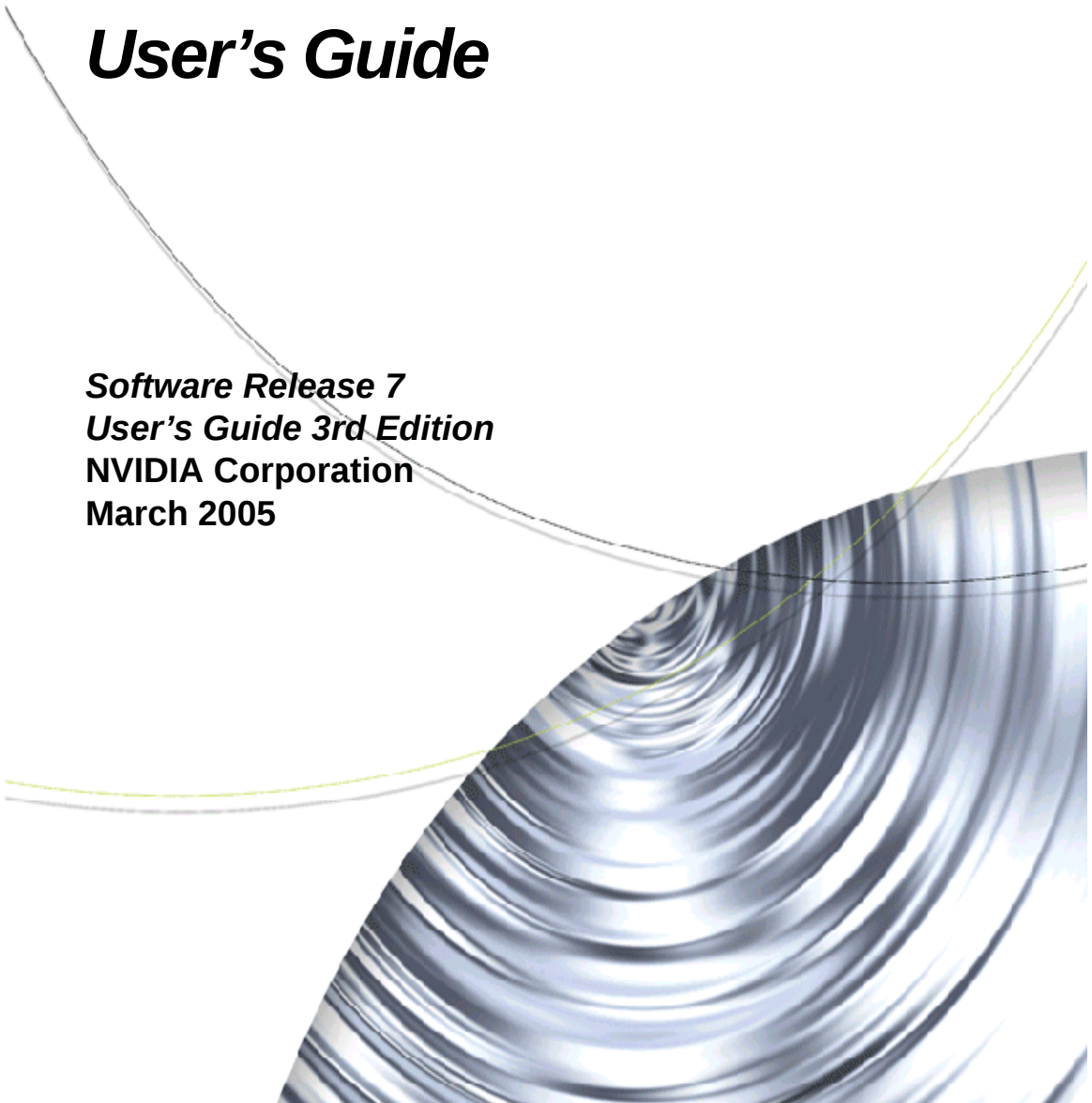




Workstation Application for Windows
NVIDIA MAXtreme
User's Guide

Software Release 7
User's Guide 3rd Edition
NVIDIA Corporation
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OVERVIEW OF NVIDIA MAXTREME

What Is NVIDIA MAXtreme?

The NVIDIA® MAXtreme™ Release 7 3D application driver is a tool that enhances the productivity of the discreet® 3ds max® 7 and Autodesk® VIZ 2005 applications. The NVIDIA MAXtreme driver performs the following functions:

- Allows you to control the application's viewport display quality and rendering speed,
- Enables a variety of rendering enhancements.
- Optimized for use with the full line of NVIDIA Quadro® GPU-based graphics cards.

You can use the NVIDIA MAXtreme 3D driver configuration dialog box to customize the driver for display quality and speed.

Key Features

The following sections provide an overview of the key features in NVIDIA MAXtreme:

Fog

NVIDIA MAXtreme supports the rendering of Standard fog into the viewports since version 1.01.00. You can enable this feature from the NVIDIA MAXtreme Driver Configuration dialog box ([Figure 3.1](#)). Currently, only one Linear or Exponential Standard Fog is supported and additional Standard Fogs and all Layered Fogs are ignored.

Wireframe Viewport Options

- Apply antialiasing to wireframes
- Render wireframes using triangle strips
- Customize the vertex dot size

Rendered (Shaded) Viewport Options

- Apply antialiasing to edged faces
- Render using the environmental background color
- Render fogging
- Customize the vertex dot size
- Configure magnification texture filtering for quality or speed
- Configure minification texture filtering for quality or speed
- Control anisotropic texture filtering
- Compress textures for quality or speed
- Control background texture size
- Control material texture size

Online Help

From the open 3ds max 7 or VIZ 2005 application, when you have an NVIDIA MAXtreme Driver Configuration dialog box open, you can press **F1** or click the **Help** option to display information about NVIDIA MAXtreme driver features and configuration.

System Requirements

Before you can install the NVIDIA MAXtreme software, you must meet the system requirements listed in [Table 1.1](#).

Table 1.1 System Requirements

System Requirement	Description
Operating system	Windows [®] XP or Windows 2000
3ds max 7 or VIZ 2005	You must have either the 3ds max 7 or VIZ 2005 application installed on your computer <i>before</i> you can install the NVIDIA MAXtreme driver.
Hard disk space	You need a minimum of 2.5 MB free hard disk space
NVIDIA-based graphics card	You must have a workstation graphics card based on an NVIDIA Quadro series graphics processing unit (GPU) installed in your computer.
NVIDIA display driver	You need the most current NVIDIA display driver software for Windows XP/Windows 2000 installed on your computer in order to use your NVIDIA graphics card.

Supported Languages

User Interface

The NVIDIA MAXtreme user interface supports the English language:

Online Help

The NVIDIA MAXtreme online Help supports the following languages:

English	German	Spanish	Chinese (simplified)
French	Italian	Japanese	Chinese (traditional)

INSTALLING NVIDIA MAXTREME

This chapter contains the following sections:

- “Installation Files” on page 7
- “Installing NVIDIA MAXtreme” on page 7
- “Uninstalling NVIDIA MAXtreme” on page 8

Installation Files

The NVIDIA MAXtreme **Setup directory** contains the following files:

- **MAXtreme7_readme.txt** file
- **setup.exe** installation program for Windows
- Other files required for installation

Installing NVIDIA MAXtreme

About Installation (setup.exe)

When you run the Release 7 NVIDIA MAXtreme installation program (**setup.exe**), it performs the following tasks:

- Copies the MAXtreme software into the 3dsmax 7 and/or the VIZ 2005 location you specify
- Configures 3ds max 7 and/or VIZ 2005 to use the NVIDIA MAXtreme driver
- Verifies that your computer is installed with an NVIDIA Quadro GPU-based graphics card

Note: If a Quadro GPU-based graphics card is not installed in your system, the MAXtreme driver will not be installed.

- Verifies that a 3ds max 7 and/or VIZ 2005 installation exists on your hard disk

Note: If such an installation doesn't exist, or if the installation program detects an older version of 3ds max or VIZ 2005, the NVIDIA MAXtreme driver will not be installed. In this case, note any messages and warnings and proceed accordingly.

Installation Procedure

Follow these steps to install the MAXtreme software.

- 1 Before you run **setup.exe**, be sure you have met all the requirements listed in [“System Requirements” on page 6](#).
- 2 From the Setup directory, run the **setup.exe** program and follow the instructions that appear in the InstallShield prompts.

Note: For details about responding to the prompts or any error conditions that may appear, see [“About Installation \(setup.exe\)” on page 7](#). If the installation program stops processing and generates an unknown error message, you may want to run the program after logging in with Administrator access rights.

Uninstalling NVIDIA MAXtreme

Follow these steps to uninstall the MAXtreme software from your computer:

- 1 From your Windows taskbar, click **Start > Settings > Control Panel**.
- 2 Double-click the **Add/Remove Programs** icon.
- 3 Click **NVIDIA MAXtreme** icon from the list.
- 4 Click the **Change/Remove** button.
- 5 Follow the instructions from the Install Shield program to complete uninstallation.

CONFIGURING NVIDIA MAXTREME

The following major topics are discussed in this chapter:

- “Accessing NVIDIA MAXtreme Driver Settings” on page 9
- “Auto-Configuring for Speed or Quality” on page 11
- “Configuring Individual Settings” on page 13
- “Explanation of Configuration Settings” on page 14

Accessing NVIDIA MAXtreme Driver Settings

Note: After completing the NVIDIA MAXtreme driver installation process, in certain cases, when you start the 3ds max 7 application, you may see a message prompting you to open the NVIDIA MAXtreme Driver Configuration dialog box. In this case, click **Yes** to proceed, which opens the NVIDIA MAXtreme Driver Configuration dialog box (Figure 3.1). Then skip to these sections to configure the MAXtreme driver:

“Auto-Configuring for Speed or Quality” on page 11

“Configuring Individual Settings” on page 13

“Explanation of Configuration Settings” on page 14

If the NVIDIA MAXtreme Driver Configuration dialog box doesn't appear when you open the 3ds max 7 or VIZ 2005 application, follow these steps to access this dialog box:

- 1 Start your **3ds max 7** or **VIZ 2005** application.
- 2 From the main menu, click **Customize > Preferences** and then click the **Viewports** tab to display the Viewports page, as shown in Figure 3.2.

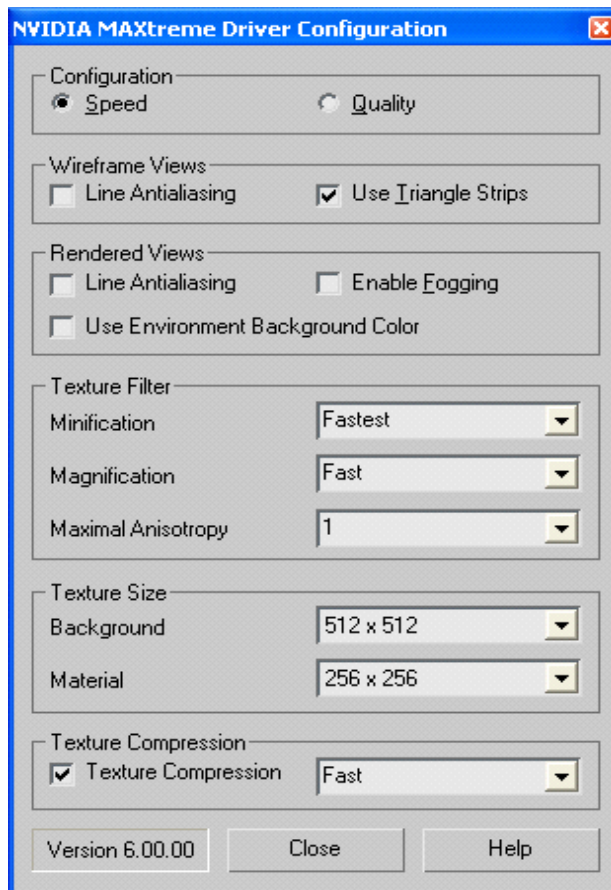


Figure 3.1 NVIDIA MAXtreme Driver Configuration Dialog Box

- 3 From the Display Drivers section, click **Configure Driver** to open the NVIDIA MAXtreme Driver Configuration dialog box (Figure 3.1).

Note: If you do not see the NVIDIA MAXtreme Driver Configuration dialog box, this means you have another driver enabled. To enable the NVIDIA MAXtreme driver, follow these additional steps:

- 4 Click **Choose Driver** and then click the option that allows you revert the driver. The Graphics Driver Setup dialog box opens.
- 5 Click **Custom** and then choose the NVIDIA MAXtreme driver file (**MAXtreme7.drv**) from the list.
- 6 Click **OK** and restart your computer for the change to take effect.
- 7 Repeat steps 1. through 3. to open the NVIDIA MAXtreme Driver Configuration dialog box.

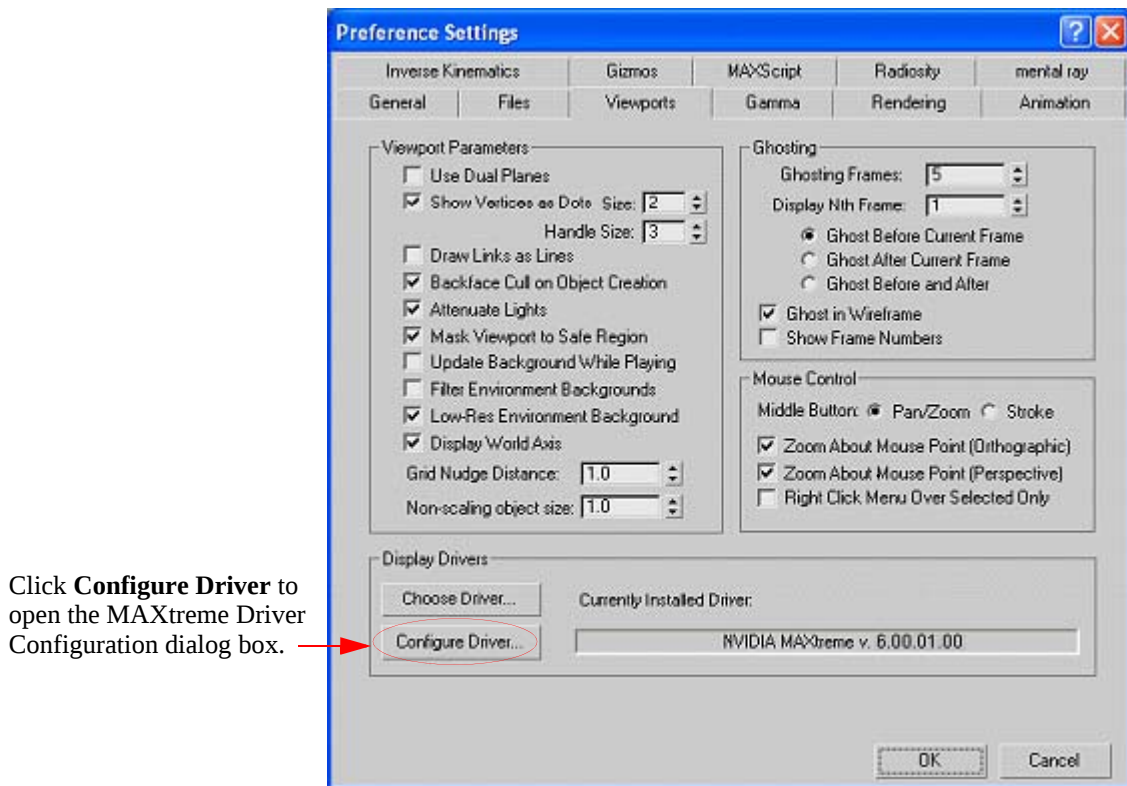


Figure 3.2 3ds max 7 Preference Viewports Page

Auto-Configuring for Speed or Quality

The “Configuration” section of the NVIDIA MAXtreme Driver Configuration dialog box enables you to choose between an optimal Speed or an optimal Quality setting (Figure 3.3). Choosing **Speed** or **Quality** automatically configures several settings in the dialog box to achieve the desired optimization, as listed in Table 3.1.

Table 3.1 Speed and Quality Settings

Section of the NVIDIA MAXtreme Driver Configuration Dialog Box	Option	Speed Setting	Quality Setting
Wireframe View	Line Antialiasing		X
	Use Triangle Strips	X	
Rendered Views	Line Antialiasing		X
	Use Environment Background Color		X
Texture Filter	Minification	Fastest	Nicest
	Magnification	Fast	Nice
Texture Compression		(X) Fast	

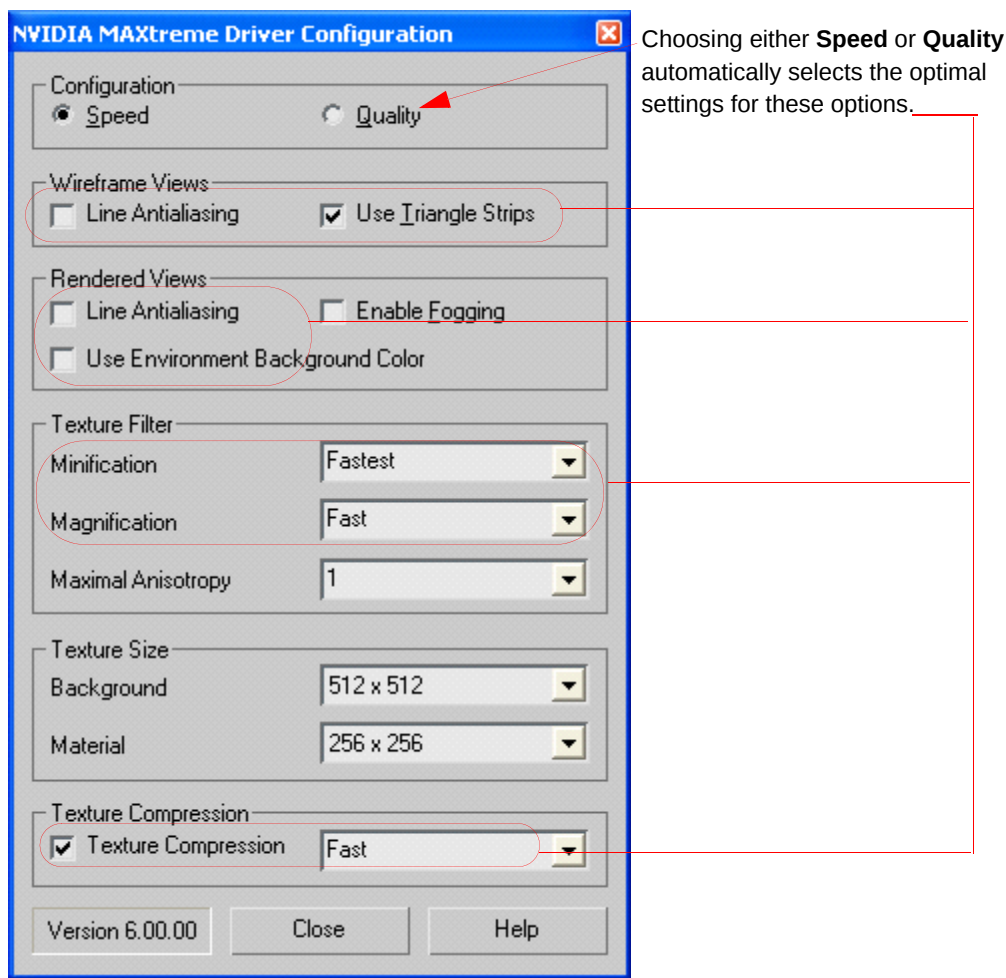


Figure 3.3 Sections Affected by the Speed and Quality Setting

Configuring Individual Settings

Figure 3.4 gives basic descriptions of the MAXtreme configuration settings. Additional information for these settings are given later in this section.

See “Auto-Configuring for Speed or Quality” on page 11

Select this check box to enable antialiasing for lines in wireframe views.

Select this check box to enable the use of triangle strips in wireframe views.

Select this check box to enable antialiasing of wireframe lines in rendered views, when edged faces are enabled.

Select this check box to enable the display of fog in rendered camera views.

Select this check box to display environment background color in rendered views.

Choose the minification texture filter method:
Fastest - Provides the fastest rendering but can also result in severe aliasing artifacts.
Fast - Provides smoother results than the Fastest setting.
Medium - Can result in minor aliasing artifacts.
Nice - Provides smoother results than the Medium setting.
Nicest - Provides the smoothest results.

Choose the magnification texture filter method:
Fast - Provides fast rendering but can also result in aliasing artifact
Nice - Provides smoother results than the Fast setting.

Choose the maximum degree of anisotropy needed to compensate for texture filtering.

Choose a background texture size. The 3ds max 7 (VIZ 2005) application scales the image textures to the specified size. The larger the size, the better the image quality.

Choose a material texture size. The 3ds max 7 (VIZ 2005) application scales the image textures to the specified size. The larger the size, the better the image quality.

Reduces texture memory usage. Select the check box and choose either Fast (more compression) or Nice (less compression).
 See “Texture Compression” on page 17.

Figure 3.4 NVIDIA MAXtreme Driver Configuration Settings

Explanation of Configuration Settings

This section provides additional information about the settings in the NVIDIA MAXtreme Driver Configuration dialog box.

Configuring Wireframe Viewports

Wireframe viewports can be configured to display wireframes using antialiased lines and/or using triangle strips.

Line Antialiasing

In wireframe views, lines can be displayed as antialiased. To display a line on a screen, the line must be *rasterized*. When the line is not exactly horizontal or vertical, the result is a “staircase” appearance.

Note: This option is automatically chosen if you select the **Quality** setting in the NVIDIA MAXtreme Driver Configuration dialog box.

Use Triangle Strips

Triangle strips are a form of surface representation that renders efficiently using the graphics hardware, and results in faster rendering.

Note: This option is automatically chosen if you select the **Speed** setting in the NVIDIA MAXtreme Driver Configuration dialog box.

Configuring Rendered (Shaded) Viewports

The following enhancements can be made in rendered views within the 3ds max 7 or VIZ 2005 applications.

Line Antialiasing

In rendered views with edged faces enabled, the shaded objects are overlaid by the Wireframe mesh. The overlaid lines can be antialiased.

On some hardware, antialiasing may slow down rendering performance.

Note: This option is automatically chosen if you select the **Quality** setting in the NVIDIA MAXtreme Driver Configuration dialog box.

Enable Fogging

To achieve more realistic image quality, NVIDIA MAXtreme supports the display of **Standard fog** in rendered camera views in the 3ds max 7 or VIZ 2005 application.

To add fog to the image:

- 1 From your 3ds max 7 or VIZ 2005 application, click the **Rendering** (menu) and then select the **Environment** option to open the Environment dialog box.

2 Click the **Environment** tab.

3 In the Atmosphere section, click **Add**, select the atmospheric effect named **Fog**, and click **OK**.

There are two types of fog: **Standard** and **Layered**.

NVIDIA MAXtreme supports both **Standard fog types: Exponential** and **Linear**.

Note: NVIDIA MAXtreme supports the display of Standard fog under the following conditions:

- At least **one Standard fog must exist**; additional standard fogs and all layered fogs are ignored.
- An **Environment Color Map** or **Environment Opacity Map** is *not in use* with this Standard fog.
- The **Near** percentage is **0.0** and the **Far** percentage is **100.0**.

Note: For an **Exponential** fog, the **Near** percentage (camera environment range) must remain at **0.0**. The thickness of the fog is controlled by the camera environment range. If you change this range, the corresponding fog is immediately displayed.

Use Environment Background Color

For more realistic appearances of images in 3ds max 7 and VIZ 2005 applications, NVIDIA MAXtreme supports the use of the **Environment Background Color** in rendered views.

Follow these steps to change the Environment Background Color:

- 1 From your 3ds max 7 or VIZ 2005 application, click **Rendering** (menu) and then select the **Environment** option to open the Environment dialog box.
- 2 Click the **Color** selector in the Background section to change the background color.

Note: After you change the Environment Background Color, the viewport may not be updated with the new color until the application redraws the image.

Texture Filtering Options

Texture filters control the appearance of texture mapping. Following are the texture filter controls that can be controlled with the NVIDIA MAXtreme driver

Note: After changing the settings described here, the image may not reflect the changes until the application reloads the textures.

Minification

The Minification filter is used when the pixel being textured maps to an area in the texture greater than one texture element (texel). NVIDIA MAXtreme uses the following Minification texture-filtering methods:

- **Fastest:** This method uses the texel closest to the center of the pixel to texture the entire pixel. Since only part of the texture is used, this method can result in severe aliasing artifacts.

Note: This method is automatically chosen if you select the **Speed** setting in the NVIDIA MAXtreme Driver Configuration dialog box.

- **Fast:** This method uses a weighted linear average of the 2x2 array of texels that are closest to the center of the pixel. The results are smoother than the ‘Fastest’ method.
- **Medium:** This method first selects the **Level of Detail (LOD)** from the mipmap pyramid where the mapped texel area is closest to the size of a pixel. From this LOD, the single texel that is closest to the center of the pixel is selected and mapped to the pixel.

This method can result in minor aliasing artifacts.

- **Nice:** This method first selects the LOD (from the mipmap pyramid) where the mapped texel area is closest to the size of a pixel. From this LOD, the 2x2 array of texels closest to the center of the pixel is selected. Finally, the weighted linear average of the texel array is computed and mapped to the pixel.

This method provides smoother results than the Medium method.

- **Nicest:** This method first selects the LODs from the mipmap pyramid where the mapped texel areas are closest to the size of a pixel. From each of the selected LODs, the weighted linear average of the 2x2 array of texels closest to the center of the pixel is computed. Finally, the linear interpolation between the two averages is determined and mapped to the pixel, resulting in true trilinear filtering.

Note: This methods yields the best results, and is automatically chosen when you select the **Quality** setting in the NVIDIA MAXtreme Driver Configuration dialog box.

Magnification

The Magnification filter is used when the pixel being textured maps to an area in the texture less than or equal to one texture element (texel). NVIDIA MAXtreme uses the following Magnification texture-filtering methods:

- **Fast:** This method uses the single texel closest to the center of a pixel. One texel may be mapped to more than one pixel.

This method can result in aliasing artifacts, and is automatically chosen with the Speed configuration.

- **Nice:** This method uses a weighted linear average of the 2x2 array of texels that are closest to the center of a pixel. The results are smoother than the ‘Fast’ method.

Note: This method is automatically chosen if you select the **Quality** setting in the NVIDIA MAXtreme Driver Configuration dialog box.

Maximal Anisotropy

This option provides a mechanism for supporting anisotropic texture filtering schemes. You can specify the maximum degree of anisotropy to account for texture filtering.

Texture Size Control

Background Texture Size

In background textures, a background image is drawn as a textured rectangle. *Background* textures have a specific size that differentiates them from *material* textures.

The background texture is scaled by the 3ds max 7 (or VIZ 2005) application to the selected size. The smaller the size, the less memory the texture requires on the graphics card. The larger the size, the more details are visible in the texture.

Material Texture Size

Textures of an image are scaled to a selected size by 3ds max 7 (or VIZ 2005). Smaller texture sizes require less texture memory on the graphics card to render the image. Larger texture sizes require more memory but more of the texture details are visible.

Texture Compression

Texture compression reduces the memory required for rendering. For example, the amount of memory required to render an image with a background texture size of 64x64 is similar to that required for an image with a background texture size of 256x256 with compression enabled. The 256x256 texture size results in a better quality image, while compression minimizes the memory requirement.