

WebSphere MQ
To support your business objectives



WebSphere[®] software



How to become an SOA superhero.

“The scale and pace of [global economic integration] is unprecedented ... the greater part of the earth’s population is now engaged.”

— Ben Bernanke, chairman, U.S. Federal Reserve System





Today's business landscape in the global economy affects companies of all sizes. These companies are being forced to reshape themselves in fundamental ways to address important changes:

- **New and changing customers.** *China and India will add over one billion new consumers over the next 5 to 10 years. Baby boomers will either spend their accumulated wealth or pass it on to their heirs.*
- **Global integration.** *Technology and standards will enable the immediate transfer of goods and services, as well as redefine how information is shared. Work will be broken into pieces that flow globally to wherever it can be done best and then reassembled.*
- **Business-model innovation.** *Industry, revenue and enterprise models will emerge that enable companies to rapidly seize new opportunities, differentiate themselves and their partners from the masses, and dynamically adapt to change.*
- **New technology models.** *New architectures, systems and skill sets will emerge in order to more effectively support business-model innovation.*

In 2006 IBM conducted a CEO survey. The results showed that 87 percent of CEOs believe that fundamental change is required over the next two years to drive innovation. It also revealed that extensive integrators were growing revenue 5 percent faster than their competitors. CEOs who extensively integrated business and technology reported greater customer satisfaction, speed and flexibility than their less-integrated peers.

Where are the superheroes when you need one?

Imagine being able to connect with, interact with and deliver information to any and all of your technology assets, whether they are home-grown assets, packaged applications, mobile devices or even unmanned devices on a remote oil pipeline. Imagine also being able to start simple to meet your immediate needs while at the same time creating a foundation for the future that enables you to grow and adapt dynamically without having to rearchitect your solutions. IBM WebSphere® software provides that ability so that all your assets can be incorporated and reused in your multiple business processes, adding levels of scalability and qualities of service to match your business needs.

Without reliable connectivity, your business and its profitability can be directly affected by breakages in business continuity that prevent having the right information at the right time to support the decision-making process. Organizations can be overwhelmed with the complexity of IT systems—along with the development and maintenance costs of those systems. Flexible, agile integration capabilities enable IT to respond quickly to new business-driven opportunities.

Service oriented architecture: Join the superheroes club

Service oriented architecture (SOA) simplifies IT projects and enables business agility. It is an IT architectural style that supports integrating your business as a set of linked services. What do we mean by a service? It is a repeatable business task, such as checking a potential customer's credit rating or opening a new account. The task can be orchestrated into current and future business processes.

Many companies today are already adopting SOA and realizing meaningful benefits, but the most agile and globally integrated organizations are taking it to the next level, employing the IBM Smart SOA™ approach. With this approach, the continuum of challenges faced by an organization is matched to a continuum of SOA responses—from basic to advanced. This means that the adoption of SOA technology evolves along with the innovation of business models, and that the transition to an agile, globally integrated enterprise can occur in incremental stages. SOA succeeds by decoupling the physical implementation of a software component from its representation or interface. In this way, the service definition and its interface can remain stable for as long as the business requires, shielding them from lower-level technology changes.

How to become a superhero with WebSphere MQ—the messaging backbone for SOA

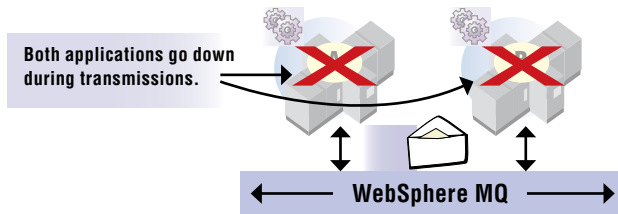
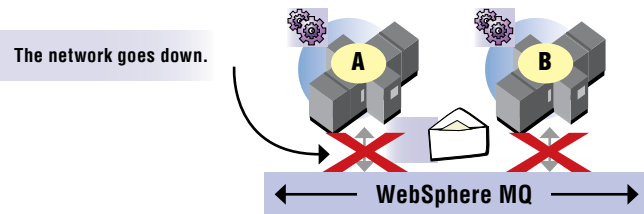
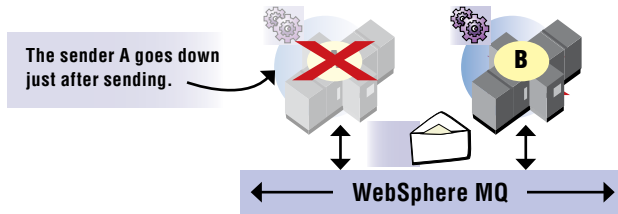
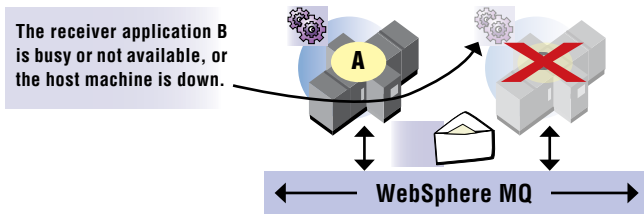
Many businesses face the challenges of connecting resources that were never designed to work together, including multiple hardware systems from different vendors, as well as, operating systems and programming languages within and outside the enterprise.

WebSphere MQ provides a universal messaging backbone for your SOA with assured transactional delivery, connecting everything together using a common interface so that information can flow freely. The backbone removes connectivity code from applications and places it in the network, so that your developers spend less time maintaining connection code and more time developing business logic. This also allows information to flow between every application and technology service, helping to provide end-to-end transactionality and deliver high availability, scalability and security.

They say you are only as young as your spine is flexible. Businesses are no exception. Without this kind of messaging backbone, parts of your business are paralyzed. For example, a bank would not be able to exchange information easily between its COBOL application on the mainframe, a new Microsoft® Visual Basic application at a branch office and its new Web 2.0 application available through its self-service Internet channel without having to contend with the different operating systems and codepage sets while providing transactional integrity.

With the Smart SOA approach, the continuum of challenges faced by an organization is matched to a continuum of SOA responses — from basic to advanced.





WebSphere MQ provides an always-connected experience for applications.

Customers process billions of transactions a day through their SOA. Four out of five customers considering messaging-backbone software choose IBM WebSphere software. It has become a de facto standard. In its *Worldwide Mission Critical Messaging Market Opportunities, Market Forecasts and Market Strategies, 2007-2013* report, Wintergreen Research states that “IBM leads the mission critical messaging markets.”

Your special superhero powers

With WebSphere MQ, you can gain the quality-of-service benefits of an integrated, adaptable SOA.

Application independence and asynchronous power

WebSphere MQ enables applications to communicate when they need to while maintaining their independence from a development and usage point of view. A WebSphere MQ application—let’s call it Application A—sees other applications it needs to communicate with as a set of service interfaces represented through queues. The physical implementation of these other applications might change over time. For example, the purchase-order processing system might be an off-the-shelf, packaged application on a particular hardware and operating-system configuration. If the packaged application is replaced with a different vendor’s application hosted on a different platform configuration, Application A is unaffected.

If Application A sends information to a destination application—let’s call this one Application B—the information is stored safely in the infrastructure, ready for Application B to process it. Application B doesn’t need to know anything about Application A. It just processes the message and, if necessary, sends a reply back to Application A, where the service name is included in a special part of the message. Even if both applications are temporarily experiencing an outage or the network has failed, all business-critical messages are kept safely in the infrastructure. WebSphere MQ enables you to choose which messages need to be tracked (logged) and which ones are not so critical (not logged).

The sending and receiving applications do not need to be concurrently available, and so they are less dependent on each other. WebSphere MQ can, therefore, send several requests concurrently and process the replies when they arrive. When business volumes grow, the asynchronous nature of WebSphere MQ means that multiple instances of Application A can send and receive information independent of one another.

Maximizing return on investment: Connecting the now and the tomorrow

WebSphere MQ connects virtually any commercial IT systems supporting over 80 different platform configurations, so no matter if you have COBOL, C, C++, C#, Fortran, Java™, .NET or Web 2.0 applications, you can connect them all, enabling information to be easily exchanged with transactional integrity and once-and-once-only delivery. More than 10 000 customers depend on WebSphere MQ to move their business-critical information within and beyond their companies. As one customer said, “We have been using WebSphere MQ for 10 years, and we have never lost a single piece of information.” WebSphere MQ makes best use of the skill set you already have. It provides a consistent programming interface across the different platforms it supports, while taking full advantage of the unique capabilities of the underlying operating system. For example, WebSphere MQ can leverage the IBM Parallel Sysplex® and coupling facilities of the IBM System z™ platform for dynamic workload distribution, resilience and high availability.

Up, up and away with fast, simple installation and configuration

When you're short on time and need to get started now, you can rely on WebSphere MQ to get you connected simply and quickly. It can be installed and configured in minutes. With the product comes a sample application to test connectivity across the backbone and battle-tested sample code in a range of programming languages that you can reuse to save time and get to market quickly. Anything you build today can be reused tomorrow and can scale as your business dictates without any need to be rearchitected.

Higher and higher availability

When your business is faced with increased orders, whether through rapid customer growth, higher demand for your products and services, or peak periods, WebSphere MQ provides scalability and the ability to spread the load through clustering. Multiple servers share the workload, coping with failure by dynamically rerouting the work across the remaining servers. According to a 2005 Infonetics Research report, *The Costs of Enterprise Downtime: North American Vertical Market*, by Rob Dearborn, downtime costs financial companies as much as 16 percent of their revenue, annually.¹ According to the U.S. National Archives and Records Administration, 25 percent of the companies that experienced an IT outage of two to six days went bankrupt immediately.² And that's not even counting the damage to your brand, especially if your organization depends on the Internet for business. Nor does it account for regulatory penalties. Clustering provides the resilience you need to so that your business can run 24x7.

X-ray vision into your businesses backbone

WebSphere MQ Explorer is a tool that provides a single view of everything connected through the backbone, enabling you to monitor and manage the health of your infrastructure. As you add applications to the backbone, the applications become visible through this window on your world. All WebSphere MQ artifacts—such as queue managers, queues, communication channels, messages being processed and clusters—across all the platform configurations are visible and manageable through the Explorer tool. The management of your infrastructure can be extended with system management products such as IBM Tivoli® OMEGAMON® software.





Shielding your business from risk

In a world of standards and an ever-increasing number of technologies, it is sometimes difficult to choose which ones are right for your business. Betting that one approach is right for the long term can be a risky business. WebSphere MQ reduces that risk by supporting developing standards and technologies—such as XML, SOAP, WS* and Web 2.0—going beyond what those standards provide, as well as supporting your heritage investments.

Java Messaging Service (JMS) is a Java Enterprise Edition (JEE) specification for a messaging interface used by the Java community. Most businesses have a range of applications, only some of which are Java based. WebSphere MQ is a fully compliant JMS with the benefit of reaching out to all the other technologies previously mentioned. Although JMS provides a consistent programming model across multivendor JEE environments, it does not prescribe how messages should be physically represented. So that's a problem when you need different Java implementations to interoperate. WebSphere MQ addresses this problem by making itself available to any JEE-compliant application server at run time, enabling all messages to interoperate. WebSphere MQ also goes beyond the qualities of service provided by JMS. The qualities of service, levels of reliability and resilience of WebSphere MQ make it the ideal transport for SOAP messages, making Web services ultrareliable while Web services specifications continue to mature.

You will comply

There have been, and will continue to be, high-profile cases of companies failing to meet audits and regulatory compliance. More companies in a range of industries are being confronted with regulations from industry bodies, suppliers and governments. These regulations impose real penalties on senior individuals (such as imprisonment) and companies (such as fines or dramatic effects on stock valuation). Most regulatory compliance obligations are based on the need to ensure that financial records are timely and accurate. This is difficult to do and demonstrate if critical business data about transactions moves through the organization in a way that is not secure, auditable and trustworthy. Because WebSphere MQ can help ensure that records meet regulatory requirements by logging information about transactions, many clients find that they can reduce their exposure to failing compliance by using it instead of the alternatives. With WebSphere MQ, you can confidently answer the what, who, when and how questions.

WebSphere MQ: The invisible force

The qualities of service, resilience, reliability and delivery of WebSphere MQ make it highly attractive to architects and developers who need to interconnect heterogeneous applications using diverse sets of programming languages, interfaces and skills. Some developers, however, and definitely users, just want to use these qualities of service without having to know how to program them. Let's look at two examples:



- *Web 2.0 attempts to deliver a simpler view of the world through a less-complex skill set.* Four simple verbs provide access to resources through Representational State Transfer (REST)-based Web services. However, the need for secure, reliable access to and delivery of business information remains. WebSphere MQ provides Web 2.0 integration, representing WebSphere MQ resources as a set of uniform resource identifiers (URIs) – a common way to represent services in Web 2.0 – and thereby eliminates the need for Web 2.0 developers to learn anything about WebSphere MQ.
- *File transfers can be prone to error.* Using the widely available File Transfer Protocol (FTP), both sender and receiver resources need to be available at the same time. If only a partial file is received, problems could arise if that part of the file is used to start processing information. For example, arrival of the full version of that file could cause some duplicate information to be processed. Another potential problem is that files might be intercepted or corrupted as they are transferred from user to user. You need to be sure that no one has been able to change the content by the time it arrives on your PC. Clients and WebSphere MQ can provide the reliable transport layer for moving files, providing a more flexible, auditable backbone than sequences of FTP transfers.



Should you, would you, could you

Having integrated everything using WebSphere MQ, you want to make sure that only the right applications can and are authorized to communicate with one another, and that only authorized users can access information through the WebSphere MQ backbone. As part of your governance strategy, you need to ensure that every application using WebSphere MQ (current and future) can be rendered or represented as a service, invoked, its life cycle monitored and managed, and its relationship with other services (whether created with WebSphere MQ or another application) understood. WebSphere MQ is fully integrated with IBM WebSphere Service Registry and Repository, enabling WebSphere MQ applications to be more visible and maximizing reuse across the enterprise. Even low-level WebSphere MQ artifacts—such as queue managers, queues, communication challenges and common functions—can be visible in the registry. IBM Tivoli systems management solutions are integrated with WebSphere Service Registry and Repository, allowing every WebSphere MQ artifact and application to be fully monitored and managed.

My WebSphere MQ: React exactly

In a world of information overload, sometimes you want to be alerted only about information that is relevant to you at a specific moment. Today, at this hour, you might only want to receive information about a particular sporting event. Tomorrow you might only want to know about shares of a company exceeding a particular value. Alternatively, you might always want to be alerted if the pressure on a pipeline exceeds a safety threshold. So, it depends on who you are and what you're interested in. WebSphere MQ provides publish-and-subscribe capabilities. This paradigm allows you to stay in control of what information you receive, when and under what circumstances you should receive it. You let the system know what you're interested and what your criteria are, and WebSphere MQ does the rest. As soon as an event occurs, you can take action, be the first to know and stay ahead of the pack.

Super-low latency

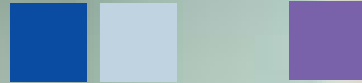
There are times when latency between sending and receiving messages costs businesses money if delays over a certain threshold occur. Sometimes massive volumes of data need to be delivered across the network and delivered to multiple endpoints simultaneously, without overburdening any endpoint. The messaging backbone just got more flexible. WebSphere MQ Low Latency messaging reduces latencies, enabling more than 8 million messages a second to be processed.³ With a choice of unicast, multicast, reliable delivery and stream failover, message filtering and control of traffic-rate congestion, high volumes of data can move at rates to meet pressing business needs.

Conclusion

Major businesses around the world depend on WebSphere MQ. For example, all 20 Global Fortune 500 banks have WebSphere MQ. One finance customer moves over US\$35 trillion in a single day through a single gateway of WebSphere MQ and Society for Worldwide Interbank Financial Telecommunication (SWIFT). Government clients process in excess of 675 million messages a day. U.S. Customs and Border Protection has specified WebSphere MQ products as two of the four approved ways of integrating with them. And yet, WebSphere MQ can be installed in minutes, and is shipped with sample code and sample applications to speed your time to market.

No matter what applications, systems and skills you have now, and no matter what systems, technologies and skills you might incorporate in the future, it is likely that WebSphere MQ can integrate it all as part of your SOA.





Get the message. Get connected.

For more information

To learn more about WebSphere MQ, visit:

ibm.com/software/integration/wmq

You can explore WebSphere MQ in the IBM sandbox at:

ibm.com/developerworks/downloads/soasandbox/connect

Or try WebSphere MQ now by visiting:

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¹ Dearborn, Rob, et al., "The Costs of Enterprise Downtime: North American Vertical Markets 2005," Infonetics Research, January 2005, p. 79.

² "Business resilience - Ensuring continuity in a volatile environment," A report from the Economist Intelligence Unit Sponsored by ACE, IBM and KPMG, 2007.

³ The stated performance numbers are based on measurements using standard IBM benchmarks in a controlled environment. The actual throughput that any application will experience may vary depending upon considerations such as message size, transmission rate, hardware platform, and network configuration. Therefore, no assurance can be given that an individual application will achieve the throughput or latency stated here. Customers should conduct their own testing. For more detailed performance information, consult your IBM sales representative.