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Private Cloud Implementation at Enterprise with IBM Workload Deployer

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Abstract- Cloud computing is a general term for anything that involves delivering hosted services over the Internet. These services are broadly divided into three categories: Infrastructure-as-a-Service (IaaS), Platform-as-a-Service (PaaS) and Software-as-a-Service (SaaS) The cloud manager provides a self-service deployment interface that maintains permissions, information about cloud artifacts such as virtual images and patterns, and resource usage. The IBM Workload Deployer a secure hardware appliance that represents such a cloud manager. It optimizes the configuration, deployment, and management of Application environments in a cloud. While the IBM Workload Deplorer's targeted for private or on-premise cloud computing environments, it can also be used by service providers providing hosted public clouds and software-as-a-service environments to simplify and standardize repeated deployments of their software.

Keywords- IBM Workload Deployer, Cloud Computing, Hypervisor, Patterns, Virtual Image.

I. INTRODUCTION

Annual IT operational costs continue to increase, with labor commanding larger and larger share. For example, an IBM internal study of its own distributed infrastructure showed labor to be more than 60 percent of the total operational cost per year [1], while industry analysts estimate labor costs can be as high as 80 percent of overall data center costs [2]. As a result, many organizations are turning to private clouds, implementing such technologies as virtualization and consolidation, standardized workloads and automation using self-service provisioning to reduce these costs. While only 12 percent of enterprises currently utilize some of these techniques, this number is expected to rise to 50percent in upcoming days.

Quantifying the impact that private cloud technologies have on various aspects of labor has proven elusive, resulting in slower adoption rates. IT organizations want to know, for example, just how much these solutions will affect the labor required to setup and maintain the physical and virtual infrastructure for a given deployment platform before committing resources to implementation

This paper describes an approach to help answer this question. We first examined the current problem face by the Enterprise then concept of cloud computing then IBM Workload Deployer as Cloud provider

II. CONCEPT OF CLOUD COMPUTING

A. *Introduction:*

Cloud Computing is a technology that uses the internet and central remote servers to maintain data and applications. Cloud computing allows consumers and businesses to use applications without installation and access their personal files at any computer with internet access. This technology allows for much more efficient computing by centralizing data storage, processing and bandwidth.

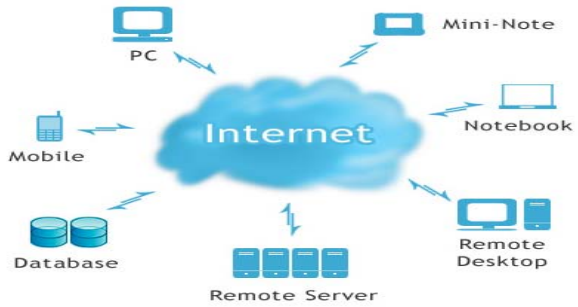

Figure 1: Cloud Computing

B. *Service Models:*

Once a cloud is established, how its cloud computing services are deployed in terms of business models can differ depending on requirements. The primary service models being deployed (see Fig. 2) are commonly known as:

- ***a. Software as a Service (SaaS):*** Consumers purchase the ability to access and use an application or service that is hosted in the cloud. A benchmark example of this is Salesforce.com, as discussed previously, where necessary information for the interaction between the consumer and the service is hosted as part of the service in the cloud.
- ***b. Platform as a Service (PaaS):*** Consumers purchase access to the platforms, enabling them to deploy their own software and applications in the cloud. The operating systems and network access are not managed by the consumer, and there might be constraints as to which applications can be deployed.
- ***c. Infrastructure as a Service (IaaS):*** Consumers control and manage the systems in terms of the operating systems, applications, storage, and network connectivity, but do not themselves control the cloud infrastructure.

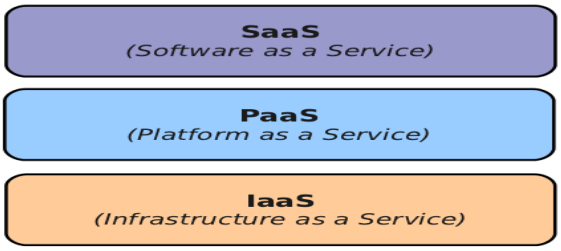

Figure 2: Service Model for Cloud Computing

C. *Deployment Model:*

Deploying cloud computing can differ depending on requirements, and the following four deployment models have been identified, each with specific characteristics that support the needs of the services and users of the clouds in particular ways (see Figure 2).

- ***a.*** ***Private Cloud*** - The cloud infrastructure has been deployed, and is maintained and operated for a specific organization. The operation may be in-house or with a third party on the premises.
- ***b.*** ***Public Cloud*** - The cloud infrastructure is available to the public on a commercial basis by a cloud service provider. This enables a consumer to develop and deploy a service in the cloud with very little financial outlay compared to the capital expenditure requirements normally associated with other deployment options.
- ***c.*** ***Hybrid Cloud*** - The cloud infrastructure consists of a number of clouds of any type, but the clouds have the ability through their interfaces to allow data and/or applications to be moved from one cloud to another. This can be a combination of private and public clouds that support the requirement to retain some data in an organization, and also the need to offer services in the cloud.

Figure 3: Deployment Model for Cloud computing

D. *Benefits of Cloud Computing:*

The following are some of the possible benefits for those who offer cloud computing-based services and applications:

- ***a.*** ***Cost Savings*** - Companies can reduce their capital expenditures and use operational expenditures for increasing their computing capabilities. This is a lower barrier to entry and also requires fewer in-house IT resources to provide system support.
- ***b.*** ***Scalability/Flexibility*** - Companies can start with a small deployment and grow to a large deployment fairly rapidly, and then scale back if necessary. Also, the flexibility of cloud computing allows companies to use extra resources at peak times, enabling them to satisfy consumer demands.
- ***c.*** ***Reliability*** - Services using multiple redundant sites can support business continuity and disaster recovery.
- ***d.*** ***Maintenance*** - Cloud service providers do the system maintenance and access is through APIs that do not require application installations onto PCs, thus further reducing maintenance requirements.
- ***e.*** ***Mobile Accessible*** - Mobile workers have increased productivity due to systems accessible in an infrastructure available from anywhere.

III. CURRENT PROBLEM IN ENTERPRISE WHILE DEVELOPMENT AND TESTING

Enterprise consists of different products theses require differ application environments of combination of operating system, application server, database. So following are the problem we are facing:

a. The average lead time to get a new application environment up and running is 2-4 months because of time required for Approvals, procurement, shipment, hardware installation, license procurement, OS installation, Application installation and configuration.
b. 30% of bugs are introduced by inconsistent configurations because these bugs are often of the most difficult variety to detect and they often emerge when moving between dev/test, QA, production
c. And it's so expensive to set up an environment; there is an incentive to hold onto them even when no longer needed "just in case"

IV. IBM WORKLOAD DEPLOYER

IBM Workload Deployer (IWD) is one of the foundational elements for the private cloud strategy. This is a hardware appliance that enables the rapid adoption and deployment of both Infrastructure and Platform as Service offerings. It provides a high degree of integration and automation for common scenarios and assists organizations with the adoption and lifecycle management of a private cloud. All of this can be accomplished without investing significant resources into the development of unique skills or advanced process maturity [3].

Figure 4: Hardware Appliance –IBM Workload Deployer v3.0

So IWD manage all the cloud resources i.e. Hypervisor (hypervisor is a virtualization platform) cross existing Enterprise private cloud.

V. SOLUTION PROVIDED BY IBM WORKLOAD DEPLOYER (IWD)

The task of deploying a software stack as a VM image onto a virtualized server has historically been a highly labor-intensive task. For instance, one has to first deploy and configure the OS along with all requisite patches. After that,

the administrator has to install and configure the application server and all its constituent components (e.g. HTTP server, etc.) as well as patches and other fixes. For applications requiring a database, that becomes yet another piece of middleware that needs to be installed and configured. Then there is the application itself. Collectively, deploying and testing a complete application manually can require days or weeks to accomplish depending upon its overall complexity. In a private cloud environment, this kind of turnaround is untenable[7].

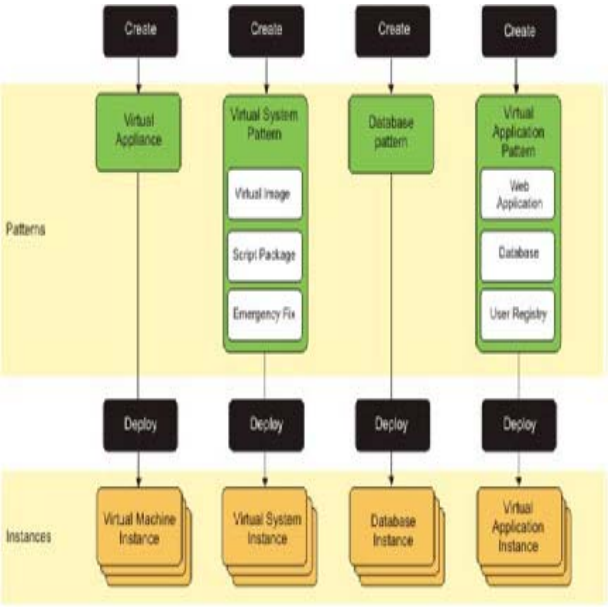

Figure 5: Architecture of IBM Workload Deployer.

To support virtualization IBM WorkLoad Deployer support three virtualization platform [4]

- ***a. PowerVM hypervisors:*** PowerVM hypervisors, in IBM Workload Deployer, are defined within cloud groups that are managed by IBM Systems Director VMControl
- ***b. z/VM hypervisors:*** z/VM hypervisor are added manually and individually to be managed with a custom cloud group.
- ***c. VMware ESX hypervisors:*** VMware ESX hypervisors can be administered as part of custom cloud groups or they can be managed by VMware Virtual Center.

Additionally IBM WorkLoad deployer v3.0 comes up with various in build IBM Hypervisor Edition Images, Script package and Add-ons. By using these in build content you can create various patterns according to your Enterprise requirements. if these resources are failed to satisfy your enterprise requirements, in that condition IBM WorkLoad Deployer support IBM Image Construction and Composition Tool [5] which helps to create different virtual images apart from those are present in IBM WorkLoad Deployer Catalogs.

VI. IMPLEMENTATION APPROACH.

We are trying to implement private cloud at Enterprise by using IBM WorkLoad Deployer (IWD)[6].

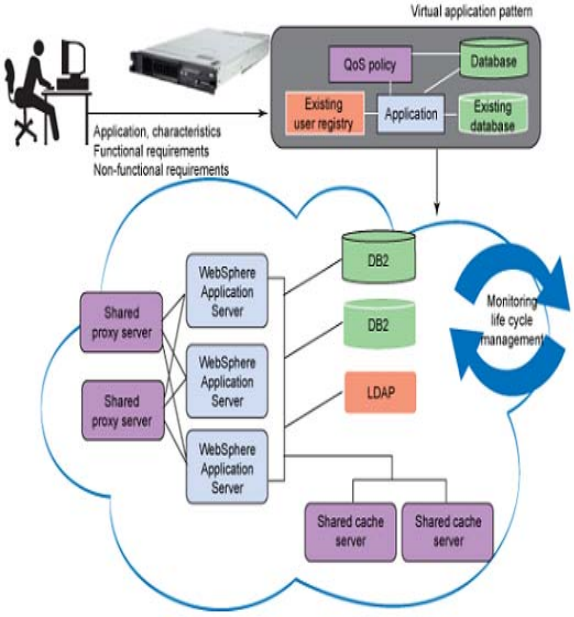

Figure 6: Life cycle of Pattern creation with IWD

For that we are deploying different pattern that are created by using the existing virtual images in the catalog of IBM WorkLoad Deployer over the private cloud. If the required virtual images are not present in IWD catalog, then create virtual images of required Operating System (OS), Application server (AS) and Database (DB). And then import those virtual images into IBM WorkLoad Deployer (IWD). Catalog, then will try to deploy over the private cloud.

VII. CONCLUSION

Virtual application patterns represent a bold step toward a more application-centric cloud experience. Like virtual system patterns, the design of IBM Workload Deployer allows for extensive customization of this deployment artifact. By creating plug-ins, you can enable the creation of highly customized virtual application patterns, thereby creating cloud-based deployments suited for your needs. IBM Workload Deployer (IWD) provides a high degree of integration and automation for common scenarios and assists organizations with the adoption and lifecycle management of a private cloud.

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