

# OpenSceneGraph



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*<http://www.openscenegraph.org>*



## Topics

- What is Open Scene Graph?
- Why Open Source?
- Open Scene Graph design concepts
- Multi-threaded, Multi-display OSG
- Who and how
- Questions?



## What Is Open Scene Graph?

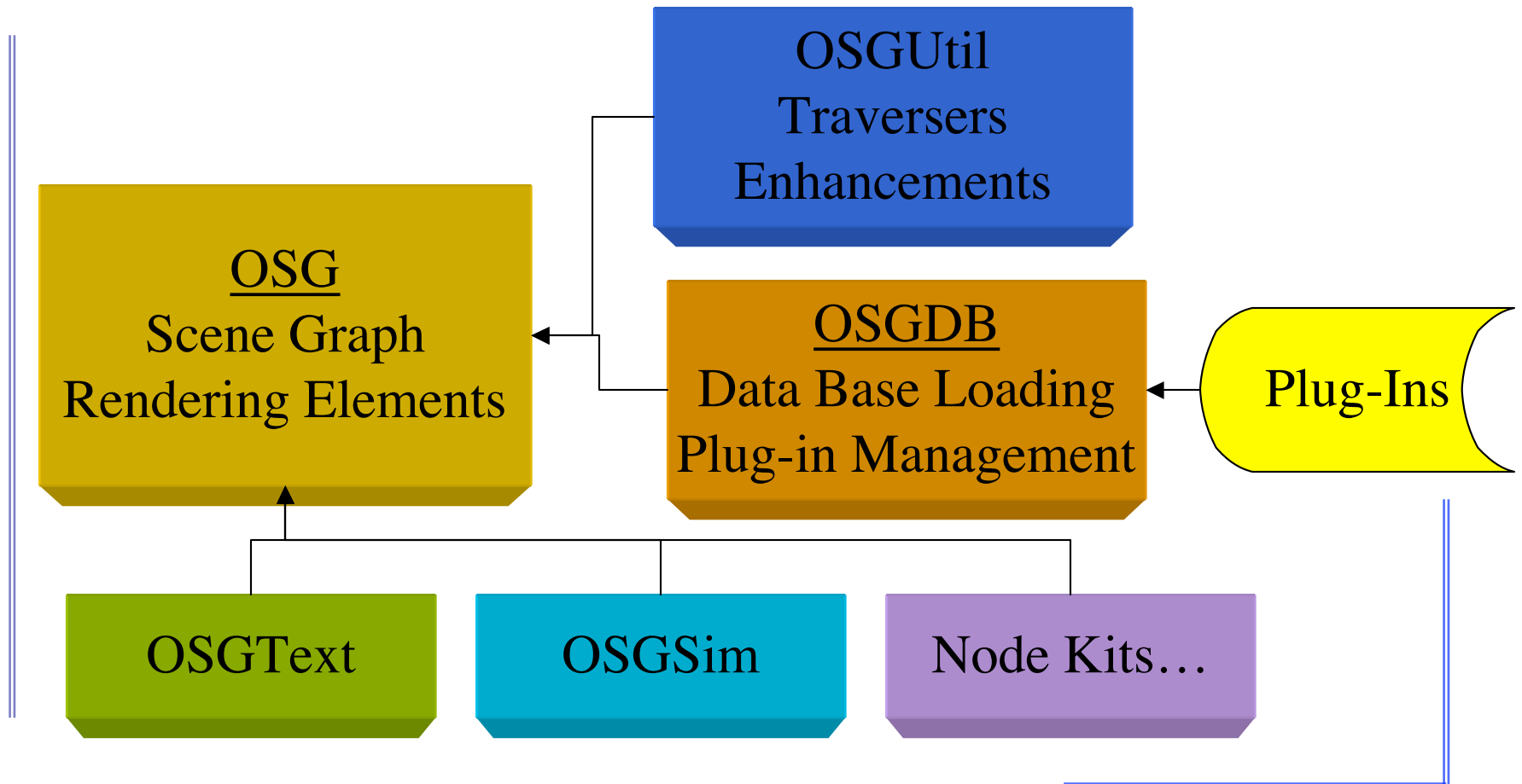


## What Is Open Scene Graph?

- A C++ API built on OpenGL for
  - Scene Management
  - Graphics Rendering Optimization
- Cross-platform
- Windowing system agnostic
- Open Source



## Functional Components





# File Formats Supported

## File Formats

3dc	3ds	ac3	dw	flt	Freetype
iv	ive	logo	lwo	md2	obj
osg	osgtgz	tgz	txp	directX	zip

## Image Formats:

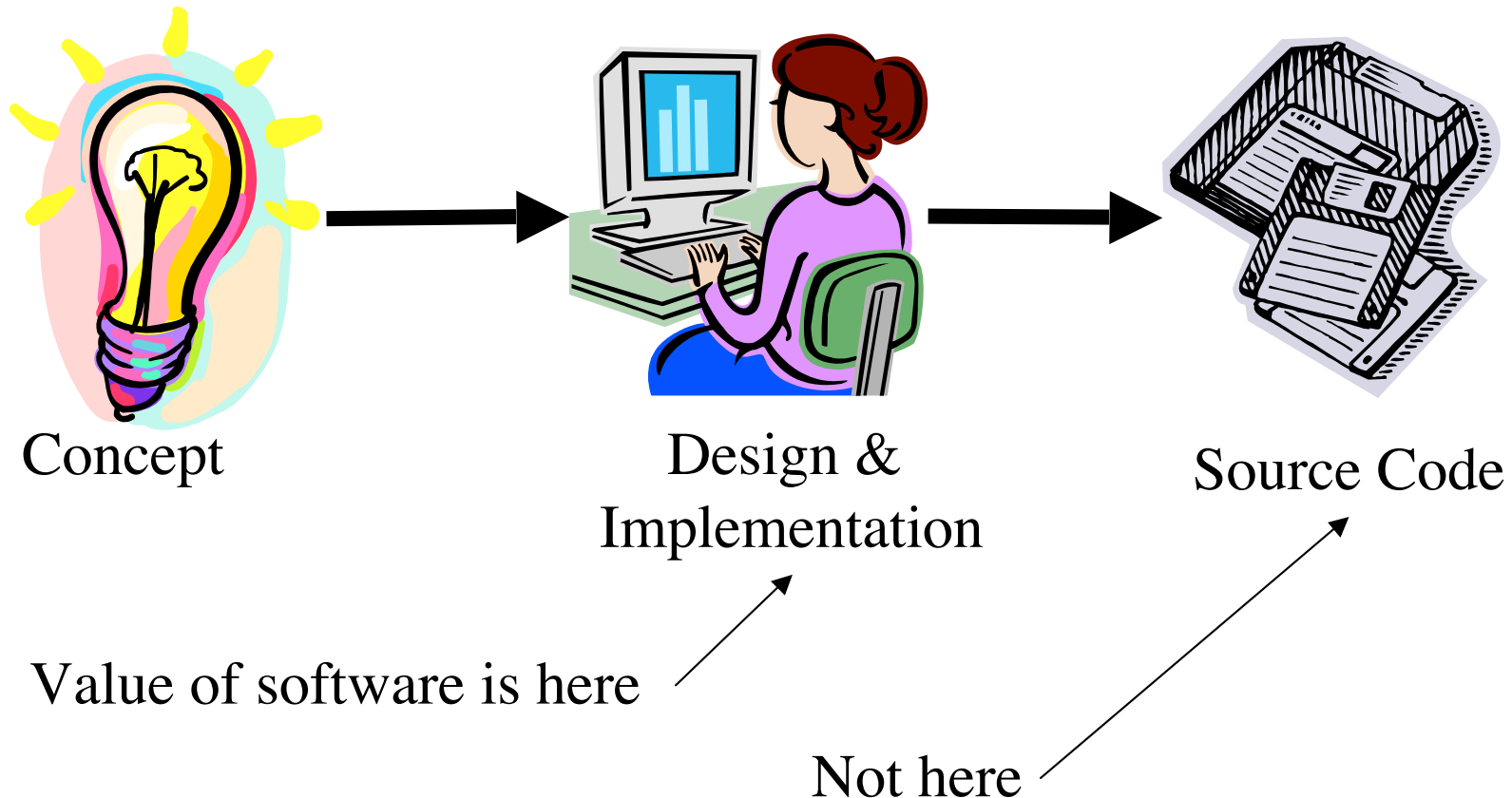
bmp	dds	pic	png
pnm	qt	rgb	tga



## Why Open Source?



## Why Open Source?





## Why Open Source?

The software “food chain”

Application Users

Don't care what's “under the hood”

Application Developers

Know-How overlap

Middleware Developers

Often the role of the hardware vendor

System Developers

*Problem #2 Application developers depend on  
Middleware developers*



## Why Open Source?

- Free of intellectual property concerns
- Free of business model restrictions
- Benefits the application developer
- Benefits the middleware developer
- Improved software quality



# Crucial Elements for Open Source Success

- Quality
  - Usefulness
  - Stability
  - Design
- Support
  - Responsiveness
  - Thorough
  - Courtesy and Friendliness



# Open Scene Graph Design Concepts



# Design by Evolution, Evolution by Design

- Adaptive development
- Key Factors
  - Portability
  - Extensibility
  - Scalability
  - Flexibility



# Open Scene Graph - Support

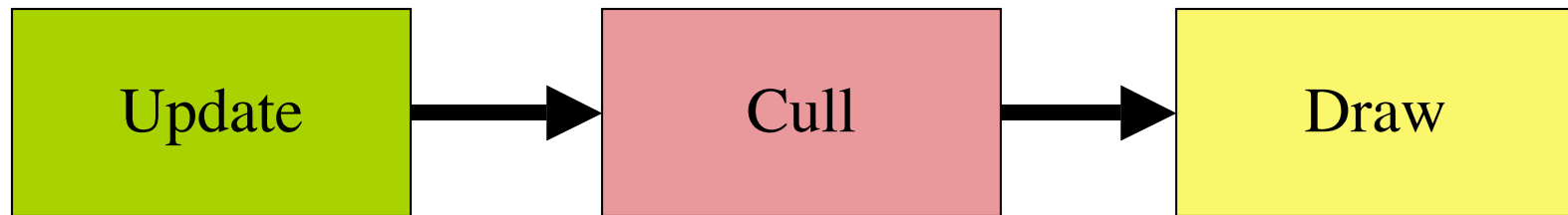
- Mailing list
- Web site support
- On-line reference guides
- Examples
- Contributions



# Multi-threaded, Multi-display with Open Scene Graph

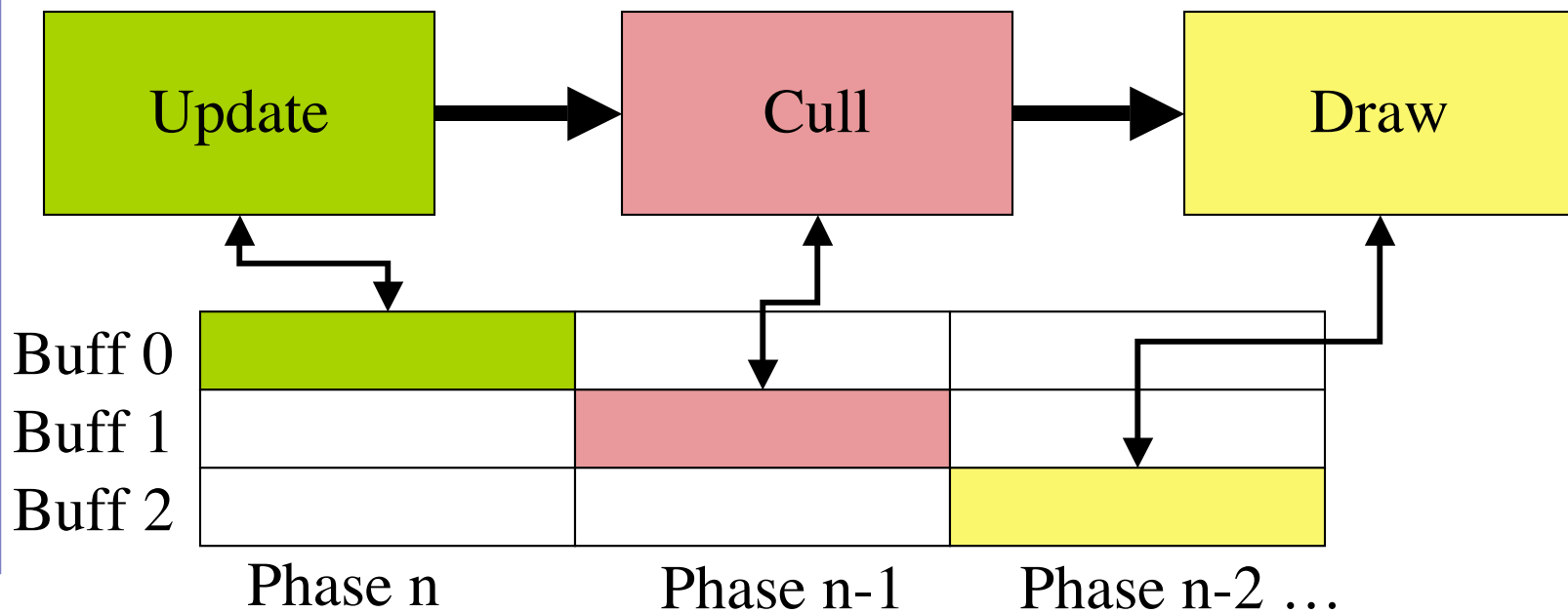


# Processing phases



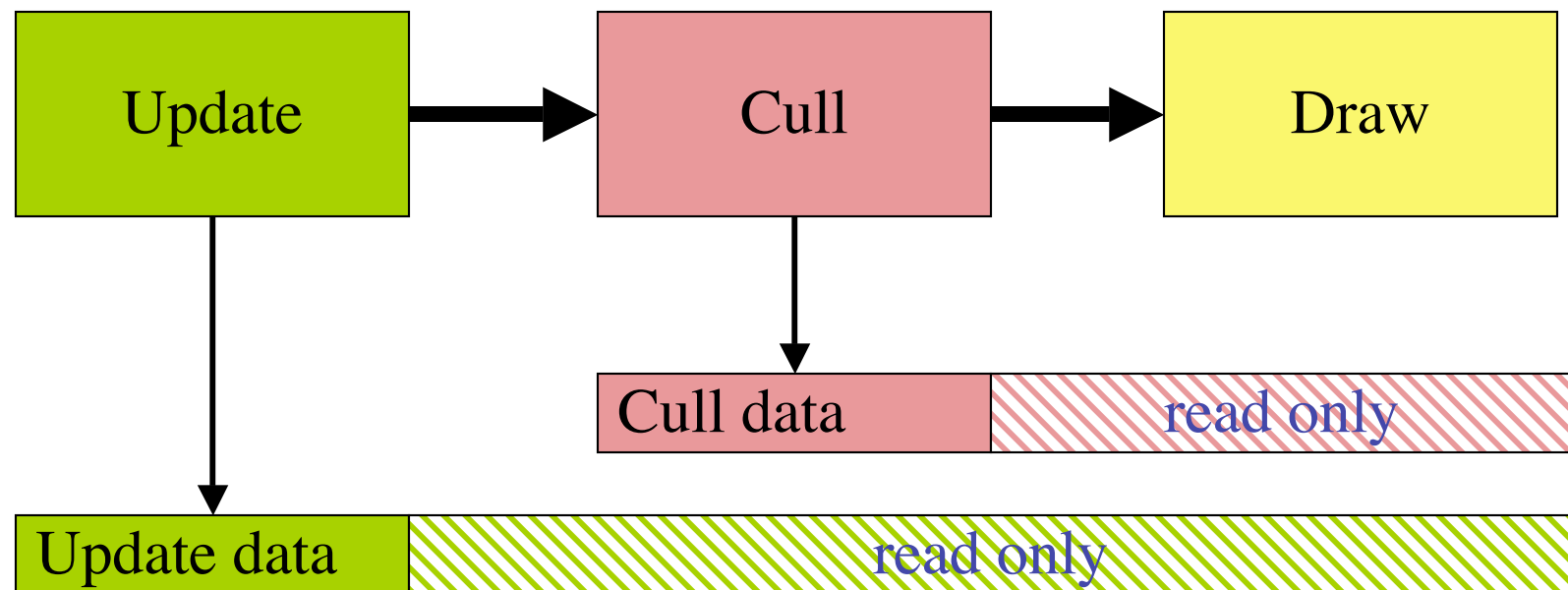


# Multi-buffered Data Protection





# Write Protected Data Protection



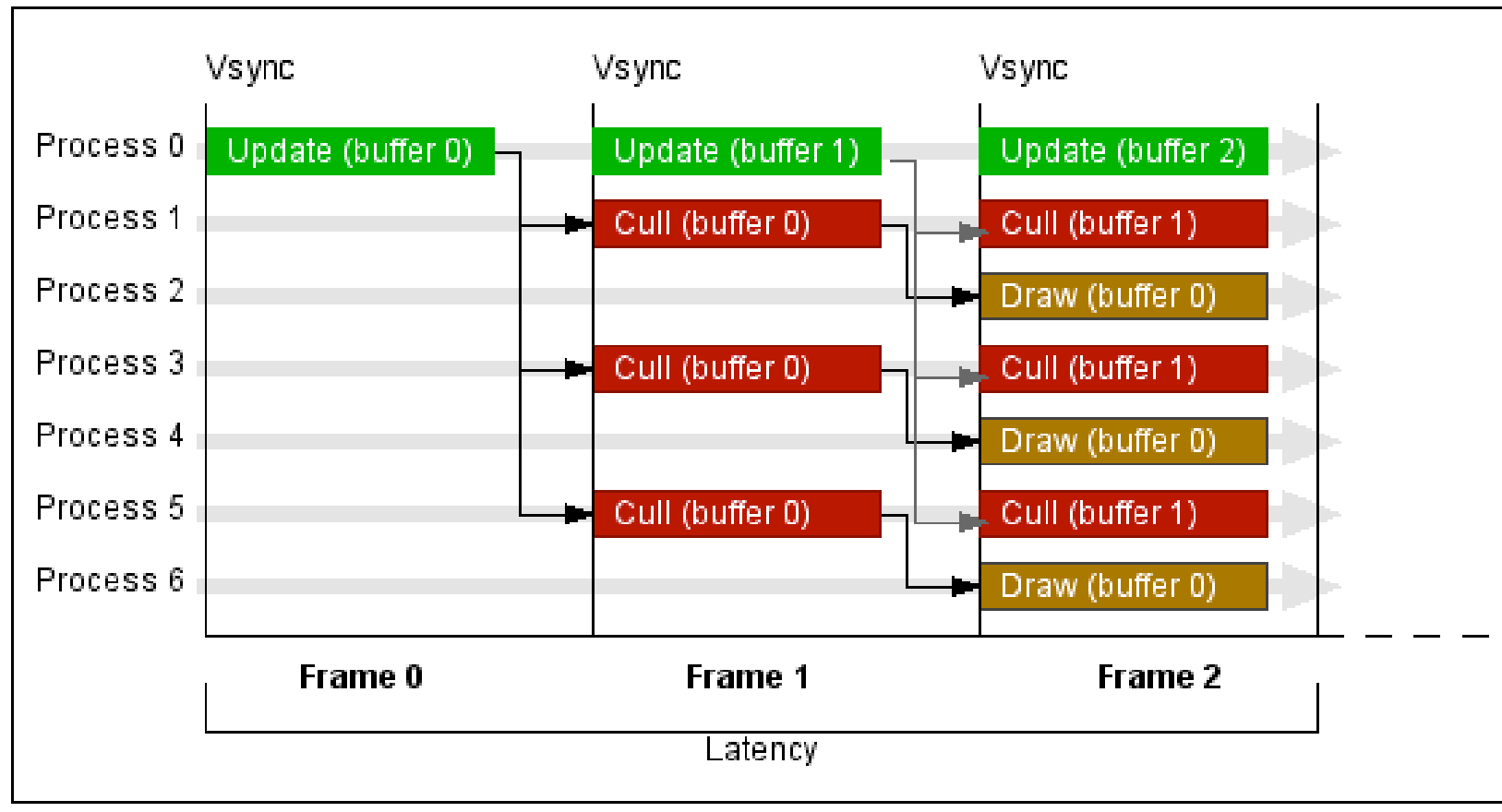


# Multi-threading in OSG

- Single display performance
- Multi display scalability
- Run-time optimized
- There are caveats!

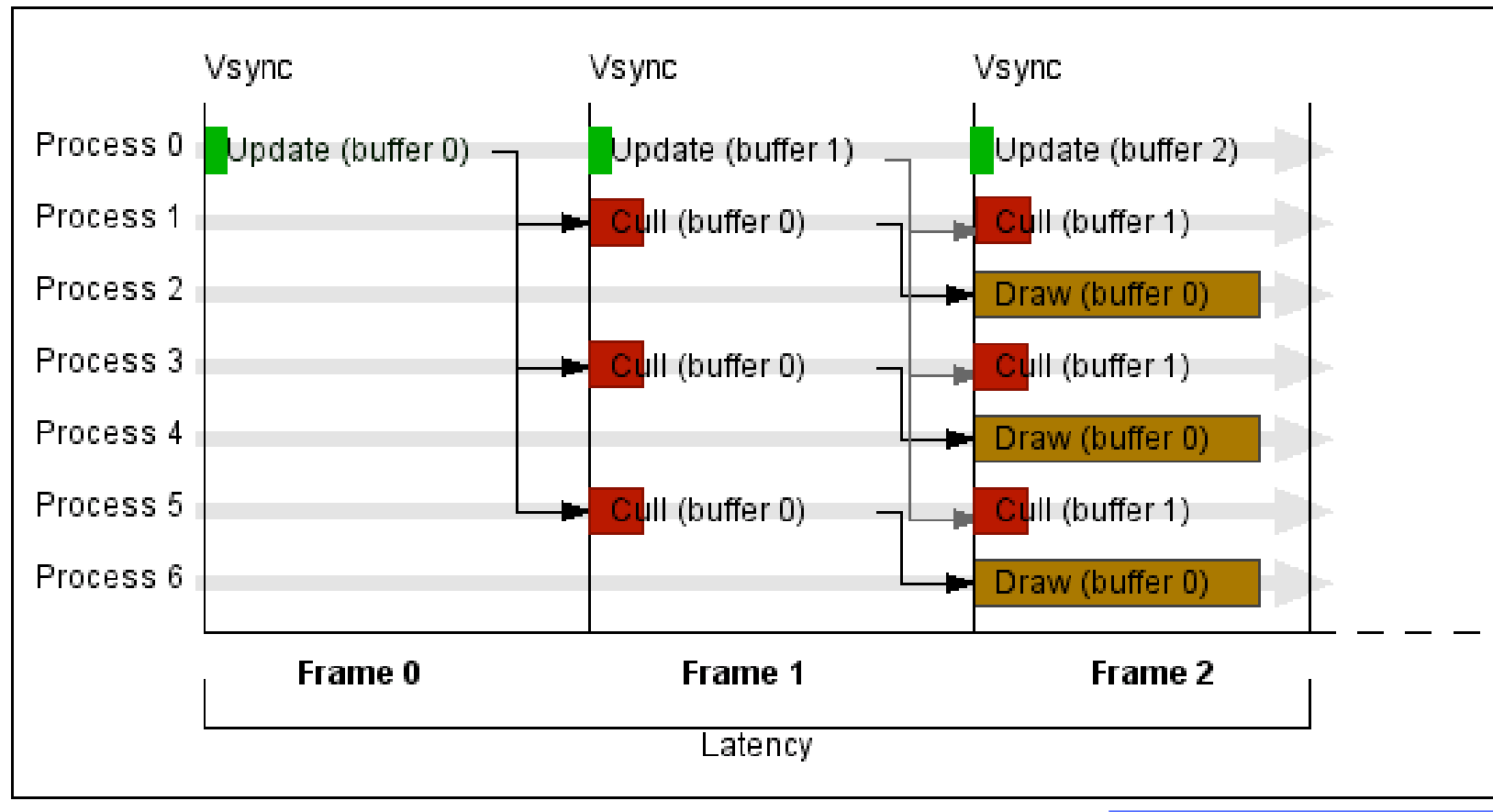


# “Traditional” Phase Diagram



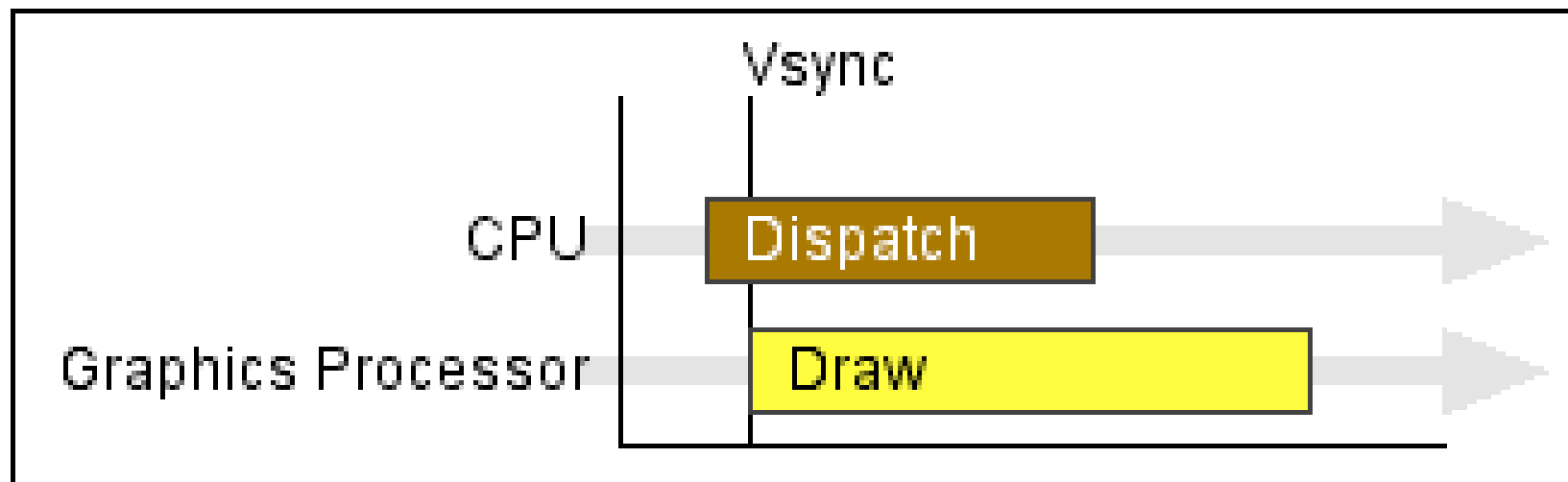


## Phase Diagram, 2003





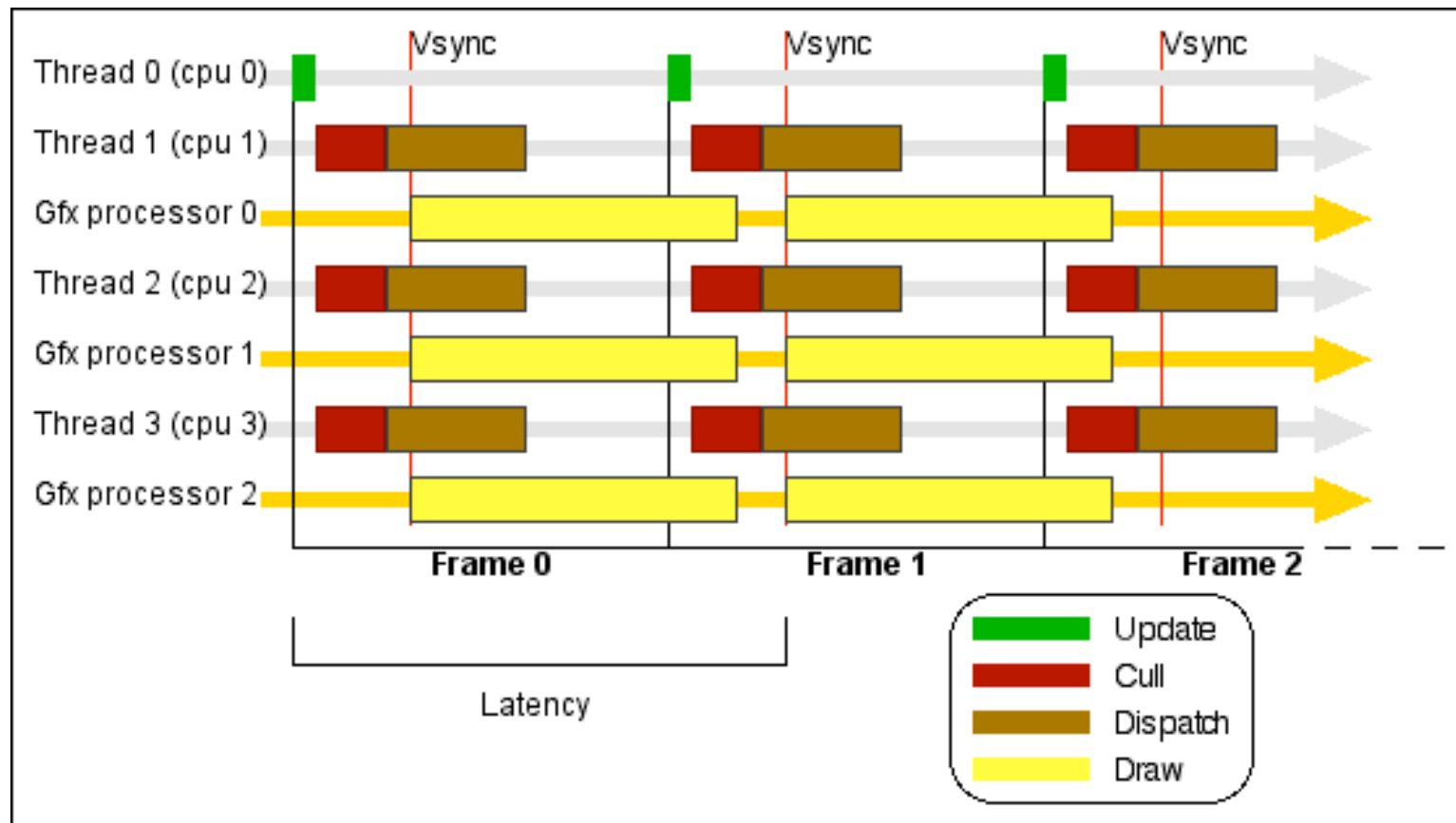
## Draw



Draw is actually two, parallel processes!



# Phase Shifted Diagram





## Who and How?



## Who is using OSG?

- Magic Earth - Geoprobe® - Oil & Gas
- Boeing - Flight simulation
- Indra - Train simulation
- STN Atlas - Simulation
- NASA - Earth visualization
- Norcontrol - Maritime simulation
- Real World Entertainment - Gaming (Releasing Java Bindings)
- Terrex - LOD Paging



# Things that have changed since the paper

- Binary (.ive) read and write
- Paging PagedLOD
- OpenGL 2.0 support



# How to get involved

- Check the web site:  
<http://www.openscenegraph.org>
- Download and play
- Join the mailing list
- Help us write the book!



Questions?

*Questions?*