



# Proposal for Global Computing

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for the CDF Collaboration

- **Reasons for the sudden rush**
- **Services @ Offsite Centers**
- **Example sites**
- **Support Model**
- **Organization of Global Computing**





# Context

- **Physics Motivation:**
  - **Max. physics output @ low Lumi**
    - > CSL output rate from 80 to 360Hz by 06**
- **Costs: offline short by ~0.5/1.5/1.5 Mill \$ in 04/05/06**
- **Accelerate Global Computing plans:**
  - 50% @ FNAL & 50% outside FNAL by 05**



## Aside: 2004 Power Crisis

- **Needs & Plan presented @ Bird Review:**

**Deploy 2.2THz extra for summer 2004**

- **Actual deployment in New Muon:**

**160 \* 6GHz = 1THz extra**

**We need to accelerate offsite deployment even further!**



## Needs Revisited

**Simplify Rick Sniders #'s a bit ...  
and concentrate on CPU only.**

	<i>Thz</i>	<i>%offsite</i>	<i>CPU speed</i>	<i>#duals to deploy</i>
<i>FY04</i>	<i>3.7</i>	<i>25%</i>	<i>3GHz</i>	<i>~150</i>
<i>FY05</i>	<i>9.0</i>	<i>50%</i>	<i>5GHz</i>	<i>+360</i>
<i>FY06</i>	<i>16.5</i>	<i>50%</i>	<i>8GHz</i>	<i>+220</i>

***This is 6-7 sites with ~100 Duals each by 2006.***

***+ ~700 Duals @ FNAL***

***(only CDF owned duals counted)***



## **Aside: NON-CDF @ FCC**

**In 2002 CDF reviewed “trailer computing” concluding that it was not cost-effective to build the infrastructure @ CDF-trailers to support Institutional clusters.**

**Instead, we offered “buy-in” into CAF.**

**As a result, ~1/3 of CAF is not for CDF general use.**



# 3 Levels of Service

## “Official” Monte Carlo Production

## User level MC Production

- All users have access
- No data on site **but want “sam store”**

## User level data analysis

- All users have access
- Selected samples on site -> **want full sam**



## Aside: CPU useage @ CDF

**We use ~ twice as much CPU/IO than we projected.**

**We believe that this is explained in large part by  
CAF useage for MC production.**

**Having offsite MC sites accessible for general  
user submission might have a big impact on  
CPU needs @ FNAL.**



## Example: (Small) User MC Site

MC production: ~15GHz sec / 150kB event

=> 200 GHz site needs 2+2 MB/sec WAN connect.

### Example Shopping List 1/1/2004:

<i>30 Dual 3GHz compute nodes</i>	<i>\$60k</i>
<i>1 head node</i>	<i>\$5k</i>
<i>1 code server</i>	<i>\$5k</i>
<i>LAN &amp; console server</i>	<i>\$5k</i>
<i>20% contingency</i>	<i>\$15k</i>
	<i>-----</i>
	<i>roughly \$90k for hardware</i>

***This system has ~1 Million evts/day capability***



## E.g.: (Large) User Analysis Site

Site that hosts one or more datasets for all CDF users.

Data stays @ site “permanently” (several months).

E.g. 10MB/sec WAN allows 10TB in ~2 weeks

### Example Shopping List 1/1/2004:

<i>100 Dual 3GHz compute nodes</i>	<i>\$200k</i>
<i>1 head node</i>	<i>\$5k</i>
<i>1 code server</i>	<i>\$5k</i>
<i>2 DH infrastructure nodes</i>	<i>\$10k</i>
<i>3 x 6TB fileserver</i>	<i>\$30k</i>
<i>LAN &amp; console server</i>	<i>\$20k</i>
<i>20% contingency</i>	<i>\$50k</i>
	<i>-----</i>
	<i>roughly \$320k for hardware</i>



# Support Model

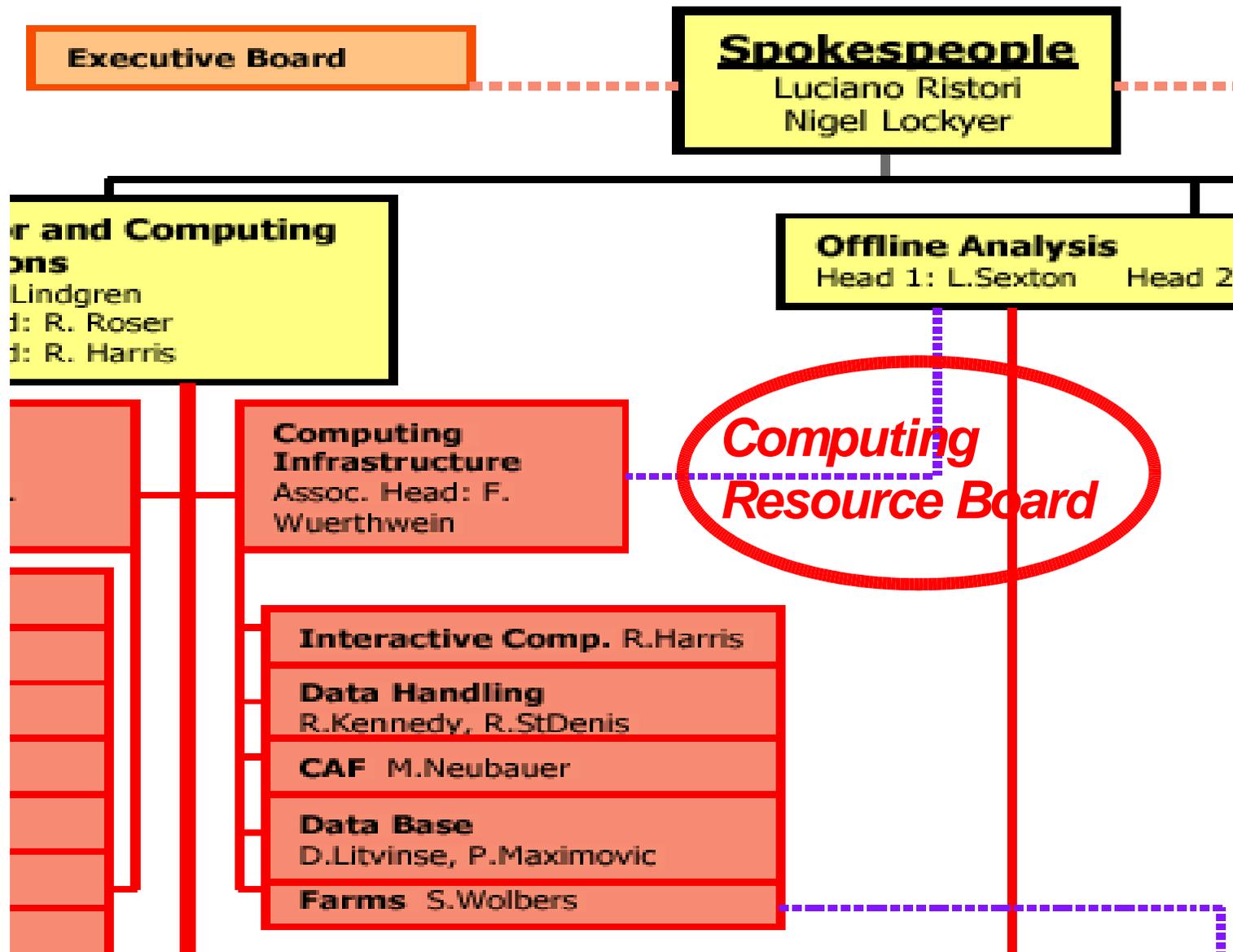
- **Sites make MOU commitments:**
  - just like UCSD/FNAL-CD for FNAL CAF**
  - **Hardware operations support**
  - **Infrastructure operations support**
  - **User support**

**If something goes wrong with a user's job on site X  
then the ops crew at site X deal with user questions!**

***(this model is contested)***



# Proposed Organization





# Computing Resource Board

## Members :

**Assoc. Head. Of Comp. Infrastructure**

**One of the 2 Offline Heads**

**CD-CDF Department Head**

**One Rep. for each site**

## Purpose of CRB:

- **Collective Assessment of computing needs**
- **Resolution of interoperability details**
- **Negotiation of service commitments**
  - **Short term allocations**
  - **Long term procurement planning**
  - **Assessment of delivered service**



# Timeline

**Installation workshop : Jan. 20-22<sup>nd</sup> Florida**

**1 day each CAF/dCache/SAM**

participants from: Canada, Germany, Italy, Japan, Korea, MIT, Taiwan, UCSD, UK, ...

**CRB Meetings 04: January/April/August/December**

**Prototype User MC sites: Early 2004**

**First Production Quality Sites: April 2004**



# Scope for Summer 04

## **Minimal Goal:**

**MC submission via CafGui & output stored via SAM.**

## **More ambitious:**

**MC submission brokered using JIM.**

## **Most ambitious:**

**full replica of FNAL CAF/dCache/SAM offsite.**

*(personal view --- not yet sufficiently discussed with DH team)*



## Summary & Conclusions

**Offsite contributions are necessary to maximally exploit detector capabilities, especially @ low luminosity.**

**Need 6-7 sites of 100 Duals each by 2006.**

**Details are still being worked out.**

**First meeting of CRB @ Jan. Coll. Meeting.**