



**Scaling Digital Twin Experiences 302  
Configurations and Content Storage with ThingWorx**

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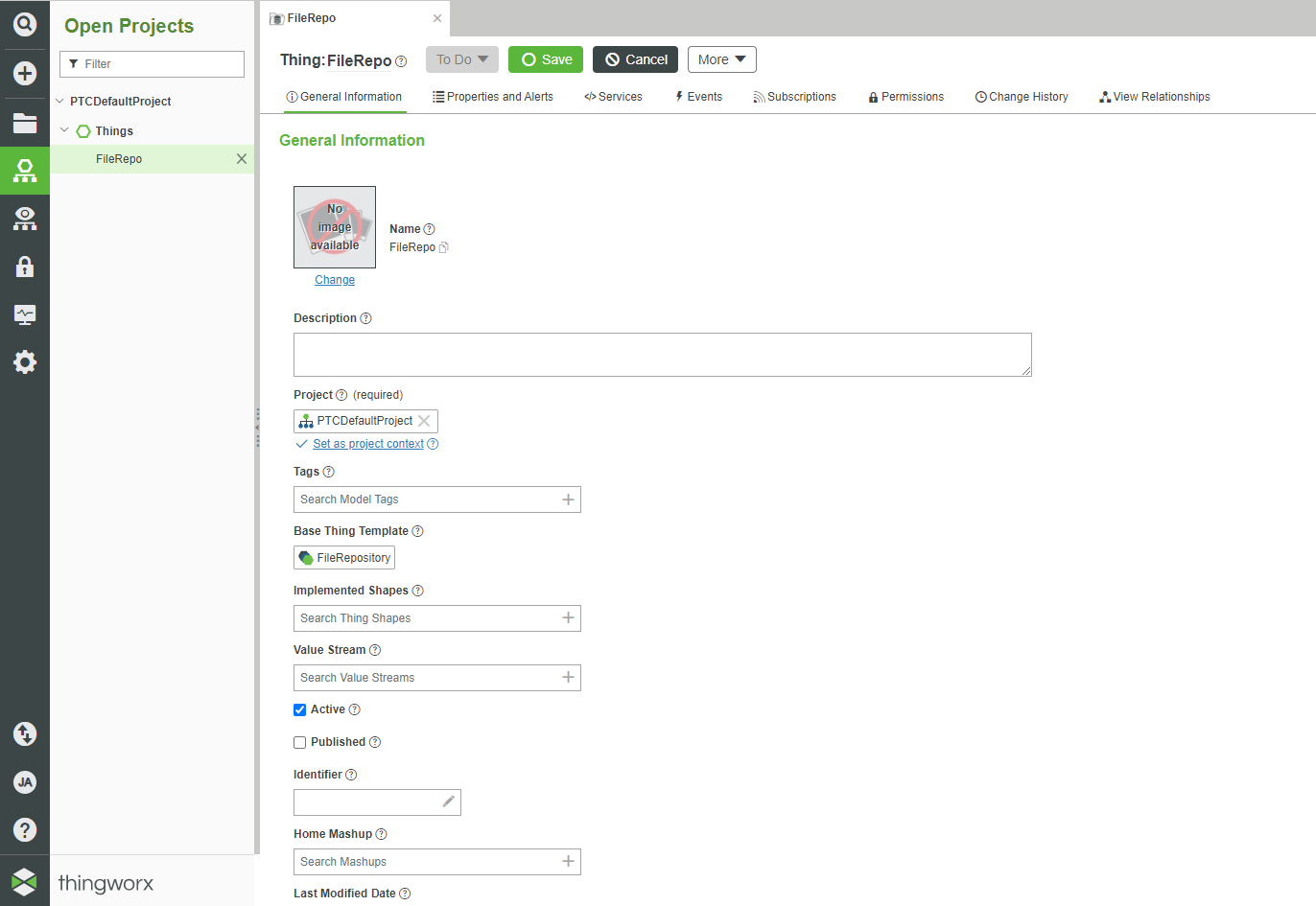
**Intro**

You saw in the previous tutorial that you can create AR experiences that have configuration data stored in ThingWorx in tandem with the IRS. The same data that was stored in the IRS can also be stored completely in ThingWorx, including the PVZ of your model! This tutorial will teach you how to use ThingWorx data storage for creating configured Vuforia Studio experiences.

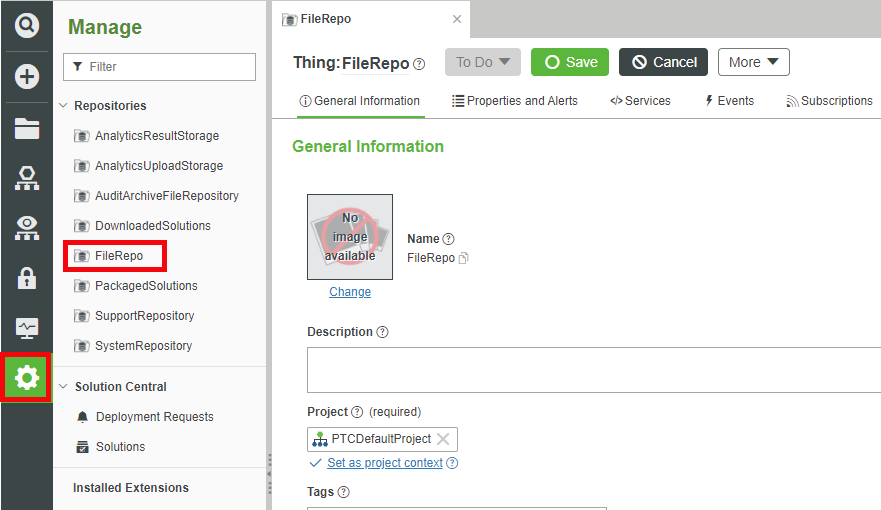
**302.1 Creating a File Repository in ThingWorx**

Before anything can be edited in Vuforia Studio, a file repository needs to be created in ThingWorx to store PVZ models.

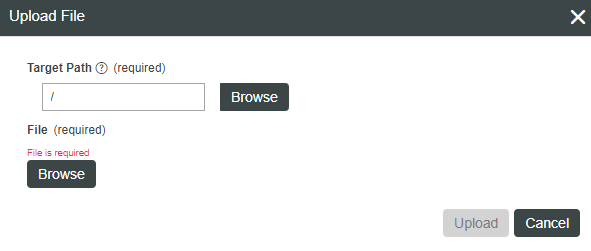
1. In your ThingWorx instance, create a new Thing. Populate the **General Information** tabwith the following information and click **Save**:
   1. **Name**: FileRepo
   2. **Project**: Your project name
   3. **Base Thing Template**: FileRepository



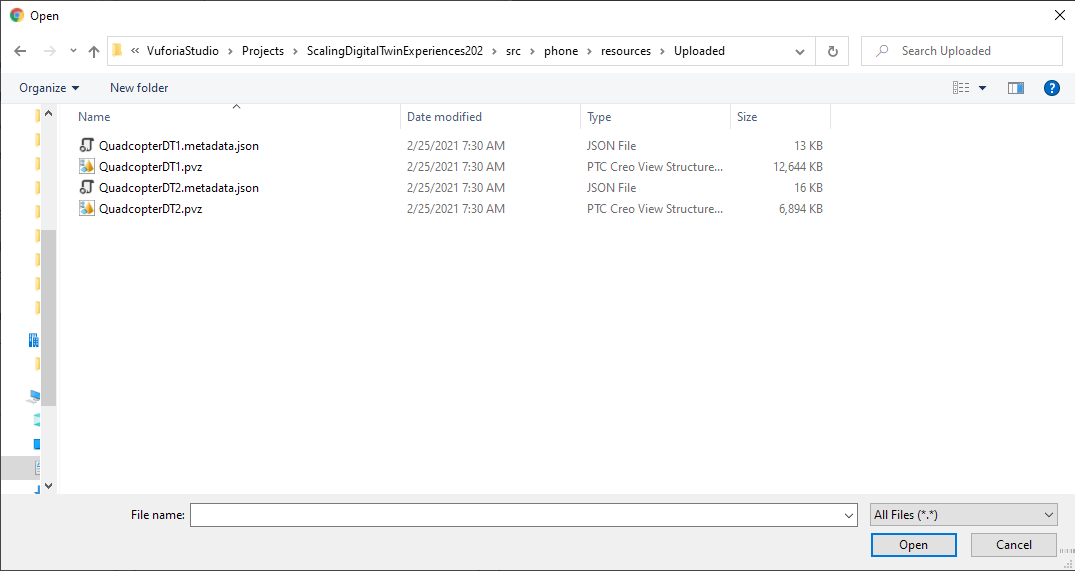
1. In the ThingWorx sidebar, open the **Manage** tab. You will see FileRepo listed under **Repositories**.



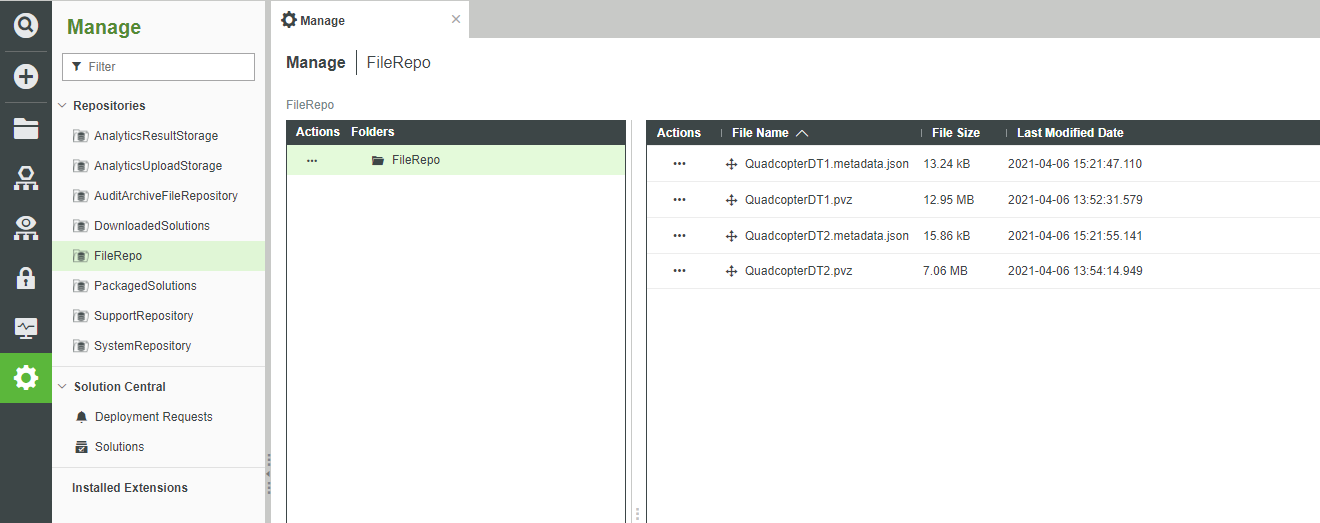
1. Open FileRepo and click on the **…** in the **Actions** column. Select **Upload** to upload the **Upload File** window.



1. Find the ScalingDigitalTwinExperiences202 folder where you have your Vuforia Studio projects stored. Inside the project folder, follow the path of **src > phone > resources > Uploaded** to locate the PVZ and metadata JSON files for both quadcopter models that you have been using.



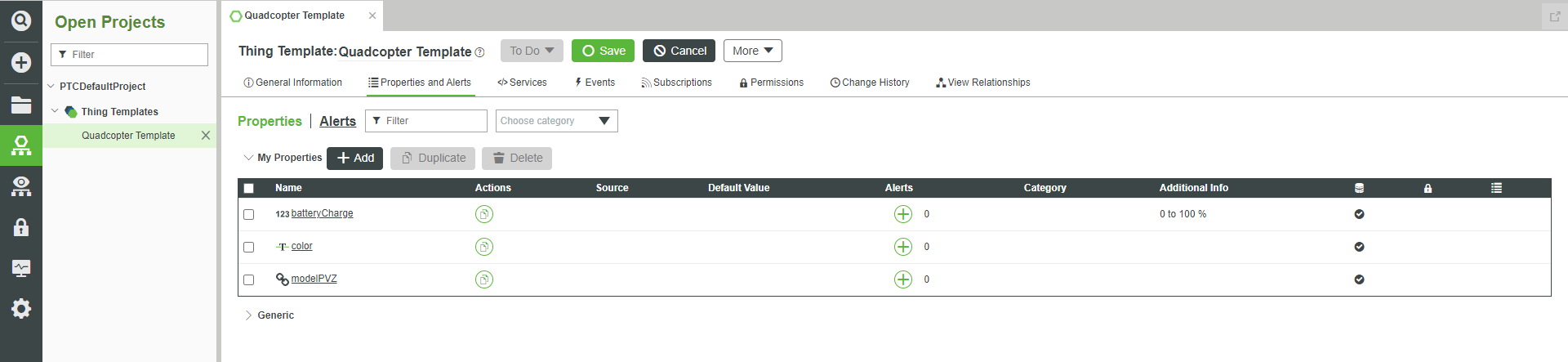
1. One by one, select each file and click **Open**. Once it is added to the **Upload File** window, click **Upload** to upload the file to the repository.
2. Your repository should have PVZ and JSON files for both quadcopter models when complete.



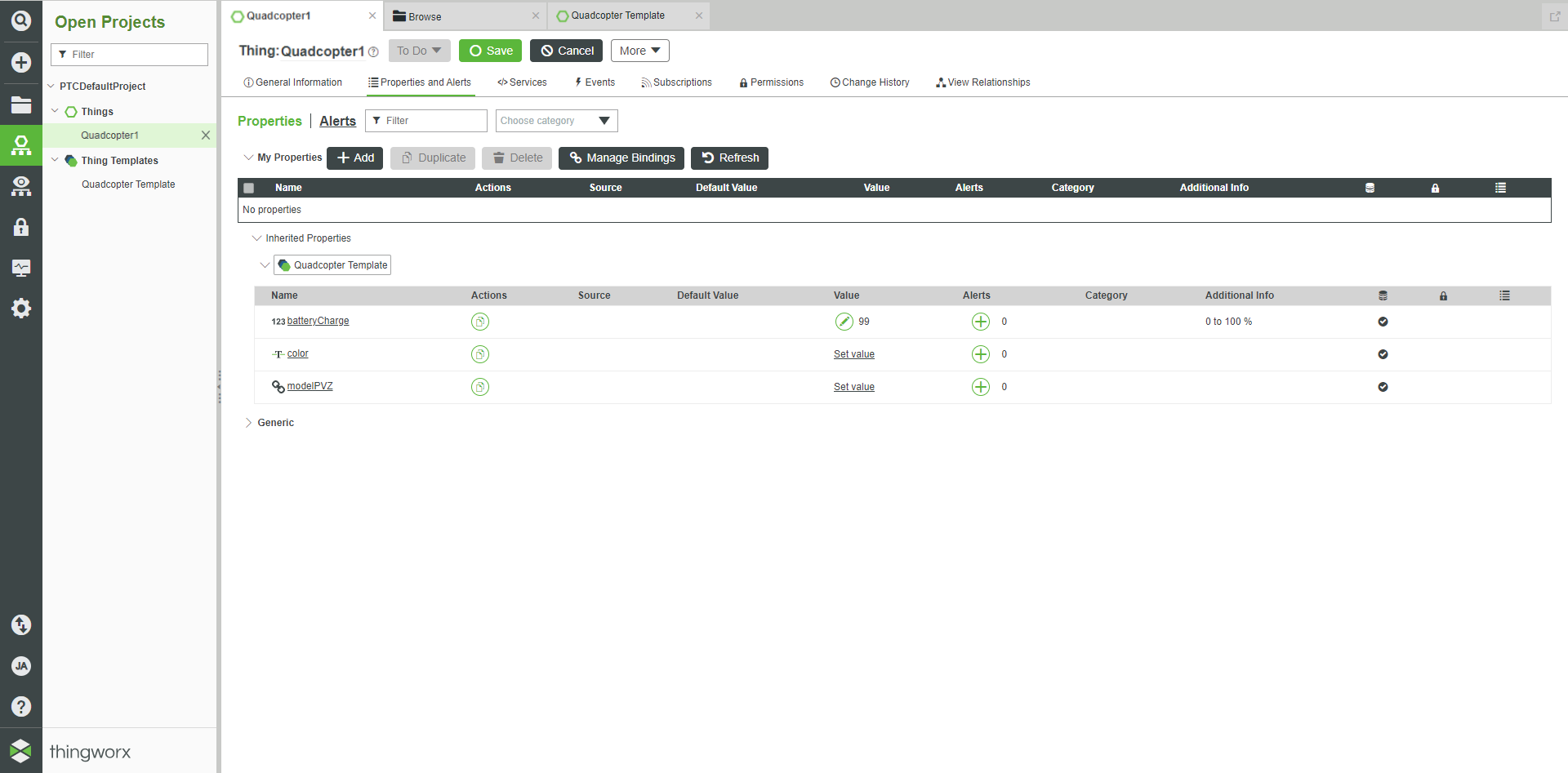
**302.2 Edit Your Thing Template and Things**

Since they will not be stored in the IRS anymore, the properties for each quadcopter will need to be added to the Quadcopter Template Thing Template. Adding those properties to the Thing Template will add them to each Thing that is created from that template. Once the Thing Template is updated, each Quadcopter Thing will need to give values to their new properties.

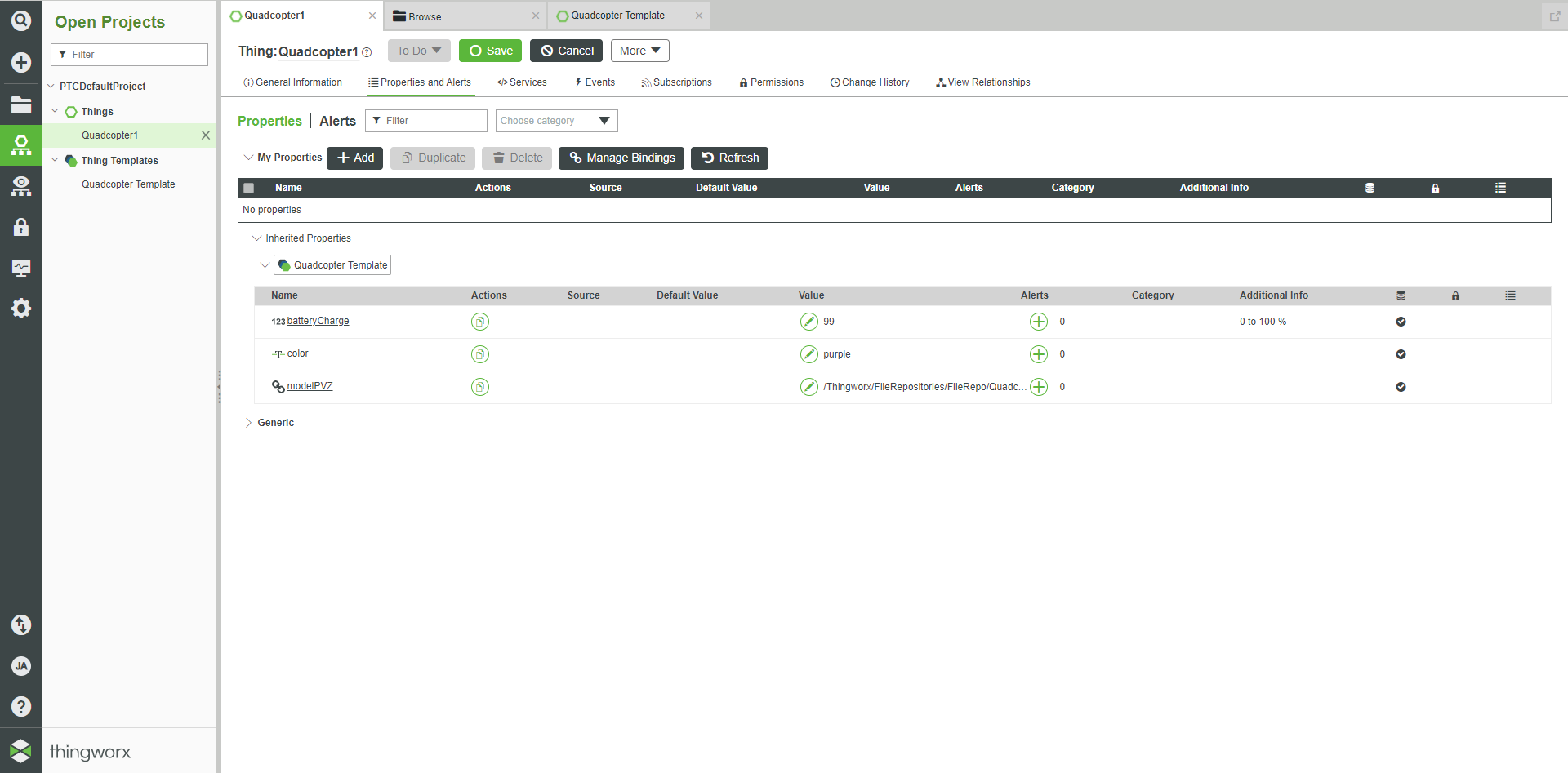
1. Open your Quadcopter Template Thing Template in ThingWorx.
2. Navigate to the **Properties and Alerts** tab.
3. Add two new properties to the template: color and modelPVZ. color will act the same as before, it will be a string type that is added into Vuforia Studio and used to determine the color of the quadcopter shell. modelPVZ will be a hyperlink type with an URL that connects to the model storage in the repository that you created in the last section.
   1. color
      1. **Name**: color
      2. **Base Type**: STRING
      3. **Persistent**: ON
   2. modelPVZ
      1. **Name**: modelPVZ
      2. **Base Type**: HYPERLINK
      3. **Persistent**: ON



1. Click **Save** to save your new properties for the Quadcopter Template.
2. Browse to your Quadcopter1 Thing that you created in the last tutorial. You should see that the color and modelPVZ properties have now been added to your Thing.



1. For the color property, set it to the one of the color values that was created in Studio. The value of the modelPVZ property needs to be set to the location inside ThingWorx that the PVZ files are stored in. The value of this property should follow this format: /Thingworx/FileRepositories/(YOUR REPOSITORY NAME)/(YOUR MODEL NAME). Any folders within folder will add another level to the path. In this case, set the URL to /Thingworx/FileRepositories/FileRepo/QuadcopterDT2.pvz

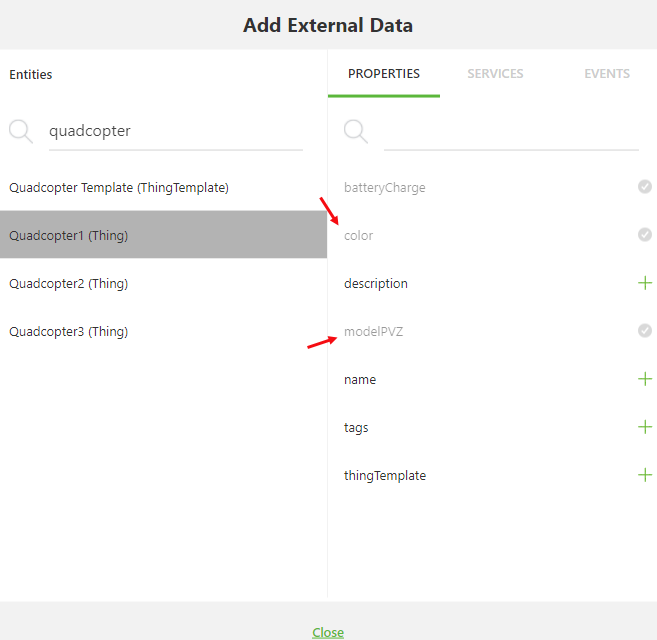


1. Repeat this process for the Quadcopter2 and Quadcopter3 Things so their properties are populated. This will complete all the edits that need to be made to your ThingWorx instance.

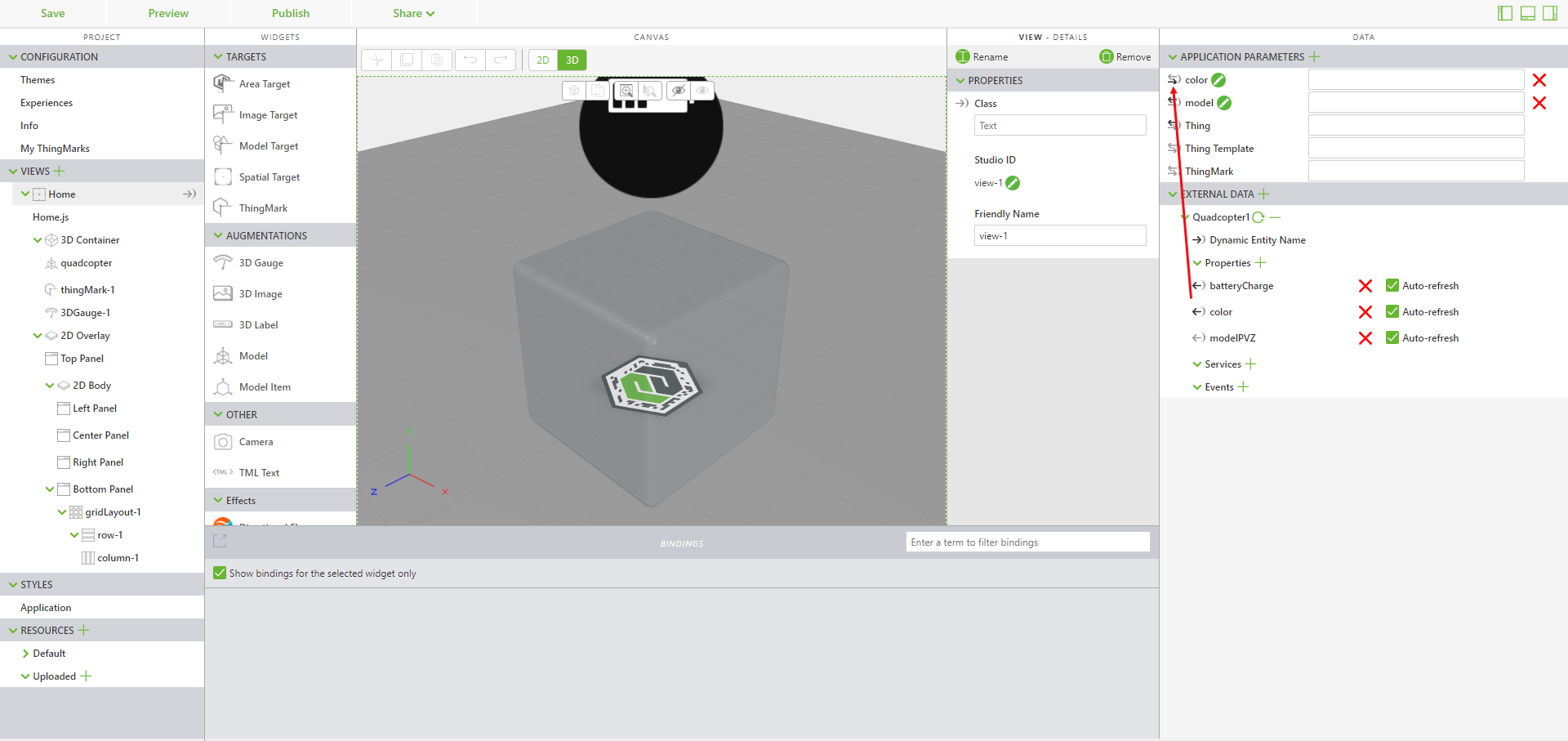
**302.3 Update Your Vuforia Studio Experience**

Now that your configuration data has been stored inside ThingWorx, your Vuforia Studio experience needs to be edited to accept these changes.

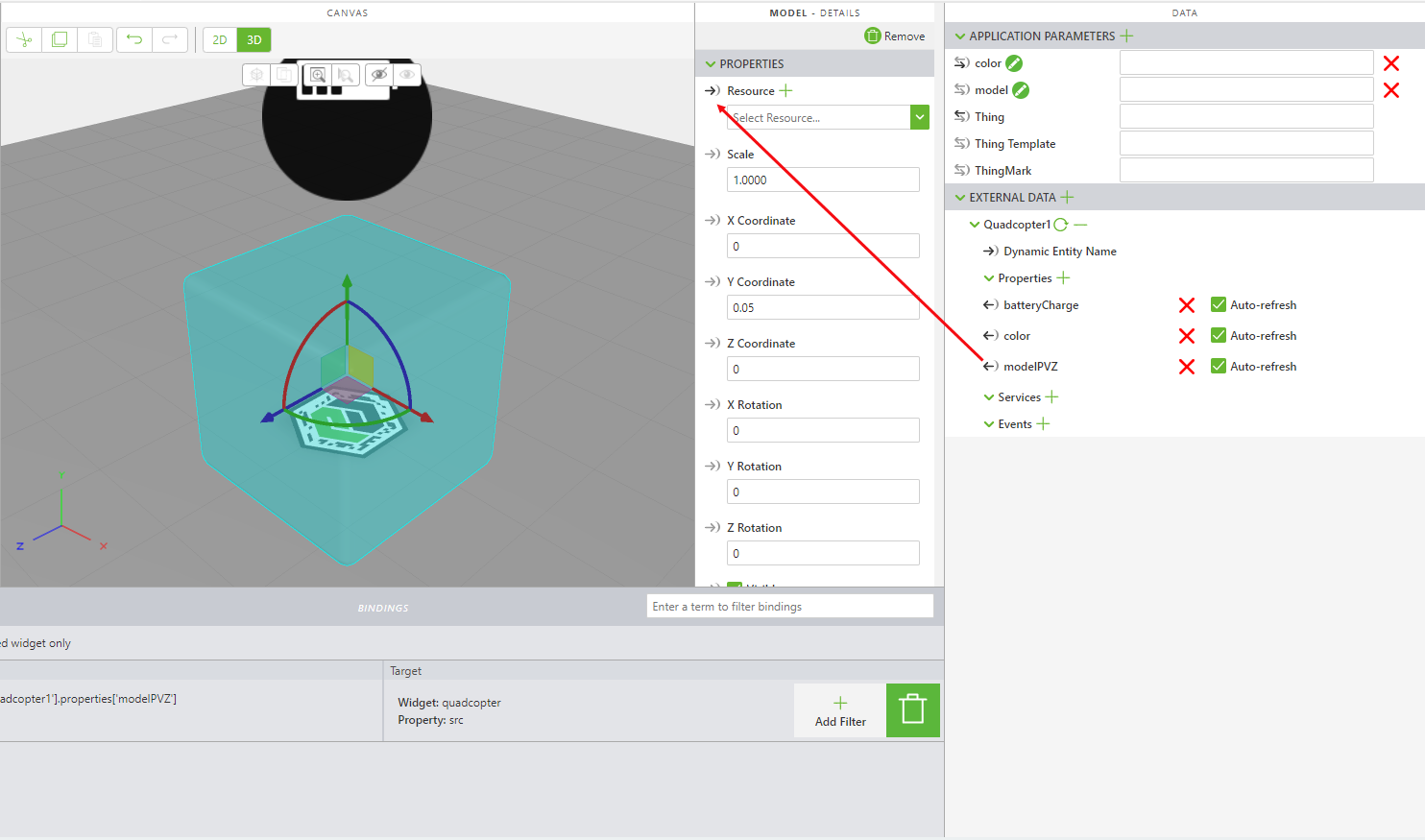
1. Open ScalingDigitalTwinExperiences202 in Vuforia Studio.
2. Remove all PVZ and JSON files under **Resources**. These will be loaded from ThingWorx now.
3. The newly created color and modelPVZ properties will need to be added to the experience for the dynamic Quadcopter entity. Click the **+** next to **External Data** to open the **Add External Data** window. Search for Quadcopter1 and add the color and modelPVZ properties to the experience. These will allow data from ThingWorx to be accessible inside Vuforia Studio.



1. Bind the color property to the **color** application parameter. The value of this application parameter will now be set by the property value for color in ThingWorx.



1. Bind the modelPVZ property of Quadcopter1 to the **Resource** property of the quadcopter model widget. Instead of using a model loaded into Vuforia Studio, the Resource property will set itself to be the file that is located at the URL that is the value of the modelPVZ property.



1. You may have noticed that the binding between the **model** application parameter and the **Resource** property of the quadcopter model widget was broken in the last step. The **model** application parameter is no longer needed since the model is being stored in ThingWorx, so you should remove it completely.
2. Your Vuforia Studio experience has now been updated to its proper state. Click **Publish** to publish your updated experience.
3. A Vuforia Studio project with the new changes added in this section named [ScalingDigitalTwinExperiences302](https://github.com/PTCInc/StudioExamples/tree/master/Scaling%20Digital%20Twin%20Experiences/Scaling%20Digital%20Twin%20Experiences%20200/ScalingDigitalTwinExperiences202) can be found in GitHub. **Note**: As with the last tutorial, this project is meant to be used as a reference material for the project file unless you have changed your template mapping.

**302.4 Delete IRS Mappings**

Since the color and model properties are now stored within ThingWorx, their mappings in the IRS need to be deleted. The only IRS mappings that should still exist for your configurations should be to the Things that they are associated with.

1. Open your CLI and change your directory if necessary, to the location of your batch files for this tutorial set.
2. Find the ID of the mappings that you created for mapping the color and model properties to the configurations that you have created. There should be 6 ID’s in total that were used for those property mappings. Use the line of code below in the CLI to remove those mappings from your experience. Substitute IDNUMBER with the ID of the mapping that you are deleting.

curl -u %uname%:%passwd% -k -H "X-Requested-With: XMLHttpRequest" -X DELETE %server%/ExperienceService/id-resolution/mappings/IDNUMBER

1. Your remaining mappings should be the following:
   1. urn:vuforia:vumark:YOURTHINGMARK => urn:curriculum:config:1
   2. urn:curriculum:config:1 => urn:curriculum:thing:Quadcopter1
   3. urn:curriculum:config:1 => urn:thingworx:template:curriculum
   4. urn:thingworx:template:curriculum => your experience
   5. urn:vuforia:vumark:YOURTHINGMARK => urn:curriculum:config:2
   6. urn:curriculum:config:2 => urn:curriculum:thing:Quadcopter2
   7. urn:curriculum:config:2 => urn:thingworx:template:curriculum
   8. urn:vuforia:vumark:YOURTHINGMARK => urn:curriculum:config:3
   9. urn:curriculum:config:3 => urn:curriculum:thing:Quadcopter3
   10. urn:curriculum:config:3 => urn:thingworx:template:curriculum
2. Validate your new mappings. Scan each of your ThingMarks. If the correct combinations of color, quadcopter model, and battery level appear with the correctly designated ThingMark, you have successfully completed this tutorial. Try changing the properties inside ThingWorx to see how they can be updated in real time.