

# **RadNet**



## **Concepts and Applications**

# RadNet Basics



- ⌘ Developed by Los Alamos National Labs in conjunction with instrument manufacturers
- ⌘ Created as a solution to distribution of real-time data from multiple instruments and multiple manufacturers
- ⌘ Provides a manufacturer-independent method for basic data collection

# What is RadNet?



- ⌘ RadNet is an open communication protocol which defines the structure of information to be communicated across a known hardware and electronic interface
- ⌘ RadNet defines the method of communication between instruments and the software which presents that information to the end user

# Radnet Does Not:



- ⌘ Define in any manner how information is displayed to the end user
- ⌘ Define what information is collected by an instrument being used in the field
- ⌘ Define any procedures for acting on information provided to the end user
- ⌘ Replace standard calibration and set-up software

# How RadNet Works

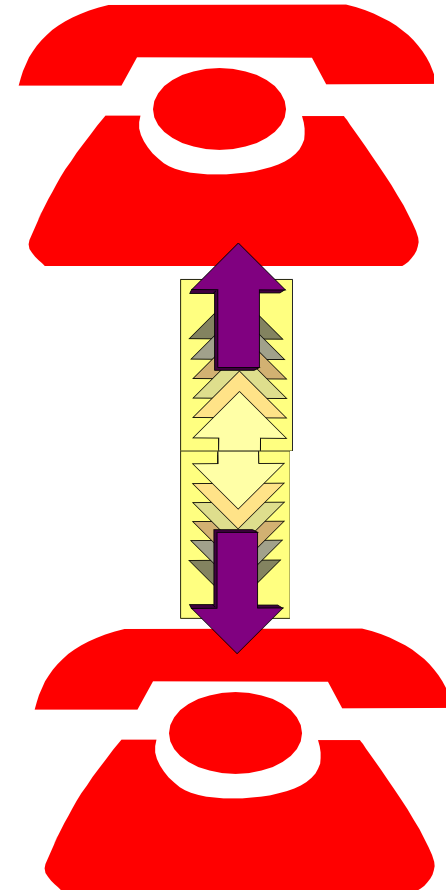


- ⌘ RadNet uses UDP (Universal Datagram Protocol) instead of TCP/IP (Transmission Control Protocol/Internet Protocol)
- ⌘ RadNet is basically uni-directional, with the exception of alarm acknowledges, source check commands and pass-through messages

# UDP

vs.

# TCP/IP

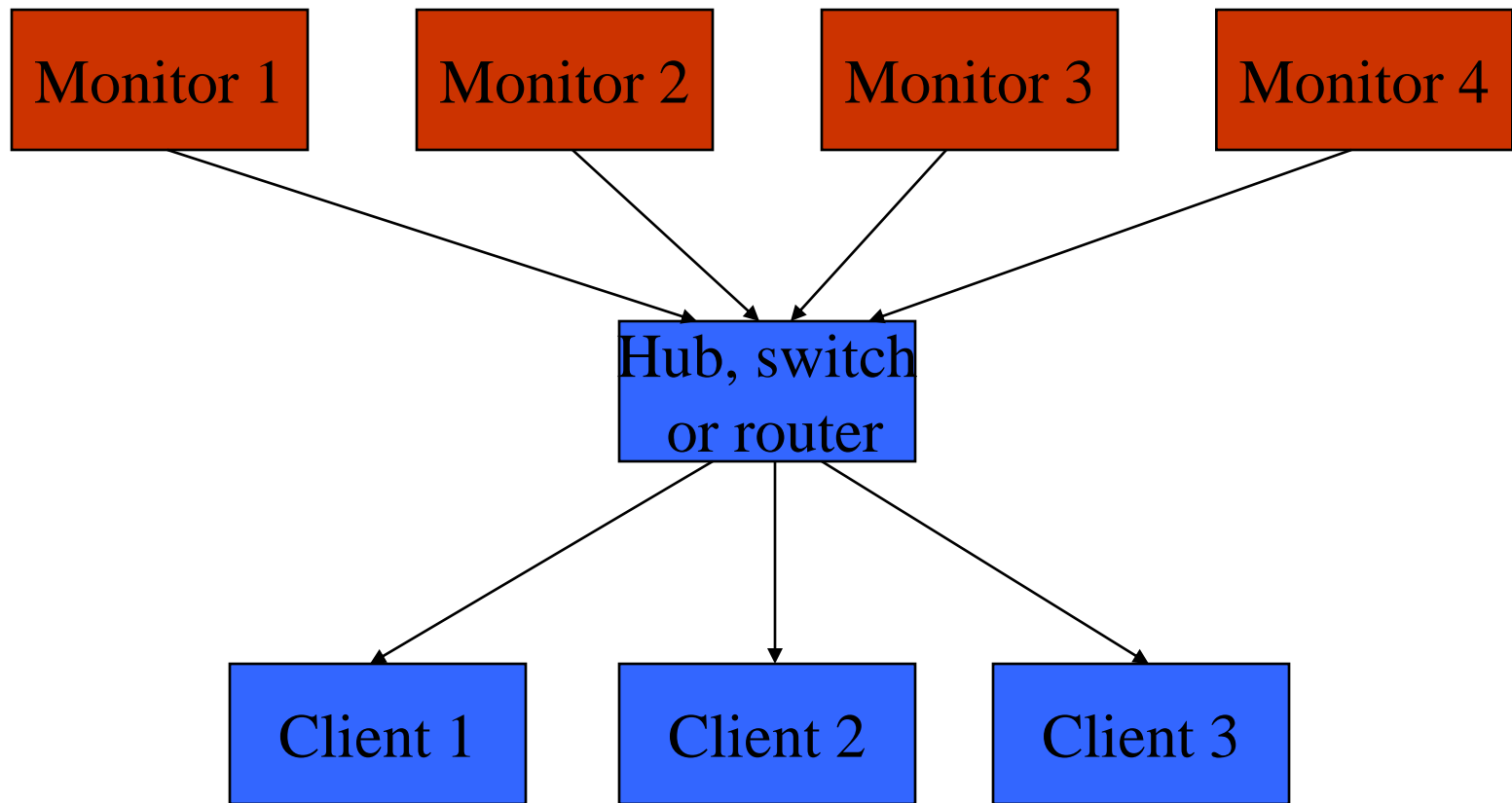


# RadNet Hardware Support



- ⌘ Designed to use the existing communication pathways of ethernet and the Internet, including wireless ethernet
- ⌘ Allows for multiple information destination points for multiple instruments through broadcast methods
- ⌘ RadNet messages are compatible with routers and switches

# A RadNet System





# Typical Radnet Messages



⌘ Status Changes

⌘ Transactions

⌘ Normal Status Data

⌘ Abnormal Status Data

⌘ Spectrum Data (Alpha CAMs only)

# Radnet Responses



- ⌘ Alarm acknowledge
- ⌘ Source check command
- ⌘ Any message implemented by manufacturer using the pass-through mode, specific to each manufacturer's version of the RadNet software

# RadNet Connection Methods



- ⌘ Direct connection to instruments that have an ethernet port
- ⌘ A serial to ethernet adapter for instruments that support RadNet protocol (hardwired or wireless)
- ⌘ A RadNet server for instruments that do not support RadNet protocol

# RadNet Direct Connections



- ⌘ Instruments which have an ethernet port built in need only broadcast the proper information on the proper port number to the desired addresses
- ⌘ The software in the instrument allows definition of all RadNet operating parameters
- ⌘ Minimal return message requirements

# Serial to Ethernet Connection



- ⌘ The instrument sends data out an RS-232 or RS-485 port as specified in the RadNet protocol and receives minimal commands
- ⌘ Data converted to ethernet connection by the interface box
- ⌘ Some RadNet parameters are in the instrument and some are in the interface box

# RadNet Servers



- ⌘ The server communicates with one or more instruments in their native language
- ⌘ The server requests the appropriate information at the necessary intervals
- ⌘ The server reformats information to comply with the RadNet protocol
- ⌘ The server provides the serial to ethernet interface

# RadNet Capabilities



- ⌘ Status logging to record instrument reliability
- ⌘ Transaction logging to record activity
- ⌘ Status change alerts via e-mail
- ⌘ Status change alerts via paging
- ⌘ Data collection via data logging if implemented

# RadNet Uses



## ⌘ Operational status paging and e-mail

- ☑ Alerts HP to alarm conditions

  - ☒ Could include user, location, etc.

- ☑ Can indicate the need for routine maintenance

- ☑ Frees up HP from constantly monitoring a single location

- ☑ Keeps multiple staff apprised of activities



# RadNet Uses



- ⌘ Hardware status paging and e-mail
  - ☑ Alerts technician to instrument failures
    - ☑ Status gives initial indication of failure mode, allowing better preparation for a repair activity
  - ☑ Promotes logging of failures at any e-mail address
  - ☑ Keeps multiple staff apprised of activities
  - ☑ Provides periodic reminders until failure is resolved

# RadNet Uses



- ⌘ Permits customization of critical data displays for each client location
  - ☑ Each user can configure for highest priority information
    - ☑ Display groups
    - ☑ Instruments logged
  - ☑ Allows each user to access backup information to diagnose current situation
  - ☑ Allows remote access of data in emergencies

# Summary



- ⌘ Multiple instruments, multiple access
- ⌘ Highly configurable
- ⌘ Uses proven ethernet/internet technology
- ⌘ Simple well defined wiring interface
- ⌘ Open protocol
- ⌘ Uniform access across all manufacturers and all instruments supporting RadNet

# More Information



⌘ LANL web site:

<http://drambuie.lanl.gov/~radnet/index.html>

⌘ Eberline RadNet Training Class