NetflixOSS Spinnaker

Quick Start Reference Deployment

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## Overview

This Quick Start reference deployment guide provides step-by-step instructions for deploying Spinnaker, which is a continuous deployment tool from [Netflix Open Source Software](http://netflix.github.io/), on the Amazon Web Services (AWS) cloud. [Quick Starts](http://aws.amazon.com/quickstart/) are automated reference deployments that use AWS CloudFormation templates to launch, configure, and run the AWS compute, network, storage, and other services required to deploy a specific workload on AWS.

This Quick Start is for IT infrastructure architects, administrators, and DevOps professionals who are planning to implement Spinnaker to manage their AWS compute resources.

Spinnaker is used as a continuous delivery platform for releasing software changes. The continuous delivery process begins with the creation of a deployable asset (such as a machine image, a Jar file, or a Docker image) and ends with a deployment to the cloud.

Spinnaker provides two sets of features:

* Cluster management, to configure, delete, disable, and deploy cloud resources like server groups, security groups, and load balancers, using strategies like blue/green deployments.
* Deployment management, to create and manage continuous delivery workflows called *pipelines*.

Pipelines are configurable, reusable processes that can be triggered by the completion of a Jenkins job, by a CRON expression, or even by another pipeline. Pipelines consist of *stages*, which are operations or phases in the continuous delivery process. Spinnaker comes with a number of stages, such as baking a machine image, deploying an image, running a Jenkins job, or waiting for user approval. Pipeline stages can be run in parallel or serially. For more information on built-in stages, see the [Spinnaker overview](http://www.spinnaker.io/docs/overview#section-deployment-management).



Figure 1: Deployment management with Spinnaker

An expanded version of this deployment guide with detailed instructions and screen illustrations is available on the [Spinnaker website](http://www.spinnaker.io/).

## Architecture

Deploying this Quick Start with the **default parameters** builds the following Spinnaker environment in the AWS cloud.

**

Figure 2: Quick Start architecture for Spinnaker on AWS

This Quick Start deploys the resources shown in Figure 2 and uses them as follows:

* An Amazon Virtual Private Cloud (VPC) is created in the region you choose when you launch the stack.
* The security group in public subnet only has port 22 open for Secure Shell (SSH) access.
* One Spinnaker instance is deployed into the VPC private subnet.
* The Quick Start creates the following IAM users and roles:
* **SpinnakerUser** – User account that the end user uses on the Spinnaker instance to access AWS resources.
* **SpinnakerRole** – Role that the Spinnaker instance uses to access AWS resources. This role has permission to launch other EC2 instances, pass the **BaseIAMRole** role to other EC2 instances, and create AWS resources.
* **BaseIAMRole** – Role that Spinnaker passes onto application instances that it deploys.

## Prerequisites

### Specialized Knowledge

Before you deploy this Quick Start, we recommend that you become familiar with the following AWS services. (If you are new to AWS, see [Getting Started with AWS](http://docs.aws.amazon.com/gettingstarted/latest/awsgsg-intro/intro.html).)

* [Amazon VPC](http://aws.amazon.com/documentation/vpc/) - The Amazon Virtual Private Cloud (Amazon VPC) service lets you provision a private, isolated section of the AWS cloud where you can launch AWS services and other resources in a virtual network that you define. You have complete control over your virtual networking environment, including selection of your own IP address range, creation of subnets, and configuration of route tables and network gateways.
* [Amazon EC2](http://aws.amazon.com/documentation/ec2/) – The Amazon Elastic Compute Cloud (Amazon EC2) service enables you to launch virtual machine instances with a variety of operating systems. You can choose from existing Amazon Machine Images (AMIs) or import your own virtual machine images.
* [AWS CloudFormation](http://aws.amazon.com/documentation/cloudformation/) – AWS CloudFormation gives you an easy way to create and manage a collection of related AWS resources, and provision and update them in an orderly and predictable way. You use a template to describe all the AWS resources (for example, Amazon EC2 instances) that you want. You don't have to individually create and configure the resources or figure out dependencies—AWS CloudFormation handles all of that.
* [IAM](http://aws.amazon.com/documentation/iam/) – AWS Identity and Access Management (IAM) enables you to securely control access to AWS services and resources for your users. With IAM, you can centrally manage users, security credentials such as access keys, and permissions that control which AWS resources users can access.

## Deployment Steps

### Step 1. Prepare an AWS Account

1. If you don’t already have an AWS account, create one at <http://aws.amazon.com> by following the on-screen instructions.
2. Use the region selector in the navigation bar to choose the AWS Region where you want to deploy Spinnaker on AWS.
3. Create a [key pair](http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html) in your preferred region.
4. Open the IAM console at at <https://console.aws.amazon.com/iam/>, create an IAM role called **BaseIAMRole**, and choose Amazon EC2 as the role type. EC2 instances launched with Spinnaker will be associated with this role.
5. If necessary, [request a service limit increase](https://console.aws.amazon.com/support/home#/case/create?issueType=service-limit-increase&limitType=service-code-) for the Amazon EC2 **m4.xlarge** instance type. You might need to do this if you already have an existing deployment that uses this instance type, and you think you might exceed the [default limit](http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-resource-limits.html) with this reference deployment.

**Launch**

### Step 2. Launch the Quick Start

1. Deploy the AWS CloudFormation template into your AWS account.

The template is launched in the US West (Oregon) region by default. You can change the region by using the region selector in the navigation bar.

This stack takes approximately 10 minutes to create.

**Note** You are responsible for the cost of the AWS services used while running this Quick Start reference deployment. There is no additional cost for using this Quick Start. See the pricing pages for each AWS service you will be using or the [AWS Simple Monthly Calculator](http://calculator.s3.amazonaws.com/index.html) for full details.

You can also download the template to use it as a starting point for your own implementation.

1. On the **Select Template** page, keep the default setting for the template URL, and then choose **Next**.
2. On the **Specify Details** page, review the parameters for the template. Enter values for the parameters that require your input. For all other parameters, you can customize the default settings provided by the template.

|  |  |  |
| --- | --- | --- |
| Parameter | Default | Description |
| SpinnakerVPC | *Requires input* | CIDR block for the Amazon VPC for Spinnaker. |
| SpinnakerPublicSubnet | *Requires input* | CIDR block for the public subnet in the VPC where Spinnaker will be deployed. |
| SpinnakerPrivateSubnet | *Requires input* | CIDR block for the public subnet in the VPC where Spinnaker will be deployed. |
| KeyName | *Requires input* | Public/private key pair, which allows you to connect securely to your instance after it launches. When you created an AWS account, this is the key pair you created in your preferred region. |
| Password | *Requires input* | Password for the Spinnaker user account. This must be a string consisting of 1-41 characters. |
| SSHLocation | *0.0.0.0/0* | The IP range that can be use to whitelist client connecting to Bastion Hosting using SSH |

When you finish reviewing and customizing the parameters, choose **Next**.

1. On the **Options** page, you can [specify tags](https://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/aws-properties-resource-tags.html) (key-value pairs) for resources in your stack and [set advanced options](https://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/cfn-console-add-tags.html). When you’re done, choose **Next**.
2. On the **Review** page, review and confirm the template settings. Under **Capabilities**, select the check box to acknowledge that the template will create IAM resources.
3. Choose **Create** to deploy the stack.
4. Monitor the status of the stack. When the status is **CREATE\_COMPLETE**, the deployment is complete.
5. You can use the URL displayed in the **Outputs** tab for the stack to view the resources that were created.

### Step 3. Test the Deployment

The steps in this section walk you through some of the basics with Spinnaker. You'll set up a Spinnaker pipeline that bakes a Amazon Virtual Image (AMI) image that contains a Redis server, and then deploys that image to a test cluster.

#### Connect to your Spinnaker Instance

1. Connect to your Spinnaker instance, and port forward to the Spinnaker console and APIs:

ssh -L 9000:localhost:9000 -L 8084:localhost:8084 -L 8087:localhost:8087 [ubuntu@ec2-198-51-100-1.compute-1.amazonaws.com](mailto:ubuntu@ec2-198-51-100-1.compute-1.amazonaws.com)

1. In your web browser, open the Spinnaker web page <http://localhost:9000>.

#### Create a Spinnaker Application

1. In Spinnaker, click **Actions**, **Create Application**.
2. For **Name**, type example, and for **Owner Email**, specify your email address.
3. Click inside the dashed rectangle next to the **Accounts** heading and select **Default**.
4. Choose the **Consider only cloud provider health when executing** **tasks** button next to **Instance Health**.
5. Choose **Create**.

#### Create and Configure a Security Group

Next, you'll create a security group that specifies traffic firewall rules for the cluster. You'll configure the firewall rules to allow all incoming traffic on port 80, for clusters associated with this security group.

1. Choose **Security Groups**, and then choose the + button to create a security group.
2. For **Detail (optional)**, type test. For **Description**, type Test environment.
3. Select **defaultvpc** as the **VPC** field, and then choose **Next**.
4. Choose **Add new Security Group Rule**.
5. For **Security Group**, choose **default**.
6. Change **Start Port** and **End Port** to 80.
7. Choose **Create**.

#### Create a Load Balancer

Next, you'll create a load balancer in Spinnaker.

1. Click **Load Balancers**, and then choose the **+** button to create a load balancer.
2. For **Stack**, type test.
3. For **VPC Subnet**, choose **internal (defaultvpc)**.
4. Choose **Next** .
5. For **Security Groups**, choose **example-text**.
6. Choose **Next**, and then choose **Create**.

#### Create a Deployment Pipeline

Your final task is to set up a Spinnaker pipeline. Let's name it **Bake & Deploy to Test**. The pipeline will produce an image containing the redis-server package and then deploy it. In this tutorial, you'll trigger the pipeline manually. To create the pipeline:

1. Choose **Pipelines**, and then choose **Configure**,  **Create New**.
2. For **Pipeline Name**, typeBake & Deploy to Test.
3. Choose **Create Pipeline**.

#### Set up the First Stage of the Pipeline

You're now going to create the first stage of the pipeline. It will build an image from an existing redis-server package.

1. Choose **Add stage**.
2. For **Type**, choose **Bake**.
3. For **Package**, type redis-server.
4. Choose **Save Changes**.

#### Set up the Second Stage of the Pipeline

You're now going to set up the second stage of the pipeline. This stage takes the image constructed in the Bake stage and deploys it into a test environment.

1. Choose **Add stage**.
2. For **Type**, choose **Deploy**.
3. For **Server Groups** , choose **Add server group**.
4. Choose **Continue without a template**.
5. In the **Configure Deployment Cluster** window, for **Stack**, type test.
6. For **VPC Subnet**, choose **defaultvpc**.
7. Choose **Next**.
8. Click the text area next to the **Load Balancers** heading, and then select **example-test**. Choose **Next**.
9. For **Security Groups**, choose **example-test (example-test)**. Choose **Next**.
10. Choose **Micro Utility**  to set the **Instance Profile**, and then choose **Next**.
11. Select the **Medium: m3** size, and then choose **Next**.
12. For **Number of Instances**, type 2, and then choose **Add** .
13. Save the pipeline configuration by choosing **Save Changes**.

#### Try It Out!

1. Choose **Pipelines** in the navigation bar.
2. Choose **Start Manual Execution** for the **Bake & Deploy to Test** pipeline.
3. Choose **Run**.

Now, watch Spinnaker in action. A **Manual Start** section will appear, and will show progress as the pipeline executes. At any point during pipeline execution, use the horizontal bar to see detailed status for any of the stages in the pipeline.

Feel free to navigate around the Spinnaker menus, create new pipelines, clusters, server groups, load balancers, and security groups, etc. and see what happens.

When you're ready to stop, don't forget to clean up your resources. An easy way to do this is to visit the pipelines, clusters, load balancers, and security groups pages, choose the ones you created and select the appropriate **Delete** command from **Actions**.

## FAQ

**Q.** I encountered a CREATE\_FAILED error when I launched the Quick Start. What should I do?

**A.** If AWS CloudFormation fails to create the stack, we recommend that you relaunch the template with **Rollback on failure** set to **No**. (This setting is under **Advanced** in the AWS CloudFormation console, **Options** page.) With this setting, the stack’s state will be retained and the instance will be left running, so you can troubleshoot the issue. (You'll want to look at the log files in %ProgramFiles%\Amazon\EC2ConfigService and C:\cfn\log.)

**Important** When you set **Rollback on failure** to **No**, you’ll continue to incur AWS charges for this stack. Please make sure to delete the stack when you’ve finished troubleshooting.

For additional information, see [Troubleshooting AWS CloudFormation](http://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/troubleshooting.html) on the AWS website or contact us on the [AWS Quick Start Discussion Forum](https://forums.aws.amazon.com/forum.jspa?forumID=178).

See the [Spinnaker Troubleshooting Guide](http://www.spinnaker.io/docs/troubleshooting-guide) for more information on troubleshooting Spinnaker-related issues, and see [Frequently Asked Questions](http://www.spinnaker.io/docs/frequently-asked-questions) for more information on Spinnaker.

## Additional Resources

**AWS services**

* AWS CloudFormation  
  <http://aws.amazon.com/documentation/cloudformation/>
* Amazon EC2  
  <http://docs.aws.amazon.com/AWSEC2/latest/WindowsGuide/>
* Amazon VPC  
  <http://aws.amazon.com/documentation/vpc/>
* IAM  
  <http://aws.amazon.com/documentation/iam/>

**Spinnaker**

* Spinnaker home page<http://www.spinnaker.io>
* Spinnaker documentation  
  <http://www.spinnaker.io/docs>
* Spinnaker Slack Channel  
  <https://spinnakerteam.slack.com>
* Spinnaker Github  
  <https://github.com/spinnaker/spinnaker>

**Quick Start reference deployments**

* AWS Quick Start home page  
  <https://aws.amazon.com/quickstart/>
* Quick Start deployment guides  
  <https://aws.amazon.com/documentation/quickstart/>

## Send Us Feedback

We welcome your questions and comments. Please post your feedback on the [AWS Quick Start Discussion Forum](https://forums.aws.amazon.com/forum.jspa?forumID=178).

You can visit our [GitHub repository](https://github.com/aws-quickstart/quickstart-spinnaker) to download the templates and scripts for this Quick Start, and to share your customizations with others.

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