Chapter III
Semantic Integration for B2B Service Assurance

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ABSTRACT

This chapter describes an approach to support operational support system (OSS) integration across organisation boundaries. The requirement for such business-to-business (B2B) interfaces is expected to increase as is the need to carry out integration in much more flexible way. Existing approaches for integration tend to be implementation specific, operate at the syntactic level and are realised by programme code. Consequently they are inflexible due to their highly coupled nature and are costly to setup and maintain. An approach to decouple B2B interfaces is introduced, which allows them to be flexibly coupled as required with the use of scalable, semantic mediation. An initial prototype is described based on an Assurance Integration scenario for BT Wholesale’s B2B gateway.

CURRENT SITUATION

The number of companies in the telecommunications industry has increased rapidly in recent years. The industry has been transformed by changes in regulation and the emergence of the Internet and mobile technologies. The days of one organisation providing end-to-end services to customers are gone. Supply chains now involve many players of differing size and function. Companies now need to efficiently provide service fulfillment, assurance and billing across organisational boundaries (Evans et al., 2002). The problem is exacerbated by today’s fast moving market and dynamic business-to-business (B2B) relationships. Getting a new service to market quickly involves close integration of data with existing and new partners. The integration of heterogeneous
operational support systems (OSS) of all parties is crucial. However, this can be a costly process. A Forrester survey (Koetzle et al., 2001) found that average annual spending on integration by the top 3500 global companies was $6.3 million and 31% was spent on integrating with external trading partners. In the telecommunications sector, costs of OSS integration can rise to 70% of the total OSS budget (McKenna, 2002).

Like many companies, BT is transforming its systems with the adoption of a service orientated architecture (SOA) (Strang, 2005) which can be defined as a system in which resources are made available to other participants in the network as independent services that are accessed in a standardized way – allowing more flexible, loose coupling of resources than in traditional systems architectures. The business goals are to increase speed to market (organisational agility), to reduce overall IT costs (through greater reuse and reduced integration costs), to improve the alignment of IT with the business, but also to differentiate themselves in their customer service (e.g. through improved responsiveness, leaner/faster support processes, quicker delivery, etc.). SOA components can be exposed to business partners allowing service-chains to be developed across organisational boundaries.

BT Wholesale’s B2B Gateway is provided to Internet Service Providers (ISPs) to allow them to integrate their own operational support systems with those of BT. Without such a system the ISP would either need to manually coordinate with BT via a BT contact centre or operate a system separate to its own OSS that communicated with BT’s – thus requiring information to be entered twice.

The B2B Gateway exposes an interface whose behaviour is a combination of transport technologies such as SOAP, security protocols such as SSL, messaging middleware such as ebXML and the process behaviour of back end systems. Messages formats are expressed using XML Schema (XSD) which has the advantage of availability of tools and the increased possibility of integrating with newer transport standards such as Web Services.

The Gateway currently exposes a number of interfaces concerned with service fulfilment and assurance. These are generally concerned with regulated services. The interfaces allow Service Providers to manage faults (i.e. raise and manage faults, request, confirm and cancel repair appointments and receive status fault status notifications) and carry out diagnostics (i.e. request tests and handle the response to these).

Currently the process involved in granting access to the Gateway for a new service provider is lengthy and complex. It commences with a communication phase where partners assess their technical suitability, receive documentation and consider the level of fit with their existing OSS. A development phase follows this during which support is provided by BT. During the testing phase, the partner is given access to a test environment provided by BT where they can test the validity of their messages and their transport and security mechanisms. Firewalls, proxies, etc. must be configured by both parties to ensure that communication can occur. Once the testing phase is complete and documented the partner can move to a pilot phase where terms must first be agreed regarding volumes, frequency and support arrangements before access is given to the live system. Transactions are monitored during the pilot phase to ensure validity.

Problem Statement

The process described in the previous section can take several months from start to finish. One of the major issues is the level of manual effort required firstly to interpret the documentation and secondly to generate adaptation software that allows the systems of the parties involved to interoperate. Related to this are the inherent disconnect between the documentation and the XML descriptions of the interfaces. An approach that
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