# Dell helps Bellagio
hit the
Jackpot

Four months before the opening of one of the most expensive hotels in history, the IT department at Mirage Resorts, Incorporated was in a bind. They had already settled on the platforms they needed for the new Bellagio hotel, systems selected to help assure uptime and minimize the strain on their massive network. But what they wanted was the latest 4-way Intel® Xeon™ processor technology to help drive this network – the capabilities of which they had tested but were not yet generally available – and they wanted it on Dell® PowerEdge® servers.

*Dell PowerEdge® Servers
and PowerVault® Storage Systems*
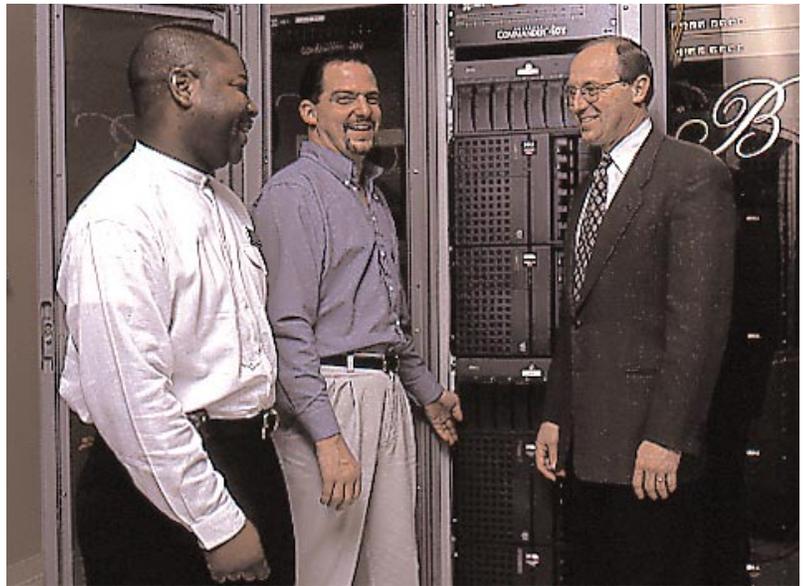
Left to right: Jerry Withers, Senior Computer Engineer; James Deutschkron, Computer Engineer; and Glenn Bonner, Chief Information Officer for Mirage Resorts.

Dell Servers Power Business-Critical Functions of Vegas' Largest Hotel and Casino

"We only had a small window to get the latest technology. Once Intel released the new processors, Dell was the first to hit the market with the systems we really needed," recalls Glenn Bonner, Chief Information Officer for Mirage Resorts.

Dell's NT-based PowerEdge 6300 servers and PowerVault 650F fibre-channel storage – in addition to a mix of 100 Dell PowerEdge 2200 and 2300 workgroup-level servers – now make up Bellagio's data center, running everything from reservations to the hotel's massive uniform control system, to its paperless employment application process.

"It was the goal of Bellagio to have as many components of the administrative and day-to-day functions of the hotel be completely paperless," Bonner said. "With **Microsoft Exchange** housed on Dell PowerEdge servers, we have made this a reality, with everything from employee requisitions to training schedules, to the intranet for human resources, all online and paper free."

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From the back office to the casino floor, Dell Computer Corporation's servers and storage systems are helping power the business-critical functions of Bellagio, the newly-opened $1.6 billion Las Vegas resort.

The Latest and Greatest

Bellagio hotel in Las Vegas is the crown jewel of Mirage Resorts. Opened in October of 1998, Bellagio is named after an Italian village on Lake Como and is billed as one of "the most romantic hotels built in the history of the world," by Mirage Resorts Chairman Stephen A. Wynn. The 3,005 room hotel features a gallery of original paintings by Vincent van Gogh, Claude Monet, and Pierre-Auguste Renoir, canals with gondolas, and an 8.5-acre lake featuring 1,200 synchronized fountainheads. What is also expected to be a masterpiece is the unparalleled service from a staff of more than 9,500 — two thousand more employees than the original Mirage Hotel itself, which is widely regarded as a leader in customer service.

With this in mind, the computing infrastructure at Bellagio was tailored to help enhance Bellagio's reputation for service. While major corporations need to sustain their networks

around the clock, it is unusual for any company to have thousands of customers expecting a sensational experience every second of the day. In the case of Bellagio, having server systems that can deliver reliability was imperative.

While The Mirage has several legacy mainframe systems for functions such as customer credit and payroll, NT-based server systems handle everything else, powering more than 80 applications that are run across the company's network. The most critical of these applications run on Dell servers is the Hotel Property Management system, supporting the front desk check-in and check-out functions.

Rather than a traditional client/server environment, where PCs would run directly off of a server, Bonner chose to go with a thin-client/client-server hybrid deployment, with the goal of creating a highly secure, highly scalable computing environment. In this scenario, Bonner uses Dell's PowerEdge 2200 and PowerEdge 2300 servers to run hundreds of different

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workgroups at the hotel. More than seventy percent of the clients are Wyse Winterm terminals, while thirty percent are Dell OptiPlex® desktops. The terminals and desktops access the network through either Citrix WinFame™ or Microsoft® Terminal Server Edition™. Bonner's objective was to create a virtual local area network (VLAN) to control traffic and to minimize the flow of information on the network.

"We wanted to set up the network so that the only data transported was controlled from the computer room," said Bonner. Moreover, he explains, was that he wanted the ability to create a guaranteed five-minute fix for any terminal. If there is ever a major failure with a PC, it can take several hours to replace the unit, Bonner said. But the customer representatives at Bellagio could not afford that kind of downtime. In the thin-client environment he has created, a broken terminal can be replaced in less than five minutes. While Bonner admits the concept of swapping out "dumb terminals" is rather primitive, running this thin-client environment on powerful servers provides him the ability to service any problem in real time.

The Dell PowerEdge 6300s completely run the thin-client environment, using Citrix Winframe to pool the applications, in addition to maintaining control over Bellagio's 600 printers. The Dell PowerEdge 2200s and 2300s are used to run most of the hotel's applications, providing the high-availability components Bonner requires to help assure uptime.

In a further effort to keep information off of hard drives and in the data center, Bonner worked with Dell to cluster the PowerEdge 6300 servers with Dell's fibre-channel based PowerVault 650F storage. This configuration allows clients on the network to store files off of their hard drives. The PowerEdge and PowerVault were clustered on site by Dell system engineers who spent several weeks at Bellagio working directly to train and assist the IT team there and complete the integration effort.

"Several years ago we would never have thought Dell could provide the service and the products needed for this type of business-critical deployment. But Dell's PowerEdge servers now have the key components — from redundant power supplies to hot swappable fans, to reduced form factors, that when combined with the best price/performance in the industry makes them impossible to overlook," Bonner said.
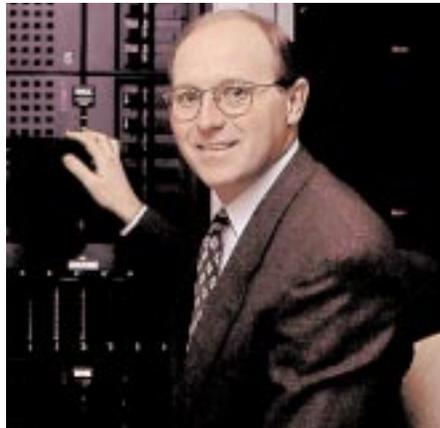
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Business Critical from the Pits to the Laundry

When casino customers at Bellagio want to be extended a line of credit, the bosses in the pit can now turn to a Windows-based terminal and see if the customer's request can be granted. The interaction, viewed on a Dell flat-panel screen, is processed through Dell servers.

"We look at our architecture as the ultimate stress test for workgroup-level servers," said Bonner, who runs **Microsoft SQL Server™ 6.5 on Dell PowerEdge 2300s.** These applications store all the hotel's financials, while another set of PowerEdge 2300s runs **Microsoft Outlook™** for e-mail.

The SQL Server database also has another very unique application; it runs one of the largest dry cleaning systems in the world, keeping up with

the distribution, laundering, and retrieval of more than 27,000 uniforms worn by the hotel's 9,500 employees. With every uniform bar-coded, the database is responsible for tracking every bow tie, every sequined vest, and every cummerbund at Bellagio.

The Microsoft SQL Server database running on Dell servers has also helped The Mirage Resorts completely change their hiring process. Whereas there once were lines of 10,000 people waiting in the parking lot to fill out applications, The Mirage now has people make appointments and type their information into a computer, after which a SQL Server database processes their qualifications based on their responses. No more lines, and no more paper.

"This is the ultimate 24/7 scenario. If the systems aren't reliable, we can't serve our customers," Bonner said. "Dell has provided the technology, the service, and the solutions that have enabled us to implement the network we need to help make this one of the truly great resorts in the world."

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