# Peak2Cloud: Scientific Computing in the Cloud

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**Abstract**

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

**Index Terms**

cloud computing, scientific computing, high-performance computing, message passing

## I. 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 [**?**] 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 [**?**].

## II. Related Work

Studies have been published to evaluate the applicability of the cloud for scientific computing.[**?**] [**?**][**?**][**?**][**?**][**?**][**?**][**?**][**?**].Most of these utilized the public cloud, specifically Amazon EC2 as their testbed.

### *A. subsection*

### *B. another subsection*

## III. Methodology

### *A. Openstack*

### *B. Hardware Requirements*

### *C. Network Architecture*

### *D. vcluster*

### *E. Benchmarks*

## IV. Results and Discussion

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Table I
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## V. Conclusions

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## APPENDIX A
## FIRST APPENDIX

Citation:

## APPENDIX B
## SECOND APPENDIX

## ACKNOWLEGMENT

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