

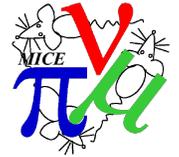
# Computing & Software

Durga Rajaram

MICE CM 41

RAL

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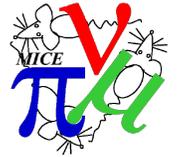
# OVERVIEW

- Software & Computing Project
  - Organizational changes
- Computing Infrastructure
  - Configuration tools, GRID
  - WBS, Status, Plans
- Schedule
- Summary

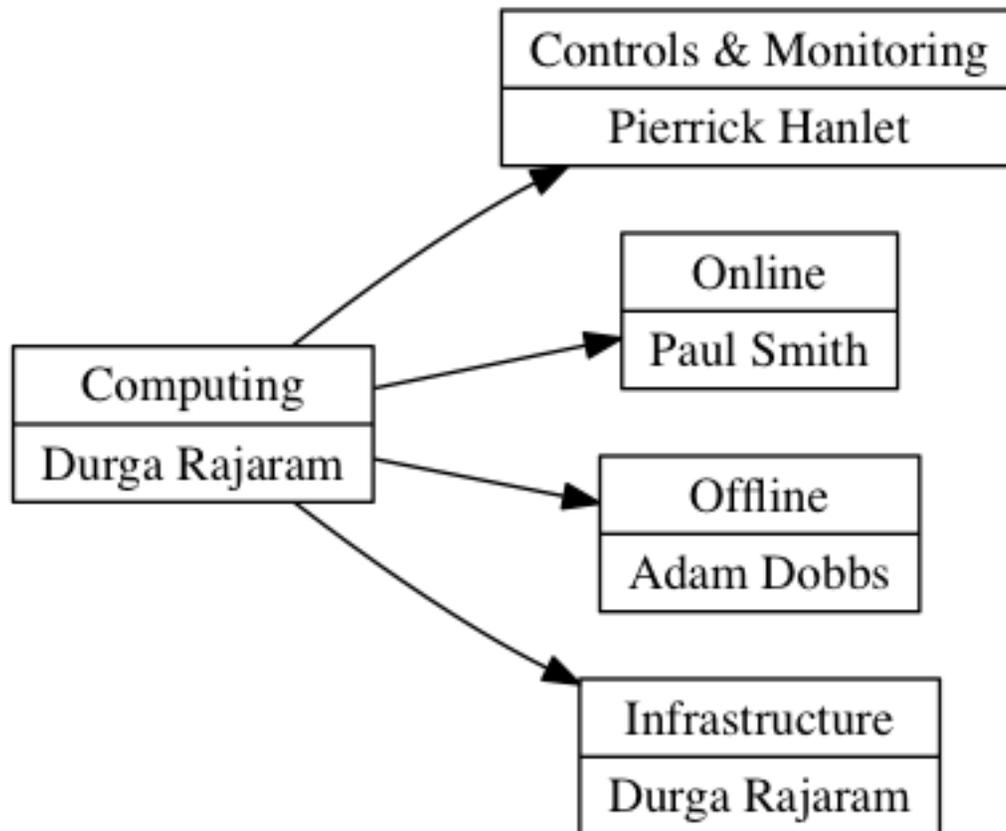


# COMPUTING & SOFTWARE

- Wide range of tasks
  - Read out detectors – DAQ
  - Provide hardware controls & monitoring
  - Manage and maintain Control Room servers
  - Reconstruct data
  - Provide Online monitoring (DAQ) & Online reconstruction (MAUS)
  - Describe geometry, fields
  - Provide Monte Carlo simulation of the experiment
  - Manage data storage
  - Provide database tools to manage configurations
  - Web services
- Aim to turn around reconstructed data within 24 hours of data taking



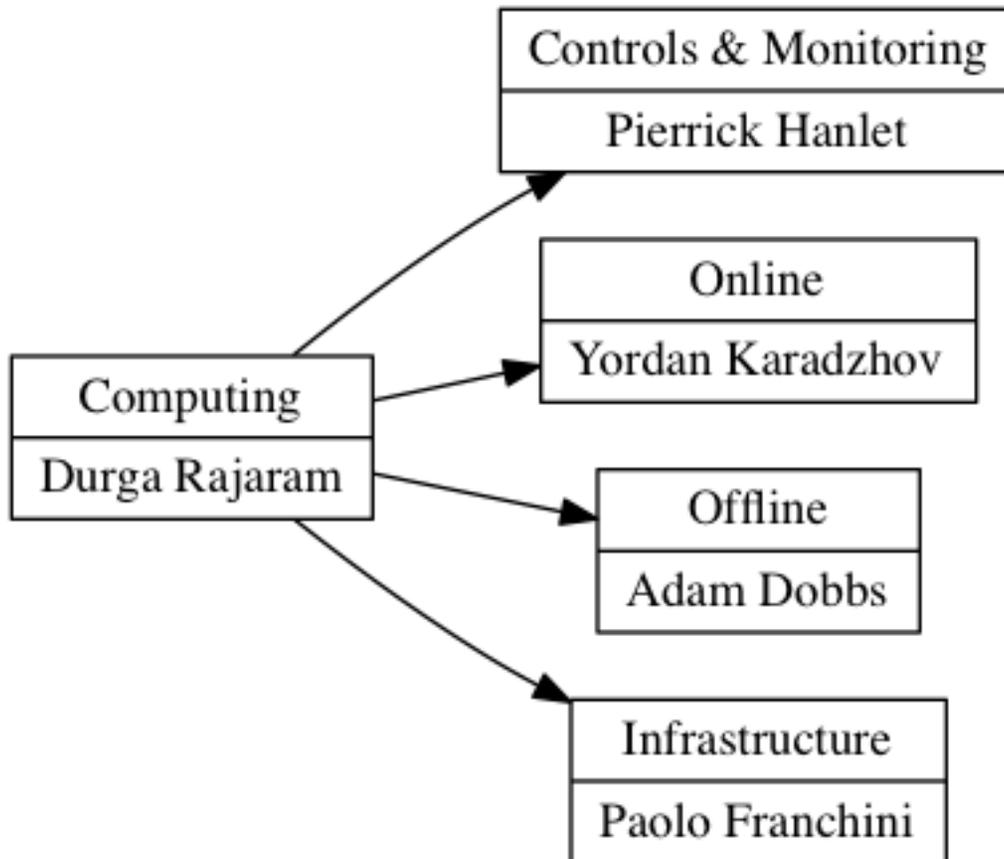
# ORGANIZATION



- Personnel changes:
  - Paul Smith is leaving
    - Many thanks to Paul for all the hard work



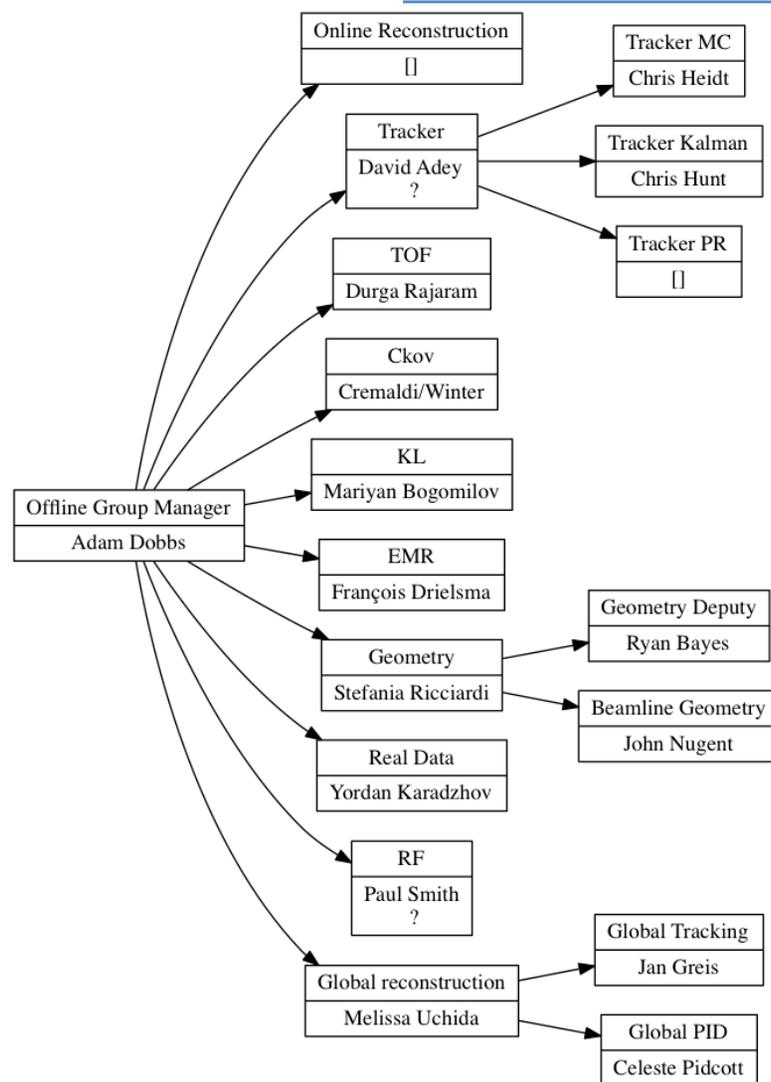
# ORGANIZATION



- Personnel changes:
  - Paul Smith is leaving
  - Yordan Karadzhov taking over Online
  - Paolo Franchini has taken over Infrastructure

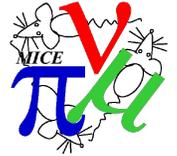


# ORGANIZATION



- Personnel changes in Offline:
  - David Adey is leaving
  - Need to fill for tracker software coordinator

# OVERVIEW



- C&M, Online, Offline will report separately in more detail
- **Offline:**
  - Joint analysis+software parallel – lots of progress on detector reconstructions
  - Great progress on global reconstruction
  - MAUS paper in draft, expecting inputs from remaining detectors shortly
- **Online:**
  - Successfully read out tracker by end of MDR in Jan
  - Need beam to validate integrated trigger
  - At this CM came up with ways to catch corruption a.s.a.p – need to implement
  - Wrapper to handle incompatible DATE+unpacker versions being looked at
- **C&M:**
  - MDR successes: Beamline IOCs, state machine, run control
  - MDR lessons: RC must be more flexible
  - Detectors @ next MDR

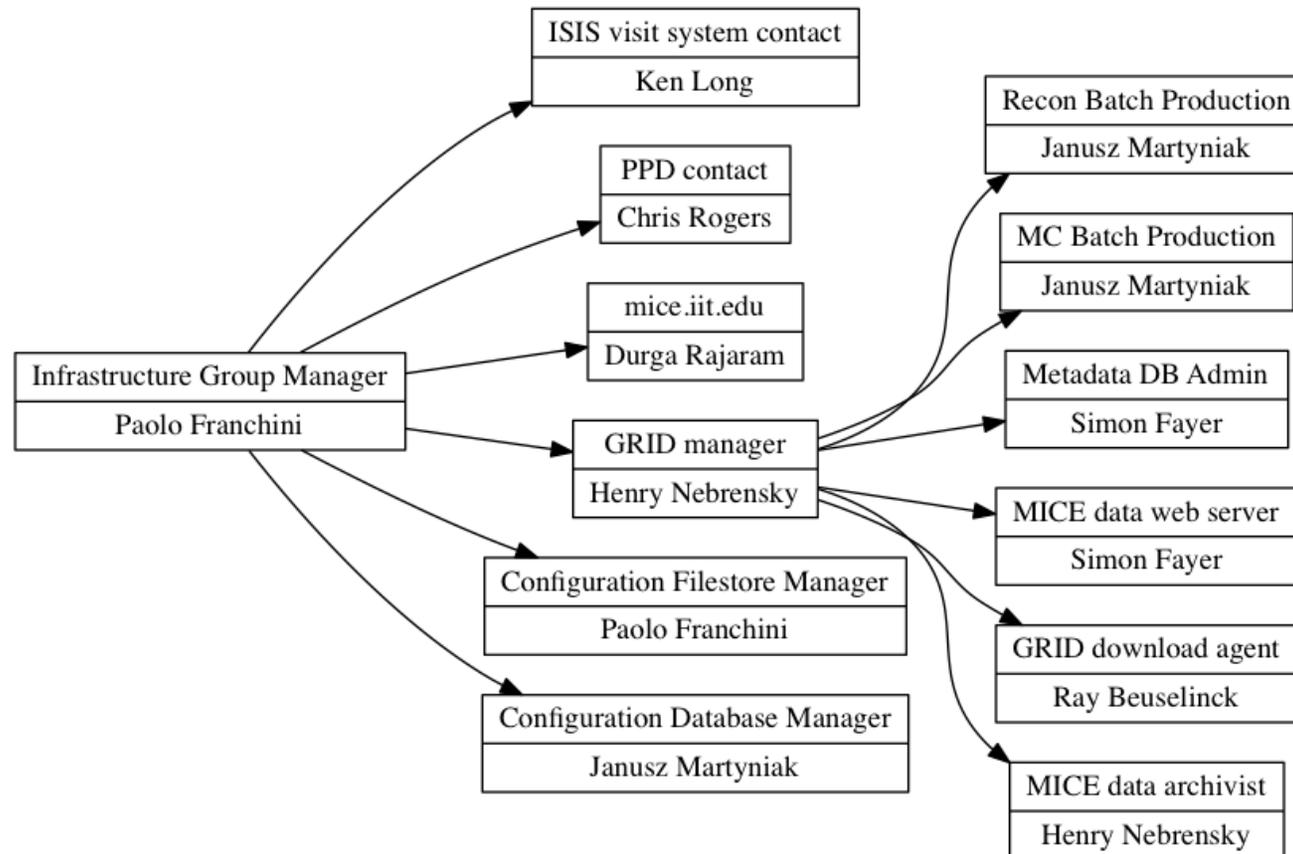


# COMPUTING: INFRASTRUCTURE

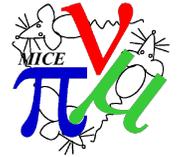
- Organization
- Configurations & calibrations management (CDB)
- GRID services
  - Data curation
  - Batch processing
  - Resource needs for Step IV & MC



# INFRASTRUCTURE: WBS



- Paolo Franchini (Warwick) is new head of Infrastructure



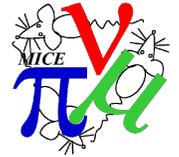
# INFRASTRUCTURE: CDB

- Status
  - Production database has tables implemented for all subsystems:
    - beamline, cooling channel, state machine, alarm handler, cabling, calibrations, geometry
  - CDB infrastructure and API done for setting Reconstruction and MC datacards
    - Tested on preproduction DB, to be tested with MAUS on GRID
- Plans
  - CDB master/slave failover has to be tested before data-taking
  - We want to store data quality and reconstruction quality flags from data-taking and batch reconstruction
    - Is a run “analyzable” – were currents normal? Did detectors operate ok? Did they reconstruct?
    - Database group will implement the table, but the flags themselves will have to be defined and filled by detector & reconstruction groups
  - Populate CDB with information from older “missing” runs

# INFRASTRUCTURE: GRID



- Datamover
  - Software migrated to new machine (datamover02)
  - Rewritten to use EMI 3 security model
  - Setup for Step I and Step IV runs
  - Used during mock data run in January
- Batch Production
  - Last reconstruction of MICE data was with MAUS v0.9.1 in Oct 2014
    - ~3-5% of jobs were “killed” we think due to hitting memory limit
  - Aim to reprocess with fixed tracker unpacking after it has been verified
  - Script to control Monte Carlo production has been developed and needs to be tested



# INFRASTRUCTURE: GRID

- Automated data movement from MLCR to tape
  - HN's datamover script needs to get triggered automatically
  - Decision at this CM: trigger from Run Control
- Quick offline reconstruction at RAL Tier-1
  - Some issues with the certificate/proxy on the RAL queue in Jan ( worked earlier in Oct)
  - Janusz is working with RAL folks to sort it out

# INFRASTRUCTURE: GRID



- We were asked to estimate our resource storage and cpu needs for 2015-17 for GridPP5
- Estimated disk usage for raw and reconstructed data ~ 1 PB
- MC is the big unknown
  - Guidance from analysis group: want 2000 MC simulations
  - Disk usage: ~3 PB, dominated by digitized MC output, but 3 PB on tape is not crazy (but having it all available via http could be)
  - CPU usage overwhelmed by G4BL:
    - ~240,000 cpu-hours *for 1 MC* G4BL generation (1e7 muons at TOF1)
    - ( For ref. the entire Step I data takes 5,000 cpu-hours at Imperial )
    - To generate 2000 such beam libraries: 100, 000 *cpu-years*
- Working through & sorting out the numbers....

# SCHEDULE



- Computing & Software schedule fully integrated with MICE schedule
- Identified milestones to track & report
- Offline:
  - Final Fit Track Reconstruction: Apr 1, 2015
  - Global Tracks and PID: June 26, 2015
- Online:
  - Integrated DAQ: March 20, 2015
  - Integrated Trigger: May 1, 2015
- Infrastructure:
  - Automated Data movement: April 6, 2015
    - Resource needs: HN, PH
- Controls & Monitoring: milestones identified last year, see PMH's talk
- Holding schedule for now & need to keep going