

Enabling Open Data Movement Across Hybrid Cloud and the Internet of Things

Learn how Solace's state-of-the-art open data movement technology can link applications and information assets across public and private clouds, datacenters, and the Internet of Things.



Executive Summary

The Situation

A perfect storm of technology trends is driving information overload.

The proliferation of big data strategies, cloud computing, mobile devices and the Internet of Things is driving more data between more diverse senders and receivers.

That information needs to get where it's needed without flooding recipients with a deluge of data they can't handle, whether it's flowing within datacenters, through the cloud, or to mobile and IoT devices.

The Problem

Conventional messaging middleware approaches and infrastructure can't keep up.

To effectively manage this increasing amount of information and diversity of endpoints, IT departments need elastic capacity and deployment flexibility.

You simply can't keep up with rising data volumes and connect the diverse environment of tomorrow with incompatible technologies that were designed to meet different needs in terms of volume and deployment environments.

The Solution

Solace message routing software and appliances move large volumes of information between diverse and distributed endpoints.

Open data movement technology enables data to flow efficiently between applications, information sources, connected devices and user interfaces.

Solace improves the economics, ease of use and performance of enterprise IT by delivering the world's best data movement technology as high-capacity hardware and software that can be deployed in virtually all clouds and datacenter environments.

The Results

Cut the cost and complexity of your infrastructure while making it faster, more robust and easier to manage.

- **Performance:** Solace can meet the throughput and latency requirements of any application.
- **Robustness:** Solace offers built-in high availability and disaster recovery with fast failover times.
- **Savings:** Solace reduces expenses with high-capacity hardware, flexible software, and the ability to deploy the right solution for each problem.
- **Simplicity:** Solace unifies all kinds of data movement across all environments under one platform that's easy to deploy, develop applications for, manage and scale.

The Proof

Successful deployments in the most demanding industries, and growing presence in mainstream markets.

Solace's technology has been successfully deployed by global leaders in data-driven industries like financial services and telecommunications, and is being adopted by leaders in other sectors such as energy, government, manufacturing, online gaming and transportation.

- 6 of the world's 10 biggest banks
- 2 of the top 4 mobile carriers in the U.S.
- 3 of the 4 biggest foreign exchange firms in the world

Products

Solace delivers its message routing capabilities in the form of purpose-built appliances and a software product called the Virtual Message Router. Together, these interoperable products give companies the power to deploy a ubiquitous data distribution platform that spans all levels and locations of their business, from core datacenters to field offices and IoT gateways.

Appliances

Solace's message routing software can run on high-performance custom hardware for customers and scenarios that require the centralized routing of high volumes of messages.

- The Solace 3560 is Solace's highest capacity and performance message router.
- The Solace 3530 meets the needs of departmental applications, satellite datacenters and on-premise solutions.



Virtual Message Router

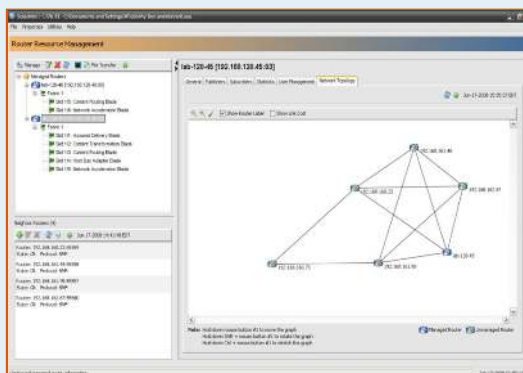
The VMR provides localized message routing and persistence anywhere, including cloud and the Internet of Things. The VMR features a multi-threaded, parallel pipelined architecture, optimized for modern multi-core processor architectures so it can scale in proportion to the number of processor cores.



Unified Management and Monitoring

Solace's platform includes a comprehensive monitoring and management framework that makes it easy for administrators to keep your messaging infrastructure running at peak performance and troubleshoot problems not just in your messaging layer, but with applications or your network.

This framework is accessible via CLI or a GUI element manager called SolAdmin, can send information and alerts to other management systems using Syslog or SNMP, and tie into their existing framework with a RESTful management API called Solace Element Management Protocol.



Solace lets you manage the performance of your entire messaging estate from one place, and even troubleshoot issues with your applications and network.

Capabilities & Qualities of Service

Reliable

Solace message routers deliver messages with reliable or "best effort" quality of service with low latency even at high volume.

Guaranteed

Solace can guarantee that each message is successfully delivered to every recipient that needs it, and ensure that they arrive in the same order they were sent.

IPC Shared Memory

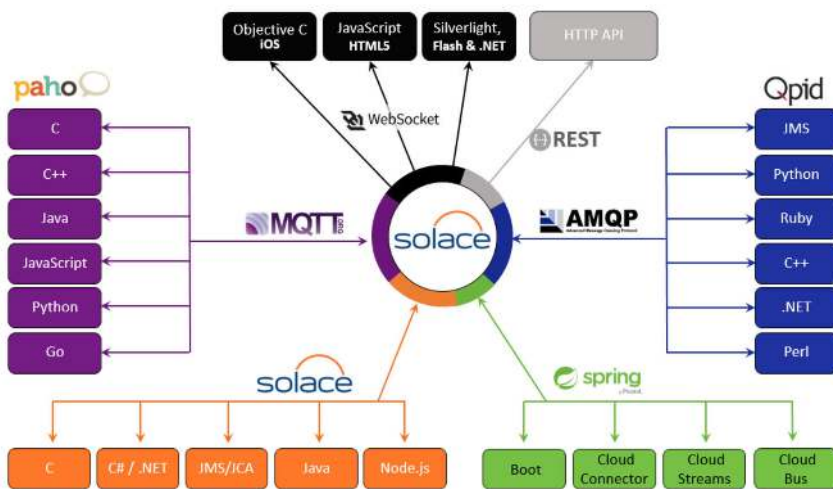
When you're running multiple applications on a single server, Solace's IPC-based shared memory messaging offers average latency under 400 nanoseconds.

Low Latency

For situations when speed matters more than anything, Solace supports latency under 20 microseconds with consistency other solutions can't touch.

APIs & Protocols

Solace is easy to integrate with your favorite technologies with support for popular programming languages, standard protocols and open source technologies.



Solace Messaging APIs

A unified API makes Solace's solution a one stop shop for all of your messaging needs. It provides robust and uniform client access to all of Solace's capabilities.

- **C:** Low-level threadless API that lets developers use any threading model. Available for Linux, Solaris, Windows and AIX.
- **JMS:** Supports JMS 1.1 including queues and topics, and provides an admin console for managing the JMS Provider and JMS managed objects accessible via JNDI.
- **Java:** 100% pure Java, with support for reliable and guaranteed messaging.
- **Java-Real-Time-Optimised (Java-RTO):** JNI-wrapped version of Solace's C API for low-latency Java applications, supports reliable and guaranteed messaging.
- **.NET:** Simple interface to reliable and guaranteed messaging services for server applications built with .NET languages such as C# and Visual Basic.
- **JavaScript:** Supports server applications developed in Node.js.
- **Inter-Process Communications (IPC):** for ultra-low-latency C and Java applications deployed within a single server.

Open APIs & Protocols

AMQP 1.0 / Qpid

Advanced Message Queuing Protocol 1.0 is an open standard for sending information between applications. Apache Qpid is an open source implementation of AMQP that offers transaction management, queuing, distribution, security and multi-platform support.

JMS

Solace supports persistent and non-persistent JMS. Client applications connect to Solace like any other JMS broker so companies whose applications are struggling with performance or reliability issues can easily upgrade to Solace's hardware.

MQTT / Paho

Solace supports the OASIS MQTT 3.1.1 standard to meet the needs of connected devices and mobile applications that need an efficient way to send and receive information that requires very little bandwidth, client-side processing power and/or bandwidth.

REST

The Solace REST Interface allows HTTP clients to send and receive messages with a Solace message router using HTTP POST requests. This enables REST clients to send messages to and receive messages from any Solace message router clients. To learn more read our REST Integration Concepts Guide.

WebSocket

Solace enables streaming and Web messaging with APIs for JavaScript and iOS, and supports HTML5 WebSocket for full-duplex communication channels over a single TCP connection.

Open Source Friendly

Solace offers interoperability for Apache ActiveMQ and other JMS-based middleware. Configuring Solace as the transport for open source frameworks lets developers using Apache Camel, UltraESB, WSO2, Mule and jBoss boost the performance of their applications and ESBs.

Sharing Data Beyond Your Walls and Around the World

Streaming Data to Web and Mobile Apps

Two factors are revolutionizing the way people access information on the job and in their personal lives:

- The increasing ubiquity of smartphones and tablets
- New technologies like Flash, HTML5 and Silverlight that enable dynamically updated applications.

Today's internet infrastructure was designed to serve static web pages and send data "on demand," so it struggles to support proactive real-time streaming to such a wide range of devices.

Solace helps companies easily deploy Rich Internet Applications with a turnkey middleware appliance that distributes real-time data over the internet.

- Highest message rate; millions of messages a second
- Lowest, most consistent latency
- Lowest TCO thanks to small footprint and simple architecture and operations

Solace offers bi-directional communications with many messaging features such as pub/sub, request/reply, fanout, rate control, filtration, and prioritization.



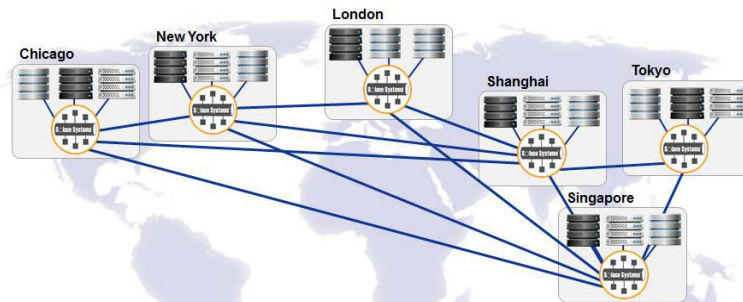
Solace streams real-time data over the internet using the same API and equipment as your internal messaging.

Spanning Wide Area Networks

Enterprise applications frequently share data across geographically-dispersed sites for disaster recovery, performance, scalability, and separation of concerns.

Several factors come in to play when application traffic flows from a high-speed LAN to a slower, less predictable WAN: bandwidth, latency, and security.

Solace makes it easy to share and sync information between applications and databases/datagrids across geographically distributed datacenters.



Solace offers unparalleled WAN performance thanks to a number of features and optimizations:

- Temporarily queues messages so messages can be continuously sent in both directions without always awaiting acknowledgements of receipt.
- Automatic compression and decompression of messages, selectable by subscriber or topic.
- One copy of each message is sent over the WAN, then fanned out to multiple subscribers at the other end.

Horizontal Use Cases

While Solace's initial success came in data-centric industries like financial services, government and telecom, Solace has a clear and compelling value proposition for all kinds of companies.

- **Big Data:** Solace message routers can meet the demands of big data collection with better performance, lower TCO and less complexity than any other solution, commercial, open source or home grown.
- **Cloud and Internet Services:** It takes powerful data distribution infrastructure to connect back-end applications, synchronize information across datacenters, and stream real-time data to clients over internet and mobile networks. Solace message routers enable cloud delivery models by efficiently routing real-time data over LANs, WANs and the internet.
- **Distributed Database Synchronization:** Pairing Solace message routers with CDC software enables the real-time synchronization of data across any number of geographically dispersed databases.
- **Enterprise Data Grid:** Solace message routers can efficiently distribute, filter and synchronize information between data grid instances, analytics and data warehouses within datacenters and around the world.

Financial Services Use Cases

Solace has delivered value to many of the world's leading financial institutions including top exchanges, hedge funds investment banks.

- **Equities:** Equities trading and OMS platforms require ultra low latency non-persistent messaging in the front office and high-volume persistent messaging in the back office. Solace meets both needs.
- **FX Trading:** Solace is the ideal foundation for FX trading systems with support for the many kinds of messaging they require and the unique ability to maintain low latency even at the volumes FX trading demands.
- **Real-Time Dashboards / Single Dealer Platforms**
Solace message routers are the ideal messaging platform for SDPs, and is in fact the only product that satisfies all the data distribution needs of an SDP.
- **Exchanges:** Solace can handle feed distribution to large numbers of systems and serve as a buffer between real-time and non-real-time elements of system.
- **Market Data Distribution:** Solace enables fast fan-out to any number of applications or users using specialized hardware that eliminates the roadblocks and variables that can impact latency and predictability.

Applications in Other Industries

- **Energy:** Solace provides a range of solutions for energy companies including energy trading, pipeline monitoring, and smart grid monitoring, all at very large scale.
- **Gaming/Gambling:** Solace helps online gaming sites, as well as casinos, horse racing venues and sports books, offer real-time odds, responsive in-game play and reliable service even during periods of peak activity.
- **Government:** Solace meets the needs of government applications such as inter-agency communications, emergency response and homeland security.
- **Manufacturing:** Solace lets manufacturers stream data about materials availability and production processes to all kinds of systems so they can optimize efficiency, track inventory across their supply chain, and meet quality requirements.
- **Online Services:** Solace helps providers of web-based commerce and community improve user experience and support huge transaction volumes.
- **Retail:** Solace technology can aggregate and distribute in-store data so retailers can execute effective promotions, get products where they're most needed, and provide excellent customer service.
- **Telecommunications:** Solace can connect carriers' back-office systems and customer-facing services in real-time so they can offer superior customer experience.
- **Transportation & Logistics:** Solace helps transportation and logistics companies track and control all kinds of assets and distribute real-time information so customers are kept well informed, employees are able to make smart decisions, and SLAs are met.

Concluding Summary

Technology trends such as big data, cloud computing, mobile computing, social networking and the Internet of Things are converging to drive an unprecedented flow of information between increasingly diverse and distributed endpoints, and many companies are struggling to keep up with, let alone capitalize on this change.

By meeting all kinds of data movement needs with a unified platform that offers both high capacity and flexible deployment options, Solace makes it easier and less expensive to establish a reliable flow of information across your entire enterprise.

Leading companies in many industries have successfully solved pressing business challenges and seized new opportunities with the help of Solace message routers, and we'd love to talk about how we can help you do the same.



Solace technology enables open data movement by routing information between applications, devices and people across clouds using open APIs and protocols.

Open data movement helps companies modernize legacy applications and successfully pursue analytics, big data, cloud computing and Internet of Things strategies.

Leaders in a wide range of industries and around the world have used Solace technology to become more agile and efficient, to improve decision making and to offer their customers innovative data-driven services.

Learn more at <https://solace.com>.