

# Quick Look on dCache Monitoring at FNAL

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# FNAL dCache systems

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- Four major dCache systems:
    - FNDCA – public dcache
      - <http://fndcam.fnal.gov/>
    - CDFDCA – CDF dCache
      - <http://cdfdca.fnal.gov/>
    - CMSDCA – USCMS T1 dCache
      - <http://cmsdcam.fnal.gov/>
    - LQCD – Lattice QCD cluster dCache
      - <http://lqcd-pm.fnal.gov/>
  - More test and development systems
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# Data Movement

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## □ CDFDCA:

- Read peaks about 30 TB/day,
- Recent record 75 TB/day

## □ CMSDCA

- Read peaks about 50 TB/day,
  - Recent record about 75 TB/day
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# Disk Space

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- USCMS T1:

  - 14 TB Resilient

  - 40 TB Read

  - 25 TB Write

  - 12 TB Eval. Read and Write pools

  - ~ 90 TB total

- See "Pool Space" plots on USCMS T1 web page.

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# Standard dCache

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- ❑ Administration interface through admin door
  - ❑ Web Collector accumulates monitoring data, embedded dcache httpd cell serves data to clients (port :2288)
  - ❑ Billing data stored in DB
  - ❑ Log files
    - Issue – file grows, needs rotation and/or 'nullifying' of the log file.
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# CGI scripts + Apache

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- ❑ FTP door writes short files with transfer status.
  - ❑ Python CGI script processes files and generates table with recent "FTP Transfers".
  - ❑ Shell script generates table for SRM Transfers
- Easy to implement
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# Tomcat Servlets : 8090

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- ❑ Data about transfers stored in Billing DB.
  - ❑ Servlets generate and display plots on “Data Movement”
    - Volume of transfers
    - Number of transfers
    - dCache internals (transaction cost).
  - ❑ Replica Manager Monitoring
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# Shell scripts

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- Access dCache status and statistics data through admin interface
  - Generate plain text or html files, located in 'known' place, user has access to files through web interface
    - Pool Directory Listings
    - Login List
    - ... more
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# Shell scripts (more)

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- Shell scripts can accumulate data by appending intermediate text files
  - Another scripts generate historical plots (html + .gif + .ps)
    - Door Logins
    - Queue size (movers, stores, restores, p2p transfers)
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# Shell scripts (WatchDogs)

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- Some shell scripts regularly poll dcache cells info through admin interface and check that dcache operates correctly. May send e-mail with warning to admin list.
    - Pool status (crashed or disabled because disk errors)
    - IP tables are up
    - Self check – watchDogs are running
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# More Shell Scripts

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- ❑ In large scale storage system low probability bit errors sift through parity checks. Script regularly recalculate CRC sums for the files in pools and reports broken files.
  - ❑ Occasional dcache audits (script run manually) to verify dcache consistency (e.g. 'cached' files are on tape).
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# Page DCache

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- ❑ Checks dcache is operational
  - ❑ Regularly performs various basic dcache operations (transfer file through different doors) and rises alarm if transfer fails.
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# Ganglia Monitoring

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- Status of the nodes in the cluster and historical data on
    - CPU usage
    - Memory
    - Networking
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# dgang

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- ❑ “rgang” is FNAL tool to perform distributed operations in cluster (e.g. distribute script, execute, collect output)
  - ❑ “dgang” is dcache oriented wrapper for rgang.
  - ❑ Knows about dcache cluster configuration
  - ❑ Simplify distributed administration:  
Execute *abc* command on all pool nodes.
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