

# Improve the Speed, Reliability and Scalability of Your ESB

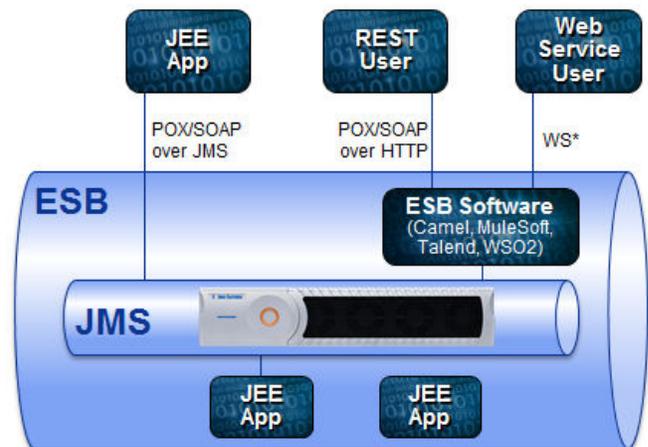
Enterprise Service Buses (ESBs) make information and interactive services accessible to a wide range of distributed applications and users. They handle information routing, permission management, version control and resource allocation.

The logical functionality and processing power of ESBs is handled by ESB software – either open source options such as Camel, MuleSoft, Talend and WSO2 or commercial off-the-shelf products like IBM WebSphere, Oracle Enterprise Service Bus and TIBCO BusinessWorks.

The movement of data through an ESB is handled by messaging technology, usually an implementation of Java Message Service (JMS) such as IBM's MQ or TIBCO's EMS, or open source options like ActiveMQ, Qpid and RabbitMQ.

Since software-based JMS brokers only route a few thousand messages per second, you need to deploy and integrate multiple brokers to handle the volume of messages associated with enterprise-scale ESBs. Multi-broker systems are inherently complex, difficult to manage, monitor, scale and make robust.

Thanks to the use of JMS the messaging layer underneath an ESB is fairly straightforward to replace. Solace's hardware JMS broker can handle 10-30x as many messages per second with stable, predictable performance with much lower architectural complexity, operational hassle and total cost of ownership.



**Solace Systems®**

# Benefits of Solace's ESB Infrastructure

## Improve Performance and Uptime

When it comes to providing real-time information or interactive services, the performance and availability of ESBs directly and immediately affect the customer experience. Not only do slow response times and stalled out applications suspend revenue-generating activity such as orders and purchases, they can quickly drive frustrated customers to explore competitive options that in many cases are just a couple of clicks away.

Solace's integrated hardware-based solution is much more reliable than software messaging products, offering superior and steady performance even during periods of peak volume, through fault conditions and in complex scenarios involving the distribution of data across local and wide area networks.

## Streamline Application Development

The complexity and inconsistencies of multi-broker open source messaging platforms frequently force developers to address shortcomings and mitigate problem conditions by coding functionality and workarounds into their applications. This leads to longer, higher risk and more expensive development cycles, as well as bloated applications that are less reliable and harder to scale and maintain than lighter weight applications.

## Reduce Operating Expenses

Messaging software is difficult to deploy, monitor and manage because message flow needs to be load balanced across many brokers, and they rely on additional software for things like fault tolerance, disaster recovery, WAN distribution and Web messaging.

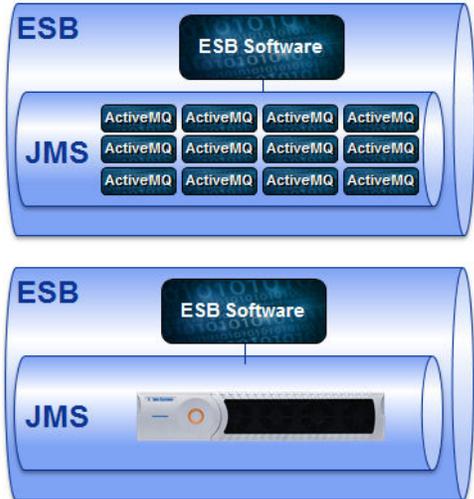
Solace message routers offer full functionality and all the capacity you need in a simple "rack and run" device that reduces datacenter footprint and is highly available and fault tolerant out of the box. It also includes robust monitoring and management tools that make it easy to keep the system running at peak efficiency and troubleshoot problems anywhere in your applications or network.

## High Capacity without Datacenter Sprawl

To boost the capacity of an ESB or extend its reach across distributed environments, you need to scale the ESB software itself and the underlying messaging platform. With a software-based message bus, this leads to an untenably complex environment where you split traffic across many brokers, and across separate WAN optimization solutions.

Solace message routers have enough capacity for very high volume applications, and you can add more capacity without increasing the physical footprint or architectural complexity by upgrading to a higher performance card within an existing message router. Support for virtualization means you can divide each message router into many discrete virtual message buses so one piece of equipment meets the needs of many different services or departments, the same way many applications can reliably share high-volume IP network equipment.

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## Improve Performance and Uptime

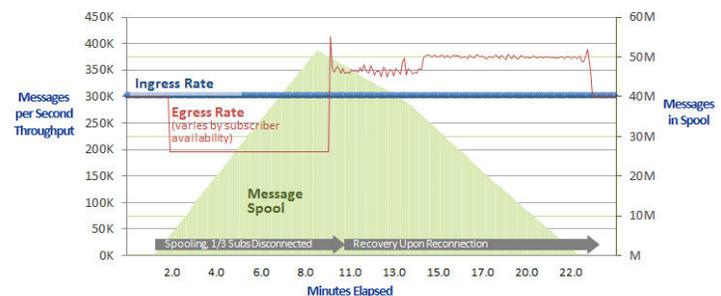
Since so many applications today are “real time”, outages quickly affect user satisfaction and the bottom line by knocking revenue producing services out of commission. As shared resources that many applications rely on, ESBs must be highly available and fault tolerant.

By keeping information flowing through your ESB, Solace keeps services available for customers which protects your bottom line and keeps your customers happy. A more reliable system is easier and less costly to keep running, because you’re not constantly troubleshooting and applying risky fixes on production systems.

- High Availability and Fault Tolerance:** In addition to redundant components and RAID mirroring of storage, Solace includes high availability facilities like clustering, fencing and failover management, all in hardware so it’s robust, accurate and easy to manage. Solace message routers can complete a failover to their standby in just seconds regardless of how much messaging data is stored. Software systems, on the other hand, must reload all messages and delivery state from disk which is unpredictable and can take ten minutes or longer, thereby increasing the outage window.
- Guaranteed Delivery:** In situations where messages can’t be lost and must be delivered in sequence, ESBs persist messages to disk – a performance bottleneck that restricts throughput to a few thousand messages per second. Solace uses a patented approach that offers 10-30 times higher throughput with latency measured in microseconds. This releases the limits most architects experience with today’s guaranteed messaging software, enabling faster performance, fewer delays, and application designs not previously possible.
- Handling of Slow and Disconnected Consumers:** If an application that receives 1,000 messages per second goes offline for five minutes, 300,000 messages will need to be stored and delivered when it comes back online. With a software system limited to a few thousand messages per second, it would take hours to deliver those 300,000 along with the newly arriving messages, resulting in slowed or even interrupted service to other applications during recovery. Solace can deliver 450,000 messages per second so backlogs can be metered into the system with nominal impact.

The first chart to the right shows what happens when 1/3 of a message router’s subscribers are disconnected for several minutes. The blue line shows that the ingress rate continues unimpeded while messages build up in the queue, shown by the orange line. The egress rate, represented by the black line, drops because messages are only being delivered to those subscribers still connected. Then, once the subscribers are reconnected, the queue quickly empties as egress exceeds ingress to “catch up” subscribers that have reconnected. The second chart shows that the latency of message delivery to well-behaved subscribers is barely affected by the outage.

The Solace message router is a self-contained device that’s as easy to install as an IP router, with control software delivered as a single, fully integrated bundle.



- **Easy to Upgrade:** Since Solace message routers don't require a wide variety of software products running on commodity servers with general purpose operating systems, it eliminates the cycle of upgrades that requires patching and regression testing.

## Streamline Application Development

There are several ways software-based messaging brokers complicate the architecture of ESB applications. Because messaging software requires you to divide message traffic across multiple brokers, applications need to know which traffic goes where. Many software messaging products also lack functionality and robustness, so developers have to compensate with code that fills in feature gaps and accommodates frequent failures and slowdowns.

By making it easier to build ESB applications, Solace can help you get new services to market much more quickly, reduce the costs and risk associated with complicated architectures, and let your developers focus on creating awesome applications that delight your customers and differentiate you from the competition.

## Solace's Advantages

- **Single Broker Architecture:** Since Solace message routers provides a single foundation for your ESB, with traffic being handled by a single broker, applications can be built lean and lightweight, focused on their core business logic without needing to accommodate a complicated and error-prone messaging environment.
- **Feature Rich Platform:** The Solace message router is rich with features that developers can use to accelerate their development efforts and reduce the complexity of their applications by delegating such functions to the underlying transport layer. Such features include exclusive/non-exclusive queues, a single queue attracting multiple topics, last-value-queue, congestion controls, all-or-nothing delivery, and consistent delivery order across topics.
- **Messaging as a Service:** As mentioned above, Solace offers built-in high availability, fault tolerance and disaster recovery that developers can easily tap into, so applications don't need to address ugly "what if" contingencies.
- **Easy Integration with ESBs:** Solace's solution offers plug-and-play integration with leading ESBs, so it's easy to replace an inferior software solution with Solace's high capacity, high performance offering.

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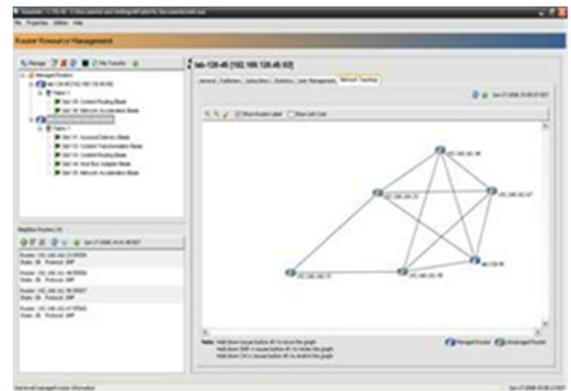
## Reduce Operating Expenses

Running the messaging software needed to support traffic for a high-volume ESB can be a costly affair. Scaling messaging software entails not just buying, deploying and managing the software licenses, but a myriad of discrete non-integrated components including servers, operating systems, file systems and clustering software. Software-based messaging provides fragmented tools to monitor and manage different areas of the system via dashboards that don't give administrators the visibility they need to efficiently troubleshoot problems.

By making your ESB easier to operate, Solace can significantly reduce the manpower costs associated with deploying and running your ESB, and reduce the risk of experiencing downtime due to fault conditions or during upgrades.

- **“Rack and Run” Deployment:** Solace message routers are easy to deploy and operate. For starters, they're self-contained devices that are as easy to install as an IP router, with control software delivered as a single, fully integrated bundle. That makes initial installation and upgrades straightforward, and eliminates the costly, time-consuming process of patching and regression testing many inter-related components every time you upgrade any one piece of the puzzle.
- **Architectural Simplicity:** Supporting 10-30 times more message traffic and multiple qualities of services with a single message router means Solace-powered ESBs are architecturally simple, which inherently makes them easier to operate due to fewer pieces and integration points.
- **Virtualization:** You can virtualize each Solace message router so many applications can have their own logically separated messaging environment on the same equipment without interfering with each other. This makes it very easy to deploy new applications because they can safely tap into your existing high-capacity messaging infrastructure.
- **Sophisticated Management and Monitoring:** Solace offers a rich monitoring and management GUI and framework that makes it easy for administrators to identify and address problems anywhere in the messaging layer, applications, or physical network. A programmatic management interface makes it easy to integrate Solace message routers into existing monitoring, capacity planning and provisioning systems. It all adds up to a high degree of management visibility that's always available regardless of messaging activity and never impacts messaging performance. You can monitor the health of and troubleshoot applications from this single point – pinpointing the network, server or application as the root cause of problems. Application development is also made faster since fewer management functions need to be built into your applications.

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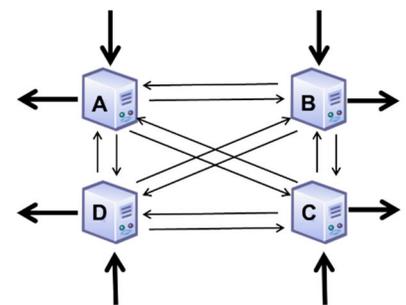
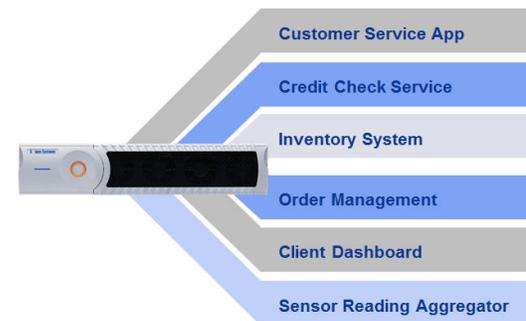


## Scale Without Datacenter Sprawl

When increasing the capacity of your ESB you can't just add more ESB software, you also need to scale the underlying messaging platform. Unfortunately adding message brokers to your ESB does not increase capacity linearly because of the complexity associated with integrating, capacity planning, load balancing, etc. So you need to add an inordinately large amount of messaging capacity to scale up your ESB, which entails considerable expense and effort. Many high-volume ESBs are deployed with tens, hundreds and even thousands of underlying messaging servers.

Being able to support a massive amount of information flow within Solace's compact message router keeps hardware, licensing and maintenance costs to a minimum even as you grow your ESB. The ability to easily increase the capacity and reach of your ESB means you can add new applications and accommodate more volume within that same cost-effective footprint. This allows you to more quickly and easily deploy innovative services that satisfy your customers and extend your competitive advantage.

- **High Capacity:** With support for over 450,000 guaranteed messages a second, each Solace message router can meet the messaging needs of several high-volume applications, or a large number of low-volume applications that each drive a few thousand messages a second. Solace makes available hardware cards with different levels of capacity, so you can start with the basic card and easily upgrade your message router to support higher throughput without increasing the footprint or complexity of your system.
- **Virtualization for Elastic Capacity:** Solace message routers can be partitioned into hundreds of virtual message brokers that can meet the messaging needs of many discrete applications that require logical separation. Each of these brokers can be given access to as much (or little) of the device's capacity as desired, so different brokers can face their own peaks and valleys of demand without leading to overloaded systems or wasted capacity.
- **Efficient Scaling:** When you add brokers to support higher throughput, scaling is inefficient because some percentage of each broker's capacity is wasted passing messages back and forth with other brokers. The more brokers you add, the more wasted capacity, which leads to diminishing returns and leads to a complicated and fragile environment where publishers and subscribers need to be clustered together. By handling your ESB's message traffic with a high-capacity message router, Solace eliminates the inefficiency inherent in multi-broker systems



## Summary

Solace is the ideal messaging infrastructure for any enterprise-class ESB. Not only does Solace offer higher, more predictable performance than any software broker available, along with much better reliability and fault tolerance, but it costs a lot less and is much easier to deploy, manage and scale. Best of all, plug and play integration with leading ESB software means it's easy to swap out an ESB's default messaging infrastructure for Solace.

To learn more visit  
[solacesystems.com](http://solacesystems.com) or  
call +1 613-271-1010.