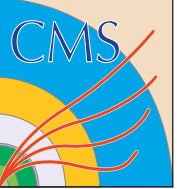


# **CMS Online - System administration aspects**

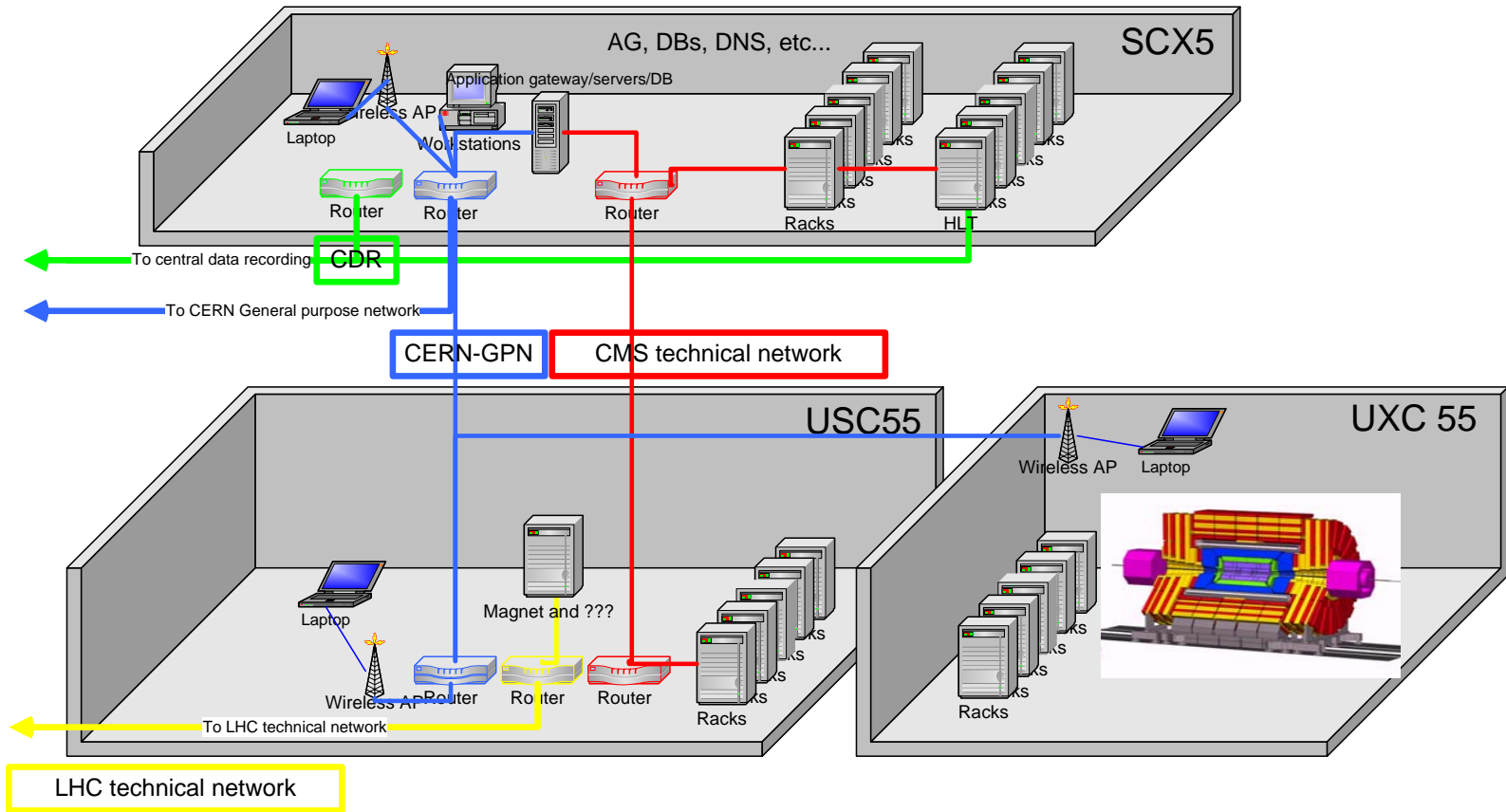
Eric Cano PH/CMD



# Network layout

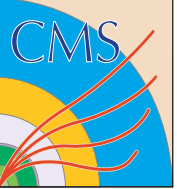
- Standard CNIC separated networks
- Most servers are real head nodes, with 2 physical interfaces, to have a better control
- Worker nodes have no default route (unless machine has business to do with outside)
  - Strict confinement to private network
  - Main exception is Windows machines ( $\approx$ DCS), need to talk to central IT servers (no AD servers at point 5)
- Network infrastructure maintained by IT/CS

# CMS Networks

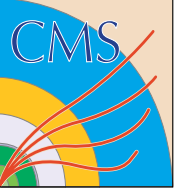


- The 4 networks

- CMS-Experiment Network (CMS-EN)
- LHC-Technical network (TN)
- CERN's general purpose network (GPN)
- Central data recording (technically, a very restricted part of GPN)

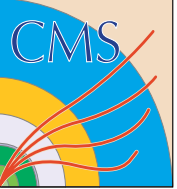


- Basic control
  - Power control
    - Rack control by DCS
    - PC control with IPMI
- System installation and software deployment
  - System locally installed on hard drive through central deployment systems (Quattor/CMF)
    - Local instance of quattor.
    - Central IT installation servers and CMF
    - No diskless



# Services (cont'd)

- Local network services
  - DNS
    - Own domains: .cms. / ipmi.cms. / minidaq.cms. / rbn{1,2,3}.cms.
    - Using same device names everywhere.
    - Using tricks in .cern.ch names due to limitations on interface of IT's interface.
    - From TDR demonstrator and cmsdaqpreseries/MTCC.
  - DHCP
    - For worker node's control interface+IPMI's IP.
    - Replaced IT's even for Windows machines (bug in support for bound interfaces)
  - TFTP for PXELinux (installation)
  - Nagios (only remote monitoring so far, no agents, no history, only system, not apps)
  - LDAP user information
  - Kerberos authentication
  - NFS home directories (not intended to be run from)
  - ORACLE servers
  - Run control
  - Monitor (for applications)
  - Storage managers (disk buffers between HLT and CDR)
  - General purpose login machines



# Various topics

- Automated power down/up of the clusters
  - By mean of IPMI
  - Ad-Hoc scripts so far
- Booting and the post boot configuration
  - PXELinux boots into either kickstart (re-installation) or hard drive
  - Configuration file on server
  - Kickstart config file removed automatically after successful install by a small demon (next boot on hard drive)
- VME controllers
  - VME interfaces in Linux PCs, experiment-wide model
  - Fibre from PC-racks to VME racks
  - Standard system, with driver



# Interaction with Windows, PVSS nodes, TN



- Some PVSS nodes are exposed to CERN network
- Others accessible via Linux headnodes/rdesktop
- Application level server provides and interface between the DAQ framework and the DCS/PVSS (inside CMS network)
- Exposing 1 machine in TN and one in CMS will allow them to communicate (standard solution so far)