Travel Solutions

WORLDSPAN Takes Off with IBM

If you have ever relied on an airline to fly you anywhere in the world – whether it's to an important business meeting or a long-overdue vacation – you know how crucial it is that the airline's reservation system work flawlessly. The same is also true of reservation systems for hotels, car rental companies, and other travel-related services. Without the ability to make reservations or change your travel plans, you're grounded.

As the world's largest airline hosting company, WORLDSPAN® provides communications and distribution of key travel information to its owners – Delta Airlines, Northwest Airlines, and TransWorld Airlines – and more than 18,000 travel agencies in over 60 countries. Operating in an extremely competitive environment, WORLDSPAN succeeds because of its ability to process and deliver information to travel agents and airlines quickly and consistently. Indeed, the company processes billions of dollars' worth of airline tickets every year. Without a truly reliable system, WORLDSPAN risks losing hundreds of thousands of dollars' worth of business for every minute of downtime.

WORLDSPAN's Challenge

Maintaining continuous global operations – 24 hours per day, 365 days per year – of the WORLDSPAN computer reservation system is no easy feat. For one thing, the sheer volume of data is staggering: 15 IBM Transaction Processing Facility (TPF) transactions for each reservation, with more than 2,200 transactions received each second during peak periods (over 90 million per day). And while 80 percent of the transactions are fairly simple, the other 20 percent are extremely complicated.

Applications:	Network re-design and upgrade to reduce downtime of WORLDSPAN's computerized reservations system and increase customer satisfaction
Software:	IBM Advanced Peer-to-Peer Networking (APPN), IBM Network Control Program (NCP) 7.4, IBM Transaction Processing Facility (TPF) 4.1, IBM Virtual Telecommunications Access Method (VTAM) 4.4, OS/390 2.4 operating system
Hardware:	IBM 3745 Communications Controller, IBM 3746 Nways Multiprotocol Controller Model 900, IBM 9032 ESCON Director



To balance this huge workload and ensure quick processing, WORLDSPAN originally connected its network to one IBM mainframe computer which functioned as a communications front-end. This mainframe operated as a "traffic cop", feeding transactions to seven additional mainframes over channel-to-channel connections to ensure that each carried its proper share of the workload. (The actual transaction processing was done on these additional mainframes.) At the same time, this configuration ensured fast processing. Because each mainframe ran TPF software, any system could process the transactions.

As the volume of transactions grew, however, staff became increasingly concerned about the potential of a single point of failure. If the "traffic cop" mainframe failed, the entire reservation system would be unavailable. That possibility, in turn, convinced staff that they should run only communications applications on that computer – which meant that they couldn't use the processor to its full capacity. They also recognized that eliminating the "traffic cop" functions would free up the system for processing travel agent and airline transactions. "We needed to reduce our downtime *and* take full advantage of our processor resources," says Gaines Hillix, Communications Systems Software Manager at WORLDSPAN.

The Solution

After evaluating several approaches to eliminating the mainframe's "traffic cop" functions, WORLDSPAN decided that IBM offered an ideal combination of products and services. The TPF reservations system was already IBM-based, and the staff had years of experience with SNA networking. WORLDSPAN needed a new kind of SNA that would allow the network – rather than a dedicated mainframe – to manage the traffic. IBM could deliver a flexible architecture, Advanced Peer-to-Peer Networking (APPN), that was supported in TPF and could handle the various network interfaces. Meanwhile, preserving its investment and system stability was also crucial. "We didn't want a huge migration with all of the associated risks," says Hillix.

Over the next 18 months, Hillix's staff worked closely with IBM representatives from Raleigh and Poughkeepsie to re-design the network. The plan was ambitious: add IBM APPN software to TPF and MVS/VTAM, and upgrade its IBM 3745 Communications Controllers with multiple IBM 3746 Nways Multiprotocol Controller Model 900s and new IBM Network Control Program (NCP) releases. WORLDSPAN would also upgrade TPF on the "traffic cop" processor and write TPF modules to assist with load balancing. The team faced the added challenge of ensuring that customers wouldn't notice any difference in system performance or availability during the re-design.

APPN appealed to WORLDSPAN because of its 100 percent availability – a crucial feature made possible by its non-disruptive re-routing around failures in the network. And its dynamic update of network topology and routes would significantly reduce the amount of time required for programmers to make changes, allowing them to focus instead on more complicated issues. Meanwhile, WORLDSPAN chose the IBM 3745 Communications Controller and the IBM 3746 Nways Multiprotocol Controller Model 900 for their predictable, reliable performance. Ultimately, the combination of APPN and the TPF upgrade would allow WORLDSPAN to connect the reservation system to its SNA network as an advanced peer-to-peer networking end node.

"We all worked together well as a team," says Hillix. "IBM's original developer of APPN, for example, spent several months ensuring the highest degree of customization for our demanding environment." From planning the new system and customizing software to configuring hardware, benchmarking performance, and solving connectivity issues, the team reworked the entire infrastructure.

Advantages of Partnering with IBM: Decreased Downtime and Increased Customer Satisfaction

Both staff and customers immediately noticed a difference in the reservation system's performance. System availability quickly jumped from 99.85 percent to 99.96 percent – a huge increase in service levels when you're measuring downtime in seconds. In fact, only 9.7 percent of the year's total system downtime occurred after APPN was implemented in June. This boost in availability, in turn, allowed WORLDSPAN to meet its uptime goal for 1998. As a result, WORLDSPAN is running well ahead of its 1999 goal. And system availability is approaching 99.99 percent.

The new design has also translated into greater flexibility. Staff can now bring down one mainframe to load updated software, airline fares, and other travel information into the reservations system while the rest of the computers continue running. (Fares and other travel rates are moving targets and require numerous changes daily.)

The bottom line? Travel and airline agents sitting at thousands of terminals around the world never notice a dip in the reservations system's performance. Instead, they gain a distinct competitive advantage. They simply continue receiving the most up-to-date travel fares, arranging trips for millions of people around the world, boarding passengers, and ensuring that their own customers remain satisfied. "The feedback has been very positive," says Hillix. "At our last board of directors' meeting, we learned that our implementation of APPN was one of two factors that added the most to shareholder value in 1998."

"Our goal at WORLDSPAN has always been to offer seamless connectivity with maximum availability to our travel agency partners and airline owners," adds David Lauderdale, Director Communications Software at WORLDSPAN. "Clearly, IBM helped us deliver on that commitment."





© International Business Machines Corporation 1999

IBM Corporation
Department J7UB
PO Box 12195
RTP NC 27709

Printed in the United States of America
5-99
All Rights Reserved

References in this publication to IBM products or services do not imply that IBM intends to make them available in all countries in which IBM operates.

Copying or downloading the images contained in this document is expressly prohibited without the written consent of IBM.

The following are trademarks of International Business Machines Corporation in the Unites States and/or other countries: IBM and Nways.

Other company, product and service names may be trademarks or service marks of other companies.



Printed on recycled paper.

G224-7055-00