BusinessWorks Container Edition (BWCE) on the AWS Cloud

Quick Start Reference Deployment

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*TIBCO Software*

*AWS Quick Start Reference Team*

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This Quick Start deployment guide was created by Amazon Web Services (AWS) in partnership with TIBCO Software.

[Quick Starts](http://aws.amazon.com/quickstart/) are automated reference deployments that use AWS CloudFormation templates to deploy key technologies on AWS, following AWS best practices.

## Overview

This Quick Start reference deployment guide provides step-by-step instructions for deploying BusinessWorks Container Edition on the Amazon Web Services (AWS) Cloud.

This Quick Start is for users who want to use BusinessWorks Container Edition

### BusinessWorks Container Edition on AWS

*Using TIBCO BusinessWorks Container Edition and Plug-ins for AWS, you can quickly and easily connect API’s, microservices and backend systems. With easy-to-use drag-and-drop graphical development environment, graphical data mapper and a vast library of connectors, you can quickly and easily create cloud-native integration applications and deploy them on AWS leveraging native features of AWS Elastic Container Service.*

### Costs and Licenses

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 the Quick Start.

The AWS CloudFormation template for this Quick Start includes configuration parameters that you can customize. Some of these settings, such as instance type, will affect the cost of deployment. For cost estimates, see the pricing pages for each AWS service you will be using. Prices are subject to change.

*BusinessWorks Container Edition for AWS follows a Flexible Consumption Pricing (FCP) model. Consumption-based pricing model leads you to only pay for the number of containers running per hour. This gives you flexibility to scale on demand and manage software cost as you.*

## Architecture

Deploying this Quick Start for a new virtual private cloud (VPC) with **default parameters** builds the following BusinessWorks Container Edition environment in the AWS Cloud.

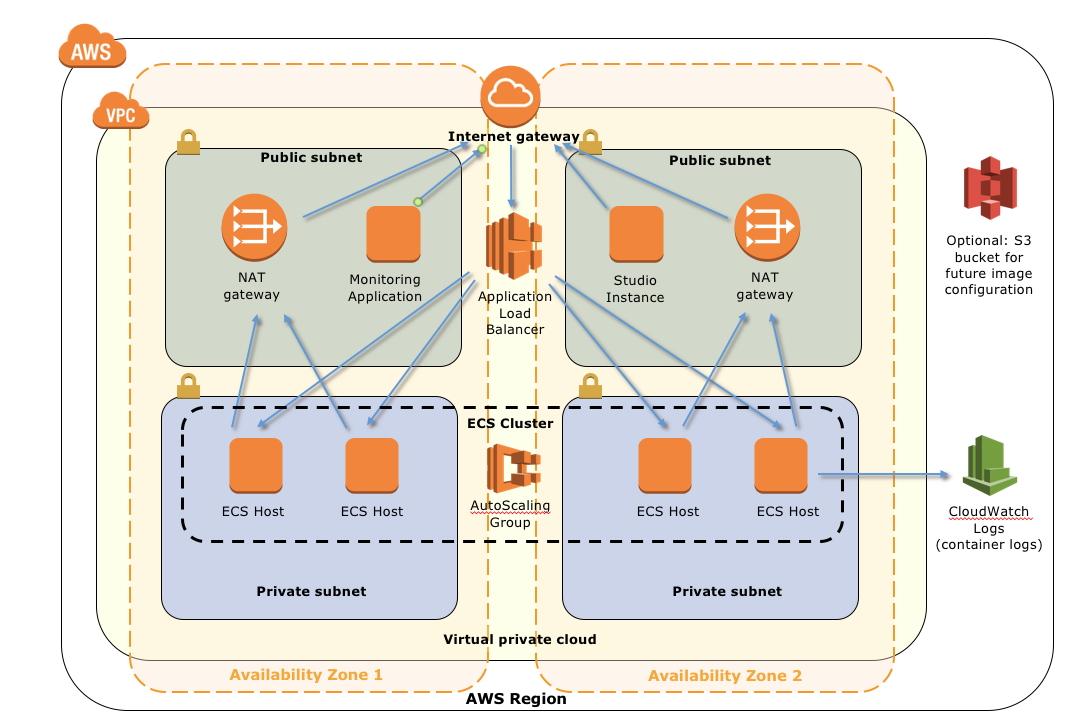


Figure 1: Quick Start architecture for *BusinessWorks Container Edition* on AWS

The Quick Start sets up the following:

* A highly available architecture that spans two Availability Zones.\*
* A VPC configured with public and private subnets according to AWS best practices, to provide you with your own virtual network on AWS.\*
* An internet gateway to allow access to the internet. This gateway is used by the bastion hosts to send and receive traffic.\*
* In the public subnets, managed NAT gateways to allow outbound internet access for resources in the private subnets.\*
* In one of the public subnets, your Studio Instance (BWCE design time) and Monitoring Application EC2 instances will be deployed.
* In the private subnets, your ECS Host instances are deployed. These instances will manage and host your ECS applications.
* An ECR repository that contains a BWCE image with selected plugins installed.
* Optional: Create an S3 bucket to stores plugins

**\*** The template that deploys the Quick Start into an existing VPC skips the tasks marked by asterisks and prompts you for your existing VPC configuration.

## 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](https://aws.amazon.com/getting-started/).)

* [Amazon EC2](https://aws.amazon.com/documentation/ec2/)
* [Amazon EBS](https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/AmazonEBS.html)
* [Amazon VPC](https://aws.amazon.com/documentation/vpc/)
* [AWS CloudFormation](https://aws.amazon.com/documentation/cloudformation/)
* [AWS S3](https://aws.amazon.com/documentation/s3/)
* [AWS ECS](https://aws.amazon.com/documentation/ecs/)

### Technical Requirements

*The license for BusinessWorks Container Edition is built within the pay as you go model.*

## Deployment Options

This Quick Start provides two deployment options:

* **Deploy** BusinessWorks Container Edition **into a new VPC** (end-to-end deployment). This option builds a new AWS environment consisting of the VPC, subnets, NAT gateways, security groups, bastion hosts, and other infrastructure components, and then deploys BusinessWorks Container Edition into this new VPC.
* **Deploy** BusinessWorks Container Edition **into an existing VPC**. This option provisions BusinessWorks Container Edition in your existing AWS infrastructure.

The Quick Start provides separate templates for these options. It also lets you configure CIDR blocks, instance types, and BusinessWorks Container Edition settings, as discussed later in this guide.

## Deployment Steps

### Step 1. Prepare Your AWS Account

1. If you don’t already have an AWS account, create one at <https://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 BusinessWorks Container Edition on AWS.
3. Create a [key pair](https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html) in your preferred region.
4. 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 t2.medium 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 deployment.

### Step 2. Subscribe to the BusinessWorks Containers Edition AMI

1. Log in to the AWS Marketplace at <https://aws.amazon.com/marketplace>.
2. Open the page for BusinessWorks Container Edition, and choose **Continue**.
3. Choose the results that is **NOT** BYOL.
4. Use the **Manual Launch** option to launch the AMI into your account on Amazon EC2. This involves accepting the terms of the license agreement and receiving confirmation email. For detailed instructions, see the [AWS Marketplace documentation](https://aws.amazon.com/marketplace/help/200799470).

### Step 3. Launch the Quick Start

**Note** You are responsible for the cost of the AWS services used while running this Quick Start reference deployment. You will also be charged for the apps you deploy on to your ECS cluster. For full details, see the pricing pages for each AWS service you will be using in this Quick Start. Prices are subject to change.

1. Choose one of the following options to launch the AWS CloudFormation template into your AWS account. For help choosing an option, see [deployment options](#_Deployment_Options) earlier in this guide.

|  |  |
| --- | --- |
| [Option 1](#_Scenario_1:_Deploy_1)  Deploy BusinessWorks Container Edition into a  new VPC on AWS  [**Launch**](https://console.aws.amazon.com/cloudformation/home?region=us-east-2#cstack=sn%7EOracle-Database%7Cturl%7Ehttps://s3.amazonaws.com/quickstart-reference/) | [Option 2](#_Scenario_2:_Extending_1)  Deploy BusinessWorks Container Edition into an existing VPC on AWS  [**Launch**](https://console.aws.amazon.com/cloudformation/home?region=us-east-2#cstack=sn%7EOracle-Database%7Cturl%7Ehttps://s3.amazonaws.com/quickstart-reference/) |

**Important** If you’re deploying BusinessWorks Container Edition into an existing VPC, make sure that your VPC has two private subnets in different Availability Zones for the ECS Host instances. These subnets require [NAT gateways or NAT instances](http://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/vpc-nat.html) in their route tables, to allow the instances to download packages and software without exposing them to the internet. You will also need the domain name option configured in the DHCP options as explained in the [Amazon VPC documentation](http://docs.aws.amazon.com/AmazonVPC/latest/UserGuide/VPC_DHCP_Options.html). You will be prompted for your VPC settings when you launch the Quick Start.

Each deployment takes about 25 minutes to complete.

1. Check the region that’s displayed in the upper-right corner of the navigation bar, and change it if necessary. This is where the network infrastructure for BusinessWorks Container Edition will be built. The template is launched in the US East (Ohio) Region by default.
2. On the **Select Template** page, keep the default setting for the template URL, and then choose **Next**.
3. On the **Specify Details** page, change the stack name if needed. Review the parameters for the template. Provide values for the parameters that require input. For all other parameters, review the default settings and customize them as necessary. When you finish reviewing and customizing the parameters, choose **Next**.

In the following tables, parameters are listed by category and described separately for the two deployment options:

* [Parameters for deploying BusinessWorks Container Edition into a new VPC](#sc1)
* [Parameters for deploying BusinessWorks Container Edition into an existing VPC](#sc2)
* **Option 1: Parameters for deploying <software> into a new VPC**

[View template](https://s3.amazonaws.com/quickstart-reference/)

*<The following parameter tables are generated automatically from the templates. Don’t enter the parameter information manually. The information below is provided only as an example. We recommend that you use these group and parameter labels if you’re providing similar functionality in your CloudFormation templates.>*

*VPC Network Configuration:*

|  |  |  |
| --- | --- | --- |
| Parameter label (name) | Default | Description |
| Availability Zones (AvailabilityZones) | *Requires input* | The list of Availability Zones to use for the subnets in the VPC. The Quick Start uses two Availability Zones from your list and preserves the logical order you specify. |
| VPC CIDR (VPCCIDR) | 10.0.0.0/16 | The CIDR block for the VPC. |
| Private Subnet 1 CIDR (PrivateSubnet1CIDR) | 10.0.0.0/19 | The CIDR block for the private subnet located in Availability Zone 1. |
| Private Subnet 2 CIDR (PrivateSubnet2CIDR) | 10.0.32.0/19 | The CIDR block for the private subnet located in Availability Zone 2. |
| Public Subnet 1 CIDR (PublicSubnet1CIDR) | 10.0.128.0/20 | The CIDR block for the public (DMZ) subnet located in Availability Zone 1. |
| Public Subnet 2 CIDR (PublicSubnet2CIDR) | 10.0.144.0/20 | The CIDR block for the public (DMZ) subnet located in Availability Zone 2. |
| Permitted IP range (AccessCIDR) | *Requires input* | The CIDR IP range that is permitted to access <software>. We recommend that you set this value to a trusted IP range. For example, you might want to grant only your corporate network access to the software. |

*Amazon EC2 Configuration:*

|  |  |  |
| --- | --- | --- |
| Parameter label (name) | Default | Description |
| Key Name (KeyPairName) | *Requires input* | A 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. |

*AWS Quick Start Configuration:*

|  |  |  |
| --- | --- | --- |
| Parameter label (name) | Default | Description |
| Quick Start S3 Bucket Name (QSS3BucketName) | quickstart-reference | The S3 bucket you have created for your copy of Quick Start assets, if you decide to customize or extend the Quick Start for your own use. The bucket name can include numbers, lowercase letters, uppercase letters, and hyphens, but should not start or end with a hyphen. |
| Quick Start S3 Key Prefix (QSS3KeyPrefix) | atlassian/bitbucket/latest/ | The [S3 key name prefix](https://docs.aws.amazon.com/AmazonS3/latest/dev/UsingMetadata.html) used to simulate a folder for your copy of Quick Start assets, if you decide to customize or extend the Quick Start for your own use. This prefix can include numbers, lowercase letters, uppercase letters, hyphens, and forward slashes. |

* **Option 2: Parameters for deploying** BusinessWorks Container Edition **into an existing VPC**

[View template](https://s3.amazonaws.com/quickstart-reference/)

*<The following parameter tables are generated automatically from the templates. Don’t enter the parameter information manually. The information below is provided only as an example. We recommend that you use these group and parameter labels if you are providing similar functionality in your CloudFormation templates.>*

*Network Configuration:*

|  |  |  |
| --- | --- | --- |
| Parameter label (name) | Default | Description |
| VPC ID (VPCID) | *Requires input* | The ID of your existing VPC (e.g., vpc-0343606e). |
| Private Subnet 1 ID (PrivateSubnet1ID) | *Requires input* | The ID of the private subnet in Availability Zone 1 in your existing VPC (e.g., subnet-a0246dcd). |
| Private Subnet 2 ID (PrivateSubnet2ID) | *Requires input* | The ID of the private subnet in Availability Zone 2 in your existing VPC (e.g., subnet-b58c3d67). |
| Bastion Security  Group ID  (BastionSecurityGroupID) | *Requires input* | The ID of the bastion security group in your existing VPC (e.g., sg-7f16e910). |

*Amazon EC2 Configuration:*

|  |  |  |
| --- | --- | --- |
| Parameter label (name) | Default | Description |
| Key Pair Name (KeyPairName) | *Requires input* | A 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. |

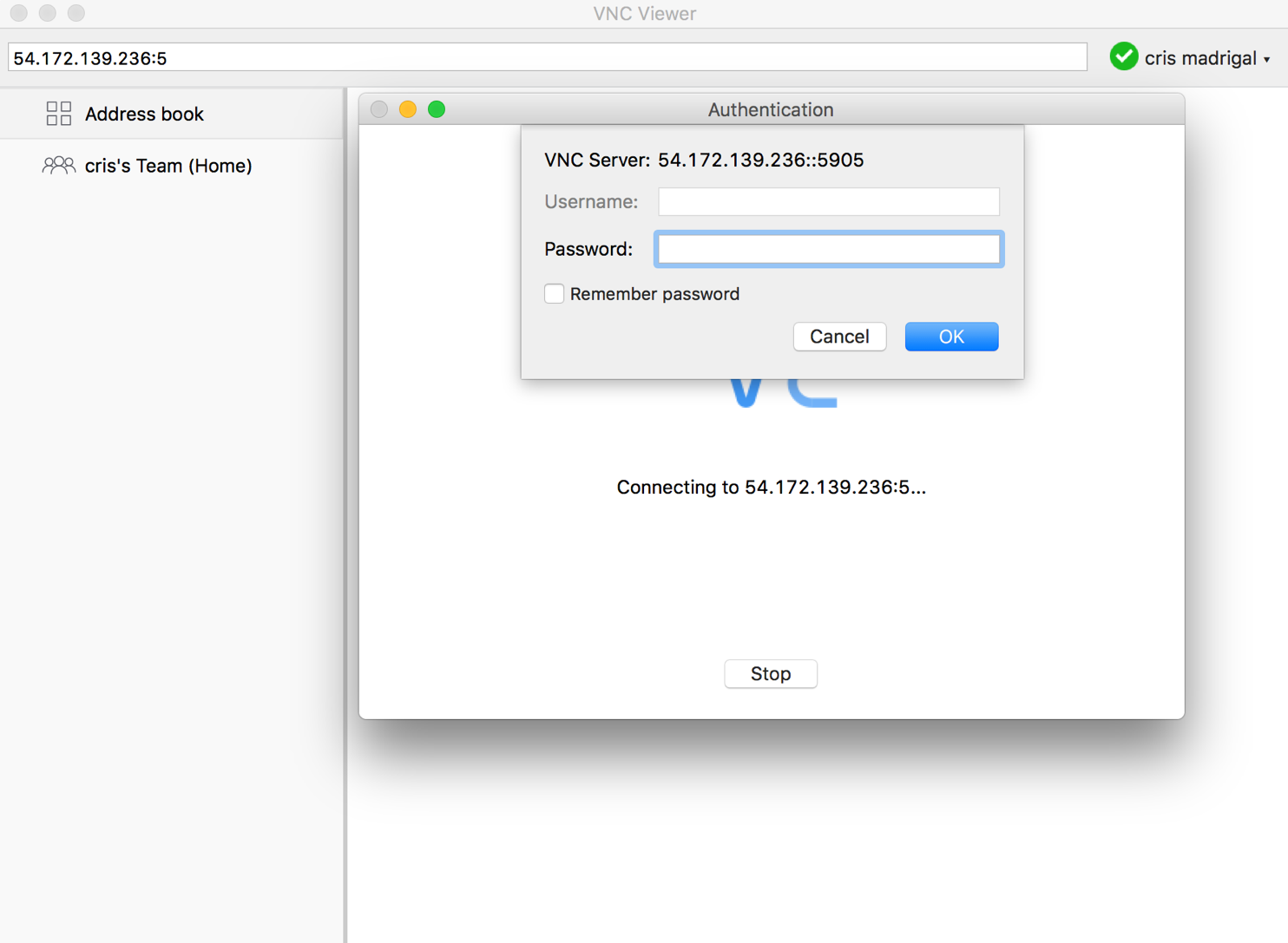
1. On the **Options** page, you can [specify tags](https://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/aws-properties-resource-tags.html) (key-value pairs) for resources in your stack and [set advanced options](https://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/cfn-console-add-tags.html). 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 BusinessWorks Container Edition cluster is ready.
5. Use the URLs displayed in the **Outputs** tab for the stack to view the resources that were created.

### Step 4. Test the Deployment

*When the AWS Cloudformation template successful creates the stack, the EC2 instances will be running in your AWS account, and the TIBCO BWCE software will be installed to the ECS host instances and studio instance.*

*To verify that the BWCE Studio instance is running and accessible, follow these steps:*

1. *In the AWS CloudFormation console, choose the* ***Outputs*** *tab, and navigate to the EC2Instance Key. Clicking the link will open up a new tab with all EC2 instance sorted by instance state.*
2. *Wait 25 minutes for the BWCE Studio instance to run through all the user data scripts.*
3. *After waiting, open up your favorite VNC viewer. The BWCE Studio instance leverages VNC to provide a GUI for BusinessWorks Container Edition design time. The VNC server will be running port 5905. The username of the VNC user will be ‘ec2-user’ and the password is the first 8 characters of your stack name.*

**

1. *The first time you access your VNC Server you will have to do the initial gnome setup. The setup will include: what language you want to use, the keyboard type, and turning location services on or off.*
2. *Either with the terminal or the GUI open up BusinessStudio. This can be found in: /home/bwce/bwce-studio/studio/4.0/eclipse. Open “TIBCOBusinessStudio”. You will be prompted to enter a workspace. This can be any directory, but we suggest you leave it as is. You are now ready to design on BusinessWorks Container Edition!*

**Note** The first time starting BusinessWorks Container Edition studio may take a few minutes. If you get an error message that prompts you to “Force Quit” or “Wait”, select “Wait”. Studio should get started shortly afterwards. Any other messages can be ignored.

## Best Practices Using BusinessWorks Container Edition on AWS

*TIBCO BWCE behaves the same on AWS as on any other deployment platform. Be mindful in making sure your ECS host instances are healthy and span across several availability zones.*

## Security

*The default security group for the BWCE Studio Instance opens up port 22 and 5905. For the sake of simplicity, the ports are open at startup. It is suggested that you set the CIDR block for this security group to only be available to either your IP or a range of IPs for your company.*

## Helpful Information

*If you wish to change the aspect ratio of your display, open up your settings and navigate to “Displays”. You will have the option to change the resolution and aspect ratio of your display. By default, the resolution is set to 1024 x 768 (4:3).*

*No Docker image will exist on your Studio instance at startup. Pull the image from the ECR repository you specified during the configuration stage to your studio instance.*

*Your monitoring application URL can be found under the output tab on your Cloud Formation page.*

## FAQ

*Any tips or answers to anticipated questions. This could include the following troubleshooting information. If you don’t have any other Q&A to add, change this heading to “Troubleshooting” and remove the Q/A headings below.*

**Q.** I encountered a CREATE\_FAILED error when I launched the Quick Start.

**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. (Look at the log files in %ProgramFiles%\Amazon\EC2ConfigService and C:\cfn\log.)

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

For additional information, see [Troubleshooting AWS CloudFormation](https://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/troubleshooting.html) on the AWS website.

**Q.** I encountered a size limitation error when I deployed the AWS Cloudformation templates.

**A.** We recommend that you launch the Quick Start templates from the location we’ve provided or from another S3 bucket. If you deploy the templates from a local copy on your computer or from a non-S3 location, you might encounter template size limitations when you create the stack. For more information about AWS CloudFormation limits, see the [AWS documentation](http://docs.aws.amazon.com/AWSCloudFormation/latest/UserGuide/cloudformation-limits.html).

## Git Repository

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

## Additional Resources

*Additional reading, with full URLs. Revise the following as appropriate.*

**AWS services**

* Amazon EBS  
  <https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/AmazonEBS.html>
* Amazon EC2  
  <https://aws.amazon.com/documentation/ec2/>
* Amazon VPC  
  <https://aws.amazon.com/documentation/vpc/>
* AWS CloudFormation  
  <https://aws.amazon.com/documentation/cloudformation/>
* AWS S3

<https://aws.amazon.com/documentation/s3/>

* AWS ECS

<https://aws.amazon.com/documentation/ecs/>

**BusinessWorks Container Edition documentation**

* TIBCO Software

<http://www.tibco.com>

* *BusinessWorks Container Edition 2.3.3*

<https://docs.tibco.com/products/tibco-businessworks-container-edition-2-3-3>

**Quick Start reference deployments**

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

## Document Revisions

|  |  |  |
| --- | --- | --- |
| Date | Change | In sections |
| <month> 2017 | *Brief description of change. Formatting and minor text changes don’t warrant any mention; major additions and changes do.* | *Links to revised sections* |
| Feb 2018 | Initial publication | — |

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# Style Guide

Delete this section after following these guidelines.

## Terminology and usage

* For a word list and usage guidelines for AWS content, see the [AWS Usage Dictionary](https://alpha-docs-aws.amazon.com/awsstyleguide/latest/styleguide/dictionary.html) (internal AWS use only).
* For AWS service names and allowed variations, see the [AWS Service Names](https://w.amazon.com/bin/view/AWSDocs/editing/service-names/) wiki page (internal AWS use only).

## Bullet lists

* Use the **List Bullet** style instead of using the bullets control on the Word ribbon.
* Use the **List Paragraph** style for additional paragraphs under the bullet.
* Use nested bullet lists sparingly.

Use the **List Bullet 2** style for second-level bulleted lists.

Keep both first-level and second-level lists short. Three to seven items is a good rule of thumb to follow.

Because bullet lists have less spacing after each paragraph, consider manually changing the spacing after the last item to 14 pt.

## Numbered lists for procedures

1. Use a numbered list only when there’s a sequence (of steps, or priorities, etc.) involved.
2. Use the **List Number** style instead of using the numbered list control on the Word ribbon.
3. Use the **List Paragraph** style for additional paragraphs under the number.
4. Use nested lists sparingly.
5. Use the **List Number 2** style for second-level numbered lists.
6. Because numbered lists have less spacing after each paragraph, consider manually changing the spacing after the last item to 14 pt.

## Tips, Notes, Warnings

Use the **Note** style, which provides the following formatting. Change “Note” to “Tip” or “Warning” as needed.

**Note** You are responsible for all costs incurred by your use of the AWS services used while running this Quick Start Reference Deployment. See the pricing pages of the specific AWS services you will be using for full details.

## Figures

* Use the **Picture** style, which centers the illustration.
* Below the figure, add the figure caption using the **Caption** style. Specify the number in the format **Figure *n*: Caption**. Use sentence capitalization for captions (that is, just capitalize the first word and any proper nouns).
* For architecture diagrams, use the [Visio](https://github.com/aws-quickstart/quickstart-examples/raw/master/doc/Quick%20Start%20architecture%20diagram.vsdx) or [PowerPoint](https://github.com/aws-quickstart/quickstart-examples/raw/master/doc/Quick%20Start%20architecture%20diagram.pptx) templates we provided, and the [AWS simple icons](https://aws.amazon.com/architecture/icons/), and please send us the source file.

## Tables

* Create a table in Word (**Insert** > **Table**), and apply the **AWS** table style from the menu on the **Table Tools**, **Design** tab. There’s also an **AWS wide** style if you need a wider table.
* Use the **Table text** style for the contents of the table.
* Add boldface for headings.
* Turn on the **Repeat Header Rows** option on the **Table Tools**, **Layout** tab.

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
|  | January | February | March | April |
| North | Red | Green | Blue | Black |
| South | Red | Green | Blue | Black |
| East | Red | Green | Blue | Black |
| West | Red | Green | Blue | Black |

## References

* Use the **Hyperlink** style.
* Use the title of the paper or website as link text. Don’t use phrases like “click here” or “this website” for your links.
* In some cases, you might want to shorten the link text and weave it into the sentence, e.g., “Create a [key pair](http://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html) in your preferred region.”
* Don’t display the URL in text (unless you’re linking to a home page or to a main section under the home page), but make sure to include the full title and URL in the “Additional Resources” section.
* When providing information from other sources, be sure to use your own words. Use short quotations if necessary. It’s OK to use text from the AWS documentation.

## Code

For code that appears within a sentence, use the Code Inline style.

For code blocks, use the **Code Snippet** style:

"Conditions": {

"GovCloudCondition": {

"Fn::Equals": [

{

"Ref": "AWS::Region"

},

"us-gov-west-1"

]

}

},

In the HTML version of the deployment guide, we can use syntax highlighting for selected languages, including JSON, PowerShell, Bash, and Python. The PDF format doesn’t support syntax highlighting.

## Sidebars

**Create Sidebars with an Inset Text Box**You may have to apply a text wrap to your text box. The Square option is usually best. Avoid using multiple paragraphs.

If you want to use a sidebar to highlight content, create a text box (**Insert** > **Text Box**) and style the text inside as **Side Body**. There is no heading style, so if you want to add a heading, style it as **Side Body** and then manually apply the bold attribute.

Avoid using multiple paragraphs, because these are converted to separate text boxes in the PDF. (You can use soft returns to work around this limitation.)

## Colors

When you need to use color, select from the following color palette.

|  |  |  |  |  |  |  |
| --- | --- | --- | --- | --- | --- | --- |
|  |  |  |  |  |  |  |
| R: 242  G: 165  B: 44 | R: 178  G: 36  B: 145 | R: 0  G: 124  B: 188 | R: 139  G: 201  B: 66 | R: 0  G: 0  B: 0 | R: 166  G: 166  B: 166 | R: 89  G: 89  B: 89 |