Microsoft Private Cloud Infrastructure

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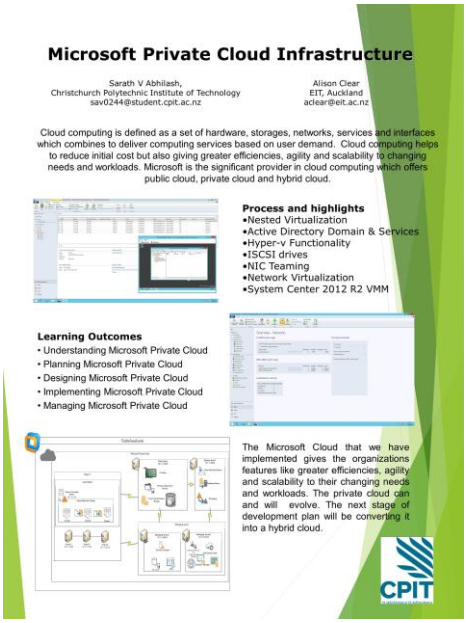
ABSTRACT
Cloud computing is defined as a set of hardware, storage, networks, services and interfaces which combines to deliver computing services based on user demand. Cloud computing helps to reduce initial cost but also gives greater efficiencies, agility and scalability to changing needs and workloads. Microsoft is the significant provider in cloud computing which offers public cloud, private cloud and hybrid cloud.

The purpose of developing this project for CPIT is to conduct research on Microsoft private cloud. It includes five infrastructures, Hyper V Infrastructure, VMWare Infrastructure, Data Server Infrastructure, Manage Infrastructure, and Backup Infrastructure. This report describes the different infrastructures, their functions and roles in implementing private cloud and different issues faced in implementation of Microsoft private cloud.

Categories and Subject Descriptors
C.2.1 Network Architecture and Design

General Terms
Performance, Reliability, Security.

Keywords
Cloud Computing



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1. INTRODUCTION
Microsoft Cloud computing creates new challenges for IT, offering powerful new capabilities that can cut costs while delivering new value. Using Hyper-V, System Centre Virtual Machine Manager and Operations Manager, organizations can bring the "cloud" architecture agility to their own datacentres. This is commonly referred to as a "private cloud". Private Cloud concept brings together the mind set of resiliency over redundancy, predictability through homogenization and standardization, resource (compute, network and storage) pooling, virtualization, fabric management, elasticity, partitioning of shared resources, and cost transparency.

This project is a research project on Microsoft private cloud implementation. It implements Microsoft a private cloud for any industry according to the users need. The users can run their machines on this cloud and also they can manage their machines according to their need. The concept provides a mechanism to test research questions about potential benefits of cloud computing.

Virtualization in computing is the creation of virtual version of hardware, platform, software etc. in this project we use this virtualization technology to implement the infrastructure in order to create a cloud. Using virtualization the administration of different resources can be simplified and also increase hardware utilization. Nested virtualization is used for Hyper-v servers.

2. PRIVATE CLOUD INFRASTRUCTURE
Microsoft Private Cloud Infrastructure includes:

- Hyper V Infrastructure
- Data Server Infrastructure
- Manage Infrastructure
- Backup Infrastructure
- VMware Infrastructure

2.1 HyperV Infrastructure
Hyper V Infrastructure include one windows server 2012 R2 running Hyper V role and two servers running Microsoft Hyper-v Server 2012 R2(x64). These hyper V servers used to run the virtual machines as required by the client. All the three servers are joined to the domain techcloudsav.com. Multipath I/O feature is installed on all the three hyper-v servers.

2.2 Data Server Infrastructure
Storage Server Infrastructure includes one windows server 2012 R2 running windows Deployment service. To this server different operating system images are loaded so the new virtual machine created can be installed with operating system through network based installation. This server has file and storage service running, it stores all the virtual machines installed in the Hyper V infrastructure. iSCSI target server role is installed on this server. Storage pool is created and on this storage pool iSCSI virtual disk is created and all hyper v hosts are added as the

initiators. SQL Server 2012 standard edition is also installed because System Center 2012 R2 required SQL Server in order to run. SQL database is configured to store Virtual machine login user details. Windows server backup feature is installed. A scheduled back up is created in order to back up every day at 9 pm .This server is also joined to the domain techcloudsav.com

2.3 Manage Infrastructure

Managing infrastructure includes two windows server. One server with windows server 2012 R2 standard edition running Active directory service with domain name techcloudsav.com and DNS service. Created a container on active directory to store distributed key management using ADSI Edit. Full permission is given to the VMM users to edit this container.

The other server is installed with windows server 2012 R2 Data Centre edition running system center 2012 R2 Virtual Machine manager. System center 2012 R2 Virtual machine manager is used to create, edit, start, stop and control Virtual machines running in the Hyper V infrastructure.it also used to see performance and utilization static of the virtual machines. Self-service user privileges helps the users manage their instances. Windows server backup feature is installed.

2.4 Backup Infrastructure

Backup infrastructure consist of a windows server 2012 R2. This server is used to store the backup files from the data server infrastructure servers and managing infrastructure servers. Veeam Server is installed in this server, used to back up and replicate the virtual machines created in hyper-v hosts as well as VMware Esxi hosts.

2.5 VMware Infrastructure

VMware infrastructure consist of a windows server 2012 R2 and two VMware Esxi hosts. VMware VCenter Server is installed in windows server. VMware Esxi hosts is used for run virtual machines required by the clients. These three machines are added to the domain techcloudsav.com**.**

3. NETWORK VIRTUALISATION

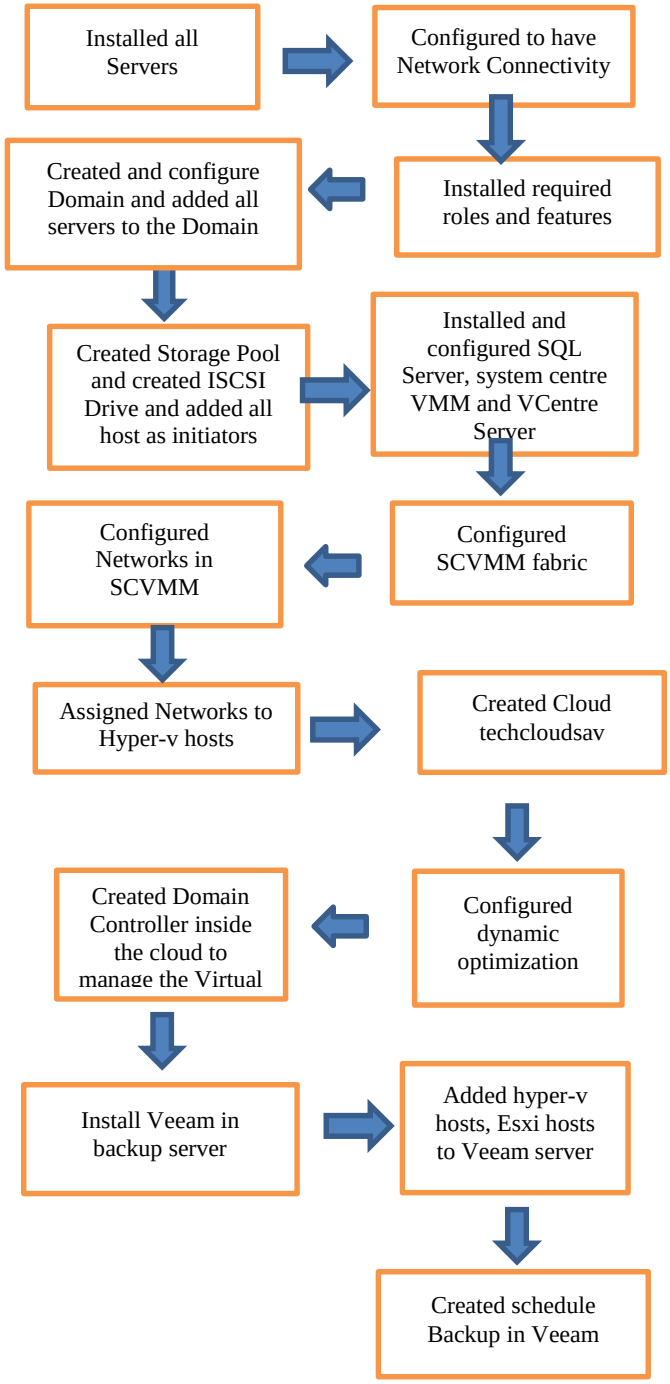
Network virtualization can solve various network challenges, it is the ability to stimulate the hardware platform in software. Network virtualization creates logical or virtual network from the network hardware. System centre 2012 R2 Virtual machine manager is used to create Network virtualization.

Logical Network is an abstraction of physical network and enables to make different network virtualized over it. Logical network consist of network sites, IP pools, VLANs that is used to organize and assign networks.

A Virtual network is created over logical network, it links logical network definition into network that can be connected in through hyper-v switch running on hyper-v host. Virtual network is created one per VLAN defined in logical network

A network site is created in a logical network. It defines the host group to which the network site is assigned. A network site associate on one or more subnets, VLANs and subnet/VLAN.

4. STEPS INVOLVED IN BUILDING TECHCLOUDSAV



5. CONCLUSION

The Microsoft Cloud that we have implemented gives the organizations features like greater efficiencies, agility and scalability to their changing needs and workloads. The private cloud can and will evolve. The next stage of the development plan will be converting it into a hybrid cloud.