<u>**Symposium Tutorial**</u>

Resource Management in VMware Powered Cloud: Concepts and Techniques

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Abstract:

In this tutorial we will discuss three layers of VMware software stack that work together to create a cloud environment. These layers include ESX hypervisor, VirtualCenter (vCenter) for management and vCloud Director to combine various virtual centers in to a scalable cloud environment. I will describe each one of these in more detail, while focusing on resource management controls that are provided at each layer. First, I will present the high level architecture of ESX and resource management model that is available for better performance isolation among VMs and high consolidation. ESX provides a very rich set of controls for all resources including CPU, memory, network and storage IO. The next step in resource management is providing techniques to handle a group or cluster of hosts. VMware technologies such as DRS can take care of automatically placing VMs on a cluster and performing load balancing across hosts using live migration of VMs (a.k.a. vMotion). Similarly a recent feature called Storage DRS provides initial placement of virtual disks on a cluster of storage devices and does load balancing across storage devices using live virtual disk migration. I will conclude with our cloud product called vCloud Director, which allows federation of multiple vCenters.

Presenter Biography:

Pradeep Padala is a senior member of technical staff in the distributed resource management team at VMware. He is working on developing automated resource management mechanisms for the cloud tackling problems of optimized placement and balancing. In the past, he worked as a research engineer at NTT DOCOMO USA labs, focusing on network virtualization. He received his PhD from the University of Michigan in 2009. He is the recipient of two best paper awards at the USENIX ATC 2010 and ICAC 2011. He has served on the program committees and presented at various conferences including Eurosys and USENIX ATC.