LCFG Developments

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The LCFG Project

- A production system for the Informatics Division at Edinburgh (400-800 systems)
- A testbed for system configuration research
- No external funding (No EDG funding)
- Export of the system is not a priority, although there is a demand to do this
- No fixed "releases"
  - » Although there are hard deadlines for functional requirements
- These will not always match EDG requirements

LCFG Aims

- "Large" scale - O(1,000) nodes
  - » Research towards "Very large scale" – O(50,000)
- Very diverse nodes
  - » Servers, cluster nodes, desktops, laptops ..
  - » About 70 components (EDG uses about 30)
- Distributed development (modular)
- Distributed management (aspects)
- A flexible research framework, but a production-quality system
- These will not always match EDG aims

LCFGng

- A major development phase for expansion within the Division, and to provide EDG functionality:
  - » Well-defined component API and development standards (library and method calls)
  - » "Enterprise-level" server
  - » Simple component creation (templates)
  - » More modular
  - » Complete removal of NIS dependency
  - » Removal of all site-specific code
- See slides from last workshop for details, but here are two specific issues ....

LCFG Server

- Language is recognised as historical
  - » Will be replaced at a a later stage with something based on current theoretically-oriented research
  - » Is currently awkward, but adequate
- Production requirements have driven the current updated version of the server:
  - » Spanning maps
  - » Pluggable back-ends (SQL, LDAP, Different XML)
  - » Multiple domains. Multiple source directories. Multiple master servers for different aspects.
  - » A better dependency system
  - » A better status display
- Server Framework is as important as language

EDG-Motivated Features

- EDG Monitoring interface
  - » Pem sensor, pem server and client components
  - » Monitoring method in framework
  - » LCFG monitoring is currently very simple – we do not have a real monitoring framework (although the server status reports have been improved)
- Perl component infrastructure
  - » It is now possible to write components in Perl
  - » We are not using this, and we would be interested to see use examples where it is really advantageous
  - » We currently think that most components should be very simple, and the template processor provides a "code-free" solution
- Site-independent modules
- 6.2 & Bash 1 backport

Immediate Developments

- Over the summer, there is a big deployment effort for DICE
  - » This will leave little effort for new LCFG developments
- Many components have yet to be (fully) converted to the new standards
  - » These need to be converted
- Development priority will be given to new client-end features that are required to interface the EDG HLL.
  - » We cannot give hard timescales for this, but expect to have something in production by the end of the summer

LCFG Client Developments

- An abstract definition of the LL data structures
- Support for client-end reading of serialization and type information
  - » To support EDG HLL with existing components
- Aspect composition in the client
  - » Formal support for local context information
  - » Support for fetching of profile aspects from different servers
- Pluggable front-end to support multiple formats
  - » New XML profile, LDAP, SLP
- Pluggable back-ends to support multiple formats
  - » complex data structures, existing DBM format

Other Developments

- DICE "phase 2" will start in the autumn. Some expected LCFG developments include:
- Non-NFS RPM transport
- More support for remote management in general, including better (some ☺) security
- Server backends for (for example) LDAP spanning maps

Future Research

- A new language
  - » A simple language with a formal semantics for aspect composition
- Experimentation with more client-end composition
- A possible collaboration with HP on configuration issues in general
- A PPARC-funded Phd student working on some aspect of large-scale system configuration
- Student project on a user interface