



LIONSHARE

# Agenda

- Introduction to LionShare
- Demonstration of Alpha Client
- Questions and Answers



# Peer-to-Peer (P2P)

- Peer-to-peer is a communications model in which each party has the same capabilities and either party can initiate a communication session.
- P2P Applications
  - File sharing
  - Instant Messaging
  - Web Services
  - Distributed Computing



# P2P Myths

- P2P = File Sharing
  - File sharing is just one use of P2P architecture
- There are no legal uses for P2P technology
- No legal file sharing networks exist
- Penn State bans file sharing
- Shawn Fanning (Napster) invented P2P
  - Napster architecture was centralized



# Why use P2P in Academia?

- Collaboration among
  - Student groups
  - Faculty members
  - Staff/Departments
- Digital Media Explosion
  - In the classroom
  - Personal Media
    - Digital consumer devices



# LionShare Use Scenarios

- Matchmaker for users with common interests
- Publication of Academic Media Collections
- Personal Media Collections
- Group Projects
- Person to Person
- Departmental Sharing
- Media Organization (offline use)



# LionShare Architecture

- Based off the Limewire Open Source project
- Uses a modified version of the Gnutella protocol
  - P2P + Client/Server Architecture
- The three A's of LionShare
  - Authentication
  - Authorization
  - Accountability



# Limewire

- Open source (GPL) Gnutella Application
- Multiplatform (Java)
  - Windows
  - OSX
  - Linux/Solaris/BSD
- UltraPeer Technology
- Metadata Support
- Active/Rapid Development process

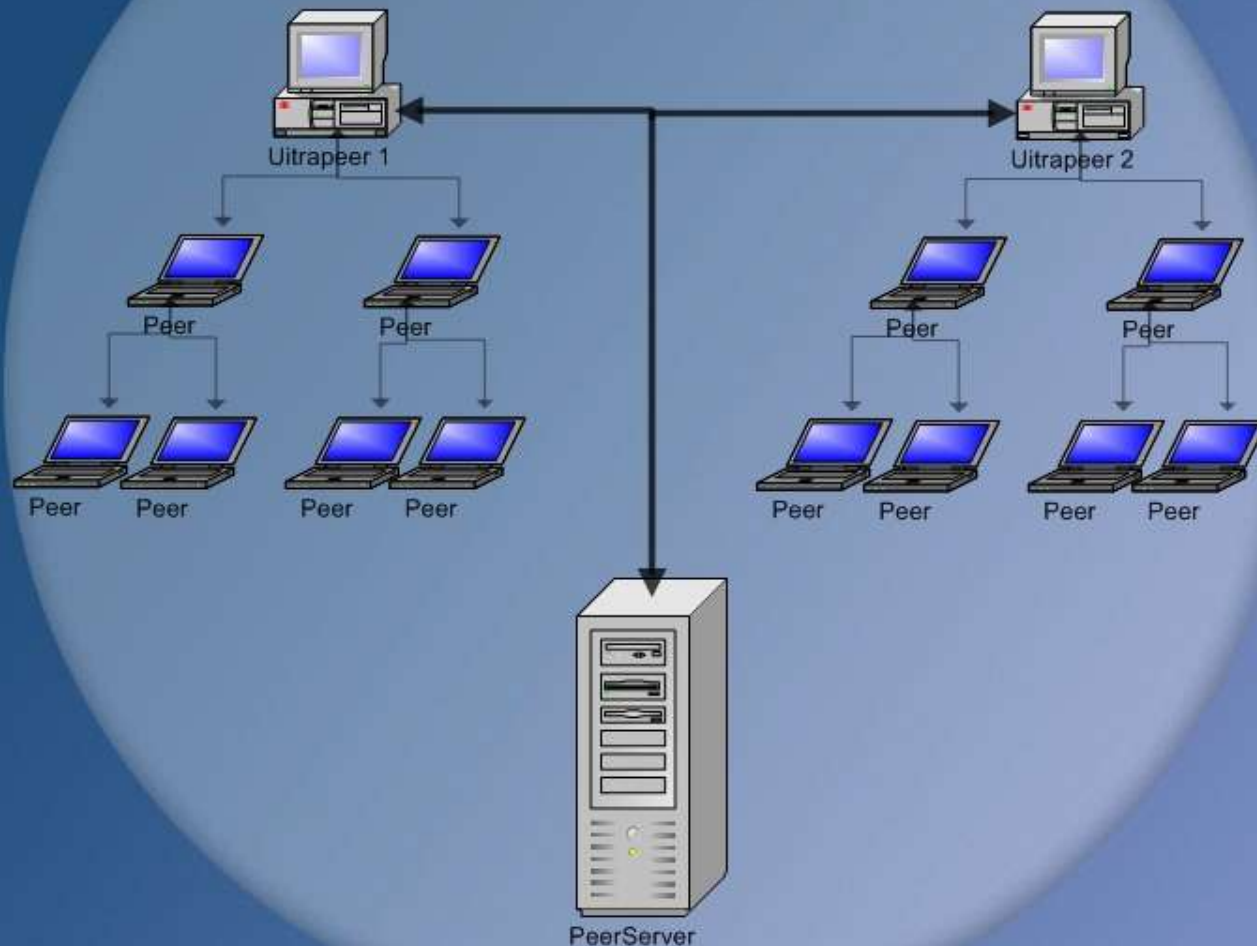


# LionShare Protocol

- Private
- Hybrid topology (P2P+Client/Server)
  - PeerServers
    - Users can publish files to a server to remain shared on the network even though the user is not connected to the network.
  - PeerServer Uses
    - Off-line sharing
    - Remote backup
    - WWW publication possibilities



# LionShare | Topology



High bandwidth UltraPeers route network traffic to nodes with slower connections.

Ultrapeers are automatically selected by connection analysis code.

The PeerServer allows for persistent file sharing so users can share without network connectivity.

All LionShare queries hit the PeerServer and all available Peers on the network.



# The Three A's

- Authentication
  - Kerberos
- Authorization
- Accountability
  - Non-anonymous network
    - Userid associated with shared files
    - Activity logging



# Pre-Grant Progress

- Accomplishments
  - LionShare Architecture Design
  - LionShare Alpha
    - MIT Kerberos compatibility
    - XML schemas for learning object description
    - Protocol customization
  - LionShare PeerServer Prototype
  - Grant from the Andrew W. Mellon foundation

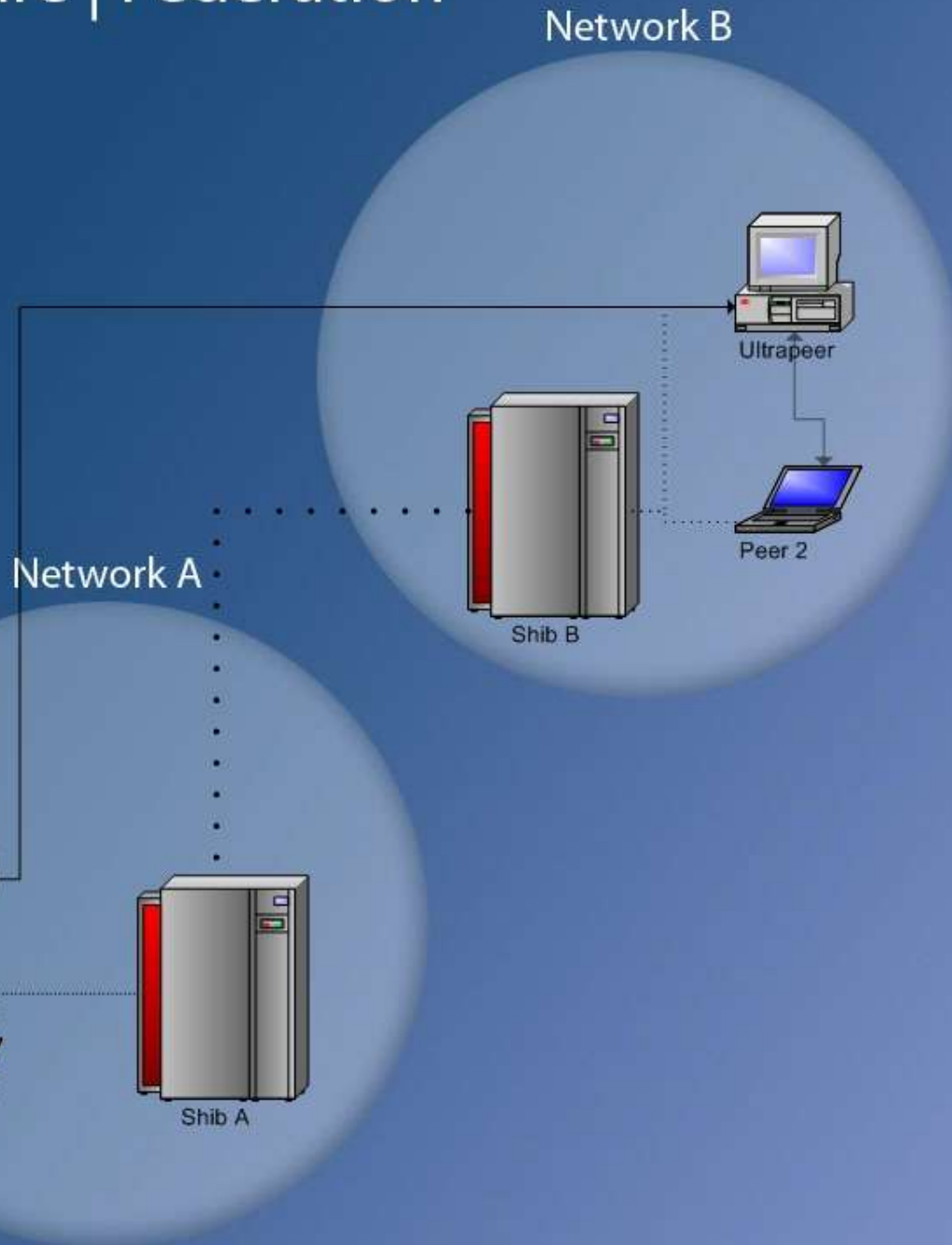


# LionShare Dev Plans

- Hardening the Application
- Federation of the LionShare protocol
  - Shibboleth
- Connecting to Fixed Repositories
  - OKI DRI Spec



# LionShare | Federation



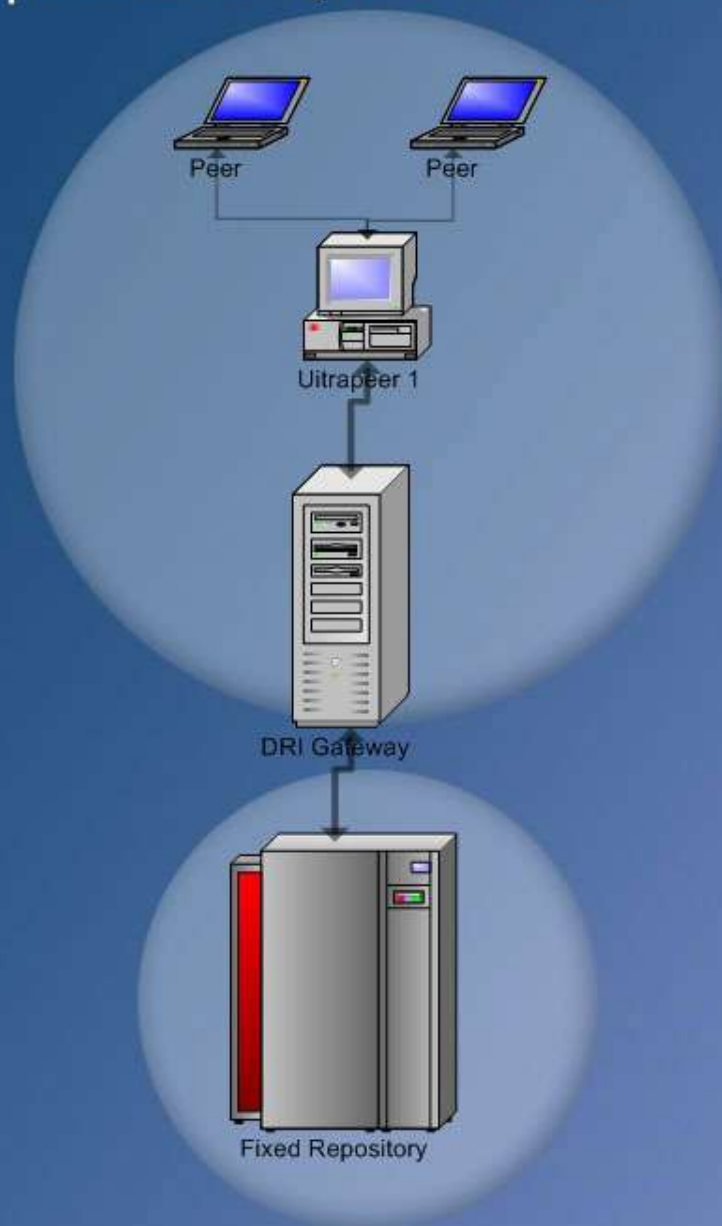
Shibboleth middleware architecture allows for the secure sharing of user information between multiple autonomous networks.

User privacy is ensured by allowing users to specify what information is shared to each individual network.

In this simplified example Peer 1's attributes are sent to network B to allow access to multimedia files shared by Peer 2.



# LionShare | Fixed Repositories



The IMS Digital Repositories Interoperability (DRI) specification is a standard for describing a number of high level repository functions.

A Gateway exists between the repository and the LionShare network, giving users the ability to connect to the repository via DRI.

A Gateway could be used to connect to other P2P networks implementing DRI such as eduSource Canada.



# LionShare Team

- Penn State University
- Internet 2 Middleware Group
- eduSource Canada



# Contact

- Interim LionShare website:
  - <http://p2p.libraries.psu.edu>
- Mike Halm ([mjh@psu.edu](mailto:mjh@psu.edu))

