

Oracle

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Oracle Cloud Infrastructure 2023 Architect Professional

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Topic 1, Performance Based Questions

Latest Version: 6.0

Question: 1

Challenge 1

Implement Private DNS Names and Private DNS Resolver

Deploy a Serverless Function and Access Using an API Gateway

Deployment in OCI

Scenario

You have joined ACME as their new Cloud Solutions Architect. Your organization wants to verify if they can execute their microservices deployed as serverless functions on another cloud provider using Oracle Functions in OCI.

Preconfigured

To complete this requirement, you are provided with the following:

- Access to an OCI Tenancy, an assigned compartment, and OCI credentials.
- Access to Cloud Shell to execute the Fn CLI and Docker commands.
- Code for a sample Python function, ExamFunction-main.zip.
- Permissions to perform only the tasks within the challenge.

Note: Throughout your exam, ensure to use assigned Compartment99248134-C01 and Region us-ashburn-1

Complete the following tasks in the provisioned OCI environment:

1. Create a new VCN with the name exam-vcn within your assigned compartment by using the Start VCN Wizard.
 2. Create a new Oracle Functions application named exam-app within your assigned compartment by using the private subnet in your previously created VCN.
- Ensure you use all defaults provided with the Create VCN with Internet Connectivity option.

Answer: See the explanation for this task.

Explanation:

Here are the steps to complete the challenge:

To create a new VCN with the name exam-vcn within your assigned compartment by using the Start VCN Wizard, follow these steps:

In the OCI Console, go to Networking and click Virtual Cloud Networks.

Select your assigned compartment from the list on the left.

Click Start VCN Wizard.

Select Create VCN with Internet Connectivity and click Start VCN Wizard.

Enter exam-vcn as the VCN Name and leave the other fields as default. Click Next.

Review the summary and click Create. This will create a VCN with a public subnet, a private subnet, an

internet gateway, a NAT gateway, a service gateway, and a route table.

To create a new Oracle Functions application named exam-app within your assigned compartment by using the private subnet in your previously created VCN, follow these steps:

In the OCI Console, go to Developer Services and click Functions.

Select your assigned compartment from the list on the left.

Click Create Application.

Enter exam-app as the Application Name and select your previously created VCN from the VCN dropdown menu.

Select the private subnet from the Subnet dropdown menu and leave the other fields as default. Click Create. This will create an Oracle Functions application that can run serverless functions in a private subnet.

Question: 2

Challenge 2 - Task 2 of 5

Deploy a Serverless Function and Access Using an API Gateway

Deployment in OCI

Scenario

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- Permissions to perform only the tasks within the challenge.

Note: Throughout your exam, ensure to use assigned Compartment 99248134-

C01 and Region us-ashburn-1

Complete the following task:

In the field below, write an IAM policy statement that allows API Gateway to access Oracle Functions in your compartment.

Answer: See the explanation for this task.

Explanation:

One possible IAM policy statement that allows API Gateway to access Oracle Functions in your compartment is:

ALLOW any-user to use functions-family in compartment <your-compartment-name> where ALL {request.principal.type = 'ApiGateway', request.resource.compartment.id = '<your-compartment-OCID>'}.

This statement grants the any-user group the permission to use the functions-family resource type in the specified compartment, but only if the request is coming from an API Gateway and the function belongs to the same compartment as the API Gateway. For more information, see Create a Policy to Give API Gateways Access to Functions.

Question: 3

Deploy a Serverless Function and Access Using an API Gateway

Deployment in OCI

Scenario

You have joined ACME as their new Cloud Solutions Architect. Your organization wants to verify if they can execute their microservices deployed as serverless functions on another cloud provider using Oracle Functions in OCI.

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To complete this requirement, you are provided with the following:

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- Access to Cloud Shell to execute the Fn CLI and Docker commands.
- Code for a sample Python function, ExamFunction-main.zip.
- Permissions to perform only the tasks within the challenge.

Note: Throughout your exam, ensure to use assigned Compartment 99248134-C01 and Region us-ashburn-1

Complete the following tasks in the provisioned OCI environment:

Create a new private repository in the Container Registry named {username}/hellopython within your assigned compartment.

For example: If your user name is 99346163-lab.user02, then name the registry as 99346163-lab.user02/hello-python.

Your username is 99248134-lab.user01

Answer: See the explanation for this task.

Explanation:

To create a new private repository in the Container Registry named 99248134-lab.user01/hello-python within your assigned compartment, you can follow these steps:

In the OCI Console, go to Developer Services and click Container Registry.

Select your assigned compartment from the list on the left.

Click Create Repository.

In the Create Repository dialog box, enter 99248134-lab.user01/hello-python as the Repository Name and select Private as the Access option. You can also add a description for the repository if you want.

Click Submit. This will create a new private repository in the Container Registry that you can use to store your serverless function images.

Question: 4

Deploy a Serverless Function and Access Using an API Gateway

Deployment in OCI

Scenario

You have joined ACME as their new Cloud Solutions Architect. Your organization wants to verify if they can execute their microservices deployed as serverless functions on another cloud provider

using Oracle Functions in OCI.

Preconfigured

To complete this requirement, you are provided with the following:

- Access to an OCI Tenancy, an assigned compartment, and OCI credentials.
- Access to Cloud Shell to execute the Fn CLI and Docker commands.
- Code for a sample Python function, ExamFunction-main.zip.
- Permissions to perform only the tasks within the challenge.

Note: Throughout your exam, ensure to use assigned Compartment 99248134-C01 and Region us-ashburn-1

Complete the following tasks in the provisioned OCI environment:

1. Set up the context for Fn CLI and deploy the python function to exam-app.

a. Set up the Fn CLI context in Cloud Shell

- i. Set your region and your assigned compartment
- ii. Set your registry [repo-name-prefix], which must be: [region_key].ocir.io/[tenancy-name]/{username}

For example, if your tenancy is ocuocictrng19, user name is 99346163-lab.user02 and region is US East Ashburn, your registry must be iad.ocir.io/ocuocictrng19/99346163-lab.user02.

Your username is 99248134-lab.user01

Your tenancy is ocuocictrng16

b. Login to the registry using docker login, which will require you to generate and use an Auth Token

c. Use wget https://objectstorage.us-ashburn1.oraclecloud.com/n/ocuocictrng5/b/PBT_Storage/o/ExamFunction-main.zip to upload the zip archive containing the Python function files to Cloud Shell.

d. Extract the files by using the unzip utility and navigate to the python sub-folder

e. Deploy the python function to the exam-app using an fn command

f. Invoke the function at least 2 times using an fn command

Answer: See the explanation for this task.

Explanation:

To complete the task of setting up the context for Fn CLI and deploying the python function to exam-app, you can follow these steps:

a. Set up the Fn CLI context in Cloud Shell - In the OCI Console, go to Developer Services and click Functions. - Select your assigned compartment from the list on the left. - Click Getting Started on the top right corner. - Copy and paste the commands from the Set Up Fn CLI Context section into the Cloud Shell window. This will create a new context for your region and compartment. - Set your registry [repo-nameprefix]

by entering the following command in the Cloud Shell window:

```
`fn update context registry [region_key].ocir.io/[tenancy-name]/{username}`
```

where [region_key] is the region key for your region (for example, iad for US East Ashburn), [tenancynamename]

is the name of your tenancy (for example, ocuocictrng16), and {username} is your username (for example, 99248134-lab.user01).

For example, if your region is US East Ashburn, your tenancy is ocuocictrng16, and your username is

99248134-lab.user01, your command would be:

```
`fn update context registry iad.ocir.io/ocuoctrng16/99248134-lab.user01`
```

b. Login to the registry using docker login, which will require you to generate and use an Auth Token - To generate an Auth Token, follow these steps: - In the OCI Console, open the Profile menu on the top right corner and click User Settings. - Click Auth Tokens on the left panel and then click Generate Token. - Enter

a description for the token and click Generate Token. - Copy and save the token value. You will not be able to see it again later. - To login to the registry using docker login, follow these steps: - In the Cloud Shell window, enter the following command:

```
`docker login [region_key].ocir.io`
```

where [region_key] is the region key for your region (for example, iad for US East Ashburn).

For example, if your region is US East Ashburn, your command would be:

```
`docker login iad.ocir.io`
```

- Enter your username in the format `[tenancy-name]/oracleidentitycloudservice/{username}` (for example, ocuoctrng16/oracleidentitycloudservice/99248134-lab.user01) and press Enter.

- Enter your Auth Token as the password and press Enter. You should see a message saying "Login Succeeded".

c. Use wget https://objectstorage.usashburn1.

oraclecloud.com/n/ocuoctrng5/b/PBT_Storage/o/ExamFunction-main.zip to upload the zip archive containing the Python function files to Cloud Shell. - In the Cloud Shell window, enter the following command:

```
`wget https://objectstorage.usashburn1.
```

```
oraclecloud.com/n/ocuoctrng5/b/PBT_Storage/o/ExamFunction-main.zip`
```

This will download the zip archive to your current directory.

d. Extract the files by using the unzip utility and navigate to the python sub-folder - In the Cloud Shell window, enter the following commands:

```
`unzip ExamFunction-main.zip`
```

```
`cd ExamFunction-main/python`
```

This will extract the files from the zip archive and change your current directory to the python subfolder.

e. Deploy the python function to the exam-app using an fn command - In the Cloud Shell window, enter the following command:

```
`fn deploy --app exam-app --local`
```

This will deploy the python function to the exam-app application using your local Docker image.

f. Invoke the function at least 2 times using an fn command - In the Cloud Shell window, enter the following command:

```
`fn invoke exam-app hellopython`
```

This will invoke the function and print its output.

- You can invoke the function again by repeating the same command or pressing Up Arrow and Enter keys. You should see different outputs each time you invoke the function.

Question: 5

Deploy a Serverless Function and Access Using an API Gateway

Deployment in OCI

Scenario

You have joined ACME as their new Cloud Solutions Architect. Your organization wants to verify if

they can execute their microservices deployed as serverless functions on another cloud provider using Oracle Functions in OCI.

Preconfigured

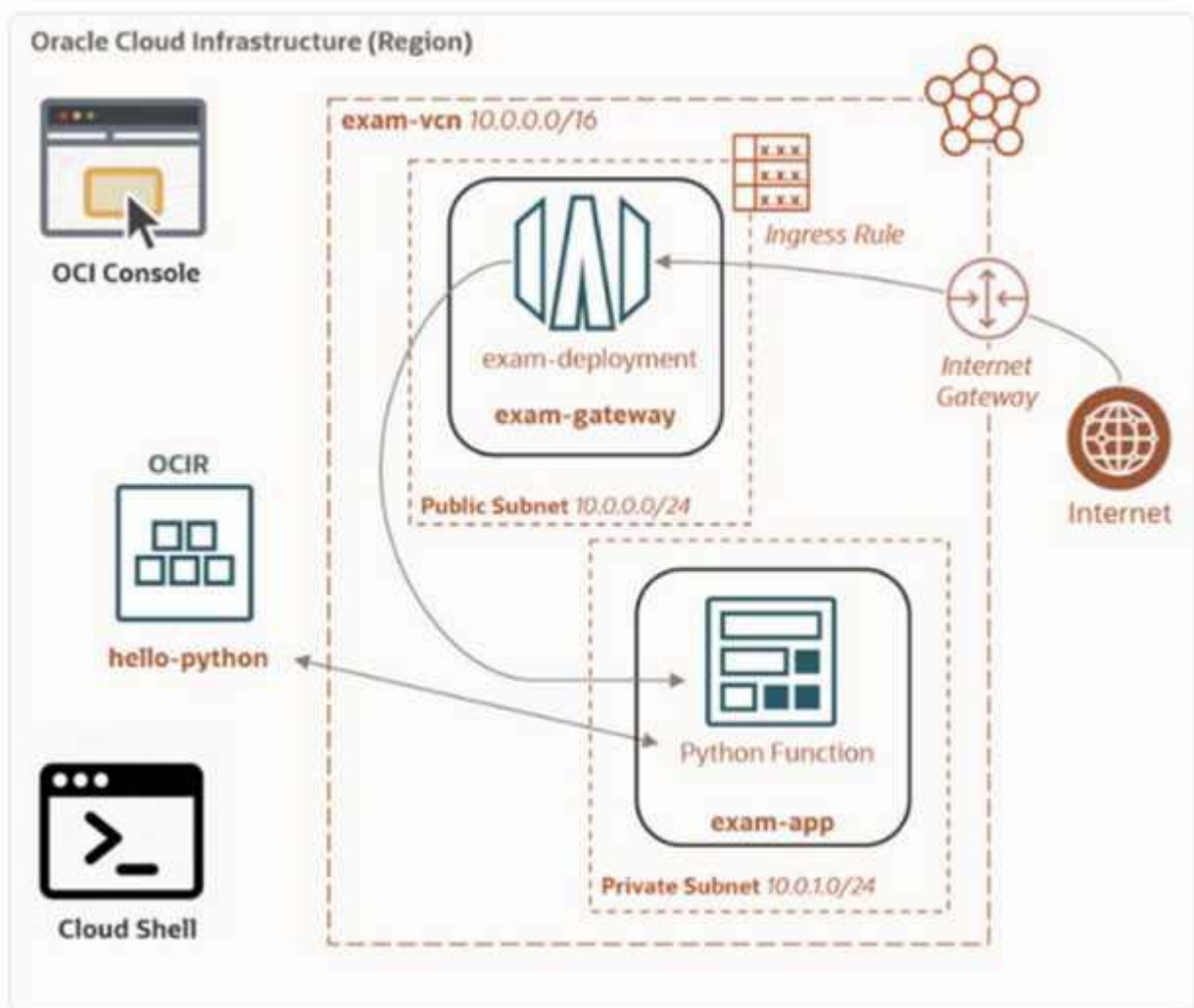
To complete this requirement, you are provided with the following:

- Access to an OCI Tenancy, an assigned compartment, and OCI credentials.
- Access to Cloud Shell to execute the Fn CLI and Docker commands.
- Code for a sample Python function, ExamFunction-main.zip.
- Permissions to perform only the tasks within the challenge.

Note: Throughout your exam, ensure to use assigned Compartment 99248134-C01 and Region us-ashburn-1

Having deployed a private function to an Oracle Functions application in OCI as proof-of-concept, demonstrate that it can be invoked via a public API Gateway deployment. Before you proceed further, ensure that you have created the following resources:

- An OCI VCN in your compartment for hosting the API Gateway2
- The hello-python function deployed to a Functions application in your compartment



Complete the following tasks in the provisioned OCI environment:

1. Create a new public API Gateway in your compartment named exam-gateway.
2. Create a new API Deployment named exam-deployment using /v1 as the path prefix

in exam-gateway.

3. Create a new route by using /hello as the path and GET as the method. The route must invoke the hello-python function.
4. Create a new stateful CIDR Ingress Rule that allows for TCP HTTPS traffic (port 443) from all IP addresses and ports in the default Security List for exam-vcn.
5. Use curl to call the function via your API Gateway deployment.
curl -k -X GET {deployment-endpoint}/hell

Answer: See the explanation for this task.

Explanation:

To complete the task of creating a public API Gateway and invoking a private function in OCI, you can follow these steps:

To create a new public API Gateway in your compartment named exam-gateway, follow these steps:

In the OCI Console, go to Developer Services and click API Gateway.

Select your assigned compartment from the list on the left.

Click Create Gateway.

Enter exam-gateway as the Name and select Public as the Type. You can also add a description for the gateway if you want.

Select your previously created VCN from the VCN dropdown menu and select any subnet from the Subnet dropdown menu. You can also enable logging for the gateway if you want.

Click Create. This will create a new public API Gateway in your compartment that can expose your functions to the internet.

To create a new API Deployment named exam-deployment using /v1 as the path prefix in exam-gateway, follow these steps:

In the OCI Console, go to Developer Services and click API Gateway.

Select your assigned compartment from the list on the left and click on your previously created gateway (exam-gateway).

Click Deployments on the left panel and then click Create Deployment.

Enter exam-deployment as the Name and select From Scratch as the Specification Type. You can also add a description for the deployment if you want.

Enter /v1 as the Path Prefix and leave the other fields as default. Click Next.

To create a new route by using /hello as the path and GET as the method, follow these steps:

In the Create Deployment dialog box, click Add Route.

Enter /hello as the Path, select GET as the Method, and select Oracle Functions as the Type.

Select your previously created function (hello-python) from the Function Name dropdown menu and leave the other fields as default. Click Save Changes. This will create a new route that will invoke your function when you send a GET request to /v1/hello.

To create a new stateful CIDR Ingress Rule that allows for TCP HTTPS traffic (port 443) from all IP addresses and ports in the default Security List for exam-vcn, follow these steps:

In the OCI Console, go to Networking and click Virtual Cloud Networks.

Select your assigned compartment from the list on the left and click on your previously created VCN (exam-vcn).

Click Security Lists on the left panel and then click on the default security list for your VCN.

Click Edit All Rules and then click Add Ingress Rule under the Ingress Rules section.

Enter 0.0.0.0/0 as the Source CIDR, select TCP as the IP Protocol, and enter 443 as both the Source Port Range and the Destination Port Range. You can also add a description for the rule if you want.

Click Save Security List Rules. This will create a new stateful CIDR Ingress Rule that will allow HTTPS traffic from any source to reach your API Gateway.

To use curl to call the function via your API Gateway deployment, follow these steps:

In the OCI Console, go to Developer Services and click API Gateway.

Select your assigned compartment from the list on the left and click on your previously created gateway (exam-gateway).

Click Deployments on the left panel and then click on your previously created deployment (examdeployment).

Copy the value of the Endpoint URL field. This is the base URL for your API Deployment.

In a terminal window, enter the following command:

```
curl -k -X GET {deployment-endpoint}/v1/hello
```

where {deployment-endpoint} is the base URL that you copied.

For example, if your deployment endpoint is `https://abc123xyz456.apigateway.us-ashburn-1.oci.customer-oci.com`, your command would be:

```
curl -k -X GET https://abc123xyz456.apigateway.us-ashburn-1.oci.customer-oci.com/v1/hello
```

This will send a GET request to your API Deployment and invoke your function. You should see a response similar to this:

```
{"message": "Hello World!"}
```

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