The Handle Turns Itself...

Adventures In Account Management

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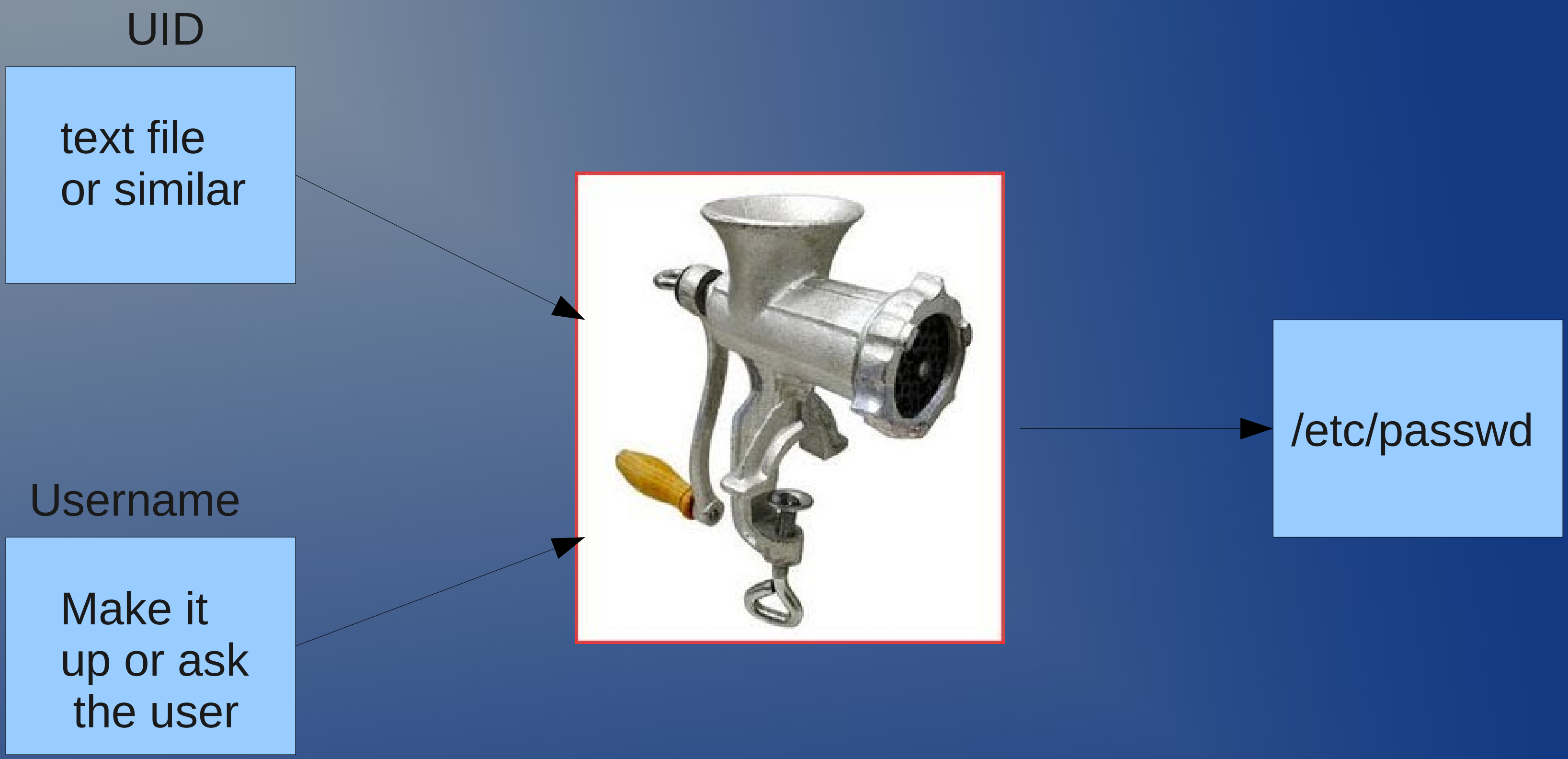
The Good Old Days



UID

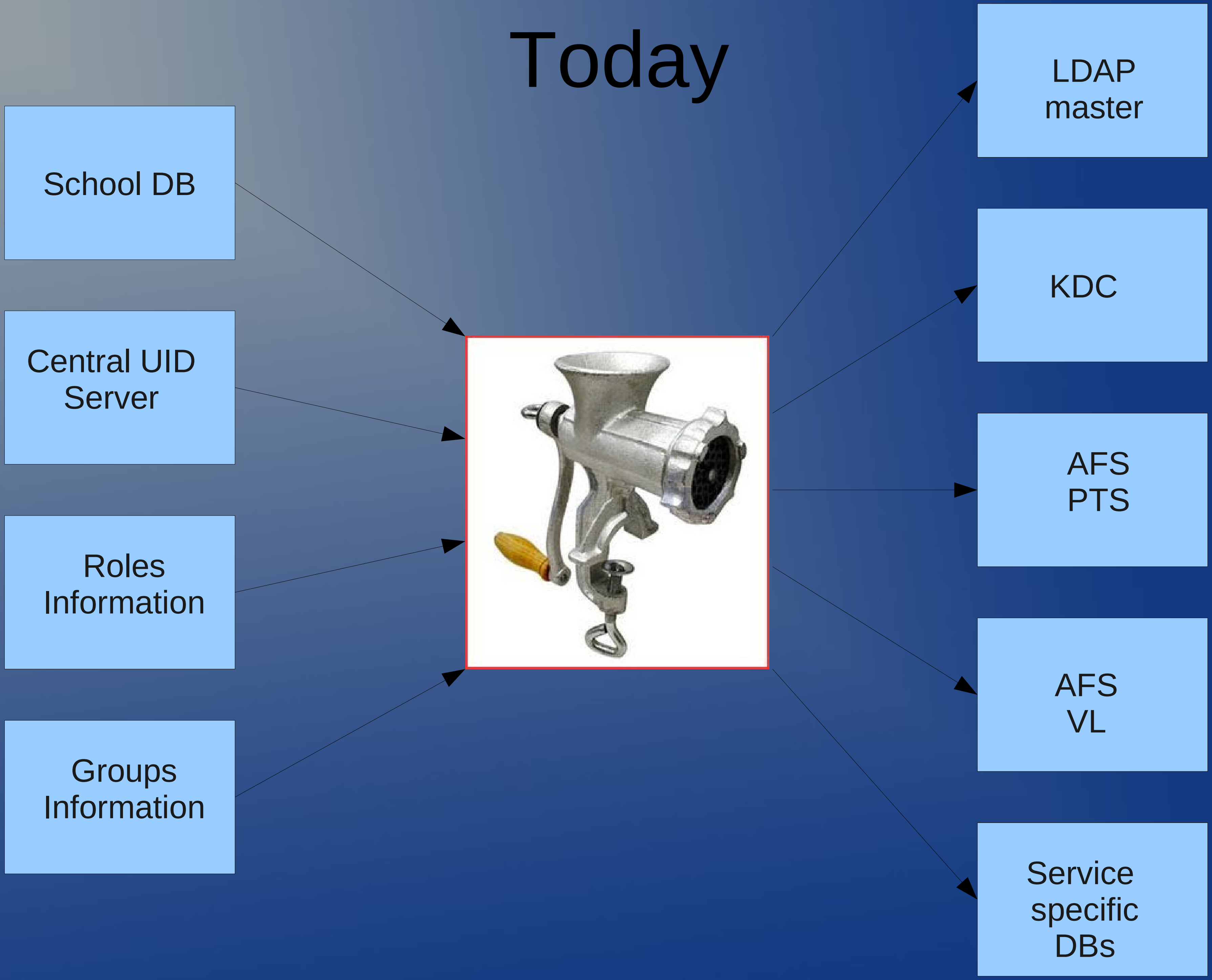
text file or similar

Username

Make it up or ask the user

/etc/passwd

Today



School DB

Central UID Server

Roles Information

Groups Information

LDAP master

KDC

AFS PTS

AFS VL

Service specific DBs

So Let's Automate Things!

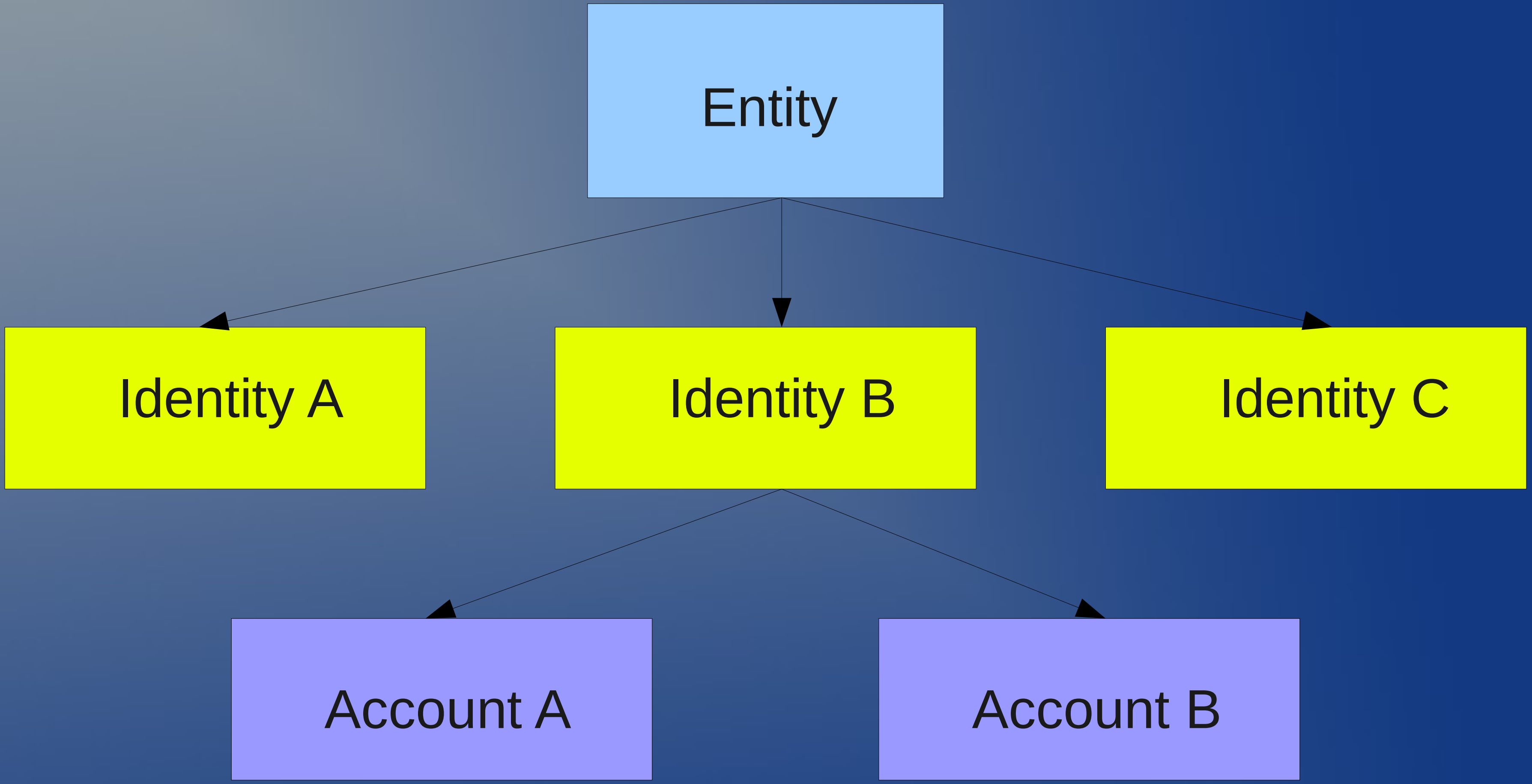
- Over the years, various scripts and manual procedures were written
- This led to different mechanisms to update different things running in different places and managed in different ways
- One of the initial issues when writing the new system was to work out just what needed to happen where it needed to happen and when it needed to happen
- This was difficult to extend and made managing the account lifecycle (archiving/deleting etc) impossible
- Something better was needed leading to...

Prometheus!

Prometheus

- Written in OO Perl using Moose
- Uses LDAP for its central database (Olympus)
- Models *entities* which can have *identities* which in turn can have *accounts*
- Makes heavy use of *roles* and *entitlements*
- Does its work using *stores* and *conduits*

The Entity Model



Entity

Identity A

Identity B

Identity C

Account A

Account B

Roles and Entitlements

- A *role* is a function that an entity fulfils or a position it holds:
  - person
  - staff member
  - computing officer
- An *entitlement* is something an entity can do:
  - log into a School machine
  - access the staff-only part of the School web site
  - become root on School machines
- Roles contain entitlements, negative entitlements and other roles

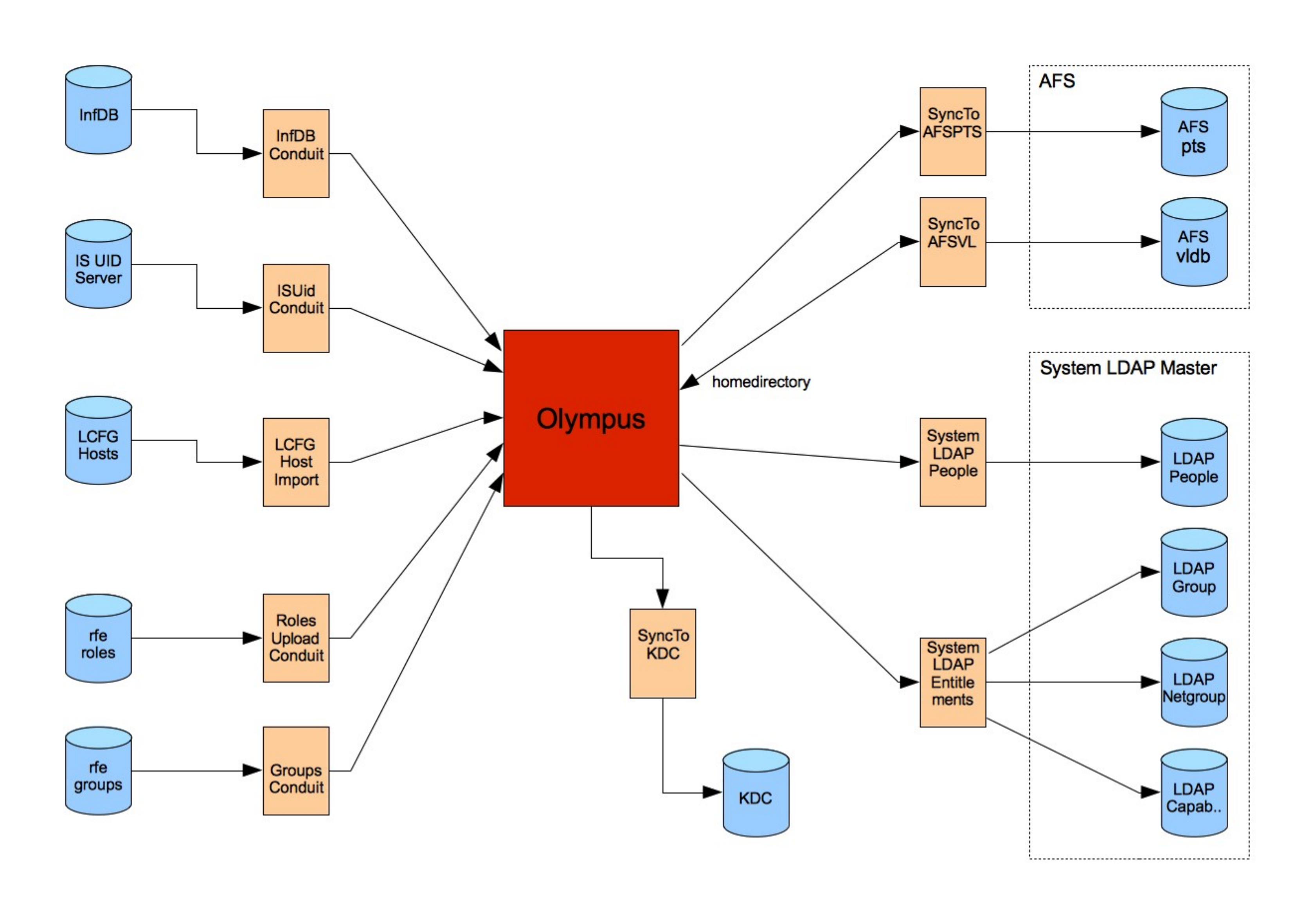
The Store

- A store is an abstraction of a source of data
  - LDAP database
  - KDC
  - External datasource
- A store provides methods to
  - enumerate the entire contents of the store
  - fetch, add, update and delete individual store objects
- A store may also do other service specific tasks
  - the KDC store manages Kerberos password setting/modification

The Conduit

- Manages the flow of data between stores
- Two modes of operation:
  - audit – reports what changes a sync would make and any issues found with the data
  - sync – actually changes the data
- Conduits can do other things
  - the AFS VL conduit decides which server and partition a new user volume should be created on
- Conduits can be run individually but in practice are normally run in a continual loop
- A conduit run can also be triggered by an event of some sort.

In all its glory



The Kerberos Store and Conduit

- Store uses Authen::Krb5::Admin to communicate with KDC
- Conduit interates through all identities and makes any necessary additions and modifications to the KDC
- Should do deletions as well but not yet
- Benefits – new principals are created with ~allow_tix. The principal isn't activated until the password has been set with prometheus tools.
  - at start of term students can set password using web interface – much better than old system
  - If necessary, can do blanket or selective disabling of principals until password has been changed. This has been necessary in the past.

AFS Stores and Conduits

- Stores and conduits for managing AFS PTS and VL databases
- Mostly uses AFS::* perl modules but resorts to shell commands in some places
- PTS entries and user volumes are created automatically for identities which qualify.
- server/partition is allocated by VL conduit from hand maintained pool of available partitions.
- roles/entitlements control which kind of partition volume is created on
- VL conduit takes care of creating all enclosing volumes, mountpoints etc

AFS Stores and Conduits – Improvements and Additions

- Quotas currently are managed automatically but outwith Prometheus. Would be simple to add using new store/conduit
- Better way of managing partition pools
- Automatic load-balancing of servers by moving volumes around whilst meeting partition requirements etc

And so the handle turns by itself

- All the constituent parts of our user accounts are now generated automatically once the system has the information it needs
- For example, every August data for hundreds of new student accounts appears in the various source databases
    - Prometheus takes the information from these source databases and creates all the necessary entries in the downstream databases for these accounts
    - The students are mailed automatically to tell them that their accounts are ready
    - The students set their initial password via a password portal using Prometheus tools
    - All of this happens without significant sysadmin input.

The future

- Full management of the lifecycle of an account
- extensions and additions (AFS quotas, mailing list …)
- Web interface
- refinements/enhancements to roles and entitlements
- ...

More Information

https://wiki.inf.ed.ac.uk/DICE/PrometheusOverview

Questions?