



Computing in High Energy and Nuclear Physics

*13-17 février 2006, T.I.F.R. Mumbai,
India*

Résumés



Séances plénières :

- Etat d'avancement de LHC
- Réseau de PC low-cost en inde
- E-Science par microsoft
- mySQL
- High Performance Computing par IBM
- LCG
- Le futur de ROOT
- Les activités de la grille (japon, chine, taiwan, applications médicales...)
- QCD
- Résumé des sessions parallèles
- Talk sur la grille par le président d'inde.
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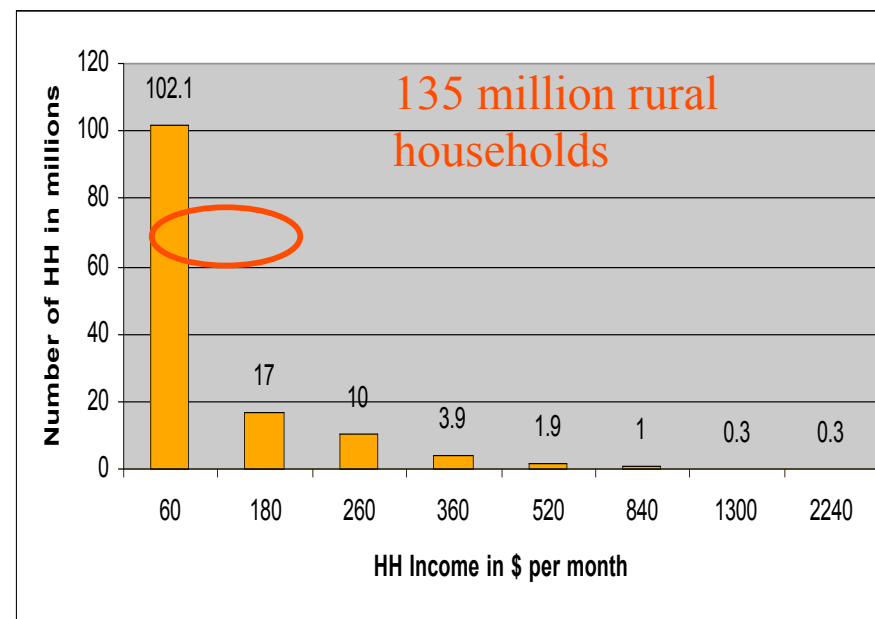


Quelques exemples :

- Low Cost Connectivity Initiative in India Ashok JHUNJHUNWALA (IIT, Chennai)
- ROOT in the era of multi-core CPUs by Rene BRUN (CERN)

700 Million de personnes en zones rurales

- Répartis dans plus de 600000 villages (près de 1000 personnes par village avec moins de 0,5Euros par jour.
- En plus du téléphone, Internet joue un grand rôle pour :
 - l'éducation
 - la santé
 - les micro entreprises



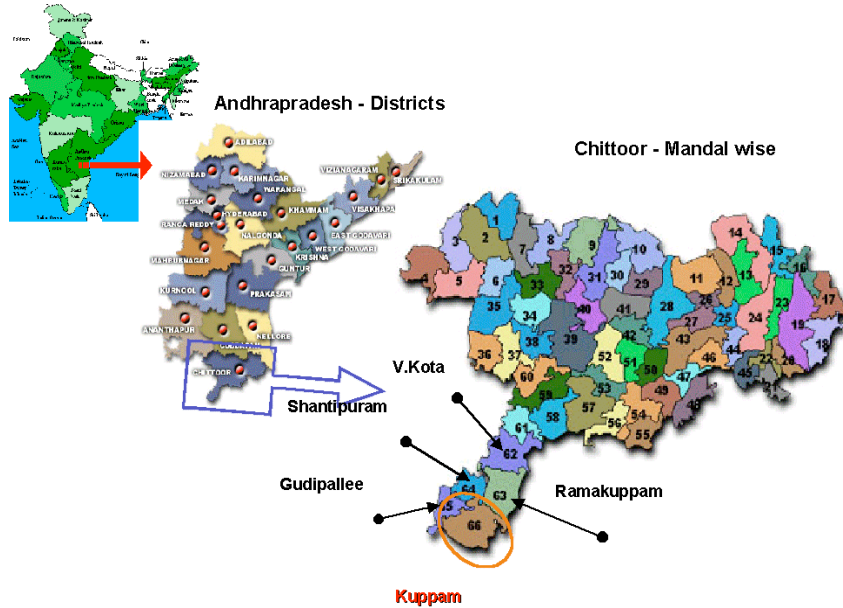
- Apporter dans 600000 villages
 - Les technologies
 - Un modèle solide de développement
 - Une organisation qui pense et agit "Rural"



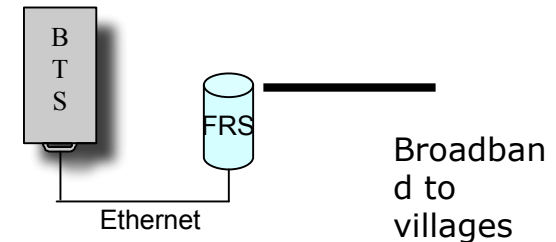
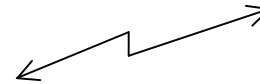
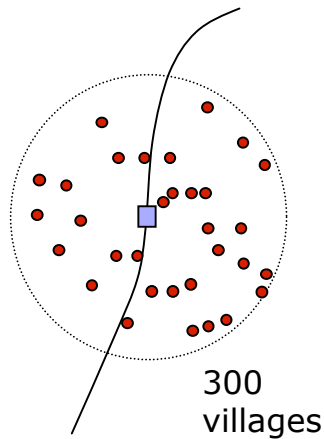
Priorités :

- Infrastructure ■ 3+
- Capacity Building ■ 2+
- Services Point à Point
 - Services de base (email, browsing, games, DTP, astrologie, services public, photographie) ■ 4
 - Communication (VoIP, Mobile) ■ 3
 - Education ■ 3+
 - Micro-franchise ■ 2+
 - ITeS ■ 2
 - Telemedicine ■ 2+
 - Agriculture ■ 2-
 - Services financiers ■ 2-
 - Jobs ■ 1
 - Buying and Selling ■ 1-
 - E-governance ■ 1+
 - Micro-enterprise ■ 0+
 - Jeux en réseaux ■ 0

Architecture :



- Réseau de fibre optique national entre les grandes villes
 - Désert 300 villages autour de chaque fibre
- Puis réseau sans fil jusqu'au terminaux "low cost" :
 - 80\$ par terminal + écran





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What is BOOT?



- A small, easy to install, standalone executable module (< 5 Mbytes)
 - One click in the web browser
- It must be a stable system that can cope with old and new versions of other packages including ROOT itself.
- It will include:
 - A subset of ROOT I/O, network and Core classes
 - A subset of Reflex
 - A subset of CINT (could also have a python flavor)
 - Possibly a GUI object browser
- From the BOOT GUI or command line, the referenced software (URL) will be automatically downloaded and locally compiled/cached in a transparent way.



Software component and libraries :

- Summary from CHEP
 - Review of LCG Application area software
- Data Management
 - Historical overview
 - ROOT I/O
 - Relation Databases (4 talks)
 - Condition Databases (3 talks)
- Reflection in C++ (2 talks)
- Math and Statistical libraries and tools (5 talks)
- Geometry representation (3 talks)
- Graphics and Visualization (6 talks)
- Visualization for quantitative analysis in nuclear physics
- MC Generators services (2 talks)
- Integrated development environment (Eclipse)

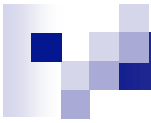


Online Computing

- Summary from CHEP

- Expériences représentées :
 - ATLAS (7 talks)
 - CMS (7 talks)
 - LHCb (3 talks)
 - CDF (2 talks)
 - HERA (2 talks)
 - Babar
 - Belle
 - Other... (8 talks)

- Thèmes couverts :
 - LCG dans les expériences
 - Modèles de calculs
 - Productions Frameworks et expériences à travers la grille
 - Bases de données et gestion des données




Event Processing Applications

Summary from CHEP

The image displays a grid of 48 posters from the CHEP conference, organized into 6 rows and 8 columns. Each poster represents a different event processing application or software development project. The posters are arranged in a grid and cover various topics related to event processing, including GEANT4, CMS, ATLAS, and LHCb. The posters are arranged in a grid and cover various topics related to event processing, including GEANT4, CMS, ATLAS, and LHCb. The posters are arranged in a grid and cover various topics related to event processing, including GEANT4, CMS, ATLAS, and LHCb.

Key posters include:

- Geant4 in production: status and developments** (Willy Appel, CERN)
- Update On the Status of the FLUKA Monte Carlo Transport Code** (CERN)
- GEANT4E: Error propagation for track reconstruction inside the GEANT4 framework** (Pablo Ace, KERNAT)
- Recent developments and upgrades to the Geant4 geometry modeler** (CERN)
- The recent upgrades in the Geant4 Standard Electromagnetic Physics Package** (CERN)
- Geant4 Acceptance Suite for Key Observables** (Z. Apostolakis, I. Maier, P. Mendz-Lorenz, A. Ribon, J.P. Wellisch, CERN PH/SFT)
- Systematic validation of Geant4 electromagnetic and hadronic models against proton data** (CERN)
- Simulation for LHC Backscattered Backgrounds** (CERN)
- Simulation of heavy ion therapy system using Geant4** (CERN)
- The CMS Object-Oriented Simulation** (CERN)
- EvGen in ATLAS/LHC** (CERN)
- Geant4 Acceptance Suite for Key Observables** (CERN)
- DELPHI - parameterised electromagnetic shower in CMS** (CERN)
- Event Data Model in ATLAS** (CERN)
- The New CMS Event Data Model and Framework** (CERN)
- The ALICE Offline Framework** (CERN)
- BESH Offline Software** (CERN)
- A modular Reconstruction Software Framework for the ILC** (CERN)
- FLUKA and the Virtual Monte Carlo** (CERN)
- Reconstruction Software at CMS** (CERN)
- Track reconstruction with the ATLAS Detector** (CERN)
- Adaptive on-the-fly calibration of TPC distortions** (CERN)
- RecPack: a general reconstruction toolkit** (CERN)
- Track based alignment of composite detector structures** (CERN)
- Software Solutions for Variable ATLAS Detector Description** (CERN)
- Tracking in High Density Environment** (CERN)
- High Energy Physics Event Selection with Gene Expression Programming** (CERN)
- Access to Non-Event Data for CMS** (CERN)
- The LHCb Alignment Framework** (CERN)
- Implementation of a global fit method for the alignment of the Silicon Tracker in ATLAS Athens framework** (CERN)
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- OHP: An Online Histogram Presenter for the ATLAS experiment** (CERN)
- Software for the CMS Control Challenge** (CERN)
- Event Visualisation for the ATLAS experiment - the Technologies involved** (CERN)
- Application of Data Visualisation techniques to particle physics** (CERN)
- Data Quality Monitoring of the CMS Tracker** (CERN)



Software Tools and Information Systems

- Summary from CHEP
- Received 38 abstracts
 - 33 oral presentations, 5 posters
- Four main themes (with “fuzzy” borders)
 - GUI and generic application design
 - Release and distribution management, validation, job configuration and workflow
 - Computing studies: compilers, parallel, performance optimization
 - Communication and information management

Grid Middleware and e-Infrastructure Operations

Summary from CHEP

CHEP 06

Categories

- **Grid Infrastructures**
 - The Open ScienceGrid, The Integration Testbed of the Open Science Grid, The German HEP-Grid Initiative
- **Substructures (Site, Site wide Grid, and Campus Grid)**
 - Grif, a Tier2 center for the Paris Region, FermiGrid-Status and Plans, Integrating a heterogeneous and shared computer cluster into grids
- **Interoperation**
 - Grid Deployment Experiences: The interoperations activity between OSG and LCG
- **Operations**
 - Grid Operations: the evolution of the operational model over the first year, Global Grid User Support: the model and experience in the Worldwide LHC Computing Grid, Gridview: A Grid Monitoring and Visualization Tool, GridICE: Requirements, Architecture and Experience of a Monitoring Tool for Grid Systems, Operations structure for the management, control and support of the INFN-GRID/Grid.IT production infrastructure, A Statistical Analysis of Job Performance with LCG Grid
- **Virtualisation**
 - An Edge Service Framework (ESF) for EGEE, LCG and OSG, Virtualisation: Performance and Use Cases



Distributed Data Analysis

- [Summary de CHEP](#)
- Voir le talk de vincent

Computing facilities and networking

- [Summary de CHEP](#)



Distributed Event production and Processing

- Summary from CHEP
- 7 parallel sessions, total of 32 talks
 - 7 ATLAS, 7 CMS, 3 LHCb, 2 CDF, 2 HERA, 1 Babar, 1 Belle, 8 other
- A number of key themes, covering:
 - LCG Service Challenges, including experience;
 - Experiment Computing Models;
 - Grid Monitoring;
 - Production Frameworks and experiences on the Grid(s);
 - Databases & Data Management.