Hyperledger Fabric

Getting Started

入门

一、Prerequisites

一、前提

Before we begin, if you haven't already done so, you may wish to check that you have all the prerequisites below installed on the platform(s) on which you'll be developing blockchain applications and/or operating Hyperledger Fabric.

在我们开始之前，如果您还没有这样做，您可能希望检查您是否在开发区块链应用程序和/或操作超级账本结构的平台上安装了以下所有先决条件。

1、Install cURL

1、安装 cURL

Download the latest version of the cURL tool if it is not already installed or if you get errors running the curl commands from the documentation.

如果尚未安装 curl 工具，或者从文档中运行 curl 命令时出错，请下载该工具的最本。

Note

注释

If you're on Windows please see the specific note on Windows extras below.

如果您在 Windows 上，请参阅下面有关 Windows 附加程序的特定说明。

2、Docker and Docker Compose

2、Docker 和 Docker Compose

You will need the following installed on the platform on which you will be operating, or developing on (or for), Hyperledger Fabric:

您将需要在运行或开发（或用于）Hyperledger 结构的平台上安装以下组件：

MacOSX, *nix, or Windows 10: Docker Docker version 17.06.2-ce or greater is required.

需要 MacOSX、*NIX 或 Windows 10:Docker Docker 版本 17.06.2-CE 或更高版本。

Older versions of Windows: Docker Toolbox - again, Docker version Docker 17.06.2-ce or greater is required.

旧版本的 Windows:Docker 工具箱-同样，需要 Docker 版本 Docker 17.06.2-CE 或更高版本。

You can check the version of Docker you have installed with the following command from a terminal prompt:

您可以在终端提示下使用以下命令检查已安装的 Docker 版本：

```
docker --version
```

Note
注释
Installing Docker for Mac or Windows, or Docker Toolbox will also install Docker Compose. If you already had Docker installed, you should check that you have Docker Compose version 1.14.0 or greater installed. If not, we recommend that you install a more recent version of Docker.
Mac 或 Windows 安装 Docker，或 Docker Compose，因此安装 Docker Toolbox 提供。如果你已经安装 Docker，你应该检查你的安装，一个安装 1.14.0 的 Docker。如果需要，我们建议你安装一个新版本的 docker。

You can check the version of Docker Compose you have installed with the following command from a terminal prompt:

您可以在终端提示下使用以下命令检查已安装的 Docker Compose 的版本：

```
docker-compose --version
```

3、Go Programming Language

3、GO 编程语言

Hyperledger Fabric uses the Go Programming Language for many of its components.

HyperledgeFabric 对其许多组件使用 Go 编程语言。

Go version 1.11.x is required.

需要 Go 版本 1.11.x。

Given that we will be writing chaincode programs in Go, there are two environment variables you will need to set properly; you can make these settings permanent by placing them in the appropriate startup file, such as your personal ~/.bashrc file if you are using the bash shell under Linux.

考虑到我们将在 Go 中编写 chaincode 程序，您需要正确设置两个环境变量；如果您在 Linux 下使用 bash shell，则可以将这些设置永久保存在适当的启动文件中，例如您的 Personal ~/.bashrc 文件。

First, you must set the environment variable GOPATH to point at the Go workspace containing the downloaded Fabric code base, with something like:

首先，必须将环境变量 gopath 设置为指向包含下载的结构代码库的 go 工作区，如下所示：

```
export GOPATH=$HOME/go
```

Note
注释
You must set the GOPATH variable
必须设置 gopath 变量
Even though, in Linux, Go's GOPATH variable can be a colon-separated list of directories, and will use a default value of $HOME/go if it is unset, the current Fabric build framework still requires you to set and export that variable, and it must contain only the single directory name for your Go workspace. (This restriction might be removed in a future release.)

即使在 Linux 中，go 的 gopath 变量可以是以冒号分隔的目录列表，并且将使用默认值 $home/go 如果不设置，当前结构构建框架仍然要求您设置和导出该变量，并且它必须只包含 go 工作区的单个目录名。（此限制可能在将来的版本中被删除。）

Second, you should (again, in the appropriate startup file) extend your command search path to include the Go bin directory, such as the following example for bash under Linux:

其次，您应该（同样，在适当的启动文件中）扩展命令搜索路径以包括 go bin 目录，例如下面的 Linux 下的 bash 示例：

```
export PATH=$PATH:$GOPATH/bin
```

While this directory may not exist in a new Go workspace installation, it is populated later by the Fabric build system with a small number of Go executables used by other parts of the build system. So even if you currently have no such directory yet, extend your shell search path as above.

虽然这个目录可能不存在于新的 Go 工作区安装中，但稍后将由 Fabric Build 系统填充，生成系统的其他部分使用少量的 Go 可执行文件。因此，即使您目前还没有这样的目录，也可以如上所述扩展您的 shell 搜索路径。

4、Node.js Runtime and NPM

4、Node.js 运行时和 NPM

If you will be developing applications for Hyperledger Fabric leveraging the Hyperledger Fabric SDK for Node.js, you will need to have version 8.9.x of Node.js installed.

如果您将利用用于 node.js 的 hyperledger fabric sdk 开发用于 hyperledger fabric 的应用程序，则需要安装 node.js 的 8.9.x 版本。

Note

注释

Versions other than the 8.x series are not supported at this time.

目前不支持 8.x 系列以外的版本。

Node.js - version 8.x

node.js-版本 8.x

Note

注释

Installing Node.js will also install NPM, however it is recommended that you confirm the version of NPM installed. You can upgrade the npm tool with the following command:

安装 node.js 也将安装 NPM，但是建议您确认安装的 NPM 版本。可以使用以下命令升级 NPM 工具：

```
npm install npm@5.6.0 -g
```

5、Python

5、Python

Note

注释

The following applies to Ubuntu 16.04 users only.

以下仅适用于 Ubuntu 16.04 用户。

By default Ubuntu 16.04 comes with Python 3.5.1 installed as the python3 binary. The Fabric Node.js SDK requires an iteration of Python 2.7 in order for npm install operations to complete successfully. Retrieve the 2.7 version with the following command:

默认情况下,Ubuntu16.04 附带了作为 python3 二进制文件安装的 python3.5.1。fabric node.js sdk 需要迭代 python 2.7 才能成功完成 NPM 安装操作。使用以下命令检索 2.7 版本：

```
sudo apt-get install python
```

Check your version(s):

检查你的版本

```
python --version
```

6、Windows extras

6、Windows 附加程序

If you are developing on Windows 7, you will want to work within the Docker Quickstart Terminal which uses Git Bash and provides a better alternative to the built-in Windows shell.

如果您是在 Windows7 上开发的，那么您将希望在使用 Git-Bash 的 Docker QuickStart 终端中工作，并为内置的 Windows Shell 提供更好的替代方案。

However experience has shown this to be a poor development environment with limited functionality. It is suitable to run Docker based scenarios, such as Getting Started, but you may have difficulties with operations involving the make and docker commands.

然而，经验表明，这是一个功能有限的糟糕的开发环境。它适用于运行基于 Docker 的场景，例如入门，但是在涉及 make 和 docker 命令的操作中可能会遇到困难。

On Windows 10 you should use the native Docker distribution and you may use the Windows PowerShell. However, for the binaries command to succeed you will still need to have the uname command available. You can get it as part of Git but beware that only the 64bit version is supported.

在 Windows 10 上,您应该使用本机 Docker 分发版,并且可以使用 Windows PowerShell。但是，要使二进制文件命令成功，您仍然需要有 uname 命令可用。您可以将其作为 Git 的一部分获得，但请注意，仅支持 64 位版本。

Before running any git clone commands, run the following commands:

在运行任何 git clone 命令之前，请运行以下命令：

```
git config --global core.autocrlf false
git config --global core.longpaths true
```

You can check the setting of these parameters with the following commands:

您可以使用以下命令检查这些参数的设置：

```
git config --get core.autocrlf
git config --get core.longpaths
```

These need to be false and true respectively.

这些需要分别是 false 和 true。

The curl command that comes with Git and Docker Toolbox is old and does not handle properly the redirect used in Getting Started. Make sure you install and use a newer version from the cURL downloads page

Git 和 Docker 工具箱附带的 curl 命令是旧的，不能正确处理入门中使用的重定向。确保从 curl 下载页面安装并使用更新版本

For Node.js you also need the necessary Visual Studio C++ Build Tools which are freely available and can be installed with the following command:

对于 NoDE.js，您还需要必要的 VisualStudioC++生成工具，这些工具可以自由使用，并且可以安装以下命令：

```
npm install --global windows-build-tools
```

See the NPM windows-build-tools page for more details.

有关详细信息，请参阅“NPM Windows 生成工具”页。

Once this is done, you should also install the NPM GRPC module with the following command:

完成后，还应使用以下命令安装 NPM GRPC 模块：

```
npm install --global grpc
```

Your environment should now be ready to go through the Getting Started samples and tutorials.

您的环境现在应该准备好学习入门示例和教程了。

Note

注释

If you have questions not addressed by this documentation, or run into issues with any of the tutorials, please visit the Still Have Questions? page for some tips on where to find additional help.

如果您有本文档未解决的问题，或者遇到任何教程的问题，请访问“还有问题”部分？有关在哪里查找其他帮助的一些提示，请参见第页。

二、Install Samples, Binaries and Docker Images

二、安装示例、二进制文件和 Docker 映像

While we work on developing real installers for the Hyperledger Fabric binaries, we provide a script that will download and install samples and binaries to your system. We think that you’ll find the sample applications installed useful to learn more about the capabilities and operations of Hyperledger Fabric.

在我们为 HyperledgeFabric 二进制文件开发真正的安装程序时，我们提供了一个脚本，该脚本将下载示例和二进制文件并将其安装到您的系统中。我们认为，您将发现安装的示例应用程序对于进一步了解 Hyperledger Fabric 的功能和操作非常有用。

Note

注释

If you are running on Windows you will want to make use of the Docker Quickstart Terminal for the upcoming terminal commands. Please visit the Prerequisites if you haven’t previously installed it.

如果您在 Windows 上运行，您将希望使用 Docker QuickStart 终端来执行即将到来的终端命令。如果您以前没有安装，请访问先决条件。

If you are using Docker Toolbox on Windows 7 or macOS, you will need to use a location under C:\Users (Windows 7) or /Users (macOS) when installing and running the samples.

如果在 Windows 7 或 MacOS 上使用 Docker 工具箱，则在安装和运行示例时需要使用 C:\users（Windows 7）或/users（MacOS）下的位置。

If you are using Docker for Mac, you will need to use a location under /Users, /Volumes, /private, or /tmp. To use a different location, please consult the Docker documentation for file sharing.

如果使用 Docker for Mac，则需要使用/users、/volumes、/private 或/tmp 下的位置。要使用其他位置，请查阅 Docker 文档以共享文件。

If you are using Docker for Windows, please consult the Docker documentation for shared drives and use a location under one of the shared drives.

如果您使用的是 Docker for Windows，请查阅 Docker 文档中的共享驱动器，并在其中一个共享驱动器下使用一个位置。

Determine a location on your machine where you want to place the fabric-samples repository and enter that directory in a terminal window. The command that follows will perform the following steps:

确定计算机上要放置结构示例存储库的位置，然后在终端窗口中输入该目录。下面的命令将执行以下步骤：

1、If needed, clone the hyperledger/fabric-samples repository

2、Checkout the appropriate version tag

3、Install the Hyperledger Fabric platform-specific binaries and config files for the version specified into the /bin and /config directories of fabric-samples

4、Download the Hyperledger Fabric docker images for the version specified

1、如果需要，克隆 hyperledger/fabric-samples 本库

2、检查适当的版本标签

3、安装 hyperledgerfabric 平台-将特定版本二进制文件和配置文件的下载到 fabric-samples 下/bin /config 的目录结构

4、下载版本指定的 hyperledger fabric docker 镜像

Once you are ready, and in the directory into which you will install the Fabric Samples and binaries, go ahead and execute the following command:

准备好后，在将要 Fabric Samples 和二进制文件的目录中，继续执行以下命令：

```
curl -sSL http://bit.ly/2ysbOFE | bash -s 1.4.0-rc2
```

Note

注释

If you want to download different versions for Fabric, Fabric-ca and thirdparty Docker images, you must pass the version identifier for each.

如果要下载不同版本的 Fabric、Fabric CA 和 Thirdparty Docker 镜像，则必须为每个图像传递版本标识符。

```
curl -sSL http://bit.ly/2ysbOFE | bash -s <fabric> <fabric-ca> <thirdparty>
curl -sSL http://bit.ly/2ysbOFE | bash -s 1.4.0-rc2 1.4.0-rc2 0.4.14
```

Note

注释

If you get an error running the above curl command, you may have too old a version of curl that does not handle redirects or an unsupported environment.

如果运行上面的 curl 命令时出错，则可能是 curl 的版本太旧，无法处理重定向或不受支持的环境。

Please visit the Prerequisites page for additional information on where to find the latest version of curl and get the right environment. Alternately, you can substitute the un-shortened URL:

https://raw.githubusercontent.com/hyperledger/fabric/master/scripts/bootstrap.sh

请访问“先决条件”页，以获取有关在哪里找到最新版本的 curl 并获得正确环境的其他信息。或者，可以替换未缩短的

URL:https://raw.githubusercontent.com/hyperledger/fabric/master/scripts/bootstrap.sh

Note

注释

You can use the command above for any published version of Hyperledger Fabric. Simply replace 1.4.0-rc2 with the version identifier of the version you wish to install.

您可以将上述命令用于任何已发布版本的 Hyperledger 结构。只需将 1.4.0-rc2 替换为要安装的版本的版本标识符。

The command above downloads and executes a bash script that will download and extract all of the platform-specific binaries you will need to set up your network and place them into the cloned repo you created above. It retrieves the following platform-specific binaries:

上面的命令下载并执行一个 bash 脚本，该脚本将下载并提取所有平台特定的二进制文件，您需要设置网络并将它们放入您在上面创建的克隆 repo 中。它检索以下特定于平台的二进制文件：

configtxgen,
configtxlator,
cryptogen,
discover,
idemixgen
orderer,
peer, and
fabric-ca-client
and places them in the bin sub-directory of the current working directory.

并将它们放在当前工作目录的 bin 子目录中。

You may want to add that to your PATH environment variable so that these can be picked up without fully qualifying the path to each binary. e.g.:

您可能希望将其添加到 PATH 环境变量中，这样就可以在不完全限定每个二进制文件的路径的情况下提取这些变量。例如。：

```
export PATH=<path to download location>/bin:$PATH
```

Finally, the script will download the Hyperledger Fabric docker images from Docker Hub into your local Docker registry and tag them as 'latest'.

最后，脚本将从 Docker Hub 下载 Hyperledger Fabric Docker 镜像到本地 Docker 注册表，并将其标记为“最新”。

The script lists out the Docker images installed upon conclusion.

脚本列出了在结束时安装的 Docker 镜像。

Look at the names for each image; these are the components that will ultimately comprise our Hyperledger Fabric network. You will also notice that you have two instances of the same image ID - one tagged as "amd64-1.x.x" and one tagged as "latest". Prior to 1.2.0, the image being downloaded was determined by uname -m and showed as "x86_64-1.x.x".

看看每个图像的名称；这些组件最终将构成我们的超级账本结构网络。您还将注意到，您有两个相同镜像 ID 的实例，一个标记为“amd64-1.x.x”，另一个标记为“最新”。在 1.2.0 之前，下载的镜像由 uname-m 确定，显示为“x86_64-1.x.x”。

Note

注释

On different architectures, the x86_64/amd64 would be replaced with the string identifying your architecture.

在不同的体系结构上，x86_64/amd64 将替换为标识体系结构的字符串。

Note

注释

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三、Hyperledger Fabric SDKs

三、Hyperledger Fabric SDKs

Hyperledger Fabric offers a number of SDKs to support various programming languages. There are two officially released SDKs for Node.js and Java:

Hyperledger Fabric 提供一些 SDK 作为支持各种编程语言。有两个 node.js 和 Java SDK 的正式发布：

Hyperledger Fabric Node SDK and Node SDK documentation.

Hyperledger Fabric Java SDK.

In addition, there are three more SDKs that have not yet been officially released (for Python, Go and REST), but they are still available for downloading and testing:

此外，有三个更多的 SDK 是还没有被正式发布（Python，CRP 与 REST），但他们仍然是可用的下载和测试：

Hyperledger Fabric Python SDK.

Hyperledger Fabric Go SDK.

Hyperledger Fabric REST SDK.

四、Hyperledger Fabric CA

四、Hyperledger Fabric CA

Hyperledger Fabric provides an optional certificate authority service that you may choose to use to generate the certificates and key material to configure and manage identity in your blockchain network. However, any CA that can generate ECDSA certificates may be used.

Hyperledger Fabric 提供认证服务，你可以选择使用生成的证书和密钥材料来配置和管理你的网络身份 blockchain。然而，任何可以生成 CA 证书可以使用 ECDSA