VisTrails and VTK Updates from Utah

Latest VisTrails Features
VisTrails Plug-in for ParaView
Streaming and Multi-core Functionality in VTK

VisTrails 1.3

- Released July 3rd, 2009
- SubWorkflows
- Control Flow Package
- Debugging Support
- Thumbnails
- VTK
  - Added InfoVis (Titan) support
  - Display progress for vtkAlgorithm subclasses
  - Support picking in VTKCell

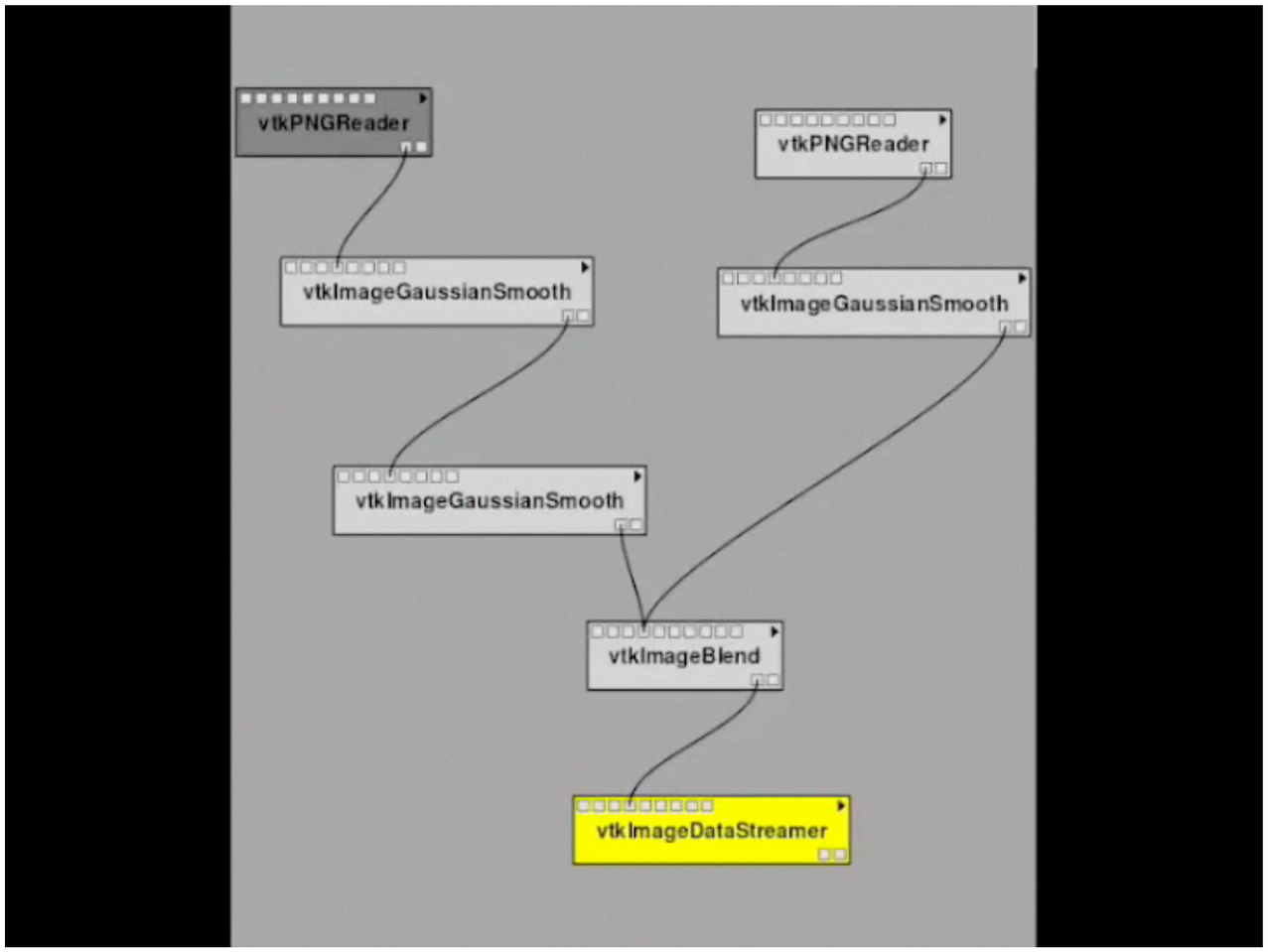
VisTrails Plug-in for ParaView

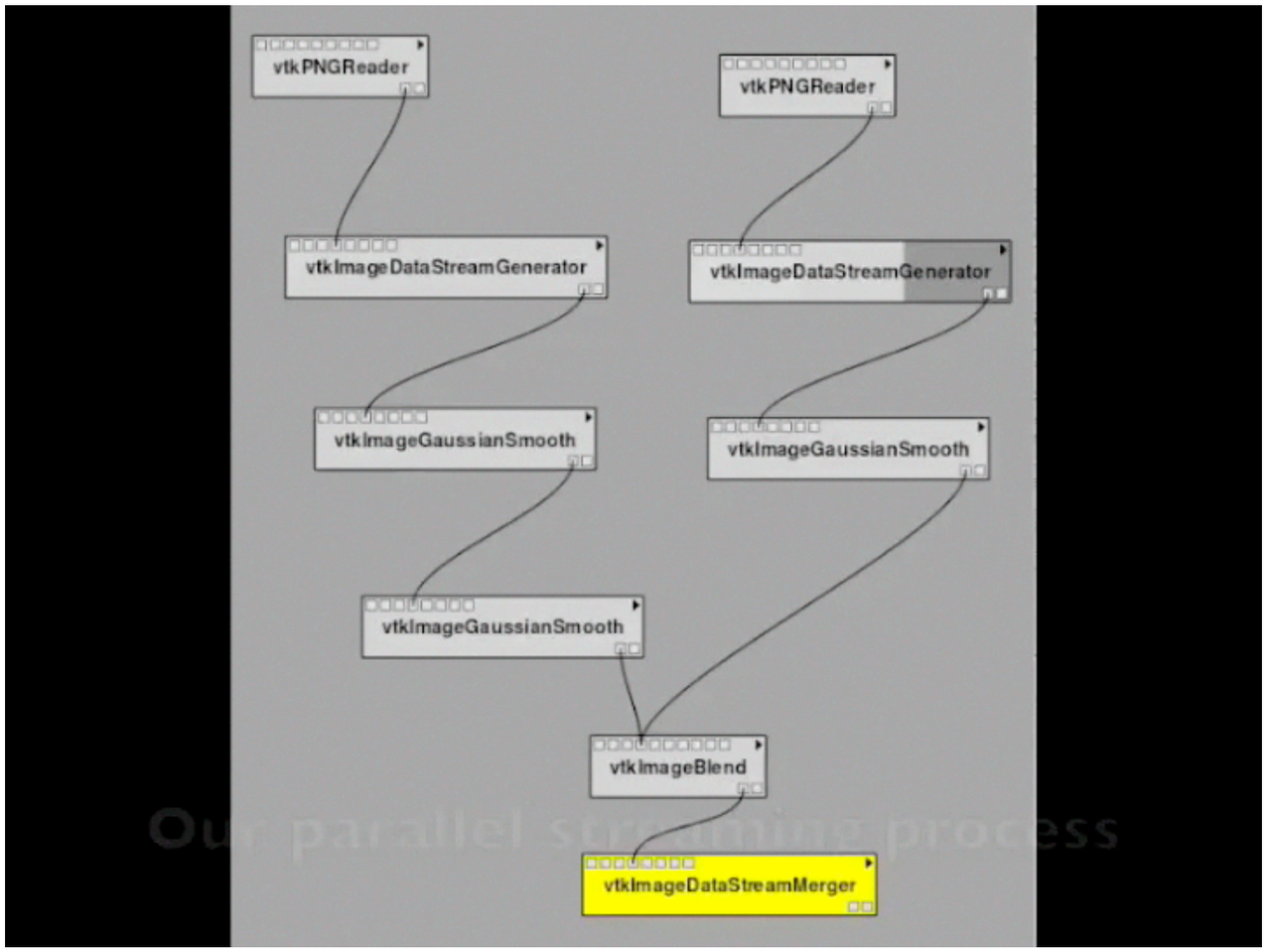
- ParaView: http://www.vistrails.org/index.php/ParaView_Plugin
  - VisTrails plug-in will be included with next ParaView release

VisTrails Plugin for ParaView

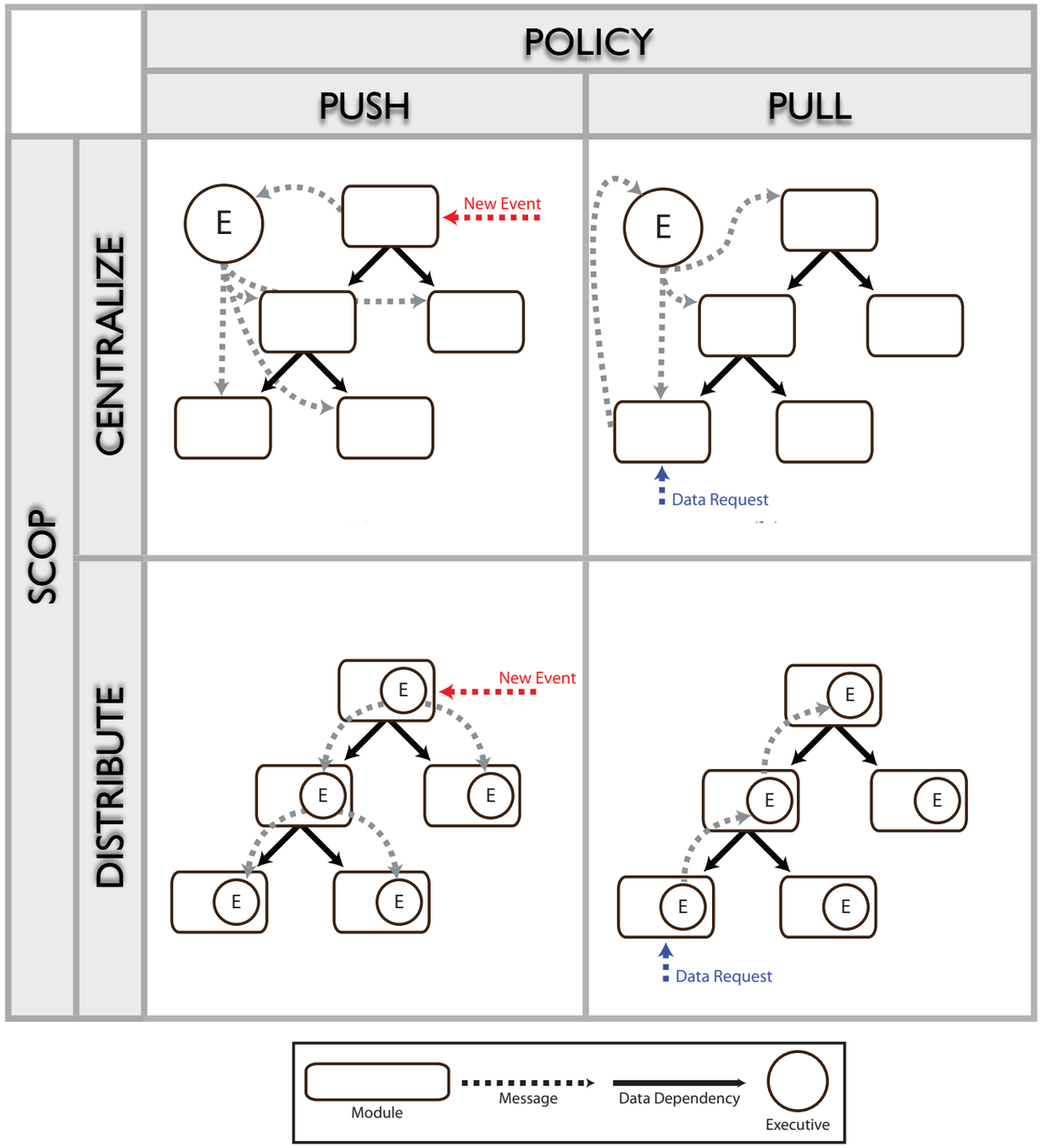
[Callahan et al., IPAW 2008]

Multi-Threaded Streaming Pipeline



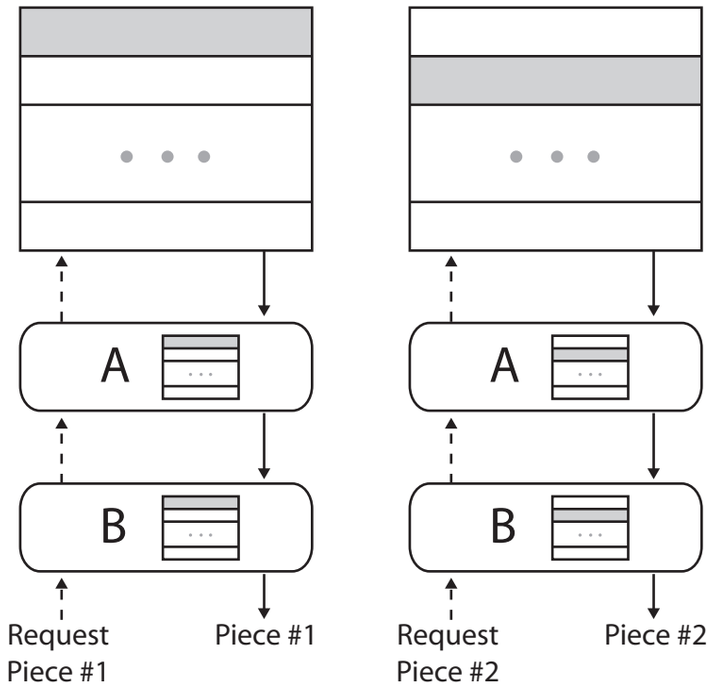


Executive Classification by Scope and Policy



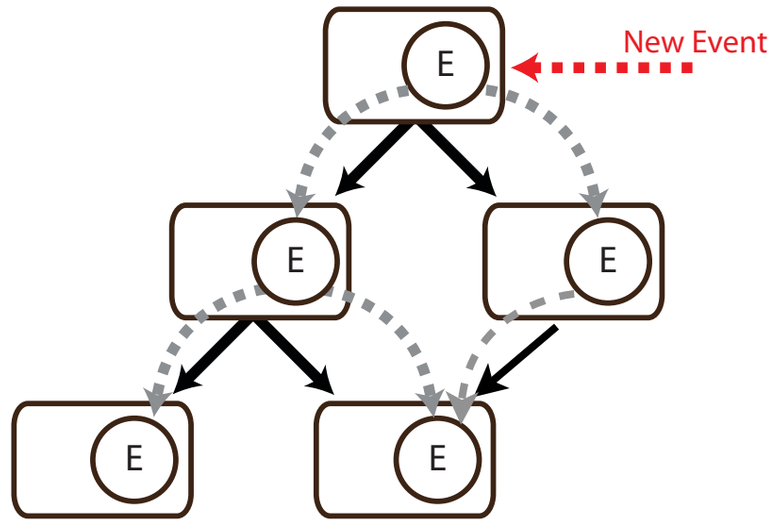
Challenges in Achieving Efficiency

Streaming Pull



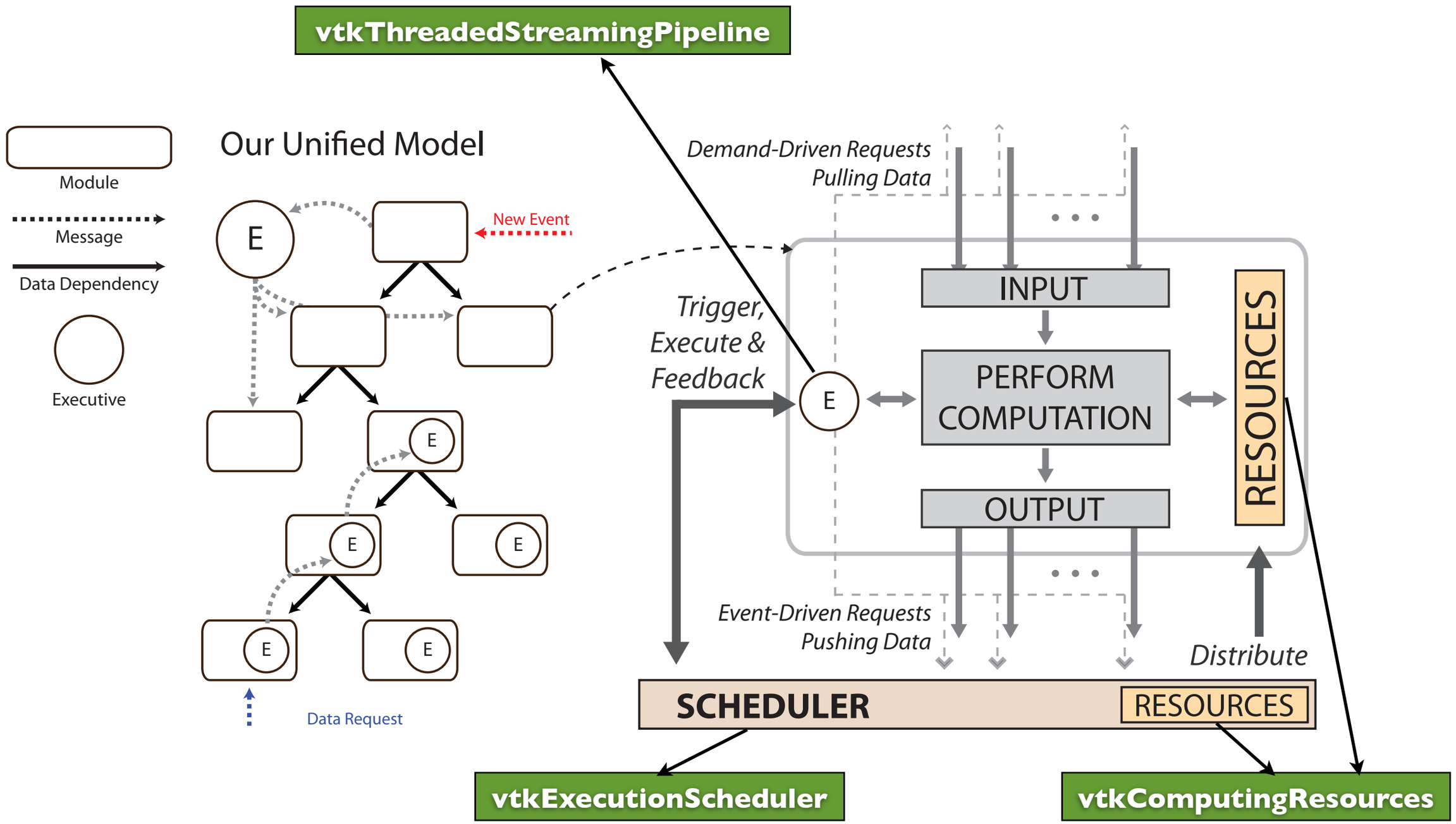
lack of pipeline parallelism

Push



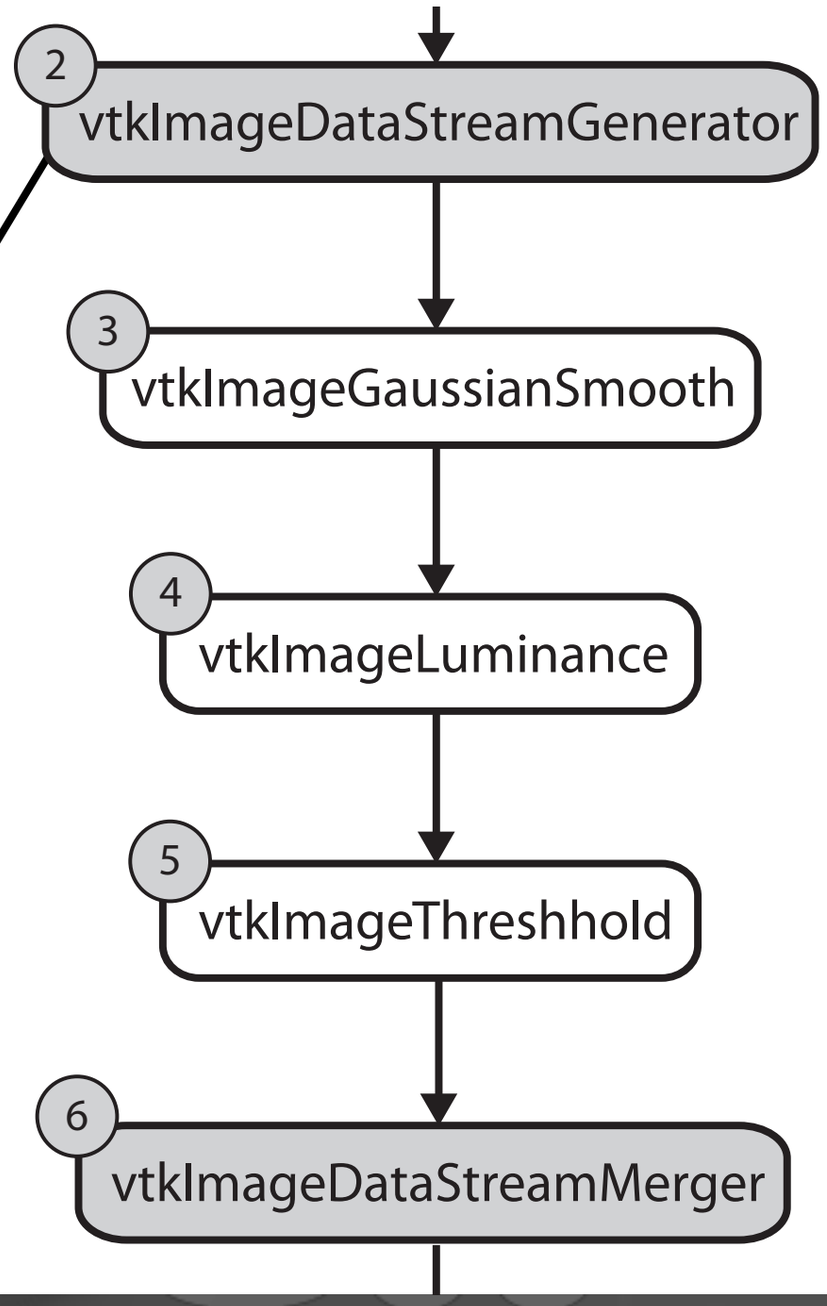
inefficiency due to repeated updates

Adding Multi-Threaded Streaming to VTK



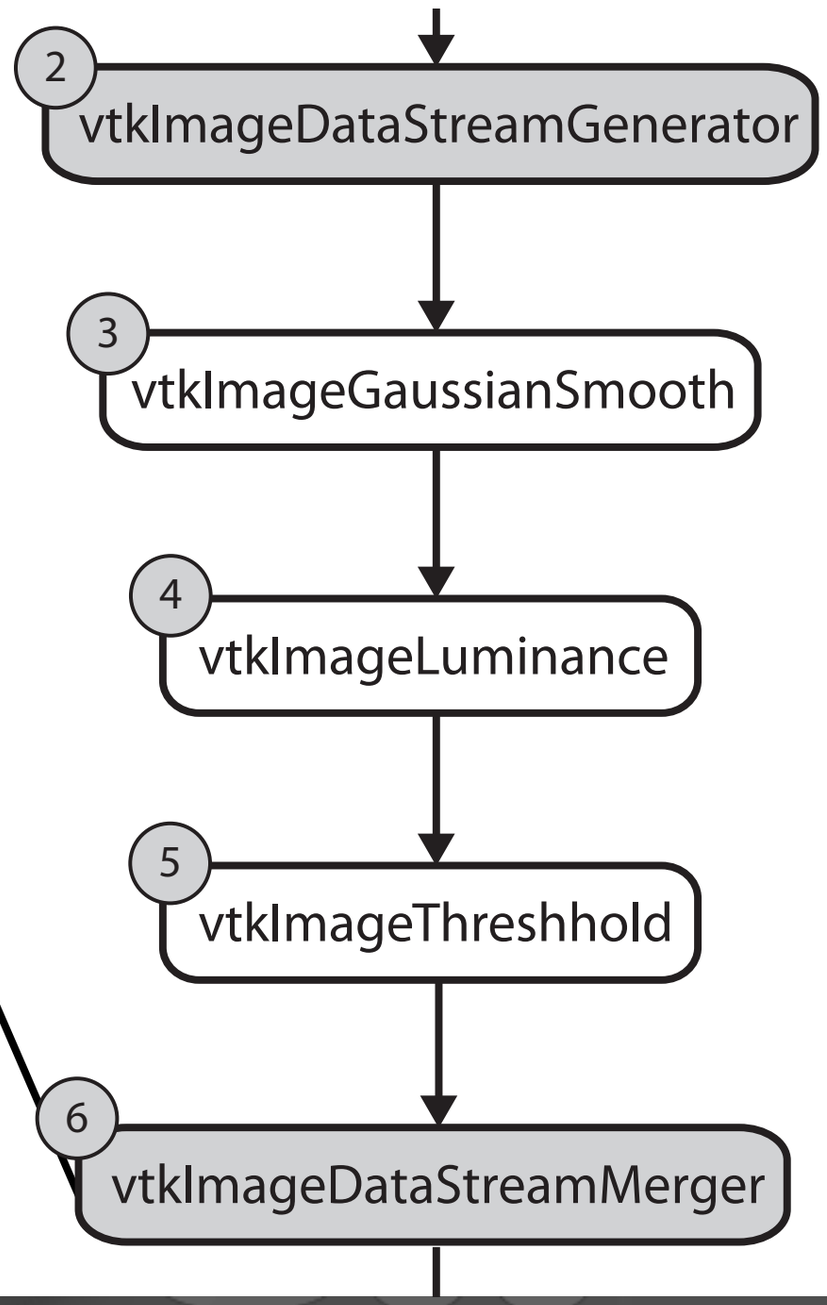
Example: Using Push for Streaming

```
while (!EndOfStream())

  // Read in next piece

  ...

  this->GetExecutive()->Push()
```

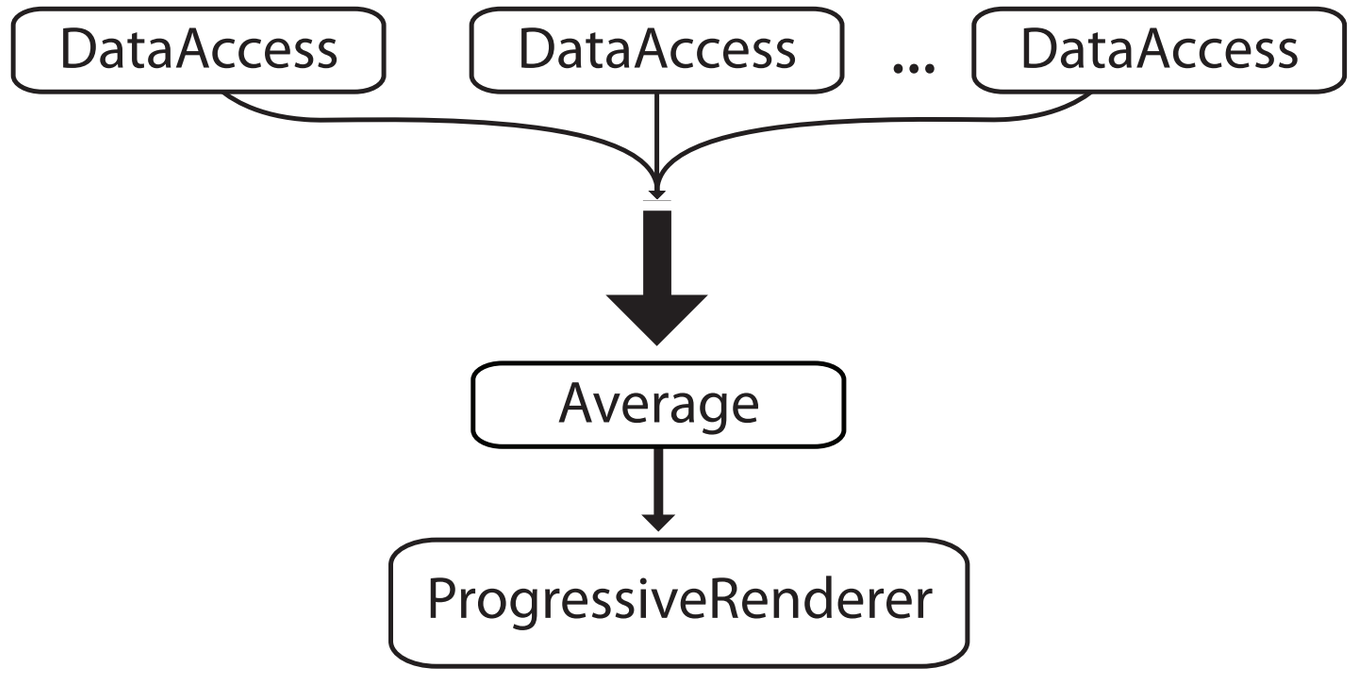


Example: Using Pull for Streaming

```
for(i=0;i<numPieces;i++)

  // Set desired region

  ...

  this->GetExecutive()->Pull()
```



Example: Progressive Rendering



Push

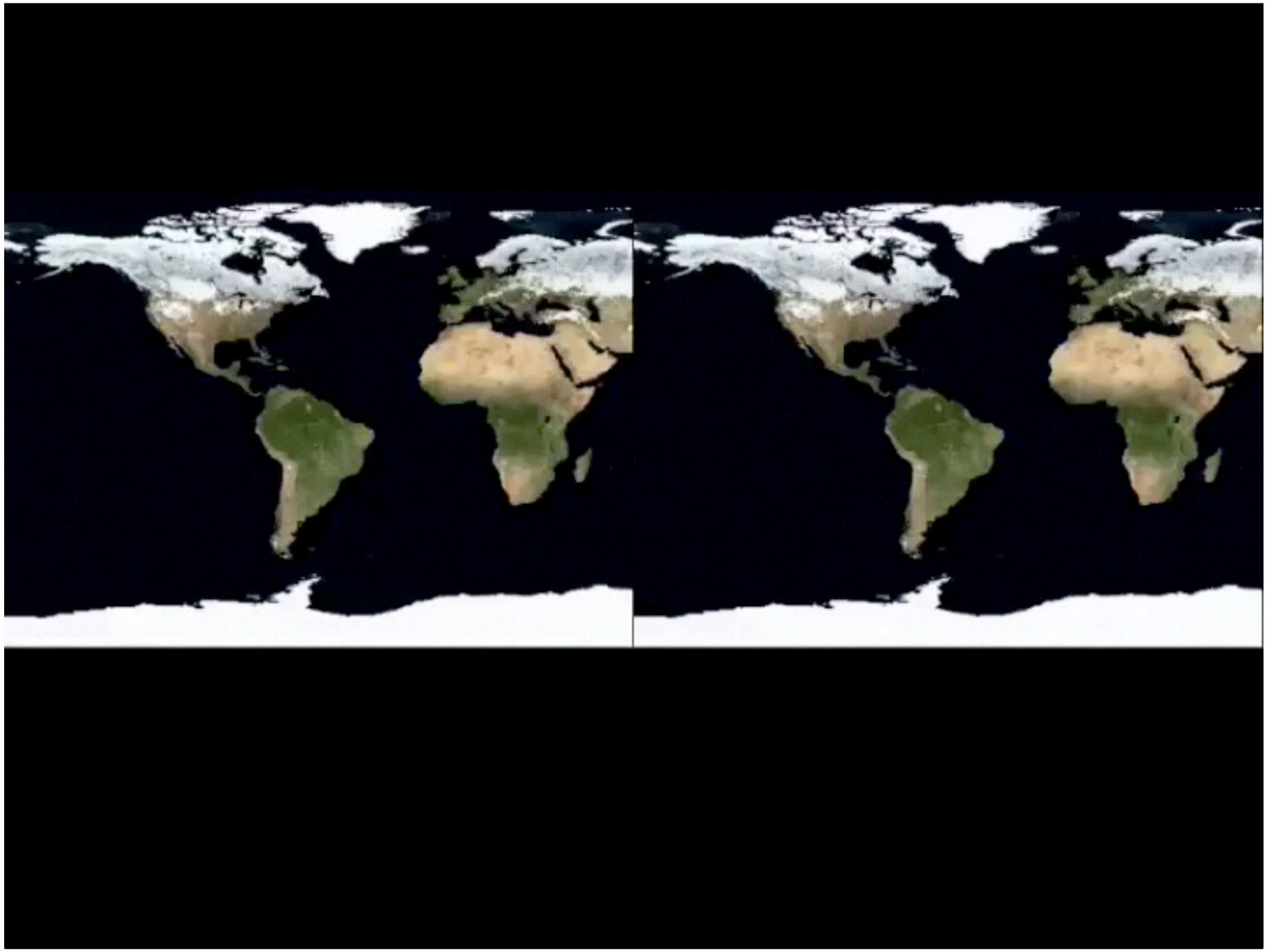
```
viewportChangedEvent()
  while (LOD>0)
    // Set LOD of DataAccesses
    ...
    Push(<list of DataAccess>)
    LOD = LOD - 1
```

Pull

```
viewportChangedEvent()
  while (LOD>0)
    // Propagate LOD to DataAccesses
    ...
    Pull(Average Module)
    LOD = LOD - 1
```

- Better Pipeline Parallelism
- Simpler Interface

ViSUS



Current Status

- Commiting into VTK
  - Available for TESTING soon
- Adding various Scheduling Strategies
  - For example TBB
- Extending to GPU/Cluster
  - Preliminary results on GPUs