

THE COMPUTERWORLD HONORS PROGRAM

CASE STUDY



LOCATION:
*San Antonio, Texas,
United States*

YEAR:
2006

STATUS:
Laureate

CATEGORY:
Business and Related Services

NOMINATING COMPANY:
EMC

ORGANIZATION:

AT&T Messaging

PROJECT NAME:

Next Generation Unified Messaging Services

Summary

In designing its new IP-based next-generation messaging service (now called AT&T Unified Messaging) to meet customers' demand for anytime, anywhere communications, AT&T selected an open, rather than a proprietary, architecture. This approach allowed AT&T to tightly integrate technologies to help deliver extremely high availability (99.999 percent uptime) and a very scalable service. This approach to deploying a next-generation messaging service has enabled AT&T to significantly reduce the number of servers required to provision its service, branded as AT&T Unified MessagingSM. It now takes half the number of servers to support the same number of customers, dramatically reducing costs per subscriber by almost 42 percent.

Introductory Overview

In 2004, the affiliates of SBC Communications Inc. (collectively "SBC") of San Antonio, Texas, (now AT&T Inc.) began testing the concept for a next-generation messaging service. With this advanced service, telecommunications subscribers would be able to retrieve and send voice, fax and e-mail messages from a single interface – such as a landline phone, a cell phone, or an Internet-enabled device like a PC or laptop. It was a burgeoning market, but breaking down the technology barriers among different media, technologies and applications to allow anyone to communicate anywhere and anytime was a formidable challenge.

The company realized that customers relying on Unified Messaging would expect it to be as highly available as their telephone service and Internet access and wouldn't tolerate any downtime. That meant that the underlying infrastructure for any solution that SBC created had to be rock-solid and reliable. Moreover, if the subscriber base for the service grew as rapidly as projected, the solution would also have to be highly scalable with a low delivery cost per subscriber, in addition to being available 99.999 percent of the time. The company made the strategic decision to design the solution using open systems to better position the service to accommodate future customer needs and emerging communication technologies and devices. And finally, the service needed to be easy and flexible for subscribers to integrate into their lifestyle. Otherwise, it would fail to gain acceptance.



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When SBC acquired AT&T Corp. in 2005, the Unified Messaging project dovetailed nicely with the large-scale IP networks that AT&T Corp. had already developed. The Unified Messaging application is comprised of 13 vendors' technologies integrated into a single IP-based network that allows customers a unified view of all the different types of messages that they deal with on a daily basis. The networking subsystem provides external IP interfaces for Web and voice access, managing the routing, authentication and security for system users. The telephone user interface incorporates interactive voice recognition technology. An automated provisioning subsystem allows the company to channel services to customers in real-time as needed, which enables Unified Messaging to scale as needed. An administrative subsystem handles maintenance for the Unified Messaging solution. And the centralized storage subsystem houses message information and associated subscriber data.

Benefits

Though the Unified Messaging applications are very IP-centric, they interoperate not only with IP-based technology but with existing public switch telephone network technology as well. This connectivity to multiple networks enables AT&T to support customers who are still using legacy telephony systems as well as position itself to capitalize on any newly emerging technologies in the consumer Voice over IP (VoIP) and business Web arenas. AT&T projects that this integration with new technologies will reduce its cost structure even lower, which, in turn, will allow the company to continue offering AT&T Unified Messaging at competitive rates for its subscribers.

To reduce its costs for setup and hosting maintenance of the Unified Messaging applications, AT&T implemented a Clustered Network Server solution. This enabled Unified Messaging to use a Network File System (NFS) engine that provided high availability, saved about \$2 million in projected licensing fees and provided an opportunity to consolidate servers by a factor of more than one-third. Instead of having 350 servers, the Unified Messaging environment could be run with fewer than 200 servers.

To lower costs even further, AT&T implemented networked storage equipped with a more efficient parity RAID (redundant array of independent disks) approach to protect against multiple storage drive failures and to avoid disk mirroring, which requires larger numbers of disk drives. Doing this helped reduce the overall cost per subscriber by almost 42 percent.

The AT&T Unified Messaging network consists of multiple interconnected message centers to provide seamless service to subscribers. The network infrastructure allows AT&T to centralize the personnel that supports the traffic on the service. As the service scales up over the next three or four years, AT&T projects this architecture will lower the overall cost of maintenance and support by 15 to 20 percent, while providing better service to subscribers.

By deciding to use an open architecture rather than build proprietary technologies, AT&T has been able to take advantage of cost reductions afforded by open systems. With this type of infrastructure design, servers become commodities that can be easily swapped out as products and technologies evolve and price-performance improves. Vendors are already upgrading their applications to benefit from the improved performance of new server technologies. For instance, in the original business case, Unified Messaging was supported by a message center server that would handle 800,000 subscribers. Today, with improved server technology, AT&T has doubled the storage capacity of the message center server to support 1.5 million subscribers while reduc-



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ing the hardware cost by about 40 percent.

AT&T is also moving to implement more standard Internet application technologies such as XML to run some of its Unified Messaging voice applications. This gives AT&T the ability to customize and modify applications much more quickly and at a much lower cost than it could have with the proprietary systems AT&T used to have in place. AT&T projects that XML will allow new Unified Messaging features to be rolled out to the subscriber base 20 to 30 percent faster than before.

The Importance of Technology

Subscribers to AT&T Unified Messaging service like the convenience of being able to have a single message store that can be accessed via the Web, phone or mobile device. The wireless integration of the services allows subscribers to store landline and wireless voice mail in one place and check messages online or via telephone interface or other device, whichever happens to be more convenient at that particular point in time.

With telecommunications users becoming more Web-centric, this new service gives them the flexibility to handle message communications however and whenever they choose. For corporate customers, especially those with a mobile work force, the ability to retrieve and listen to messages – whether through a telephone user interface or a Web user interface – empowers them to maintain productivity even when they're traveling.

To ensure that AT&T Unified Messaging service delivered a comparable level of high availability that subscribers expect from their telephony systems, all the components of the Unified Messaging application needed to interoperate at optimum levels. Being IP-centric, the application is able to utilize the very large-scale IP networks that AT&T already has in place, which offers great advantages in terms of scalability and cost-effectiveness in delivering the service. The service maintains seamless connectivity to AT&T's existing legacy switches, enabling it to interoperate across the board – both in the IP environment and the company's existing telephony spaces. By choosing an open rather than a proprietary architecture for the Unified Messaging solution, AT&T estimates it has reduced the cost structure for connecting the Unified Messaging to the public switch telephone network by 30 to 40 percent.

Tight integration among all the vendors' products which comprise the open architecture has enabled AT&T to optimize performance among all the components. As a result, the company has been able to reduce the number of servers required for Unified Messaging by half to support the same number of customers. The initial design called for between 500 and 600 servers to support the operation. Today, AT&T has only needed to deploy 300 to 400 servers.

John Lemay, an executive director at AT&T Laboratories, said, "We've been able to take advantage of the cost reduction in a lot of open system technologies, including what I'd call commodity server technology, which has dramatically dropped in price over the last four years while significantly increasing in performance. So we've been able to benefit on three fronts: fewer servers, lower server cost for the same performance, and improved efficiency of our applications to take advantage of higher-performance server technology."

To help efficiently and centrally manage more than 300 terabytes of storage for its public messaging systems, AT&T is using storage systems and software specifically optimized for large-scale operations. With this approach, AT&T can cost-effectively handle its storage and opera-



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tions reports with minimal staff.

AT&T is able to scale a single message center capacity to hundreds of terabytes with no noticeable degradation in customer service. With the NFS technology, AT&T subscribers can easily access their messages across hundreds of terabytes of storage, which gives AT&T huge scalability potential.

Originality

AT&T Unified Messaging is a groundbreaking concept in service. It is the first extremely large-scale application of its kind. The service has sparked an entire portfolio of communication services being offered to AT&T subscribers. It's also an important component for AT&T's Project Lightspeed initiative which will deploy a next-generation, IP-based network to deliver IP-based TV, broadband and voice services using fiber-to-the-neighborhood and fiber-to-the-premises technologies.

Success

Customer feedback on the feature-rich communication platform has been positive, with the satisfaction experience increasing as customers use more of the service's features. AT&T Unified Messaging was rolled out well under budget (30-40 percent) and continues to increase in functionality and performance far in excess of projected expectations. Thanks to robust, open architecture design, AT&T has been able to maintain "five nines" reliability across the network for its Unified Messaging service.

Creating one solution that could service both enterprise customers and the mass market was both a technical challenge and is one of AT&T's biggest strengths. But the approach used for AT&T Unified Messaging provides a solution that is scalable to both environments and offers the flexibility to adapt to changes in the marketplace and customer needs. Basing the architecture on IP technology gives AT&T the maximum flexibility to offer a variety of IP connectivity and integrated network solutions for its Unified Messaging service as new technologies evolve.

Difficulty

Because Unified Messaging represented a merger of IP and voice mail technology, AT&T needed to create an application that would meet the high availability demands of subscribers in both worlds. Phone users expect "five nines" reliability, but for Internet services three or four "nines" uptime is considered the accepted norm. It was a challenge to get the vendors of all the technologies being used for the Unified Messaging up to the "five nines" level. Teamwork among all the parties involved – from research, operations, procurement and planning, as well as all the vendors – resulted in the roll-out of the service at the high level of availability demanded by the market.