Amazon AppStream 2.0: SOLIDWORKS Deployment Guide

Build an Amazon AppStream 2.0 environment to stream SOLIDWORKS to your users

June 2018

https://aws.amazon.com/appstream2/
Welcome

This guide describes how to deploy and stream SOLIDWORKS desktop application for your company (in this example, DemoCo) by using Amazon AppStream 2.0, a fully managed, secure application streaming service that runs in the AWS Cloud.

What you’ll accomplish:

- Provision an Amazon virtual private cloud (Amazon VPC) to provide an isolated virtual network infrastructure within the AWS Cloud. Your AppStream 2.0 resources will use this environment.

- Provision a SOLIDWORKS license server in your VPC.

- Use the AWS Management Console to perform the basic administrative tasks required to build an AppStream 2.0 environment. Specifically, you’ll:
  
  1. Install and configure SOLIDWORKS for streaming using an image builder.
  
  2. Provision a fleet of instances to stream your applications. The fleet will use the Graphics Design instance type and adhere to scaling policies to match the number of users that you want to be able to stream concurrently.
  
  3. Provision a stack to create a web portal from which users can stream your applications.
  
  4. Configure persistent storage that users can access across application streaming sessions.
  
  5. Create a user pool to manage users who access your streaming applications.

What you need before starting:

- **An AWS account:** You need an AWS account to use AppStream 2.0 and other AWS services. For information about how to sign up for and activate an AWS account, see Appendix A.
- **A current email address:** During the user configuration process for your AppStream 2.0 environment, AWS sends you two emails. You must use these emails to complete the process.

- **Skill level:** You do not need prior experience with AWS to complete these exercises. A basic understanding of desktop computing is helpful but not required.

- **A SOLIDWORKS account.** This account is required to log in and download SOLIDWORKS application installers. If you don't have a SOLIDWORKS account, you can create one from [https://customerportal.solidworks.com](https://customerportal.solidworks.com).

- **An active SOLIDWORKS Network License (SNL).** This license is required for the SOLIDWORKS products that you want to import into AppStream 2.0. Contact your SOLIDWORKS reseller or SOLIDWORKS sales team for more information.
Create a streaming URL
Enable persistent storage for the stack
Provide stack details and associate the stack with a fleet
Create an AppStream 2.0 stack and a streaming URL
Step 9: Manage user access with an AppStream 2.0 user pool ................................................................. 35
  Create a user ............................................................................................................................................ 35
  Assign a stack to the user ......................................................................................................................... 36

Step 10: Test the end user authentication and application streaming experience ............................................ 37

Step 11: Take the next step with AppStream 2.0 .......................................................................................... 38

Appendix A: Create and activate an AWS account ...................................................................................... 41
  Create your AWS account ......................................................................................................................... 41
  Add a payment method ............................................................................................................................. 42
  Verify your phone number ....................................................................................................................... 42
  Choose an AWS Support plan .................................................................................................................. 42
  Watch for three AWS account confirmation emails .................................................................................... 43

Appendix B. Manually create and configure network resources ..................................................................... 44
  AppStream VPC requirements .................................................................................................................. 45
  Allocate an Elastic IP address .................................................................................................................. 45
  Create a VPC by using the VPC Wizard ................................................................................................... 45
  Add a second private subnet ..................................................................................................................... 47
  Modify the subnet route tables ................................................................................................................ 48

Appendix C. Configure Chrome .................................................................................................................. 51

Appendix D. Install Notepad++ .................................................................................................................. 54

Appendix E. Clean up your AppStream 2.0 resources ................................................................................. 55
  Stop and delete your image builder ......................................................................................................... 55
  Revoke stack permissions for users in the user pool .............................................................................. 55
  Disassociate your fleets from your stack and delete your stack ................................................................. 55
  Stop and delete your fleet ......................................................................................................................... 55

Appendix F. Additional resources ............................................................................................................... 57
Step 1. Sign in to the AWS Management Console and select an AWS Region

If you do not have an AWS account, you must first complete the steps in Appendix A.

1. Sign in to the AppStream 2.0 console at

2. Type your email address or your AWS account ID, and choose Next.

3. Type your AWS account password, and choose Sign In.

4. In the menu in the upper right corner of the console, select the AWS Region for your environment. AWS currently hosts services in 18 different geographical areas.

5. Select one of the following seven Regions in which AppStream 2.0 is available:

   Figure 1: Available AWS Regions for AppStream 2.0.

Step 2: Create network resources

In this section, you will create an Amazon virtual private cloud (VPC) and other network resources required for your AppStream 2.0 environment. The following steps use a
template in AWS CloudFormation to automatically create and configure the necessary network resources. To manually create and configure network resources, see Appendix B.

1. Make sure that you are signed in to the AWS Management Console.

2. In the following list of regional choices, open the link associated with the AWS Region in which you want to build your AppStream 2.0 environment.
   - US East (N. Virginia)
   - US West (Oregon)
   - EU (Frankfurt)
   - EU (Ireland)
   - Asia Pacific (Singapore)
   - Asia Pacific (Sydney)
   - Asia Pacific (Tokyo)

   The AWS CloudFormation console displays the URL of a template that is used to create your network resources and the name of the resulting AWS CloudFormation stack.

3. In the bottom right corner of the window, choose Create. AWS CloudFormation starts creating the resources and displays a status message to indicate progress.
4. When the creation process completes, usually within five minutes, the AWS CloudFormation console displays the status `CREATE_COMPLETE`.

5. Navigate to the Amazon VPC console at https://console.aws.amazon.com/vpc/.

6. In the navigation pane, under **Virtual Private Cloud**, choose **Your VPCs**. In the list of VPCs, you should see the following VPC that was automatically created:

   ![Figure 3: VPC created by AWS CloudFormation.](image)

   **Note:** The VPC ID value will differ for your VPC.

7. In the navigation pane, under **Virtual Private Cloud**, choose **Subnets**. In the list of subnets, you should see the following subnets that were automatically created:
Figure 4: Subnets created by AWS CloudFormation.

Note: The Subnet ID and VPC values will differ for your subnets.

8. You have now successfully created your network resources by using AWS CloudFormation. You can proceed to Step 3.

Step 3: Set up the SOLIDWORKS license server

We will now deploy the SOLIDWORKS license server by using an EC2 instance. SOLIDWORKS applications running on your AppStream 2.0 streaming instances will contact this license server for license activation.

In this section, you will:

- Configure an EC2 instance that will function as the SOLIDWORKS license server.
- Configure VPC Security Group rules for the license server instance.
- Configure another EC2 instance that will be used to remotely administer the license server.
- Install and configure the SOLIDWORKS license server.
- Configure Windows Firewall on the license server instance to open up the license communication ports.

Configure an EC2 instance that will function as the SOLIDWORKS license server

1. Open the Amazon EC2 console at https://console.aws.amazon.com/ec2/.
2. Click **Launch Instance**.

3. In **Step 1: Choose an Amazon Machine Image (AMI)**, select the **Microsoft Windows Server 2012 R2 Base** image.

4. In **Step 2: Choose an Instance Type**, select **t2.medium** as the instance type, and then click **Next: Configure Instance Details**.

5. In **Step 3: Configure Instance Details**, choose the following:
   
   a. **Network** – AppStream2 VPC
   
   b. **Subnet** – AppStream2 Private Subnet1

6. Leave the remaining options set to their default values, and then click **Next: Add Storage**.

7. In **Step 4: Add Storage**, in **Size (GiB)**, enter 60, and then click **Review and Launch**.

8. In **Step 7: Review Instance Launch**, confirm that the instance configuration details are correct, and then click **Launch**.

9. In **Select an existing key pair or create a new key pair**, choose **Create a new key pair**. Provide a name for the instance key pair. Click **Download Key Pair**, download the key pair file and store it securely for future reference.

10. Click **Launch Instances**.

11. Click **View Instances** to view the newly launched EC2 instance. This instance will be used as the SolidWorks license server and is provisioned in the private subnet.

**Configure security group rules for the license server instance**

1. On the EC2 Dashboard, in the navigation pane, select **Instances**, and then select the instance that you just launched.
2. On the **Description** tab for the instance, click the name of the security group that is associated with the instance. The name of the security group is formatted as a link. Clicking this link opens the details page for the security group.

3. On the details page for the security group, click the **Inbound** tab, and then click **Edit**. Enter the first rule shown in the following screenshot, and then click **Save**.

![Figure 5: Inbound Security Group rules for the license server](image)

This rule allows SOLIDWORKS applications to communicate with the SOLIDWORKS license server over TCP ports 25734 and 25735.

**Note**: Do not configure the second security group rule for now. You will configure this rule after you launch the jump host.

4. Click the **Outbound** tab, and confirm that the outbound rule is configured as shown in the following screenshot.

![Figure 6: Outbound Security Groups rules for the license server](image)

Configure an EC2 instance that will act as the jump host to enable remote license server administration

1. Repeat the steps in the “Configure an EC2 instance that will function as the SolidWorks license server” procedure to launch a second instance, but with the
following changes for step 5 of the procedure (which describes how to select the instance subnet on the **Configure Instance Details** page):

- In **Subnet**, select the public subnet (*AppStream2 Public Subnet1*).
- In **Enable for Auto-assign Public IP**, select **Enable**.

You will use this instance to connect to the SOLIDWORKS license server that is deployed in the private subnet.

2. On the EC2 Dashboard, in the navigation pane, select **Instances**, and then select the new instance that you just launched.

3. On the **Description** tab for the instance, click the name of the security group that is associated with the instance.

4. On the details page for the security group, note the ID that is displayed in the Group ID column. You will need to enter this ID later in the procedure.

5. On the navigation pane, click **Instances** to return to the list of EC2 instances.

6. Select the SOLIDWORKS license server instance.

7. On the **Description** tab for the instance, click the name of the security group that is associated with the instance.

8. On the details page for the security group, click the **Inbound** tab, click **Edit**, and then click **Add Rule**.

9. Enter the second rule shown in the following screenshot.

   - In the **Source** box, enter the security group ID that you noted in step 4 (the ID shown in the screenshot is an example ID).
   - In the **Source** list, select **Custom**.
This rule adds one more security group rule to the security group associated with the license server instance. The rule enables you to use the jump host to establish a remote connection to the license server so that you can remotely administer the server.

10. Use the key pair file that you downloaded to your local computer earlier to obtain the password for the license server and the jump host. To do this, complete the following steps for each instance.

   a. In the navigation pane, select **Instances**, select the instance, choose **Connect**, and in **Connect To Your Instance**, choose **Get Password**.

   b. In **Key Pair Path**, click **Browse**, and then locate the file that contains the key pair associated with the instance.

   c. Click **Decrypt Password**. Save the decrypted password to your local computer for later use.

   d. Download the RDP connection file to your local computer so that you can use it to start a remote connection.

11. On your local computer, open an RDP client to establish a remote connection to the jump host.

12. On the jump host, open an RDP client to establish a remote connection to the SOLIDWORKS license server.
Install and configure the SOLIDWORKS License Server Manager

1. After you connect to the SOLIDWORKS license server, log in into your SOLIDWORKS customer portal at https://customerportal.solidworks.com.

2. Download the SOLIDWORKS 2018 application from the Downloads and Updates page.

3. Extract the downloaded zip file to a known file path and start the SolidWorks Installation Manager.

4. For the type of installation, select Server Products, and then select Install SolidNetWork License Manager.

5. On the SolidNetWork License Manager Options page, specify the SolidWorks License serial number and SolidNetWork License Manager installation path.

6. On the summary page, click Install Now to complete the SolidWorks Installation Manager process.

7. To activate SolidNetWork licensing, do the following:
   a. Start SolidNetWork License Manager.
   b. When prompted to activate licensing, click Yes.
   c. On the SolidNetWork License Manager information screen, select A firewall is in use on this server, and specify the default values for the port number (25734, 25735).
   d. On the Activate Your SolidWorks Product screen, select the Internet procedure, and then click Next.
   e. Click Finish.

Configure Windows Firewall to open up the license server ports

To enable the license server to communicate with client computers, complete the following steps to add exception rules to open the required ports on Windows Firewall.
1. Select **Start -> Control Panel -> Security and System -> Windows Firewall.**

2. In the left pane, select **Advanced settings.**

3. Right-click **Inbound Rules,** and then select **New Rule.**

4. Select **Port,** and then click **Next.**

5. Make sure that **TCP** is selected, enter port **25734,25735** in **Specific local port,** and then click **Next.**

6. Select **Allow the connection,** and then click **Next.**

7. Enter a name for the rule, and then click **Finish.**

**Step 4: Create an AppStream 2.0 image builder**

AppStream 2.0 uses EC2 instances to stream applications. You launch instances from base images, called **image builders,** which AppStream 2.0 provides. To create your own custom image, you connect to an image builder instance, install and configure your applications for streaming, and then create your image by creating a snapshot of the image builder instance.

To install and configure applications to stream to your users, you must create an image builder instance as described in the following procedure.

**Deploy an image builder instance to install applications**


2. If you have not previously configured any AppStream 2.0 settings, the following page appears:
Figure 8: The AppStream 2.0 first experience page.

**Note**: If the AppStream 2.0 navigation page appears instead, skip to step 5.

3. Choose **Get started**.

4. In the lower right corner of the page, choose **Skip** (this guide walks you through a different process for getting started with AppStream 2.0).

Figure 9: AppStream 2.0 getting started options.

5. In the navigation pane, choose **Images, Image Builder, Launch Image Builder**.

6. In the **Step 1: Choose Image** window, in the list of images, select the image builder with the name `Graphics-Design-Image-Builder-mm-dd-yyyy`, where `mm-dd-yyyy` represents the most recent date. Base images include the latest updates to
Microsoft Windows and the AppStream 2.0 agent software. You use this base image to create a custom image that includes your own applications.

7. At the bottom of the page, choose **Next**.

8. In **Step 2: Configure Image Builder**, the following image builder configuration options are displayed:

9. Type the following information and then choose **Review**.

**Configure image builder fields**

<table>
<thead>
<tr>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>Provide a unique name identifier for the image builder, such as <em>DemoCo_Image_v1_mmddyyyy</em>, using any of the following characters: a-Z,0–9,_,.</td>
</tr>
<tr>
<td>Display Name</td>
<td>Provide an optional name, such as <em>DemoCo Image v1 April 2018</em>, to be displayed in the console for easier reference and readability.</td>
</tr>
<tr>
<td>Instance Family</td>
<td>Choose <a href="#">Graphics Design</a></td>
</tr>
<tr>
<td>Instance Type</td>
<td>Select <code>stream.graphics-design.xlarge</code> from the list of available instance types.</td>
</tr>
<tr>
<td></td>
<td>Choose <strong>Next</strong> to continue to <strong>Step 3: Configure Network</strong> and then type the following information.</td>
</tr>
<tr>
<td>Default Internet Access</td>
<td>Make sure that this option is not selected.</td>
</tr>
<tr>
<td>VPC</td>
<td>Select the option corresponding to <strong>AppStream 2 VPC</strong>.</td>
</tr>
<tr>
<td>Subnet</td>
<td>Select the subnet with the IP address range 10.0.1.0/24 (<a href="#">AppStream2 Private Subnet</a>).</td>
</tr>
<tr>
<td>Security group(s)</td>
<td>Accept the default security group listed.</td>
</tr>
<tr>
<td>Active Directory Domain</td>
<td>Do <strong>not</strong> configure any options.</td>
</tr>
</tbody>
</table>

10. Choose **Review**, and confirm the details for the image builder. To change the configuration for any section, choose **Edit** and make your changes.
11. After you finish reviewing the configuration details, choose **Launch**. If an error message notifies you that you don’t have sufficient limits to create the image builder, submit a limit increase request through the AWS Support Center. For more information, see [AWS Service Limits](#).

12. The image builder creation process takes about 15 minutes to complete. During this process, the status of the image builder displays as **Pending** while AppStream 2.0 provisions the necessary resources.

13. Click the **Refresh** icon periodically to update the image builder status. After the status changes to **Running**, the image builder is ready to use and you can create a custom image.

   **Note:** Charges accrue for an image builder instance while it is running, even if no user is actively connected. You can stop or delete the image builder at any time. No user fees are incurred when users connect to an image builder. For more information, see [AppStream 2.0 Pricing](#).

**Step 5: Connect to the image builder and install applications**

Now that you have provisioned an image builder, you can use it to install and configure the applications to stream to users. First, you must establish a remote connection to the instance to install and configure your applications.

**Connect to the image builder instance**


2. In the navigation pane, choose **Images, Image Builder**.

3. Select the image builder instance that you created earlier *(DemoCo_Image1_mmddyyyy)*. Verify that its status is **Running** and choose **Connect**.
Figure 10: Choosing an image builder instance.

**Note:** If the status is **Stopped**, select the instance, and choose **Actions, Start**. Click the **Refresh** icon periodically to update the instance list until the status is **Running**.

4. The new browser tab opens, displaying options for logging into the image builder instance. Choose **Local User, Administrator**.

Figure 11: The image builder instance login options window.

**Note:** If a new browser tab does not open, configure your browser to allow pop-ups from https://console.aws.amazon.com/.

5. After a few moments, you are connected to the image builder instance with administrator rights.

Add the license server hostname to the image builder host list

The next step is to map the IP address of the computer name of the SOLIDWORKS license server to the hostname list of the image builder. This enables the image builder to communicate with the license server.

1. Log in into the license server EC2 instance by using the jump host.
2. After you are connected to the license server, open **Command Prompt**, type `ipconfig` and then press ENTER. Note the IP address of the license server.

3. At the command prompt, type `hostname` and then press ENTER. Note the computer name of the license server.

4. Switch to the AppStream 2.0 image builder. On the image builder, launch **Powershell** using the **Run as Administrator** option.

5. Browse to `C:\Windows\system32\drivers\etc` and open the **hosts** file by using the command `notepad hosts`.

6. Add the IP address and computer name to the hosts file as shown in the following screenshot, and then save the file.

![Hosts file screenshot]

**Install and configure SOLIDWORKS applications**

1. Open Firefox from the image builder desktop and browse to the SOLIDWORKS customer portal at [https://customerportal.solidworks.com](https://customerportal.solidworks.com).

2. Browse to the **Downloads and Updates** page and download the SOLIDWORKS Installation Manager to your image builder desktop.

3. After the download is complete, open the application installer and extract the application to a local folder.
4. Browse to the extracted folder and launch the Setup application.

5. On the welcome screen, select **Individual (on this computer)** for **Type of installation**, and then choose **Next**.

6. On the serial number screen, select the products that you want to install. For each product, provide the SOLIDWORKS license key, and then choose **Next**.

7. Review the information provided. On the review page, you can edit the products you want to install, the folder location to which SOLIDWORKS application binaries will be downloaded, and the installation folder. After you review the information, choose **Install Now**.

**Disable Internet Explorer Enhanced Security Configuration**

SOLIDWORKS applications use Internet Explorer to open http links embedded in the applications. When you launch one of these links, Internet Explorer displays a warning message for every webpage that it opens. This behavior is due to the Internet Explorer Enhanced Security Configuration, a security setting of IE that blocks access to web content and application scripts for security reasons. We can safely disable this setting to enable SOLIDWORKS function properly. To disable this feature for AppStream 2.0 users, do the following.

6. Connect to your image builder as **Administrator**.

7. Open **Server Manager** from the Windows Task bar.

8. Choose **Local Server -> IE Enhanced Security Configuration**.

9. Choose Off option for both Administrators and Users.
10. Choose **Admin Commands** -> **Switch User** -> **Template User** to switch to Template User account.

11. Once you are logged into the Template User account, launch **Internet Explorer**.

12. Choose **Settings** -> **Internet Options** from the top right menu of Internet Explorer. In the prompted dialog, choose **Advanced**.

13. Click the **Reset** button. Click **Reset** again in the prompted dialog. Close **Internet Explorer**.

14. Switch to **Administrator** account. Launch **Image Assistant**. Choose **Next** to proceed to the Configure step. From this tab, click **Save settings**. This will save the template user settings as default user settings.

15. Switch to test user. Launch Internet explorer. Confirm that the message “Internet Explorer Enhanced Security configuration is not enabled” is displayed in the home page. Browse to any website to confirm that IE is not displaying any blocking prompts.
Step 6: Use Image Assistant to create an AppStream 2.0 image

At this point, you have launched an image builder instance and installed SOLIDWORKS on the image builder. Now you’ll prepare the applications for streaming, optimize them for streaming performance, and create your image.

In this section, you’ll do the following:

- Create an application catalog by using Image Assistant.
- Test the applications by using a local user account that has the same permissions that end users will have in their streaming sessions.
- Optimize the applications’ launch performance.
- Configure the image.
- Finish creating the image.

Create your AppStream 2.0 application catalog

The process of creating an AppStream 2.0 application catalog includes specifying the name, display name, executable file to launch, and icon to display for each application that you plan to stream.

1. From the image builder desktop, open Image Assistant.

2. In the Add Applications to Image dialog box, on the Add Apps tab, choose Add App.
3. Navigate to the location of the SOLIDWORKS application executable, select the application executable, and then choose **Open**.

4. In **Edit Application Setting**, type the following information and choose **Save**.

<table>
<thead>
<tr>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>SOLIDWORKS_x64_vW.X.Y.Z (where W.X.Y.Z matches the version number of the Chrome installer)</td>
</tr>
<tr>
<td>Display Name</td>
<td>The name of the application that is displayed to end users. Type SOLIDWORKS.</td>
</tr>
<tr>
<td>Launch Path</td>
<td>The location of your application executable file. Accept the default value.</td>
</tr>
<tr>
<td>Icon Path</td>
<td>Accept the default value of C:\ProgramData\Amazon\Photon\AppCatalogHelper...</td>
</tr>
<tr>
<td>Launch Parameters</td>
<td>Leave this blank.</td>
</tr>
<tr>
<td>Working Directory</td>
<td>Leave this blank.</td>
</tr>
</tbody>
</table>

5. Now that you have added SOLIDWORKS to your catalog, choose **Next**.
Test your applications by using a local user account
An image builder includes a test user account that enables you to test your applications by using the same policies and permissions as your users. Follow these steps to confirm that your applications open correctly.

1. In the **Test** tab, choose **Switch User, Test User**.
   You are now logged into the same Windows Server 2012 R2 instance as a local user who has regular (non-administrative) user rights.

2. Open Image Assistant. In **Test Applications**, SOLIDWORKS application that you added are displayed.

3. Choose the application to open it.

4. After SOLIDWORKS completely opens and loads fully, close the application. The application test verification is now complete.

5. Choose **Switch User**.

6. On the **Local User** tab, choose **Administrator**.

7. On the Image Assistant **Test** tab, choose **Next**.

Optimize the launch performance of your applications
During this step, Image Assistant opens your applications one after another, identifies their launch dependencies, and performs optimizations to ensure that applications launch quickly.

1. On the **Optimize** tab, choose **SOLIDWORKS, Launch**.

2. Wait for SOLIDWORKS to completely start, as prompted by a message in the application.

3. After you complete the first run experience for the application and verify that it functions as expected, choose **Continue**.

Configure the image
1. On the **Configure Image** tab, type the following information.
<table>
<thead>
<tr>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
</table>
| Name                        | The unique name identifier for the image, such as `DemoCo_Image_Chrome_Notepad_v1_mmddyyyy`, using any of the following characters: a-Z,0–9,-,_,.  
Note: The name cannot begin with "Amazon," "AWS," or "AppStream." |
| Display Name                | A user-friendly name to display in the console                                                                                         |
| Description                 | An optional description for the image: for example, `Image v1 created by (your initials or name) on mm/dd/20yy.`                          |
| Always use latest agent     | Leave this check box selected so that streaming instances that are launched from your image always include the latest AppStream 2.0 features, performance improvements, and security updates. For more information, see Amazon AppStream 2.0 Agent Version History. |
| version                     |                                                                                                                                         |

**Finish creating the image**

Complete the following steps to disconnect from the remote session and start the image creation process.

1. Review the image details, and choose **Disconnect and Create Image**.
2. The remote session disconnects within a few moments. When the Lost Connectivity message appears, close the browser tab.

![Lost connectivity](image.png)

*Figure 13: The Lost connectivity message indicating that the image creation process has started.*

3. Return to the Amazon AppStream 2.0 console and choose Images, Image Registry. While your image is being created, the image status in the image registry of the console appears as Pending. While your image is being created, you cannot connect to it.

4. Click the Refresh icon periodically to update the status. Image creation takes about 20 minutes. After your image is created, the image status changes to Available and the image builder is automatically stopped.

**Note:** To make changes to your image, such as adding other applications or updating existing applications, you must create a new image. To do so, restart and reconnect to the image builder, make your changes, and then repeat the Image Assistant process to create a new image that includes the changes.

**Step 7: Provision a fleet**

An AppStream 2.0 fleet defines the hardware, network, Active Directory (if applicable), and scaling configuration for your application streaming infrastructure. For more information, see Amazon AppStream 2.0 Stacks and Fleets.

In this section, you’ll do the following:

- Provide details for your fleet.
- Choose an image.
- Configure the fleet.
- Configure the network.

**Provide fleet details**


2. In the navigation pane, choose **Fleets, Create Fleet**.

3. For **Step 1: Provide Fleet Details**, type the following text and choose **Next**.

<table>
<thead>
<tr>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>The unique name identifier for the fleet, such as <em>DemoCo_Fleet_v1_timestamp</em>, using any of the following characters: a-Z,0-9,-,_.&lt;br&gt;Note: The name cannot begin with &quot;Amazon,&quot; &quot;AWS,&quot; or &quot;AppStream.&quot;</td>
</tr>
<tr>
<td>Display Name</td>
<td>The name displayed in the console, such as <em>DemoCo Fleet v1 April 2018</em>.</td>
</tr>
<tr>
<td>Description</td>
<td>An optional description for the fleet. For example, <em>Fleet v1 created by (your initials or name) on mm/dd/20yy</em>.</td>
</tr>
</tbody>
</table>

**Choose an image**

For **Step 2: Choose an image**, choose the image that you created, scroll to the bottom of the page, and then choose **Next**.

**Configure the fleet**

1. For **Step 3: Configure fleet**, in **Choose instance type**, you define the hardware configuration for each of the instances that make up your fleet. Because you created the image by using the Graphics Design family, the instance type is already populated. However, you can select any of the four instance type options that are presented.

2. For this exercise, select the **Graphics Design** instance family, and then choose **stream.graphics-design.xlarge**. For more information, see [Amazon AppStream 2.0 Instance Families](https://console.aws.amazon.com/appstream2).
3. Under **Fleet Type details**, choose a fleet type that suits your needs. The fleet type determines the availability of streaming instances and affects your costs. You can choose either of the following:

- **Always-on**: Instances run all the time, even when no users are streaming applications. When this option is selected, instances are immediately available for the next user to connect to immediately.

- **On-Demand**: Instances run only when users are streaming applications. Idle instances that are available for streaming are in a stopped state. When this option is selected, a user must wait for one to two minutes for an instance to start up.

For this exercise, select the **On-Demand** option.

4. Under **User session details**, define the maximum amount of time that users can be connected to streaming sessions and how long streaming sessions should remain active after users disconnect.

   - **Maximum session duration** defines how long user streaming sessions can remain active. If users are still connected to a streaming session five minutes before this limit is reached, they are prompted to save any open documents before being disconnected. Choose **8 hours**.

   - **Disconnect timeout** defines how long user streaming sessions can remain active after users are disconnected. If users try to reconnect to the streaming session after a disconnection or network interruption within this time interval, they are connected to the previous session. After the disconnect timeout expires, the session is terminated, and the user must start a new session to reconnect. Leave the default setting of **15 minutes**.

5. Under **Fleet capacity**, set **Minimum capacity** to 2 and **Maximum Capacity** to 4.

**Notes:**

- Capacity is defined in terms of the number of instances within a fleet and, consequently, every unique user streaming session that is served by a separate instance.
• The minimum capacity for your fleet is the minimum number of users who are expected to be streaming at the same time.

• The maximum capacity for your fleet is the maximum number of users who are expected to be streaming at the same time.

6. Choose Next.

Configure the network

1. For Step 4: Configure Network, make sure that the Default Internet Access check box is not selected. This option does not need to be selected because you already configured a VPC with a NAT gateway to provide internet access.

2. For VPC, select vpc-xxxxxxx (AppStream2 VPC).

3. For Subnet 1, choose subnet-xxxxxxx | (10.0.1.0/24). This is the AppStream2 Private Subnet1.

4. For Subnet 2, choose subnet-xxxxxxx | (10.0.2.0/24). This is the AppStream2 Private Subnet2.

5. Choose Next.

6. Confirm the fleet configuration details. To change settings for any section, choose Edit, and make the needed changes. After you finish reviewing the configuration details, choose Create.

7. In the pricing acknowledgement dialog box, select the acknowledgement check box, and choose Create to begin provisioning your fleet with the initial set of running instances.
Figure 14: The AppStream 2.0 streaming instance pricing acknowledgement dialog box.

**Note:** If an error message notifies you that you don’t have sufficient limits to create the fleet, submit a limit increase request to the AWS Support Center. For more information, see Amazon AppStream 2.0 Service Limits.

Fleet provisioning usually takes 10 minutes to finish. While your fleet is being created and fleet instances are provisioned, the status of your fleet displays as **Starting** in the Fleets list. Choose the **Refresh** icon periodically to update the fleet status until the status is **Running**.

8. After the status changes to **Running**, the fleet is available and you can use it to create a stack.

**Step 8: Create an AppStream 2.0 stack and a streaming URL**

An AppStream 2.0 stack consists of a fleet, user access policies, and storage configurations. You create a stack to start streaming applications to users.

In this section, you’ll do the following:

- Provide details for your stack and associate your stack with a fleet.
- Enable persistent storage for the stack.
- Create a streaming URL.
Provide stack details and associate the stack with a fleet


2. In the navigation pane, choose **Stacks, Create Stack**.

3. For **Step 1: Stack Details**, type the following information and choose **Next**.

<table>
<thead>
<tr>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name</td>
<td>The unique name identifier for the stack, such as DemoCo_Stack_mmdyyyy, using any of the following characters: a-Z,0–9,-,. Note: The name cannot begin with &quot;Amazon,&quot; &quot;AWS,&quot; or &quot;AppStream.&quot;</td>
</tr>
<tr>
<td>Display Name</td>
<td>The name displayed in the console, such as DemoCo Stack April 2018.</td>
</tr>
<tr>
<td>Description</td>
<td>An optional text box where you can enter details of the stack:</td>
</tr>
<tr>
<td>Redirect URL</td>
<td>An optional URL to which users are redirected at the end of their streaming session. Type: <a href="https://aws.amazon.com">https://aws.amazon.com</a></td>
</tr>
<tr>
<td>Fleet</td>
<td>Select the DemoCo_Fleet_v1_mmdyyyy fleet that you created.</td>
</tr>
</tbody>
</table>

Enable persistent storage for the stack

1. For **Step 2: Enable Storage**, make sure that the **Enable Home Folders** option is selected. When this option is selected for an AppStream 2.0 stack, users of the stack are presented with a persistent storage folder in their AppStream 2.0 sessions. Data stored by users in their Home Folders is backed up to an Amazon S3 bucket that is automatically created in your AWS account. For more information, see [Persistent Storage with AppStream 2.0 Home Folders](#).
2. Choose Review.

3. Confirm the stack configuration details. To change the settings for any section, choose Edit and make the needed changes. After you finish reviewing the configuration details, choose Create.

After a few moments, the Stacks list reappears. Your stack is listed with a status of Active.

Create a streaming URL

To quickly test application streaming without setting up users, create a temporary URL that can be pasted into a new browser window.

1. In the navigation pane, choose Stacks.

2. For Stacks, select the stack that you just created.

3. Choose Actions, Create streaming URL.

4. In the Create streaming URL dialog box, type the following information and choose Get URL.
<table>
<thead>
<tr>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>User id</td>
<td>An ID for the user of the streaming URL. For this exercise, type DemoCoTestUser1.</td>
</tr>
<tr>
<td></td>
<td>Note: This entry is not tied to Active Directory or an LDAP type of directory service. It is simply an identifier for creating a unique URL.</td>
</tr>
<tr>
<td>Session Expiration</td>
<td>The length of time that this URL is available to use. For this exercise, choose 1 hour.</td>
</tr>
</tbody>
</table>

5. The **Create streaming URL** dialog box refreshes, displaying the user ID that you entered and the URL that AppStream 2.0 generated for the user.

6. Choose **Copy Link** to copy the full URL to the clipboard.

![Create streaming URL dialog box](image)

**Figure 17:** The **Create streaming URL** dialog box.

7. The **Create streaming URL** dialog box refreshes again, confirming that the link was successfully copied to the clipboard. Close the **Create Streaming URL** dialog box.

**Notes:**

- Providing access to an AppStream 2.0 streaming session through a console-generated link as described in this procedure is for testing only.
- In a production environment, several authentication and authorization options are available to provide your users with access to AppStream 2.0. These options include federation through SAML 2.0, the AppStream 2.0 user pool (a built-in identity management feature), and custom identity solutions. For more information, see Setting up SAML and Manage Access with the AppStream 2.0 User Pool.
8. In a browser, open a new tab, paste the streaming URL into the address bar, and press Enter. AppStream 2.0 displays an application catalog page that lists the applications that you have configured for streaming.

9. Choose the SOLIDWORKS icon to stream the SOLIDWORKS application, and confirm that it functions as expected.

**Step 9: Manage user access with an AppStream 2.0 user pool**

An AppStream 2.0 user pool is a built-in identity management feature that you can use to enable users to access their streamed applications. Alternatively, you can use SAML 2.0 to federate through Microsoft Active Directory or any other custom identity solution provider that supports SAML 2.0.

**Note:** This guide describes how to manage user access to AppStream 2.0 with the user pool. For information about configuring third-party SAML 2.0 identity provider solutions to work with AppStream 2.0, see [AppStream 2.0 Integration with SAML 2.0](#).

To enable users in the user pool to open applications after they sign in to the AppStream 2.0 user portal, you must assign each user to at least one stack that contains applications. After you assign the user to a stack, AppStream 2.0 sends an optional notification email to the user with instructions about how to access the stack and a URL. The user can access the stack by using the URL until you delete the stack or unassign the user from the stack.

In this section, you’ll configure an AppStream 2.0 user pool and grant a user access to AppStream 2.0 by doing the following:

- Create a user in the user pool. AppStream 2.0 then sends a welcome email with instructions and a temporary password.
- Assign the stack that you created to the user.

**Create a user**


2. In the navigation pane, choose **User Pool, Create User**.
3. In the Create User dialog box, type the following information and choose Create User.

<table>
<thead>
<tr>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Email</td>
<td>An active email address that you can access.</td>
</tr>
<tr>
<td>First Name</td>
<td>The first name of the user.</td>
</tr>
<tr>
<td>Last Name</td>
<td>The last name of the user.</td>
</tr>
</tbody>
</table>

4. After a few moments, the User Pool list refreshes, and the user is listed and enabled.

![Image: User Pool dashboard showing the newly created user.](image)

*Figure 18: The User Pool dashboard showing the newly created user.*

Assign a stack to the user

1. In the navigation pane, choose User Pool, and select the user that you created.

2. Choose Actions, Assign Stack.

3. In the Assign Stack dialog box, for Stack, select the DemoCo_Stack_mmddyyyy stack that you created earlier.

4. Leave the Send email notification to user option selected.

5. Choose Assign Stack.
6. After a few moments, the User Pool list refreshes. The user that you created appears under User Details with DemoCo_Stack_mmddyyyy as an assigned stack.

![User Pool dashboard](image)

*Figure 19: The User Pool dashboard showing the newly created user with a stack now assigned.*

**Step 10: Test the end user authentication and application streaming experience**

In the previous section, you added a user to the user pool by providing a name and an email address and then assigned a stack to the user. AppStream 2.0 sent an email to the email address after each action. To test the end user experience, sign in to AppStream 2.0 as the user that you created and start a streaming session.

1. Open the first notification email that you received, and open the *Login page* link. The AppStream 2.0 portal sign-in page opens in your browser.
2. Type the email address used for the user that you created and the temporary password that was provided in the email, and then choose Log in.

3. When prompted, type a new password, confirm it, and then choose Set Password. The AppStream 2.0 application catalog page opens, displaying the applications that are available for streaming.

4. Choose an application to begin streaming.

**Step 11: Take the next step with AppStream 2.0**

Congratulations, you have now successfully created an AppStream 2.0 environment to stream applications. Below is an architectural diagram illustrating the AppStream 2.0 environment you created:
This guide provided an introduction to AppStream 2.0 by walking you through basic configuration and deployment exercises for SOLIDWORKS application. To increase your understanding of AppStream 2.0 and take advantage of more features, consider doing the following:

1. Try using different instance types and sizes to match your application’s requirements. For information about the different instance types and sizes available for AppStream 2.0, and their pricing, see [Amazon AppStream 2.0 Pricing](#).

2. Enable single sign-on (SSO) access to your streamed applications through SAML 2.0. When you do this, your users can use their existing credentials to sign into AppStream 2.0 streaming sessions through your own web portal. For more information, see [Single Sign-on Access to AppStream 2.0 Using SAML 2.0](#).

3. Join your AppStream 2.0 fleets and image builders to domains in Microsoft Active Directory. Your users can then benefit from access to Active Directory network resources such as printers and file shares from within their streaming sessions. You can also apply Group Policy settings to your streaming instances and users to meet the needs of your organization. For more information, see [Using Active Directory with AppStream 2.0](#).
4. Configure your fleet scaling policies to increase or decrease the number of instances available to users in response to changes in user demand or according to time of day. For more information, see Fleet Auto Scaling for Amazon AppStream 2.0.

**Important:** Remember to delete the resources that you created in these exercises to avoid further charges to your account. For information about how to delete AppStream 2.0 resources, see Appendix E. For more information about AppStream 2.0 pricing, see Amazon AppStream 2.0 Pricing.
Appendix A: Create and activate an AWS account

If you do not already have an AWS account, complete the following steps to create and activate one. During this process, you do the following:

- Create your AWS account.
- Add a payment method.
- Verify your phone number.
- Select an AWS Support plan.
- Watch for three account confirmation emails.

Create your AWS account

1. In a browser window, open the Amazon Web Services webpage.

2. Choose Create an AWS Account. If you've signed in to AWS recently, you might see Sign In to the Console instead. If Create a new AWS account isn't visible, choose Sign in to a different account, Create a new AWS account.

3. On the Create an AWS Account page, type a valid email address, a password and password confirmation, and an AWS account name.

4. You must note the account name, email address, and password that you choose for your AWS account because you need these credentials to sign in to AWS.

5. Choose Continue.

6. On the Contact Information page, the option to choose a company account or personal account is available. These two account types function identically. For the exercises in this guide, choose Personal Account, and then enter the requested contact information.

7. Review the AWS Customer Agreement, and select the corresponding check box.

8. Choose Create Account and Continue.
**Note:** After you receive an email to confirm that your account is created, you can sign in to your new account by using the email address and password that you provided. However, you must continue with the activation process before you can use AWS services.

**Add a payment method**

On the **Payment Information** page, type the requested information associated with your payment method. If the address for your payment method is the same as the address you provided for your account, choose **Secure Submit**. Otherwise, choose **Use a new address**, type the billing address for your payment method, and then choose **Secure Submit**.

**Verify your phone number**

1. On the **Phone Verification** page, type a phone number that you can use to accept incoming calls.

2. Type the code displayed in the captcha.

3. When you're ready to receive the call, choose **Call me Now**. In a few moments, you'll receive an automated call from AWS that prompts you to enter your PIN to validate the AWS account.

4. When you receive the call, enter the provided PIN on your phone's keypad.

5. After the process is complete, choose **Continue**.

**Choose an AWS Support plan**

On the **Select a Support Plan** page, choose **Basic**. For information about AWS Support, see [AWS Support Features](#).

After you choose a Support plan, a confirmation page indicates that your AWS account is being activated. Accounts are usually activated within a few minutes, but the process may take up to 24 hours. If you attempt to sign in to the AWS Management Console before your account is active, the following message appears:
Watch for three AWS account confirmation emails

When you sign up for your account, you receive three account confirmation emails:

- The first email, with a subject line of “Welcome to Amazon Web Services,” confirms the creation of your AWS account and is sent almost immediately after you verify your phone number.

- The second email, with a subject line of “AWS Support (Basic) Sign-Up Confirmation,” confirms the AWS Support option that you selected during the account creation process.

- The third email, with a subject line of “Your AWS Account is Ready - Get Started Now,” is sent after your AWS account ID is ready to use. After you receive this email, you can access AWS services by using the AWS Management Console.
Appendix B. Manually create and configure network resources

Step 2 of this guide described how to use a CloudFormation template to automatically create and configure the necessary network resources for your AppStream 2.0 environment. To manually create and configure network resources, follow the steps in this appendix. At the end of this appendix, the topology of your “DemoCo” VPC should look similar to the following diagram:

![Diagram of DemoCo VPC architecture](image)

*Figure 23: DemoCo VPC architecture.*

**Note:** The CIDR block assignments for the private subnets might be reversed depending on the availability zones used by the VPC wizard.
AppStream VPC requirements
At a minimum, AppStream 2.0 requires a VPC that includes one public subnet and two private subnets. A public subnet has direct access to the internet through an internet gateway. A private subnet requires a Network Address Translation (NAT) gateway or NAT instance to access the internet.

Allocate an Elastic IP address
Before you create your VPC, you must allocate an Elastic IP address in your AppStream 2.0 region. An Elastic IP address enables your streaming instances to be accessible through an internet gateway.

1. Open the Amazon EC2 console at https://console.aws.amazon.com/ec2.
2. In the navigation pane, under Network & Security, choose Elastic IPs.
3. Choose Allocate New Address and then choose Allocate.
4. Note the Elastic IP address and then choose Close.

![Figure 24: An allocated Elastic IP address.](image)

Create a VPC by using the VPC Wizard
The easiest way to start building your VPC environment is to use the VPC Wizard. The wizard guides you through the process of creating a public subnet, private subnet, NAT gateway, and internet gateway, with the correct route table configurations.

1. Open the Amazon VPC console at https://console.aws.amazon.com/vpc/.
2. In the navigation pane, choose VPC Dashboard, Start VPC Wizard.
3. In **Step 1: Select a VP Configuration**, choose **VPC with Public and Private Subnets**, Select.

![Image]

*Figure 25: Creating a VPC with the VPC Wizard.*

4. In **Step 2: VPC with Public and Private Subnets**, type the following information and then choose **Create VPC**.

<table>
<thead>
<tr>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>IPv4 CIDR block</td>
<td>10.0.0.0/20</td>
</tr>
<tr>
<td>IPv6 CIDR block</td>
<td>Accept the default value: <em>No IPv6 CIDR Block</em></td>
</tr>
<tr>
<td>VPC Name</td>
<td>AppStream2 VPC</td>
</tr>
<tr>
<td>Public subnet’s IPv4 CIDR</td>
<td>Accept the default value: <em>10.0.0.0/24</em></td>
</tr>
<tr>
<td>Availability Zone</td>
<td>Accept the default value: <em>No Preference</em></td>
</tr>
<tr>
<td>Public subnet name</td>
<td>AppStream2 Public Subnet</td>
</tr>
<tr>
<td>Private subnet’s IPv4 CIDR</td>
<td>Accept the default value: <em>10.0.1.0/24</em></td>
</tr>
<tr>
<td>Availability Zone</td>
<td>Accept the default value: <em>No Preference</em></td>
</tr>
<tr>
<td>Private subnet name</td>
<td>AppStream2 Private Subnet1</td>
</tr>
<tr>
<td>Option</td>
<td>Value</td>
</tr>
<tr>
<td>---------------------------------------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>Elastic IP Allocation ID</td>
<td>Click in the text box and select the value that corresponds to the Elastic IP address you created. This address is assigned to the NAT gateway.</td>
</tr>
<tr>
<td>Service endpoints</td>
<td>Choose <strong>Add Endpoint</strong>.</td>
</tr>
<tr>
<td>Service</td>
<td>Select the entry in the list that ends with “s3” (the <code>com.amazonaws.xx-rrrr-x.s3</code> service that corresponds to the region in which the VPC is being created). <strong>Note:</strong> This is not the default value.</td>
</tr>
<tr>
<td>Subnet</td>
<td>Select <strong>Private subnet</strong>.</td>
</tr>
<tr>
<td>Policy</td>
<td>Accept the default value: <strong>Full Access</strong></td>
</tr>
<tr>
<td>Enable DNS hostnames</td>
<td>Accept the default value: <strong>Yes</strong></td>
</tr>
<tr>
<td>Hardware tenancy</td>
<td>Accept the default value: <strong>Default</strong></td>
</tr>
</tbody>
</table>

**Note:** The VPC names and subnet names are for identification purposes only. You can use different names.

5. After a few minutes, when a message in the VPC dashboard notifies you that the VPC is created, choose **OK**.

**Add a second private subnet**

1. In the navigation pane, choose **Subnets**.

2. Select the subnet with the name **AppStream2 Private Subnet1**. On the **Summary** tab, below the list of subnets, make a note of the Availability Zone for this subnet.
3. At the top of the same page, choose Create Subnet. Enter the following information in the Create Subnet dialog box and then choose Yes, Create.

<table>
<thead>
<tr>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Name tag</td>
<td>AppStream2 Private Subnet2</td>
</tr>
<tr>
<td>VPC</td>
<td>Select the VPC with the name AppStream2 VPC.</td>
</tr>
<tr>
<td>Availability Zone</td>
<td>Select an Availability Zone other than the one you are using for AppStream2 Private Subnet1. Selecting a different Availability Zone increases fault tolerance.</td>
</tr>
<tr>
<td>IPv4 CIDR block</td>
<td>10.0.2.0/24 (This is a subset of the CIDR block for your VPC.)</td>
</tr>
</tbody>
</table>

Modify the subnet route tables

1. In the navigation pane, choose Subnets, and then select the subnet with the name AppStream2 Public Subnet.

2. On the Route Table tab, note the ID of the route table (similar to rtb-XXXXXXXXX).

3. In the navigation pane, choose Route Tables and select the route table with the ID that you noted in the previous step.
4. For **Name**, open the empty field, type *AppStream2 Public Route Table*, and then select the check mark to save your changes.

![Image](image.png)

*Figure 27: Opening the name field for the route table that serves the AppStream2 Public Subnet.*

5. Make sure that **AppStream2 Public Route Table** is still selected. On the **Routes** tab, verify that the route table includes the following two routes:

<table>
<thead>
<tr>
<th>Destination</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0.0.0/20</td>
<td>local</td>
</tr>
<tr>
<td>0.0.0.0/0</td>
<td>igw-XXXXXXXX</td>
</tr>
</tbody>
</table>

These two routes function as follows for all resources within a subnet that is associated with the route table:

- **Local**: All traffic from the resources destined for IPv4 addresses within the 10.0.0.0/20 CIDR block is routed locally within the VPC.
- **Outbound**: Traffic destined for all other IPv4 addresses is routed to the internet gateway (identified by *igw-XXXXXXXX*) that was created by the VPC Wizard.

To modify the route table, choose **Edit** and make the needed changes. For more information, see [Route Tables](#).

6. In the navigation pane, choose **Subnets** and select the subnet named **AppStream2 Private Subnet1**.

7. On the **Route Table** tab, note the ID of the route table (similar to *rtb-XXXXXXXX*).

8. In the navigation pane, choose **Route Tables** and select the route table with the ID you noted in the previous step.

9. For **Name**, open the empty field, type *AppStream2 Private Route Table*, and then select the check mark to save your changes.
10. Make sure that **AppStream2 Private Route Table** is still selected, and on the **Routes** tab, verify that the route table includes the following routes:

<table>
<thead>
<tr>
<th>Destination</th>
<th>Target</th>
</tr>
</thead>
<tbody>
<tr>
<td>10.0.0.0/20</td>
<td><em>local</em></td>
</tr>
<tr>
<td>0.0.0.0/0</td>
<td><em>nat-XXXXXXXXXXXXXXXXXXXXX</em></td>
</tr>
<tr>
<td>pl-YYYYYYYYYYY</td>
<td><em>vpce-ZZZZZZZZZ</em></td>
</tr>
</tbody>
</table>

These three routes function as follows for all resources within a subnet that is associated with the route table:

- **Local**: All traffic from the resources destined for IPv4 addresses within the 10.0.0.0/20 CIDR block is routed locally within the VPC.
- **Storage**: Traffic destined for S3 buckets is routed to the S3 endpoint (identified by *vpce-ZZZZZZZZZ*).
- **Outbound**: Traffic destined for all other IPv4 addresses is routed to the NAT gateway (identified by *nat-XXXXXXXX*).

To modify the route table, choose **Edit** and make the needed changes. For more information, see [Route Tables](#).

11. In the navigation pane, choose **Subnets** and select the subnet with the name **AppStream2 Private Subnet2**.

12. On the **Routes** tab, verify that the route table is the one named **AppStream2 Private Route Table**. If the route table is different, choose **Edit** and select this route table.
Appendix C. Configure Chrome

After you install applications on your image builder instance, you might need to configure them before creating your image. Examples of tasks or configurations to consider at this stage include:

- Applying patches or updates
- Managing auto-update functionality
- Creating startup or run/runonce commands
- Performance tuning
- Disabling application startup prompts, such as license prompts or first-run experiences.
- Configuring file associations
- Clearing or resetting log files or event logs

Chrome includes an automated update process that you can disable so that users aren’t exposed to it. Use Windows Task Scheduler to disable it with the following steps.

**Note:** Although these steps are specific to Chrome, you may need to perform similar steps to disable updates for other applications that you configure for streaming through AppStream 2.0.

1. In your image builder instance, choose the Windows **Start** menu.
2. Choose **Control Panel, System and Security, Administrative Tools**.
3. Open **Task Scheduler**.
4. When Task Scheduler opens, expand the window to full screen for easier viewing.
5. On the left side, under **Task Scheduler (Local)**, choose **Task Scheduler Library**. Click the **Name** column in the center pane to sort the task names alphabetically. If necessary, widen the **Name** column to display the full names of the listed items.
6. Select the task **GoogleUpdateTaskMachineUA**. Choose **Action, Delete**. When prompted, choose **Yes**.
7. Repeat step 6 to delete the **GoogleUpdateTaskMachineCore** task.


9. Disable any auto update services. In the Administrative Tools window, which should still be open, open **Services**.

10. When the Services window opens, expand the window to full screen for easier viewing. In the list, open the first of two **Google Update Service** entries, **Google Update Service (gupdate)**.

11. For **Startup type**, choose **Manual**.

---

Figure 29: Windows Task Scheduler with the GoogleUpdateTaskMachineUA task selected.

Figure 30: Windows Services, with the two Google Update services listed.
12. Next to the **Service status** label, verify that the service shows the status **Stopped**. If not, choose **Stop**.

13. Choose **Apply**, **OK**.

14. Repeat steps 10 to 13 for **Google Update Service (gupdatem)**.

15. Close **Services** and any other open windows.
Appendix D. Install Notepad++

Step 4 in this guide described how to connect to an image builder and download the installer for Notepad++. To complete the Notepad++ installation process, follow these steps.

1. Connect to the *DemoCo_Image1_mmddyyyy* image builder that you created.

2. In the image builder, in File Explorer, open the Downloads folder and open *npp.x.x.x.Installer.x64.exe*.

3. In **Installer Language**, choose **English** if it is not already selected, and then choose **OK**.

4. In **Welcome to Notepad++ Setup**, choose **Next**.

5. In **License Agreement**, review the agreement and then choose **I Agree**.

6. In **Choose Install Location**, choose **Next** to accept the default destination folder for the installation and proceed.

7. In **Choose Components**, leave the default components selected, and then choose **Next**.

8. In the next **Choose Components** page, leave all three options unselected, and then choose **Install**.

9. In **Completing Notepad++ Setup**, clear the **Run Notepad++** check box so that it is not selected, and then choose **Finish**.
Appendix E. Clean up your AppStream 2.0 resources

Although you can continue to use this AppStream 2.0 environment, keep in mind that you pay for your running resources. For more information, see Amazon AppStream 2.0 Pricing.

Cleaning up the resources that you created frees up resources and helps you avoid unintended charges to your account.

Stop and delete your image builder


2. In the navigation pane, choose Images, Image Builder.

3. Confirm whether the image builder that you created in Step 3 in this guide is in a stopped state. If not, select the image builder and choose Actions, Stop. If you created multiple image builders, repeat this step for each image builder that you created.

4. After the image builder has stopped, choose Actions, Delete. Repeat this step for each image builder that you created.

Revoke stack permissions for users in the user pool

1. In the navigation pane, choose User Pool.

2. Select the user you created in Step 9 in this guide and choose Actions, Unassign stack. This action revokes the stack permissions for the user.

Disassociate your fleets from your stack and delete your stack

1. In the navigation pane, choose Stacks.

2. Select the stack you created and choose Actions, Dissociate Fleet. This action dissociates the fleet from the stack.

3. To delete the stack, choose Actions, Delete.

Stop and delete your fleet

1. In the navigation pane, choose Fleets.
2. Confirm whether the fleet that you created in Step 6 in this guide is in a stopped state. If not, select the fleet and choose **Actions, Stop**.

3. After the fleet has stopped, choose **Actions, Delete**.
Appendix F. Additional resources

For more information about AppStream 2.0, visit the following resources:

- Amazon AppStream 2.0 Product Details
- Amazon AppStream 2.0 Pricing Details
- Amazon AppStream 2.0 FAQs
- Amazon AppStream 2.0 Developer Guide
- Amazon AppStream 2.0 API Reference
- Amazon AppStream 2.0 CLI Reference
- Amazon AppStream 2.0 Try It Now Demo
- Amazon AppStream 2.0 Resources