Airport Efficiency and Revenues Climb with Common Use Model

Greater Toronto Airports Authority modernizes and virtualizes operations with end-to-end campus network.

EXECUTIVE SUMMARY

GREATER TORONTO AIRPORTS AUTHORITY
- Transportation
- Toronto, Ontario
- 1227 employees
- More than 80,000 people employed at Toronto Pearson International Airport

BUSINESS CHALLENGE
- Lack of control over network infrastructure made it difficult to keep pace with demands for new services and tighter security
- Proprietary, airline-assigned gates impeded fast response to unexpected events
- Aggressive growth and expansion plans required a more cost-effective, adaptable communications infrastructure

NETWORK SOLUTION
- Optical solutions and Catalyst switches support a wide range of services across core, distribution, and access layers
- Unified Communications provide voice services for passenger information kiosks, gate areas, contact centers, and help desks
- Multiple solutions are in place to secure the network, servers, and desktops

BUSINESS RESULTS
- New fee-based IT services, such as VoIP and WiFi, have increased airport revenue
- Integrated baggage solutions have reduced the number of mishandled bags
- Self-service check-in kiosks have reduced lines during peak hours
- Shared infrastructure has increased speed to market for airlines, and simplified the relocation of facilities within the airport
- VoIP contact centre solutions have significantly improved customer call processing.

Business Challenge

The Greater Toronto Airports Authority (GTAA) was established to provide the Greater Toronto Area with a regional system of airports to meet current and future demands, a daunting mandate for many reasons. Airport management has become more challenging in recent years in the face of heightened security, escalating costs, and the demand for better, faster service by airlines and passengers.

Toronto Pearson International Airport is among the busiest in the world, handling over 31 million passengers per year. Like most airports, Toronto Pearson's gate facilities were previously operated and maintained by resident airlines. This proprietary environment made it difficult for airlines to adapt quickly to change, and for the GTAA to allocate and manage airport resources with optimal efficiency. The communications infrastructure was just as complicated, with more than 14 networks from different service providers crisscrossing the 1800 hectare (18 square kilometer) airport campus.

The GTAA had a vision for building a more efficient, service-oriented airport based on a Common Use Environment (CUE) model. But

implementation depended on creating a network foundation that could consolidate different networks, and integrate over 200 existing IT and telecommunications systems into a single, secure, shared environment. Although other airports have implemented a CUE model for gates, the GTAA intended to be among the first to use the model to encompass multiple airport activities, including check-in, baggage handling, customer assistance, and commercial and retail operations.

Network Solution

After an extensive evaluation process, the GTAA selected Cisco® for its new campus-wide network. "We had an ambitious architectural vision for providing voice, data, video, wireless, and other services on a unified, converged network," says Ian Grant, General Manager, IT&T Engineering and Architecture. "We also had extensive requirements for security, redundancy, virtualization, and ease of management. Our philosophy is to be at the leading edge, but we want proven, tested solutions, and only Cisco met all of those needs."

The backbone of the campus network consists of two optical rings based on the Cisco ONS 15454, which combines IP intelligence with the capacity and efficiency of dense wavelength-division multiplexing (DWDM). Sitting on top is a SONET ring, where all third-party carriers connect to the campus network, while the GTAA maintains control of the cabling infrastructure.

More than 160 Cisco Catalyst® switches are deployed at the core, distribution, and access layers, making Toronto Pearson one of the largest Cisco-switched networks in North America. The GTAA also uses Cisco content switches for load balancing across the network. The distribution layer is based on redundant Cisco Catalyst 6513 or 6509 switches with dual Supervisor 720s and redundant power supplies. The GTAA uses Cisco Catalyst 6500 and 3750 Series switches in the wiring closet, and each switch has two uplinks to each of the distribution switches with automatic failover capabilities. To secure the network, the GTAA uses Cisco Catalyst firewall services modules (FWSM) and Cisco Catalyst intrusion detection service modules (IDSM) in select Cisco Catalyst 6500 Series switches, as well standalone Cisco PIX firewalls. Cisco Security Agent (CSA) secures the desktops and the servers.

For unified communications, the airport uses Cisco Unified Communications Manager (CallManager) and Cisco Unified Contact Center, configured with dual servers for redundancy. Different queues prioritize traffic for the Passenger Information Representative contact center, courtesy kiosk IP phones, and the GTAA's four call centers.

> ## "We have the foundation to support tremendous projected growth, while continuing to meet the standard of excellence that we have set for airport operations."
> —Ian Grant, General Manager, IT&T Engineering and Architecture

More than 700 Cisco wireless access points provide wireless Internet access for passengers and support wireless solutions such as hand-held devices for the Baggage Tracking and Reconciliation System. All of the campus' 1100 Cisco Unified IP phones and 700 wireless APs are powered by Power over Ethernet (PoE) provided by the Cisco Catalyst switches, eliminating the time and money associated with running electrical drops around the campus.

The new network was phased in over four years. The GTAA and Cisco developed a migration strategy that allowed the GTAA to provision new buildings and integrate legacy systems without

disrupting existing operations. "For the opening of Terminal 1 in 2004, we had all of our IT staff on-site at four o'clock in the morning, and Cisco was right beside us monitoring every step," says Clarence Leonard, GTAA Manager of Network and Voice. "There was zero disruption from a public or operational view; not a single transaction was interrupted. It was quite an achievement. In fact, every major milestone over the three-year rollout has gone smoothly."

Business Results

Compared with the rigidity of the old proprietary gate model, the modern CUE environment offers valuable flexibility to the GTAA and its airlines. The GTAA can add a new airline to the network in a matter of minutes by setting up a new MPLS VPN and corresponding VLANs on the Cisco Catalyst switches. If a landing gate has to be changed, the airline's profile can be sent to the new gate by the simple switch of a communications port. "Moving tenants around the campus is so much simpler with our unified network," says Leonard. "Instead of taking days or even weeks to move someone, we can respond in less than a day. That translates to cost savings and more productive operations for our tenants."

PRODUCT LIST
Routing and Switching
• ONS 15454
• Catalyst 6500 Series Switches
• Catalyst 3750 Series Switches
• Cisco 7200 Series Routers
• Cisco 3825 Integrated Services Routers
Security and VPN
• Catalyst Firewall Services Modules
• Catalyst Intrusion Detection Modules
Voice and Unified Communications
• Cisco Unified Communications Manager
• Cisco Unified Contact Center
• Cisco Unified IP Phones 7960G, 7970G
Wireless
• Cisco 1200 Series Wireless Access Points
• Catalyst Wireless Services Modules

Infrastructure costs have dropped significantly as a result of having one network to manage instead of separate voice, data, and video networks. In terms of non-aeronautical revenue, the campus-wide network has enabled the GTAA to offer new fee-based IT services, such as VoIP and WiFi. Between 2003 and 2006, the average annual increase directly attributable to IT was 166 percent.

Airlines have realized cost benefits as well. The sophisticated communications network and services enable smaller or low-cost airlines to compete more effectively with their larger rivals.

But perhaps the most important measurement for success is providing better service to the millions of passengers passing through Toronto Pearson every year. Examples abound: the wireless baggage tracking system, which tracks over 29,000 pieces a day, is helping reduce the number of mishandled bags. New call centre solutions have streamlined customer calls. Over 140 self-service kiosks on the network have helped reduce long check-in lines during peak traffic periods.

Upon the opening of Terminal 1 in 2004, Toronto Pearson was widely recognized as a leader in airport technology. The project has received several awards, including being voted "Best Global Airport 2006" by the Institute of Transport Management (ITM). The GTAA also won the prestigious Silver award at the Canadian Information Productivity Awards in 2006 for efficiency and operational improvements.

Next Steps

Toronto Pearson handled 31.5 million passengers in 2007, and that number is expected to reach 50 million in 2020. "With the Cisco infrastructure we have in place, we have the foundation to support tremendous projected growth, while continuing to meet the standard of excellence that we have set for airport operations," says Grant.

For More Information

For more information on

- Cisco products, go to: http://www.cisco.com
- Cisco Catalyst switches, go to: http://www.cisco.com/go/switches
- Cisco routers, go to: http://www.cisco.com/go/routers
- Cisco MPLS technologies, go to: http://www.cisco.com/go/mpls
- Cisco security solutions, go to: http://www.cisco.com/go/security
- Cisco wireless solutions, go to: http://www.cisco.com/go/wireless
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