Single Titan system stores e-mails and hosts Web sites for 180,000+ broadband users.

Knology's more than 180,000 customers count on BlueArc's Titan Storage System to provide instant access to e-mail and custom-built Web sites, made possible through its hardware-accelerated architecture, delivering sustained high speeds and data retrieval under heavy user load and access spikes.

The Background

Knology Inc., headquartered in West Point, Georgia, is a leading provider of interactive communications and entertainment services in the Southeast United States. Knology serves both residential and business customers with one of the most technologically advanced broadband networks in the country. Innovative offerings include over 200 channels of digital cable TV, local and long distance digital telephone service with the latest enhanced voice messaging features, and high-speed Internet access, which enables consumers to quickly access e-mail, video, audio and graphic files using a cable modem.
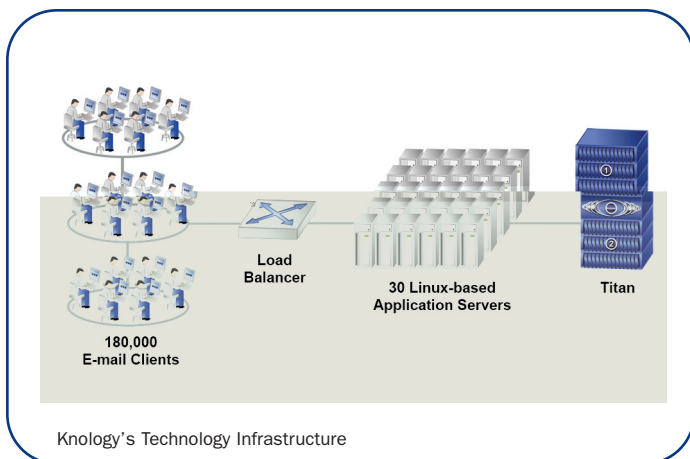
The Challenge

As Knology's Internet services, primarily including e-mail and Web site hosting, gained customers rapidly, soon exceeding 100,000 individual accounts, demand on the company's storage rose sharply, resulting in delays in accessing data, impacting the customer experience. By 2003, the company's existing NAS equipment, in use for nearly three years, had reached its performance limit, and needed to be replaced, either through a fork-lift upgrade, or by adoption of new technology from an alternative vendor, who could provide a solution capable of meeting future requirements and user load.

Through any upgrade, Knology aimed to stay "ahead of the curve on performance," said Bradley Frye, Senior Manager of Data Network Operations. In parallel, quotas on customers' stored e-mail and Web hosting data, at 10 megabytes, going to 25, promised a consistent growth pattern for capacity.

The Solution

To meet escalating user requirements today, while retaining available performance and capacity headroom for planned growth and service enhancements, Knology selected BlueArc's Titan Storage System, with five terabytes of high performance fibre channel drives. With an expanding customer base needing instant access to e-mail and Web content regardless of time or location, Knology eliminated future bottlenecks through selecting a scalable storage infrastructure that would grow alongside the company in terms of both performance and capacity. The system purchase delivered immediate performance improvements, and simplified the company's storage infrastructure, without requiring changes to network design or other supporting technologies.

> "Storage got slower as time went on, and you didn't realize how slow it was until it was affecting incoming mail. We didn't realize how slow it was until we had replaced the unit."

> "We didn't ever want to be behind on performance."

> "We don't even notice if we have spikes."

> "We could at least double on a single Titan. We expect that we could scale to about 500,000 users. We felt we could scale it indefinitely."

> - Bradley Frye, Senior Manager of Data Network Operations

BLUEARC®

Knology's Technology Infrastructure

The Value

Knology's core offering is the ability to serve voice, video and data over a single line to the customer, through a diverse offering of several hundred video channels, high speed Internet access, Web page hosting and voice telephony. This service has attracted hundreds of thousands of customers in the southeastern United States. With so many people relying on their infrastructure to be bullet-proof, ensuring anytime access to data, Knology's decision to move to BlueArc instantly solved performance lags that threatened customer access. Titan is now poised to play a continued important role at the center of the company's on-demand offerings, even as their customer base double or triples, Frye estimates.

Prior to installing Titan, Knology found that existing storage from a leading NAS vendor would "get slower as time went on, and you didn't realize how slow it was until it was affecting the incoming mail," Frye said. To combat this problem, additional servers were added to help balance load to the NAS devices, introducing additional complexity, and not fully eliminating the sluggish throughput. As the existing storage infrastructure had reached its performance ceiling, new technology was needed, and after extensive investigation, Knology found Titan met and exceeded all their requirements. Upon implementing Titan, performance issues were eliminated, and expenses were reduced, as they consolidated multiple network storage devices, meeting all customer needs with a single Titan.

With Titan in place, Knology has configured the system as the back-end repository for all e-mail and associated attachments for more than 180,000 customers. With dozens of e-mails per customer being stored on Titan at one time, the number of small files, sometimes as little as 1 kilobyte apiece, can number into the millions. As a result, Knology found Titan's hardware-driven file system to be extremely beneficial, offering a simple way to manage huge numbers of files and continue to deliver outstanding performance – something they found an issue in their previous solution. Capacity was not an immediate issue, as Knology knows they scale capacity on their Titan to meet increasing customer storage quotas.

Titan's ability to deliver consistently high levels of performance has put Knology at ease, remarking they hardly notice peaks in demand that could cripple less-robust systems. In Frye's estimation, a single Titan server could scale to about 500,000 users, delivering the company room to expand, upwards of three times the current user load. Additionally, intelligent storage management tools, including user quotas, virtual volumes and snapshots, combine to offer Knology a robust administration suite capable of support such massive user growth.

Frye says snapshots are taken and kept for two days for convenient recovery. While the snapshots themselves are not backed up, the structure of system's mail directory and Web space is backed up to tape, while previous day's e-mails are stored in snapshots for rapid retrieval. Quota software included with Titan is utilized to administer customers' Web space, easing the company's efforts to bring storage in line with business needs.

The Conclusion

In the Internet Services market, new technology capabilities and increasingly savvy users are demanding a variety of data-driven services, and are expecting fast responsive performance and increasing capacity limits, Knology has been able to deliver meet customers' demands for current services and plans for expected growth in customer base in the future.

For Knology, they have made a business decision to never compromise on performance, ensuring highest-quality offerings to their expanding customer base, and for them, the Titan storage system delivers the ability to serve users today while retaining headroom for tomorrow's growth and challenges – whether that be unforeseen spikes in demand, or ever more demanding innovative services.

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