How Solace Message Routers Reduce the Cost of IT Infrastructure

This paper explains how Solace’s innovative solution can significantly reduce the total cost of ownership of your messaging middleware platform and IT infrastructure.
The Situation
Message-Oriented Middleware is the cornerstone of modern enterprise IT and big data.
Messaging middleware, which has historically been delivered as software, lets incompatible applications share data without being directly connected to one another. It’s the mission-critical layer that ties modern IT systems together in a way that’s fast, flexible and scalable.

The Problem
It’s too complex and expensive to own and operate, especially as data volumes climb.
Software-based messaging is very expensive because it requires racks worth of servers, each one of which entails not just hardware costs but messaging licenses, operating systems and more. Then there’s the expense of integrating products from a variety of vendors, and keeping them working together as each product evolves.

The Solution
Solace’s message routers are much easier and less expensive to deploy, run and scale.
By moving middleware into hardware, Solace transforms the economics, ease of use and performance of enterprise IT systems much like how routers and switches revolutionized the simplicity, speed and scalability of IP networks back when packets were routed in software.

The Results
Solace cuts all kinds of upfront capital costs and ongoing operational expenses.
Capital Expenses: Solace collapses the entire messaging layer into a plug-and-play, rack mountable message router powerful enough to replace dozens of software-based message brokers.
Operating Expenses: As a purpose-built device featuring specialized hardware and custom firmware, Solace’s solution offers the operational characteristics of network equipment, but for middleware infrastructure.

The Proof
The cost savings of Solace’s solution has been proven by customers around the world.
Customers large and small around the world have reported rapid ROI and tangible TCO savings. With their help we’ve created a sophisticated TCO calculator that can help you understand the total cost of your middleware so you can fairly evaluate the cost of Solace and other options. We invite you to try it out! Contact us for more information.
Summary of Savings

Savings can add up quickly with Solace, typically in the range of 50 to 80% lower TCO, as our solution replaces or reduces expenses in all of the areas shown in this chart and explained to the right.

- **Maintenance**: Maintenance agreements are usually a percentage of the cost of your software and servers, so as you cut those costs with Solace your ongoing maintenance expense also goes down.

- **Setup and Operations**: It takes a lot of datacenter resources and manpower to run software-based middleware platforms, which can consist of dozens or hundreds of servers, many middleware products, complex upgrade cycles and cross-product dependencies. Solace is easier to operate thanks to a unified API and admin framework, and requires less power, rack space, cooling and connectivity so can shrink your middleware infrastructure’s footprint by 80% and cut your power and cooling costs by 73%.

- **Other Software and Hardware**: Messaging software often introduces the need to buy additional software and hardware components such as the operating system it runs on, admin tools to monitor and manage the environment, and technologies that “harden” the servers and system with high availability, security, disaster recovery and more.

- **Messaging Software**: With Solace you can say goodbye to the messaging software licenses that run on all those servers, because Solace’s self-contained message router is a one-time hardware purchase with all of its leading edge functionality baked right in.

- **Server Hardware**: It takes 10 or more high-end servers to route the same volume of messages as each Solace message router.

There’s no better way to improve the cost-effectiveness of your middleware than choosing Solace.

<table>
<thead>
<tr>
<th></th>
<th>20 Software Brokers on Servers</th>
<th>2 Solace Appliances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Capital Expenses</td>
<td>$1,460,000</td>
<td>$310,400*</td>
</tr>
<tr>
<td>Operating Expenses</td>
<td>$886,687</td>
<td>$146,725</td>
</tr>
<tr>
<td>3 Year TCO</td>
<td>$2,346,687</td>
<td>$457,125</td>
</tr>
<tr>
<td></td>
<td></td>
<td>81%</td>
</tr>
</tbody>
</table>

* Based on a typical configuration.
Lowering Capital Expenses

When evaluating broker based messaging solutions, it’s important to identify the factors that drive the capital cost of a software-based solution:

- Middleware licenses, which can include per core or per client costs
- Operating System (Windows, Linux, etc)
- Servers that are refreshed every 24-36 months
- 3rd party middleware monitoring and management tools

Solace collapses this entire stack into a message router that can 10 to 30 software middleware brokers running on many servers. These factors result in dramatic TCO reductions.

Simple, Predictable Commercial Model

Solace sells hardware for a fixed price with an annual maintenance fee that includes 24x7 support and all upgrades. Solace’s solution doesn’t entail any per core, per seat or per user licensing, and doesn’t require the periodic auditing of an enterprise license agreement (ELA) with frequently shocking renewal costs.

Platform Unification

The nature of interactions between applications varies greatly, so companies have had to buy many kinds of messaging solutions to meet all of their needs. For example, in capital markets, they need low latency messaging for market data distribution, guaranteed messaging for order management, WAN messaging to synchronize distributed risk positions, and web streaming capabilities to offer clients real-time trading dashboards.

Companies in all kinds of industries face similar variety of needs, and have historically had to buy a separate infrastructure for each one— not just the software, but servers to run them on, third-party software to harden the servers for high-availability, SAN for storage, etc. And they need to integrate the environments so applications across their business can share data. Such bridges often become new potential bottlenecks between environments.

By meeting a wide range of messaging requirements with exceptional performance, predictability and resilience, Solace’s solution can support many qualities of service which means you can standardize on one messaging middleware solution as the global backbone. This avoids deploying new messaging systems for every application, purpose and line of business and eliminates the need to integrate and bridge between the various software environments.
Device Consolidation
When deploying software-based middleware solutions, the primary drivers of horizontal scaling and server sprawl are port I/O, disk I/O (for persistence) and CPU utilization. Here are some of the ways software-based messaging drives server sprawl, and how Solace lets you shrink your middleware layer’s footprint.

- The need to persist messages to disk for guaranteed delivery is bottlenecked by disk I/O. This is a major issue in today’s real-time IT infrastructures. Organizations have had little choice but to horizontally scale servers to load balance the disk I/O bottleneck across many servers.

- Large number of queues and topic namespaces for message routing and filtering consumes significant CPU resources and causes latency in software running on general purpose processors. Servers must be horizontally scaled to load balance the topic space across cores to lower the CPU utilization per core.

- The resources consumed by TCP connections and the memory copies that occur in general purpose CPU environments force each server to limit TCP connections per broker, which in turn increases the number of brokers as connections increase. Even multi-core machines are bottlenecked to network interface resources that are not linear to the cores that are available.

Solace has removed the O/S from the middleware datapath and embedded I/O, fan-out, persistence, and message routing into purpose-built, reprogrammable hardware (i.e. FPGAs and network processors). As a result each Solace message router can route millions of reliable messages a second, and hundreds of thousands of guaranteed messages with low, consistent latency.

By removing the major bottlenecks that drive horizontal scaling of servers, message broker consolidation of anywhere from 10:1 to 30:1 is very common. This lets enterprises with both large and small middleware server farms lower their middleware TCO substantially year after year.

Message Bus Virtualization
Solace’s technology was developed specifically to combine low latency, guaranteed, and WAN messaging into one packaged appliance that can be virtualized for multi-tenant deployments.

This virtualization lets multiple application groups utilize the same appliance with complete control and separation, opening the door for true middleware consolidation. This reduces the need to have different messaging brokers because the clients of that broker are in different application groups.

How much can Solace reduce your capital expenses?
This table compares the three-year operating expenses of software-based middleware with Solace, assuming a conservative consolidation ratio of 10 software brokers per Solace message router.

To learn about the cost assumptions we used, or perform a TCO comparison using your own numbers, ask us about our TCO calculator.

<table>
<thead>
<tr>
<th></th>
<th>20 Software Brokers on Servers</th>
<th>2 Solace Appliances</th>
</tr>
</thead>
<tbody>
<tr>
<td>Server Hardware</td>
<td>$170,000</td>
<td>$250,000*</td>
</tr>
<tr>
<td>Messaging Software</td>
<td>$768,000</td>
<td>$-</td>
</tr>
<tr>
<td>Other Software and Hardware</td>
<td>$522,000</td>
<td>$60,400</td>
</tr>
<tr>
<td>3 Year TCO</td>
<td>$1,460,000</td>
<td>$310,400</td>
</tr>
</tbody>
</table>

79%

* Based on a typical configuration
Cut Operating Expenses

The initial cost of most IT solutions is usually dwarfed by the cost of operating it over time. Most middleware platforms rely on a complex mix of hardware and software components from several vendors, each one of which must be configured, managed and upgraded over time.

Solace message routers do their job right out of the box—no third-party software to install, integrate and upgrade and little, if any, configuration or tuning.

3-year Comparison of Operating Expenses

<table>
<thead>
<tr>
<th>Year</th>
<th>Messaging Software on Servers</th>
<th>Solace Appliances</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>$1.0M</td>
<td>$0.2M</td>
</tr>
<tr>
<td>2</td>
<td>$0.8M</td>
<td>$0.4M</td>
</tr>
<tr>
<td>3</td>
<td>$0.6M</td>
<td>$0.2M</td>
</tr>
</tbody>
</table>

Solace reduces or eliminates operating expenses in many areas to offer lower TCO than software-based solutions.

- **Datacenter Density and Efficiency**: Solace message routers deliver millions reliable messages per second, and hundreds of thousands of guaranteed messages per second, all in a compact device that consumes very little power. That enables higher message processing density which reduces datacenter footprint and expenses.

- **“Rack and Run” Provisioning**: Provisioning servers is challenging and time consuming because it entails the installation of messaging, OS and supporting software. Solace message routers work like network devices, i.e. self-contained with their own on-board firmware.

- **Easy and Instant Upgrades**: Upgrading a software-based messaging platform entails patching and regression testing middleware, an OS, and other software. As such, seemingly simple upgrades can tie up resources and introduce risk for weeks. On the other hand, you can upgrade your Solace message routers by uploading one file and executing a single command.

- **Consistent Out of the Box Performance**: Messaging software is frequently deployed across the enterprise, running on different platforms, OSs and networks. These differences make it hard to predict performance and capacity plan. Solace’s solution is tuned for peak performance out of the box, so every message router will deliver exactly the same performance in every installation.

- **Rapid Troubleshooting**: Solace collects of per-client and per-message stats in real-time with no impact on performance, and provides much more granular statistics than general purpose operating systems so administrators can quickly identify the root cause of problems, whether they’re in the broker, the client or the network.

- **Lower Application Development Costs**: The functional breadth, high capacity and shareable nature of Solace message routers means developers can learn a single API and tap into whatever quality of service they need for a given application.

How much can Solace reduce your operating expenses?

This table compares the three-year operating expenses of software-based middleware with Solace, assuming a conservative consolidation ratio of 10 software brokers per Solace message router.

To learn about the cost assumptions we used, or perform a TCO comparison using your own numbers, ask us about our TCO calculator.
Concluding Summary

Solace’s state-of-the-art message routers, which meet the demands of all kinds of enterprise messaging, can dramatically reduce the cost of the middleware layer of your IT infrastructure.

**First you save up front** because each Solace message router handles the workload of dozens of servers, each one of which would entail not just hardware cost but messaging licenses, operating systems and more. Not to mention the hassle of integrating all those technologies from a variety of vendors.

**Then you save even more over time** because Solace message routers meet your needs while occupying a fraction of the overhead and requiring much less administrative manpower than software-based solutions.

Why does this matter? Most companies spend 80% of their time and money maintaining existing assets, and 20% innovating, year after year. By slashing the cost of maintaining your messaging, Solace frees up resources you can use to differentiate and evolve your business. And when those efforts drive success, you’ll be ready to seize even more new opportunities thanks to your easily scalable infrastructure.

How would your business change if your middleware cost 80% less and was more scalable, more reliable and easier to manage?

---

Key Customers

Solace’s state-of-the-art message routers, which meet the demands of all kinds of enterprise messaging, can dramatically reduce the cost of the middleware layer of your IT infrastructure.

**First you save up front** because each Solace message router handles the workload of dozens of servers, each one of which would entail not just hardware cost but messaging licenses, operating systems and more. Not to mention the hassle of integrating all those technologies from a variety of vendors.

**Then you save even more over time** because Solace message routers meet your needs while occupying a fraction of the overhead and requiring much less administrative manpower than software-based solutions.

Why does this matter? Most companies spend 80% of their time and money maintaining existing assets, and 20% innovating, year after year. By slashing the cost of maintaining your messaging, Solace frees up resources you can use to differentiate and evolve your business. And when those efforts drive success, you’ll be ready to seize even more new opportunities thanks to your easily scalable infrastructure.

How would your business change if your middleware cost 80% less and was more scalable, more reliable and easier to manage?

---

Key Customers

Solace enables application-aware networks with its message routers that improve the way information moves between distributed applications. High-speed, reliable information sharing is an essential part of virtually all modern IT initiatives from accelerating legacy business processes to enabling big data, cloud computing and the Internet of Things. Solace message routers unify many kinds of data movement so companies can efficiently and cost-effectively move all of the information associated with better serving customers and making smarter decisions. Solace is a leading provider of application-aware networking equipment, with a rapidly growing customer base that spans all major industries. To learn more visit http://solacesystems.com.