Graphics *-Buffer Glossary

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Overview

- Single depth layer
  - Z buffer
  - W buffer
  - G buffer
- Multiple depth layers
  - A buffer
  - K buffer
  - F buffer
Z-Buffer (aka “Depth Buffer”)

- **Purpose**
  - “Render geometry in any order and capture front-most depth layer”

- **Key Attributes**
  - Fixed memory regardless of amount of geometry
  - Accelerated in all current GPUs
W-Buffer

- **Purpose**
  - “Just like z-buffer but store depth in eye space (linear) rather than post-projective screen space.”

- **Key Attributes**
  - Similar storage to z-buffer (but always floating point)
  - Different precision distribution across depth range
G-Buffer

- **Purpose**
  - Deferred rendering
  - “Render to an image-space buffer that captures per-pixel surface information such that the lighting can be computed in a post-processing image-space computation pass”

- **Key Attributes**
  - Fixed memory requirements
  - Decouples geometry from lighting
A-Buffer

- **Purpose**
  - “Render translucent and opaque geometry in any order, capture all depth layers, and resolve to final image”
  - Also capture per-sample coverage information for anti-aliasing

- **Key Attributes**
  - Unbounded memory requirements
  - Used in REYES / RenderMan
K-Buffer

- **Purpose**
  - “Render geometry that will generate fragments that are no more than k out of order, and use k-buffer to do final streaming sort”

- **Key Attributes**
  - Fixed memory requirements
  - Requires read-modify-write operations on framebuffer or custom blending logic
F-Buffer

- **Purpose**
  - “Capture all rendered fragments in a linear output stream”

- **Key Attributes**
  - Unbounded memory requirements
  - Indexed by re-rendering geometry
  - Does not support random indexing by pixel position without sorting entire f-buffer