

Sizing Dell PowerEdge Servers for SAP Business One

Dell™ PowerEdge™ servers can be reliable, robust platforms for the SAP® Business One application. However, when these platforms support other applications in addition to SAP Business One, performance can degrade. This article examines tests performed in two PowerEdge server–based environments to help determine how many users could adequately be supported while providing high performance for all the applications.

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SAP Business One is an integrated, affordable business management application designed specifically for small and midsize businesses. It provides enterprises with a single system to automate critical operations, including sales, finance, purchasing, inventory, and manufacturing, and offers an accurate, up-to-the-minute picture of their business.

To derive a series of recommended configurations for deploying SAP Business One in a real-world production environment, a team from Summit Business Solutions, an SAP Business One partner, tested this software on Dell PowerEdge servers in January and February 2006. The SAP Business One application by itself performs well on Terminal Services, a component of Microsoft® Windows® operating systems. However, performance problems may arise when additional applications that integrate into SAP Business One run on the same server as SAP Business One. Although the issue of application stability has been largely addressed by Service Pack 1 (SP1) of SAP Business One 2005, this test project addressed the issue of sizing a suitable server to the appropriate number of users and functions. Using Dell PowerEdge servers, the test team

was able to get a sizeable number of users running SAP Business One with multiple applications integrated.

Configuring the test environments

The team tested two environments: SAP Business One running in a Terminal Services environment in an average-size deployment with 10 to 20 users; and SAP Business One running on Microsoft Small Business Server 2003 Premium Edition in a small business environment with 3 users.¹

SAP Business One in an average-sized environment

In the first scenario, the test team ran the applications in a Terminal Services environment on two Dell PowerEdge 1850 servers, each with a dual-core Intel® Xeon® processor with up to 8 GB of RAM, dual 1 GB network interface cards, and two 73 GB SCSI hard drives. The team added the two servers to a Microsoft Active Directory® domain as member servers with access to a network printer and other standard business accessories typically connected to business workstations.

One server ran Microsoft Windows Server™ 2003 and Microsoft SQL Server™ 2000 with all the security patches

¹ For more information about the test configurations, visit www.dell.com/sapb1. A Webinar series for SAP Business One using Dell and Microsoft SQL Server and a demo copy of SAP Business One are also available at this Web site.

SIMPLIFYING AND ENHANCING RETAIL OPERATIONS WITH CITIXSYS iVEND RETAIL, SAP BUSINESS ONE, AND DELL HARDWARE

The speed and pace of today's retail environment demand systems and processes that help evaluate, plan, and respond quickly to client needs. A retail management system must accurately record sales and maximize the customer experience at the front end, while providing quality data behind the scenes for making quick, informed decisions about ordering, replenishment, and logistics.

The iVend Retail point-of-sale (POS) and retail management software from CitiXsys Technologies is designed to simplify retail operations and enhance the information available for store management and business planning. The iVend Retail software system powered by SAP Business One has been optimized for Microsoft SQL Server and Dell PowerEdge servers operating at both store and head-office levels. This optimization is critical because moving updated information between stores and the head office quickly and efficiently is a key factor for decision making in retail operations. Too often there is a disconnect between what is happening at the POS and what management needs to know to manage inventory, security, customer satisfaction, and profitability.

iVend Retail provides a comprehensive solution that combines easy-to-learn, easy-to-use functionality at the POS terminal with a full range of dynamically updated operations information conveyed back to the head office. Inventory, security, promotions, commissions, and many other store-specific requirements are set up by the head office to maintain control, but managed at the store level through a central store server. The iVend Retail head office administration is built into SAP Business One rather than into a separate head office system, which cuts down one level of synchronization and replication.

In terms of architecture, each POS terminal links to a local store server, which in turn links to the head office through various replication options—wide area network, FTP, dial-up, or CDs. The replication frequency schedule is determined by the administrator and can range from real time to once each day. Each POS terminal can continue to work even if the store server goes down; when the server is functional again, the data collected at the POS is transmitted at the next replication event. Standard options for backup mechanisms include CD-RW drives, database backup possible at every POS, and SQL backup possible at each store location.

Each POS database is uploaded to the store server database, and the store server databases are uploaded to the FTP repository

server through the Common, Head Office, Stores, and Status folders. The Status folder is used to signal the status of the synchronization process. The FTP repository server then downloads to the iVend Retail management server which, because it is built inside the accounting application, is also the server running SAP Business One. Data originating at the head office is uploaded to the FTP repository server, and files move to the Synchronized folder automatically upon completion of the synchronization process. The files in the Synchronized folder are periodically deleted through a simple batch process. Data is downloaded onto the store server from the FTP repository server. iVend Retail data replication provides centralized control from the head office over master data, support for tracing the synchronization process at the record level for every destination site through a detailed error log, and a set of distribution rules that support the store-specific transfer of data.

Dell PowerEdge servers deployed for the application/database and FTP repository servers must have dual Intel Pentium or Intel Xeon processors at 1.6 GHz or higher and 2 GB of error-correcting code (ECC) RAM. Depending on customer requirements, the hard drive configuration should be RAID-0, RAID-1, or RAID-5, with a minimum of one system disk and three RAID disks. The OS platform must be Microsoft Windows 2000 Server, Standard Edition, or later. Required software includes Microsoft SQL Server 2000 with mixed mode authentication (SQL Server and Windows), Microsoft Data Access Components 2.7, and Microsoft .NET Framework 1.1. The FTP repository server also requires Microsoft Internet Information Services 5.0. For the POS terminals, minimum requirements include one Intel Pentium III processor at 600 MHz, 128 MB of RAM, Windows XP Professional with SP1 or later, and .NET Framework 1.1. A variety of Dell POS monitors, printers, scanners, keyboards, and cash drawers are supported as well.

iVend Retail from CitiXsys Technologies is designed to work in a wide range of small and medium-sized enterprises, from one store with two terminals to 100 stores or more. By using iVend Retail with industry-standard Dell servers and POS system technology and the SAP Business One application, enterprises can streamline store operations and refine business processes—helping to reduce inventory risk, securely manage employees and purchase transactions, and improve analysis and planning.

loaded. This server, called Dell-SAP1, acted as a database, file, and Web server. The test team also installed the license for SAP Business One as well as the server components of SAP Business One. The second server, Dell-SAP2, had Microsoft Windows Server 2003 with Terminal Services activated. It also had all the relevant security patches for Windows Server 2003 loaded.

For remote access and application publishing, the test team used the Provision Management Framework–Enterprise Edition from Provision Networks. This tool let the team publish and load balance SAP Business One, with instant delivery over Remote Desktop Protocol (RDP), using features such as Seamless Windows and Session-Sharing. The Provision Networks tool used Microsoft SQL Server on Dell-SAP1 as the database engine as well as the Web access component for the terminal server. Finally, the team installed iBOLT Special Edition for SAP Business One from Magic Software on Dell-SAP1 to perform the functions of recalculating a quote price and inserting the new calculated price in the sales order module.

On the second server, Dell-SAP2, which had Terminal Services activated, the test team installed the client components of SAP Business One and other standard office applications such as Microsoft Office XP, Adobe Acrobat Reader, and a desktop fax client, allowing faxing of documents from the desktop through the network to a fax machine. This server also had Fixed Asset and Outlook Integration for SAP Business One installed. In addition, XL Reporter was loaded and all the printers defined on the server were mapped to a print server outside the terminal server environment—hence, no local spooling.

After successfully testing this environment, the test team replaced the memory on both servers with 4 GB of double data rate 2 (DDR2) memory sticks and tested this environment again.

SAP Business One in a small business environment

For the small business environment, the test team used a Dell PowerEdge SC1420 server—one of Dell’s entry-level servers configured with 2 GB of RAM and adequate hard drive space—which ran Microsoft Small Business Server 2003 Premium Edition. The team installed SAP Business One as well as all the applications used in the average-sized test environment to test up to three users. For the desktops, the team used standard Dell Dimension™ desktops with Intel Pentium® 4 processors and 512 MB of RAM. They also tested the desktops configured with 1 GB of RAM to identify any performance differences.

On the PowerEdge SC1420 server, the test team increased the memory to 8 GB and configured Microsoft SQL Server to use a maximum of 4 GB of RAM. The team then installed iBOLT, XL Reporter, Microsoft Office XP, Adobe Reader, and the server components of SAP Business One. All of the software had the latest patches, including patch 8 on 2005A for SAP Business One.

The functions performed in the test environment included generating quotes, invoice processing, and receiving payment. The test team also performed data maintenance, such as changing addresses and telephone numbers. They built enough data to be able to run

manufacturing resource planning (MRP) on fairly sizeable data and run manufacturing processes as well. On the accounting side, they entered typical office journal entries using scripts learned in the training class for SAP Business One.

Finally, the test team installed Provision Networks Web-IT component and published the application over the Internet, allowing remote users access to the applications as well as the ability to print reports to a local printer defined as a slave of their workstations. For Internet bandwidth, broadband (DSL or cable) was assumed to be sufficient for the test.

Testing performance of an average-sized deployment of SAP Business One

The team began testing the average-sized environment by simulating 10 concurrent users on Dell-SAP2. The Terminal Services technology helped improve navigation and the responsiveness of the SAP Business One application because only one copy of the application is loaded into memory. All of the other applications installed also performed much better with the Terminal Services technology than without it. The test team then activated the Max-IT module from Provision Networks to improve any remaining performance issues and to address some of the environment-related issues that were encountered. Max-IT helped resolve many of these issues, and as a result, XL Reporter and Outlook Integration were more responsive than before Max-IT was activated. Figure 1 shows virtual memory usage and savings for each application on the Dell-SAP2 server.

The test team then created an entire set of quotes for iBOLT to recalculate the sales order prices by dividing by 10 and inserting the new calculated value as a sales order in SAP Business One. While this was occurring, users were accessing SAP Business One and either creating, printing, or querying orders. No performance degradation was observed. The test team started to print reports through

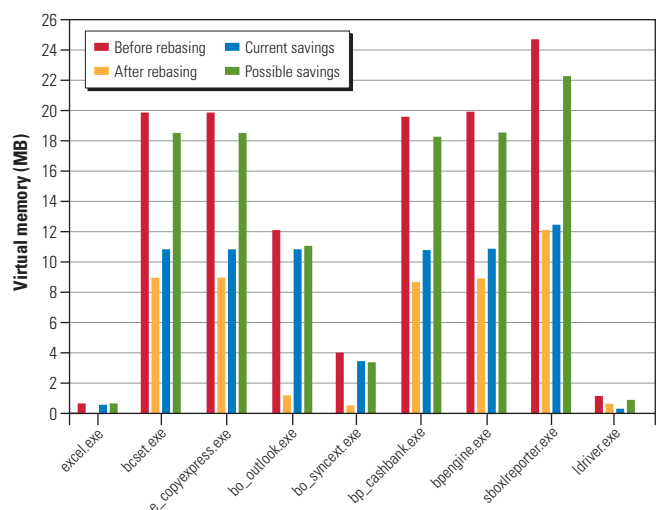


Figure 1. Per-application memory usage and savings in an average-sized terminal server environment for SAP Business One

the in-house print server and again there was no notable performance issue. The server and the complete environment remained up and performed satisfactorily. This proved that the Dell server (Dell-SAP1) was more than capable of handling the responsibilities of a file server, a license server, a Web server, and a database SQL server as well as that of an application server.

With Max-IT running, the test team decided to increase the workload by simulating up to 15 concurrent users, adding one user at a time. Performance remained acceptable at 15 users. As the team increased the number of users to 20, they began to notice some performance changes. Around the 17-user level, the change in application response was noticeable. XL Reporter and Outlook Integration, in particular, started showing very noticeable performance changes. However, the environment continued to function. For remote users, the only noticeable change was a screen refresh on some of the graphics.

In general, the logon process was ahead of the SAP splash logo but that was not an issue with users. Some of the graphs from XL Reporter took longer to refresh than they had with fewer simulated users. Data navigation was not affected as the number of users increased, and the system continued performing well even when performing computations or posting.

Running MRP

In all test scenarios, the test team noticed a significant change in performance when MRP ran. However, most enterprises typically do not run MRP in the middle of the day—they either run it at the beginning of the day to plan their day or at the end of the day to plan the next day. So this effect on performance should not necessarily be viewed as a concern. In addition, with just one user running MRP, the performance was fast.

Comparing performance expectations with test results

The average-sized deployment performed as the test team expected. XL Reporter, however, did not perform as expected—it consumed a significant amount of resources. IT organizations should consider this fact when sizing a Dell PowerEdge server and the number of XL Reporter users. In contrast, the Dell servers and SAP Business One kept up with demands. The Provision Networks software allowed the test team to get that extra margin of performance from the hardware, hence reducing total cost of ownership.


Testing performance of a small business deployment of SAP Business One

The Dell PowerEdge SC1420 server handled the workload of SAP Business One and the other applications surprisingly well—especially considering that Microsoft Small Business Server Premium Edition was used to run the entire network, including other workstations and servers on the network. Performance was somewhat sluggish but acceptable for a three-user environment. Screen refresh

sometimes took an extra second, especially the posting and computing screens. For data navigation and other simple tasks, the PowerEdge SC1420 performed as well as needed to browse through data intelligently. Upgrading the client memory to 1 GB enhanced the performance of the applications; in particular, the performance of XL Reporter was much better than the results achieved with the 512 MB configuration.

Identifying best practices for sizing deployments of SAP Business One

The average-sized server environment is well suited for most deployments of SAP Business One. Although the Dell PowerEdge 1850 server with the maximum specifications proved capable of handling the workload, placing all applications on one server is not recommended. Instead, best practices recommend using two PowerEdge 1850 servers with average specifications—one to act as the database and license server and the other to act as the terminal server deploying the applications to the workstations. In addition, instead of having all 20 users on one terminal server, IT administrators can deploy multiple small terminal servers and load balance them with tools such as those from Provision Networks. This can then be scaled up for large environments, with all the terminal servers connecting to an enterprise server on which the databases are housed. The PowerEdge 1850 is well suited for such deployments. Microsoft SQL Server can house SQL databases but should not perform other functions on the network. A PowerEdge SC server can be used to act as an authenticating server to run the network and perform other functions such as file serving.

With the Microsoft Small Business Server environment, the results showed that the entry-level Dell PowerEdge SC1420 server can be a reliable platform for a robust deployment of SAP Business One. Small businesses can deploy SAP Business One without spending a significant amount on infrastructure. However, in this case, workstations should be upgraded and administrators must be creative as to when to run certain tasks such as MRP. Administrators should set appropriate expectations for performance, but for IT organizations with tight budgets, this deployment can be cost-effective. 

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