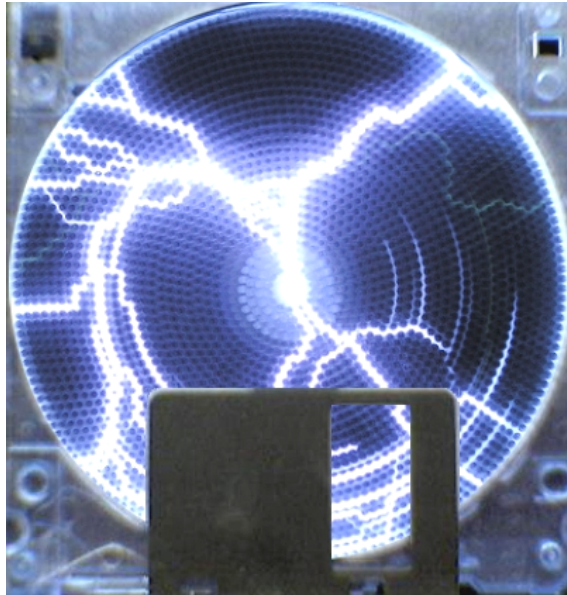


# IU Lustre WAN Update



Stephen C. Simms  
Manager, Data Capacitor Project  
[ssimms@indiana.edu](mailto:ssimms@indiana.edu)

Lustre User Group Meeting  
Sonoma, California – April 29, 2008

# The Data Capacitor Project

NSF Funded

535 Terabytes Lustre storage

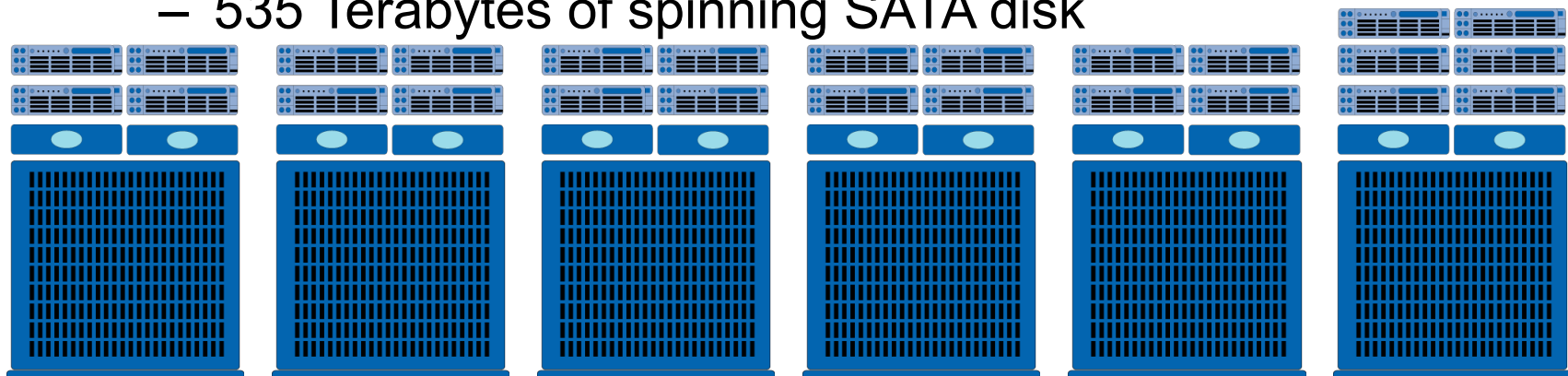
14.5 GB/s aggregate write

Short term storage



# Data Capacitor

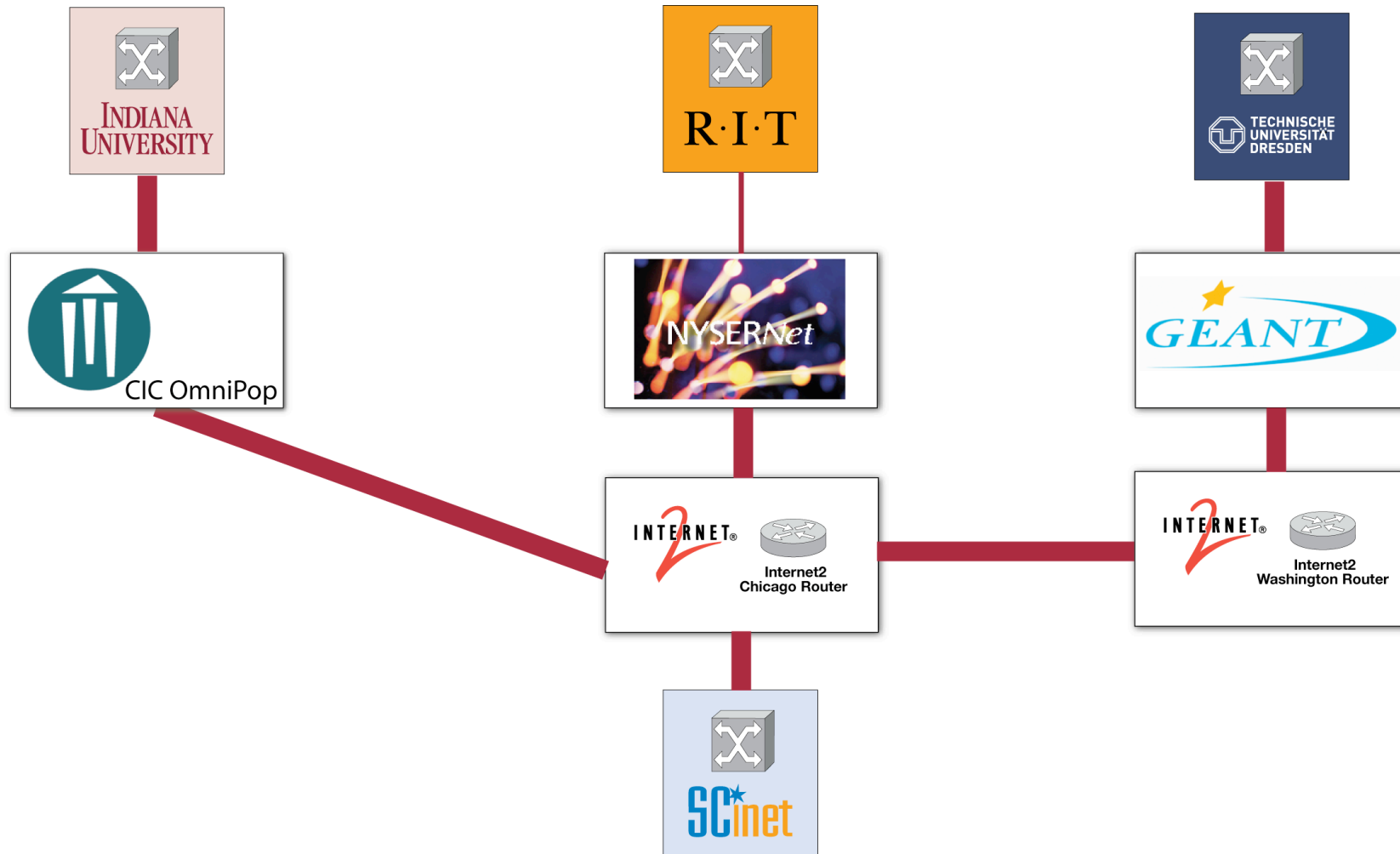
- 12 pairs Dell PowerEdge 2950
  - 2 x 3.0 GHz Dual Core Xeon
  - Myrinet 10G Ethernet
  - Dual port Qlogic 2432 HBA (4 x FC)
  - 2.6 Kernel (RHEL 4)
- 6 DDN S2A9550 Controllers
  - Over 2.4 GB/sec measured throughput each
  - 535 Terabytes of spinning SATA disk



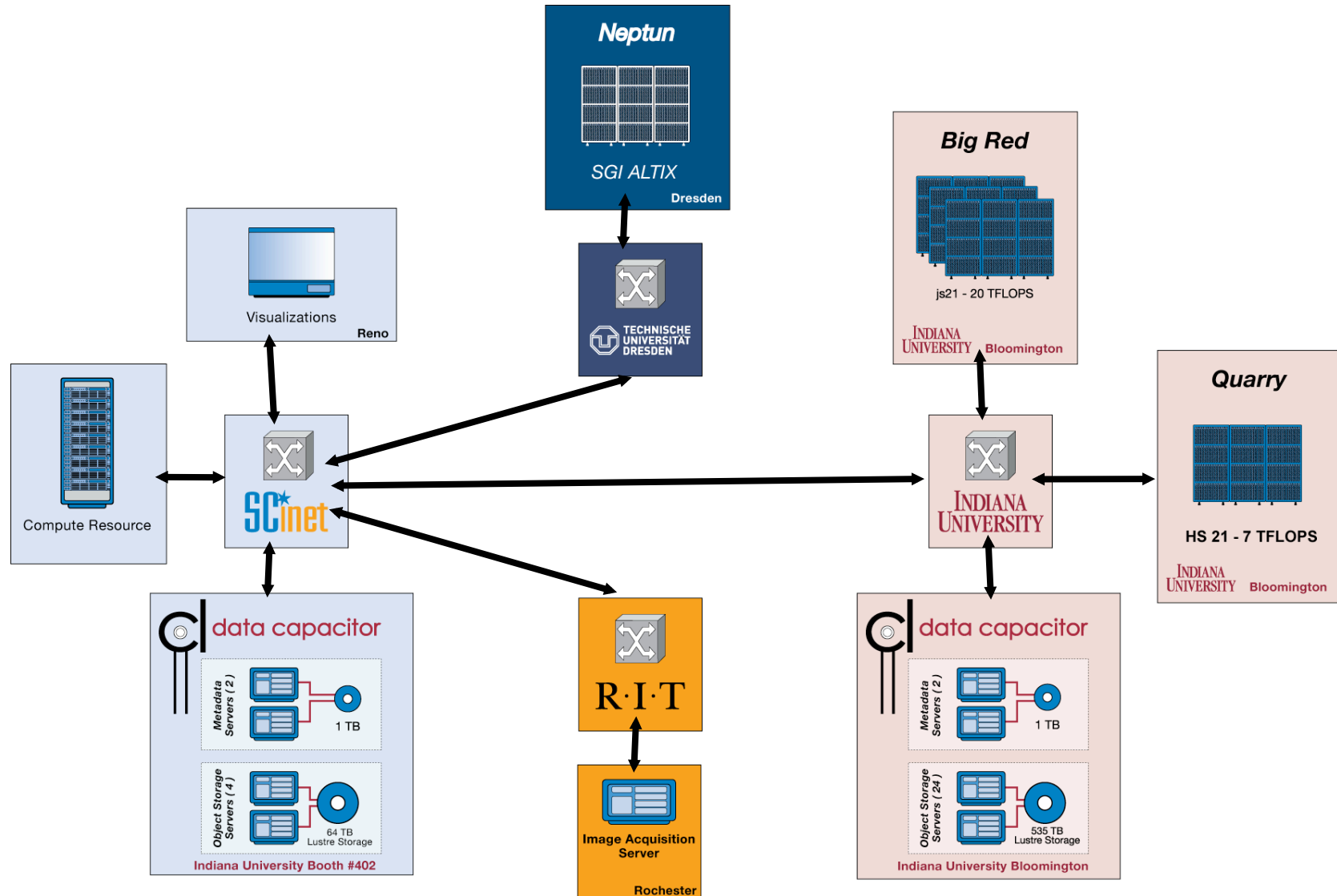
# The Challenge: Five Applications Simultaneously

- Acquisition and Visualization
  - Live Instrument Data
    - Chemistry
  - Rare Archival Material
    - Humanities
- Acquisition, Analysis, and Visualization
  - Trace Data
    - Computer Science
  - Simulation Data
    - Life Science
    - High Energy Physics

# The Network

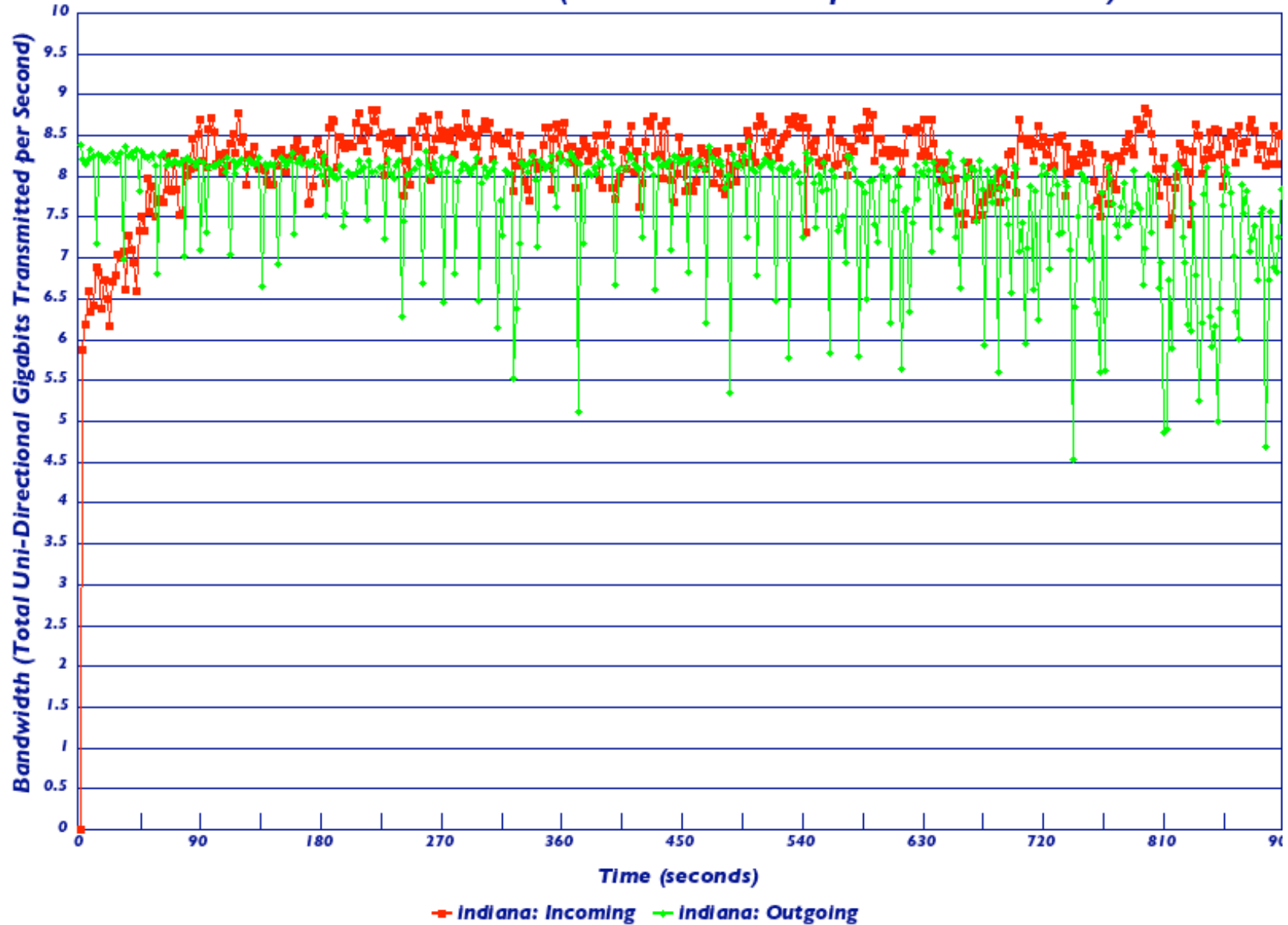


# Bandwidth Challenge Configuration



# Challenge Results

*Bandwidth Over Time (Current Max Datapoint: 18.21 Gb/sec)*



# Root Squash / UID Mapping

Lightweight

Not everyone needs / wants kerberos

Only MDS code changed

Lookup table for

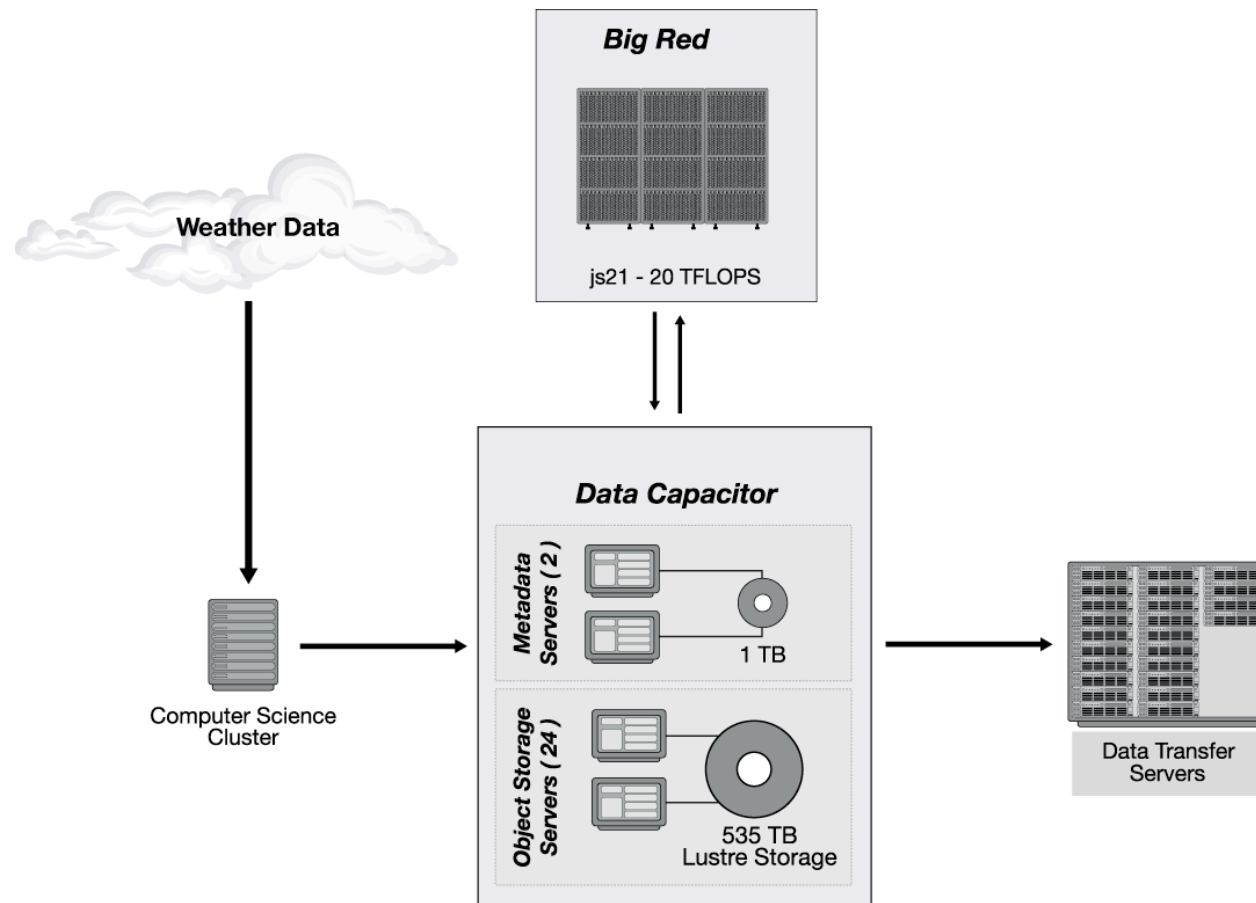
NID (range) UIDmds UIDremote

Pluggable module

Other schemes possible



# LEAD Workflow for WxChallenge at IU



# Digitization of “*Sarvamoola Granthas*”

Sarvamoola Granthas – original manuscript



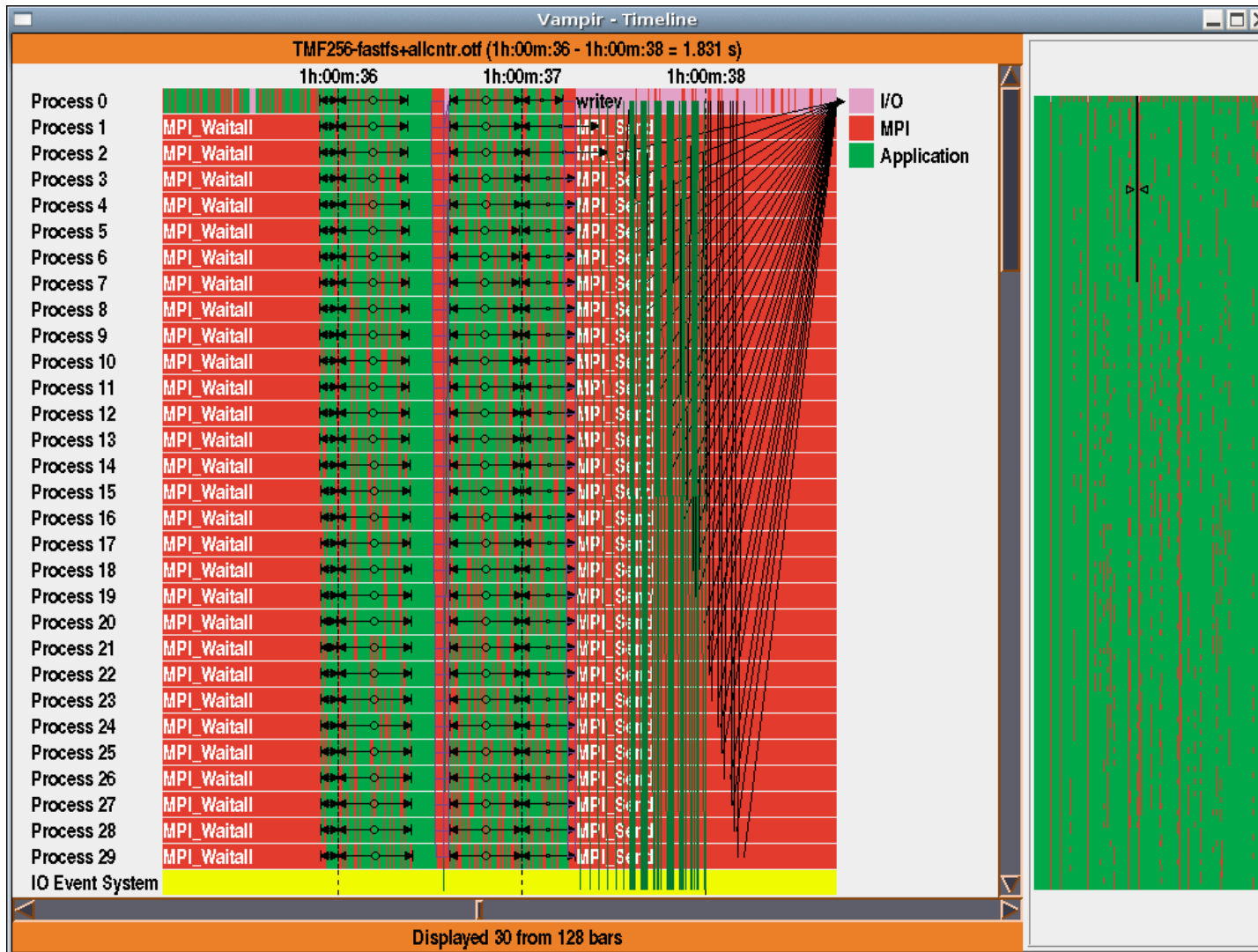
# Digitization of “*Sarvamoola Granthas*”

Post processed images of palm leaves

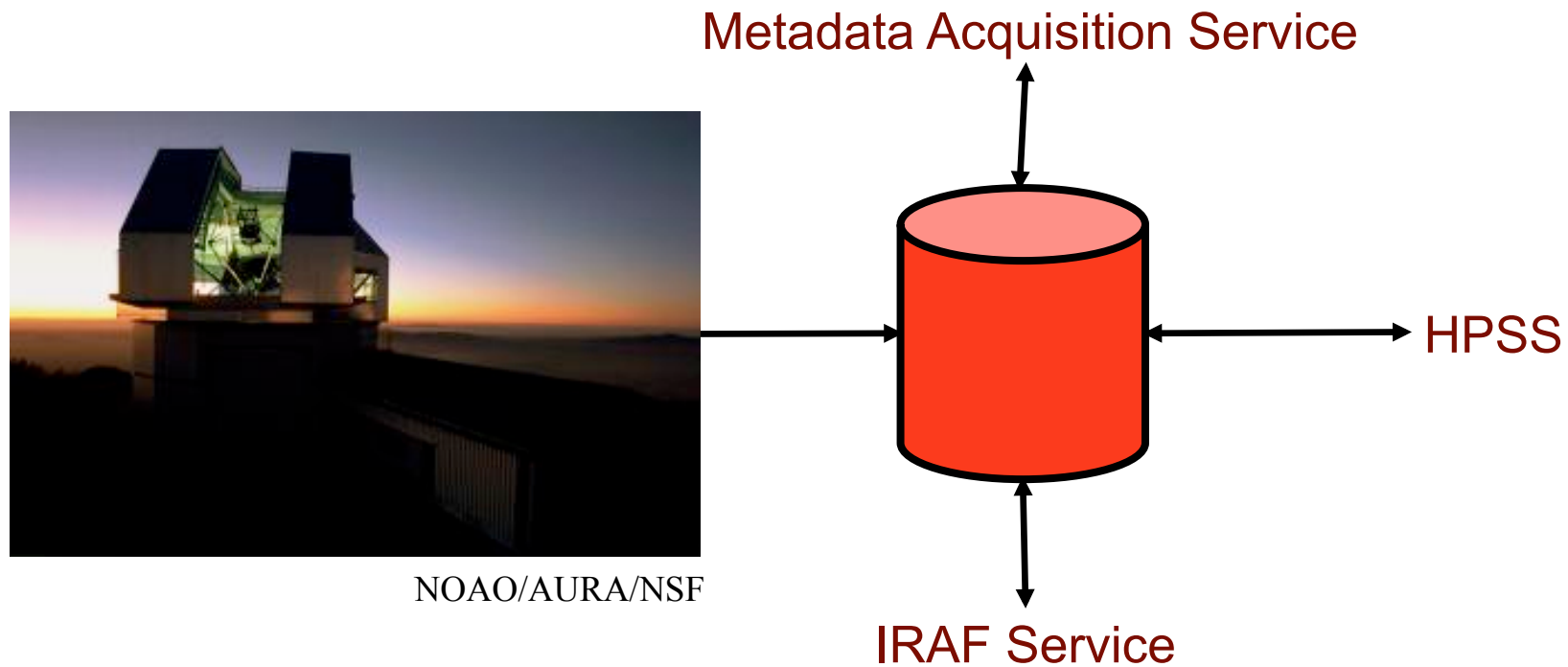


Sample images of the palm leaf of *Sarvamoola granthas*.  
Final image after contrast enhancement

# Visualizing Trace Data with Vampir Server



# WIYN Telescope at Kitt Peak



# IU's Lustre WAN service

- New Dedicated system of 360 TB
- For research collaboration
- Mounted in IU's astronomy department
- Mounted on Quarry cluster
  - All nodes in early May
- Mounted on Big Red's test nodes
- Working with NCSA to further support LEAD
- Looking for collaborators
  - [ssimms@indiana.edu](mailto:ssimms@indiana.edu)
  - [dc-team-l@indiana.edu](mailto:dc-team-l@indiana.edu)

# Many Thanks

- Bret Hammond, Josh Walgenbach, Justin Miller, George Turner, Dave Hancock, Matt Link (IU)
- Kit Westneat (DDN)
- Sun/CFS support and engineering
- Michael Kluge, Guido Juckeland , Robert Henschel, Matthias Mueller
- P. R. Mukund (RIT)
- Doug Balog and PSC
- Greg Pike and ORNL

Support for this work provided by the National Science Foundation is gratefully acknowledged and appreciated (CNS-0521433)

# Thank you!



## Questions?

<http://datacapacitor.iu.edu>