Openwave Messaging

Openwave Messaging is the leading global provider of innovative messaging software solutions. The company’s Universal Messaging Suite™ provides a powerful, open and flexible, complete messaging environment optimized for today’s most complex messaging requirements, including millions of mailboxes, security controls, identity management, and ease of integration with both internal systems and external partners. Based in Redwood City, California, Openwave Messaging’s customers are the industry-leading communications service providers, including several of the largest global broadband providers.

The Challenge: Messaging to Accommodate Changing Habits.

Openwave Messaging provides products that enable its telecommunication customers to manage vast stores for data related to email, voice mail, and text messages, along with the rich media that is increasingly associated with messaging. Since messaging is key to consumer stickiness, most Tier 1 service providers would like to “own” the messaging infrastructure.

It’s no surprise that the telcos are operating in a continually changing world when it comes to messaging. Photos, videos, and other attachments have dramatically increased the average size of messages, and rather than deleting messages, end users commonly leave them on the server so that they access them from a range of devices. While this shift offers great conveniences for users, it presents enormous data storage challenges for telcos, often increasing CapEx and OpEx costs and requiring them to pay closer attention to always-on availability and complete data durability. The Openwave Messaging solution addresses these specific needs.

For Openwave Messaging, a few key mandates are front and center:

• Scalable data storage—including structured (metadata) and unstructured (BLOB) data
• Continuous exponential growth driven by changing consumer habits
• Making metadata available for searching and mining
• Maintaining availability at five 9s
• Achieving all of the above in the most cost effective way

With email volumes and storage needs growing exponentially, Openwave Messaging needed to move away from expensive, licensed proprietary solutions from traditional RDBMS and storage vendors. Licensing costs were only part of the problem. High operating expenses around training and vendor lock-in for custom hardware and software solutions also contributed to unacceptably high costs for customers.

With one eye carefully on costs, Openwave Messaging also kept close track of its customers’ strategic needs and its own long-term goals. Its customers, global Tier 1 service providers, need to compete effectively on cost, relevance and reliability of the messaging experiences it offers to end users. These are key strategies for reducing customer churn. Openwave Messaging knew that to support its own continued growth it needed to continue developing and delivering a spectrum of cloud, hybrid and on-premise deployment capabilities, using both products and hosted service offerings.

Company
Openwave Messaging

Data Size
Structured data expected to double in a year

Business Challenge
Provide a TCO efficient and geo resilient messaging solution responsible for storing and accessing vast, ever-growing message data for global Tier 1 service providers

Solution
The DataStax Cassandra-based platform reduced costs while providing a highly scalable data store supported by native geo-redundancy and cluster-ring architecture.
At Openwave Messaging, we have the perfect symphony of distributed system challenges. We have to solve all these problems at scale, with a dense footprint, with very resilient systems, with a lean team. With DataStax and Cassandra, we’re doing that.”

Cost control has been critical, and has been achieved in two main ways. With Cassandra, Openwave Messaging can use commodity servers from off-the-shelf hardware vendors to build its backend storage. In addition, though several types of databases compose its solution, it pays no license fees for Cassandra, further reducing those costs.


Low cost is meaningless if the solution at hand can’t solve the core business needs: extreme scalability, round-the-clock availability, and lightning-fast response times for transactional queries.

Driven primarily by changing email habits, in which users leave messages on servers for anytime, anywhere access and messages often include large media files, Openwave’s database size has been on a rapid upward climb.

The data growth Openwave’s customers experience spans various data types. Openwave Messaging’s product has to handle a per-node, 36x increase in structured metadata, and a per-node 4x increase in unstructured BLOBs (related to media files) YoY. Customer deployments differ, of course, but a typical medium-scale deployment might include a 20-node, IOPS-constrained Cassandra ring for structured, metadata, and a 15-node, storage-constrained ring for unstructured BLOB data. Fortunately, Cassandra allows for reduced dependency related to IOPS. While achieving this exponential growth, Openwave’s customers see a per-node savings of 40% read IOPS and 60% write IOPS.

With so much data being stored and accessed, and such high expectations from end-users about being able to access that data quickly, Openwave Messaging’s customers are especially concerned about durability and availability. “Telcos are extremely risk averse,” says Darshan. “Some of our Tier 1 customers in certain regions may demand up to five copies of data, and are willing to deploy high powered SSDs to increase system IOPS if needed. Hence keeping overall TCO down while increasing reliability is a constant challenge.”

Thanks to its ring architecture, Cassandra lacks a single point of failure. With active-active configuration, Cassandra achieves tiered resiliency at optimal cost for each tier, both within and across data centers.

Geographic redundancy is a special concern, especially in the wake of Japan’s March 2011 tsunami, which put disaster recovery top of mind for service carriers worldwide. “Geo-redundancy is out-of-the-box with Cassandra,” Darshan noted, adding that the team has been able to easily meet customers’ needs on this front.
Success Under Fire and Insights for the Future.

Traditional high availability systems required some downtime impact, but DataStax Cassandra has achieved near 100% uptime even during critical system maintenance. For example, a major customer’s legacy file system experienced catastrophic corruption in late 2012, leaving about 800,000 users without email access. The team resolved the problem by bringing its test Cassandra system live. When the “lab” system was barely surviving production load, the team were able to make necessary hardware upgrades many of which took less 20 minutes individually. All this while the solution went live with no customer impact and 100% uptime.

Openwave Messaging has relied on help and expertise from DataStax from the very start of its experience with Cassandra, and has drawn a number of insights from its work. It has focused on application use cases that play to Cassandra’s strengths – no single point of failure, high read and write performance, compatibility with commodity hardware. Digging in to understand Cassandra internals, rather than being a “user” of Cassandra, has also been important, Darshan noted.

Adequate sizing has been key to absorbing the costs of eventual consistency, and Openwave Messaging performed extensive field readiness and customer lab tests at near production scale. “Our iterative learn, fix, and text cycles have been critical in maturing Cassandra’s use within our stateless product for very demanding customers,” Darshan noted.

“The way the internal architecture of Cassandra has been optimized is truly amazing,” Darshan said. “At Openwave Messaging we have the perfect symphony of distributed system challenges. We have to solve all these problems at scale, with a dense footprint, very resilient systems, and a lean team. With DataStax and Cassandra, we’re able to do this.”

It is estimated that by 2014, 60% of Openwave Messaging customers’ end users will have data stored in Cassandra.