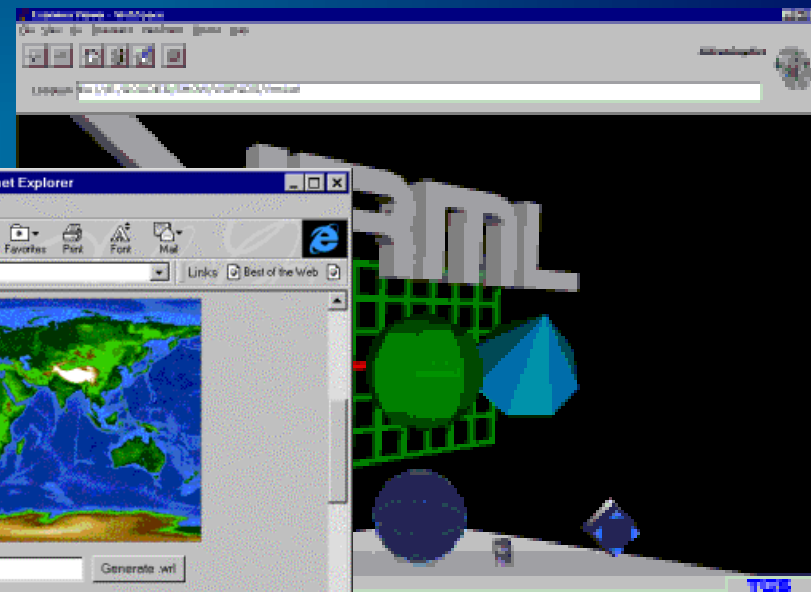
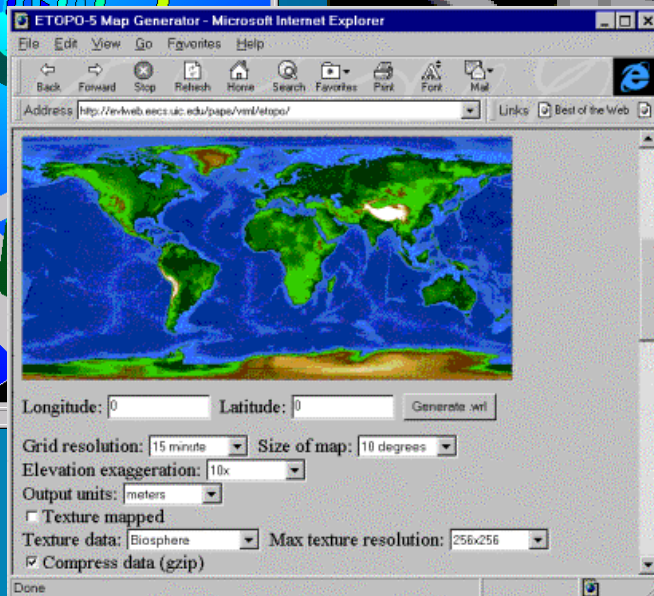
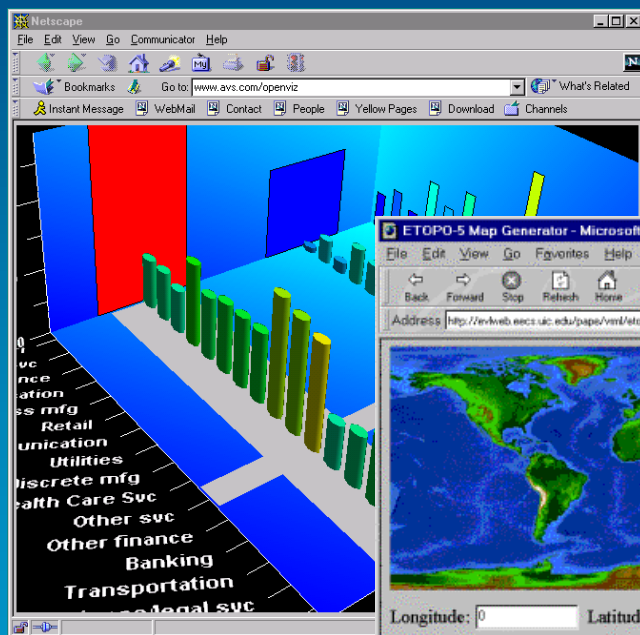




# AVS ADVANCED VISUAL SYSTEMS

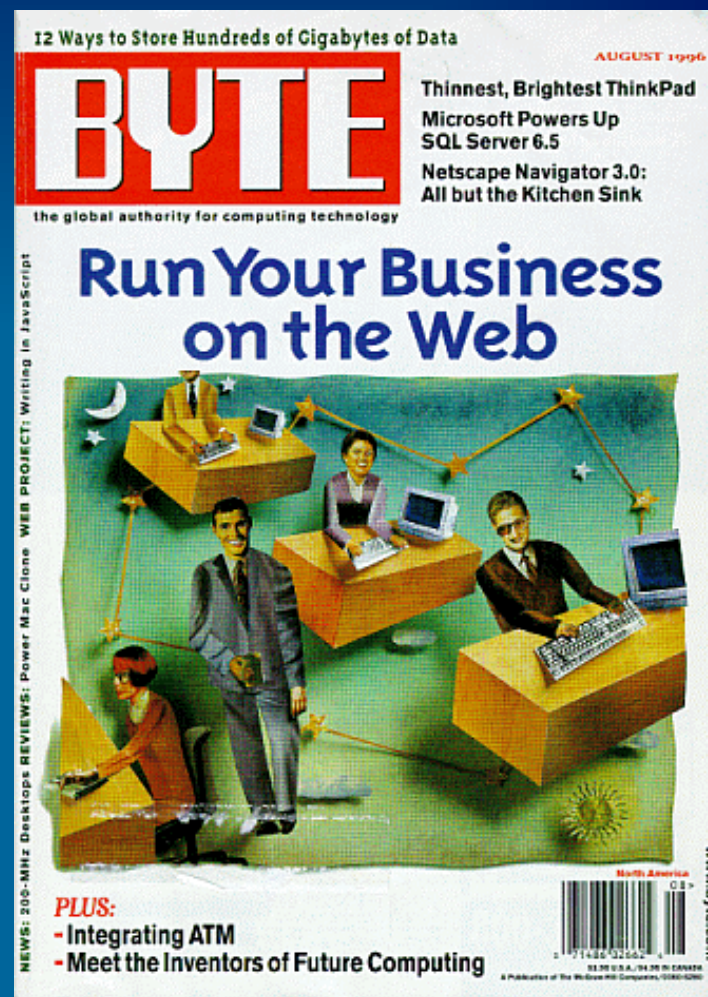
## Web-based Graphical Display





# TRENDS IN GLOBAL NETWORK COMPUTING

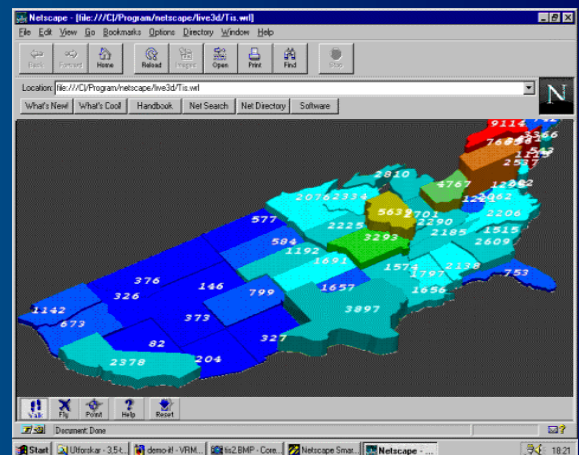
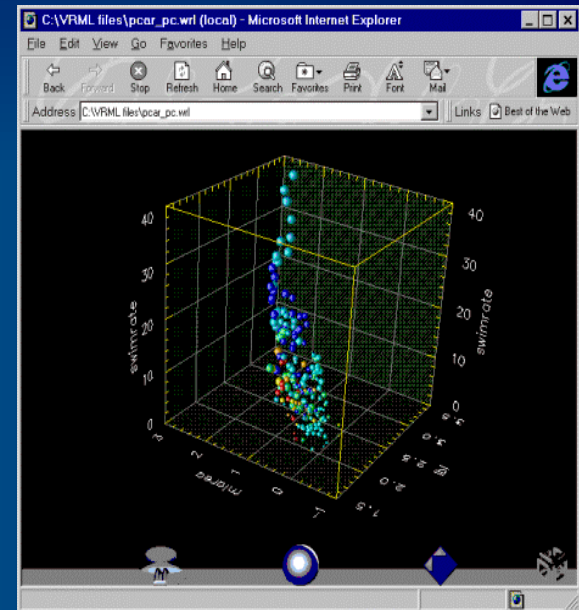
- "The software business is reborn !!!"
- "This is not only an Evolution but a Revolution"





# BROWSER-BASED VISUALIZATION

- Return to a “centralized” computing model
- Ease-of-Use
- Affordable Desktop
- 100+ million users
- Internet Explorer dominating commercial software world
- Netscape, Mozilla, AOL for ‘personal’ use





## TRENDS IN VISUAL NETWORK COMPUTING

- Return to a centralized computing model
- High bandwidth networking - The driving force for computing
  - *2D images, 3D Graphics, animation,.. needs bandwidth!!*
  - *56 Kbps means "World Wide Wait"!*
  - *Two Mbps is required*
  - *Intranet already has high bandwidth!*
  - *The Network is the Computer??*



# THE BATTLE FOR INTERNET ARCHITECTURE

SUN  
Netscape/AOL  
Oracle

IBM  
HP/Compaq

Microsoft  
Intel  
SGI

Linux/UNIX  
Navigator  
JavaBeans  
JavaScript  
Java  
Oracle  
JavaStation

*.....Operating System.....*  
*.....Browser.....*  
*.....Components.....*  
*....Script Language.....*  
*..Programming Language...*  
*.....Database.....*  
*.....Network computer.....*

Windows NT/2000  
Explorer  
ActiveX  
VBscript, Jscript  
Visual J++, MVM  
SQL  
.Net



ie Ziegler  
y, December 04, 1999

**Facilities** Executive Summary

vs  
igital Pilot  
ews and Information  
ystem Maintenance

**Company Voice**

at do you like most  
out the new web  
?  
Online billing  
Work order status  
Customer Support  
Don't like it

vote

*All responses are anonymous*

**Line Usage** ◆ ✕

Owner: John Anderson Last update: 11/14/99

**Personal Links** ◆ ✕

- [ZDNet](#)
- [Search Engines](#)
- [Personal Bookshelf](#)
- [Technical Reference](#)
- [Yahoo](#)
- [Excite](#)
- [Alta Vista](#)

Owner: Cindy Arnold Last update: 11/3/99

**Weather** ◆ ✕

 **Dallas, TX**  
Reported by Dallas, TX  
**Cloudy**

Sat Dec 4 10:21 am EST  
**Temperature: 68**  
**Humidity: 90**  
**Barometer: 29.81**  
**Wind Speed: 17**



[www.weather.com](http://www.weather.com)  
Click for Forecast

 **Boston, MA**  
Reported by Boston, MA  
**Cloudy**

Sat Dec 4 10:21 am EST  
**Temperature: 45**  
**Humidity: 60**  
**Barometer: 30.06**  
**Wind Speed: 7**



[www.weather.com](http://www.weather.com)  
Click for Forecast

 **San Francisco, CA**  
Reported by San Francisco, CA  
**Clear**

**Line Summary** ◆ ✕

Current Month Line Summary  
Select the phone number for detailed information

Line	Name	LD Usage	LD Cost
<a href="#">(214) 555-3001</a>	Primary Fax	56	\$8.87
<a href="#">(214) 555-3003</a>	John Public	11	\$1.34



# WEB VISUALIZATION CLIENT SCENARIOS

## Hypertext

## Forms

## "Standard Plug-in"

## Application deployed Components

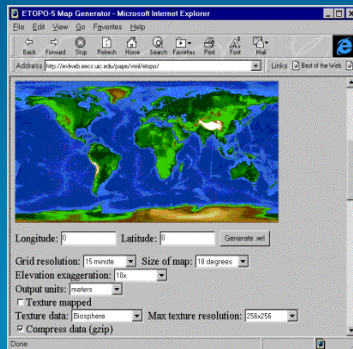
high

Functionality

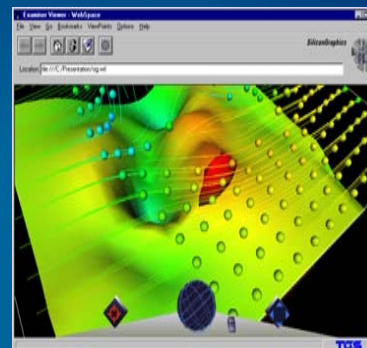
low



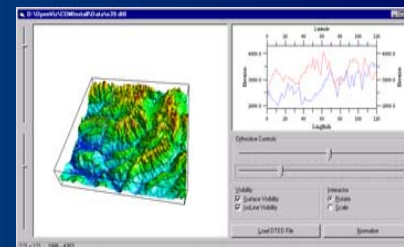
HTML, XML  
GIF, MPEG



Forms  
CGI  
Scripts  
...



VRML, X3D,  
SVG, FLASH



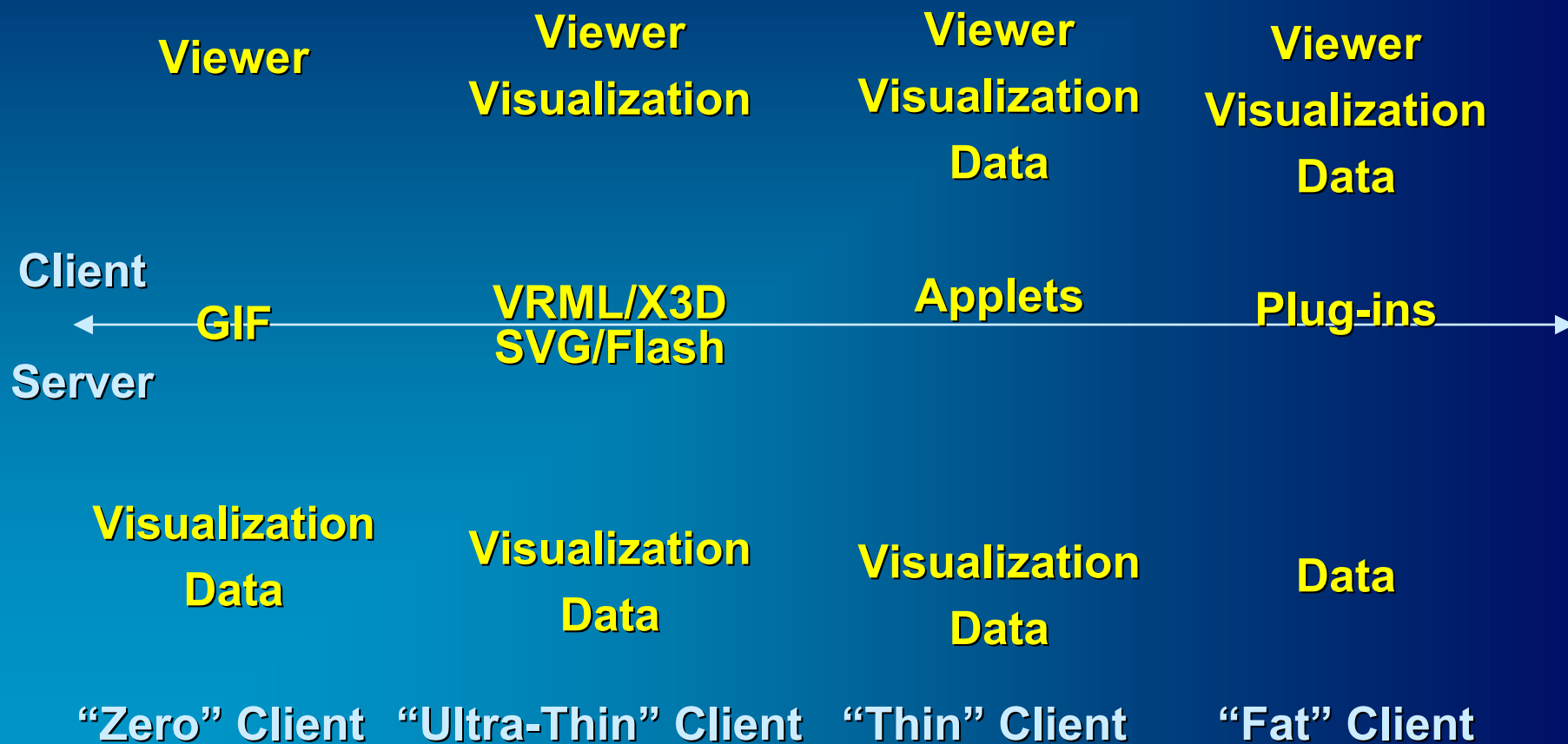
JavaBeans  
ActiveX  
Applets

Interactivity

high



# ZERO/THIN/FAT CLIENT ~ SUMMARY





# GRAPHICS 'STANDARDS'

## 2D

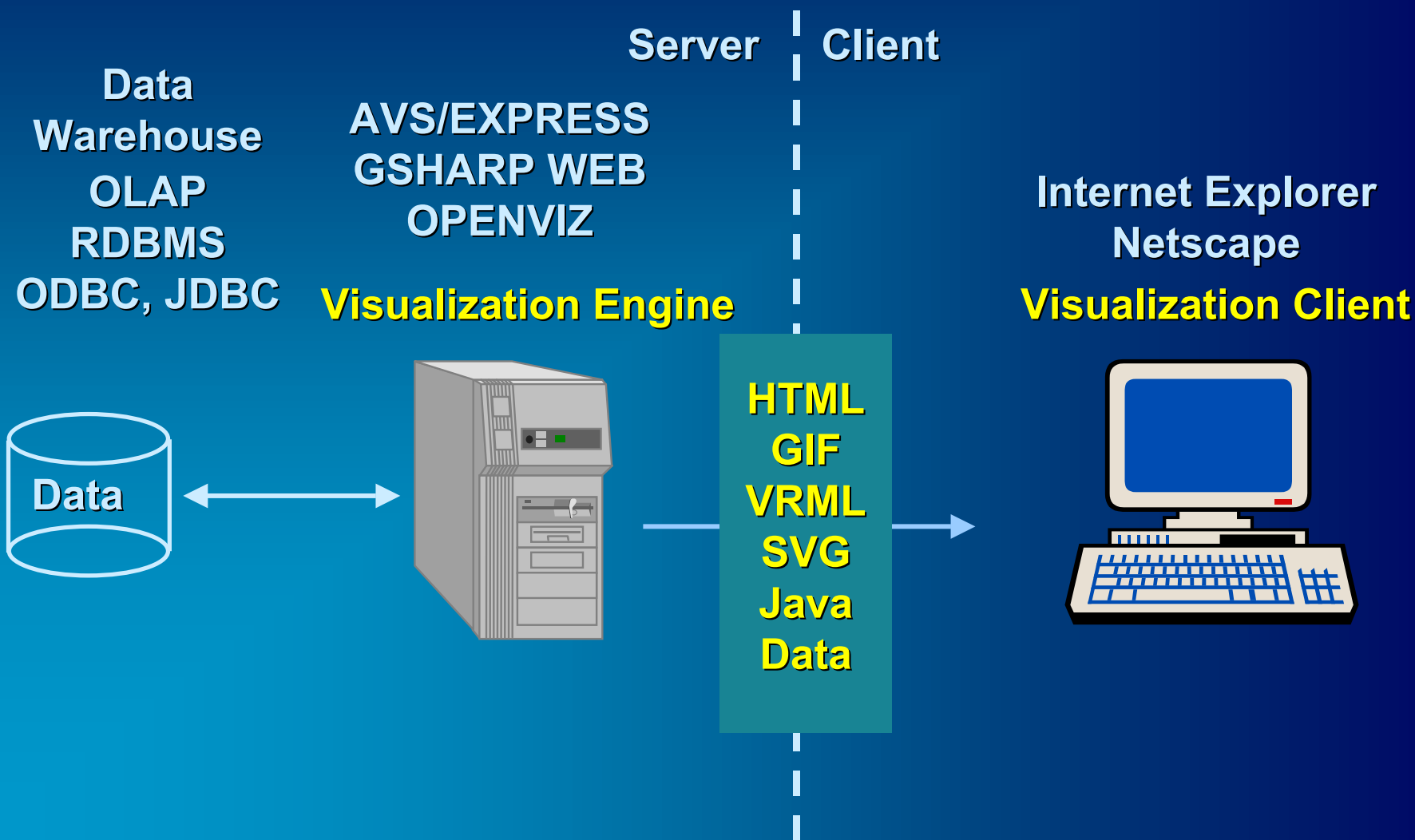
- **Images - GIF**  
- plus image-map capabilities
- **Flash, Macromedia**  
- 200 million+ users
- **SVG**  
W3C standard

## 3D

- **VRML - developed initially by SGI, but now development stalled**
- **X3D**  
W3C standard - to replace VRML - yet to complete standardisation process

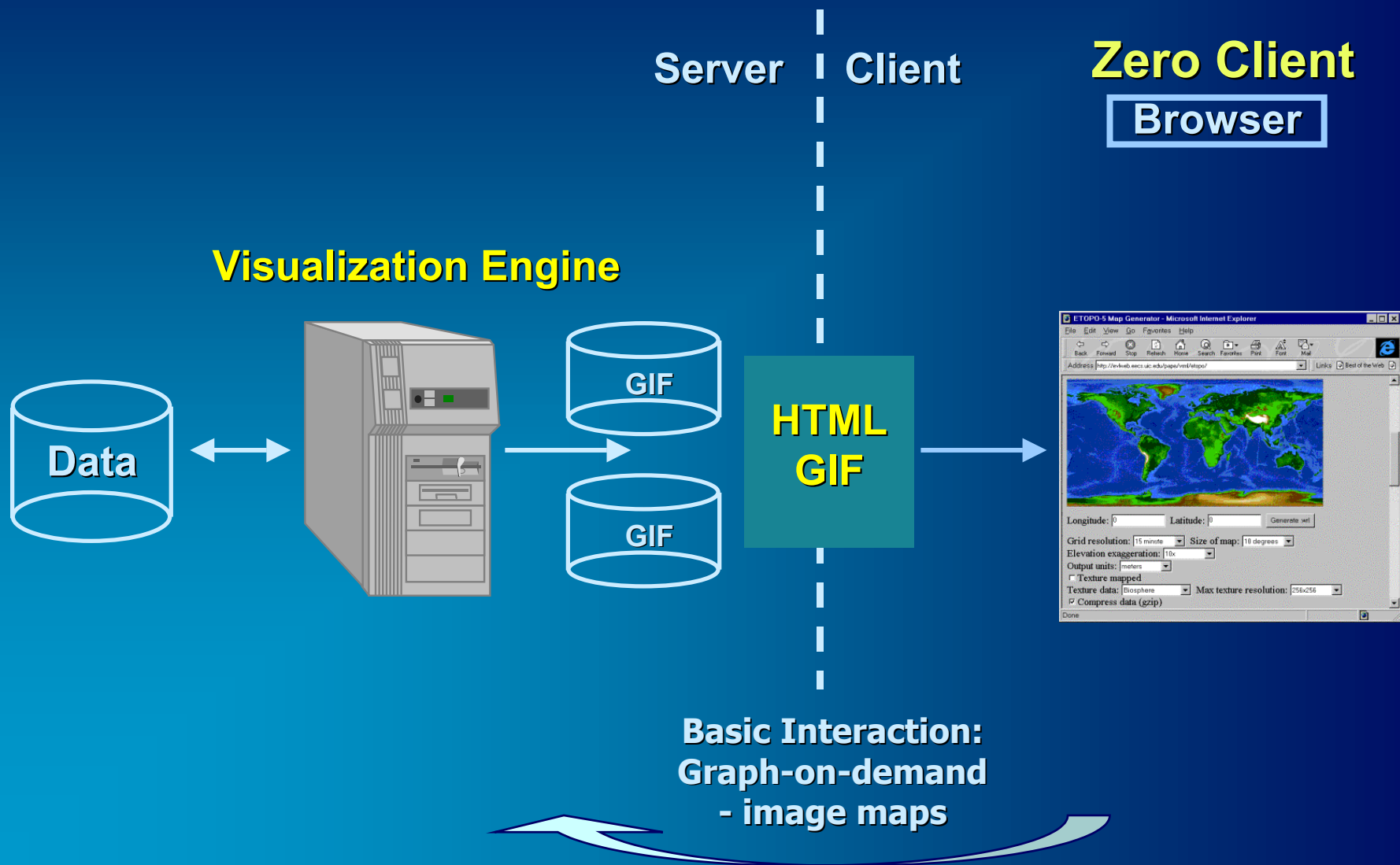


# ZERO/THIN/THICK CLIENTS IN VISUALIZATION



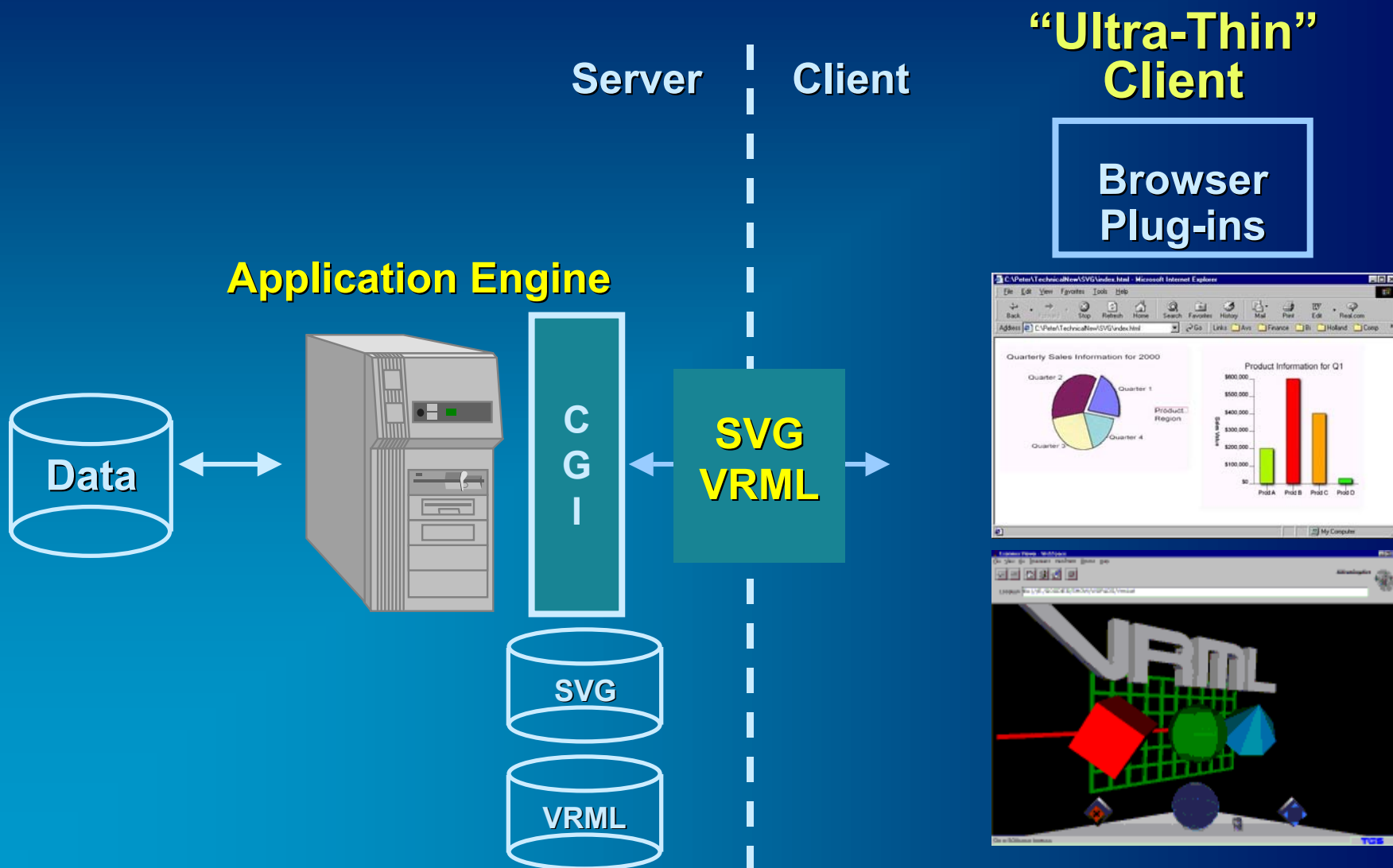


# “STATIC” WEB - ZERO CLIENT



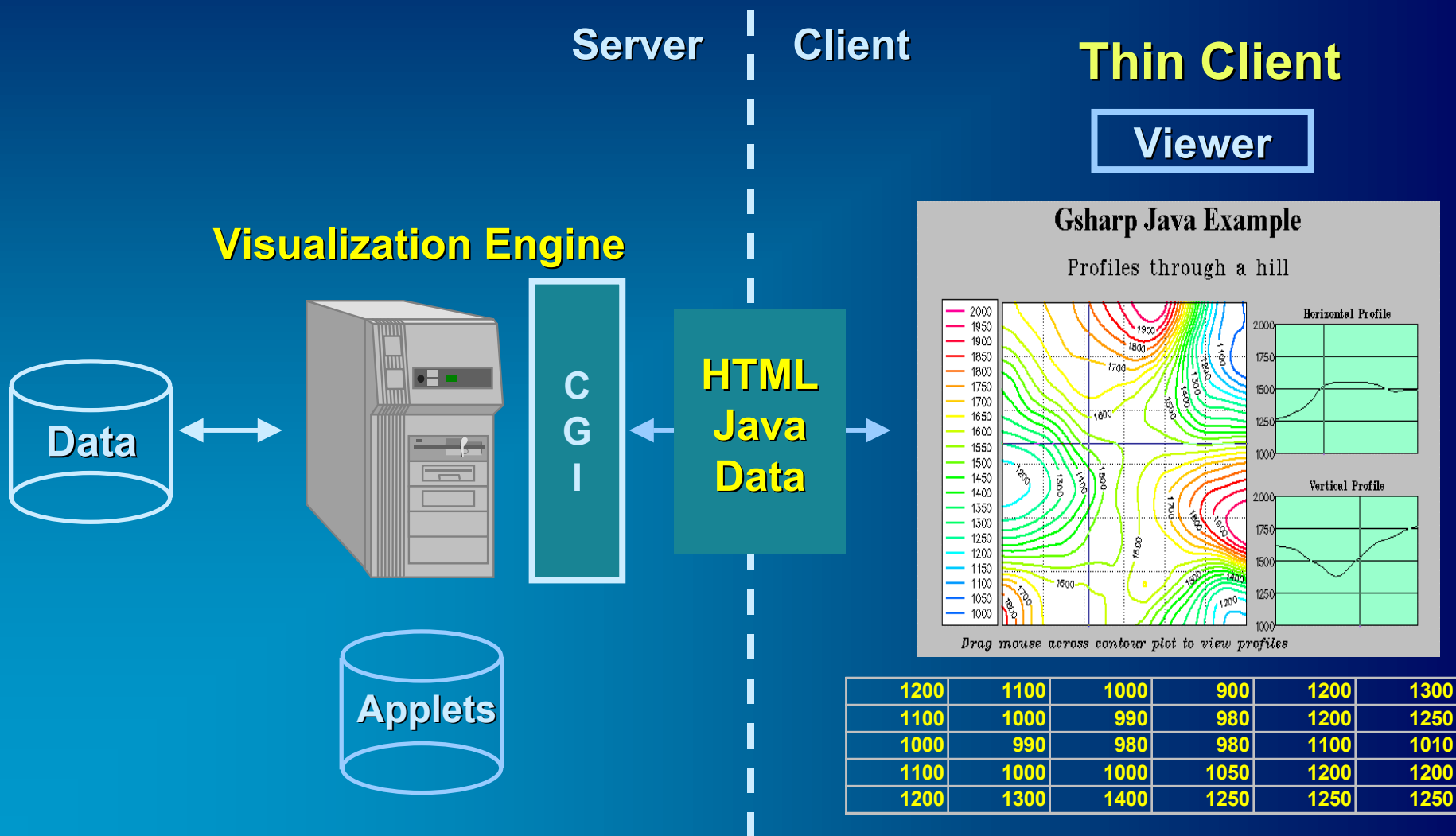


# BROWSER PLUG-INS (FREELY AVAILABLE)





# JAVA APPLETS





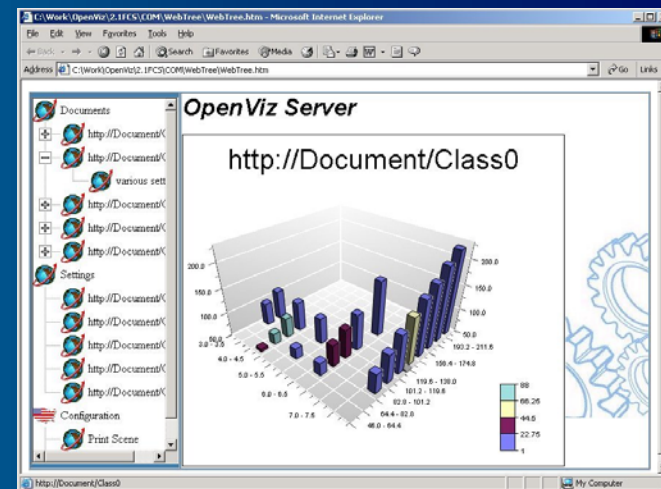
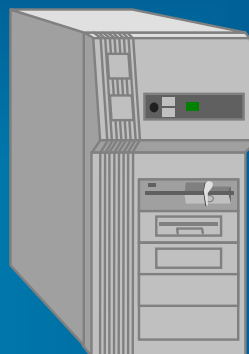
# APPLICATION CLIENTS

Server

Client

**“Thick” Client**

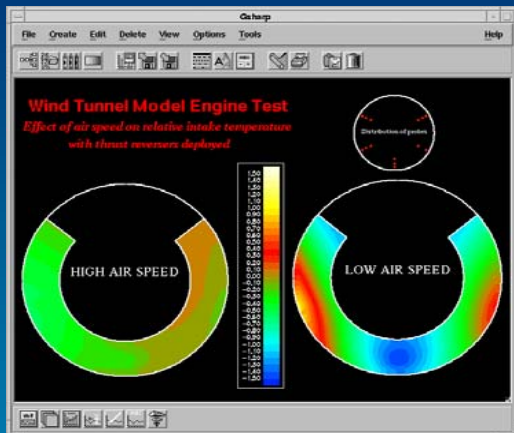
**Visualization Engine**





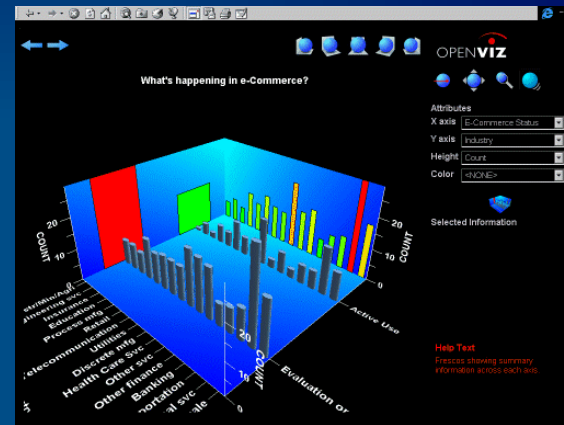
# AVS WEB-GRAPHICS PRODUCTION

## Gsharp Web Edition



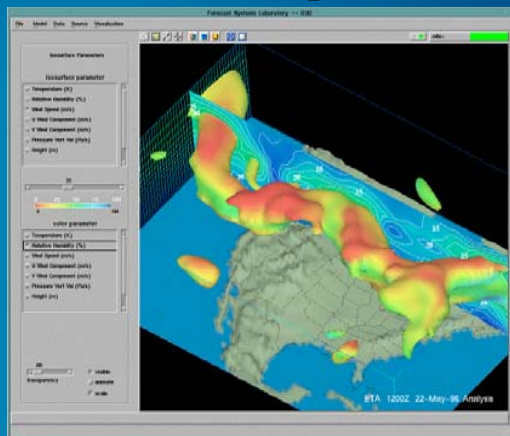
**High-quality  
Graphics Production  
- Image-server**

## OpenViz



**Business Visualization  
- Image, SVG-server  
& client-side viewer**

## AVS/Express



**Advanced Visualization  
- Image and VRML-server**



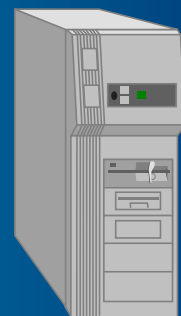
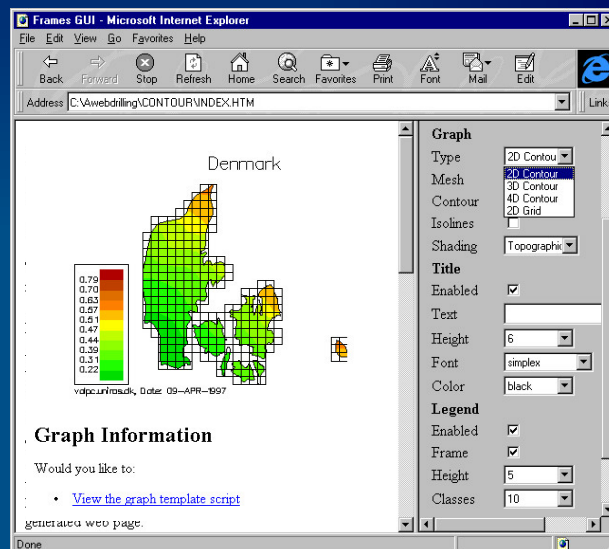
# GSHARP WEB EDITION

## Server Process

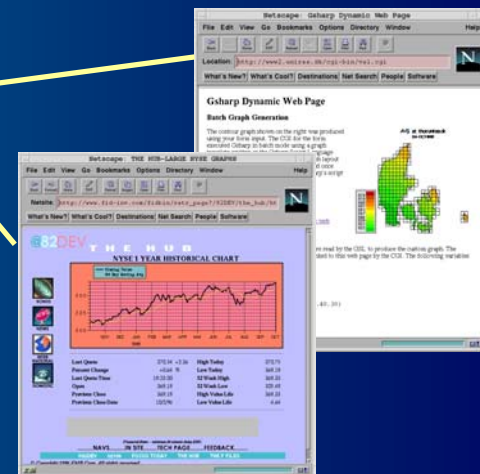
- Smaller, Faster Graph Engine
- Unlimited Access, No License Daemon
- UNIX, Windows NT

## Web Features

- GIF, JPEG, PNG Image Formats
- Built-In Image Map Creation
- URL Data Readers
- Graph-on-Demand, Drill-Down, Java Examples



## Server Graph Engine

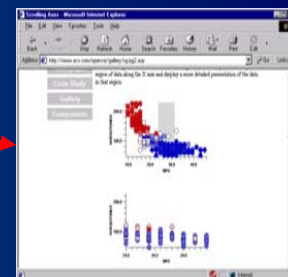
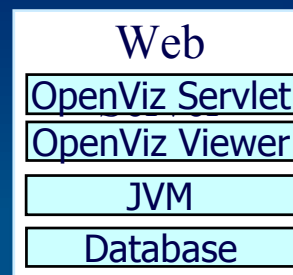




# OPENVIZ DEPLOYMENT

## ● Zero Clients - Image Generation

- Java Servlets/Active Server Pages
- Images generated and sent to the client
- Interactivity re-generated on server

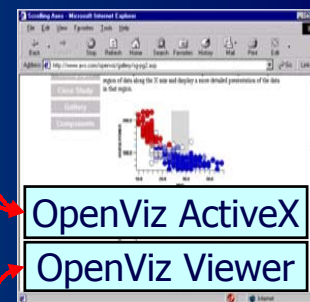


## ● Thin Clients - SVG Renderer

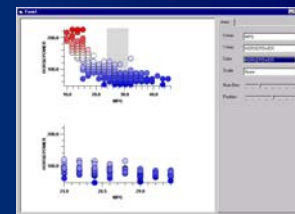
- Enhanced client interactivity/functionality
- SVG re-generated on the server

## ● Thick Clients - OpenViz Viewer

- Comprehensive interactivity/functionality
- ActiveX Controls/ Java Applets
  - 100% Java for high portability
  - HW accelerated (via OpenGL)



## ● Standalone OpenViz Applications





## AVS/EXPRESS EXAMPLE: NOVICE

- Open and Scalable Web-based Visualization tools
- Web-based Data Archive
- Open Image Analysis tools
- Parallel Modules
- Data Reduction tools – Low Bandwidth Demand
- Web-based Demonstrators and High-performance Computing Service to European hospitals



# ISOSURFACE-ON-DEMAND

Compute Server

DEMONSTRATORS

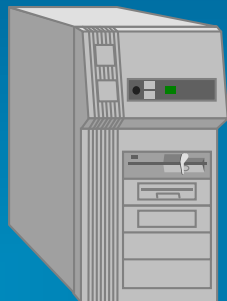
Visualization tools

Parallel Visualization tools

Image Analysis tools

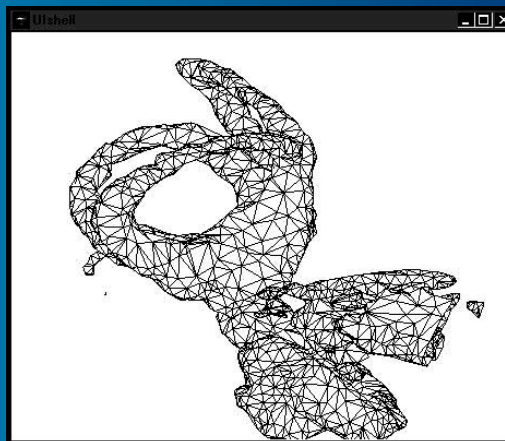
Data Reduction Tools

Teleradiology tools



**AVS/Express  
Visualization Engine**

REQUEST  
VOLUME  
IsoSurface





# DEMONSTRATIONS

- AVS/Express: VRML output of geometries
- Gsharp: Web Server image generation with Java applet
- OpenViz: Zero, Thin (SVG), Thick Clients

