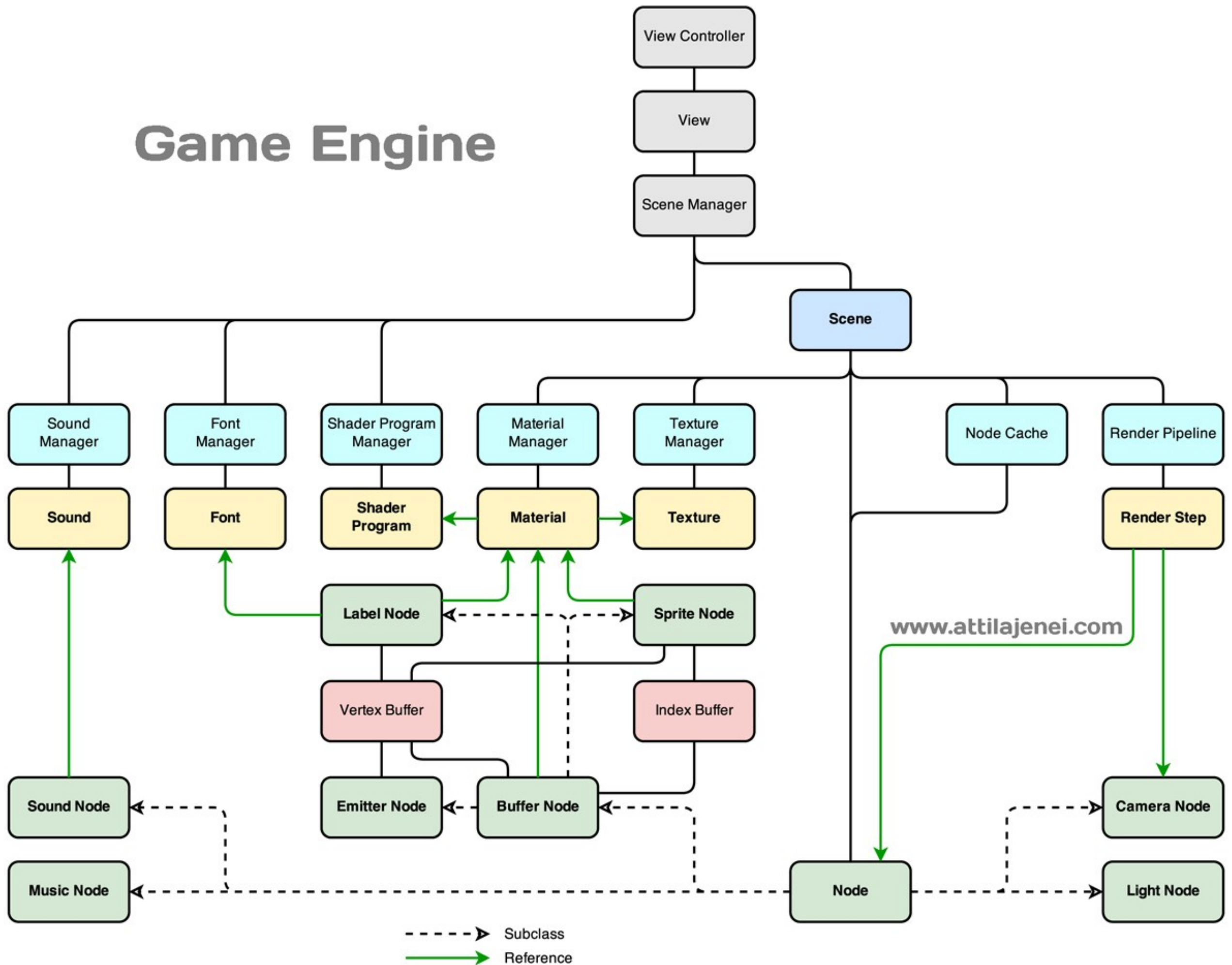


GAME ENGINE ARCHITECTURE

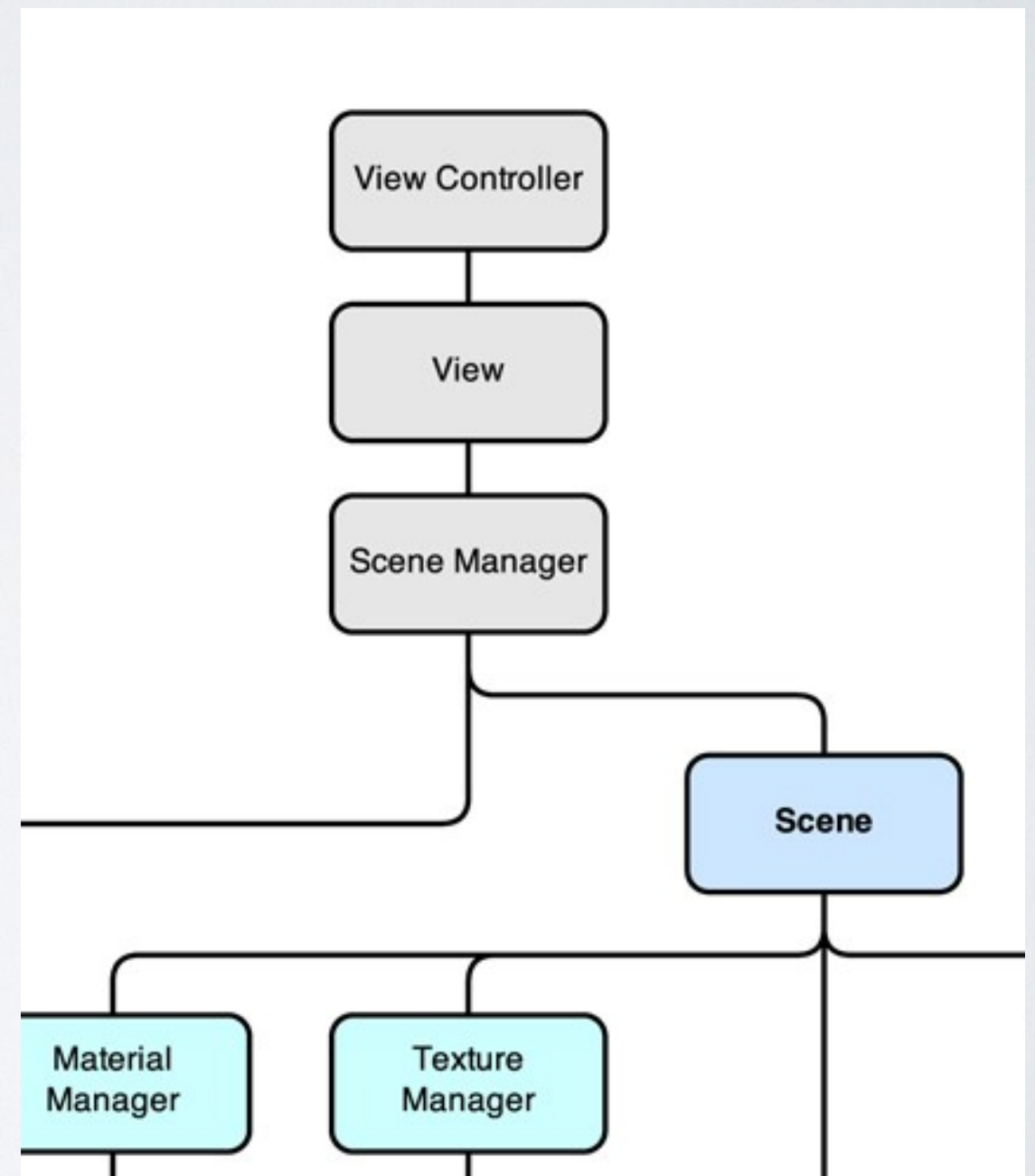
Game Engine



MAIN CLASSES

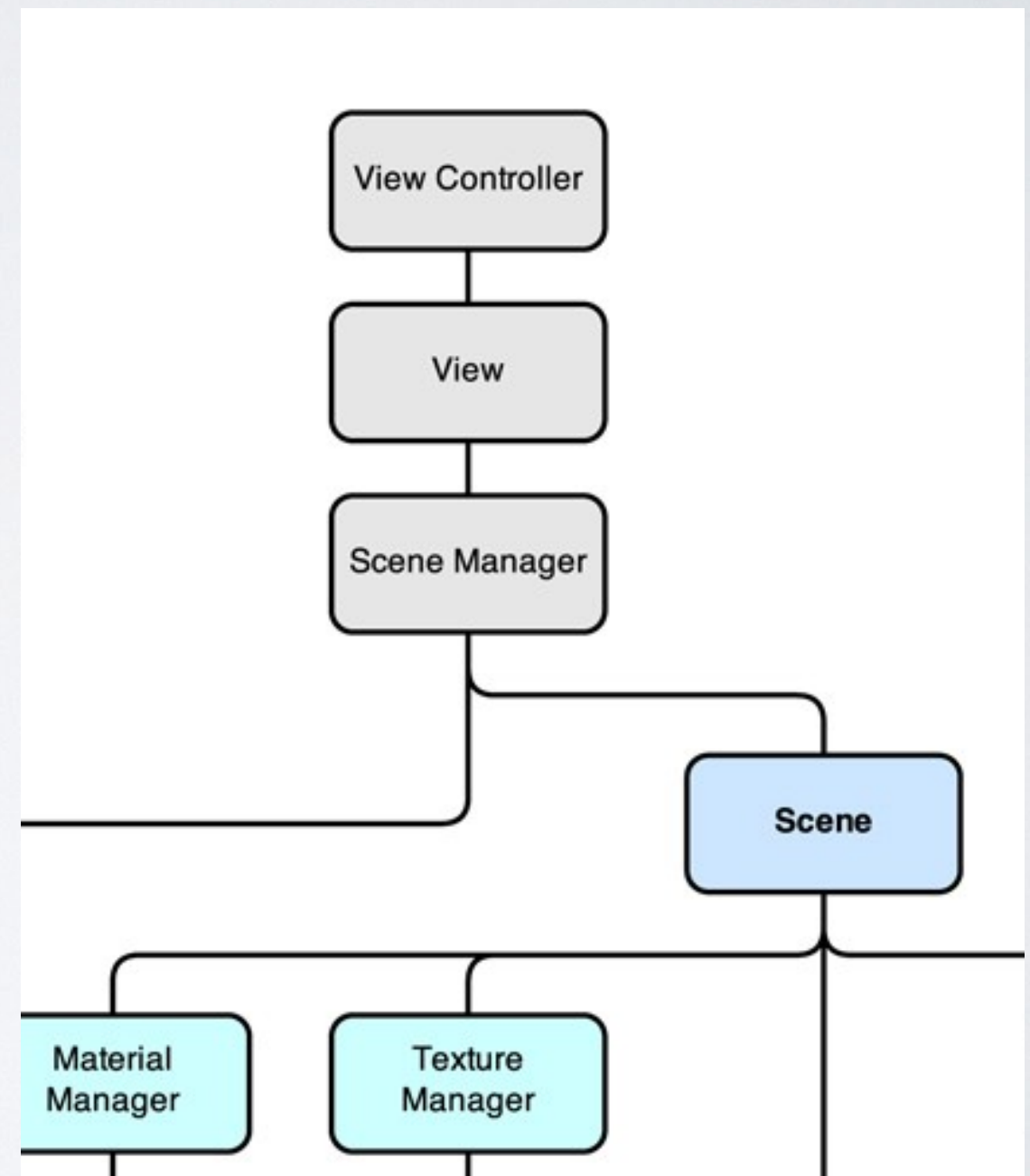
VIEW CONTROLLER, VIEW

- Update loop
- Render loop
- Events



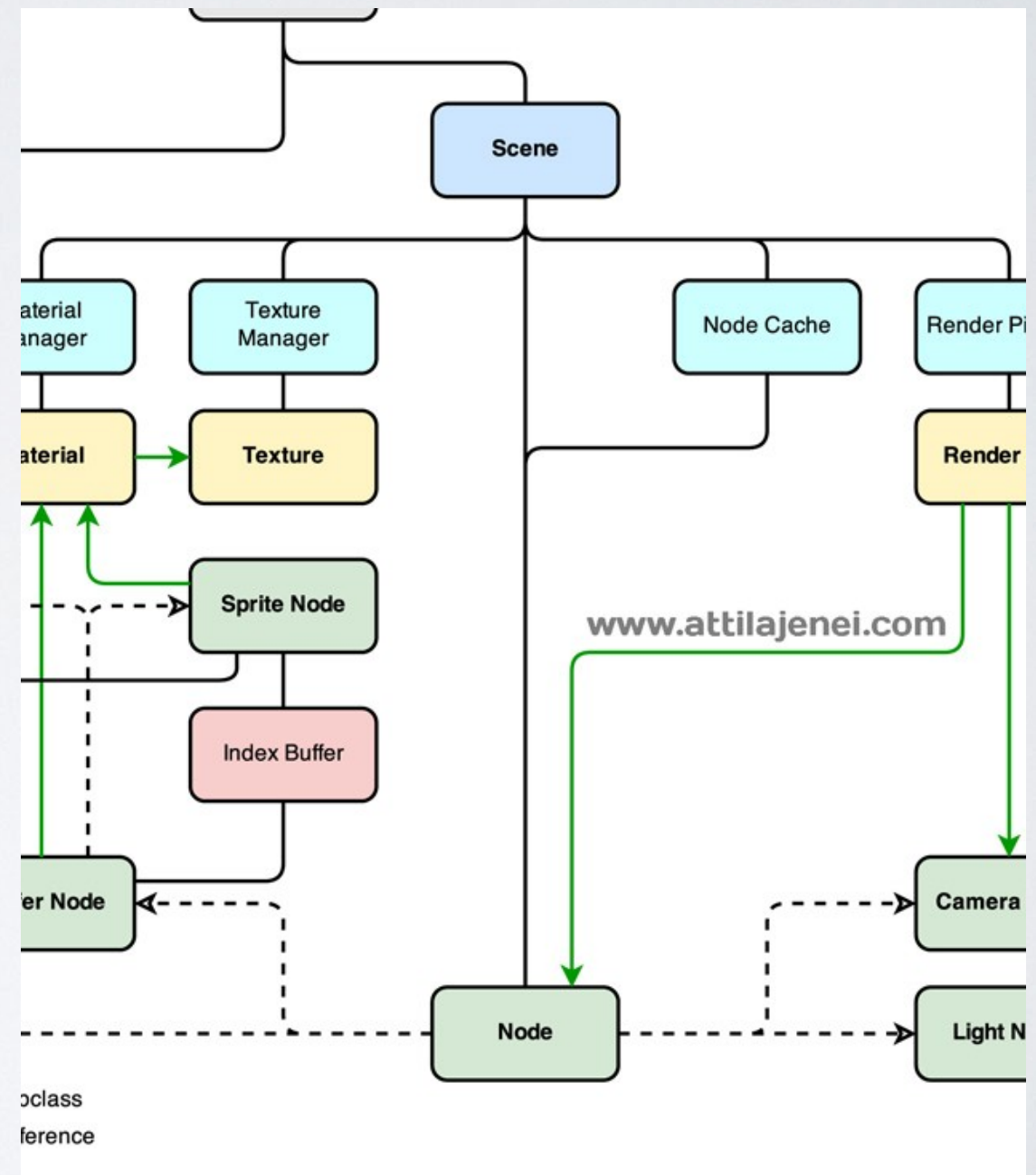
SCENE MANAGER

- On update and render cycle
- Swaps scenes
- Handles events



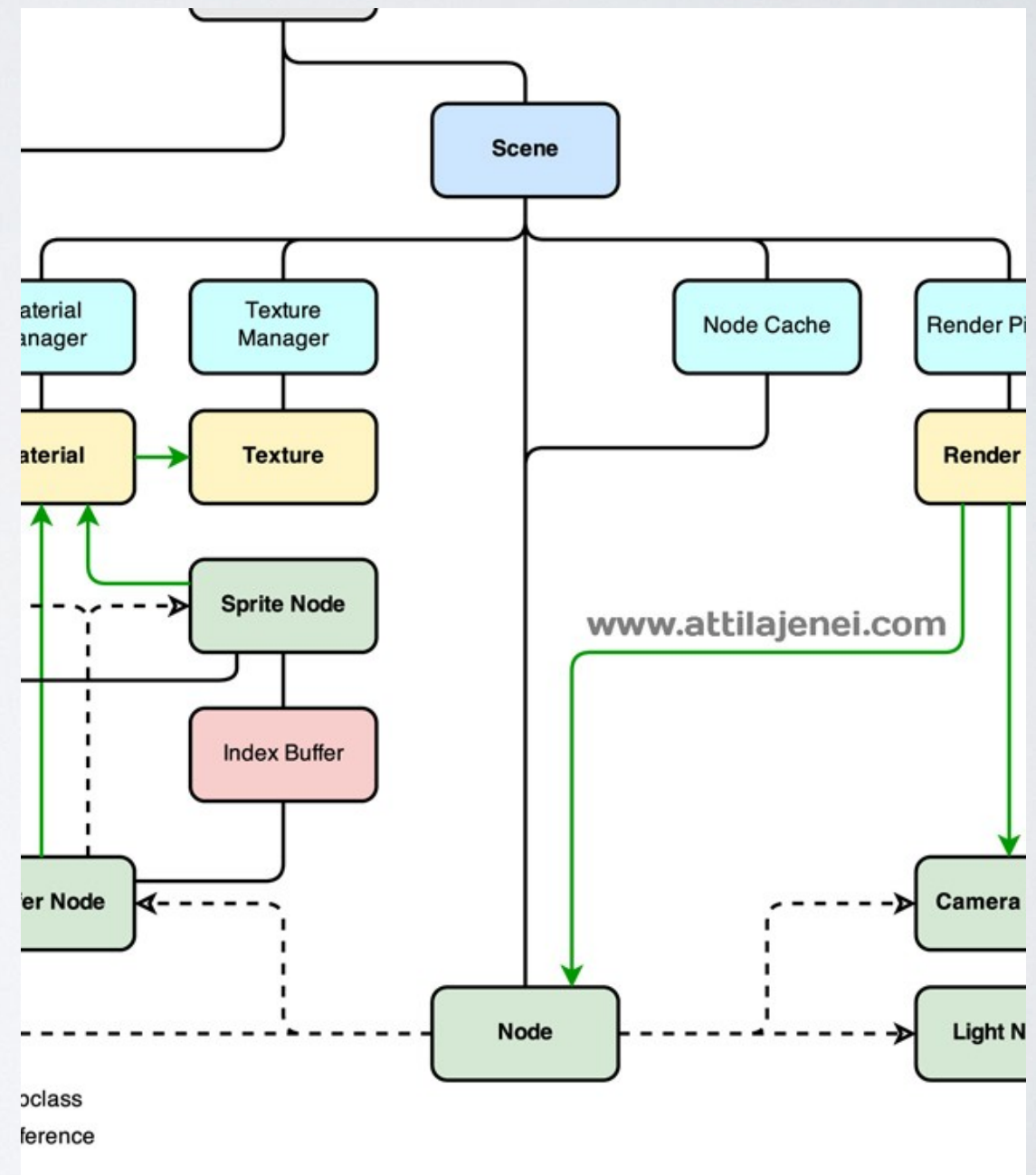
SCENE

- Content into scenes
- Nodes to be rendered
- Per-frame processing



NODE

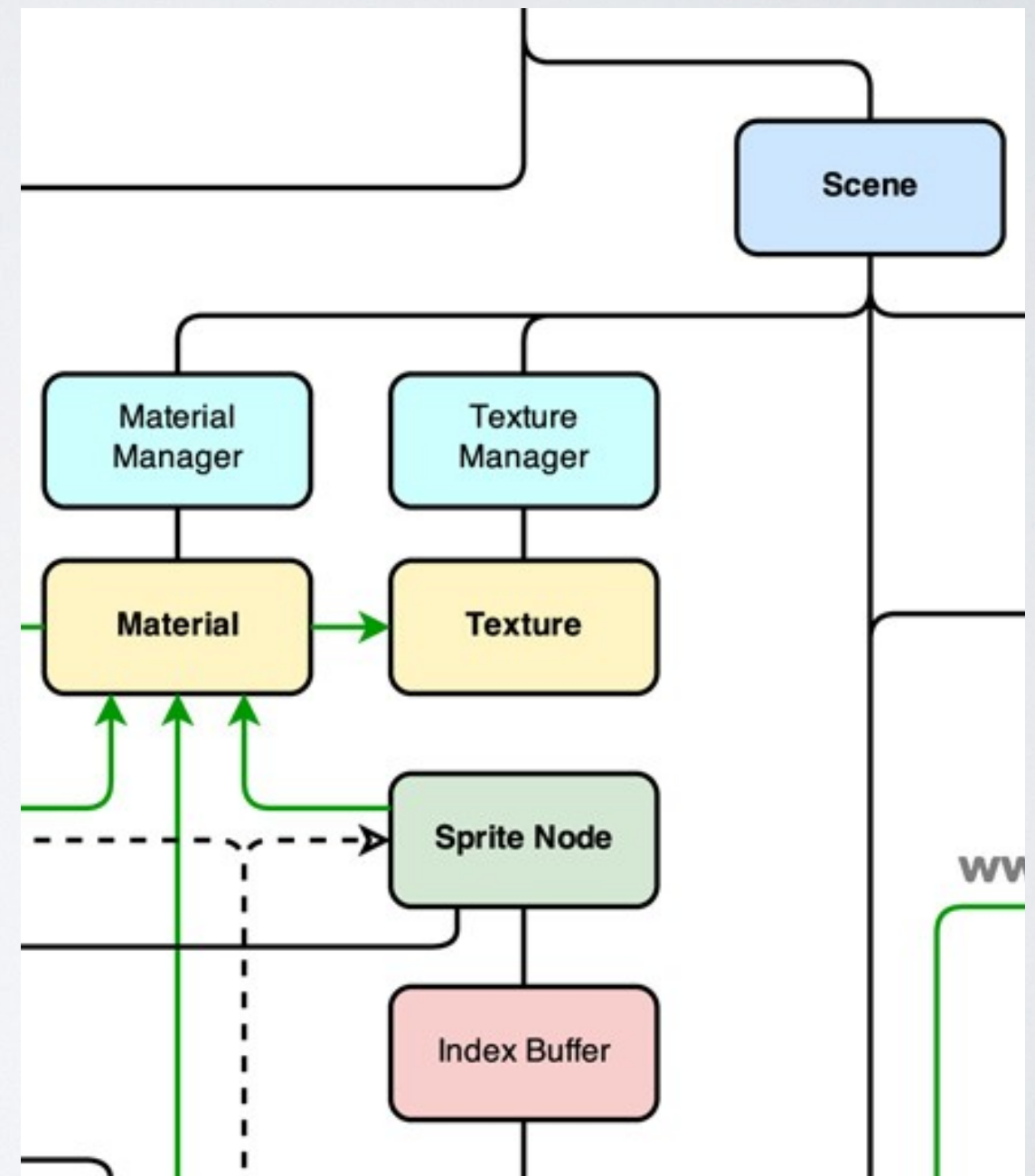
- Basic elements
- Tree hierarchy
- Selected properties are applied from parent



RESOURCES

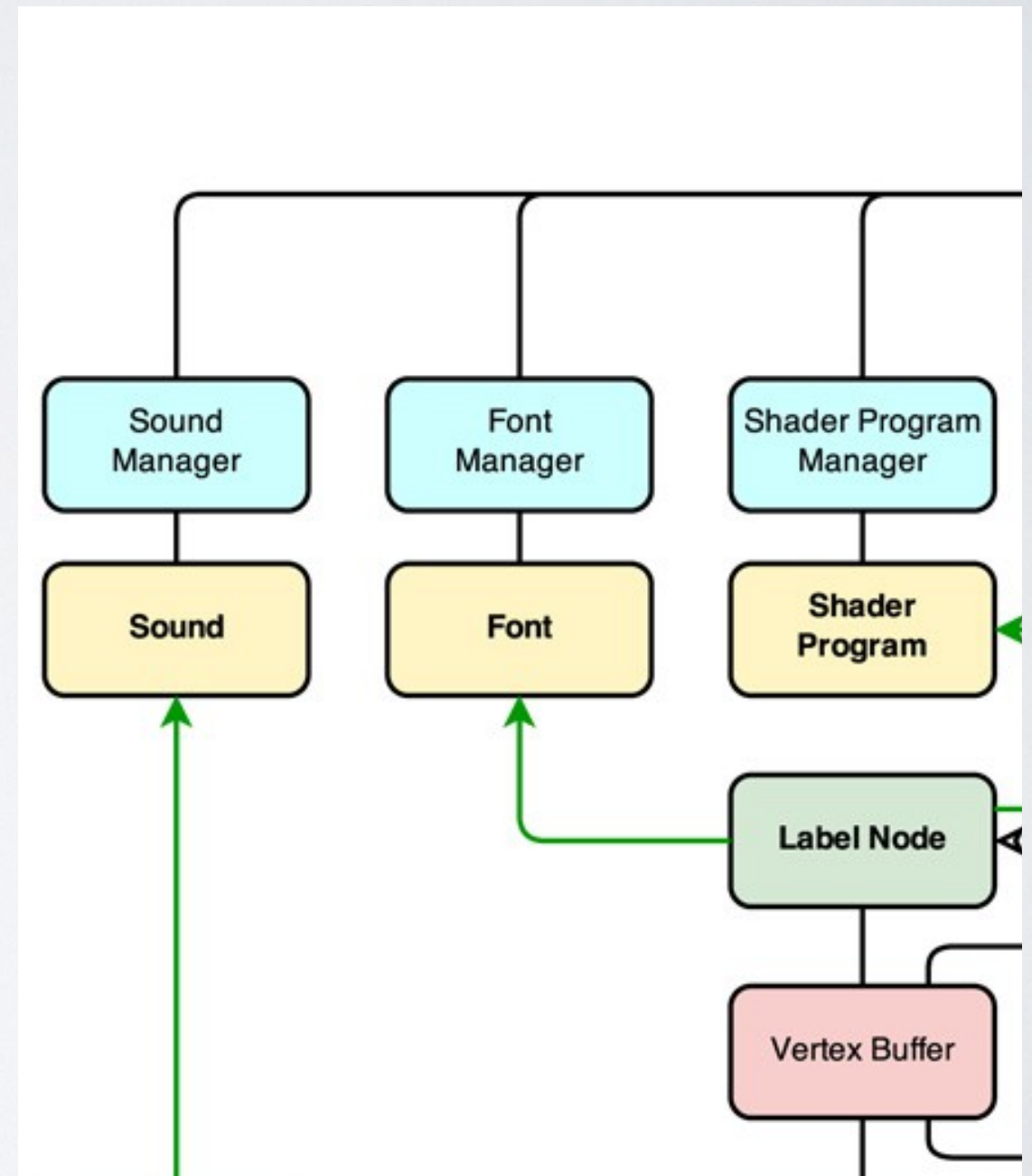
TEXTURES

- Graphical data
- Avoid from multiple memory usage
- Preloading



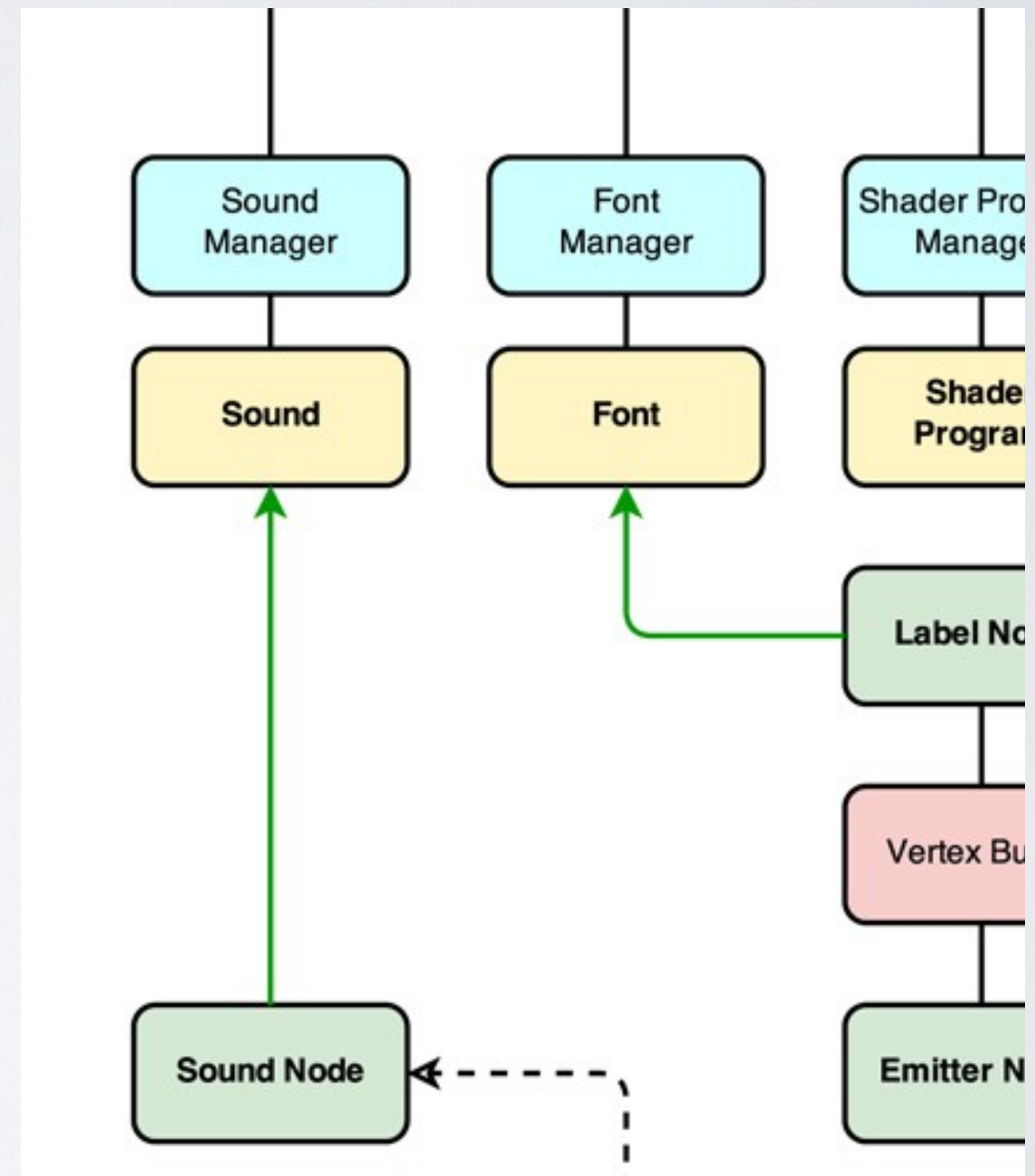
FONTS

- Image, or
- Pre-generated bitmap from vector font



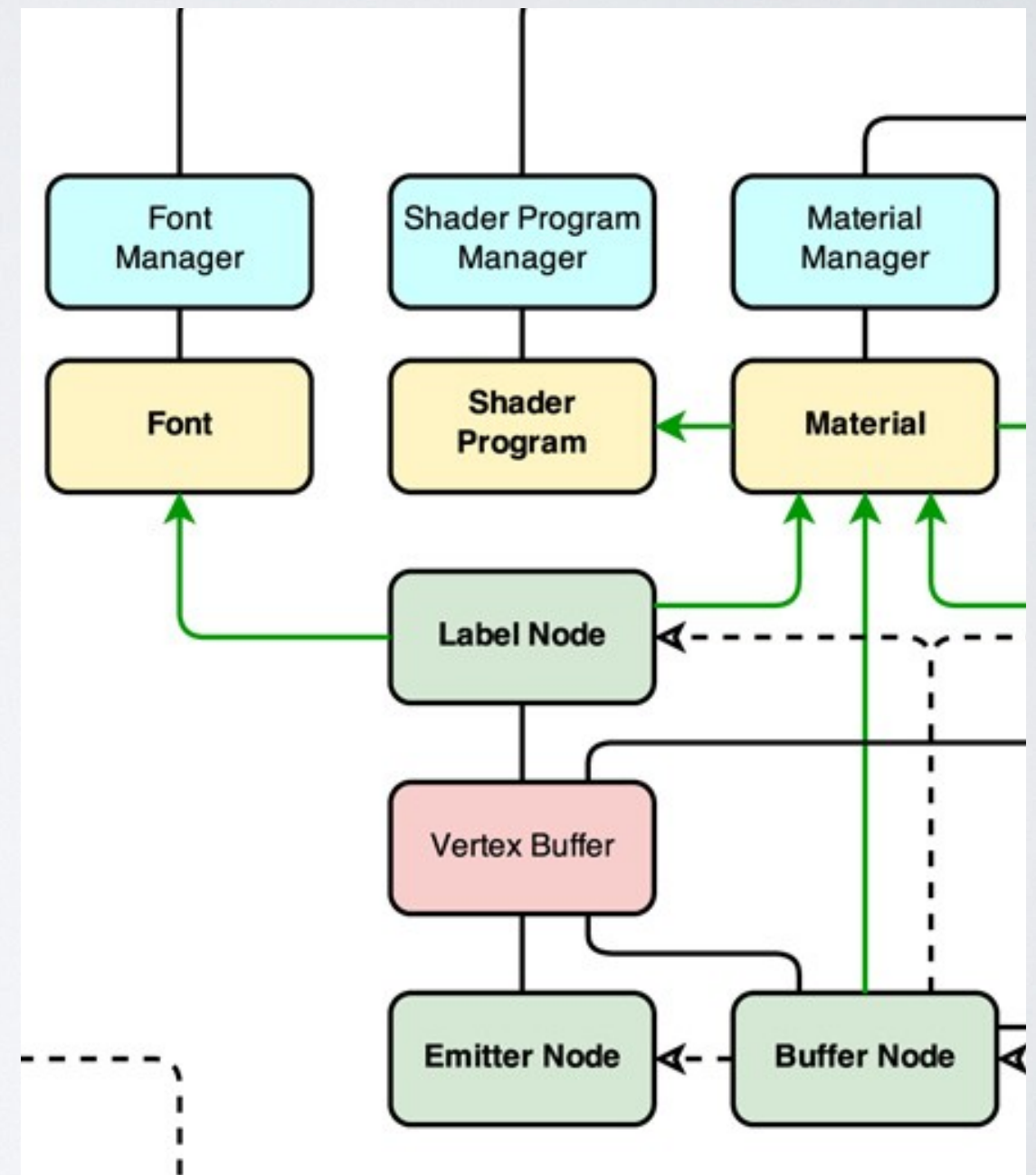
SOUNDS

- Short sound effects
- Instant play
- Simultaneous play
- Uncompressed data
- Preloading



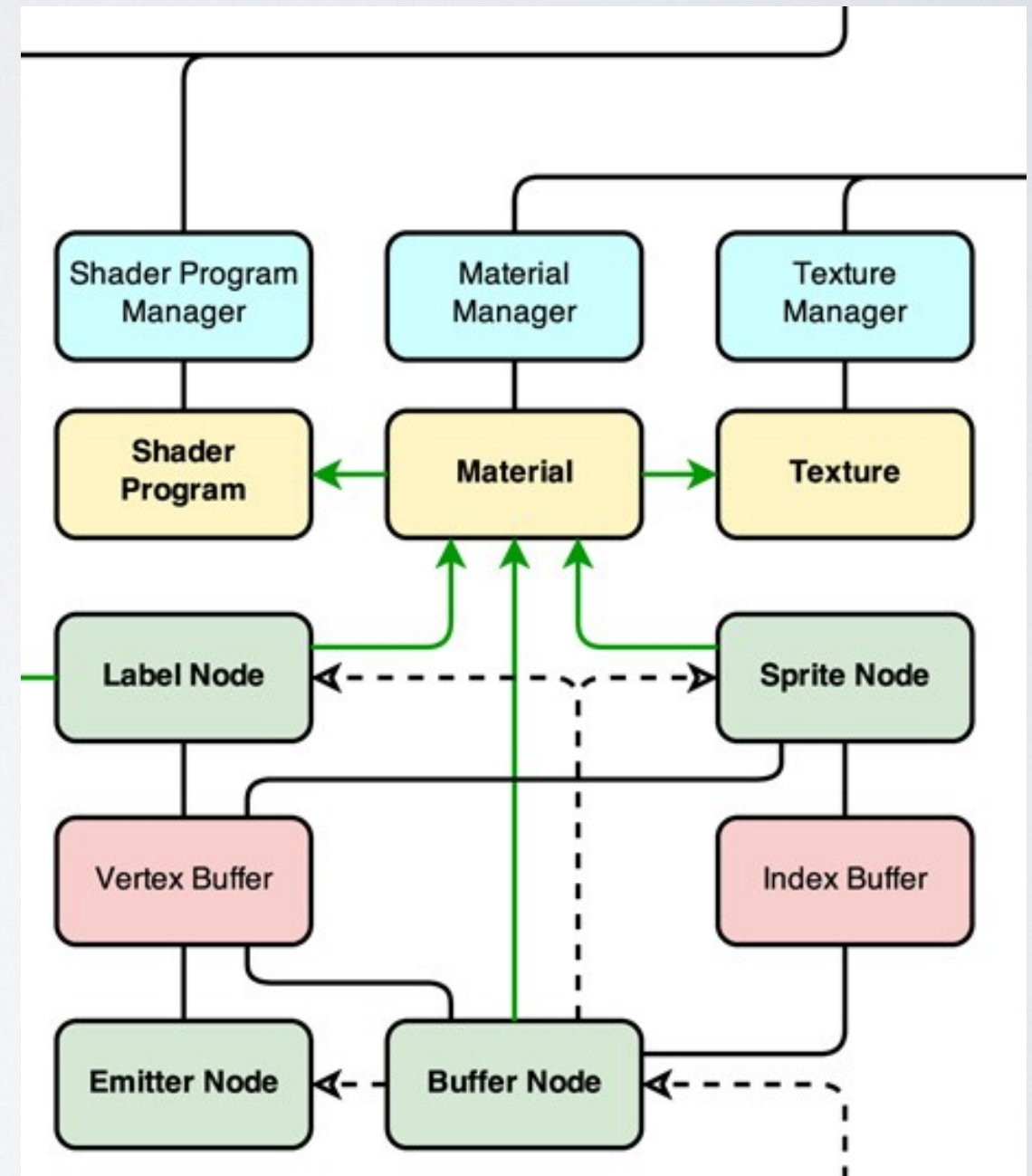
SHADERS

- Programs for GPUs
- Visual effects
- Less CPU usage



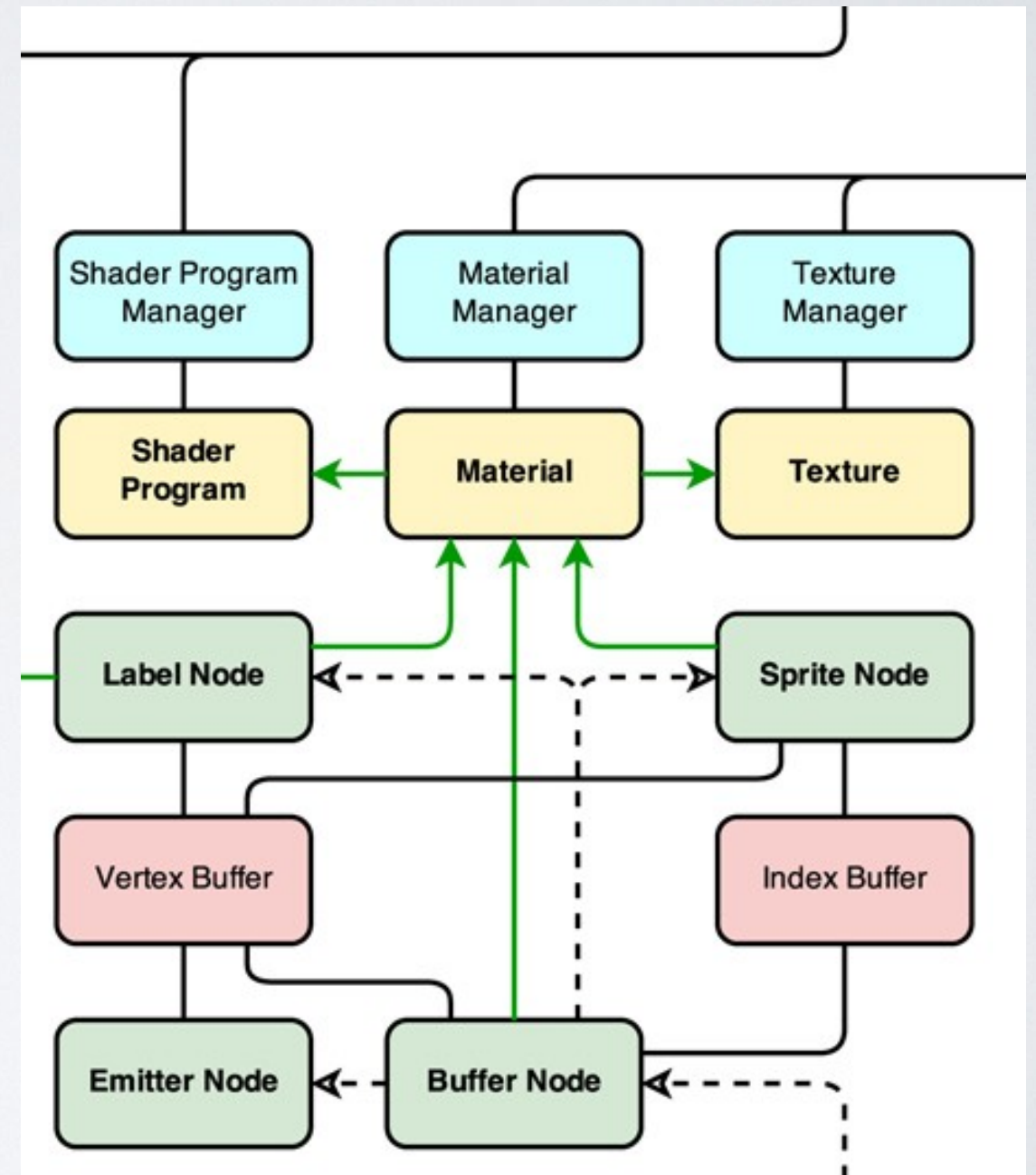
MATERIALS

- Lighting properties
- Shader Program selection
- Used by Buffer Nodes



VERTEX AND INDEX BUFFER

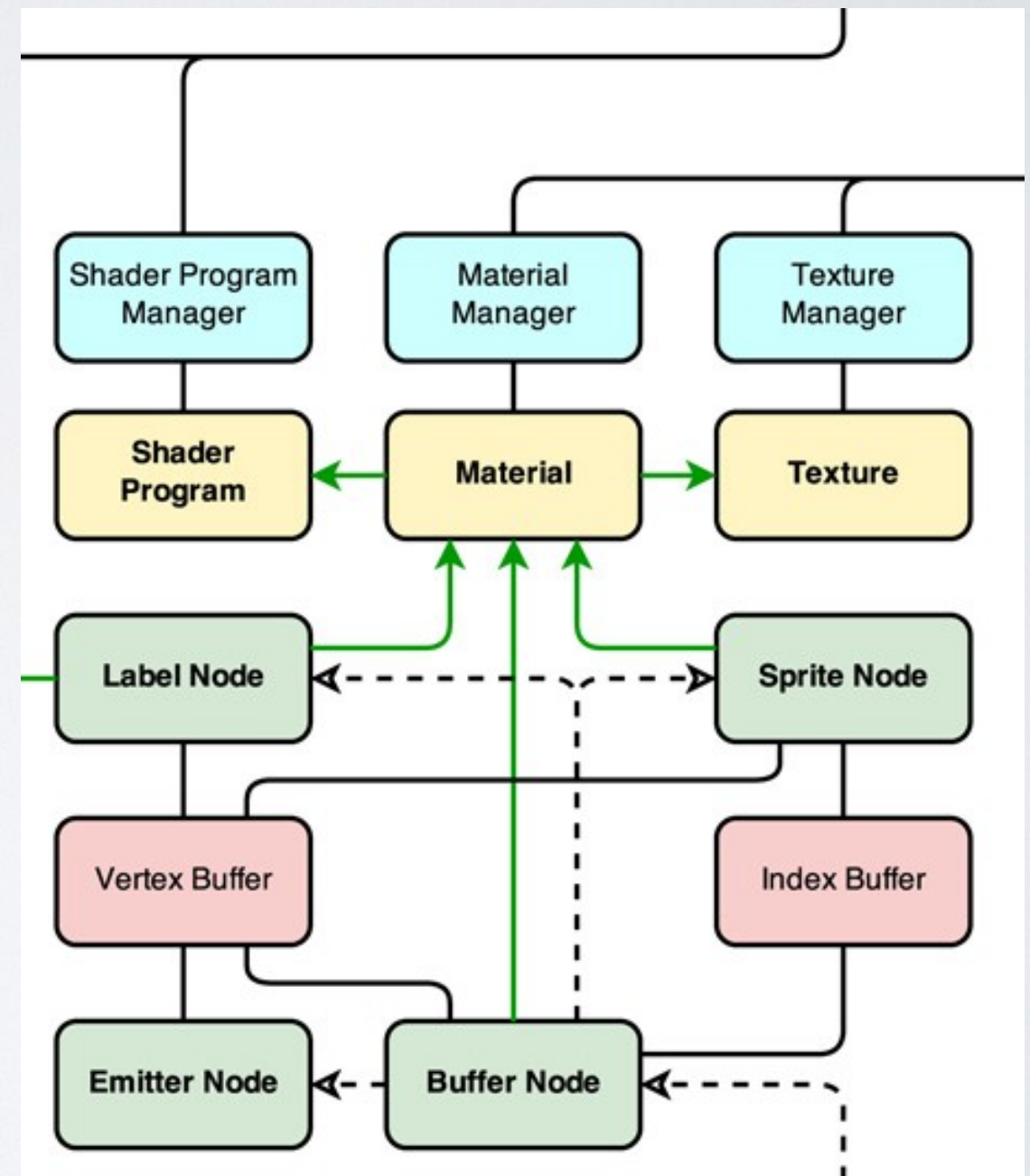
- Vertex data
- Index data
- Points, lines, or triangles
- Owned by Buffer Nodes



NODES

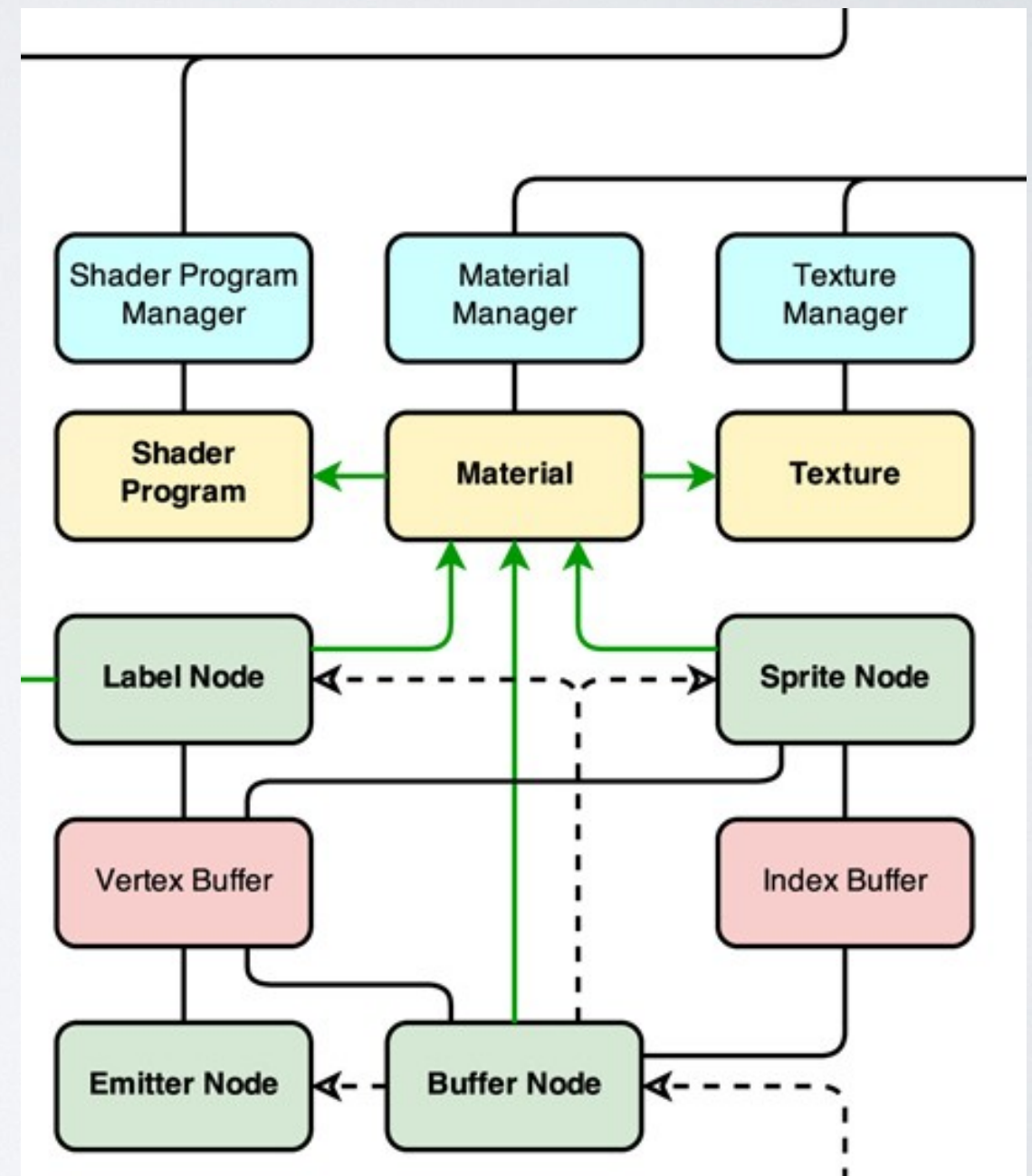
BUFFER NODE

- Draws a Vertex Buffer
- Index Buffer is optional



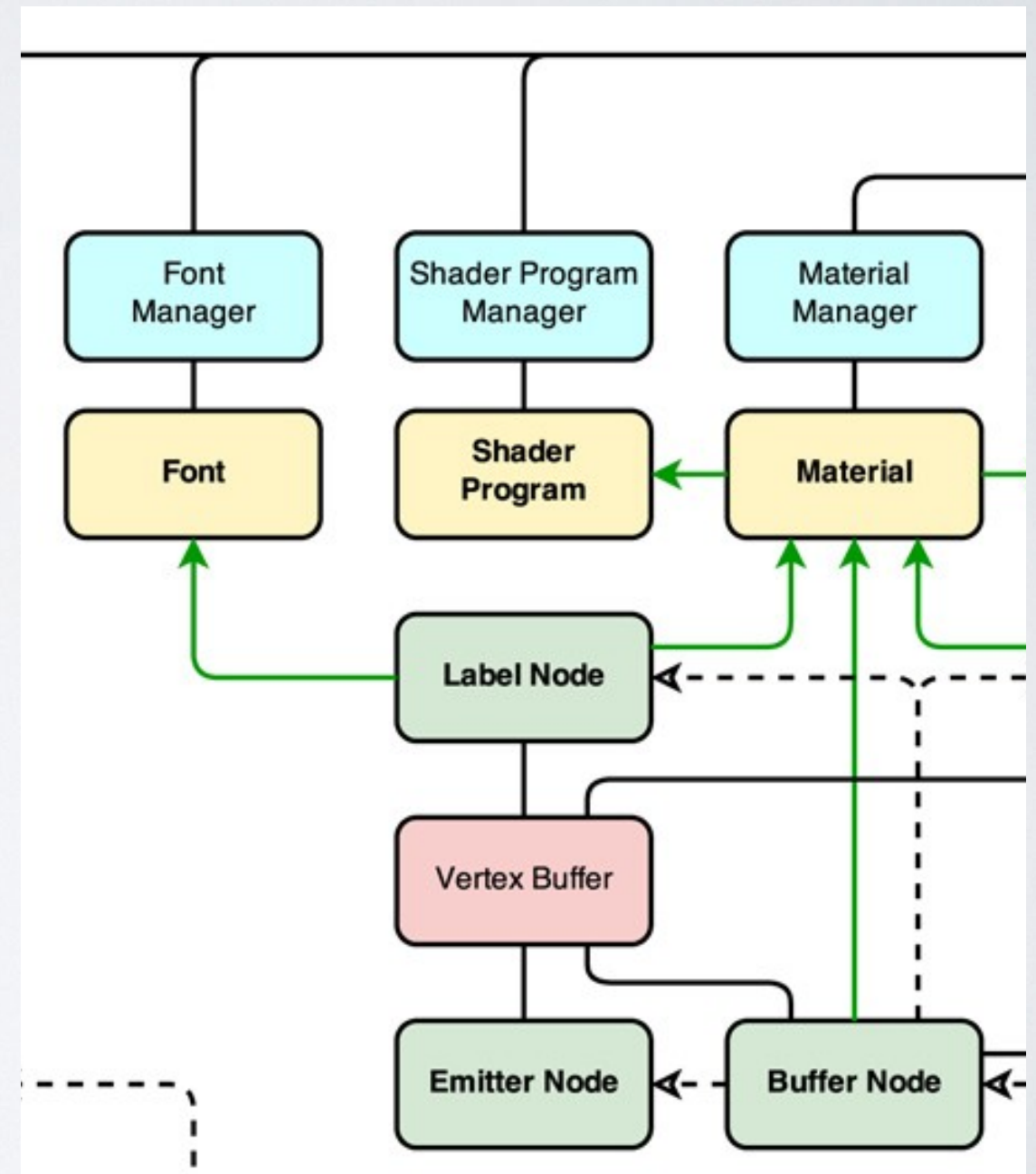
SPRITE NODE

- Textured sprite
- Rectangular 2D image
- Clipping



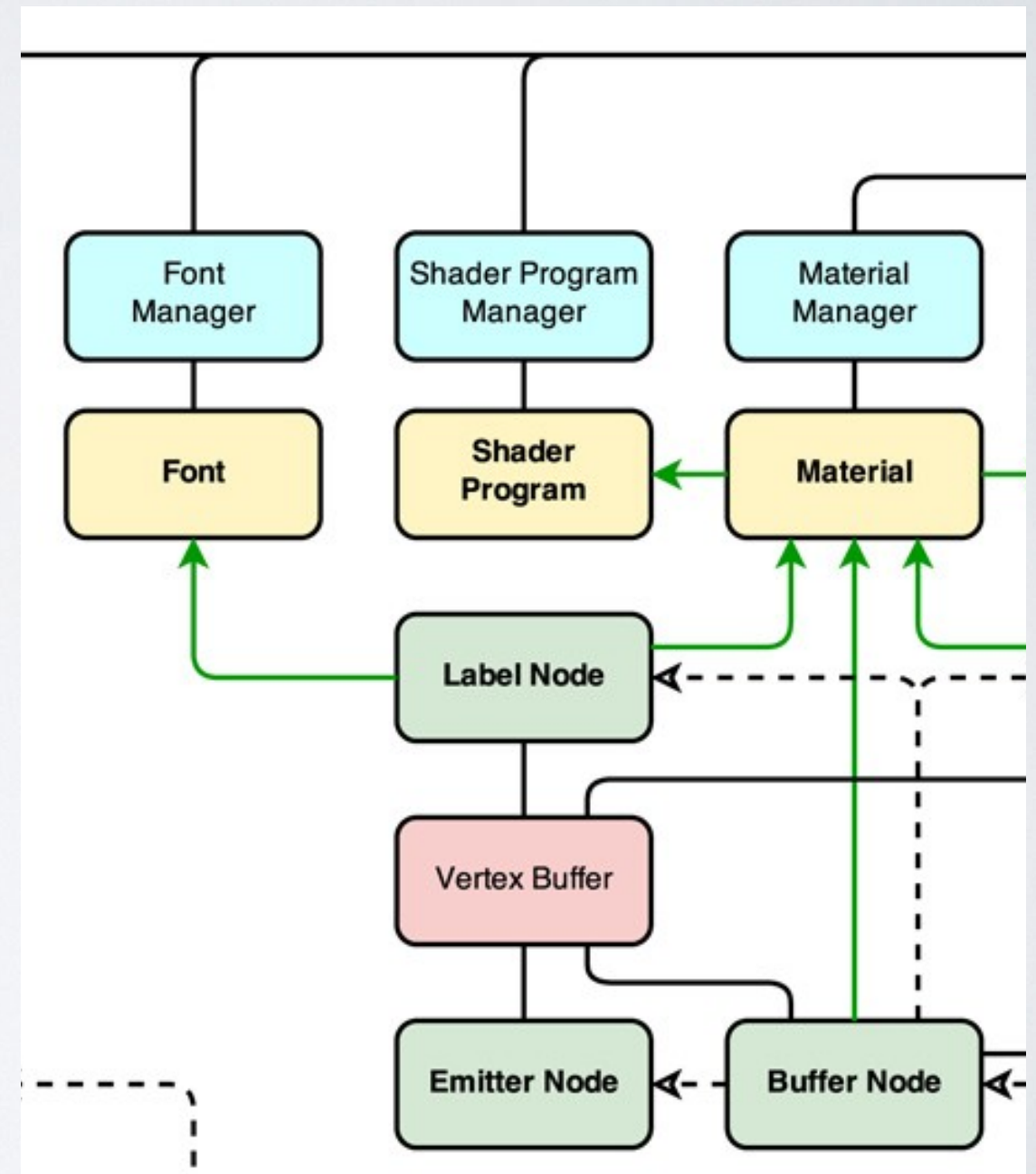
LABEL NODE

- Draws a string
- Uses Font resource
- Align modes
- Word-wrap
- Clipping



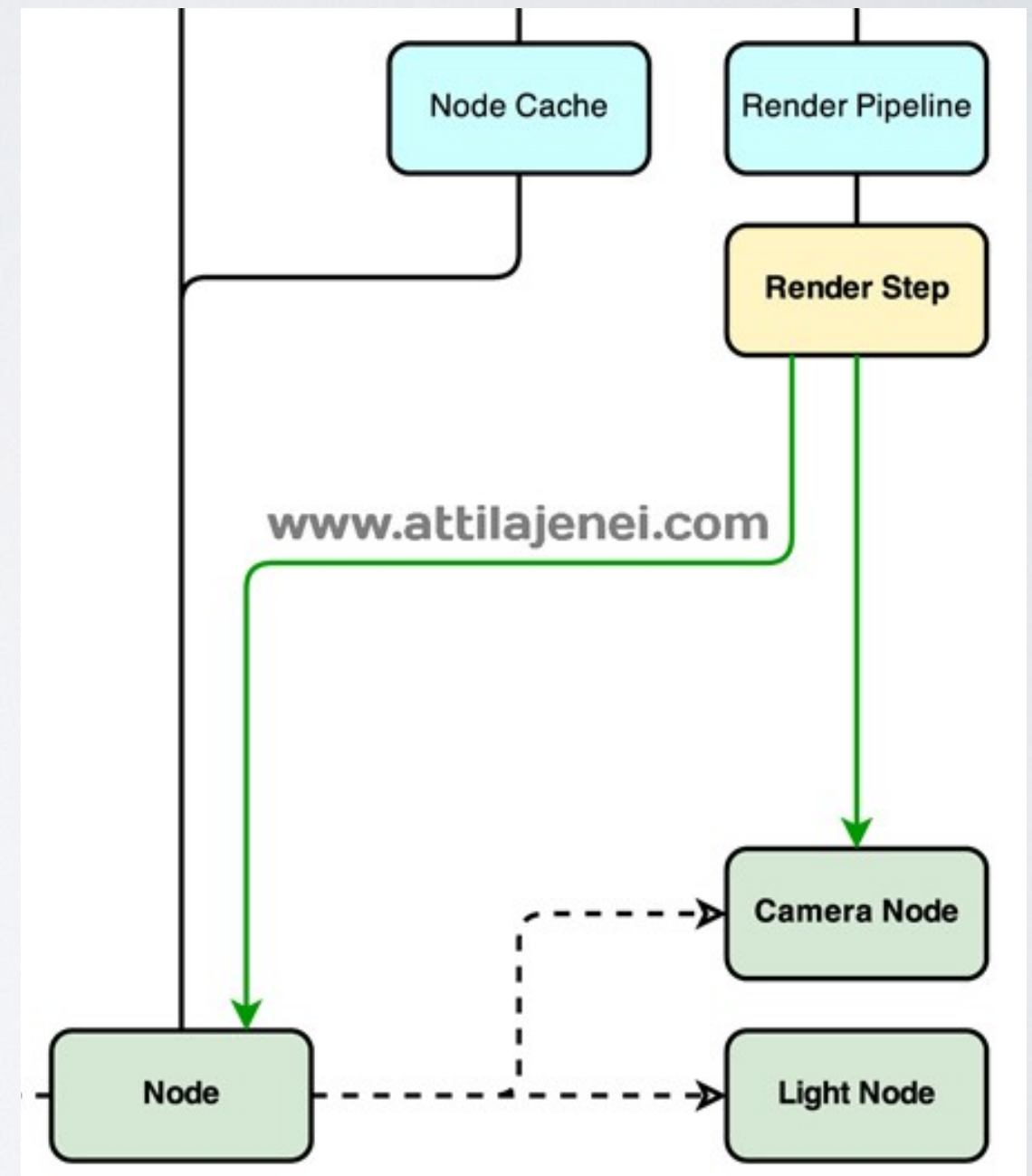
EMITTER NODE

- Particle systems
- Visual effects
- Own coordinate-system
- Source of particles



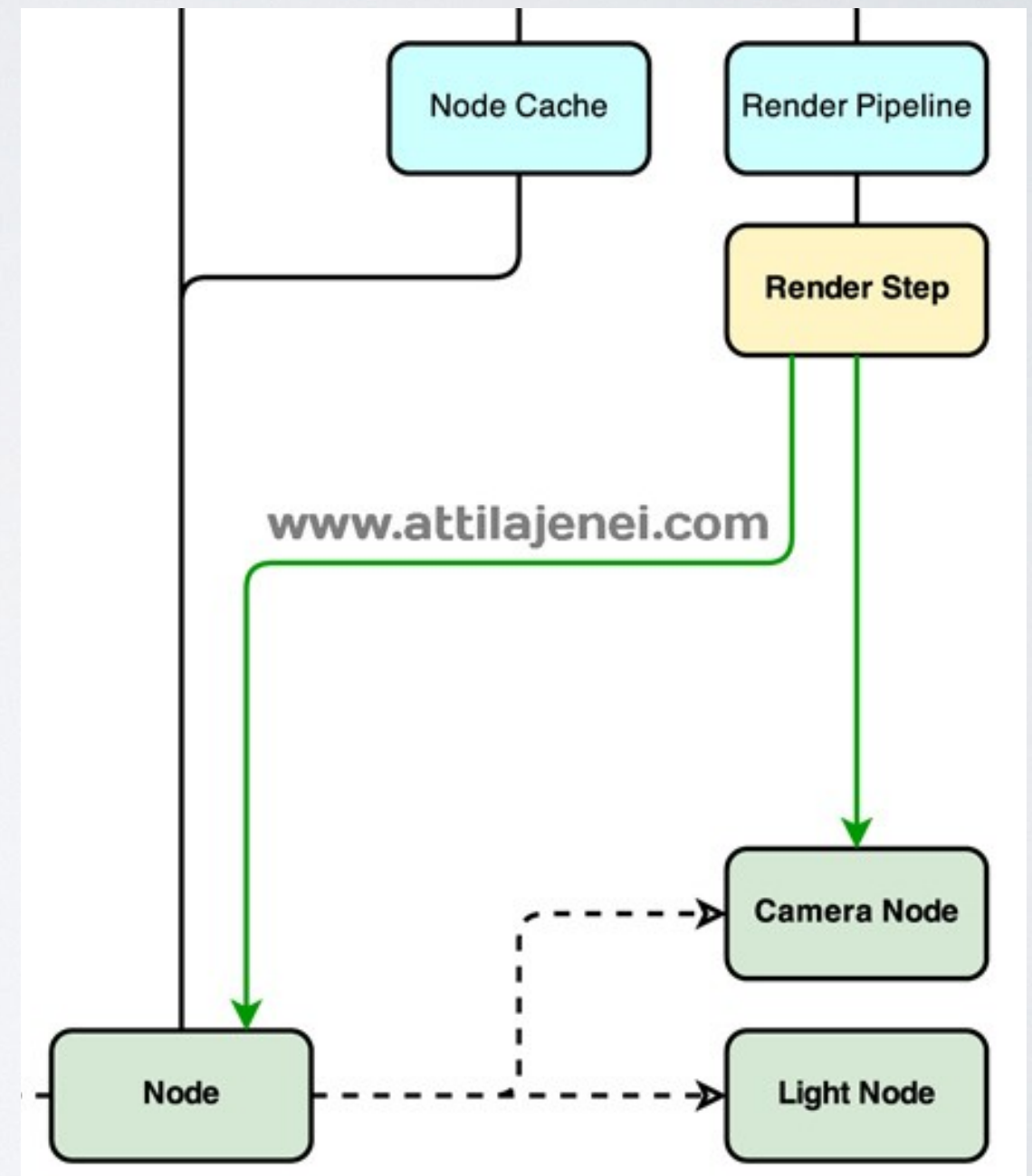
CAMERA NODE

- Represents the viewer's point of view
- Used by the Render Pipeline



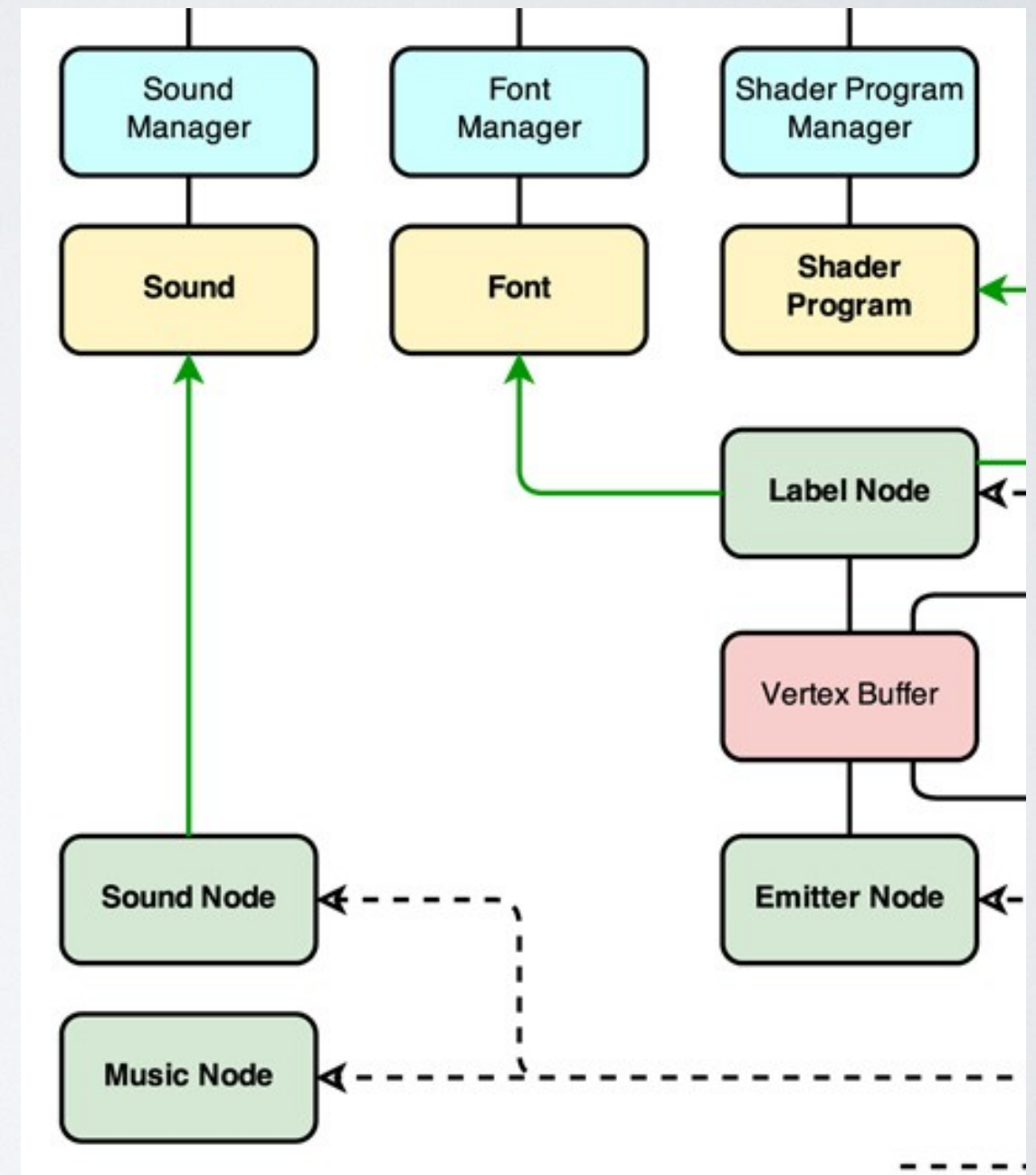
LIGHT NODE

- Ambient, directional, point source
- Lighting is enabled by the used Material
- Limited count



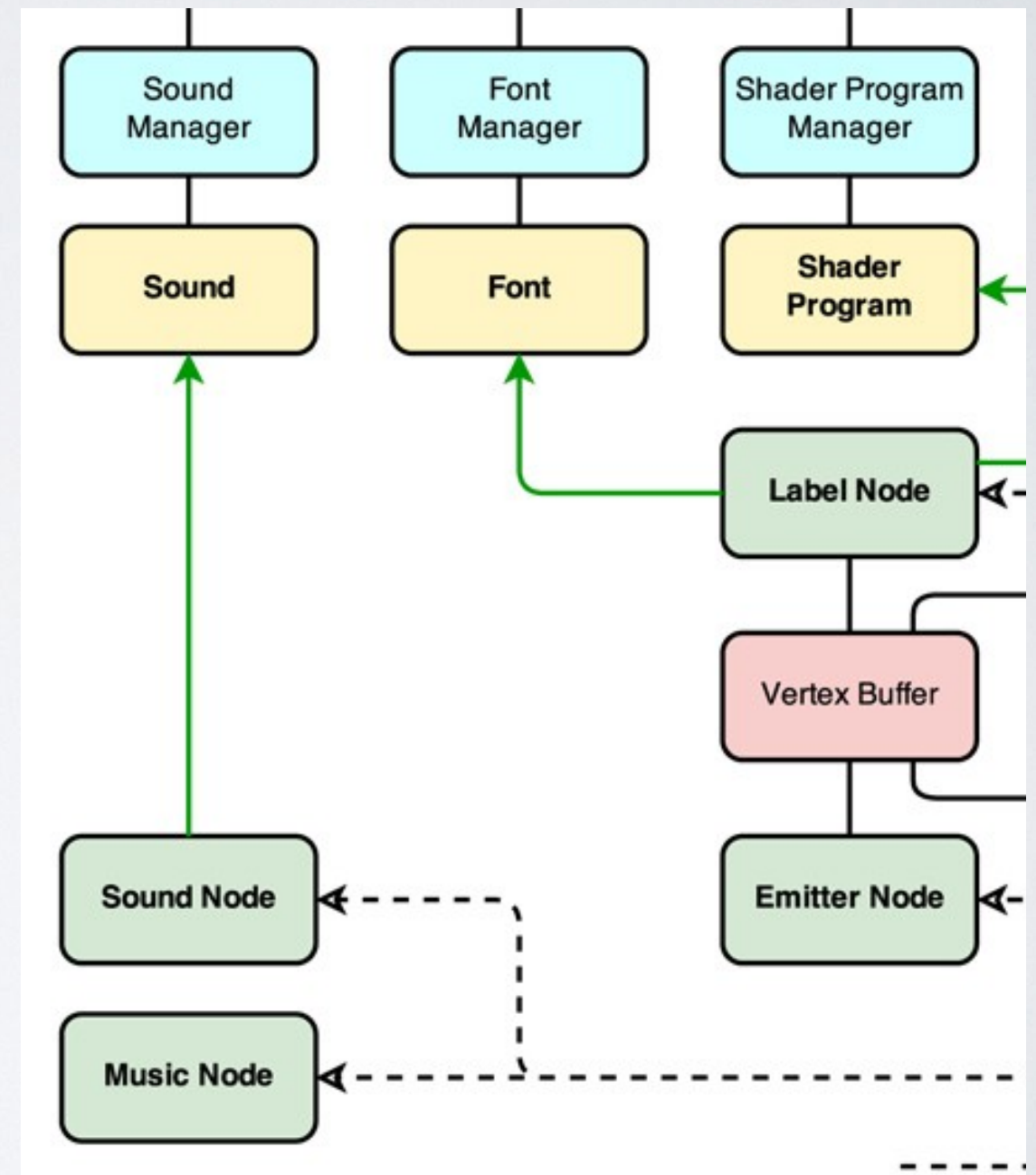
SOUND NODE

- Plays a sound
- 3D or stereo sound effect by its position
- Attach to graphical representation



MUSIC NODE

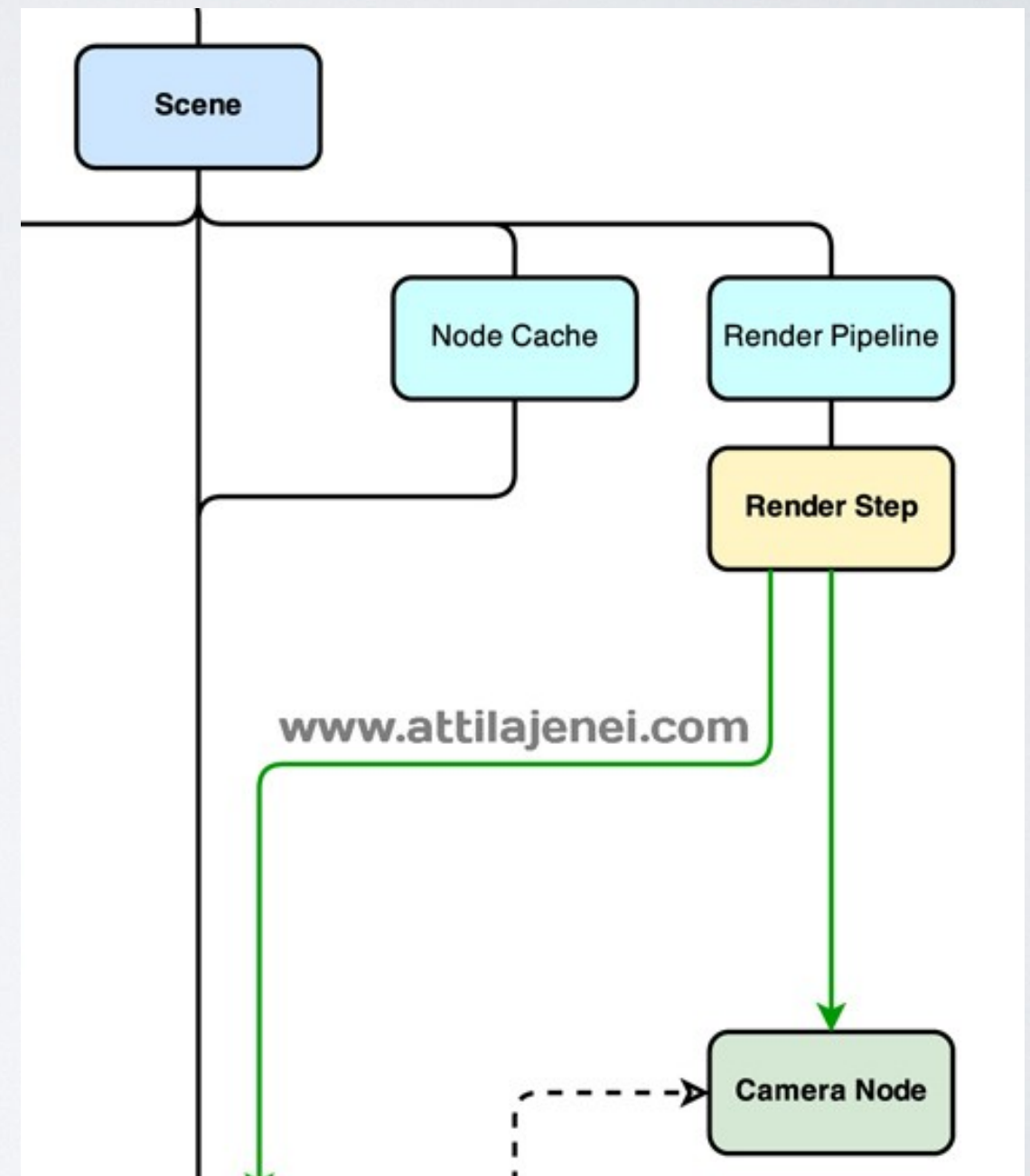
- Plays the background music
- Single
- Compressed data
- Buffered play
- Looping



RENDER PIPELINE

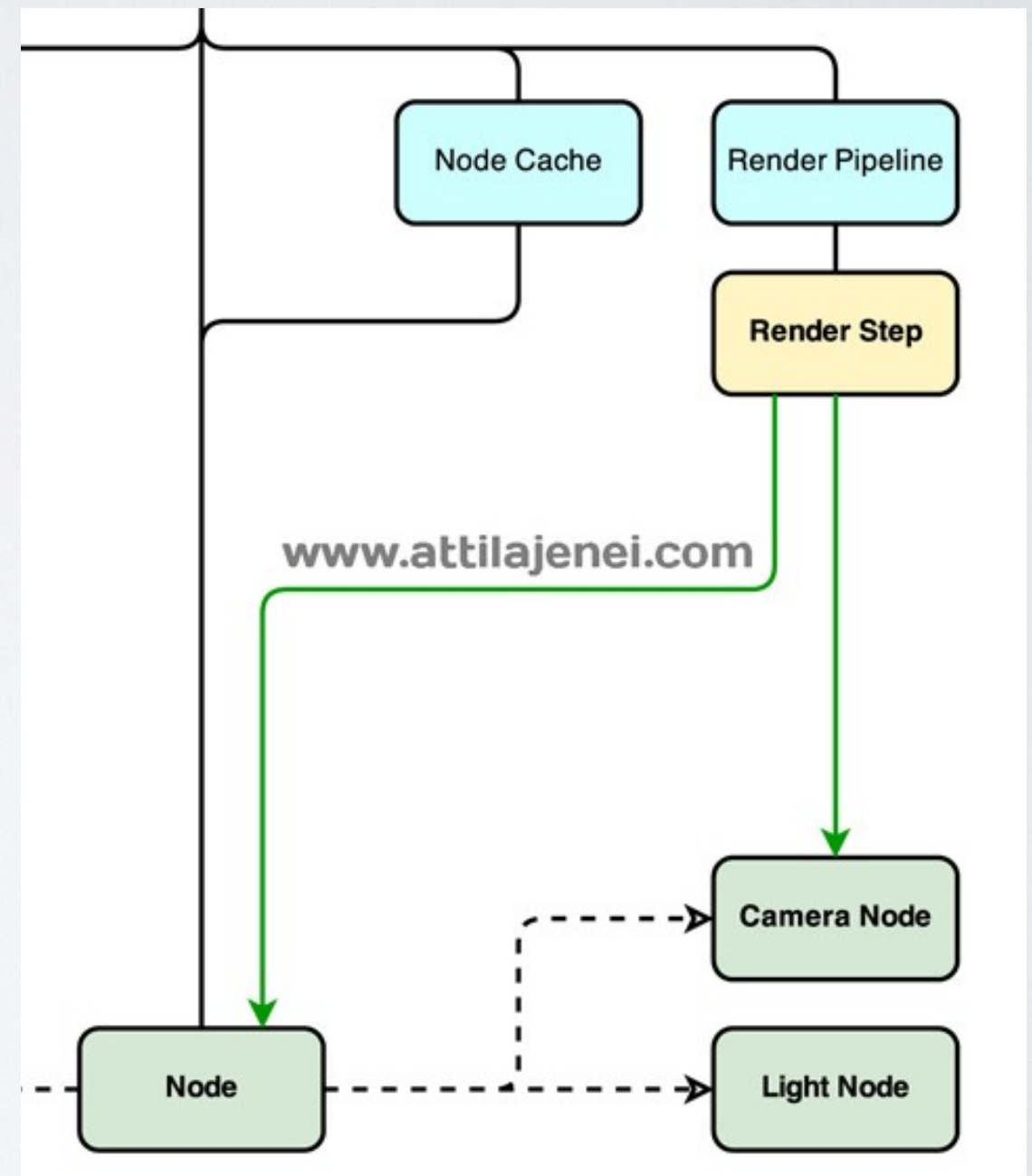
RENDER PIPELINE

- Executed on render cycle
- For the presented scene
- Single or multiple steps



RENDER STEP

- Selects destination buffer
- Specifies root source node (generally the scene)
- Uses a camera for the point of view



OTHER COMPONENTS

GAME RELATED

- 2D or 3D physics simulation
- Game Center or similar gaming network

MONETIZATION, MEDIA

- In-app purchases
- Advertising
- Social media interactions

Game Engine Architecture

by
Attila Jenei

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