

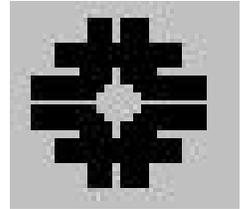
New Software Tools

Sae Woo Nam, Steve Eichblatt

Stanford University, Fermi National Laboratory



Networking Basics



Peer to Peer

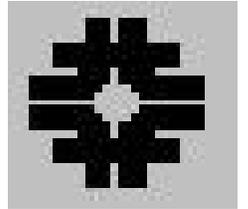


Client/Server





Peer-to-Peer Network



◆ Advantages:

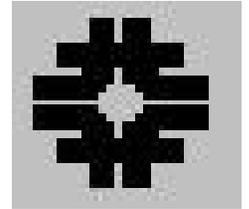
- ◆ **Less initial expense** - No need for a dedicated server.
- ◆ **Setup** - An operating system already in place may only need to be reconfigured for peer-to-peer operations.

◆ Disadvantages:

- ◆ **Decentralized** - No central repository for files and applications.
- ◆ **Security** - Does not provide the security available on a client/server network.



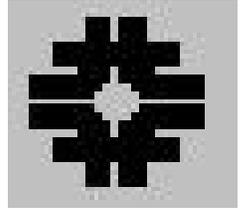
Client/Server Network



- ◆ **Advantages:**
 - ◆ **Centralized** - Resources and data security are controlled through the server.
 - ◆ **Scalability** - Any or all elements can be replaced individually as needs increase.
 - ◆ **Flexibility** - New technology can be easily integrated into system.
 - ◆ **Interoperability** - All components (client/network/server) work together.
 - ◆ **Accessibility** - Server can be accessed remotely and across multiple platforms.



Client/Server Network

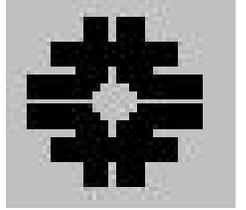


◆ Disadvantages:

- ◆ **Expense** - Requires initial investment in dedicated server.
- ◆ **Maintenance** - Large networks will require a staff to ensure efficient operation.
- ◆ **Dependence** - When server goes down, operations will cease across the network.



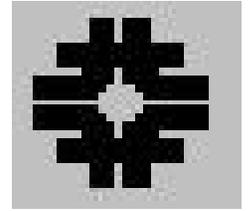
netProtocol - Major Features



- ◆ “Put” & “Get” raw data
- ◆ Built-in GZIP compression capability
- ◆ Retrieve raw Events
- ◆ Retrieve RQ’s
- ◆ Handle simple WWW requests
- ◆ Handle GPIB commands



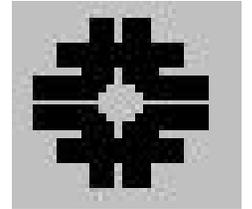
Demonstrations



- ◆ **LabView : MacOS**
 - ◆ **netClient** - writes data from a DAQ system directly over the network to a unix box running 'netServer'
- ◆ **MATLAB: MacOS & UNIX**
 - ◆ **netLoad** - load a matlab file located on a remote computer running 'netServer'
- ◆ **Java: MacOS & UNIX**
 - ◆ **netServer** - handles 'ntp' requests



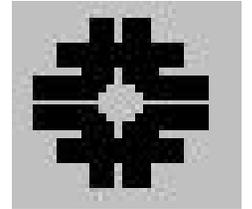
Volatile Topics



- ◆ **LabView: MacOS**
 - ◆ Asynchronous netClient for CDMS DAQ
 - ◆ 'netServer' with GPIB for CDMS DAQ
- ◆ **MATLAB/PAW/ROOT:MacOS & Unix**
 - ◆ netLoadEvent
 - ◆ netPullTeeth
 - ◆ netFillCavities
- ◆ **Java: MacOS & Unix**
 - ◆ 'netServer' with GPIB



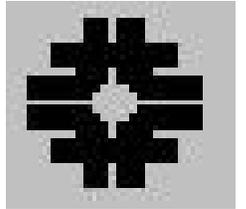
Our Strengths



- ◆ **Customization**
- ◆ **Speed**
- ◆ **Platform Independence**
- ◆ **Built & Building on previous work**



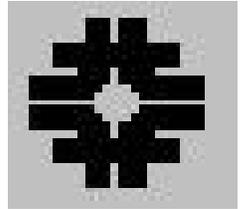
Key Benefits



- ◆ Supports opportunities to use a wider range of programming environments
- ◆ Less painful upgrading as computing and computing environments improve
- ◆ Highly scalable solution
- ◆ You can watch the experiment on the Web!



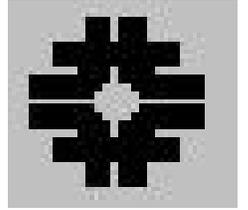
Next Steps



- ◆ Help!!!
- ◆ Programs which display the quality of the data
- ◆ Completion of the transformation in data access and storage to implement a complete client/server system.



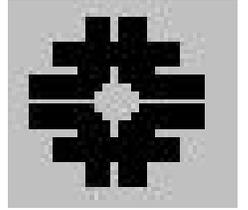
Objective



- ◆ Distribution of information via TCP/IP and the internet
- ◆ Use of “standard” network tools
- ◆ Building upon previous work and experience



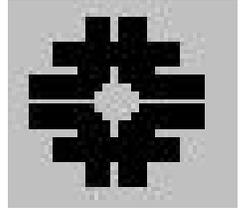
CDMS Requirements



- ◆ Fast and efficient means of sharing raw data
- ◆ Fast and efficient means of sharing analyzed data
- ◆ Wide distribution of the status of the experiment
- ◆ Remote Control of the experiment!!!



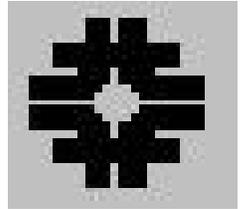
Meeting the Needs



- ◆ **netProtocol**
 - ◆ A custom internet communication protocol optimized for the exchange of CDMS data/information.
 - ◆ Supports simple WWW requests.
 - ◆ Simple and Fast
- ◆ **netServers**
- ◆ **netClients**



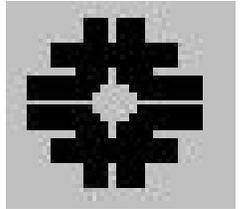
netServers and netClients



- ◆ **Java, LabView, and Matlab**
- ◆ **Unix and MacOS**
- ◆



Cost Analysis



- ◆ Point out financial benefits to the customer
- ◆ Compare cost-benefits between you and your competitors