



# Windows Server® 2008

Customer Solution Case Study



## Continental Airlines Optimizes Security and Streamlines Application Management

### Overview

**Country or Region:** United States

**Industry:** Transportation–Aviation

### Customer Profile

Based in Houston, Texas, Continental Airlines is one of the largest air carriers in the world, flying thousands of domestic and international passenger flights a year. It has 45,000 employees.

### Business Situation

The company capitalizes on innovative technologies to improve operations and customer service. Its existing Web server presented challenges with ease of configuration and troubleshooting application errors.

### Solution

Continental is deploying Windows Server® 2008 with Internet Information Services 7.0 to take advantage of enhanced Web application management and new security technologies.

### Benefits

- Faster application troubleshooting
- More efficient Web management
- More secure communications
- Cost savings through enhanced network protection
- Stronger competitive position

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Eric Craig, Director of IT Engineering, Continental Airlines

As one of the world’s leading air carriers, Continental Airlines is committed to implementing advanced technologies that help improve operations and customer service. Recently, the company began upgrading its server environment to the Windows Server® 2008 operating system and is streamlining Web application management with the troubleshooting and configuration capabilities of Internet Information Services 7.0. By deploying Windows Server 2008 security and authentication technologies, including Active Directory® Rights Management Services and Network Access Protection, Continental anticipates additional cost savings. Moreover, the company expects to save hundreds of IT management hours annually with a more flexible and secure server environment, and it will be able to dedicate more time to developing new customer service offerings.

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### Situation

Founded in 1934, Continental Airlines is one of the largest air carriers in the world, with thousands of domestic and international passenger flights each year to more than 280 destinations worldwide. Based in Houston, Texas, Continental has more than 45,000 employees and has annual revenue of more than U.S.\$14 billion.

A vital element in Continental’s success has been its use of innovative technologies to enhance internal operations and customer service. It was one of the first airlines to offer e-ticketing service for flyers, one of the first to allow customers to change flights online, and it also was among the pioneers in developing an electronic boarding pass for business travelers. According to Eric Craig, Director of IT Engineering for Continental Airlines, “We believe there is a competitive advantage to being an early adopter of infrastructure technologies. Actively using the capabilities of emerging software and hardware helps us operate more efficiently and provide better offerings to our customers.”

The airline maintains an IT environment of 2,000 servers, 18,000 workstations, and 1,500 mobile devices. Seventy percent of the company’s servers run the Windows Server® 2003 operating system, and thirty percent run the Windows 2000 Server operating system. The company manages hundreds of Web-based applications that run on Windows Server 2003 with Internet Information Services (IIS) 6.0 or Windows 2000 Server with IIS 5.0.

Says Dawn Getteau, Systems Architect for Continental, “The IIS 6.0 and IIS 5.0 Web servers are reliable and provide great application performance. But on the infrequent occasions when there is an application error, the troubleshooting

process can be very time-consuming. There is no automatic alert, so we typically find out about the problem via a phone call or e-mail from a user. If the server in question is behind a load balancer, we might not know exactly which server is the source of the problem. It can take us hours to find the right piece of the puzzle.”

Continental also relies on its server infrastructure to provide multiple levels of security, identity verification, and network access management. “We operate in locations where we don’t have direct management over the network or the physical environment where IT assets are placed. Therefore we are always looking for innovative ways to enhance and optimize our security.”

### Solution

With its focus on technological innovation, operational efficiency, and network security, Continental jumped at the chance to participate in a Microsoft® Rapid Deployment Program for Windows Server 2008. According to Craig, “We saw some significant improvements being designed into Windows Server 2008. It allows complete server and IIS 7.0 configuration via script or command line, next-generation virtualization, security improvements such as network access protection (NAP) and Active Directory Rights Management Services, and several other new technologies. So having a chance to be an early adopter was a no-brainer.”

When the first beta release of Windows Server 2008 became available for testing in April of 2007, Continental began test deployments in its lab environment. From early in its evaluation of Windows Server 2008, the Web server staff was excited about the operating system’s new features. “It was apparent from the beginning that the management enhancements in IIS 7.0

are huge, and the troubleshooting features are truly amazing," says Getteau.

After a successful evaluation and testing period during May and June of 2007, Continental was ready to deploy Windows Server 2008 in a production environment. Craig and Getteau selected an IIS 5.0-based Web application called Trip Trade for the first deployment. Continental's pilots and flight attendants use Trip Trade to arrange daily flight schedules, exchange assignments, and reserve vacation times. The application was selected because it is load-balanced, thus limiting potential risk, but still in use enterprisewide, allowing Continental to evaluate IIS 7.0 on a broad scale.

In July 2007, Continental deployed Windows Server 2008 Standard with IIS 7.0 to six HP ProLiant BL 460 Blade servers with Dual-Core Intel Xeon processors. During deployment the staff utilized the Microsoft Deployment Toolkit for Windows Server 2008, a technical solution accelerator that automates deployment of multiple images across a collection of servers. Once the servers were deployed, Continental migrated the Trip Trade application to the new IIS 7.0 environment without incident, and the application has continued to run in the production environment on IIS 7.0 Release Candidate 1 into early 2008.

Continental is planning to take advantage of other Windows Server 2008 technologies as well:

- The company's Finance and Legal departments have begun a pilot program with 500 users to evaluate Active Directory® Rights Management Services (RMS), a technology in Windows Server 2008 that can help make content more secure. In combination with Active Directory RMS-enabled client applications, such

as the 2007 Microsoft Office system, companies can use Active Directory RMS to safeguard documents and other information through persistent usage policies.

- Continental is evaluating a deployment of Network Access Protection (NAP), a set of operating system components included with Windows Server 2008 that help ensure that client computers on a private network meet administrator-defined requirements for system health. Administrators can use NAP to monitor and ensure compliance with health-requirement policies by validating the health status of computers on the network, automatically updating policy-compliant computers, and confining noncompliant computers to a restricted network.
- To prepare for a companywide deployment of Windows Server 2008 and IIS 7.0, Continental plans to use the Microsoft Assessment and Planning Solution Accelerator (MAP), a network-wide agent-less inventory tool from Microsoft, to help determine if its physical servers with existing Active Directory domain controllers can accommodate the upgrade to Windows Server 2008 and to recommend new hardware upgrades and acquisitions where appropriate.

## Benefits

Continental Airlines is already seeing benefits from updating its Web application infrastructure. By implementing new technologies in Windows Server 2008 and IIS 7.0, Continental will defer some large network hardware and third-party application software investments. Also, by using IIS 7.0 to automate tasks typically

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performed by administrative and development staff, it frees those resources to focus on higher-value tasks.

“With IIS 7.0 we can provide rich infrastructure right out of the box,” says Craig. “That’s less code we have to write for infrastructure and more code we can write about the business of Continental Airlines.”

#### **Faster Application Troubleshooting**

“The troubleshooting features in IIS 7.0 have been enhanced by leaps and bounds,” says Getteau. “At the end of the day, what matters to us and our users is not just how well our IIS applications run, but also how fast we can troubleshoot them if they go down.”

If an individual page in Trip Trade renders incorrectly, Continental administrators can use the failed requests tracing capabilities in IIS 7.0 to locate the error and solve it quickly. Using logs generated by IIS 7.0 to monitor for hard-to-pinpoint intermittent errors, administrators can configure Microsoft System Center Operations Manager 2007 to pull the information and issue automated error alerts.

Using the management tools in IIS 7.0, administrators have reduced the time it takes to troubleshoot an application error from hours to minutes; and by eliminating the need to configure applications manually, they have reduced the number of errors overall. “Before we had failed request tracing, troubleshooting was often just a guessing game, like finding a needle in a haystack,” says Getteau. “We could spend hours finding the one piece of the pie that hadn’t been configured correctly. But with the enhanced features in IIS 7.0, we can find and fix an error in a matter of minutes.”

#### **More Efficient Web Management**

Using shared configuration features in IIS 7.0, Continental automates the configuration of applications that serve the main Web site. If administrators or developers make a change in one application, it is automatically replicated to all applications. Thus, Continental administrators spend less time managing Web applications. By automating server configuration with Windows Server 2008 and IIS 7.0, Continental can move or add applications with fewer errors and in less time.

Says Getteau, “When we scaled the platform out to the six servers, the value of shared configuration really jumped out at me. Not having to make adjustments to every single application underneath the main Web site is just a huge timesavings. We’re talking days sometimes.”

#### **Better Information Protection**

Continental’s pilot of Active Directory RMS is intended to help ensure the security of communications and intellectual property across the organization by safeguarding files from unauthorized access and distribution. In addition to managing access to documents, Active Directory RMS also can track when and by whom a document is opened. The company sees several applications for this technology, including serving as a part of the Legal department’s efforts to ensure compliance with Sarbanes-Oxley regulations or Payment Card Industry Data Security Standards.

Says Jason Foster, Senior Manager of Technology at Continental, and head of the Active Directory RMS pilot, “I believe that Active Directory RMS will be a watershed technology like e-mail or the Web browser. It will be a fundamental technology that everyone uses, and it will not be thought of as a separate application. It will be like

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Active Directory—it is just there and everyone uses it.”

#### **Cost Reductions with Enhanced Network Protection**

With Network Access Protection, Continental will have a system-wide improvement in security standards compliance, an easier approach to standards enforcement, and an increase in system uptime. A reduction in malicious software attacks also will reduce the amount of time that IT staff must dedicate to repairing infected systems.

Furthermore, says Craig, “NAP is a great example of how keeping the operating system up-to-date can save us a lot of money by deferring large costs in hardware. We can’t implement NAP in the network layer at Continental without a large purchase of switch equipment, but we can implement NAP at the operating system layer for the relatively low cost of software acquisition, and gradually move this feature into the network as our standard hardware refresh program permits.”

#### **Stronger Competitive Position**

Continental believes that it can maintain a competitive advantage by adopting advanced technologies that its developers can use to be first to market with enhanced customer services. Examples include the company’s e-tickets and wireless boarding passes that passengers can obtain from BlackBerry wireless e-mail devices, cell phones, and other mobile devices. “Having the vision to implement technologies like Windows Server 2008 and IIS 7.0 gives our developers the flexibility and freedom to do whatever we need them to do,” says Getteau.

## For More Information

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[www.microsoft.com](http://www.microsoft.com)

For more information about Continental Airlines products and services, visit the Web site at:

[www.continental.com](http://www.continental.com)

## Windows Server 2008

Windows Server 2008, with built-in Web and virtualization technologies, enables you to increase the reliability and flexibility of your server infrastructure. New virtualization tools, Web resources, and security enhancements help you save time, reduce costs, and provide a platform for a dynamic and optimized datacenter. Powerful new tools like IIS 7.0, Server Manager, and Windows® PowerShell™, allow you to have more control over your servers and streamline Web, configuration, and management tasks. Advanced security and reliability enhancements like Network Access Protection and the read-only domain controller option for Active Directory Domain Services harden the operating system and protect your server environment to ensure you have a solid foundation on which to build your business.

For more information, go to:

[www.microsoft.com/windowsserver2008](http://www.microsoft.com/windowsserver2008)

### Software and Services

- Microsoft Server Product Portfolio
  - Windows Server 2008 Standard
  - Internet Information Services 7.0
  - Microsoft System Center Configuration Manager 2007
  - Microsoft System Center Operations Manager 2007
- Microsoft Deployment Toolkit 2008
- Microsoft Assessment and Planning Solution Accelerator

### Technologies

- Active Directory Rights Management Services
- Network Access Protection

### Hardware

- HP ProLiant BL 460 Blade servers with Dual-Core Intel Xeon processors

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