©   
**Architecting on AWS - Lab 5 - Multi-Region Failover with Route 53**

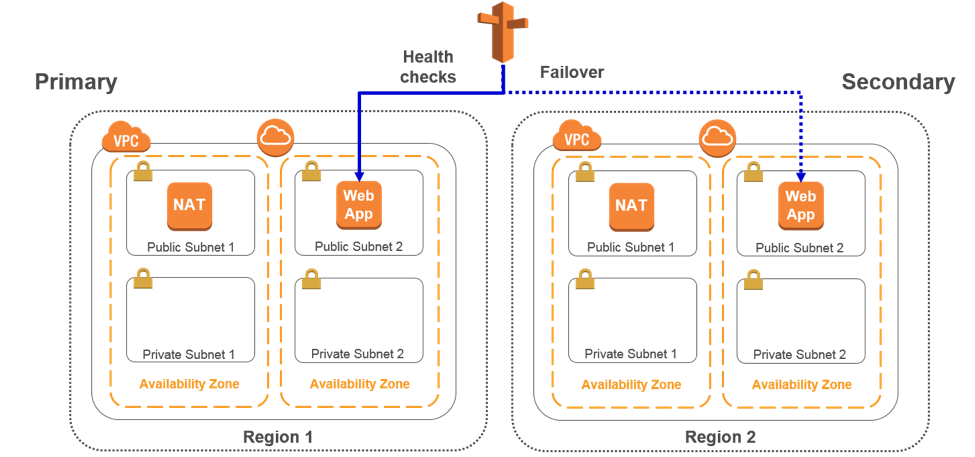
* [Lab 5 - Multi-Region Failover with Amazon Route 53](https://globalknowledge.qwiklab.com/focuses/17011#lab-5-multi-region-failover-with-amazon-route-53)
  + [Accessing the AWS Management Console](https://globalknowledge.qwiklab.com/focuses/17011#accessing-the-aws-management-console)
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  + [Task 2.1: Configure Route 53 Failover and Health Check](https://globalknowledge.qwiklab.com/focuses/17011#task-2-1-configure-route-53-failover-and-health-check)
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Lab 5 - Multi-Region Failover with Amazon Route 53

In this lab, you will configure and test a cross-region disaster recovery scenario.

This lab comes with a basic application environment already created, duplicated across two separate regions. You will set up your domain so that if the web application's resources in its primary region become unavailable, Route 53 automatically fails the application's traffic over to its secondary region.

Here is what your environment will look like when you're done:



**Objectives**

After completing **this** lab, you will be able to:

* Use Route 53 to configure cross-region failover of a web application.
* Use Route 53 health checks to determine the health of a resource.

**Prerequisites**

This lab requires:

* Access to a notebook computer with Wi-Fi running Microsoft Windows, Mac OS X, or Linux (Ubuntu, SuSE, or Red Hat)
* For Microsoft Windows users: Administrator access to the computer
* An Internet browser such as Chrome, Firefox, or IE9 (previous versions of Internet Explorer are not supported)

**Duration**

This lab will require around **30 minutes** to complete.

Accessing the AWS Management Console

1. To the right of the lab title, click **Start Lab** to launch your Qwiklabs.

C:\Users\student\Desktop\architect\lab4\Architecting on AWS - Lab 5 - Multi-Region Failover with Route 53  Qwiklabs + globalknowledge_files\start.png

1. On the **Connect** tab of the Qwiklabs page, copy the **Password** to the clipboard and then click **Open Console**.

C:\Users\student\Desktop\architect\lab4\Architecting on AWS - Lab 5 - Multi-Region Failover with Route 53  Qwiklabs + globalknowledge_files\open.png

1. Sign in to the AWS Management Console using the following steps:
   * For **User Name**, type **awsstudent**
   * For **Password**, paste the password copied from the clipboard.
   * Click **Sign In**.

Task 1: Inspect Your Environment

Below is a diagram of the environment that was created for you using CloudFormation when you started this lab:

In addition, a randomly generated domain was created for you and is listed in Route 53. In this part of the lab, you will configure your domain so that if your primary resources become unavailable, Route 53 automatically fails over new requests to your secondary resources instead.

**Scenario**

Region-wide events, such as natural disasters, can disrupt the availability of a region for an extended length of time, making cross-region availability a critical component to ensuring that an application is as highly available as possible. This part of the lab demonstrates that, if resources in one region become inaccessible, Route 53 can help keep your web application available with a minimal amount of downtime.

**Task 1.1: Examine the Primary Region**

In this task, you will assess the VPC and Amazon EC2 resources in your primary region, which have been automatically created for you by CloudFormation.

1. In the **AWS Management Console** , on the **Services** menu, click **VPC**.
2. In the navigation pane, click **Your VPCs**.

**LabVPC** should be listed.

1. In the navigation pane, click **Subnets**.

There should be two sets of public and private subnets, with one of each in separate Availability Zones. Other subnets are listed, but these are attached to the Default VPC for your account and can be ignored.

1. On the **Services** menu, click **EC2**.
2. In the navigation pane, click **Instances**.
3. You should see a **NAT** instance and a web application instance named **Web-Application-1**.

Task 2: Examine the Secondary Region

In this task, you will assess the VPC and Amazon EC2 resources in your secondary region, which have been created for you with CloudFormation.

1. Return to your the qwikLABS page.
2. Click the **Addl. Info** tab to see where your secondary region is.

Use the chart below to ensure that your environment was set up correctly:

| **Primary Region** | **Secondary Region** |
| --- | --- |
| US East (N. Virginia),US West (Oregon or N. California),South America (São Paulo) | **EU** (Ireland) |
| EU (Ireland or Frankfurt) | **US East** (N. Virginia) |
| Asia Pacific (Singapore, Tokyo, or Sydney) | **US West** (N. California) |

1. Return to the AWS Management Console, and click your current region to expand the region drop-down list, and then click your secondary region.
2. On the **Services** menu, click **VPC**.
3. In the **VPC Dashboard** , click **Your VPCs**.

**LabVPC** should also be listed in this region.

1. Verify that you have the same VPC configuration as the first region, including two public subnets and two private subnets, one of each type in each of the two Availability Zones.
2. On the **Services** menu, click **EC2**.
3. In the navigation pane, click **Instances**.

You should find a **NAT** instance and a web application instance named **Web-Application-2**.

Task 2: Configure Your Primary Resources to Failover to Your Secondary Resources

In this task, you will take a domain which has already been registered for you, add a health check and two record sets to it (one for each region's instance), and configure the record sets so that if an error is returned by the primary region, any new requests to the domain will fail over to the secondary region instead.

The objective of this lab is to demonstrate how to configure Route 53 to fail over from one region to another.

**Note** In the lab environment, you are not using a registered domain. The domain name that you see in the Route 53 Dashboard is an auto-generated, unique, un-registered, non-existing domain.

Task 2.1: Configure Route 53 Failover and Health Check

In this part of the lab, you will create a health check for your primary server and then configure your domain to failover to your secondary region in the event that the first region registers as unhealthy.

1. On the **Services** menu, click **Route 53**.

If you see an error message, you can safely ignore it because this is due to the IAM restrictions placed on these lab accounts by the CloudFormation template.

1. In the navigation pane, click **Health checks**.
2. Click **Create health check** , and then enter the following:
   * For **Name**, type 
   * For **IP address**, type ***Web Application 1's public IP***
   * For **Path**, type 
3. Expand **Advanced configuration** and enter the following:
   * For **Request interval**, type 
   * For **Failure threshold**, type 
4. Leave all other settings as the default. Click **Next**.
5. Click **Create health check**.

Route 53 will now check the health of your site by periodically requesting the IP address and path combination you provided and verifying that it returns a successful response (to be more specific, it's checking independently from multiple locations around the world, with each location requesting the page every 10 seconds).

You can view the CloudWatch metrics for healthchk-1 on the **Monitoring** tab on the **Health Checks** page.

1. In the navigation pane, click **Hosted zones**.

The domain name **qwiklabs-.training** has already been created for you to use.

In a real-world scenario, you need to create a hosted zone for your own domain name; however, this step would require you to modify the DNS settings for a real domain that you own, so this unregistered domain was generated for you.

1. Select **qwiklabs-.training**.

**Note** All lab participants will have a unique domain name.

1. Click **Go to Record Sets**.
2. Click **Create Record Set**.
3. In **Create Record Set** , configure the following:
   * For **Name**, type 
   * For **Type**, click **A – IPv4 address**.
   * For **TTL (Seconds)**, click **1m** to set the TTL to 60 seconds.
   * For **Value**, type ***<Web Application 1's public IP>***
   * For **Routing Policy**, type 
   * For **Failover Record Type**, click **Primary**.
   * For **Associate with Health Check**, click **Yes**.
   * For **Health Check to Associate**, click **healthchk-1**
4. Leave all other settings as the default and click **Create**.

An A type record set should be listed. If the newly created record does not immediately appear in the table, periodically click the refresh icon to update the table until it appears.

1. Click **Create Record Set** again.
2. In **Create Record Set** , configure the following:
   * For **Name**, type 
   * For **Type**, click **A – IPv4 address**.
   * For **TTL (Seconds)**, click **1m** to set the TTL to 60 seconds.
   * For **Value**, type ***<Web Application 2's public IP>***
   * For **Routing Policy**, click **Failover**.
   * For **Failover Record Type**, click **Secondary**.
   * For **Associate with Health Check**, click **No**.
3. Leave all other settings as the default and click **Create**.
4. In the navigation pane, click **Health checks**.

The status for **healthchk-1** should be *Healthy*.

1. Select **healthchk-1**.

The **Monitoring** tab in the lower pane displays more detail about the selected health check's status.

You have now configured your web application to fail over across two regions.

Task 2.2: Check the DNS resolution

In this task, you will query DNS to obtain the IP address mapping in order to verify that Route 53 is pointing correctly to your primary web application server.

Because the domain you are using is un-registered, you will not be able to check your domain's DNS resolution directly via a web browser. Instead, you will use a website that performs an nslookup command for you.

1. In the navigation pane, click **Hosted zones**, and then select the check box for your domain name.
2. Click **Go to Record Sets**.
3. Copy your **A** record name to a text editor, *but do not copy the ending period*.
4. In a new browser window or tab, open this URL:

<http://networking.ringofsaturn.com/Tools/nslookup.php>

**Note** If this website does not work properly for you, there are many similar sites that can be found with a quick search of "nslookup."

1. For **Hostname/Domain Name**, paste the **A** record name you copied in step **34**.
2. Return to your previous browser window or tab, where the record sets for your hosted zone are displayed.
3. Copy one of the **NS** record type values to a text editor, ***but do not copy the ending period***.

You will use one of these name server record values in the following step.

1. Return to your browser or tab with the *nslookup* tool.
2. For **Server** , paste the **NS** record name you just copied.
3. Click **Submit**.

In a few seconds, you should receive results at the bottom of the page. The address under your **A** record name should be the same IP as the server in your primary region.

This DNS resolution check confirms that requests to your domain will be routed to the server in your primary region.

1. Keep this nslookup page open, as you will use it again later to test your multi-region failover in the next task.

Task 3: Test Your Failover

In this task, you will try to verify that Route 53 correctly fails over to your secondary region if your primary region fails. For the purposes of this demonstration, you will simulate a region failure by manually stopping the instance in your primary region.

Because the domain you are using is un-registered, you will not be able to test the failover through the web browser. Instead, you will use the nslookup web application used in the last task.

**Task 3.1: Stop the Primary Web Application Server**

To test your application's cross-region failover ability, you will stop the primary server, **Web-Application-1**.

1. Return to the AWS Management Console. On the **Services** menu, click **EC2**.
2. Select your primary region from the region drop-down list.
3. In the navigation pane, click **Instances**.
4. Right-click **Web-Application-1**, click **Instance State**, and click **Stop**.
5. In the **Stop Instances** dialog box, click **Yes, Stop**.

Wait until the instance state is *stopped*.

1. On the Services menu, click **Route 53**.
2. In the navigation pane, click **Health checks**.
3. Select **healthchk-1**, and click the **Health checkers** tab in the lower pane. It should start reporting failed health checks.
4. Wait until the status of healthchk-1 is *Unhealthy*. If necessary, periodically click the refresh icon.
5. Return to your web browser or tab with the nslookup web application and click **Submit** again.
6. This time, the query results should return the IP address of the web application server in your **secondary** region instead.

If you don't get the correct results, re-confirm that healthchk-1 has registered as *Unhealthy* and then try again.

You've now successfully confirmed that your application environment can fail over from its primary region to its secondary region if the server in the primary region fails.

Lab Complete

Congratulations! You have successfully completed the lab. To clean up your lab environment, do the following:

1. To sign out of the **AWS Management Console** click **awsstudent** in the navigation bar, and then click **Sign Out**.
2. Return to the **qwikLABS** page where you launched your lab and click **End**.

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* Connect
* Lab Details
* Addl. Info
* **Lab Connection**   
  Please follow the lab instructions to connect to your lab

**Warning:** Do not transmit data into the AWS Console that is not related to Qwiklabs or the lab you are taking.

* + **AWS Console Details**
  + **Access Key Details**
  + [Show Access Keys](https://globalknowledge.qwiklab.com/focuses/17011#accessKeyIdModal)
  + **Key Pair Details**

|  |  |
| --- | --- |
| **Setup Time (min.)** | 6 |
| **Duration (min.)** | 120 |
| **Access (min.)** | 120 |

|  |
| --- |
| **Tags:** [**AWS-100-ARC-51-lab-5-failover**](https://globalknowledge.qwiklab.com/tags/AWS-100-ARC-51-lab-5-failover)  **Lab Description:** In this lab, you are going to configure and test a cross-region disaster recovery scenario with Route 53.  **Lab Creator:** qwikLABS publisher  **Date Created:** May 18, 2017 11:25  **AWS Region::** [us-west-2] **US West (Oregon)** |

Additional Lab Information:

* **PrimaryRegion:**
* us-west-2
* **SecondaryRegion:**
* eu-west-1 - Ireland