



Cloud Autoscale Case Study



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1. Executive Summary

Most enterprises look to virtualization as a way to save money. But, virtualization is really an entry point to a datacentre architecture evolution that leads to cloud computing. Thus, virtualization should not be seen as just a consolidation or cost-savings project, but rather as the beginning of an overall long-term plan that provides an on-ramp to cloud computing.

Enterprises of all sizes engage in virtualization to consolidate and reduce costs, and many organizations have expanded virtualization to improve automation and operational expenses. Indeed, basic virtualization is just the beginning of abstracting underlying platform and infrastructure to improve the efficiency of operations and services. Today's organizations are experimenting with building private clouds that can be extended to a hybrid cloud architecture by extending "workloads" running from their own datacentre to a public cloud for maximum flexibility, and to optimize capital expense.

BSNL-Dimension Data in conjunction with Directorate of Information Technology, Govt. of Maharashtra (henceforth to be referred as DIT, GoM) have engaged into a similar initiative which allows DIT, GoM to extend their datacentre to a secure, public cloud environment in order to provide flexibility to meet increasing resource demands and optimize captive investments towards procurement of new infrastructure to meet the growing demands of nodal agencies requesting for additional resources to meet their seasonal needs.



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2. Introduction

DIT, GoM drives IT Infrastructure and eGovernance projects including Mission Mode Projects (MMPs) under NeGP, Govt. of India. Their objective is to create a better IT infrastructure and user friendly citizen services using advanced solutions from ICT that enhances and leads improvements in the quality of life in the state of Maharashtra. Due to the excellent IT Infrastructure and leveraging skilful human resources, the state of Maharashtra has emerged as a leader in utilizing IT skills for better governance and also proved to be a “Leader” in e-Readiness ranking in India.

Driving the Cloud Autoscale project is one of this advanced initiatives DIT, GoM has undertaken along with its extended datacentre partners, BSNL and Dimension Data and is the hallmark of driving “niche” ICT solution for better utilization of existing resources and optimize captive investments to meet the growing demands of business. DIT GoM’s private cloud is built upon VMware technologies and utilizes vCloud Director (vCD) and vCenter as the tool for operational and management of their private cloud environment.

Dimension Data in conjunction with BSNL have deployed public cloud services in India that are delivered out of secure, Tier III Certified and ISO27001 certified datacentres. Dimension Data Cloud Services are available across the Globe through Managed Cloud Platform (MCP), and are accessible via the Internet, Lease Line, MPLS options. It comprises of industry leading hardware, VMware virtualization technology, and Dimension Data CloudControl. Dimension Data CloudControl provides operational control and automation of cloud resource provisioning, orchestration, administration and billing. The MCP enables clients to manage their cloud assets via a web-based interface or REST-based application programming interface (API), supporting integration of the platform with third-party cloud or enterprise system management software.



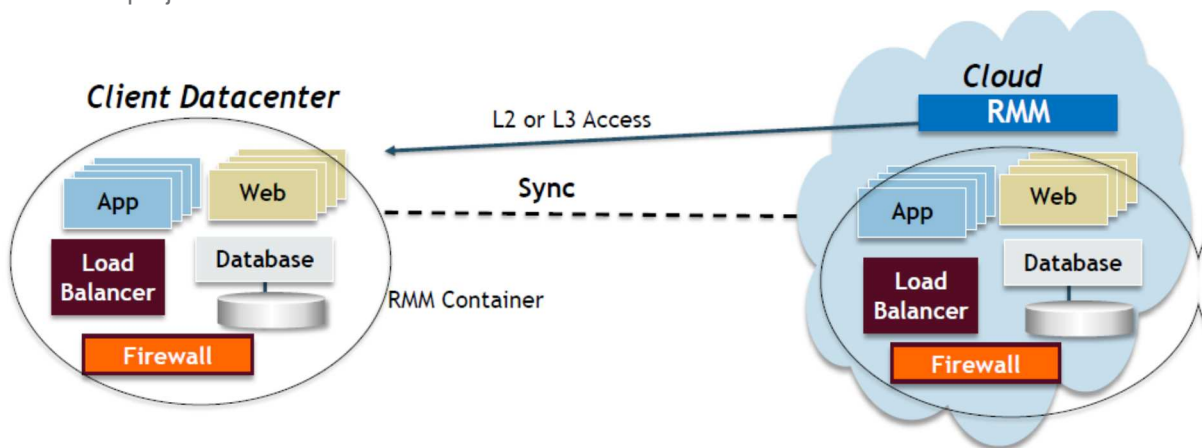
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3. Solution Overview

To explore the capability of Cloud Autoscale, DIT, GoM and Dimension Data technical team held multiple meetings between various stakeholders to build the use cases for testing the Cloud Autoscale capabilities between DIT GoM’s private cloud and BSNL-DD public cloud.

As the two environments were not connected to each other, it posed even greater challenges to meet the desired expectations of testing the Cloud Autoscale functionality.

Dimension Data ran through multiple solution options with DIT, GoM team before identifying the right partner solution that would meet the desired expectations and business outcome from the Cloud Autoscale project.



3.1. Initial setup and connectivity challenges

DIT, GoM project team and Dimension Data team identified resources to setup the environment for testing the Cloud Autoscale functionality between DIT, GoM’s private cloud and BSNL-Dimension Data enabled public cloud.

It was decided to setup a “test-bed” environment outside the production environment in DIT, GoM’s private cloud and couple of “workloads” were created to test the functionality of Cloud Autoscale.

DIT, GoM and Dimension Data engineers worked day-in and day-out, sometimes even at “odd ours” for setting up Site-to-Site VPN connectivity between the two environments to lay the foundation of testing Cloud Autoscale functionality.



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3.2. Solution for Cloud Autoscale

Dimension Data's solution team worked with their US partner solution team to identify and deliver the Cloud Autoscale demo between DIT, GoM's private cloud and BSNL-Dimension Data run public cloud through a software based solution that leverages the API layers for both VMware enabled vCloud Director and Dimension Data CloudControl automation / orchestration layer.

The solution identified by Dimension Data has a unique blend of capabilities that address the evolutionary flow of workloads from virtualization in the datacentre / private cloud to the public cloud environment and provides the intelligence and automation needed to meet these changing needs.

Key benefits derived out of the solution were the following:-

- On-demand to meet changing business needs for Cloud Autoscale
- Balances availability and cost by seamlessly transitioning from private cloud to public cloud shared resources
- Controls consumption with transparency
- Data migration and Cloning independent of image migration
- Bi-directional Cloud migration
- Ability to sync to remote datacentre / cloud
- Mobility across private virtual cloud to public cloud
- Support for Hybrid cloud (private to public cloud)
- Automated scaling / bursting in and across cloud
 - Increase availability of enterprises by meeting demands for additional resources to meet growing business demands
 - Lower cost for enterprise IT providers by leveraging scalable, elastic public cloud environment for meeting seasonal workload needs

3.3. Cloud Bursting – Launching Cloud Machines to meet demand on-the-fly

The solution identified by Dimension Data delivers automatic scaling between private and public clouds. The solution's AutoScaling feature provides server resources on demand based on real-time usage, load and performance. Groups of hosts can be defined with operational parameters that influence when hosts are activated and deactivated to meet these fluctuating demands.

- ScaleOut and ScaleIn operations are “triggered” as load increases above or below set points
- Scaling to the number of hosts specified by minimum and maximum parameters

In the demo, Dimension Data partner solution team demonstrated Cloud Autoscale / Cloud Burst between DIT, GoM private cloud to BSNL-Dimension Data public cloud using CPU defined triggers.



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3.4. On-boarding – Migrate workloads between datacentre and clouds

The solution has an on-boarding capability that utilizes a push button, automated mechanism to move workloads between different datacentres and cloud via the WAN. It is an easy and convenient process that has the advantage of creating an exact duplicate of the image (minus the network specific elements) without the burden on the administrator of any Image creation or complicated configuration. All Operating System and application settings are maintained in the process. Once, the image is pulled into the destination datacentre / cloud, the new network and storage identify can be defined, then the Image assigned to a System (virtual machine instance):

- Push-button, Automated On-boarding
- Automated, semi-Automatic, or manual configuration of application in the new environment
- Transfer the image(s) securely to new environment



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4. Conclusion

Cloud is leveraged for all kinds of business processes such as Websites, retail transactions etc. to name a few. At the same time, Cloud resources rarely work optimally in isolation but are deployed most effectively working in conjunction with other resources in the datacentre. In fact, an ideal use for Cloud Computing is to address peak loads of applications that have great swings of demand.

It is typical for a core set of resources to be deployed to meet normal level of demands. But, building out datacentre infrastructure in anticipation of these peaks is not cost-effective as they may be idle a majority of the time. Investment in capital and heavy maintenance costs such as power, cooling and administration are prohibitive.

Achieving cost objectives and meeting peak demands without degraded or interrupted service, requires a cohesive system of workload mobility and policy framework that spans multiple environments. The necessary elements of a Cloud Bursting solution include efficient On-boarding of existing applications to the Cloud, along with dynamic scaling of resources based on policy (AutoScaling).

DIT, GoM and BSNL-Dimension Data have partnered together to deliver this excellence in technology that drives innovation, optimizing costs thus realizing the full potential of Cloud Computing.

