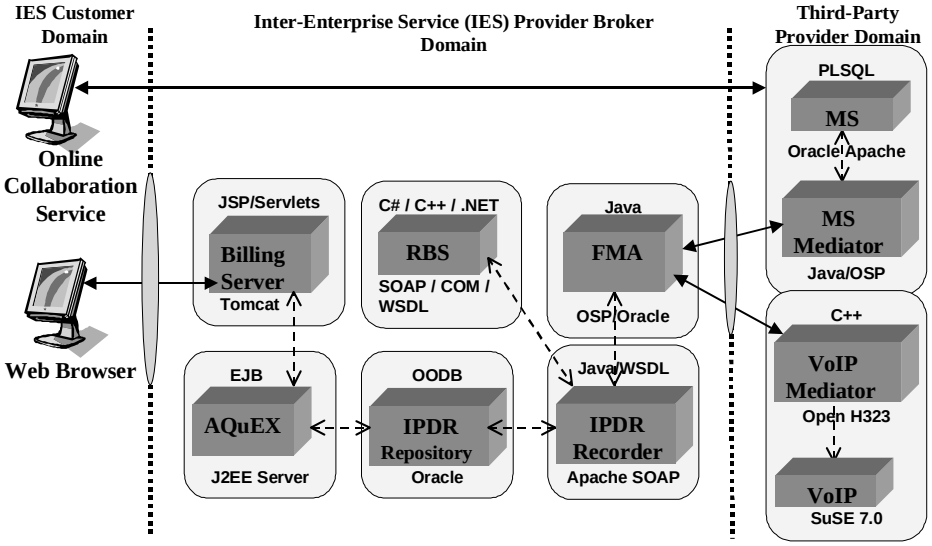
Architecture

- Adaptable and composed of reusable building blocks.
- Enables process automation for key billing management activities.
- Support for service value chain and charge settlement.
- Real-time and usage-by-usage service mediation.
- Support for federated mediation in a multiple service provider environment.
- Support for rating of composite services and charge settlement.
- The use of differential tariffs and support for QoS and SLA.
- Online query and access to service charges.

Dissemination

Please see a separate entry below.

Federated Accounting System Architecture



- **Online Collaboration Service** is composed of two services: VoIP (Voice over IP) and MS (MediaShop).
- **Federated Mediation Adaptor**: It aggregates E-IPDR documents sent by two Mediation Adaptors (Mediator) working for MS and VoIP.
- **IPDR Recorder and Repository**: Accumulate and store incoming E-IPDR documents in a database and send them to RBS on demand.
- **Rating Bureau Service (RBS)**: It extracts usage data from E-IPDR documents, applies tariffs, and calculates charges and does charge settlement among several SPs.
- **Billing Server** receives customer queries on charges and forwards them to **AQuEX** , which returns the query reply.

Dissemination

- **TMForum** TMWorld Conference (Nice, France) May 2001.
- **OMG**: Contribution to Distributed Accounting Facility RFP.
- **IRTF AAA WG** meeting (Berlin, Germany) Sept 2000.
- **IM 2001** (Seattle, USA) May 2001.
- **IT&T TECNET** (Athlone, Ireland) Sept 2001.
- **LA NOMS** (Brazil) Sept 2001.

Please contact FOKUS or WIT for disseminated papers and presentations.

Future Plans

FOKUS and WIT plan to continue the federated accounting work in the following areas:

- Convergence of services, UMTS and 3G services
- Use of ebXML for federated accounting. management business process.
- Generic approach to aggregated services mediation.
- Web service technologies (XSLT, WSDL, SOAP).
- Enhanced accounting information models.
- Support for QoS and charge settlement.
- Support for guaranteed delivery of IPDR records.

FORM results will be reused for the investigation into these areas in the context of IST Project AlbatrOSS.

Information and Contacts

Further information on the federated accounting work being undertaken in FORM is available at:

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