HP Service Delivery Platform

Breakthrough business technology that brings governance, management and quality to converged telecom, IT and Web 2.0 services

A white paper from HP

Business technology for an expanding marketplace

The market for rich, converged services is rapidly expanding and transitioning from early adopters to the mainstream. In response, communications, media and entertainment companies have been evolving their digital services infrastructure to profitably meet growing demand and enhance the customer experience.

An essential part of that evolution has been the implementation of a service delivery platform (SDP). These core-to-edge service-oriented architectures (SOA) enable operators to quickly and cost-effectively develop, deliver and manage converged digital services. Service delivery platforms help to break down the inefficient, redundant siloed services infrastructures currently in place and improve collaboration across the services ecosystem. New services can be developed and rolled-out to customers faster and more reliably, shortening the time to revenue; risks are off-loaded and costs can be better controlled.

Originally, SDP architectures were designed to abstract and thus more easily share network resources across applications. Integration of third-party content and services was also addressed, with developers able to securely access and use network resources without requiring knowledge of the underlying systems. The result has been faster and easier development and deployment of a wide range of high-margin value-added services that more fully leverage existing investments, as well as improved customer satisfaction and loyalty.

However, while current service delivery platform technologies have been helping to drive better business outcomes for companies offering digital services, the requirements for an effective SDP have themselves been evolving. Today, new service delivery requirements have crystallized.

Solution scalability must address governance, management and quality across the network, IT and web-based services. As the walls come down and potentially millions of traditional and non-traditional mash-up applications, content and services become part of the SDP ecosystem, they must be tested and quality must be controlled; personalization and the associated security, privacy and identity management issues that go along with it must be paramount across the infrastructure; and integration of the SDP into the enterprise-wide SOA must be constructed such that the end-to-end service lifecycle and workflow across operational and business support systems is guaranteed.

HP Service Delivery Platform 2.0 positions operators to meet evolving requirements.

Developed to enable organizations to leverage the flexibility of a service-oriented architecture-based infrastructure, HP Service Delivery Platform 2.0 (SDP 2.0) provides a controlled clearinghouse environment for all service types, whether they are coming from the network, IT, the web or from other applications. HP SDP 2.0 provides end-to-end governance, policy control, transparency and management of converged services, including internal services and applications, those coming from third-party developers, and those created by "prosumers" and other non-traditional developers who can use services governed by HP SDP 2.0 to create their own service "mash-ups" using Web 2.0 technologies.

Current service delivery platforms	HP Service Delivery Platform 2.0
Web Services abstraction of network resources	Provides the ability to abstract and integrate all services, including network, IT and Web 2.0 services. Also enables policy management of the services with end-to-end transparency of their state across the operational and billing domains.
Integration of third-party content and services	Delivers federated data management and comprehensive value chain enablement, solidifying service provider control across the entire wholesale and retail business ecosystem.
Converged voice and data applications	Facilitates context-aware voice, data and content services by enabling applications to share state and session information. These personalized, dynamic services attract and retain subscribers.
Managing a static or slowly expanding menu of service choices, with success still mainly dependant upon a "killer app"	Enables the secure creation, delivery and management of hundreds or thousands of highly personalized services, with access controlled via user profile brokering and service governance.
Separation of service delivery from operations and billing	Seamlessly integrates with back-office systems to establish a holistic environment with cross-domain service orchestration and a management infrastructure that enables rapid identification of system events affecting the quality of service delivery.

Enhanced and expanded capabilities that drive better business outcomes

HP Service Delivery Platform 2.0 delivers new services and technologies that meet the increasingly challenging requirements for offering rich, converged services. The table above shows the capabilities of current SDP technologies and contrasts them with the highly evolved capabilities of HP SDP 2.0.

Each of the expanded and evolved capabilities of HP SDP 2.0 will be explained in further detail in the following sections of this document.

HP SDP 2.0—extended functionalities in detail

A number of additional or expanded functionalities have been incorporated into HP Service Delivery Platform 2.0. These enhancements draw upon deep and broad HP experience in both telecom environments and IP-based technologies, and are designed to leverage legacy business technology infrastructure already in place to bridge the current operator environment toward a true Web 2.0 environment. The following sections will detail how HP SDP 2.0 addresses key requirements for the evolving marketplace, including:

- Governance and policy management
- Value chain enablement through federated data management
- Context-aware services
- Federated device management
- A holistic service environment across domains

Governance and policy management

Abstraction of network services—a decoupling of network resources from the service development and delivery processes—has been a core principle of SDP functionality. Using standards-based interfaces such as Parlay-X and Session Initiation Protocol (SIP), a service delivery platform allows abstracted network resources to be easily and securely shared and reused, so services and content can be developed without underlying knowledge of the network, shortening the time-to-market for new services.

Today, it's clear that abstraction simply isn't enough. Service environments are rapidly scaling to accommodate growing demand, and the number of internal, network and third-party services is escalating wildly. Further, Web 2.0 mash-ups are becoming increasingly common within the service provider domain, injecting additional complexities. With the growing penetration of Web 2.0 service providers into the marketplace, such as Google, Yahoo, Facebook and others, this trend will only continue. The sheer numbers of service interactions occurring along the services value chain demand dramatically enhanced governance and policy management capabilities, and that's exactly what the purpose-built HP SDP 2.0 delivers.

HP Service Delivery Platform 2.0 provides robust policy management at all levels of the infrastructure. It integrates field-proven components such as the HP Systinet SOA Repository and other products with off-the-shelf Java™ 2 Enterprise Edition (J2EE) and SIP application servers, for optimal flexibility across heterogeneous service environments. As part of the SOA environment, HP

SDP 2.0 answers the three fundamental requirements for effective SOA governance:

- *Visibility*, through an environment in which services can be easily found and understood at every phase of their lifecycle
- *Trust*, with tools to establish consistency, interoperability and formal service agreements
- *Control*, by enabling the management of the service lifecycle from introduction to retirement

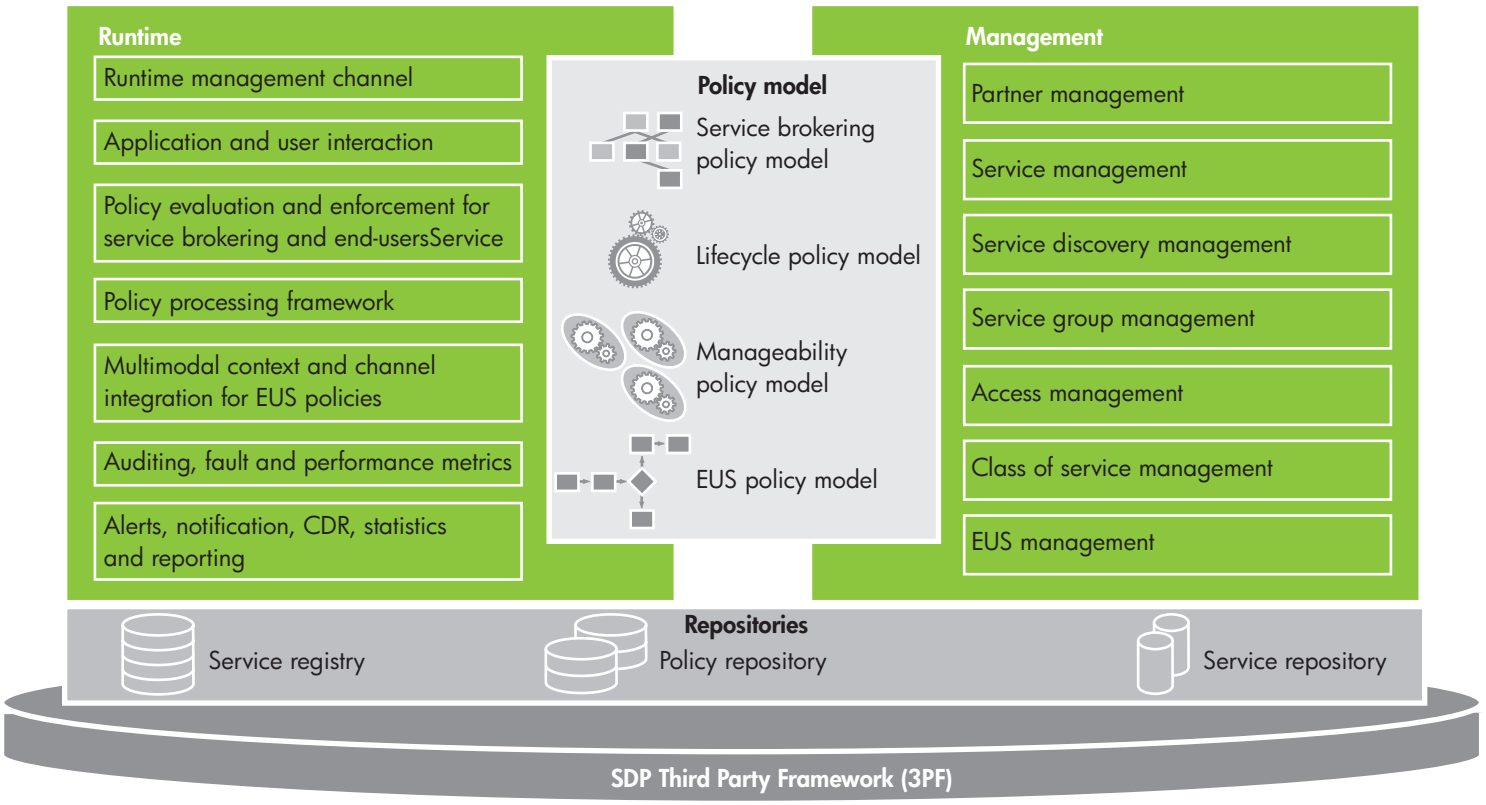
In addition, HP SDP 2.0 delivers expanded third-party services governance capabilities, including:

- Centrally controlled, role-based capabilities with easy-to-use portal interfaces for managing the activities related to offering third-party services
- Services for secure service registration, integration, access, metadata collection and management
- Simplified service aggregation and orchestration
- Identity and policy-control mechanisms that lower risk when orchestrating network and other third-party services into new end-user applications

Value chain enablement through federated data management

In most communications, media and entertainment companies, critical data surrounding their subscribers and services ecosystem partners is scattered across multiple, siloed databases and repositories and in various formats and structures. This key information includes user identity and profile data that is required for establishing security policy and control functions. With such basic "building block" information tied into specific repositories and unable to be easily shared with other applications and services, creating and delivering new personalized services is costly and inefficient. What's needed is a structured, secure and robust mechanism for gathering and securely brokering this data for SOA-based applications.

In response, HP SDP 2.0 features a new component called the HP Virtual Identity and Profile Broker (VIP Broker). This feature-rich and modular, virtual digital identity solution offers significant and ongoing competitive benefits for communications, media and entertainment companies, service developers and end users. As an extension of the SDP architecture, VIP Broker provides a central control and policy application point that provides outstanding transparency into user-centric



data, which can be dynamically aggregated from multiple independent data stores. Virtual aggregation capabilities offer protocol independence and allow operators to enable dynamic access to user data in a controlled secure fashion. The VIP Broker delivers SOA-based data management via a common data model and advanced Web 2.0 technologies including Resource Description Framework (RDF) and Really Simple Syndication (RSS). It provides a single access path and a consistent mechanism to simplify data management, security and policy enforcement for use of subscriber profile data. And that allows service providers to become enablers of a whole new class of SOA and Web 2.0-based applications that deliver context-sensitive, personalized responses to subscriber interactions.

Context-aware services

Sales professionals know that coming in with the right offer at the right time is critical to making a successful sales pitch. Context—understanding not only what prospective buyers are doing, but when and why they're doing it—provides competitive advantage that drives significantly better business outcomes. Putting a personalized, targeted offer in front of a naturally more receptive potential customer results in greater success for the seller, as well as a greater degree of satisfaction from the end customer. All of which leads to more traffic flowing across the network.

The concept of implementing contextual awareness is especially intriguing in light of today's more active lifestyles. Mobile users present a particularly attractive opportunity for communications, media and entertainment companies and other digital service providers; in a service-oriented architecture environment with SDP technologies implemented, service enablers such as geo-location, presence and availability, device awareness and others can all be creatively combined to deliver context-aware content and services.

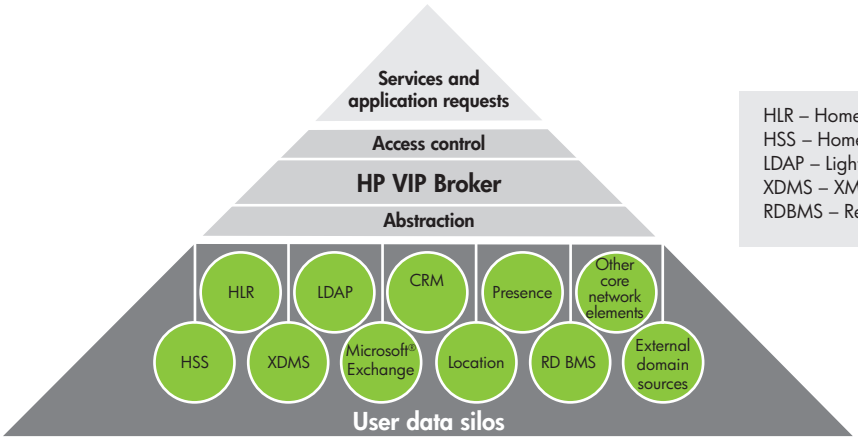
Context must also be thought of in terms of both "services context," such as utilizing the appropriate service and network components to provide an optimal user experience, and "subscriber context," such as the individual's current location. Together, these contextual details can be incorporated into what HP calls Intelligent Service Flow Adaptation. That is, successful dynamic services-based applications will take into account the technical context of the service request and the stated or inferred preferences of the user making the request, the details of which can be gathered by the VIP Broker.

As an example of subscriber context, a young woman might be approaching the musical venue where she's about to see her favorite band perform in concert. Alerted to her location through location-based services, an entertainment company might offer her the band's latest CD, along with a ringtone of the group's latest hit single. She could download a band-themed wallpaper, stream their latest video or order other themed merchandise. And because she might be hungry before or after the event, she could be sent the latest coupons from area restaurants, along with menus and directions from the arena parking lot so that she and her friends—who are also coming to the show and communicating through text messaging as they travel—could meet for a bite. Because this customer is already known to have interest in the products and services she's being offered, the chances of successful sales are high.

Services context for the above example encompasses recognition of the digital device, the access network, the subscriber identity profile and relevant contextual data, and then utilizing the correct infrastructure, formats, protocols and applications to deliver content and offers to the user with optimal presentation and usability. This strict level of governance for using service components and versions enhances efficiency and can improve customer satisfaction. For example, it would be appropriate to stream high-quality video to a user accessing through a 3G network, but for a 2.5G network, the results would likely be unsatisfactory due to packet loss and other issues. By ensuring users gets the best possible results from their service interaction, churn drops and more revenue flows across the network.

HP SDP 2.0 provides both innovative technologies and a proven methodology for capitalizing on subscriber and service context for Intelligent Service Flow Adaptation. Rather than require separate data stores where user and device profile data reside, HP SDP 2.0 uses virtualized maintenance of user profile data, such as the services a particular user is authorized to access, as well as the contextual information related to subscriber interaction for that particular communication session. The data is captured and made available for the next service interaction, whether that interaction is within the current session or at another point in time.

This powerful concept provides the technical means to accomplish a more enhanced form of personalization across IT, network web, television and video domains. Group-based services including instant messaging (IM) and multimedia conferencing are converging with network services like location and presence to form innovative, collaborative community-based services that drive increased subscriber retention. HP SDP 2.0 context management capabilities enable operators to profit from service mash-ups and group-based services. Context-sensitive applications and content will enable operators to—for the first time—deliver a truly personalized interactive subscriber experience. That's a critical point of differentiation in the Web 2.0 environment.



HLR – Home Location Register
HSS – Home Subscriber Server
LDAP – Lightweight Directory Access Protocol
XDMS – XML Data Management Server
RDBMS – Relational Database Management System

Federated device management

The flood of new digital devices into the consumer marketplace shows no signs of slowing; services and content are flowing across multiple networks and in many different modes and formats before reaching these devices. In many cases today, detailed device characteristics required for efficient cross-device multimedia service delivery are locked inside proprietary stovepipe applications, and are typically not visible or easily accessible. This inefficiency will become far more obvious and severe in a service delivery platform environment, because the SDP will encounter a rapidly increasing number of devices, services and content formats. HP recognizes the need to implement a mechanism for reducing or eliminating the slow and wasteful overlap of applications dedicated to maintaining and managing device characteristics.

HP SDP 2.0 features a Unified Device Capabilities Repository (UDCR) that creates a virtualized single interface to multiple device characteristic databases across the service infrastructure. This interface simplifies development and reduces operational expenses (OpEx).

A holistic environment across domains

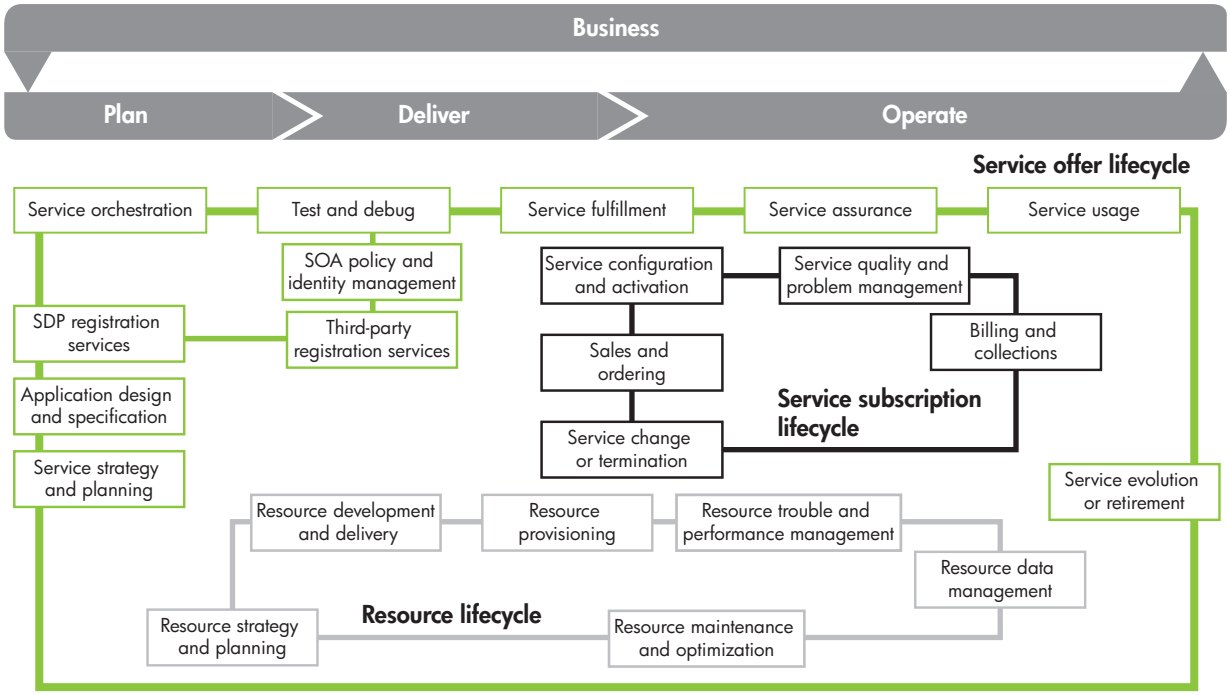
The interface between the traditional operational support system (OSS) and the SOA environment of the SDP has to be achieved in a way that does not restrict the dynamics of next-generation SOA services. The HP SDP 2.0 integrates with the OSS environment transparently. Atomic and compound services in the SDP are made visible to the OSS environment and the OSS service bus; this allows the services and applications to be quickly and accurately configured, provisioned and managed from initial service instantiation through service deactivation. The approach takes into account SOA principles of loosely coupled applications, common communication infrastructure, and standardized interfaces that facilitate the management of value-added services in convergent telecom and IT environments.

HP SDP 2.0 integrates three lifecycles: the Service Offer Lifecycle where services are planned, designed, orchestrated and tested; the Service Subscription Lifecycle where services are packaged configured and made ready for sales and billing; and the Resource Lifecycle where the services are managed and monitored for performance, quality, optimization and maintenance.

To help enable optimal operation from end to end and drive quicker return on investment, the HP SDP 2.0 solution integrates with the HP Integrated Service Management Solution, which includes pre-built OSS/J adapters that provide fault and performance monitoring for a wide range of infrastructure components and services, including:

- Hardware elements and operating systems
- Application environments such as SIP, J2EE and others
- Services, such as web conferencing and location lookup services running in J2EE or SIP application environments
- Value-added services, including third-party VAS, as listed in the HP SDP common framework UDDI registry

The monitoring and management of both the physical network and IT assets and the applications infrastructure and services are presented to IT and network managers using an intuitive graphical user interface that enable rapid discovery of the source of performance or fault management issues. Operators can quickly distinguish physical network element issues, problems with service



element performance or other faults, and drill down to whatever issue is causing a problem in the end-to-end service delivery chain.

Service Delivery Platform testing

The costs and complexities of SDP deployment and evolution dictate that every critical action surrounding the implementation be the correct one. That's why HP offers a service delivery platform testing solution stack that leverages highly regarded HP business technology optimization (BTO) products. The solution features a rich set of tools, including testing templates, scripts, and test plans that help speed deployment of a fully functional SDP environment.

The HP SDP testing solution supports Hypertext Transfer Protocol (HTTP), Simple Object Access Protocol (SOAP), and other standard protocols, along with testing of service enablers and Parlay-X APIs, which abstract service capabilities for call control, presence, conferencing or other capabilities from any type of network, including converged networks. The testing solution also expands to address very specific telco testing aspects such as SIP, Intelligent Network Application Protocol (INAP), Diameter and IP multimedia subsystem (IMS) testing for both function and performance.

The HP advantage for SDP environments

Evolving marketplace requirements are driving communications, media and entertainment companies to transition their infrastructure to develop, deploy and manage rich, context-aware converged services that will engage users and deliver profitable revenue.

Building upon the field-proven HP Service Delivery Platform, the powerfully enhanced HP Service Delivery Platform 2.0 is standards-based service-oriented architecture that enables communications, media and entertainment companies to rapidly and cost-effectively develop, deploy, integrate and manage converged voice, data and content services. Further, HP SDP 2.0 enables seamless integration of those services with operational and business support system (OSS/BSS) environments, and delivers the strong SOA governance, subscriber data management, and quality management capabilities required to truly create a holistic service delivery environment from end to end.

Successful SOA adoption requires solutions for governance, quality and management.

Heterogeneous platforms are the norm. Customers require platform-neutral solutions.

You need much more than technology for SOA deployment. You need a trusted guide.

Communications, media and entertainment companies have to control costs and shorten the time-to-market for new services. They must answer subscriber demand for the innovative service capabilities that will enable users to create their own service mash-ups to meet the ways they live, work and play. And while the transition to a SOA-based infrastructure is necessary, it is also a complex process that requires an experienced technology partner.

HP is that partner, offering globally demonstrated expertise in both telecom and IT environments, innovative business technologies and a strong track record of successfully managing complex infrastructure launches. Leveraging strong partnerships with industry leaders and a holistic perspective on the complete service environment, HP helps operators determine which SDP 2.0 components and capabilities will help them achieve the business outcomes they seek. And HP has a global delivery pipeline and locally experienced HP personnel in more than 170 countries worldwide to help enable that deployment is fast, with minimal impact on current operations. As the requirements for service delivery platforms environments evolve, HP is the technology partner that offers more.

HP Services

Every HP solution leverages proven global experience that spans people, processes and technology. HP Services consultants understand the communications, media and entertainment marketplace, and can help companies get the most from their IT investments. HP Services can help in these critical areas:

- **Application modernization services**—HP offers a full range of current and future business need assessments, strategic and technological roadmaps for change, infrastructure transition services, and monitoring services for the evolved application environments.
- **Mission critical support**—Onsite consulting and technical support is available at whatever level of service the organization desires, including Operational ITSM to help benchmark IT processes against others.
- **Outsourcing services**—HP offers a comprehensive portfolio of innovative and scalable sourcing options, so company personnel can focus time and resources on their core business.
- **Security services**—HP has developed a detailed methodology for evolution of the IT environment with enhanced security features. Risk is decreased and both the data and the network are protected.
- **Financial services**—HP Financial Services offers a range of creative and flexible financing options that can remove the final obstacle to network evolution.

Across the globe, enterprise customers rely on HP Services to design, build, integrate and manage the IT systems that run their businesses. HP Services capabilities cover consulting and integration, outsourcing, support, and education services, all delivered by more than 69,000 services professionals in 170 countries. As the marketplace continues to evolve, HP Services will be there to help communications, media and entertainment companies adapt and compete.

To learn more, visit www.hp.com/go/cme

4AA1-6286ENW, October 2007

invent