



Remote Visualization of Large Multi-dimensional Radio Astronomy Data Sets

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CyberSKA

www.cyberska.org

- develop (cyber) infrastructure for SKA
- collaboration portal
- applications accessible online
- minimal software & hardware requirements for client side (browser and internet)

the problem



server
big file



user
internet



the problem



server
big file



user
internet

existing solutions

- file transfer
 - not easy for 'very' large files
- remote X11 and VNC
 - permissions & security
 - resource allocations
 - integration with web
 - interactivity

CyberSKA approach

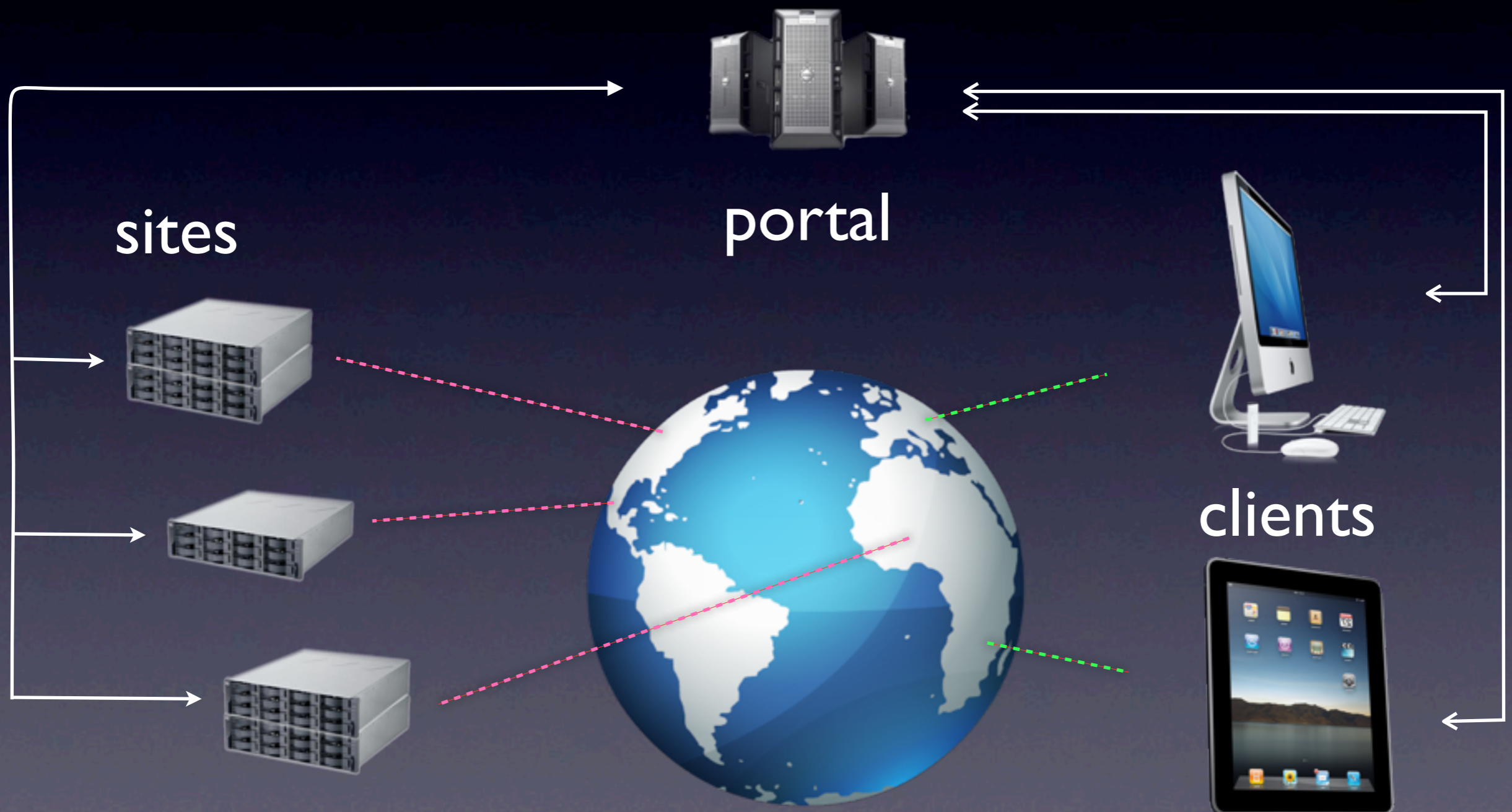
sites



clients



CyberSKA approach



client-side viewer

- last year ADASS
 - client-side visualization tool
 - downloads portions of FITS file
 - all processing & visualization done in browser
 - JavaScript & HTML5

client-side viewer

The screenshot shows the CybersKA website interface. At the top, the browser address bar displays www.cyberska.org. The website header features the "CYBERSKA" logo and the tagline "A Cyberinfrastructure platform to meet the needs of data-intensive radio astronomy on route to the SKA". A navigation menu includes links for Home, Profile, Settings, myDashboard, myGroups, Tools, About, Help, and Administration, along with a search bar and a Log out button.

The main content area is dominated by a network map of Canada, illustrating the infrastructure connections. The map is titled "canarie" and shows various nodes and their interconnections. Key nodes labeled include UBC, UBCO, UofC, WestGrid, McGill, and others. Red lines represent network links between these nodes. A legend at the bottom left of the map provides details about the network types and connections.

Below the map, there are two columns of content:

- News:** Two news items are listed. The first, dated 17 days ago, states "CyberSKA has just reached the 200 member marker!". The second, dated 19 days ago, announces "CyberSKA Portal v1.3.2 released - Site can now support measurement data in addition to FITS data! See release notes - <http://t.co/3BMvt1QJ>". A "Follow CyberSKA on Twitter" button is also present.
- Events:** Two upcoming events are listed: "ADASS XXI Astronomical Data Analysis Software and Systems Conference" (6 Nov 2011 - 10 Nov 2011) and "ASKAP SSP Internal Review and Science Meeting ASKAP SSP Review" (7 Nov 2011 - 11 Nov 2011). A "More Events..." link is provided at the bottom of this section.

At the bottom of the page, a "Project Partners" section displays logos for various institutions, including UBC, and other partners.

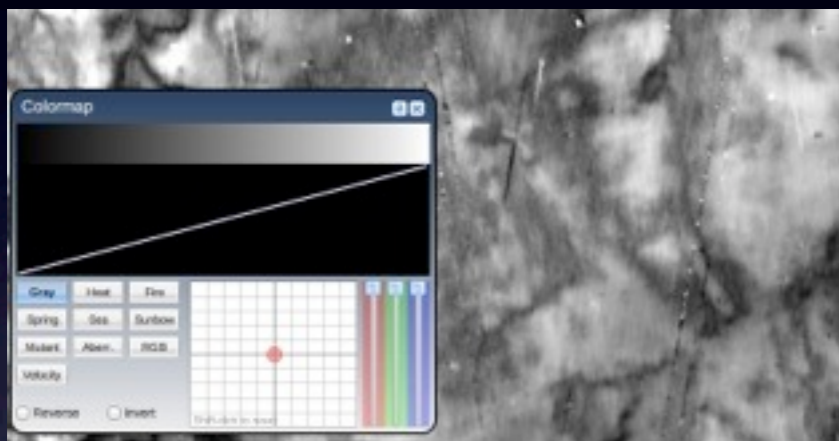
client-side viewer

- users asked for more features
- faster startup
- handle larger files
- profiles along X,Y and Z axis
- playing movies along 3rd axis

server-side visualization

- some tasks must be done server-side
- might as well do them all on server
- client handles GUI (thin client)
- server does all computation and rendering
- server “tells” client what to render

general idea



colormap = "heat"

recomputes
image

client
server

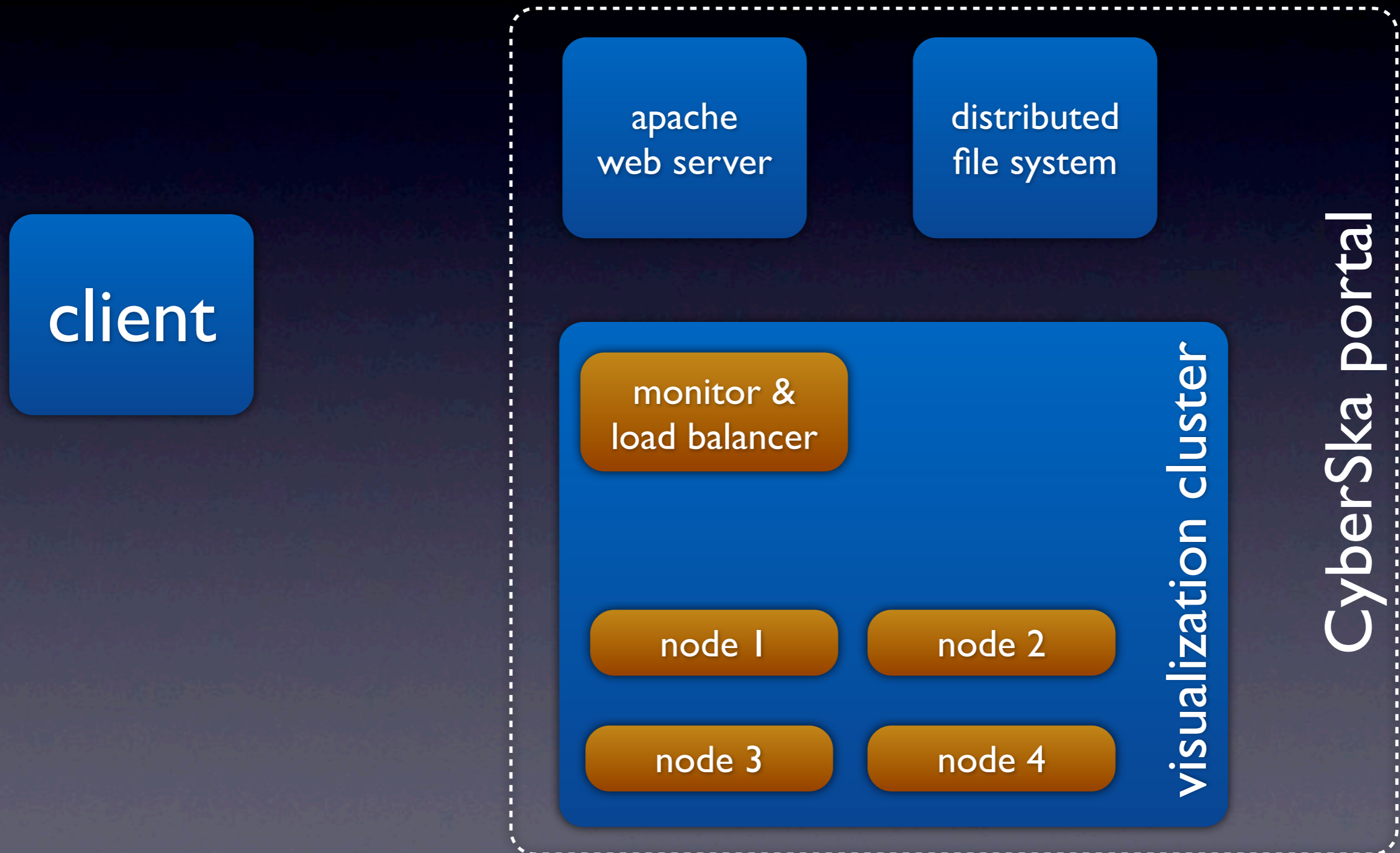
compresses to
JPEG



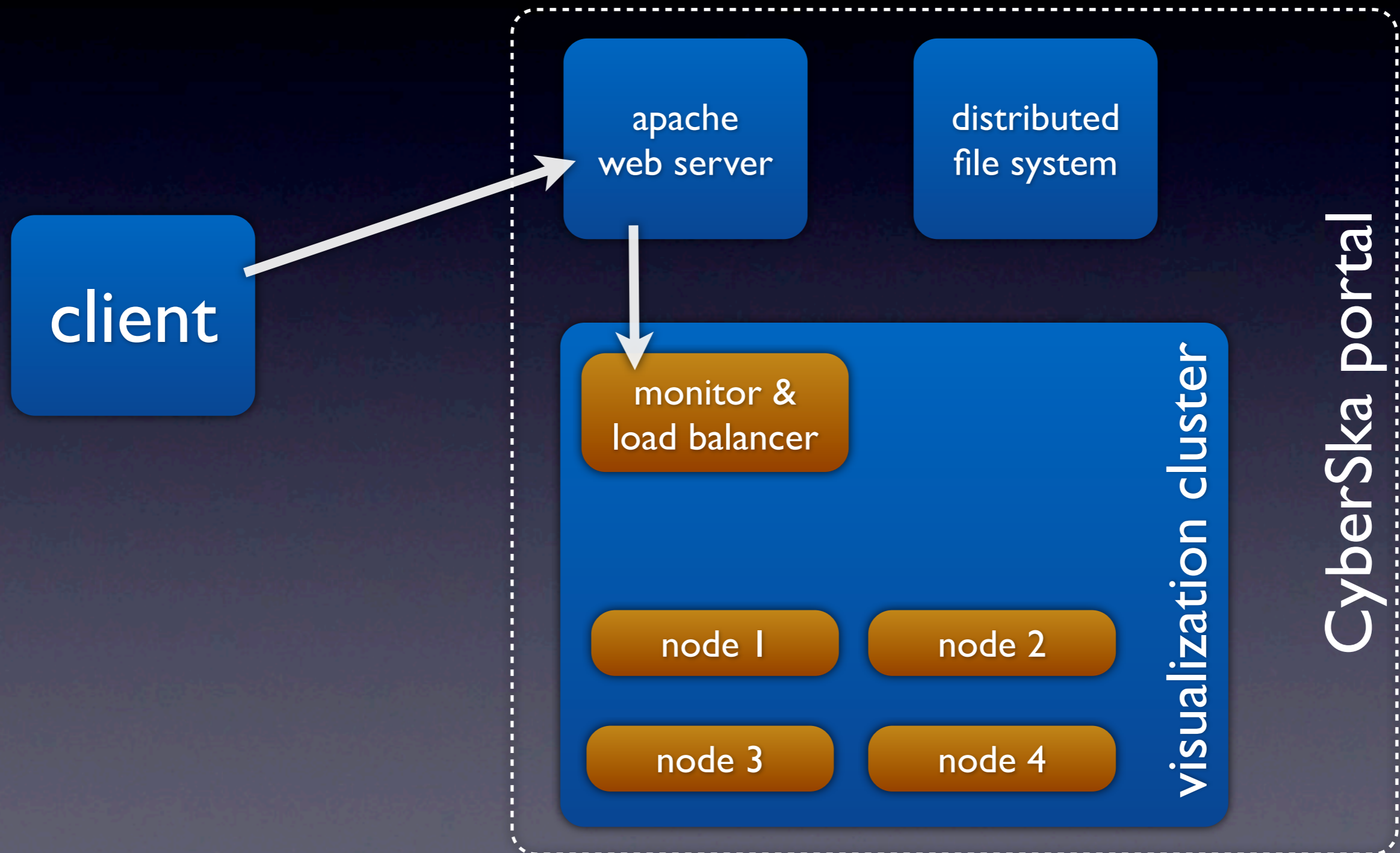
JPEG

sends JPEG to
clients

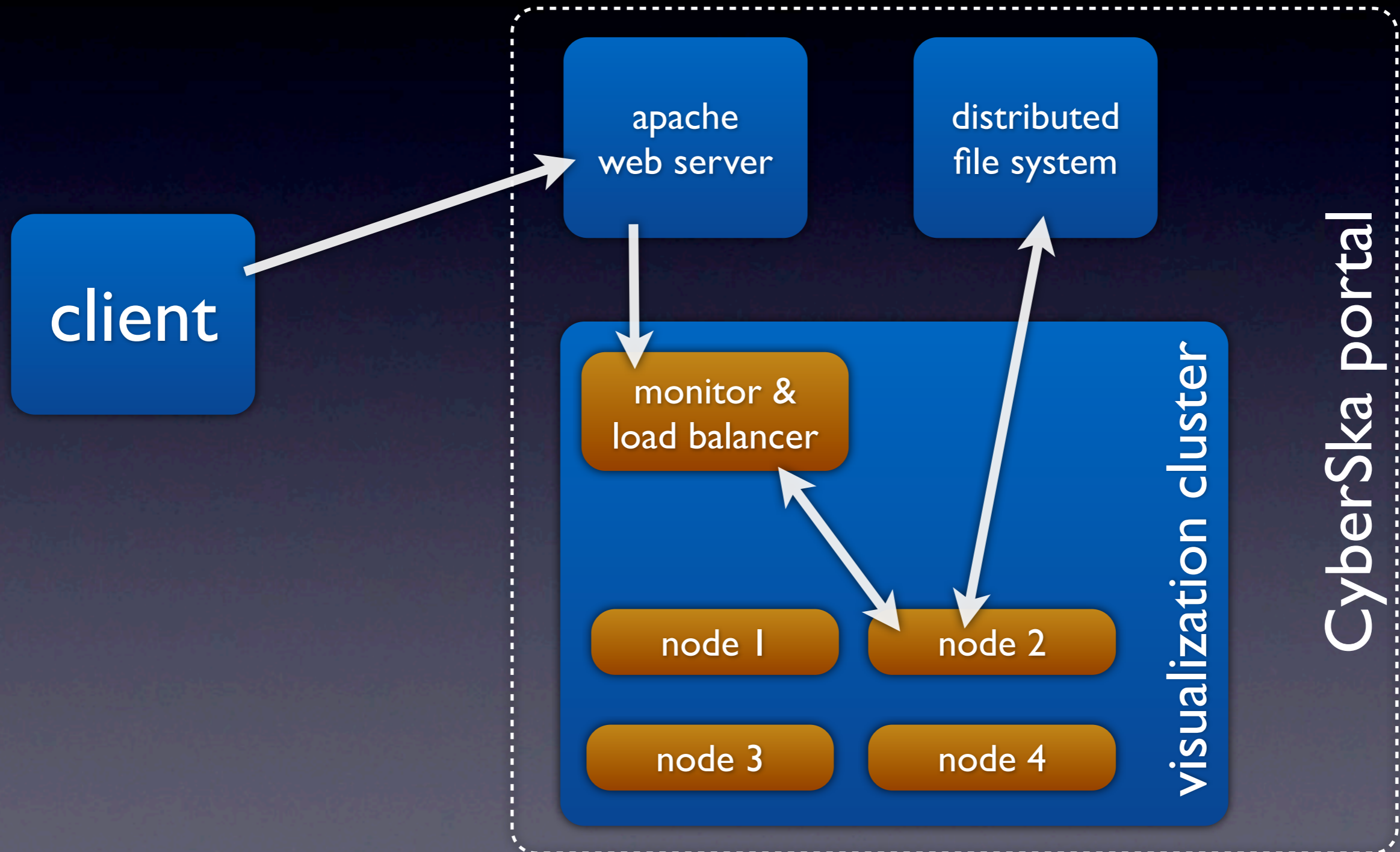
implementation



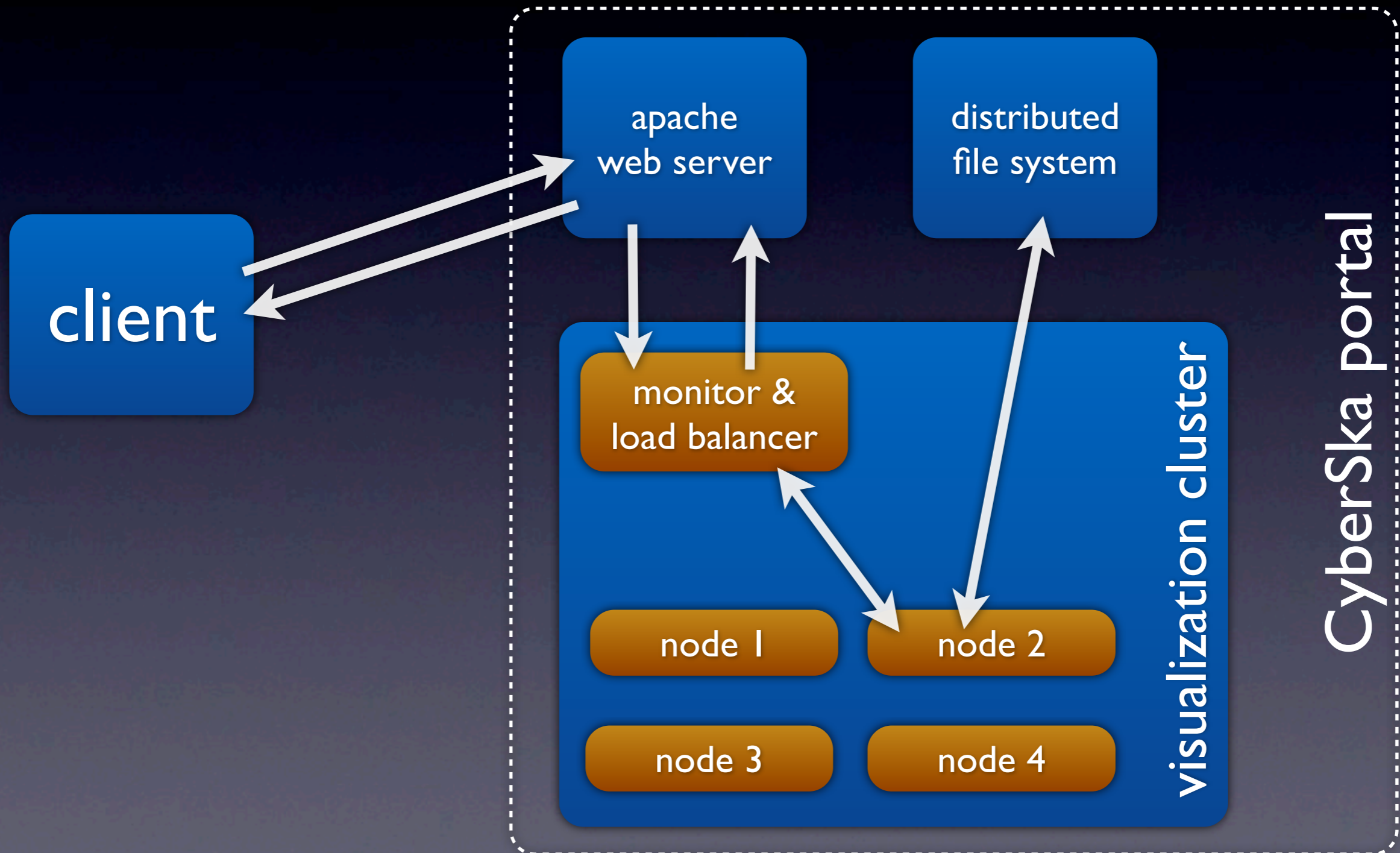
implementation



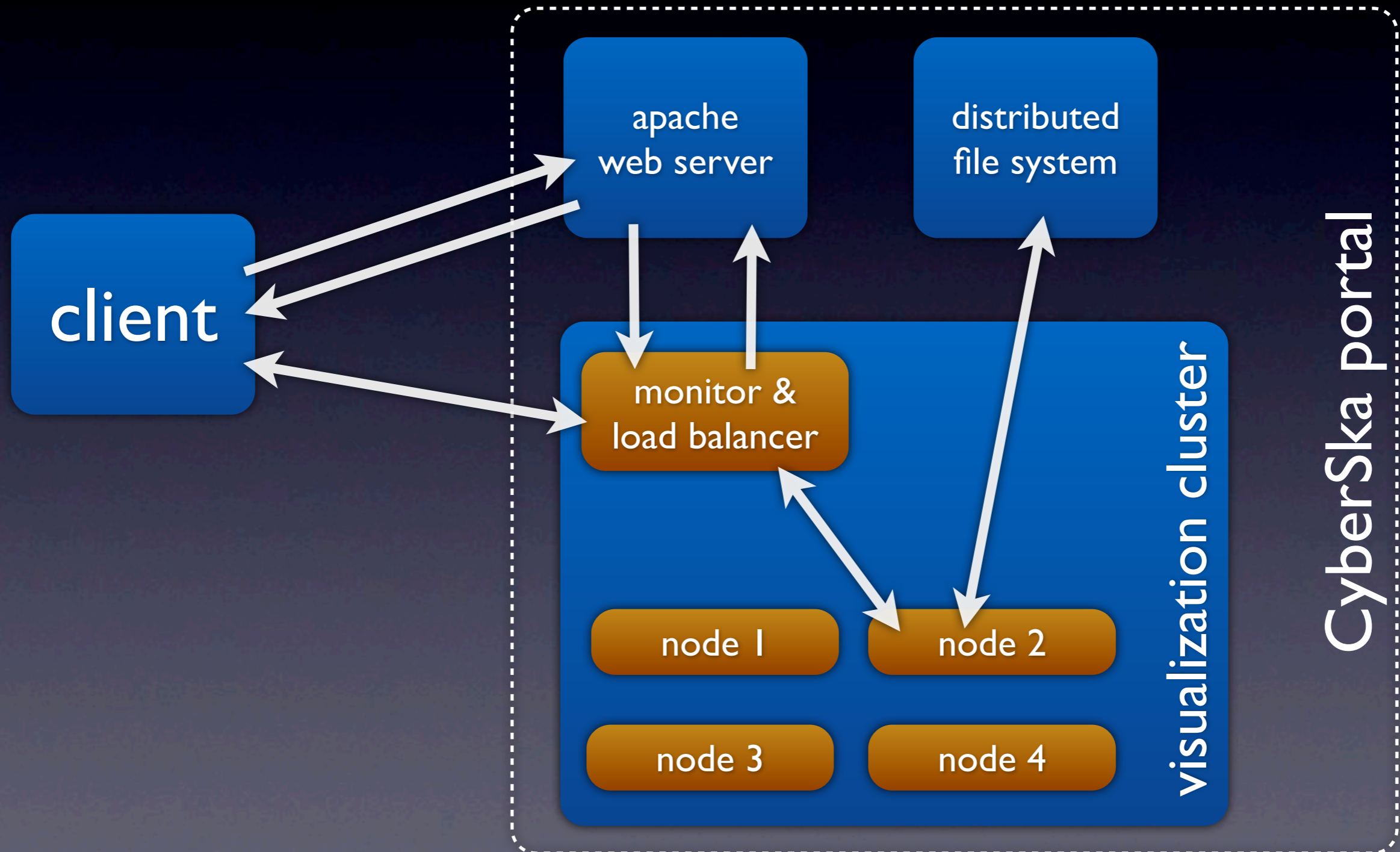
implementation



implementation

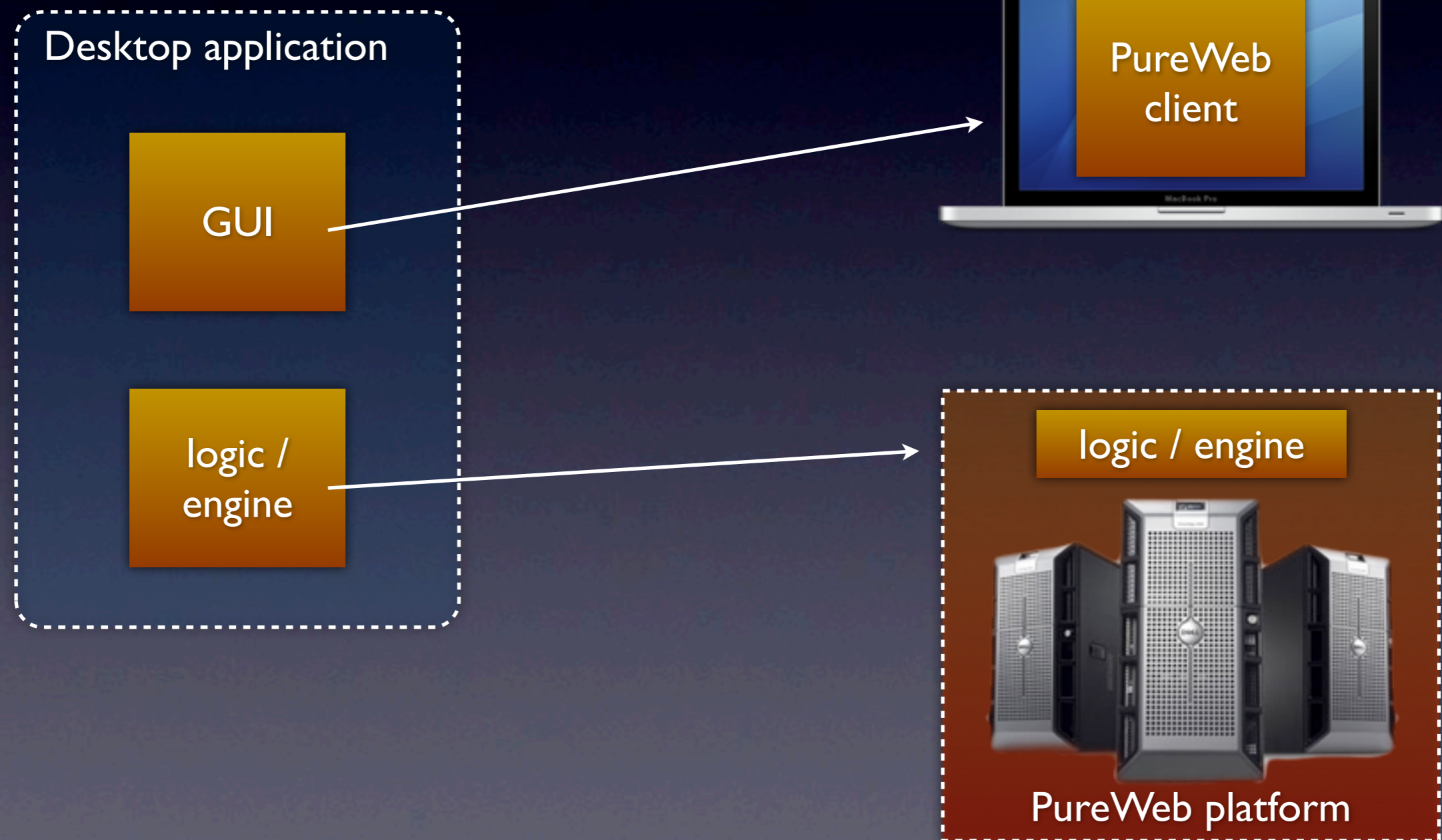


implementation



PureWeb

by Calgary Scientific



server-side viewer

 **Russ Taylor**

 Bookmark this



Player
Histogram
Colormap
Header info
X Axis
Y Axis
Z Axis
Share
Demo Files

x: 1014
y: 724
z: 152

Frame: 152
Value: 31.1002

future work

- parallel processing and rendering
- experiment with MPEG vs JPG
- switch from flash to HTML5



Thank you.

implementation

