

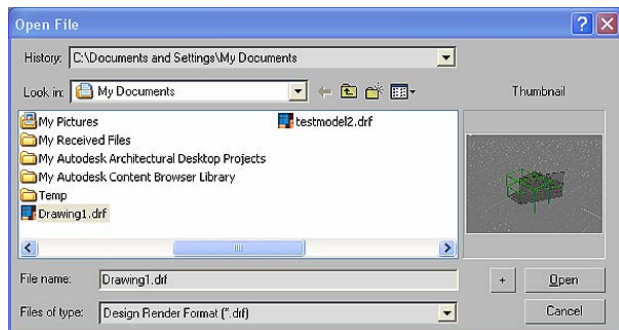


VIZ Render Overview

VIZ Render is the newly designed rendering application to be coupled with Autodesk's ® latest release of Architectural ADT 2004 (ADT 2004). This release marks the first time a full platform release also includes a full rendering package. VIZ Render promotes a streamlined user interface with out-of-the-box defaults for producing accurate radiosity based visualizations. Within this rendering environment VIZ Render remains transparently linked, at all times, to the model file in ADT 2004. This live link becomes the means for a user to test designs, materials and lighting, thereby providing the ultimate platform flexibility for Architectural studies.

Project Workflow from Autodesk® Architectural Desktop 2004 to VIZ Render

A user creates the building model within ADT 2004. Objects such as walls, curtain walls, slabs and doors have inherent material mapping, which VIZ Render can then translate into the rendering environment at any time. A live link is established via a single left click on the new Drawing Window Status Bar menu above the command line of ADT 2004. VIZ Render then transparently translates that information into a new file format, *.drf or Discreet Render Format. This is the sole file format supported by VIZ Render. Legacy Max files will only be able to be merged into VIZ Render. It is also important to mention that the previous ability to link *.dwg format is no longer available from within VIZ Render. Once the translation is completed, the model will be zoomed to extents in full screen mode and automatically saved in the same folder as the model itself. Users are able to update content in VIZ Render from changed geometries in ADT 2004 via three options:



Reload geometry Refreshes the geometry, but not the materials settings. This feature is useful when objects in the linked file have been modified and users want to update VIZ Render with the geometrical changes, but do not want to overwrite materials changes made in VIZ Render.

Reload geometry and materials Refreshes both the geometry and the materials. In addition to refreshing the geometry, invoking this option will overwrite any VIZ Render material settings with those stored in the linked ADT 2004 drawing.

Bind Terminates the ability for content to be updated from ADT 2004.

Of note: Any time a user initiates a link via the command line in ADT 2004 it generates a new session of VIZ Render for each open model session.

Startup Customization

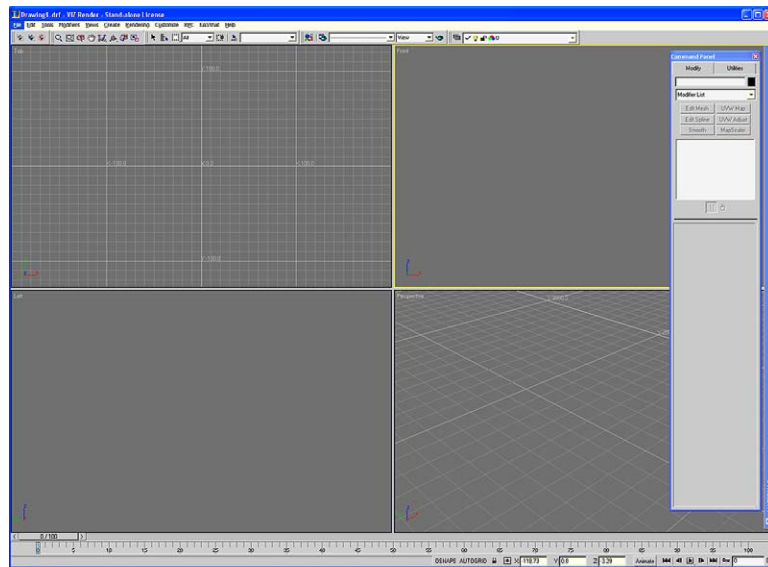
As in previous releases, specific files can be manipulated in order to customize setups beyond out-of-the-box defaults. It is suggested to make backups of any files listed below prior to altering them.

- **vizr.ini** – (C:\Program Files\Architectural Desktop 2004\) This file gets updated when you start and exit VIZ Render, as well as when you change most Preferences settings. It contains values relating to program defaults, including the graphics driver, directories used to access external files such as paths and images, preset render sizes, dialog positions, snap settings, and other preferences and default settings.
- **vizstart.drf** – (C:\Program Files\Architectural Desktop 2004\Scenes) At startup, VIZ Render looks for this file in the \scenes folder, and if found, loads it. This allows you to specify the default state of the workspace whenever you start the program. For instance, if you primarily do design work in a specific area, you can setup a daylight system relative to your location and save it as vizstart.drf and it will load automatically for you in each session.

Of Note: To achieve Microsoft XP certification, some legacy file locations were moved to remote directories from the install directory.

User Interface

The UI bears resemblance to the legacy environments of the 3D Studio series, and yet has been even more refined than Autodesk VIZ 4. Users will be familiar with quad menus, resizable viewports, layers and toolbars. Similar legacy customization has been maintained in VIZ Render as well.



The Command Panel has been condensed to Modify and Utility tabs and still maintains the ability to dock to either side or float. Within the Modify tab, users will immediately note the reduced scope of modifiers geared towards the ADT model, however their application or function has not really changed. One nice feature is these modifiers listed below do not require the command panel and can be applied via the pull down menu.

- **Edit Mesh** – Use of sub-object levels on the selected object to manipulate: vertex, edge, and face/polygon/element.
- **Edit Spline** – Use of sub-object levels on the selected shape to manipulate: vertex, segment, or spline.

- **MapScaler (World Space Modifier)** – Applies a scale factor that is consistent across various size objects. This lets you resize the object without altering the scale of the map.
- **Mesh Select** – Use of sub-object levels on the selected object to manipulate: vertex, edge, and face/polygon/element.
- **Normal** – Enables object faces to unify or flip the normals orientation.
- **Smooth** – Provides method of making objects to appear smoother via the angle of adjacent faces.
- **Subdivide** – Provides an algorithm for refinement of surface lighting detail on an object. Processing radiosity requires meshes that have elements shaped as close as possible to equilateral triangles.
- **UVW Map** – Provides control over how mapped and procedural materials appear on the surface of an object.
- **UVW Adjust** - Enables further adjustments to tiling and offsets in existing UVW mapped coordinates.



Another highlight of the streamlined User Interface is the redistribution of toolbars. Many of the toolbars have been turned off in the default UI. The legacy location of the Viewport Navigation controls has not only been relocated but refreshed with a new organization. The previous object/layer relationship, which existed in Autodesk VIZ 4, has been corrected in VIZ Render. Both the Layer toolbar and Layer Properties dialog force objects to be dependent on their parent layers which reflects intuitive behavior. Many of the previous wishlist items have made it into the software as well like dialog driven selection sets, view restores and saves on the existing viewport, dialog driven selection sets and viewport grabs.

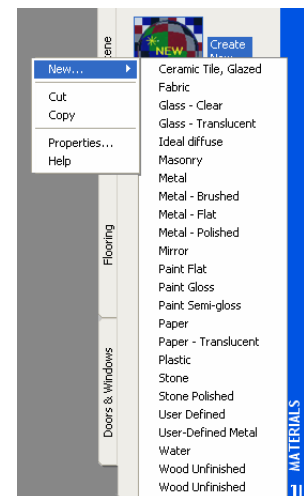
Of Note: It is important to mention that all modeling features have been removed from the VIZ Render environment.

Materials Palette

Advancements have been made in both Materials and the Material Editor and now include over 100 tileable preset maps for radiosity settings. The new material palette boasts a scratch tab, recycled tab and predefined material tabs or you can create a new material from material templates. Material libraries are now stored in all sessions simply by use in a scene. The Content Browser enables users to manage and share materials catalogs with ADT 2004 and other users. The new Material Editor reflects only the properties of current edited material. This however does not reduce the power of the legacy Material Editor. In fact, in many ways, it makes it superior. For instance, only fine tuning for radiosity settings are present, and all represent default values from template files. The material templates, along with the preset maps and default radiosity settings make for a very efficient and flexible Material Editor.

Of Note: The Material Palette is the only aspect of VIZ Render that is not dockable but fortunately it Auto-hides and does not use a lot of screen real estate.

New materials are started by right clicking on the scratch palette material and selecting New. In the Scratch Palette a user can freely edit and manipulate templates or materials to their choosing, without committing them to the scene. However, any materials which have not been applied in the current scene will automatically jump to the Recycled Palette and will not be reloaded from session to session. With over 24 default templates to choose from, any material can conceivably be achieved. Applying a material is done by dragging and dropping on an object. All objects within that layer will be assigned that material. This in turn moves the material to the Current Scene Palette.



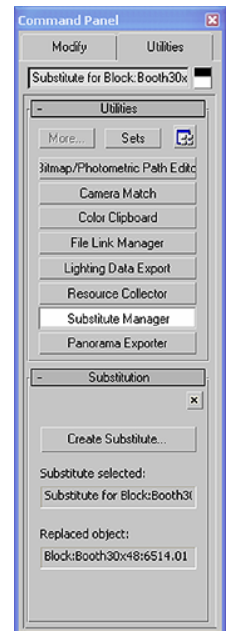
Existing materials or those translated via the Architectural Desktop wall styles are automatically placed in the Current Scene Palette. These may also be manipulated and saved back to the Content Browser. The Content Browser is the one of two methods of getting saved Materials from within VIZ Render back into the wall styles of ADT 2004. This is important because once applied in ADT 2004, that wall style can be used over and over and linked without the efforts of material modification. The other method is simply dragging and dropping from VIZ Render into ADT 2004. Both materials and tool palettes can be dragged and dropped into and from a tool catalog in the Content Browser.

As mentioned above, the Content Browser provides a means for organizing project specific material catalogs for archiving, sharing, or use in ADT 2004. Users can share *.clb (Content Browser Library) files which contain the content listed above.

Of Note: The Content Browser can not be initiated from within VIZ Render. It is a separate application which can be run from AecCB.exe in explorer or from within ADT 2004.

Substitution Manager

Another highlight of the feature-set within VIZ Render is the Substitution Manager accessed from the Utility tab of the Command Panel. This powerful tool enables replacement of ADT 2004 objects or blocks, with max files. In most cases, a block is a representation of the actual three dimensional object. As an example, 2D furniture blocks in a model could easily be substituted for 3D detailed furniture blocks. The feature is made more useful by the fact that it becomes an intelligent placeholder upon linked geometry reloads even when representative block locations have been moved, created or deleted.



Lighting

The rendering engine accuracy has been enhanced and also boasts an increase in performance. VIZ Render enables use of both Radiosity and Ray-tracing in its ability to simulate Global Illumination. Most do not understand their very significant differences. Radiosity excels at rendering diffuse-to-diffuse inter-reflections between element surfaces, while Ray-tracing excels at rendering specular reflections from available light sources. VIZ Render makes use of the SRR algorithm (Stochastic Relaxation Radiosity) when calculating the amount of light distributed between triangular meshes. Meshes are the essential building block of rendering processing and are ideally equilateral and are uniformly applied to all objects in a scene. Like Autodesk VIZ 4, light sources in a scene are based on industry standard photometric characteristics of light fixtures. Support for IES, CIBSE and LTLI distribution patterns enable designers to see how specific real-world light fixtures affect the scene.

Radiosity Processing Explained

As paraphrased from the VIZ Render User Reference file:

The radiosity process involves three stages of increasing refinement. The first two stages occur during the primary radiosity processing, and the third stage can be used during the final rendering. These stages are Initial Quality, Refine, and then Regathering.

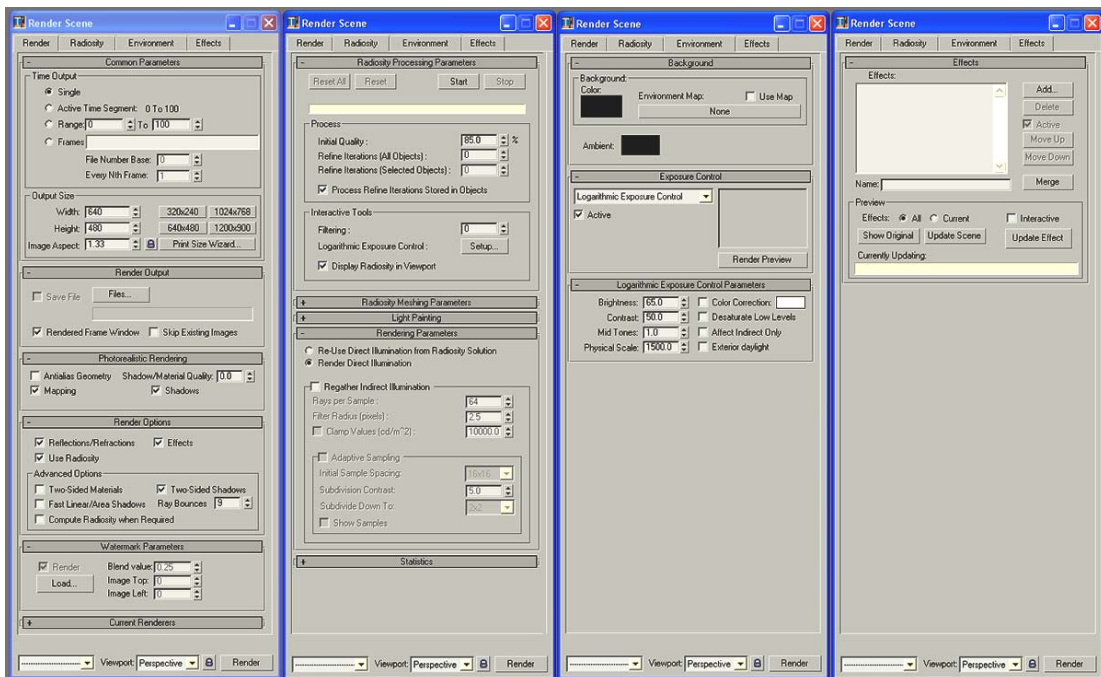
- In the **Initial Quality** stage, the distribution of diffuse lighting in the scene is calculated by essentially mimicking the behavior of real photons. As with any statistical sampling process, the greater the number of rays used in the approximation, the greater the

accuracy of the solution. During the initial quality stage, the overall appearance of the lighting level of the scene is established. The initial quality stage performs repeated passes, which are shown in the dialog's progress bar.

- Refine Iterations (All Objects) and Refine Iterations (Selected Objects)**
 Because of the random nature of the sampling during the initial quality stage, some of the smaller surfaces or mesh elements in the scene might miss being hit by enough rays (or any rays at all). These small surfaces remain dark, and result in the appearance of "variance" or dark spots. To alleviate these artifacts, the Refine stage "regathers light" at every surface element. You can perform the Refine stage for the entire scene, or for selected objects in the scene.
- Even after the Refine stage, it is still possible for visual artifacts to appear in a scene because of the topology of the original model. These artifacts sometimes appear as shadow or light "leaks." To eliminate even these model-based artifacts, a third, optional refinement stage known as Pixel **Regathering** occurs at the time of image rendering. This involves a final "regather" process for each pixel of the image. Regathering can add a considerable amount of time to the rendering of a final image, but it also produces the most detailed and artifact-free images possible. One benefit of using Regathering is that it means the initial modeling and mesh resolution don't need to be nearly as "refined" or "tight" as would otherwise be required

Radiosity settings

Since the release of Autodesk VIZ 4, Radiosity processing and the settings thereof have really challenged users throughout the rendering community. In VIZ Render, refinements behind the scenes demonstrate that this will no longer be the case. Use of the new rendering presets really demystifies radiosity processing for any user. These settings have been consolidated into the new Rendering Scene dialog window consisting of the Render, Radiosity, Environment and Effects settings. While similar to Autodesk VIZ 4, this feels better organized and now offers a thumbnail render previewer.



Lighting Made Easy

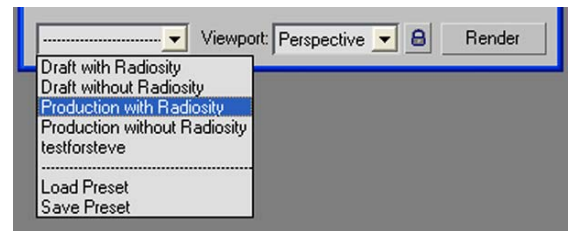
Logically speaking, real-light characteristics simulate real-world conditions. VIZ Render replicates this behavior by utilizing two light types: photometric light objects and the Daylight System. Photometric light objects can be created by use of the software, or downloaded with I-drop technology from several manufacturers' websites. With the ability to read and use assemblies (Autodesk VIZ 4), photometric lights in concert with assemblies have the potential to greatly affect the world of lighting models with more accuracy and immediate, predicable results.

The Daylight System feature combines the IES Sun, IES Sky and Texture Sky of Autodesk VIZ 4 to unify and consolidate the interface. Within the Modify tab of the Command Panel, users can access all settings for the Daylight System in one place.

Of Note: Standard lighting in previous releases has been removed.

Rendering Presets

Any rendering is subjectively dependent upon many variables and experience is typically needed to make productive, predictable results. VIZ Render takes this simple truth and places this information in rendering presets. Conceptually, rendering presets are the textbooks of rendering. What makes this so powerful is that it is customizable and can be shared with other users. It follows that as needs develop, users potentially can have several different rendering presets for applicable rendering scenarios.



Animation in VIZ Render

VIZ Render enables users to animate the transforms of any object to create walkthroughs and shadow studies as well as parameters for the animation of ADT doors and windows with the same techniques of key framing from previous releases.

Plug-ins

Because VIZ Render is based on legacy 3D studio series platforms, it is expandable. Two companies' plug-ins will be available for use in Viz Render. Archvision will provide samples and license to use their popular RPC (Rich Photorealistic Content) content. Bionatics will also provide samples and license of their EASYnat software based on AMAP technology. The plug-ins will be available via web download. Summaries of the plug-ins are as follows:

Archvision

The RPC plug-in enables users to path both new and existing RPC content for use in VIZ Render. RPC content collections include dozens of ready-to-render libraries of people, trees, automobiles and other objects. The latest tools include Mass Populate. When used in conjunction with RPC proxies (placeholder helper objects), it makes distribution of the RPC's easier than ever, adding life-like 3D content to your model based designs. Users can control distributions with RPC helper objects like Attractor, Repulsor and Focus. The new plug-in supports the latest available content from Archvision.

EASYNat

The EASYNat plug-in enables users to add realistic 3D vegetation to their models. With the 4 sample plants shipped with this version, users can easily add a natural touch of realism to their renderings. Plants are both accessible from the Design Center within ADT as Multi-View Blocks and from within VIZ Render, from the EASYNat menu. Users can generate the 4 plant models at different ages and seasons, adjust the height, diameter and Level of Detail, however these sub object controls are not able to be animated.

Of Note: Maxscript exposure in the UI has been removed.

Summary

This initial release of VIZ Render coupled with Autodesk® Architectural Desktop 2004 is a testament to the simplification and integration of a rendering and modeling package. The transparent ability to link models into the VIZ Render environment has been made seamless. The new User Interface is streamlined and reflects a simplification geared towards Architects. The use of preset Materials in conjunction with Rendering Presets really make rendering easier and predictable. Material Palettes mark a new direction which visually identifies all the active materials at once as well as provides templates and scratch areas for experimentation. The addition of the Substitution Manager to control 2D or multi-view blocks as proxies for 3D detailed blocks is beneficial for production in both ADT 2004 and VIZ Render. With a platform built off of legacy functions and several new enhancements, VIZ Render is the optimal tool for creation of design studies, material and lighting investigation and realistic presentation graphics.

Acknowledgements

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This document was written for the Vizdepot and Archidigm publication and can be freely distributed. The information is intended for printing using an 8 1/2x11 portrait format.

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