Frontier @ CDF

Petar Maksimovic, for the Frontier team:

Lee Lueking, Jim Kowalkowski, Marc Paterno, Sergey Kosyakov, Steve White, Dennis Box (CD)
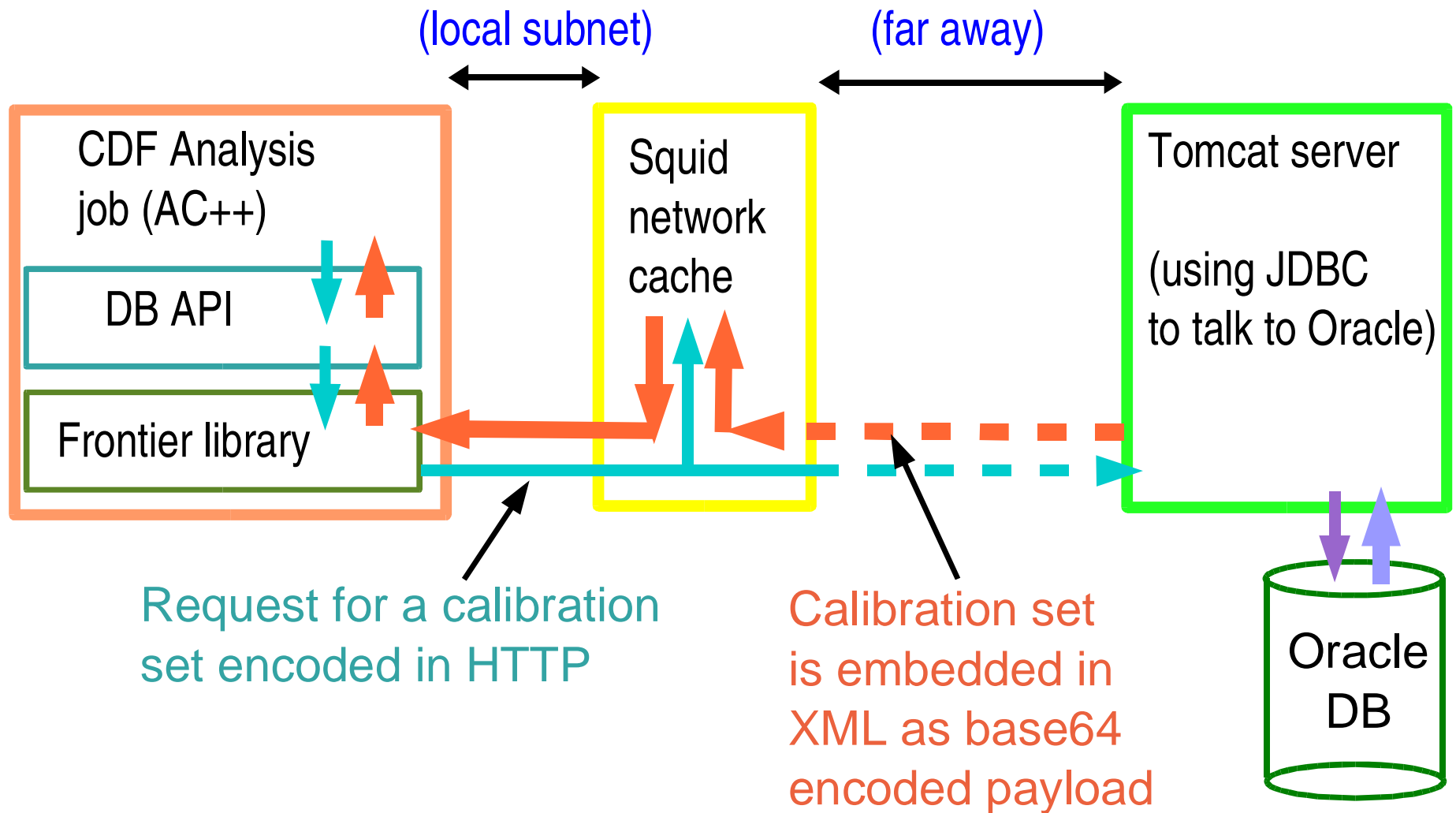
Barry Blumenfeld, Mark Mathis, P.M. (JHU)

- Why Frontier?

- What is Frontier?

- Frontier is not bad for you

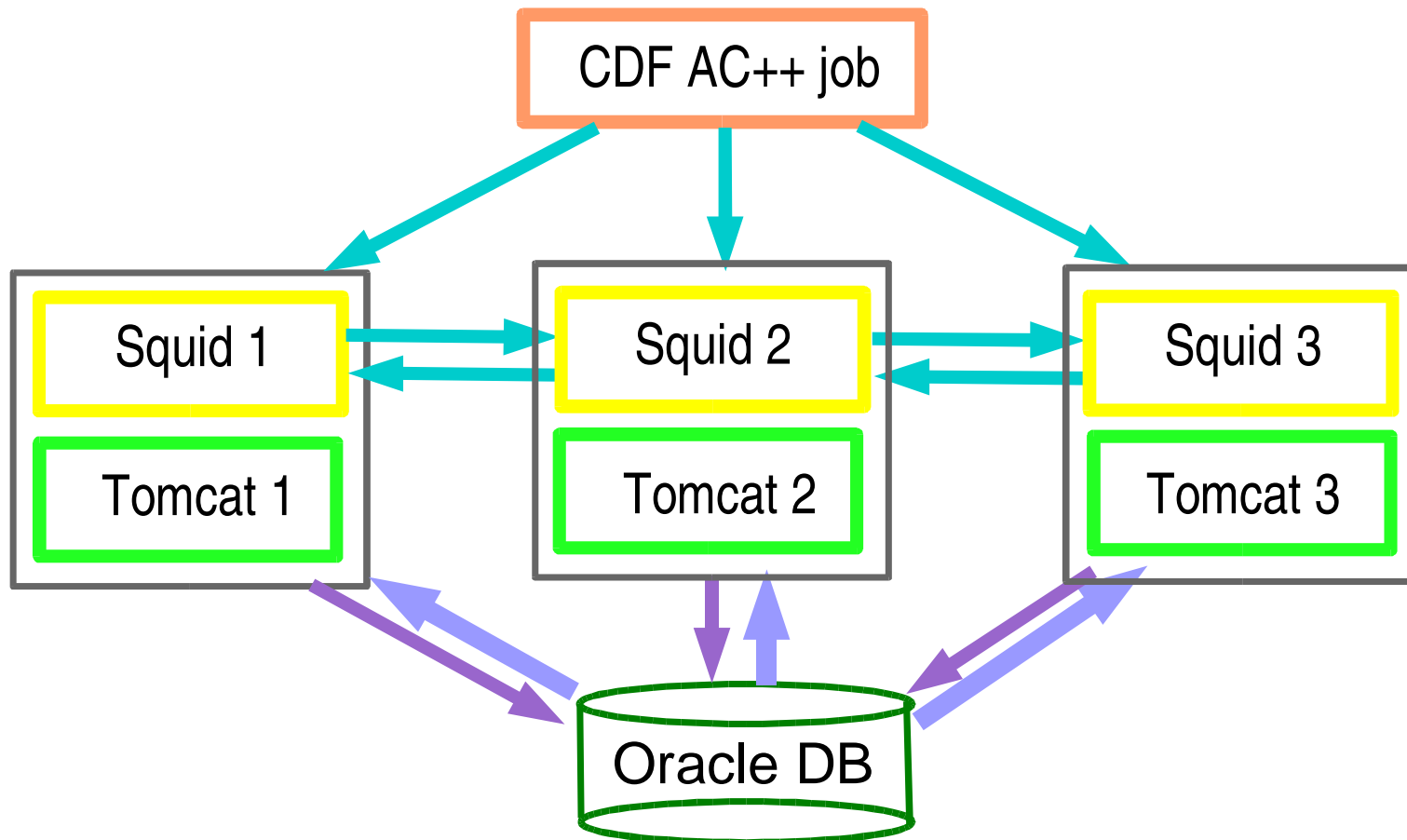- Frontier, in fact, may be good for your jobs

Why Frontier?

- Prehistory: CDF used "secondary sourcing" in Run1

    ("secondary sourcing" = keeping a local copy of DB constants on remote machines)

- D0 does it too ("DAN", written in Python)

    – D0's Oracle DB never gets overloaded by calibration queries

- Recent history: used to have DB overloads

- Present: so much CPU power in DCAFs!

What is Frontier?

(local subnet)   (far away)

CDF Analysis job (AC++)

DB API

Frontier library

Squid network cache

Tomcat server

(using JDBC to talk to Oracle)

Oracle DB

Request for a calibration set encoded in HTTP

Calibration set is embedded in XML as base64 encoded payload

Frontier servers at Fermilab

- "The Launchpad":
  - cdfdbfrontierN.fnal.gov, N=1,2,3

Frontier is not bad for you

- Extensively validated

- Calibrations frontierized since 5.3.4 – used in B group's MC production for ~ 1.5 years

- Everything else frontierized since 6.1.1, last bug fixed in 6.1.3

  - including a bug-fix in Oracle back-end!

- MC tarball exes validated in 6.1.3

- Turned on by default in MC tarball in 6.1.4!
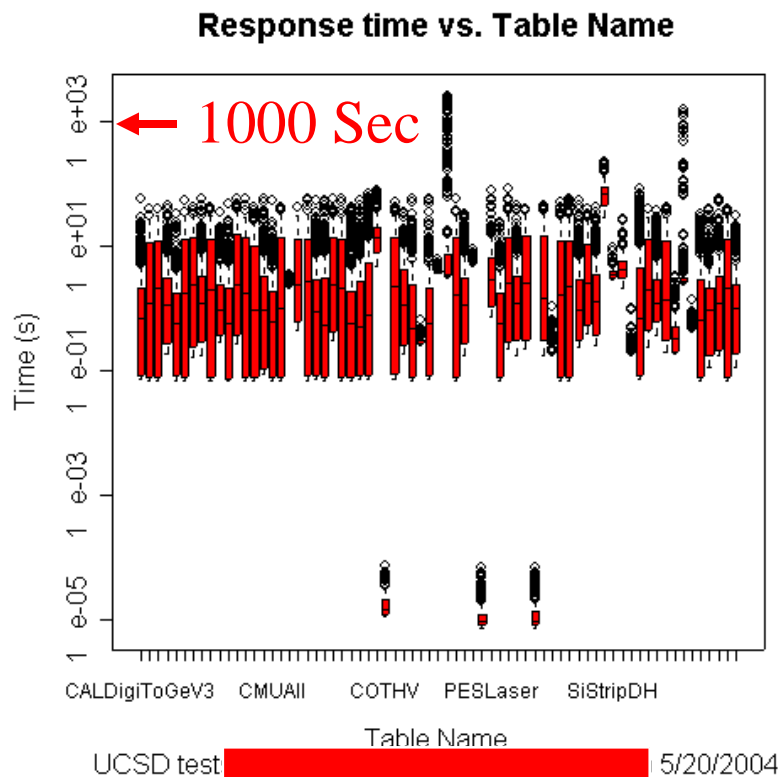
Frontier's knobs

setenv the following variables:

- `USE_FRONTIER=1`

  – to build the back end libs (default)

- `LINK_FRONTIER=1`

  – to link a Frontierized exe (default)

- `CALIB_USE_FRONTIER=1`   (since 6.1.4)

  – to turn Frontier ON (NOT the default in cdfsoft2)

  – turned ON only in MC tarball!

  – use Production/setup_calibration.tcl
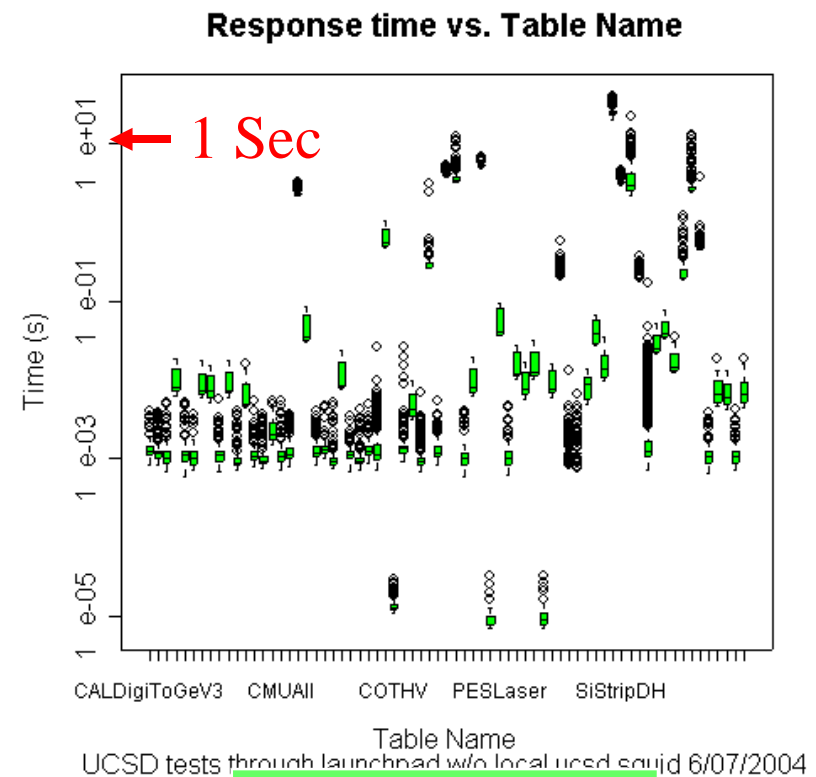
Other Frontier env.variables

- Servers: `FRONTIER_SERVER[1-3]`
  - `FRONTIER_SERVER1=`
  - `http://cdfdbfrontier.fnal.gov:8000/Frontier`

- Proxies: `FRONTIER_PROXY[1-3]`

  - `FRONTIER_PROXY1=` (defined by DCAF admins!)

- Optional: - Log level: `FRONTIER_LOG_LEVEL`

  - - Log file: `FRONTIER_LOG_FILE`

What can Frontier do for you?

- For small objects (beamlines!) improvement up to ~ 1000 times!

Response time vs. Table Name

1000 Sec

UCSD test... 5/20/2004

No Caching

Response time vs. Table Name

1 Sec

UCSD tests through launchpad w/o local ucsd squid 6/07/2004

Caching at SDSC Squid

What can Frontier do for you (2)

- Karlsruhe test job running on stripped data (lots of beginRuns)
  - using Oracle   ~ 18 hrs
  - using Frontier   ~ 11 hrs

- for similar jobs, effectively improves CDF's offline computing by > 60%

- immune to Oracle bottlenecks & overloads

- bypassing Oracle limits!

Frontier is in your (LHC) future

- it's a POOL plugin – used by all LHC experiments

- CMS timing for ECAL calibrations (1.6 MB):

Access Times (seconds)

Site Name	Frontier @CERN	Squid @CERN	Squid @site
Bari	29.7	22.5	NA
CERN	7.7	3.3	-
CIEMAT	11.0	11.0	0.13
DESY	8.8	7.0	NA
FNAL	47.2	54.9	0.13
IN2P3	NA	NA	NA
PIC	16.0	16.0	0.14
Purdue	23.2	22.6	0.19
RAL	8.9	5.7	0.96
UCSD	89.7	81.5	NA

Transfer Rates (kB/sec)

Site Name	Frontier @CERN	Squid @CERN	Squid @site
Bari	362	478	NA
CERN	1393	3302	-
CIEMAT	940	940	80460
DESY	1228	1534	NA
FNAL	228	196	82795
IN2P3	NA	NA	NA
PIC	671	670	75842
Purdue	465	476	57610
RAL	1200	1887	11273
UCSD	120	132	NA

Frontier Navigation

- Documentation:

  http://lynx.fnal.gov/ntier-wiki/CdfFrontierUserGuide

- Monitoring:

  http://fcdfcaf325.fnal.gov:8888/

- Notifications to all users are sent to:

  cdffrontier-users@fnal.gov

- Problems? Questions? Ask the experts:

  cdffrontier-support@fnal.gov

Welcome to the new Frontier!

- Frontier is cute, safe, fast

- Linked into all exes by default
  (but not turned on)

- Turned on by default in MC tarball

  NB: 6.1.4 MC is identical to 6.1.3 (no changes to the code, only tcl cleanup/customization!)