How to Leverage Dynamic Display in ArcGIS Engine Applications

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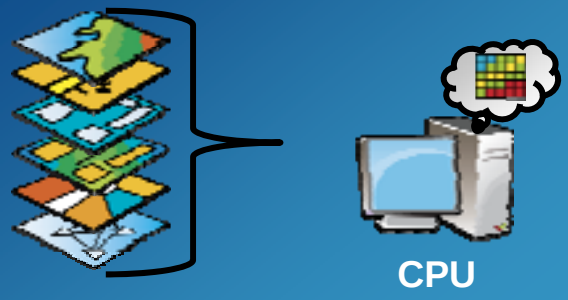
The Display Pipeline

Static Layers are drawn and rasterized



Stored as tiles in cache folder

Dynamic layers drawn directly to the Graphics Card

Tiles are loaded and pulled from the graphics card

Increase Static Layer Performance

- How can we create a smooth and fast Dynamic Display application?
- This can be done in 2 ways:
  - 1. Optimize your data and layers.
  - 2. Use IDynamicCacheLayerManager to:
    - Control cache storage and retrieval.
    - Update your cache.
    - Control cache display characteristics.

Increase Static Layer Performance

- **Data Optimization**
  - **Do:**
    - Use rasters, specifically rasters with pyramids.
    - Use cached map services whenever possible. (Ex. ArcGIS Online, Microsoft Virtual Earth, your own services)
    - Use File or properly tuned SDE Geodatabases.
    - Use Geodatabase Annotation for labels and graphics.
  - **Don't:**
    - Personal GDB, Shapefiles, and SDC datasets.

Increase Static Layer Performance

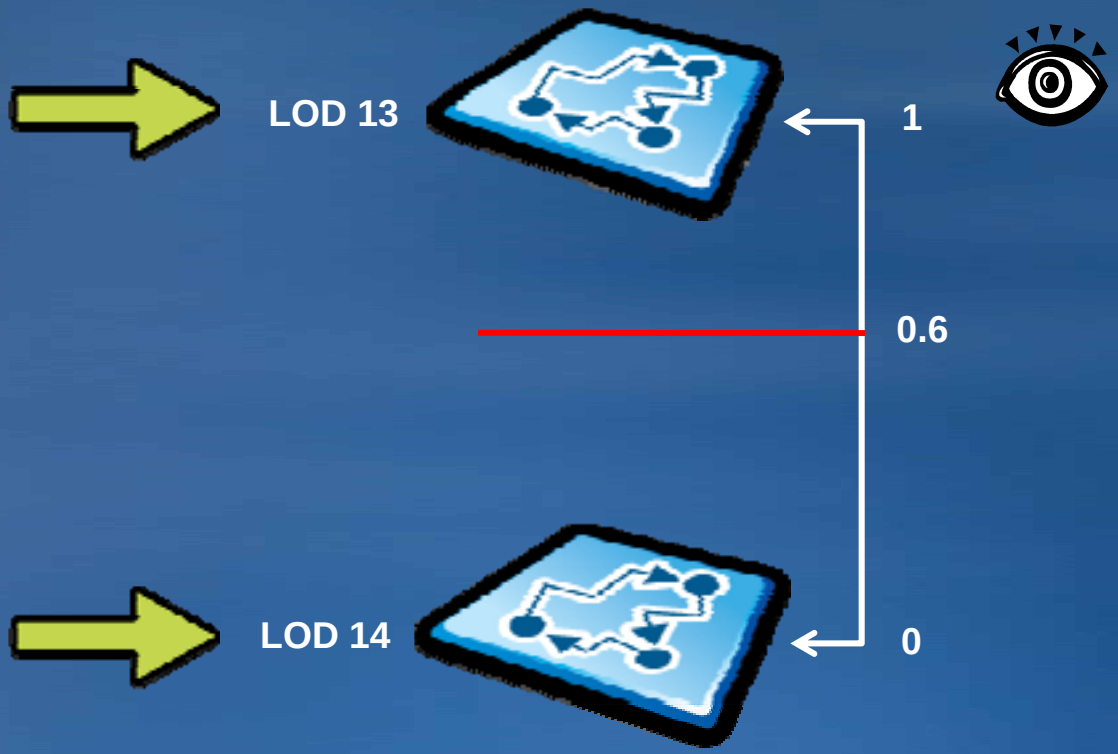
- **Map design optimization**
  - **Do:**
    - Reduce number of layers in the map.
    - Group similar layers together.
    - Simplify all symbology (Ex. ESRI Optimized Style).
  - **Don't:**
    - Make changes to static layers while the application is being used.
    - Use Labels or Graphics
    - Reproject your data on the fly

Managing your Cache – IDynamicCacheLayerManager

- **Init** (Map, Layer)
  - To use the DynamicCacheLayerManager call initialize and pass in the Map and the Layer.

Managing your Cache – IDynamicCacheLayerManager

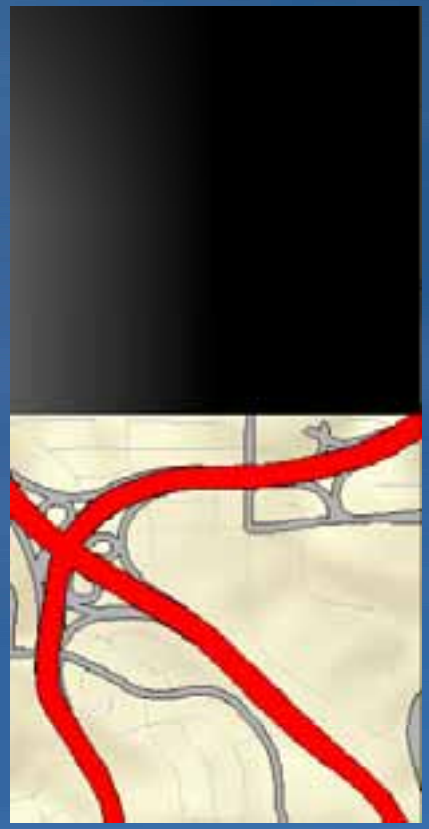
- **DetailsThreshold** : Double (0 to 1)
  - The normalized value at which the coarser texture will be chosen over the finer grained texture.

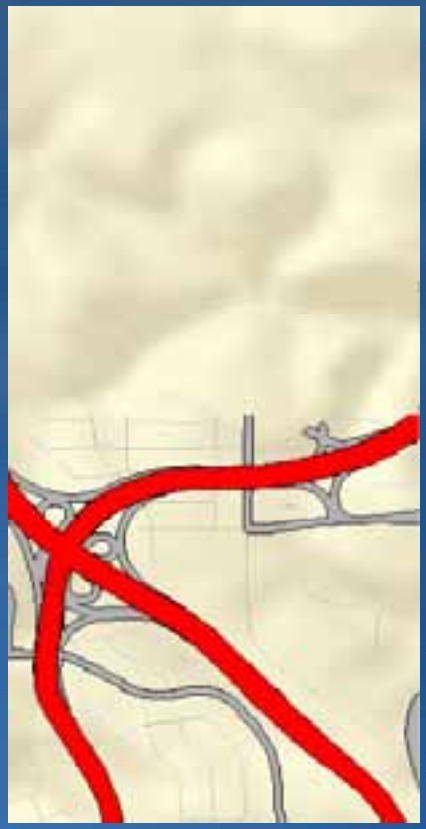


Managing your Cache - IDynamicCacheLayerManager

- **AlwaysDrawCoarsestLevel : Boolean**
  - If no tiles exist it will draw the coarsest texture so that it draws something.

True

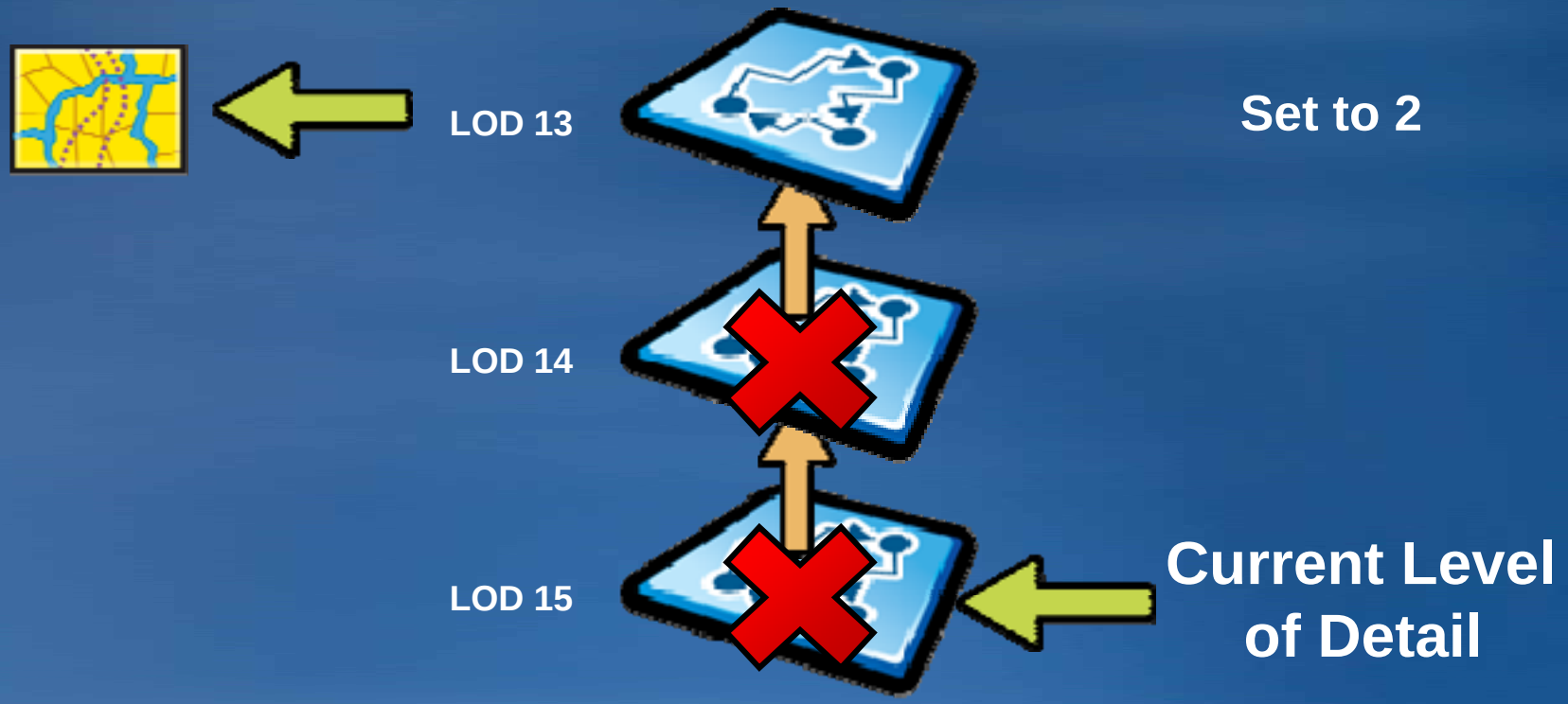




False

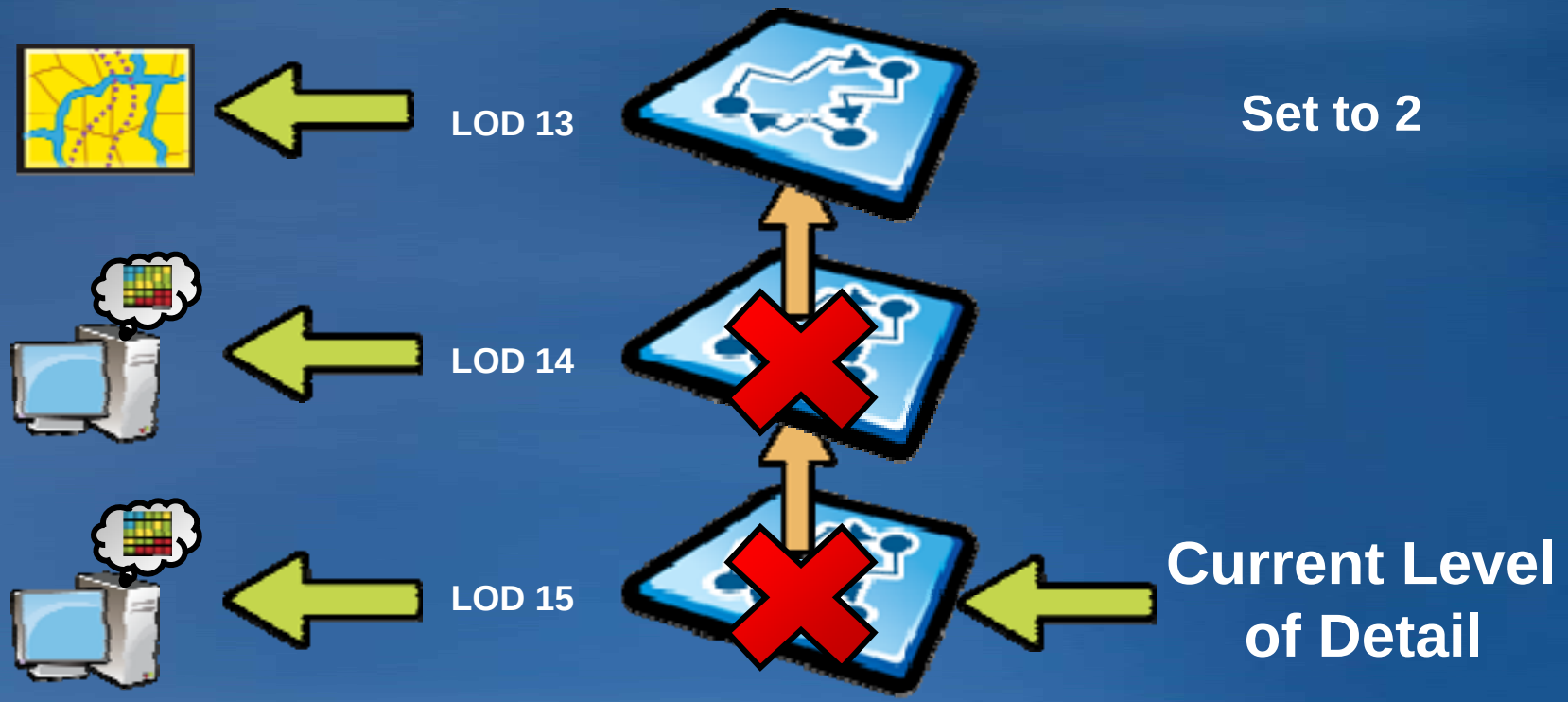
Managing your cache - IDynamicCacheLayerManager

- **ProgressiveDrawingLevels : Integer (zero based)**
  - Number of levels to travel up the cache to display a tile.



Managing your cache - IDynamicCacheLayerManager

- **ProgressiveFetchingLevels** : Integer (zero based)
  - Number of coarse levels of data to generate while the current tile is processed.

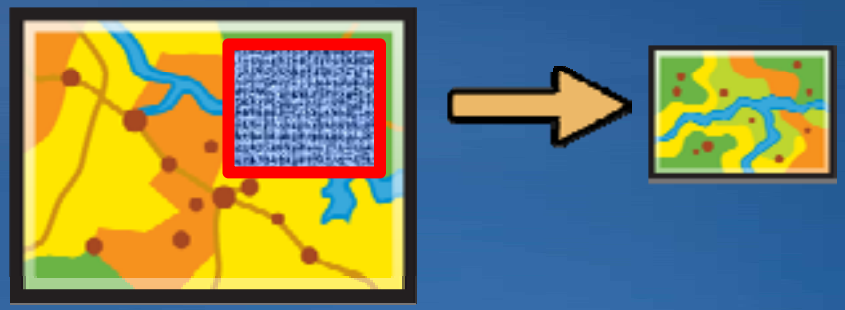


Managing your Cache - IDynamicCacheLayerManager

- **StrictOnDemandMode : Boolean**
  - Forces Dynamic Display to only fetch tiles for the current level of detail.
  - Essentially sets the ProgressiveFetchingLevels to 0.
- **MaxCacheScale : Double**
  - Use this to limit the largest (closest) scale cache.
  - This is the cache that will take the longest to generate.

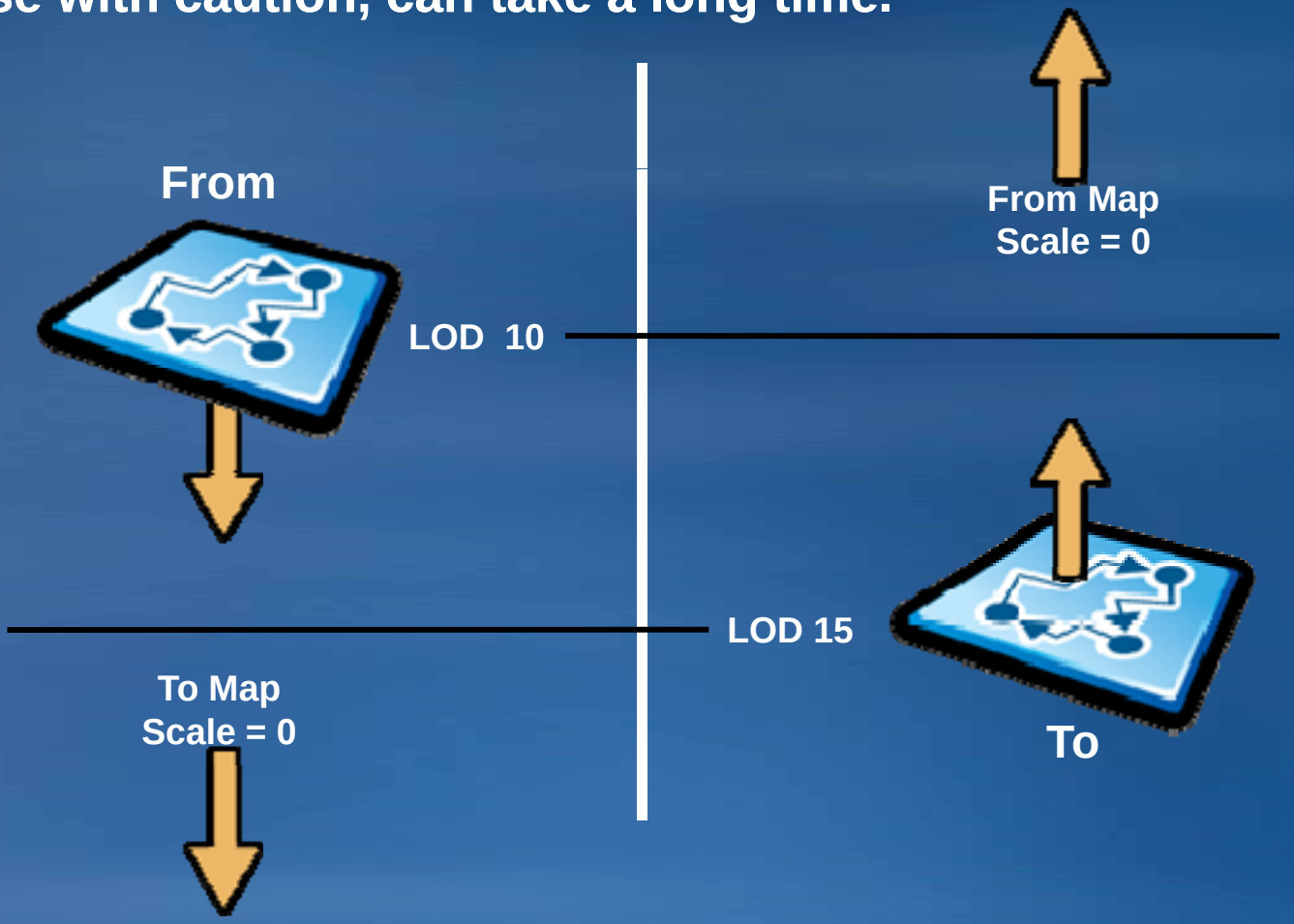
Managing your Cache - IDynamicCacheLayerManager

- **Invalidate** (Envelope, Double Buffer)
  - Useful if you must made some changes to the underlying data.
  - Specify an envelope, and Boolean value for double-buffer.
  - Double-buffer = True -> Invalidated tiles will still be rendered as they are gradually replaced.
  - Double-buffer = False -> Invalidated tiles will disappear.



Managing your Cache - IDynamicCacheLayerManager

- **Update**(Extent, From Map Scale, To Map Scale, Mode)
  - Can be used to pre-cook cache.
  - Use with caution, can take a long time.



Managing your Cache - IDynamicCacheLayerManager

- **Reusing Cache**
  - Save the Map Document or the Layer file, which will persist the cache information.
  - Next time you use the layer or map the cache information will be persisted, provided that layer is still the same.
- **Connect** (Folder Path, Folder Name)
  - Use this if you decide to move the cache to a new folder.
  - Run this prior to enabling Dynamic Display.
  - Pull the folder name from the Layer.

Additional Resources

Questions, answers and information…

- ***ESRI Resource Centers***
  - **PPTs, code and video**

resources.esri.com

- ***Social Networking***

www.twitter.com/ESRIDevSummit

tinyurl.com/ESRIDevSummitFB