Cloud Computing Architecture

Assignment 3

Multi-Cloud Architecture Deployment

Due date: 09:00 AM (AEST) Monday of Week 12 (end of Week 11), to Canvas.
Late submissions will not be accepted for this assignment.
No Extensions will be available for this assignment.

Presentation Interview (required): Taking place in Week 12. Appointments for presentation will be scheduled and announced during week 11. Go to **Canvas | People | Assignment 3 – Groups** and form a group and send your group details (screenshot) to your tutor *by end of week 10*.

Prerequisite requirements:

1. Scored at least **70%** in **every** Intermediate A Tasks (**Labs, Assignment 1a, Assignment 1b, MCQ Test 1** and **Lecture Quizzes**)
2. Submitted **Assignment 2**

All supporting materials mentioned in this document can be found in the corresponding assignment page on Canvas.

This assignment must be completed as a group of minimum three(3) and maximum four(4) students.
It will be beneficial to have multiple perspectives on a problem when discussing design alternatives.

Additional requirements will apply to group submissions, as indicated below in this document.
To form your group, go to *Canvas/People/Assignment 3 – Groups*.
Only one student per group should submit the assignment Report file, however, all group members must present in week 12.

Objectives

In this assignment, students will deploy a multicloud architecture, leveraging what they have been learning about AWS and OCI cloud services during the semester.

NOTE: students are expected to research any new requirements that have not been covered during the semester and be able to deploy necessary services to satisfy the specified requirements for this assignment.

Business Scenario

The same website that was deployed for assignment 1 and 2 will be used for this assignment but in a multicloud infrastructure:

- AWS to host the compute nodes (e.g. webserver)
- OCI to host the storage services (e.g. database, object storage)

Deployment Requirements

1. Webserver will run on AWS cloud;
2. MySQL Database will run on OCI cloud;
3. Due to security reasons, Webserver MUST connect to MySQL database via its private IP address, over a private IPsec VPN connection between the two cloud environments; **NOTE:** IPsec connection does not require to have both Tunnels configured and running. One Tunnel is enough to provide the required connectivity;
4. Images are stored on OCI object storage bucket that can be publically available.

Architecture Design

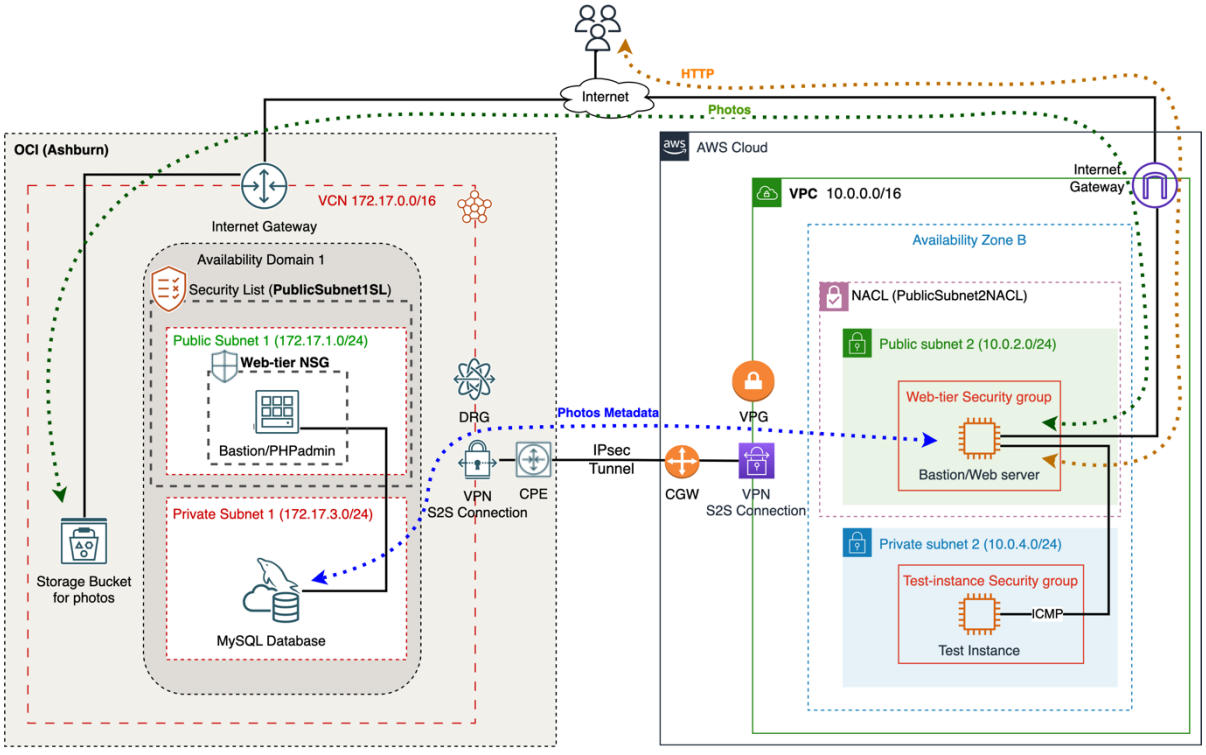

Figure 1: Architecture Diagram (AWS and OCI)

Submission

For this assignment you MUST:

- Submit a **single PDF document, maximum 15 pages**, in **IEEE Conference Style in either one or two column mode** submitted to Canvas by the due date.
- Provide a **presentation**, scheduled for week 12 (presentations timetable will be announced by week 12).
  NOTE: For Assignment 3 presentations, students to be prepared for technical questions about their assignment. Students must be able to answer questions by navigating through their assignment 3 report document and its architectural diagram. Students could optionally prepare a power point presentation file (maximum 3 minutes can be given to each student to present during their presentation).

IMPORTANT: both submissions mentioned above are MANDATORY for this assignment. Group members who are not able to present their part of the project will receive no marks for this assignment.

Group Submissions: Groups of **maximum 4 students** can be created via *Canvas/People/Assignment 3 - Groups* tab. Your submission **must** also include the details of the tasks that have been allocated to each individual group member.
Irrespective of task allocations, all team members are expected to be able to understand, analyse and demonstrate all tasks.

Marking Scheme

Deployment

- Requirements are met.
- Services fulfill new requirements in a well-deployed architecture.
  - Security is provide in the least priviledged manner
  - Database traffic is only traversed over private VPN connecton
  - Webserver is only available on AWS via a unique URL
  - Storage services are running on OCI only

Documentation and presentation

- Report document to meet the same formate requirements as specified in Assignment 2.
- The report document to include detailed description of the function of each service. Service descriptions are adequate. Explain the functionality of service and why it is used.
- The report document to include your research results about different type of private connections between cloud providers (e.g. DirectConnect, FastConnect, IPsec VPN…) and their differences.
- The repot must include a list of group memebers and a break down of tasks that each individual group member was responsible for, in this assignment.
- Presentation is timed and each student will have to keep their presentation within 2-3 minuts.
- Students are supposed to be prepared for technical questions and may be asked to

demonstrate and explain some particular configurations of their deployment, during their presentation.

Assignment 3 Checklist

Make sure all the following task are successfully completed.

Submission Checklist

Student Name: ……

Student Id: ……

Tutorial time: ……

Date of submission: .....

OCI account/tenancy name: .....

Submit to Canvas:

- ☐ A PDF document file as specified in the Submission section of the assignment specification.
- ☐ Public URL has been provided in the document.
- ☐ IAM user has been created and its details have been provided to your tutor.

NOTE: for the rubric details and a breakdown of allocated marks, please refer to Canvas, **Assignment 3**, and **Assignment 3 Presentation** pages under the "Assignments" tab.

END