

## Leica Virtual Explorer V3.0

There are many considerations to take into account when attempting to stream geospatial content over the Web due to its much larger size than most traditional Internet information. The performance of Leica Virtual Explorer 3D scenes can depend on many factors that will be discussed in the following sections.

### Raster Imagery Format

Raster imagery demands the most bandwidth when it comes to streaming 3D scenes; therefore, it is crucial that raster imagery is optimized as much as possible. In many cases, the end user will not notice degradation in rendering performance even if the most inefficient image format is fed to the server. However, in 3D scenes with many raster images and large amounts of data, the degradation can be substantial. If you are not publishing your 3D scenes using Leica Virtual Explorer DVD (discussed in next section), it is recommended that you follow the guidelines below to optimize your raw data for the server:

- Create your imagery with a tiled format if possible. In general, tiled IMG and TIFF imagery will be the best performers.
- Make sure that all data is in the same coordinate system to avoid reprojecting on-the-fly.
- Mitigate the number of images that you are placing on the server. The higher the number of images in a scene the more data the server has to stream. If possible, it is recommended that coincident imagery of small extent be mosaicked together to reduce the number of images in a scene (not to be confused with image coverage area).
- Verify that all of your input raster images have their pyramid layers and that the pyramid layers are built correctly. This means that ALL pyramid layers are present. If you are using ERDAS IMAGINE to produce your imagery you must verify that the **Initial Pyramid Layer Number** in the **Image File (General)** section of your preferences is set to 1.0.
- Avoid stripped format, be it TIFF or IMG, due to its storing whole lines of data, it is bad for real time purposes.
- Avoid feeding the server with high compression imagery, such as JPEG 2000 and MrSID as they strain the servers CPU when decompressing on-the-fly.
- The use of imagery that is not rectified or that contains rigorous projections is not advised, as these will have to be done at scene composition time.

Serving imagery in its raw format is the easiest and quickest way to compile a rich 3D scene and is unique to Leica Virtual Explorer. However, to achieve optimal performance, especially in instances of extremely large scenes, your 3D scenes can be published using Leica Virtual Explorer DVD.

## **Publishing Your 3D Scenes**

Publishing 3D scenes using Leica Virtual Explorer DVD is yet another way to increase the streaming performance of the data to users worldwide. Publishing a 3D scene performs 3 separate data compressions to reduce its size and optimize its streaming performance: raster compression, terrain compression and texture compression. The main benefit to publishing geospatial information, besides reducing its size, is that when a scene is initially accessed the pre-compiled scene will be faster due to its compact format. However, as more areas of interest are exposed and more of the scene becomes cached the speed will gradually even out. In all instances publishing a 3D scene will optimize streaming speed, however, it will be most noticeable in larger scenes and scenes that contain raster imagery that is not efficient for web applications (as discussed above).

## **Server Rendering**

Server Rendering controls how the server interprets each raster in each scene; as independent images that can be individually customized or as one large mosaic that cannot be modified. The latter case is how most 3D visualization packages function to maximize streaming performance, however, Leica Virtual Explorer gives a choice on how the server operates. Each method has advantages and disadvantages that will be discussed.

In most scenes Server Rendering is not necessary, allowing clients to toggle on/off individual raster layers in the scene and customize each by using the raster editing tools and changing their properties. As the number of raster and terrain layers increases in a scene (not to be confused with image coverage area or combined size of the scene), the more images the Leica Virtual Explorer Client or Pro Client must geographically compose, gradually decreasing performance. The performance degradation is dependant on a remote user's hardware performance and their Internet bandwidth, however, in most cases it is negligible unless the streamed scene contains hundreds or even thousands of images.

Why would you want to use Server Rendered? In special cases where a scene contains hundreds or thousands of raster or terrain files, performance degradation will occur due to the Leica Virtual Explorer Client bearing the load of composing each raster. Enabling Server Rendering relieves the client of this task and forces the server to do all the image composition by fixing the properties of each raster layer and treating all layers as one mosaic. This dramatically increases the roaming performance of larger scenes with hundreds of image layers, however, the client loses their ability to toggle on/off raster and terrain layers, bring up their properties, or use raster editing tools.