MEP Builder

User Guide

Version 1.0

November 2021

Document Change Record

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1.0	31 October 2021	Original
1.0	18 November 29, 2021	Update - Added Installation Instructions
1.0	29 November 2021	Update – Modified Installation Instructions

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1 NIEM MEP BUILDER OVERVIEW

The NIEM MEP Builder is a tool designed to assist a user when constructing Message Exchange Packages (MEP)s, formerly known as Information Exchange Package Documentation (IEPD)s. This tool streamlines the process used to produce these packages to use with the National Information Exchange Model (NIEM).

2 ENVIRONMENT OVERVIEW

The NIEM MEP Builder can be deployed to a server or downloaded as a stand-alone application. Once the application has been deployed to your server or downloaded and installed on your computer, the following software requirements apply:

- Windows10 operating system
- Microsoft Edge or Google Chrome web browser
- Connection to the internet
- Username and Password (server instance)

Note: If you are an admin for your organization and desire to install a NIEM Tool instance to your server, please consult the NIEM Tool Admin Guide for server installation instructions.

3 TOP MENU BAR

The top menu bar contains two functional areas for this release (Figure 3.1). Both Contact and Sign-In are functional. Clicking “Contact” will invoke a pop-up to display advising you to contact information@niem.gov with any questions and/or comments regarding the NIEM MEP Builder as illustrated in (Figure 3.2) The Sign in menu item will display the username while logged in. Also, this is where you can go to log out of the application. See Figure 3.3.

Figure 3.1 Top Menu Bar

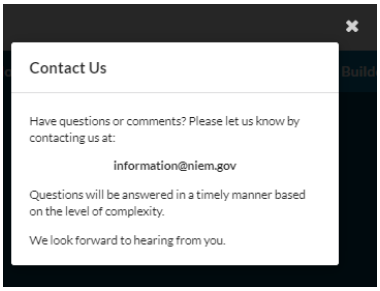


Figure 3.2 Contact

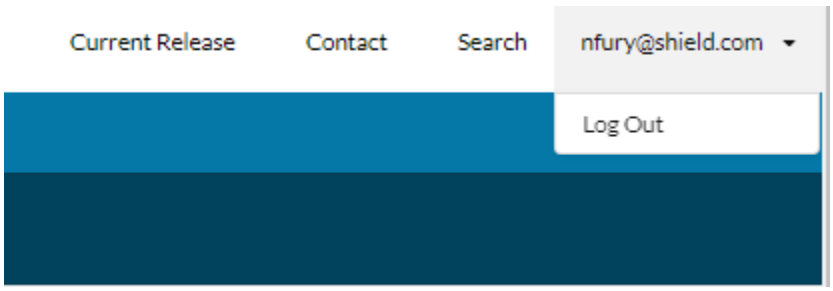
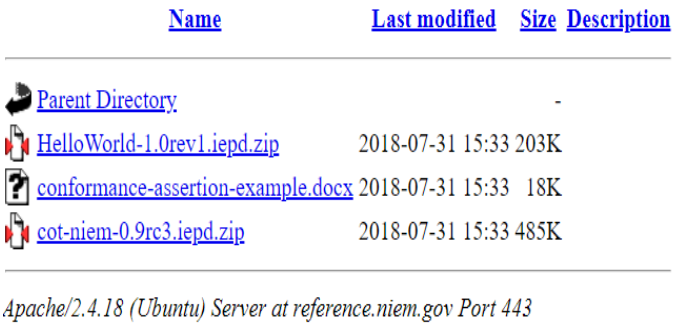


Figure 3.3 Username/Log Out

4 GETTING STARTED

The **Getting Started** page provides a link to example Packages. Clicking the link in Figure 4.1 will take you to a download site depicted in Figure 4.2 to download examples.

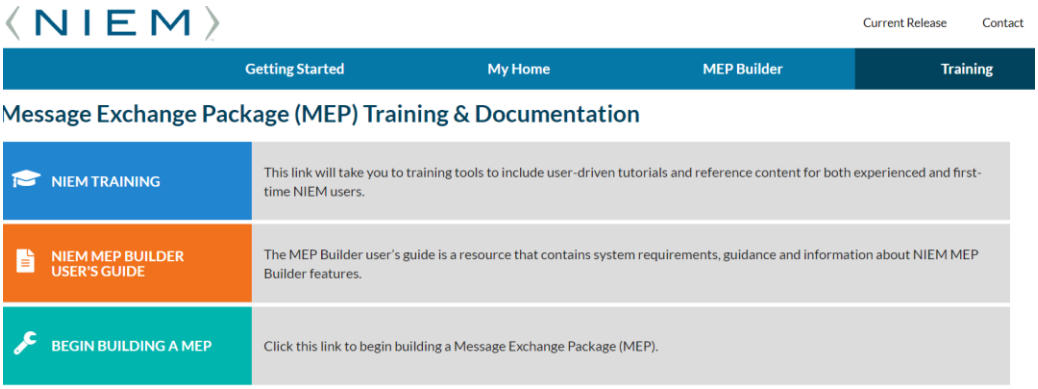
(Figure 4.1)



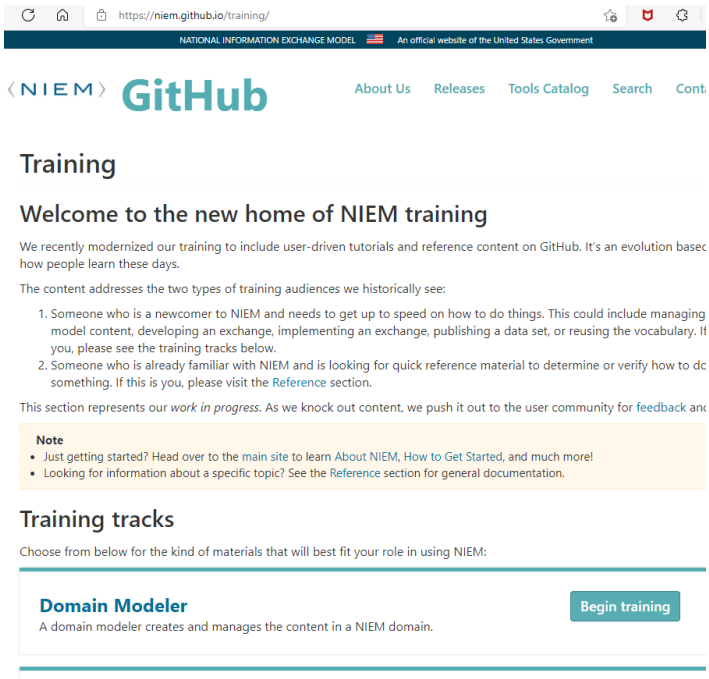
(Figure 4.2)

5 TRAINING TAB

Navigating to the **Training Tab** will take you to an interactive graphic (Figure 5.1) where you can follow training tracks on NIEM.Gov (Figure 5.2) or view this User Guide. If you are already logged in or using the stand-alone version, you can also click the bottom link on the graphic to begin creating your Message Exchange Package (MEP). If you haven't logged in yet, clicking "Begin Building a MEP link will take you to the Login screen.



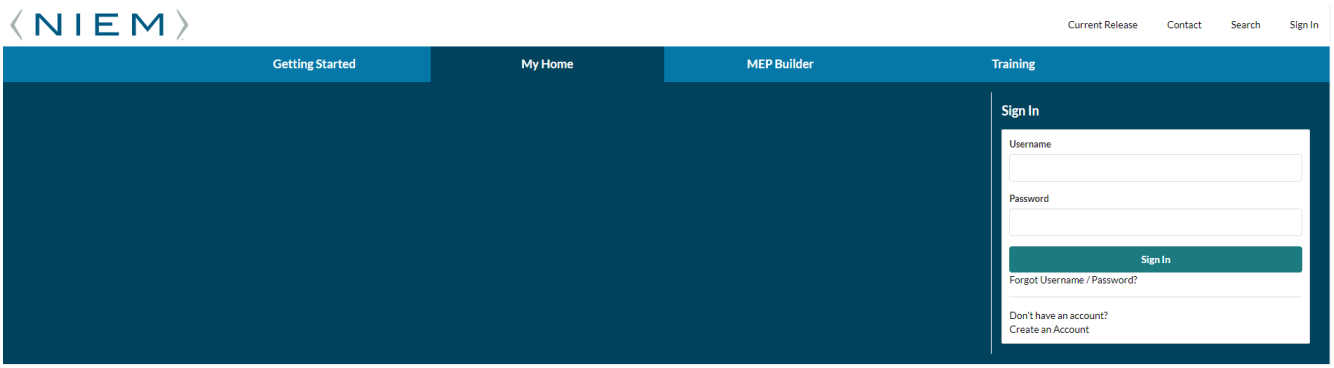
(Figure 5.1)



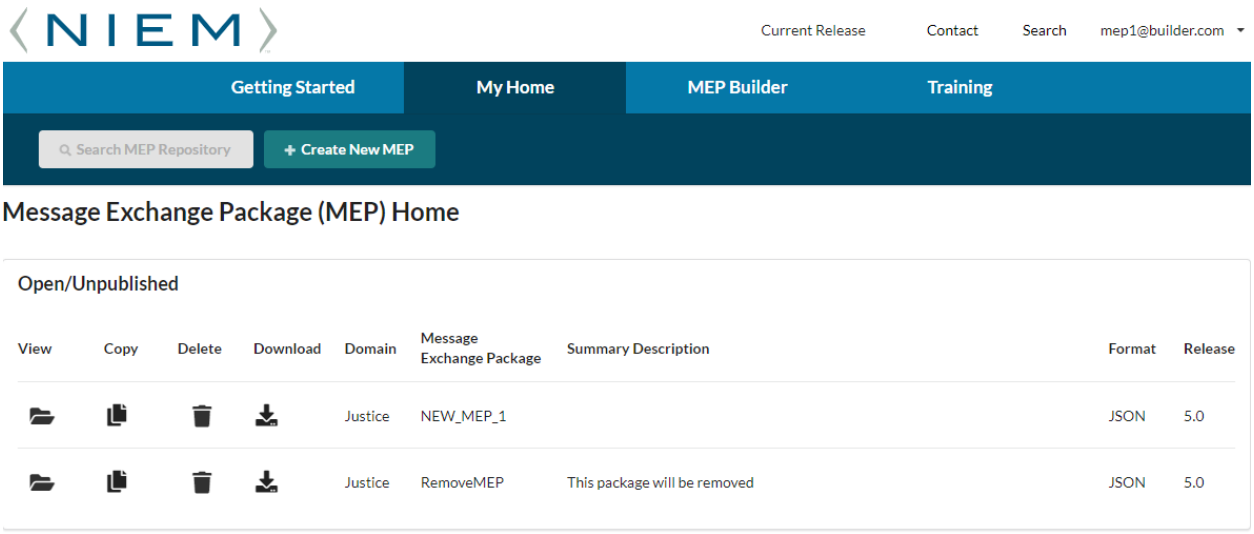
(Figure 5.2)

6 LOGIN

While the system is deployed in a stand-alone environment, Login credentials are not required. In this instance, you will be presented with the My **Home Tab** screen (see Figure 6.2) upon accessing the URL. Accessing via a public server, the user will be presented with a login screen (see Figure 6.1). After entering approved credentials, the user will click “Sign in” to gain access to the system. Once you have logged in, you will be taken to the home page (See Figure 6.2)



(Figure 6.1)

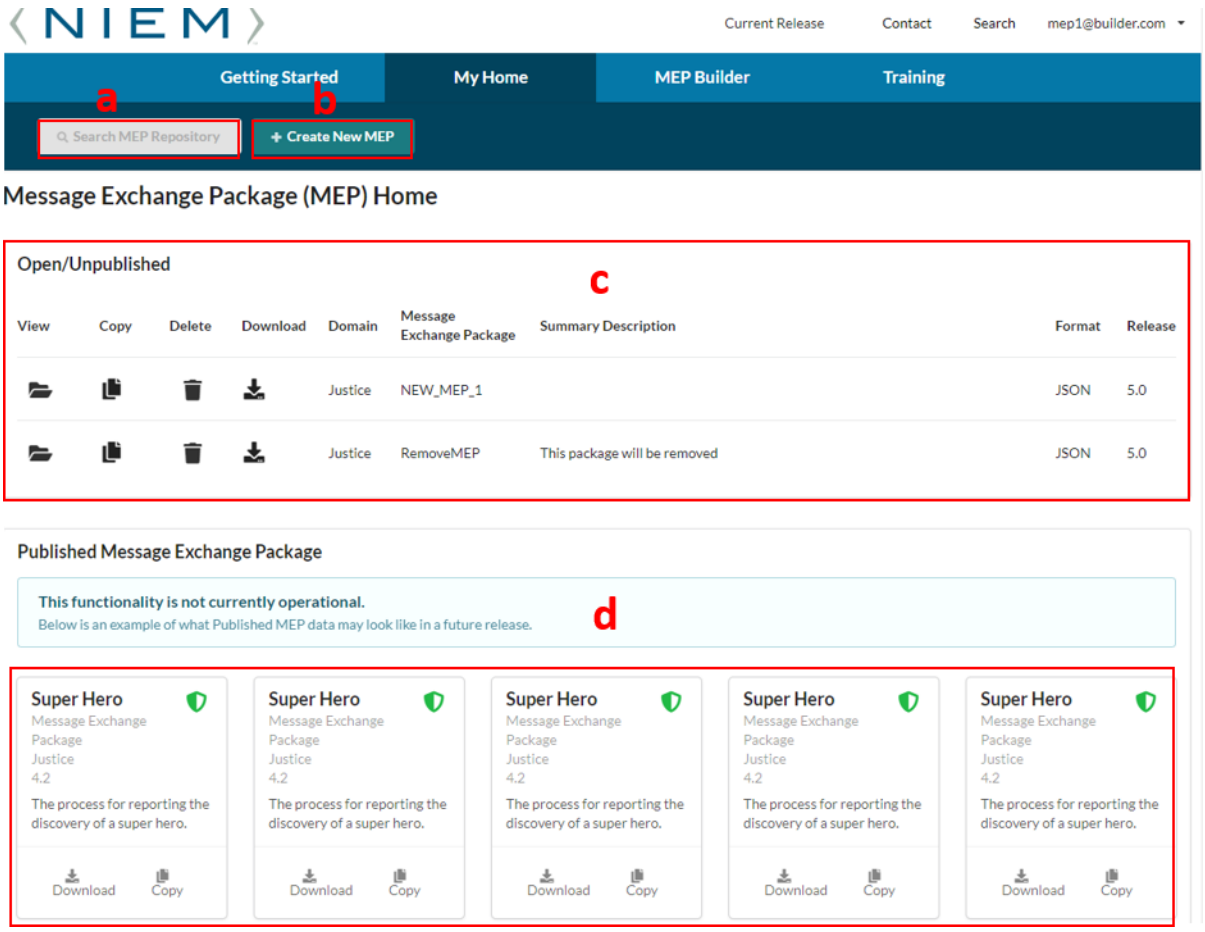


(Figure 6.2)

7 MY HOME TAB

This page is the landing page when you sign in using a server instance. For the stand-alone instance, after you navigate to local host URL you will land on this page as well. The functionality of the **My Home** tab is described below and highlighted in Figure 7.1:

a. "**Search Repository**" button (currently not available in the current release).
b. The **Create New MEP** button takes you to the **MEP Builder** page to begin building a MEP.
c. A list of saved unpublished MEP Packages that you can access via the View "folder" icon ( ). The Open/Unpublished section contains summary metadata from the saved package. The Domain, the MEP package name, Summary, Format and Release Number are displayed for each unpublished package saved. Unpublished packages can be deleted by using the Delete "Trashcan" Icon ( ).
d. The Published Message Exchange Package area is not functional in the current release.



(Figure 7.1)

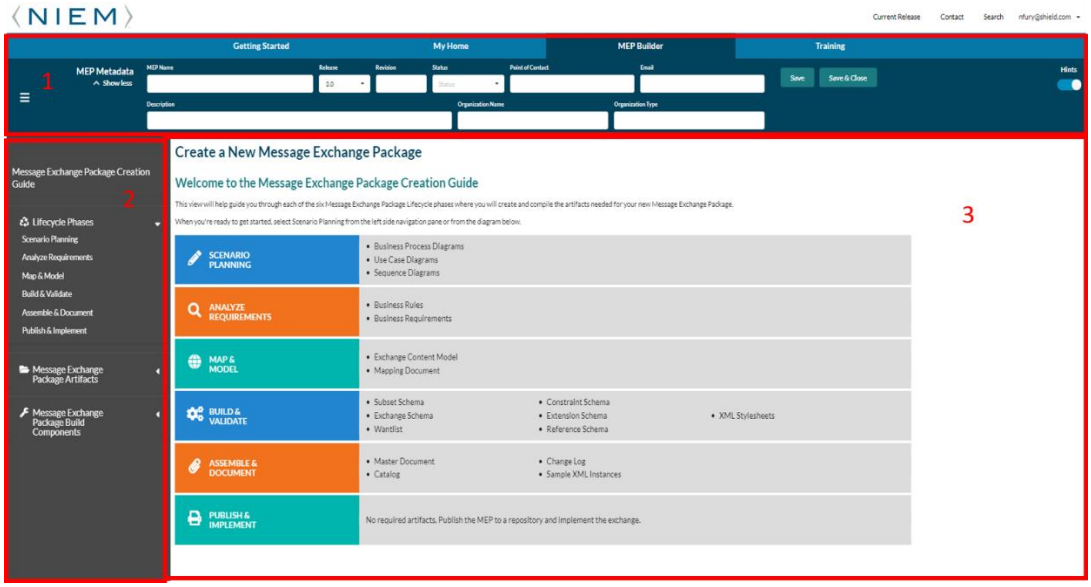
8 MEP BUILDER TAB

a. **MEP Builder** Page Navigation: (Figure 8.1)

(1) **Metadata** area - MEP Metadata fields, Save, Save and Close and Hints toggle. **TIP** - Prior to uploading any files to include in your MEP package, you must first enter a MEP Name in the "MEP Name" field

(2) **Left Navigation** area - Lifecycle Phases, Message Exchange Package artifacts and Message Exchange Package Build Components.

(3) **Workspace** - Interactive MEP Lifecyle Graphic, MEP Mapping Spreadsheet Import and modification.

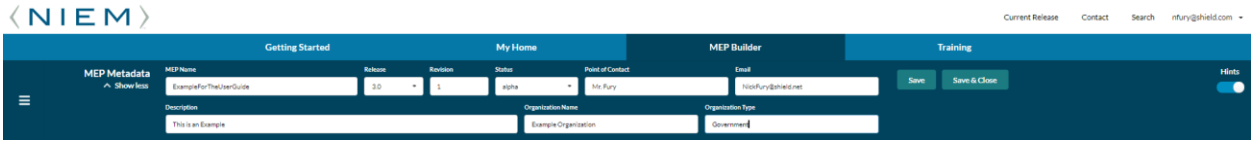


(Figure 8.1)

b. Metadata fields: Starting from the top of the page, the metadata fields allow you to enter data specific to the MEP package. This section is expandable and is collapsed in the default state (Figure 8.2.). Figure 8.3 shows the section in the expanded state. Available fields in the metadata section are listed below.

(1) MEP Name - The name of the MEP package.
(2) Release - This field only contains valid release numbers and defaults to version 3.0
(3) Revision
(4) Status
(5) Point of Contact - User enters desired POC here.
(6) Email - Contact email if desired.
(7) Description - A summary describing the MEP.
(8) Organizational Name - As applicable.
(9) Organizational Type - Describes type of organization listed above.

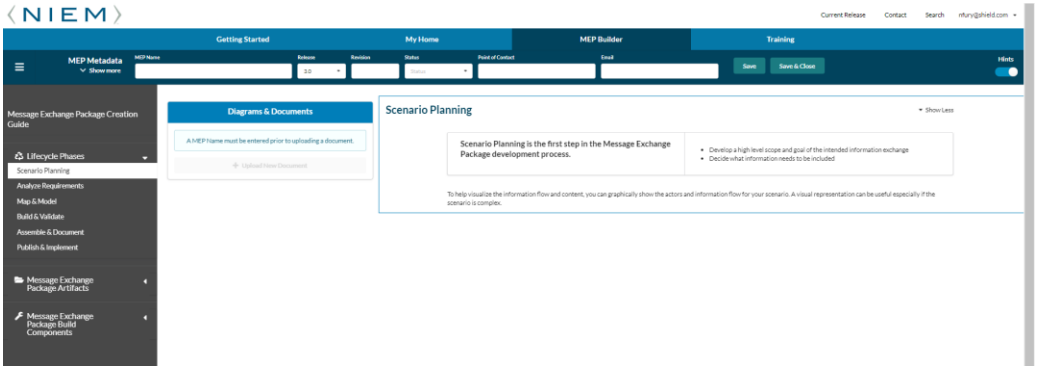
(Figure 8.2)



(Figure 8.3)

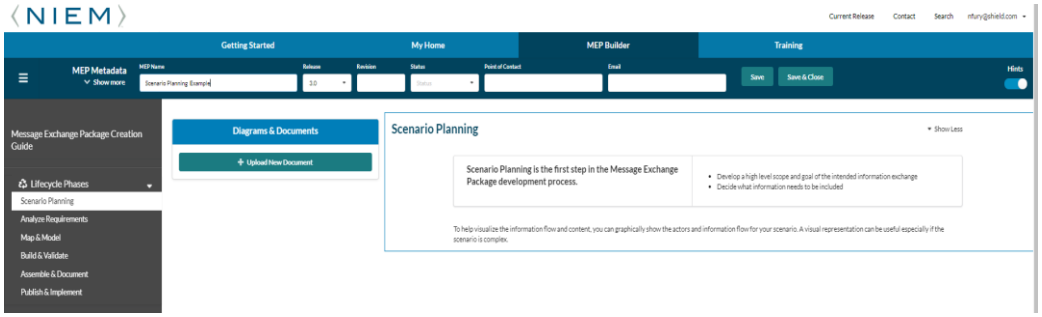
c. **Lifecycle Phases**.

(1) **Scenario Planning** - To begin constructing the MEP package, begin with "Scenario Planning" by clicking on the MEP Graphic in the workspace or clicking the left navigation area. If you have started the scenario planning workflow and have not entered a MEP name in the metadata field, the upload document functionality is by default disabled (Figure 8.4)



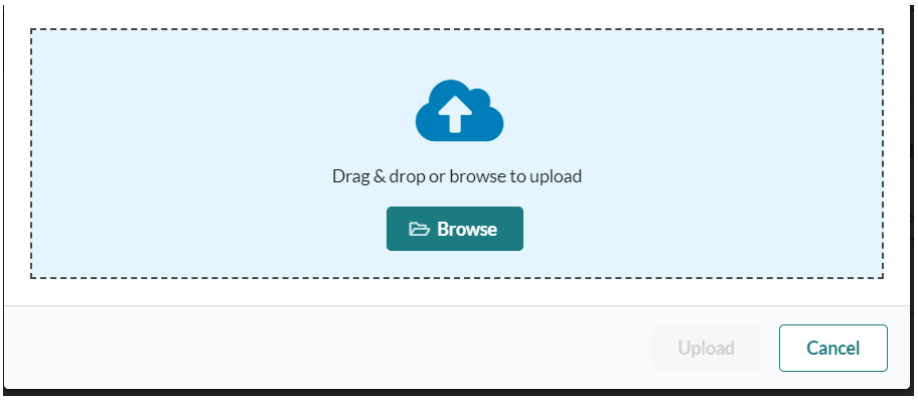
(Figure 8.4)

(a) Once a MEP name has been entered, you can upload a document by clicking the "Upload Document" button. See Figure 8.5.



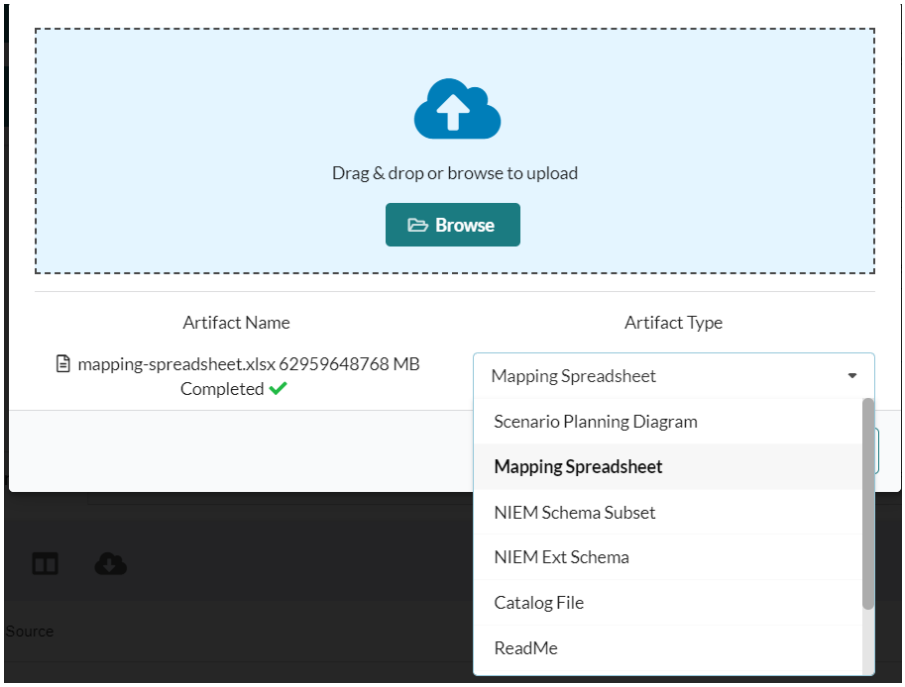
(Figure 8.5)

(b) Once the "Upload Document" button has been pressed, the upload document dialogue will display see (Figure 8.6). Here you can either drag and drop a file or browse for a file within you computer directory structure.

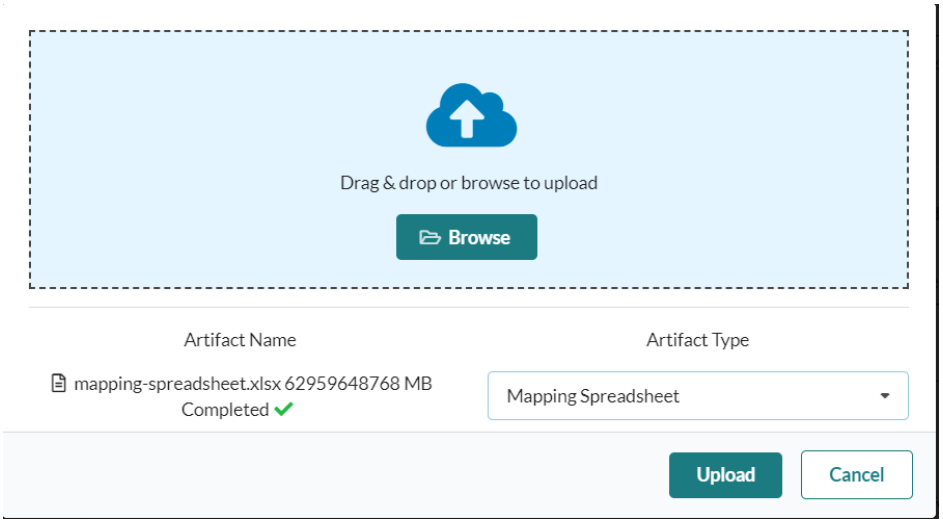


(Figure 8.6)

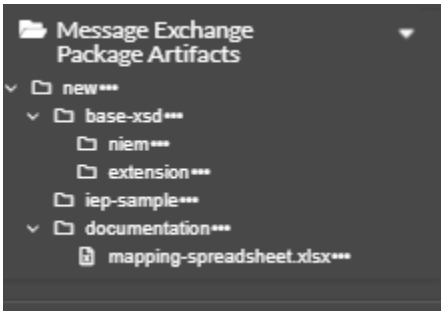
(c) Once the file has been selected, the system provides notification via a checkmark that the file is in the queue. Next, select the Artifact Type for example “Mapping Spreadsheet” as depicted in figures (8.7 and 8.8) Also, expand the Message Exchange Package Artifacts to see your file in the tree structure. See Figure 8.9



(Figure 8.7)

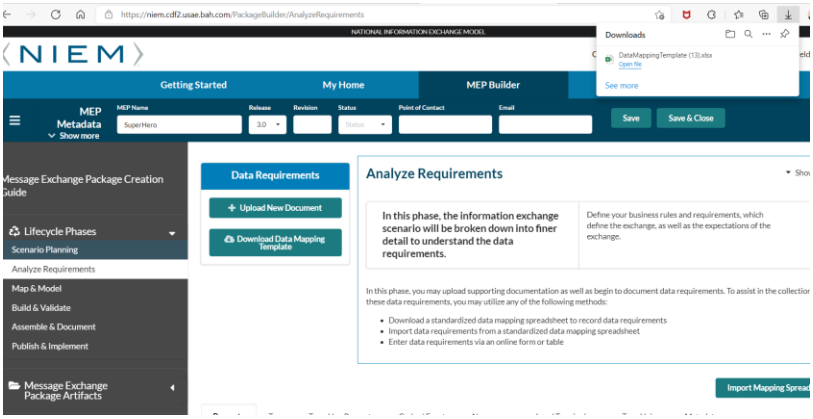


(Figure 8.8)



(Figure 8.9)

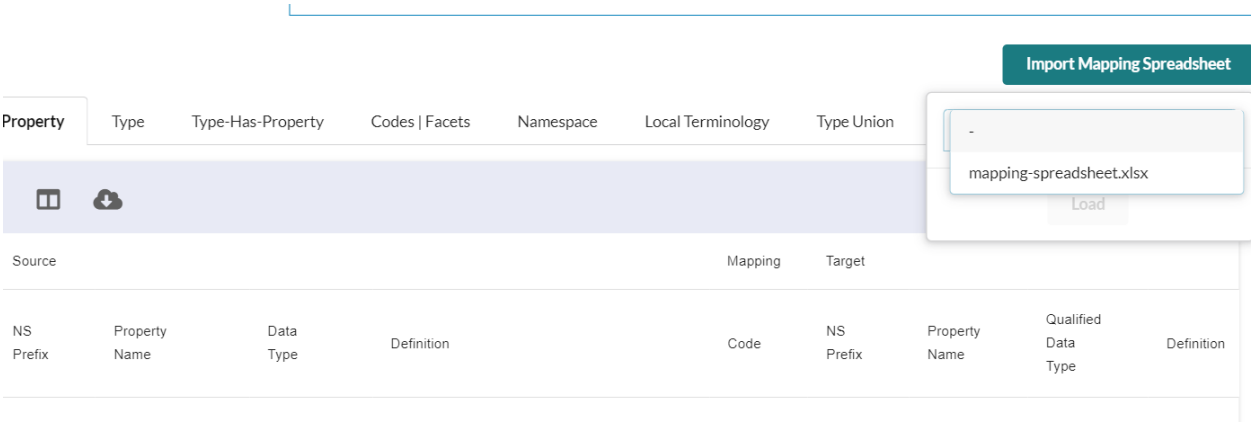
(2) Analyze Requirements - In this phase, the tool provides the ability to:
(a) Download a Mapping Template. Figure 8.10



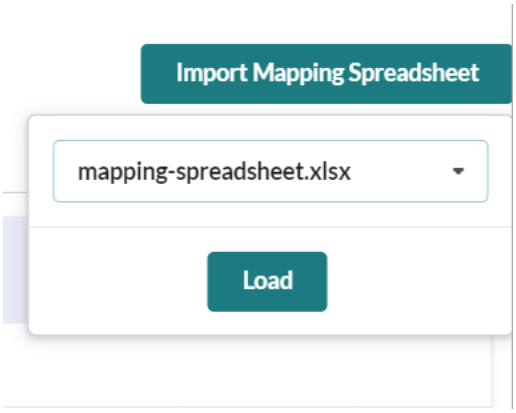
(Figure 8.10)

(b) Upload Documents - See upload document details in the previous section.

(c) Import a Mapping Spreadsheet - A mapping spreadsheet can be imported into the mapping grid and modified within the application. Select the desired document, then click the **load** button and the file will populate the grid on the workspace. See Figures 8.11 and 8.12

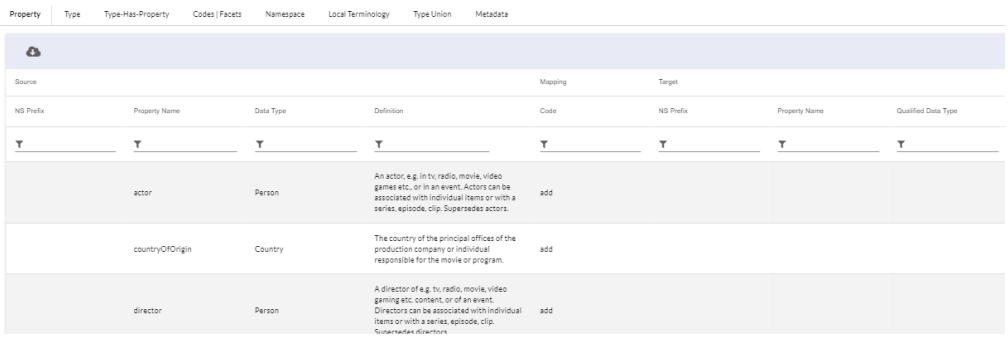


(Figure 8.11)



(Figure 8.12)

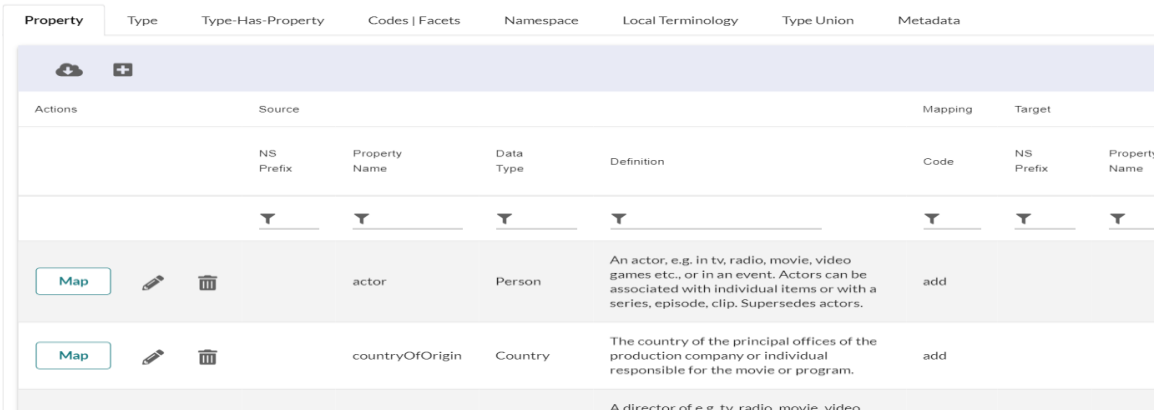
Now that the grid has populated, you can export the data sheet in .csv or .pdf format by clicking the “Cloud” Icon. See Figure 8.13



(Figure 8.13)

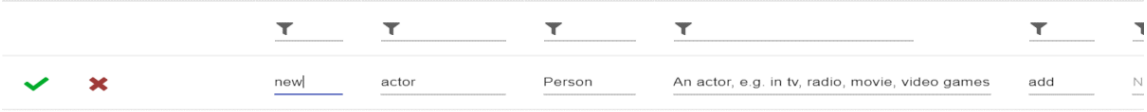
(3) **Map and Model** - Here you can you can edit the mapping sheet within the workspace and Map SSGT results for the "Property" and "Type" tabs to your mapping spreadsheet:

(a) Click the plus sign to add a row. See Figue 8.14 and 8.15



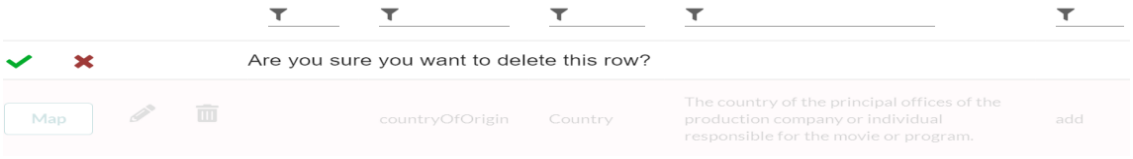
(Figure 8.14)

(b) Click the pencil to edit a row. The green checkmark confirms and the red "x" cancels. See Figure 8.15



(Figure 8.15)

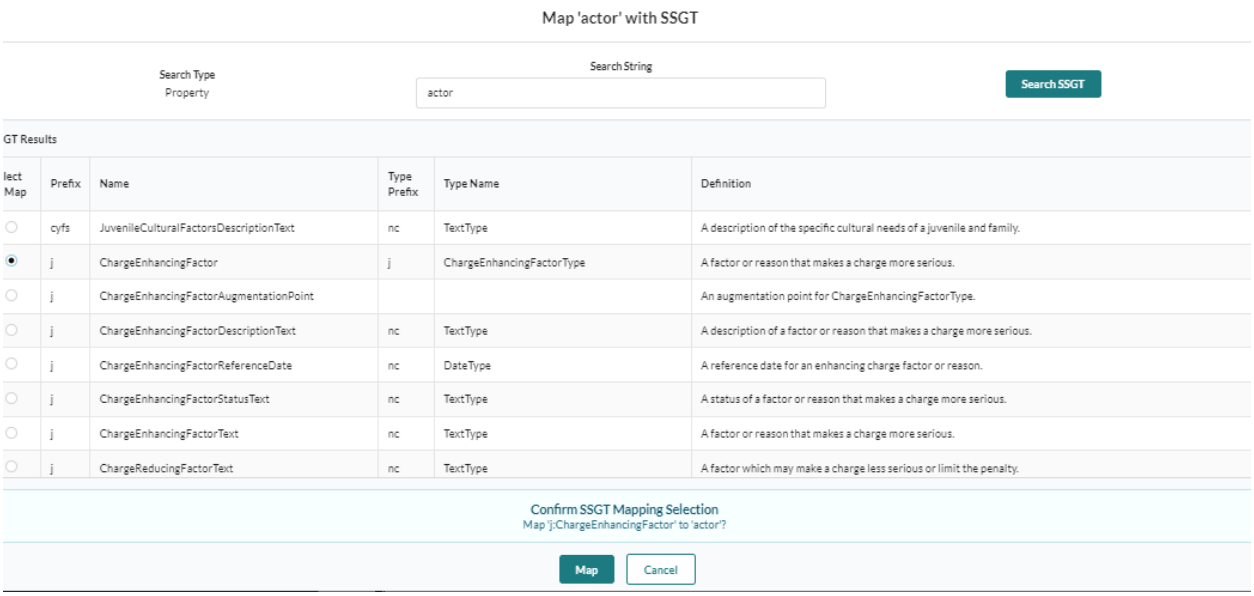
(c) Click the trash can to delete a row. The green checkmark confirms and the red “x” cancels. See Figure 8.16



(Figure 8.16)

(d) Map SSGT Results - Click the Map search SSGT and append results to your mapping spreadsheet as follows:

- Click the “**Map Button**” which will result in a searchable dialog. See Figure 8.17
- Review the results and select the element to map to your mapping spreadsheet by clicking the radio button.
- Click the “**Map button**” to append your selection to the maping spreadsheet.



(Figure 8.17)

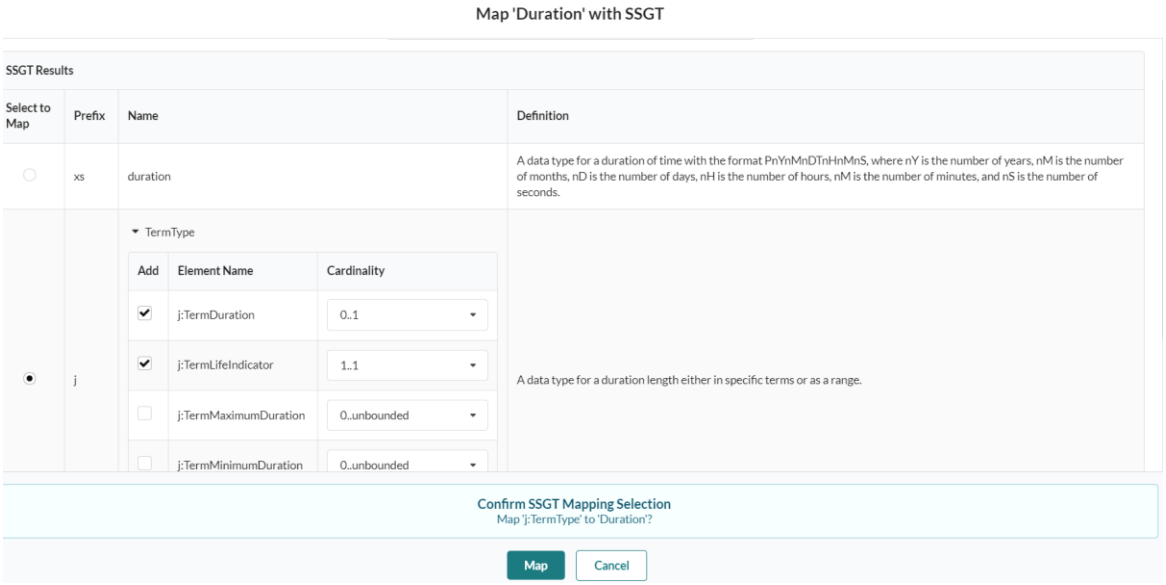
*View the results of your mapping in the Mapping spreadsheet. See Figure 8.18

Property Name	Data Type	Definition	Code	NS Prefix	Property Name	Qualified Data Type
actor	Person	An actor, e.g. in tv, radio, movie, video games etc., or in an event. Actors can be associated with individual items or with a series, episode, clip. Supersedes actors.	add	j	ChargeEnhancingFactor	ChargeEnhancingFactor

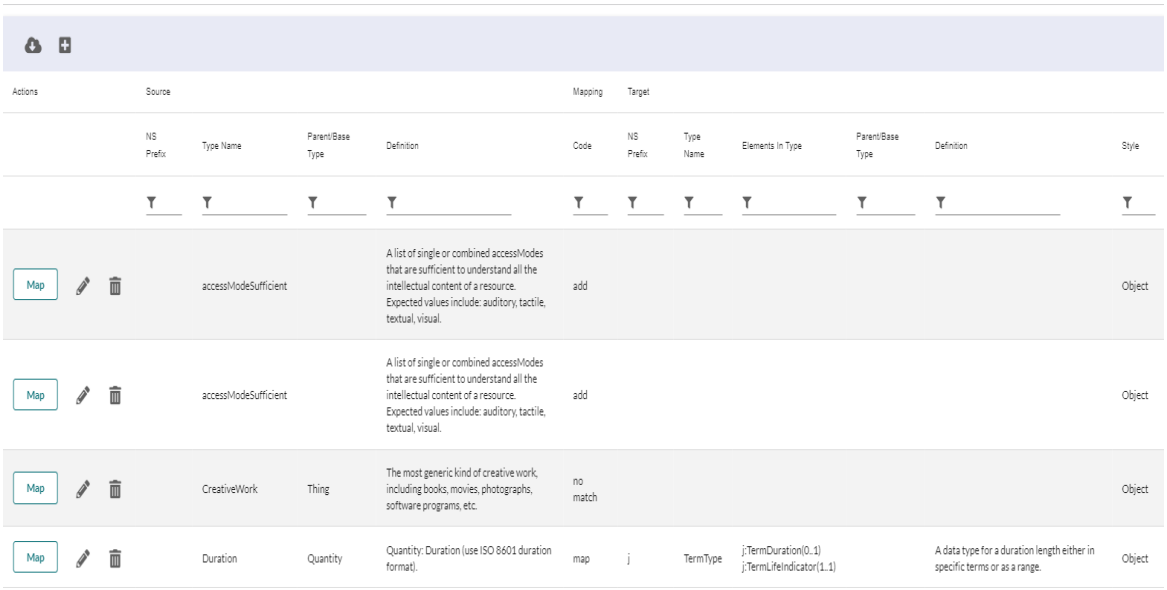
(Figure 8.18)

(e) To Map “Type” and set Cardinality complete the following steps:

- On the “Type” tab of your mapping spreadsheet, click the Map button beside the row you wish to SSGT search results.
- Click select from the default results or search for another string.
- When you find the desired results expand Name results and select the elements you wish to add by clicking the check box(s) in the “add” column.
- Set the Cardinality at 0.1,1.1, 0.unbounded, 1.unbounded. See Figure 8.19
- Click the Map button to append these results to the mapping spreadsheet. See Figure 8.20



(Figure 8.19)

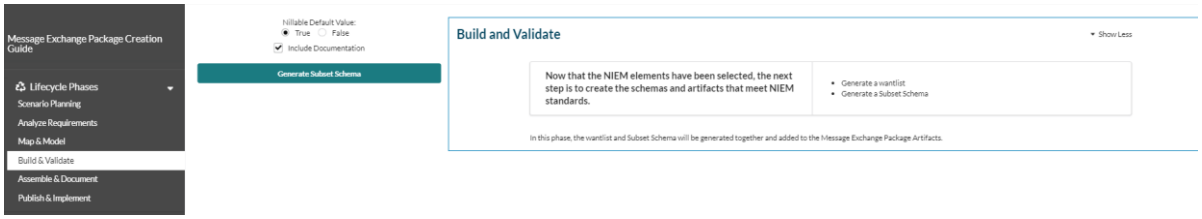


Actions	Source				Mapping	Target					
	NS Prefix	Type Name	Parent/Base Type	Definition	Code	NS Prefix	Type Name	Elements In Type	Parent/Base Type	Definition	Style
Map		accessModeSufficient		A list of single or combined accessModes that are sufficient to understand all the intellectual content of a resource. Expected values include: auditory, tactile, textual, visual.	add						Object
Map		accessModeSufficient		A list of single or combined accessModes that are sufficient to understand all the intellectual content of a resource. Expected values include: auditory, tactile, textual, visual.	add						Object
Map		CreativeWork	Thing	The most generic kind of creative work, including books, movies, photographs, software programs, etc.	no match						Object
Map		Duration	Quantity	Quantity: Duration (use ISO 8601 duration format).	map	j	TermType	j:TermDuration(0..1) j:TermLifeIndicator(1..1)		A data type for a duration length either in specific terms or as a range.	Object

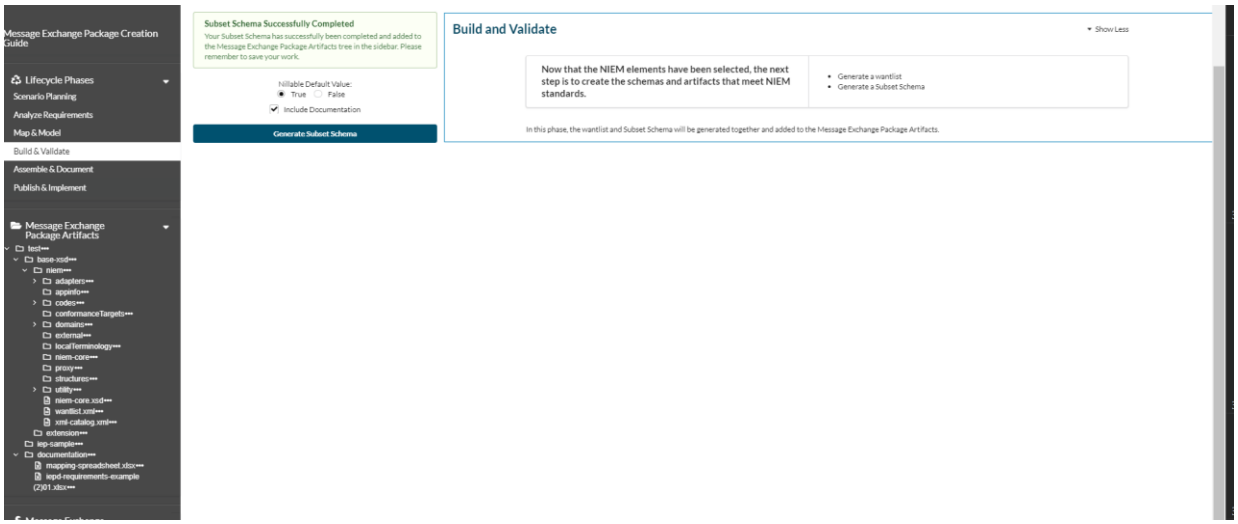
(Figure 8.20)

(4) **Build and Validate** - This Phase will allow you to generate the wantlist and subset schema. Here you can set Nillable Default values and decide to include documentation to the schema.

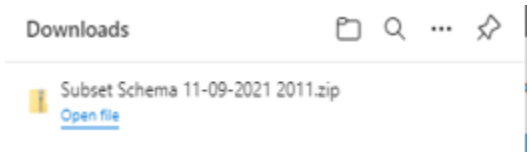
- Click the Build and Validate item in the left navigation area
- Choose nillability
- Choose whether to include documention.
- Click the "**Generate Subset Schema**" button to generate the wantlist and subset schema. See Figure 8.22
- A green notification will notify you that the Subset Schema has been generated and you can see the schema and wantlist populate the MEP Artifacts area of the left Nav. See figure 8.23
- Immediately after generating the Subset Schema, the package can be downloaded and available to open. The standard windows download dialogue will render at the top right of your screen. See figure 8.24
- After downloading the Subset Schema, you can open the download folder in the Windows File Explorer. You will see the schema files, including the "Wantlist" if applicable. See Figure 8.25



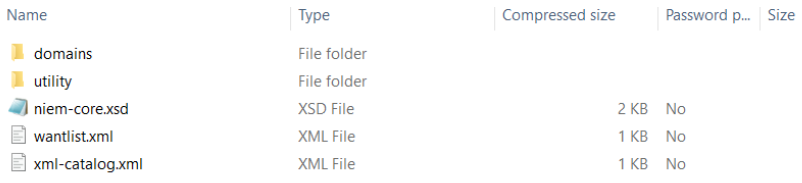
(Figure 8.22)



(Figure 8.23)



(Figure 8.24)



(Figure 8.25)

(5) **Assemble and Document** – This Phase is not available as of the current Release 1.0 and reserved for future development.

(6) **Publish and implement** – This Phase is not available as of the current Release 1.0 and is reserved for future development.

9 NIEM TOOL INSTALLATION INSTRUCTIONS

1. **Prerequisites**

- Administrator privileges
- Access to a command-line
- Username and password for the Github website (optional)
- Username and password for Docker Hub (optional)
    - Note: This will increase rate limits docker imposes on containers.

Install Docker

https://docs.docker.com/desktop/windows/install/

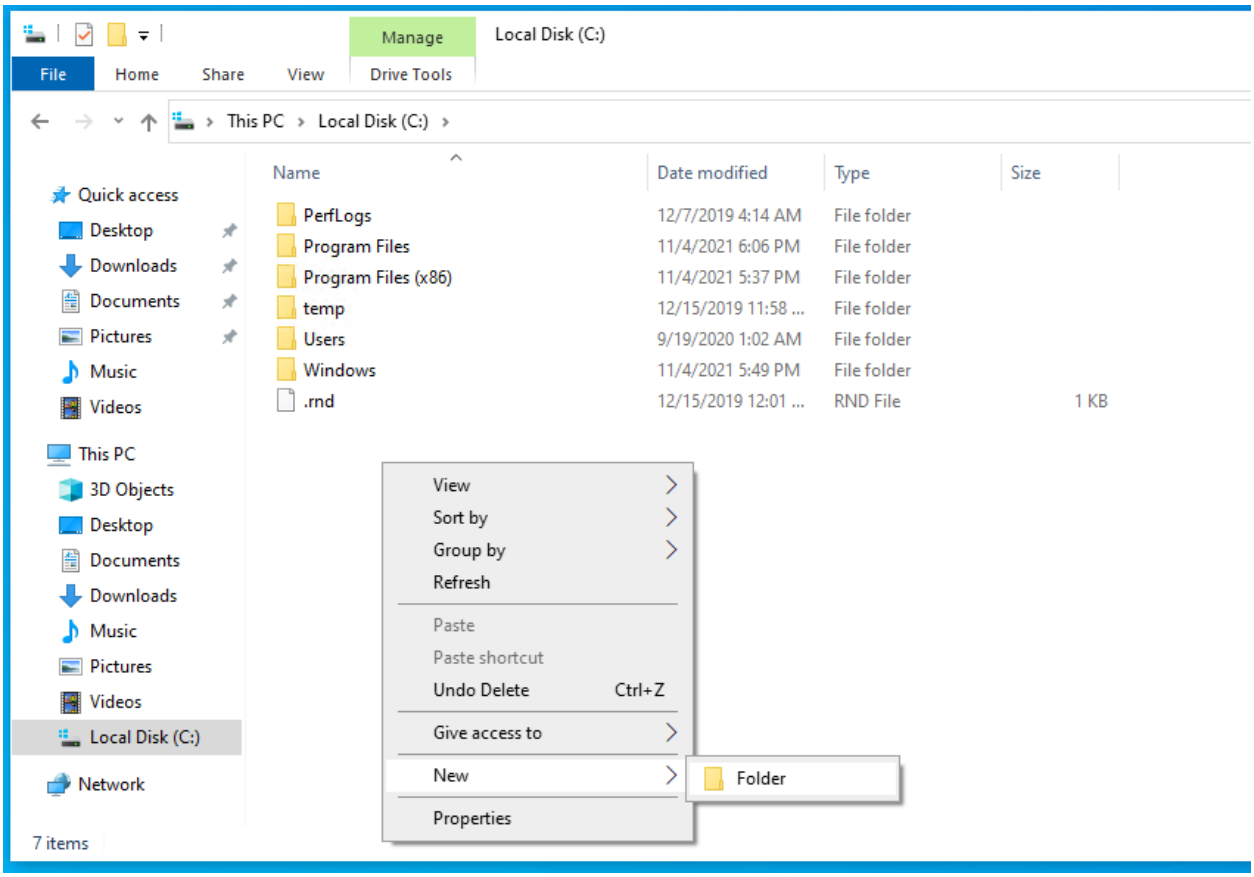
Note

At the time this was written all defaults were selected during install which utilized WSL2.

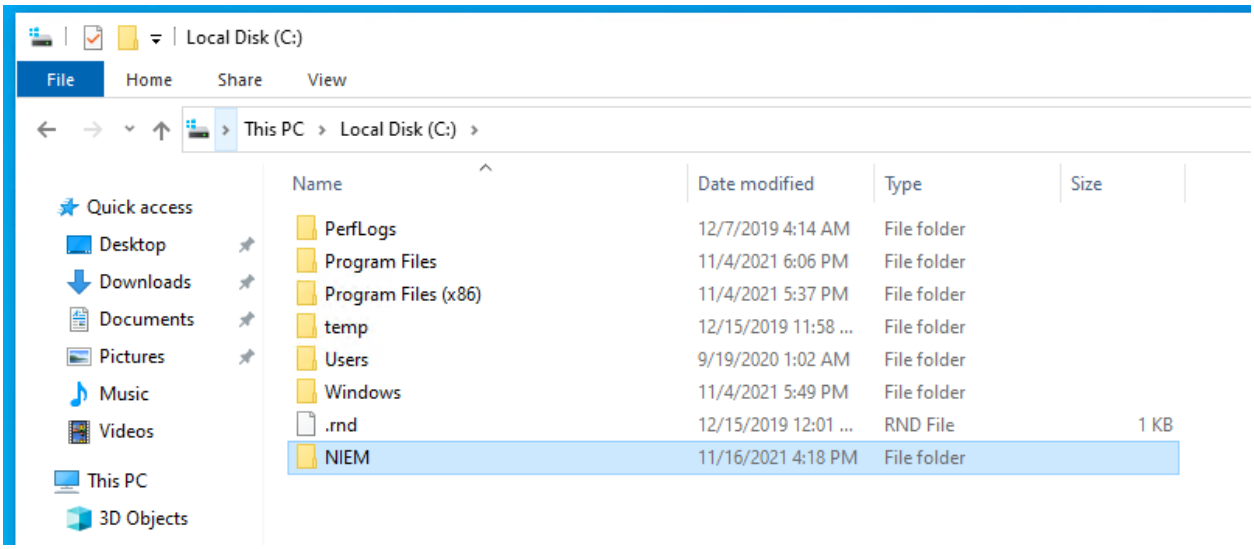
2. **Create Project Directory**

This is an optional section to create the directory where the project files will be stored. Follow these steps to create the project directory:

1. Open the File Explorer and navigate to the C:\ drive
2. Right-click in the white space and select New > Folder



3. Name this folder 'NIEM'

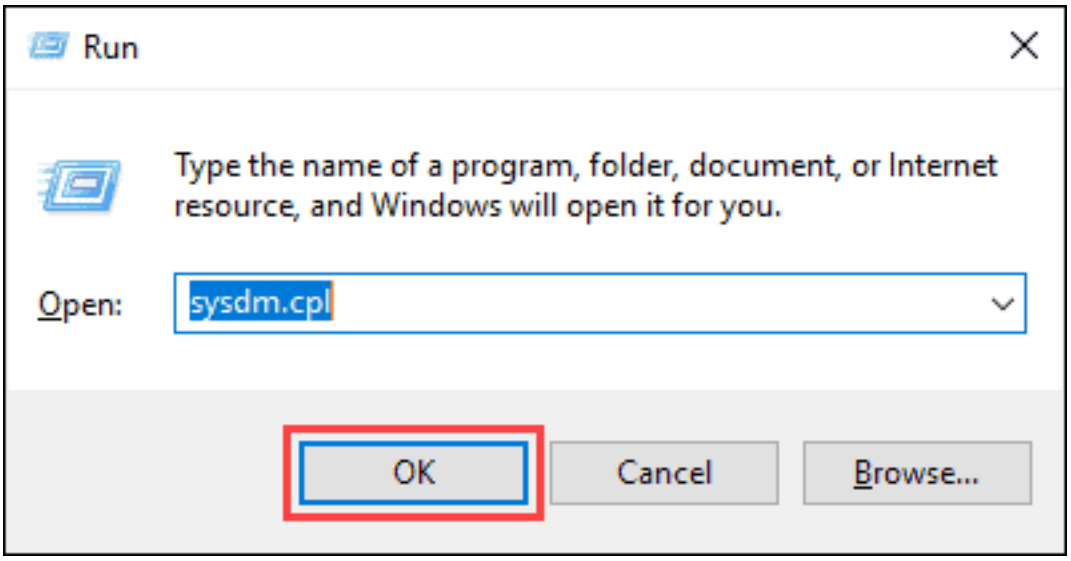


3. Set Environment Variable in Windows via GUI

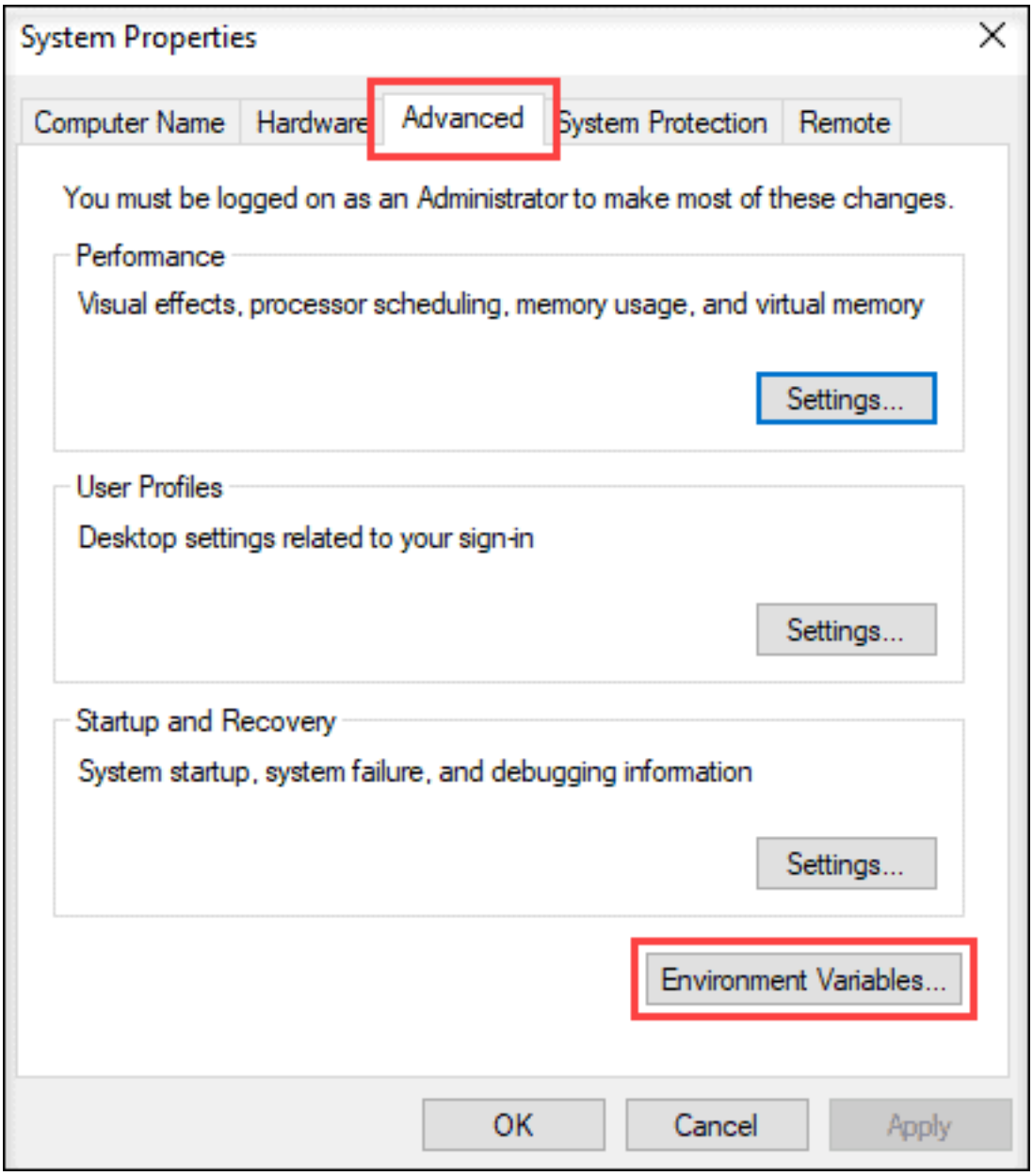
Follow the steps to set environment variables using the Windows GUI:

1. Press **Windows (⊞) + R** to open the Windows Run prompt.

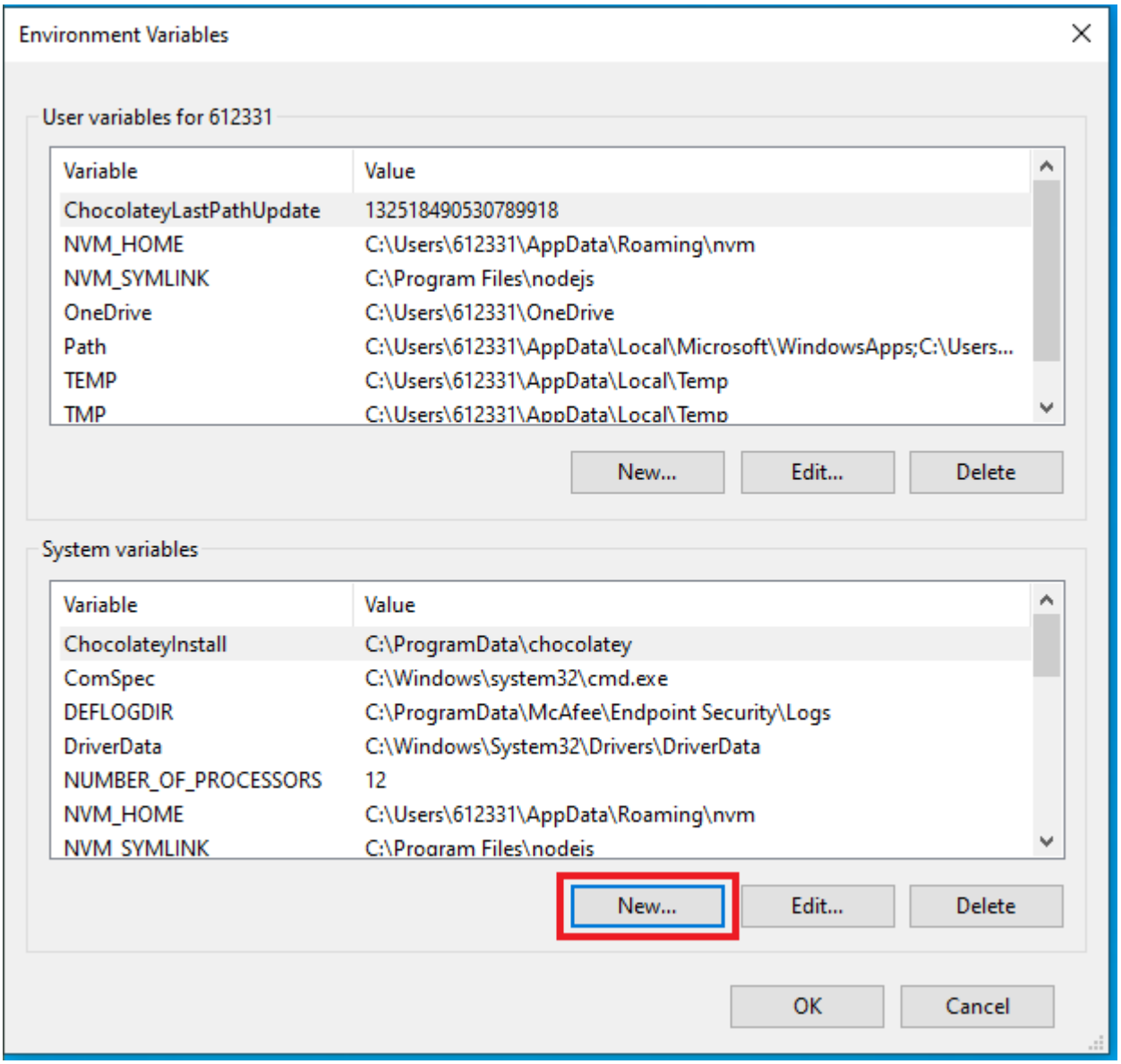
2. Type in **sysdm.cpl** and click **OK**.



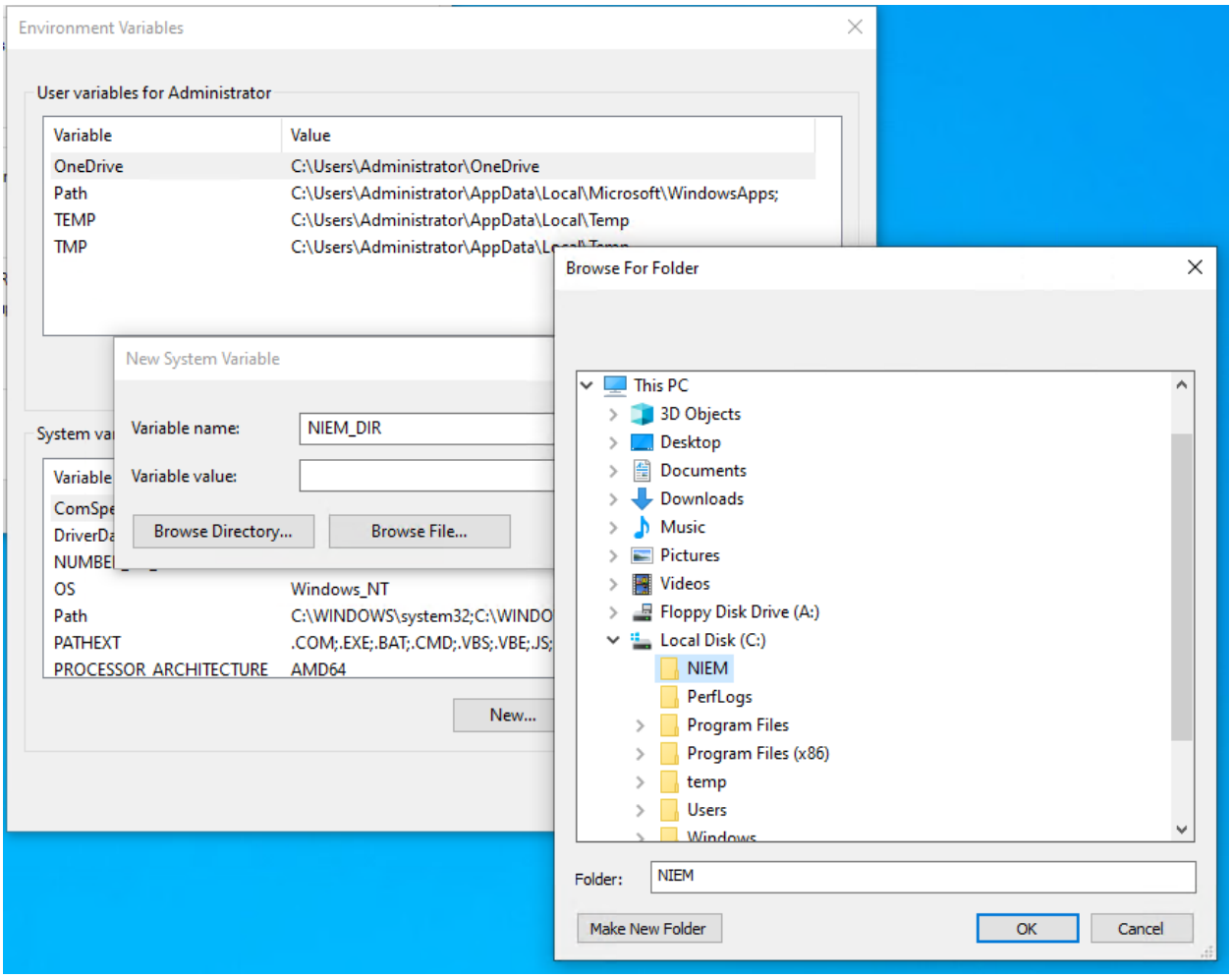
3. Open the **Advanced** tab and click on the **Environment Variables** button in the System Properties window.



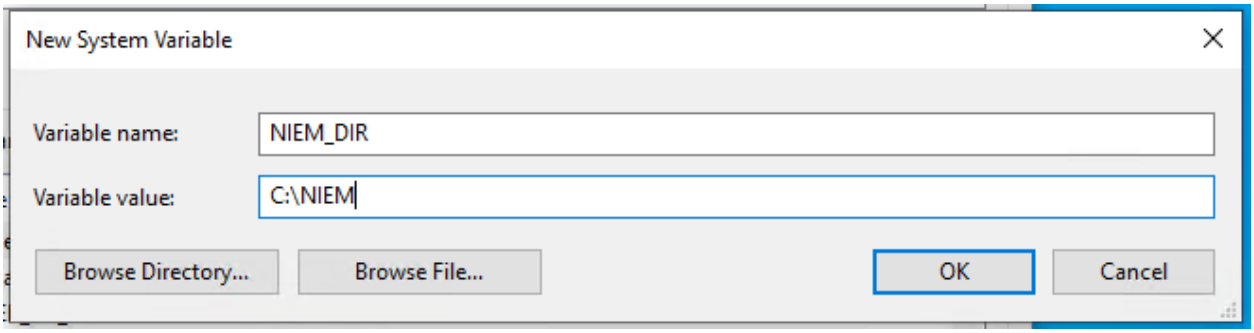
4. The Environment Variables window is divided into two sections. The sections display user-specific and system-wide environment variables. To add a variable, click the **New…** button under the system-wide section.



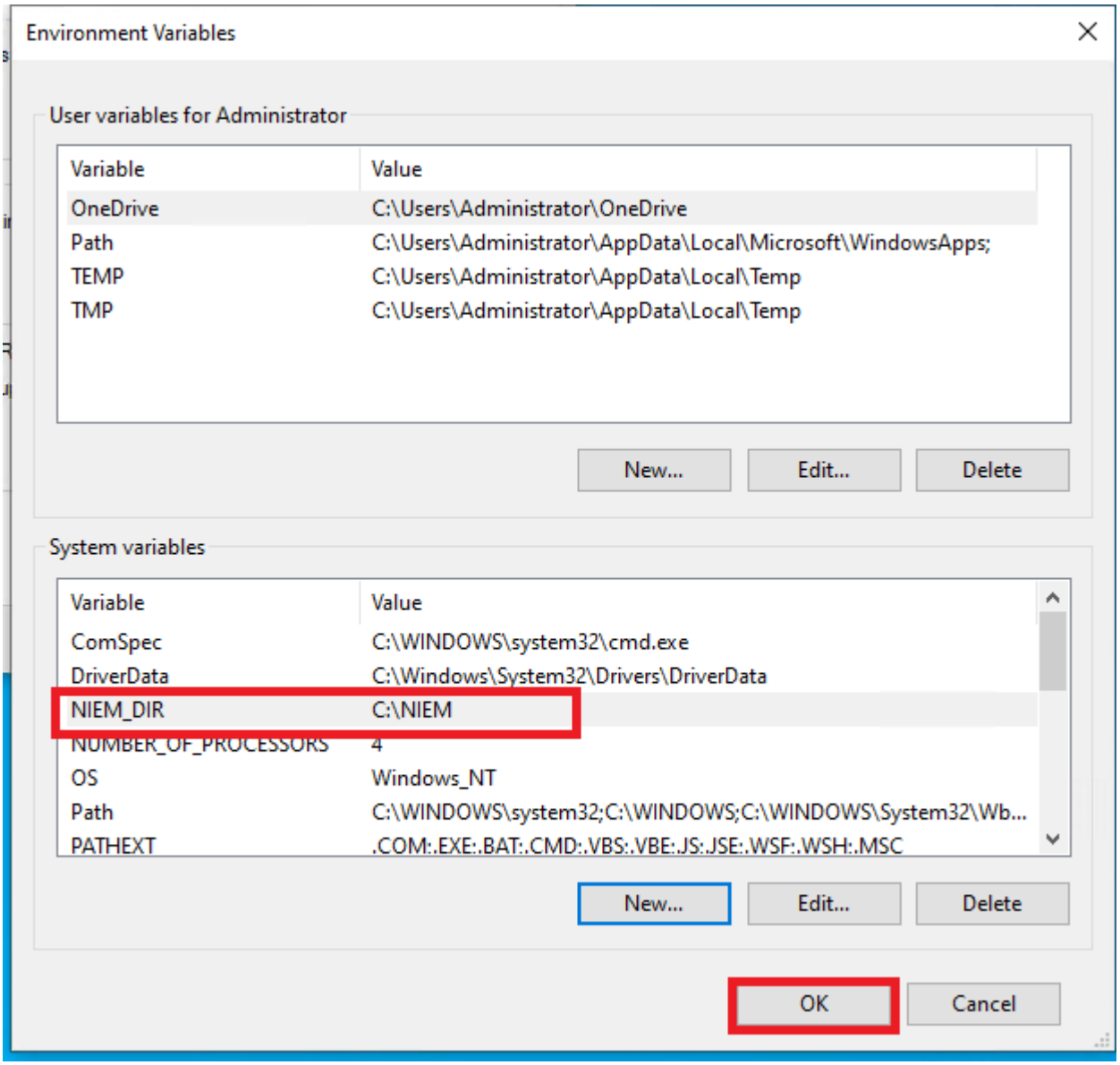
4. Enter the variable name, "NIEM_DIR", click "Browse Directory" and navigate to where you want to save NIEM data and select the appropriate folder. If the earlier steps were followed in the 'Create Project Directory' section, select the C:\NIEM directory.
5. Click **OK**.



6. You should now see something that looks similar to below. Click **OK.**



7. Verify that the new system variable was created as below and click **OK**



4. **Download & Install NIEM**

The following section provides three installation instruction options. Choose to follow only one of the following options which best suit your environment and needs:

a. **Offline Installer (Recommended)** – Recommended for most users and/or for air gapped / non-internet connected devices.

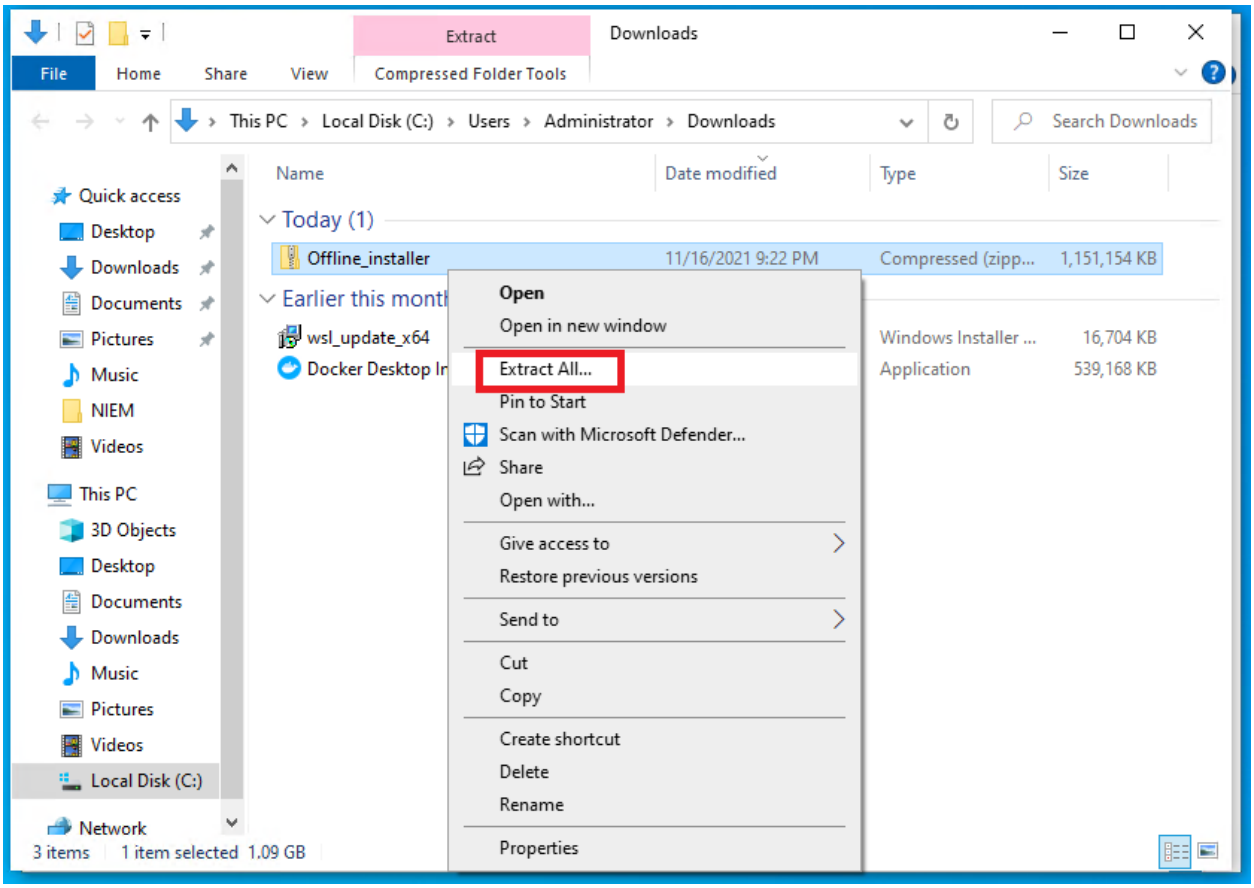
b. **Online Installer** - For computers with access to GitHub and an internet connection.

c. **Build Installer** - For developers who want to rebuild the application.

5. Option 1: Offline Installer

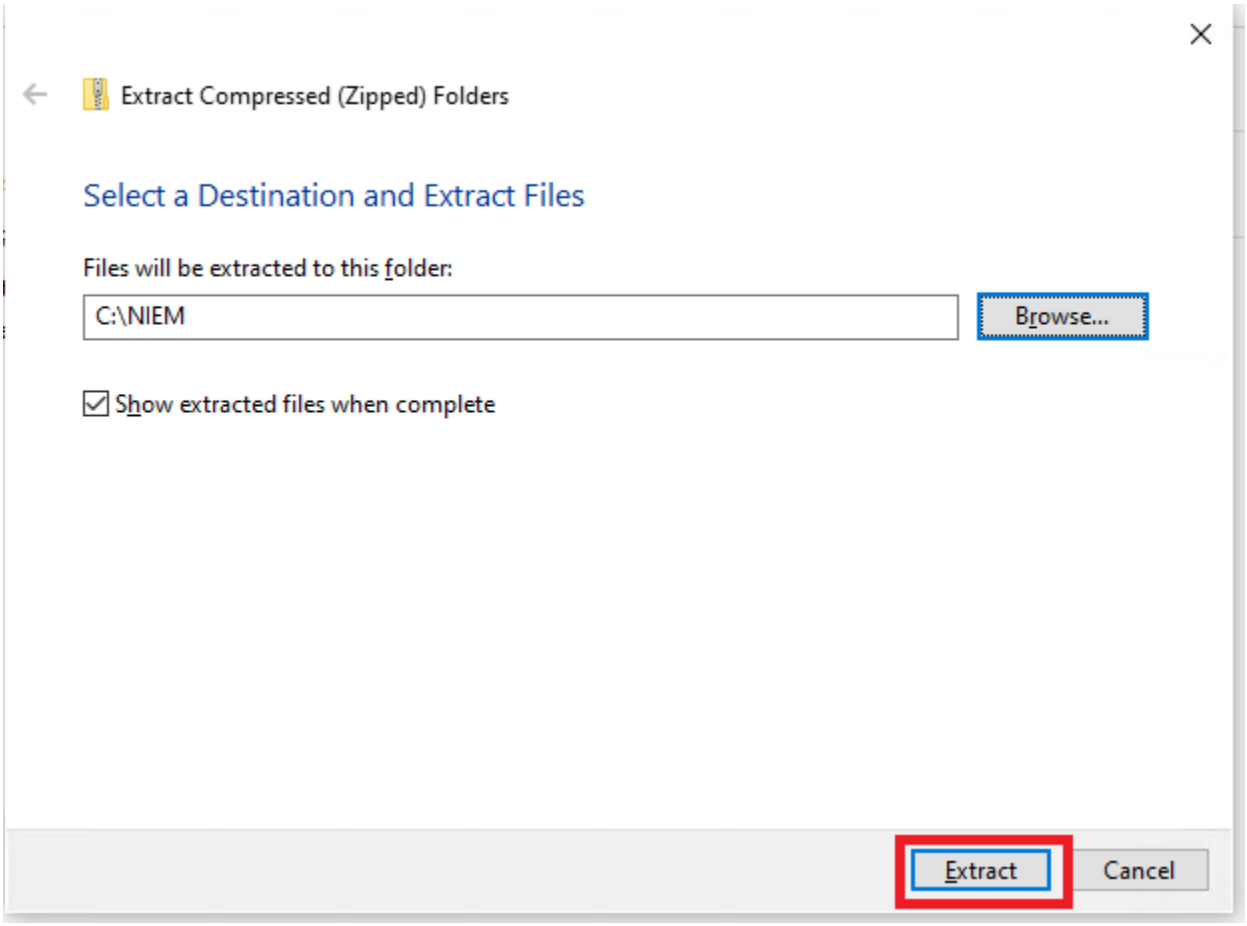
1. To begin the offline install process, you must first have the Offline_Installer.zip file downloaded to your computer.

2. Navigate to the zip file in the file explorer. Right-click on the zip file and select 'Extract All…'

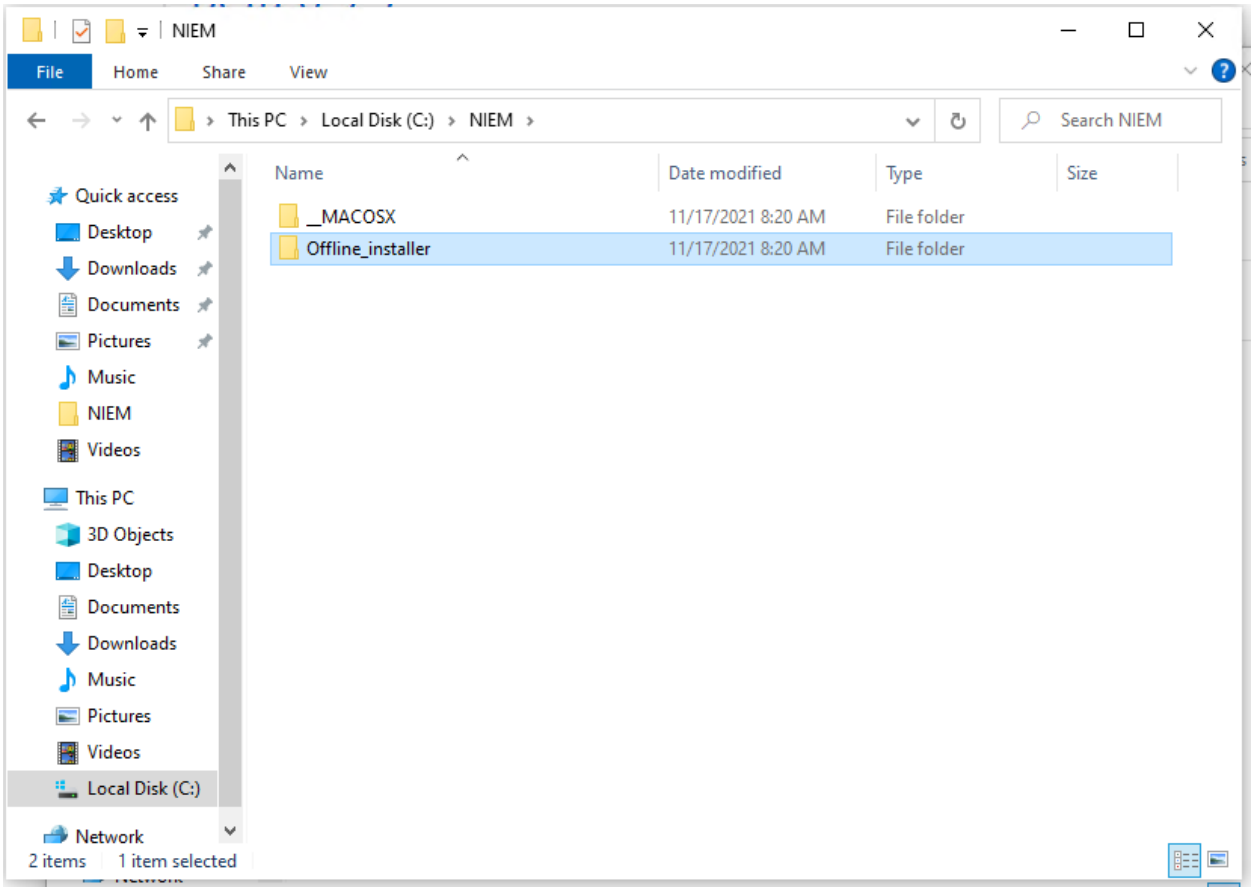


3. Click 'Browse' and browse and select the folder location you wish to extract the project files. If the earlier steps were followed in the 'Create Project Directory' section, select the C:\NIEM directory.

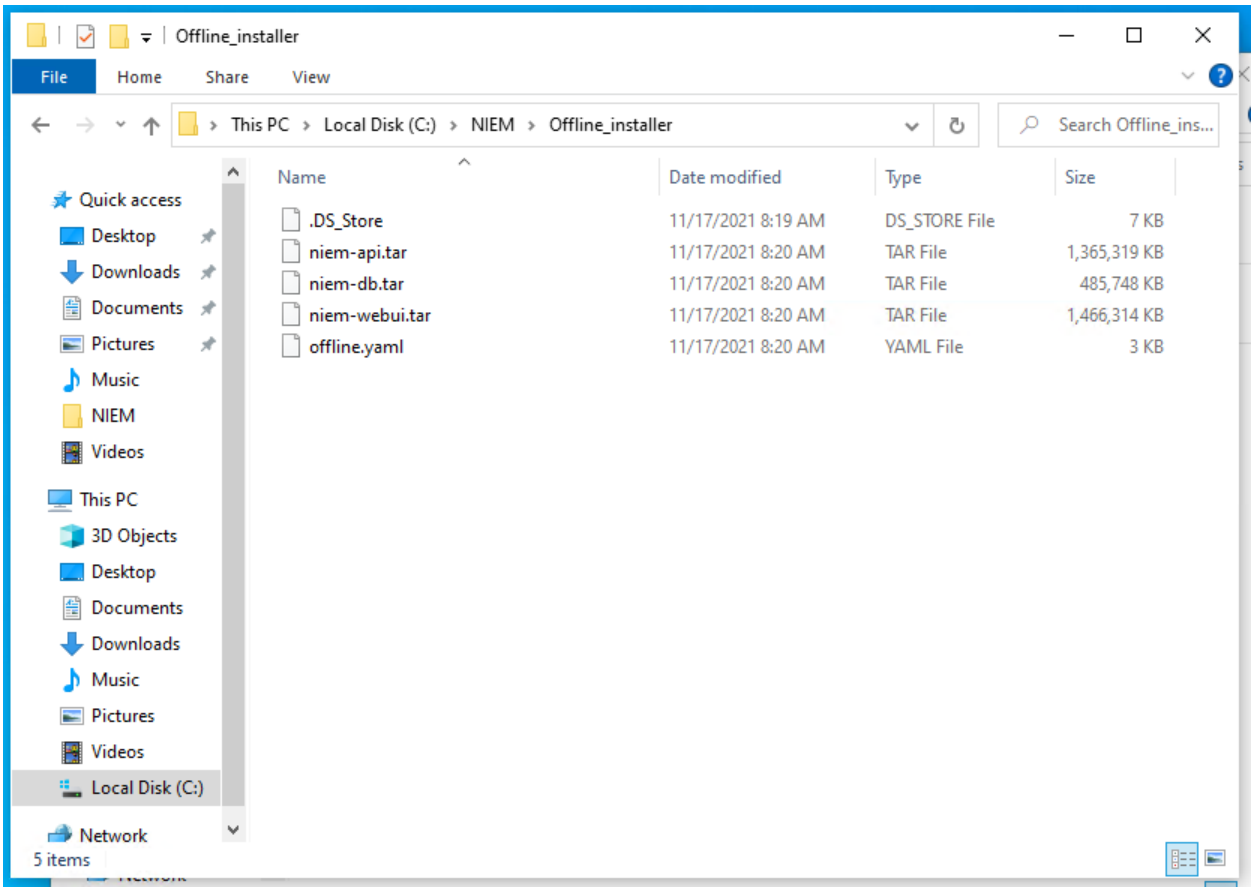
4. Click 'Extract'



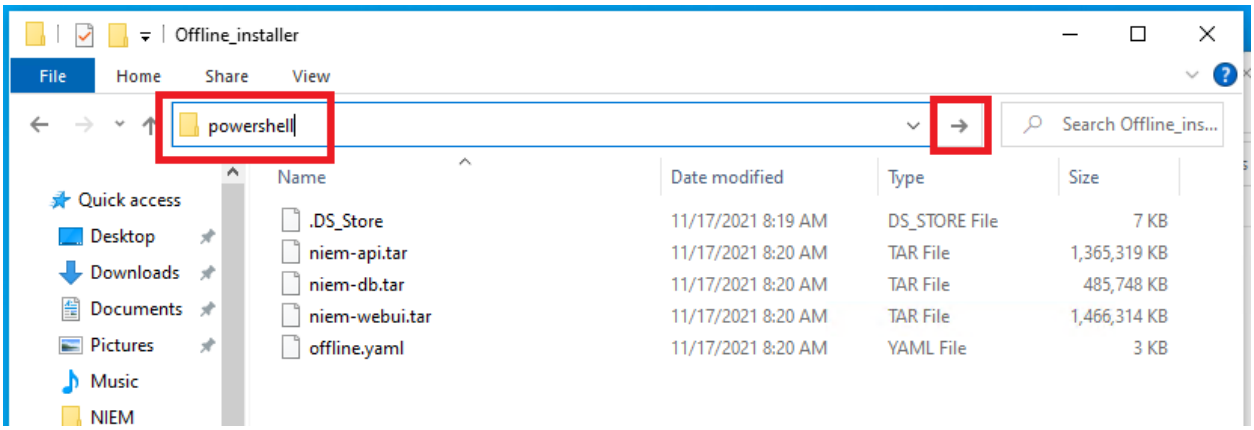
5. If the extracted files do not automatically pop-up upon completed extraction, navigate to the directory to where they were extracted.



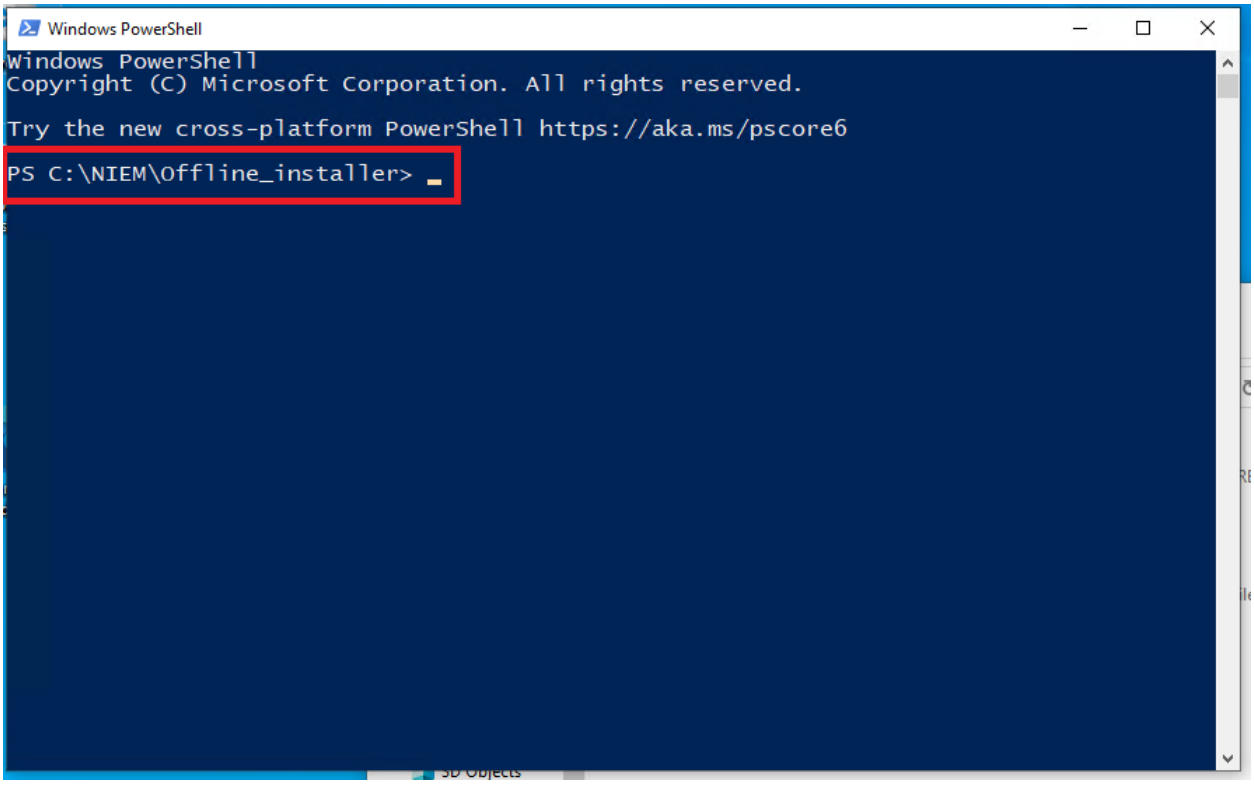
6. Open the 'Offline_installer' folder



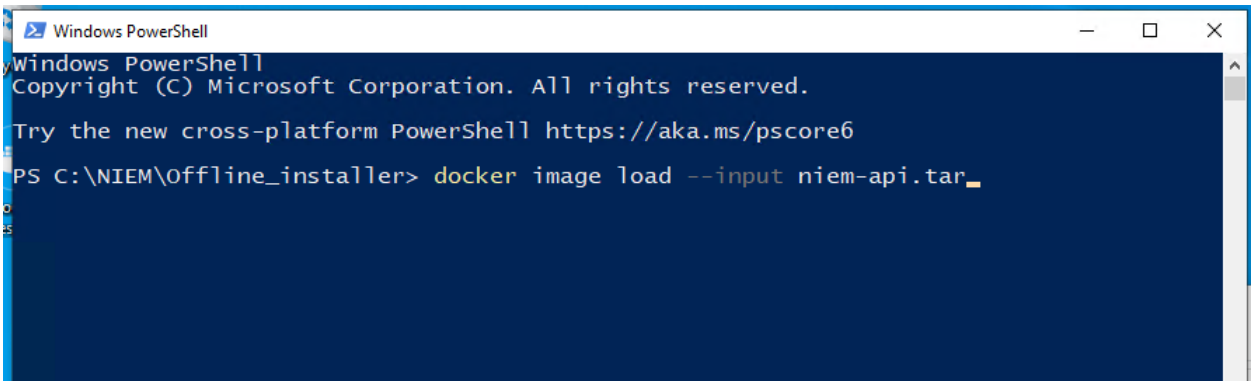
7. Type 'powershell' in the directory path field and either type 'Enter' on your keyboard or click the arrow to go to powershell.



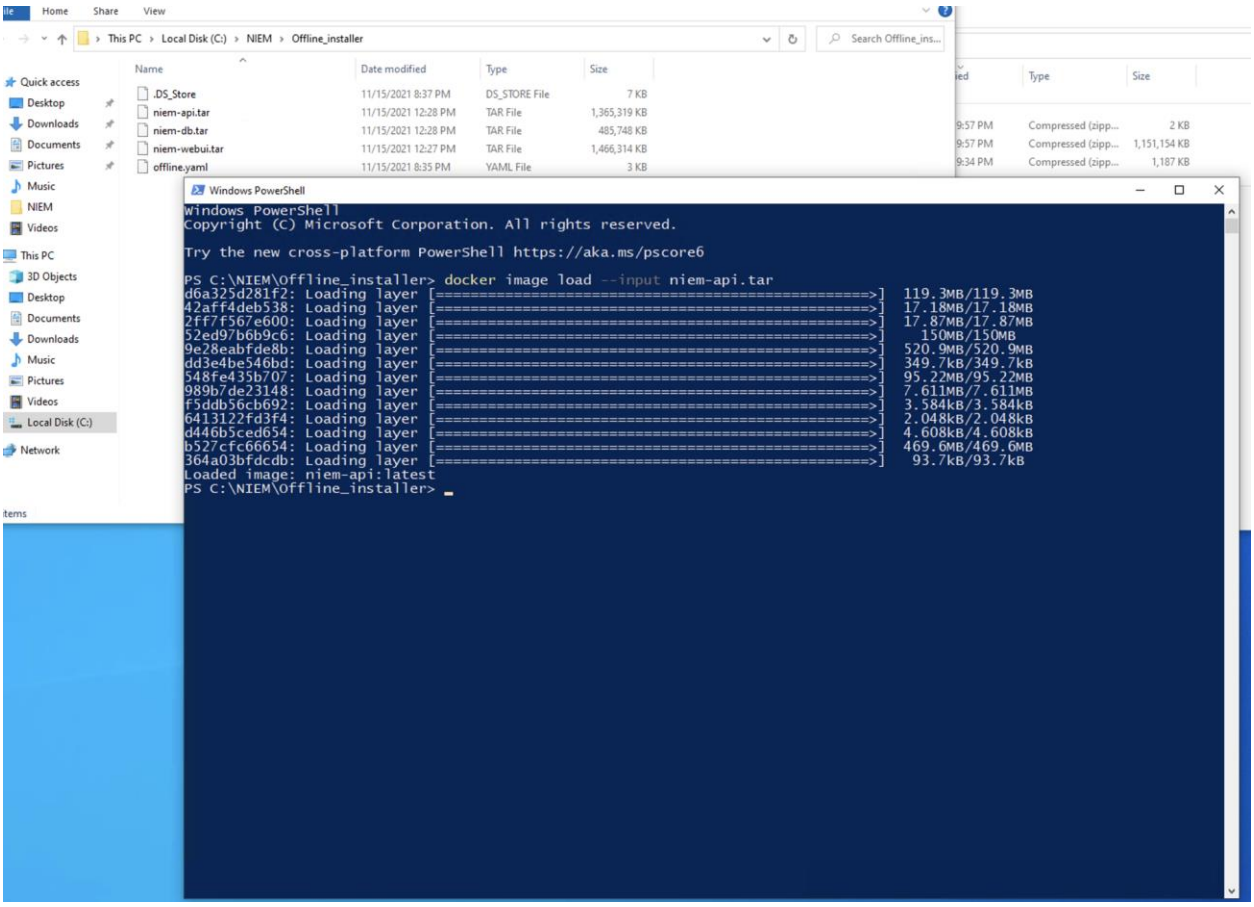
8. A PowerShell window should appear. Verify that the directory listed is the path to your Online_Installer folder.



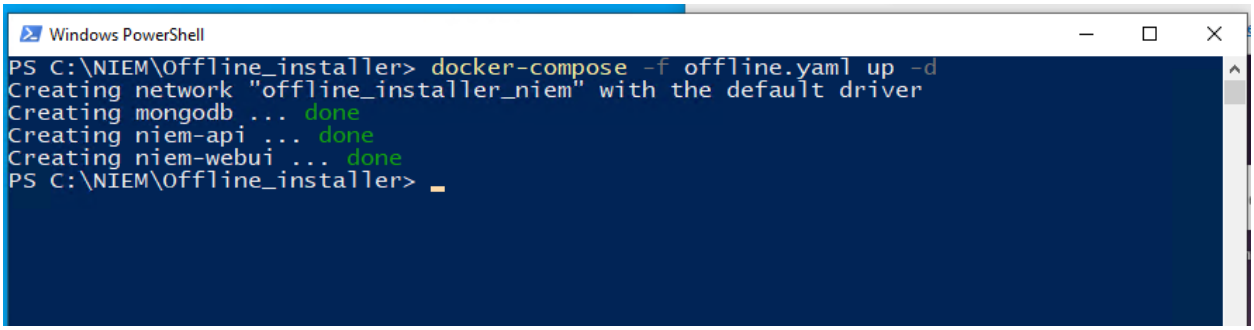
9. Type or copy/paste the following command: docker image load --input niem-api.tar
    a. **NOTE** There are two '-' marks before the word 'input'



10. Click the Enter key on the keyboard to run the above command
11. It will take a few minutes for the image to be loaded. It will be completed when you see the 'loaded image' name and the directory path as shown at the bottom of the image below

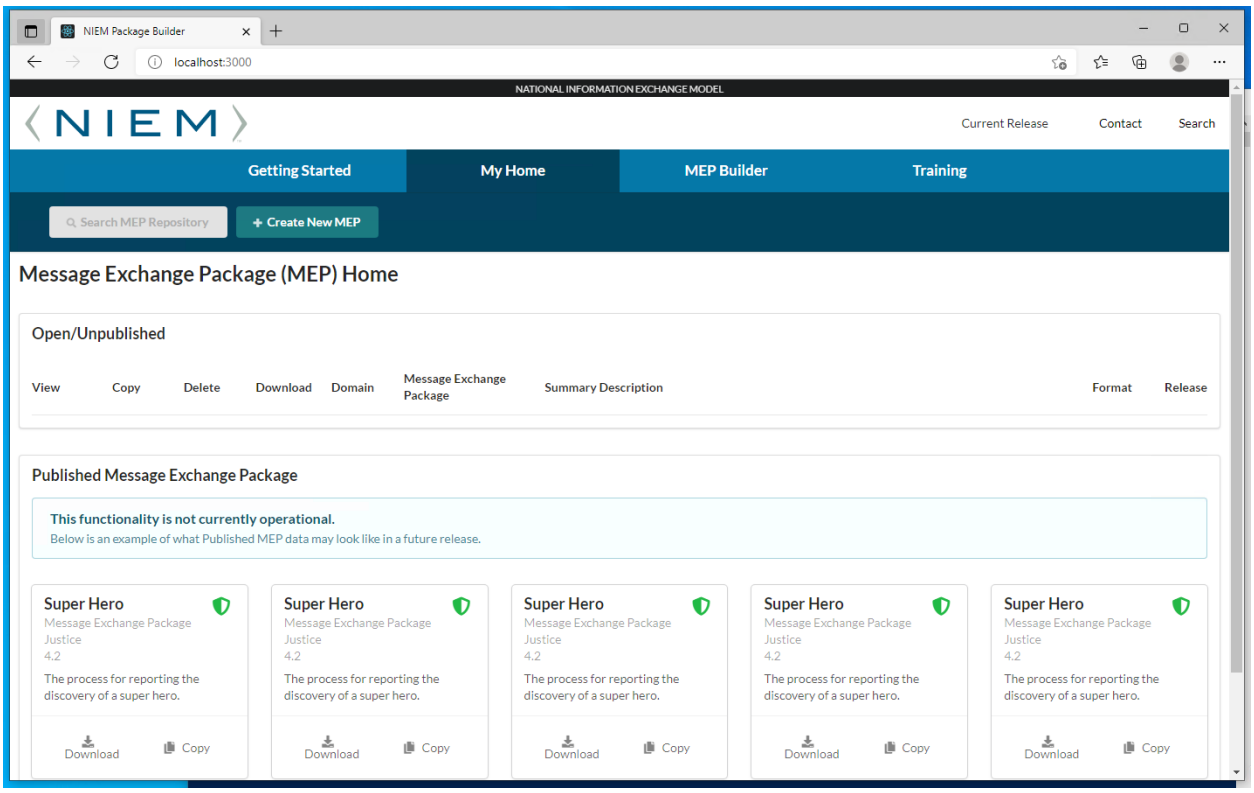


12. Repeat steps 9-11 for the following commands:
    a. docker image load --input niem-db.tar
    b. docker image load --input niem-webui.tar
13. Type or copy/paste the following command:
    a. docker-compose -f offline.yaml up -d
14. Click the Enter key on the keyboard to run the above command
15. It will take a few minutes for the image to be loaded. It will be completed when you see three 'done' statuses and the directory path as shown at the bottom of the image below



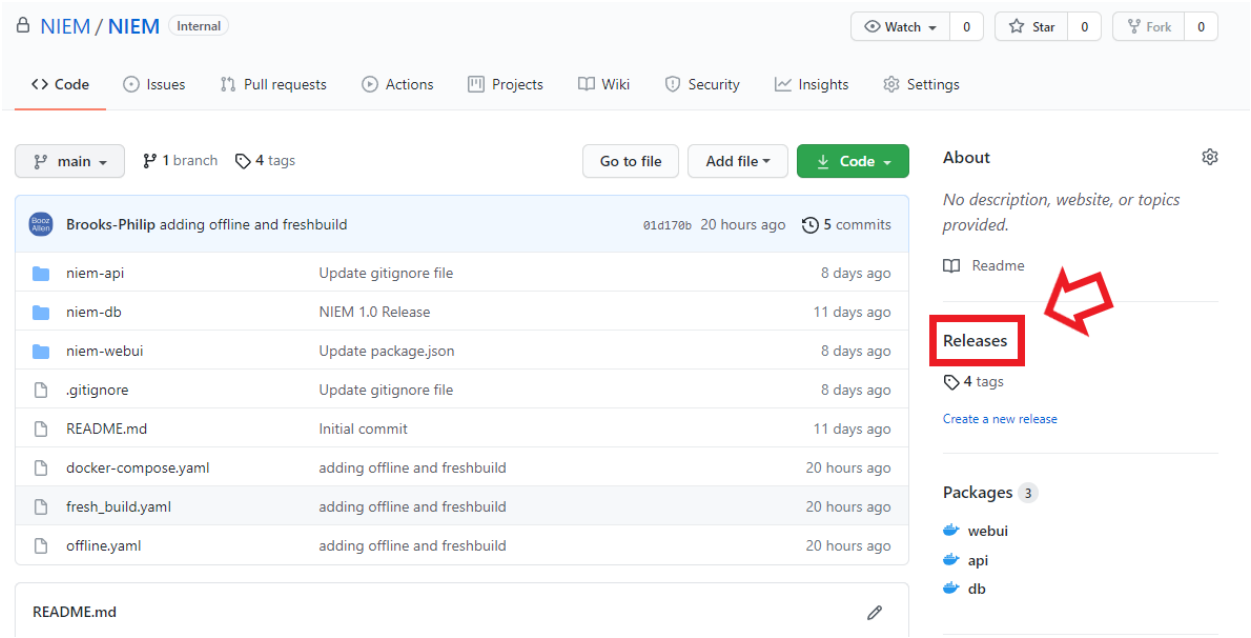
16. You can now run the application by going to your browser and typing the URL 'localhost:3000'

    a. **NOTE** Upon initial startup, the webpage may continue to load for a few more moments before it is actually ready.

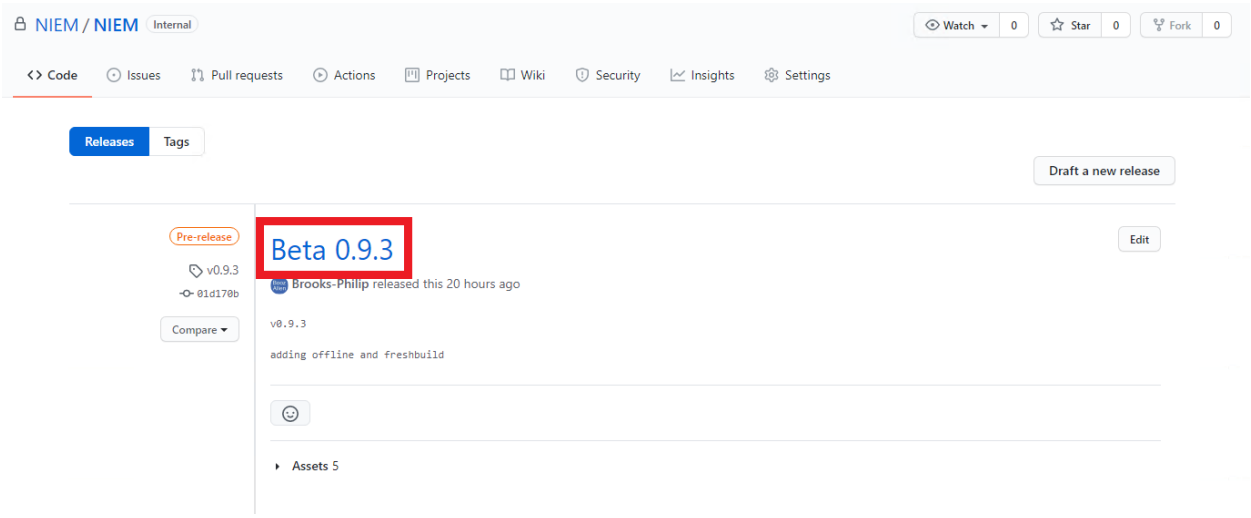


6. Option 2: Online Installer

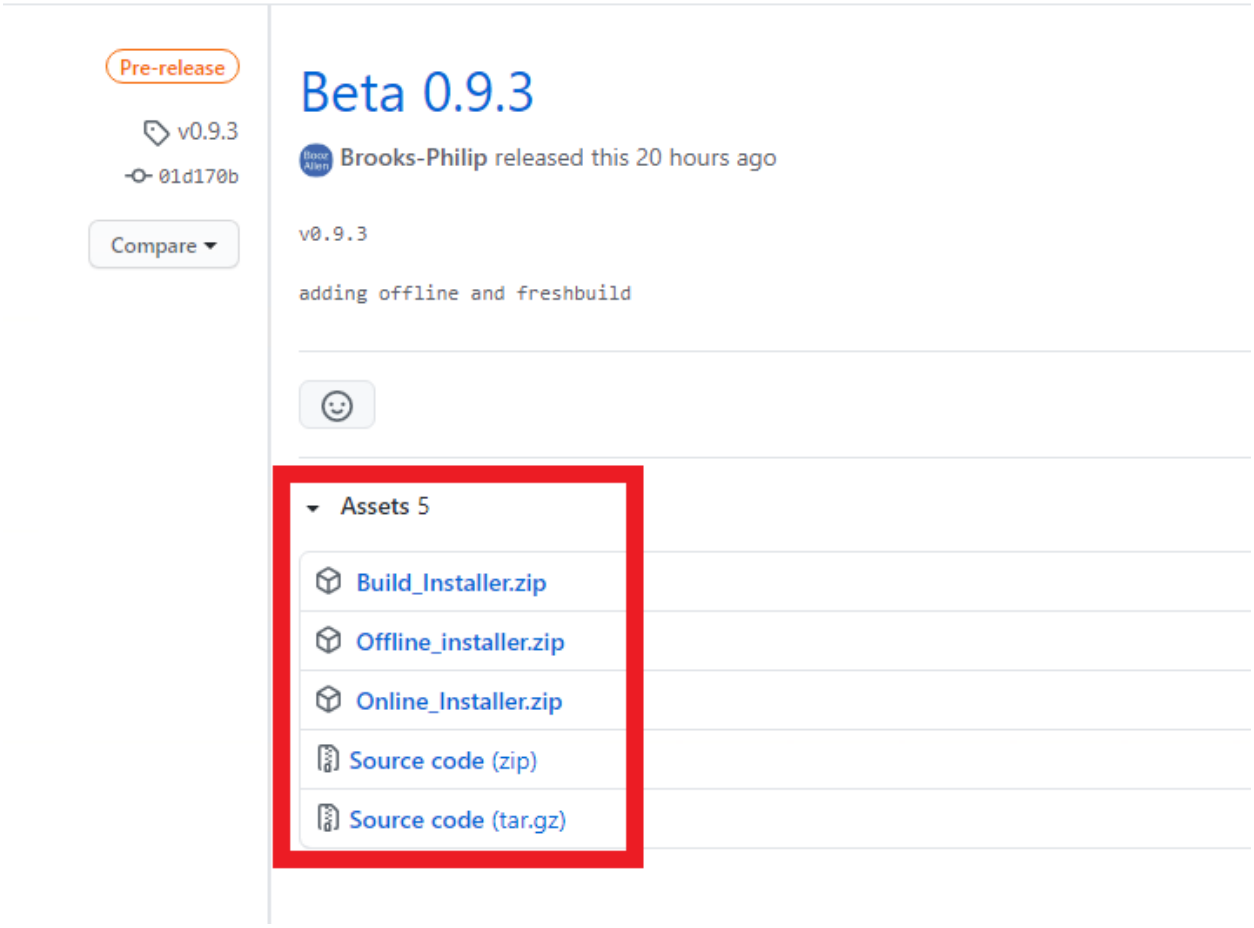
1. Navigate to the NIEM GitHub page and click on the **Releases** link



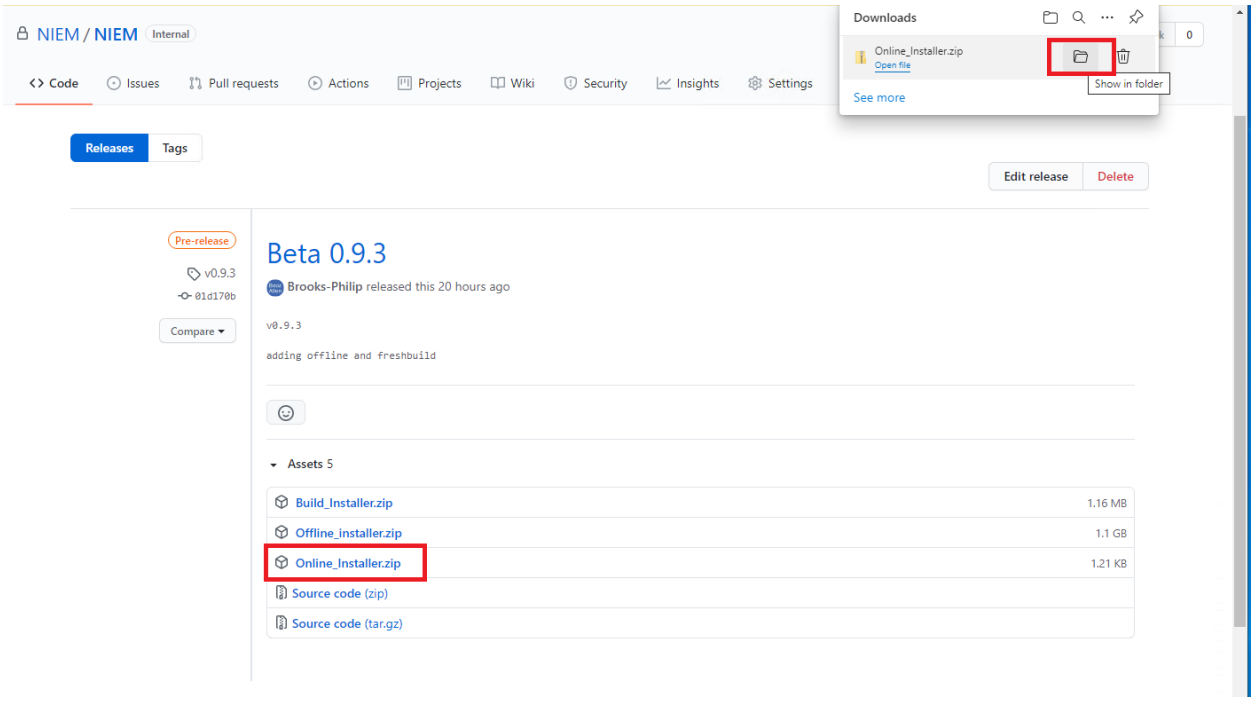
2. Select the release you would like to deploy



3. View that the release will have several assets.

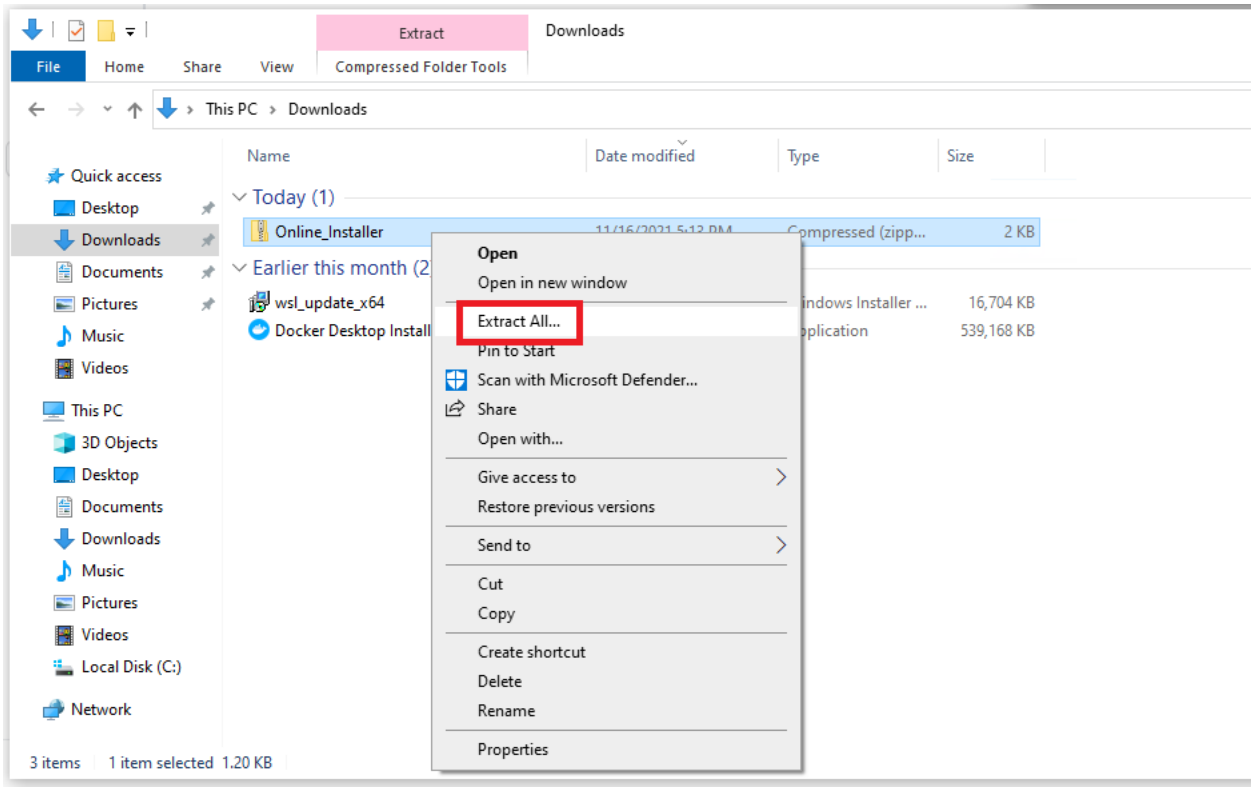


4. Click on 'Online_Installer.zip' to download it to your machine



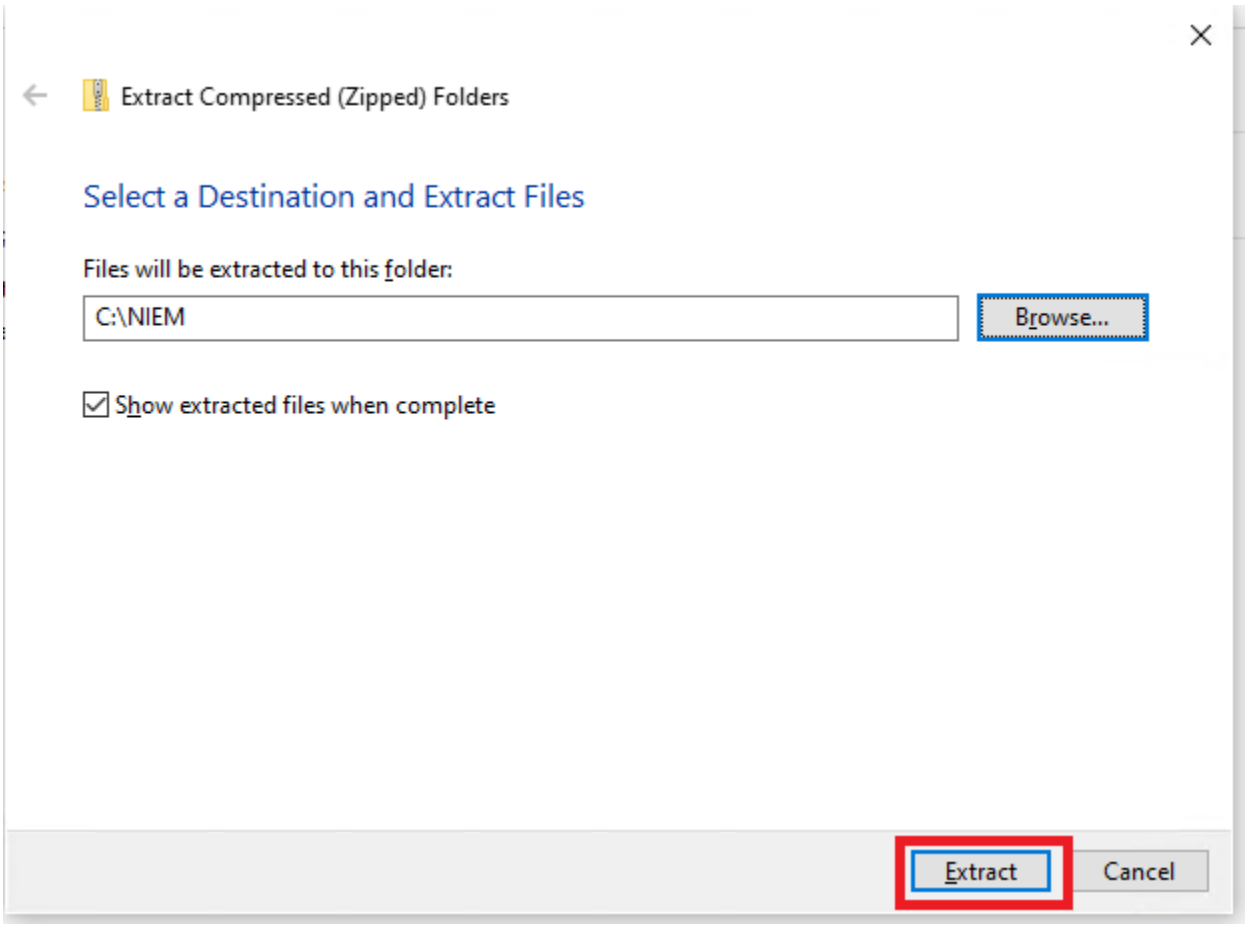
5. View the zip file by either clicking 'Show in Folder' on the browser download pop-up (see image above) or navigating to your system's default download folder

6. Right-click on the zip file and select 'Extract All…'

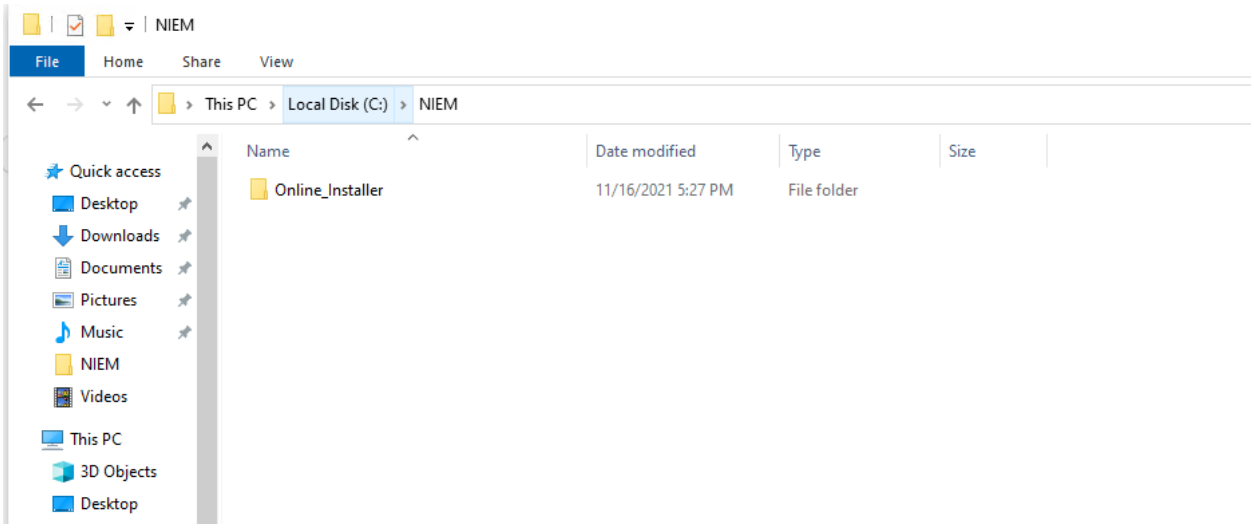


7. Click ‘Browse’ and browse and select the folder location you wish to extract the project files. If the earlier steps were followed in the ‘Create Project Directory’ section, select the C:\NIEM directory.

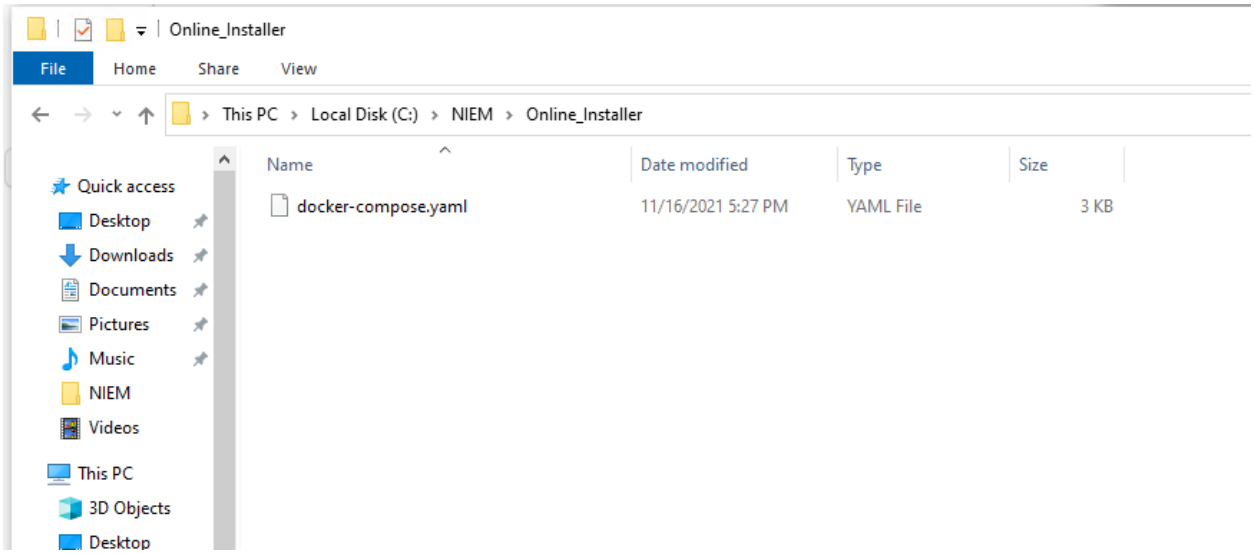
8. Click ‘Extract’



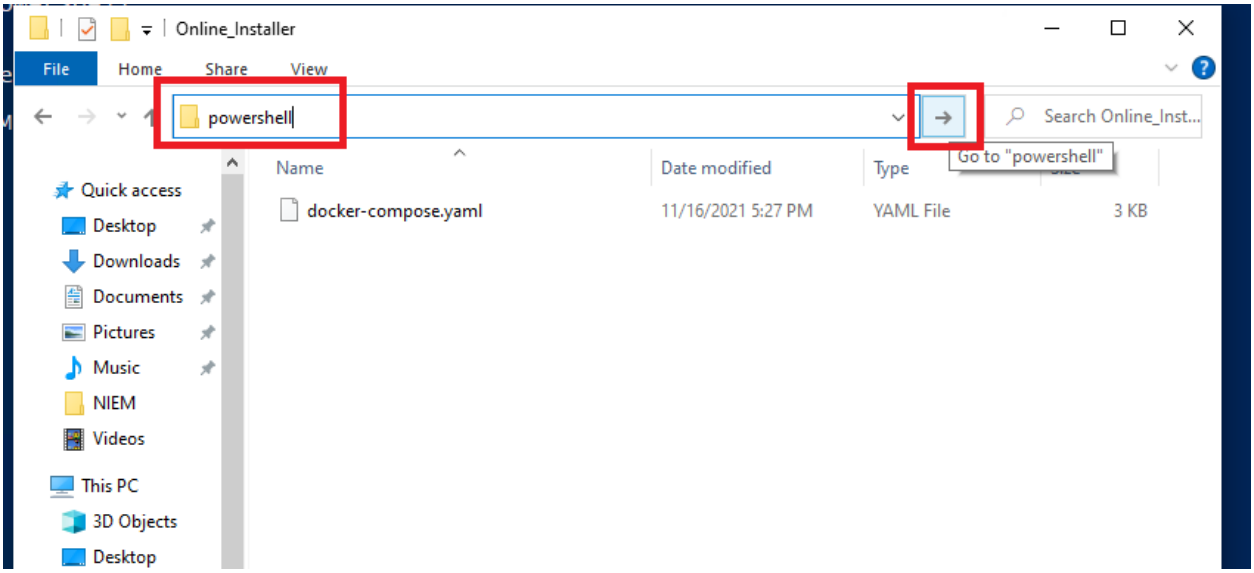
9. If the extracted files do not automatically pop-up upon completed extraction, navigate to the directory to where they were extracted.



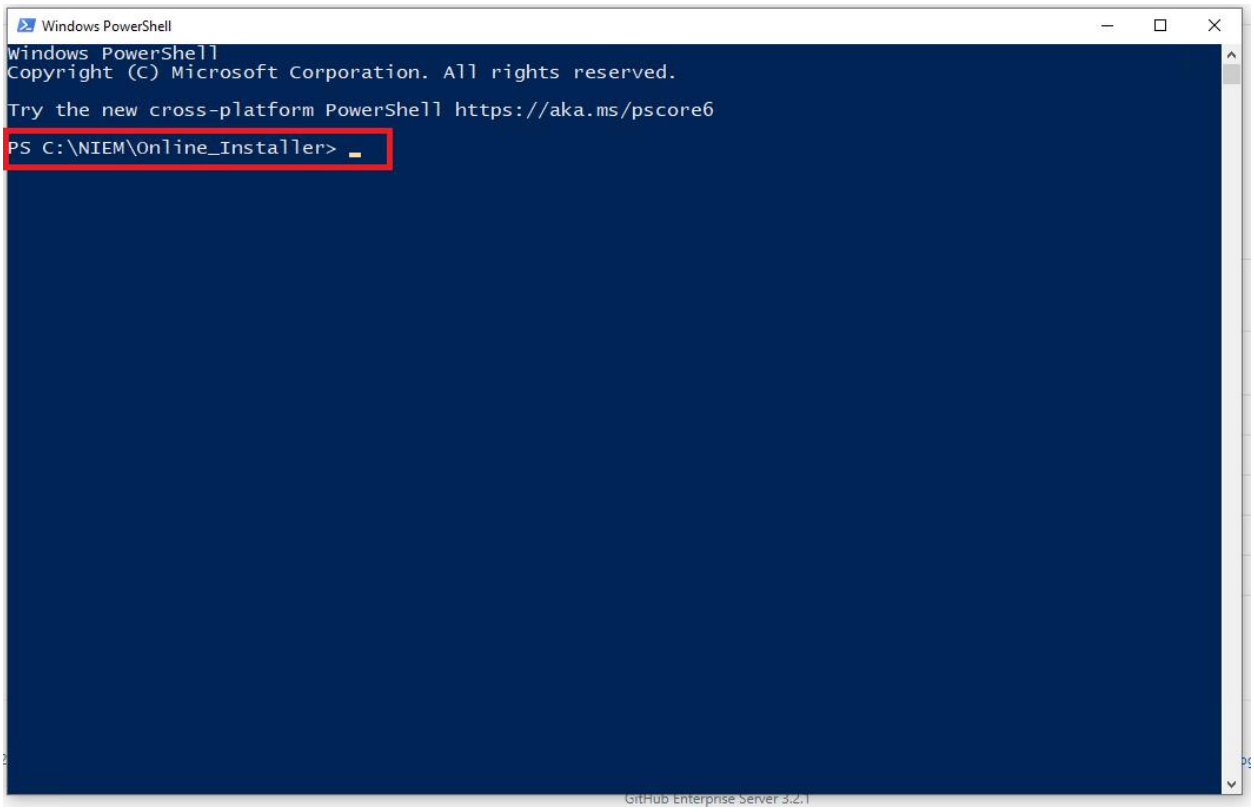
10. Open the 'Online_Installer' folder



11. Type 'powershell' in the directory path field and either type 'Enter' on your keyboard or click the arrow to go to powershell.

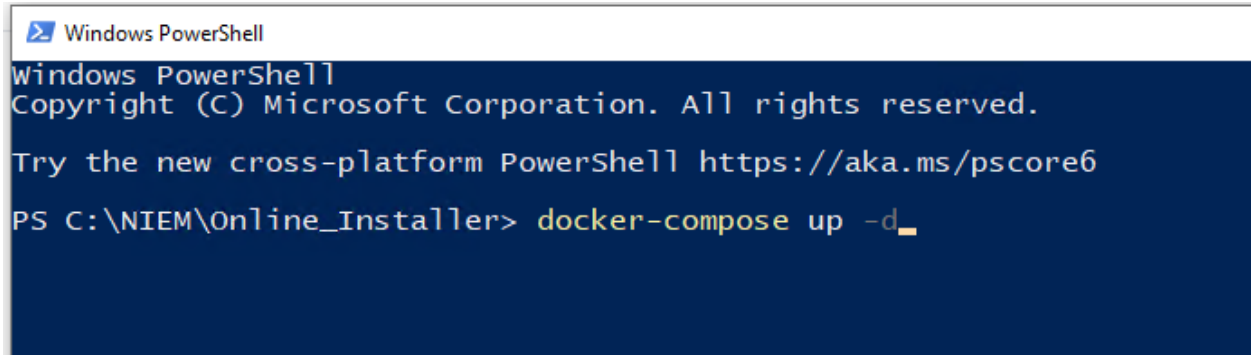


12. A PowerShell window should appear. Verify that the directory listed is the path to your Online_Installer folder.

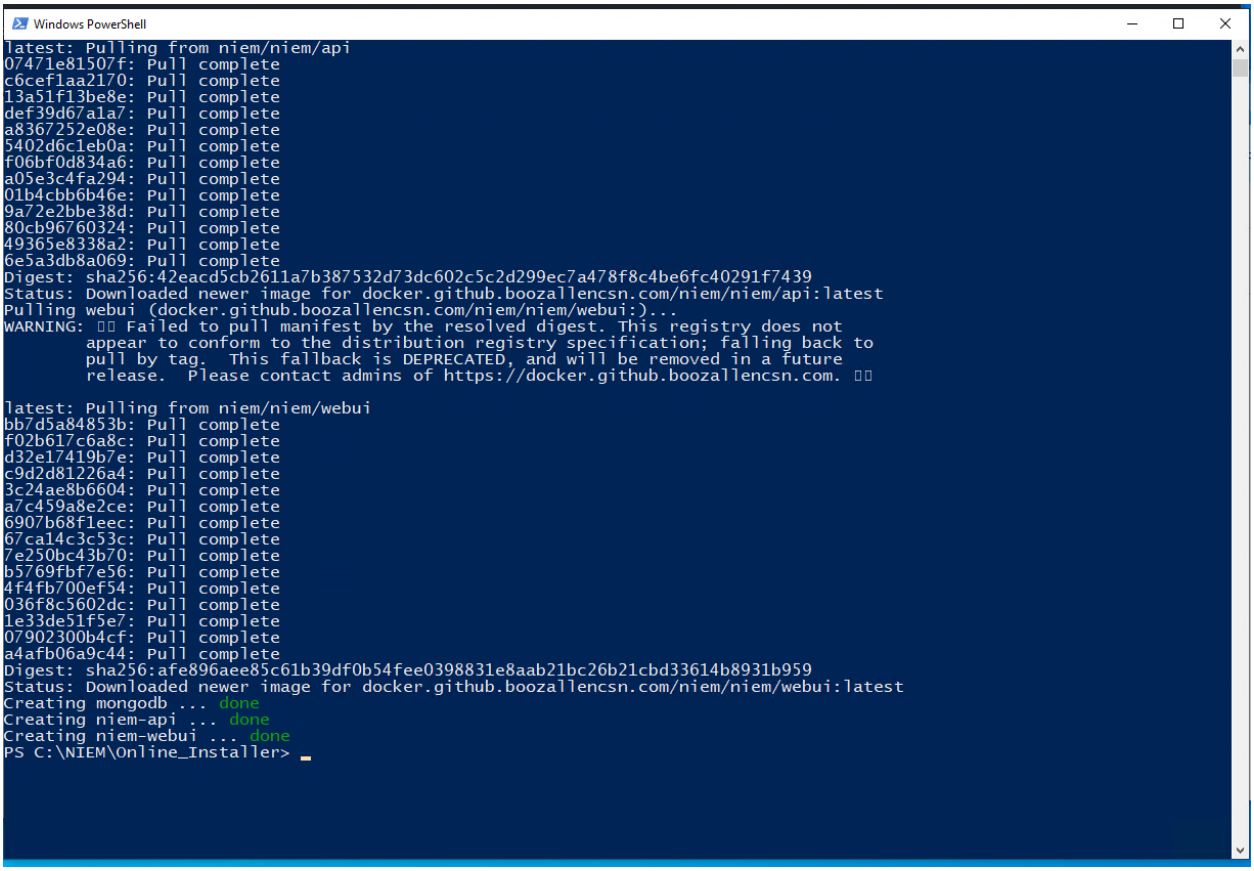


13. Type or copy/paste the following command: docker-compose up -d

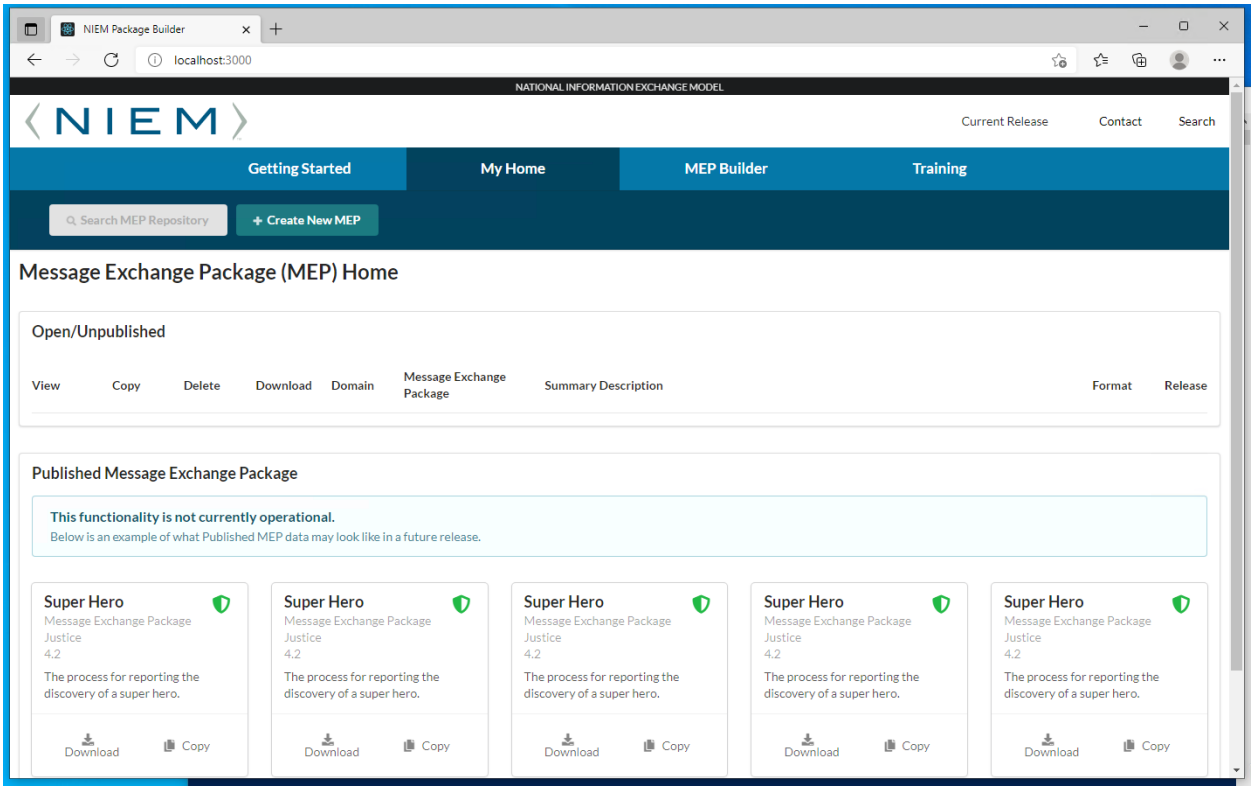
- **NOTE** Depending on the permissions of the container repo you may be required to login with "docker login" and a personal access token will need to be created in Github.



14. Click the Enter key on the keyboard to run the above command
15. It will take a few minutes for the images to be pulled. They will be completed when you see three 'done' statuses and the directory path as shown at the bottom of the image below

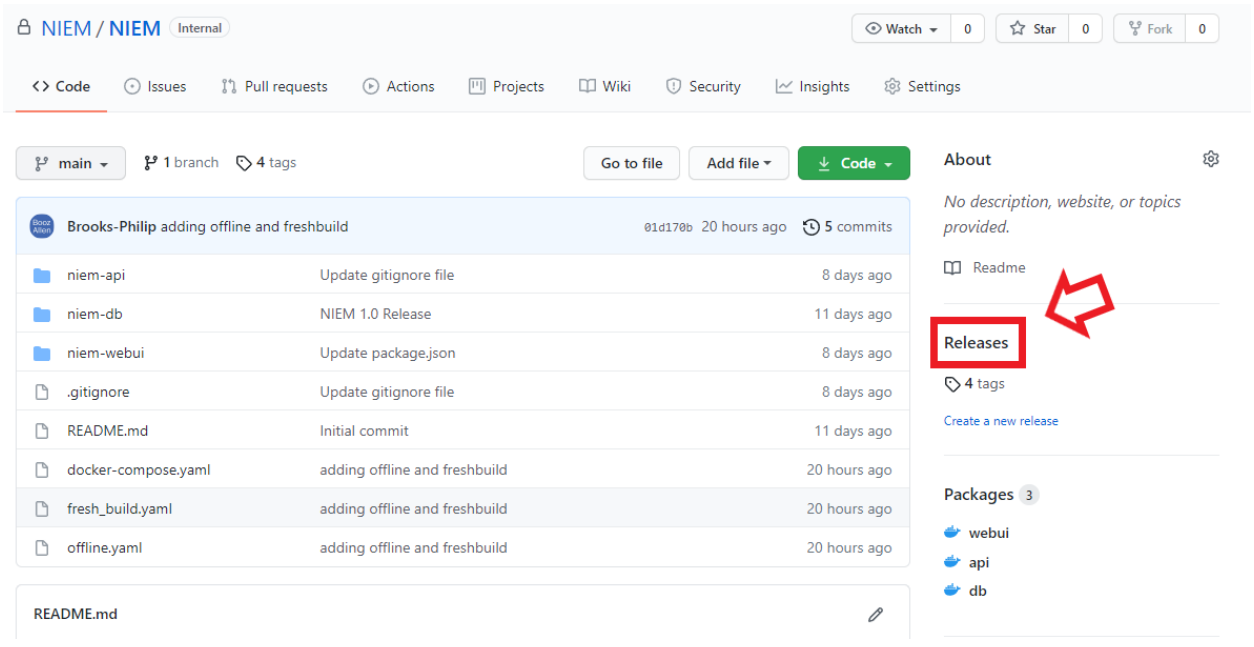


16. You can now run the application by going to your browser and typing the URL 'localhost:3000'

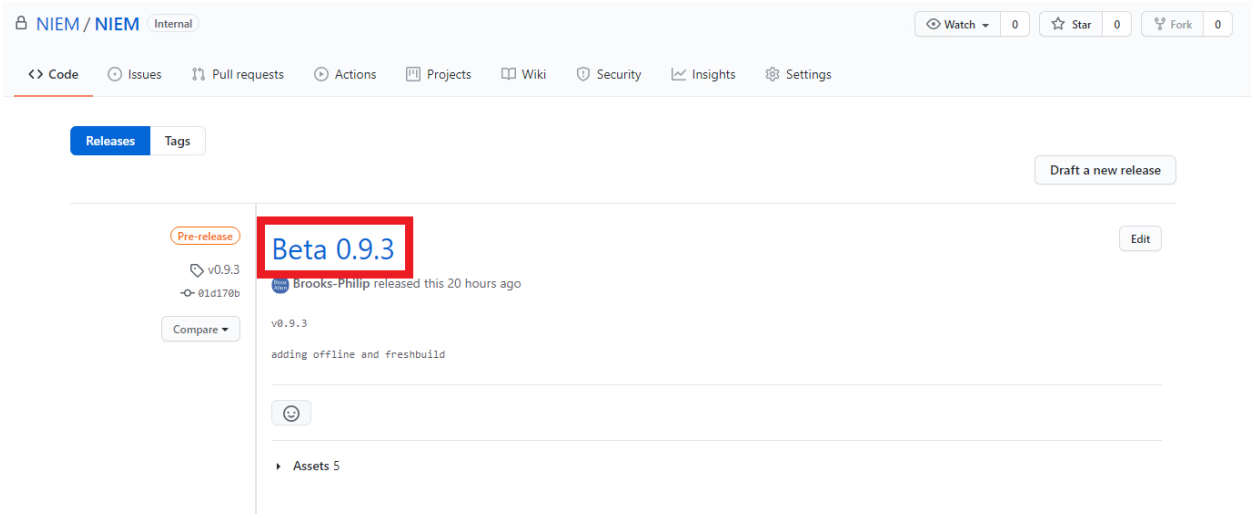


7. Option 3: Build Installer

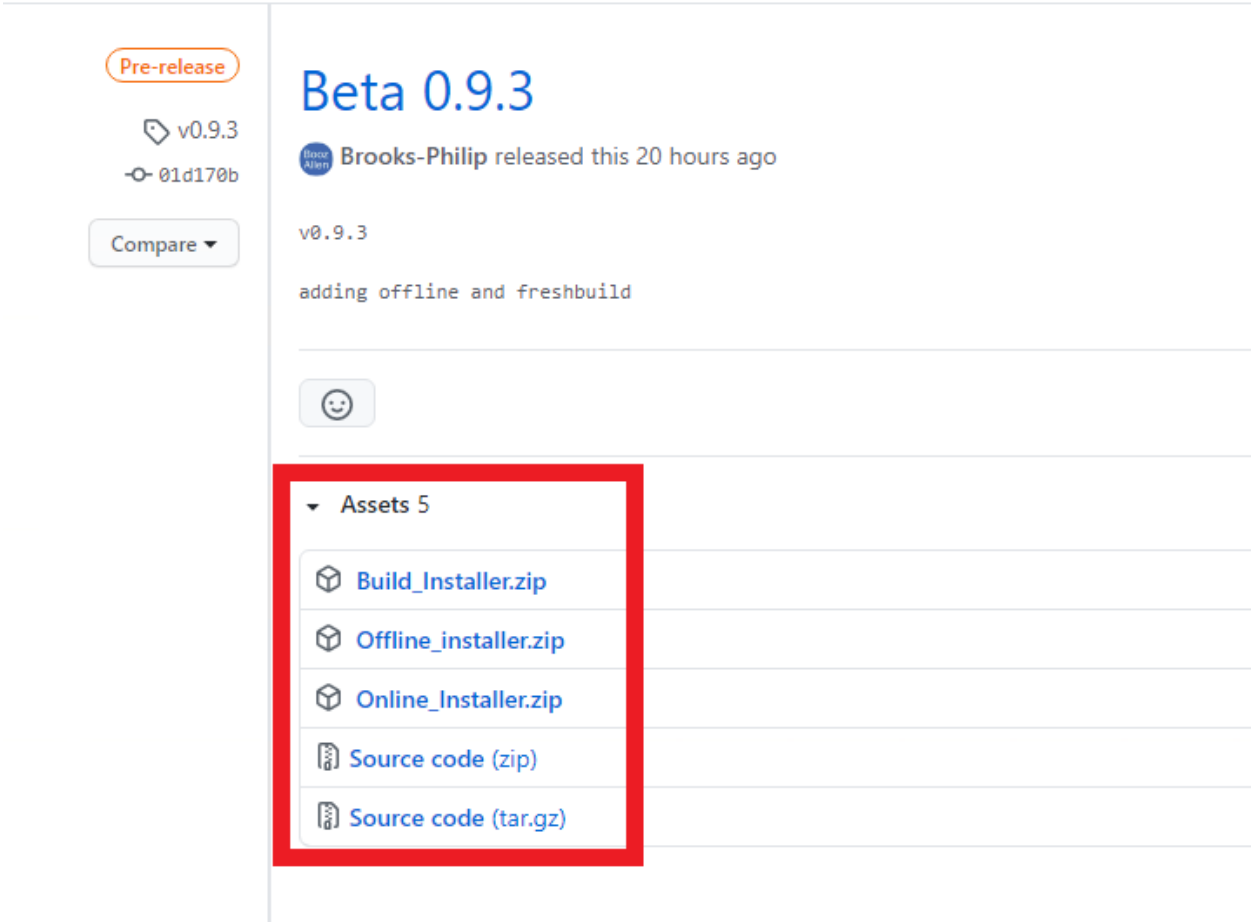
1. Navigate to the NIEM GitHub page and click on the **Releases** link



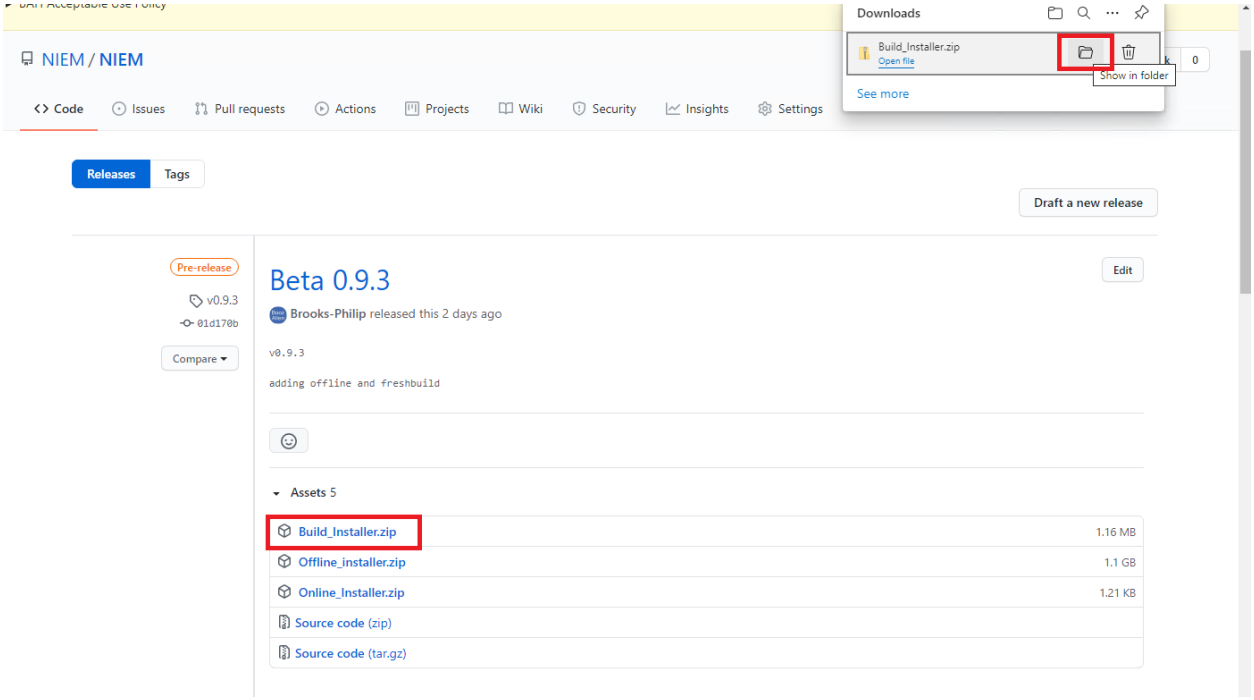
2. Select the release you would like to deploy



3. View that the release will have several assets.

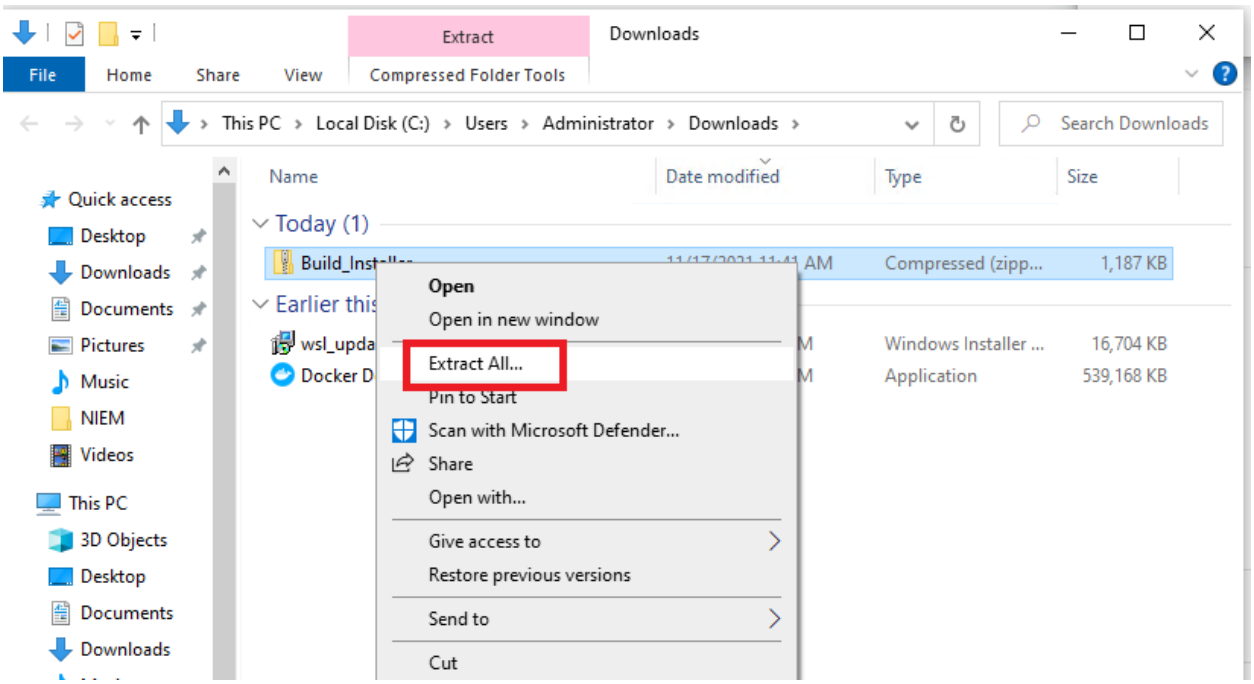


4. Click on ‘Build_Installer.zip’ to download it to your machine



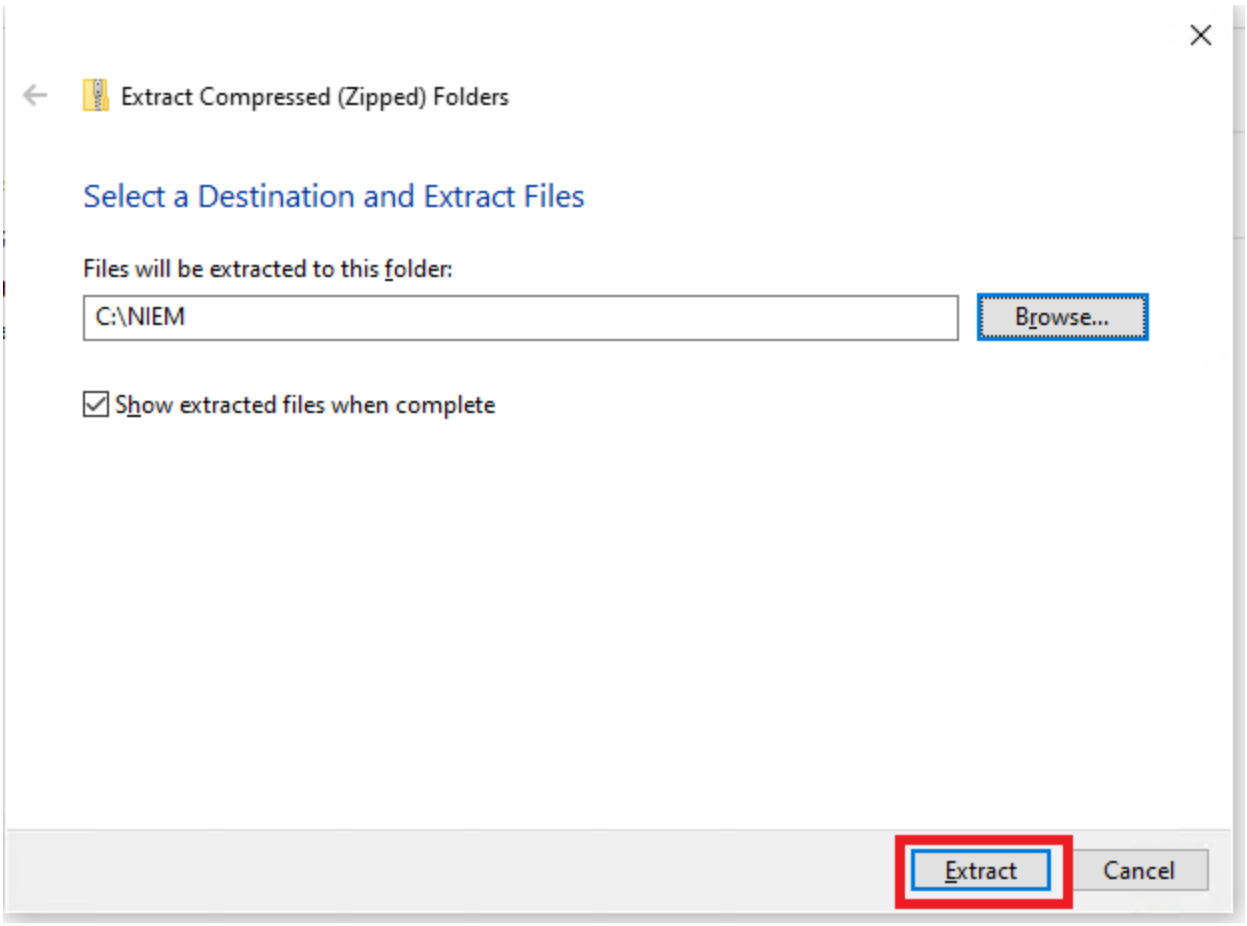
5. View the zip file by either clicking ‘Show in Folder’ on the browser download pop-up (see image above) or navigating to your system’s default download folder

6. Right-click on the zip file and select ‘Extract All…’

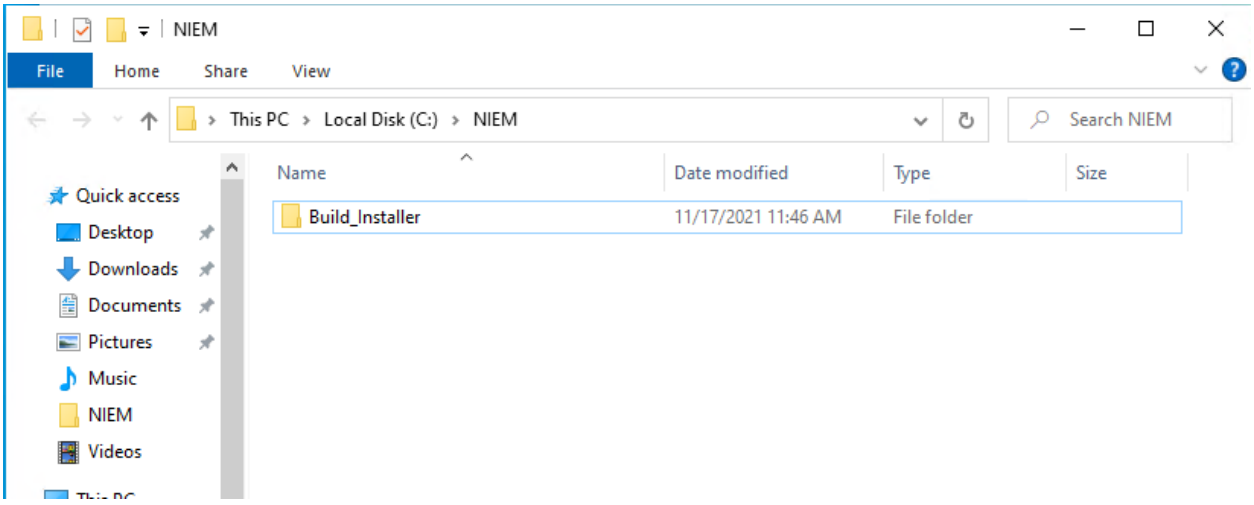


7. Click 'Browse' and browse and select the folder location you wish to extract the project files. If the earlier steps were followed in the 'Create Project Directory' section, select the C:\NIEM directory.

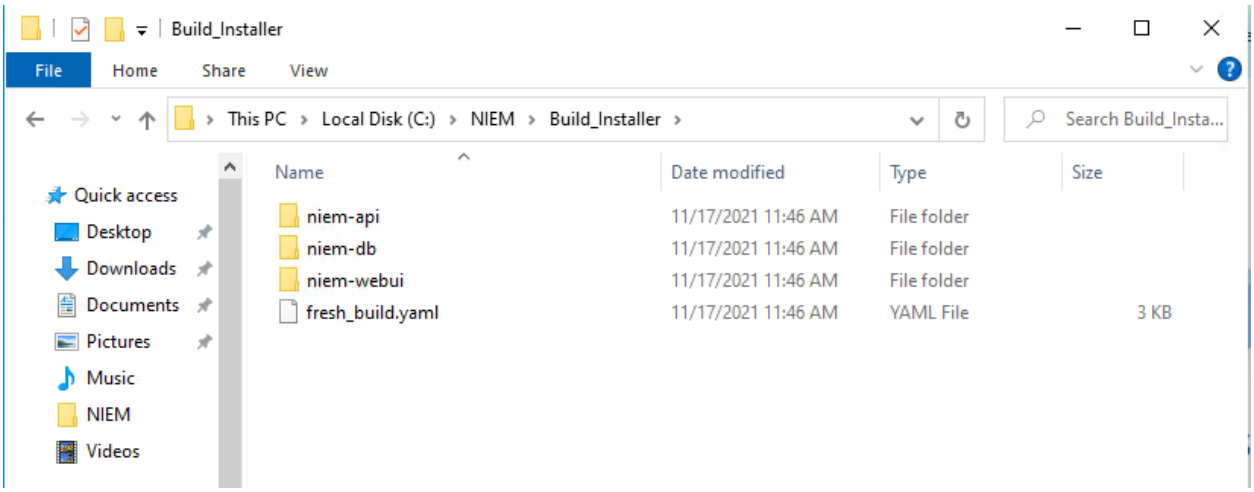
8. Click 'Extract'



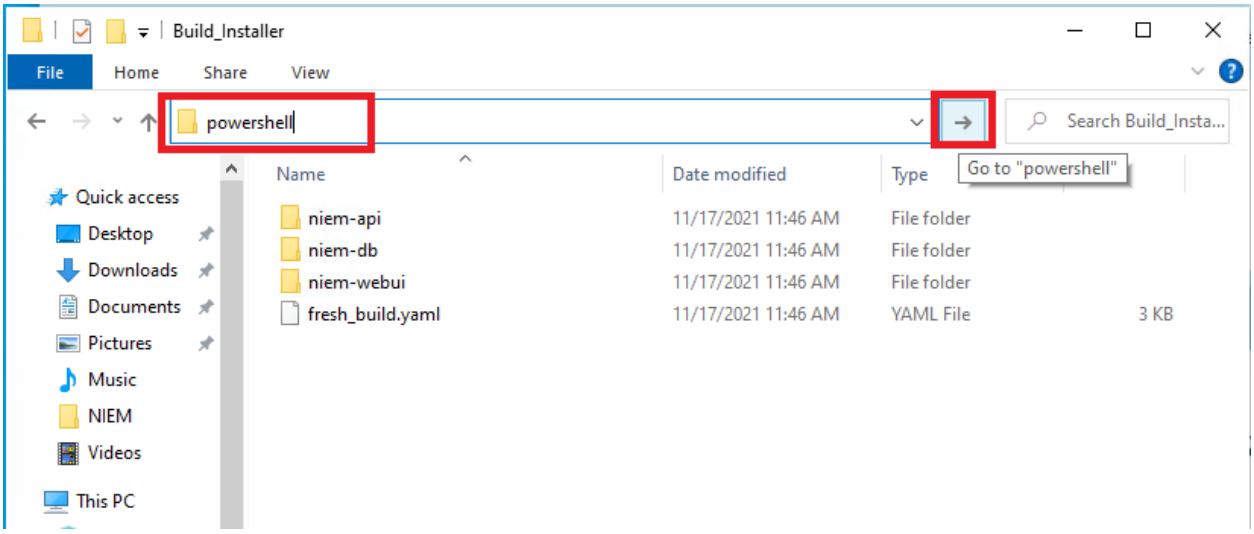
9. If the extracted files do not automatically pop-up upon completed extraction, navigate to the directory to where they were extracted.



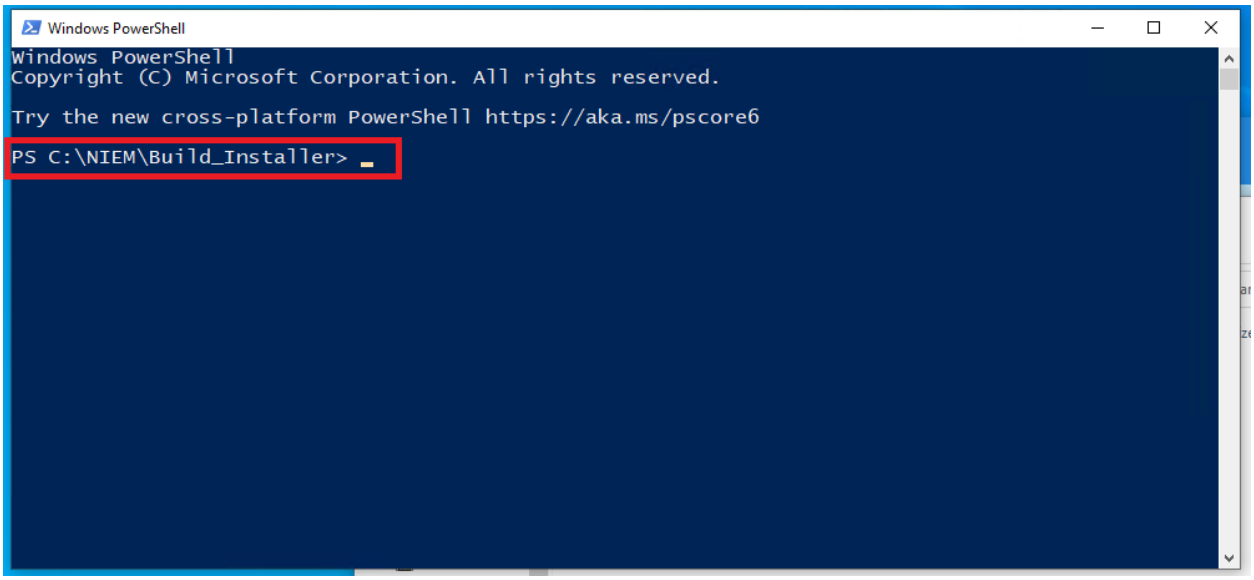
10. Open the 'Build_Installer' folder



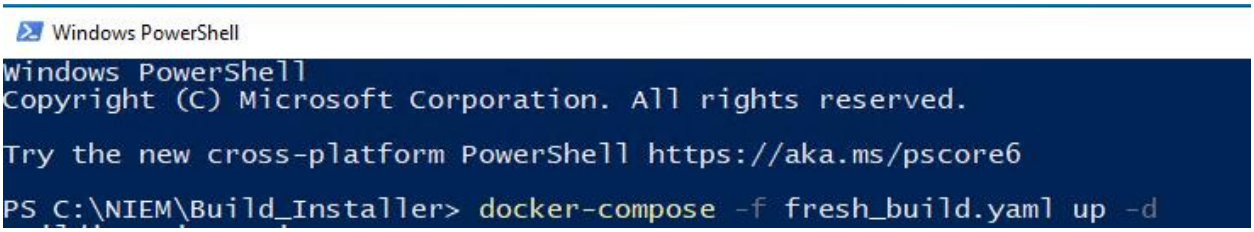
11. Type 'powershell' in the directory path field and either type 'Enter' on your keyboard or click the arrow to go to powershell.



12. A PowerShell window should appear. Verify that the directory listed is the path to your Build_Installer folder.

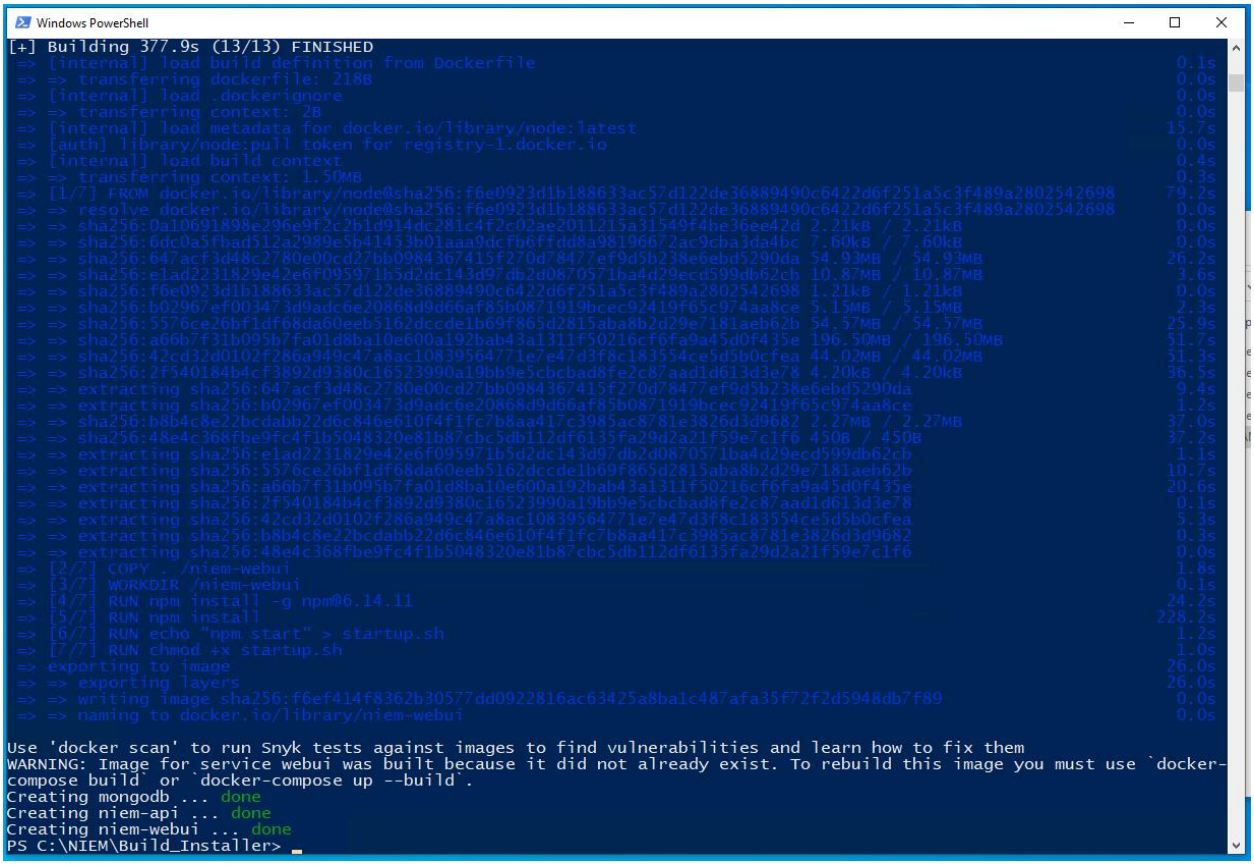


13. Type or copy/paste the following command:
    - docker-compose -f fresh_build.yaml up -d



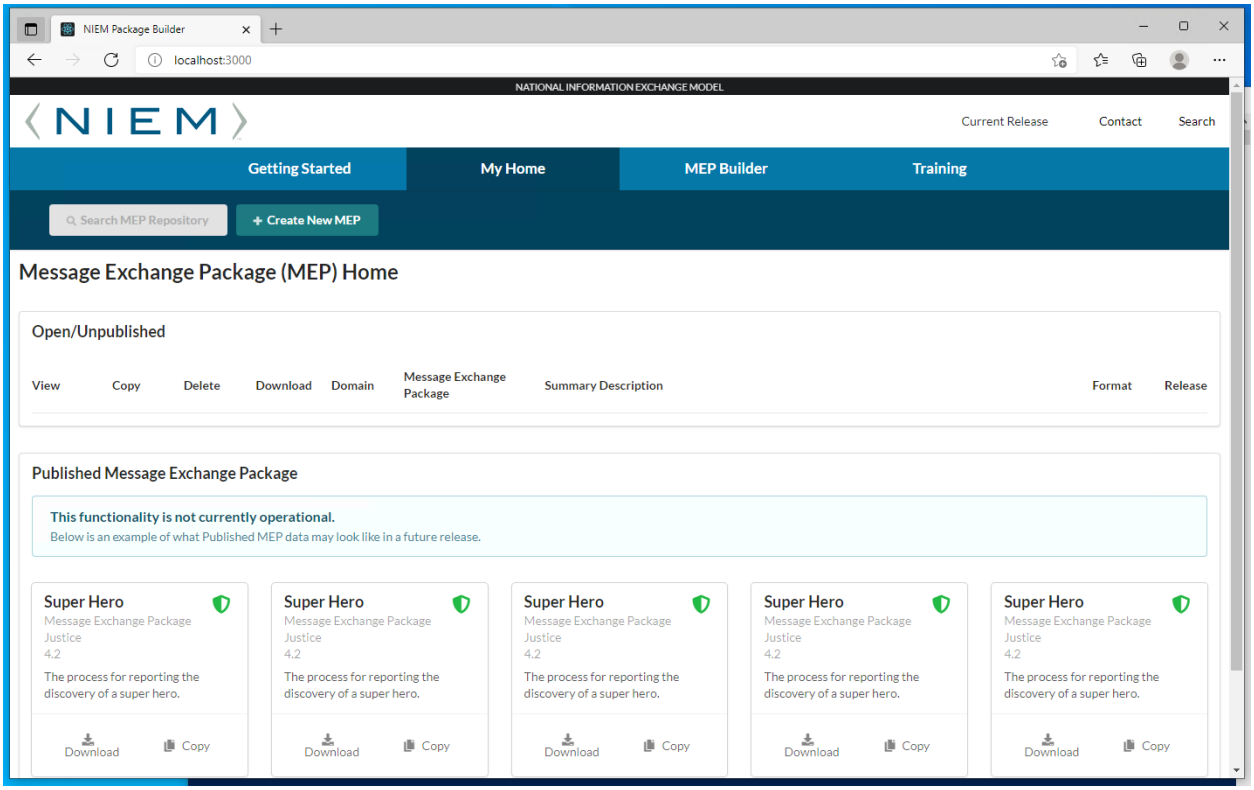
14. Click the Enter key on the keyboard to run the above command

15. The container images will build and deploy. This process initially takes about 20-30 min. Once the deployment is complete, you will see three 'done' statuses and the directory path as shown at the bottom of the image below

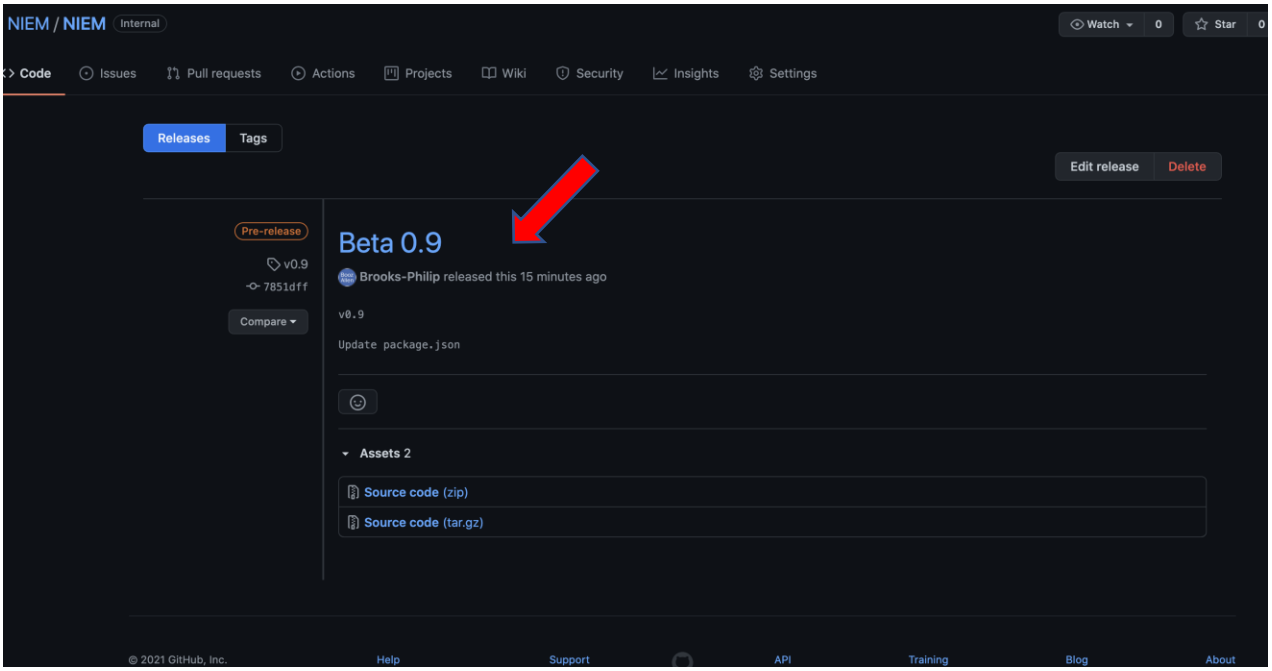


16. You can now run the application by going to your browser and typing the URL 'localhost:3000'

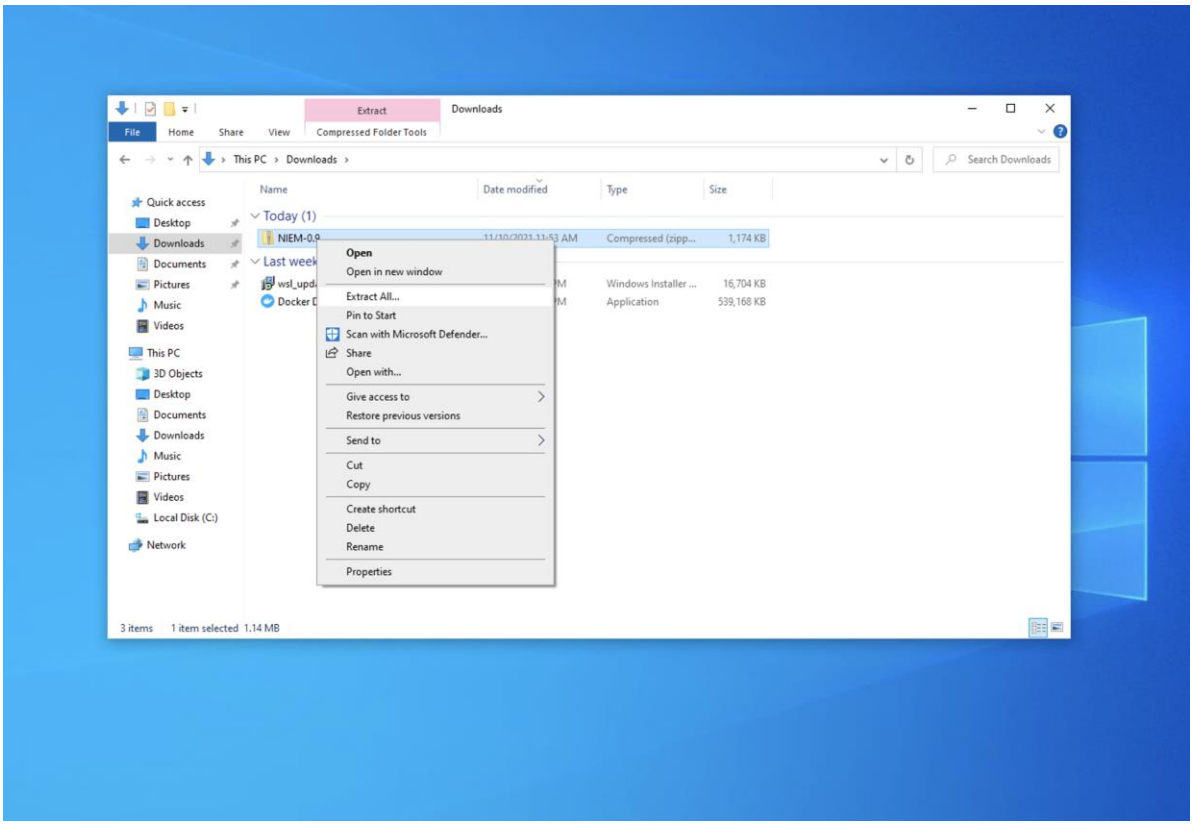
    - **NOTE** Upon initial startup, the webpage may continue to load for a few more moments before it is actually ready.


NIEM Package Builder
localhost:3000
NATIONAL INFORMATION EXCHANGE MODEL
NIEM
Current Release
Contact
Search
Getting Started
My Home
MEP Builder
Training
Search MEP Repository
+ Create New MEP
Message Exchange Package (MEP) Home
Open/Unpublished
View
Copy
Delete
Download
Domain
Message Exchange Package
Summary Description
Format
Release
Published Message Exchange Package
This functionality is not currently operational.
Below is an example of what Published MEP data may look like in a future release.
Super Hero
Message Exchange Package
Justice
4.2
The process for reporting the discovery of a super hero.
Download
Copy

Click the source code asset corresponding to the operating system you are deploying NIEM on. (Zip for Windows; tar.gz for Linux)



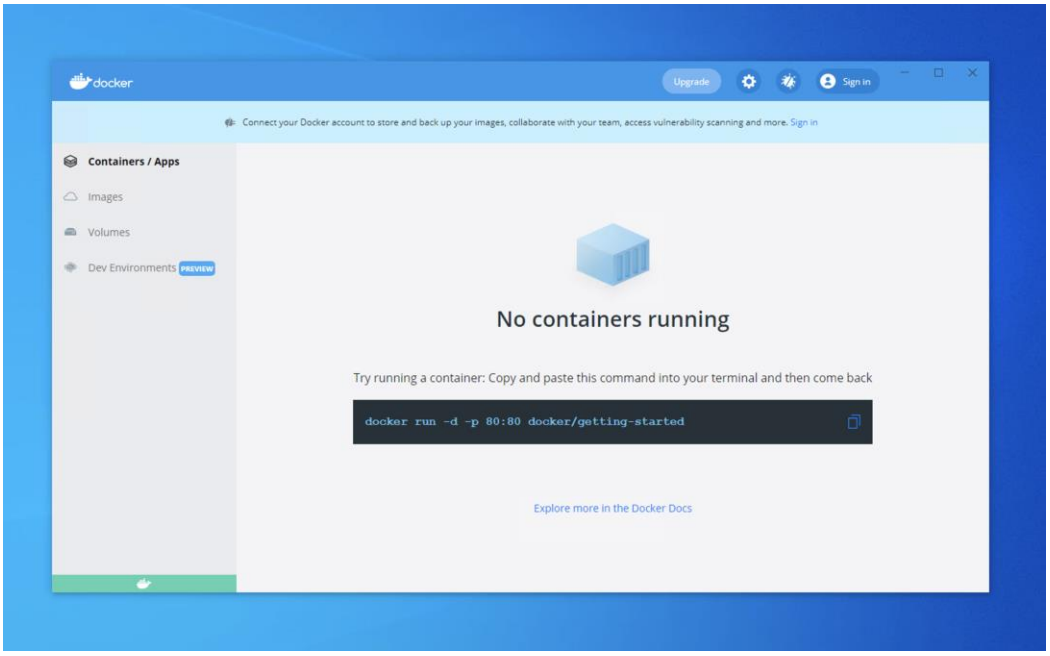
Navigate to the downloaded archive. **Right click** and select **"Extract All"**



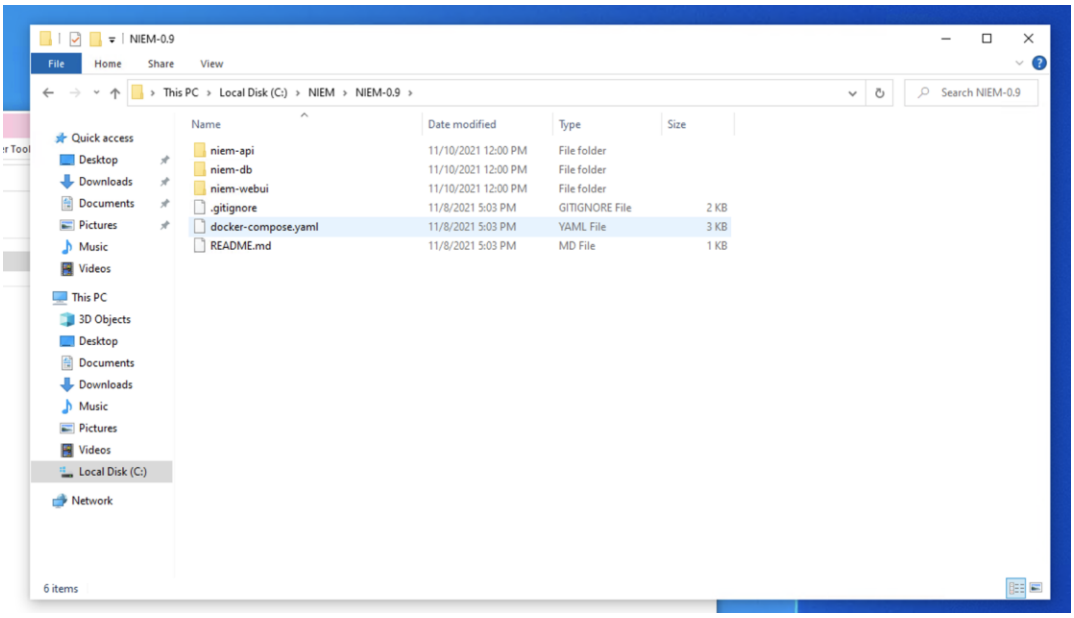
Extract the folder to a location on your C Drive. This location will be used to create the NIEM Environmental Variable. Then Select **Extract**

Final step… docker-compose up -d offline.yaml

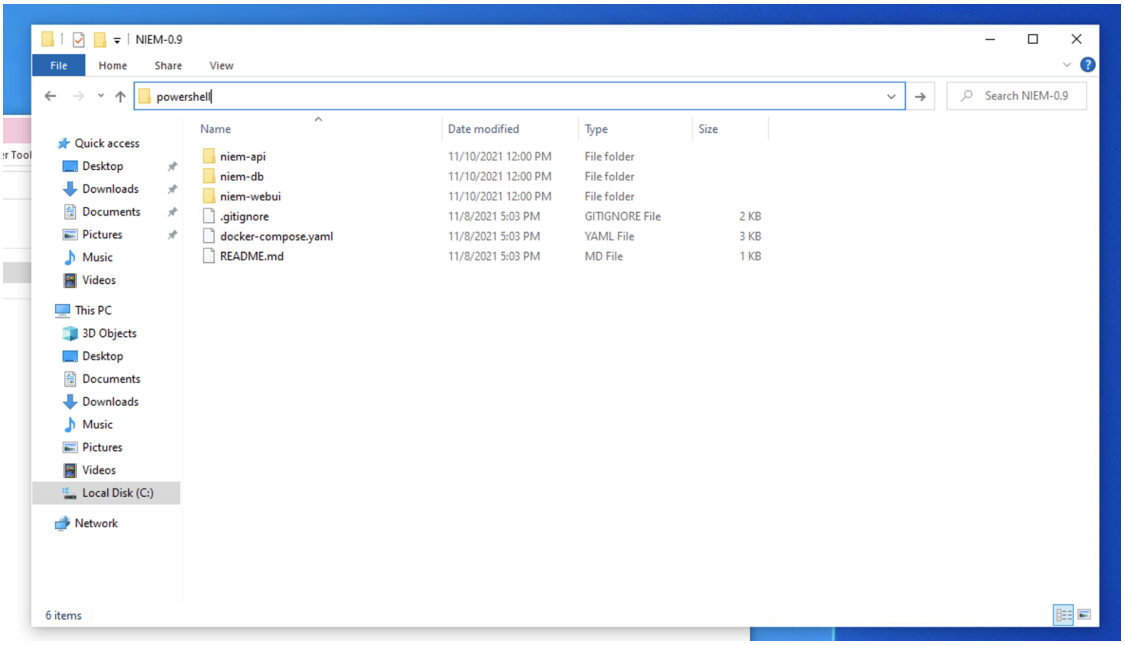
1. Ensure Docker is running by opening Docker Desktop. Notice the Green Bar at the bottom left.



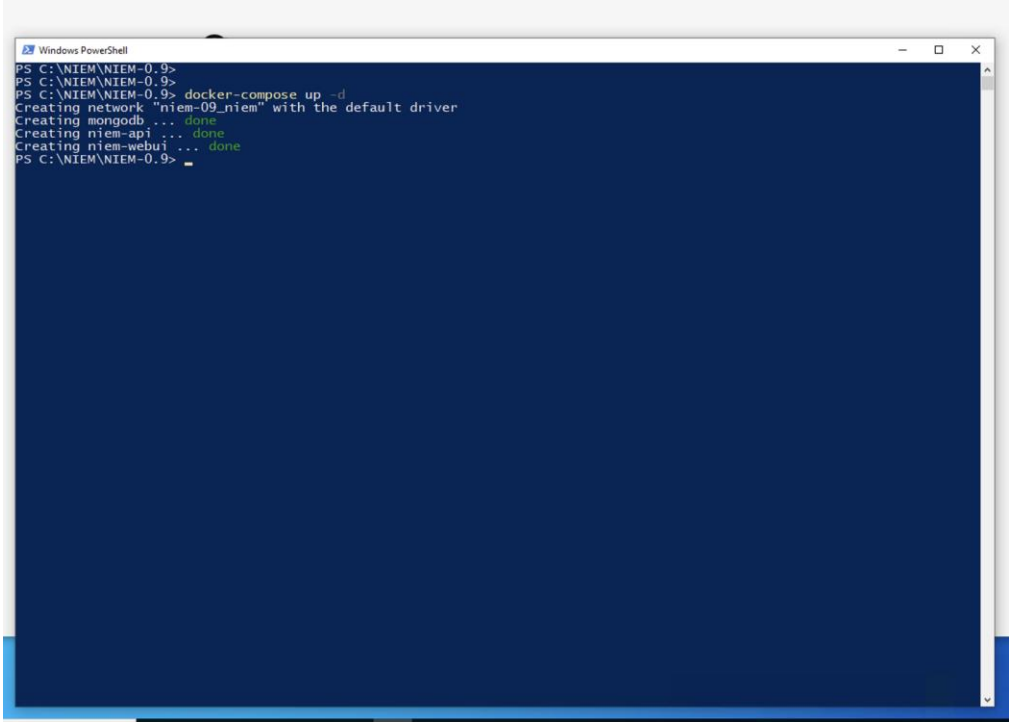
2. In Windows Explorer Navigate to the directory where you extracted the NIEM archive.



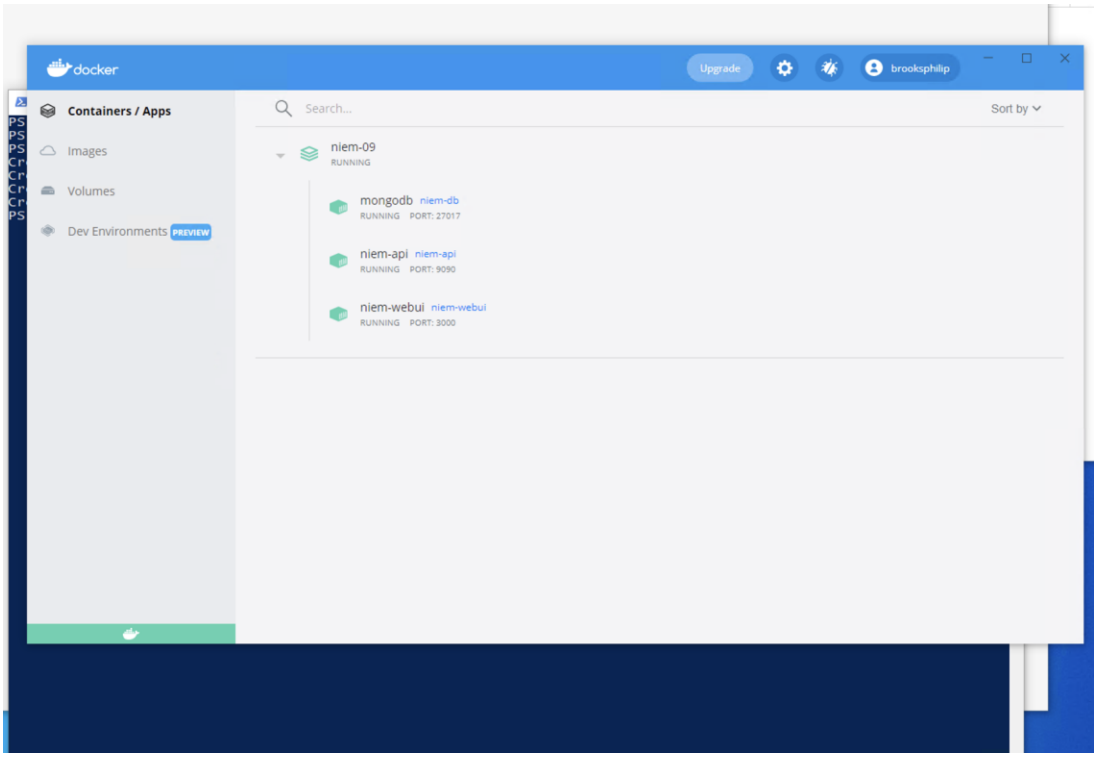
3. In the address bar type "powershell" and hit **Enter** to open a Powershell in the NIEM_DIR.



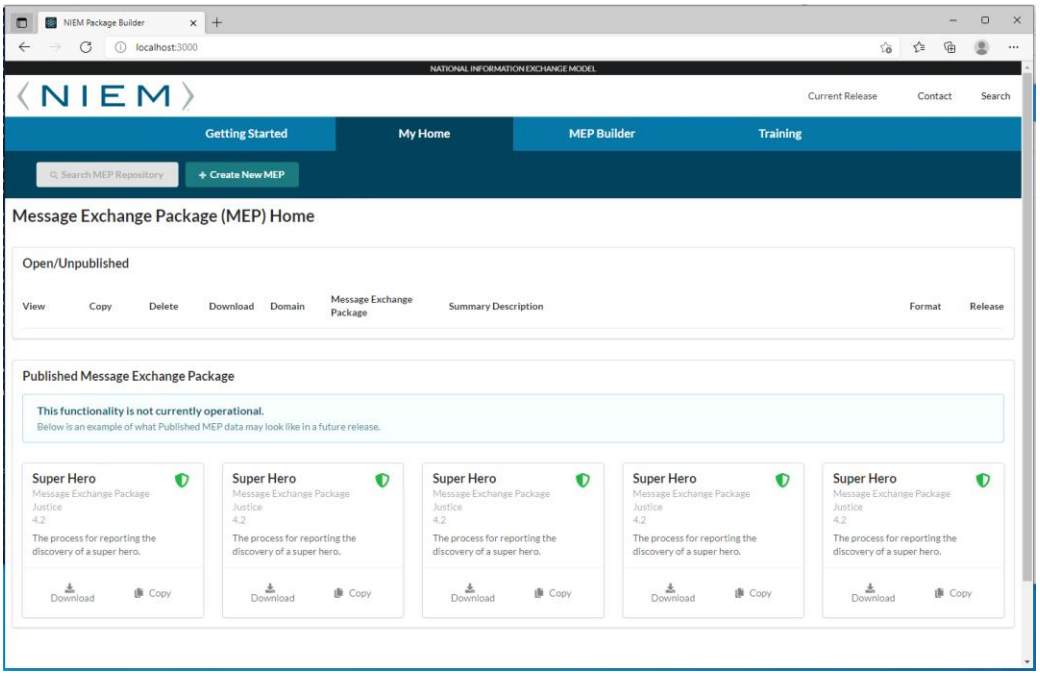
4. In the newly opened Powershell **Type** "docker-compose up -d fresh_build.yaml" and hit **Enter.**



5. The container images will build and deploy. This process initially takes about 20-30 min. Once the deployment is complete you will be able to see them running in the Docker Desktop UI.



6. Open a browser and navigate to localhost:3000.



7. The NIEM Application is now up and running