



















































optimization

Problem with multiple  
duplicated meshes:  
too many draw calls

**Messh**

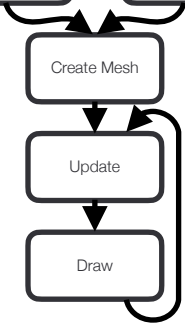
Create  
Geometry

Create Material

Create Mesh

Update

Draw



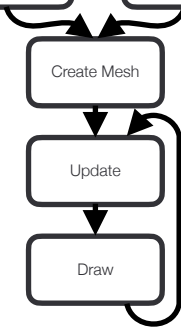
Create  
Geometry

Create Material

Create Mesh

Update

Draw



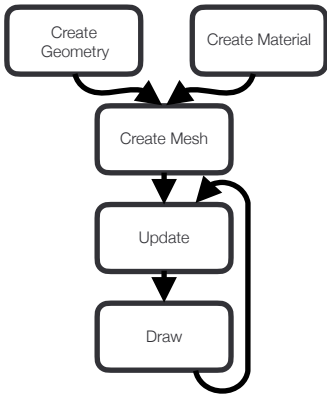
Create  
Geometry

Create Material

Create Mesh

Update

Draw





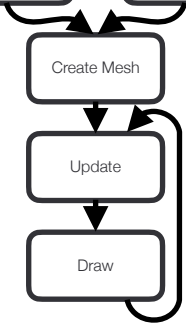
Create  
Geometry

Create Material

Create Mesh

Update

Draw



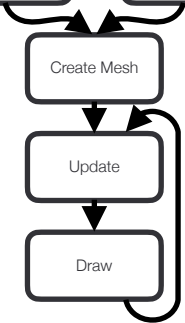
Create  
Geometry

Create Material

Create Mesh

Update

Draw



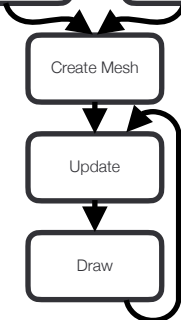
Create  
Geometry

Create Material

Create Mesh

Update

Draw



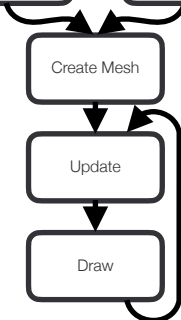
Create  
Geometry

Create Material

Create Mesh

Update

Draw



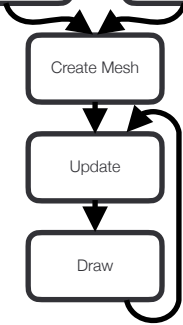
Create  
Geometry

Create Material

Create Mesh

Update

Draw



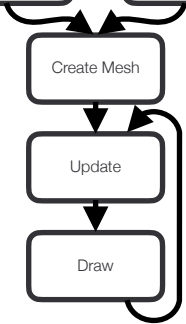
Create  
Geometry

Create Material

Create Mesh

Update

Draw



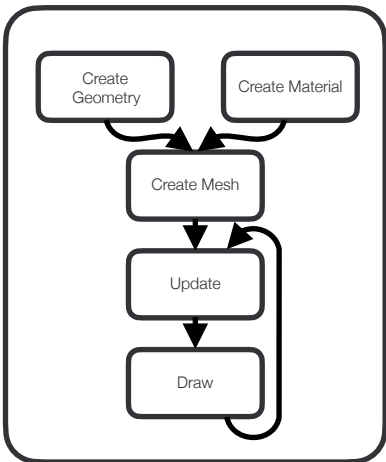
Create  
Geometry

Create Material

Create Mesh

Update

Draw



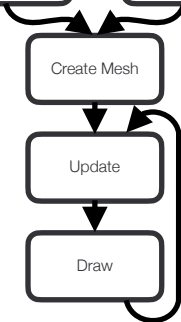
Create  
Geometry

Create Material

Create Mesh

Update

Draw





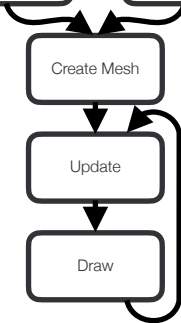
Create  
Geometry

Create Material

Create Mesh

Update

Draw



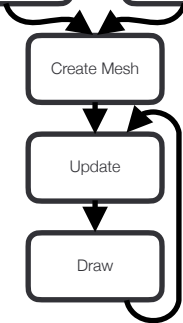
Create  
Geometry

Create Material

Create Mesh

Update

Draw



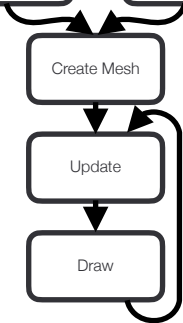
Create  
Geometry

Create Material

Create Mesh

Update

Draw



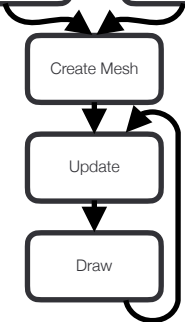
Create  
Geometry

Create Material

Create Mesh

Update

Draw



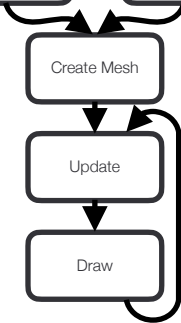
Create  
Geometry

Create Material

Create Mesh

Update

Draw



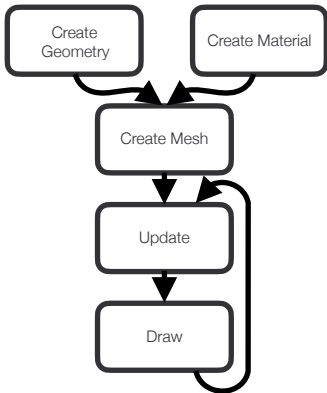
Create  
Geometry

Create Material

Create Mesh

Update

Draw



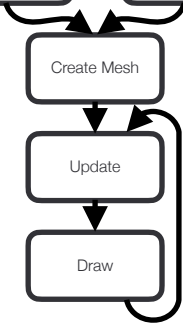
Create  
Geometry

Create Material

Create Mesh

Update

Draw



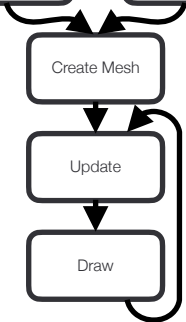
Create  
Geometry

Create Material

Create Mesh

Update

Draw





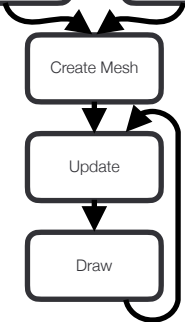
Create  
Geometry

Create Material

Create Mesh

Update

Draw



$$\text{drawCalls} = n_{\text{meshes\_in\_frustum}}$$

# Reducing Draw Calls - Instanced Mesh

duplicate meshes:

Problem with multiple

too many draws calls

Use instances to

reduced draws













**Messin**

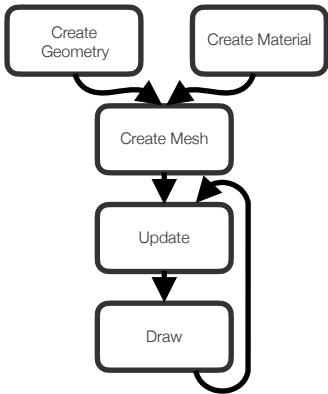
Create  
Geometry

Create Material

Create Mesh

Update

Draw



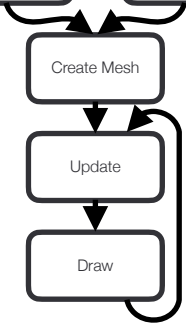
Create  
Geometry

Create Material

Create Mesh

Update

Draw





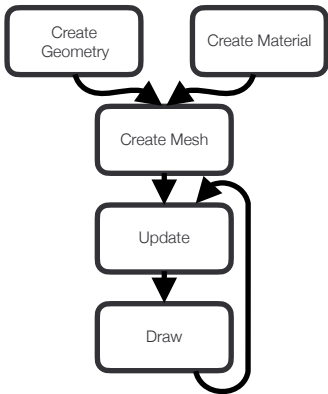
Create  
Geometry

Create Material

Create Mesh

Update

Draw



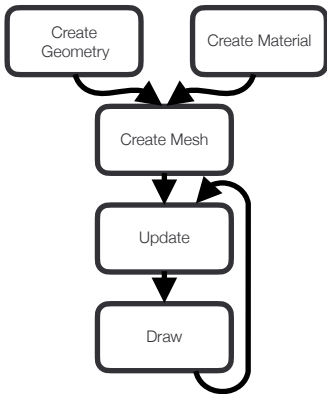
Create  
Geometry

Create Material

Create Mesh

Update

Draw



$$\textit{drawCalls} = n_{\textit{meshes\_in\_frustum}}$$