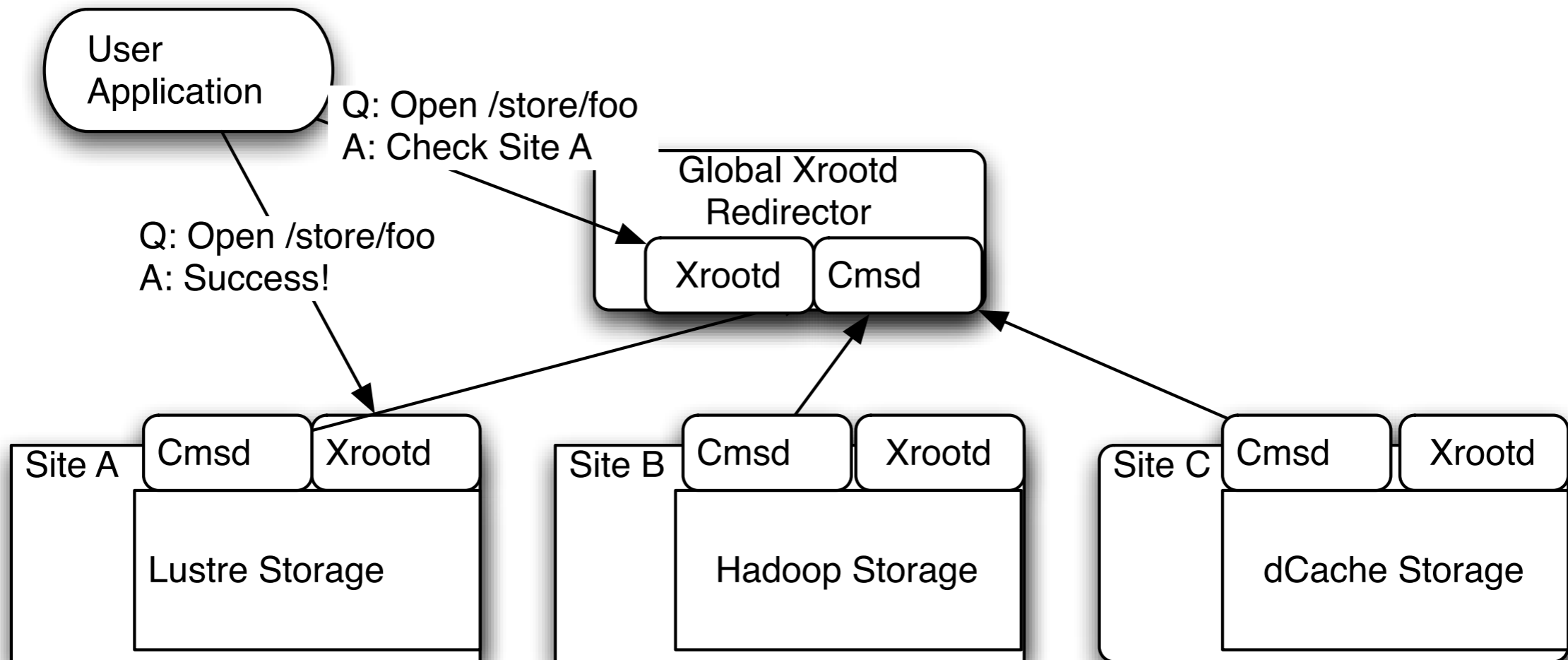# Hands-on with the CMS Xrootd System

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This is not a presentation

- This is a hands-on activity.

- It's much more engaging if you follow along.

A Reminder

User Application

Q: Open /store/foo
A: Check Site A

Q: Open /store/foo
A: Success!

Global Xrootd Redirector
Xrootd | Cmsd

Site A
Cmsd | Xrootd
Lustre Storage

Site B
Cmsd | Xrootd
Hadoop Storage

Site C
Cmsd | Xrootd
dCache Storage

Environment Setup

- To use Xrootd, you need:

  - "Grid setup". Proxy and CA certs

  - Client software. Comes with CMSSW.

  - Basic connection details.

Basic Setup

- On lxplus:

  - source /afs/cern.ch/cms/cmsset_default.sh

  - source /afs/cern.ch/cms/LCG/LCG-2/UI/ cms_ui_env.sh

- voms-proxy-init --voms cms:/cms

Connection Details

- For CMS file $LFN, you can open it in xrootd using:

  - root://xrootd.unl.edu/$LFN

- For today, we'll use:

  - /store/relval/CMSSW_5_2_0_pre5/Electron/RECO/GR_R_52_V2_RelVal_electron2010B-v1/0000/28794D48-7A57-E111-98FB-002618FDA248.root

  - Available at FNAL, but nowhere else.

What To Do?

- A few example use cases:

  - Download a complete file.

  - Call xrootd directly from CMSSW/ROOT.

  - Integrate Xrootd into your site's setup.

Download a Complete File

- The download utility is called "xrdcp":

    - xrdcp root://xrootd.unl.edu//store/relval/CMSSW_5_2_0_pre5/Electron/RECO/GR_R_52_V2_RelVal_electron2010B-v1/0000/28794D48-7A57-E111-98FB-002618FDA248.root /dev/null

- Play with the "-x" and "-d" flags.

Call Xrootd directly from CMSSW

- Download the sample python config from the Indico page.

- Setup a CMSSW working area:

  - cmsrel CMSSW_5_2_0

  - cd CMSSW_5_2_0

  - cmsenv

  - vim xrootd_sample.py

- Run the example: cmsRun xrootd_sample.py

- Try opening the file with ROOT also.

Integrate with your Site

- Your site's CMSSW configuration can automatically switch to xrootd for files not at your site.

  - You need to edit *site-local-config.xml* to have a second event-data source.

  - You need to edit *storage.xml* to point at the xrootd.unl.edu redirector.

- See the sample files attached to .

Integrate with your Site

- After changing your XML files, re-run the xrootd_sample.py.

  - However, first, remove the root://... prefix from the InputFiles.

  - Just have the "normal" /store/relval/...

More Reading

- https://twiki.cern.ch/twiki/bin/view/Main/CmsXrootdArchitecture