

LCG Workshop - Fabrics

Introduction & Overview

Wolfgang von Rueden, CERN-IT

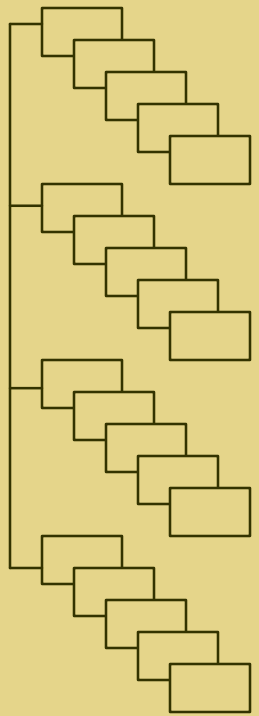
Topics

LCG Fabrics

- **Scope of “Fabrics”**
- **What is the Goal ?**
- **Where do we start from ?**
- **Update of Requirements**
- **Technology Watch – more Pasta**
- **Open Questions**
- **Short-term Actions**
- **Today’s Programme**

Scope of Fabrics – My View

LCG Fabrics



- “Fabrics” is another word for a computer centre for LHC physics
- A managed facility offering a large range of **generic** services supporting the computing needs of the experiments
- A “mainframe” built mostly from commodity components
- One node in a Grid
- CERN’s centre has a special role, due to the Central Data Recording
- Operations Centre? What is the model ?

What is the goal ?

LCG Fabrics

- **Develop the technology and acquire the know-how to build “fabrics” matching the needs of LHC**
- **Master the integration with the world-wide facility**
- **Phase 1: prototype of sufficient size as “existence proof”**
- **Phase 2: large scale deployment and commissioning**
- **Phase 3: long-term operation and maintenance**

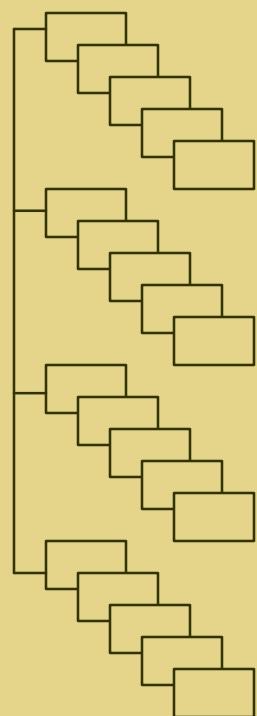
Where do we start from ?

LCG Fabrics

- **Hoffmann Review is a good basis, but is it still valid?**
- **Council Paper: the basis to get the LCG project off the ground, but already partially out of date due to new LHC starting date**
- **Experiments have now a better understanding of their needs, but this is surely not the last word**
- **Financial constraints are severe**

Update of Requirements

LCG Fabrics



- **Input needed from Experiments on**
 - Trigger rates and event size
 - Data models for storage of raw data
 - Access patterns for reconstruction
 - Analysis models and access patterns
 - Simulation needs
- **Conditions data**
- **Detector debugging, access to raw data?**
- **Calibration process**
- **Anything else ... ?**
- **Regular updates needed (every 2 years?)**

Technology Watch

LCG Fabrics

- **Our present Pasta numbers are from 1999, a new round is needed in 2002, another one in 2005**
- **Disks versus tapes: when do we have to decide? Do our present developments include a “disk only” scenario?**
- **64-bit architectures: do we need them and if yes, when? Impact on software?**
- **Compiler technology and program optimisation: How much can we gain ?**
- **What are the cost drivers ?**

Open Questions (1)

LCG Fabrics

- **How can we profit in the best way from the developments in the various GRID projects?**
- **What is not covered yet ?**
- **How do we match the developments to the on-going and growing computing needs, including Data Challenges and non-LHC experiments ?**
- **Will each centre develop its own tools and operations environment or do we want common solutions ? If yes, how far can we go without over constraining ourselves?**

Open Questions (2)

LCG Fabrics

- **Do we need a “Fabric Builders Toolkit” out of the box?**
- **Any views on how to manage and exploit the distributed facility 24h/day? Mobile operations centre?**
- **What do Tier1 and Tier2 centres expect from CERN?**

Open Questions (3)

LCG Fabrics

- **Are we developing main stream technology that industry will offer once we have finished? Example emulators for LEP**
- **Is the present model still what we need and what we want?**

Short-term Actions

LCG Fabrics

- **Agree on goals and project participation**
- **Establish project plan**
- **Clarify relationship to Grid projects**
- **Launch next Pasta round**
- **Get new set of experiments' parameters (trigger rates, event sizes, computing models), reviewed by the LHCC**
- **Work towards Data Challenges**

Today's Programme

LCG Fabrics

- **Learn about Technologies**
 - Addressed by domains, not by institutes
 - Mass Storage, Disks and File Systems, CPUs, LANs
- **First experience with a T2 centre**
- **Fabric Automation**
- **Data Challenges**
- **Discussion**