IDC TECHNOLOGY SPOTLIGHT

Software Appliances Ease Cloud Application Deployment

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Software appliances continue to generate interest and gain momentum in the industry, riding on the coattails of the exploding virtualization and cloud computing markets. In general, software appliances bring the promise of simplified application stacks, application isolation, and utility computing to create a single composite package. IDC predicts that the software appliance market will grow to $3.7 billion by 2014. In addition, growth rates and resulting overall volume forecast for 2012 support IDC's expectation that Linux will emerge as the platform favored by independent software vendors (ISVs) for building next-generation software appliances. This Technology Spotlight examines the major challenges associated with software development, integration, and maintenance and the complexities of software as a service (SaaS) and cloud computing that are driving interest and growth in software appliances. It explains how software appliances fit into the greater picture of IT simplification and consolidation enabled by virtualization and cloud computing and how ISVs in particular can benefit from this technology as they build out their cloud strategies. The paper also looks at the role that SUSE plays in this strategically important market.

Addressing the Complexities of Traditional Software and Cloud Solutions

Technologies such as cloud computing, SaaS, and managed services are rapidly growing in popularity in response to the numerous problems and the amount of money spent on the tasks associated with customizing and maintaining traditional software, as well as getting it to work seamlessly in the environment. IDC research has shown that end users believe that they spend the most time on integrating, installing, acquiring, and maintaining traditional software, in that order. This perception is certainly one reason why end users and far too many companies have habitually stayed with their existing software for long periods of time — not because it is necessarily the best solution but because the biggest hurdle to replacing or upgrading their software is all the things that have to be done after acquiring it.

With the ongoing uncertain economy, organizations, end users, and ISVs, in particular, are more attuned than ever to these difficulties as well as to the added expenses associated with software acquisition and integration. Consequently, they are increasingly looking for alternatives that address these inherent software complexity challenges as well as ways to streamline operations with more cost-effective solutions that can be readily "plugged into" existing environments.

Despite their advantages, SaaS and cloud computing are not a panacea because these technologies force customers to have a constant connection online and keep their data outside the firewall. Moreover, connectivity and security issues are natural inhibitors to these deployment options.

Additionally, the migration to any one of three cloud models — SaaS, platform-as-a-service (PaaS) hosting, or infrastructure-as-a-service (IaaS) hosting — is frequently very disruptive to existing development models and, in the case of a multitenant architecture, may be cost prohibitive. PaaS is in its relative infancy, and while the technology looks promising, switching costs are very high, and there is no easy access to middleware or operating systems. IaaS hosting is a better choice, particularly with the second of the following two optional form factors: moving applications inside a virtual machine (which can often be cumbersome) or turning applications into a software appliance.

The technology most capable of resolving many of the previously mentioned concerns is software appliances. Simply stated, a software appliance is a confluence of software products that integrate operating system and applications or application functionality into a single composite package. Software appliances can be patched and managed as a single entity and deployed aboard industry-standard client or server hardware, either on a virtual machine or directly on the hardware.

The broad deployment of hypervisor technology, including in the public cloud, enables the proliferation of software appliances. The growing popularity of software appliances is due to how well suited they are to assuage the connectivity and security challenges of SaaS and cloud computing. Software appliances can simplify deployment while maintaining software and data on premises. Their appeal is also attributed to the following factors:

- **Easy acquisition.** The preintegrated nature of software appliances and the flexible deployment options, including virtual, mean that evaluations are simple and quick. Both demo and production code can typically be downloaded and tested or installed within minutes.

- **Integration.** Because a software appliance is a prepackaged, preconfigured application, organizations do not have to worry about installing and configuring multiple pieces of the software stack.

- **Maintenance.** Software appliances solve support matrix challenges by providing a single stream of patches that applies to the base operating system, the application, and the middleware components, if middleware components are included in the software appliance.

Furthermore, the decoupling of the hardware from the software, while preserving the low-touch, easy-to-maintain, plug-and-play features that hardware appliances offer, presents exciting new deployment opportunities for ISVs. Software appliances also give end users more software choices and allow customers to choose where they would like to deploy the application. They provide a better on-ramp to the cloud, enabling customers to gradually move over at their own pace. The numerous advantages of software appliances and the fact that they are being produced in a highly effective manner are spurring adoption of the technology across a broad range of industries with little or no hesitation.

Software Appliance Benefits for ISVs and Users

Contrary to popular expectations, the economic downturn has not diminished consumption of software appliances; in some cases, it has actually accelerated buying interest. This is because the flexibility of software appliances has created a value proposition for both customers and ISVs seeking to simplify their support matrix and go-to-market plans.

By their composite nature, software appliances present interesting and new opportunities for ISVs. They enable ISVs to create an optimized, single platform that can be deployed physically, virtually, or in the cloud. ISVs are more easily able to build software appliances that are tailored to their customers' needs, which can ultimately improve customer satisfaction and decrease overall support costs. Software appliances enable ISVs to demonstrate value to their customers in terms of reduced infrastructure costs and better management of capital expenditures.

The shift from traditional software to software appliances can help organizations reduce their costs and the complexity of developing and testing software because ISVs can assemble, build, and maintain portable application stacks in minutes and deploy them wherever they are required. In this way, software appliances can both accelerate the ISV's time to market and increase revenue opportunities. They also enable ISVs to more easily achieve new deployment targets and enter new markets without traditional or extensive rearchitecting.

Many ISVs are embracing SaaS and cloud opportunities through either hosting partners or rearchitecting their software for multitenancy. Creating a software appliance is usually cheaper than rearchitecting an application for multitenancy. Further, because software appliances are easy to install and uninstall, they enable sales and marketing professionals to promote their applicability at a customer site and demonstrate actual business value. The zero footprint left behind as a virtual machine installation makes it easier for customers to test software in their own environment, which can go a long way to overcoming concerns and giving the ISV a competitive advantage.

Moving Toward the Holy Grail of Cloud Computing

Growth rates and overall volume forecast for 2012 support IDC's expectation that Linux will emerge as the platform favored by ISVs for building next-generation software appliances. IDC expects more and more ISVs to adopt commercial distributions because of the support many commercial providers can offer. IDC believes that for ISVs without internal operating system expertise, there is a far greater return on investment to paying for support than there is for building that expertise in-house.

IDC also recognizes that the competition for internal (and hybrid) cloud will continue to transform from pure virtualized infrastructure delivered as a service toward virtualized application fabrics (PaaS) that provide application services and runtime instead of just raw infrastructure. The application fabric models target the holy grail of cloud computing, which is the ability to write next-generation applications that consume resources available in cloud infrastructures and use unique cloud-aware middleware as a virtualization layer. This allows the application to leverage the cloud resources without being specifically aware of how the cloud is actually constructed.

Considering SUSE

SUSE is a business unit of The Attachmate Group, the company that acquired Novell in April 2011. SUSE provides enterprise Linux solutions, including tools that enable organizations to deliver computing services across a variety of architectures. With its latest release of SUSE Studio version 1.2, SUSE integrates x86, mainframe, and cloud development into a single authoring tool that has a single source for documentation and version control. SUSE Studio eliminates most of the inefficient manual processes for application deployment.

Its intuitive interface simplifies the process of building and testing Linux configurations and applications as well as sharing and downloading these applications as file images. SUSE Studio allows enterprises to standardize development processes and policies across architectures and enables applications to be deployed within x86 or mainframe environments. It eases the transition of migrating mainframe applications to the cloud by allowing the different versions of software to be developed and maintained using a single tool and only a few mouse clicks.

SUSE claims that its SUSE Appliance Program offers the fastest and easiest way for ISVs to build, configure, and maintain portable and cloud-enabled application images or appliances in order to reduce the complexity, maintenance, and support costs of software deployments to a physical, virtual, or cloud environment. By using the combination of SUSE Studio and SUSE Linux Enterprise, ISVs can create virtual or cloud applications within a couple of minutes instead of having to reengineer a multitenant single-instance application.

Because the tool's update and configuration mechanisms are cloud enabled, little or no additional investment is required to move to cloud architectures, including Amazon EC2. For instance, SUSE Studio eliminates the long and tedious process of building, testing, and debugging EC2 images with its complete end-to-end solution for building and deploying cloud images. Additional benefits for ISVs include the following capabilities:

■ Providing customers with optimized, tailored, and portable solutions

■ Facilitating expansion into new markets without extensive rearchitecting

■ Accelerating time to market

■ Reducing support calls, improving customer satisfaction, and decreasing support costs

SUSE Studio encapsulates an application's dependencies in a preintegrated, self-contained package. It assembles operating system, middleware, and software applications for on-demand delivery to private and public cloud environments and stores the application image configurations as well as all build-related information.

Software application images or appliances can be created in several formats, making it easy to deploy them on physical hardware, in virtualized environments, or to cloud environments. It enables the building of ISO files for creating installable Live CDs or raw disk images that can be written directly to physical hard drives or removable media such as USB sticks. It also enables developers to quickly create, test, and deploy virtual applications for all major hypervisors, including VMware, KVM, and Xen, as well as industry standards such as OVF.

SUSE Studio can be used to significantly reduce the complexities of software development and integration. By leveraging the appliance form factor, it effectively decouples the software installation from the underlying layer. This eliminates many of the traditional versioning and patch management issues. It also enables the creation of virtual applications that are optimized and ready to run on many virtualization platforms. It facilitates standardization of applications to further reduce development time, costs, and maintenance for software applications deployed into any environment.

The tool is designed to reduce the complexity and footprint of the combined installation, maintenance, and support efforts by managing operating system, middleware, and application intricacies. Its reported ability to also reduce download time and support secure testing of all application images before they are downloaded or deployed makes it easy to reproduce any application image or appliance. Integrated version control and change logging enable any changes to be reviewed, tested, or audited before any application image or appliance is downloaded or moves into production. Once approved, the application image becomes the baseline to which further changes may be applied in future.

SUSE Studio is available in two editions: Standard Edition, which is primarily targeted toward ISVs, and Advanced Edition, which is primarily for enterprise organizations and includes support for System z. Additional SUSE Studio features and benefits include the following:

■ Provides several templates that can be used as a starting point, including SUSE Linux Enterprise Server and SUSE Linux Enterprise JeOS

■ Supports the creation of standardized solution stacks

■ Enhances security with application control and timely updating and stores all information about virtual images or appliances so they can be reproduced, duplicated, or deployed to virtual or cloud environments with a single mouse click

■ Adapts quickly and easily to new business drivers

■ Increases software portability for virtual and cloud environments

Challenges

The real challenge for SUSE is how well the company can execute its vision and compete in this space now that it has been acquired by Attachmate. It appears that Attachmate will allow SUSE to continue executing on its current business plan. Ultimately, SUSE's opportunity for success requires continued investment and close cooperation between Attachmate, Novell's former partners, and the current customer base that utilizes SUSE Studio. If SUSE stumbles or there are any missteps along the way, there is always a possibility that Attachmate could either spin off SUSE as an independent company or sell it to another vendor.

Conclusion

For several years now, IDC has maintained that it is time to strategically think about releasing software as an appliance. Because this form factor has officially entered the mainstream, there is no longer an issue of education or training. While questions certainly arise concerning issues around centralized management, inserting plug-ins, operating system support, and so forth, the products that can answer those questions are out there in one form or another.

The latest economic downturn has taught us that companies are willing to spend on solutions that bring immediate value to the table. Software appliances are a prime example of this type of solution. The physical, virtual, and cloud-based deployment flexibility that software appliances offer is a key attribute that makes them such a compelling form factor. Cloud computing, specifically clouds that are enabled by a virtualization layer, will provide new go-to-market opportunities, and software appliances will help simplify this transition.

Cloud computing, in conjunction with software appliances, will also create new business models that allow companies to sell a single product on premises, on demand, or in a hybrid deployment model — something that has already been proven by some early software appliance innovators.

Software appliances are of particular importance to ISVs, which can benefit from the numerous economic and business advantages the appliances provide. The ability to tailor software solutions to the specific needs of customers and to demonstrate value in terms of reduced infrastructure costs and better management of capital expenditures allows ISVs to enter new markets without the overhead and expense of rearchitecting traditional software solutions.

More importantly, the availability of tools that can help ISVs assemble, build, and maintain portable application stacks in minutes and deploy them wherever they are required is changing the dynamics of the way ISVs will be addressing the market and business requirements for many years to come. To the extent that SUSE and its Studio tools and ISV support programs continue to deliver solutions that address the needs of the developer and ISV communities with highly competitive capabilities, the company has significant opportunity for further success and growth in the future.