CloudVision Mastery Workshop
Lab Guide

IMAGE MANAGEMENT

Create and manage image bundles, which can be pushed to devices in Network Provisioning. Each bundle can contain an image, one or more extensions, or both. Bundling an image with extensions allows you to create a software package that can be repeatedly pushed to different devices.

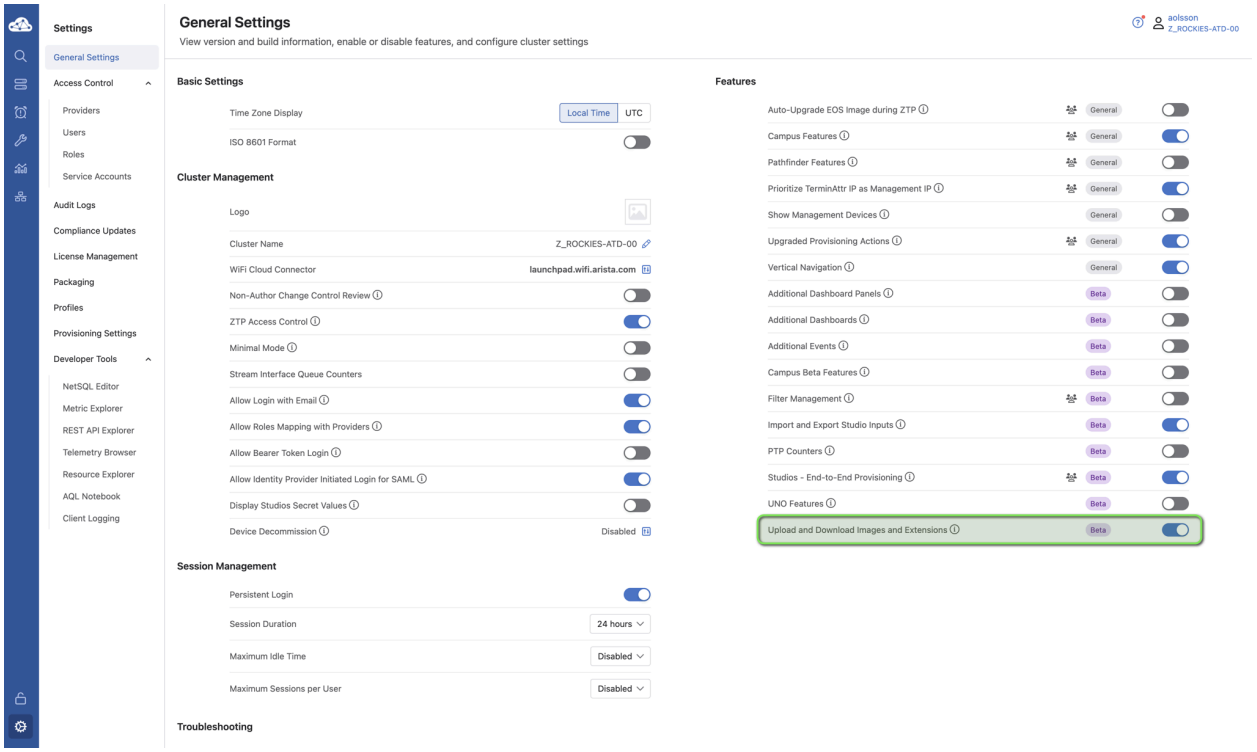
Images and Image Bundles

CloudVision simplifies image management for all network devices. A more recent CloudVision feature now allows users to download Arista images and extensions directly from within CloudVision, minimizing the steps required to deploy images to network devices.

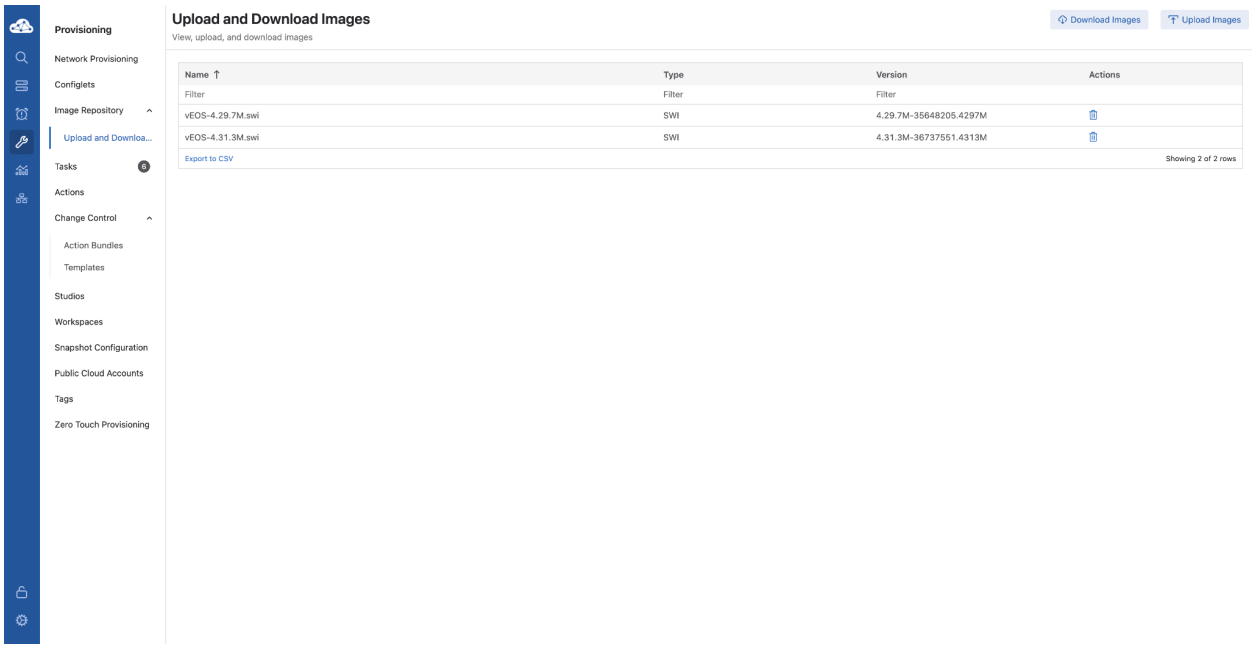
> **NOTE**: The Compliance Token added in the previous section is required to be able to download images from within CloudVision

First, we must enable the feature that allows images to be downloaded from within CloudVision.

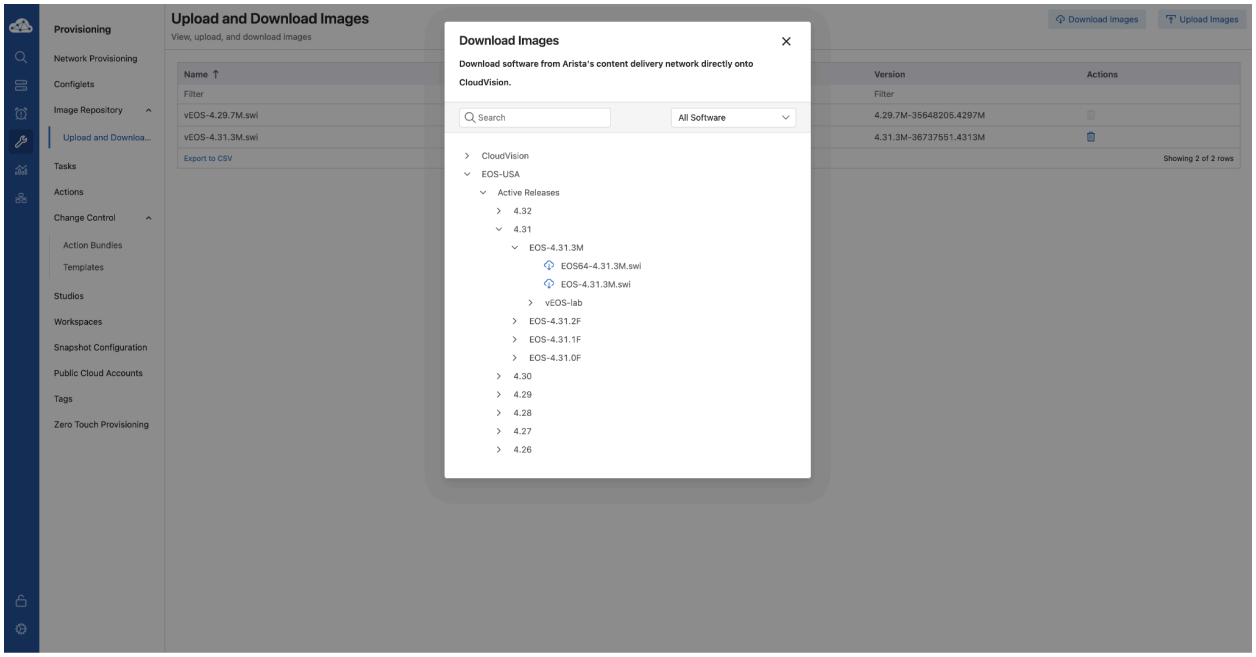
1. Let's navigate to **Settings** > **General Settings.**
2. The General Settings page has a section called "**Features**" On the right side of your screen. Let's enable the "**Upload and Download Images and Extensions**" feature.



3. Now let's Navigate to **Provisioning** > **Image Repository** > **Upload and Download Images**



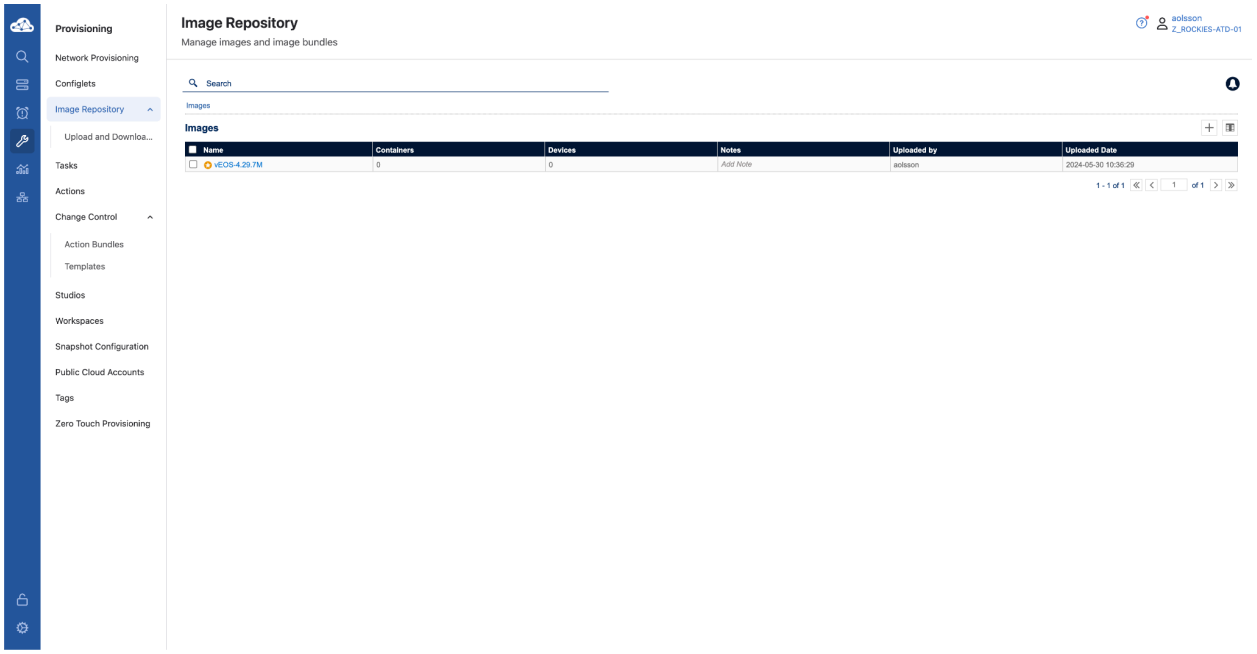
1. In the upper right corner, select "**Download Images**"
2. A pop-up window will appear showing the available images to be downloaded.
3. Expand **EOS-USA** > **Active Releases** > **4.31** > **EOS-4.31.3M**



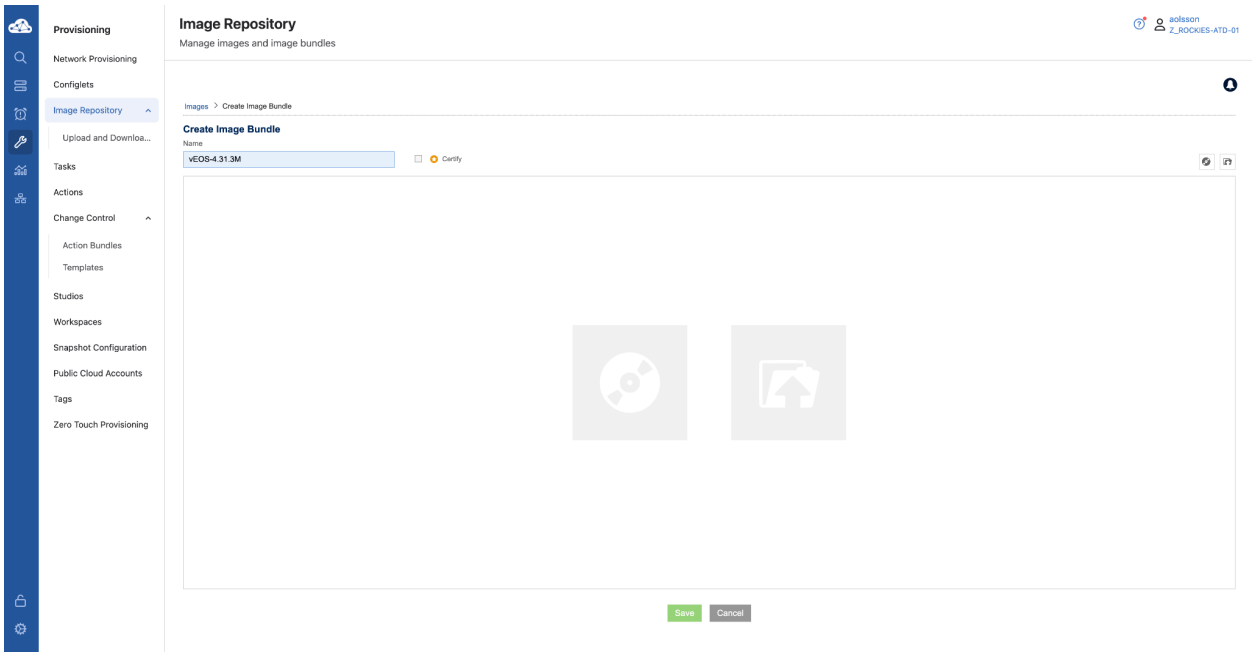
4. Typically, you would click on the blue cloud icon to download an image, but we don't need to download any images for this lab.

NOTE: The images required for this lab are unique and have already been uploaded to CloudVision. **Please use the provided images in the steps going forward!**

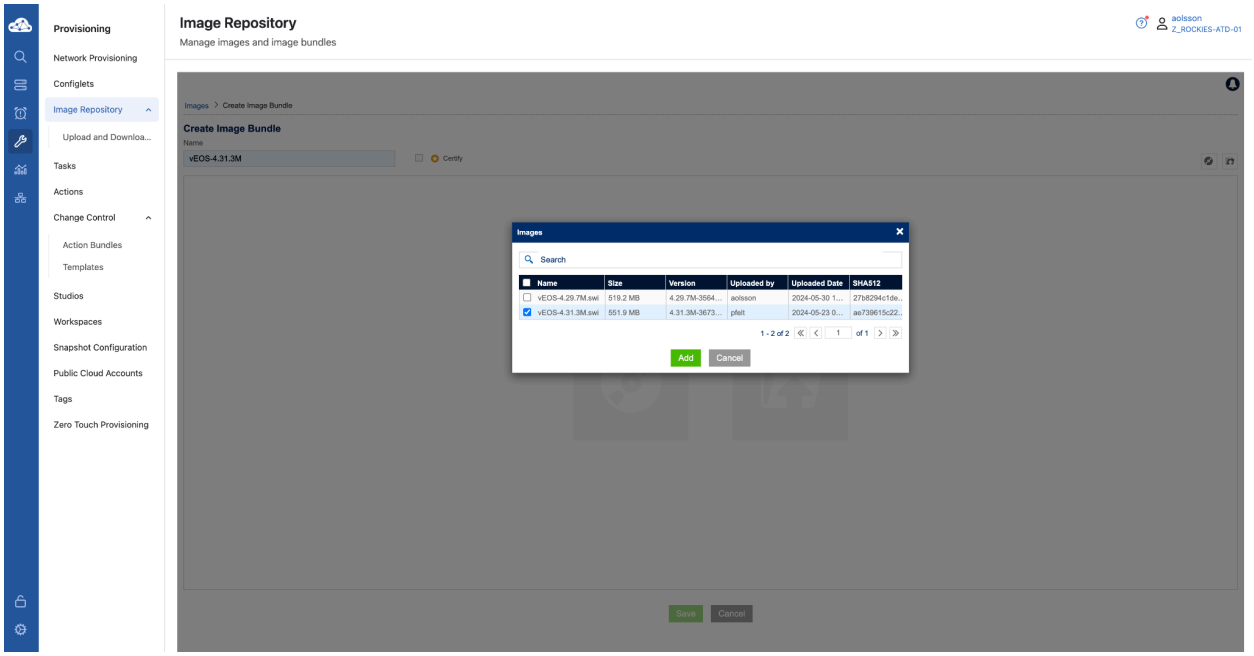
5. Now that the image is downloaded, we need to create the Image Bundle that can be assigned to devices. Head to **Provisioning** > **Image Repository**.
6. Click on the "**+**" icon near the top of the right side of the screen.



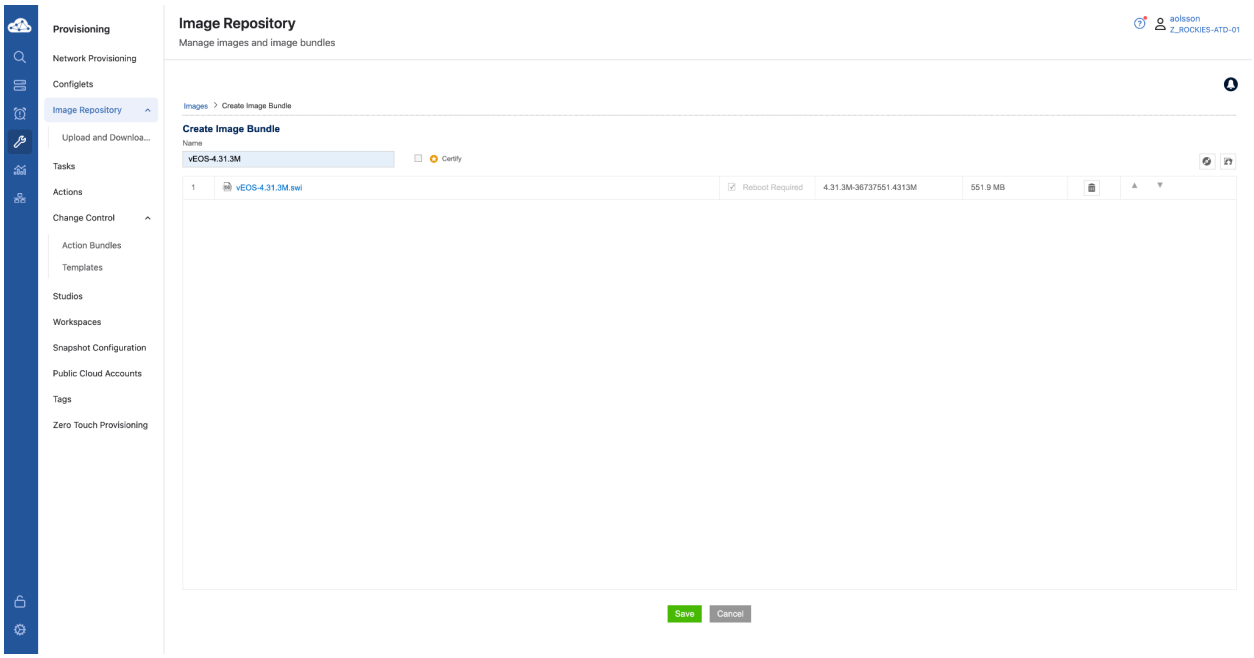
7. In the "**Name**" field, enter a meaningful name for the image. For this lab, we'll use "**vEOS-4.31.3M**".



8. To add the Image to the Image Bundle, you can select either the large disk icon in the center of the page or the smaller disk icon on the upper right side of the screen.
9. An "**Images**" dialog box will appear. Select **vEOS-4.31.3M.swi** and then select the "**Add**" button.



10. You'll be returned to the "**Create Image Bundle**" page and should see the Image you just added. Click the "**Save**" button to save the image bundle.



11. The **vEOS-4.31.3M** image bundle will now appear in the Image Repository

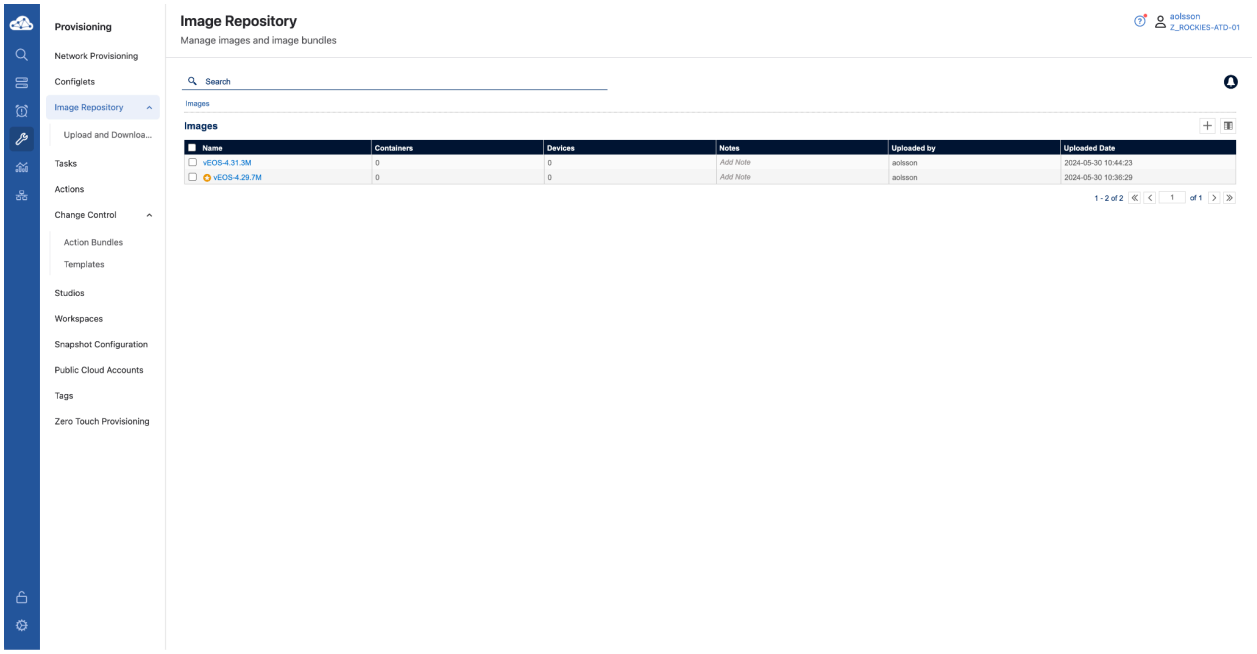
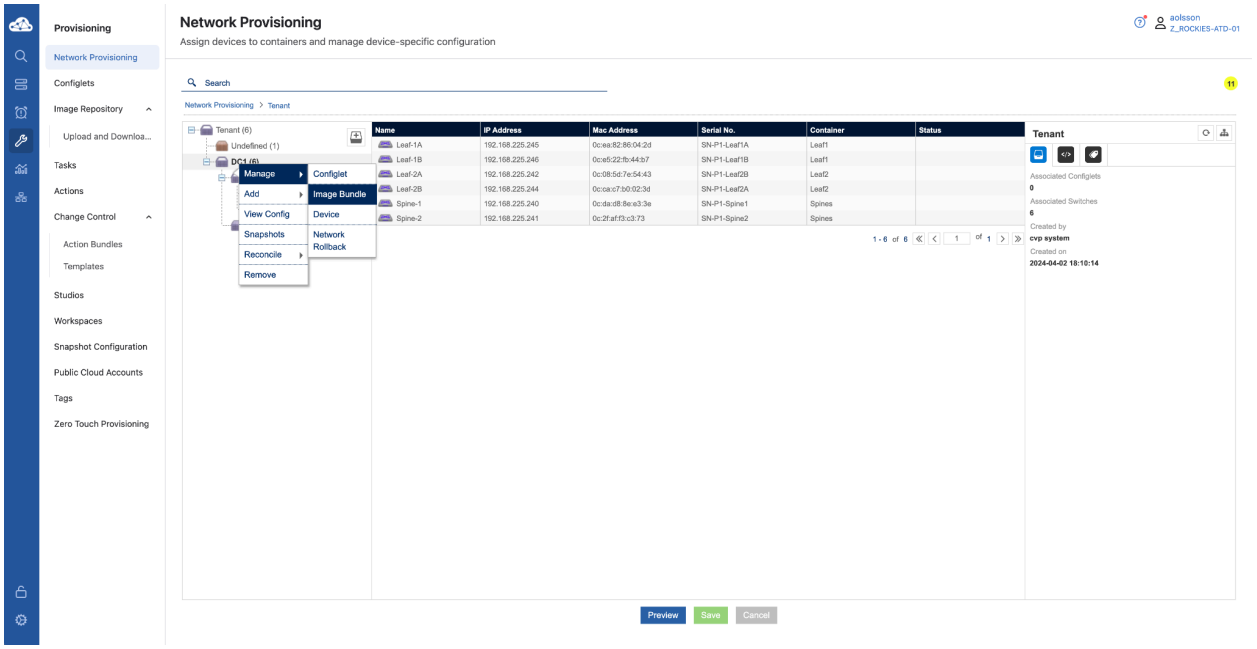


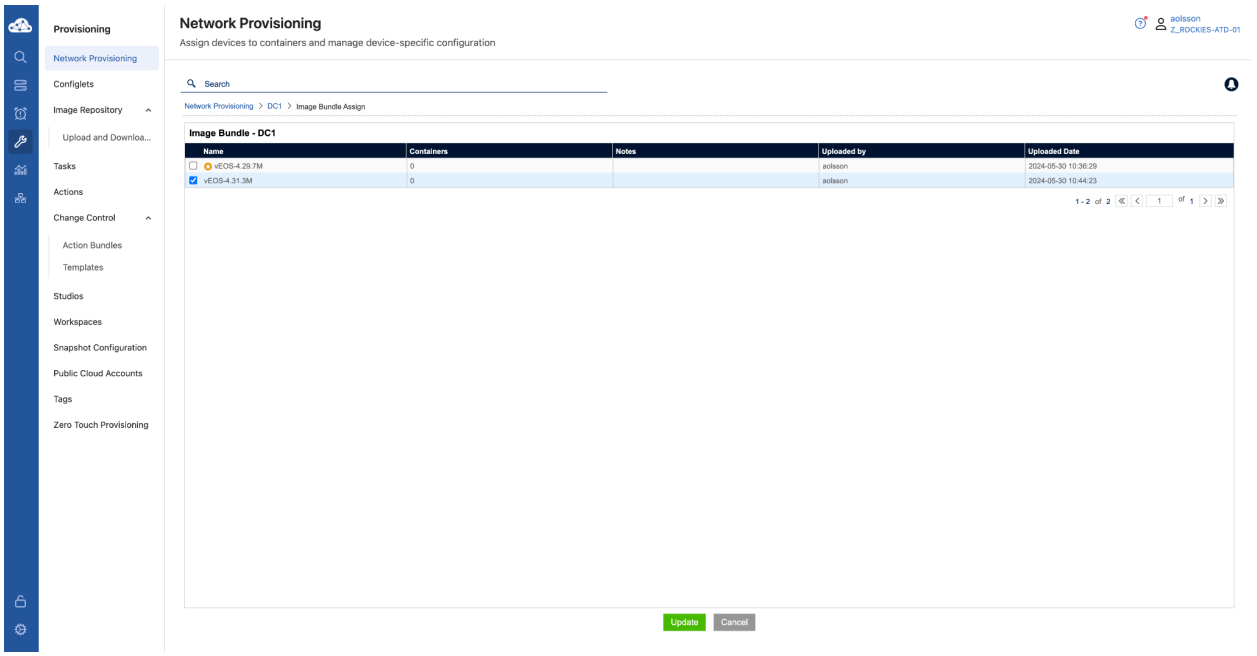
Image Assignment

Now that an Image Bundle has been created, we can assign it to the devices in the topology.

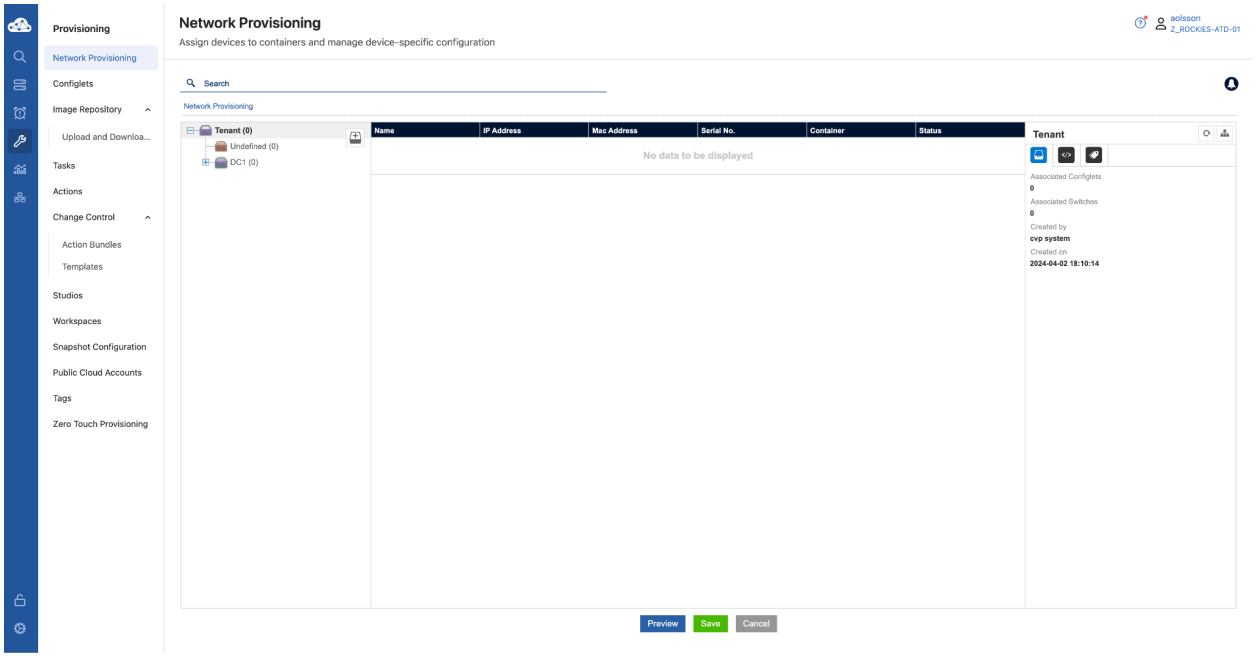
1. Let's start by navigating to **Provisioning** > **Network Provisioning**
2. Right-click on the "**DC1**" container and select **Manage** > **Image Bundle**



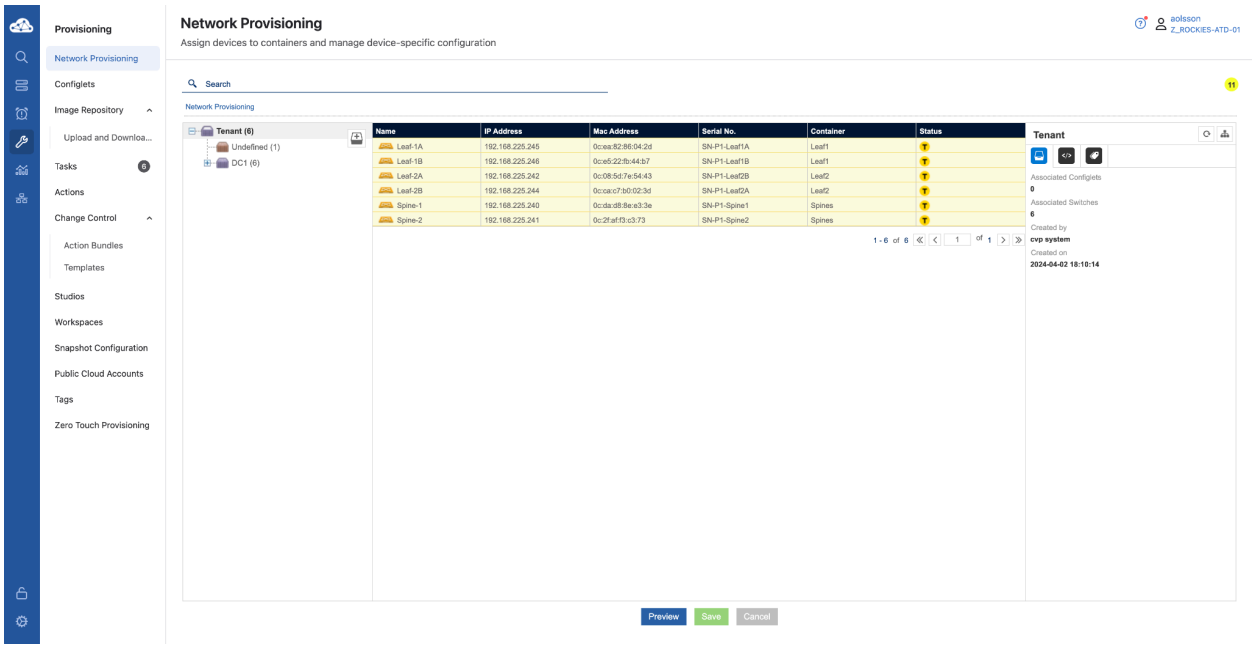
3. Select the one created in the previous step, **vEOS-4.31.3M**, from the available image bundles.
4. Select the "**Update**" button at the bottom of the screen to assign the Image Bundle to all devices in the DC1 container.



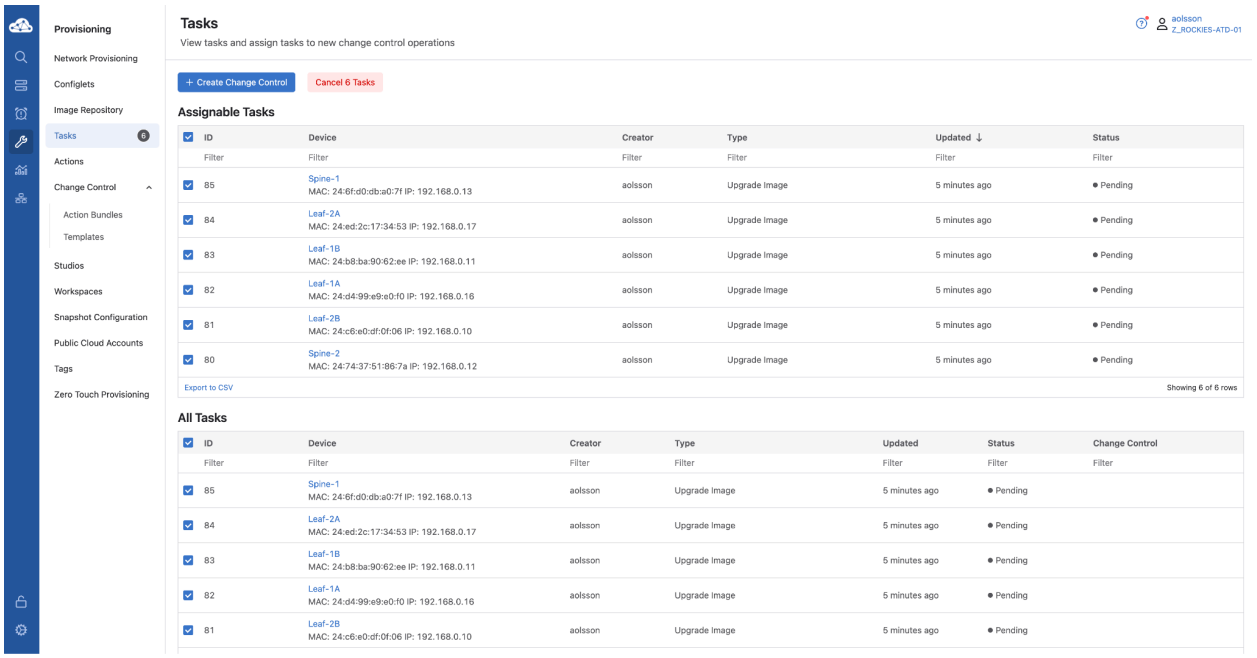
5. You will now see a green hue surrounding the "**DC1**" container and the switches under the "**DC1**" hierarchy, indicating that changes must be saved. Click the "**Save**" button at the bottom of the screen to save the image assignment changes.



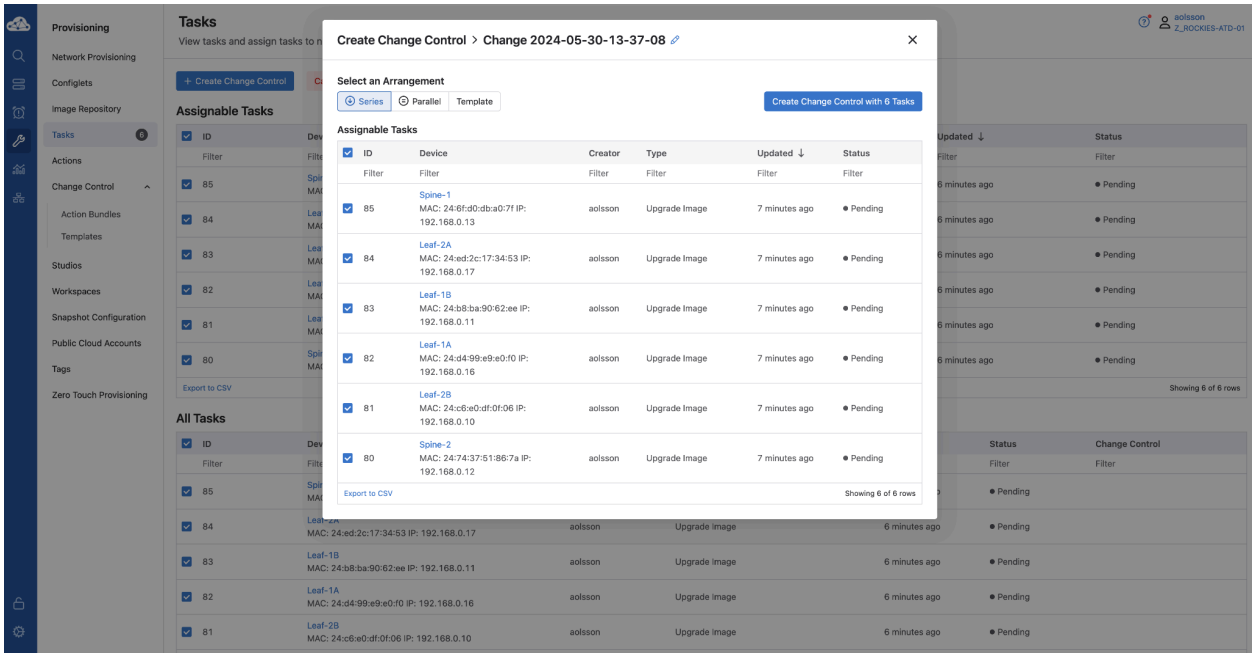
6. You'll now see the switches are all shown in yellow with a "**T**" in the status section, indicating that these devices have available tasks.



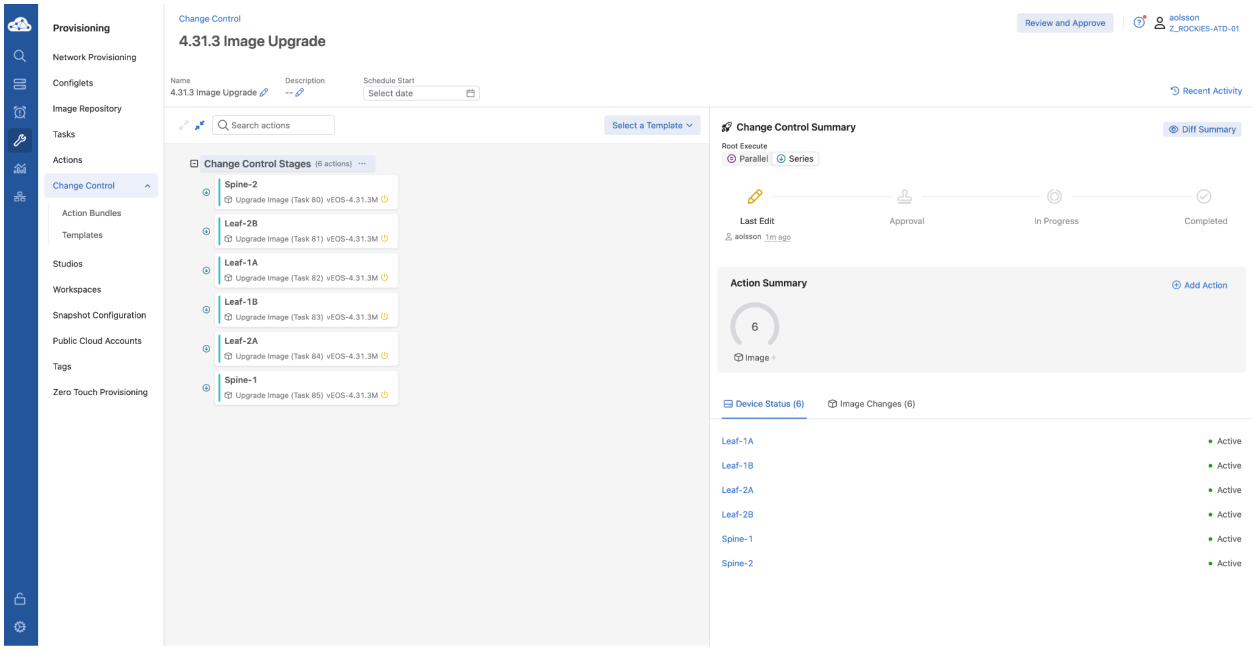
7. On the left side of the screen, select "**Tasks**." You should see 6 pending tasks, one for each device in the topology.
8. Select the 6 "**Upgrade Image**" tasks in the "**Assignable Tasks**" section.



9. Now, we need to create a change control with those tasks, so select the "**+ Create Change Control**" button at the top of the screen.
10. The "**Create Change Control**" screen should pop up. Ensure all 6 tasks are selected and that "**Series**" is chosen. Then, choose "**Create Change Control with 6 Tasks**" on the top left of the pop-up.



11. You'll then be taken to the change control screen. Let's continue by giving the change control a meaningful name. At the top of the change control where it says "**Name,**" click the little pencil icon and enter "**4.31.3 Image Upgrade**" and press enter.



As you can see in the change control, every device in our topology will be upgraded in series. While that might look good, it's not an optimal upgrade process for our environment. For example, how do we know that MLAG Health is in a good state so we don't have an outage during the upgrade? How do we know that the MLAG timers have been completed and the switch is back online before taking down its peer for the upgrade? Let's leave the change control as is for now and return to it once we've completed the following steps.

ACTION BUNDLES

An action bundle is a collection of actions that are applied to the stage rule(s) of a change control template. The template is then used in a change control action, to organize the tasks into logical steps as administratively defined.where the actions contained in its action bundles are executed

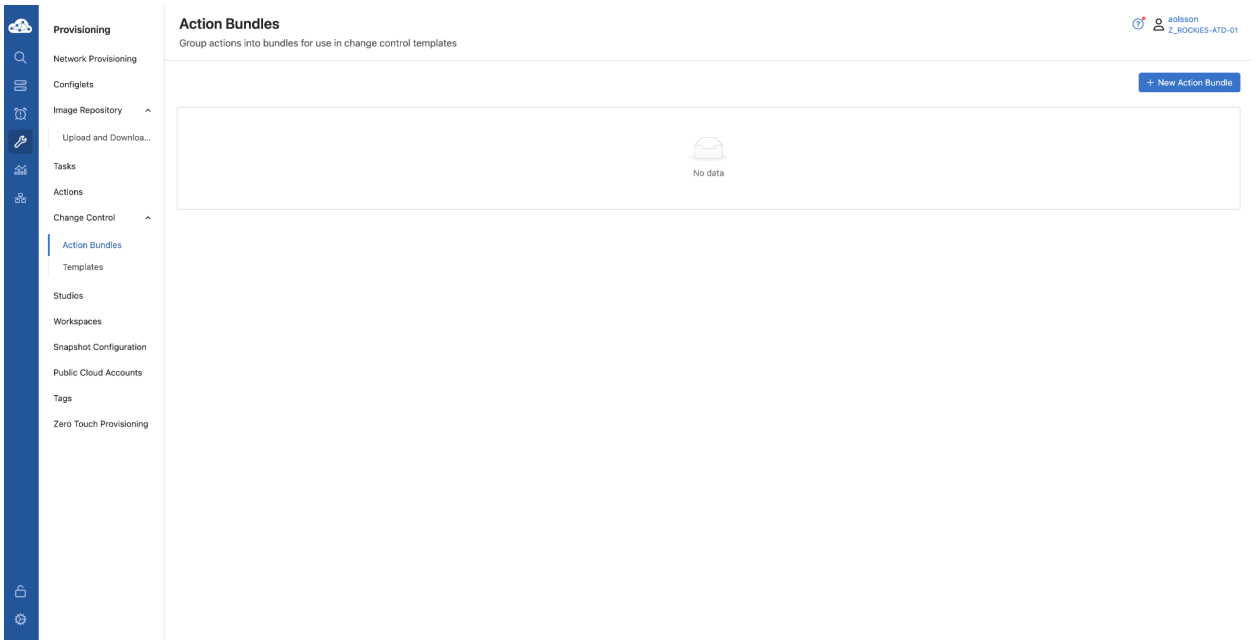
Each action bundle can contain up to one task action and an unlimited number of non-task actions. You can apply the same action bundle to multiple change control templates.

Create an Action Bundle for the Leafs

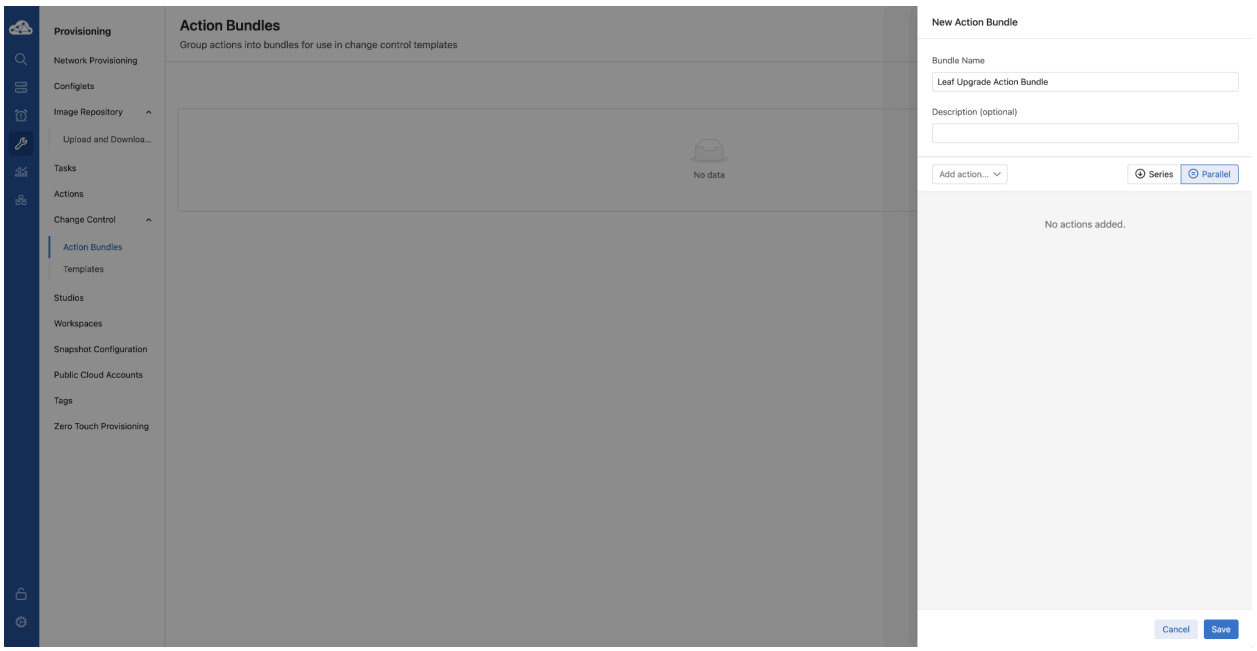
Let's create a new action bundle for our Leafs that can help us do MLAG validation as part of the upgrade process.

1. Start by navigating to **Provisioning** > **Action Bundles**.

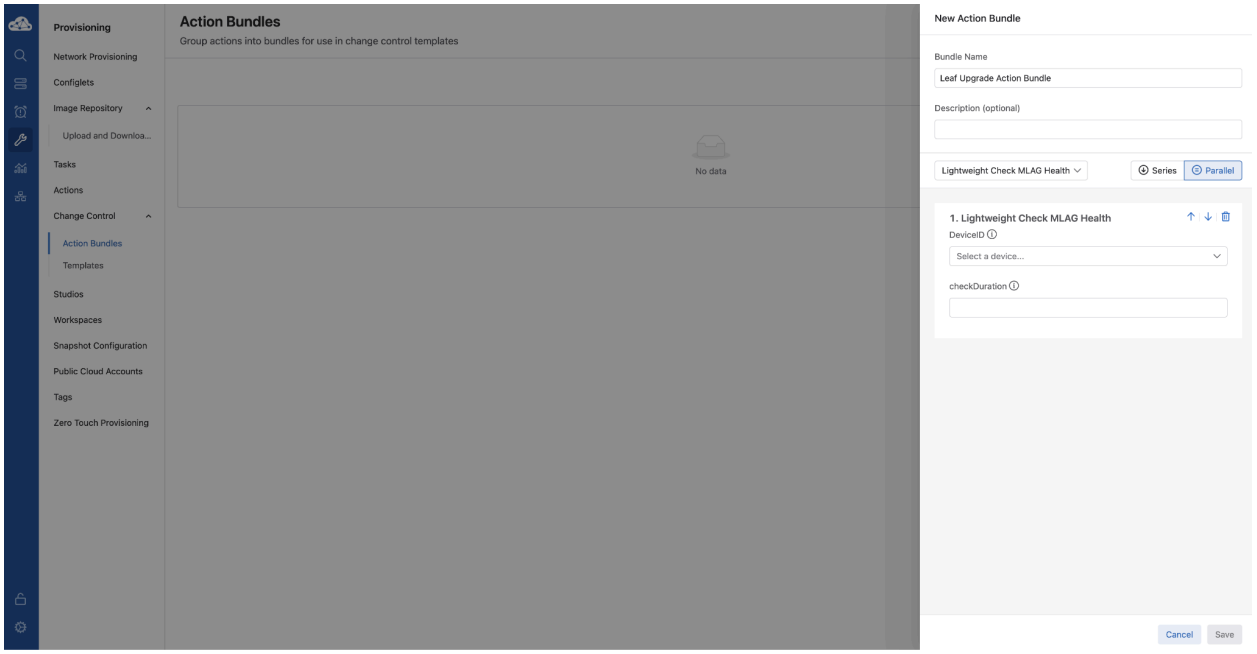
2. Select “**New Action Bundle**”.



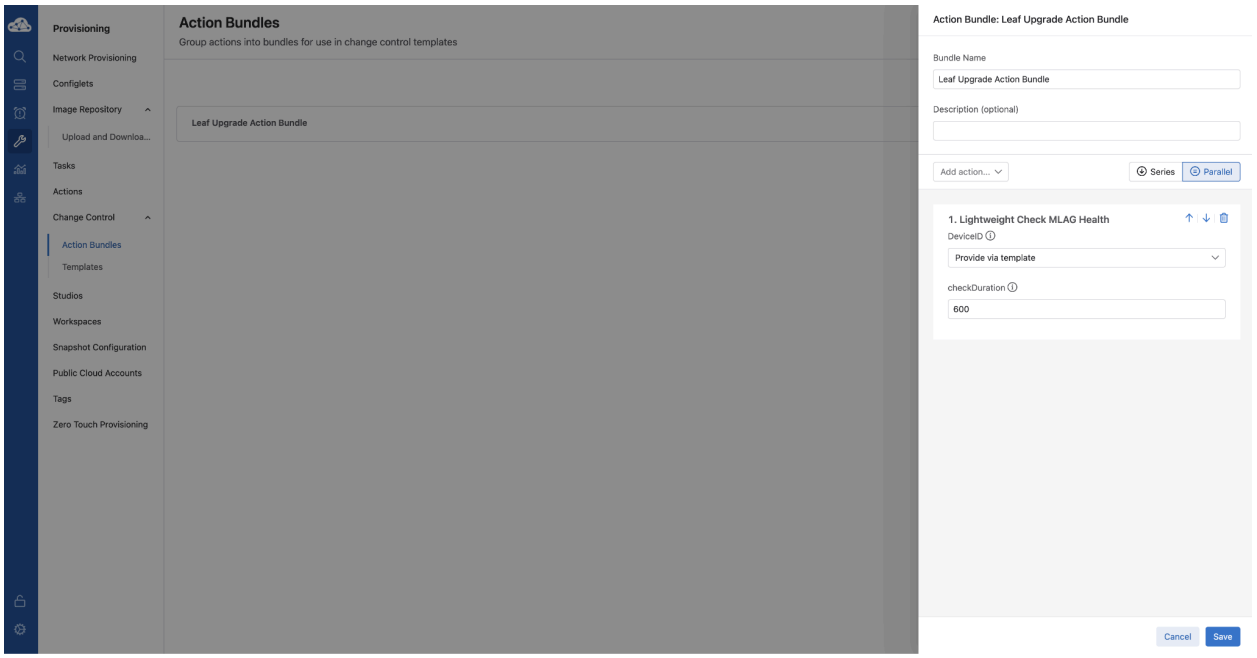
3. In the “**Bundle Name**” field, enter a meaningful description for this action bundle. This Action Bundle will be used for Leaf upgrades, so we’ll use the name “**Leaf Upgrade Action Bundle.**”



4. Select the “**Add action**” dropdown box and choose the “**Lightweight Check MLAG Health**” action.

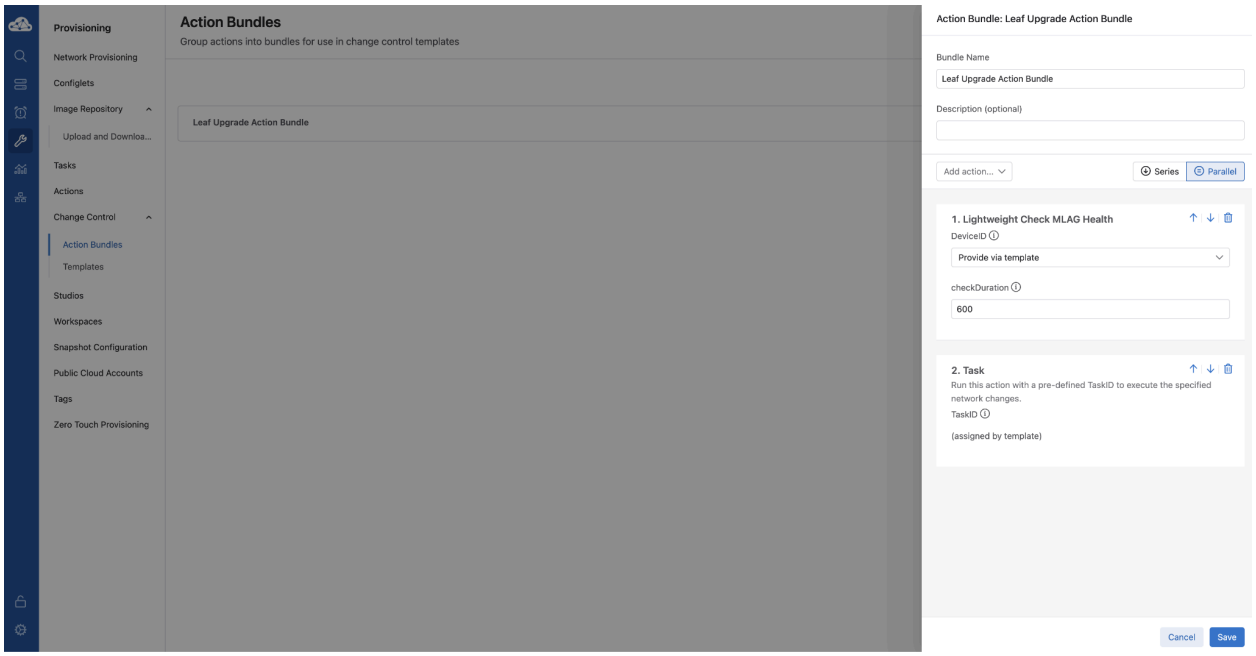


5. In the "**DeviceID**" section, choose the "**Provide via template**" option and set the "**checkDuration**" to 600 (5 Minutes).

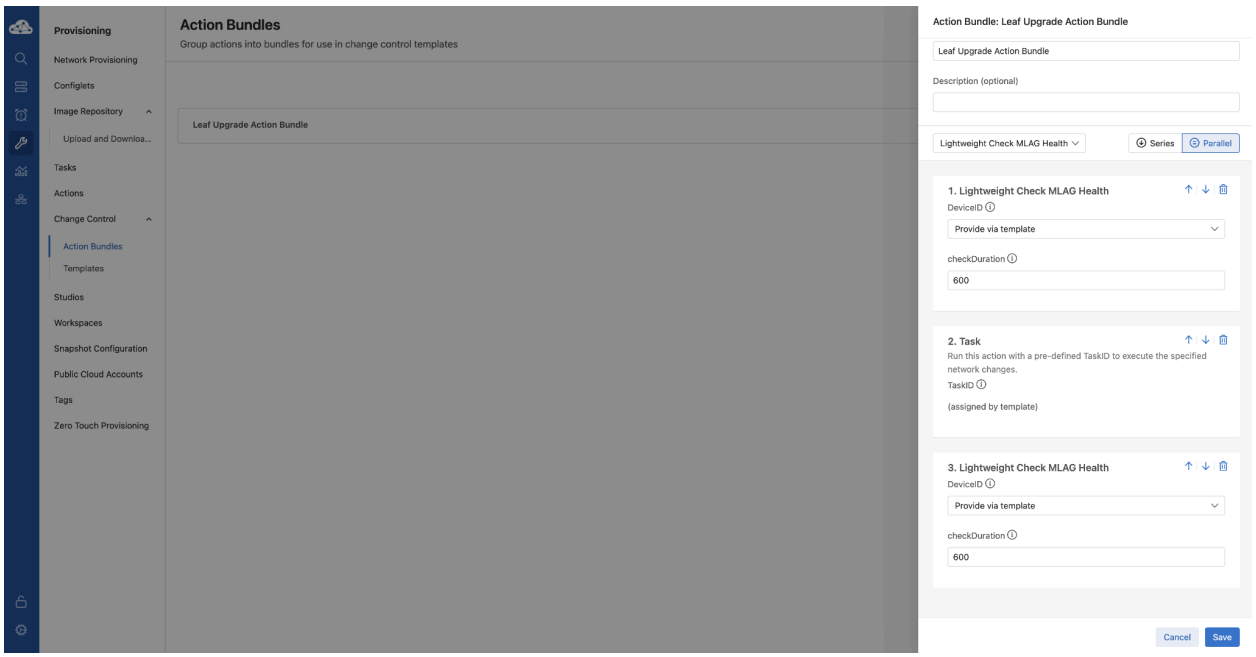


NOTE: The "**Add action**" dropdown may stay populated with the name of the last action that was chosen

6. Select the “**Add action**” dropdown box and select the “**Execute Task**” action.

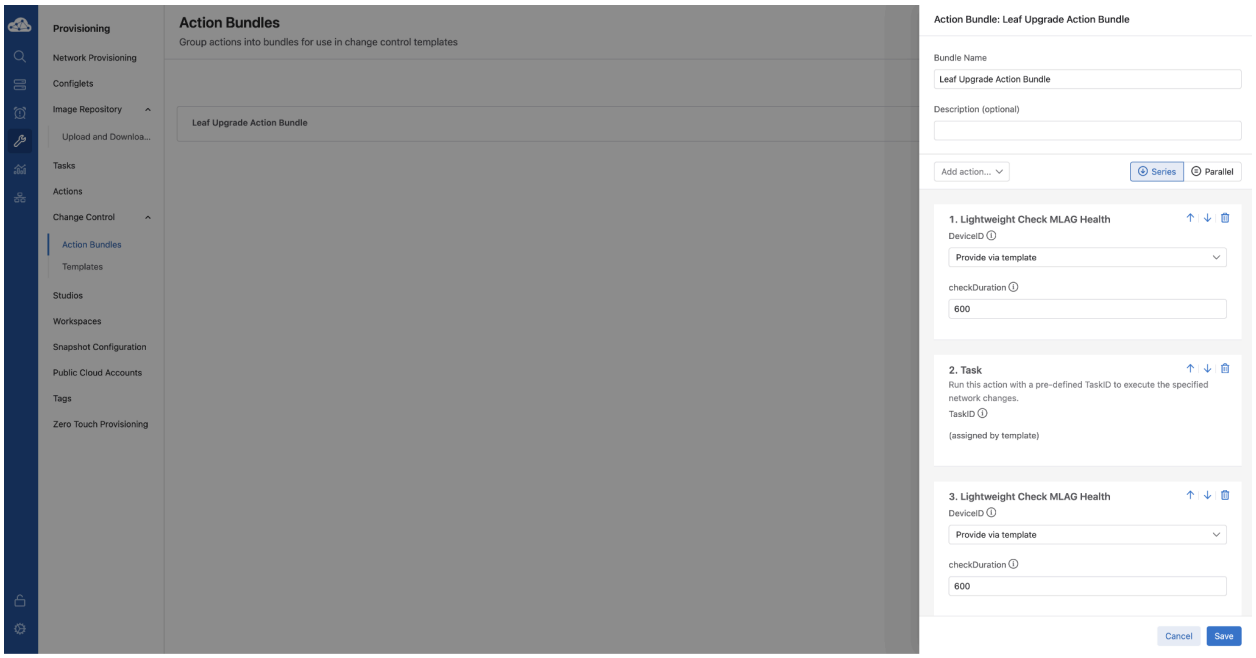


7. Select the “**Add action**” dropdown box again and select the “**Lightweight Check MLAG Health**” action.
8. In the “**DeviceID**” section, choose the “**Provide via template**” option and set the “**checkDuration**” to 600 (5 Minutes).



9. Select the “**Series**” option so that the actions in this Action Bundle are in series.

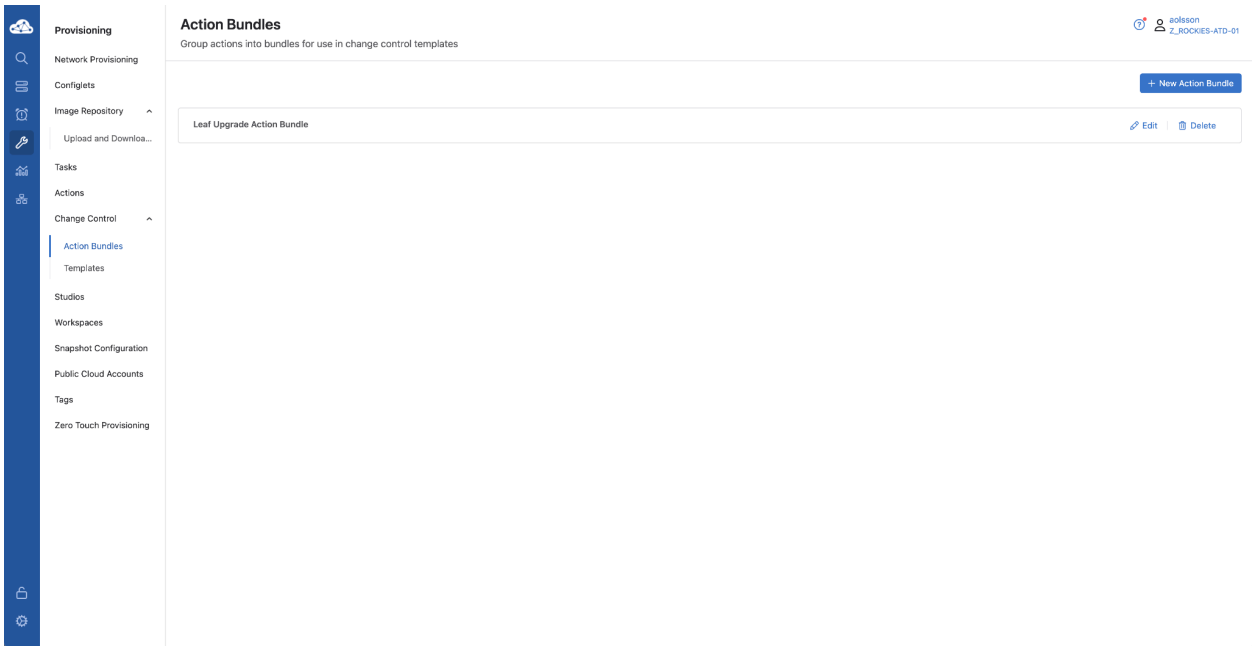
10. Select “**Save**” once the Action Bundle looks like the one in the screenshot below.



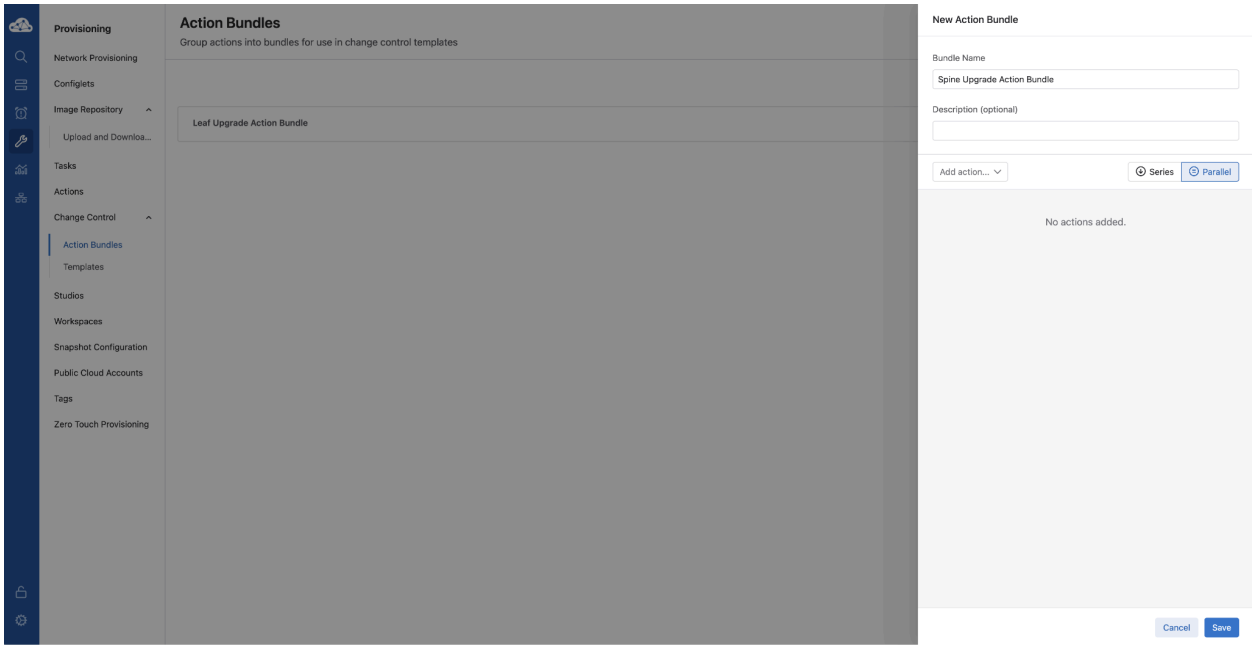
Create an Action Bundle for the Spines

Now, let's repeat the process we just went through with a few changes tailored to the Spines. Since the Spines aren’t in an MLAG pair, we don’t need to do the MLAG Health Check, but we can use BGP Maintenance Mode since all the peers are running BGP and support the BGP GSHUT community.

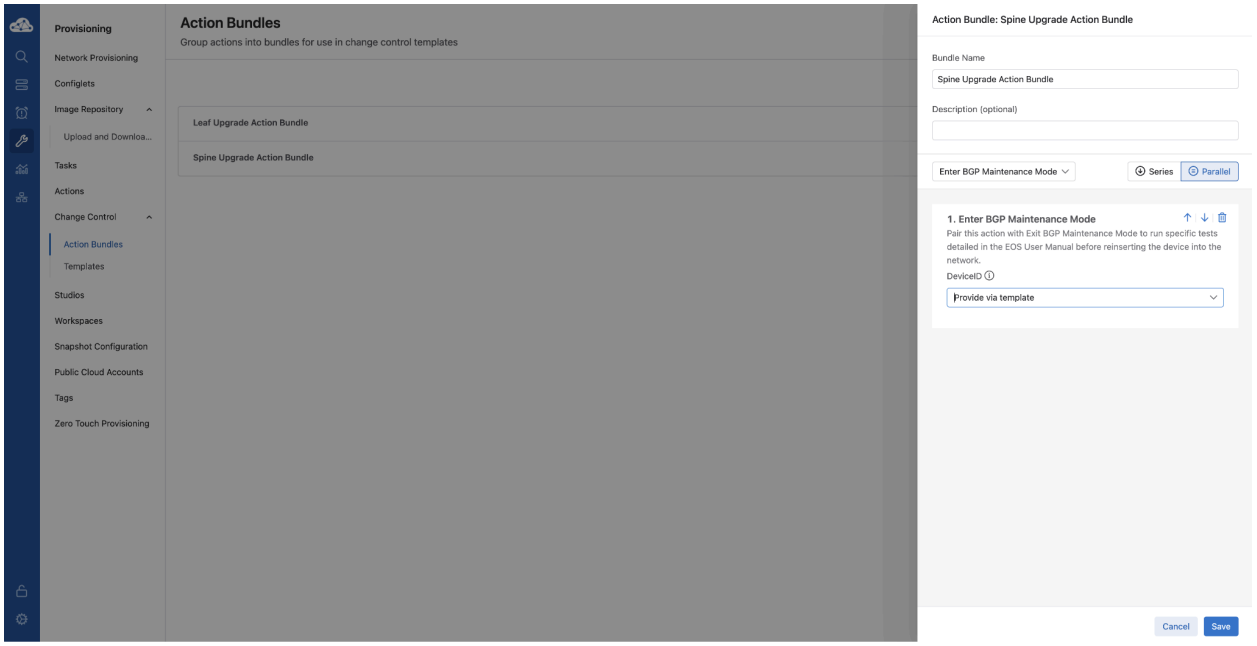
1. Let’s start by creating a new Action Bundle. Click “**New Action Bundle**” on the top right of the screen.



2. In the "**Bundle Name**" field, enter a meaningful description for this action bundle. This Action Bundle will be used for Spine upgrades, so we'll use the name "**Spine Upgrade Action Bundle**."

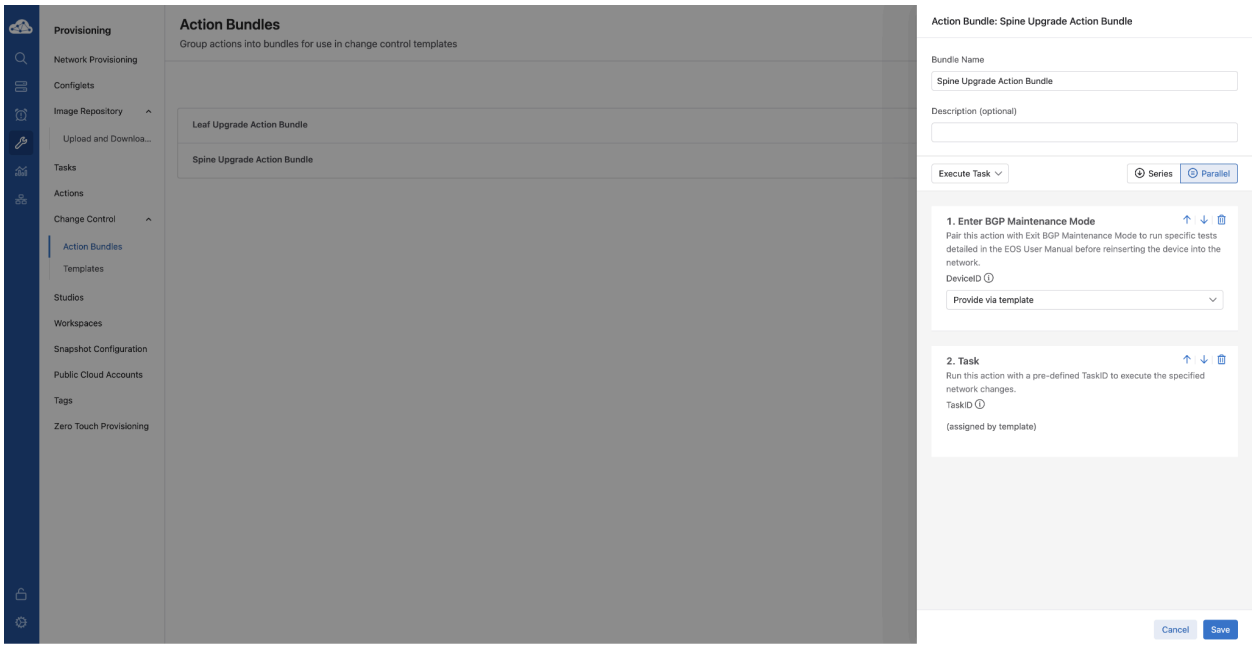


3. Select the "**Add action**" dropdown box and select the "**Enter BGP Maintenance Mode**" action.
4. In the "**DeviceID**" section, choose the "**Provide via template**" option.



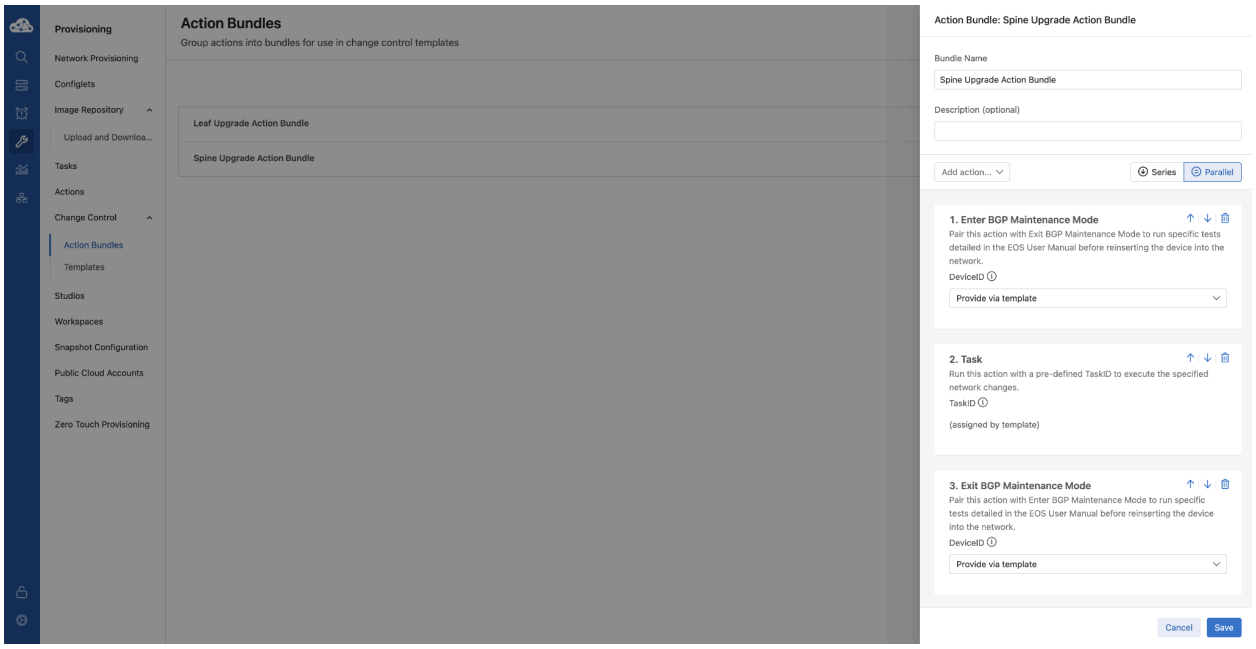
NOTE: The "**Add action**" dropdown may stay populated with the name of the last action that was chosen

5. Select the "**Add action**" dropdown box and select the "**Execute Task**" action.

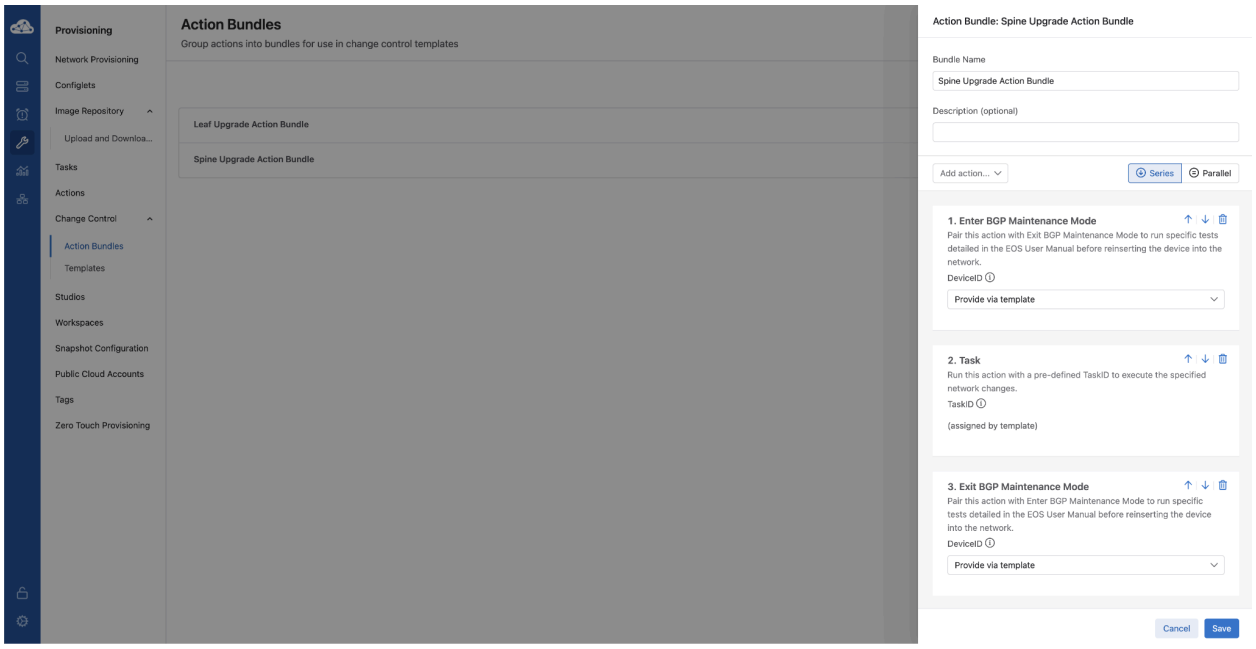


6. Select the "**Add action**" dropdown box again and select the "**Exit BGP Maintenance Mode**" action.

7. In the “**DeviceID**” section, choose the “**Provide via template**” option.



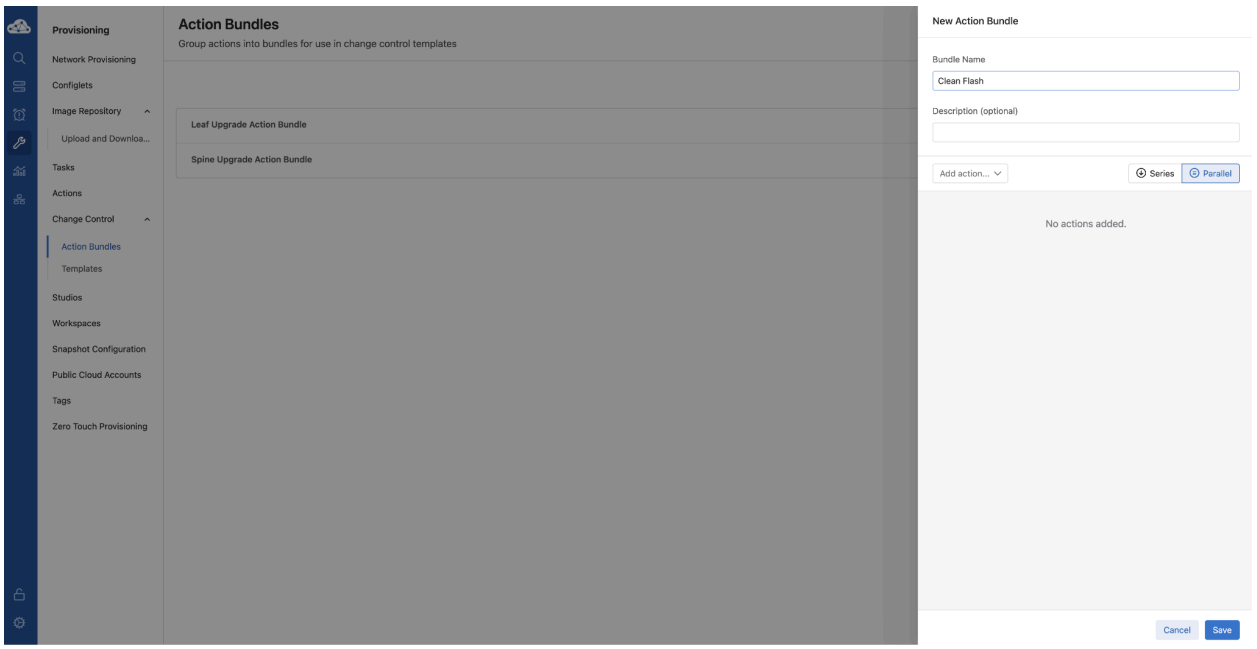
8. Select “**Series**” so that the actions in this Action Bundle are in series.
9. Select “**Save**.”



Create an Action Bundle to Cleanup the Flash

The final action bundle that we'll create will remove the old images from Flash so we can keep the Flash nice and tidy and not have old images hanging around forever.

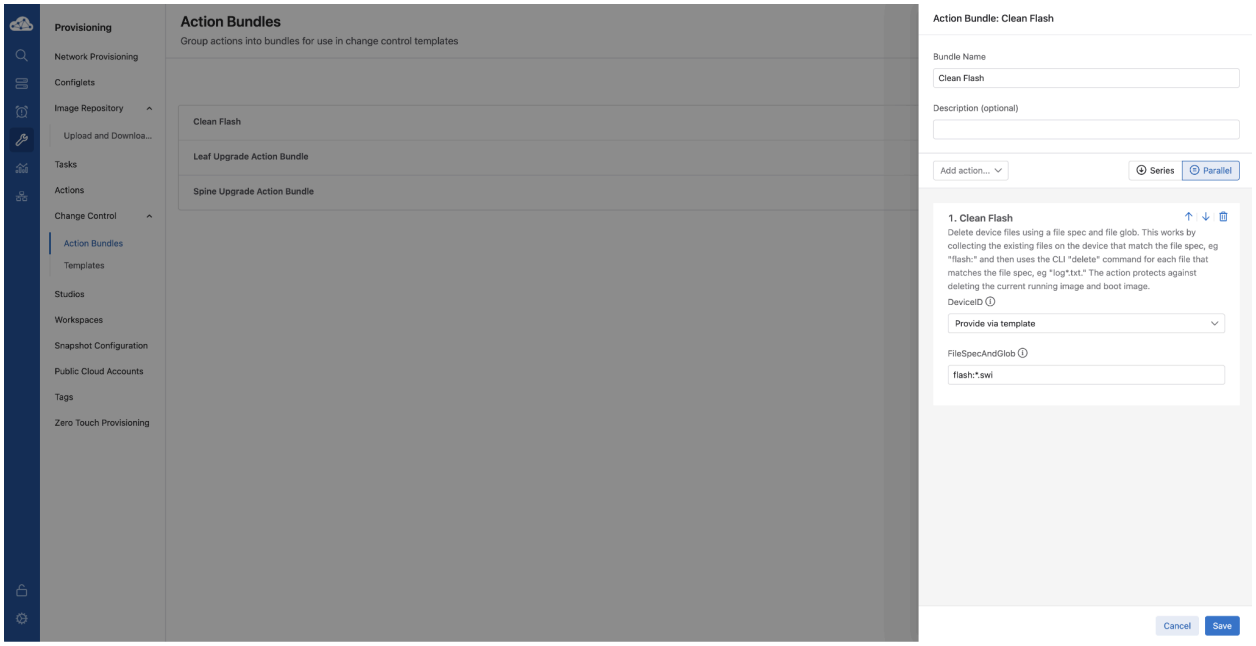
1. Select "**New Action Bundle**"
2. In the "**Bundle Name**" field, enter a meaningful description for this action bundle. This Action Bundle will be used to clean up the flash, so we'll use "**Clean Flash**."



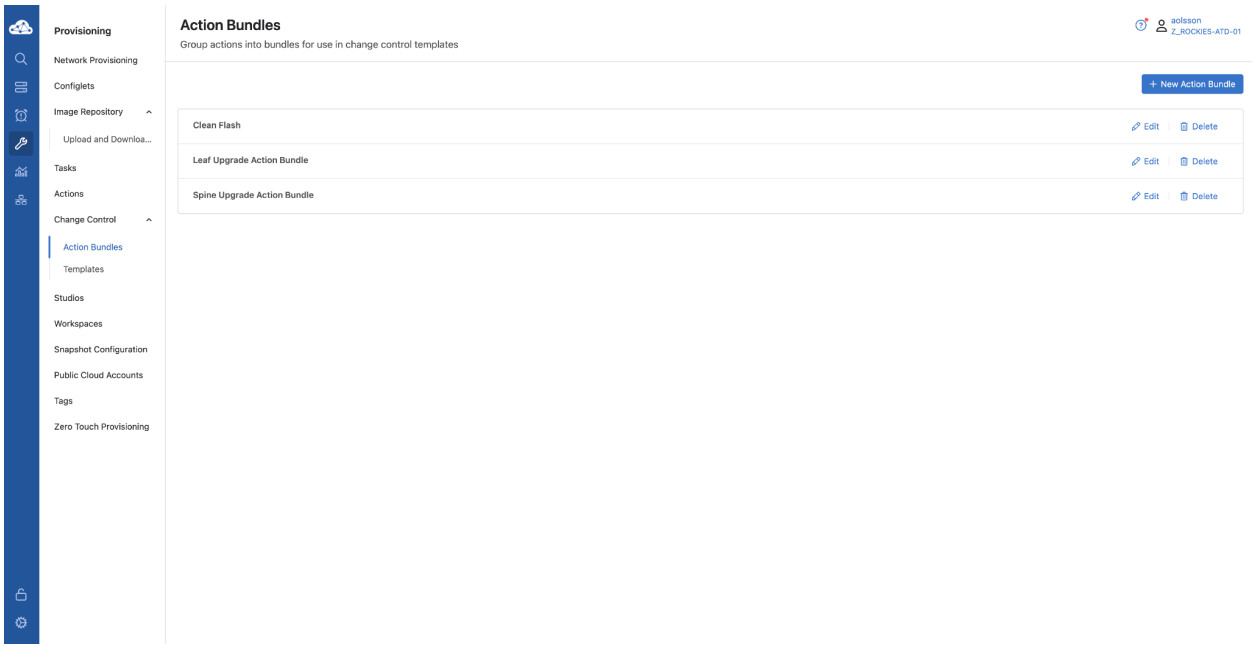
3. Select the "**Add action**" dropdown box and select the "**Clean Flash**" action.
4. In the "**DeviceID**" section, choose the "**Provide via template**" option.
5. In the "**FileSpecAndGlob**" section, enter:

```
flash:*.swi
```

6. Select "**Save**."



7. You should now see the three Action Bundles that have been created.



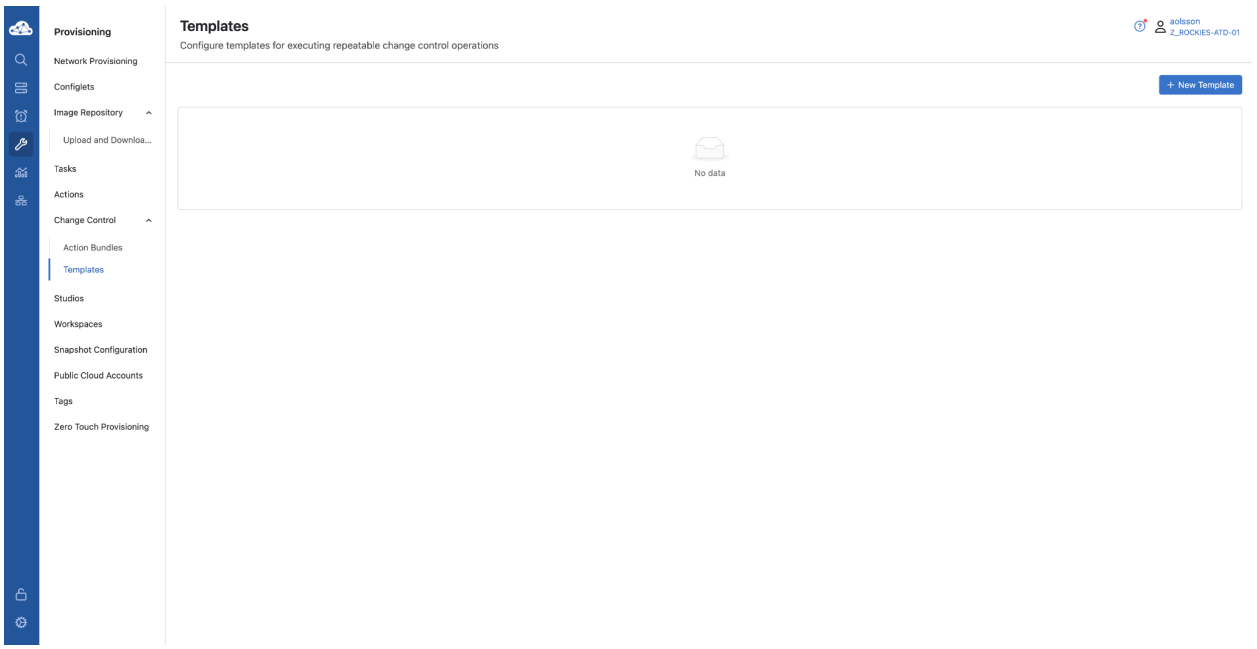
TEMPLATES

A change control template is used as a structure for repeatable change control operations. It enables you to complete common and frequent changes in your network without needing to configure the details of the change control operation each time.

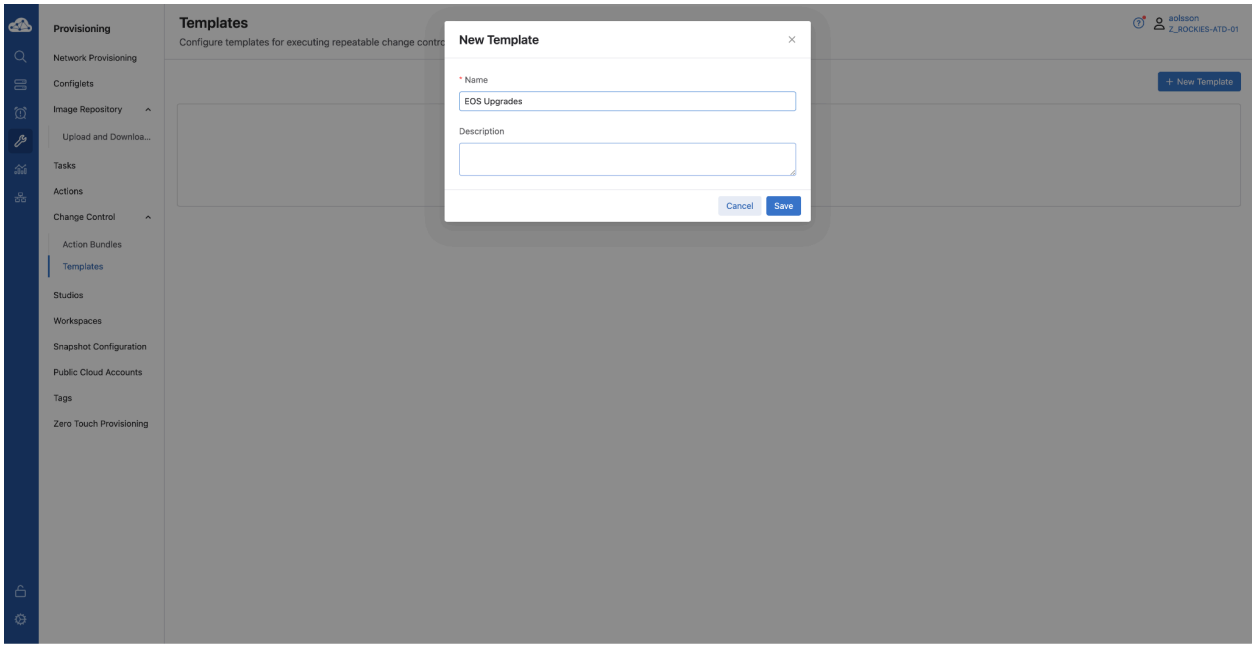
Two elements are used to construct a change control template, action bundles, and templates. Once a template has been created, you can then use it in all future change control operations.

Create a Template

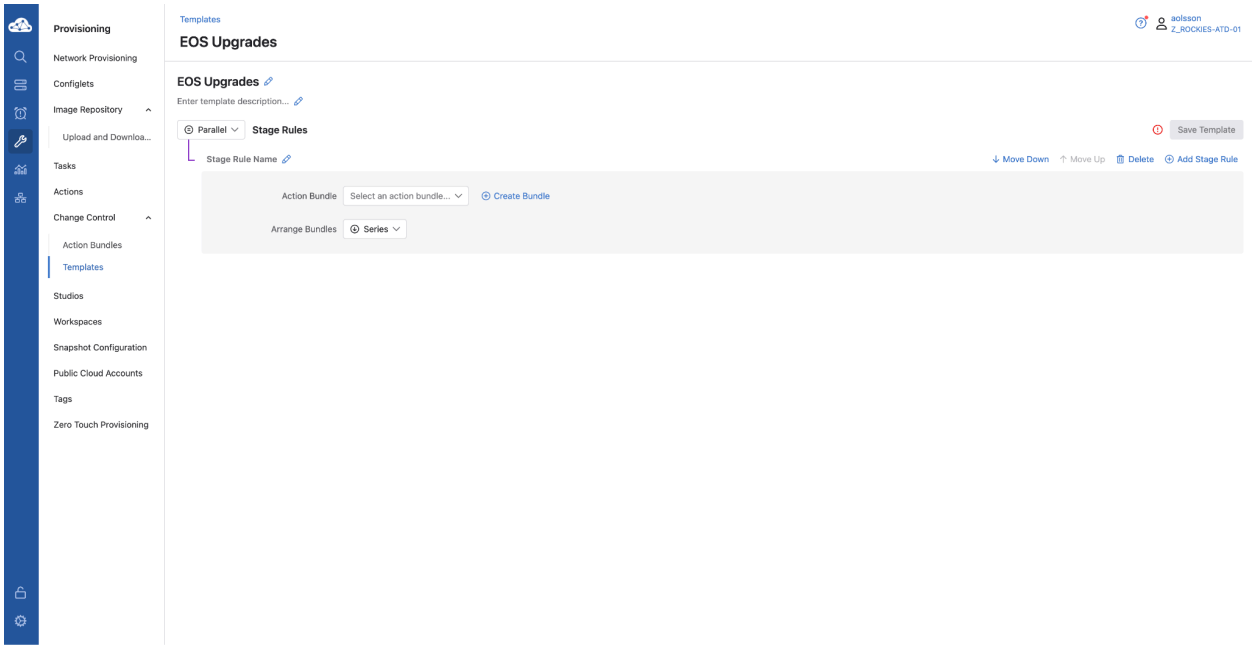
1. The first thing we need to do is navigate to **Provisioning** > **Templates**.
2. Create a new template by selecting "**+ New Template**".



3. The "**New Template**" dialog box should appear. Enter a name for the new template. Since this template will be for upgrades, let's call it "**EOS Upgrades**."
4. Click "**Save**."



5. Next, you'll be taken to a page where you can define the template options.



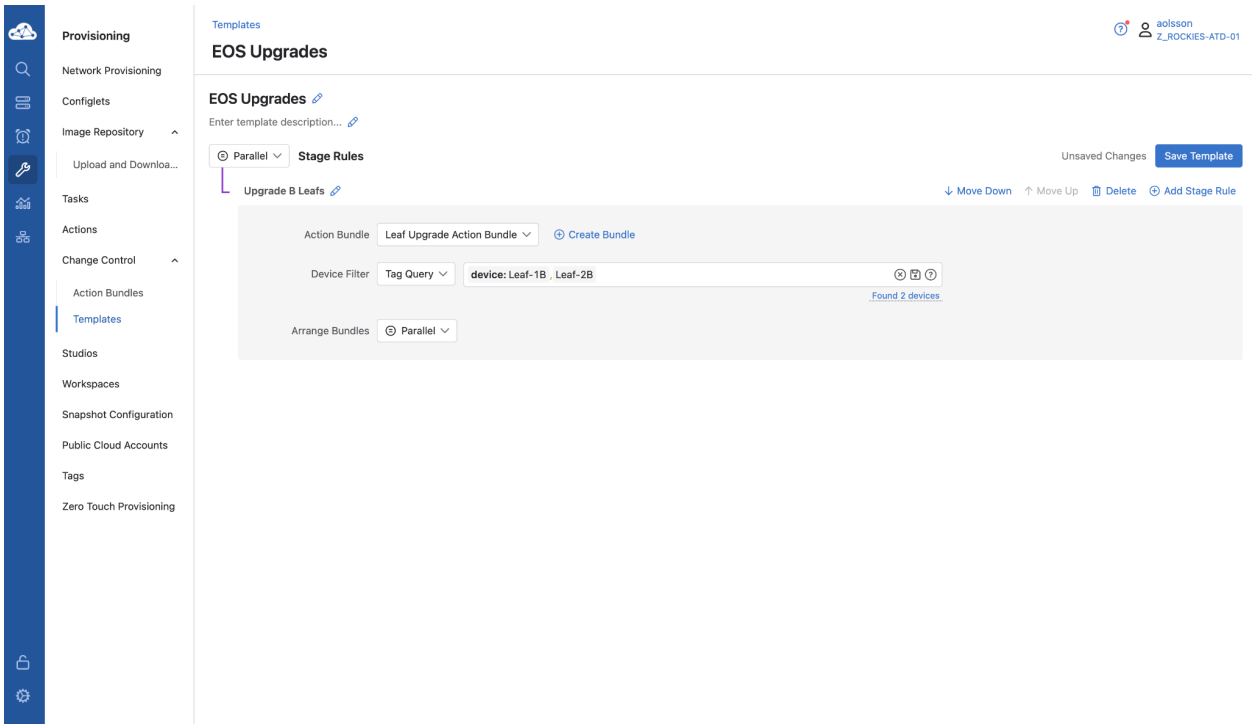
6. Now, let's add the first stage to the Template. On the right side of the page, select "**+ Add Stage Rule**".

NOTE: The Stage rules need to match the order they are in the lab guide. Ensure you are clicking the "**Add Stage Rule**" of the last Stage in the Template.

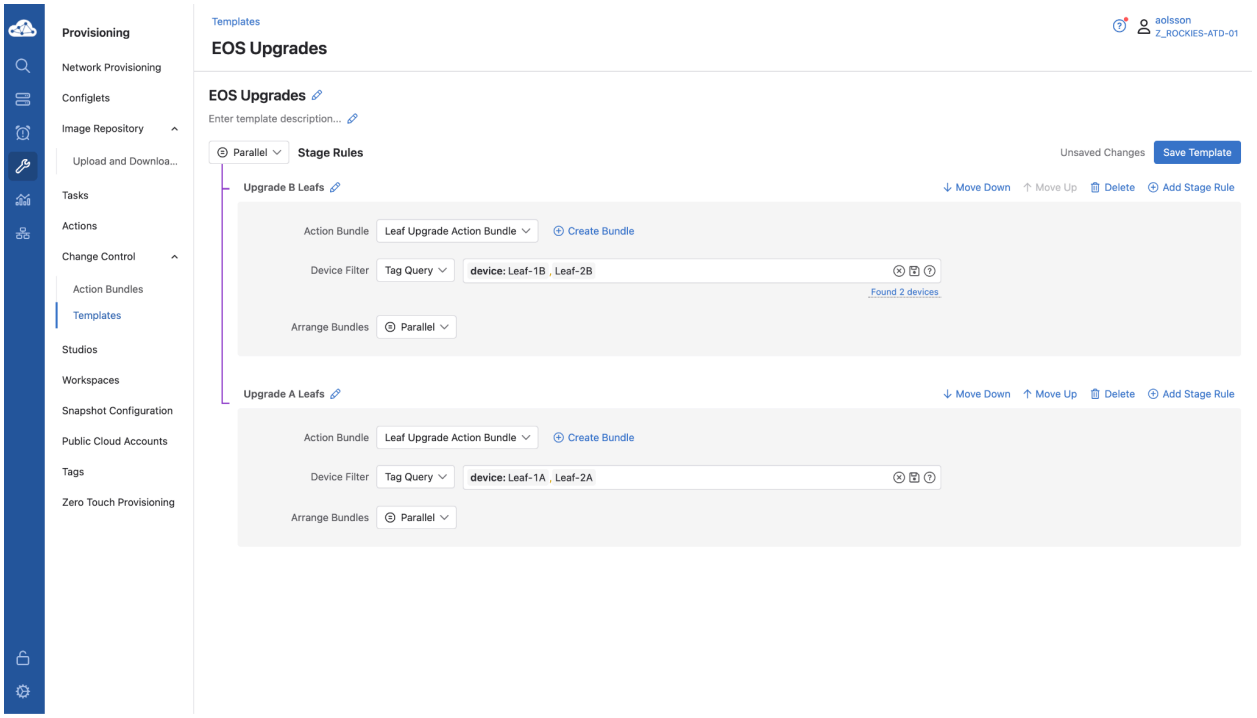
7. Click on the pencil icon next to the "**Stage Rule Name**" of the first stage rule and name it "**Upgrade B Leafs**." As you can probably tell from the name, this stage will only be used to upgrade the B Leafs.
8. Since we'll upgrade the Leafs in this Template stage, choose "**Leaf Upgrade Action Bundle**" in the "**Action Bundle**" dropdown.
9. In the "**Device Filter**" dropdown, change the selection to "**Tag Query**."
10. In the box just to the right of the "**Tag Query**" dropdown, we must select Leaf-1B and Leaf-2B. To do this, type "**Device:**" and choose Leaf-1B from the dropdown followed by a "**,**" then select Leaf-2B.

NOTE: Keep in mind that the Tag Key:Value pairs are case sensitive.

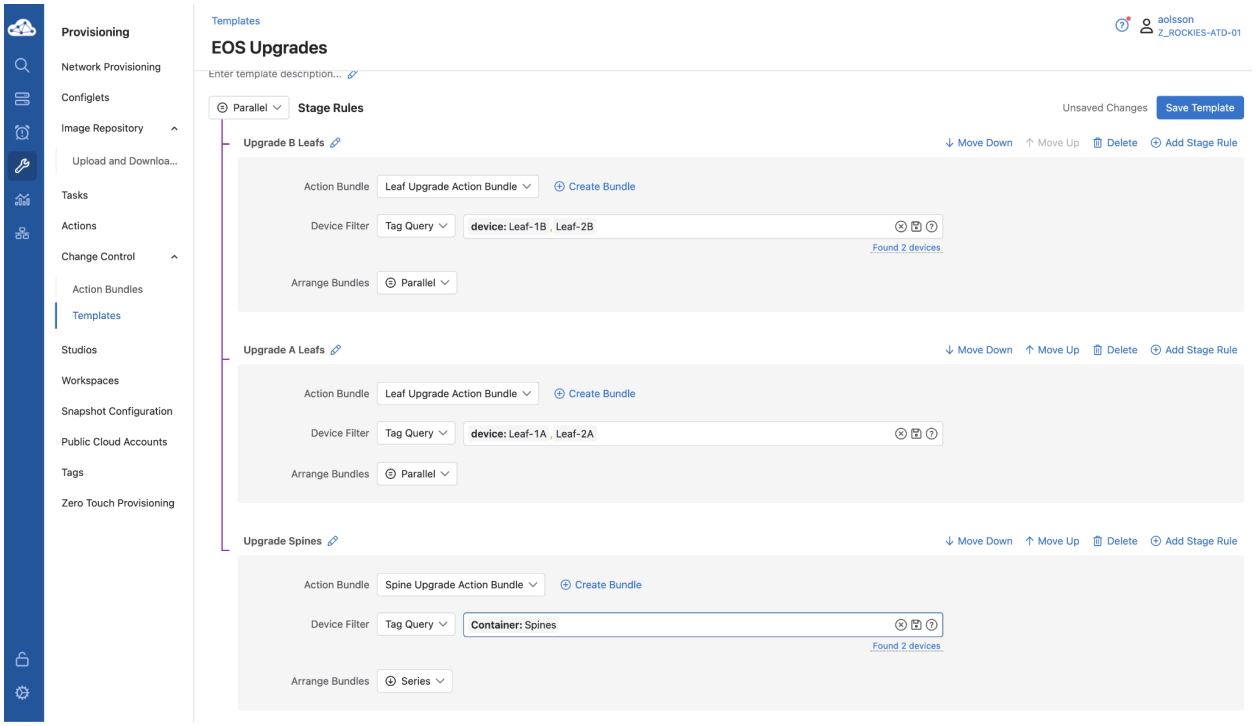
11. Change the "**Arrange Bundles**" dropdown from "**Series**" to "**Parallel**" so that this action can be run on both B switches at the same time.



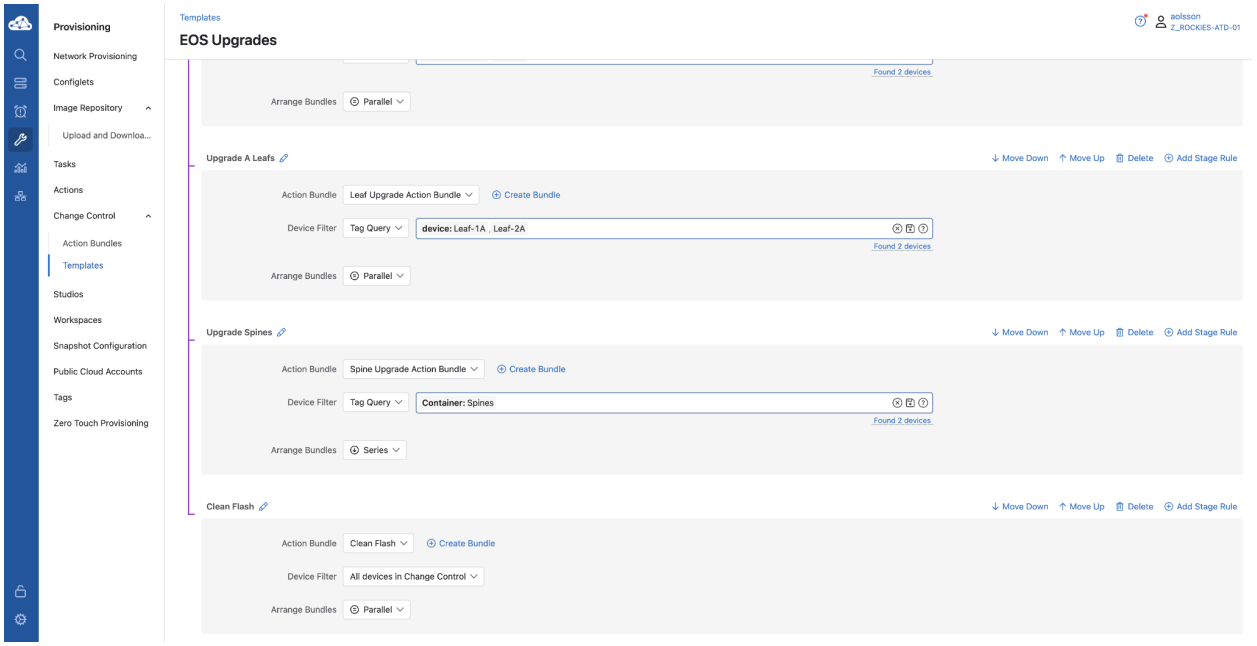
12. Repeat the steps completed for the "**Upgrade B Leafs**" stage, but for "**Upgrade A Leafs**." Be sure to select both Leaf-1A and Leaf-2A in the Tag Query.



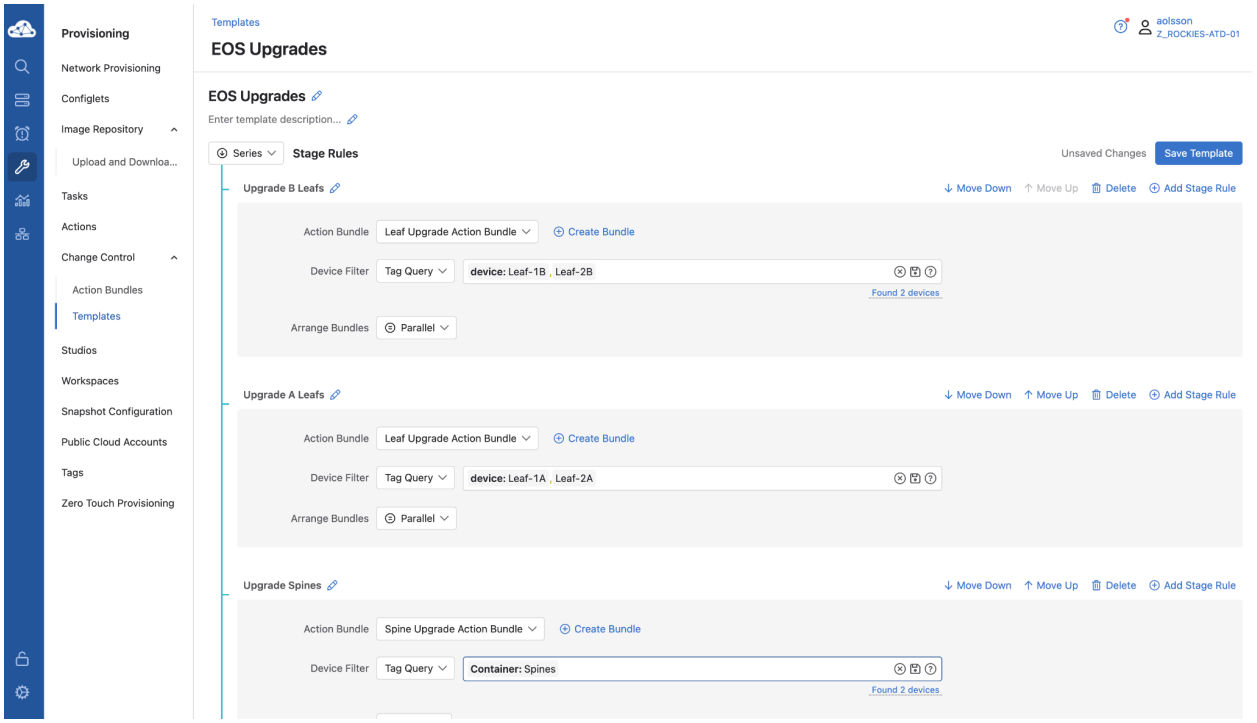
13. Now that the stages for the Leafs are complete, we can create the next stage, which will be used to upgrade the spines. Click on "**+ Add Stage Rule**" once again.
14. Change the name of the stage to "**Upgrade Spines**."
15. For the "**Action Bundle**," we need to use the "**Spine Upgrade Action Bundle**".
16. The Tag Query will be a bit different, we will use the "**Container**" tag for the Spines since both Spines are in the same container in Network Provisioning. Enter "**Container: Spines**" in the Tag Query field.
17. We'll leave the Arrange Bundles dropdown as "**Series**" because we want to upgrade one Spine at a time.



18. Add a final stage to the Template to clean the flash. We'll name it "**Clean Flash**". This will remove the old EOS Image after all the upgrades are completed. Select the "**Clean Flash**" action bundle created in the previous section in the Action Bundle dropdown.
19. The "**Device Filter**" can remain unchanged because we want to clean the flash on all the devices in the change control as part of this stage in the Template.
20. Change the "**Arrange Bundles**" dropdown from "**Series**" to "**Parallel**" so that this action can be run on all devices simultaneously.

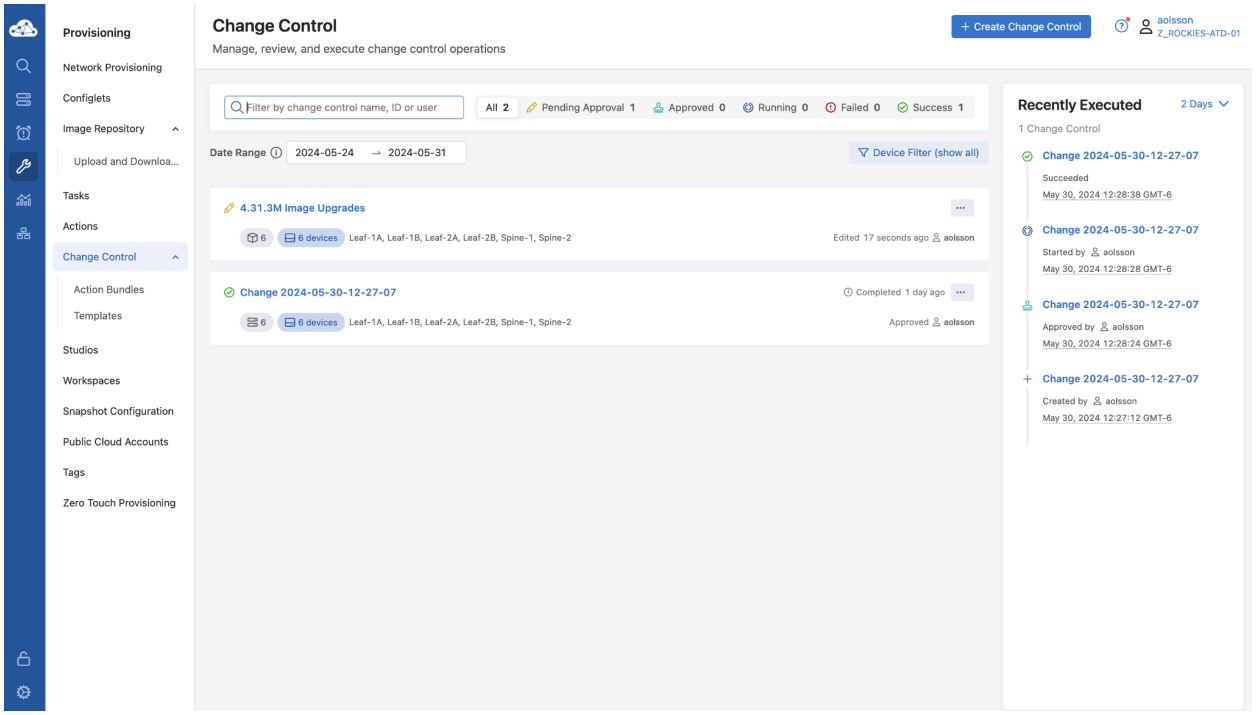


21. Change the “**Stage Rules**” section at the top left of the page to “**Series**” so all stages in the template happen in series.
22. Click on “**Save Template**” on the top right of the screen.

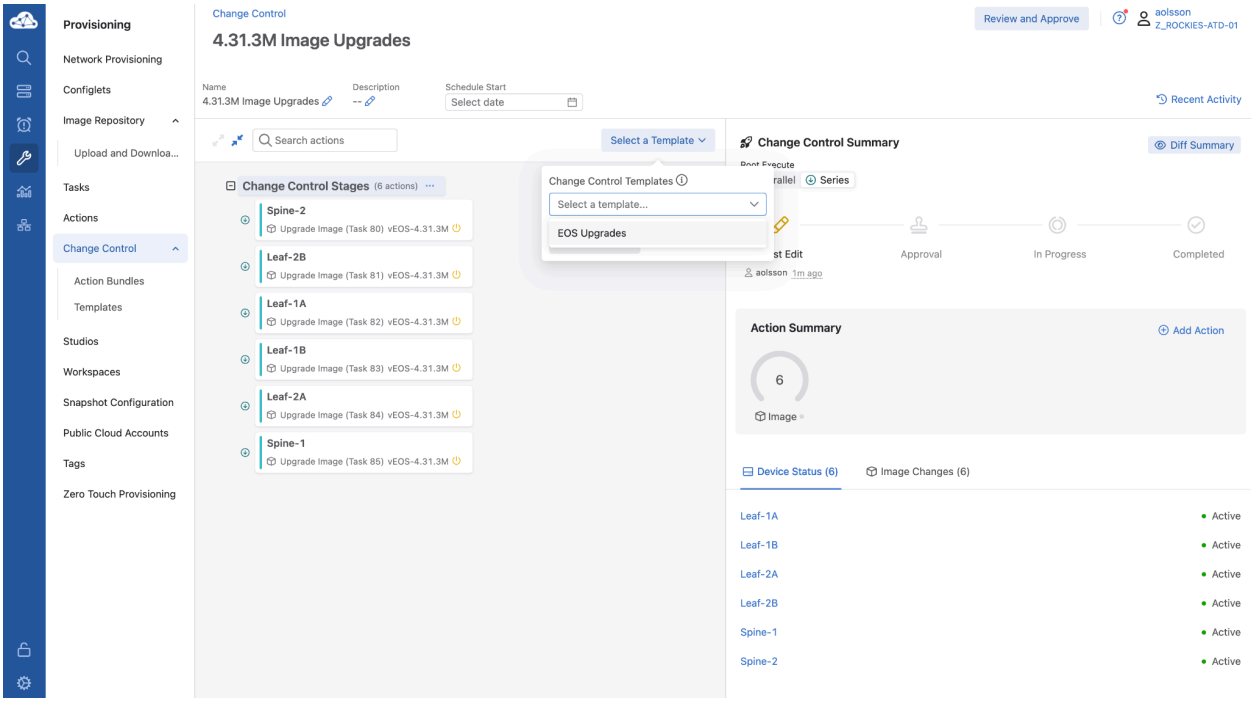


Now that the Action Bundles and Upgrade Template have been created, they can be added to the change control created previously.

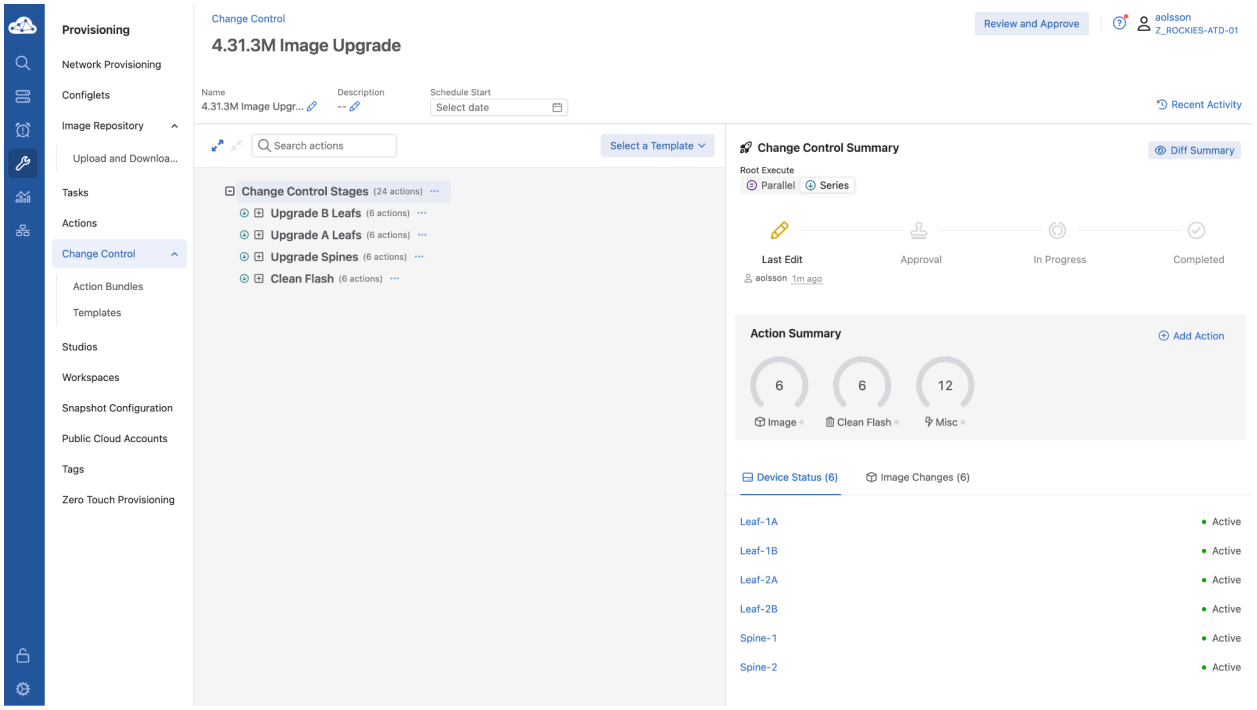
23. Head over to **Provisioning** > **Change Control**.
24. Select the "**4.31.3 Image Upgrade**" Change Control.



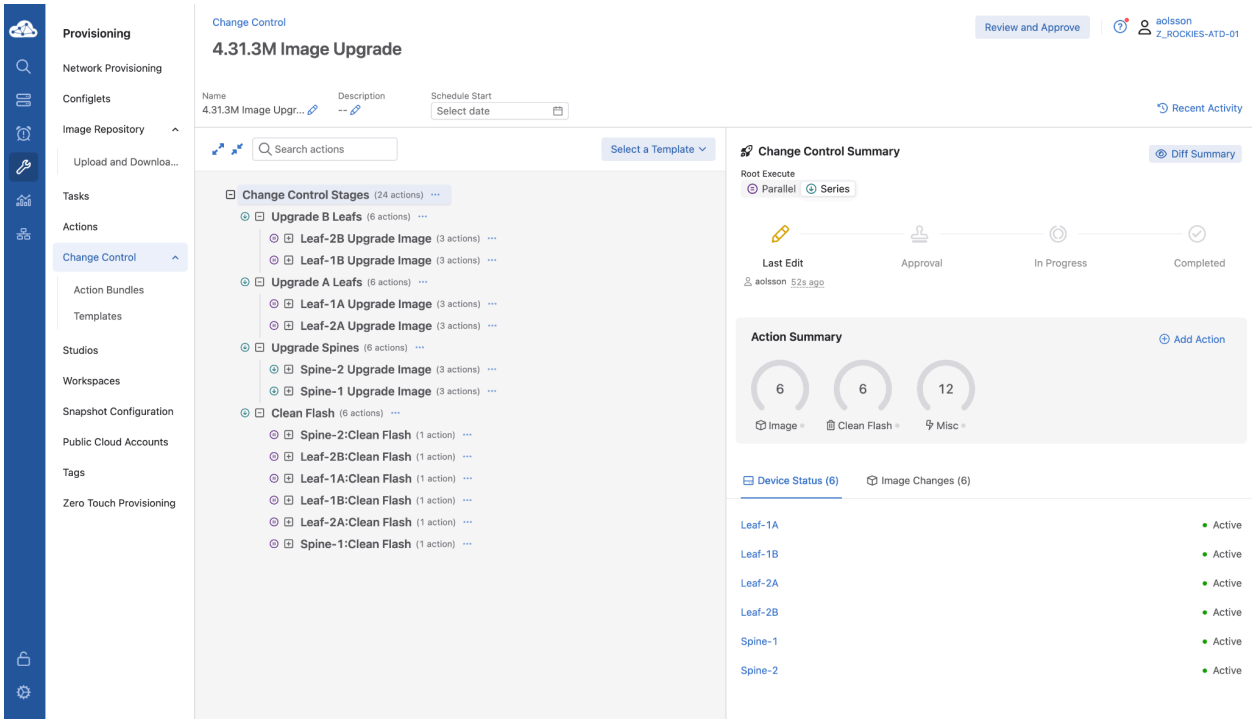
25. Once in the change control, click the blue "**Select a Template**" dropdown box.
26. In the "**Change Control Template**" dialog box, select the "**EOS Upgrades**" Template created in the previous section.
27. Select "**Apply Template**".



The change control will reflect what was defined in the upgrade template. While expanding the newly added stages and looking at the change control, remember that the green circle with the arrow in the center means that the action will be completed in series, and the purple circle with the two parallel lines means that those actions will be completed in parallel.

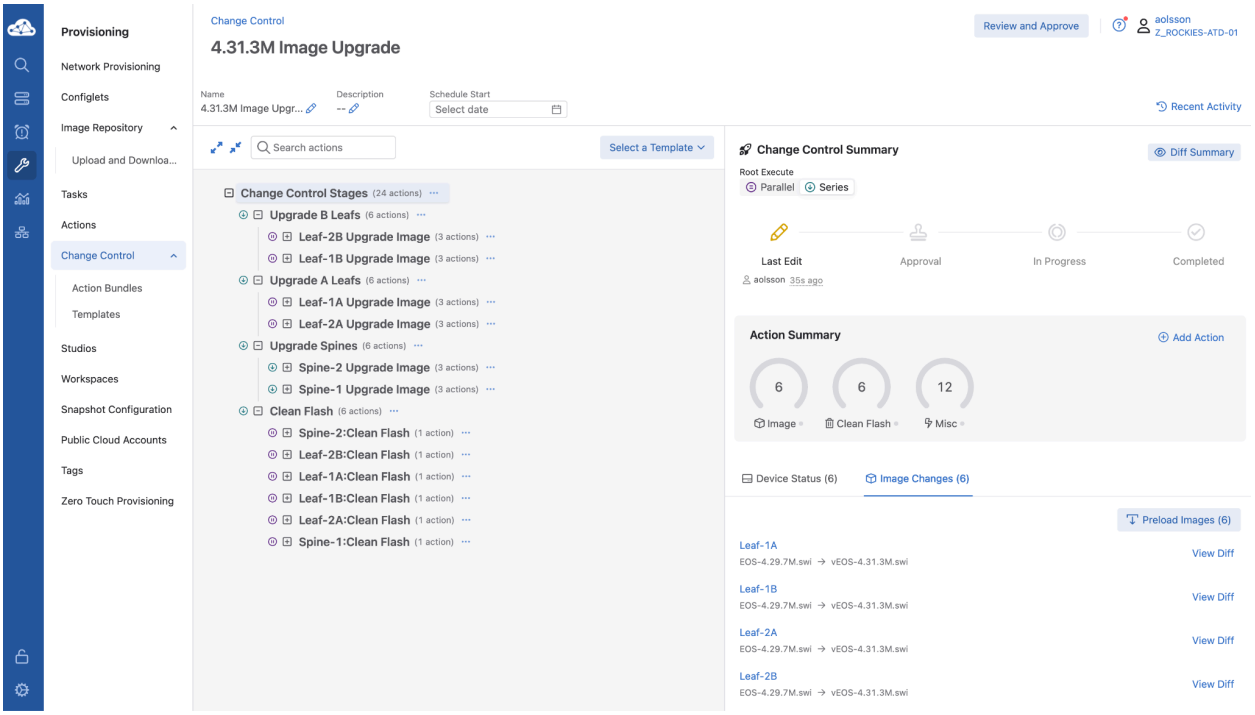


28. Expand each stage of the change control by Clicking the "**+**" next to each stage.
29. Validate that your change control looks similar to the screenshot below.

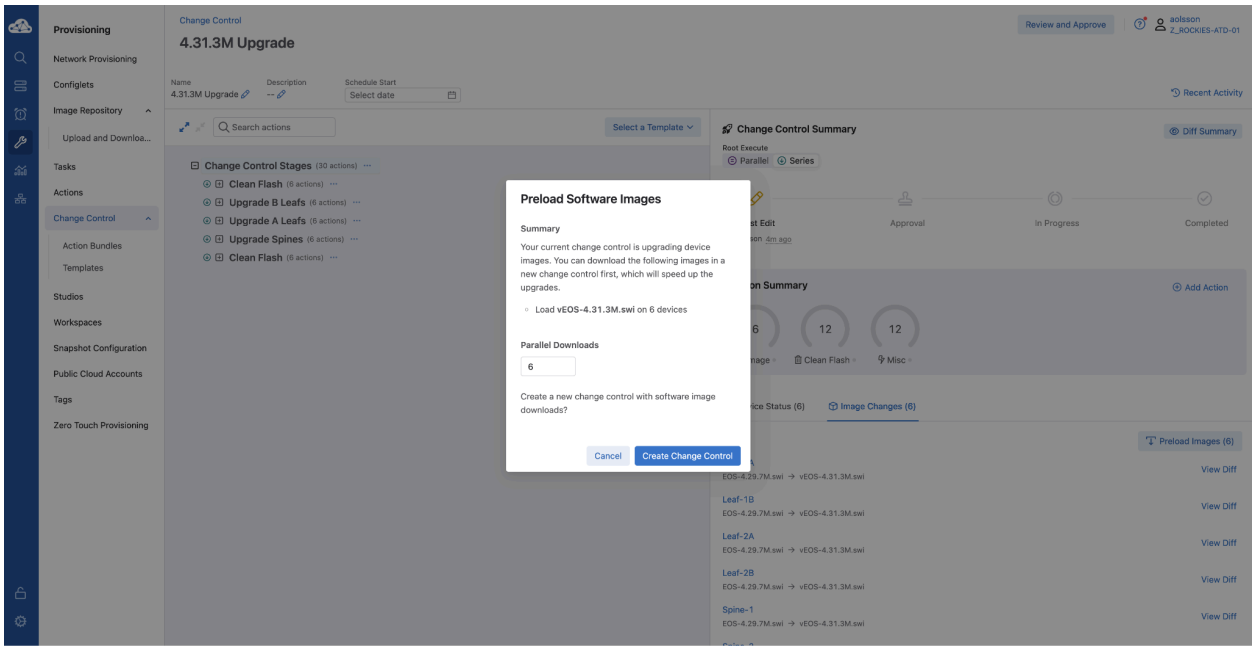


Now that the change control has been updated using the template, it can be executed as is. However, there's a process that can be used to preload the images on the devices to minimize upgrade times during a maintenance window.

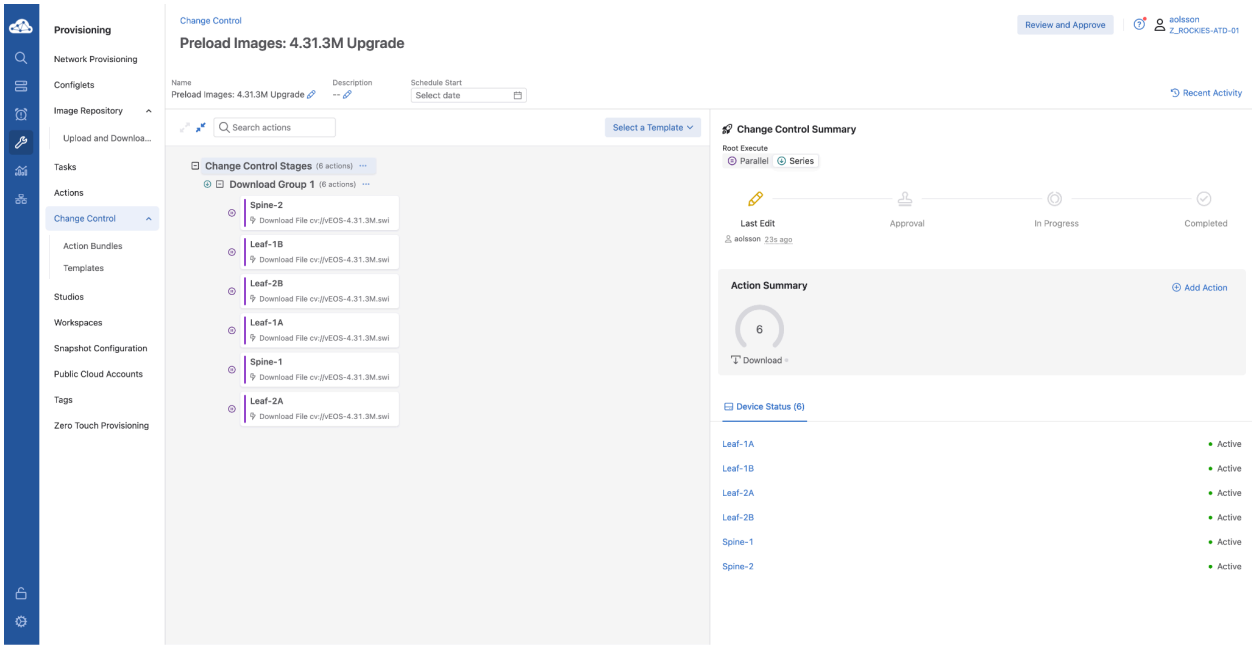
30. On the bottom right section of the change control, click on "**Image Changes**"



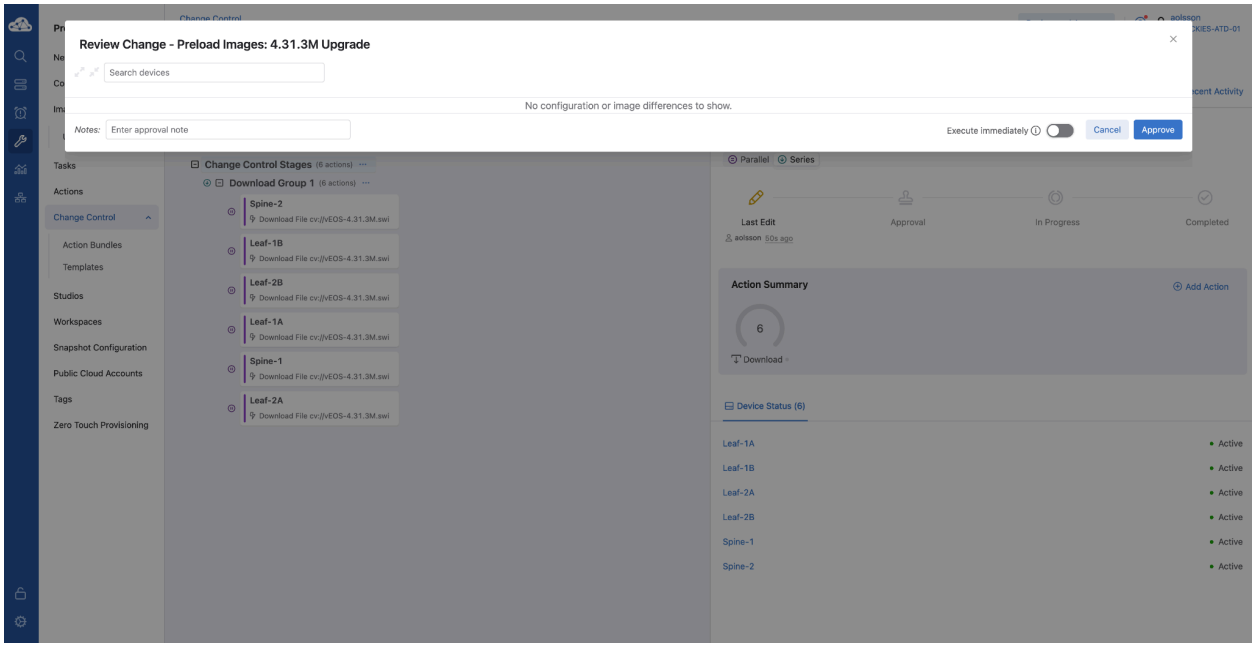
31. Select the blue "**Preload Images**" button.
32. A "**Preload Software Images**" dialog box appears. From here, the number of Parallel Downloads, which can be 6 for the lab, can be specified.
33. Click "**Create Change Control**" to generate a new change control to preload the images on all devices.



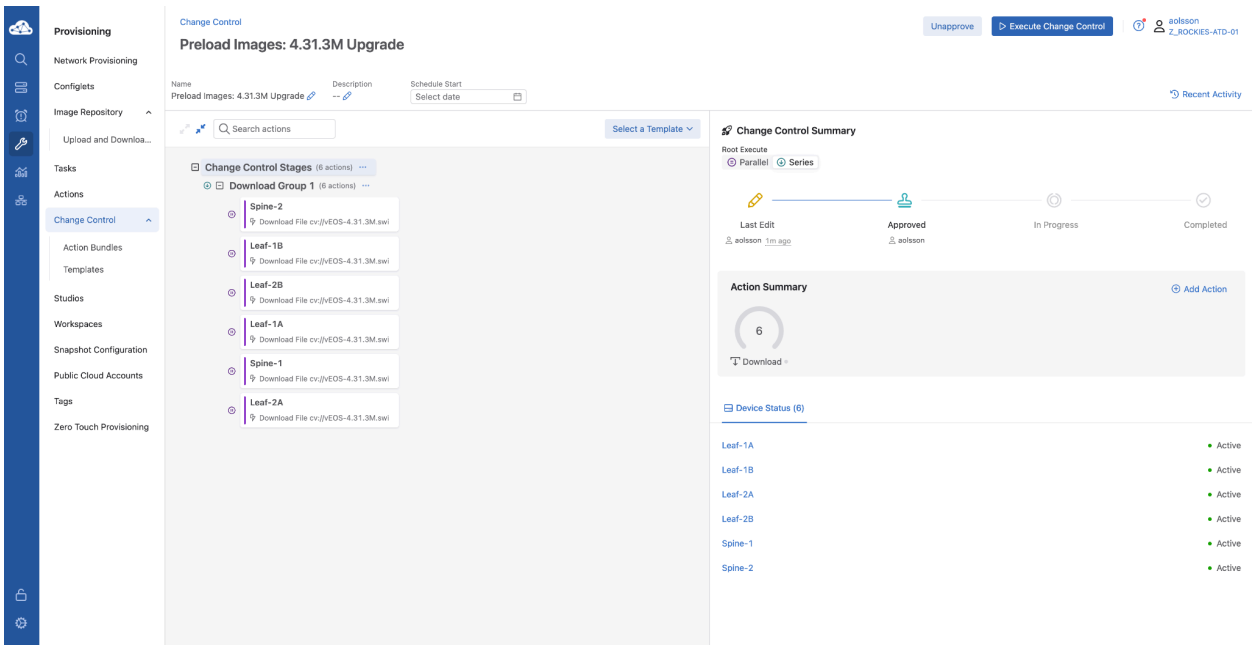
34. CloudVision will redirect you to the new "**Preload Images: 4.31.3M Upgrade**" change control.
35. Select "**Review and Approve**" in the upper right corner to review the change control.



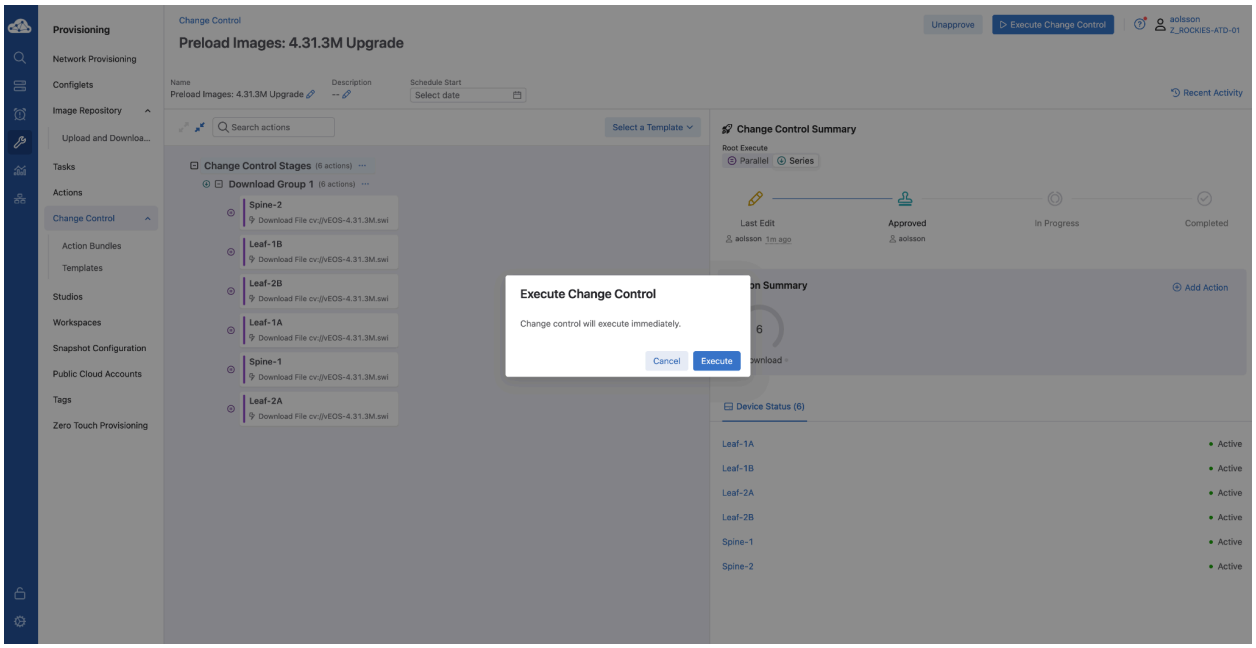
36. The "**Review Change**" pop-up will appear and show no changes to the device are being made. This is expected because we're just transferring the EOS image to the device, so no actual changes are being made.
37. Once satisfied with the change control review, select "**Approve**."



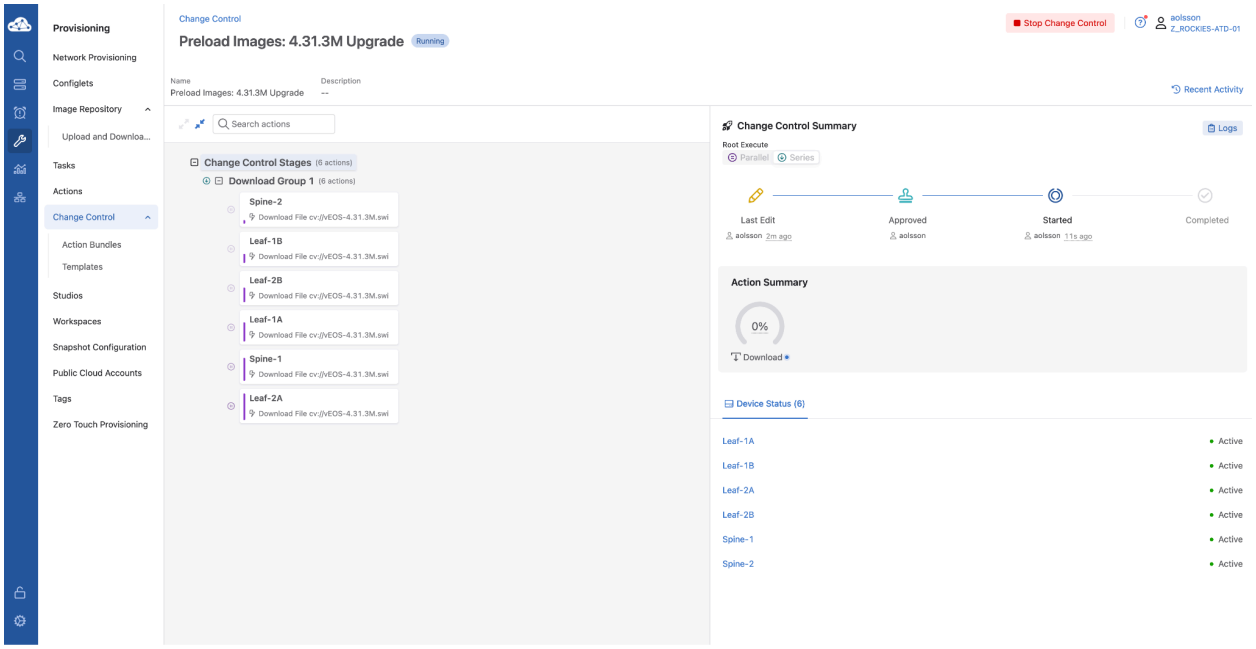
38. Select the blue “**Execute Change Control**” button.



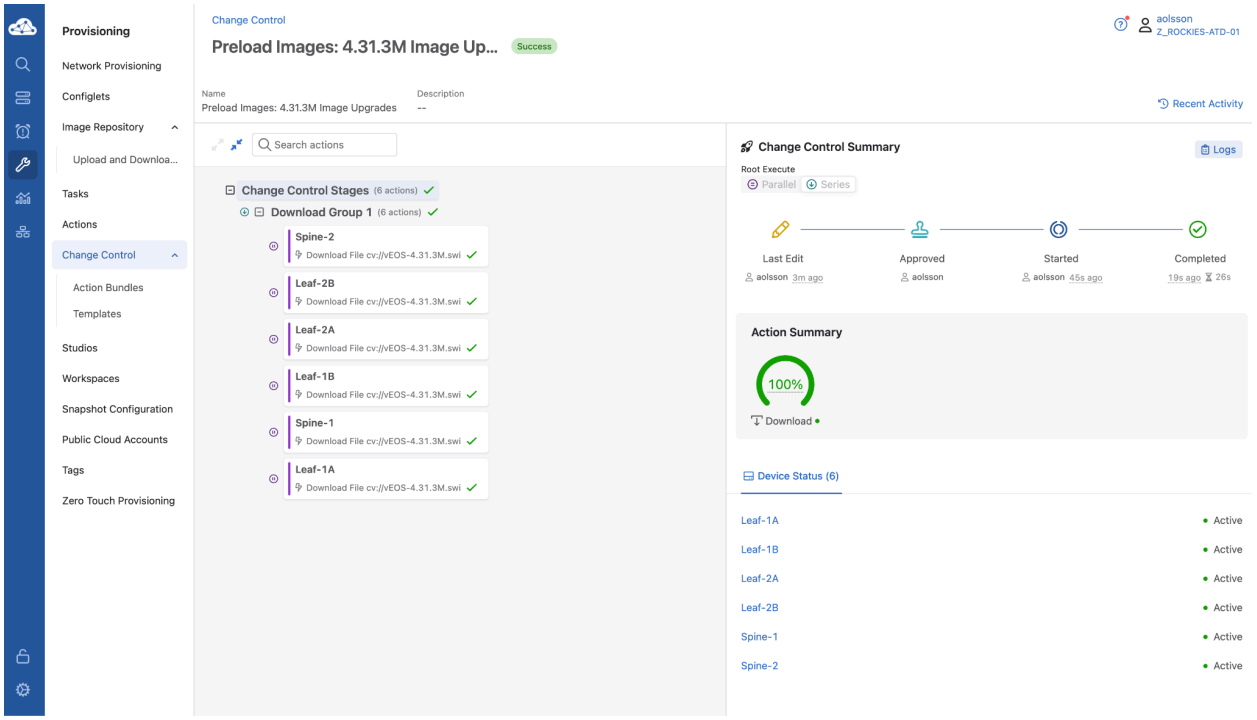
39. An “**Execute Change Control**” pop-up will appear. Select **Execute** to begin the change control execution.



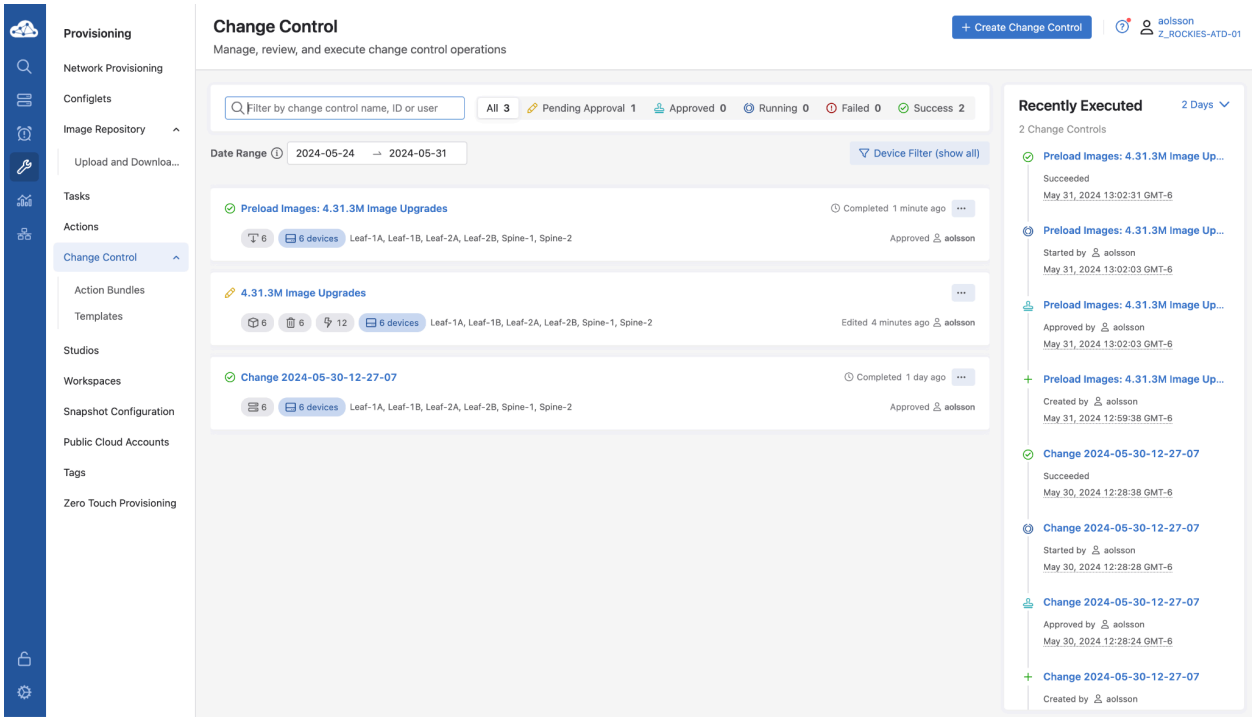
40. The change control animations will appear next to each task in the change control, showing that all tasks are being executed.



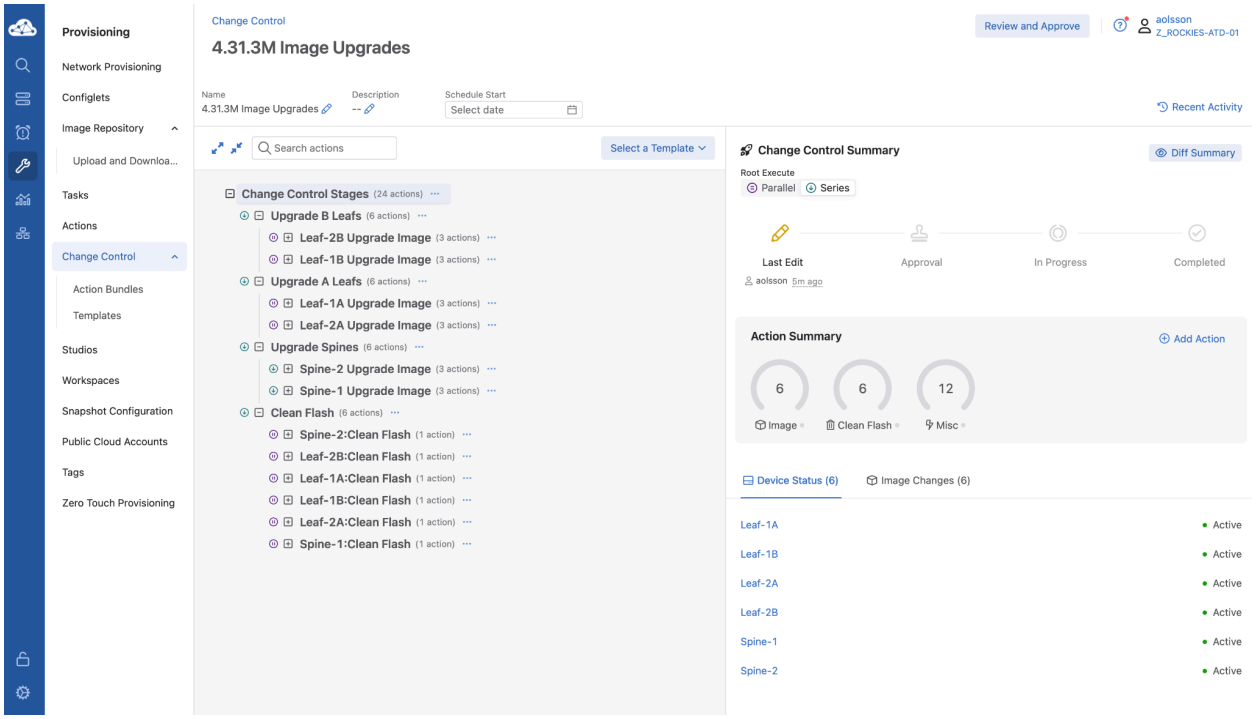
41. As the tasks are complete, a green check will appear at the right of each task. Once the change control has been completed, a green “**Success**” message/label will appear to the right of the change control name.



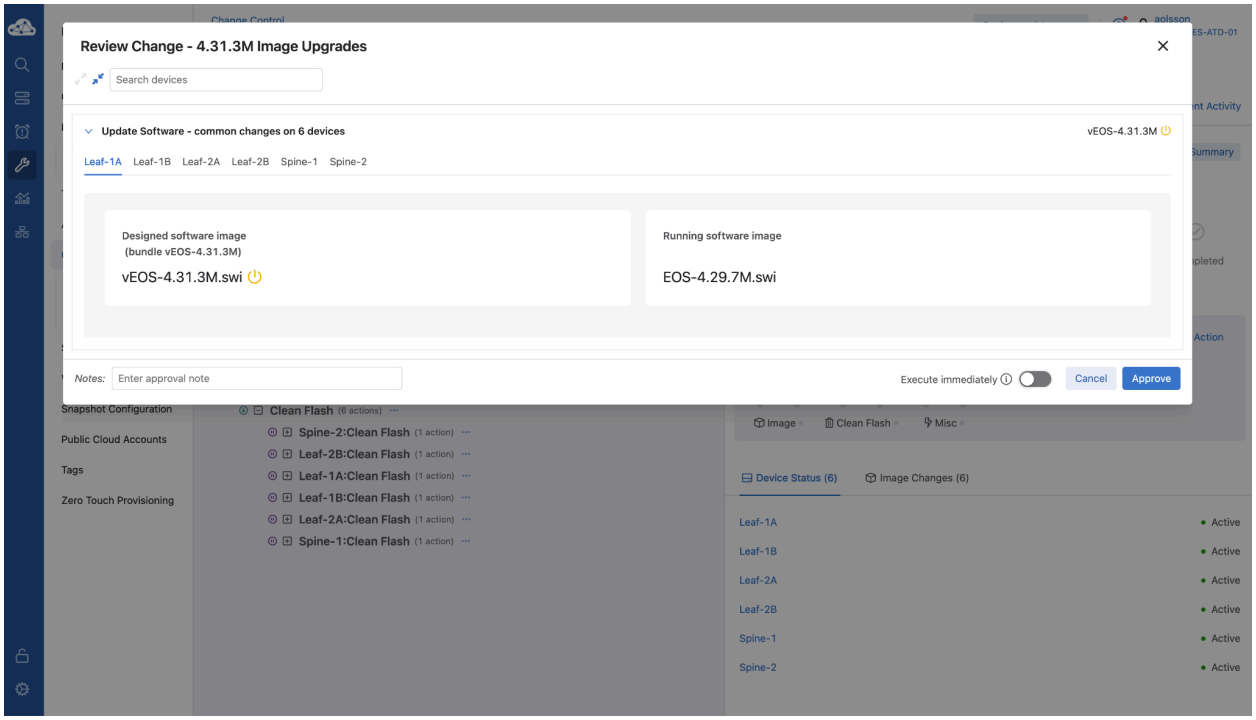
42. The upgrade change control can be executed now that the EOS images have been preloaded onto all devices. Head to **Provisioning** > **Change Control** and select the upgrade change control, which is named "**4.31.3M Image Upgrades**."



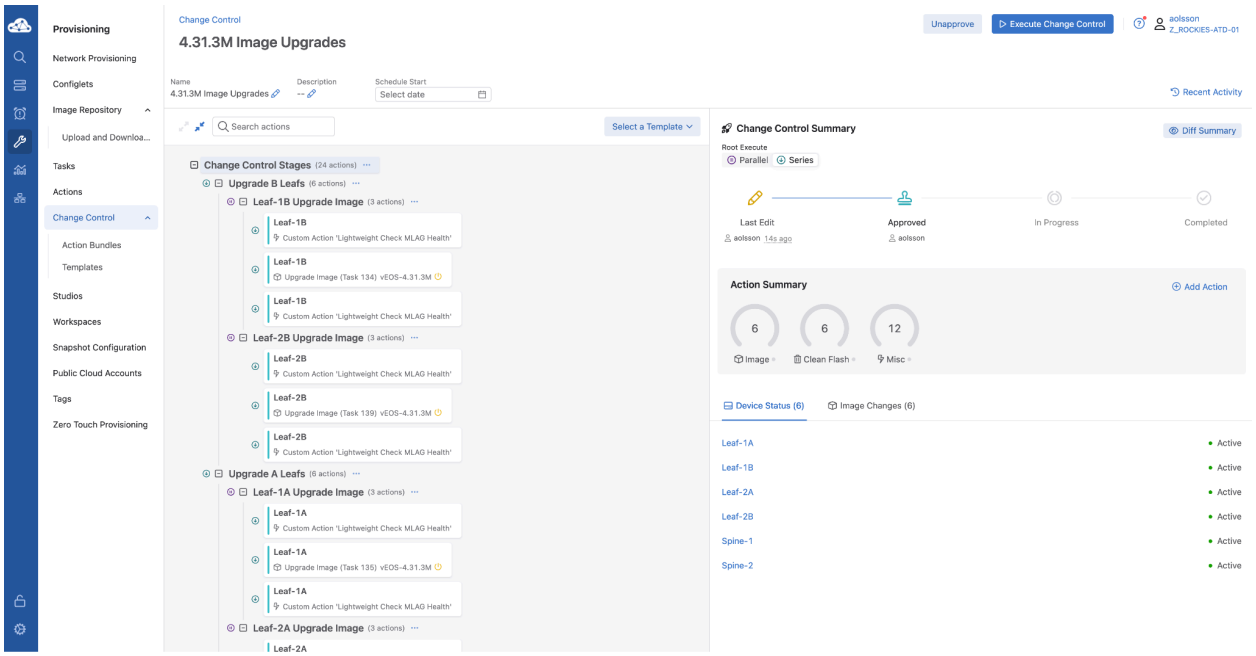
43. Select the blue "**Review and Approve**" button in the upper right corner.



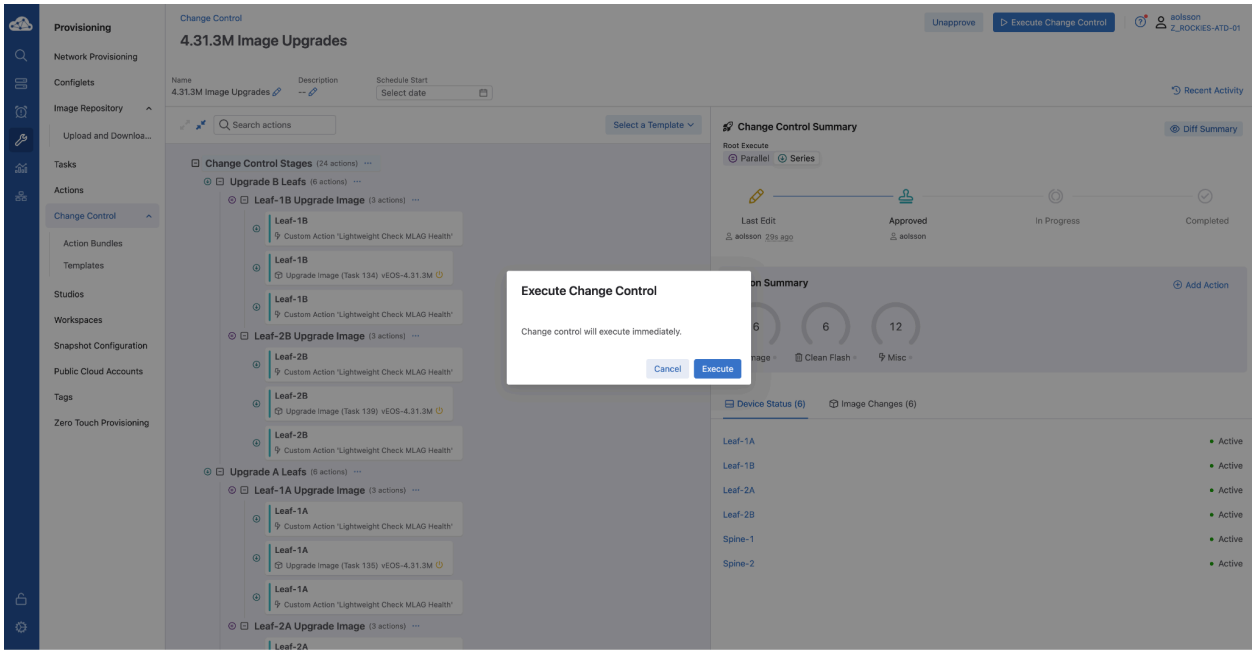
44. The "**Review Change"** pop-up will appear for this change control and should indicate that EOS is being upgraded. The changes for each of the 6 devices should be grouped together because all 6 devices are running the same version of EOS and are being upgraded to the same version of EOS. Select the blue "**Approve**" button to approve the changes.



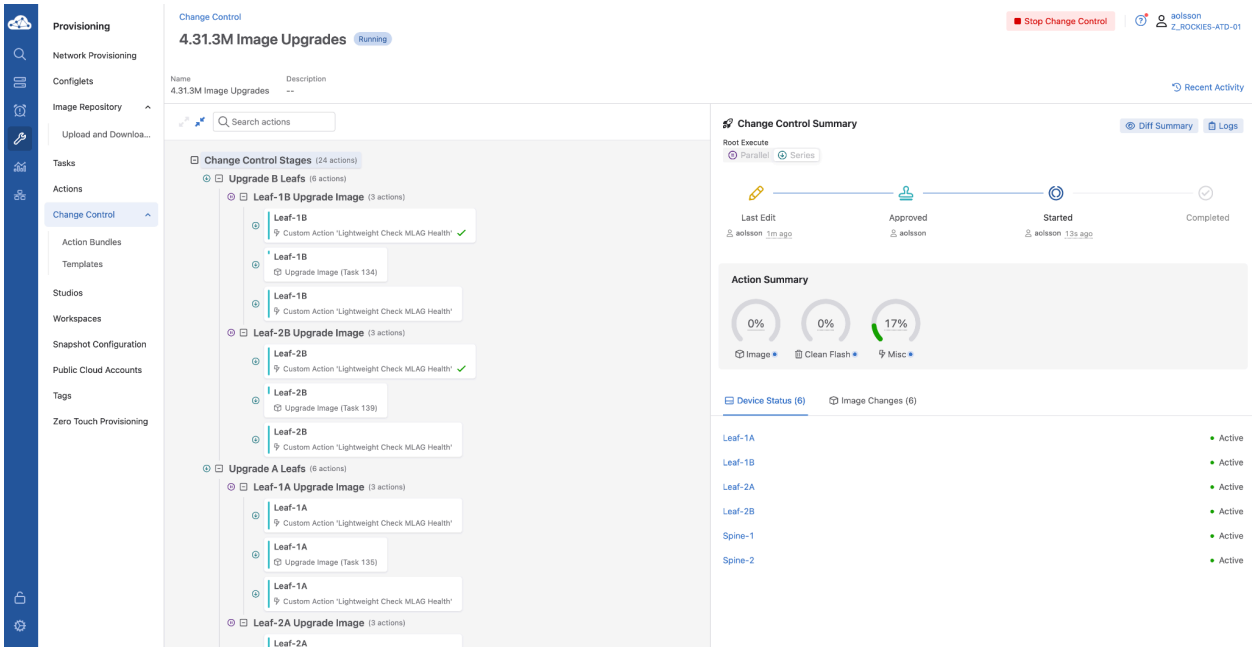
45. Select the blue "**Execute Change Control**" button in the upper right corner.



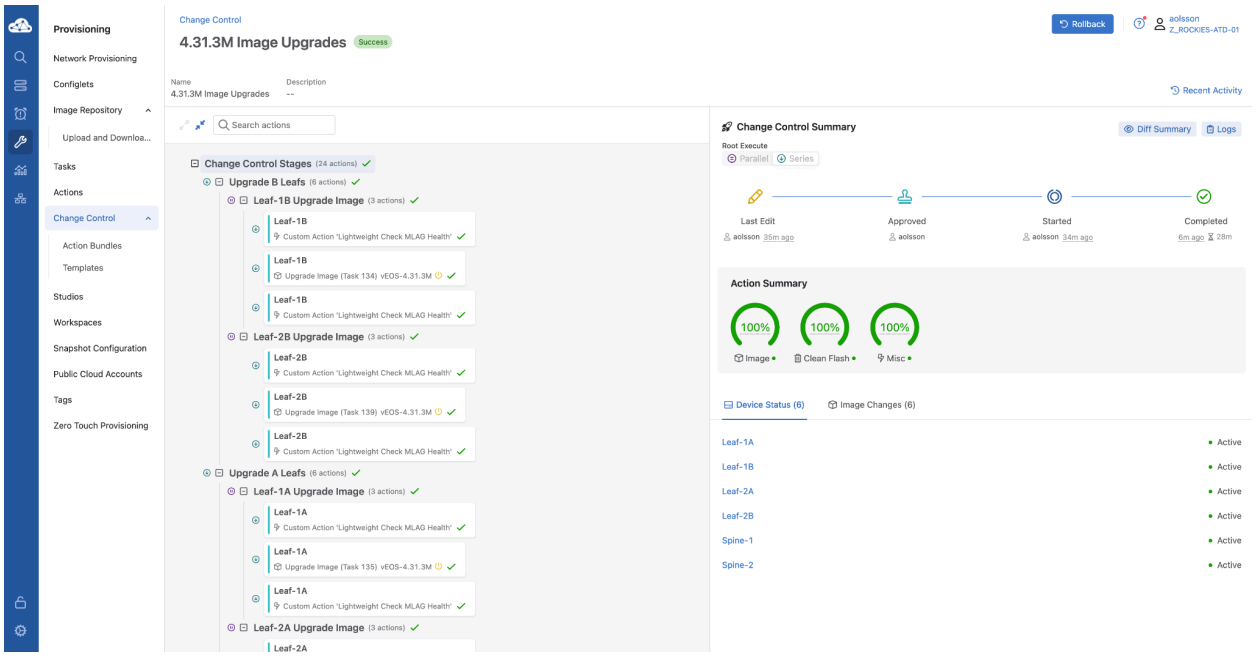
46. An "**Execute Change Control**" pop-up will appear. Select **Execute** to begin the change control execution.



47. Once again, the change control animations will appear next to each task in the change control as it runs. A green check mark will appear just to the right of each task when it is completed.



48. When the change control has been successfully completed, a green “**Success**” message/label will appear next to the change control name.



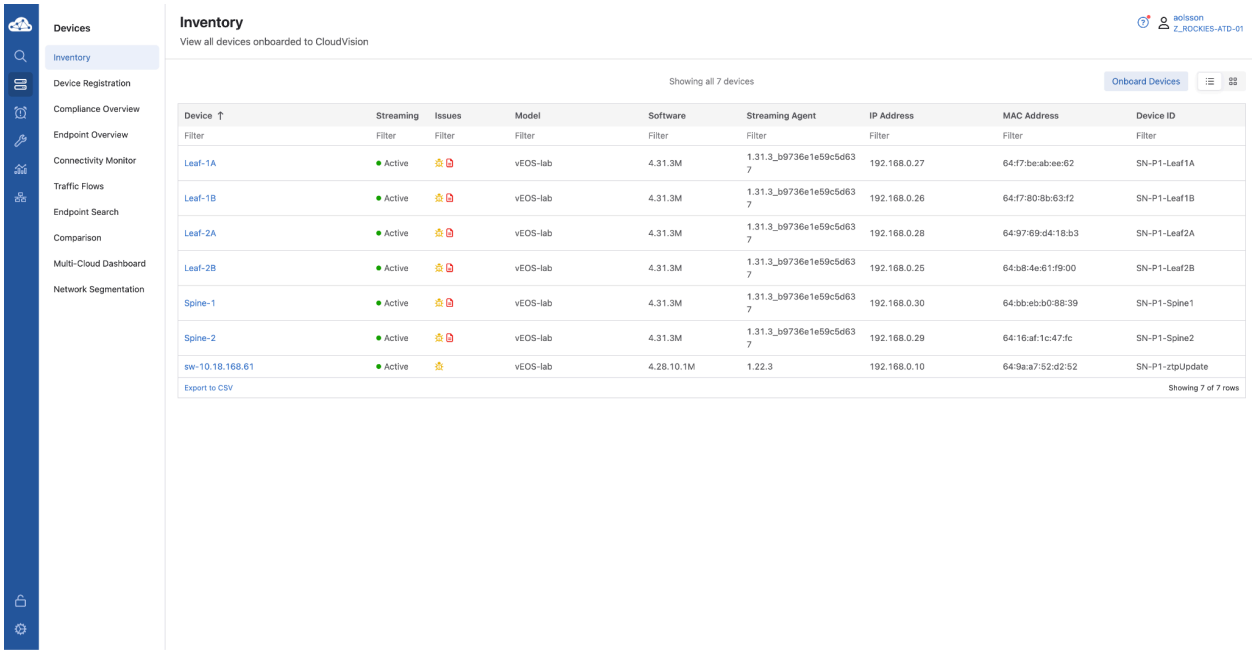
COMPLIANCE

CloudVision continuously computes image and configuration compliances. If a device is either configuration, image, or extension non-compliant, CVP automatically generates a non-compliant event on the Compliance dashboard and flags the device as non-compliant on the Inventory screen.

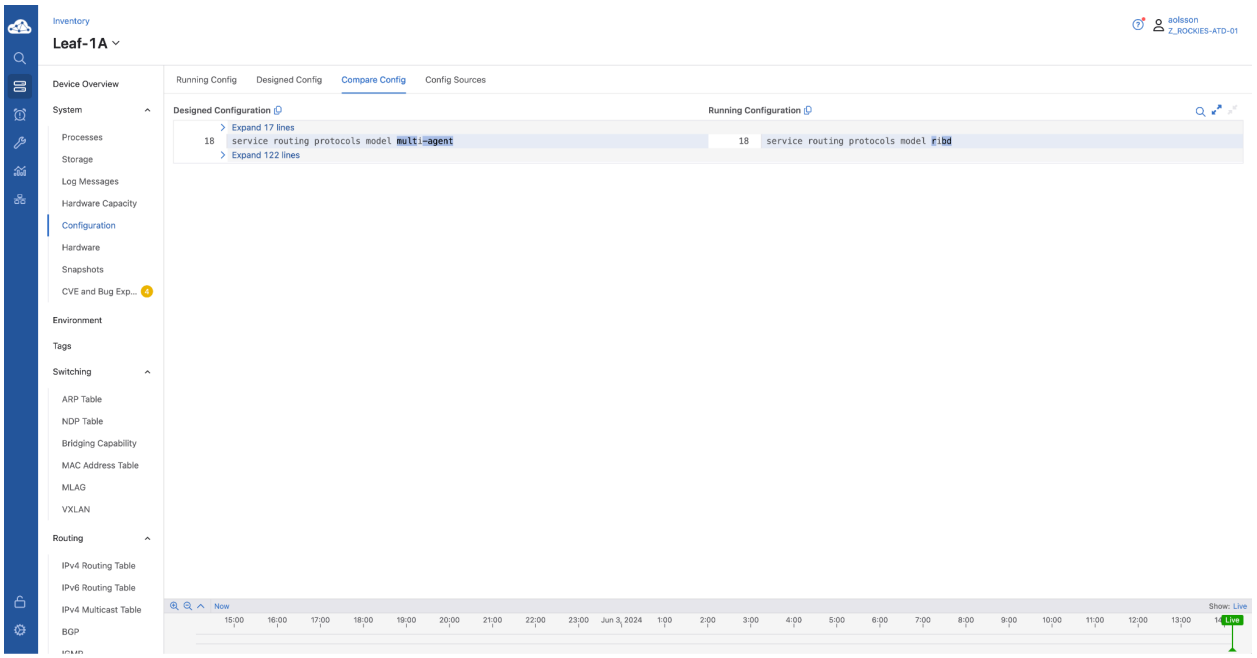
1. Navigate to **Devices** > **Inventory**.

   The Inventory page will show that all devices are now running 4.31.3M but will also show a red “**Page**” icon in the “**Issues**” column that wasn’t there before the upgrade. This icon indicates that the running configuration on the devices differs from what CloudVision thinks it should be running. This happened because “**ribd**” was the default routing model before EOS 4.30, and “**multi-agent**” was the default for EOS 4.30 and later.

NOTE: Changing the routing model protocol from “**ribd**” to “**multi-agent**” requires a reboot for the changes to take effect. This lab will skip the reboot due to time limitations.

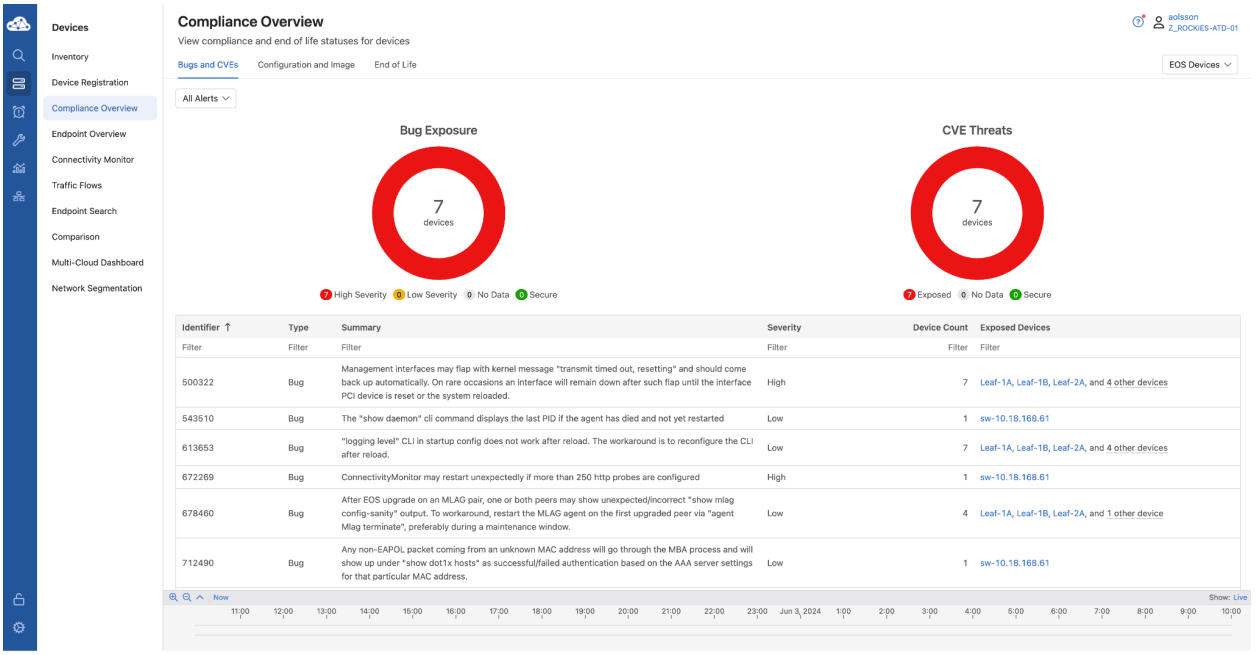


2. Click on the red “**Page**” icon next to one of the devices. This will take you to that device’s configuration “**Compare Config**” section.

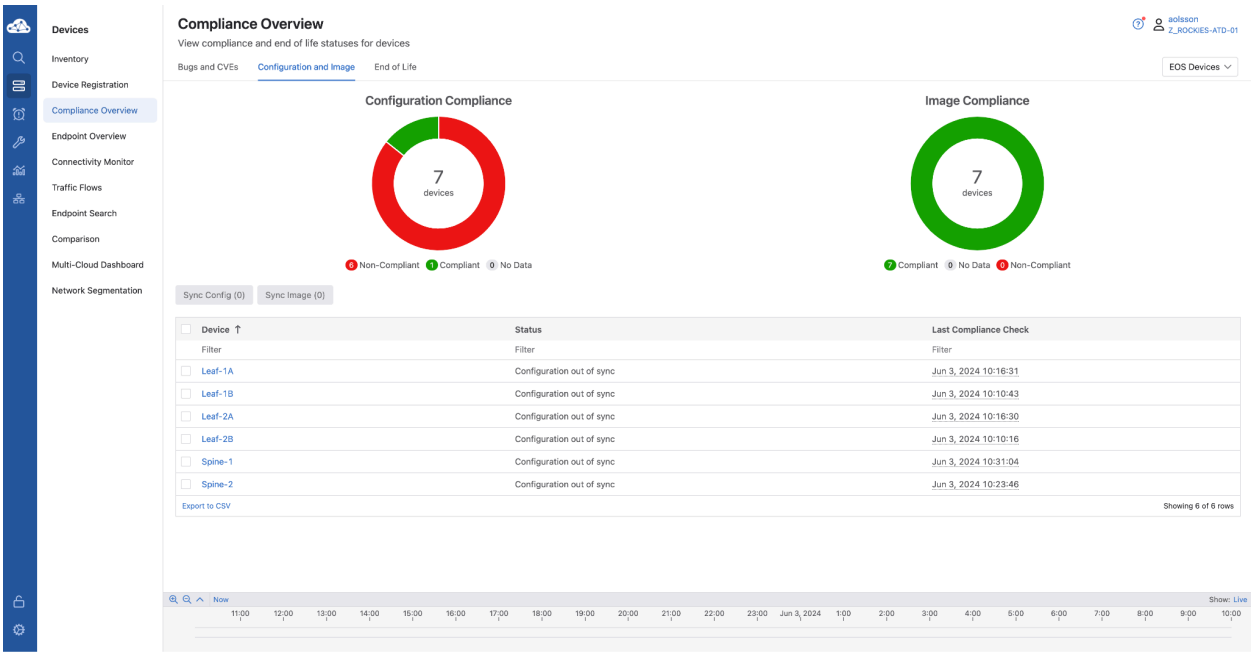


NOTE: It’s always a good idea to validate device configuration compliance within CloudVision after an upgrade in case EOS default values have changed.

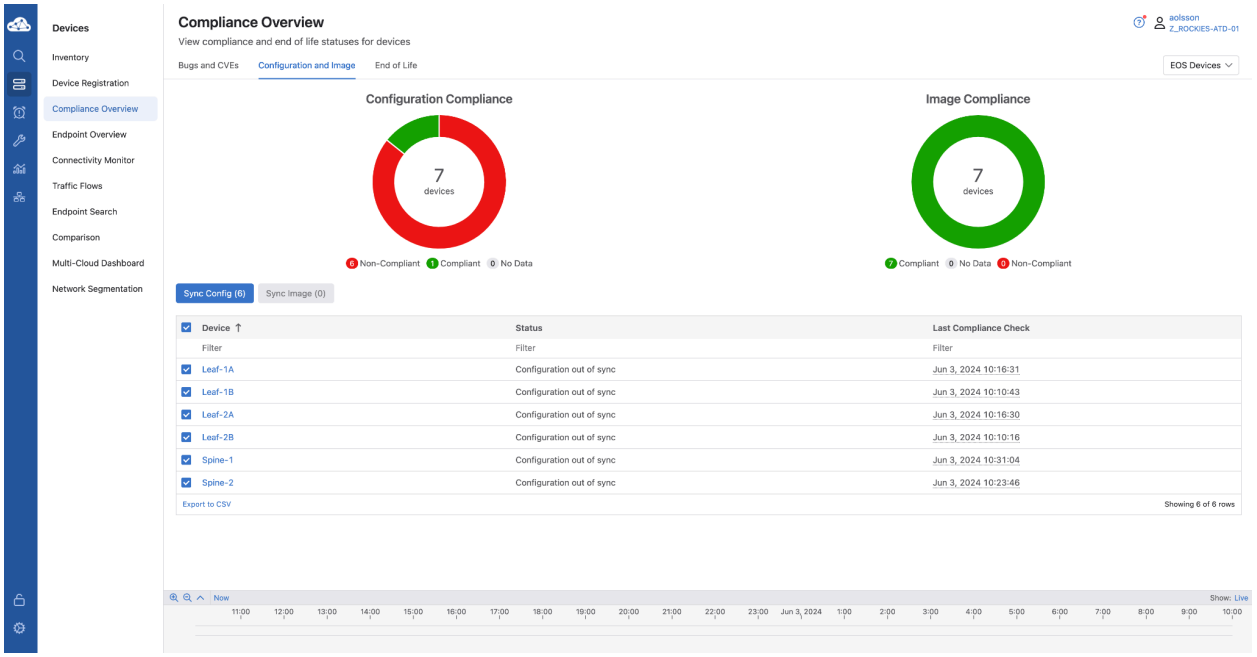
3. To bring the device configuration back into compliance, head to **Devices** > **Compliance Overview**



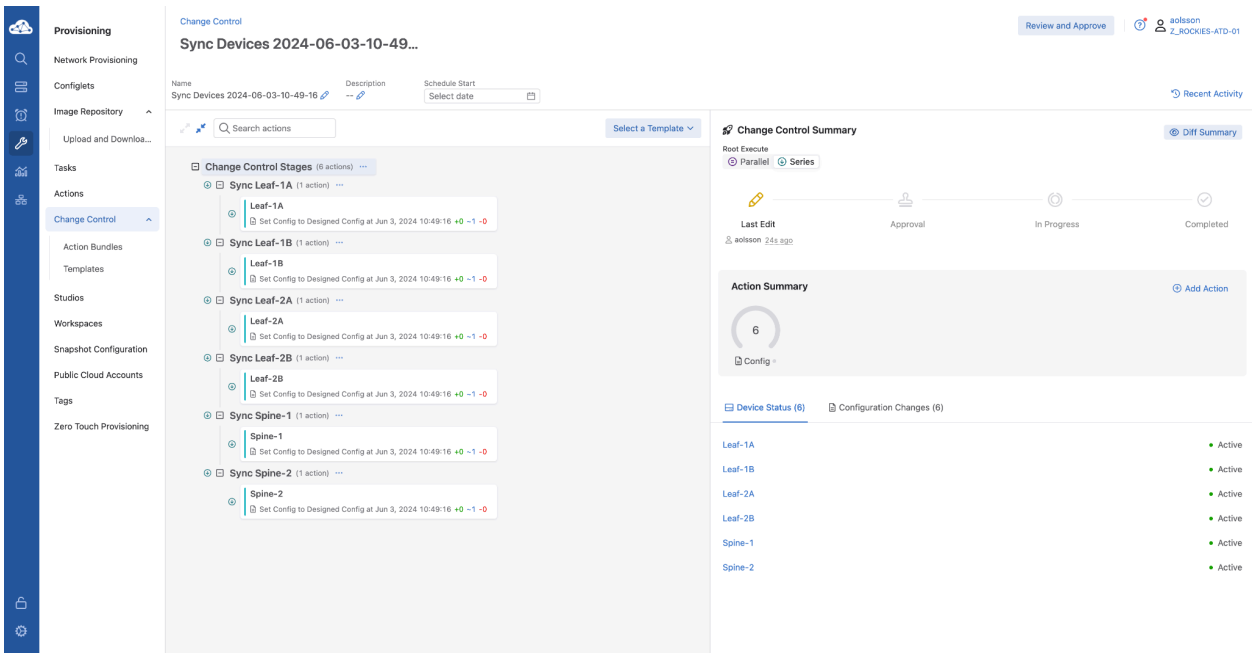
4. Select the “**Configuration and Image**” tab near the top.



5. Select all 6 devices that need to be brought back into compliance
6. Click the blue “**Sync Config**” button



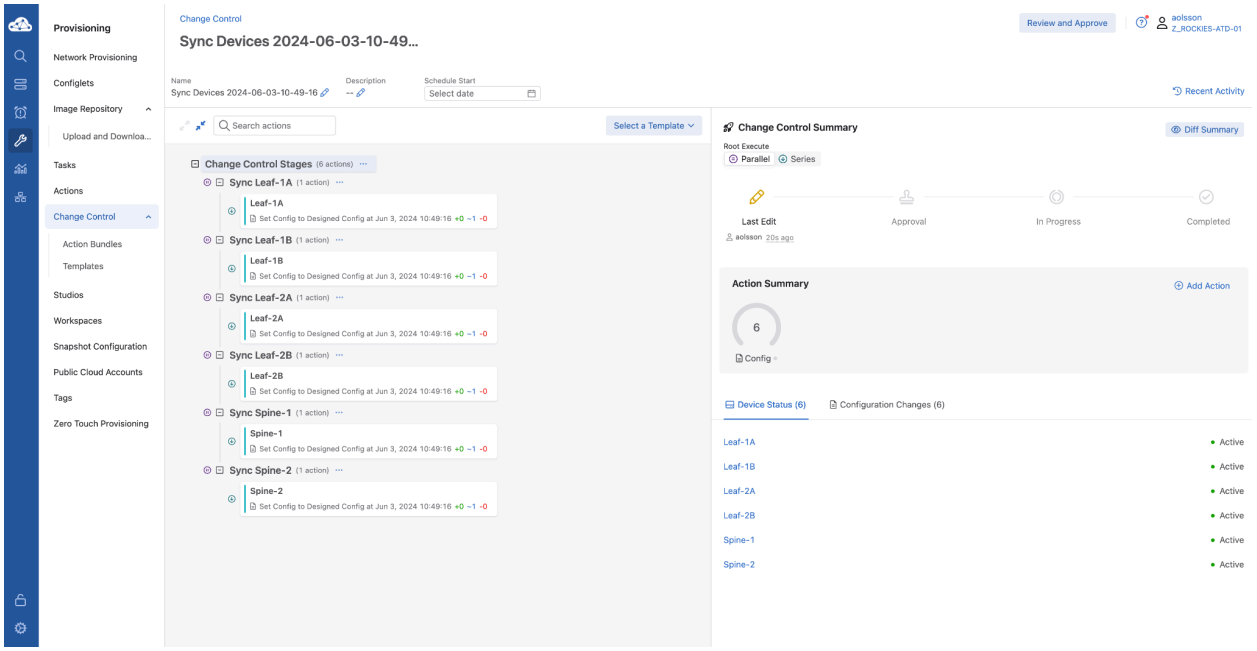
7. You'll be redirected to the change control overview screen for the change control created to bring the devices back into compliance.



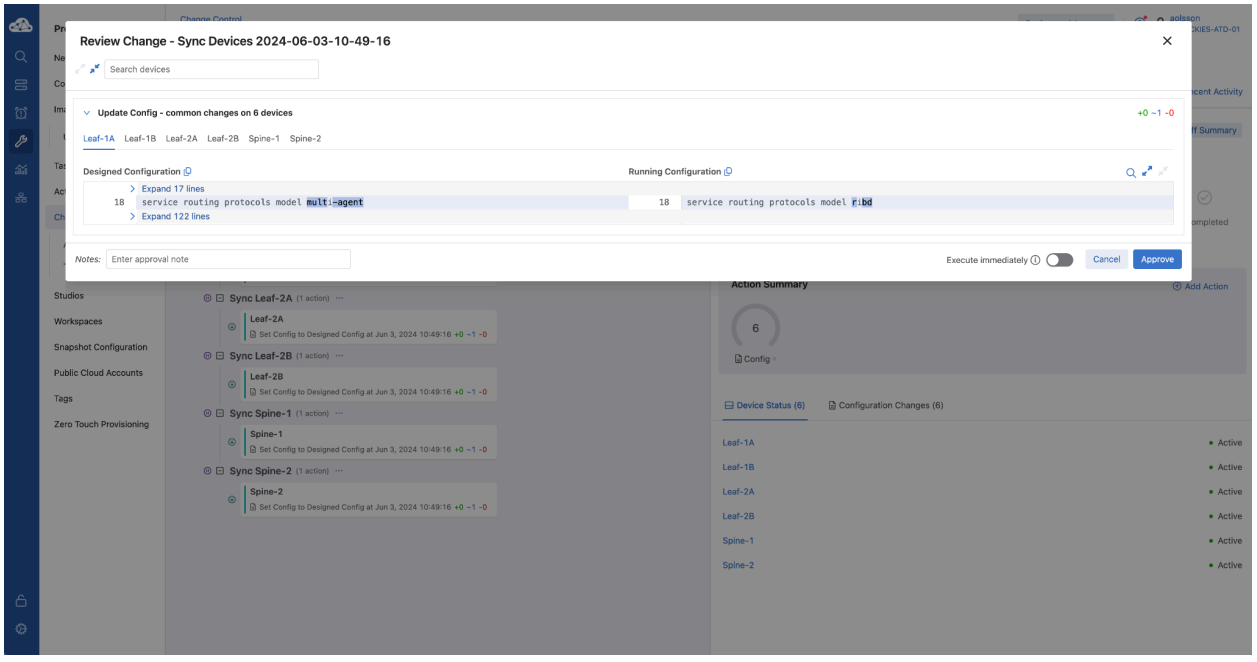
8. By default, all change controls created using the "**Compliance Overview**" page will be in series. For this lab, we want to run all changes in parallel, so select the "**Change Control Stages**" line item at the top of the screen in the section showing the tasks to be

executed. Once the "**Change Control Stages**" line is highlighted, select the "**Parallel**" button on the right side of the screen just under the "**Change Control Summary**."

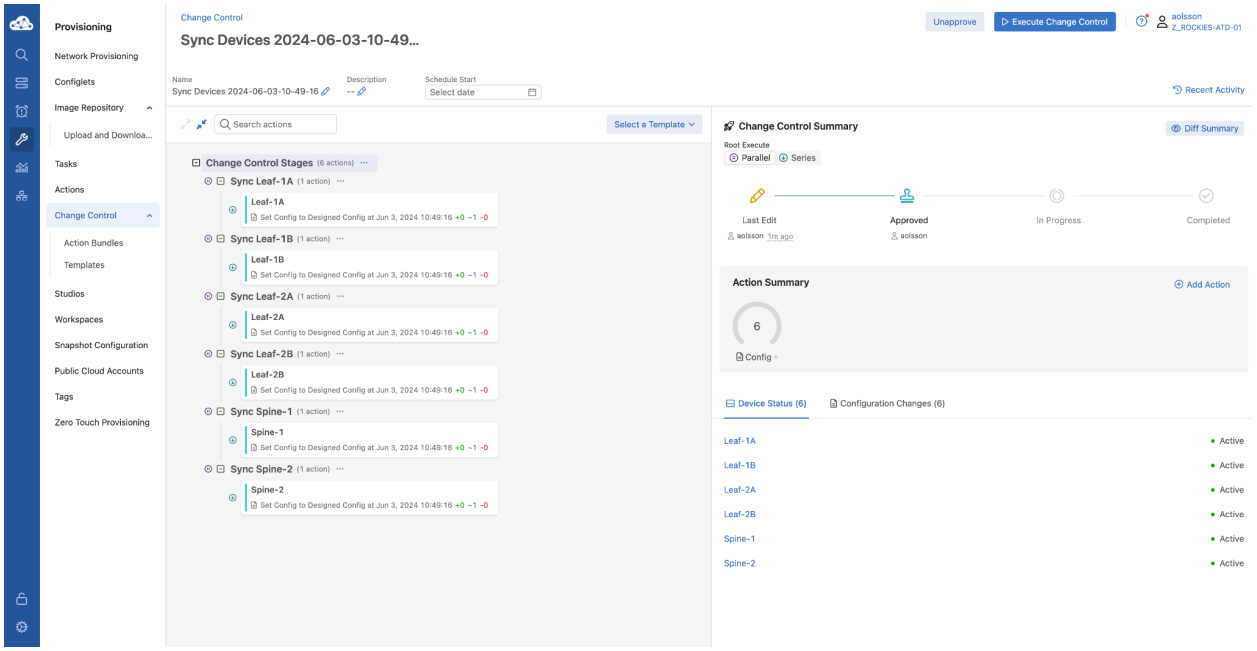
9. Select the blue "**Review and Approve**" button on the top right of the screen.



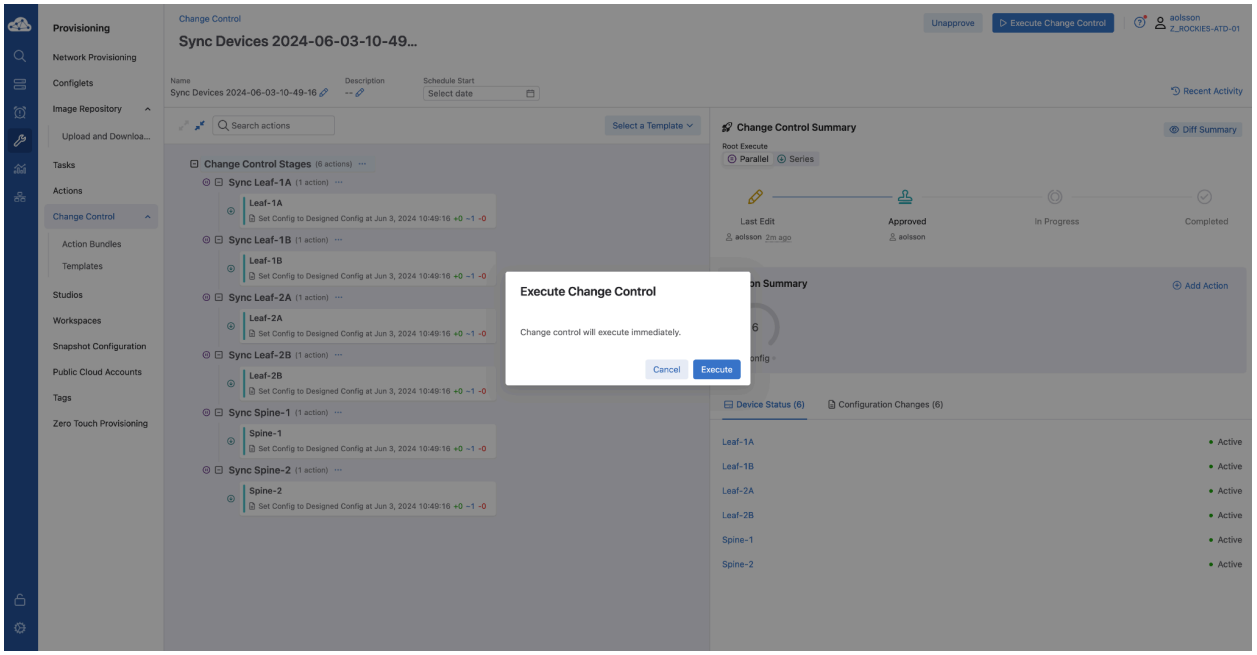
10. The "**Review Change**" pop-up will appear, showing a single configuration change on all 6 devices. Select the blue "**Approve**" button to approve the change control.



11. Select the blue "**Execute Change Control**" button on the top right.



12. The “**Execute Change Control**” pop-up will appear. Select the “**Execute**” button to continue.



13. Once completed, green check marks will appear next to each task, and the green “**Success**” icon will appear to the right of the change control name.