

FroNTier at BNL

Implementation and testing of
FroNTier database caching and
data distribution

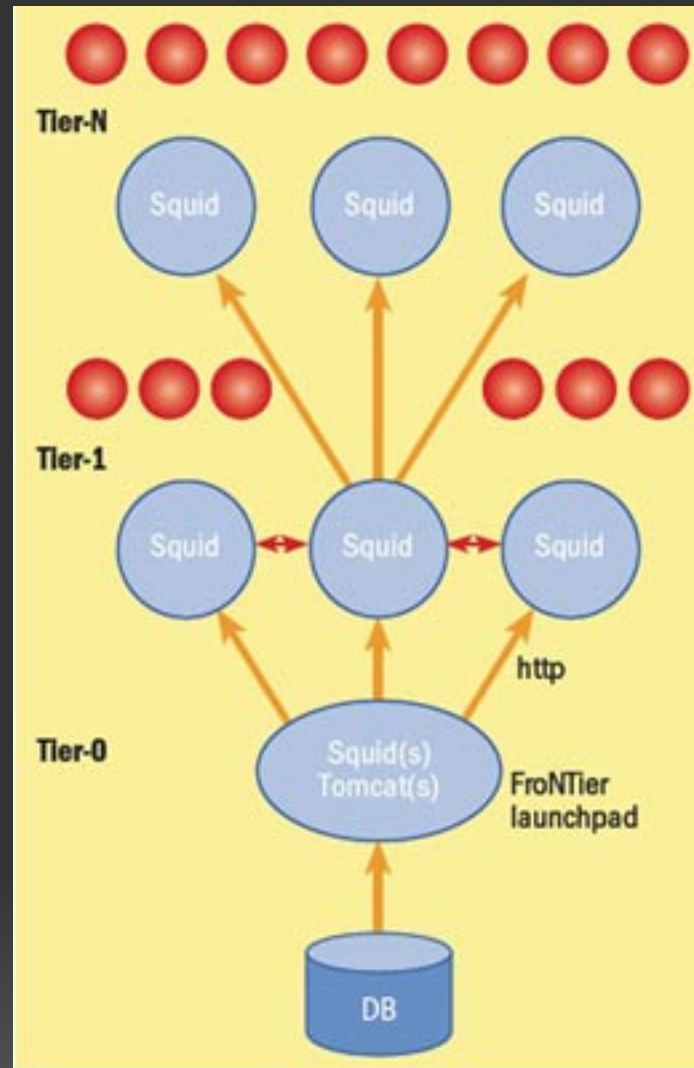
John DeStefano, Carlos Fernando Gamboa, Dantong Yu
Grid Middleware Group
RHIC/ATLAS Computing Facility
Brookhaven National Laboratory
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What is FroNTier?

A distribution system for centralized databases

- Web service provides read access to database
- Supports *N-Tier* data distribution layers
- Developed by Fermilab for CDF data
- Adapted by CMS at CERN
- Used for distributing conditions data

FroNTier architecture



CMS: FroNTier server with tiered Squids to cache database data

Image source: CERN Courier, <http://cerncourier.com/cws/article/cnl/27615>

FroNTier prerequisites and components

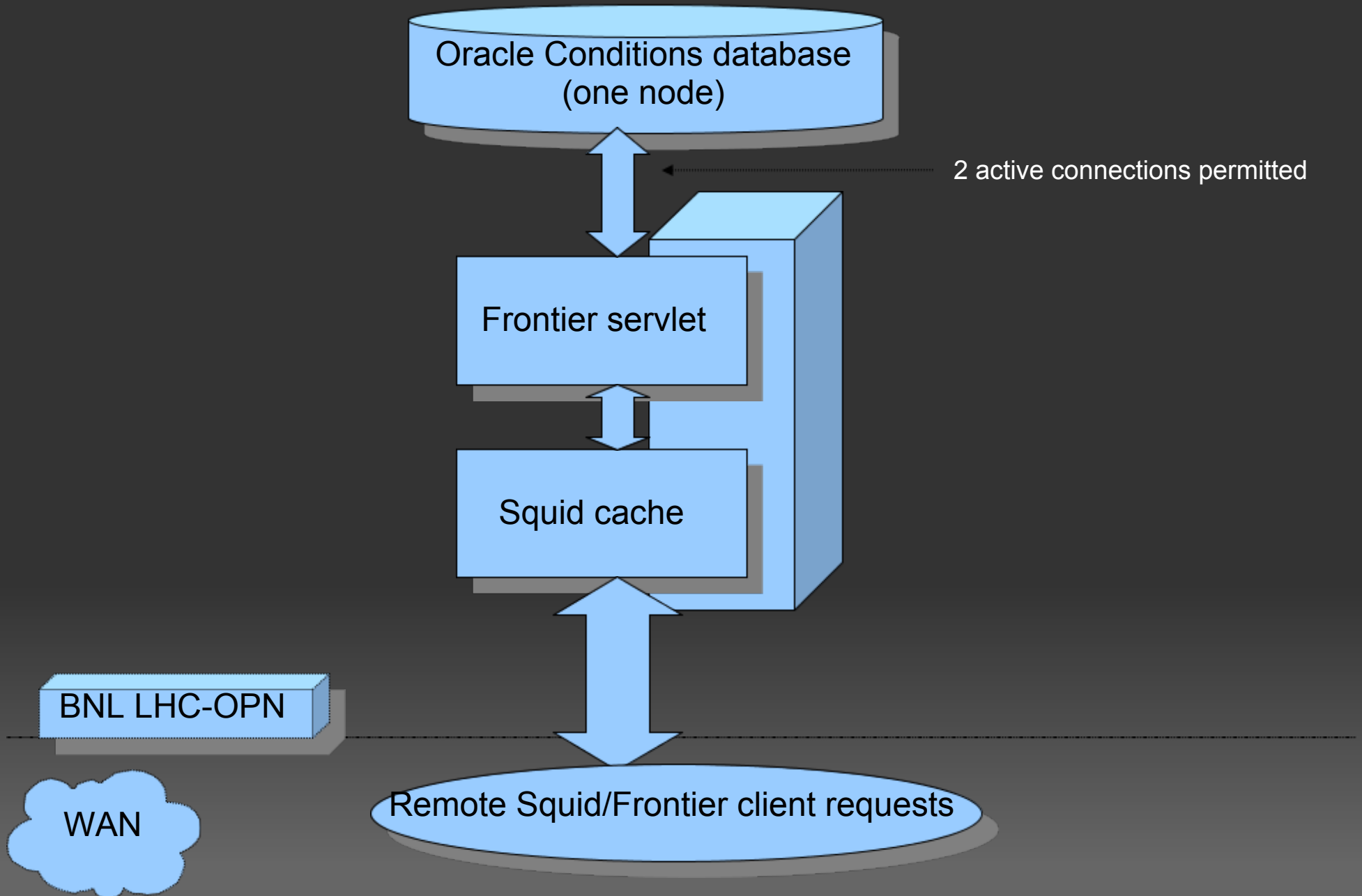
FroNTier:

- Java
- Tomcat
- Ant
- Xerxes XML parser
- Oracle JDBC driver libraries
- FroNTier servlet

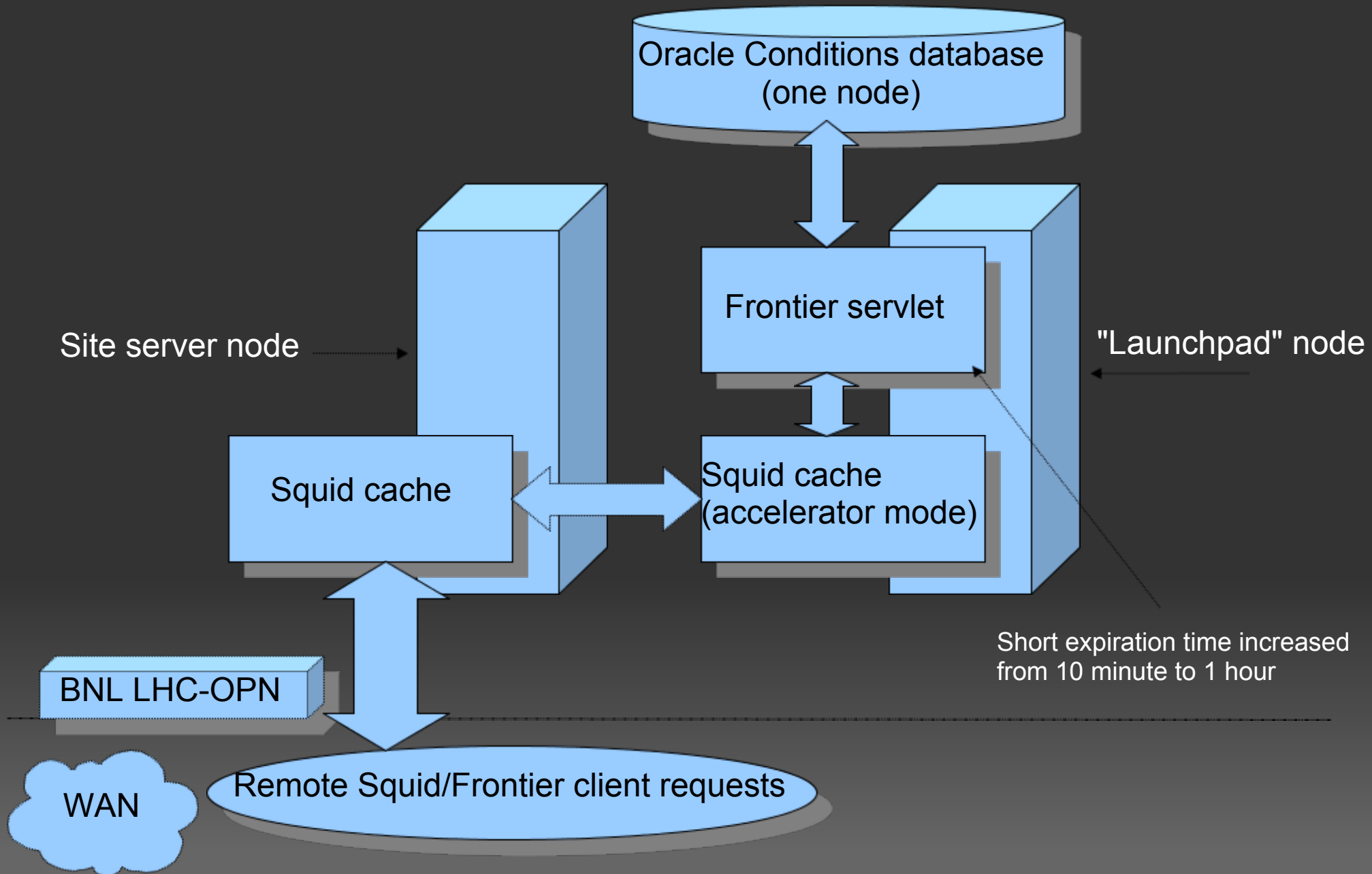
Cache:

- Squid
- Custom shared object libraries
- HW prereqs/recommendations: 100+ GB, 2+ GB, 64-bit

Initial test bed: single node



Initial test bed: two nodes

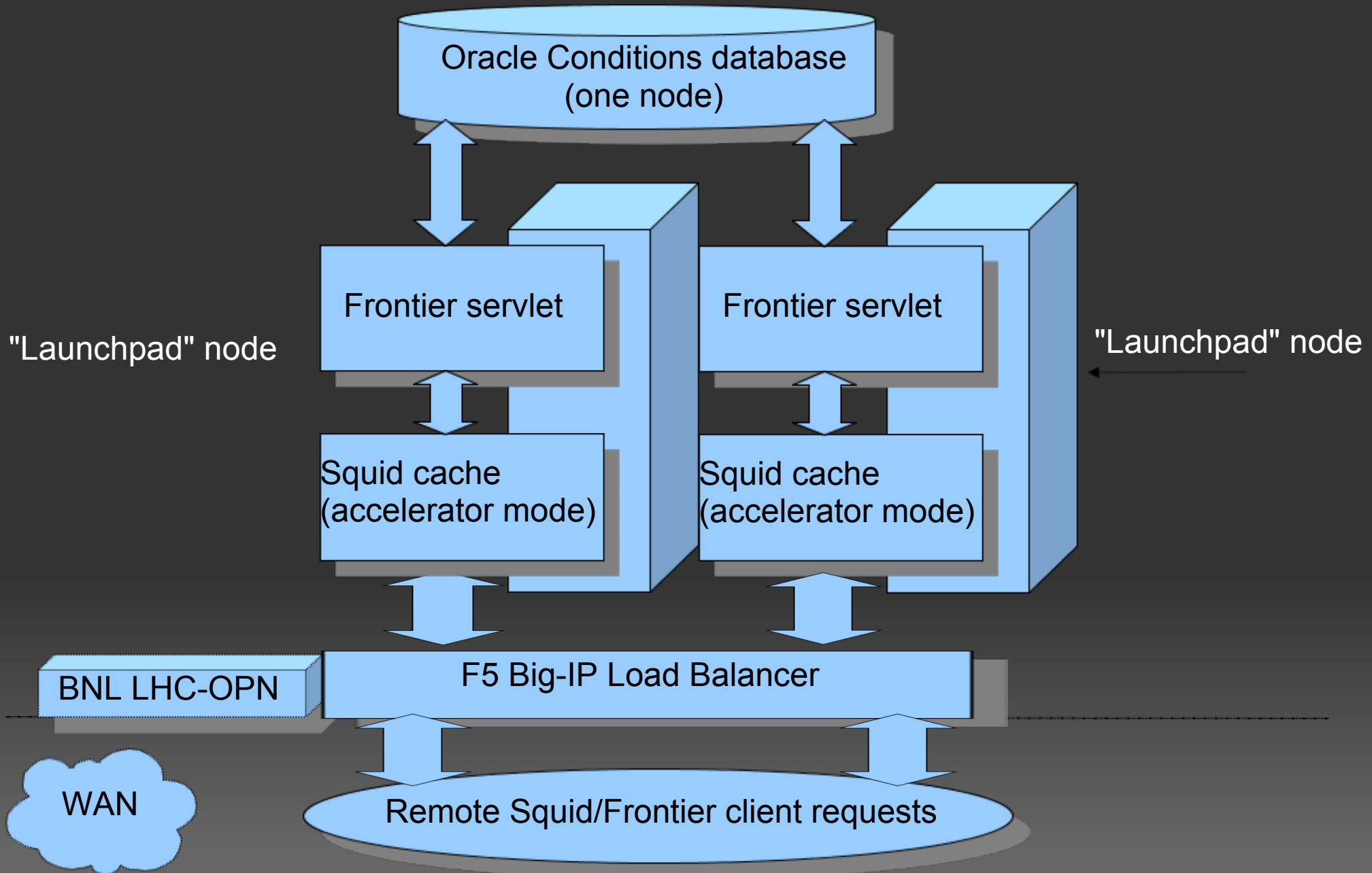


AGLT2 Results:

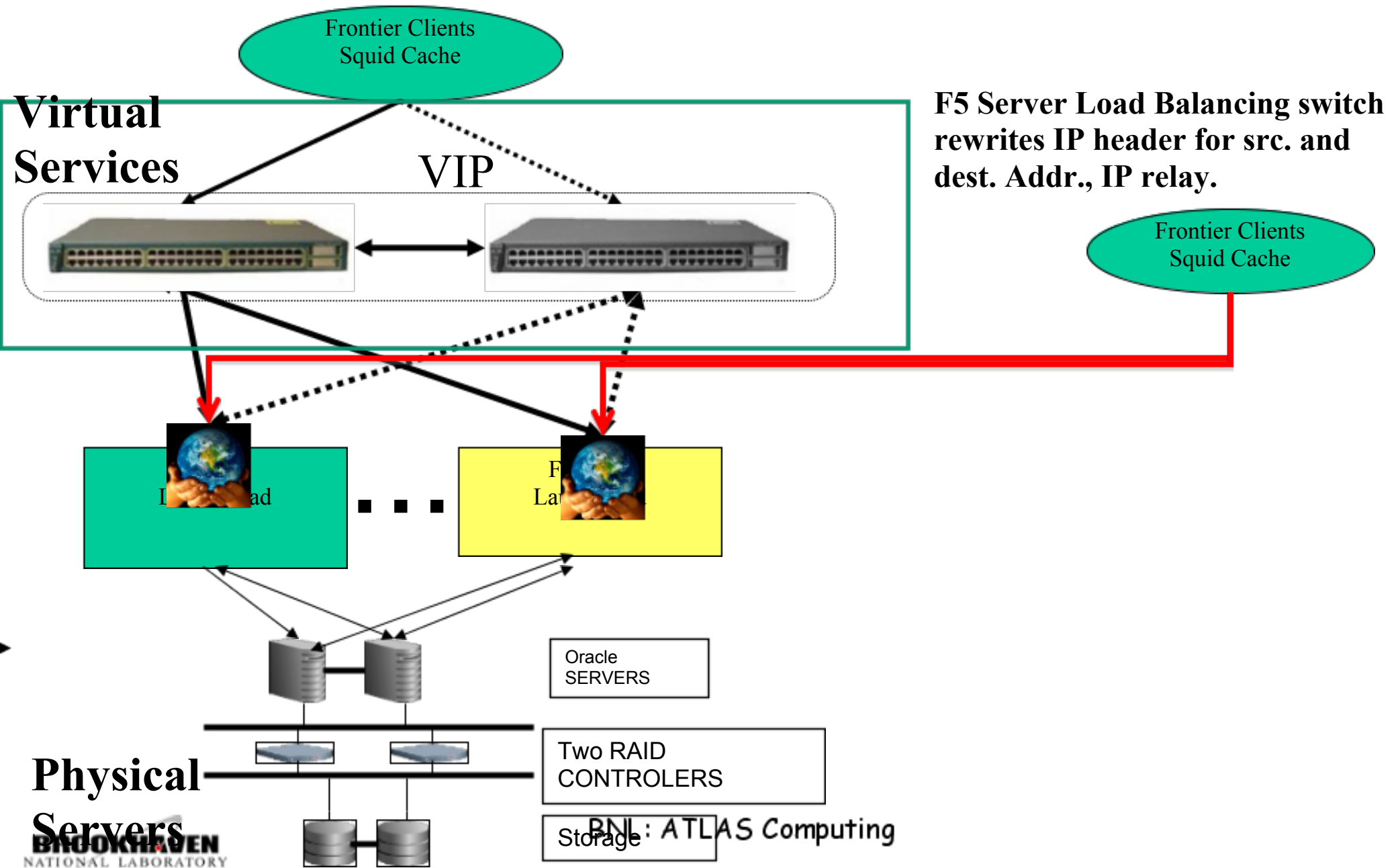
Dual-node configuration

- Feb. 27 - March 2, muon reconstruction, 3 cosmic data (89507, 91060 and 91639) used:
 - 20266 cosmic data jobs, 600 maximum job submission rate from UofM
 - 83 crashes (all from 91060 data)
 - 11115 cosmic data jobs, 738 maximum job submission rate from UofM
 - 35 crashes
 - 37626 cosmic data jobs, 738 maximum job submission rate from UofM
 - 82 crashes; test terminated by Squid log size crash
 - Network glitches *may* have contributed to results

Current test bed configuration



Reliable/High Performance Frontier Services



Future plans

- Additional scalability tests for Reconstruction and Analysis jobs
- Additional cache nodes
- Implement Oracle/Frontier triggers to guarantee cache freshness and coherency, based on Oracle data modification time (Dave Dykstra at Fermi, Tier 0 DBAs at CERN)

References and resources

- CERN Frontier site
<http://frontier.cern.ch/>
- CERN CMS TWiki: Squid for CMS
<https://twiki.cern.ch/twiki/bin/view/CMS/SquidForCMS>
- US ATLAS Admins TWiki: Tier 2 Frontier configuration
<https://www.usatlas.bnl.gov/twiki/bin/view/Admins/SquidT2>
- RACF Frontier at BNL:
<https://www.racf.bnl.gov/docs/services/frontier>
- BNL Frontier Mailing List:
<https://lists.bnl.gov/pipermail/racf-frontier-l>

Acknowledgments

- RACF GCE
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Wei Yang, Douglas Smith
- Fermilab
Dave Dykstra
- TRIUMF
Rod Walker