

The Virtual Block Store System

Xiaoming Gao¹, Mike Lowe², Marlon Pierce¹

¹Community Grids Laboratory

²University Information Technology Services
Indiana University

Abstract

The fast development and deployment of cloud computing systems stimulate the needs for a standalone block storage system which can provide flexible in-line and off-line block storage services to the virtual machine instances and virtual clusters maintained by the cloud management software. This poster presents the Virtual Block Store (VBS) System, a standalone block storage system developed by the Community Grids Lab of Indiana University. We have built a prototype of VBS based on LVM, iSCSI, and Xen hypervisor, which can provide basic block storage services such as creating and destroying logical volumes and snapshots, and attaching and detaching a volume to/from a running Xen DomU instance. The concept and functional interfaces of VBS are based on the Amazon Elastic Block Store (EBS) service; moreover, VBS can be used independently and directly with an existing volume server and Xen nodes, and can be easily extended to support other VM management systems, and integrated to various cloud computing systems.

In this poster we will present various aspects of the design and implementation of VBS, including its system web service architecture, functionality and service interfaces, workflow, metadata maintenance, and implementation details. Based on this prototype we will further discuss the prospective challenges in the future development of VBS, including scalability, consistency, reliability, etc., and talk about directions of our future research, such as support for other VM management systems, and integration with the Nimbus project at the University of Chicago.

Keywords: Cloud Computing, Block Storage System, Virtual Block Store