

A MAGAZINE FOR AIRLINE EXECUTIVES

2004 Issue No. 2

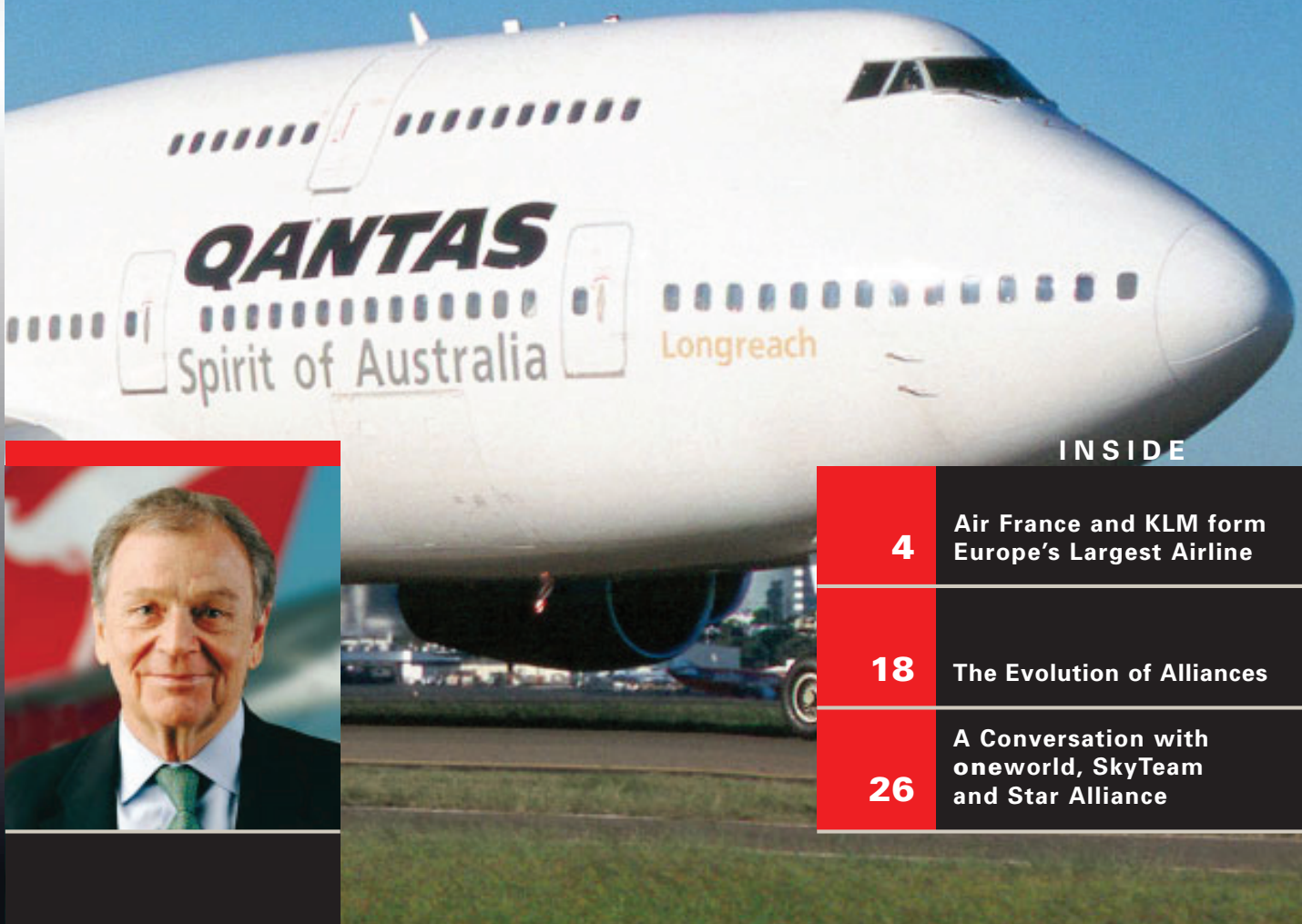
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Taking your airline to new heights

AN ALLIED FRONT

A conversation with ...

Geoff Dixon, CEO, Qantas Airways



INSIDE

4

Air France and KLM form
Europe's Largest Airline

18

The Evolution of Alliances

26

A Conversation with
oneworld, SkyTeam
and Star Alliance



Riding the RAIL

Sabre Holdings Labs is working on breakthrough technology to help airlines significantly reduce the cost of communicating among alliance members by using the redundant array of Internet links.

■ By Gary Potter | *Ascend* Contributor

Strong alliances require active communication — not just between people but also between systems via high-speed, cost-effective networks. Until recently, such networks were something of a contradiction in terms — it was difficult for a network to achieve high speed at a reasonable cost. But, new enabling technologies becoming available today are helping resolve the performance dilemma.

One exciting development involves the redundant array of Internet links, or RAIL, which connects an end point via multiple networks. New technology tools are being developed and deployed to manage routing of messages over the RAIL, enabling airlines to communicate more cheaply or rapidly.

Research indicates that a migration strategy that moves an airline off of a wide area network in favor of the RAIL would result in a 40 percent to 50 percent annual savings on network costs while maintaining reliability. Qualcomm, the inventor of the code division multiple access wireless telephone standard, and an early adopter of RAIL technology,

saved as much as 50 percent a year on its network costs by switching from frame to Internet service provider links. And, roundtrip time (entry and response) was reduced by almost a third.

“... a migration strategy that moves an airline off of a wide area network in favor of the RAIL would result in a 40 percent to 50 percent annual savings ...”

The development of RAIL technology during the past two years has caused many information technology officials to rethink their position on networks.

As recently as late 2002, Forrester Research spoke with IT directors about their

wide area network strategies and found that they intended to continue with costly frame relay and dedicated links as their primary WAN service. Why? Reliability. Of those surveyed, 47 percent had no plans to change. Of those, 33 percent did not consider the Internet as a suitable replacement for a WAN — 17 percent considered the technology too new and risky, and another 17 percent said moving to the Internet wasn't necessary.

Two years ago, very few businesses were making the leap to route control — technology that searches the Internet and makes routing decisions based on either performance or price based upon message priority. Most resisted the change, citing the uncertainties of new technologies.

When asked about multi-homing (connecting one location via multiple providers for greater reliability), approximately half of the IT directors questioned said they used or planned to use it, but most still had no plans to replace their existing WAN with the Internet. As one participant in the study said, “Who are

THE HIGH • LEVEL view

News Briefs from Around the Globe

Who

Qantas Airways

What

Has gone live with release 10 of *Sabre® AirFlite™ Schedule Manager* and *Sabre® AirFlite™ Profit Manager*, providing

automation of the airline's flight scheduling and route evaluation processes.

Why

“I have been very pleased with the smooth introduction that Sabre Airline Solutions has achieved with *Schedule Manager*,” said David

Round, manager network systems and communication for Qantas.

“As the first airline to go live with the new system version, we were expecting some initial problems, but we have been impressed with the system and support we have received from the staff at Sabre Airline Solutions.” [E](#)



you going to call when there's a problem, 1 800 INTERNET?"

In 2002, Forrester Research concluded that companies would remain on their private WANs. With concerns about privacy and reliability, very few companies were ready to make the move to multi-homing, although the study did find such technology was gaining wider acceptance as companies hedged their positions by relying on multiple network providers. Yet, while interested in route control, not many companies were willing to leave the comfort of their private networks and make the leap to the new technology.

Now, fast forward to 2004, multi-homing has gained acceptance as well as introduced new challenges. Companies have bought into the idea that using multiple carriers at varying price points makes a lot of sense. Unfortunately, in a multi-homing scenario, border gateway protocol, or BGP, the basic routing mechanism for directing Internet traffic to its destination via the shortest route, does not balance price with speed. When everything runs smoothly, traffic is sent via natural routing. But when bottlenecks appear as throughput increases and routing changes are made, low-priority traffic is likely routed over high-cost circuits because BGP is unable to determine whether it is more important for the message to be sent quickly or less expensively. This continues until the bottleneck clears or throughput decreases.

But the new tools available to manage routing over the RAIL are addressing the cost/speed equation while still providing

sufficient reliability. Multi-homing solved the reliability challenge presented on open/public networks, offering performance comparable to WAN.

The tools combine routing objectives (price vs. speed) and policies (priority of message) with live data taken from probes on the Internet. The probes, small applications deployed on Internet routers, collect end-to-end network measurements such as bit rates, latencies, etc. in real time through a combination of endpoint flow collection and trace probing. Specific Internet protocol addresses are identified and verified as valid for the business goals of meshing message priority with its corresponding price and speed of delivery.

“Sabre Holdings Labs, which uses applied technology to create business opportunities through innovation, is working ... to define a strategy for deploying RAIL solutions in the airline environment.”

Once IP addresses are verified, raw measurement data are collected from the probes and analyzed at the enterprise level. Network paths are measured to show latency, which can impact response time, and loss, which affects data integrity. These raw

measurements are used to establish transport delay or behavior of low-level protocols. When these measurements are applied to a series of metrics, the models can determine the correct path for network application traffic. And via a series of ongoing iterations, the models are continuously verified until adjustments are necessary due to business-rule violation.

Control points for adjustments are usually the edge routers — they connect the WAN links. Adjustments are sometimes necessary to increase availability, improve performance or reduce costs by measuring current performance and comparing it against continually validated metrics.

And finally, today's tools include some sort of reporting mechanism. Reports include avoided networks, selected network including latency statistics as well as status and log messages, measurements that show how well each network serves the various applications, and a utilization summary for billing.

Sabre Holdings Labs, which uses applied technology to create business opportunities through innovation, is working with Sabre Airline Solutions to define a strategy for deploying RAIL solutions in the airline environment. The Labs team, which holds nine patents with 20 pending, is continuing to explore ways to deploy these networking tools. **E**

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THE HIGH • LEVEL view

News Briefs from Around the Globe

Who

Cathay Pacific Airways

What

Renewed its contract for two key products — *Sabre® Dispatch Manager* and *Sabre® Movement Manager* — to help strengthen the airline's position as a leading global hub and the gateway to mainland China.

Why

“We recently expanded our commitment to the region by resuming flights to the Chinese mainland, so now more than ever, we need reliable, cutting-edge IT solutions that will enable us to maintain superior service,” said Capt. John McCormick, general manager of operations for

Cathay Pacific Airways. “Sabre Airline Solutions’ technology plays an integral role in our daily business operations and provides the proven foundation we need to maximize organizational success.” **E**