



[www.pipelinepub.com](http://www.pipelinepub.com) Volume 4, Issue 8

## **SOA-Based Communications Service Delivery – Ready for Prime Time?**

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### **Introduction**

Today, service providers are undergoing wrenching change. The widespread adoption of IP and the Internet, and the resulting commoditization of voice revenues – the traditional mainstay of service providers' business – are turning traditional business models upside down. At the same time, the increasing availability of network-agnostic, over-the-top services from new-generation, Internet-only service providers demonstrates that innovation and revenue-generating services are far from dead. To the contrary, the current era will most likely be recognized as a time when communications became truly democratized, more personal and more ubiquitous than ever before.

Fortunately, the same approaches that have enabled new-generation service providers to succeed on the Web can also make it possible for traditional service providers to innovate rapidly and bring new services to market without sacrificing their traditional DNA around scale, mission-criticality, and service availability. Service oriented architecture (SOA)-based design of next-generation network capabilities provides a blueprint for such innovation, enabling providers to quickly and accurately deliver next-generation services and deliver a better, more personalized communications experience.

### **Evolution of SOA**

The emergence of SOA concepts has been a major driver of enterprise architecture evolution over the last decade. SOA principles of loose coupling, separation of concerns (e.g., component logic from orchestration logic) and standards compliance have allowed enterprises to be more agile and adaptive to change brought by the Internet. By enabling component reuse and rapid service assembly, SOA has enabled enterprises to greatly improve IT productivity.

As SOA adoption has become mainstream, communications providers are increasingly looking to SOA-based approaches to next generation service delivery. Standards-based service delivery platforms (SDPs) built on Internet-technology standards – such as Java Platform Enterprise Edition (Java EE) – are leading the way. As its name suggests, the SDP is the horizontal platform that forms the basis

for development, deployment, execution, and management of next-generation services in a telecommunications environment. In the context of a communications provider, the SOA design principles remain the same as in the enterprise environment with some subtle enhancements and variations. In particular:

- **Loose coupling:** Providers can benefit from the ability to expose network capabilities through components such as Enablers – as defined by the Open Mobile Alliance (OMA) – that allow specific capabilities of the underlying network to be exposed using standard interfaces. Client applications can make use of these capabilities without being tightly coupled to a particular implementation or a particular underlying network protocol.
- **Standards compliance:** By developing network capabilities and other application components through standard interfaces, and by making use of standards such as Web services and Business Process Execution Language (BPEL), it is possible to leverage development tools and methodologies that the Internet community has matured over the last decade. Ultimately, standards compliance leads to vendor independence, application portability, and lower costs.
- **Separation of concerns:** By separating concepts, such as policy enforcement or service composition, from the underlying service, it is possible to evolve a service behavior without having to rewrite a service. At the same time, service assembly as a separate task from service development becomes possible, opening up the world of service delivery to a much wider development talent pool.



### How SOA Can Help

As service providers look to innovate ever faster and bring to market new services that combine unique capabilities, such as location or presence, with next generation data services, a SOA-based approach can help in at least three different ways:

- **More services, faster:** Proper usage of SOA principles allows for the exposure of network capabilities (such as location or presence or the ability to make a phone call) and new services through standard interfaces such as Web services. This in turn allows providers to build composite services by

leveraging a (large) repository of pre-existing services quickly and easily. Sophisticated and easy-to-use service assembly tools make it possible for mere mortal developers and business analysts to build new services without going through extensive, labor-intensive, multi-stage requirement phases. This allows a service provider to bring new services to market faster and respond quickly to service adoption in the marketplace – an ability that is invaluable in today’s fiercely competitive communications industry. Further, the reduction in service development time makes it possible for a service provider to address the long tail, where even if a service is relevant to only a fraction of the service provider customer base, it can still be profitable to provide such a service.

- **Protecting the network:** Interestingly, exposing network capabilities through standard interfaces (e.g., Web services) allows a network operator or service provider to make use of the full set of SOA capabilities for policy enforcement. For example, once the location information of a mobile subscriber has been exposed through Web services interfaces, it is possible to define authorization policies that regulate who can consume the location information. Similarly, providers can enforce load-balancing or service level agreements through declarative policies that are defined (and enforced) separately from the underlying capability itself. This separation of the policies from the underlying capability allows providers to adapt the usage of the service in response to customer usage or business requirements, without needing to re-implement the underlying service. Finally, policy enforcement at the service layer can make use of detailed subscriber profile information (usually not available at the network protocol layer) and provide a highly custom, personalized service experience to every user.
- **Rapid monetization:** Finally, SOA principles can dramatically reduce the time it takes from service development to service monetization by accelerating the process of operational and business support systems (OSS/BSS) integration for service providers. Historically, OSS/BSS integration has been a painful, highly customized, fragmented integration nightmare. However, by leveraging industry standards such as BPEL, abstracting common capabilities (such as the Charging Enabler as defined by the OMA), and implementing end-to-end communications processes such as concept-to-cash, service providers can dramatically reduce the time necessary to bring new services to market. In addition, an integrated, end-to-end solution can maximize customer relationship management (CRM) by integrating this application with the billing and OSS systems. Further, providers can monitor service adoption and usage, particularly for service level charging, in real-time or near real-time through integration with billing and revenue management (BRM) systems. Ultimately, using SOA principles, it is possible to not just develop new services faster but also to integrate those new services more quickly with existing, business-critical systems, accelerating the entire process from service creation to payment.

### How It’s Done

However, understanding how to leverage SOA for next-generation communications services is only half the battle. Service providers face a real challenge and marketplace confusion as they look to deliver real next-generation services according to SOA principles. In particular, it is often difficult to separate fact from

roadmap in vendor products; de facto and de jure standards compliance are often not quite the same and, above all, the business case for next-generation services is still unproven for many providers.

Fortunately, Internet-standard platforms, particularly those that leverage Java EE, provide an interesting approach that is well worth the consideration of service providers. Java has proved itself as one of the two de facto standards for building Internet applications, and is the only one that has an industry-driven consensus-based approach to evolution and standardization. There are over three million Java developers who build applications on the Internet today and a large number of these developers are familiar with SOA methodologies and principles. In addition, industry standards such as BPEL and associated design tools and execution environments enable developers and business analysts to build composite applications relatively easily. Even though in the early years Java had limitations for use in a communications environment because of issues such as dynamic memory allocation and de-allocation, such issues have been addressed quite effectively. Standards-based SDPs that leverage Java EE provide a robust and flexible SOA-based platform for next-generation communications service delivery.

### **Learning from Early Adopters**

British Telecom (BT) is one of the pioneers of a SOA-oriented approach to communications service delivery. While most everyone in the industry is aware of British Telecom's 21CN network initiative for building out an IP-core network, of equal significance – but as yet less renowned – is the Innovation Platform that BT is establishing for service delivery on top of 21CN. BT has designed the Innovation Platform in conformance with the SOA principles outlined above. Working with Oracle and other industry leaders, BT's Innovation Platform provides a set of core capabilities that can be used to dramatically expand the set of services that it can deploy on next-generation networks. By making an Internet-standard platform the basis for its Innovation Platform, BT plans to bring the full benefits of SOA principles to developers and independent software vendors (ISVs) who are developing next-generation communications services.

### **Conclusion**

It is an interesting time for service providers, and there is little doubt that the service provider of the future will be quite different from the service provider of today. While there is little consensus on the exact form of the future service provider, it is clear that SOA will have a significant role to play in the evolution. The basics of SOA have been derived from more than 15 years of experimenting with service delivery on the Internet and proper adoption of these principles in the communications domain have the promise of bringing Internet speed and flexibility to the communications industry, without sacrificing the traditional service provider attributes around scale, reliability, and mission-criticality.

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