Customer Profile

Carnival Australia Improves It Productivity And Reduces It Costs By Optimizing Satellite Wan

Carnival Australia is a division of Carnival Corp. and is the leader of the Australian and New Zealand cruise industry responsible for seven ships operating in Australian waters – four P&O Cruises' ships and three Princess Cruises' vessels (including Sea Princess from September 2011). P&O Cruises has been cruising from Australia since December 1932 when the P&O mail steamer, Strathaird, departed from Sydney on a five-day cruise to Brisbane and Norfolk Island. In addition to operating P&O Cruises, Carnival Australia represents a number of Carnival brands – P&O Cruises World Cruising (UK), Cunard Line, Princess Cruises, Seabourn and Carnival Cruise Lines.

Ships in the P&O Cruises' fleet rely on IP-based satellite wide area network (WAN) connectivity to access applications, transfer files, and communicate between ships and the head office data center located in North Sydney, Australia. The ships rely on critical protocols and applications that include CIFS and FTP for file transfers, HTTP/S for Internet traffic, RDP for remote administration, and IBM's Lotus Notes and Domino for messaging and collaboration.

The ships also transmit data intensive media via satellite, such as medical x-rays that are sent to on-shore hospitals. The data from these combined applications, which can exceed 100 Megabytes (MB), is replicated each day to the company's data center in North Sydney.

The Satellite Performance Problem

Carnival needed to improve WAN connectivity, which was being affected by latency, packet loss, out of order packets,and network jitter common with satellite connections. The ships experienced slow ship-to-ship and ship-to-shore WAN performance over the 756 Kbps IP-based satellite connections.

Specific challenges included high latency, high packet loss (5%+ during peak times), and reduced bandwidth capacity (1Mbps) on P&O Cruises' satellite WAN. These WAN challenges were causing the company's Domino application and file transfers to frequently hang, and forced data replication to take far too long, reducing productivity and frustrating the ship staff. P&O Cruises regularly replicates large files of up to 5 Gigabytes (GB) to three of its ships, Pacific Dawn, Pacific Jewel and Pacific Pearl.

Latency on WAN connections can be caused by the physical distance that signals travel from the earth to the orbiting satellite and back to earth to complete a round-trip data transmission. Unfortunately, the laws of physics determine the baseline of the round-trip time, and their end-to-end latency could take 500 milliseconds or more due to satellites orbiting thousands of miles above the equator. This physical limitation is common to all satellite network service providers.

To further complicate things, IP-based satellite systems that deliver broadband

Customer: Carnival Cruise Line

Business Challenges

- High latency and 5% packet loss over satellite WAN
- Domino applications and file transfers hanging
- Lengthy data replication times due to low quality WAN
- Frustrated IT staff

Network Background

- IP-based 756 Kbps satellite WAN
- CIFS, FTP, HTTP/S, RDP, and IBM Lotus Notes and Domino
- 100 MB daily app traffic to HQ in North Sydney
- 5 GB regular replication from data center to ships

Silver Peak Results

- 80% improvement in application performance
- 90% improvement in data transfer times
- Lotus Notes traffic improved by 80%
- HTTP and SMTP traffic cut by 70%
- Avoided expensive WAN upgrade

services sustain much greater levels of latency because of the tremendous number of TCP and application protocol handshakes. Large amounts of redundant data can also impact WAN performance.

The application hang-ups and lengthy transaction times from transmission interruptions and re-transmissions led Carnival Australia to deploy a WAN optimization solution for the three P&O Cruises' ships

The Silver Peak Solution

Carnival Australia was able to achieve necessary improvements using Silver Peak's data center class WAN optimization appliances to optimize satellite connections and address the network-induced latency, bandwidth limitations, and packet-loss issues on the WAN.

Carnival initially limited a test with a Silver Peak NX appliance to one ship and an NX appliance in the head office. They started a replication process on a Friday afternoon, and the ship with Silver Peak WAN optimization enabled finished on Sunday, while the other two ships completed the replication on the following Tuesday.

The Silver Peak appliances reduced the packet loss and significantly improved the reliability of the satellite connection leveraging Silver Peak's real-time Forward Error Correction (FEC), TCP acceleration, and Network Memory™ capabilities with advanced de-duplication and compression. Today, Carnival Australia has deployed Silver Peak NX-series WAN optimization appliances on all three ships, as well as in the head office data center in North Sydney.

"Silver Peak is a great fit for our unique environment that spans both land and sea," says IT Director for Carnival Australia. "Silver Peak's innovative WAN acceleration solutions improve our ability to streamline our business and IT operations, both on and off our ships. Silver Peak has been an excellent partner to work with, and their data center class WAN optimization has proved very useful in improving IT efficiencies and avoiding added costs for WAN bandwidth."

Silver Peak AutoSupport

When the P&O Cruises' ships do turnarounds in port, the IT team has limited time to go on board to service the IT equipment. As such, they require solutions that are extremely reliable, as well as easy to deploy, manage, and maintain. Silver Peak's WAN optimization appliances install quickly and easily, and unique AutoSupport capabilities remove the need for human interaction for maintenance and support. Silver Peak AutoSupport helps speed problem-resolution, helps avoids errors, and improves overall satisfaction with the products, especially for a business like Carnival Australia where ships have busy cruise schedules.

While unanticipated and unlikely, AutoSupport tied to the Silver Peak WAN optimization appliances rapidly detects and isolates problems, making proactive recommendations for ongoing maintenance. This minimizes any downtime of the WAN optimization appliances, and helps further reduce IT support costs by eliminating the need for hands-on maintenance.

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The Benefits

As a result of deploying Silver Peak, employees on-board the P&O Cruises' ships experienced improved productivity due to faster performing use of Notes and Domino, file transfers, and other HTTP/S applications.

The Silver Peak implementation has also eliminated the need for an expensive upgrade in satellite WAN bandwidth. Additionally, IT staff time and resources were significantly reduced by not having to respond to application delivery problems.

Additional benefits and advantages include:

- Silver Peak compression and caching reduced the transmission time for the applications, delivering more than an 80% improvement in application performance.
- The integrity of the satellite WAN connection was improved (packet loss was significantly reduced or eliminated).
- Both head office and ship-based users benefited from faster and more consistent file transfer and application response times.
- Silver Peak's FEC reconstructed lost and damaged packets between the head office and the three ships to ensure WAN reliability.
- Silver Peak's compression on collaboration applications reduced data transfers by over 90%, Lotus notes traffic was decreased by over 80%, and SMTP and HTTP traffic was cut down by over 70%.

Summary

Carnival Australia chose Silver Peak's WAN optimization to improve their ship-to-ship and ship-to-shore communications over high-latency, error prone satellite WAN connections. Its goals of achieving significantly faster application delivery, file transfer, and data replication performance while eliminating the need for a bandwidth upgrade have been realized.

Silver Peak provided Carnival Australia with significant improvements in reducing and even eliminating WAN latency, and eliminating packet loss and data re-transmissions. Data center and ship-based personnel are freed from the distractions and frustration of network delays and reliability issues, and ship employees are more productive in conducting business at sea.