FIO Fabric Infrastructure and Operations

CERN IT Department

Computer Centre Power @ CERN

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Background

- Overall 2.5MW capacity
  - 250kW->350kW with diesel backup for “critical” loads (email, EDH, database servers,…)
  - 2.25MW->2.15MW for “Physics”
- Planned in ~2000 when PC power looked to be flat at ~100W/box.
- Obvious since ~2005 that 2.5MW is insufficient for the long term
  - PC power now understood to scale with CPU capacity…

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Planning for Growth

- Formal project to plan for additional capacity requested at end-2006, but not approved.
- Informal planning during 2007 concludes
  - construction of a new building at CERN is the most cost-efficient option
    - Cost estimates for a building to provide 2.5MW capacity initially and grow to 5MW range from 25-55MCHF.
    - Time estimates range from 27 months (IBM: 18 months construction plus ~9 months needed to select contractor) to 43 months if work is overseen by CERN facilities department.
  - hosting is an option to cover short term needs
    - but expensive: 3.6MCHF/year/MW
  - Assuming a cost of 35MCHF for a new building, the costs can be covered within the foreseen IT budget out to 2020, but provided that CPU capacity is restricted to 30% annual growth
    - C.f. ~100% annual growth since 1990

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Current Position

- IT requests to initiate selection of
  - a design and construction company
  - a hosting company

  have not been approved.

⇒ No additional power for computing at CERN before Autumn 2010 at earliest, possibly not before end-2011.

- Current load is 1.7MW; expect ~400kW in next months ⇒ already at 2.1MW limit.
- **Aggressive removal** of older equipment will *perhaps* enable us to install the required additional CPU and disk capacity for 2009.
  - Provided critical loads remain at 350kW! Demand may be up to 500kW…
- Installation of the full required CPU and disk capacity for 2010 is not possible with the current constraints.

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