



**A software primer -
delivering business value with
IBM software and SPDE**

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Introduction

Today's telecommunications service provider's business strategy is increasingly linked to their ability to rapidly leverage software to effectively and efficiently execute business strategies. IBM software technologies, when effectively applied through an industry specific reference point, helps service providers to deploy and integrate complex solutions that address a broad range of business and operational challenges. A solution is the synthesis of technology, business process, and industry insight. The IBM telecommunications software portfolio is more than technology, it embraces telecommunications industry and information technology (IT) standards, as well as the industry specific blueprint called SPDE (Service Provider Delivery Environment) to create a flexible, e-business on demand infrastructure designed to support service provider's emerging business needs.

In addition to overcapacity and declining revenues for increasingly commoditized voice based services, service providers face many challenges:

- *Convergence and management of legacy and next generation OSS / BSS (Operational Support Systems / Business Support Systems)*
- *Speed to market with new revenue generating services*
- *Risk associated with OSS / BSS integration*
- *Implementation of COTS (Commercial Off The Shelf) software that involve multiple partners*
- *Simplifying the process and systems for managing security*
- *Churn and low customer satisfaction*
- *Decreasing costs and improving efficiency across the board*

This paper outlines how the IBM software portfolio leverages the IBM SPDE reference architecture to help service providers implement solutions that address the myriad of challenges they face today. The intent is to provide the basis for ongoing discussions with service providers including positioning of IBM software offerings in the context of SPDE, outlining the role of standards organizations, and demonstrating how IBM software products effectively serve the unique requirements of service providers using a solution oriented approach.

Highlights

“Telecom service providers for years have been seeking a core IT infrastructure that not only offers scalability, availability and security but is also flexible enough to allow them to interface new systems for supporting market changes and to quickly introduce new services,”

— Karl Whitelock, Stratecast Partners Program Director, OSS Competitive Strategies and Analysis.

SPDE reference architecture

The IBM Service Provider Delivery Environment is a scalable and flexible reference architecture designed specifically for telecommunications service providers. The foundations for SPDE include:

- *Adoption of industry and IT standards, e.g. the TeleManagement Forum (TMF), Open Mobile Alliance (OMA), Parlay, Linux, W3C, etc.*
- *Numerous customer engagements with some of the world's largest and most innovative wireless, wireline, and broadband providers.*
- *Extensive research conducted at IBM Network Innovation Labs on industry leading tools, method, and business processes.*

IBM SPDE defines a consistent delivery and management environment for services, applications and content across multiple networks and devices. Service providers can implement and integrate all or parts of IBM SPDE within their existing environment. SPDE enables a service provider to:

- *Introduce and manage new services faster, easier and more cost effectively.*
- *Facilitate access for service provider's business partners to deliver “value-add” services in a consistent and secure manner. This enables partners to develop new and innovative revenue generating offerings in cooperation with the service provider.*
- *Integrate new capabilities and content consistent with the service provider's legacy environment.*
- *Take advantage of new commercial applications, programs and technologies as they become available.*
- *Reduce the duplication of systems to lower operating expenses.*
- *Rapidly respond to changes in a business environment through a tight coupling of proven business processes with a flexible technology infrastructure.*
- *Provide a metering, billing and settlement infrastructure to maximize revenue.*

Highlights

IBM software solutions created with SPDE increase business responsiveness, improve operational efficiency and provide rapid return on investment (ROI) in two key areas:

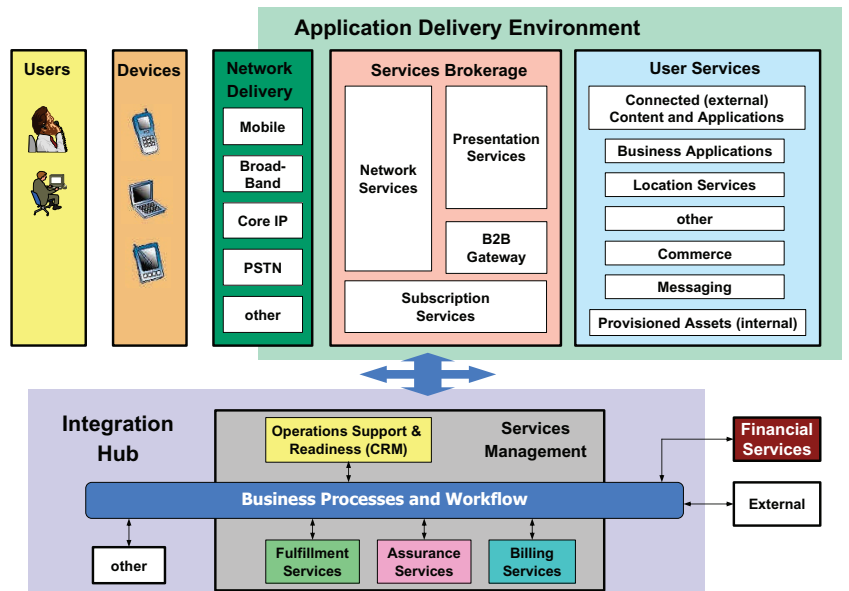
1. IBM software helps service providers reduce operating and capital expenses through enablement of a flexible services delivery infrastructure for both consumer and corporate oriented content and applications (Applications Delivery Environment).
2. IBM software reduces and manages complexity by providing a platform for technology and business integration of disparate software based systems (Integration Hub).

“With the proliferation of new devices and new access channels, these companies need an environment that is device and network agnostic. Solutions such as the IBM Service Provider Delivery Environment are well positioned to address such needs.”

IBM continues to develop industry-specific software products and solutions for the telecommunications industry. IBM actively collaborates in the development of numerous industry standards and fora. IBM also invests in research and development to meet the emerging requirements of service providers.

— Karl Whitelock, *Stratecast Partners Program Director, OSS Competitive Strategies and Analysis.*

Figure 1- SPDE reference architecture



Highlights

“The really big win is in time to market, we’ve seen the delivery of the “one month” service interface ... from start of development to production in one month”

— Jon Calladene, Systems Architect, British Telecom

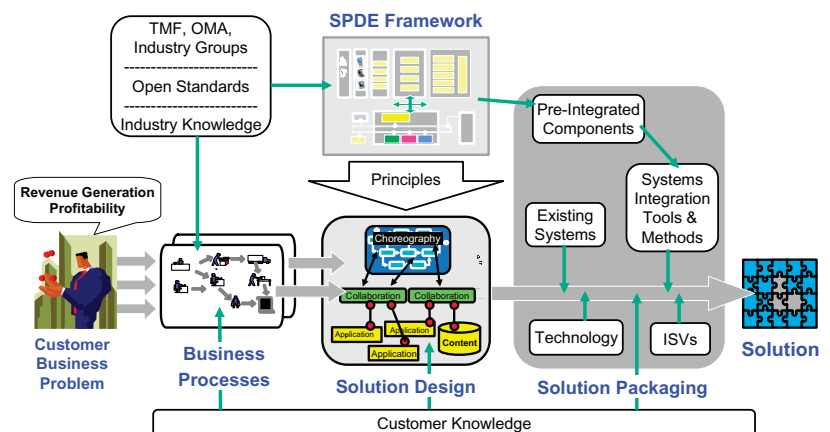
Making SPDE work with IBM software

The Service Provider Delivery Environment is not a single product nor a “one-size fits all” solution, rather it is a blueprint for improving business results through the use of a flexible and resilient infrastructure which is enabled by the integration of “best-in-class” software. IBM Global Services consulting and integration expertise coupled with the “best-in-class” IBM software offers service providers the competitive advantage required to succeed in today’s demanding market conditions. The framework enables service providers to identify the basic elements necessary to improve ongoing business operations and processes. It also encourages reuse and identifies areas of overlap and duplication. Figure 2, depicts how business processes can be managed and enabled through software, resulting in an environment which integrates disparate business functions and technology. This results in a value chain where the service provider is able to deliver new "plug-and-play" services that reinforce each other.

The remainder of this paper will outline the seven SPDE domains and highlight the use of key IBM software within each of these domains. For additional information regarding SPDE, the reader is encouraged to reference the following IBM white papers:

- *An introduction into the IBM Service Provider Delivery Environment*
- *Services Brokerage and the IBM Service Provider Delivery Environment*
- *Business insights into the IBM Service Provider Delivery Environment*

Figure 2 - Making SPDE work



Highlights

Far EasTone Communications (FET), Taiwan's leading convergence wireless service provider, launched its Common Service Platform (CSP) which is based on SPDE ... this reduces application development efforts by 40 percent and significantly speeds time-to-market for services by concealing the complexity of different access and core networks and providing a single access point.

IBM software and the SPDE domains

To create an implementation of a framework or part there of i.e. a template, the abstract components and connections within the template must be instantiated. In other words, they must be implemented with actual products. The ability to reuse instantiated components across different solutions is a major benefit of SPDE.

SPDE groups functionally-related capabilities into key seven domains. A domain is a grouping of related components or groups of components, including how they connect together.

A service provider desiring to offer a service, can instantiate the service to meet their specific needs. IBM, working with our customers and business partners, has made a significant investment to determine and instantiate solution utilizing "best-of-breed" components. Many of these solutions have been validated and pre-integrated by IBM Global Services utilizing the IBM software portfolio and key business partner offerings.

An important characteristic of these domains is that they only need to be aware of adjacent domains. For example, the *User Services domain* is connected to the *Network Delivery domain* and the *Device domain* without having to deal with the underlying complexities of those domains. This minimizes the solution complexity and long-term maintenance costs while improving the reliability.

Domain edges are based on open, industry standards including HOP, HTTP, IMAP, J2EE, OMA and Parlay. The adherence to open standards improves the cooperation between instantiated components and the adjacent domains. Domain edges provide logical points for hardening the solution by enhancing security, reliability, availability and scalability capabilities by introducing components such as firewalls and load balancing.

Domains are drawn schematically and in greater detail than the simple definitions outlined above. It's important to note that these domains are intended to be representative.

Highlights

Delphi will use the IBM J9 virtual machine environment in the design of new mobile multimedia products that include embedded, real-time control systems using full-motion video, speech and voice processing, Internet and Java™ technologies to enhance communications and entertainment applications for original equipment vehicles.

User domain

The *User domain* includes any individual who uses a device defined within the *Device domain*. A user may be a person or an application or web service. A user may be external, for example a customer, or internal. The characteristics of the *User domain* differ significantly between service providers and are dependent on the go-to-market strategy of each service provider. This strategy is also dependent on the service provider's regulatory environment, handset capabilities, availability of capabilities and brand awareness.

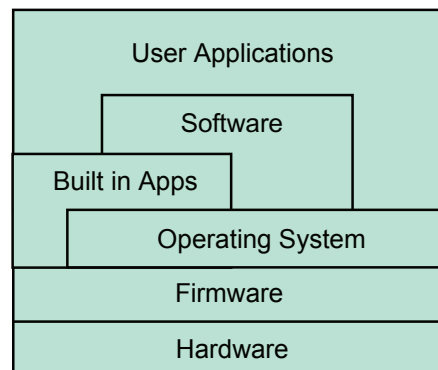
Device domain

The *Device domain* is populated with various device types including telephones, notebook computers, mobile phones and PDAs. A device may also be a computer program.

The devices have varying structures and capabilities. For some devices, like conventional telephones, the structure is minimal. Other devices, like cellular phones or PDAs, can have an extensive structure. It is common for many of these devices to have firmware, an operating system, software, built-in applications and user applications. Figure 3 depicts a typical *Device domain* environment.

Devices provide a minimum of three basic services. First, they must communicate with the *Network Delivery domain*. This can be as simple as sending an analog signal from a plain-old telephone (POTs). Or it can involve more complex protocols like PPP and SIP.

Figure 3 - Device domain



Highlights

“IBM’s WebSphere Everyplace Access represents a huge step forward for wireless e-business,”

— Jonathan Oakes, Director of Enterprise Strategy, Palm, Inc.

IBM and Sharp Corporation bring together IBM software and Sharp technologies in a Linux-based mobile solution that makes it easier for businesses to extend enterprise applications to mobile workers. The new Enterprise Edition Zaurus™ — Sharp’s Linux based PDA that works on a foundation of IBM’s software — will include WebSphere® Everyplace Access and WebSphere Everyplace Connection Manager.

Second, they must render content received from the *Network Delivery domain*. The ability of devices to render content limits the kinds of services suitable for the device. The core services are based on requests and deliver their results as HTML over HTTP as the transport layer. This does not exclude other descriptive languages or transport mechanisms. SPDE is open and can accommodate new and emerging standards.

IBM software products within the Device domain

IBM offers a wide variety of software products within the *Device domain*. Table 1 outlines some of the functionality and benefits of these IBM software products. Additional product information is available in this paper’s appendix.

Table 1 - Device domain IBM software product mapping

	Functional Area	Product	Benefit / Capabilities
Software	Configuration & Change Management	Tivoli Configuration manager	Effective software distribution & inventory management
	Enterprise data synchronization	DB2 Everyplace	Small footprint database for mobile client devices
	e-mail, calendars, contacts and task synchronization	WebSphere Everyplace Mobile Connect	Provides 2-way file transfer, database synchronization & remote installation of applications
	PIM Synchronization, device management, and Transcoding	WebSphere Everyplace Access	Support for mobile solutions including unified clients, connected & disconnected
	Messaging infrastructure	WebSphere MQ Everyplace	Assured message delivery
	Operating System	Embedded applications	WebSphere Everyplace Embedded Software: Embedded Evaluation Kit for Intel PCAs, PDAs, Service Gateways, Set-top boxes, Smart Phones Everyplace Embedded Foundation for Intel PCAs, PDAs, Service Gateways, Set-top boxes, Smart Phones

Highlights

“For us, it would be impossible to offer corporate access services without the help of IBM. Nobody has more experience with wireless in the Lotus environment than IBM.”

— Juan R. López, Manager of Data Services Development, Telefónica Móviles España

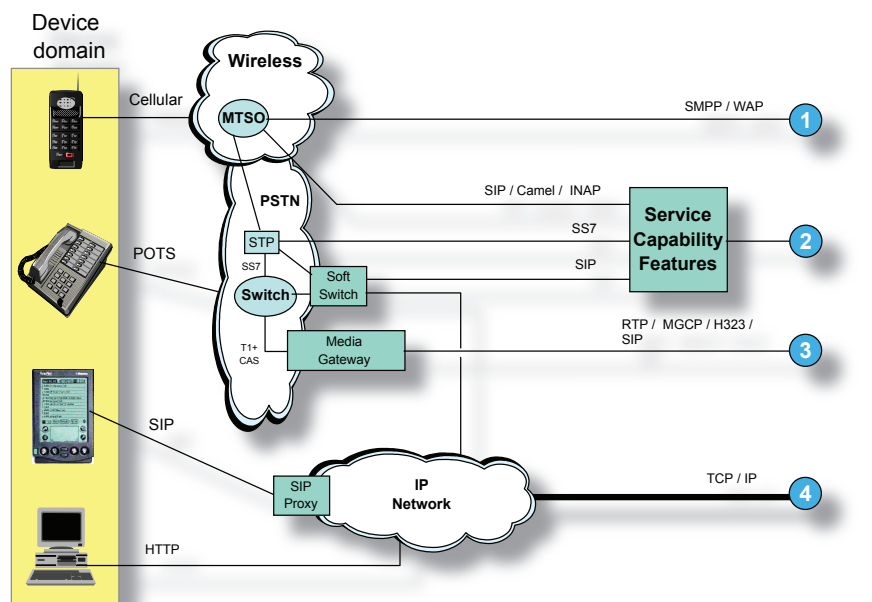
Network Delivery domain

The *Network Delivery domain*, shown in Figure 4, provides the transport mechanism between the *Device domain* and the *Services Brokerage domain*. It does this over various communications networks like the Public Switched Telephone Network (PSTN), Internet Protocol (IP) networks and wireless networks.

Note that some of the lines in Figure 4 are labeled with circled numbers. These circled numbers connect to corresponding numbers in Figure 5. This will allow the reader to join the various figures in each SPDE domain into a single unified view.

The *Network Delivery domain* is more than a transport mechanism and contains additional features, which are provided by services called “Service Capability Features” and by special network components. “Service Capabilities Features” are typically functions like call control, user location and status, device capabilities, data session control, generic messaging, connectivity, account management, content based charging, policy management, presence and availability.

Figure 4 - Network Delivery domain



Highlights

Huawei is working to integrate the WebSphere Application Server for Telecom with the Huawei Parlay / Open Service Access* (OSA) Gateway.

These services can be exposed to the *Services Brokerage domain* through open APIs like Parlay / OSA or OMA. It's through this interface that SPDE *Services Brokerage* components are integrated with wireless, PSTN and other networks.

Network components in the *Network Delivery domain* provide a wide variety of associated network services. Some examples include soft switches, media gateways, location servers, WAP gateways, SIP proxies and can be used by components contained in the *Services Brokerage domain*.

Over the years, IBM has worked closely with key Network Equipment Providers, Business Partners and Independent Software Vendors to embed many of IBM's software products within their products in the *Network Delivery domain*.

With many service providers looking to upgrade and reduce their infrastructure expenses, more and more companies are tapping into open standards platforms such as Linux®. Many of the IBM software products are available for Linux. IBM is working closely with the Open Source community to deliver "carrier-grade" Linux along with new features that will help independent software vendors (ISVs) create enhanced applications for Next-Generation Networks (NGN) running on Linux.

"We believe Linux is a 'game changer' for Service Providers and others. It provides reduced total cost of ownership, greater flexibility via Open System Architecture, speed of deployment, and the efficiency of having a converged voice / data IP network, instead of two networks"

As Linux continue to evolve by delivering more "carrier-grade" capabilities, it will penetrate deeper into the core service provider network. Linux will be a key enabling technology for the deployment of NGN and the transition from proprietary based to COTS based solutions. Tomorrow's NGN solutions will utilize a single IP-based network that will provide voice, data and other new services, such as Unified Messaging. This will enable service providers to drastically lower their total cost of ownership and create opportunities for the deployment of new revenue generating services.

— Rich McDevitt, Manager, Linux Service Provider Lab, IBM

Highlights

“Carriers, especially RBOC’s, have traditionally relied on enhanced services contributing to their bottom lines ... [and] have proven to be nothing less than licenses to print money for carriers. Beyond increasing revenue, enhanced services have proven invaluable toward increasing customer loyalty and reducing churn.”

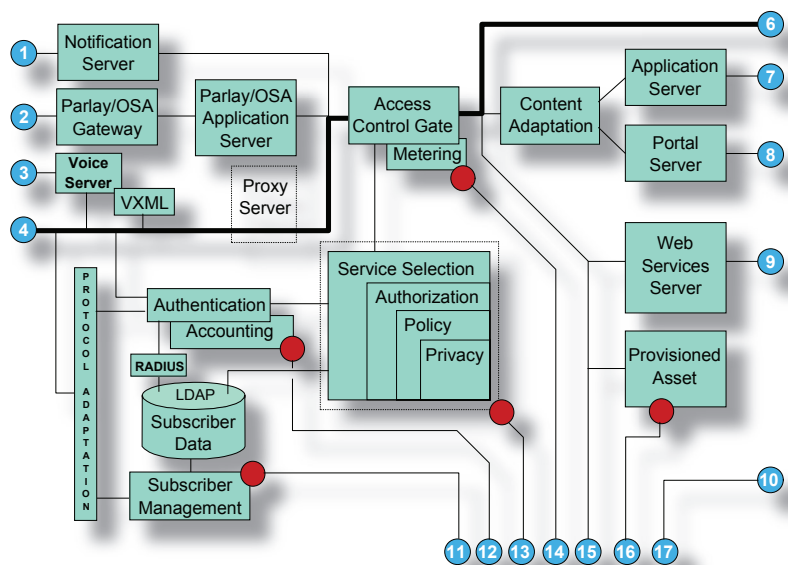
— William Stofega & Elizabeth Farrand, *Fulfilling the Promise or Wait Until Next Year*, IDC

Services Brokerage domain

The *Services Brokerage domain* is at the SPDE crossroads and connects the *Network Delivery domain* with the *User Services domain* and *Services Management domain*. It is comprised of middleware used to locate, aggregate, select and render requested content and applications. The purpose is to reduce the complexity associated with supporting multiple device types (*Device domain*) and networks (*Network Delivery domain*) when establishing a connection between the user (*User domain*) and the application (*User Services domain*). A schematic of the *Services Brokerage domain* is provided in Figure 5.

The interface between the *Services Brokerage domain* and the *User Services domain* is standards based. The most prominent of these standards is J2EE (portlets and servlets) and Web Services (SOAP, UDDI and WSDL). SPDE uses these and other standards to separate content from content delivery. For example, the J2EE server resides in the *Services Brokerage domain*, while the corresponding portlet or servlet resides in the *User Service domain*.

Figure 5 - Services Brokerage domain



Highlights

A service in the *User Services domain* may pass information directly through the *Services Brokerage domain* to the *Network Delivery domain*. This kind of service can be metered and should comply with the authorization, policy and privacy rules enforced by the *Services Brokerage domain*. Messaging and services that require bandwidth and connectivity to the *Network Delivery domain* fall into this category.

The *Services Brokerage domain* also connects to the *Services management domain*. Through this interface it requests / receives OSS, BSS and CRM services / transactions to manage, fulfill, assure and bill for consumed services.

“WebSphere is the perfect answer for carriers who want to provide e-business solutions to their subscribers”

— Gina Lombardi, Senior Vice President of Marketing and Product Management, QUALCOMM

The *Services Brokerage domain*, like all SPDE domains, is a template and does not explicitly represent specific products. The connections between the boxes are recommendations. An instantiation of a template may require connections different than those outlined.

A powerful attribute of SPDE is the ability to be instantiated into multiple and different architectures. Each architecture can contain middleware and applications specific to a customers needs.

A SPDE template documents the functions performed in a domain. For the *Services Brokerage domain*, these functions could include middleware for protocol adaptation, user authentication, authorization, policy, subscriber management, access control, service selection, content adaptation, content delivery, Parlay services, notification, Web Services and voice processing.

IBM software products for the Services Brokerage domain

IBM offers a wide variety of software products that can be used within the *Services Brokerage domain*, some of which are highlighted in Table 2. Additional product information is available in this paper’s appendix.

Table 2 - Services Brokerage domain software products

	Product capability
Notification Server - metering	<ul style="list-style-type: none"> • WebSphere Everyplace Server, Service Provider Offering is an integrated, performance-tuned package, with all of the required middleware infrastructure needed to connect, adapt, manage, transform, and scale today's Web applications.
Voice Services	<ul style="list-style-type: none"> • WebSphere Voice Server is for the development and deployment of voice-enabled e-business solutions that use speech-recognition and Text-to-Speech to enable a more natural customer interaction. • WebSphere Voice Server for Transcription is a specialized speech recognition offering that allows solution developers and service providers to integrate transcription (or deferred dictation) into their applications. • WebSphere Voice Response with DirectTalk technology is a voice processing platform that brings expanded functionality to Interactive Voice Recognition (IVR) applications, including speech recognition and VoiceXML capabilities.
Parlay / OSA Application Server	<ul style="list-style-type: none"> • WebSphere Application Server for Telecom provides a set of Parlay extensions to the IBM WebSphere Application Server for the rapid creation and delivery of new revenue producing telecommunications services which integrate e-business applications with diverse telecommunications networks (wireline, wireless and Internet).
Authentication	<ul style="list-style-type: none"> • Tivoli Access Manager delivers enhanced security beyond the available native authentication in the operating system, application or messaging systems.
Accounting	<ul style="list-style-type: none"> • WebSphere Everyplace Server, Service Provider Offering is an integrated, performance-tuned package, with all of the required middleware infrastructure needed to connect, adapt, manage, transform, and scale today's Web applications.

Table 2 - Services Brokerage domain software products - continued

	Product capability
Authorization & Access Control Gateway	<ul style="list-style-type: none"> • Tivoli Access Manager delivers enhanced security beyond the available native authentication in the operating system, application or messaging systems
Policy	<ul style="list-style-type: none"> • Tivoli Access Manager delivers enhanced security beyond the available native authentication in the operating system, application or messaging systems.
Privacy	<ul style="list-style-type: none"> • Tivoli Privacy Manager for e-business allows companies to define, deploy, monitor and audit adherence to privacy policies on an enterprise-wide basis. This allows enterprises to push privacy policies into their IT systems and applications, thereby helping lower the costs of privacy compliance through automation.
Content Adaptation	<ul style="list-style-type: none"> • WebSphere Everyplace Server, Service Provider Offering provides synchronization to any ODBC-compliant database and direct synchronization between Palm OS or Windows® CE and EPOC devices and Lotus® Notes® or Microsoft® Exchange® servers for e-mail, calendars, contacts and to-do lists. • WebSphere Transcoding Publisher dynamically adapts, reformats and filters Web content and applications to make them optimally suited for mobile devices such as telephones, personal data assistants (PDAs) and pagers. • WebSphere Translation Server is a machine translation offering that can help companies remove language as a barrier to global communication and e-commerce.
Application Server	<ul style="list-style-type: none"> • WebSphere Application Server provides a powerful platform for Web Services, including business-to-business applications, a rich set of open-standards implementations, and virtually any-to-any connectivity with transaction management and application connectivity.

Table 2 - Services Brokerage domain software products - continued

Product capability	
Web Services	<ul style="list-style-type: none"> • WebSphere Application Server provides a powerful platform for Web Services, including business-to-business applications, a rich set of open-standards implementations, and virtually any-to-any connectivity with transaction management and application connectivity.
Service Selection, Subscriber Management & RADIUS	<ul style="list-style-type: none"> • WebSphere Everyplace Subscription Manager is a software product that provides the necessary functions and features for service providers to enroll, authenticate, service and support their customers.
Subscriber Data	<ul style="list-style-type: none"> • DB2 Universal Database enable an easily integrated, standards-based e-business infrastructure supporting innovative applications. Built-in functions automate data encryption improving security. UNICODE support automatically converts data for worldwide audiences.
Access Control Gate	<ul style="list-style-type: none"> • Tivoli Access Manager delivers enhanced security beyond the available native authentication in the operating system, application or messaging systems.
Service Selection	<ul style="list-style-type: none"> • WebSphere Everyplace Subscription Manager is a software product that provides the necessary functions and features for service providers to enroll, authenticate, service and support their customers.
Network Services	<ul style="list-style-type: none"> • WebSphere Everyplace Server, Service Provider Offering provides synchronization to any ODBC-compliant database and direct synchronization between Palm OS or Windows® CE and EPOC devices and Lotus® Notes® or Microsoft® Exchange® servers for e-mail, calendars, contacts and to-do lists.

Highlights

“Working with IBM on this [Web Services Provisioning Manager] pilot will enable us to test delivery of a wider range of applications to complement our managed Lotus applications [hosting] ...”

— Neil Lock, Manager of Lotus Applications, BT Ignite

User Services domain

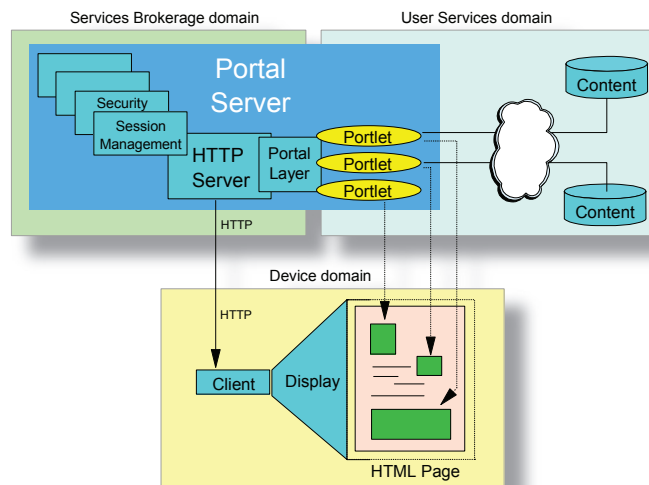
The *User Services domain* encompasses the content and applications utilized by the users in the *Users domain*. Content and applications can either be under the control of the service provider (Provisioned) or provided by third parties (Connected). Services in this domain connect to the *Services Brokerage domain* by utilizing open standards, such as SOAP, UDDI, IMAP, SMS and others.

The open API interfaces and protocols is a key enabler within the *User Services domain* that facilitates the rapid deployment of new content and applications by service providers.

Coupling the open standards mentioned above with a standard execution environment, such as the Java 2 Enterprise Edition (J2EE), provides the ability to seamlessly integrate applications from multiple vendors in the *User Services domain*. A uniform and standard programming environment helps the application development communities to rapidly develop and deploy new revenue generating services.

IBM and America Online work together to provide secure, streamlined access between IBM Lotus Instant Messaging and AOL® Instant Messenger™ service.

Figure 6 - Portal Server and SPDE domains



Highlights

AT&T Wireless mobilizes U.S. businesses to take IBM's Lotus Domino and Instant Messaging applications 'everyplace'

"Initially, we considered Oracle as a partner, but IBM offered a total solution with a licensing agreement that was one-fourth the cost of Oracle."

— Magnus Johnson, Systems Integration Manager, the PhonePages of Sweden AB

IBM software products for the User Services domain

IBM offers a wide variety of software products that can be used within the *User Services domain*. The list below outlines some of the functionality and benefits of these IBM software products. Additional product information is available in this paper's appendix.

- **WebSphere Application Server** provides a powerful platform for Web Services, including business-to-business applications, a rich set of open-standards implementations, and virtually any-to-any connectivity with transaction management and application connectivity.
- **DB2 Universal Database** provides an innovative self-managing and self-tuning database technology, which eliminates, automates and simplifies data management tasks. DB2 lays the foundation for new levels of information integration across the enterprise.
- **DB2 Content Manager** helps streamline workflow, improve productivity and deliver new, powerful and advanced services that leverage critical rich content, with information and services delivered to users conveniently and automatically.
- **DB2 Information Integrator** provides fast, coherent access to diverse and distributed data. DB2 Information Integrator for Content (I14C) expands access to critical structured and unstructured information across and beyond the enterprise.
- **WebSphere Studio Application Developer** is an easy-to-use, integrated development environment for building, testing, integrating, and deploying Java 2 Platform, Enterprise Edition (J2EE platform) applications that rapidly grow and adapt to meet the most stringent business demands and Web Services.

Highlights

MCI Moves IBM Technology Into its “Neighborhood” ... open standards help build flexible, integrated voice mail infrastructure. Using IBM software, this service will deliver message notification and message retrieval, alerting users to new messages via phone, pager or e-mail and providing listening options via phone or the Web to over 2.5 million mailboxes.

Terra Lycos to roll out new Instant Messaging service based on IBM Lotus Instant Messaging ... allow millions of Terra Lycos users to talk to each other and bridge to other supported instant messaging communities.

- ***Unified Messaging for WebSphere Voice Response*** (formerly IBM Message Center) is a messaging solution that manages voice mail, e-mail, and telephone facsimile access from virtually anywhere and anytime over the telephone or the Internet. It takes the chaos out of communications by giving access to information from mobile phones, voice mail systems, e-mail, pagers, fax, and message services.
- ***Lotus Domino*** provides a foundation for collaboration and e-business, driving solutions from corporate messaging to Web based transactions - and everything in between. This robust messaging and collaboration system is built to maximize human productivity by unleashing the experience and expertise of individuals, teams, and extended communities.
- ***Lotus Instant Messaging*** (formerly Sametime) is a secure, robust, scalable instant messaging and Web conferencing solution for business. By providing presence awareness, instant messaging and Web conferencing, Lotus Instant Messaging helps speed communication, reduce travel expenses and rapidly produce results.
- ***WebSphere Portal server*** provides customers with a single point of personalized interaction with applications, content, processes and people.
- ***WebSphere Everyplace Server - Service Provider Option***, can deliver a variety of location services including:
 - *privacy-based access to specific location information*
 - *locate mobile users by latitude-longitude coordinates or by city-state-country identification*
 - *supply information to applications to deliver personalized content depending on location, such as the nearest restaurant or gas station*
 - *user control over which applications are authorized to receive information about their location*

Highlights

“IBM’s integration technology enables us to provide better services. We’re confident that this advantage will help us win market share.”

— Miguel Angel Ceballos, Senior Manager, Technical Support and Operations, Pegaso PCS

Services Management domain

The *Services Management domain* utilizes a centralized infrastructure and modular components within a “hub-and-spoke” architecture. The “hub-and-spoke” architecture reduces the complexity and the number of required application interfaces using adapters. The business process logic resides within “hub” components called collaborations and choreographies. Collaborations are stateless which coordinate business processes and data exchange between disparate applications.

A collaboration exchanges data between multiple applications by encapsulating the data within a normalized business object. By using a common business object data model, the exchange of data between applications is greatly simplified.

Adapters link applications to collaborations via the SPDE Integration Hub. An adapter consists of two parts; the adapter controller and the adapter agent. The adapter controller interacts directly with a collaboration and resides within the SPDE Integration Hub. The adapter agent interacts directly with an application, and resides with the application. Transport between these two parts is performed using standard protocols like HTTP and IIOP. These protocols allow the adapters to interact within a network or across the Internet, through the corporation’s firewalls.

A collaboration contains one or more scenarios. A scenario implements part or all of a business process. Each scenario is stateless and specifies what happens in response to the arrival of specific business object types. Business objects are thus like events. A scenario can send a business object to another scenario or to an application.

The relationship between collaborations and scenarios is similar to the relationship between traditional software programs and subroutines. Subroutines enable a programmer to break up the logic of a program into related chunks. The same is true of scenarios. They componentize the business logic.

Highlights

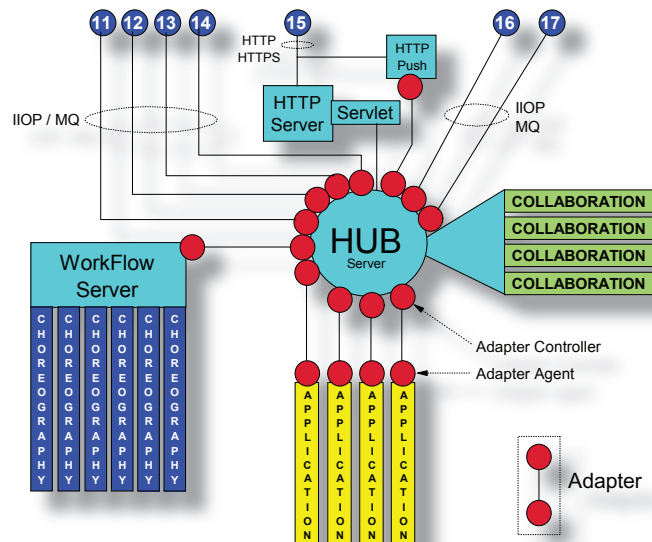
Nextel Communications and IBM announced a strategic alliance for wireless solutions and customer care. These agreements are expected to reduce Nextel's future costs by more than \$1 billion over the eight-year term and enhance Nextel's revenues through the deployment of new wireless data services.

A choreography is a collection of one or more collaborations connected by business objects. It's stateful, implements a business workflow and connects to the Integration Hub via an adapter. Choreographies, collaborations, adapters and the Integration Hub provide the core of the *Services management domain*, as shown in Figure 7 below. The numbered circles in Figure 7 illustrate how the *Services management domain* connects to the *Services Brokerage domain* in Figure 5. These connections are only representative and many other connections are possible.

The IBM WebSphere Business Integration for Telecommunications is an IBM software offering that delivers a pre-validated “hub-and-spoke” offering which links processes and information – with pre-built collaborations and adapters – for rapid implementation. To address some of these key business challenges, service providers can leverage IBM telecommunications experience to provide:

- DSL broadband provisioning
- Wi-Fi provisioning
- Wireless provisioning
- Internet Data Center provisioning
- Integrated Customer Care and Billing

Figure 7 - Services Management domain



Highlights

“In addition to the fact that the IBM solution has helped us dramatically improve our application integration, I think one of the most important outcomes of this project is that we have an invaluable team that works closely with us and that fully understands our requirements and environment.”

**— Laurentiu Mandu, IT Director,
Mobifon**

IBM software products for the Services Management domain

The WebSphere Business Integration for Telecom offering is collectively enabled by the following IBM software products:

- **WebSphere Business Integration Server** is the integration hub that helps organizations automate and simplify business processes using secure and scalable technology to accelerate e-business initiatives.
- **WebSphere Business Integration Adapters** help customers achieve business responsiveness by rapidly integrating applications, technologies, industry standards, data sources, and partner systems. Adapters are integral to a scalable, secure integration infrastructure that improves business performance and supports e-business goals.
- **WebSphere Business Integration Collaborations** are pre-built process templates that help accelerate the integration of common business processes that span multiple applications, involving information such as customers, orders, invoices, etc to address specific telecom business processes
- **WebSphere MQSeries® Workflow** aligns and integrates an organization's resources and capabilities with its business and e-business strategies. MQ Workflow drives accelerated Business Process Management and enhances business responsiveness, service-level management and the reuse of business services.
- **WebSphere® MQ Integrator Broker** is a powerful information broker that routes, transforms and enriches in-flight messages between applications. It is able to handle multiple transports, such as WebSphere MQ messaging, WebSphere MQ Everyplace for pervasive devices and telemetry integration for remote sensory and control devices.
- **WebSphere Business Integration Modeler** is used to define, model, analyze, simulate and report business processes extending IBM WebSphere Business Integration MQSeries Workflow with business tooling to visualize process impact for today's competitive global marketplace.
- **WebSphere Business Integration Monitor** provides a real-time quantified view of business processes and output, allowing you to track automated business processes and displaying key metrics via convenient dashboards to check the pulse of company performance.

Highlights

Orange France, a subsidiary of France Telecom, uses SPDE to enable more than 400 services on Orange Portal, including Movie and Info Channels, Virtual Portals for teenagers, support for color wireless application protocol phones and personal digital assistants, and Orange Smart eCars service.

IBM Named Digital Content Management company of the year by Frost & Sullivan

Tying it together with the SPDE Integration Hub & Application Delivery Environment

SPDE is a set of products, tools, techniques, methods, process templates and architectures specific to the telecom market for:

- ***Integrating and managing*** a service providers' internal business processes, such as order processing, billing and customer relationship management is provided by the Integration Hub.
- ***Simplifying and facilitating*** the external delivery of new and/or third-party services, content and applications. The Application Delivery Environment allows a service provider to rapidly develop and deliver value-add enhancements, such as location, presence, service guarantees, billing-on-behalf-of, etc. to both consumers and third parties.

The SPDE Integration Hub provides the OSS, BSS and CRM capabilities needed to bill, assure and fulfill the content delivered through the Application Delivery Environment. Adapters attach these capabilities to the Integration Hub and choreographies orchestrate their use. Choreographies and collaborations provide the business logic that knits the applications in the Application Delivery Environment and Integration Hub together to form a business.

A choreography is a program that describes the business flow of a service. It is isolated from applications by collaborations and adapters thus providing a degree of implementation independence. A choreography never sees the details of the applications it directs. This allows a choreography to be reused among multiple services that require the same workflow. Similarly, a new service can be created from an existing one simply by merely changing the services choreography. This is one way that SPDE can quickly bring new or improved services to market.

Highlights

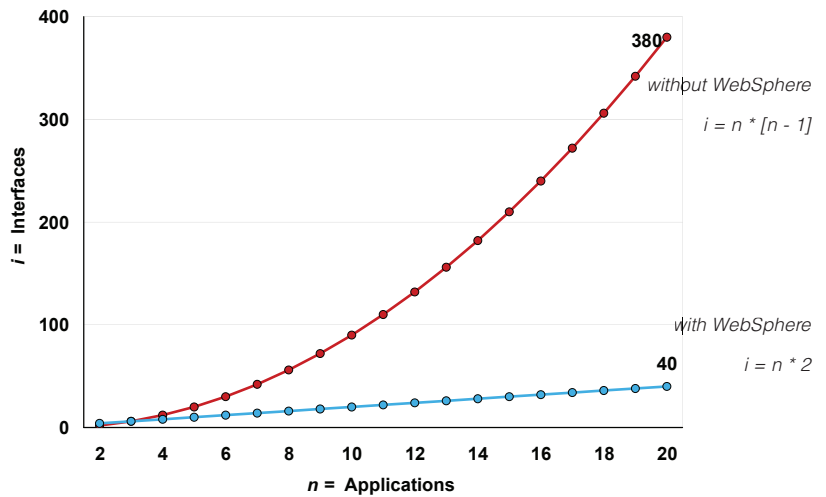
“With [WebSphere Business Integration for Telecom] integrating our SAP and Vantive systems, our customer service representatives can provide customers with real-time information. We have successfully bridged the gap between these two systems and now have a well-planned, cost-effective call center operation.”

— A Principal IT Consultant, Orange PLC Group

Business processes typically span multiple applications. This means the support of these business processes requires connections to an increasing number of packaged and legacy applications. Point-to-point integration does not scale effectively and should be avoided. This is because implementation costs, maintenance costs and development time growth is non-linear (the number of integration points required to connect n applications is $n * [n-1]$).

Using a “hub-and-spoke” model implemented in the IBM WebSphere Business Integration for Telecom offering connects multiple applications while minimizing the number of integration points and the associated development overhead required. Hence, the implementation costs are linear (number of integration points required to connect n applications is $n * 2$).

Figure 8 - Number of interfaces increases with the number of applications



Highlights

“Before we deployed our new systems architecture, we processed about two hundred contracts a month. During the first month of our implementation, we processed well over one thousand contracts and renewals - that is a staggering increase for us. [IBM] is a key part of the solution that gave us these results.”

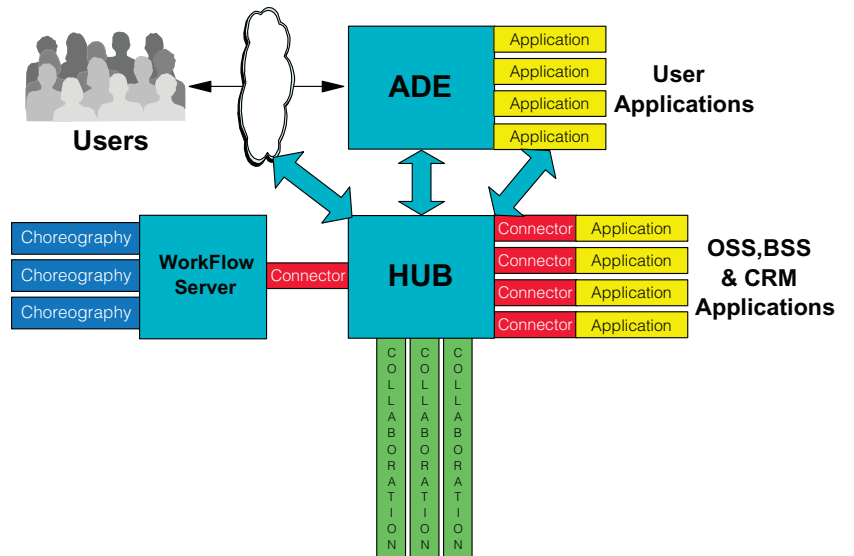
— Janice Aune, Vice President of Operations, Qwest

Business processes integration consists of five major layers of functionality:

1. the choreography (and an execution environment) for the “business process flows” that orchestrate the collaboration across multiple applications to achieve business objectives. These are industry centric by nature. These business processes can be expressed by WSFL process models.
2. common business objects that represent a composite of application data models. Identifying business objects across applications eliminates the need for point-to-point mappings. The common business object model is a set of XML data schemas.
3. transformation maps that provide mappings between specific application data models and the common business objects. Transformation is based on XSLT transformations.
4. a messaging service (transport and brokerage) that provides queuing and guaranteed delivery for synchronous or asynchronous messages (HTTP, IIOP, MQ, Web Services).
5. adapters that connect applications to the messaging service.

Figure 9 shows business process integration through the Integration Hub (choreographies, collaborations, adapters and applications) connected to the Application Delivery Environment.

Figure 9 - SPDE Integration Hub and Application Delivery Environment



Highlights

“The comparisons to the telecommunications industry undergoing the same revolution as the mainframe to client / server world are truly applicable, and nowhere is it more obvious than in the implementation of open APIs ... will open up the market for independent software vendors (ISVs). In theory, this availability will mirror the development floodgates that opened up on the Internet in the mid-1990s — a result of the industry adoption of IP, HTML, and HTTP as the lingua franca of the Internet.”

**— The Yankee Group,
The Promise of Open APIs in Carrier Networks: Will It Really Work?**

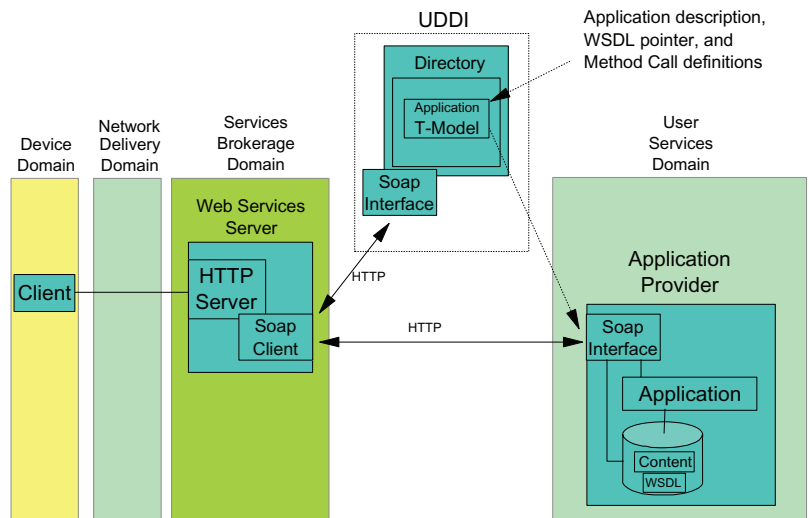
Web services and SPDE

A Web Service is an application that is accessible using standard Internet protocols. It combines the best aspects of component-based development and the Web. Web Services represent black-box functionality that can be reused without worrying about how the service is implemented. Unlike current component technologies, which are accessed with object-model-specific protocols, such as DCOM, RMI or IIOP, Web Services are accessed via ubiquitous Web protocols (e.g. HTTP, SOAP) and data formats (e.g. XML).

Web Services are the fundamental building blocks for Internet based distributed computing and becoming the technology of choice for application integration. This is due to applications being constructed with multiple Web Services from various sources that work together regardless of where they reside or how they were implemented. Web Services expose useful functionality to users through the standard SOAP (Simple Object Access Protocol) protocol.

The primary advantage of a Web Services based architecture is that it allows programs written in different languages, on different platforms, by different businesses to communicate with each other in a standard way. It allows service providers and third parties to interact without knowledge of each other’s underlying technology. Web Services is an important interfaces in the *User Services domain*. Figure 10 maps Web Services to the SPDE domains.

Figure 10 - Web Services and SPDE domains



Highlights

What is Parlay?

Parlay is an object-oriented set of open APIs that allow enterprises to interact directly with the telecommunications network used for voice and data. This allows for the development of new, intelligent applications that are portable and network independent.

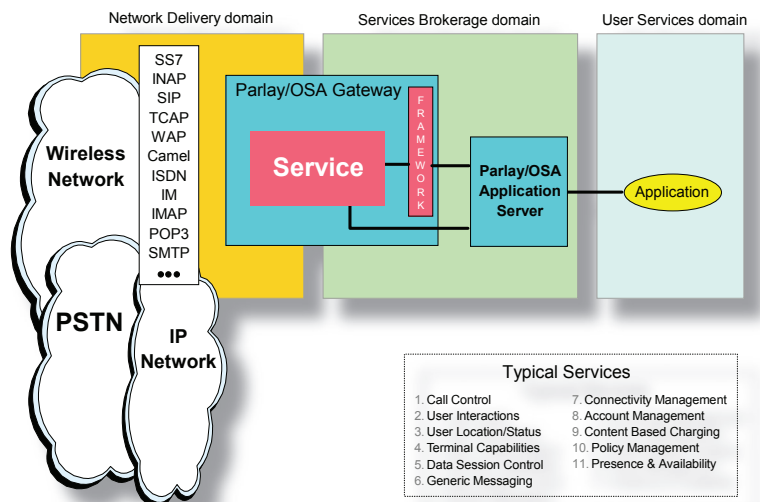
For more information, please visit www.parlay.org

Parlay and SPDE

Parlay helps support the rapid creation and delivery of new revenue producing telecommunications services which integrate e-business applications with diverse telecommunications networks (wireline, wireless and Internet). The Parlay standard is being developed by the Parlay Group in conjunction with the European Telecommunications Standards Institute (ETSI) and 3rd Generation Partnership Project (3GPP) organizations. Parlay can help enable e-business applications to leverage the capabilities of the telecommunication network by providing a framework for services external to the core network. The IBM WebSphere Application Server for Telecom provides a set of Parlay extensions to the IBM WebSphere Application Server.

The Parlay Gateway is a bridge between the *Network Delivery domain* and the *Services Brokerage domain*. It provides user applications and the middleware within the ADE, access to the intelligent network capabilities found in the *Network Delivery domain*. It also protects applications from the underlying implementation complexities in the *Network Delivery domain*. Figure 11 outlines the various components including the Parlay Gateway, Parlay Application Server and Parlay application mapped onto the SPDE domains.

Figure 11 - Parlay and SPDE domains



Highlights

Conclusion

IBM software is a key ingredient that service providers can leverage to improve their operations and differentiate their services. When used in conjunction with SPDE, IBM software delivers tangible and immediate benefits to service providers in the following manner:

1. *Lower Total Cost of Ownership for end-to-end solutions*
2. *Deliver mission critical performance, scalability, reliability and availability*
3. *Provides a long-term roadmap that embraces emerging standards*
4. *Investment protection in IT infrastructure*

The IBM Service Provider Delivery Environment (SPDE) is an open, scalable and flexible reference architecture used for deploying revenue-generating services and improving operational efficiencies. SPDE services divide into one or more of seven domains. The domains can be clustered into the Application Development Environment and Integration Hub. The Application Delivery Environment:

1. *Locates, aggregates, selects, and renders content and applications from multiple sources within the User Service domain*
2. *Provides a plug-in environment for network enabled applications*
3. *Selects, aggregates and delivers personalized content and services independent of networks and devices*
4. *Ensures a secure, scalable, flexible service environment*

Highlights

The Integration Hub is used to integrate processes and workflows among pre-built business and operational support systems, thereby improving the ability to:

1. *Manage relationships with customers*
2. *Take orders for products and services*
3. *Provision and activate network elements*
4. *Assure and bill for consumed services*
5. *Manage business and operational support systems*

The integration capabilities provided by the Application Delivery Environment and Integration Hub simplify the introduction and modification of content, applications and location-based services. This includes their supporting processes, such as billing, customer relationship management, provisioning, assurance and resource management.

Highlights

For more information

Learn how IBM software and IBM Service Provider Delivery Environment solutions can help your company achieve more revenue and reduce your costs, while helping you keep your profitable customers.

Have questions? Contact the IBM Telecommunications team today on how we can help you take advantage of our extensive industry expertise and advanced e-business technologies on the Internet at

ibm.com/industries/telecom

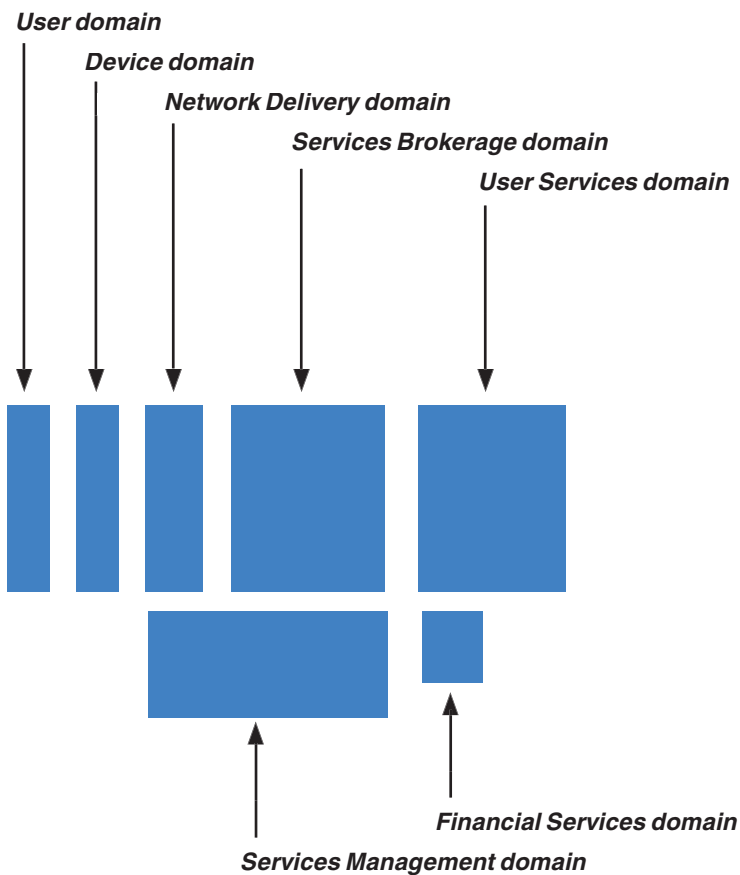
ibm.com/software

Introduction to the IBM software portfolio

This product appendix highlights IBM software products that can be used in conjunction to deliver key functional aspects of the IBM Service Provider Delivery Environment (SPDE). The appendix has been organized by the major IBM software groups, specifically:

- **DB2 Information Management software**
- **Lotus software**
- **Tivoli software**
- **WebSphere software**

the following color-coded diagram has been included to assist the reader in mapping the highlighted product functionality with the underlying SPDE domains.



IBM DB2 Content Manager

- Services Management domain
- User Services domain



IBM DB2 Content Manager is a highly scalable, distributed enterprise content management solution that can eliminate the need for many disconnected content repositories. Use it to manage and integrate critical business information on demand (text, graphics, images, computer generated reports, video audio and web content) with leading applications. It enhances solutions such as Siebel, Peoplesoft and SAP to significantly improve operational efficiencies. The solution is further enhanced with DB2 Content Manager VideoCharger which provides real-time multimedia streaming. It's a high impact tool for applications such as e-commerce, e-learning or corporate communications.

IBM DB2® Content Manager integrates with your existing hardware and software investments (IBM and non-IBM) enabling your organization to leverage common infrastructure and achieve a lower cost of ownership. IBM DB2® Content manager solutions help streamline workflow, improve productivity and deliver new, powerful and advanced services that leverage critical business content, with information and services delivered to users conveniently and automatically.

IBM DB2 Everyplace

- Device domain



IBM DB2 Everyplace™ is a small footprint (180 KB approximately) relational database and enterprise synchronization architecture for mobile and embedded devices. It is designed for low-cost, low-power, small form-factor devices such as personal digital assistants (PDAs), handheld personal computers (HPCs), or embedded devices. Data stored in the DB2 Everyplace database is queried, updated, and deleted using industry standard SQL on the mobile or embedded device. DB2 Everyplace Synchronization Server works with the DB2 Everyplace database to synchronize mobile data to and from DB2 and other JDBC-based sources.

IBM DB2 Information Integrator

- User Services domain



Information integration is about integrating diverse forms of data across and beyond the enterprise. Business drivers such as increasing customer loyalty, improving operational efficiency, and quickly capitalizing on emerging opportunities all require rapid and coherent information integration. IBM DB2 Information Integrator's key technologies include:

- Extended Markup Language (XML) facilities for storing, composing, and managing XML data
- Web services support to facilitate database access from non-traditional clients and extend the reach of the database engine to non-traditional data types
- Advanced search facilities to deliver high speed, relevant results over broad-ranging content
- Federation technology to access diverse and distributed data sources as if they were in a single database
- Policy-based caching technology to improve search and query performance
- Rich transformation features to facilitate integration and prepare data for analysis
- Flexible replication to manage data placement for performance, currency or availability

IBM DB2 Universal Database (UDB)

- Services Brokerage domain
- User Services domain
- Services Management domain



IBM DB2 continues to reduce the total cost of ownership of database management systems with innovative autonomic computing technologies, and enhanced information integration. DB2 helps customers solve critical business problems such as integrating information across the enterprise to minimize the tasks and costs associated with managing data infrastructure. DB2 eliminates, automates and simplifies data management tasks. IBM's ongoing commitment to delivering leading database management capability, reliability, performance, availability and scalability has made DB2 the database of choice for customers and partners developing and deploying solutions like Enterprise Resource Planning, Customer Relationship Management, Business Intelligence, Content Management and e-business.

Lotus Discovery server

- Services Management domain



Make better decisions faster. Quickly search across multiple sources of information throughout your organization. Automatically associate subject matter experts with information resources. The IBM Lotus Discovery Server™ identifies relationships among documents, people and topics so you can quickly find the information and expert help you need to take fast, effective action. It functions on a backdrop of collaborative tools that instantly link discovered people through online awareness and instant messaging. The Lotus Discovery Server searches for information quickly, across the entire corporation to help manage information overload. It identifies the right expertise, leveraging skills across departmental and geographical boundaries. It captures and automatically catalogues information and intellectual assets for reuse to avoid recreating work.

Lotus Domino server

- User Services domain



The IBM Lotus Domino™ Server Family provides a foundation for collaboration and e-business, driving solutions from corporate messaging to Web based transactions - and everything in between. This robust messaging and collaboration system is built to maximize human productivity by unleashing the experience and expertise of individuals, teams, and extended communities.

Functions include:

- *Integrated, collaborative services such as e-mail, Web access, calendaring, group scheduling, bulletin boards and newsgroups*
- *Internet messaging for native Internet addressing, SMTP routing, and MIME content support*
- *Support for S/MIME, SSL, POP3, IMAP4, LDAP, HTTP, HTML, SNMP, etc.*
- *Client support includes Lotus Notes client, or clients like Eudora, Microsoft Outlook Express, Netscape Mail, PDAs or smart phones*
- *Billing services to track, report and analyze system usage for billing, charge back and capacity planning*

Lotus Instant Messaging (formerly Sametime)

- Users Services domain



IBM Lotus Instant Messaging is a secure, robust, scalable instant messaging and Web conferencing solution for business. By providing presence awareness, instant messaging and Web conferencing, Lotus Instant Messaging helps speed communication, reduce travel expenses and rapidly produce results. With Lotus Instant Messaging, your employees, customers, partners, and suppliers can immediately and easily interact with one another in real-time.

Lotus LearningSpace

- *User Services domain*



Lotus LearningSpace® is dedicated to advanced e-learning, and every element reflects this focus on instruction and learning. It's a complete solution that lets you integrate custom or off-the-shelf courses, deliver them in the method most appropriate for your learners and assess, track and manage the entire e-learning process. The result? A full e-learning delivery and management system that goes well beyond the capabilities of any other e-learning product by supporting self-paced, collaborative and a live, virtual online learning in one solution for employees, partners or customers.

Lotus Notes

- *User Services domain*



IBM Lotus Notes® continues to set the standard for innovation in the messaging and collaboration market that Lotus created over a decade ago. Lotus Notes combines enterprise-class messaging, calendaring and scheduling capabilities with a powerful platform for collaborative applications.

- *Integrated, Web-like environment for Internet-based e-mail, calendar, contacts, to-do's, Web pages, News Groups and intranet applications*
-

IBM Tivoli Access Manager

- Services Brokerage domain
- Services Management domain
- User Services domain



IBM Tivoli Access Manager is a security management solution that provides authentication and authorization services. This product greatly enhances the native security environment and upgrades data protection to provide application-level, data protection. Currently supports:

- e-business (application level policies)
- Business Integration (MQ level policies)
- Operating Systems (OS level policies)

IBM Tivoli Business Systems Manager

- Services Management domain
- User Services domain



IBM Tivoli® Business Systems Manager is a true end-to-end solution which allows customers to integrate availability information from all domains (servers, mainframes, operating systems, networks, middleware, and applications) into Line of Business (LOB) views that clearly align these resources to the major business functions which they support. It allows customers to utilize the concept of end-to-end business systems management to organize related components and give business context to management decisions, while leveraging their existing availability infrastructure to instantly translate important event and alert information into a graphical view that turns these messages into easily interpreted business impact.

IBM Tivoli Configuration Manager

- Device domain



IBM Tivoli Configuration Manager can help you gain total control over your enterprise software and hardware. Its software distribution module can give you the ability to rapidly and efficiently deploy complex mission-critical applications to multiple locations from a central point. After systems have been deployed, the inventory module lets you automatically scan for and collect hardware and software configuration information from computer systems across your enterprise.

Simple, integrated installation of all components enables faster deployment and a single administrative console for both inventory and software distribution operations. Multicasting helps ensure efficient bandwidth utilization, and reference models help increase speed of software deployment by providing standards against which all systems are measured and maintained.

The capability to manage servers, desktops, notebooks, PocketPC, PalmOS, and Nokia Communicator devices with a single solution allows for the management of the widest possible spectrum of IT assets found in today's enterprises.

IBM Tivoli Enterprise Console

- Services Management domain
- User Services domain



IBM Tivoli Enterprise Console® is a powerful event management application designed to provide customers with advanced event collection, correlation, and automation capabilities. Tivoli Enterprise Console enhances availability of customer business systems and processes by examining incoming events for important relationships, such as cause-and-effect, and presenting status and severity results to customer personnel. In many instances, the Tivoli Enterprise Console is capable of automating the handling of events so that applications or systems can be restored to normal functioning with no other intervention required.

IBM Tivoli Identity Manager

- Services Brokerage domain
- User Services domain
- Services Management domain



IBM Tivoli Identity Manager provides policy-based identity management across legacy and e-business environments. Intuitive Web administrative and self-service interfaces integrate with existing business processes to help simplify and automate managing and provisioning users. It incorporates a workflow engine and leverages identity data for activities such as audit and reporting. IBM Tivoli Identity Manager is an integrated component of the IBM identity management solution that can help you get users, systems and applications online and productive fast, reduce costs and maximize return on investment. IBM identity management provides identity lifecycle management for the increasing number of internal users, customers and partners.

IBM Tivoli Privacy Manager for e-business

- Services Brokerage domain
- User Services domain
- Services Management domain



IBM Tivoli Privacy manager for e-business is the first solution that allows companies to define, deploy, monitor and audit adherence to privacy policies on an enterprise-wide basis. This allows enterprises to push privacy policies into their IT systems and applications, thereby helping lower the costs of privacy compliance through automation.

Privacy Manager is a Java™ 2 Enterprise Edition (J2EE) compliant, IBM WebSphere® software application that leverages the security infrastructure provided by Tivoli Access Manager. This lowers the cost of installation and deployment, leverages WebSphere software scalability and availability features, and extends Tivoli Access Manager's value proposition by linking data handling procedures and monitoring to the security infrastructure.

IBM Tivoli Remote Control

- Device domain



IBM Tivoli Remote Control is a leading enterprise-scale solution for remote desktop management. Tivoli Remote Control gives IT the tools to centrally support tens of thousands of workstations and PCs using secure and reliable policy-based management, enabling rapid repair of critical employee resources. Tivoli Remote Control solves the dual IT problems of preventing employee downtime and reducing support costs.

Tivoli Remote Control allows enterprises to manage through firewalls without compromising firewall security. Full datastream encryption and improved central logging add layers of additional security to fortify the overall solution. Additional enhancements to the Web console provide a clearer, more intuitive view for IT and gives administrators faster session launch times.

IBM Tivoli Risk Manager

- Services Management domain



IBM Tivoli Risk Manager helps enable customers to manage security incidents, such as denial-of-service attacks and other forms of intrusions, and perform security change management across the enterprise. It addresses the complexity of managing multiple point products by integrating and managing security events across applications, operating systems, and network devices to provide an overall view of the security architecture. Tivoli Risk Manager enables administrators to eliminate clutter such as false-positives, while quickly identifying the real security threats to help administrators respond with adaptive security measures. Decision-support tools provide insight into patterns of intrusions, as well as compliance with security policies.

IBM Tivoli Storage Manager (Available in: • Standard • Enterprise Edition)

- User Services domain



IBM Tivoli® Storage Manager family of products protects data from hardware failures, errors, and unforeseen disasters by storing backup and archive copies on offline and offsite storage. Scaling to protect thousands of computers running a dozen operating systems ranging from notebooks to mainframes and connected together through the Internet, wide area networks (WANs), local area networks (LANs), or storage area networks (SANs), Tivoli Storage Manager's centralized Web-based management, intelligent-data-move and store techniques and comprehensive policy-based automation all work together to minimize administration costs and the impact to both computers and networks. Optional modules allow business-critical applications that must run 24 hours a day and 365 days-a-year to utilize Tivoli Storage Manager's centralized data protection - with no interruption to their service.

IBM Tivoli Workload Scheduler

- Services Management domain



Automates, monitors, and controls workflow with both local and remote systems from a single point of control and features:

- Integration with IBM Tivoli Business Systems Manager
 - Multiple holiday calendars
 - Free day rule which is applied against scheduled holiday
-

IBM Mobile Connect

- Device domain



IBM Mobile Connect is a pervasive computing technology solution that helps enable handheld devices such as IBM WorkPad® computers, Palm, EPOC and Windows CE devices to be integrated into Enterprise Solutions. Mobile Connect allows organizations to directly transfer information from multiple handheld devices directly to corporate systems, without the need to synchronize via the PC. It enables 2-way relational database synchronization, 2-way file transfer, and the remote installation of applications. IBM Mobile Connect also supports direct synchronization with Lotus Notes and Microsoft Exchange for server based synchronization of e-mail, calendars, contacts and tasks.

IBM WebSphere Application Server (Available in four versions: • Standard • Advanced • Enterprise • Z/OS)

- Services Brokerage domain
- User Services domain



As the foundation of the WebSphere® platform, IBM WebSphere Application Server, reinforces its reputation as the premier Java™ and Web Services technology-based application platform integrating enterprise data and transactions with the dynamic e-business world. It provides a rich, e-business application deployment environment with a complete set of application services including capabilities for transaction management, security, clustering, performance, availability, connectivity and scalability. It manages and integrates enterprise-wide applications while leveraging open technologies and application programming interfaces, and includes powerful Web services for interoperability and business-to-business applications, a rich set of open-standards implementations, and virtually any-to-any connectivity with transaction management and application adaptability. Specialized configuration options are also available, offering control and flexibility to businesses as they choose how they want their infrastructure to respond to the dynamic marketplace.

IBM WebSphere Application Server for Telecom (formerly WebSphere Telecom Application Server)

- Services Brokerage domain



IBM WebSphere Application Server for Telecom, a key IBM Service Provider Delivery Environment (SPDE) Application Delivery Environment technology, provides a set of Parlay extensions to the IBM WebSphere Application Server. This helps support the rapid creation and delivery of new revenue producing telecommunications services which integrate e-business applications with diverse telecommunications networks (wireline, wireless and Internet). The Parlay APIs for the WebSphere Application Server for Telecom are designed in conjunction with the European Telecommunications Standards Institute (ETSI) and 3rd Generation Partnership Project (3GPP) organizations and can help enable e-business applications to leverage the capabilities of the telecommunication network by providing a framework for services external to the core network.

IBM WebSphere Business Integration for Telecom (includes WebSphere Business Integration Server)

- Services Management domain



IBM WebSphere Business Integration for Telecommunications provides sophisticated Business Support System (BSS) and Operational Support System (OSS) integration capabilities which reduce operating expense by streamlining business integration and processes. By providing easier integration of BSS/OSS applications using open-standards, service providers are able to rapidly provision new services and accelerate their time to revenue. WebSphere Business Integration for Telecommunications quickly integrates best-of-breed or legacy applications, automates individual process steps and streamlines processes for a competitive advantage.

IBM WebSphere Business Integration Adapters (formerly Crossworlds Connectors)

- Services Management domain



IBM WebSphere Business Integration Adapters are part of the WebSphere Business Integration family and help customers improve enterprise-wide business processes that span their various systems supporting sales, human resources, finance, supply change management, partner functions, and more. These adapters provide application, technology, mainframe, and e-business connections for both process integration and application connectivity requirements. Their role in making integration initiatives successful is to quickly and easily access the data and transactions within customers' enterprise systems, and then transform and route it through WebSphere integration brokers, such as WebSphere MQ Integrator or WebSphere MQ Integrator Broker or IBM WebSphere Business Integration Server. Prebuilt WebSphere Business Integration Adapters are key to scalable, secure integration infrastructure that supports e-business goals.

IBM WebSphere Business Integration Collaborations (formerly Crossworlds Collaborations)

- Services Management domain



IBM WebSphere Business Integration Collaborations are process templates enabling Process Integration: automating and improving business processes; coordinating people and applications to streamline business processes. Used with IBM WebSphere Business Integration Server, and leveraging the strength of a Common Business Object Model, Collaborations help customers to accelerate the integration of their business processes that span multiple applications.

More than 60 Collaboration sets are currently available to automate various industry's common processes that involve such information as Customers, Orders, and Invoices. In addition to streamlining horizontal processes, industry-specific Collaborations embody the business logic and best practices of processes common to the Telecommunication industry.

IBM WebSphere Business Integration Modeler (formerly Holosofx)

- Services Management domain



The IBM WebSphere Business Integration Modeler is a state-of-the-art product used to define, model, analyze, simulate, and monitor business processes for today's competitive global marketplace. The IBM WebSphere Business Integration Modeler product is a bundle of two products: IBM WebSphere Business Integration Workbench and IBM WebSphere Business Integration Workbench Server. It is the starting point, and the ending point, in the cycle of business process modeling. You start with the Process Modeler, depicting your current process in a graphical diagram. Standard symbolic shapes are used, but you may use your own icon pictures to represent input/output agents. In a multiuser environment, the IBM WebSphere Business Integration Workbench Server allows sharing and publishing business process definitions. After defining the business process, you use the Business Analyzer to help you revise your process for greater efficiency. Then comes the task of implementing the revised process: The business process models are automatically translated to be automated with IBM WebSphere MQ Workflow, IBM's robust and scalable process engine.

IBM WebSphere Business Integration Monitor (formerly Holosofx)

- Services Management domain



The IBM WebSphere Business Integration Monitor is a state-of-the-art Real-Time Monitor for today's competitive global marketplace. The Monitor provides a real-time quantified view of your business processes and output, which allows valuable insight into your company's performance. You can track all your automated business processes and display important metrics via convenient enterprise dashboards to check the pulse of company performance. You also have access to both current and historical reports to run further analysis and report performance measurements to management. With the Monitor, customers can now fully understand the performance and execution of their business processes in real time versus proposed changes to the process that are not quantifiable as they perform. The IBM WebSphere Business Integration Monitor further adds to continuous process improvement by allowing real-time process metrics to be re-routed back into the WebSphere Business Integration Modeler for further streamlining and adaptation to an ever changing environment.

IBM WebSphere Commerce Analyzer

- Services Management domain
- User Services domain



IBM WebSphere Commerce Analyzer Advanced Edition is an analytical solution that enables WebSphere Commerce Suite customers to analyze information related to their customers' e-commerce activities. WCS customers can improve the effectiveness of their marketing campaigns and promotions. WCA/Adv provides the following features:

- *Prepackaged to have reports in days.*
- *End-user browser-based analytic reporting via Brio.Inform*
- *Includes newspapers, charts, and pivot tables*
- *Easily learned dynamic queries*
- *Highly customizable by business users*
- *Extraction, transformation, move and load (ETML) functions to extract and transform WCS operational data sources using aggregation and summarizing techniques*
- *Data mining models that enable the analyzing of complex data characterizations, relationships, and projections with regard to customer segmentation*

IBM WebSphere Commerce Business Edition

- User Services domain



IBM WebSphere Commerce Business Edition is a powerful Sell-Side commerce solution designed to handle the broad range of challenges encountered when selling in Business-to-Business (B2B) and Business-to-Consumer (B2C) environments. Business Edition extends beyond the traditional web storefront providing true value to your customer and trading partner relationships while streamlining business processes. This enables you to build and maintain meaningful business relationships while optimizing business operations.

WebSphere Commerce Business Edition is built from the ground up on IBM's award winning technology delivering unparalleled dependability, scalability, and performance. WebSphere Commerce runs many of the world's largest, busiest e-Commerce Web sites, including the ShopIBM Web site. Achieve the greatest impact for the lowest cost and fastest return on investment (ROI) while deploying a truly global e-business.

IBM WebSphere Digital Media Enabler (formerly WebSphere Commerce for Digital Media)

- User Services domain



IBM WebSphere Digital Media Enabler extends your business and helps generate new revenue for your digital assets from multimedia presentations, software, lectures and educational materials to images, Web content and video. With online sales and multiple payment options, including purchase order, credit card and subscription method, WebSphere Digital Media Enabler makes content accessible - virtually immediately - to team members, as well as external buyers and clients.

This solution brings together award-winning WebSphere Commerce and IBM Content Manager. Real-time collaboration allows your team to work together, regardless of where they are located, which helps reduce time zone frustrations and encourages a faster turnaround. Water-marking features and text overlays help ensure that your valuable intellectual property is used only by those who purchase it through the proper channels.

IBM WebSphere Commerce Professional Edition (available in two versions: • Entry version • Standard)

- User Services domain



IBM WebSphere Commerce Professional Edition is an industry-leading solution for sell-side e-commerce, customer relationship management, and multichannel enablement. The comprehensive set of integrated software components helps sellers build, maintain, and manage sites and stores to sell goods and services on the Web, in Business-to-Consumer and basic Business-to-Business markets. WebSphere Commerce software runs some of the largest, busiest e-Commerce Web sites including IBM's ShopIBM Web site. WebSphere Commerce Professional Edition builds on the reputation for dependability, scalability, and performance by adding new capabilities for advanced e-marketing and campaign management, advanced order and inventory management, and customer collaboration via commerce live help.

The key components of WebSphere Commerce Professional Edition are:

- Commerce Server via WebSphere Application Server
 - WebSphere Commerce Accelerator
 - Collaborative Filtering for more targeted and personalized campaign marketing
 - Advanced merchandising and personalization capabilities
 - Advanced Order and Inventory Manager
 - WebSphere Catalog Manager bundling
 - Live Help and Customer Care Feature (via Lotus® Instant Messaging)
 - A Web server via WebSphere Application Server
 - Database support for DB2® and Oracle
 - Payment Manager bundling
-

IBM WebSphere Data Interchange

- Services Management domain



With IBM WebSphere Data Interchange your electronic data interchange (EDI) systems are no longer isolated or dead-ended, they are a resource to be exploited. Information can be promptly and freely exchanged throughout the extended IT infrastructure, eliminating the re-keying of EDI data and dramatically reducing the time to flow EDI data to other applications.

WebSphere Data Interchange provides a mapping tool with a graphical user interface to build EDI, XML, and application data format transformations for popular formats that your applications, or your partners, may use. To connect to trading partners, WebSphere Data Interchange gives you the choice of connectivity to VAN and Internet gateways, while logging enables you to recover from network failures. WebSphere Data Interchange can perform batched or real-time transmission, and EDI file enveloping and de-enveloping, and provides support for standards such as ANSI X12, EDIFACT, RAIL, UCS, VICS, HIPAA and X12 embedded HL7.

IBM WebSphere Edge Server

- Services Brokerage domain



IBM WebSphere Edge Server distributes application processing to the edge of the network and includes the following new features:

- Content Distribution deploys published Web content to caches and “rehosting servers” throughout the network.
- Enhanced Caching improves response times as a forward, reverse, or transparent proxy; cache and invalidate dynamic content.
- Enhanced Load Balancing improves server selection, load optimization, and fault tolerance.
- Transactional Quality of Service allocates computing and network resources according to a transaction’s business.

IBM WebSphere Everyplace Access

- Device domain
- Services Brokerage domain



IBM WebSphere Everyplace™ Access provides the client and server software infrastructure to support mobile solutions. It addresses the challenge of extending e-business applications to mobile devices that do not have always-on, high bandwidth connectivity through features such as intelligent synchronization services, transcoding and mobile messaging. The offering includes a unified client that supports connected and disconnected operations for today’s leading handheld devices. The offering also includes the tools necessary for developing mobile applications while providing “out-of-the box” features such as mobile access to e-mail and Personal Information Manager (PIM).

IBM WebSphere Everyplace Connection Manager

- Services Brokerage domain



IBM WebSphere Everyplace Connection Manager extends existing applications to mobile workers over many different wireless networks. It supports secure data access by both wireless application protocol (WAP) and non-WAP clients over a wide range of international wireless network technologies, as well as local area (LAN) and wide area (WAN) wireline networks. WebSphere Everyplace Connection Manager is also an ideal solution for service providers, as it enables wireless access from WAP-enabled devices and can send short message service (SMS) messages. It is highly scalable to handle large numbers of subscribers.

IBM WebSphere Everyplace Subscription Manager

- Services Brokerage domain



IBM WebSphere Everyplace Subscription Manager is a software product that provides the necessary functions and features for Service Providers to enroll, authenticate, service and support their customers. As part of the Broadband Service Portal, WebSphere Everyplace Subscription Manager provides the framework for broadband service providers to rapidly deploy value added services. These value added services like, video on demand, network storage, gaming and distance learning provide services to customers that increase the average revenue per subscriber. At the same time, features like customer self service lower service provider management and infrastructure costs.

IBM WebSphere Host Access Transformation Server

- User Services domain



IBM WebSphere Host Access Transformation Server provides all the tools you need to quickly and easily extend your legacy applications to business partners, customers, and employees. This software makes your 3270 and 5250 applications available through the most popular Web browsers, while at the same time converting your host screens to a web-like look and feel. With a zero footprint Web-to-host solution - the only software needed on the client is a Web browser. Rules-based transformation engine converts host screens to web-like GUIs on the fly, so you can have your host application online with a familiar Web interface within a day of loading the program.

IBM WebSphere MQ

- Services Management domain
- Services Brokerage domain



IBM WebSphere MQ messaging products make it straightforward for applications to exchange information among more than 35 IBM and non-IBM platforms, including Linux and Windows 2000, even if the target program is not running. They take care of network interfaces, assure delivery of messages, deal with communications protocols, and handle recovery after system problems. This product offers added security using Secure Sockets Layer (SSL), the Internet standard for secure communication. There are enhanced features for performance- especially for JMS (Java Message Service) applications, making WebSphere MQ the JMS provider of choice. Other features, particularly useful for clustering of systems that can share workload, have been added to enhance system scalability and reliability.

IBM WebSphere MQ Event Broker

- Services Management domain



IBM WebSphere MQ Event Broker enables integration between people, applications and telemetry devices in real-time based on an event model. Requesters can specify the information important to them and their business so they now what is happening as it happens. It enables processes and information that are unaware of each other to be linked based the topic or content of events. It is highly scalable, supporting tens of thousands of concurrent users, and tens of thousands messages per second per server. WebSphere MQ, WebSphere MQ Everyplace, SCADA and IP transports are dynamically interchangeable proving a class service based on the content of the message.

IBM WebSphere MQ Everyplace

- Device domain



IBM WebSphere MQ Everyplace™ connects mobile and wireless applications with the enterprise using secure and dependable messaging for online-when-available working. It supports a broad array of devices with a small, customizable footprint providing robust once-only messaging so that transactions are not lost or duplicated. WebSphere MQ Everyplace supports asynchronous and synchronous messaging as well as peer-to-peer messaging. It is highly customizable, and provides support for a range of programming languages, APIs and standards. WebSphere MQ Everyplace connects seamlessly with other Application Connectivity offerings. It extends message formatting and publish / subscribe to the mobile environment and enables online-when-available working for IBM Pervasive offerings.

IBM WebSphere MQ Integrator Broker

- Services Management domain



IBM WebSphere MQ Integrator Broker is a high performance, scalable, robust and powerful information broker. It has a graphical user-interface that allows solution developers to design message flows that route, transform and enrich in-flight messages between applications and integrate information held in corporate databases. It is able to handle multiple transports, such as WebSphere MQ messaging, WebSphere MQ Everyplace for pervasive devices and telemetry integration for remote sensory and control devices. It enables the end points to be notified of events of interest through a high performance publish and subscribe model. It provides a control center that allows solution administrators to deploy and manage a distributed network of brokers.

IBM WebSphere MQSeries Workflow

- Services Management domain
- Services Brokerage domain



IBM WebSphere MQ Workflow facilitates rapid process deployment to people, applications and Web Services, based on the IBM WebSphere software platform and WebSphere MQ messaging. It is scalable, fault-tolerant, and optimized for parallel distributed processing in service-oriented architectures based on standards. Available worldwide on a number of platforms, including native z/OS™ and the sysplex, it takes full advantage of multiprocessing engines and clustering and can execute processes running from sub-seconds to many months. It allows you to fully leverage existing resources throughout IT and organization infrastructures. Changes can be made at process level, reducing the complexity of managing change for business integration solutions.

IBM WebSphere Portal family

- Services Brokerage domain
- User Services domain



Provides a single point of interaction with dynamic information, applications, processes for building portals for business-to-employee (B2E), business-to-business (B2B), business-to-consumer (B2C). Supports wired or wireless device access and applications. Is available as three packaged offerings:

- Portal Enable (base)
- Portal Extend
- Portal Experience

IBM WebSphere Translation Server

- Services Brokerage domain



The IBM® WebSphere® Translation Server is a machine translation offering that can help companies remove language as a barrier to global communication and e-commerce. WebSphere Translation Server enables enterprises to provide Web pages, e-mail messages and chat conversations in multiple languages, in real time. Specifically designed for enterprise use, the WebSphere Translation Server allows companies to leverage their existing Web infrastructure to provide content to users in their native language, at a fraction of the cost of professional translation. WebSphere Translation Server is designed for scalability on multiple platforms: Microsoft® Windows NT®, IBM AIX®, Linux Red Hat and Sun Solaris environments.

IBM WebSphere Transcoding Publisher

- Services Brokerage domain



Extend the reach of Web content and applications with IBM® WebSphere® Transcoding Publisher, an easy-to-use solution for bridging data across multiple devices, markup languages and formats. Transcoding Publisher is a server-side software solution that dynamically adapts, reformats, and filters Web content to make it optimally suited for a variety of mobile devices, giving companies better access to customers, business partners and mobile employees in a cost efficient way. WebSphere Transcoding Publisher ships with a standard set of transcoders, device and network profiles and offers the flexibility and tooling to modify, create and import third party elements.

IBM WebSphere UDDI Registry

- Services Brokerage domain



IBM WebSphere Universal Description, Discovery and Integration (UDDI) Registry enhances the integration of business processes as Web services representing the business processes can be discovered instantly using the latest UDDI and Web services standards. Using the UDDI Registry, you can publish the underlying business processes as Web services that can be discovered and consumed dynamically. With this, you can rapidly find and integrate applications and systems.

IBM WebSphere UDDI Registry provides:

- Ability to dynamically discover, consume your business processes and provides a flexible infrastructure.
 - Organization of Web services consistent with your business practices.
 - Ability to extend your business processes as Web services to suppliers, trading partners and customers in a secured, controlled environment.
 - Ability to extend your business processes to the public at-large if needed.
-

IBM Unified Messaging for WebSphere® Voice Response (formerly IBM Message Center)

- User Services domain



Unified Messaging for WebSphere® Voice Response is a messaging solution that manages employee and customer voice mail, e-mail, and telephone facsimile access from virtually anywhere and anytime over the telephone or the Internet. It takes the chaos out of communications by giving access to information from mobile phones, voice mail systems, e-mail, pagers, fax, and message services. Message Center provides a central service that coordinates and provides access to popular communication formats through the interface that is most appropriate at the time. Users can navigate through their message store using voice commands or simple DTMF key entries.

IBM WebSphere Voice Server

- Services Brokerage domain



IBM brings more than four decades of voice recognition technology to your e-business with IBM WebSphere® Voice Server. IBM WebSphere Voice Server is a software middleware product for developing and deploying conversational e-business solutions. This allows customers access to e-business applications using telephones or wireless devices, allowing them to access information and transactions in a natural, user-friendly way - using their voices. WebSphere Voice Server supports standards, such as Java™, Voice Extensible Markup Language (VoiceXML), and Voice Over IP to simplify integration of conversational solutions with your existing applications and e-business middleware.

IBM WebSphere Voice Response Server

- Services Brokerage domain



IBM® WebSphere® Voice Response with DirectTalk® technology is a versatile voice processing platform that brings expanded functionality to Interactive Voice Recognition applications, including advanced speech recognition and VoiceXML for the Web. WebSphere Voice Response integrates information from multiple sources and can deliver direct access to the services and information needed around the clock. WebSphere voice response can answer and process a large number of calls simultaneously, reducing caller wait time and improving customer satisfaction.

IBM WebSphere Voice Server for Transcription

- Users Services domain



WebSphere® Voice Server for Transcription is a specialized speech recognition offering that allows solution developers and service providers to integrate transcription (deferred recognition) services within professional workflow solutions. Based on IBM's ViaVoice® speech technology, multiple, diverse users have access to these services from a central location. Users dictate information with a microphone, handheld recorder or a telephone, and Voice Server for Transcription converts the recorded audio into text using those users' personalized voice model. Voice Server for Transcription includes generalized medical and legal language models along with tools to customize them. It also handles user enrollment and creates and manages user profiles, including the ability to add custom pronunciations for each user. In addition, multiple Voice Servers for Transcription can be configured to provide quick turnaround and the ability to handle large volumes of transcription requests.

IBM WebSphere Voice Toolkit

- Services Brokerage domain



WebSphere® Voice Tools extend the WebSphere Studio Integrated Development Environment (IDE) framework for voice application development, making it easier to create, test, and debug applications that use speech recognition and Text-to-Speech. The tools support application development using both VoiceXML and Java™ to extend the reach of e-business applications into new business environments.

- **WebSphere Voice Toolkit** makes adding voice technology to applications faster and more accessible
 - **WebSphere Voice Server SDK** provides tools for prototyping VoiceXML applications on a PC
 - **IBM Reusable Dialog Components** speed development of VoiceXML applications by providing the building blocks for common functions
 - **WebSphere Voice Response Beans** provides JavaBeans to build interactive voice response applications that run on WebSphere Voice Response
 - **WebSphere Voice Response Simulator** allows you to test and demonstrate applications built with WebSphere Voice Response Beans from a Windows® workstation.
-

IBM WebSphere Studio Application Developer

- *User Services domain*
- *Services Brokerage domain*



WebSphere® Studio Application Developer is IBM's core application development environment for creating and maintaining Java™ 2 Platform, Enterprise Edition (J2EE) applications and Web services. Built on Eclipse innovations and written to J2EE specifications, WebSphere Application Developer helps you optimize and simplify J2EE application development with best practices, visual tools, templates, code generation, and the most comprehensive development environment in its class.

Whether you are creating client-side or server-side development, WebSphere Studio Application Developer provides integrated support for Java, Web XML, Web services, J2EE, data management, team development, and built-in test environment to address your end-to-end development needs.



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