Proof of Concept

Joint

Execution

Plan

Agreed upon scope of work for a joint proof of concept project by Oracle North America Technology Division Solution Engineering

And Rice University, Houston, TX.

**DATE: 10/13/2020**

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| Company Overview  rice-university-logo - Academy of Modern Art  Rice University is ranked among the nation’s top 20 universities by U.S. News & World Report.  They are one of the nation’s leading wide-spectrum research universities, with a beautiful campus located in the heart of Houston, one of America’s most dynamic, diverse and cosmopolitan cities. They seek to translate their research insights into social benefits for the community, the nation, and the world. New technologies, applications, and insights will allow them to bring greater prosperity and well-being to our world. 🡪 [[1]](https://research.rice.edu/) ***Source Rice University***  POC Summary  The POC will leverage this existing OpenNebula environment to manage and provision the acquired compute nodes. In addition, OpenNebula currently supports bursting into both the AWS and Azure commercial clouds. In order to take advantage of existing service relationships at Rice University, CRC is planning to make modifications to this cloud bursting functionality to include Oracle Cloud Infrastructure. This will expand the pools of available resources when re- quired by user demands and increase operational flexibility.  Why Oracle  With more than 430,000 customers – including 100 of the Fortune 100 – and with deployments across a wide variety of industries in more than 175 countries, Oracle offers a comprehensive and fully integrated stack of cloud applications, platform services, and engineered systems. Oracle has been in business since the late 70s and has grown to a $37.7 billion business spending over $6 billion annually on R&D to provide its customers world-class cloud and on premise solutions.  From data center operation to cloud applications, Oracle not only eliminates the complexity that stifles business innovation, but also engineers in speed, reliability, security, and manageability. Oracle’s industry-leading cloud-based solutions give customers complete deployment flexibility and unmatched benefits including application integration, advanced security, high availability, scalability, energy efficiency, powerful performance, and low total cost of ownership.  Why Oracle Cloud Infrastructure  Oracle Cloud Infrastructure (OCI) is an IaaS that delivers on-premises high-performance computing power to run Cloud native and enterprise company’s IT workloads. OCI provides real-time elasticity for enterprise applications by combining Oracle's autonomous services, integrated security, and serverless compute.  OCI is built for innovation. This includes industry-leading scalability and availability, integrated governance and control, and reliability backed by end-to-end SLAs. Oracle’s cloud mission extends to supporting emerging technologies such as AI, machine learning (ML), the Internet of Things (IoT), blockchain, and human interfaces.  In addition, Oracle’s IaaS offering delivers a diverse range of capabilities unmatched in the industry—from its second-generation platform and suite of bare metal services to remote direct memory access (RDMA) for technical computing clusters. This differentiation enables Oracle Cloud Infrastructure’s guarantee on both predictable performance and customer isolation.  <https://www.oracle.com/a/ocom/docs/oracle-cloud-infrastructure-ten-reasons.pdf> Scope and Approach The scope and approach of the conduct of the POC is included in the matrix below: Kickoff meeting to review proof of concept use cases, success criteria and deliverables The Oracle team will review the POC success criteria and deliverables with R.U. team and key stakeholders during the POC kickoff meeting. The intent will be to arrive at a mutual agreement on the success criteria for the proof of concept. Proof of concept Dates The POC will begin with a two-hour kickoff presentation on **October 8, 2020** and the POC will be completed by **October 29, 2020** with a final executive use case readout and walkthrough. Provision environment for POC This is estimated to be completed by the kickoff on **October 29, 2020**. Execute Use Cases and Tests The Oracle team along with the R.U team will jointly execute the use cases and tests during the course of the POC effort. Please see the use case matrix for full details. Document Results The Oracle team along with the R.U team will jointly review the results for the POC and the Oracle team will be responsible for documenting the results. Conduct Proof of concept Debriefing The Oracle team will conduct a read out with the customer on the results of the POC on **May/05/2020**. De-Provision POC environment Upon successful completion of the POC, the provisioned Oracle Cloud environment will be de-provisioned, unless other arrangements are made, such as purchase. Timelines A high-level project plan for the POC outlining the major tasks/milestones and duration is included below:   |  |  |  |  | | --- | --- | --- | --- | | **MileStones** | **Responsible** | **Start** | **End** | | Quick tour/demo on OCI/HPC/GPU and JEP | Oracle | 10/15/2020 | 10/15/2020 | | Rice tenancy provisioning | R.U/Oracle | 10/13/2020 | 10/23/2020 \* | | OCI deep dives / demo on Network architecture/FSS/ BOM | Oracle | 10/22/2020 | 10/22/2020 | | Rice familiarity with OCI | R.U | 10/23/2020 | 10/29/2020 | | Handover OCI tenancy to Rice | Oracle | 10/29/2020 | 10/29/2020 | | Rice workload bursting/testing | R.U | 10/29/2020 | 10/29/2020 | | Oracle/Rice update follow up call | Oracle/R.U | 11/30/2020 | 11/30/2020 | | Credit evaluation / Tenancy upgrade to paid | Oracle/R.U | 12/07/2020 | 12/07/2020 |   \* End date is dependent on receiving completed research application form Rice Proof of Concept Architecture This POC is part of a bigger Oracle Cloud Strategy for Rice University as illustrated below:  Proof of Concept Architecture does not represent the full end-state architecture. Below is a diagram of the proposed POC solution architecture.  **<Diagram>**    **Diagram: POC Deployment Architecture**  **<Diagram>** POC BOM:   Notes :   1. Shape service limits can be requested based on the quantity/service limits column 2. Suggested to start using a lower VM GPU shape (i,e 3.1) and scale up the cluster for desired performance.    1. VM GPU shapes have lower CPU and this satisfies the minimal CPU requirement for Computer vision    2. Cluster scaling can provide better GPU utilization and better price-performance    3. Price performant as nodes can be scaled dynamically based on workload 3. Scale up to BM 3.8 and BM 4.8 shapes for larger loads. This is because    1. Better utilization for larger workloads    2. Better price performance if all cores are utilized during the run    3. GPU4.8 can give better performance (10x GPU RAM) than GPU3.8    4. GPU4.8 can be used to leveraged if workloads have high data transfer rates across nodes 4. For other data science drivers (moderate + large CPU)    1. Suggested to start with VMGPU3.2/3.4 and scale shapes to BM.GPU3.8 or BM.GPU4.8  Success CriteriaTest Cases |  |

# Deliverables

# Proof of Concept Requirements and Prerequisites

1. R.U. will provide appropriate resources including, but not limited to, a PM level main point of contact and SMEs to assist on the POC.

# Logistics

**Location**

Remote via Zoom sessions.

**Data Cleansing**

Should any data need to be cleansed prior to conducting the POC, R.U will have the responsibility to provide Oracle with the cleansed version prior to use in the POC

# Out of Scope Items and Assumptions

1. Data cleansing (deduping, normalization, rationalization, etc.). This will need to be done prior to POC
2. Database data modeling tasks
3. Implementation of FastConnect is out of scope for the POC which means we won’t’ be able to measure end to end Performance (Client to Server)

# Contacts

**Rice University POC Sponsors / Team Members**

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# Signature Block

By executing the signature blocks below, the parties to this Joint Execution Plan, who are authorized to commit the resources of both parties, do hereby authorize the work contemplated in the document and that the successful completion of the scope of the document shall be reviewed and upon agreement of commercial terms, form the basis of the purchase of Hardware, Software, Cloud Services and Professional Services from Oracle Corporation.

The purchase of any Hardware, Software, Cloud Services, Professional Services, or other service offerings, programs or products are all separate offers and are not included in this JEP. You understand that you may purchase any of these offerings independently of any other order. Your obligation to pay under any order is not contingent on performance of any other service offerings or delivery of programs or products.

The Effective Date of this Joint Execution Plan is \_\_\_\_\_\_\_April/20/2020\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_.

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| R.U. Authorized Signature: | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | Oracle Authorized Signature: | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
| Name: | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | Name: | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |
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| Signature Date: | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |  | Signature Date: | \_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_\_ |