UNIVERSITY OF LINCOLN

# University of Lincoln Assessment Framework
# Assessment Briefing Template 2020-2021

**Module Code & Title: CMP2808M Cloud Computing**

**Contribution to Final Module Mark: 40%**

**Description of Assessment Task and Purpose:**

**Overview**

Your task for this assessment is to programmatically specify and deploy cloud service resources using a combination of DevOps focused console and template tooling. Using the tools, you will develop a cloud 'infrastructure-as-code' solution for an industry scenario. Through a declarative approach using a combination of **YAML** configuration and associated **Jinja** template files, you will be able to create and fully deploy a non-trivial cloud service configuration that meets the needs of the industry scenario.

**Industry Scenario**

You are acting in the role of a Cloud Architect and are responsible for the development and repeatable deployment of scalable cloud services for a large organisation. This is to support the migration and rapid growth of its mobile shopping business. Your role is to manage the development and deployment of the required cloud service resources to support the migration of the organisation's servers, networks, data storage, and suitable remote admin access to the cloud data storage. This enables the organisation to quickly react to the growing requirements of the organisation's web traffic and data storage requirements. The organisation has a preference for a 'lift and shift' approach, where their on-premise virtual machines are migrated to the cloud IaaS model. You should therefore focus your efforts on IaaS services where appropriate to do so.

**Development**

This development approach allows you to programmatically specify the cloud resources needed for the task in a declarative format using a single YAML based configuration file and supporting Jinja templates (do not use Python templates). The YAML and template files will be deployed via the Google Cloud Deployment Manager(DM) (https://cloud.google.com/deployment-manager/docs/fundamentals). The supporting Jinja file templates should also be used to parameterize your cloud service configuration and facilitate reusability of your code for repeatable cloud service deployments. In summary, your YAML and Jinja template files will be deployed using DM and the Google Cloud SDK which is freely available here: https://cloud.google.com/sdk/docs/install#windows for Windows, macOS and various Linux distributions.

You can only use the DM service for the cloud resource types listed at the following link, with emphasise on mostly using IaaS service types: https://cloud.google.com/deployment-manager/docs/configuration/supported-resource-types , you cannot use any other cloud service types for your solution other than those listed at the link. There are further exceptions to this, for the purposes of this assessment you **must not** use the following DM resource types:

**appengine.x.x**

**bigquery.x.x**

**bigtableadmin.x.x**

**spanner.x.x**

**iam.x.x**

There may be further exceptions for resource types that have not been identified but in general the vast majority are available to use. If you come across a resource type that states your project space does not have the correct **permissions** to deploy it then please inform the module coordinator for further advice.

**You will not be supplied with a definitive list of cloud resources to create and deploy to meet the organisation's requirements**, and instead should use the knowledge and skills you have gained in the module along with independent study to provide the most appropriate solution that you can – note there is no single correct solution as there are many cloud resources type solutions that could fit. Essentially, each student can demonstrate their intellectual curiosity and technical creativity when designing and developing their own solution. However, it should be assumed that the deployment should include core IaaS resources such as virtual machine instances in the form of suitable server instances, virtual network and subnets. Other core services should include storage services, as well as scaling services where appropriate to do so.

The YAML configuration file and template files you create should adopt an optimal approach to limit code repetition, with the emphasis on reusable templates as building blocks for importing in your configuration file. You are also expected to provide clearly written code that is suitably commented throughout both the configuration file and templates. Properties and parameters for all cloud resource types should be used correctly to define their deployment to a good standard.

Your entire solution must be able to run from a **single** YAML configuration file named with your studentID, for example **12345678.yaml**, of course this single configuration file can automatically import and run as many well-considered Jinja template files as your solution contains.

**Resource Limitations**

The maximum number of compute and SQL instances you should use as part of your solution is 8 total. Please note this is not the 'perfect' number you should aim for; solutions can be created with less. Its purpose is to provide a hard resource cap and notification to you that the business scenario given in this brief does not require more compute instances beyond this total.

**Learning Outcomes Assessed:**

LO2 Design and implement a cloud solution.

**Knowledge & Skills Assessed:**

- Analyse a case study for a cloud-based system (provided in the Overview and Industry Scenario sections of this briefing document
- Define virtualization of computing, storage, and networking resources;
- Deploy compute, network and storage cloud services and outline their role in enabling the cloud computing system model;

**Assessment Submission Instructions:**

You must make an electronic submission of your work inside a single ZIP file to the supporting documentation upload areas on Blackboard. The ZIP must only contain the below:

- Your complete YAML configuration file (named only using your student ID), associated Jinja template files, and schema files. The YAML file must have the file extension .yaml,

the templates must all use the .jinja file extension, and the schema files can use a .jinja.schema file extension.
- There should be NO other files types in the ZIP file except the YAML file, Jinja templates, and Jinja schema files.

No reports, diagrams, or any other materials should be submitted.

**Date for Return of Feedback:** The final deadline for submission of this work and feedback date is included in the School Submission dates on Blackboard.

**Format for Assessment:** This assessment is individual work. Your work must be presented according to the Lincoln School of Computer Science guidelines for the presentation of assessed written work.

Please make sure you have a clear understanding of the grading principles for this component as detailed in the accompanying Criterion Reference Grid.

If you are unsure about any aspect of this assessment component, please seek the advice of a member of the delivery team.

**Feedback Format:** Feedback will be provided on Blackboard with comments for each criterion in the supplied CRG grid. This will include feedback on the structure of the YAML and template files, their reusability, and complexity to meet the needs of the business scenario.

**Additional Information for Completion of Assessment:** You must not develop for any other cloud vendor other than the Google Cloud Platform using the cloud project space supplied by the delivery team.

**Assessment Support Information:** Details of the online lecture and workshop hours are detailed on your timetable. Additionally, further support is offered by the Demonstrator Helpdesk Teams site, which runs Monday – Friday 9-5pm.

**Important Information on Dishonesty & Plagiarism:**

University of Lincoln Regulations define plagiarism as 'the passing off of another person's thoughts, ideas, writings or images as one's own...Examples of plagiarism include the unacknowledged use of another person's material whether in original or summary form. Plagiarism also includes the copying of another student's work'.

Plagiarism is a serious offence and is treated by the University as a form of academic dishonesty. Students are directed to the University Regulations for details of the procedures and penalties involved.

For further information, see www.plagiarism.org


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