Overview:

TechnoCratic Info Solutions (also known as TIS) is an Infrastructure and Cloud service provider. They are providing Cloud architecture, deployment and operations support services to one of their customers who is looking to add a few more applications to their portfolio but want to reduce the overall operations expenditure and improve the application environment delivery timeline.

In turn it is up to TIS to manage the delivery and support with the present small team that they have for the customer. TIS is thinking of coming up with a solution that makes use of few of the cloud services and develop automation scripts to:

- Make the process simpler for the end user to request the application environment
- Come up with a quicker and automated way of deployment of the cloud resources required for the **application environment** on receipt of request from the end users
- The automation solution should be able to deploy and configure the necessary services and components required for the application environment without any manual intervention

Note: **Application environment** means all the infrastructure and software components required for one instance of the application to run. For example a particular application may need the following components for one instance of the application to run (we call this entire set of components as one application environment).

- 2 web servers each with 1 cpu, 2 GB memory and 10GB hard disk, with Apache HTTP server software installed
- 1 database server with 1 cpu, 4 GB memory and 30GB hard disk, with MySQL software installed

Solution requirement:

After having thought through various options, TIS has come up with the following requirements for the automation solution.

You need to provide a solution that comprises of the appropriate cloud services, any other tools/software/services if necessary service is not available in the cloud, while taking into consideration these requirements:

Sr. No.	Task description		Remarks
1	The end user should be provided with one of the following methods to request for application environment (you can create a solution for any one of these methods not both)		
	Method 1: Provide a web portal to the user that will collect the following information from the user		**Solution (Phase2):** Consider one of these methods in your solution **Automation/Code (Phase3):** This is optional when you develop the Code / automation solution, however having this in your code will be given additional weightage
	Method 2: User should send an email to the email address of admin team and provide the request details in the pre-defined format (you define the format)		
2	For this automation solution, it has been decided to carry out a pilot for which the "Synergy" application has been chosen to start with. This application is not very business critical but there are a lot of requests from users for creation of environments for this application.		
	Synergy app: The synergy app environment requires the following components.		
	1	A network with 2 subnets - One public subnet i.e. internet facing subnet (instances launched in this subnet should be able to access the internet and the instances should be accessible from the internet over public IP address of the instance) - One private subnet i.e. internal subnet (instances launched in this subnet should not be accessible from the internet). Consider necessary cloud network components in your solution to provide the appropriate access for the respective subnets.	**Solution (Phase2):** Your solution must show necessary cloud service components for this requirement **Automation/Code (Phase3):** You may skip code development for this in the automation solution
	2	Load Balancer in the public subnet	
	3	Security group for the load balancer that allows port 80 and port 443 with source as 0.0.0.0/0	
	4	2 web servers each with atleast 1 cpu, 1 GB memory and 8GB hard disk space for the boot cum application disk. The instances could have Linux or Windows Operating system. The web servers should be launched in the internet facing subnet	
	5	Security group for the web servers that allows port 22, port 3389, port 80 and port 443 with source as 0.0.0.0/0	

	6	If you have chosen Linux OS for the web servers, there should be Apache HTTP software installed on the web servers, if you have chosen Windows OS, there should be Microsoft IIS server installed on the web servers. The installation of the software should happen automatically as part of the automation solution.	
	7	1 database server with atleast 1 cpu, 1 GB memory and 10GB hard disk space for the boot cum data disk. The database server should be launched in the internal subnet	
	8	Security group for the database server that allows port 22, port 3389, port 1403 and port 3306 with source as 0.0.0.0/0	
	9	If you have chosen Linux OS for the web servers, there should be MySQL software installed on the database server, if you have chosen Windows OS, there should be MS SQL server installed on the database server. The installation of the software should happen automatically as part of the automation solution.	
	10	The web and database servers should be monitored with following alerts: a. Server CPU average utilization crossing 80% for 2 consecutive intervals of 5 minutes b. Server Instance going down	
	11	Configure email to be sent to administrator's email address when any of the above alerts are triggered	
	12	Schedule daily automated shutdown of the web and database server instances at 6pm and startup of the instances at 9am	
	13	Schedule for automated daily backup of the instances:	Choose the backup method which is typically used for cloud based server instances
		a. When the server instance is shutdown daily at 6pm, backup of the server instance should be taken	
		b. Only latest 2 backups should be retained, any previous backup should be automatically deleted after latest backup has been taken for that day	

Notes:

1. For Phase 2 of InfraMind you are required to provide only the technical solution
2. For Phase 3, provide working automation solution with scripts with video presentation of the solution and demo of the automation solution.
3. You may choose to use any of the deployment management tools or code in serverless or code running from a server instance on the cloud.

4. You may choose to use the SDKs from the cloud provider in your code for the automation solution or CLI or any other method

What should you response contain for phase 2 of InfraMind:

You response should have the following:

- Your solution should include the
  - Solution that allows user to request the application environment
  - Cloud services / components required for the "Synergy" application, as well as
  - Any cloud services / components used for the automation solution that actually will deploy the "Synergy" application on receipt of request from user.
- Diagram showing the Target state Solution architecture, the services from the cloud, the connectivity and any other elements that you feel are an important part of the solution
- Explanation of your proposed solution
  - You should provide enough detail (how will the solution address the requirements) and enough justification (why this is an appropriate solution and why you made this choice) for the solution that you propose.
  - You should provide details of configuration [e.g. which size instance you have selected, if you are using any messaging service then what are the different elements/components/steps of the service that you need to use/configure etc.]