



Speeding Up Previews in Discreet 3ds max™

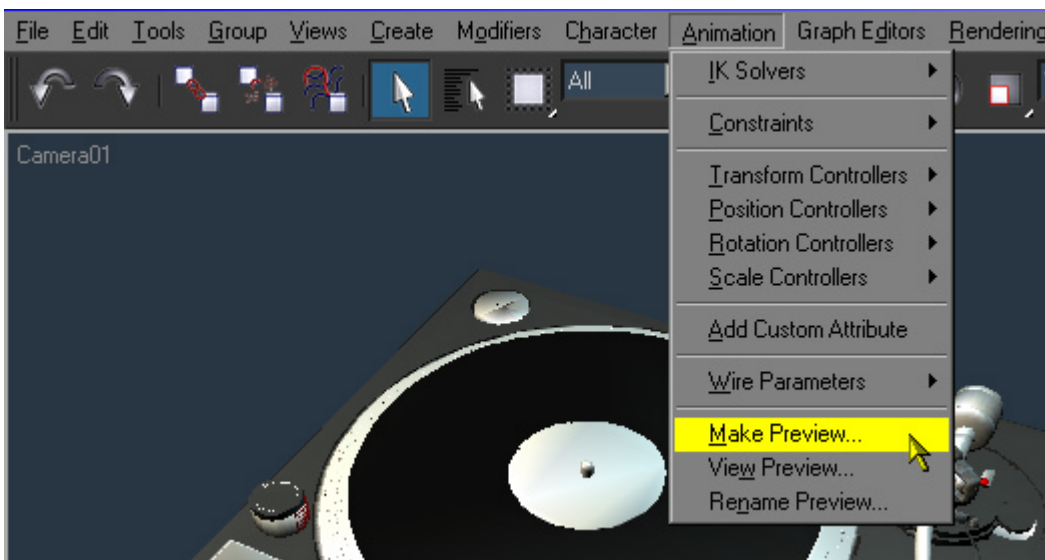
By Gary M. Davis, Discreet Training Specialist

Introduction

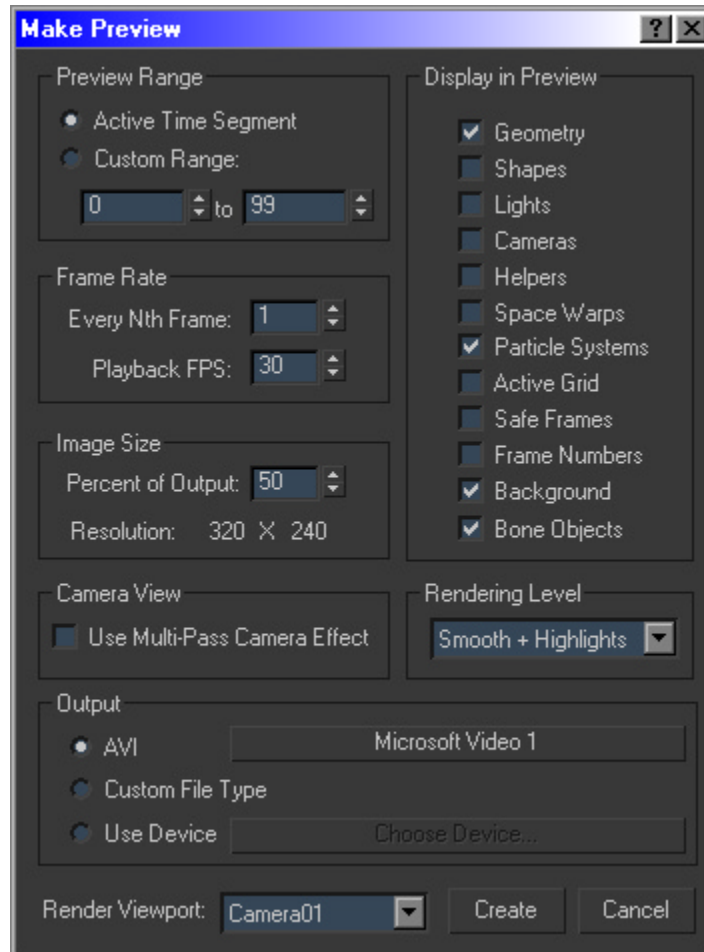
When you create an animation within 3ds max, you typically model, material, light, animate and then perform several spot-check/test renders before sending the scene off to network render. The user does the first four and the computers do the last stage of calculating the actual rendered frames. The difference here is what I like to call man-hour vs. machine hour. As much of a freak as I am for all this stuff, I honestly try to limit the number of hours that I physically spend in front of a computer creating graphics content. I would much rather get the project built and rendering as soon as possible, so that I can at least make an attempt at having a somewhat normal human existence outside of the glow of my monitors. Everyone knows and practices good procedures for keeping their render times down when creating animations. Reducing total scene polygon counts, keeping the number of shadow casting lights down, and limiting the raytracing you do are all (or should be!) familiar ways to reduce render times. However, there is a little known gem that can speed up your workflow significantly when you are creating and previewing your animations prior to sending them off to render.

Common Methods of Speeding Up a Preview

1. Test renders on a single still frame give you a sense of what the lighting and materials look like, but to see the animation and timing you often create a what is known as a render preview. If you are not familiar with this step, go to the Animation menu at the top of the user interface and select Make Preview (as seen below).

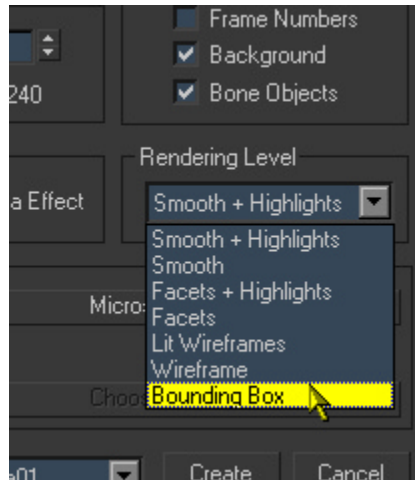


What this does is uses the current viewport to make a rough draft version of your animation using faster methods of calculation for your 3d scene. Intense calculations such as shadows and reflections (to name a few) are omitted so that you can (just) quickly get a sense of animation timing and camera placement.



(The above image is the common dialog for making a preview animation)

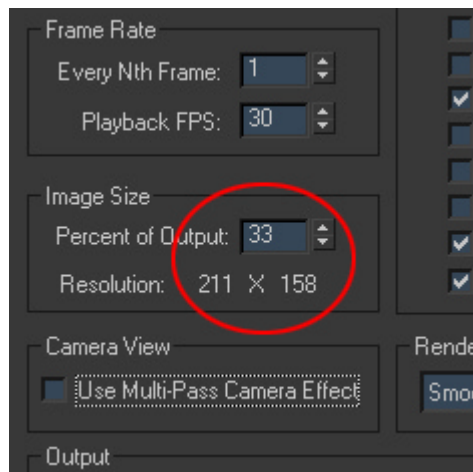
The most common way people speed up preview renders is to change the Rendering Level within the Make Preview dialog. Seen below, these different methods of drawing the objects in your scene are listed from slowest to fastest, top to bottom, respectively.



What this means is that "Bounding Box" will draw the fastest but give you the least sense of what the final rendering will look like. This is typically good for looking at animating timing only because every object in your scene will merely be drawn as box representing its geometric limits. "Wireframe" might be a better choice (and still a very fast one) if you want to actually see the shape of your models but still only need to get a sense of timing from the preview. Moving all the way up to the very top is "Smooth + Highlights" which will be the closest approximation that your graphics card can draw using the currently selected display driver's settings.

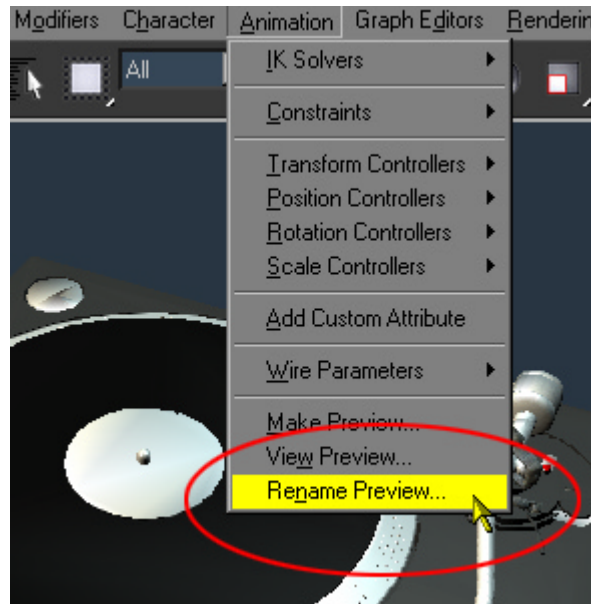
NOTE: to set the display driver and it's settings for 3ds max, go to the top of the user interface and select Customize > Preferences > Viewport > Display Drivers. If your video card can run OpenGL and/or DirectX within 3ds max, it is strongly recommended you use these drivers as opposed to the Software graphics driver (aka Heidi). OpenGL and DirectX will use the hardware and memory of the video card to assist the CPU in creating the preview. If you are running Software/Heidi drivers, the CPU alone is doing the task and it will almost always be slower. OpenGL and DirectX can *significantly* speed up the process of creating a preview animation, as well as letting you move around objects in the viewport much faster than if you are using Heidi.

2. The second common way of speeding up the process of creating a preview render is to make the image size smaller. Naturally, the fewer pixels created the faster the file can be made.



Saving Previews

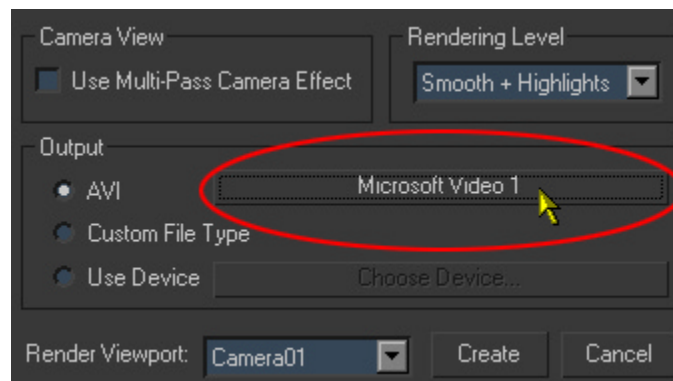
Another feature worth mentioning (before we get to the really good stuff!) is the fact that you can save a preview after it has finished rendering. The graphic below displays how to save the preview to a new file after it is finished. Merely rename the file and save it to a new location on your network.



Saving out a preview enables you to load them into a non-linear editing application so you can do things like quickly build animatic versions of your project. You can bang out several low resolution preview renders for timing purposes and then your editor can get to work cutting the offline of the project. Meanwhile, you go back into 3ds max and continue to tweak lights and materials for final rendering.

The Super Secret Gem

Ok sure, most people using 3ds max for any amount of time have gone over and are at least somewhat familiar with those above procedures. However, the step that is the hotty tip here is that the codec you chose in the Output area of the Make Preview Dialog could be the single most deciding factor when determining the speed at which your computer can make a preview. He said wha?!



There are many different kinds of algorithms for compressing files when creating an animation with computers. The exact same animation can take drastically different times to encode depending on the codec you select. Furthermore, different settings *within* the specific codec selected can further reduce creation time, albeit typically at a cost in quality (but not always). The point to remember here is that preview renders are typically for testing timing and not tests of surface rendering quality, antialiasing, etc. Quality sacrificed here is man hours saved and well worth the sacrifice. The sooner the machines can start doing the final rendering the better!

In the case of my test animation for this lesson, I loaded a turntable model and merely panned the camera in 3ds max from high and above to down low and close to my model. Each time, the animation was 300-frame duration, Smooth + Highlights and size of 320x240.

<u>Codec</u>	<u>Quality</u>	<u>Setting 1</u>	<u>Setting 2</u>	<u>Time (sec.)</u>	<u>File Size (KB)</u>
Uncompressed	*	*	*	29.5	90,010
Cinepak	99%	No keyframes	*	47.9	3,173
Cinepak	10%	No keyframes	*	47.8	3,167
MS Video 1	99%	No keyframes	Temporal Quality 75%	25.1	14,553
MS Video 1	99%	Keyframe every 15	Temporal Quality 75%	25.3	14,554
MS Video 1	10%	No keyframes	Temporal Quality 75%	20.0	40
Techsmith	*	Faster Compression	*	24.6	16,597
Techsmith	*	Better Compression	*	28.5	15,531
DivX 5.0.4		1-pass	780kb/sec	21.1	3,141
DivX 5.0.4		1-pass	2,500 kb/sec	21.1	4,295
DivX 5.0.4		1-pass	4,000 kb/sec	21.1	4,295
MOV-Animation	best	No keyframes	millions of colors	23.1	27,647
MOV-Sorenson	best	No keyframes	no data rate limit	36.3	3,731
MOV-Indeo 4.4	best	No keyframes	*	47.8	11,378
MOV-Indeo 4.4	best	No keyframes	Quick Compress	23.8	7,420

Conclusions

If you haven't already, go right now and download the free DivX codec at <http://www.divx.com>. Seriously, as you can see in the above chart, the DivX encoded files not only encoded faster than anything else; they are extremely small files and they look killer. Also of note is the fact that the high data rate DivX files take no longer and are magically (!) no bigger. Because of this fact, you might as well make them high data rate! Another observation worth mentioning is that while Cinepak is a great looking codec for things like CD-ROM playback of finished work, it encodes slow as molasses. It should be considered a major mistake to use Cinepak for making previews in 3ds max.

You should experiment with a simple teapot scene and try a few for yourself. Make the duration longer than the default 101 frames so the differences will be noticeable. After doing a few tests, you should find what codec(s) on your system work best/fast for you. Once you find a codec that is outperforming the others, you can begin to try different quality settings within that specific codec's options. There are probably more codecs out there in the world that there are flavors of ice cream, so what is on your system will undoubtedly vary from what is on your neighbor's. If you are on a computer that only has the default MS-Windows installation, I suggest using Microsoft Video 1 codec. It looks rather shoddy and creates relatively large files compared to the to the others, but the encoding will go pretty fast.

To reiterate an important point again, this tutorial and the encoding process described here is for **preview** renders and not final animation rendering. When doing a finished rendering, it is always advisable to render sequential files like TGA , PNG or TIF (etc) and compress them into an AVI or MOV later. There are several reasons for this but two main reasons are the end results will always look better and you can take advantage of network rendering.

Man-hours in front of machine reduced. Computers begin to render final projects earlier. You go mountain biking sooner. Artist is happy.

The end.

Prepared exclusively for Oregon3D. www.oregon3d.com

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3ds max | combustion



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