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WHITE PAPER

VERITAS Extends OpForce Server Provisioning with Applications Discovery and Management, Supports Integration with BEA WebLogic

Sponsored by: VERITAS Software

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IN THIS WHITE PAPER

This IDC White Paper explores the market forces that are leading information technology (IT) organizations to adopt automated approaches to provisioning and managing their distributed systems servers and software applications, and shows the relationship of server automation to utility computing. The recent announcements by VERITAS Software of new extensions to the OpForce™ server provisioning product are examined in light of these automation and utility computing trends. The extension of OpForce server provisioning to include support for software discovery, provisioning, and change management is discussed. OpForce support for provisioning the BEA WebLogic Platform™ is analyzed. OpForce case study examples of automating server provisioning based on IDC interviews of OpForce IT users are provided.

SITUATION OVERVIEW

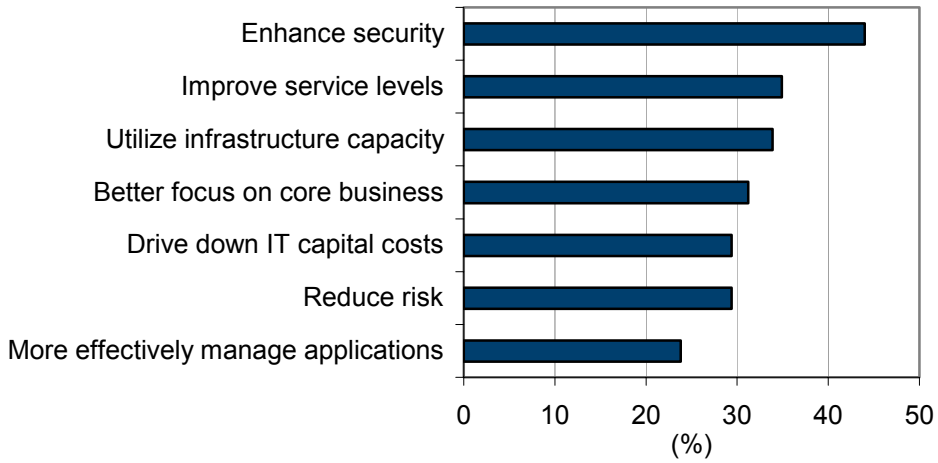
Enterprise IT is faced with many conflicting pressures. Management of multitier applications on a growing number of platforms has added complexity while IT is increasingly mandated to deliver explicit service levels. At the same time, IT must be responsive to continuing cost pressures, often with reduced budget spending and smaller IT staffs. IT is also being pressed to align more closely with the business needs and business priorities of the parent corporation. IT needs to show its business relevance, both in terms of responding to business goals and priorities, often in real time, and in terms of making a positive contribution to corporate revenue and operating efficiencies.

Key Enterprise IT Issues

IDC regularly conducts interviews with CxOs and IT managers to determine their top-of-mind concerns and issues regarding enterprise IT management and IT budget priorities. In one recent IDC survey regarding reasons for adopting new system infrastructure technologies, four out of the top five IT drivers concerned needs to improve service levels, better utilize infrastructure capacity, better focus on the core business, and drive down IT capital costs. As shown in Figure 1, these concerns were combined with needs to enhance security, reduce risk, more effectively manage applications, and be more adaptive to market conditions as key, top-of-mind issues for IT management in the area of new infrastructure technologies.

FIGURE 1

Top Reasons or Justifications for Adopting New System Infrastructure



Note: Multiple responses allowed.

Source: IDC System Infrastructure Survey, 2004

The Role of Server Automation Software

IDC views the function of server automation software as automating the process of server provisioning and management (SPM), including deployment, configuration, and management of server system software, middleware, and application stack images. The proliferation of distributed servers and distributed, multitier enterprise applications has given new impetus to the need for server automation software. Such products are targeted at IT managers, system administrators, applications managers, test environment support, geographically dispersed networks, and increasingly are being seen as a key component for enabling utility computing. IDC sees three main operational benefits to IT from using server automation software:

- The ability to accelerate initial deployment of new infrastructure and also re-deploy servers from a "safe," standardized, preconfigured, or "approved" image, ensuring that consistent images are replicated across the servers.
- The ability to quickly create and deploy one or many images that contain a complete software environment (operating system, middleware, applications) to large numbers of network-attached servers or server blades. This greatly reduces the elapsed time it takes to provision a server with fewer administrator errors.
- The ability to manage, control, and troubleshoot provisioning from a single location, with minimal manual intervention at the individual server, thus eliminating the need for an administrator to visit each server.

The promise of server automation software is that a single system administrator or equivalent can remotely manage the deployment of software for large numbers of servers. This speaks directly to the IT department's need to provide support for more services and more distributed servers with less cost, and the need to achieve a greater degree of flexibility and responsiveness in operations. These server automation benefits go directly to many of the top-of-mind IT concerns, as seen in Figure 1. In terms of major impact on IT, some of the key benefits include the following:

- Increased infrastructure flexibility to improve responsiveness to business needs and maintain platform and hardware independence
- Improved server utilization to maximize return on hardware investment
- Lowered administrative and maintenance costs to maximize return on personnel

Evolution of Server Automation

Server provisioning is not a new requirement and has gone through a number of approaches. Provisioning of servers has been evolving from "sneakers and CDs" requiring considerable operator intervention for each server (such as physically loading CDs, manually entering configuration settings, saving local copies of images) to the use of provisioning software products that can be used to create and store complex images and software packages, with settings and patches, and automatically provision them to network-attached servers, starting with bare metal provisioning, if necessary.

With appropriate server automation software, administrators can create, deploy, and manage these provisioning packages securely throughout their worldwide network. Such provisioning software products tend to concentrate on two major areas: remote management of distributed, replicated servers (for example, in a retail store, branch office or dealership environment) or server management in densely packed datacenters that typically use rackmounted equipment and, increasingly, server blades (large-scale enterprise datacenters, outsourcers, and ISPs).

Using such software, IT organizations can capture the expertise of their staff and leverage this expertise across their network-attached hardware platforms. IDC believes that the ability to identify approved server configurations; build safe corporate software packages; control and lock-down system settings; and manage deployment, distribution, maintenance and updates are essential to IT operations and will continue to grow in this market.

Server Automation and Utility Computing

Utility computing is a concept and management strategy that directly addresses IT's needs to control costs, improve resource utilization, and be responsive to changes in business requirements and priorities. At the heart of utility computing is the idea that IT infrastructure, such as the server or storage hardware, can be treated as commodities that can be acquired, provisioned, and allocated to business workloads dynamically, on an as needed basis, to achieve service goals. The promise of utility

computing is to reduce costs through automation and the more efficient use of hardware.

Given the already vast deployment of infrastructure and management software in IT organizations, it is likely that utility computing will often be implemented in an evolutionary fashion, in stages, rather than through costly "rip and replace" strategies. One of the key conditions for enabling utility computing is the ability to deploy, provision, and manage servers in response to service and workload requirements, which may change dynamically. Therefore, software that helps IT to automate the server provisioning process is an important component in the management software needed to enable utility computing.

VERITAS OpForce Server Provisioning Software

VERITAS Software made a strong entry into the server provisioning software market when it acquired the OpForce software provisioning product as part of the Jareva acquisition in 2002. OpForce software helps businesses to lower IT costs by making more efficient use of server hardware and operations staff. In particular, OpForce software reduces the need for dedicated IT staff to perform common repetitive administrative tasks required for provisioning.

OpForce software automates administrative tasks involved with controlling, provisioning, and updating servers and blades (starting from "bare metal" if necessary) with Windows, Solaris, AIX, or Linux software. With the production delivery of OpForce release 4.0, VERITAS has moved OpForce beyond base server provisioning to also include software discovery, software provisioning and configuration, as well as server configuration management. As a result, OpForce software is positioned as an "IT automation platform" since it can automate more than just server provisioning. OpForce automates the management of both the software and hardware stack from any location. Its capabilities also include the setup of IP addresses, configuration of the IP switch that connects multiple servers and the provisioning of the storage on the server.

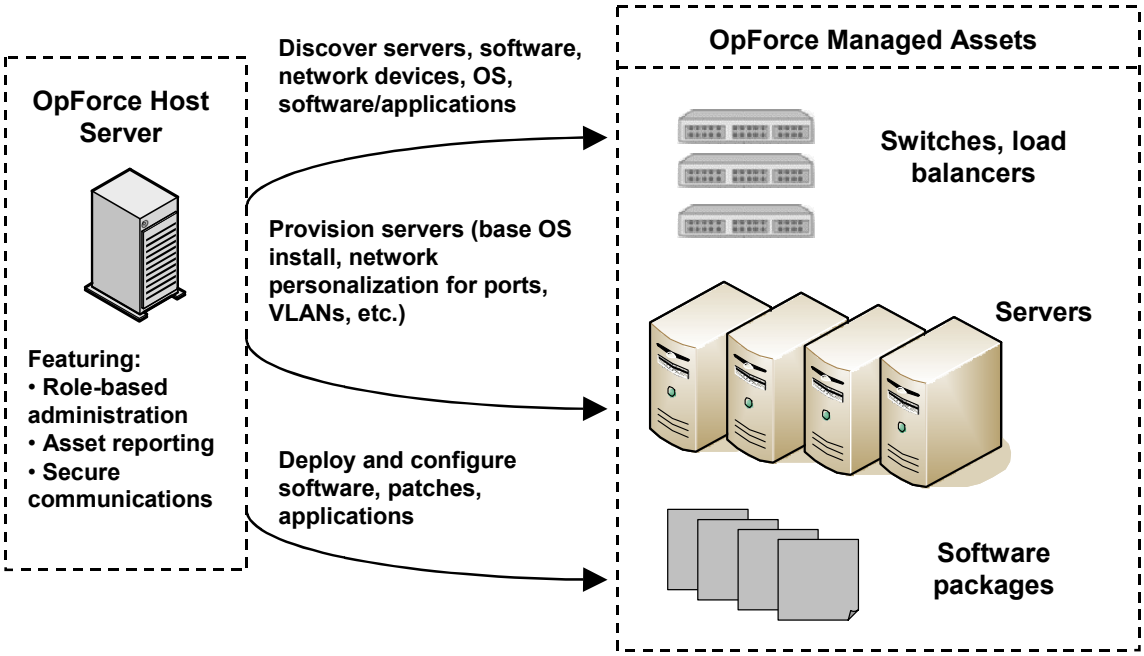
Leveraging the potential of server automation and life-cycle management depends greatly on how enterprises plan to utilize server resources to achieve higher efficiencies. OpForce software continues to support customers with a wide range of IT automation requirements. Common applications include:

- **Server deployments and migrations.** Accelerate deployment time of new infrastructure components by creating consistent and reliable processes for the configuration of server resources
- **Rapid provisioning of test and development environments.** Accelerate troubleshooting during QA and development processes by providing readily available access to the configuration repository as well as construction of reference environments
- **Datacenter operations management.** Centralize management of infrastructure devices in order to make more efficient use of IT resources

The underlying process flow of OpForce software can be summarized in a simplified high-level architecture, as described in Figure 2. In this architecture, every asset that is detected and discovered during a network boot can be placed under the control and management of OpForce software. Baseline or "reference" servers contain OS, middleware, applications, and patches and may be used to detect changes in configurations, versioning, and updates. Production servers may be configured for disaster-recovery purposes as well. Provisioned servers are personalized for proper ports, VLANs, and host information before software can be deployed.

FIGURE 2

OpForce Architecture Overview



Source: VERITAS Software, 2004

OpForce server and software templates assist in rapid deployment in large-scale migration scenarios. A typical production phase may involve software distribution or software configuration using application models, which will be explained later in this paper. Furthermore, OpForce software facilitates audits in order to ensure that configurations are accurate and that policies and procedures are followed.

Three Common OpForce Applications

Server Deployments and Migrations

Deploying new servers or moving servers between multiple datacenters typically requires a great deal of manual configuration and customization. OpForce software automates the server and software deployment and provisioning process, reducing that manual intervention. OpForce software detects new assets and can deploy a

snapshot of an existing server software to one or more new or existing servers with similar configurations. OpForce software ensures that there are no hardware or OS mismatches during this process, therefore reducing configuration errors while accelerating deployment of new infrastructure.

OpForce snapshots are comprehensive packages containing the software environment that is deployed on a server asset. This includes the OS, applications, and the data stored on the server's hard disks. In addition, it contains a set of attributes needed to successfully and reliably deploy a snapshot image. Those attributes include hard disk type, number of hard disks and partition maps, BIOS, Firmware, and RAID settings. OpForce software allows saving incremental snapshots, which contain the changes since the last full or incremental snapshot of a server asset. Using snapshots, OpForce software helps create a central repository of configuration information to be used for reference or reconstruction.

In Windows environments, OpForce 4.0 builds on top of Microsoft Sysprep technology and further automates the process of provisioning dissimilar servers. This is an efficient method of configuring many servers, using a golden snapshot. The facility enables users to create portable forward-compatible system snapshots (called "Universal Portable Snapshots"), which minimizes the time and effort needed for re-imaging servers when new server hardware is introduced or dissimilar server hardware is acquired.

Rapid Provisioning of Test and Development Environments

In order to maximize the utilization of server assets in a QA test and development environment, a solution must be used that not only automates the test processes for greater efficiencies but also ensures consistent builds across a variety of dissimilar equipment and operating systems. With OpForce software it is possible to maintain multiple simultaneous builds and multiple versions of a server configuration. The software allows deployment of standardized images, called snapshots, as discussed above.

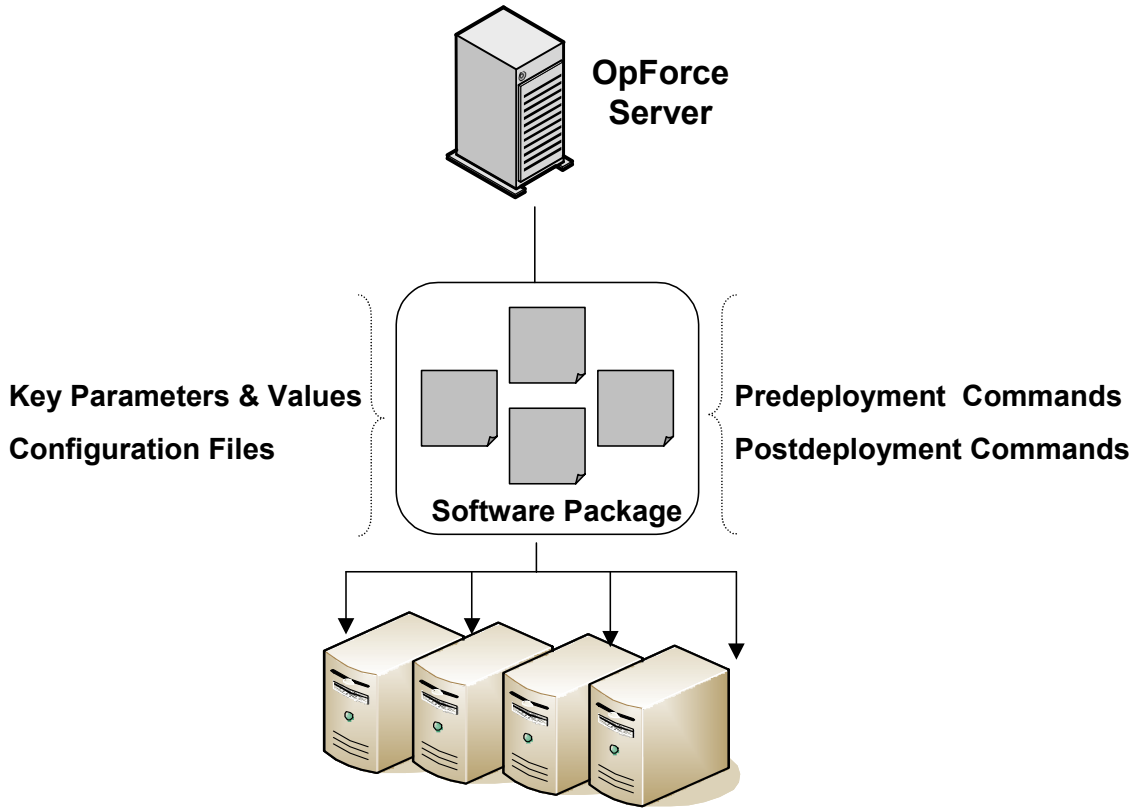
In addition to snapshots, applications can be configured and deployed using application models. The administrator can specify a set of configuration files, commands, and parameters, which automate manual and repetitive routine steps. This also enables consistent configuration of key applications throughout the environment. Support is provided for updating files on target servers and verifying file types and hardware constraints, while operations such as search and replace are conducted.

Software application packages can be assembled and provisioned with additional customization via predeployment and postdeployment commands. OpForce can incorporate key parameters and values, and process information stored in configuration files. With release 4.0, OpForce can be used to create a software application package with a model that contains parameters for customization of the applications package and specific values for parameters for specific instances of the application. This extends OpForce personalization capabilities to an application in addition to personalization of networking, OS, and middleware.

An overview of the OpForce software application provisioning process is shown in Figure 3.

FIGURE 3

OpForce Application Provisioning



Source: VERITAS Software, 2004

Datacenter Operations Management

Some of the key concerns in managing large or distributed datacenters are creating an inventory of hardware and software assets, tracking changes to the configuration of servers, applying patches, and ensuring a high level of security. OpForce addresses each of these needs.

One of the biggest operational difficulties in managing a complex, distributed applications environment is the lack of knowledge concerning the exact status of the hardware and software assets. With many distributed components and an environment that changes frequently, IT administrators are often not capable of keeping up to date with the status of the infrastructure assets without software tools. Automated discovery of both the server hardware infrastructure and the software applications and packages installed on the servers has become essential.

OpForce software discovers and inventories both prepackaged and custom software applications. Release 4.0 builds upon the existing OpForce ability to discover servers and by adding the ability to discover installed software applications on servers with an

operating system installed and in "up" state. Software discovery is enabled for specific enterprise applications, for software identified in the registry for Windows systems and for software packages shown in "pkginfo" in Solaris systems and in "rpm -q–a" lists for Linux systems. Through reporting capabilities, users can determine which packages are installed and identify duplications or old versions of software. This greater visibility into the installed base results in better asset management.

OpForce change management can also identify differences in server file systems, both for the entire disk or portions of a disk, even at the file content level. With OpForce release 4.0, users can even define server comparison templates for comparisons that need to be run on a regular basis. This functionality permits IT operations to guard against server performance problems related to "configuration drift," and to "detect and flag" out-of-compliance servers. The software deployment feature described above can then be used to deploy "gold standard" snapshots, service packs, or security patches as needed to rectify problems.

Finally, datacenter security strategies now employ multiple layers of defense. OpForce software takes a strong stance on security starting with directory-based authentication with industry-standard LDAP servers, including Microsoft Active Directory, Novell eDirectory, and Sun ONE Directory Server. Next, OpForce provides for role-based administration with users, user roles, and granular access control lists. This includes support for grouping of users and resources for authorization levels. A user can be granted specific rights for each function in OpForce, ensuring appropriate usage. Finally, encryption is supported at several levels of the OpForce software, including HTTPS/SSL encryption for GUI access, TCP/SEAL encryption for API access, and authenticated and encrypted communication between management server, agents, and network elements.

VERITAS and BEA

VERITAS Software and BEA Systems have long partnered to bring benefits to their common customers. This includes support for users of the BEA WebLogic Server®

and BEA Tuxedo® application platforms with the VERITAS High Availability and Storage Foundation Products in solution bundles, such as VERITAS High Availability Solution Suite for BEA WebLogic Server and VERITAS High Availability Solution Suite for BEA Tuxedo.

Common Vision of Utility Computing

Recently, VERITAS and BEA announced a global strategic alliance aimed at helping their mutual customers deploy enterprise applications on utility computing platforms that are open and heterogeneous. At that time, the two companies announced that they planned to provide an integrated offering and engage in joint development, sales, and marketing activities. The companies' visions can be summarized as follows:

- The BEA WebLogic Platform™ provides a standards-based scalable infrastructure for the development and deployment of enterprise J2EE-based applications and end-to-end business processes. BEA has a long-term direction

to improve the operational applications environment in mission-critical datacenters, to be more responsive and adaptive, which is consistent with BEA's sevice-oriented architecture (SOA) vision.

- VERITAS provides a building-block approach to utility computing that can enable IT to align with changing business requirements. Customers can optimize their existing IT infrastructure to meet required service levels while helping to lower the cost of operation and management. VERITAS provides support for application-specific optimization.

OpForce 4.0 and BEA WebLogic Server

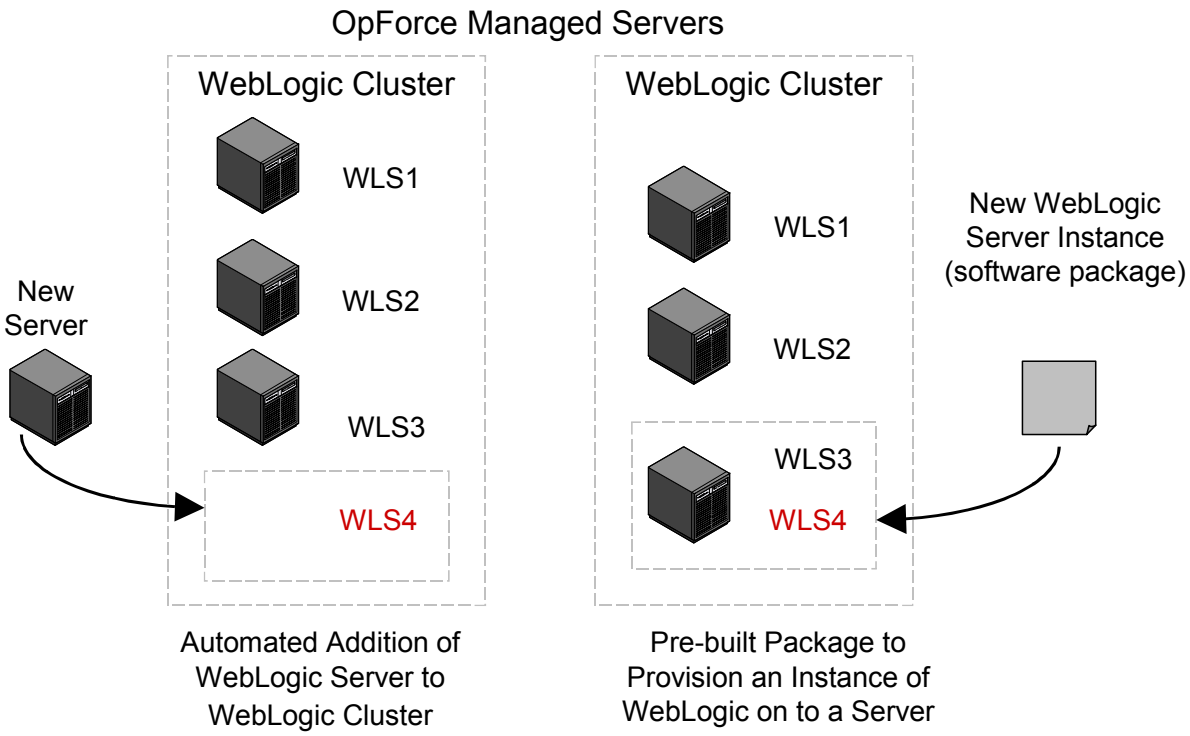
VERITAS has partnered with BEA to provide direct support for customers who are deploying applications on the BEA WebLogic Platform, as part of the OpForce release 4.0 support. The objective of the integration is to simplify and automate the deployment, provisioning, and management of BEA WebLogic Servers so that datacenters can optimize the use of their application server resources. The result is an integrated module called VERITAS OpForce for BEA WebLogic Server. The offering is designed to automate the tasks of provisioning and deploying BEA WebLogic Servers via a remote Web interface, whether for a planned build or for responding to peak activity that requires additional application server resources.

VERITAS OpForce and BEA WebLogic Integrated

The integration of OpForce automation with the BEA WebLogic Server platform required development efforts by both BEA and VERITAS. OpForce automation is based on system administrator-built templates for configuration scripts that can be product-specific and that integrate with specific components, such as application servers. As part of OpForce release 4.0, BEA has created specific templates to drive OpForce provisioning of BEA WebLogic Servers, including support for BEA WebLogic Server built-in clustering and load-balancing functionality. For example, in the case of clustered servers, a patch can be applied to the entire server farm through OpForce automation, instead of a one-off approach applied to each server. Figure 4 illustrates two scenarios for provisioning a new BEA WebLogic Server instance to an existing cluster deploying a J2EE application.

FIGURE 4

Integration: BEA WebLogic Server Provisioning with OpForce)



Source: VERITAS Software, 2004

In turn, OpForce uses the JMX-based programming interface to call the administrative functions of BEA WebLogic Server and makes use of BEA WebLogic Server administrative functionality.

Use Case Examples

Some of the use cases enabled by this close integration include global application of patches to multiple instances of applications, deployment of applications, and reconfiguration of BEA WebLogic Servers for scalability or redundancy. For example, a pool of available free servers can be dynamically provisioned as needed to meet peak loads. In one case, a large global travel ticket agency operates a BEA WebLogic application on three very large server clusters located strategically around the world in North America, Europe, and in the Asia/Pacific region. The company maintains a pool of available free servers, which can be dynamically provisioned and allocated to support the most active region, as needed, based on variations in load due to factors such as time zone differences or local events.

CASE STUDIES

Case Study: Large European Telecommunications Company

A current user example of OpForce provisioning is provided by a large European telecommunications company. The challenge for this company is to support a base of over 1,000 servers, which includes hardware from several different major vendors and a variety of OS environments, including Unix, Linux, and Windows. The hardware base includes 2-way rackmounted servers, with plans to deploy blades in the future. Currently, this company is provisioning and reprovisioning servers at the rate of 30 to 50 per month. Some of the objectives for their server provisioning process include the following:

- The ability to provision base OS images to new servers
- The ability to provision servers acquired from different hardware vendors using a common software toolset
- The ability to provision different server operating environments, including Microsoft Windows, Red Hat Linux, and Sun Solaris
- Substantial reduction in the time needed to provision a server
- Elimination of manual intervention at the server during the provisioning process

This company has been using home-grown script-based OS installs, with a technician setting up the install and physically loading a CD at the server. As mentioned above, a key objective is the ability to perform unattended installs. OpForce was introduced into this environment to help the platform managers simplify the overall server operations environment and to standardize the way an OS gets installed on a server. It wanted a toolset that could achieve the same server deployment, each time, and not be labor intensive. Also, a key requirement is to be hardware vendor independent so that the company can take advantage of favorable market conditions to acquire industry-standard Intel servers from any one of a set of competitive hardware vendors and do the OS installs from a common vendor-independent toolset.

Other requirements include the ability to reduce the staff needed for OS imaging, unattended installs, and customization of the OS to handle local environments. One feature of OpForce software that has considerable appeal is the snapshot technology, which allows the platform managers to build and save both complete and incremental snapshot images. Working with images is a prime requirement for their provisioning tasks.

The results of using OpForce software to date have been impressive. Prior to OpForce, a typical OS install required 75 minutes elapsed time per server, with about 10 minutes of onsite operator time to setup the install process. Now, with OpForce, the company can deploy a server from bare metal to OS, including monitoring agents, backup software, and security rules, in 15 minutes without any local operator intervention. Another key benefit from using OpForce software is that provisioning

results in a consistent image with constant settings across servers, eliminating local variances.

The bottom line for this company is that they are pleased with OpForce software, and are planning to move into applications provisioning that will include IIS and SQL Server. The company is ramping up its use of OpForce, and plans to be managing larger numbers of servers with OpForce in the near future.

Case Study: Large Software Company Testing Lab

A large US-headquartered software company maintains a pool of 50 servers for testing new software product releases and cross-product compatibility. The tests need to be conducted in a number of operational environments, including Linux and Windows. OpForce software is used to manage these test environments. One particular requirement in this situation is that each build must be completely refreshed so that a clean test environment is made available.

Prior to the use of OpForce software, server provisioning at this location was a highly manual process involving physical presence at the server for loading of disks or CDs, and entering configuration parameters and settings. The process involved creating an OS image on the server by loading it from a CD, customizing the image, and saving a second bootable image on the hard drive. The overall process took about 90 minutes, with considerable manual intervention, and had to be repeated for each server.

Now with the use of OpForce software, provisioning is performed from a central point, such as logging in from the Internet without visiting the individual servers. Builds can be scheduled for overnight processing without manual intervention. Consistent, uniform images can be provisioned across all servers used as test beds.

In addition to the time-saving and reduced staff-time benefits, the use of OpForce software in this environment provides the ability to utilize industry-standard hardware as a commodity, since OpForce software can provision OS images for all major Intel architecture server hardware.

FUTURE OUTLOOK

Looking Ahead: Utility Computing and Higher-Level Control

While server provisioning software is an important foundation for utility computing, it is not the whole story. Today, server provisioning software is used as a "best-of-breed" tool by system administrators, where the objective is to support the administrator in managing a large pool of servers. Utility computing envisions automating not only the provisioning functions, but also automating the higher-level processes and decision rules that control when and how provisioning should be performed. For example, a service-level objective (SLO)–based strategy can be used to decide that a specific workload should get more server resource in order to achieve a performance goal. This decision could then trigger an automated provisioning activity in order to obtain

the additional resource. Tying provisioning to higher-level control functions, with feedback from monitoring software, is an important part of enabling an automated, adaptive, utility-computing environment. VERITAS certainly understands this relationship and indeed has demonstrated early support for this function in recent user meetings. Therefore, OpForce fits IT needs both as a "now" best-of-breed provisioning tool, with considerable automation capabilities, and as a component in the architecture of the larger VERITAS utility computing strategy.

CHALLENGES/OPPORTUNITIES

VERITAS has taken a leadership role in the promotion of its utility computing vision, shared in large part by partner BEA. However, like all large visions, utility computing requires not only that products be there to support and enable the vision but also that the IT shop be at a sufficient stage of maturity to accept the vision and be willing to buy in and invest in implementing the vision. Fortunately, VERITAS has positioned OpForce software in such a way that the IT shop can find immediate value for the provisioning functions while beginning to move toward enabling utility computing.

The challenge for VERITAS is to maintain sharp focus on OpForce as a valuable product and function set in its own right, while continuing to develop the utility computing strategy with OpForce software as a building block component. VERITAS must continue to develop and promote OpForce software in the competitive marketplace for server and application provisioning software, which includes major hardware system vendors (that will continue to supply their own, often hardware-specific, provisioning solutions) as well as large independent software vendors and smaller best-of-breed vendors.

SUMMARY AND CONCLUSION

IDC has frequently recognized the significant value to IT that can be gained from the use of automated server provisioning software. This is clearly an area where automation software can result in very tangible benefits to IT, including but not limited to the following:

- Reduction in the cost of IT operations due to smaller staff requirements for administering and performing provisioning operations
- More efficient use of hardware, including higher server utilizations and easier reuse of existing servers, resulting in hardware cost savings
- Consistent and uniform OS images and configuration settings resulting in fewer interruptions and less downtime due to improperly configured systems
- Consistent and uniform application images and configuration settings, particularly important for reliable operation of distributed multitier applications, such as those deployed using BEA WebLogic Server

These benefits can certainly be expected to result from the use of VERITAS OpForce provisioning software and, indeed, have been frequently cited by the OpForce users interviewed by IDC as part of the research for this White Paper.

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