Peak2Cloud: Scientific Computing on the Cloud

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Peak2Cloud (P2C) is an Openstack-based private cloud for scientific and high performance computing. First, we present how P2C was configured and tested. Then we describe vcluster, a tool for rapidly deploying message-passing clusters on P2C. Lastly, we analyze some benchmark results on the performance of P2C deployed virtual clusters.

1. INTRODUCTION

Cloud computing has become a buzzword in today's modern computing, though there is no agreed upon meaning of the term. In 2011, NIST [Mell and Grance 2011] published a definition that is widely quoted and used. The popularity of cloud computing mainly comes from its ability to provision additional resources on demand with minimum intervention from the provider. It leverages advances in virtualization and web services technologies. For example, a website with a sudden increase in workload can start another server machine (virtual) almost instantaneously to accommodate the additional load.

Cloud computing offers service models which include Software-as-a-Service(SaaS), Platform-as-a-Service(PaaS), and Infrastructure-as-a-Service(IaaS). IaaS allows the consumer to provision computing resources(hardware, network, storage) to run arbitrary software including operating systems [Mell and Grance 2011].

2. RELATED WORK

Studies have been published to evaluate the applicability of the cloud for scientific computing.[Ekanayake and Fox 2010] [Evangelinos and Hill 2008] [Expsito et al. 2013][Ludescher et al. 2013] [Mauch et al. 2013][Jackson et al. 2010][Zhai et al. 2011] [Walker].Most of these utilized the public cloud, specifically Amazon EC2 as their testbed.

3. METHODOLOGY

4. RESULTS AND DISCUSSION

5. CONCLUSIONS

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