Amazon Managed Blockchain

Quick Start Reference Deployment

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Visit our GitHub repository for source files and to post feedback, report bugs, or submit feature ideas for this Quick Start.

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This Quick Start was created by solutions architects at Amazon Web Services (AWS).

Quick Starts 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 an Amazon Managed Blockchain network on the AWS Cloud. This initial release installs the network, the first member, and its peer nodes.

This Quick Start is for users who want to build and participate in decentralized applications shared across a consortium of members using Managed Blockchain.

Managed Blockchain

Blockchain technology makes it possible to build applications where multiple parties can execute transactions without the need for a trusted, central authority. Managed Blockchain is a fully managed service for creating and managing scalable blockchain networks using the popular open source Hyperledger Fabric framework. Hyperledger Fabric is well suited for applications that require stringent privacy and permission controls with a known set of members, such as a financial application where certain trade-related data is shared only with select banks.

Blockchain technology can be beneficial for several other use cases, including supply chain management, asset transfer and tokenization, customer loyalty programs, and digital identity.

Cost 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 edition and 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.
**Tip** After you deploy the Quick Start, we recommend that you enable the [AWS Cost and Usage Report](https://aws.amazon.com/cost-manage/) to track costs associated with the Quick Start. This report delivers billing metrics to an S3 bucket in your account. It provides cost estimates based on usage throughout each month and finalizes the data at the end of the month. For more information about the report, see the [AWS documentation](https://docs.aws.amazon.com/). 

## Architecture

Deploying this Quick Start with **default parameters** builds the following Managed Blockchain environment in the AWS Cloud.

![Architecture Diagram](image)

*Figure 1: The initial release of the Managed Blockchain deploys the area shown in yellow*

The Quick Start sets up a highly available Managed Blockchain architecture with a single initial member, Member A, that spans two Availability Zones (in the diagram, the areas that are shaded yellow). Members B and C are included in the diagram to emphasize that a typical blockchain consists of several members, although this Quick Start creates only the
first one. The other members must be invited using either the AWS Management Console or AWS Command Line Interface (AWS CLI).

### Planning the deployment

#### Specialized knowledge

This Quick Start assumes familiarity with basic concepts in the areas of networking and DevOps. This deployment guide also requires a moderate level of familiarity with AWS services. If you’re new to AWS, visit the [Getting Started Resource Center](https://aws.amazon.com/getting-started/resource-center/) and the [AWS Training and Certification website](https://aws.amazon.com/training/certification/) for materials and programs that can help you develop the skills to design, deploy, and operate your infrastructure and applications on the AWS Cloud.

#### AWS account

If you don’t already have an AWS account, create one at [https://aws.amazon.com](https://aws.amazon.com) by following the on-screen instructions. Part of the sign-up process involves receiving a phone call and entering a PIN using the phone keypad.

Your AWS account is automatically signed up for all AWS services. You are charged only for the services you use.

#### Technical requirements

Before you launch the Quick Start, your account must be configured as specified in the following table. Otherwise, deployment might fail.

<table>
<thead>
<tr>
<th>Resources</th>
<th>If necessary, request service limit increases for the following resources. You might need to do this if you already have an existing deployment that uses these resources, and you think you might exceed the default limits with this deployment. For default limits, see the <a href="https://aws.amazon.com/documentation/">AWS documentation</a>.</th>
</tr>
</thead>
<tbody>
<tr>
<td>AWS Trusted Advisor</td>
<td>offers a service limits check that displays your usage and limits for some aspects of some services.</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Resource</th>
<th>This deployment uses</th>
</tr>
</thead>
<tbody>
<tr>
<td>VPCs</td>
<td>1</td>
</tr>
<tr>
<td>Managed instances (one for each peer node)</td>
<td>1-3</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>Regions</th>
<th>This deployment includes Managed Blockchain, which currently is available only in US East (N. Virginia).</th>
</tr>
</thead>
</table>
IAM permissions
To deploy the Quick Start, you must log in to the AWS Management Console with IAM permissions for the resources and actions the templates will deploy. The AdministratorAccess managed policy within IAM provides sufficient permissions, although your organization may choose to use a custom policy with more restrictions.

Deployment steps

Step 1. Sign in to your AWS account

1. Sign in to your AWS account at https://aws.amazon.com with an IAM user role that has the necessary permissions. For details, see Planning the deployment earlier in this guide.

2. Make sure that your AWS account is configured correctly, as discussed in the Technical requirements section.

Step 2. Launch the Quick Start

Notes  The instructions in this section reflect the older version of the AWS CloudFormation console. If you’re using the redesigned console, some of the user interface elements might be different.

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. 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. Sign in to your AWS account and select the following hyperlink.

   ![Deploy Managed Blockchain](https://aws.amazon.com)

   Each deployment takes about 15 minutes to complete.

2. Check the AWS Region that’s displayed in the upper-right corner of the navigation bar, and, if necessary, change it to US East (N. Virginia), which currently is the only supported Region.
3. On the **Select Template** page, keep the default setting for the template URL, and then choose **Next**.

4. 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**.

**PARAMETERS FOR DEPLOYING MANAGED BLOCKCHAIN**

**View template**

**Network configuration:**

<table>
<thead>
<tr>
<th>Parameter label (name)</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Network name (NetworkName)</td>
<td>Requires input</td>
<td>The name you want for your Amazon Managed Blockchain network. All members of the consortium will see this name.</td>
</tr>
<tr>
<td>Network description (NetworkDescription)</td>
<td>Optional</td>
<td>A description of your network.</td>
</tr>
<tr>
<td>Edition (Edition)</td>
<td>STARTER</td>
<td>Setting that determines the number of peer nodes per member and the selection of instance types that can be used for them. Edition must be set to <strong>STARTER</strong> or <strong>STANDARD</strong>. For more information about editions and their attributes, see the <a href="https://aws.amazon.com/blockchain/pricing/">Amazon Managed Blockchain pricing page</a>.</td>
</tr>
<tr>
<td>Threshold percentage (ThresholdPercentage)</td>
<td>50</td>
<td>The percentage of favorable votes needed to approve a blockchain proposal.</td>
</tr>
<tr>
<td>Threshold comparator (ThresholdComparator)</td>
<td>GREATER_THAN</td>
<td>The comparator used to determine how the vote percentages are compared with the threshold percentage. If it is GREATER_THAN, then the percentage of favorable votes must exceed the ThresholdPercentage value for a proposal to pass. If it is GREATER_THAN_OR_EQUAL_TO, then the percentage of favorable votes must at least be equal to the threshold percentage for a proposal to pass.</td>
</tr>
<tr>
<td>Proposal duration (ProposalDurationInHours)</td>
<td>24</td>
<td>The number of hours that a proposal can be voted on. If the proposal does not gain enough Yes or No votes to determine the outcome, the proposal is expired.</td>
</tr>
</tbody>
</table>

**First member configuration:**

<table>
<thead>
<tr>
<th>Parameter label (name)</th>
<th>Default</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>First member name (FirstMemberName)</td>
<td>Requires input</td>
<td>The name of the first member in your Amazon Managed Blockchain network.</td>
</tr>
</tbody>
</table>
### Parameter label (name) | Default | Description
---|---|---
First member description (FirstMemberDescription) | Optional | A description of the blockchain’s first member.
First member admin user name (FirstMemberAdmin Username) | Requires input | The user name of your first member’s admin user. It must be alphanumeric and cannot contain spaces.
First member admin password (FirstMemberAdmin Password) | Requires input | The password of your first member’s admin user. Must be at least 8 characters long and must contain at least one uppercase character, one lowercase character, and one digit. It must not contain ’,’ ”,” \,” /,” @ or spaces. It must not exceed 32 characters in length.
Peer node 1 Availability Zone (AvailabilityZoneForPeer Node1) | us-east-1a | The Availability Zone for your first peer node.
Peer node 2 Availability Zone (AvailabilityZoneForPeer Node2) | us-east-1b | The Availability Zone for your second peer node. If you are deploying only one peer node, this can be blank.
Peer node 3 Availability Zone (AvailabilityZoneForPeer Node3) | | The Availability Zone for your third peer node. This can be blank. A third peer node is allowed only in STANDARD edition.
Instance type (InstanceType) | bc.t3.small | The type of compute instance to use for your peer nodes. If Edition is STARTER, this value must be bc.t3.small or bc.t3.medium. If Edition is STANDARD, the instance type can be any of the listed instance types.

5. On the **Options** page, you can **specify tags** (key-value pairs) for resources in your stack and **set advanced options**. When you’re done, choose **Next**.

6. On the **Review** page, review and confirm the template settings. Under **Capabilities**, select the two check boxes to acknowledge that the template will create IAM resources and that it might require the capability to auto-expand macros.

7. Choose **Create** to deploy the stack.

8. Monitor the status of the stack. When the status is **CREATE_COMPLETE**, the Managed Blockchain cluster is ready.

9. Visit the Managed Blockchain service in the AWS Management Console to see the resources that were created.
Step 3. Integrate with the deployment

You can now begin the process of building a decentralized application on top of the infrastructure that you have deployed. To get started, see Build and deploy an application for Hyperledger Fabric on Amazon Managed Blockchain on the AWS Database Blog for a step-by-step example.

Troubleshooting

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.

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://aws.amazon.com/documentation/cloudformation/troubleshooting/) 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 links in this guide 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](https://aws.amazon.com/documentation/cloudformation/).

**Send us feedback**

To post feedback, submit feature ideas, or report bugs, use the **Issues** section of the [GitHub repository](https://github.com/aws-samples/amazon-managed-blockchain) for this Quick Start. If you’d like to submit code, please review the [Quick Start Contributor’s Guide](https://aws.amazon.com/documentation/quickstart/contributors-guide/).

**Additional resources**

**AWS resources**

- [Getting Started Resource Center](https://aws.amazon.com/getting-started/

- [AWS General Reference](https://docs.aws.amazon.com/)

- [AWS Glossary](https://aws.amazon.com/glossary/)

**AWS services**

- [AWS CloudFormation](https://aws.amazon.com/cloudformation/)

- [Amazon VPC](https://aws.amazon.com/vpc/)

- [Amazon Managed Blockchain](https://aws.amazon.com/managedblockchain/)

**Other Quick Start reference deployments**

- [AWS Quick Start home page](https://aws.amazon.com/quickstart/)

**Document revisions**

<table>
<thead>
<tr>
<th>Date</th>
<th>Change</th>
<th>In sections</th>
</tr>
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<tbody>
<tr>
<td>October 2019</td>
<td>Initial publication</td>
<td>—</td>
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