Agility Platform

Docker Swarm Service Adapter Guide

Agility Platform 11.1

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Contents

Overview of the Docker Swarm Service

Docker Swarm supports native clustering for Docker. It turns a pool of Docker hosts into a single, virtual Docker host. Because Docker Swarm supports the standard Docker API, any tool that already communicates with a Docker daemon can use Swarm to transparently scale to multiple hosts.

Docker Swarm provides the following benefits:

- Distributes the load to various containers spun across multiple servers and nodes.
- Performs functions, such as inspecting and transforming header and content data, managing SSL certificate-based authentication, and compressing HTTP responses.
- Enhances network security and frees up server resources by performing tasks.

Network service adapter compatibility

The following table lists the Swarm network service adapter versions that you can use with Agility Platform and the corresponding Services SDK versions.

Docker Swarm Service Adapter Version	Agility Platform Version	Docker Version
1.0.0	10.2.5, 11.1	1.12

Installing the Adapter

The installation instructions for the adapter are dependent on which version of Agility Platform you are using:

- For Agility Platform 10.2.x, see Installing the Adapter (Agility Platform 10.2.x Only)
- For Agility Platform 11.x, see Uploading and Installing Adapters from the Dashboard.

Installing the Adapter (Agility Platform 10.2.x Only)

Important: The instructions in this section apply to Agility Platform 10.2.x only.

To install the adapter .jar file:

1. Download the adapter .jar file to your local machine.
2. In a terminal program, change to the local directory where you downloaded the jar file.

3. Run the following `scp` command:

```
scp <jar file name> username@<serverIP> :/opt/agility-platform/deploy/
```

4. Enter the corresponding password for the username.
5. Restart the Agility Platform service using the following command:

```
sudo service agility-platform restart.
```

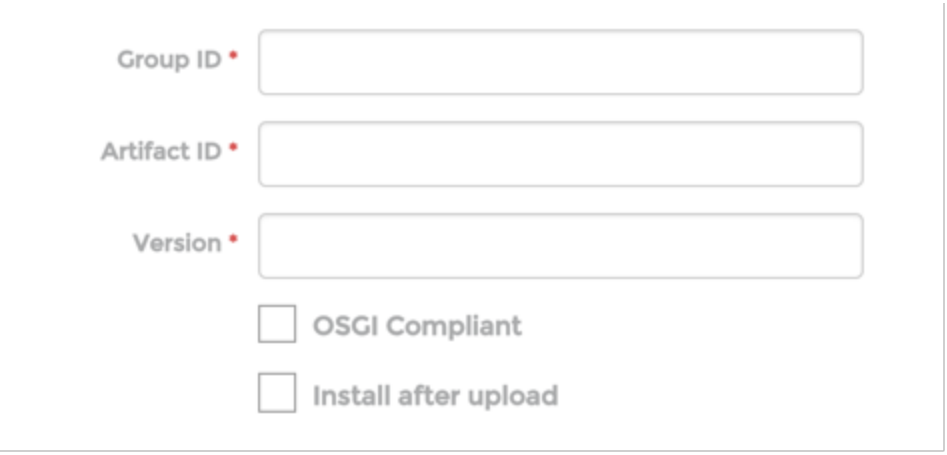
6. In the Admin perspective of Agility Platform, verify that the adapter assets are visible under the Assets list.

Uploading and Installing Adapters from the Dashboard

You can upload and install adapters from the Adapters section in the **Dashboard** perspective of Agility Platform.

1. Under **Adapters**, click **Upload Adapter**.

2. In the resulting dialog, drag your adapter file to the indicated box, or select **Choose File** to navigate to the file on your local machine.
3. Complete the required information as follows:



- **Group ID**— Identifies the adapter uniquely across all projects. Follow package naming rules (eg. org.apache.maven, com.servicemesh.agility). For example, for a network service adapter, this would be "*com.dxc.agility.adapters*."
- **Artifact ID**— Name of the .jar file without version numbers. An example of this would be: "*com.dxc.agility.adapters.service.aws.cloudformation*."
- **Version**— The version number of the adapter, for example "1.1.0."

4. Indicate if the adapter is OSGI compliant.
5. Select **Install after upload** to automatically install the adapter after it has been uploaded (recommended).

   Note: If you select **Install after upload**, the adapter state will be *Active* after it is sucessfully uploaded and installed. If you do not selected this option, the adapter state will be *Inactive* after it is uploaded. Inactive adapters must be installed in a separate step to become *Active* and ready for use.
6. Select any previously existing adapters that this adapter depends on:

7. Click **Upload**. The screen will return to the dashboard, where you can view the upload progress.

After the adapter has been successfully uploaded, it will appear in the list of adapters as *Active* if you selected the **Install after upload** option,or *Inactive* if you did not. Inactive adapters must be installed in a separate step to become *Active* and ready for use.

To install an inactive adapter:

If, for whatever reason, you uploaded an adapter without also automatically installing it, it is listed as *inactive*. To install an inactive adapter, complete the following steps.

1. Under **Adapters**, click the vertical *Ellipses* button and select **Install Adapter**.

2. Click **Install Adapter** on the dialogue that pops up to confirm the installation.

Setting up a Docker Swarm Cluster

Before you can configure a Swarm Manager network service in the Agility Platform, you need to create and configure a Docker Swarm Cluster. For more information on how to install the Docker engine, see https://-docs.docker.com/engine/installation/.

To configure a Docker Swarm cluster, you must:

- Create certificates to enable external clients to connect to the Swarm manager. For more information, see https://docs.docker.com/engine/security/https/.
- Create the Swarm cluster. For more information on how to create a Swarm cluster, see https://-docs.docker.com/engine/swarm/swarm-tutorial/create-swarm/.

  Note: Make sure that the Swarm cluster that you are creating is accessible from Agility Platform.

  Note: The examples in this guide use an Ubuntu 14.04 instance that is running on EC2.

Configuring the Cloud and Network Service Providers

Before you can configure a Swarm Manager network service in the Agility Platform, you must have a cloud provider deployed on your network that is enabled for Swarm Manager.

Swarm Manager and the Agility Platform support multiple cloud providers.

Note: For the purpose of illustration how to set up a cloud provider for Swarm Manager, this document refers to setting up Amazon EC2 as a cloud provider. Note that different cloud providers have different configuration requirements.

Example: Configuring an Amazon EC2 cloud provider that is enabled for Swarm Manager

To use an Amazon EC2 cloud provider that is enabled for Swarm Manager, you must:

- Define the Agility Platform access credentials for the cloud provider
- Define the administrator access credentials for the Amazon Web Services (AWS) console

Collect the following AWS EC2 information for configuration in the Agility Platform:

Credential	Value
Access Key ID	Used to look up the private key on the Amazon provider.
Secret Access Key	Used to generate the signature.
Hostname	Portal address, including the availability zone. An example is: `ec2-us-east-1.amazonaws.com`.
Account Number	Specifies the account number for your AWS account.
X.509 Certificate	Upload the public and private key for your X.509 signing certificate that you can create through a certificate service, such as OpenSSL, and manage through AWS Identity Access Management (IAM).

For more information about the Amazon EC2 cloud, refer to the *Agility PlatformAmazon EC2 Cloud Adapter Guide* or see the Amazon Elastic Cloud Compute Documentation.

For more information about Docker Swarm, read https://docs.docker.com/swarm/.

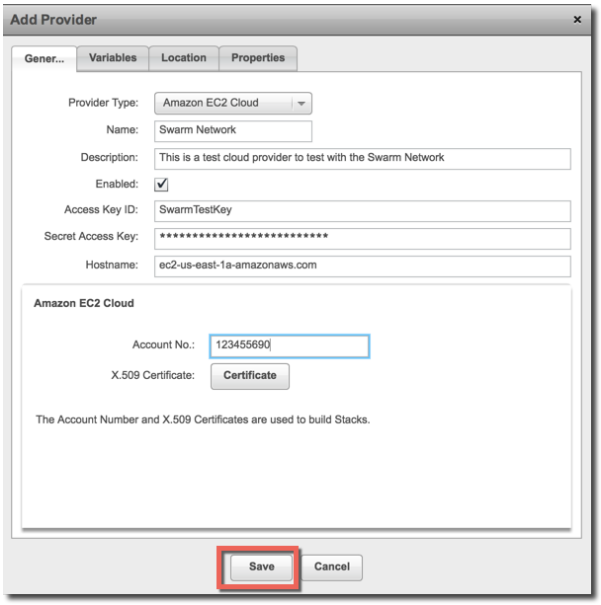
Configuring a Cloud Provider: Example: Amazon EC2

Setting up a Swarm cluster does not depend on a specific cloud provider. This section describes how to configure a cloud provider in conjunction with the Docker Swarm service by using an Amazon EC2 cloud provider as an example. The Agility Platform supports multiple cloud providers. This section shows how to configure an Amazon EC2 cloud provider for example purposes. You can also use a different cloud provider, for example vSphere, which has been tested with Docker Swarm.

Use the following instructions and the EC2 provider information you collected to configure the Amazon EC2 cloud provider in the Agility Platform:

To configure the Amazon EC2 cloud provider

1. From the **Admin** perspective in the Agility Platform, select **Cloud Providers** in the navigation pane.
2. At the bottom of the context panel, click **Add**.
3. In the **General** tab of the Add Provider dialog box, select **Amazon EC2 Cloud** from the **Provider Type** list.



4. For **Name**, enter the IP address or DNS name for the cloud provider and an optional **Description**.
5. Click **Enabled** to enable the cloud provider as a resource.
6. For **Access Key ID** enter the value for the Amazon EC2 cloud provider. The Access Key ID is used to look up the private key on the cloud provider.
7. For **Secret Access Key** enter the value for the Amazon EC2 cloud provider. The Secret Access Key ID is used to generate the signature.

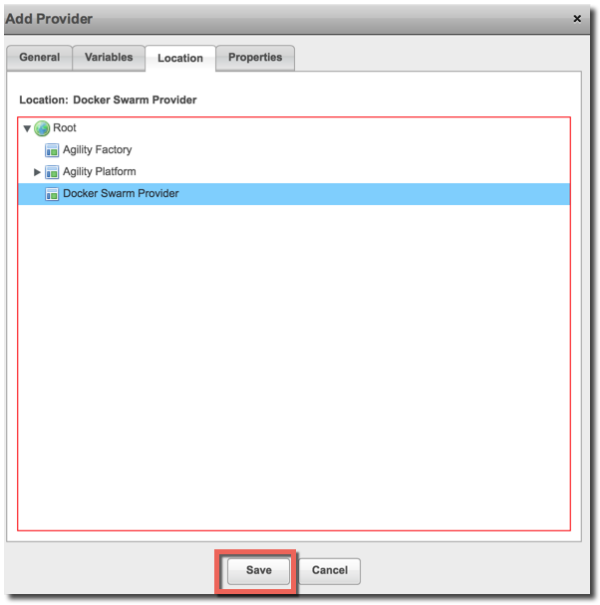
8. For **Hostname** enter the value for the portal and availability zone defined for use on the EC2 Amazon cloud provider (for example: ec2-us-east-1.amazonaws.com).

9. In the Amazon EC2 cloud section, configure the following:

   a. Enter the account number used to create stacks.

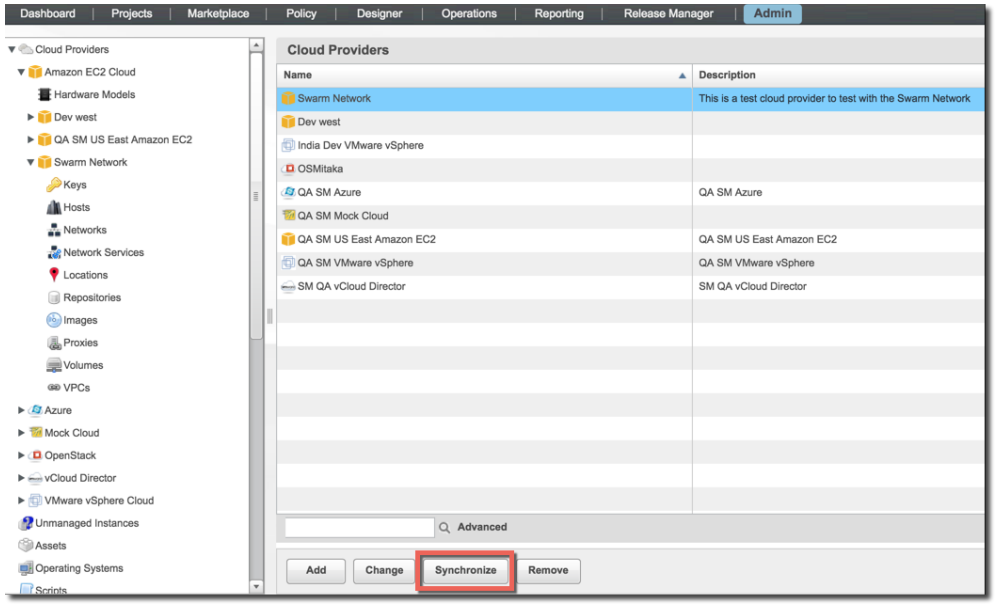
   b. Click **Certificate**, add a public and private key and click **Save**.

10. Click the **Location** tab and select the Swarm Network project that you created earlier.



11. Click **Save**.

12. From the list of cloud providers, select the cloud provider you just created, and then click **Synchronize** at the bottom of the context panel to synchronize Agility Platform with the Amazon EC2 cloud provider.

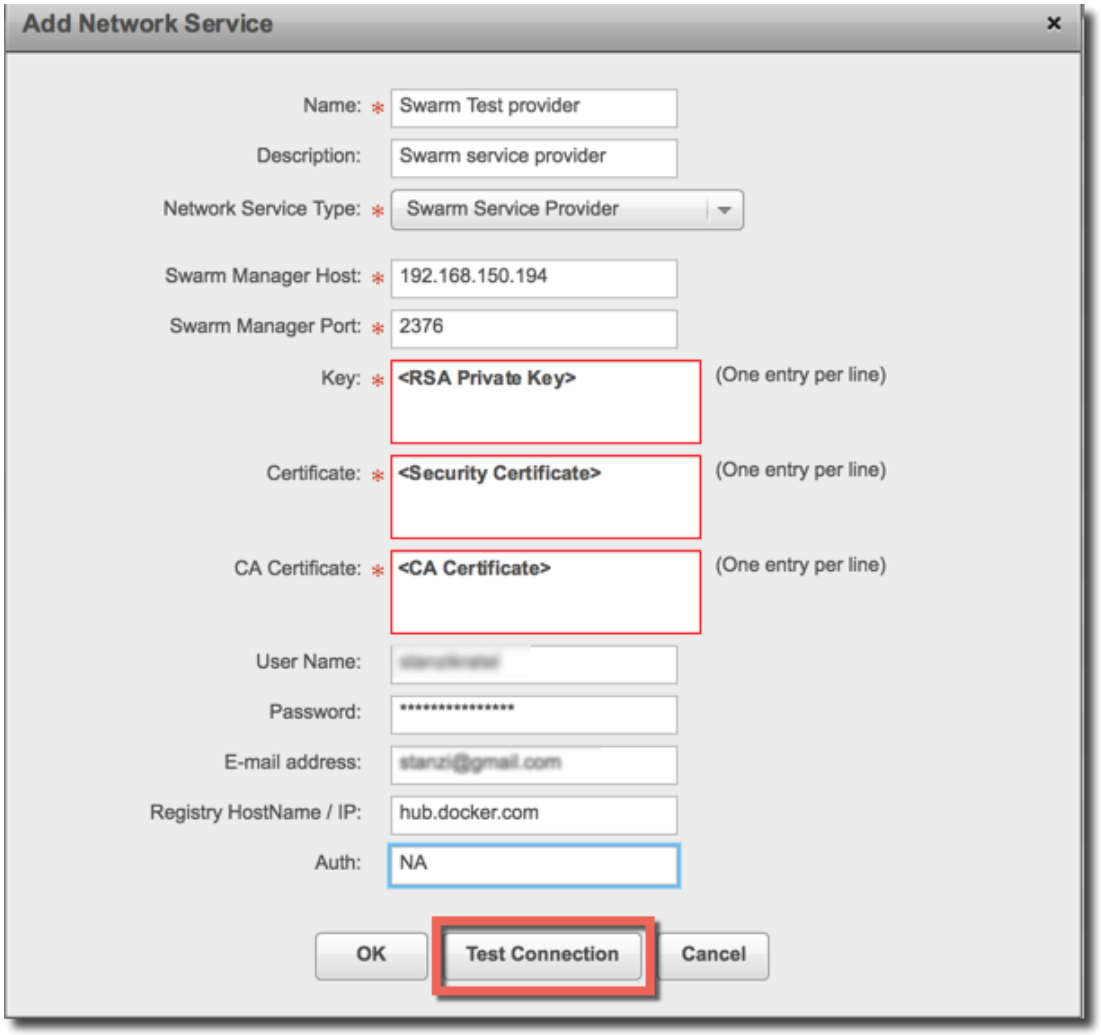


Adding the Swarm Service Provider to your Cloud Provider

Using the credentials that you have applied to set up your Swarm cluster, add the Swarm service provider to the cloud provider to enable communication among the Agility Platform, the Swarm service, and your cloud provider.

To add the Swarm service provider to the cloud provider:

1. In the Agility Platform **Admin** perspective, expand the cloud provider selection.
2. Under the cloud provider to which you want to add the Swarm service, click **Network Services**.
3. At the bottom of the context panel, click **Add**.
4. In the Add Network Service dialog box, type a **Name** and an optional **Description** for the service provider.



5. For **Network Service Type**, select **Swarm Service Provider**.
6. For **Swarm Manager Host**, type the IP address for the Swarm manager to which you connect.
7. For **Swarm Manager Port**, type the number of the port that has been exposed to listen to requests that are made by the Swarm Manager.
8. For **Key**, paste the entire RSA key that was generated for your certificate.
9. For **Certificate**, paste the entire security certificate that was generated to securely connect to the Swarm manager.
10. For **CA Certificate**, paste the entire CA certificate that was generated to connect to the Swarm manager.
11. For **User Name**, type the user name that you use to log into the host that stores your container image, for example Docker Hub.

    Note: This value is required only if you want to pull a private image.

12. For **Password**, type the password that you use to log into the host that stores your container image, for example Docker Hub.

13. For **E-mail address**, type the email address you use to log into the registry host. You can also type **NA** in this field.

14. For **Registry Hostname/IP**, type the IP address or the name of the registry host, for example `hub.docker.com`. You can also type **NA** in this field.

15. For **Auth**, type **NA**.

    Note: This value is required only if you want to pull a private image.

16. Click **Test Connection** to ensure that you can successfully connect to the network service provider.

17. After you have successfully tested your connection, click **OK** to add the Swarm manager network service.

For more information, about pulling a private image from a trusted registry host, See Pulling Private Images from Docker Hub or a Trusted Registry.

Configuring the Agility Platform Assets

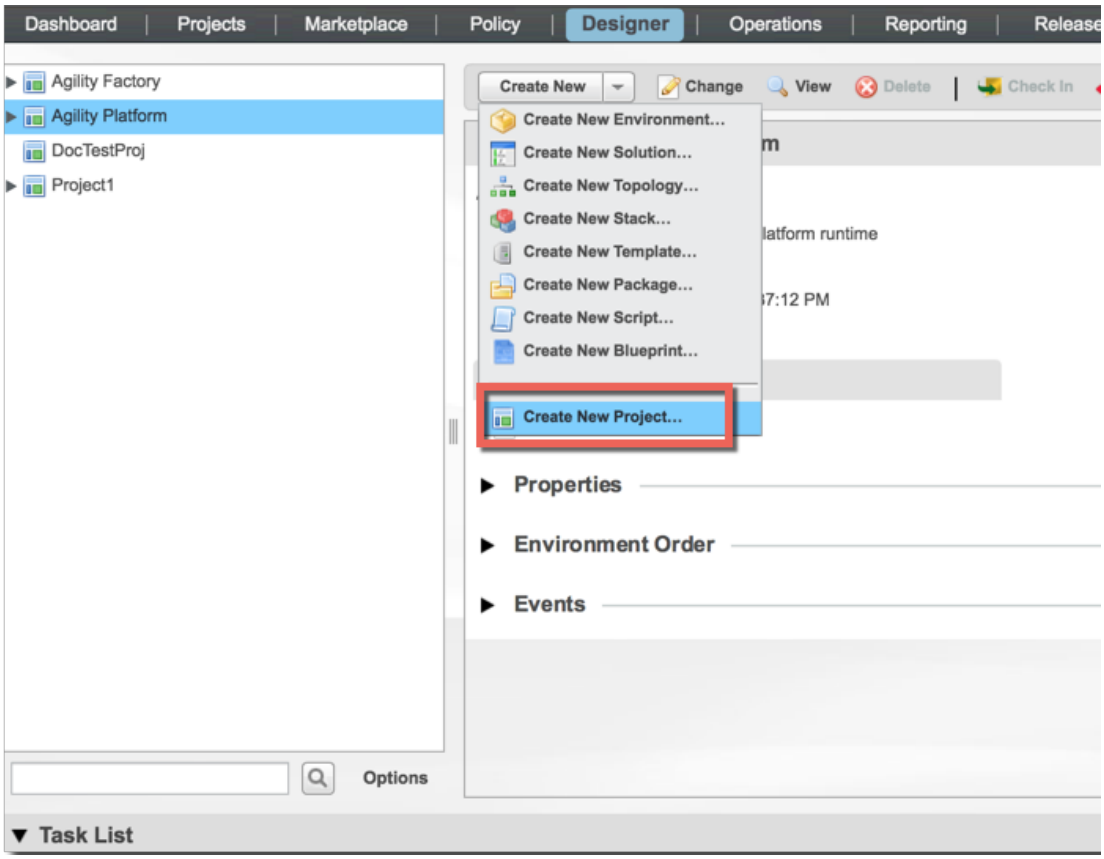
After you have added the Swarm service in the Agility Platform, you need to add and configure the required Agility Platform assets for use with the respective cloud providers.

Creating a Project

Create a project in the **Designer** perspective where you can save the blueprints you design.

To create a project:

1. In the Agility Platform **Designer** perspective, select the **Root** container, click **Create New**, and then click **Create New Project**.



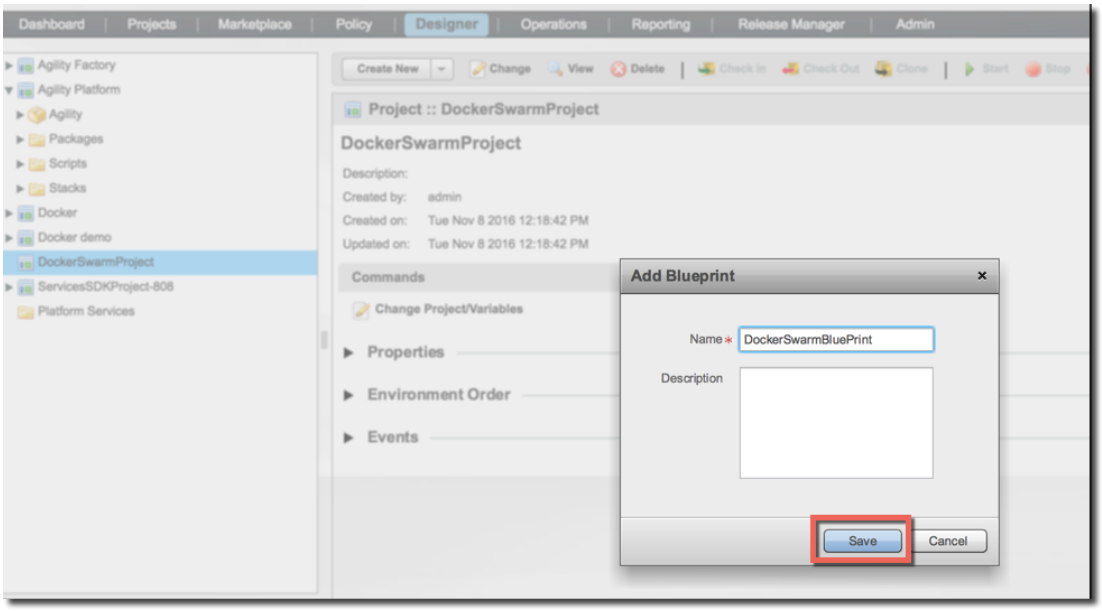
2. In the Add Project dialog box, type a **Name** for the project.
3. Click the **Location** tab and select a location only if you do not want to create your project in **Root**.

4. Click **Save**.

Creating a Blueprint

To create a blueprint:

1. From the Agility Platform **Designer** perspective, select the project you created to store blueprints.
2. On the menu, click **Create New** and then **Create New Blueprint**.



3. In the Add Blueprint dialog box, type a **Name** for the blueprint and an optional description.
4. Click **Save**.

After you create the blueprint, you are ready to add one or more Swarm services.

The following Swarm services are available for you to add to your blueprint:

- Swarm Service
- Swarm Network
- Swarm Volume

You can configure and deploy each of these services as a standalone service or you can integrate multiple services in a topology.

Fore more information, See Connecting a Swarm Network and a Swarm Service, and See Connecting a Swarm Volume and a Swarm Service.

Configuring the Swarm Service Properties in a Blueprint

After you have added the Swarm service to your blueprint, you can configure various properties for your service.

Adding the Swarm Service to a Blueprint

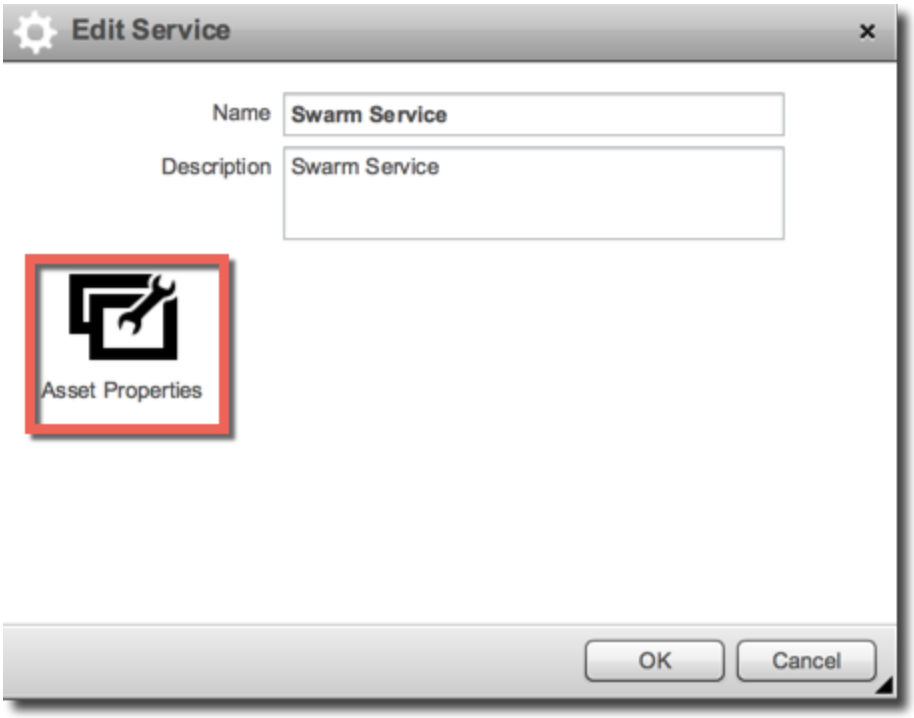
You can add one or Swarm services to your blueprint and deploy them.

To add the Swarm Service to a blueprint:

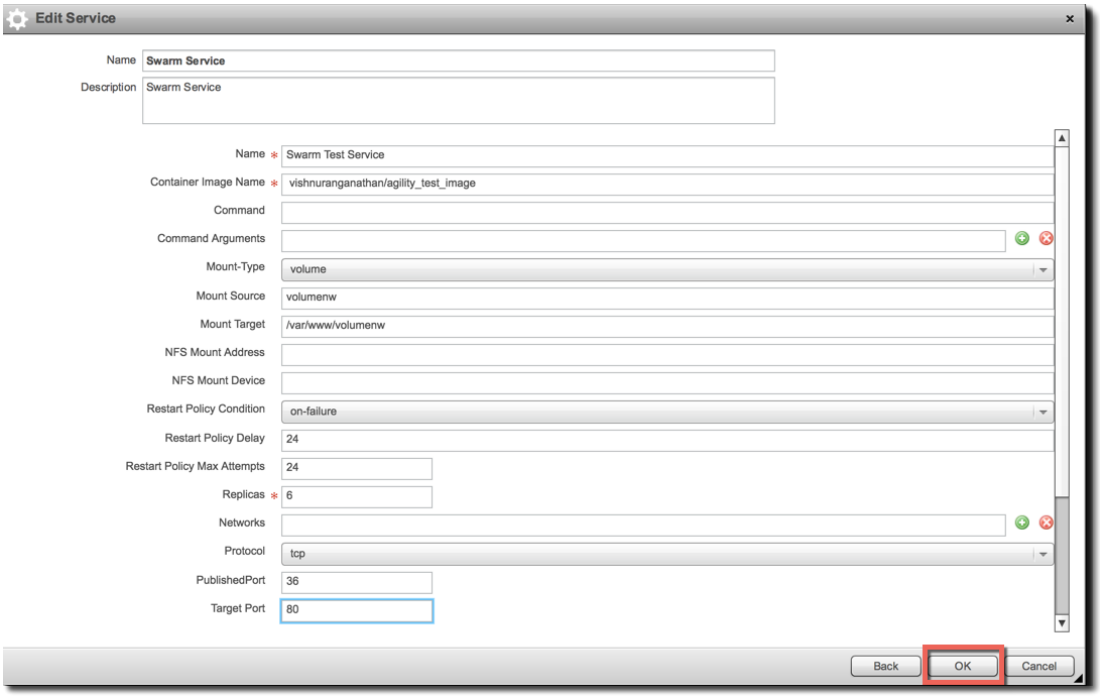
1. In the **Designer** perspective, select the blueprint you created.
2. On the right under **Services**, select the **Swarm Service** service from the **Services** list and drag it into the blueprint.

To configure the Swarm service:

1. Click the **Settings** icon next to **Swarm Service**.
2. In the Edit Service dialog box, click **Asset Properties**.



3. In the Edit Service, dialog box, configure the following Swarm Service properties:



- **Name** – Name of the service. This field is populated automatically by the Agility Platform and is not used by the Swarm service.
- **Description** – Optional description of the service.

- **Name** – Specifies the name of the Swarm Service. This field is used by the Swarm service.
- **Container Image Name** – Name and path of the container image that is stored remotely, for example in Docker Hub.
- **Command** –Specifies the command to be executed when running a container image.
- **Command Arguments** – Specifies the command arguments to be appended when running a container image.
- **Mount Type** – Specifies the type of mount. This can be either of type `volume` or `bind`.
- **Mount Source** – This property is required for volumes of type `bind` only. Specifies an absolute path to the file or directory to bind-mount to, for example `src=/path/on/host/`. `type=volume: src` is an optional way to specify the name of the volume, for example, `src=my-volume`. If the named volume does not exist, it is automatically created. If no value is specified for `src`, the volume is assigned a random name, which is guaranteed to be unique on the host, but may not be unique cluster-wide.
- **Mount Target** – Specifies the mount path inside the container, for example `/some/path/in/container/`. If the path does not exist in the container's file system, the Engine creates a directory at the specified location before mounting the volume or bind-mount.
- **NFS Mount Address** - Specifies the address of the NFS volume mount. This can be an IP address.

Note: You only need to provide this value if you have set your volume type to **nfs**.

- **NFS Mount Device** - Specifies the location of the NFS mount device, for example `:/var/nfs`.

Note: You only need to provide this value if you have set your volume type to **nfs**.

- **Restart Policy Condition** – Specifies the restart policy condition.
- **Restart Policy Delay** – Specifies the delay for the restart policy of a container.
- **Restart Policy Max Attempts** – Specifies the maximum number of restart attempts before giving up.
- **Replicas** – Specifies the number of replica tasks.
- **Networks** – Specifies the network ids.
- **Protocol** – Specifies the protocol to use.
- **Published Port** –Specifies the published port.
- **Target Port** – Specifies the target port.

4. In the **Inherited Properties** section, select the appropriate value for **Security Zone**, and then click **OK**.

Important: When deploying multiple Swarm services, you need to give each Swarm service a unique name.

Adding the Swarm Network Service to a Blueprint

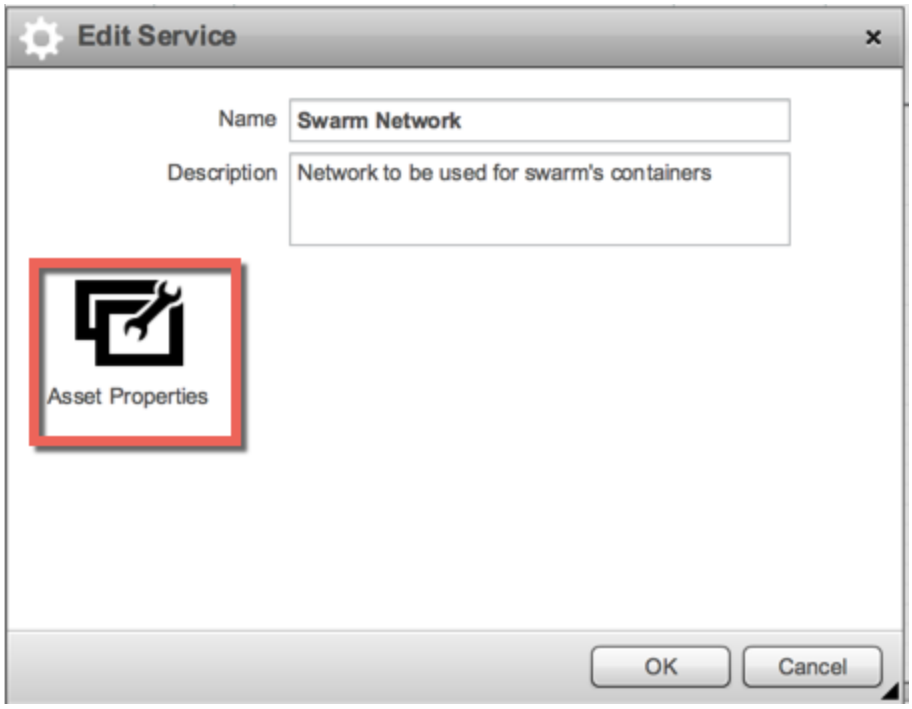
The Swarm Network Service enables you to deploy one or more Swarm networks.

To add the Swarm Network Service to a blueprint:

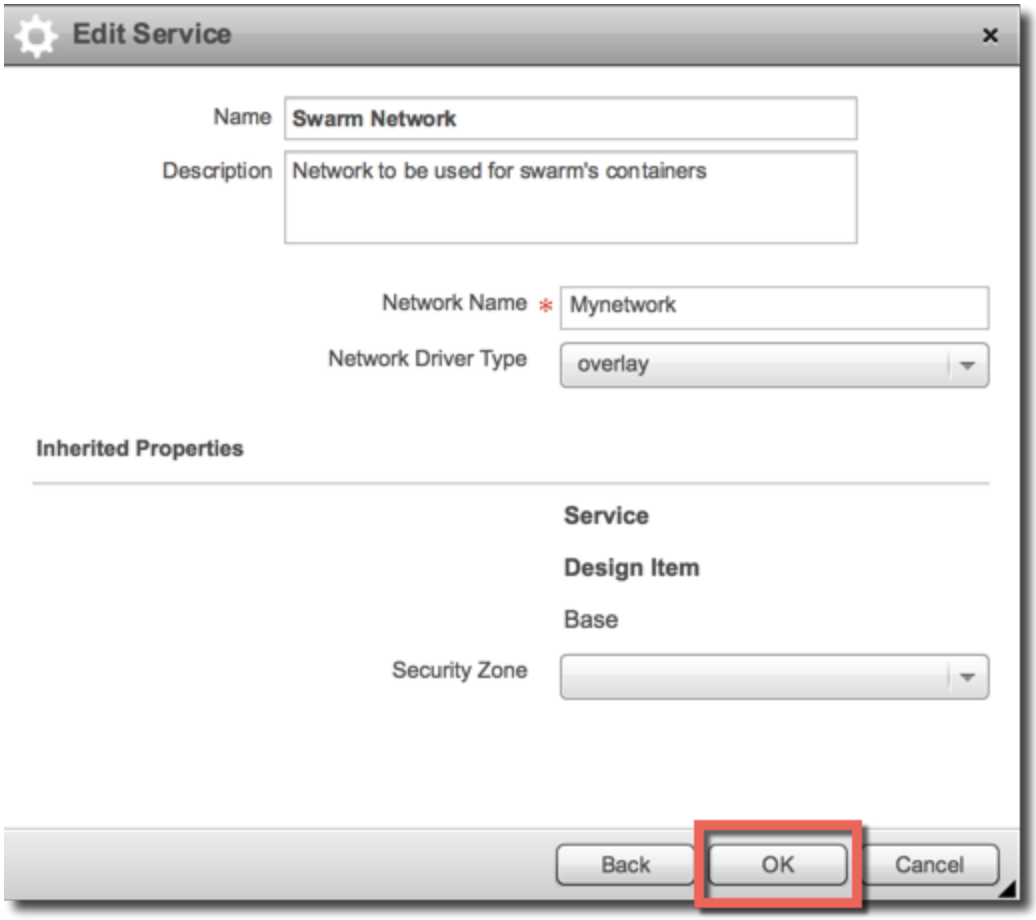
1. In the **Designer** perspective, select the blueprint you created.
2. On the right under **Services**, select the **Swarm Network** service from the **Services** list and drag it into the blueprint.

To configure the Swarm Network service:

1. Click the **Settings** icon next to **Swarm Network**.
2. In the Edit Service dialog box, click **Asset Properties**.



3. In the Edit Service, dialog box, configure the following properties:



- **Name** – Name of the service. This field is populated automatically by the Agility Platform and is not used by the Swarm service.
- **Description** – Optional description of the service.
- **Network Name** – Specifies the actual name of the Swarm network. This field is used by the Swarm service.
- **Network Driver Type** – Specifies the network driver type. This should be either `bridge` or `overlay`.

4. In the **Inherited Properties** section, select the appropriate value for **Security Zone**, and then click **OK**

Important: When deploying multiple Swarm network services, you must assign a unique name to each network service for networks with an **overlay** network driver type.

Adding the Swarm Volume service to a Blueprint

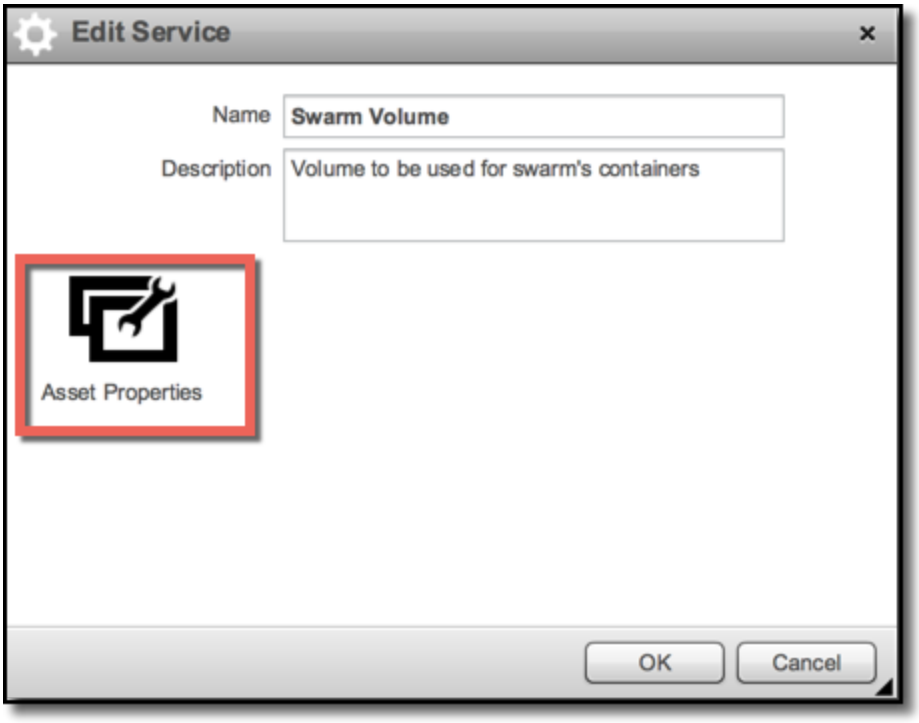
You can add one or more Swarm Volume services to your blueprint.

To add the Swarm Volume service to the blueprint:

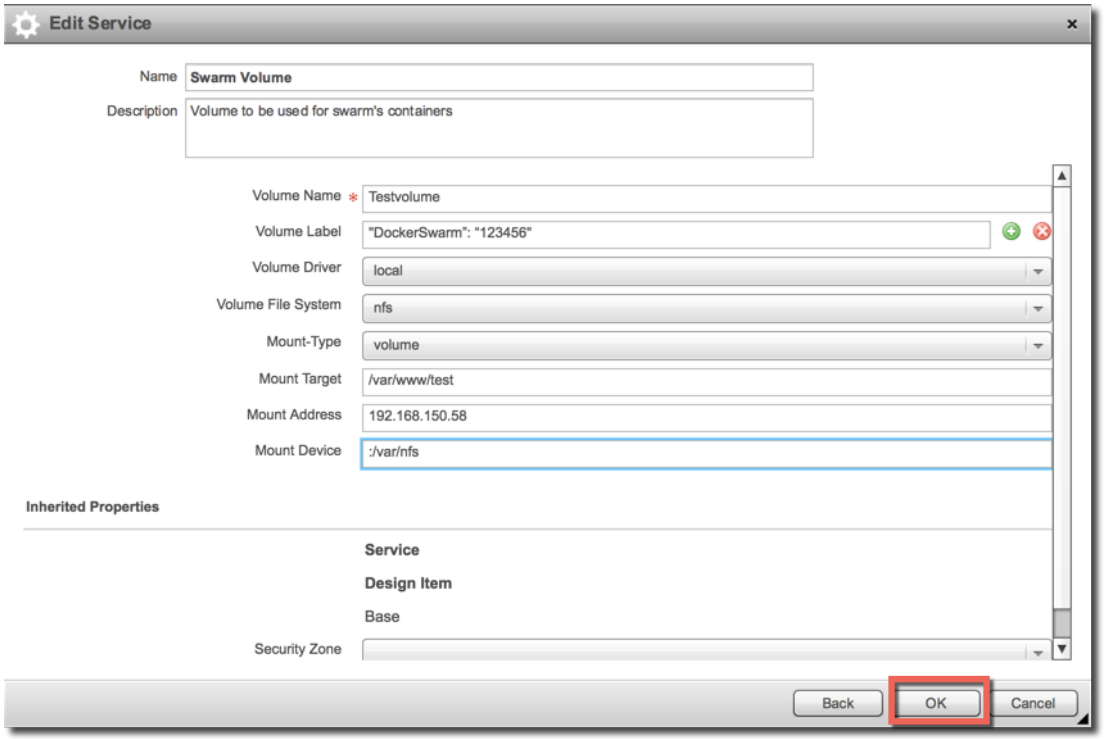
1. In the **Designer** perspective, select the blueprint you created.
2. On the right under **Services**, select the **Swarm Volume** service from the **Services** list and drag it into the blueprint.

To configure the Swarm Volume service:

1. Click the **Settings** icon next to **Swarm Volume**.
2. In the Edit Service dialog box, click **Asset Properties**.



3. In the Edit Service, dialog box, configure the following Swarm Volume properties:



- **Name** – Name of the Swarm Volume service. This field is populated automatically by the Agility Platform and is not used by the Swarm service.
- **Description** – Optional description of the service.
- **Volume Name** – Specifies the actual name of the volume. This name is used by the Swarm service.

Note: If you add multiple volumes, each volume must have a unique name.

- **Volume Label** – Specifies the label of the volume. To specify an additional volume label, click the + icon to the right of the **Volume Label** box. This value must be a key value pair that uses the `"key":"value"` format, for example: `"DockerSwarm": "123456"`.

4. From the **Volume Driver** dropdown list, select the appropriate volume driver.
5. From the **Volume File System** dropdown list, select the appropriate file system.

   Note: If you select **nfs** as the file system, you also need to specify values for : **Mount Address** and **Mount Device**.
6. From the **Mount Type** dropdown list, select the appropriate mount type.
7. In the **Mount Target** field, specify the mount target.
8. In the **Mount Address** field, specify the IP address of the volume mount.

   Note: This value must be provided for volumes of type **nfs** only.

9. In the **Mount Device** field, specify the path to the volume mount device. This must be in the format `:/<pathtothedevice>`

   Note: This value must be provided for volumes of type **nfs** and **btrfs** only. .

10. In the **Inherited Properties** section, select the appropriate value for **Security Zone**, and then click **OK**.

Important: When deploying multiple volume service, you must give a unique name to each volume service.

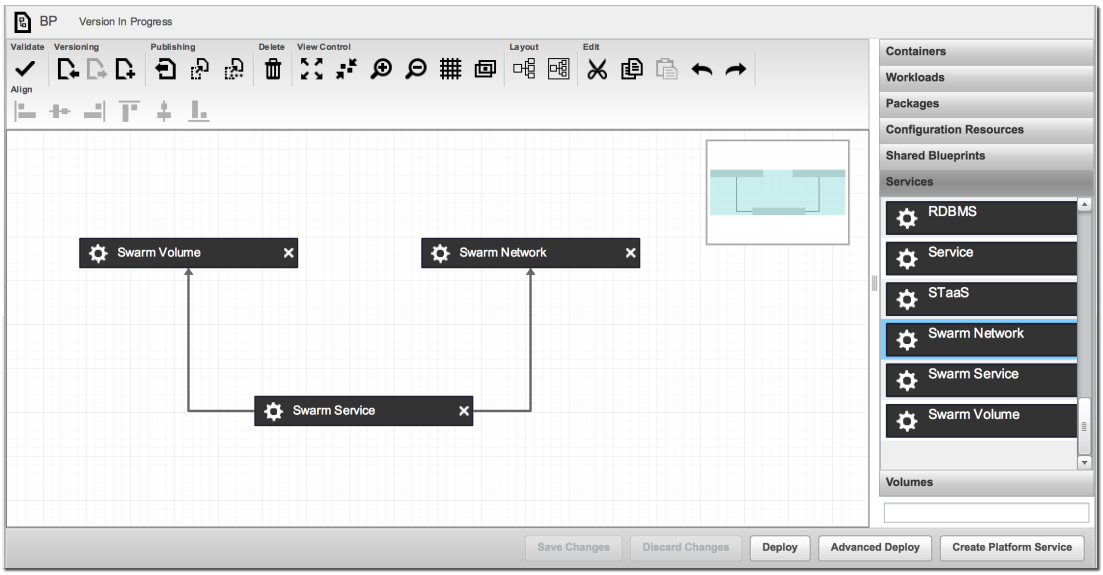
Note: For volumes with the nfs file system type, the data in the nfs server will be reflected in the Docker volume only if the volume is used by a swarm service.

Connecting all Swarm Assets

After you have configured all Swarm asset properties, you can connect them in the **Designer** perspective to establish dependencies.

To connect all Swarm assets in a blueprint

1. In the **Designer** perspective, ensure that all the required services have been added to your blueprint.
2. Connect the dependencies by dragging a connector from the Swarm Service item to the Swarm Volume service, as well as the Swarm Network service as shown in the screenshot below.



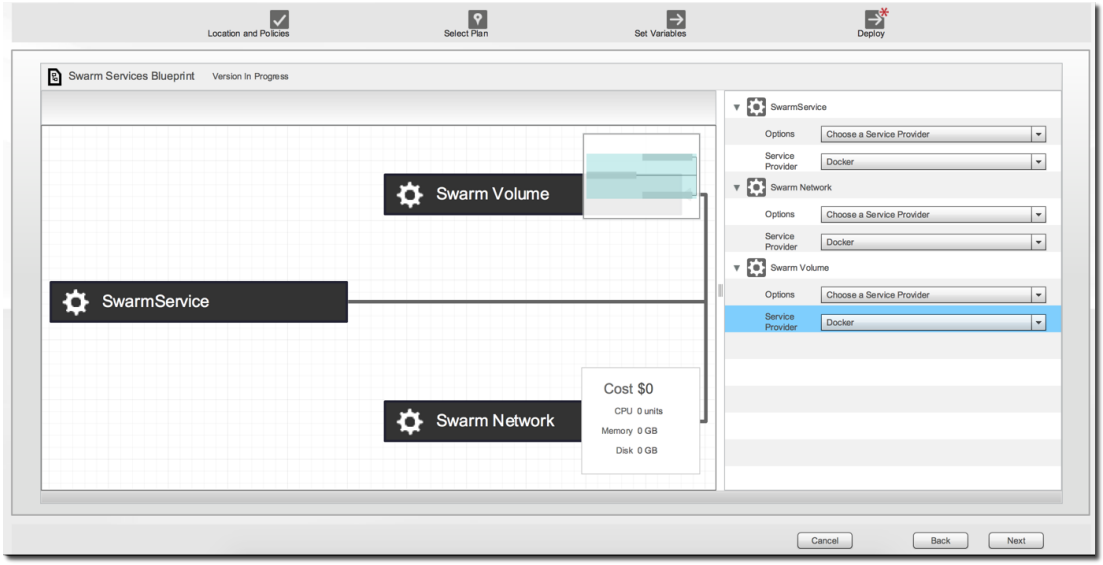
3. Click **Save Changes**.

Deploying a Blueprint

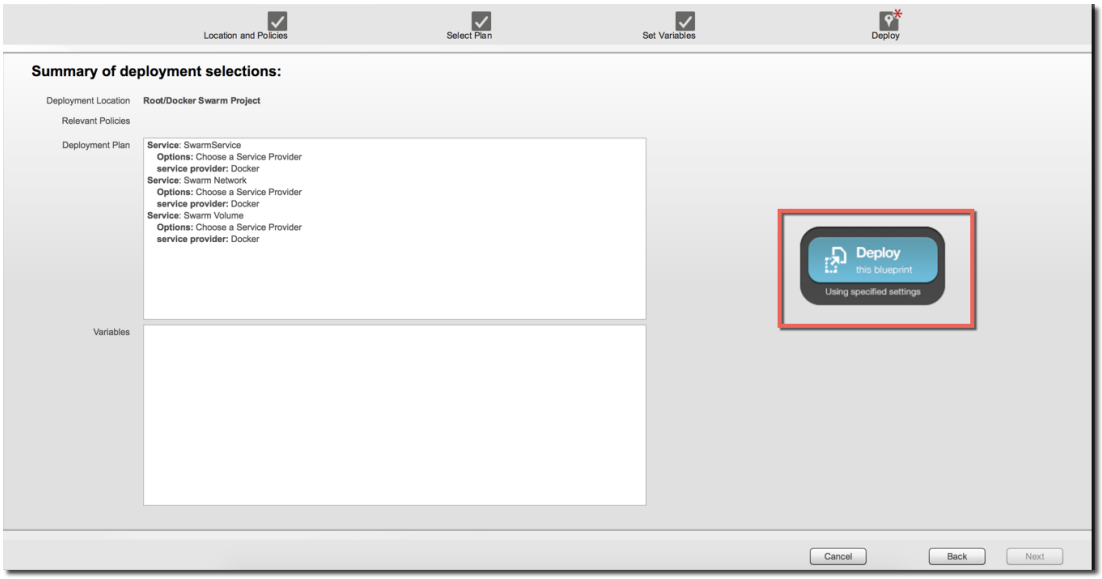
After you have added all your Agility Platform assets to your blueprint, connected the dependencies and successfully validated the blueprint, you can deploy your blueprint.

To deploy a blueprint:

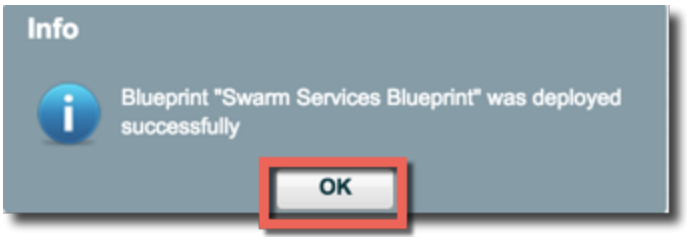
1. In the **Designer** perspective, at the bottom of the blueprint editor workspace, click **Advanced Deploy**.
2. Complete all the steps in the **Advanced Deployment** wizard.
3. Make sure that the appropriate service provider is selected for your all the Swarm services in the blueprint, and then click **Next**.



4. On the **Summary of deployment selections** page, review your deployment selections, and then click the **Deploy this blueprint** icon.



5. The deployment process will take a few minutes. After your blueprint has deployed successfully, you will receive a message saying that the blueprint was successfully deployed. Click **OK**.



Provisioning and Releasing Swarm Services

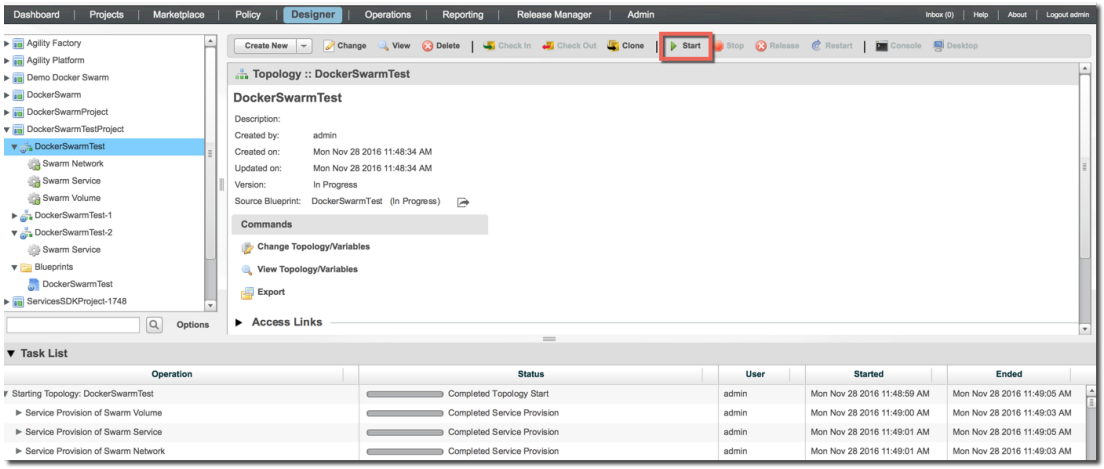
After you have successfully deployed your blueprint, you are ready to provision your Swarm topology. You can also provision and release individual Swarm services.

Provisioning a Swarm Topology

After you have successfully deployed your blueprint, you are ready to provision your Swarm topology.

To provision a Swarm topology:

1. In the Agility Platform **Designer** perspective, in the navigation panel, expand your project, and then select the appropriate Swarm topology.
2. Click the **Start** button at the top of the page.



3. When prompted to confirm that you want to start this topology, click **Yes**.

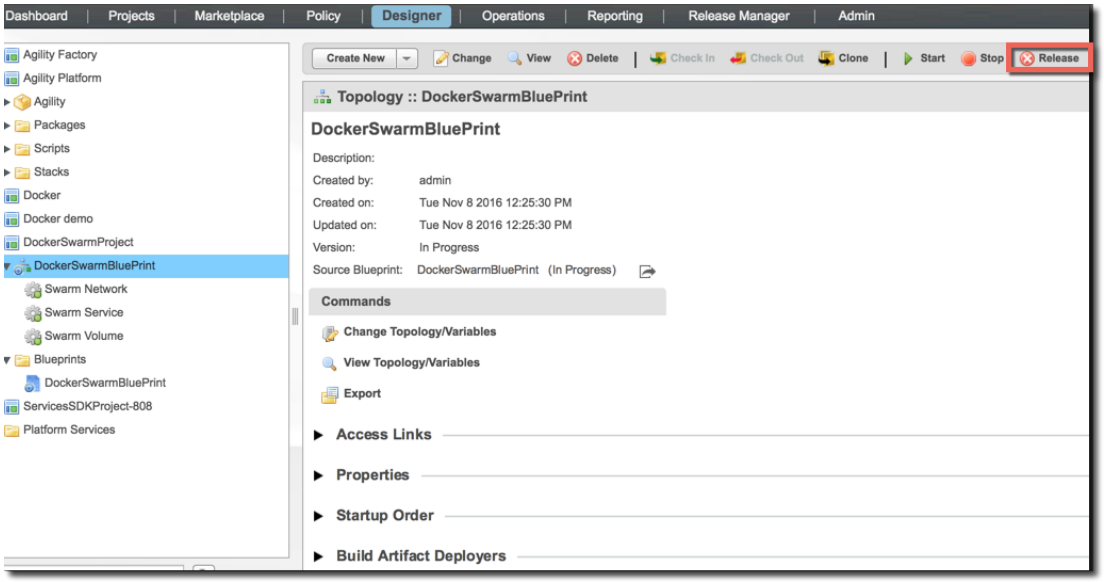
The start process may take a while. You can view the progress in the task panel.

Releasing a Topology

To release a topology:

1. In the Agility Platform **Designer** perspective, in the navigation panel, expand your project, and then select the appropriate topology.

2. Click the **Release** button at the top of the page.



3. When prompted to confirm that you want to release this topology, click **Yes**.

The release process may take a while as all service instances are being released. You can view the progress in the task panel.

Important: The release operation releases all service instances. However, in scenarios where either a Volume or a Network service is integrated with the Swarm service, you need to manually release the Volume and/or Network service.

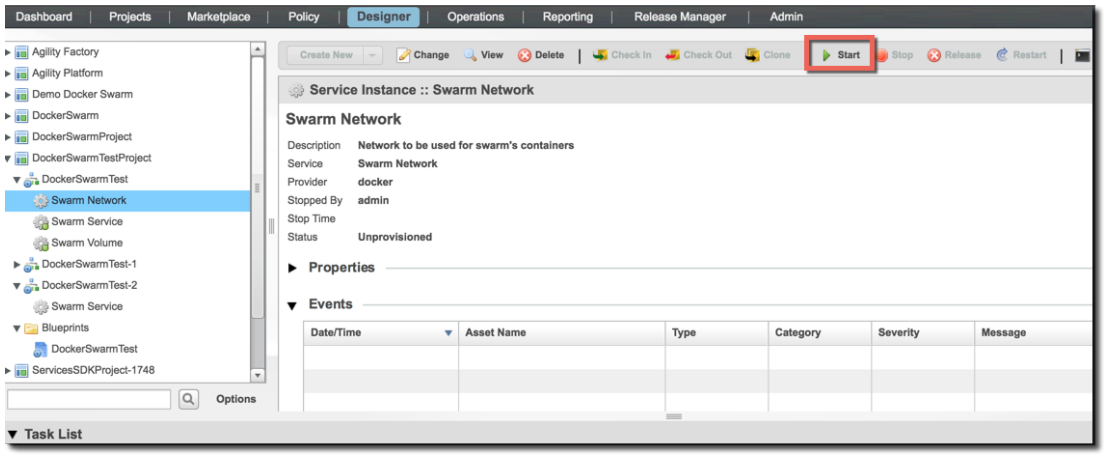
Provisioning a Swarm Network

After you have successfully deployed your blueprint, you are ready to provision your Swarm network.

To provision a Swarm Network topology:

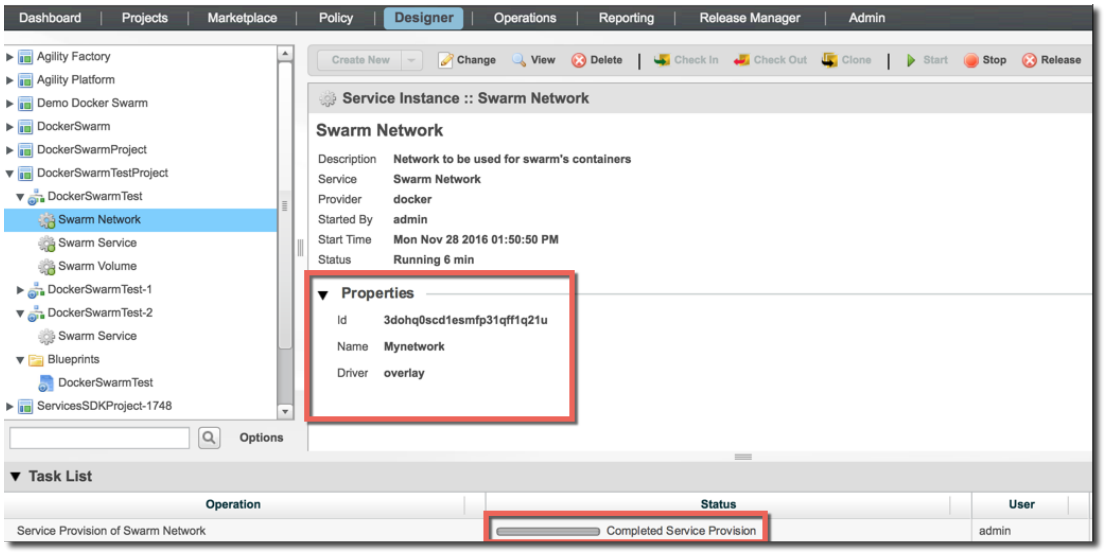
1. In the Agility Platform **Designer** perspective, in the navigation panel, expand your project, and then select the appropriate Swarm Network service.

2. Click the **Start** button at the top of the page.



3. When prompted to confirm that you want to start this service instance, click **Yes**.

The start process may take a while. You can view the progress in the task panel. After your Swarm Network service has successfully started, you can view the properties that you have defined for your network by expanding the **Properties** section as shown below.

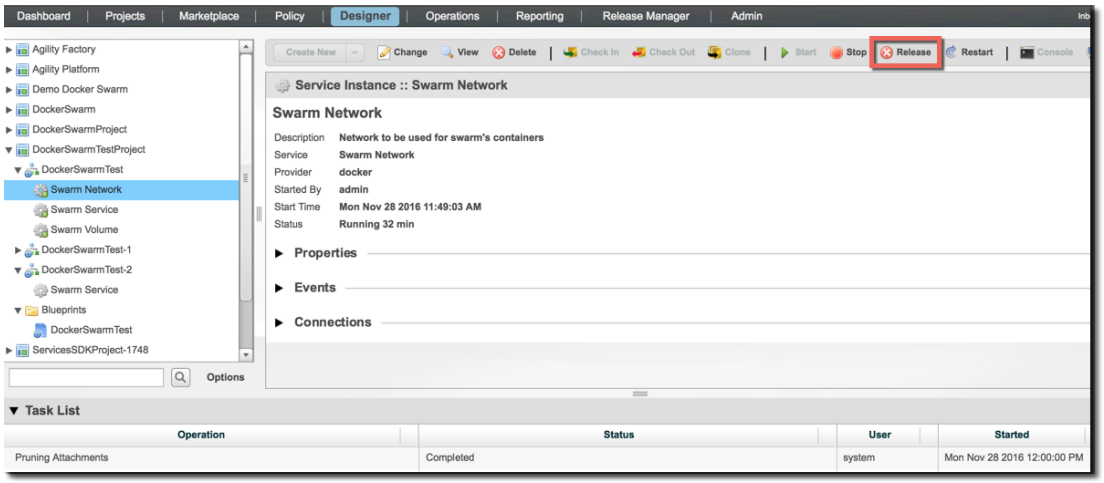


Releasing a Swarm Network

To release a Swarm Network:

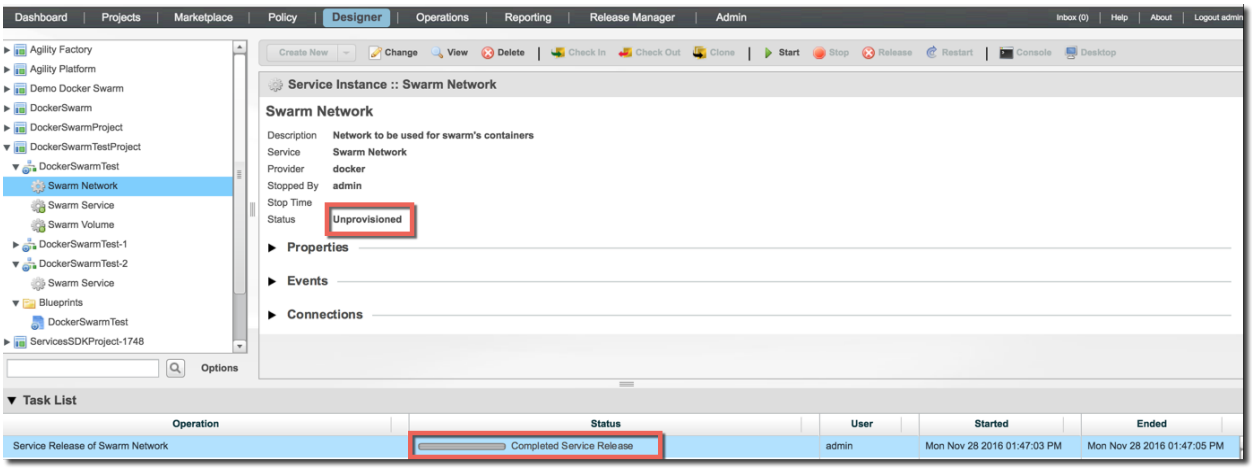
1. In the Agility Platform **Designer** perspective, in the navigation panel, expand your project, and then select the appropriate Swarm Network.

2. Click the **Release** button at the top of the page.



3. When prompted to confirm that you want to release this service instance, click **Yes**.

You can view the progress in the task panel. After the instance has been released, the status of the Swarm Network is displayed as **Unprovisioned**.



Note: You can also verify that the network service has been deleted by logging into the Docker Swarm cluster and typing `docker-network ls`. The network service that was released will no longer be displayed as part of the list of Swarm networks.

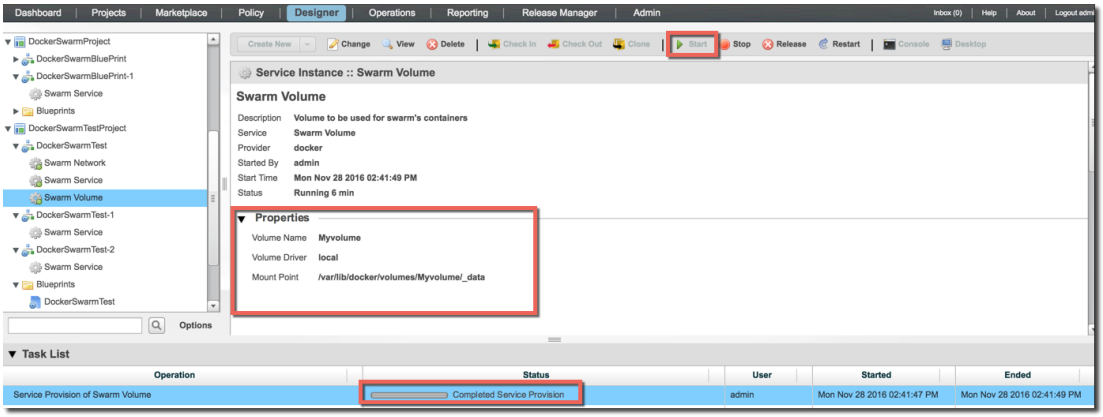
Provisioning a Swarm Volume

After you have successfully deployed your blueprint, you are ready to provision one or more Swarm Volume services.

To provision a Swarm volume:

1. In the Agility Platform **Designer** perspective, in the navigation panel, expand your project, and then select the appropriate topology.

2. Click the **Start** button at the top of the page.



3. When prompted to confirm that you want to start this service instance, click **Yes**.

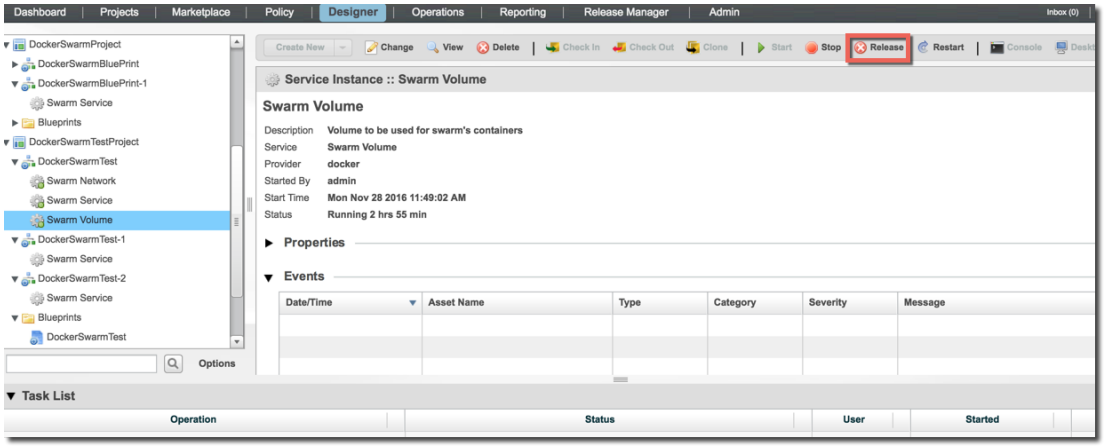
The start process may take a while. The start process may take a while. You can view the progress in the task panel. After your network service has successfully started, you can view the properties that you have defined for your network by expanding the **Properties** section.

Releasing a Swarm Volume

To release a Swarm Volume:

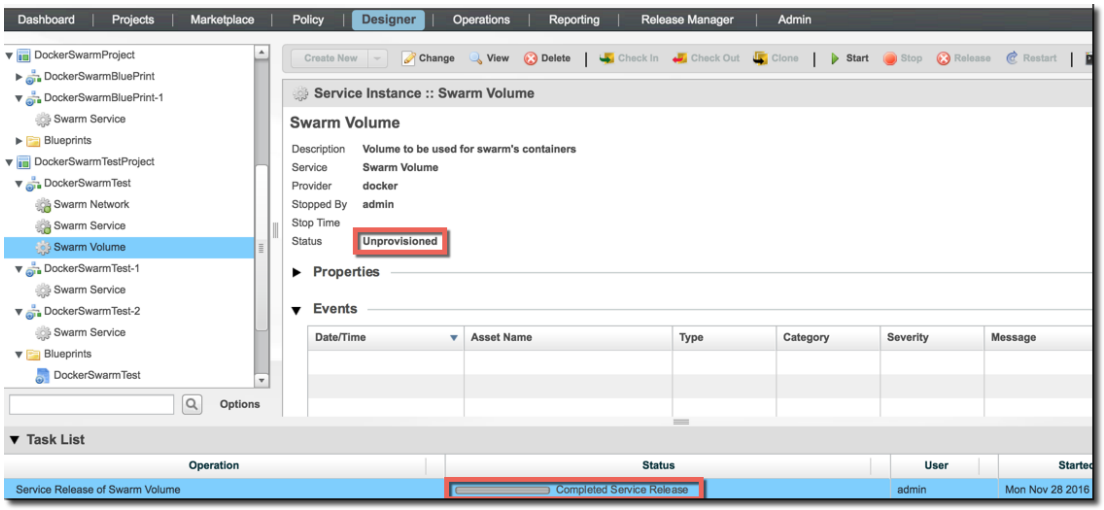
1. In the Agility Platform **Designer** perspective, in the navigation panel, expand your project, and then select the appropriate Swarm Volume service.

2. Click the **Release** button at the top of the page.



3. When prompted to confirm that you want to release this volume, click **Yes**.

You can view the progress in the task panel. After the instance has been released, the status of the Swarm Volume is displayed as **Unprovisioned**.



Note: You can also verify that the volume has been deleted by logging into the Docker Swarm cluster and typing `docker-volume ls`. The volume that was released will no longer be displayed as part of the list of Swarm volumes.

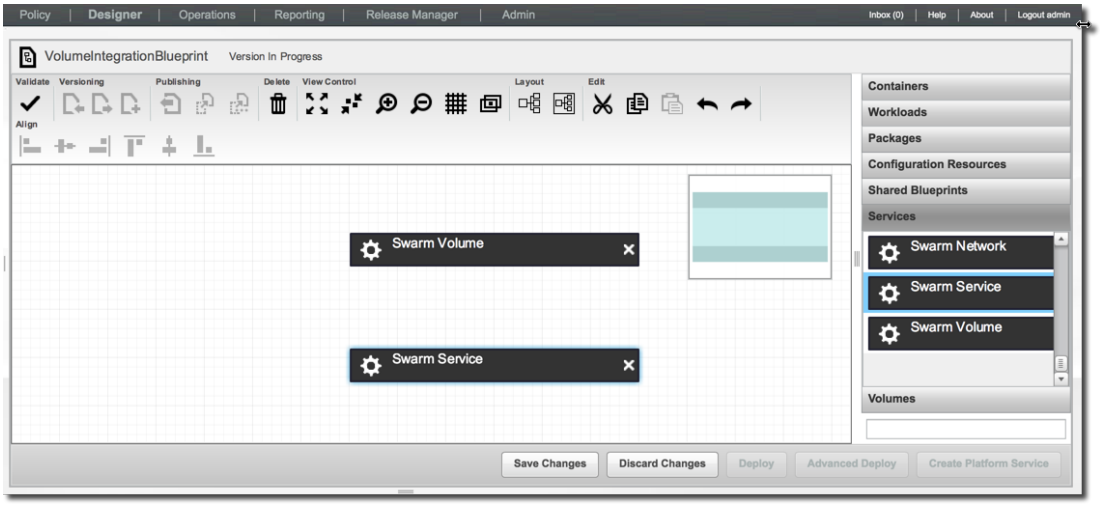
Connecting a Swarm Volume and a Swarm Service

To create a topology that consists of a Swarm volume that is connected with a Swarm service, you need to complete the following steps:

1. Create a blueprint.
2. Add the Swarm Service and Swarm Volume services to the blueprint.
3. Configure the Swarm Service and Swarm Volume services.
4. Connect the Swarm Service to the Swarm Volume service.
5. Deploy the blueprint.
6. Start the topology.

To connect a Swarm volume and a Swarm service

1. From the Agility Platform **Designer** perspective, select the project you want to use for deploying your services.
2. On the menu, click **Create New** and then **Create New Blueprint**.
3. In the Add Blueprint dialog box, type a **Name** for the blueprint and an optional description.
4. Click **Save**.
5. In the **Designer** perspective, select the blueprint you created.
6. On the right under **Services**, select the **Swarm Service** and **Swarm Volume** services from the **Services** list and drag them into the blueprint. Draw the connection from **Swarm Service** to **Swarm Volume**.



7. Click the **Settings** icon next to **Swarm Service**.

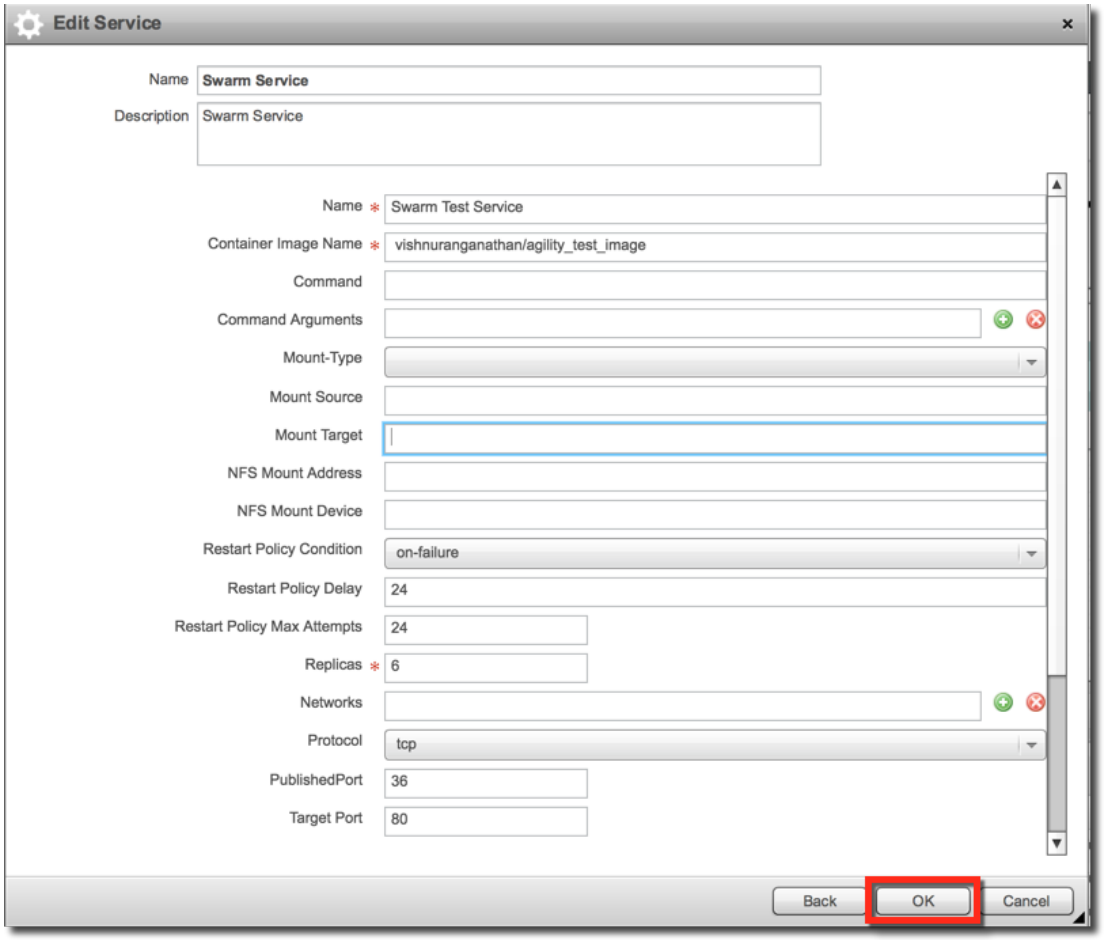
8. In the Edit Service dialog box, click **Asset Properties**.

9. In the Edit Service, dialog box, configure the following mandatory properties:

   - **Name** - Specifies the name of the service.
   - **Container Image Name** - Specifies the name and path of the container.
   - **Replicas** - Specifies the number of replicas.

     All other fields are optional.

   Note: Make sure to leave the **Mount-Type**, **Mount Source**, **Mount Targets**, **NFS Mount Address** and **NFS Mount Device** fields blank. These fields will be populated from the information that is pulled from the Swarm Volume service once the two services are connected.



10. Click **OK** to save your settings.
11. Next, to configure the Swarm Volume service, click the **Settings** icon next to **Swarm Volume**.
12. In the Edit Service dialog box, click **Asset Properties**.
13. In the Edit Service, dialog box, configure the following properties:

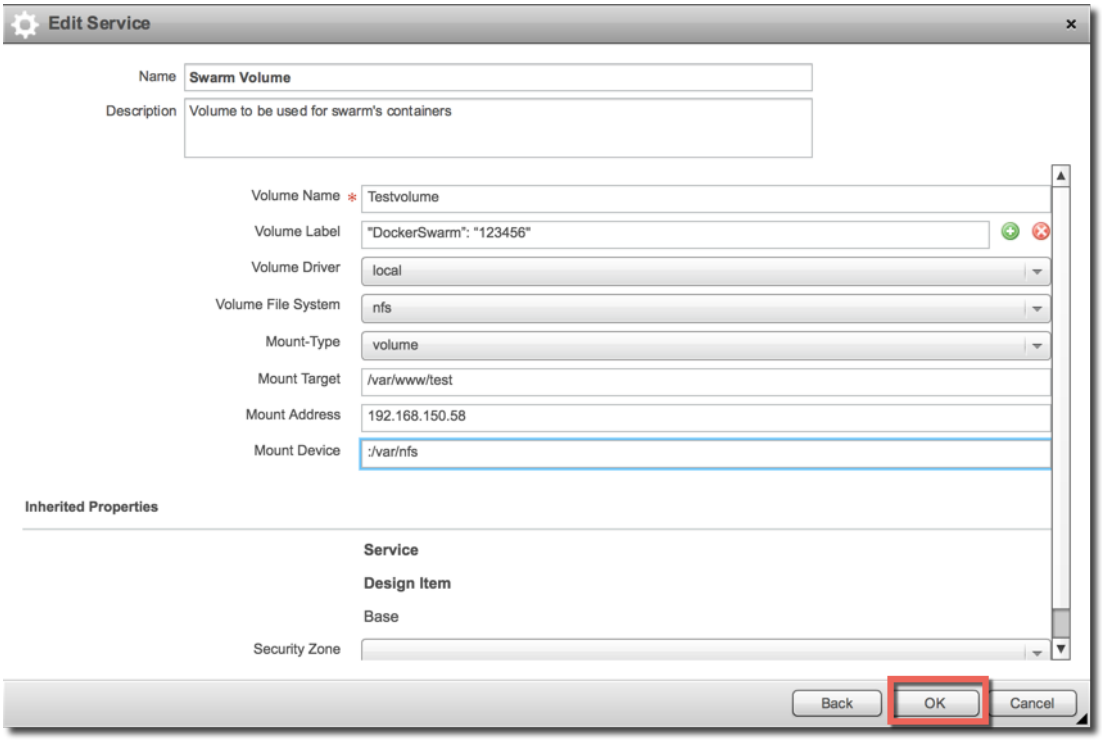
    - **Volume Name** - Specifies the name of the volume.

    Note: If you add multiple volumes, each volume must have a unique name.

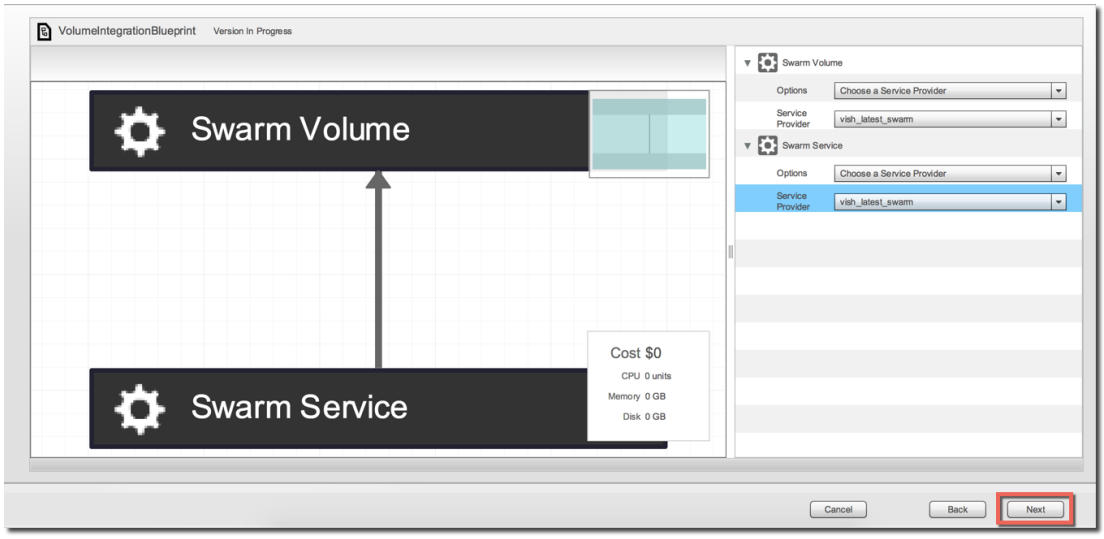
    - **Volume Label** - Specifies the volume label. This value must be a key value pair that uses the `"key":"value"` format.
    - **Volume Driver** - Select the appropriate volume driver from the dropdown list.
    - **Volume File System** - Select the appropriate mount type from the dropdown list.

    Note: If you select **nfs** as the file system, you also need to specify values for : **Mount Address** and **Mount Device**.

- **Mount Type** - Specifies the mount type.
- **Mount Target** - Specifies the mount target.
- **Mount Address** - Specifies the IP address of the volume mount. This value must be provided for volumes of type **nfs** only.
- **Mount Device** - Specifies the path to the volume mount device, for example `:/var/nfs`. This value must be provided for volumes of type **nfs** and **btrfs** only.



14. Click **Save** to save your changes.
15. Click **Advanced Deploy**.
16. Complete all the steps in the **Advanced Deployment** wizard.
17. Make sure that the appropriate service provider is selected for both Swarm services in the blueprint, and then click **Next**.



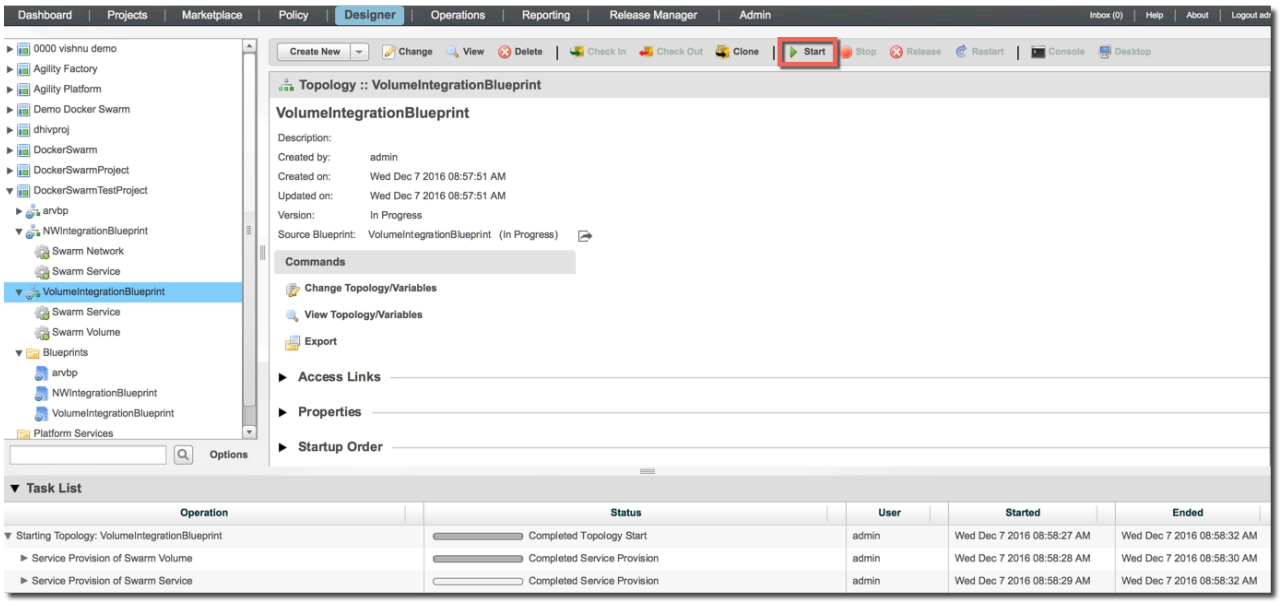
18. On the **Summary of deployment selections** page, review your deployment selections, and then click the **Deploy this blueprint** icon.

19. After you have successfully deployed your blueprint, in the navigation panel, expand your project, and then select the Swarm topology that you just created.

20. Click the **Start** button at the top of the page.

21. When prompted to confirm that you want to start this topology, click **Yes**.

You can view the progress in the task panel as your services are being provisioned.



Note: If you are integrating a Volume Service with the Swarm Service, the Agility Platform will create the volume along with the Swarm service. However, when you release the topology, only the Swarm Service will be released and not the Volume Service. To release the volume, you have to manually release the Volume Service.

Important: When deploying multiple volume service, you must give a unique name to each volume service.

Connecting a Swarm Network and a Swarm Service

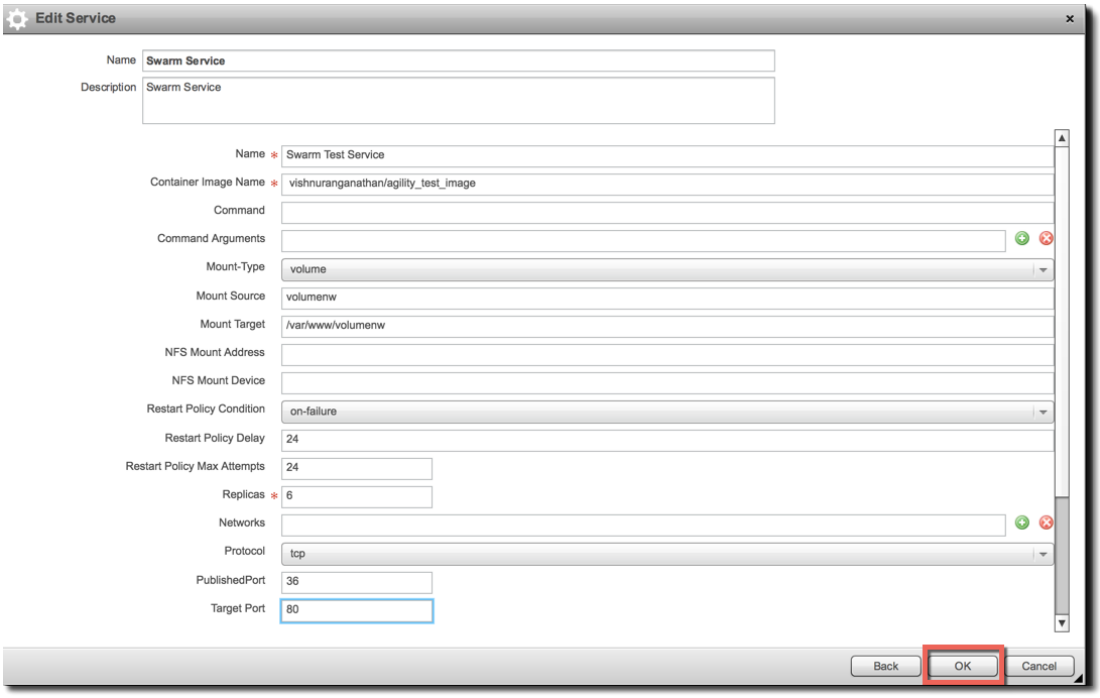
To create a topology that consists of a Swarm network that is connected with a Swarm service, you need to complete the following steps:

1. Create a blueprint.
2. Add the Swarm Service and Swarm Network services to the blueprint.
3. Configure the Swarm Service and Swarm Network services.
4. Connect the Swarm Service to the Swarm Network service.
5. Deploy the blueprint.
6. Start the topology.

To connect a Swarm network and a Swarm service

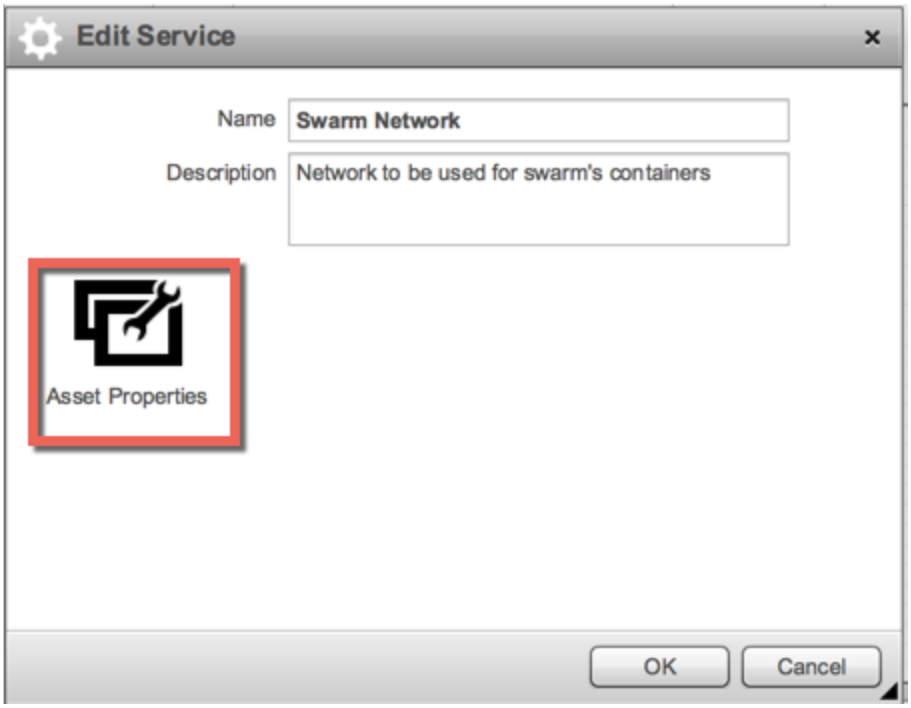
1. From the Agility Platform **Designer** perspective, select the project you want to use for deploying your services.
2. On the menu, click **Create New** and then **Create New Blueprint**.
3. In the Add Blueprint dialog box, type a **Name** for the blueprint and an optional description.
4. Click **Save**.
5. In the **Designer** perspective, select the blueprint you created.
6. On the right under **Services**, select the **Swarm Service** and **Swarm Network** services from the **Services** list and drag them into the blueprint. Draw the connection from **Swarm Service** to **Swarm Network**.
7. Click the **Settings** icon next to **Swarm Service**.
8. In the Edit Service dialog box, click **Asset Properties**.
9. In the Edit Service, dialog box, configure the following mandatory properties:
    - **Name** - Specifies the name of the Swarm Service.
    - **Container Image Name** - Specifies the name and path to the container image.
    - **Replicas** -Specifies the number of replicas.

All other fields are optional.

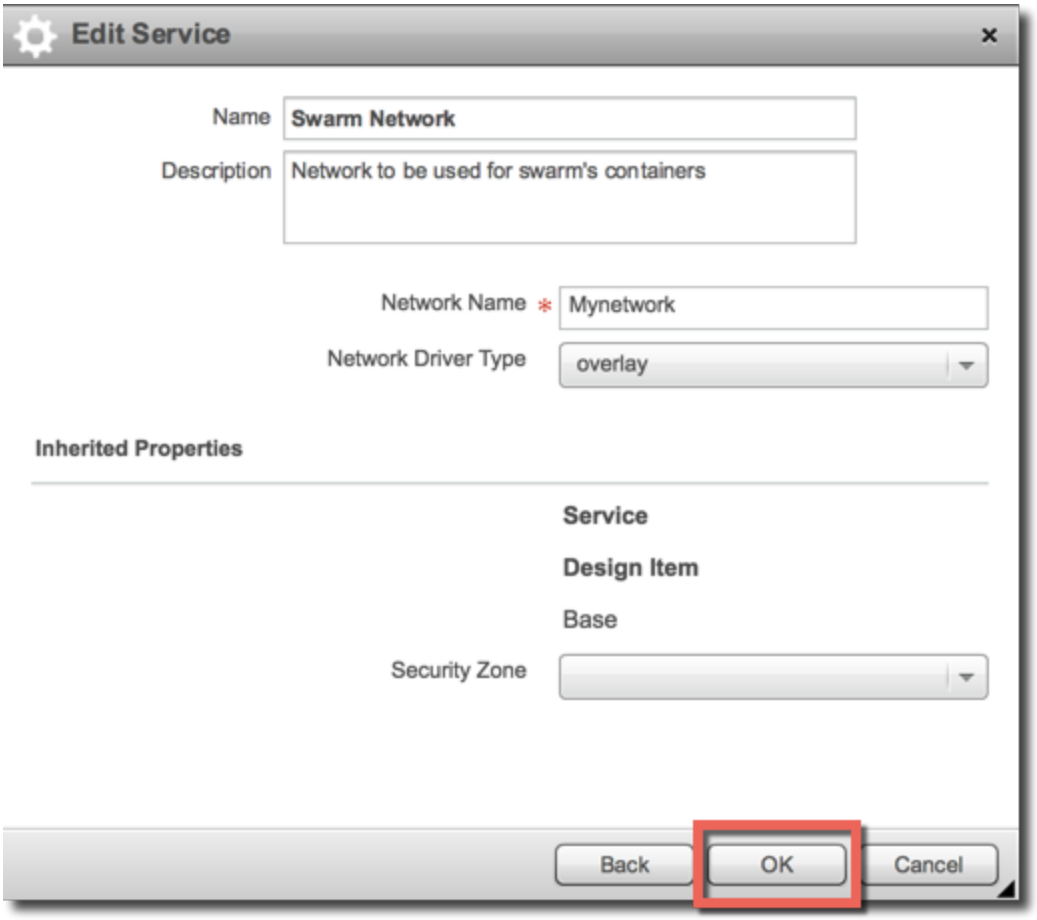


Note: Make sure to leave the **Networks** field blank. It will be populated from the information that is pulled from the Swarm Network service once the two services are connected.

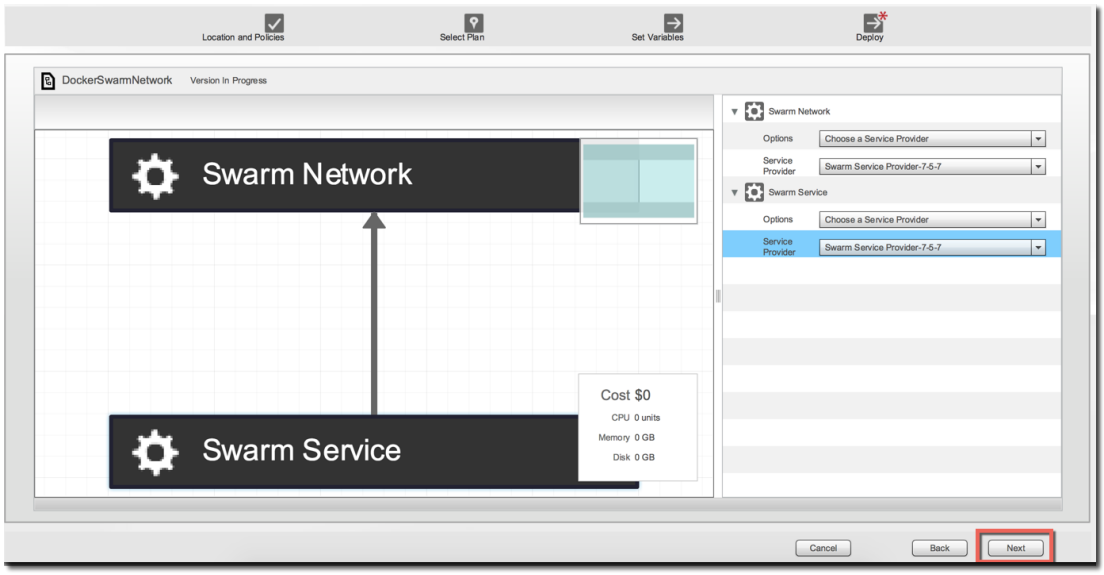
10. Click **OK** to save your settings.
11. Next, to configure the Swarm Network service, click the **Settings** icon next to **Swarm Network**.
12. In the Edit Service dialog box, click **Asset Properties**.



13. In the Edit Service, dialog box, configure the following properties:



14. Click **OK** to save your changes.
15. click **Advanced Deploy**.
16. Complete all the steps in the **Advanced Deployment** wizard.
17. Make sure that the appropriate service provider is selected for both Swarm services in the blueprint, and then click **Next**.



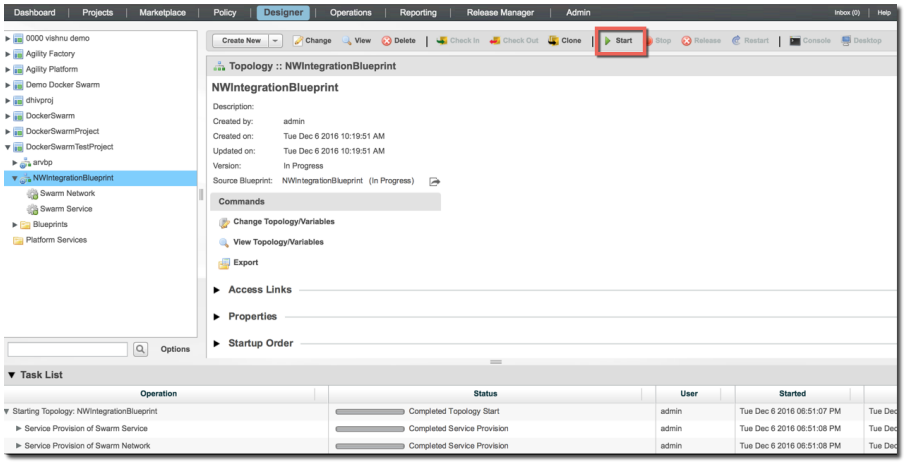
18. On the **Summary of deployment selections** page, review your deployment selections, and then click the **Deploy this blueprint** icon.

19. After you have successfully deployed your blueprint, in the navigation panel, expand your project, and then select the Swarm topology that you just created.

20. Click the **Start** button at the top of the page.

21. When prompted to confirm that you want to start this topology, click **Yes**.

You can view the progress in the task panel as your services are being provisioned.

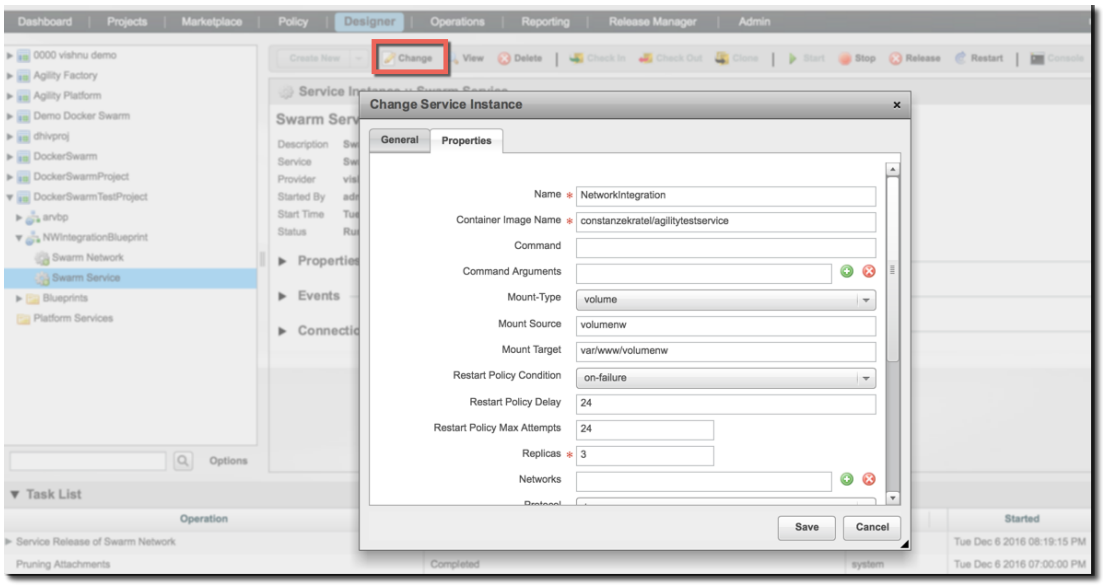


Reconfiguring a Swarm Service

After you have created and deployed a blueprint for a Swarm service, and started your service, you can reconfigure the Swarm service directly from the context panel in the **Designer** perspective.

To reconfigure a Swarm service:

1. In the **Designer** perspective, from the asset tree, click the service you want to reconfigure.
2. On the top of the context panel click **Change**.
3. In the Change Service Instance dialog box, click the **Properties** tab.



4. Update one or more of the properties in the dialog box, for example the number of replicas, and then click **Save**.

To verify that your Swarm service has been successfully updated, log into the Docker Swarm cluster and type `docker-service ls`. Copy the id of the service you modified, and then type `docker-service inspect <id>`. All the configuration information is displayed in JSON format. By looking at the JSON output you can verify if your changes have been successfully deployed.

Important: If you reconfigure a Swarm service multiple times, the Agility Platform will display an error message that says Update out of sequence. This error message is caused by a bug in Docker.

Note: Docker does not support reconfiguring of networks and volumes in a Swarm service. If you attempt to reconfigure a network or volume, you will receive an error message that says **changing network/volume in service is not supported**. This message is generated by Docker Swarm.

Pulling Private Images from Docker Hub or a Trusted Registry

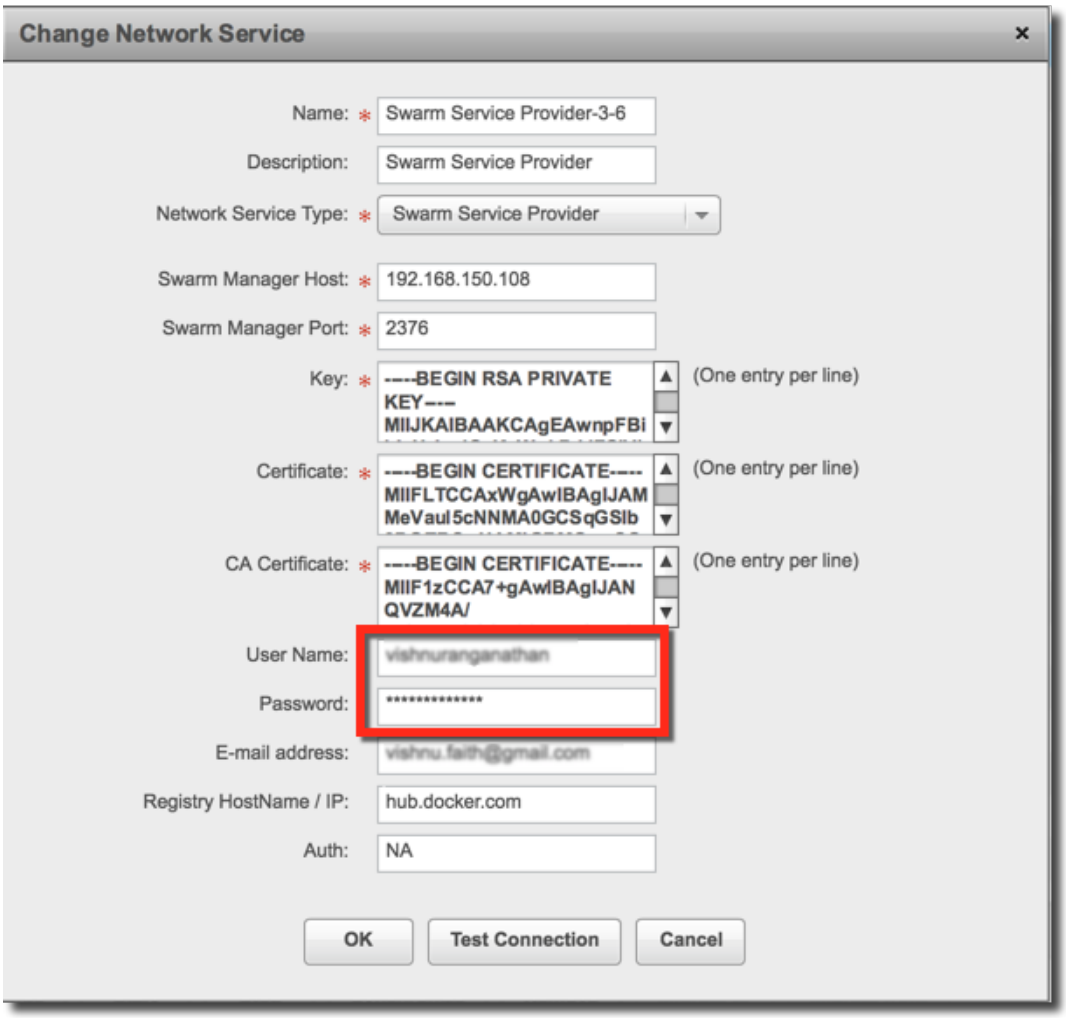
When configuring your Swarm service you can specify a container image that has been uploaded to Docker Hub or any other hosted trusted registry. Even if your Docker Hub account is public, you can pull public, as well as private images from Docker Hub.

To successfully pull a private image from a remote registry, such as Docker Hub, you need to make sure to supply your credentials when you configure the Swarm network service and add it to your Cloud provider.

Note: The Agility Platform currently does not show any errors when you try to pull a private image without supplying the appropriate credentials. This behavior is due to the Swarm service not throwing any errors when users try to pull private containers without credentials. When you deploy your topology, the Swarm service will start, but the container inside Swarm will not start because it is unable to pull a private image without the appropriate credentials.

To add your Docker Hub credentials to your Swarm network service configuration

1. In the Agility Platform**Admin** perspective, navigate to the cloud provider you are using.
2. Under the cloud provider, click **Network Services**.
3. Click on your network service provider.
4. In the Change Network Service Dialog box, fill in the appropriate information for the following fields:
    - **User Name** - Specifies the user name that you use to sign into Docker Hub.
    - **Password** - Specifies the password that you use to sign into Docker Hub.
    - **Email address** - Add the email address that you use to sign into Docker Hub. If the information is not available, add **NA**.
    - **Registry HostName/IP** - Add the name/IP address of the host, for example: `hub.docker.com`. If the information is not available, add **NA**.
    - **Auth** - Add **NA** in this field.



Note: Even though they are not marked as mandatory in the Agility Platform user interface, the **User Name** and the **Password** fields are required for pulling private images from a remote location, such as Docker Hub.

5. Click **Test Connection**, and then click **OK**.

Note: When the service is starting, Swarm will first try to pull from the public Docker Hub at hub.docker.com. However, if you have specified a private image, it will look for the credentials and will try to authenticate. If you have added your credentials to the network service provider configuration, it will successfully pull the image. After Swarm has started, you can verify that the container image has been pulled by connecting to your Swarm cluster, and typing `Docker service ls`. If the image has been successfully pulled, you will be able to see all the images and their replicas. If the image was not successfully pulled, you will not be able to see any replicas.

About this Guide

The Agility Platform™ communicates with a variety of cloud providers, storage repositories, and network services in order to accomplish complete end-to-end provisioning of applications, platforms, and services. By leveraging an adapter-based framework, DXC Technology has created and supports a number of adapters to third-party products and services. These adapters provide a mechanism for taking Agility Platform requests and converting them into formats understandable by the target products and services.

Important: If the Release Notes documents provided with the DXC Technology Agility Platform contain details that differ from the information in this guide, the information in the release notes supersedes the information in this guide.

Note: Most Agility Platform user guides are available in an Adobe Acrobat Reader Portable Document Format (PDF) in the customer area of the DXC Technology FTP site:

ftp://ftp-aus.servicemesh.com

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