



Navigating through the Storage Tsunami

Low Cost Messaging and Content Storage Solutions for Service Providers

About Openwave

Openwave Systems Inc. (Nasdaq: OPWV) is a global software innovator delivering context-aware mediation and messaging solutions that enable communication service providers and the broader ecosystem to create and deliver smarter services.

Building on our mobile data heritage, Openwave mobilizes the internet with predictive solutions based on real-time analytics that mediate among all the different ecosystem elements and enhance every mode of IP traffic. The result is a 360-degree view of users, the network, devices and services that enable our customers to proactively optimize network resources, launch smart mobile services quickly, and provide a contextually relevant user experience. Openwave is a global company with a blue chip customer base spanning North America, Latin America, Australia and New Zealand, Asia, Africa, Europe, and the Middle East. Openwave is headquartered in Redwood City, California. For more information please visit www.openwave.com.

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Introduction

When was the last time you cleaned out your email inbox?

The introduction of Gmail in 2004 changed consumer expectations about email by offering nearly unlimited mailbox capacity for free. In response, other email service providers such as Yahoo and MSN started offering higher capacity mailboxes; broadband service providers began offering multiple free email accounts to their subscribers, including 2GB of storage space per mailbox. It did not take long for consumers to take free email with content sharing and practically limitless storage for granted.

With the arrival of smarter mobile devices and richer webmail clients, more and more subscribers are using the Internet and IMAP to access, share and store their content. Today's email experience is much richer but also much more storage intensive. As a result, service providers must support all the content being shared and stored or risk losing subscribers. Welcome to the Storage Tsunami.

The cost of current storage solutions used by commercially available email products is simply too high for service providers to offer a competitive yet cost-effective email service to their consumers. **Bottom line: service providers must find low-cost storage solutions for their email services if they want their email business to be profitable.**

Market Trends

Tapping into Openwave's vast experience with messaging, we note the following market trends at our Tier-1 and Tier-2 service provider customers.

The Move to Webmail and Mobile Access

The email access profile is evolving from POP3 to Webmail/IMAP. Currently 45% of users access their messages via Webmail/IMAP as compared to 55% using POP3. As shown in Figure 1, the access trend is forecasted to continue to shift rapidly towards Webmail. Access to email using mobile devices via IMAP is also rising rapidly.

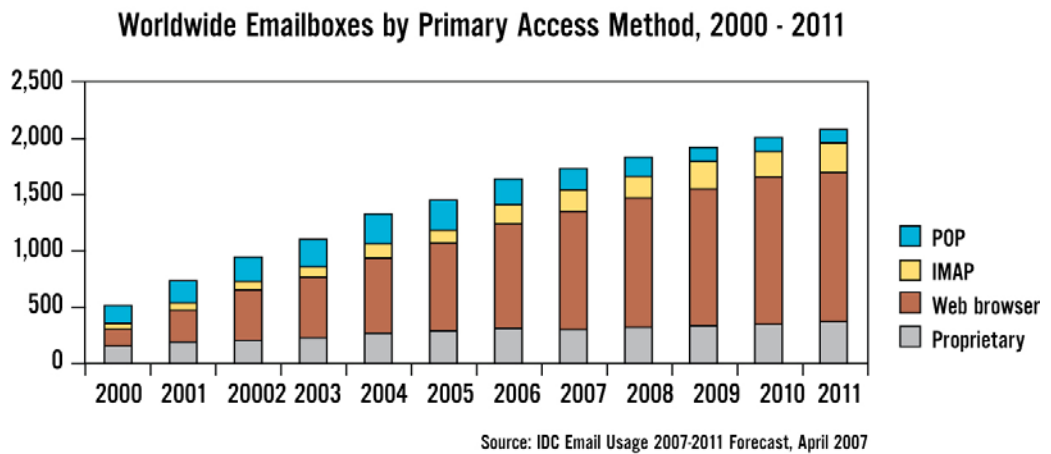


Figure 1 – Trends in primary access methods for email, forecasted through 2011.

The Growth of Richer Multimedia Content

The average message size has been increasing for the past couple of years. High resolution photo/video cameras have helped push the average size of email attachments from a few kilobytes to megabytes. This places an increasing burden on the service provider to support all the content being shared and stored. With converged mailboxes, unified communication is likely to bring even more multi-media content to the mailbox, exacerbating the problem.

An Increase in Mailbox Size

Most email clients supporting the POP3 protocol have default settings that either delete emails from the server immediately after downloading them to the client or delete the emails after a few days. This minimizes the long term storage needs of a mailbox for the service provider.

However, with increasing IMAP and Webmail access from a variety of devices, subscribers expect their messages to be available on the server for a long period of time. Subscribers now tend to treat their mailboxes as “searchable storage in the cloud.” North American service providers are reporting that the average number of emails stored per mailbox has grown from somewhere in the 10s to numbering in the 100s and in some cases even in the 1000s.¹

Change in Consumer Expectations

Consumers expect “infinite” storage. Taglines like “Never delete your email again” are becoming standard. The result is that subscribers’ mailboxes are becoming larger. The average mailbox size has increased by an order of magnitude in the past couple of years. With this trend in mind, service providers are facing the likely prospect of having to store Petabytes of data.

Effect on the Service Provider

In an attempt to try to keep up with consumer demand, service providers are starting to offer larger mailboxes; some are even offering unlimited mailbox storage space. With the increased use of mailboxes come the following issues for the service provider:

- Rising storage costs due to high storage demands
- Rising OPEX due to an increased hardware footprint
- More complicated data protection schemes
- Increased recovery time after failure
- Performance issues that current email systems are not equipped to handle

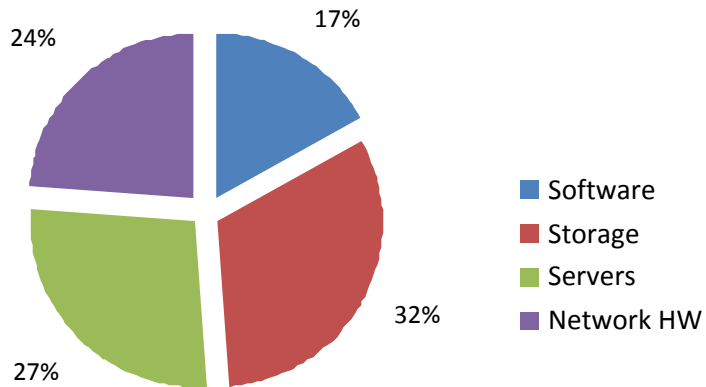
¹ Based on internal research with Openwave customers.

- In some cases, the mailstore architecture requires mailbox rebalancing when the load on a particular mailstore server exceeds capacity, adding to operating costs
- Using larger-capacity drives is not an effective solution because larger drives cannot keep up with the Input/Output Operations Per Second (IOPS) demand under load

Rising Email Platform Costs

Discussions with various service providers show that a significant portion of the CAPEX/OPEX budget for email systems is allocated towards storage hardware, maintenance and services. As shown in Figure 2, the typical service provider spends 32% of their IT budget on storage. An additional 17% of their budget is spent on software, including licenses and maintenance.

IT Budget Cost Distribution



Source: Based on internal research with Openwave customers.

Figure 2 – IT Budget Cost Distribution for Email Service Providers.

Increase in Required Storage

Increased usage of Webmail and IMAP access for email, coupled with larger multimedia content per message, is directly impacting the storage required by the service provider. Current storage cost structures do not allow service providers to compete. The storage problem is about to take a turn for the worse and service providers are very concerned.

Figure 3 shows the amount of storage required as the average size of the mailbox grows. If service providers were to continue to use the same type of storage hardware and services required/prescribed by current solutions, **the cost for storage and operations associated with storage would become prohibitive.**

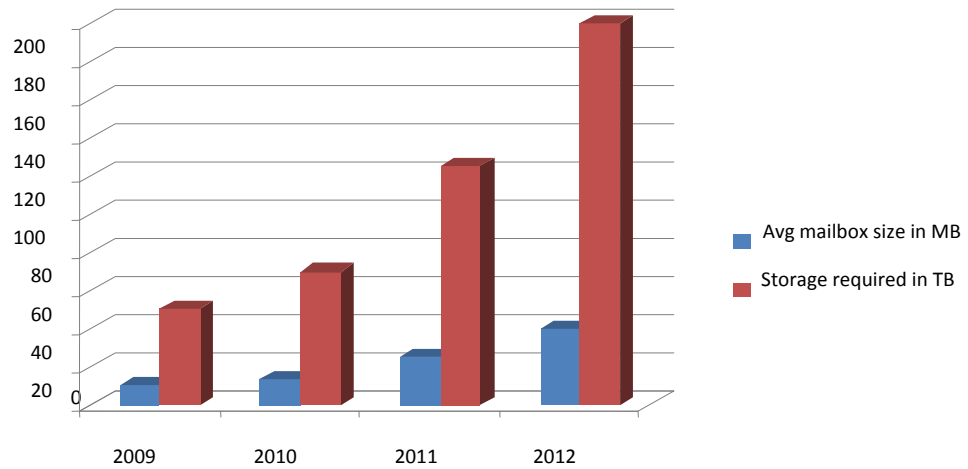


Figure 3 - The amount of storage required as the average size of the mailbox grows.

The Business Case for Commodity Hardware

Table 1 shows three different cost scenarios for a tier-1 customer, including the fully-loaded cost per Gigabyte of storage:

Cost type	High End Storage Vendor 15K RPM	Mid-tier Storage Vendor 10K RPM drive	Commodity SATA drive 7200 RPM
Naked Spindle Cost	\$13/GB	\$3/GB	\$1.60 / GB replicated
Chassis cost	\$6/GB	\$3/GB	\$1.20/GB
Operations	\$2/GB	\$1.20/Gb	\$2/GB
Total	\$21/GB	\$7.20/GB	\$4.80/GB

Table 1 - Cost scenarios for different storage vendor types.

In a deployment scenario for a 5 million mailbox subscriber base and a modest growth projection for average mailbox size (growing from 10MB in 2009 to 40MB in 2012), Table 2 shows that the amount of storage required grows at a rapid rate:

Mailbox and Storage Growth				
	2009	2010	2011	2012
Number of Mailboxes (in Millions)	5	5	5	5
Average Mailbox Size in MB	10	14	25	40
Storage Required in TB	50	70	125	200

Table 2 – Mailbox and storage growth for a 5 million subscriber network.

Introducing Openwave Email Mx

Openwave Email Mx provides an industry-leading IP messaging platform enabling personalized, converged messaging services at a low total cost of ownership (TCO). **Email Mx is a low-cost storage, infinitely scalable and highly reliable solution** that can also be expanded to provide general-purpose low-cost storage for other applications beyond email, offering a comprehensive low TCO platform for messaging products.

Openwave Email Mx addresses the three most important issues service providers are facing:

- Cost of ownership
 - Openwave’s Email Mx uses commodity storage hardware, which is significantly less expensive than the storage disks available from marquee names. Total cost of ownership can be reduced by up to 65%. While some might speculate that cheaper storage raises reliability concerns, these concerns have been proven to be invalid because the overall solution provides the same reliability. Case studies have shown that Mean Time Between Failure (MTBF) is almost identical when using commodity hardware.²
 - Email Mx uses an Open Source Distributed Database. This database meets or exceeds the reliability and scalability demands of the email application. The same database is used by leading social networking sites and responds effectively under heavy load. This results in a significant reduction in software licensing costs incurred by solutions that require commercial relational databases. Openwave’s choice of a Distributed Database was done after carefully evaluating a number of equivalent solutions, with reliability and scalability being the top evaluation criteria.
- Horizontal scalability
 - With the use of stateless servers on the backend, new servers can be added very quickly as demand grows. This reduces fork-lift upgrades of systems, reducing operations and expansion costs.
 - Use of a Distributed File System (Open Source) allows adding new storage nodes quickly as needed WITHOUT having to invest in expensive hardware solutions from storage array vendors, thereby reducing CAPEX costs.
 - Intelligent load balancing across servers and less tuning for architectural changes.
- Reliability
 - Openwave’s Email Mx customers take pride in this highly reliable product. Some offer service-level agreements (SLAs) to their business customers, while others support government mandates to provide highly reliable communication service such as email.

² Based on a study conducted by Carnegie Mellon University.

- Openwave’s architecture ensures that there is no single point of failure throughout the system. There is build-in redundancy at every level, ensuring resiliency against hardware, software and network failures with each component.
- Email Mx employs N+1 active/active scalability and failover instead of 2N active/standby, reducing the hardware required to maintain redundancy.
- Mx uses the Open Source Distributed File System and Database, which have reliability and high availability built in to the platform. This removes the need for expensive third-party HA solutions.

Figure 4 shows the total cost of ownership over four years when using high-end storage hardware vs. using commodity storage. The Openwave Stateless Message and Content Store Architecture can reduce the service provider’s storage and database costs by up to 65%.

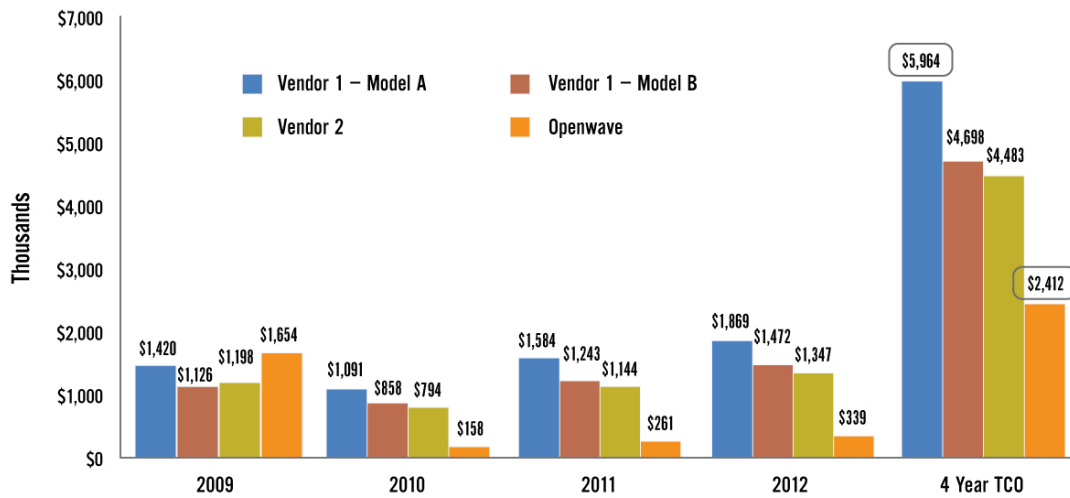


Figure 4 - Four-year TCO with name brand and commodity storage solutions.

Conclusion

The Openwave Email Mx platform is a horizontally scalable, highly reliable solution for email based on low-cost commodity storage hardware. Email Mx dramatically reduces the service provider’s TCO, and can be expanded to a general-purpose low-cost storage platform for other applications beyond email.

As service providers offer smarter devices and data-intensive services, subscribers’ demand for content sharing and storage will continue to grow. In the face of the approaching Storage Tsunami, service providers can try to fight the surge by imposing storage limits on their subscribers (and then watch them churn), or they can embrace new in-network storage solutions for email and content that will allow them to meet the growing demand in a very cost-effective manner, while also retaining the quality and reliability of the service.

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