Rhino to Twinmotion - Exporting data from Rhino to Twinmotion using the new Datasmith Rhino Exporter Video Transcript.

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Hi, this is Phil from Simply Rhino and in this short video I'd like to take a look at getting Rhino data into Twinmotion using the new Datasmith translator. Here I'm using Rhino 7 and Twinmotion 2021.1.3. and for the purposes of the video, I'm using the Windows platform.

Twinmotion is an architectural visualisation tool from which you can create still images, panoramas, video and VR from your Rhino data. Twinmotion is easy to use and learn and is modestly priced.

Once your Rhino data is inside Twinmotion, it's easy to add materials, animated people and vehicles, trees and vegetation and it's also easy to change the location, season and weather all with simple slider-based controls.

Because of its ease of use and close interoperability with Rhino, Twinmotion isn't just a visualisation tool and can be considered part of the design process as it allows for a design to be validated, modified and developed whilst being informed by its context.

The 'old' way of getting Rhino data into Twinmotion was to use the Twinmotion 'Direct Link'. There were some downsides with this however, as the Rhino layer structure was not preserved and individual Rhino geometry elements were difficult, if not impossible, to move once inside of Twinmotion.

The new Datasmith translator fixes these issues and gives some significant benefits. Going forward the Datasmith translator will provide a common file format for getting Rhino into both Twinmotion and Unreal. You should see that these Datasmith imports are much quicker than the old method and the synchronisation between Rhino and Twinmotion - when both programs are open - is much improved.
Before we look at exporting and Synchronising from Rhino, let's look at how to find, download and install the plug-in.

So, to download the Datasmith plug-in we need to go to the Unreal Engine website - I'll put the address in the description below and also put it on the screen – but this is an Unreal plug-in not a Twinmotion specific plug-in. If we Scroll down the page and go to the Rhino exporter this shows the old exporter here - so what we need to do is go to the 'Preview Version' - so it's 'Unreal Engine 4.27 Windows Preview' (or Mac of course if you are on that platform) and then download this. This plug-in will export Rhino data either into Twinmotion or Unreal and the idea is that, going forward, you can use your data in Twinmotion, for example, to create a simple VR exercise and then if you go beyond the limits of Twinmotion you can very easily move that data to Unreal.

Once we've downloaded the installer we can double click to run, select Rhino 7 and finish. It's always a good idea to restart your machine after installing a plug-in.

If we open Rhino after installing the plug-in, we should see a new tab called ‘Datasmith’ and this will have four buttons – Synchronise: Connections, Export 3D View and Messages.

This is the Rhino model that we're going to bring into Twinmotion and first, many thanks to Ot Kandri for the use of this model. Ot is an architect who uses Rhino and Grasshopper, and this model is a personal project called Hybrid Pavilion.

First, we need to consider some important things in the model – the units need to be set to Metres (as in this case) or Inches and, it makes sense to organise the model as we normally would do in Rhino - making use of Layers and Sub Layers so that we can turn on or off various parts of the model in Twinmotion just as we would do in Rhino. We can use blank layers in Rhino as a folder for Sub-Layers and this methodology is recognised in Twinmotion. Once inside Twinmotion, we can rearrange existing Layers and create new Layers or Containers as they are called in Twinmotion.

I’ve applied Materials to the geometry inside of Rhino and if I switch to Rendered View and look at some of the parts in here you will see that we've got several materials here that are applied to various parts of the model.

The default proposition in Twinmotion is that materials are replaced globally. What I mean by this is that if in Rhino all of the elements of this hexagonal lattice structure have the same material applied to them then, once inside Twinmotion, if I use the picker to select one hexagonal component and change the material then the material for all of the lattice structure will update accordingly.

Let's now look first at using ‘Export 3D View’ to take this Rhino geometry into Twinmotion, so if I go to ‘Export 3D View’ and then navigate to a destination this will write out a ‘udatasmith’ file and you'll see this is written out fairly quickly. Next, I open up the Epic Games Launcher and launch Twinmotion.

Once inside Twinmotion I can import my Datasmith file from here – so I’ll navigate to the file and in the options instead of ‘Collapse by Material’ I can choose ‘Keep Hierarchy’ which will preserve our Rhino layer structure. UV texturing is handled from Rhino so if you have specific UV mapping requirements then do this in Rhino before exporting. You may find it useful to use a ‘dummy texture’ to set the mapping. The units will convert 1:1 unless we disable the ‘Auto’ setting here and then we can set the value manually.

Hitting OK will now bring in our Rhino geometry. If I open up the right-hand side panel I’ll see the various Rhino Layers or Containers as they are called in Twinmotion. Unlike Rhino, however, I’ll see all the separate geometry elements - each of the meshes for the ‘Hex Shading’ or each of the BREPS (solids and surfaces) for the Plaza.

A very quick tip which is the equivalent of ‘Zoom Selected’ in Rhino is to go to the top level which is ‘Hybrid Pavilion’ and just type ‘F’ - this will zoom the whole of the Rhino model and we’ll now see our model is sitting inside our Twinmotion world.

Twinmotion uses a Pivot that is similar to the Rhino Gumball and, using the Rhino navigation mode in Twinmotion, Alt+Right Mouse Button Orbits around the Pivot. So, if I select a single object rather than the whole scene hit ‘F’ I can now zoom to that object and orbit around it.

If I zoom out again you’ll see that I have a brick texture on some of the terrain components. This is an example of a ‘dummy texture’ that I mentioned earlier. In Rhino, I grouped several terrain surfaces together and applied a Planar mapping to them. If I now open up the panel on the left hand side and go to ‘Materials’ and ‘Ground’ and ‘Nature’ for example I can drag a ‘Grass’ texture on to here and you'll see that all of these elements will have the same mapping as the mapping is, just like Rhino, independent of the material. So the grass texture is now applied consistently across these surfaces.

If I go to the ‘Hex Shading’ container or layer here, for example, and hit F you'll see is that the elements in here can be independently moved and this is something that was difficult to do with the old Direct Link method. So, if I wanted to move for example this element here then all of these other concrete elements would come with it. Likewise, if I go to open up the ‘Hex Shading’ here and try and select one of the elements then I can move individual elements separately from their material binding.

Let's now take a look at the Datasmith Direct Link so to start with here I have both Rhino and Twinmotion open. If I go to ‘Import’ inside of Twinmotion this time I’ll use ‘Direct Link’ rather than Geometry and I’ll see here the Rhino file that I have open. If I have more than one Rhino file open or indeed any other programmes that Twinmotion will support, I'll see them in list here.

I’ll choose the Rhino file from the list and then I'll see the options ‘Collapse by Material’or ‘Keep Hierarchy’ but other than that I’ll have less import options here than when we used the ‘Geometry’ option. If I hit ‘OK’ this will process the direct link and the geometry will come into Twinmotion as before. There may be some confusion with terminology here but when we choose ‘Direct Link’ as in this example we’re using the new Datasmith translator under the hood. If your geometry doesn't come in when you link the file just use the ‘Synchronise’ button here and that will push the geometry into Twinmotion.

I’m just going to collapse the containers here and pick the ‘Pavilion’ container. Now, if I move to Rhino, and do something fairly major - let's take this whole canopy and move it vertically for example – I can update the Twinmotion file accordingly by pushing the ‘Synchronise’ button. You’ll see my geometry updates here and if I ‘Undo’ in Rhino and push the geometry again you’ll see that Twinmotion keeps up with Rhino.

In Rhino, we can add new objects, delete objects, create new layers etc and push these changes to Twinmotion. If I now ‘Save’ the Twinmotion file and then quit both Rhino and Twinmotion, I should then be able to open both files again and Twinmotion will re-make the connection. I can confirm this with the ‘Connections’ button. So, after you've used it Rhino and Twinmotion together you can save both files and open them up again the following day or week and as long as you've got both files open the two files will link.

One of the cool things about ‘Direct Linking’ is that we can link more than one file and those files can come from different sources - so for example – we could have a Twinmotion file open that is linked a Rhino file, a Revit file SketchUp file - and you can work in all of these programmes concurrently pushing geometry to Twinmotion as you go.
If I open the Twinmotion file without Rhino I’ll see the link here is showing as being broken. So, if I go to Rhino and open up the Hybrid Pavilion file then you'll see that this re-establishes the link.

I’ll cover adding Twinmotion assets such as materials, people, vegetation and looking at how we change the weather and season etc. in separate video but one thing I do want to make clear is that Twinmotion does have a fairly heavy requirement for hardware and one of the requirements is that it ideally needs a dedicated video card with 8GB of RAM. Whilst inside of Twinmotion I can open the ‘Statistics ‘panel here and this will show you the frame rate and I’ll see the ‘thumbs up’ if this is acceptable. The frame rate is of course influenced by the complexity of the geometry - so here, if I turn off the hexagonal structure of the pavilion the frame rate increases. To give you an idea of the setup that I'm using here this is a 16 core AMD Ryzen 9 machine with 64GB of RAM and an 8GB PNY Quadro RTX 4000 graphics card - and this is giving acceptable results.

If I go to ‘preferences’ I can change the quality settings manually or automatically based on the system specifications. Here this will put the quality to ‘Ultra’ but I reduced the setting too ‘High’ to speed up the frame rate whilst I was putting the model together. These settings control the sort of general feedback on the quality that we're seeing in real time preview here and you'll see that when I moved from ‘High’ to ‘Ultra’ that the frame rate dropped. I’ll also see feedback on GPU and CPU usage in the Statistics panel.

So, that's about the end of what I wanted to cover in this video - thanks for watching and, please feel free to leave any comments below. If you have found this video useful then please hit the ‘like’ button and remember that to keep up with the latest developments in Rhino then you can subscribe to this channel. At Simply Rhino we offer training for Rhino and all its key plugins - so checkout our website for more details. Thanks again for watching and I'll catch up with you in the next video.

Helpful Links, Video Software Information and Credits:

Download the Datasmith Rhino Exporter here:
www.unrealengine.com/en-US/datasmith/plugins

Model used in the video courtesy of Othmane Kandri

Video uses Rhino 7, Twinmotion 2021.1.3 on Windows