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OHDSI In-a-box

Quick Start – Installation Guide

DRAFT

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Overview

IQVIA has created an OHDSI In-a-box quick start installation guide to deploy the OHDSI Atlas Website, WebAPI and Synpuf data repositories. The purpose of this installation guide is to provide a quick and easy way to deploy all of the required software, services and databases to run the Atlas Web Application.

For the purposes of this quick start installation guide, the current OHDSI In-a-box only supports a PostgreSQL database installation. For more information on how to reconfigure the system for various databases please refer to the OHDSI community website for those specific configurations and installation instructions.

Important Note:

This installation guide is not meant to replace any of the instruction on the OHDSI community website nor replace the installation instructions for any of the applications. The OHDSI In-a-box quick start installation guide has streamlined much of the manual setup steps that would be required and has targeted a very specific implementation. For more information on the OHDSI installation instructions please refer to the links below.

Atlas Installation

<https://github.com/OHDSI/Atlas>

WebAPI Installation

<https://github.com/OHDSI/WebAPI>

Software Location

To aide in the installation process all required software and compiled source code has been packaged and stored in an AWS S3 bucket.

S3 Bucket Location:

s3://ohdsi-installation-preperation

Within this S3 bucket are the following folders:

/backups

The backups folder contains all of the database backups specific to SQL Server with a predefined set of credentials.

/software

All software required to complete the OHDSI In-a-box installation. A few items included in the software folder are as follows:

- Tomcat
- SQL Server Developer Edition
- Nodejs
- Chrome
- Java Development Kit
- Atlas
- WebAPI

Note:

If you wish to use a different version of the software please refer to the installation instructions for each of the components you wish to installation manually.

Installation Preparation

For these installation instructions it is required that you have access to AWS S3 buckets and preferred that you have an AWS cloud account. The installation will not focus on the installation of the operating system because an AWS template is going to be selected from AWS's quick start option.

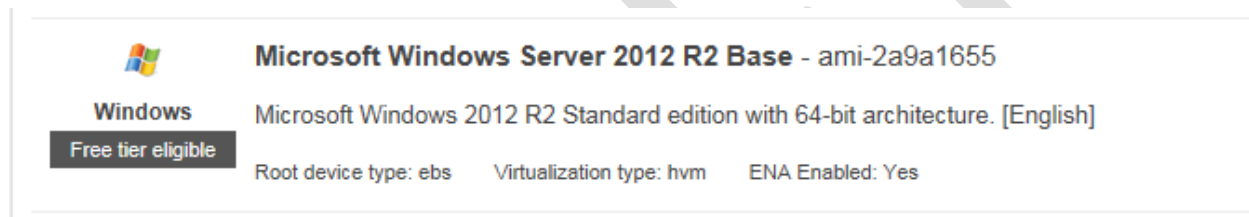
Installation Quick Start Steps

AWS Instance Deployment

To begin the installation login to your AWS account and navigate to EC2 management. From this location click on the Launch Instance Option.



Once on the Instance Options page select **Windows Server 2012 R2** as shown below.



Once selected, please navigate through the wizard selecting the recommended options below.

Instance Size: t2.2xlarge

Instance Diskspace: 1TB

You can select a smaller instance; however, the performance of the server will greatly be impacted. At a minimum it is recommended that you select a t2.medium. The software has not been tested on any lesser configuration and may not run correctly.

Security Rules:

Please be sure to allow port 3389 from your IP address so you can Remote Desktop into the computer once the server is up and running. If you do not enable this port you will not be able to connect. Please be very careful setting the security rules to prevent any unauthorized access to the server.

Key Pair Generation

For added security, generate a key pair that will be used to login to the server. For more information on how to generate a keypair refer to the following AWS link below.

<https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/ec2-key-pairs.html>

AWS CLI (Command Line Interface) Installation

Once the instance or server is ready and accessible, login to the server and copy over the AWS CLI (Command Line Interface) installation. The installation for the AWS client can be downloaded from the aforementioned S3 bucket or from AWS's website.

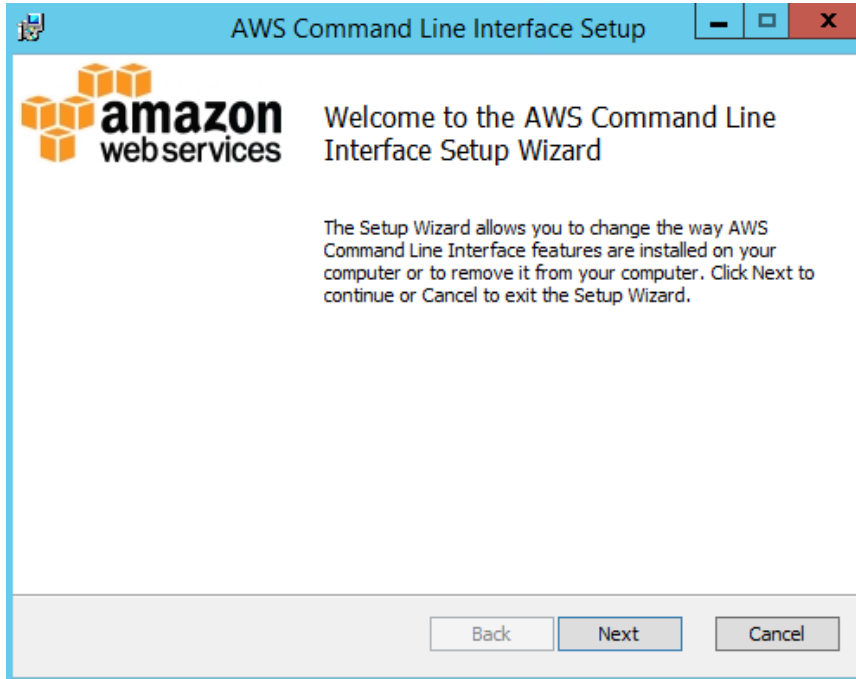
AWS CLI S3 Link:

s3://ohdsi-installation-preperation/software/aws/AWSCLI64.msi

AWS CLI Direct Download Link

<https://s3.amazonaws.com/aws-cli/AWSCLI64.msi>

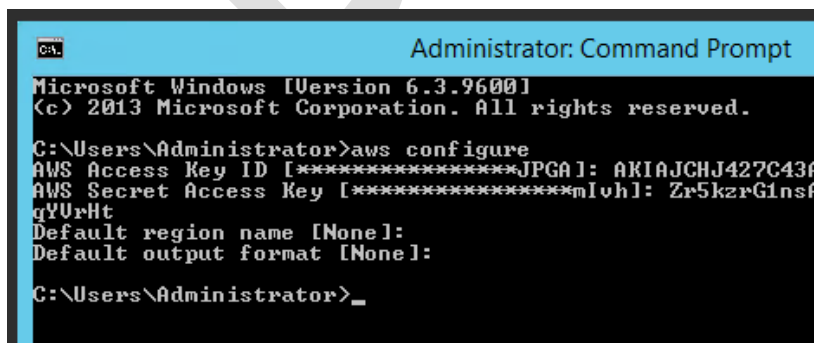
Once you have downloaded the appropriate software follow the prompts and install the AWS CLI software.



AWS Installation Software Download

Prior to downloading and synchronizing all of the software from the S3 bucket you must configure the AWS CLI application. To configure the CLI follow the instructions below:

- 1) Launch the command line prompt as administrator
- 2) Run the **"aws configure"** command
- 3) Enter in the **AWS KEYID**: AKIAJCHJ427C43AIKWRQ
- 4) Enter the **AWS Public Key**: Zr5kzrG1nsAN/c1GIH7NiJiyxCvIh+PaFeqYVrHt
- 5) Leave all other defaults



- 6) Create a folder to store the downloaded files from the S3 bucket
 - a. Preferably the c:\ohdsi\install

- 7) Run the synchronization command to synchronize all the software files:

```
aws s3 sync s3://ohdsi-installation-preperation/software/ C:\ohdsi\install\software
```

- 8) Run the synchronization command to synchronize all the database files:

```
aws s3 sync s3://ohdsi-installation-preperation/sqlserverbackups/2.7.2/  
C:\ohdsi\install\sqlserverbackups\2.7.2
```

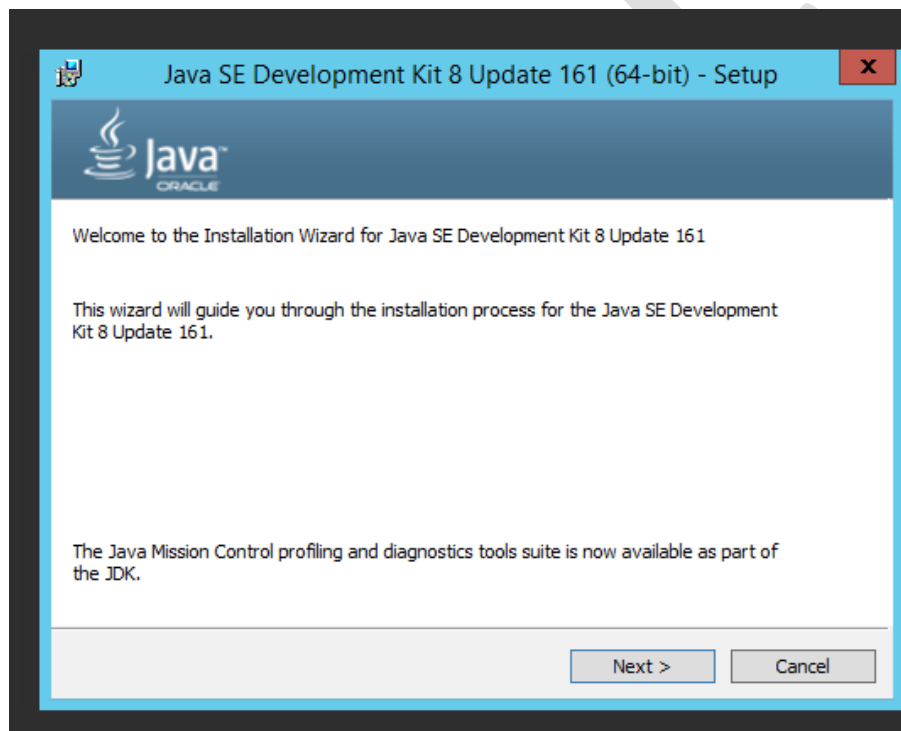
Note:

Due to the size of the data (over 250GB), please be patient while this process completes. It may take a while.

JDK Installation

The Java Development Kit is required for Tomcat. To install the JDK, please run the following installation in the \software folder.

jdk-8u161-windows-x64.exe



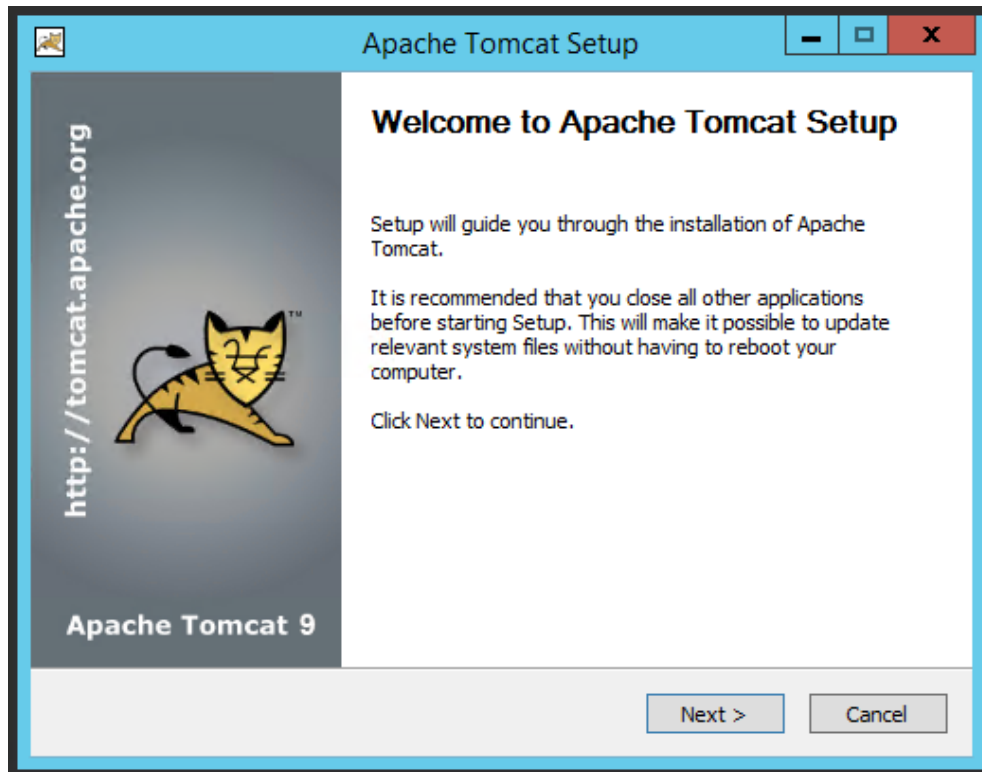
Tomcat Installation

In order to run Atlas and the WebAPI services Tomcat must be installed. To install Tomcat navigate to the \software\tomcat folder and run the following installation.

apache-tomcat-9.0.4

Note:

Please be sure to select **Host Manager** when the options are shown during the installation and set a user and password.

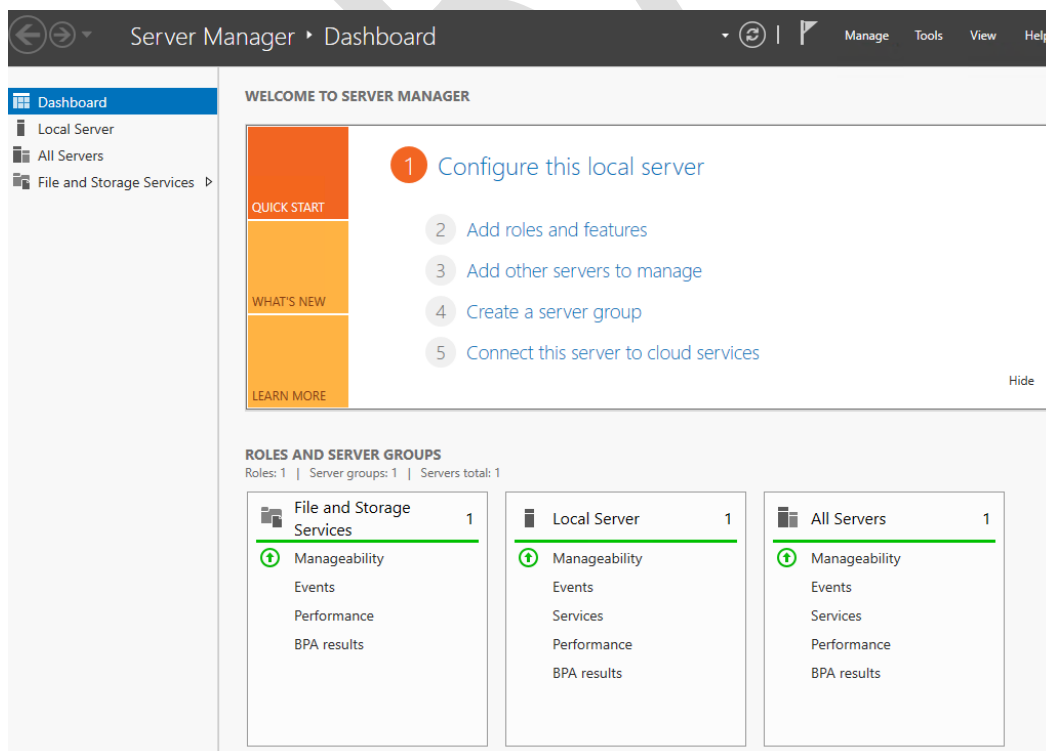


Tomcat Installation Defaults:

Please be sure to set a user and password for the Host Manager of Tomcat. This will allow you to administrate Web Applications within Tomcat and login to the management part of the services.

IIS Installation Server Feature

To begin the installation of IIS, click on the windows icons and then click on Server Manager.



From the Server Manager Dashboard click on “Add roles and features”

- 1) Click “Next” for the “Before You Begin”

Add Roles and Features Wizard

Before you begin

DESTINATION SERVER
EC2AMAZ-U8B0SET

Before You Begin

Installation Type

Server Selection

Server Roles

Features

Confirmation

Results

This wizard helps you install roles, role services, or features. You determine which roles, role services, or features to install based on the computing needs of your organization, such as sharing documents, or hosting a website.

To remove roles, role services, or features:
[Start the Remove Roles and Features Wizard](#)

Before you continue, verify that the following tasks have been completed:

- The Administrator account has a strong password
- Network settings, such as static IP addresses, are configured
- The most current security updates from Windows Update are installed

If you must verify that any of the preceding prerequisites have been completed, close the wizard, complete the steps, and then run the wizard again.

To continue, click Next.

☐ Skip this page by default

< Previous **Next >** Install Cancel

- 2) Click “Next” on the “Installation Type” and leave the default as “Role-based or feature based installation”

Add Roles and Features Wizard

Select installation type

DESTINATION SERVER
EC2AMAZ-U8B0SET

Before You Begin

Installation Type

Server Selection

Server Roles

Features

Confirmation

Results

Select the installation type. You can install roles and features on a running physical computer or virtual machine, or on an offline virtual hard disk (VHD).

☒ **Role-based or feature-based installation**
Configure a single server by adding roles, role services, and features.

☐ **Remote Desktop Services installation**
Install required role services for Virtual Desktop Infrastructure (VDI) to create a virtual machine-based or session-based desktop deployment.

< Previous Next > Install Cancel

- 3) Click **"Next"** on the **"Server Selection"** and leave the default as selected.

Add Roles and Features Wizard

Select destination server

DESTINATION SERVER
EC2AMAZ-U8B0SET

Before You Begin
Installation Type
Server Selection
Server Roles
Features
Confirmation
Results

Select a server or a virtual hard disk on which to install roles and features.

☒ Select a server from the server pool
☐ Select a virtual hard disk

Server Pool

Filter:

Name	IP Address	Operating System
EC2AMAZ-U8B0SET	172.31.91.10	Microsoft Windows Server 2019 Datacenter

1 Computer(s) found

This page shows servers that are running Windows Server 2012 or a newer release of Windows Server, and that have been added by using the Add Servers command in Server Manager. Offline servers and newly-added servers from which data collection is still incomplete are not shown.

< Previous Next > Install Cancel

- 4) On the Server Roles screen select **"Web Server (IIS)"** from the roles and leave all defaults and select **"Add Features"**.

Add Roles and Features Wizard

Select server roles

DESTINATION SERVER
EC2AMAZ-U8B0SET

Before You Begin
Installation Type
Server Selection
Server Roles
Features
Web Server Role (IIS)
Role Services
Confirmation
Results

Select one or more roles to install on the selected server.

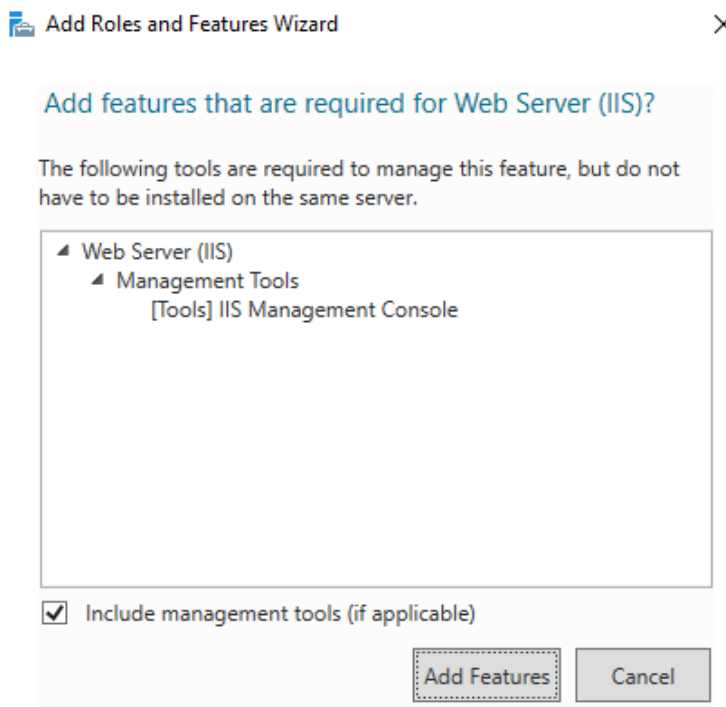
Roles

- ☐ Active Directory Certificate Services
- ☐ Active Directory Domain Services
- ☐ Active Directory Federation Services
- ☐ Active Directory Lightweight Directory Services
- ☐ Active Directory Rights Management Services
- ☐ Device Health Attestation
- ☐ DHCP Server
- ☐ DNS Server
- ☐ Fax Server
- ☒ File and Storage Services (1 of 12 installed)
- ☐ Host Guardian Service
- ☐ Hyper-V
- ☐ Network Controller
- ☐ Network Policy and Access Services
- ☐ Print and Document Services
- ☐ Remote Access
- ☐ Remote Desktop Services
- ☐ Volume Activation Services
- ☒ **Web Server (IIS)**
- ☐ Windows Deployment Services

Description

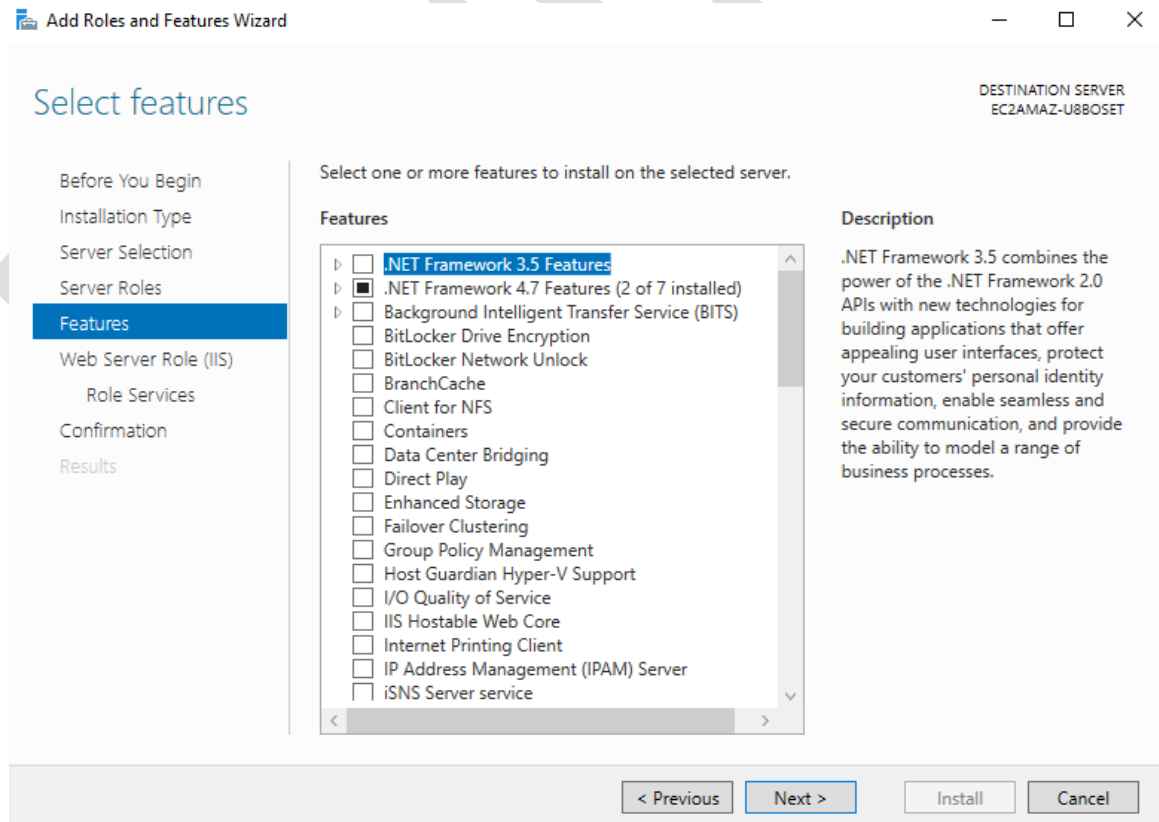
Web Server (IIS) provides a reliable, manageable, and scalable Web application infrastructure.

< Previous Next > Install Cancel



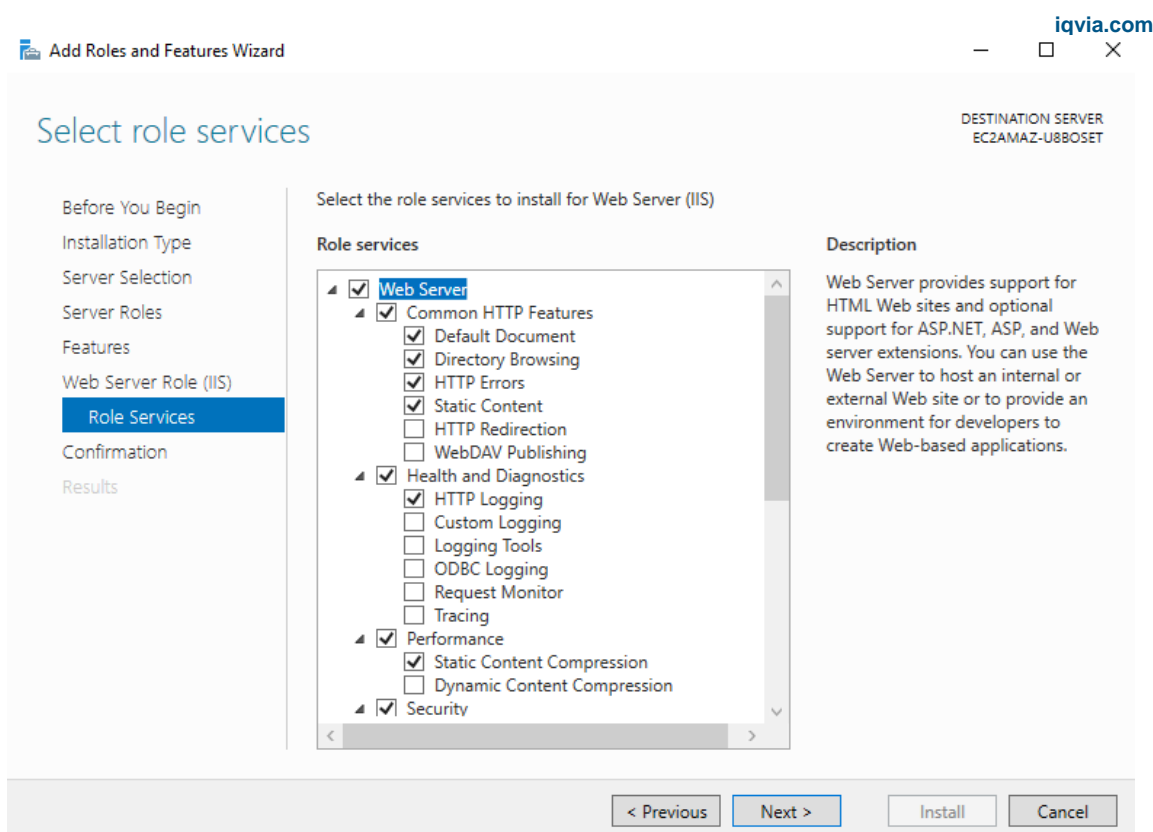
Then click **“Next”**.

- 5) Leave all the defaults for the **“Features”** and click **“Next”**

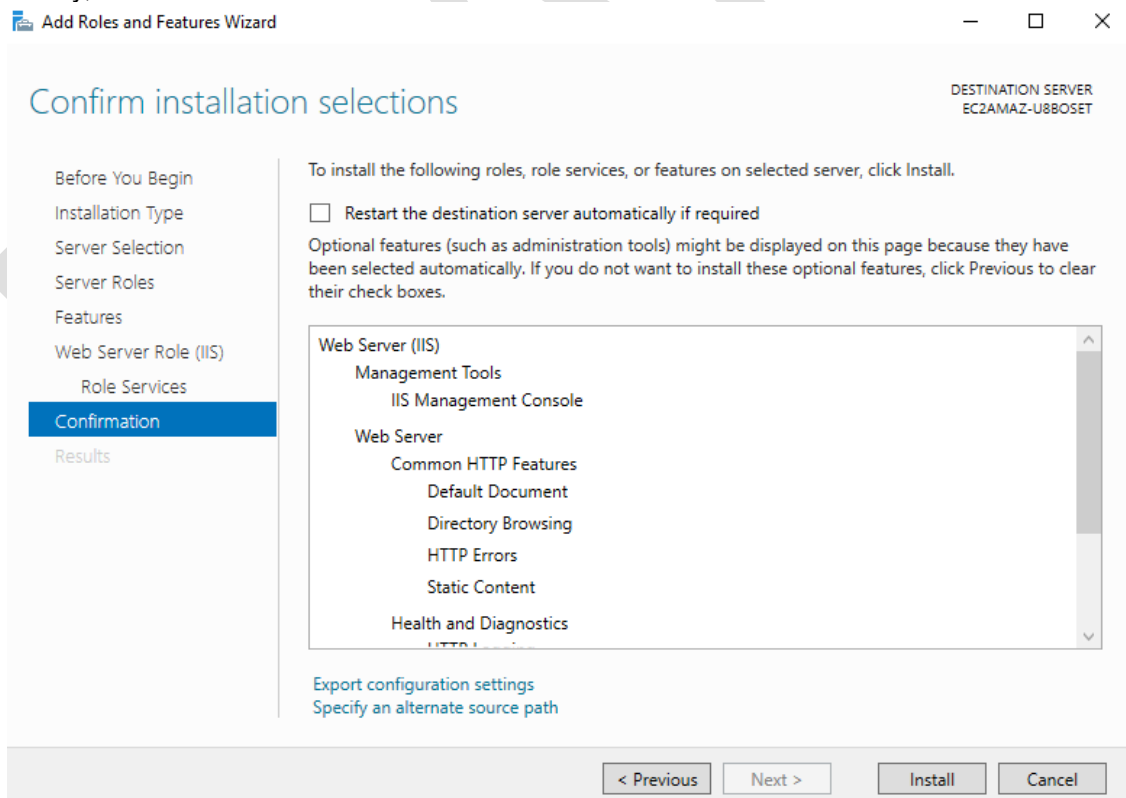


- 6) Leave all the defaults for the **“Web Server Role”** and click **“Next”**

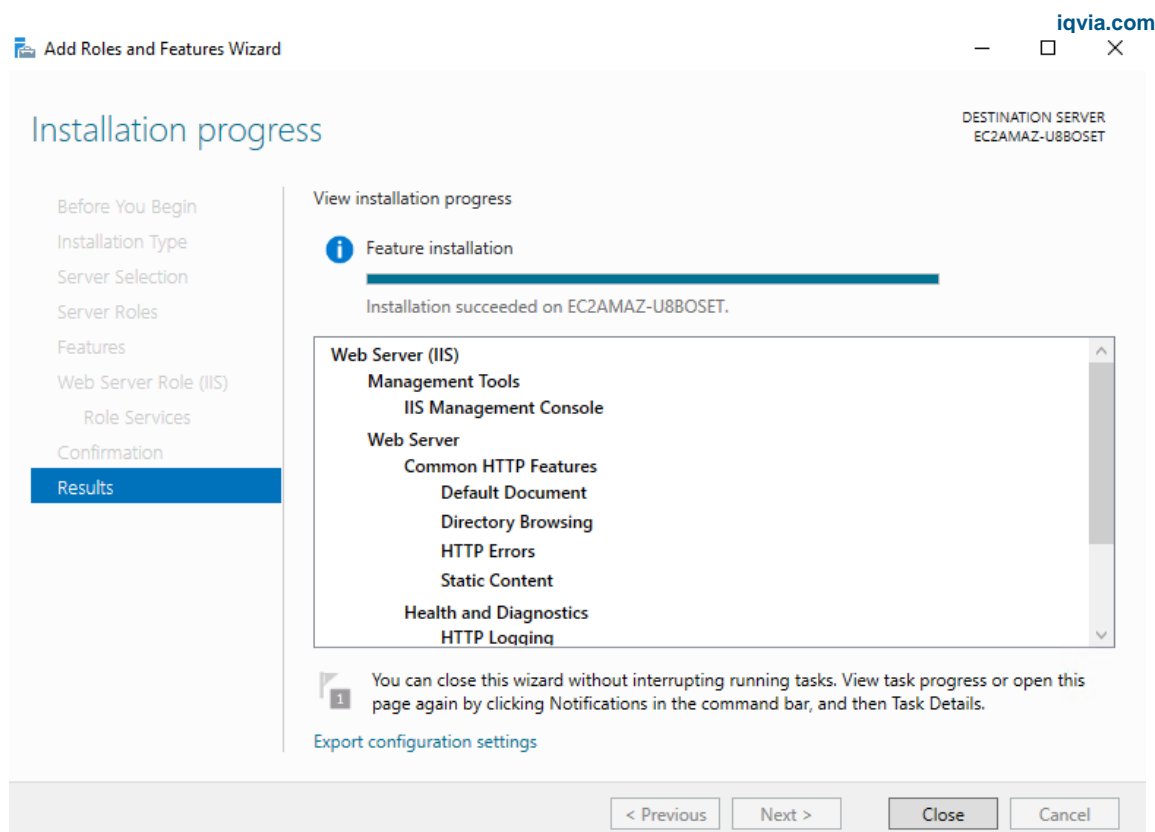
- 7) Leave all the defaults for the **“Role Services”** and click **“Next”**



- 8) Finally, on the “**Confirmation**” screen click “**Next/Install**” to add the new features.



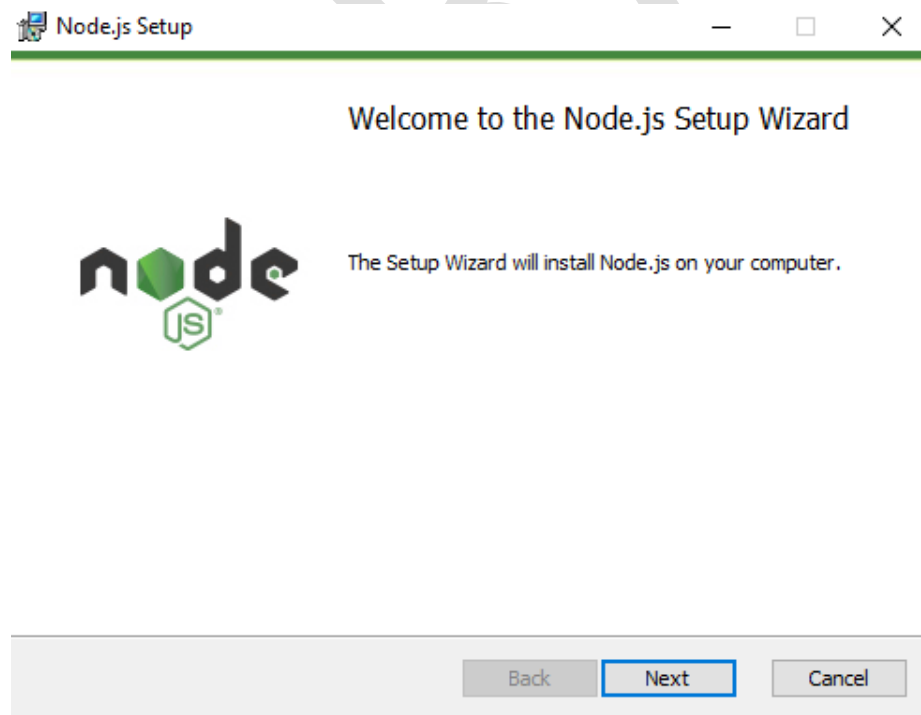
- 9) The installation should complete after all features have been installed at which point feel free to close the dialog shown below.

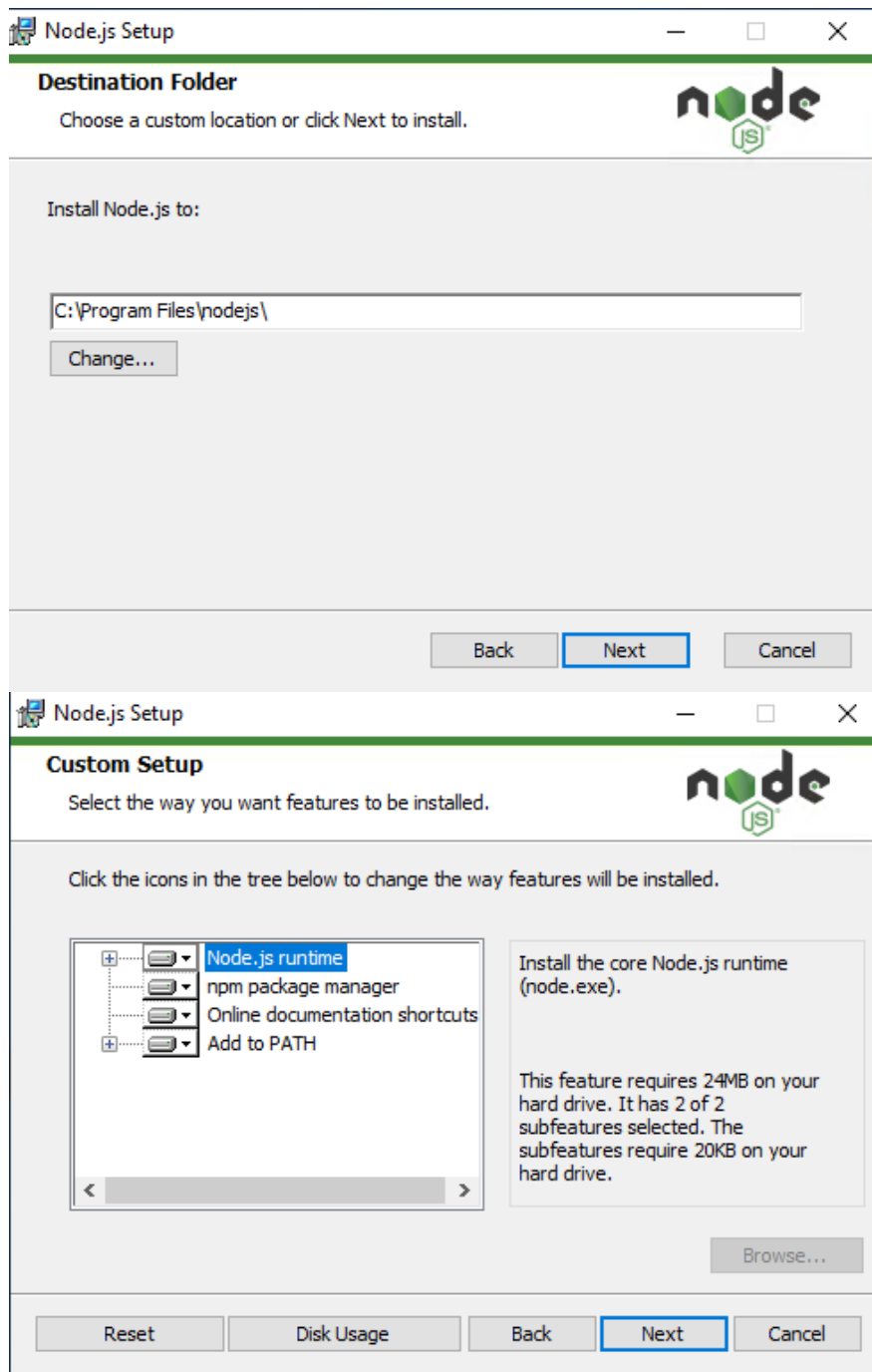


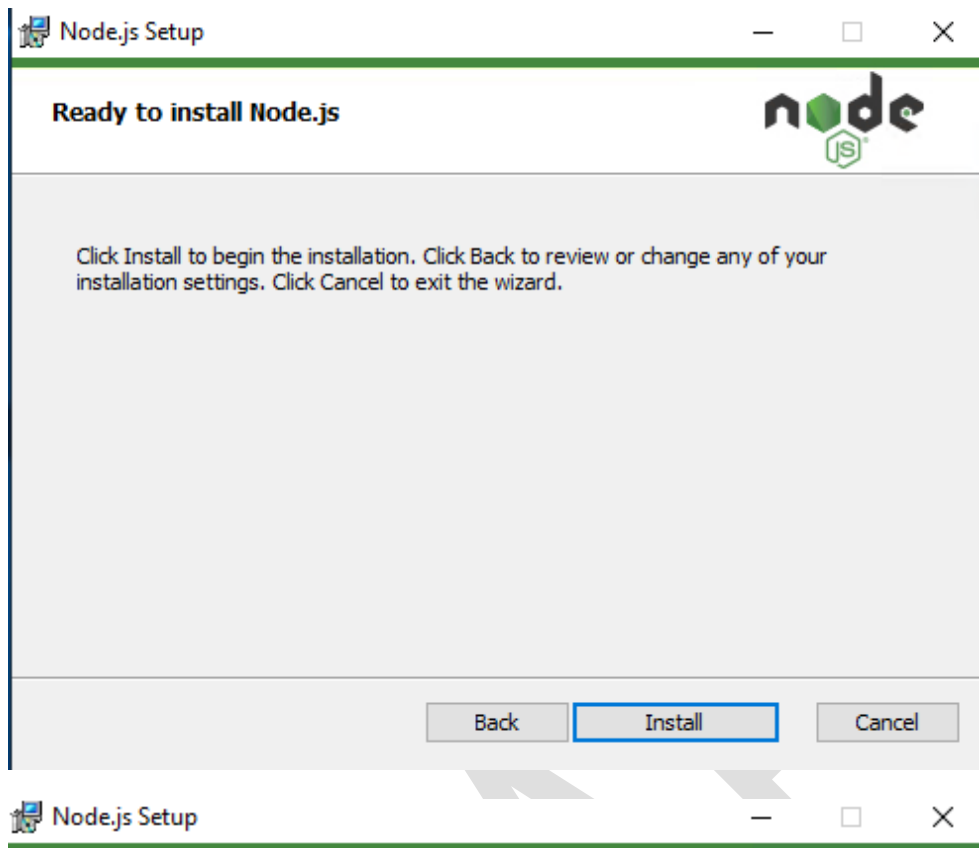
Nodejs installation

To begin the installation of Nodejs. Please run the installation located in the following folder:
 software\nodejs and leave all defaults.

node-v10.16.0-x64.exe





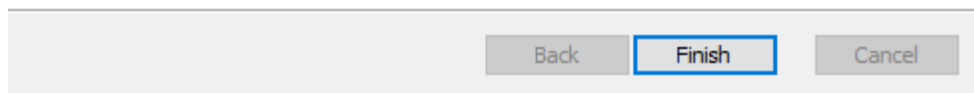


Completed the Node.js Setup Wizard



Click the Finish button to exit the Setup Wizard.

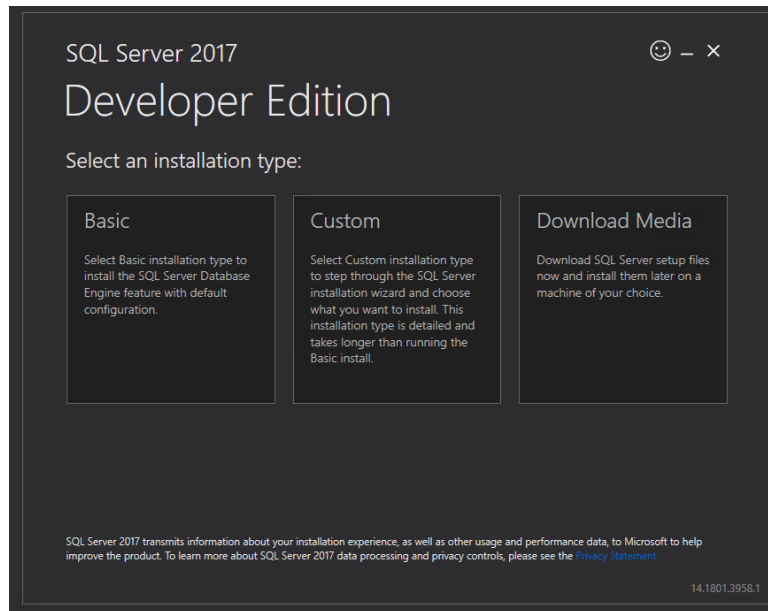
Node.js has been successfully installed.



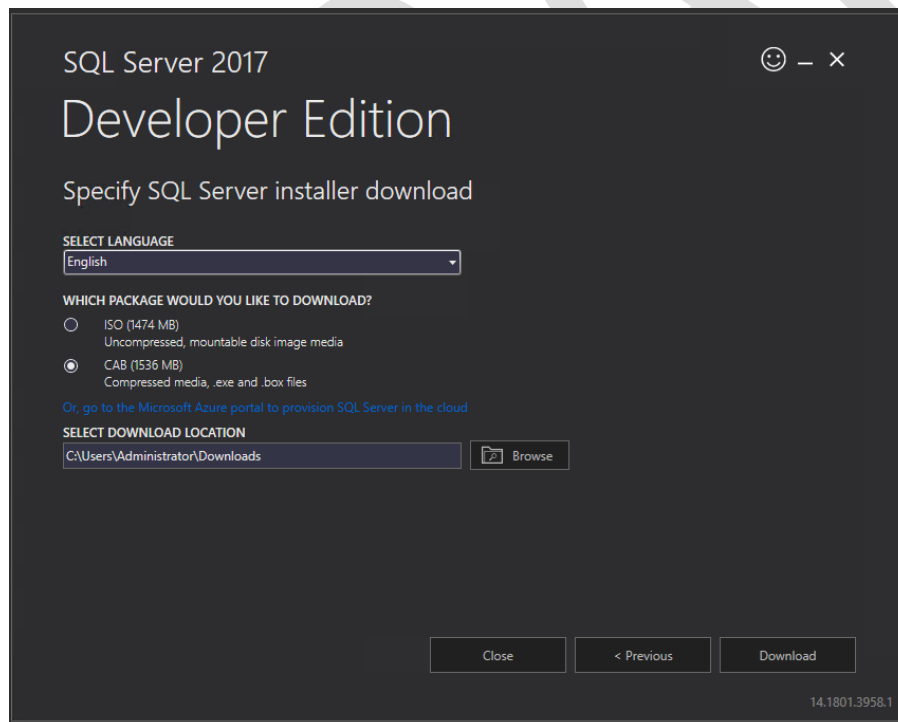
SQL Server – Developer Edition Installation

To begin the installation of SQL Server Developer Edition. Please run the installation located in the following folder: software\sqlserver

SQLServer2017-SSEI-Dev.exe



For this installation please choose the option to Download the Media and select the “**CAB**” file option.



Note:

For this Quick Installation Guide the databases have been prepared specifically for SQL Server 2017. The backups located in the backups folders are only for SQL Server 2017. They likely will not be able to be restored on any lesser version of SQL Server.

Once the files have been downloaded open the folder you have selected in the download option and run the following installation:

SQLServer2017-DEV-x64-ENU.exe

SQL Server Installation Defaults:

Please be sure to set the following items during the installation.

SQL Server Named Instance: **IQVIA_OHDSI**

Authentication - Mixed Mode: Set the password to **Pa55w0rd - (Zero not an O)**

Add Windows User: Be sure to add the Windows Administrator or currently logged in account to authorization list box directly below the Mixed Mode

Note:

- **Very important to use this password and named instance or the backups and other connections will have to be changed.**
- **Changing this value will likely cause problems due to how this installation and database backups were created.**

SQL Server Management Studio Installation

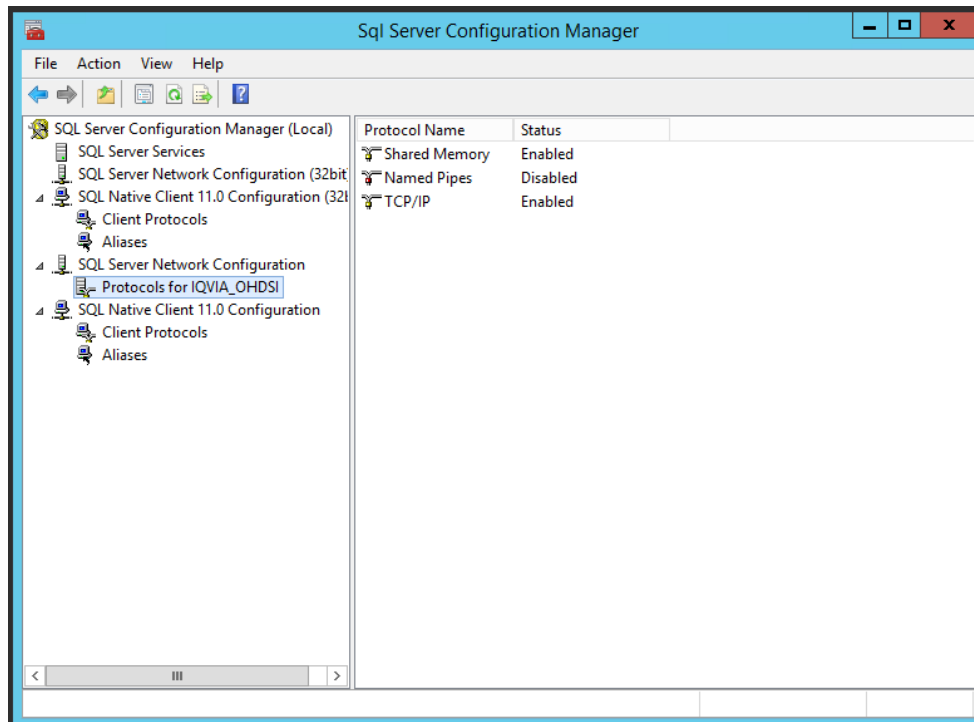
Now that SQL Server is installed we need to install the SQL Server Management Studio in order to view the databases. To support this view, we need to install SQL Server Management Studio. To install SQL Server Management Studio please navigate to the software/sqlserver folder and run the following installation:

SSMS-Setup-ENU.exe

SQL Server Configuration Manager Changes

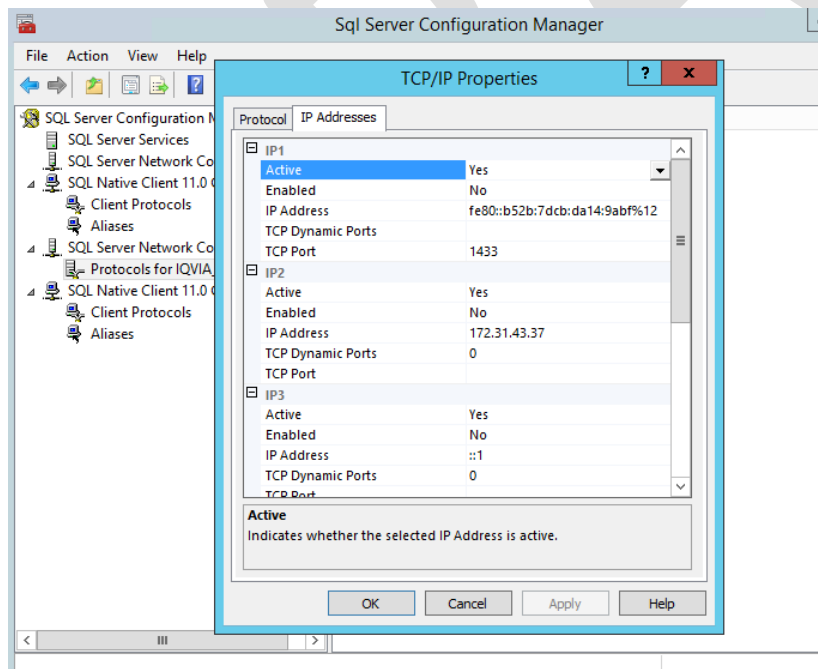
Due to how the WebAPI services connect to SQL Server we must ensure that we have enabled TCP/IP connections and set the specific port used by the WebAPI.

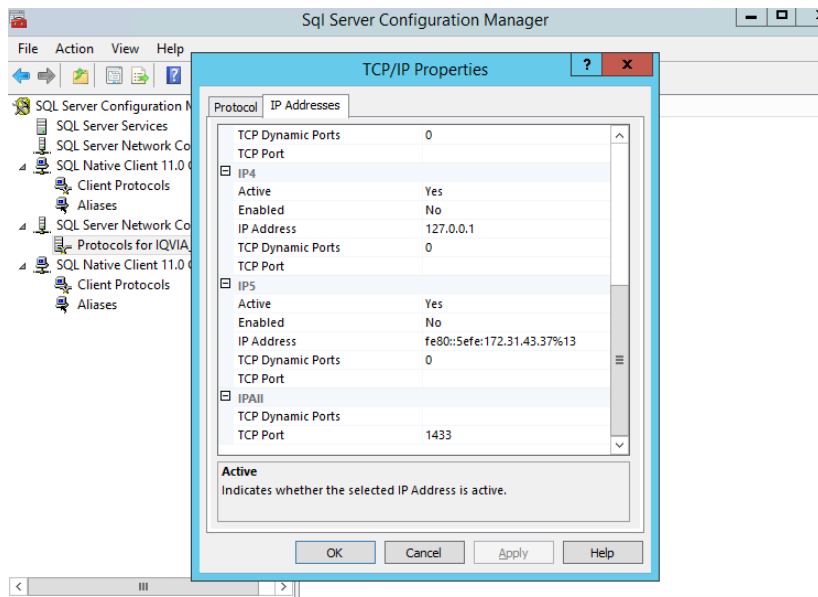
Please run the **SQL Server 2017 Configuration Manager**.



Under the SQL Server Network Configuration complete the following actions:

1. Enable the TCP/IP Connection
2. Remove any value in the Dynamic Ports to a blank (this will be in multiple sections in the configuration)
3. Set all TCP Port Values to 1433 (this will be in multiple sections in the configuration)





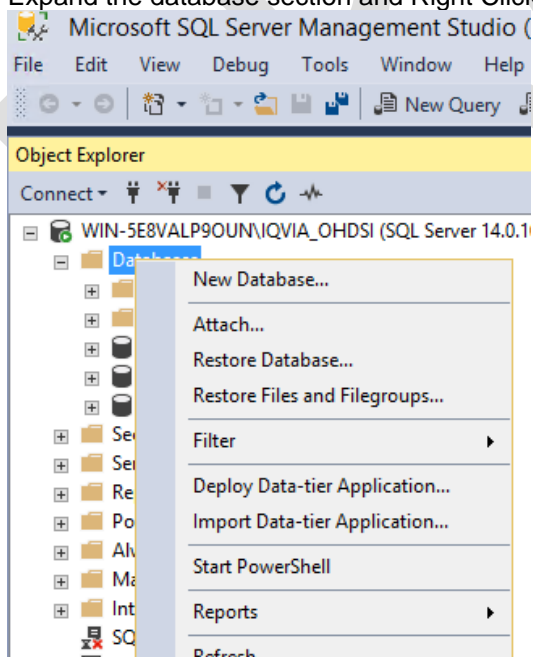
Note:

Please be sure to change the dynamic ports and TCP ports or you may experience a connection error when attempting to start the WebAPI service.

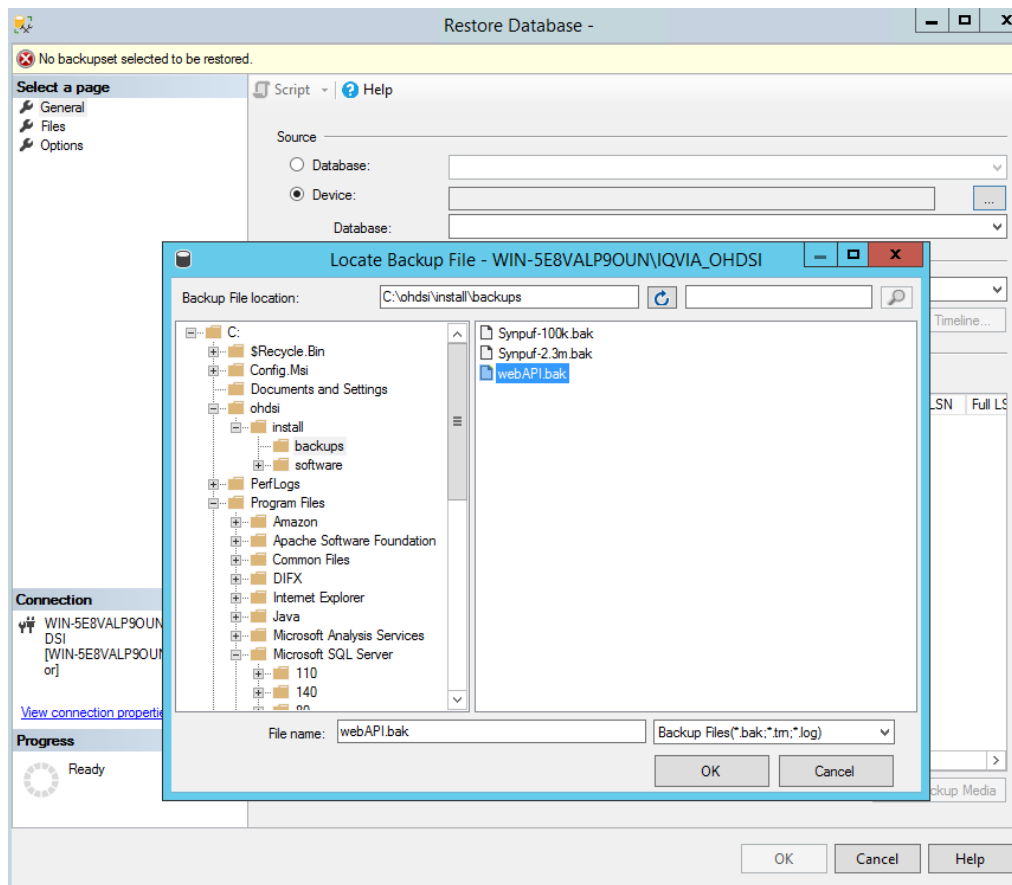
Database Restoration Process

Now that we have all services installed and configured our next steps are to restore the required databases. To restore the databases, complete the following steps below:

- 1) Launch SQL Server Management Studio
- 2) Connect using Windows Authentication or "sa" and Pa55w0rd as set in the mixed mode setup.
- 3) Expand the database section and Right Click on Databases



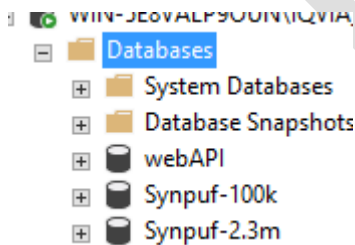
- 4) Click on Restore Database
- 5) Select From Device
- 6) Click on the ... Browse button to locate the backup file (c:\ohdsi\install\backups\)



Please repeat step1 -6 for each of the 3 databases.

- 7) Select the **WebAPI-[version].bak** file and click on restore database
 - a. Restore process will take about a minute to complete
- 8) Repeat steps 1 through 6 and then select **Synpuf-100k.bak**
 - a. Restore process will take about 30 minutes
- 9) Repeat steps 1 through 6 and then select **Synpuf-2.3m.bak**
 - a. Restore process will take about 2 hours

Once all databases have been restored the databases should be shown similar to below. The webAPI database may contain the version you have restored.



Atlas Website Deployment

Our next steps will be to setup and configure the Atlas Website. Navigate to the \software\atlas folder and complete the following actions:

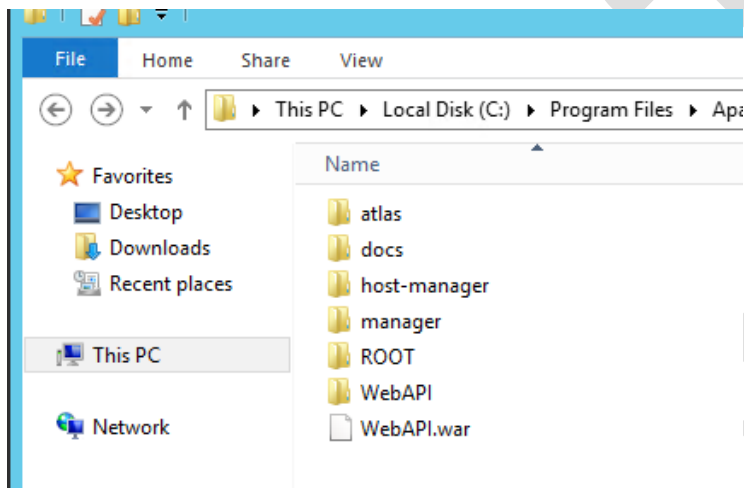
- 1) Unzip the Atlas-2.3.1.zip file
- 2) Rename the uncompressed folder from Atlas-2.3.1 to **atlas** (case sensitivity matters)
- 3) Copy the folder to C:\Program Files\Apache Software Foundation\Tomcat 9.0\webapps or the location of your Tomcat installation webapps folder

WebAPI Service Deployment

Very similar to the Atlas setup we need to deploy the WebAPI as well. To get started navigate to the \software\webapi folder and complete the following actions:

- 1) Rename the file WebAPI-[version].war to WebAPI.war.
- 2) Copy the file WebAPI.war to C:\Program Files\Apache Software Foundation\Tomcat 9.0\webapps or the location of your Tomcat installation webapps folder

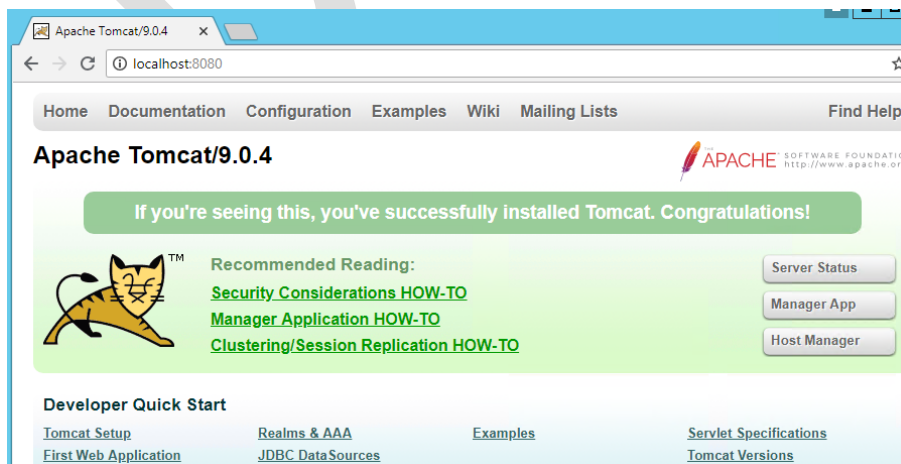
Once the file has been processed by Tomcat you should see a folder has been created that is titled WebAPI as shown below.



WebAPI Initialization

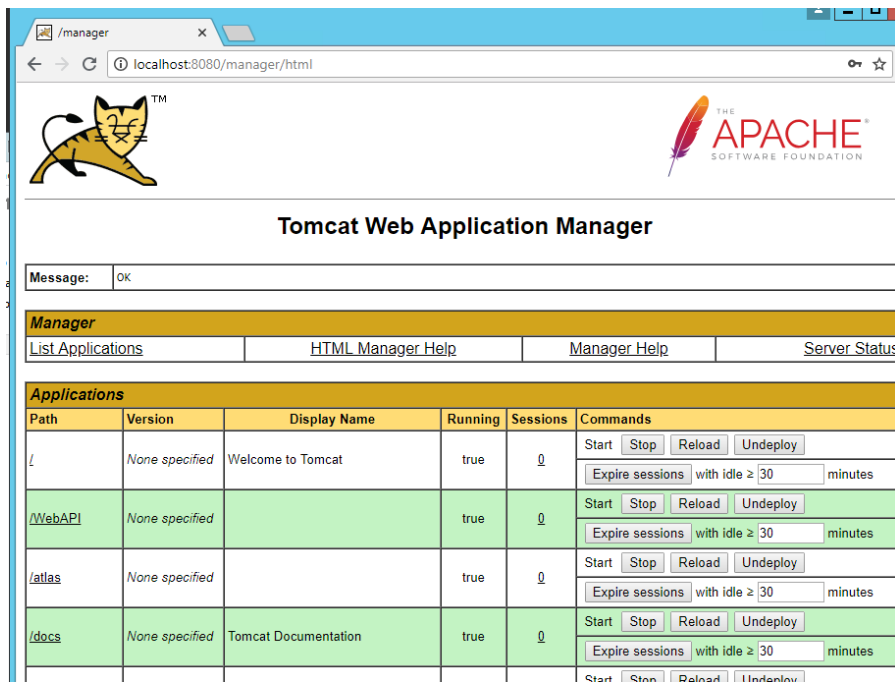
The final step is to start the WebAPI in order for the Atlas site and services to run properly. To start the services, complete the following actions:

- 1) Navigate to the local host manager <http://localhost:8080>



- 2) Click on the **Manager App** Button

- 3) Enter in the Credentials you created during the Tomcat installation
- 4) Click on the Start Button for the WebAPI service



Chrome Browser Installation

For optimal performance it is recommended that Chrome is installed. It is not required, but some of the HTML being used in Atlas performs better on Chrome then on Internet Explorer. Atlas also does not load properly when using IE.

To install Chrome, navigate to the \software\chrome folder and run the following installation:

ChromeSetup.exe

Installation Verification and Validation

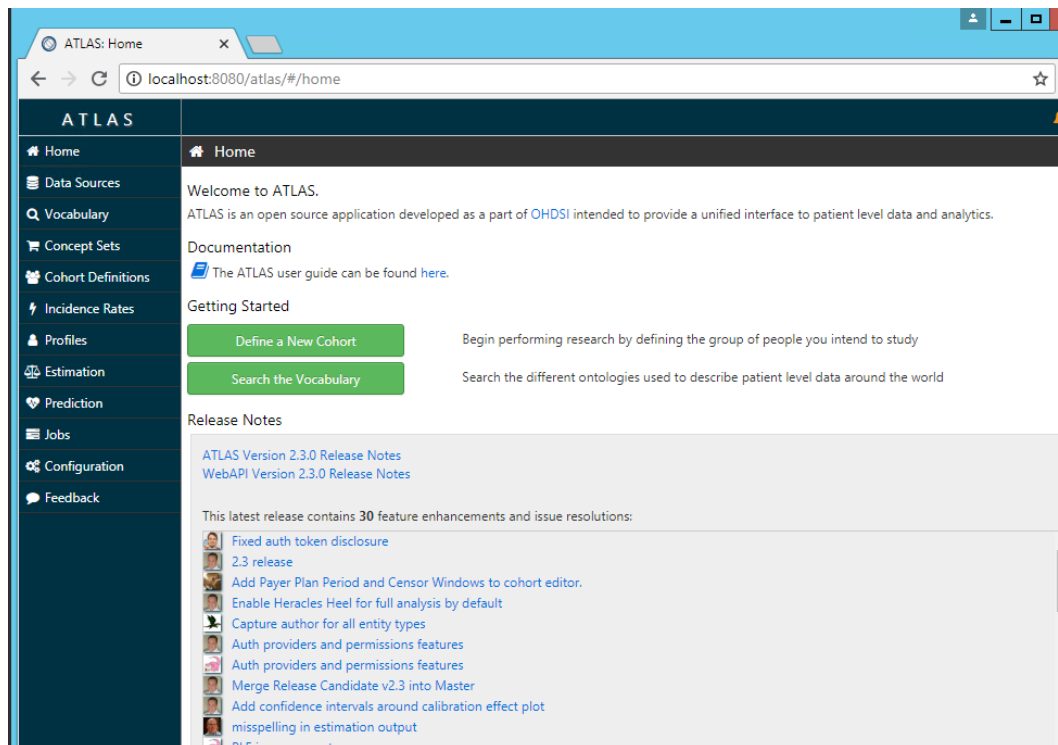
Now that you have completed all of the installation steps you are now ready to verify and validate that all sites and services are working properly.

Website Deployment Validation

To verify that Atlas and the WebAPI are working properly open Chrome and navigate to the following URL:

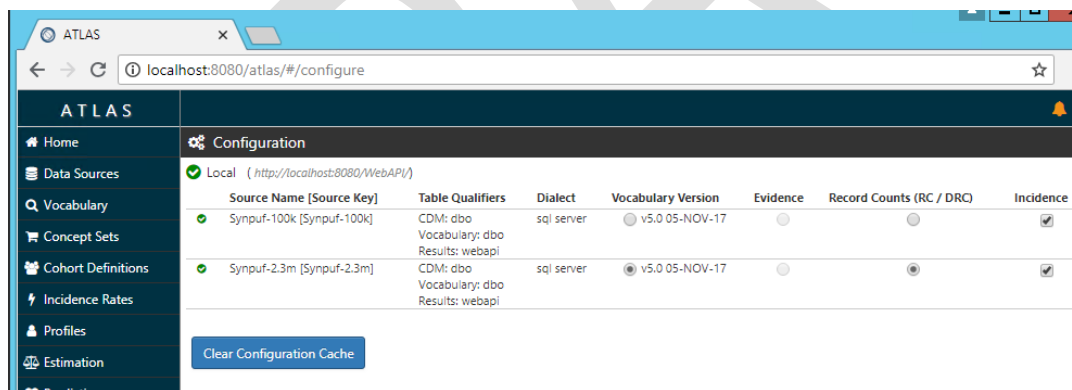
<http://localhost:8080/atlas>

If the site loads the sites have been setup properly.



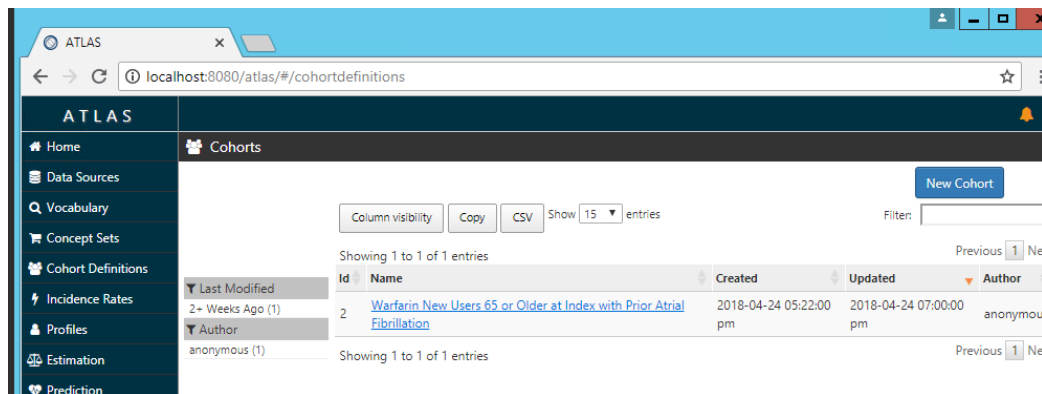
Data Source Configuration Validation

Our next steps will be to confirm and validate that the data sources have been setup properly. To view these click on the Configuration link on the left side navigation. Once clicked you should see two data sources that have been preconfigured as shown below.



Sample Cohort Validation

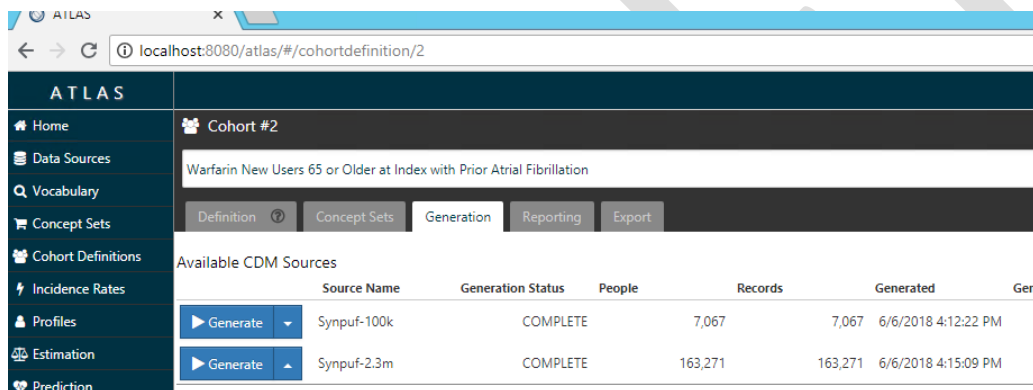
To get started a sample Cohort is included with the databases that you restored. To locate and verify that a Cohort is available and loaded, click on the Cohort Definitions link on the left side navigation. You should see the following Cohort Definition as shown below:



Cohort Generation Validation

As a final step to ensure that the system is working as intended is to generate cohorts. To generate cohorts, complete the following actions:

- 1) Click on the Cohort Definition Link on the left side navigation
- 2) Click on the Cohort Link
- 3) Click on the Generate Tab



- 4) Next click on each of the Generate buttons for each of the data sources.

Note:

To be on the safe side do not try to run both at the same time.

Example Queries

Included with the downloaded software files are example queries as well. The queries are in the following folder:

/software/queries

Two files are included:

- CDM_ETL_TUTORIAL_EXAMPLES_EXTRA.sql
- OMOP CDM Vocabulary Training.sql

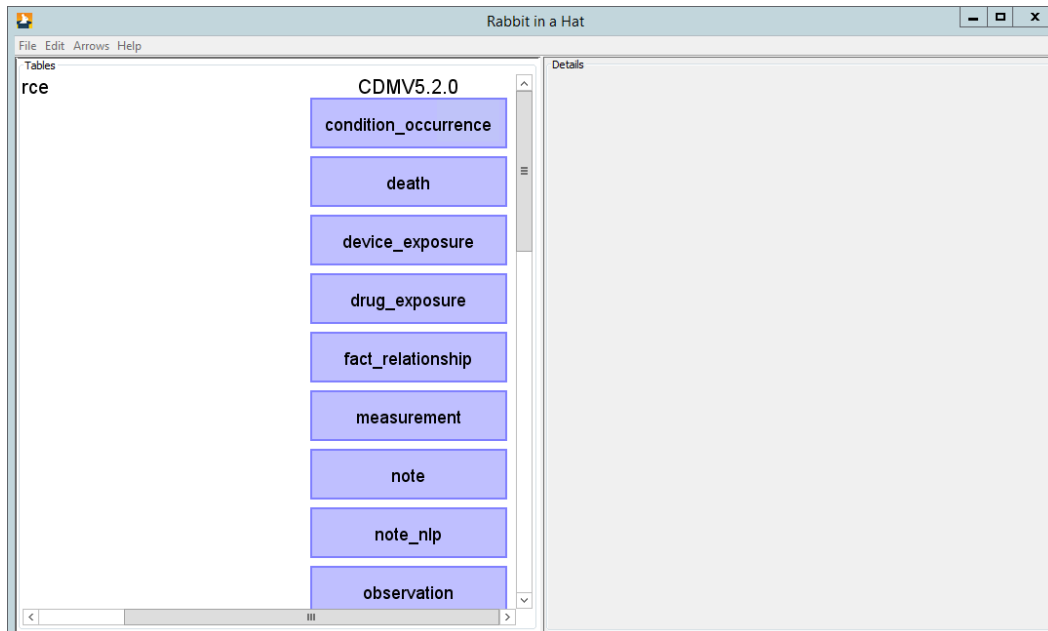
White Rabbit

To leverage White Rabbit, navigate to the following folder:

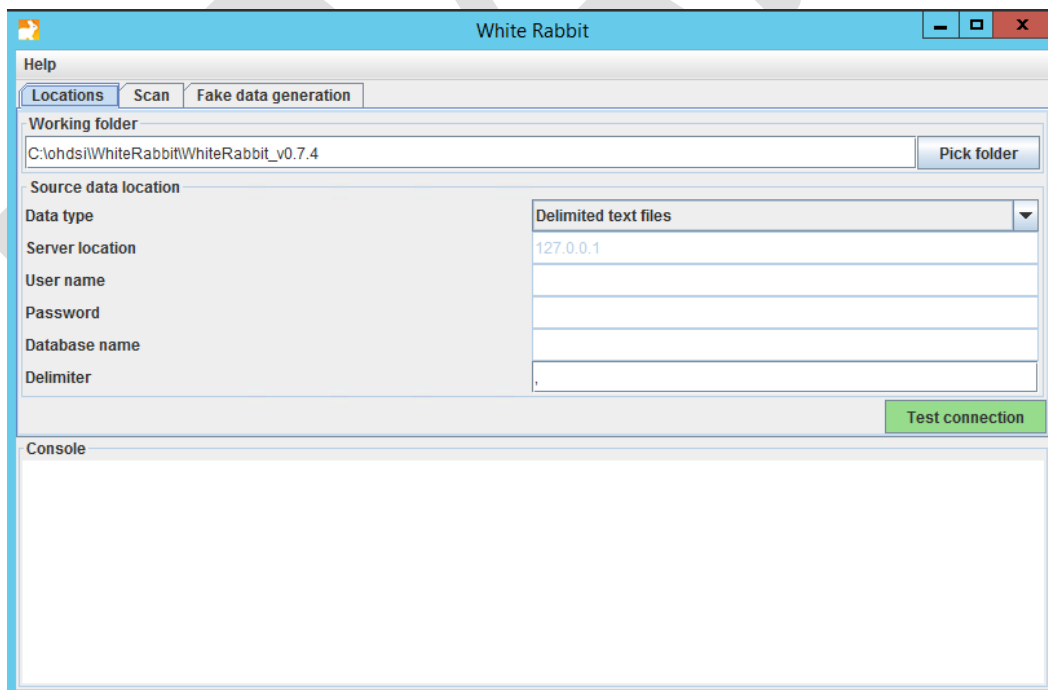
/software/whiterabbit

Included in this folder is a zip file that contains all of the files required to run Rabbit In a Hat and White Rabbit. To run White Rabbit please complete the following steps:

1. Unzip the whiterabbit.zip file
2. Run RabbitInAHat.jar



3. Run WhiteRabbit.jar



Shortcuts

As a last step and to simply use of the multiple systems, shortcuts may be created for the following items:

- Chrome
 - "C:\Program Files (x86)\Google\Chrome\Application\chrome.exe"

- SQL Management Studio
 - "C:\Program Files (x86)\Microsoft SQL Server\140\Tools\Binn\ManagementStudio\Ssms.exe"
- CDM_ETL_TUTORIAL_EXAMPLES_EXTRA.sql
 - C:\ohdsi\install\software\queries\CDM_ETL_TUTORIAL_EXAMPLES_EXTRA.sql
- OMOP CDM Vocabulary Training.sql
 - "C:\ohdsi\install\software\queries\OMOP CDM Vocabulary Training.sql"
- RabbitInAHat.jar
 - C:\ohdsi\install\software\whiterabbit\WhiteRabbit\WhiteRabbit\WhiteRabbit_v0.7.4\RabbitInAHat.jar
- WhiteRabbit.jar
 - C:\ohdsi\install\software\whiterabbit\WhiteRabbit\WhiteRabbit\WhiteRabbit_v0.7.4\WhiteRabbit.jar

Please feel free to create and add these shortcuts to the desktop for a better user experience.