#### CGL Top Projects

# NaradaBrokering

Commumity Grids Lab at Indiana University

#### NaradaBrokering Messaging Middleware

NaradaBrokering is funded in part by the Open Middleware Infrastructure Institute (OMII) of the United Kingdom. Specifications within the Grid/Web Services area that are presently being implemented within NaradaBrokering include:

- WS-ReliableMessaging
- WS-Reliability
- WS-Eventing and WS-Notification.

NaradaBrokering is an open source technology supporting a suite of capabilities for reliable/robust flexible messaging. This middleware infrastructure is designed around a scalable distributed network of cooperating message routers and processors. NaradaBrokering supports

- Core Web and Grid capabilities
- High-performance Collaborative environments

### Archtecture of NaradaBrokering

http://www.naradabrokering.org



#### Current Capabilities:

- TCP, Parallel TCP streams, UDP, Multicast, SSL, HTTP & HTTPS transports supported.
- Subscription Formats include XPath, Regular Expressions and SQL queries
- JMS compliant and support for routing P2P JXTA interactions.
- Reliable and exactly-once delivery
- Ordered delivery
- Recovery and Replay after failures
- Message-level WS-Security compatible security
- Optimizations for large message payloads
- NaradaBrokering enhanced Grid-FTP and Bridge to the Globus Toolkit-3.
- Prototype implementation of WS-ReliableMessaging

### Forthcoming features:

- Production implementation of Web Service specifications:
  - WS-Eventing
  - WS-Notification suite of specifications
  - WS-ReliableMessaging
  - WS-Reliability
- Pausing and Replaying of Live streams
- Support for fault-tolerant replicated distributed stable storages

### Performance

The results depict the performance of a single broker in Audio/Video collaborative settings. As can be seen a single broker can scale to accommodate up to 1500 audio clients with acceptable latency (less than 20 msecs). This same broker can also support up to 500 concurrent videoclients. In experimental settings a 4 broker network easily scaled to accommodate 1600 clients.

## Applications using NaradaBrokering





Shared Display for collaborative applications PDA cell phone integration with Grid sharing applications, whiteboard, audio/video and SVG Message-based MVC clients with SVG as example Collaborative PowerPoint and OpenOffice SERVOGrid Earthquake Prediction Grid Audio/Video Conferencing applications (GlobalMMC)

> Geoffrey C. Fox (gcf@indiana.edu) Shrideep Pallickara (spallick@indiana.edu) www.naradabrokering.org 501 N. Morton St., Suite 224 Bloomington, IN 47404 Phone: 812-8567977 Fax: 812-8567972