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A Strategy for Server Consolidation Testing in the Enterprise: Executive Summary

VeriTest, the world's leading independent laboratory, offers a multi-stage approach to enterprise-level server consolidation testing. With this proven methodology and a strict change management process, an IT department may prove consolidation concepts up front, ensure that each phase of consolidation proceeds smoothly, and establish a long-term "consolidation sieve" for bringing applications into the new environment.

Introduction

The 1990s was the decade of server sprawl. With commodity hardware, powerful off-the-shelf server software and the plethora of productivity applications, every department wanted to install its own server and applications. While this empowered individual departments, the daily grind of system administration and backup/recovery fell back on an increasingly overworked IT staff.

As departments grew, so did the fleets of servers necessary to handle file, print, Web, and messaging services. Database programs and the requirements of e-Commerce (Web servers, extranets, firewalls, etc.) also added racks of servers to the enterprise data center.

The thinking of IT managers has now come full circle, harking back to the days of the mainframe, which relied on centralized control and strict change management to keep systems running smoothly. The availability of dense servers with 4-, 8-, 16- and 32-way SMP processing has sped the return of mainframe-like processes back to datacenter.

Moving from the "one application, one box" mentality by adopting server consolidation is the wave of the future. Microsoft, for example, is planning to reduce the number of servers in its global Exchange network from 117 to 11 with the introduction of Windows Server 2003 and MS Exchange 2003.¹

Without a long-term testing strategy, the benefits of consolidation can be unrealized or lost. This white paper focuses on the whys, the hows and the what-to-dos of enterprise server consolidation testing, covering some pitfalls of server consolidation and presenting a formal server consolidation test methodology stage by stage.

Benefits of Server Consolidation

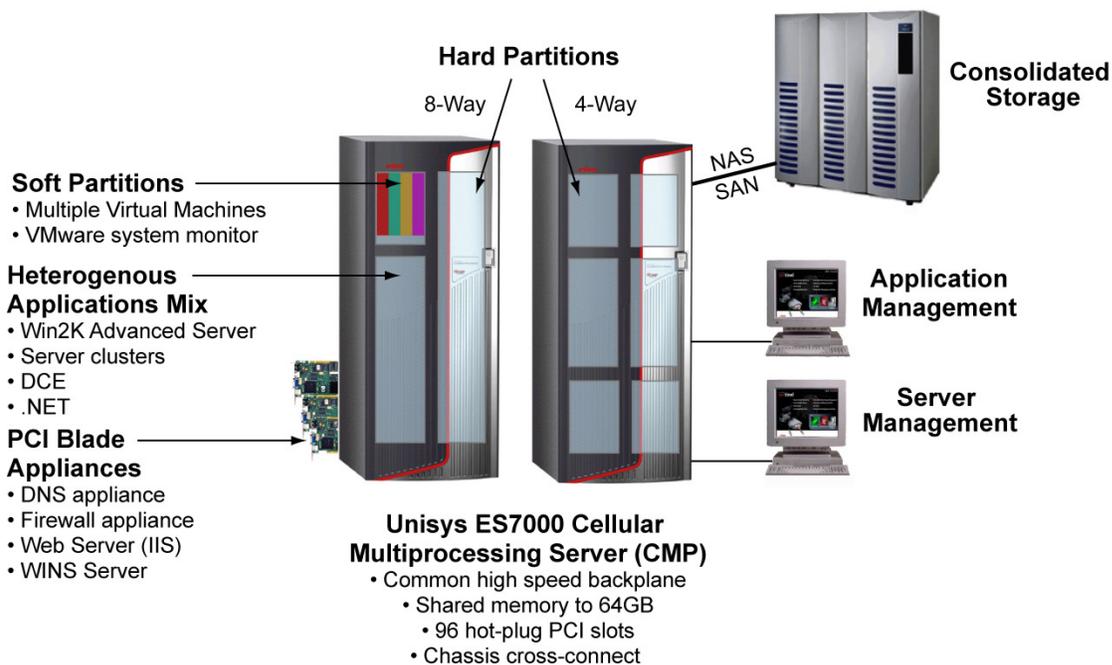
Server sprawl results in high overhead, redundancy and waste of resources in many areas. These include high costs for office space, maintenance contracts, network management, IT personnel and storage systems. Distributed servers typically have low utilization rates, but each standalone system must be built with extra capacity to handle peak loads, resulting in investment in resources that remain idle at most times. According to Wayne Carpenter, program director of consolidated solutions at Unisys, distributed servers typically run at 25 percent utilization or less.²

Enterprise IT departments are looking to server consolidation as a way to concentrate and conserve platform resources while reducing administration and overhead. Done correctly, server consolidation can result in significant savings by reducing licensing overhead in the short term and lowering maintenance and upgrade costs in the long term. Consolidation has the potential to free up IT staff time for more productive endeavors and to improve application service resiliency.

¹ Aberdeen Group, "Microsoft Slows Down to Speed Up Enterprise Sales," Executive Viewpoint, March 20, 2003.

² Unisys Executive Magazine, "Why Consolidate?" by Peter Haapaniemi, January 2001.

Modern Server Consolidation Platform for the Datacenter



Source: Unisys Corporation

Figure 1. Example of the server consolidation opportunity: adaptive dense server platforms and new server operating systems that can consolidate multiple tiers of servers. For example, the Unisys ES7000 server consolidates three basic tiers: Web/infrastructure servers, application servers, and database servers in one rack that can simultaneously run eight copies of Windows Server in hard partitions, and many more in virtual machines and blades.

Server consolidation dramatically improves platform availability and business continuity by providing reliable, affordable clustering and failover strategies that maintain service during software or machine crashes. Storage consolidation centralizes backup and restore operations, making both management and execution more efficient. Disaster recovery is streamlined through an automated and centralized backup and recovery process.

Applications can benefit as well. Physical consolidation leads to logical consolidation, whereby disparate operating system editions and application versions are standardized across the enterprise. Server consolidation further lowers the total cost of ownership (TCO) for IT management by reducing the time and resources necessary for application installation, maintenance, monitoring and provisioning.

Planned correctly, consolidation also helps IT managers improve security. Combining many servers onto a single machine reduces the number of entry points to the network. With fewer machines requiring monitoring and protection, consolidation diminishes potential misuse of server access to the enterprise. Consolidation not only improves current IT infrastructure, it provides a practical platform for the future as well. Dense servers offer a more scalable architecture, simplifying growth management from incremental user provisioning and policy implementation to comprehensive restructuring following mergers and acquisitions.

Finally, on the simplest level, consolidation increases available floor space and decreases the number of software licenses that must be procured and renewed.

Server Consolidation Testing Challenges

Importantly, a server consolidation is not a single event, but a long-term strategy. A savvy test manager will create a process which will work for the initial effort (itself a multi-stage process lasting perhaps six to eighteen months), but which will continue to function for the life of the enterprise. New applications, updated applications, and equipment are always being “consolidated” within the enterprise, and an experienced test laboratory like VeriTest can help establish a process and a change management approach which will function over the long haul.

In a scaled-out server environment, where each major application or workgroup has its own server, it may be relatively low risk to introduce a new application into production before it has been fully tested—only a single business process, a single server, or a single department may be affected by a problem. In a consolidated environment, however, each new element you introduce may threaten the smooth functioning of the whole, making it fundamental to good practice to test before introducing even the smallest changes before “going live.”

Moreover, it is important to bear in mind that most large scale enterprise applications have not been designed specifically to work within a mixed workload—indeed, most have been designed with the assumption that they would “own” their own instance of the operating system, along with a dedicated server. Conflicts will include user names, database names, and security levels along with programmatic dependencies like shared DLLs and device drivers. Some existing applications or infrastructures within the enterprise will therefore not qualify for consolidation, and new applications and equipment must be tested before introduction into the consolidated environment. It is common for 20% to 40% of application infrastructure to be rejected from the consolidation process.

It should also be borne in mind that the issues will not always be clear-cut, and often IT managers need to balance the opportunities and challenges. Server consolidation involves hurdles such as individual application performance compared with dedicated servers, application vendor support for heterogeneous environments, migration to new OS levels, attaining platform consistency among currently mixed OS-level servers, and tuning performance when combining multiple applications on a single operating system instance. As one experienced IT manager told us, “Perhaps 30% of our infrastructure will never be consolidated—for reasons that have nothing to do with compatibility or performance—but have everything to do with politics and cost.”

Without good testing and testing processes, however, these issues will never be properly clarified.

Role of the Independent Lab and VeriTest Services

An enterprise IT shop often works with a large OEM or systems integrator to establish a consolidation plan and execute it, often over a period of months or years. Within the contract for consolidation may be a large set of requirements, including performance and service levels which must be tested for compliance. VeriTest, as the world’s best-known independent application certification and performance testing lab, can play a crucial role as a third party to perform the necessary testing.

In addition, because consolidation is not a “one off” experience, but an ongoing project, VeriTest can use its experience and expertise to help enterprise clients establish ongoing “Consolidation Testing Sieves” of their own. Hence, VeriTest offers the following service models:

- Work on a consulting basis to establish long-term consolidation testing practices and processes.
- Develop a long-range test plan for a consolidation project.
- Execute testing of specific applications, application mixes, and technology configurations at various checkpoints within a consolidation project.
- Provide proof-of-concept testing before a major purchase or sale. We can work under contract to either the vendor or the customer. In either case, our work is entirely independent and unbiased.

- Work under contract with the Customer or as a subcontractor to the Integrator to provide third-party validation of consolidation mixes and environments. Again, our results are independently derived and presented.
- Provide independent performance testing to validate Service Level Agreements (SLAs) between customers and their third-party consolidation providers.

Learn more

The full version of this white paper presents a detailed discussion of the VeriTest strategy for server consolidation testing, addressing both homogeneous and heterogeneous consolidation and including the following sections:

- Theory: Thinking in Three Dimensions About Consolidation Testing
- Practice: Creating the “Consolidation Test Sieve”
 - Creating and Maintaining the Testing Sieves and Databases
- Suites, Classes and Test Cases for Consolidation
 - Some Key Testing Classifications
- Macro Stages in the Consolidation and Testing Process
- “Wintel” Consolidation Architectures
 - Unisys
 - Dell
 - Hewlett-Packard
 - IBM
- Role of the Independent Lab and VeriTest Services

To receive a copy of the complete paper or to discuss your server consolidation testing project, please contact VeriTest at info@veritest.com, or call: **877-342-5334** (toll free in the US) or **+1-919-380-2898** (outside the US).

About VeriTest

As the best-known name in independent testing since 1987, VeriTest Labs worldwide provide a broad range of outsourced testing solutions to both technology vendors and the enterprise, including migration, usability, performance, stress, security, EAI, localization, consolidation, and product certification testing. Since 1994, VeriTest has worked closely with Microsoft® to develop the Designed for Windows, Certified for Windows, Terminal Services, Commerce Server, Visual Basic for Applications, and many other industry-wide testing programs, from handheld to datacenter environments.

VeriTest now works with Microsoft, HP, IBM and Unisys to provide “Certified for Windows 2003 Server, Enterprise Server and Datacenter Server” testing and has 32-way ES7000 equipment and 8-way clustered IBM and HP servers, along with a full complement of datacenter connectivity and storage equipment deployed in three of its global sites. Windows Server 2003 Testing includes processor scale-up, memory usage, and clustered failover.

VeriTest is a division of Lionbridge Technologies, Inc., a provider of globalization solutions, and also provides on-site professional services to the enterprise. Through strategic acquisitions (of eTesting Labs in 2002, and of Data Dimensions, formerly ST Labs, in 2001) Lionbridge has expanded VeriTest's range.

The VeriTest Labs have the experience, knowledge, personnel and tools necessary to do detailed consolidation test planning and implement best practices and procedures to validate successful completion of complex projects. VeriTest can be called on to provide planning and testing services at a variety of stages along the processes detailed in this whitepaper.