

Upgrade Your MuleESB with Solace's Messaging Infrastructure

The era of ubiquitous connectivity is upon us. The amount of data most modern enterprises must collect, process and distribute is exploding as a result of real-time process flows, big data, ubiquitous mobility and the Internet of Things. The move to the cloud for economies of scale, while also maintaining an on premises architecture, is driving the need for more flexible hybrid cloud solutions that can support both query-driven and streaming application interaction. The growth in connected devices and applications is driving an API-led connectivity approach that packages underlying connectivity and orchestration as simple building blocks exposed by the API. Companies need to take a holistic view and embrace a set of technologies that when combined can provide the scale, simplicity and interoperability required to thrive in the fast-paced world we are in.

MuleSoft and Solace have teamed up to make it easy for customers with real-time, distributed, mission critical integration requirements to maximize the speed and connectivity of their MuleSoft platform by implementing Solace's world class software or hardware as their messaging layer. This combination will:

1. Offer the highest-performance messaging and scale for any EDA integration stack
2. Dramatically simplify HA and DR deployments
3. Provide a flexible messaging strategy from on-prem to public cloud for hybrid deployments
4. Expand connectivity to IoT devices and gateways, and related Big Data repositories and analytics infrastructure

MuleSoft's Anypoint Platform is a unified, flexible integration platform that solves the most challenging connectivity problems across messaging, SOA, SaaS and APIs, in a low-friction, developer-friendly way. Anypoint Platform lifts the weight of custom code and delivers the speed and agility to unlock the potential of this connectivity.

Solace is a leader in messaging middleware. Many of the world's leading banks, exchanges, telcos, gaming, manufacturers and transportation companies have used Solace's technology to meet the most demanding messaging challenges in high-scale event driven use cases.

This paper summarizes how using Solace technology as the messaging layer of your MuleSoft enterprise service bus can improve performance and availability, provide flexible deployment options, reduce TCO and enable massive scalability without the complexity inherent in traditional messaging solutions.

To learn more contact your MuleSoft or Solace account executive, or visit <http://mulesoft.com> or <http://solace.com>.



Joint Benefits

Improve Performance and Uptime with your MuleESB

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 unified software and hardware-based messaging solution is much more reliable than traditional messaging products, and offers superior, steady performance even during periods of peak volume, through fault conditions and in complex scenarios such as messaging across local and wide area networks.

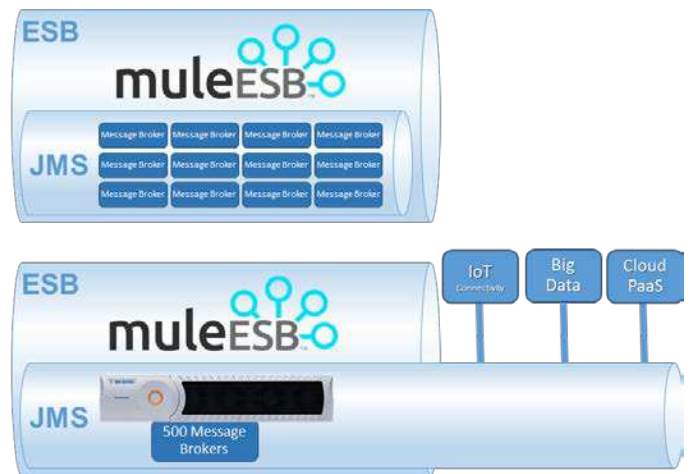
- Solace supports messaging rates 50x to 100x higher than traditional solutions across all qualities of service and patterns (async/sync, pub/sub, req/reply, peer-to-peer) in the smallest possible foot print.
- Solace technology can act as a "shock absorber" by handling bursts in the event streams so MuleESB can handle peak traffic loads without timeouts, dropped data, or having to pre-deploy unnecessary message processing infrastructure.
- Solace reduces end-to-end response times by reducing the latency at each step in work flows that push messages in and out of numerous queues.
- Solace's platform offers 99.999% reliability, and in-service upgrades to an infrastructure that was designed to be very robust with no single points of failure under all failure scenarios.

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Scale without Datacenter Sprawl

The underlying distribution and message queuing of an ESB is usually handled by a messaging broker that customers select separately based on their unique needs. As event stream or request volumes increase it is necessary to boost the capacity of your overall stack. To do so, you need to scale the ESB software and the underlying message broker platform. With the low capacity of traditional messaging systems, this leads to an untenably complex environment where you split traffic across many brokers, which leads to non-linear scale and several hot spots depending on the concentration of producers, consumers and flows.

Solace's appliance has 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 appliance. Support for virtualization means you can divide each appliance into many discrete virtual message brokers so one piece of equipment meets the needs of many different services or departments. This allows MuleESB to horizontally scale on top of a multi-tenant Solace solution that scales vertically to extreme volumes and then horizontally when needed. Once Solace is in place simplifying the JMS infrastructure, it also future proof's the infrastructure by supporting the protocols and integration into the real-time use cases such as Hadoop, cloud PaaS environments and IoT

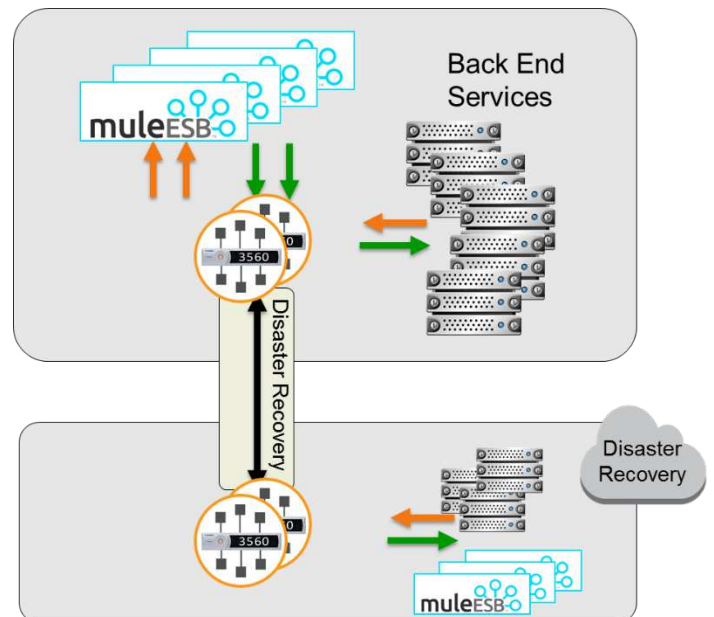


Simplify High Availability and Disaster Recovery

Reliability and compliance is becoming an integral piece of every mission critical use case. This is driving the need for higher levels of availability and zero compromise disaster recovery. The layer of software, OS, clustering software, shared disk for HA and then SAN disk replication for disaster recovery is too complex and in many cases is insufficient to meet the compliance needs of today.

As customers deploy MuleESB and Solace together, the simplicity and robustness of Solace's HA and DR strategy will provide the following benefits:

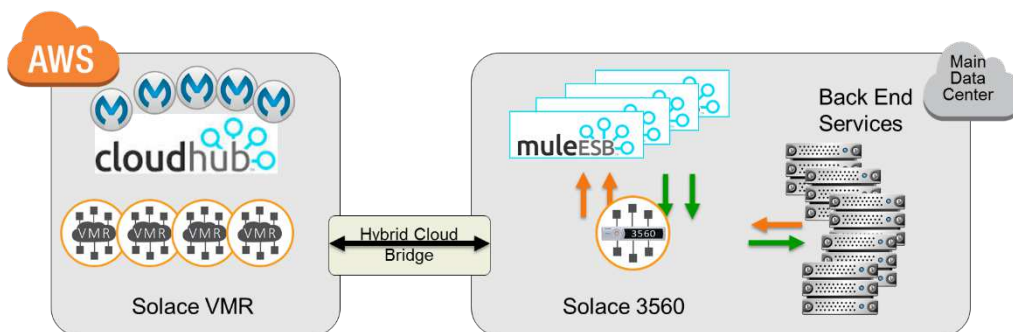
- Maximum robustness with no single points of failure under MuleESB, without compromising performance.
- With MuleESB connected to Solace, there are flexible deployment models for application fault tolerance and application load balancing.
- To extend MuleESB to disaster sites, Solace seamlessly provides the DR replication synchronously or asynchronously without the need for other 3rd party products such as Cassandra rings. This maintains a consistent messaging strategy from LAN to WAN to DR.



Augment Hybrid Cloud Deployments

More and more on premise applications are being shifted to the cloud, but because some real-time mission-critical applications will always live in corporate datacentres, companies need to find ways to let cloud-based and on premise applications interact as seamlessly as possible. MuleSoft's Cloudhub with its Anypoint platform can already support applications in the cloud and on premises. However, there are use cases where applications in the cloud need to be able to communicate with applications on premises in a federated fashion.

As an example, consider an ecommerce customer where some standard service requests are serviced regionally from the public cloud, while custom requests that have special requirements need to



be routed to the main datacentre at HQ, where there are back systems available for these requests. Another example is in Pharma where some requests must be serviced locally for regulatory requirements while others can be routed to the main datacentres for application servicing there. These use cases ultimately require a need to bridge traffic to/from the public cloud and on premises asynchronously and synchronously. The Solace solution underpinning MuleSoft's Cloudhub and MuleESB has the flexibility to provide a public cloud friendly software messaging solution for scalable pub/sub messaging bridged to high end messaging appliances (or software) on premises. This provides a seamless messaging experience across both domains with a hybrid implementation allowing public cloud applications to communicate with on-premise applications.

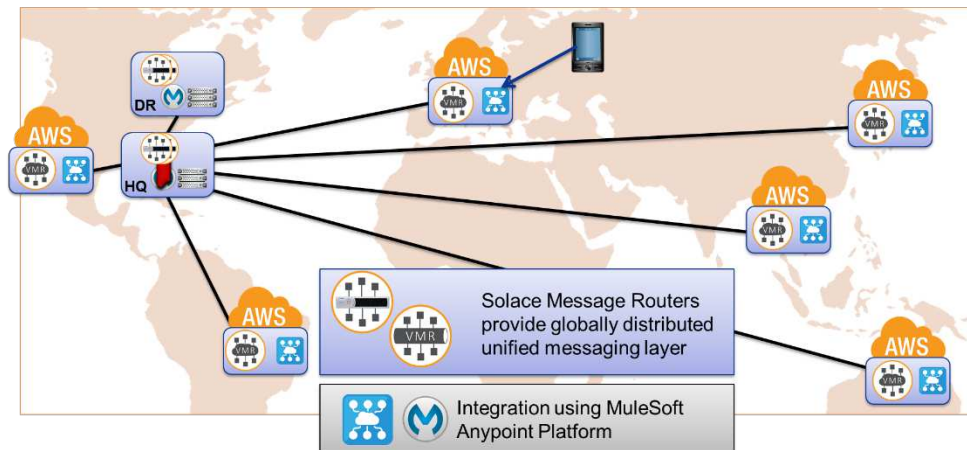
Streamline Multi-site, Distributed Environments

Today's enterprises are global and more distributed than ever before. For example:

- Retail stores such as Menard's and Wal-Mart which have a smaller number of distributed core datacenters with thousands of retail branches connecting into the core datacenters for point of sale, inventory management, etc.
- Betting and gaming companies that have core datacenters for betting engines, but have hundreds of betting terminals and mobile users that are distributed regionally all connecting back to the core set of datacenters
- Large banks that have many large global datacenters serving up their main lines of business, but also smaller departmental or branch locations that also connect to the main datacenters

Applications need to efficiently and seamlessly connect and communicate to any other application at any time in real-time, independent of where the application is located. With Solace as the multi-site, multi-tenant optimized fabric, MuleESB can connect in anywhere and leverage the Solace bus underneath.

Solace uses patented routing protocols and WAN optimization techniques to deliver the most efficient streaming experience across LAN, WAN and mobile applications. The mixture of Solace's software and hardware implementations allows for software where it makes sense, say in a smaller departmental branch, and hardware where it makes sense, such as in the core datacenters aggregating and shock absorbing the incoming event streams.



Internet of Things

The smart connected devices that make up the rapidly expanding consumer and industrial Internet of Things (IoT) are often constrained in terms of CPU, battery, and network bandwidth. These constraints can prohibit them from running traditional messaging, Internet, or ESB technology. Solace and MuleSoft combine together to bridge the gap between the worlds of traditional IT infrastructure and IoT infrastructure.

By seamlessly bridging between IT and IOT application are enabled to do the following:

- Stream real-time telemetry directly from IOT specific communications protocols (like CoAP, MQTT, LWM2M) into Big Data repositories and their associated infrastructure like Hadoop, Flume, Splunk, Storm, and Spark
- Expand beyond simple one-way "device to datacenter" communications into bidirectional command and control type applications such as opening and closing valves, controlling heavy equipment, or sending optimization instructions to remote embedded controllers like the HVAC systems in smart buildings.
- Achieve IoT scale deployments with millions of concurrently connected devices, even when the back-end systems the talk to were never designed to handle these numbers of endpoints.

Conclusion

Solace is the ideal messaging infrastructure for your Anypoint deployment. Not only does Solace offer higher, more predictable performance than any messaging technology available, it provides the flexibility required for large distributed enterprises and/or hybrid cloud deployments.

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