

REMOTE ORCHESTRATION TOOL IN SDDC

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Abstract: Software Defined data center is a new paradigm of the modern data center. Software Defined data center helps to overcome the disadvantage of the traditional data center. In the traditional data center, all the infrastructure are running on top of hardware layer. It causes more CAPEX and OPEX investment, but Software Defined data center reduce this by controlling the hardware layer inside software layer[2]. In this research paper, we introduce a remote orchestration tool or software which provides a Software Defined data center platform to manage the remote data center. This Software used virtualization technique for all resources, and provide everything as a service over the Internet. This tool also used distribute computing method for pooling all resources into a single placed is called master node. Here master node also a remote data center, which is responsible for managing all slave node through the tunnel. This remote orchestration tool is mainly used for the educational purpose to understand the concept of Software Defined data center.

Keywords: Software-Defined Data Center; Virtualization; Server OS; Web Server; Hypervisor; Tunnel;

1. Introduction

The software-defined tool is the only way to achieve data center automation. The main aim of this research paper, to build a remote tool or platform for distribute data

center resources over the Internet. Virtualization layer is the main concept of this tool, with the help of this layer we can create virtual services. We used Oracle Virtual Box and Windows server operating system for this Virtualization layer. There is two type of deployment methods in this tool single-node deployment, multi-node deployment. This tool provides a web application interface for setup, manage, and audit virtual data center, that is done by using Apache and MySQL server.

2. Literature Review

A data center is a central part of modern software technology, played a vital role in the enterprise. Data center provide a set of resource to enterprise client and help to grow enterprise business. In the earlier data center is called traditional data center, which is the singular purpose, very hardware-centric, and non-automated. Because of that reason, the enterprise is not able to grow their business. For solve, this problem enterprise requires more capital investment and operation investment[2]. In the year of 2012 VMware introduce the concept of Software Defined Data Center (SDDC) at the VM World conference in San Francisco and Barcelona[1]. Software Defined Data Center (SDDC) reduces the disadvantages of the traditional data center, by using the concept called virtualization. In Software Defined Data Center (SDDC) all the resources are virtualized and provide all resources as a service.

3. Related Work

Table 1. Relate Work

Paper Title	Authors	Year	Organization
The Software-Defined-Data-Center (Sddc): Concept Or Reality?	Davidson, Emily A	2013	Vmware
White Paper: Business Benefits Of The Software Defined Data Center	Bernd Harzog	2013	HP

The Software-Defined Data Center And The New Hitachi Unified Compute Platform	Miklos Sandorf, Mike Clayville	2013	Cisco
The Journey Toward The Software-Defined Data Center	Sandeep Raghuraman	2013	Cognizant
Transform Your Storage For The Software Defined Data Center	Emc Vopr Controller	2015	EMC
Software Defined Data Center: Time To Reimagine The Core	Anuj Bhalla, Gaurav Chaturvedi, Manjari Sharma	2015	Wipro

4. Proposed System

The main advantages of proposed System are:

- Eliminates hardware dependency.
- Simplifies data center management.

- Provide automation and orchestration.
- Increase security through policy-based governance.
- Increase the speed and service delivery.
- Decrease cost and improve efficiency as compared to the traditional data center.

5. Architecture

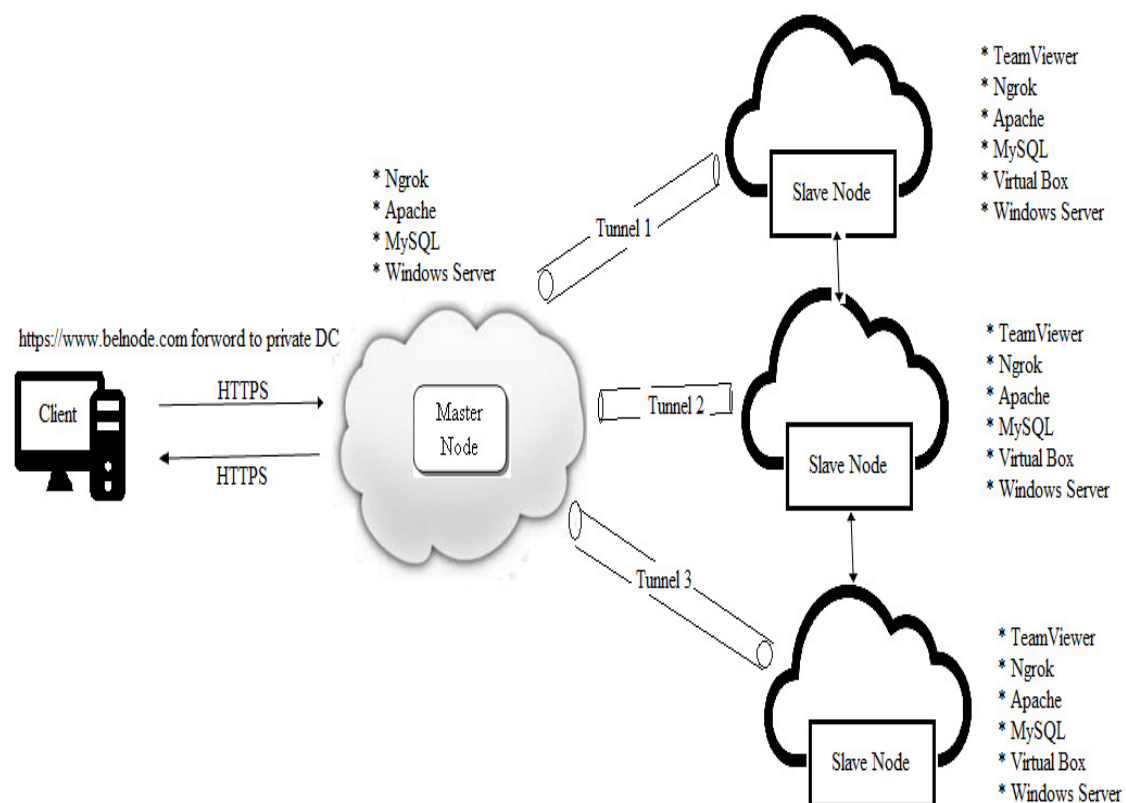


Figure 1. Diagram 1

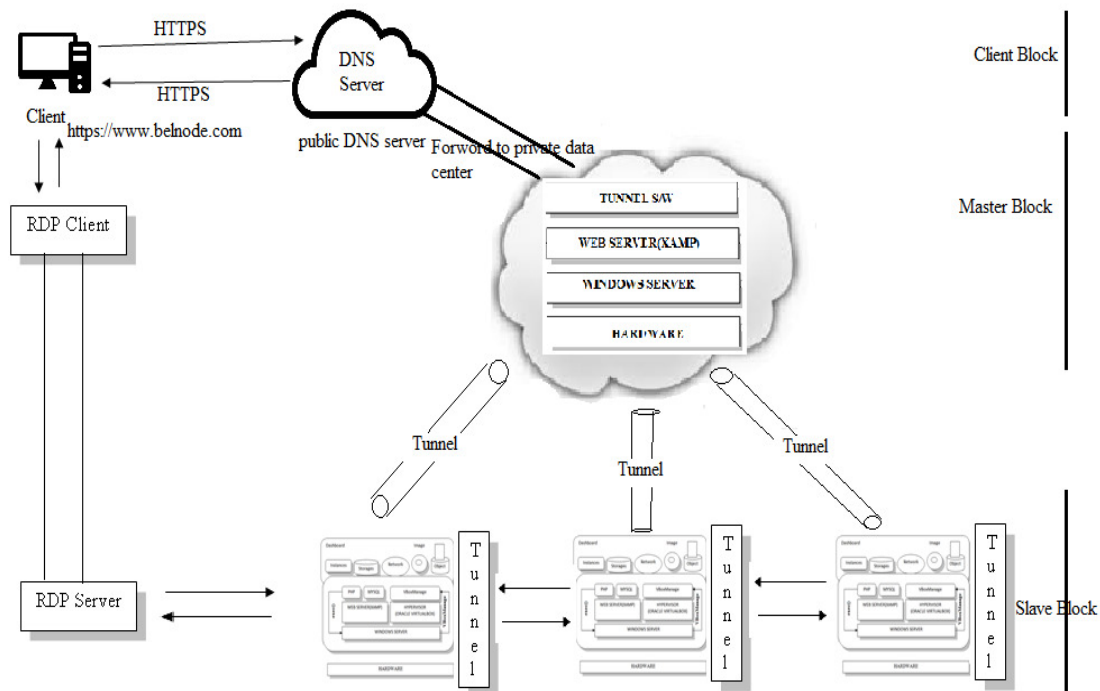


Figure 2. Diagram 2

A. Standard Hardware (Dell EMC Data Domain DD2200 Deduplication Storage)

Dell EMC data domain DD220 Deduplication storage is a small or midrange data center by DELL company. DD220 is 2U rack unit platform, the configuration of this device are 12 drive-system with 17.2TB of usable space.

B. Hosted Windows Server 2016 Operation System

Windows server 2016 developed by Microsoft, this server is a part of Windows NT version and concurrently with Windows 10. In our project we used hosted operating system, on the top of this, all other software is running.

C. Oracle Virtual Box

Oracle virtual box is a popular cross-platform hypervisor developed by Oracle. There are many version are available for Oracle virtual box software. We used Oracle virtual box 5.2.4 version for our project. The benefit of this software helps to run multiple operating systems at a time, that is called virtualization. Oracle virtual box is a type 2 or hosted hypervisor. In this type of hypervisor are run on top of the hosted operating system.

D. Apache HTTP Web Server

Apache HTTP web server is a free open source cross-platform software by Apache license 2.0. This software help to run our project through a browser.

E. MySQL Server

MySQL server is an open source software provided by GPL license. In this project, it used to maintaining our cloud user log details.

F. Ngrok Tunnel

The ngrok tunnel is software for creating a tunnel. The advantage of this tunnel software provides a secure channel between the master node and all slave nodes. Also, it helps to visible our cloud platform to worldwide.

G. Teamviewer

There are many RDP software is available Team Viewer is one of this. It used for controlling the remote desktop file transfer and web conference etc. It has many version we are using TeamViewer 12.

H. Domain Name

Domain name help to identify our project name and it redirects to the tunnel.

6. Requirements Analysis

A. Hardware Requirements:

- Machine : Intel® Core[TM] i3-3227U CPU
- Clock Speed : 1.90 GHz or More
- System Memory : 6 GB or More
- Hard Disk Space : 500 GB or More

B. Software Requirements:

- Operating System : Windows
- RDBMS : MySQL
- Web Server : Apache
- Web Browser : Mozilla, Google Chrome, Internet explorer
- Hypervisor : Oracle Virtual Box

7. Components and Services

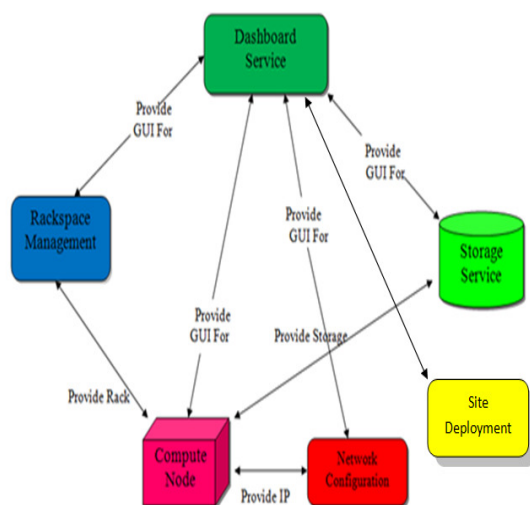


Figure 3.Components and Services

C. Dashboard Service

Dashboard service is the main component of our remote tool. Dashboard service provides a GUI based web interface for all users. Dashboard GUI based web interface helps the user to manage all other services. Because of GUI based web interface it easy to manage all service. Dashboard service also provides orchestration

for virtual machine provisioning. The dashboard is written in PHP code and hosted on Apache HTTP web server.

D. Compute Service

Compute service provide infrastructure as a service(IaaS). Compute service is responsible to create a Virtual Machine, VM clone, and VM migration etc. Compute service use Type-2 hypervisor for creating VMs. In this project, we use Oracle Virtual Box software for virtualization. Compute service is written in PHP code, VBoxManage libraries for manage VMs. Using this service we can run a different type of Operating system based on client needs. Compute service allow remote desktop connection for remote VM access using RDP software.

E. Storage Service

Storage service provides Storage-as-a-service (SaaS). Storage service is basically used for storing unstructured data in the cloud. Using storage service we can able to create a container, using container only we are able to upload data to the cloud. Also, we can able to download or delete container based on client needs the data. In this project Storage service also written in PHP code.

F. Network Service

Network component provides Network as a Service. Using this service client can able to deploy network topology They can also perform subnetting operation inside the data center.

G. Site Deployment Service

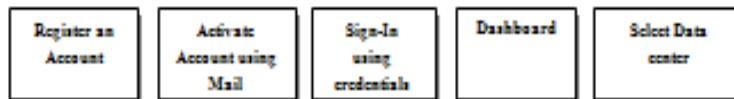
Site Deployment Service provides platform as a service (PaaS) to the client. This service provides the different type of platform (e.g. Apache, IIS, Tomcat, and Glassfish) for web application deployments.

H. Rack Space Service

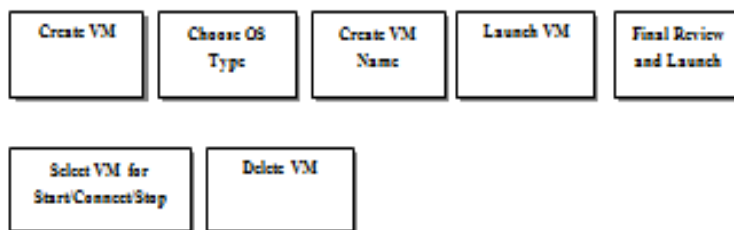
Virtual Rack Space provides virtual rack as a service. Rack space Service written in PHP code, It is a logical concept for VM management. Using this service client can able to store and manage there VMs into rack space. The client also can able to perform High Availability (HA) operation etc.

8. Deployment Steps

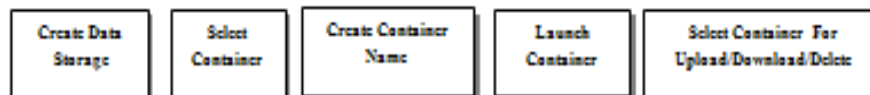
Dashboard Service



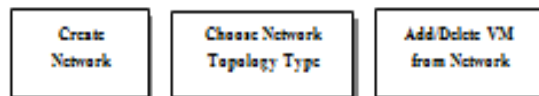
Compute Service



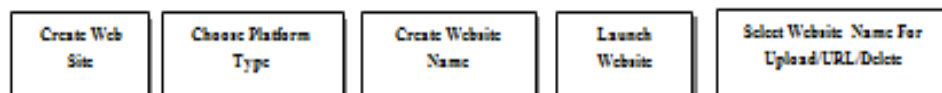
Storage Service



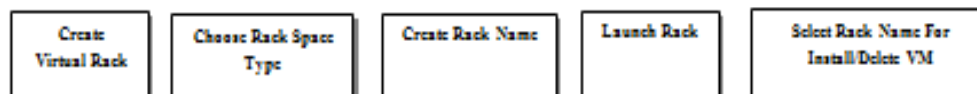
Network Service



Web Site Deployment



Virtual Rack Space Service



Account

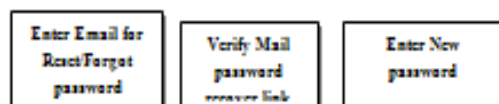


Figure 4. Deployment Steps

9. Screen Shots

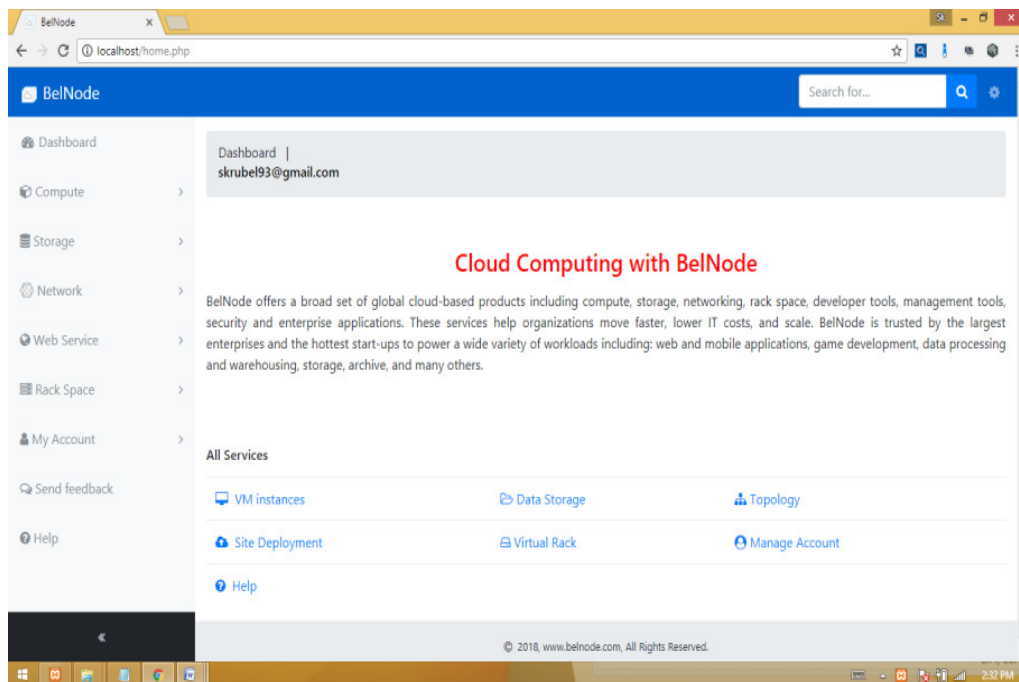


Figure 5. Dashboard Service

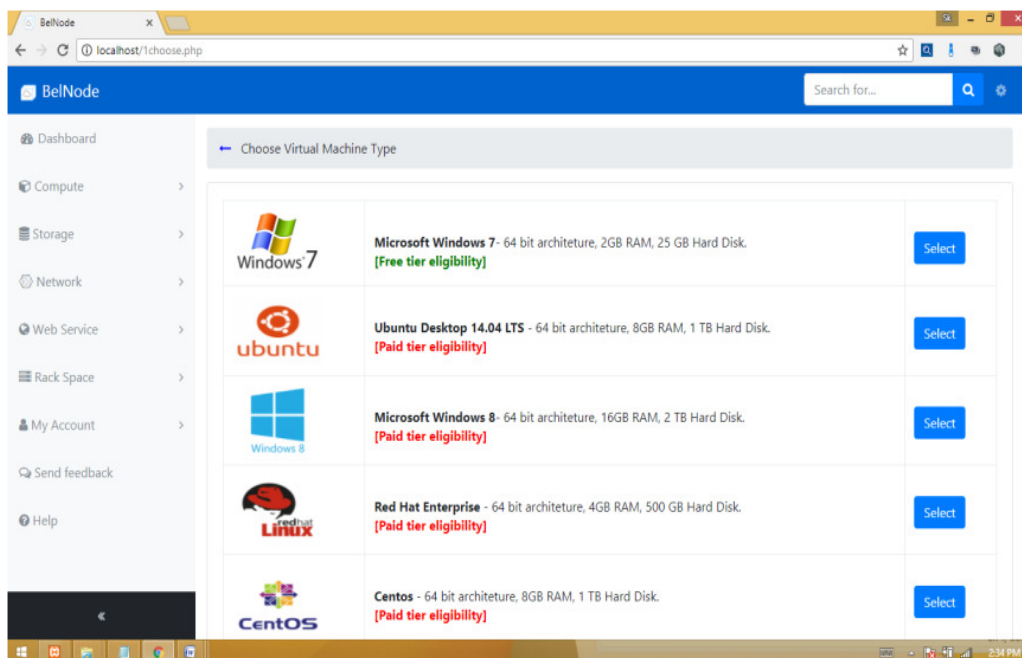


Figure 6. Create VM Instance

10. Conclusion

In this Paper, we introduce our remote orchestration tool in SDDC helps to provide automation as well as save the time of deployment. Software Defined data center also reduce the cost of investment. With the help of Software Defined data center, we can reduce traditional data center overhead. Using Remote orchestration tool, we can able to manage multiple remote nodes from a single place. This tool is running over the Internet so, anywhere anytime we can able to access remote data center resources.

11. Future Enhancements

- The current system is running on Windows Operating. But in future, we want to run this on the open source operating system(e.g. Linux OS).
- This tool used Oracle virtual box hypervisor software for virtualization. In future we want to use open source hypervisor (e.g. KVM).

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