Xrootd Deployment and Operations

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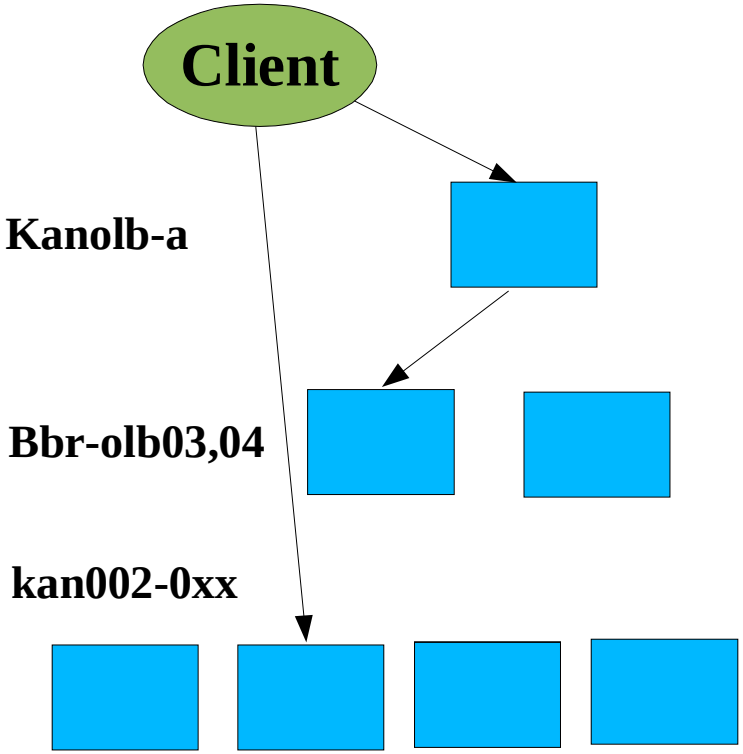
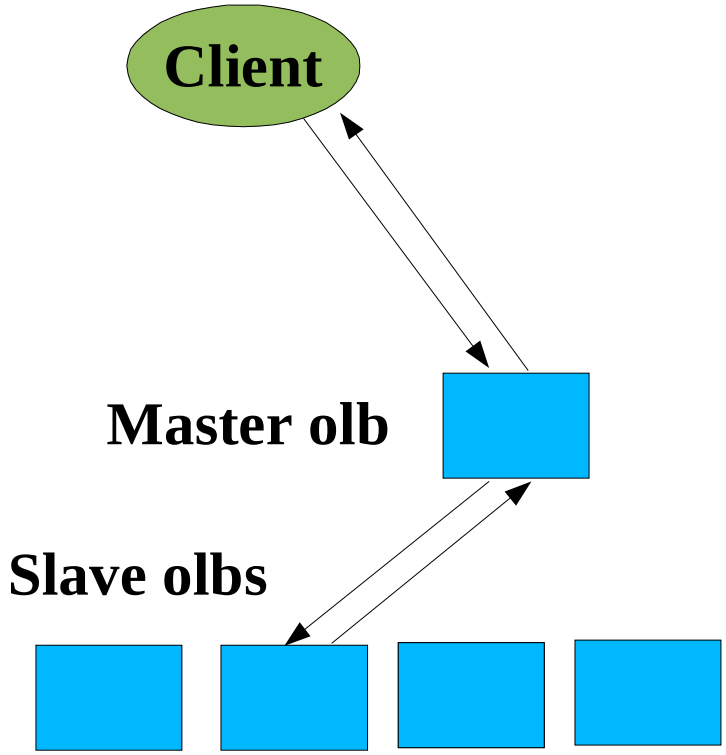
- **Our setup**
- **Xrootd/olb Administration use cases**
- **Data Management use cases**
- **Data Distribution**
- **Monitoring**

Xrootd/olb Use



- Now: 10 servers = 50 TB
- Soon: 20 servers = 100 TB
- Future: +25 servers/75 TB after Objectivity Event Store phase out.
- 2 Master load balancers
- At SLAC, we limit xrootd use for readonly data
- 20 TB of production data, rapidly growing

Second life of Xrootd/olb (XTNetAdmin)



- **File location**
- **Client: Where is file?**
- **Master olb: Slave2, ...**
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- **File placement**
- **Client: Where to put a file?**
- **Master olb: Slave3.**

Xrootd/olb Administration

- **Distributed enviroment**
  - **Many servers, many Terabytes**
  - **All new apps, except for cache fs/mass storage**
- **Need as much automation as possible**
  - **More reliable**
  - **Reduces manpower**
  - **Helps in debugging too**
- **Essentially should have data access enviroment, that integrates data management, monitoring and administration**
- **Some features are fully developed(+), some in the line(~)**
  - **Deployment slips due to slow client side dev (XTNetAdmin)**

Xrootd/olb Administration Use Cases

- **Should avoid restarting Xrootd (true that it's fault tolerant, but still...)**
  - **Dump/Load config parameters remotely(~)**
  - **Turn debugging remotely(~)**
  - **Refresh file table for single file(+)**
  - **Add/remove a server from slave pool(+)**
- **Shut down server remotely(~)**
  - **Pause server for specified period or for indefinite time(~)**
- **Scheduled restart (~)**

Xrootd/olb Administration Use cases (monitoring)

- **Get a server state/monitoring/debug info remotely**
  - **How many clients, open files, load, memory, etc(+)**
  - **Read a log file remotely(-)**
  - **Should be able to pass logging info to some monitoring server or application to further processing(+)**
- **Monitoring Application should read its logging stream and:**
  - **Correlate failures**
  - **Report on hardware failures (fs), slow I/O**
  - **Mass Storage failures**
  - **Should “turn off” problematic host, i.e. avoid dispatching clients to it.**

Xrootd/olb Data Management

- **50 servers, 150 TB, ~1 M files**
- **Cache FS:**
  - **Dynamic staging/purging**
  - **Staging/migration queues with different priorities**
  - **Async operations with message notifications**
  - **Supports pinning of files**
  - **Transparent mass storage ops (i.e. Rename)**
- **HPSS: very difficult to manipulate on a low level for efficient data retieval.**

Xrootd/olb Data Management Use Case

- **Admin file operations (to perform remotely)**
  - **Locate file in slave pool, get file attributes (+)**
  - **Locate file in mass storage system(+)**
  - **Stage/restage files(+)**
  - **Relocate/replicate files(~)**
  - **Migrate, remove, pin files(~)**
- **In general: provide complete interface to file cache and mass storage system. Not yet clear if all this should be done within xrootd...**
- **Perform selected operation on all copies of a file(+)**
- **Need to group and combine operations(~)**
- **Long operations should be async(+)**

Xrootd/olb – Admin friendly tool

- **Much better than we have with Objectivity**
  - **Requires <0.5FTE for support.**
- **Many new usefull features for administration, data management.**
  - **XTNetAdmin interface for calls other than serving data**
- **Integrated monitoring**
  - **Ganglia back end (adapted for BaBar by Yemi Adesanya)**
- **Thanks to developers!**