Columbia University
IN THE CITY OF NEW YORK

PHENIX

FVTX Power

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ROC Power Requirements

- From Mark P:
  - ROC 3.3V regulated:
    - FPGA: 5 channels @ 3A/channel
    - Fiber Optic: 2 channels @ 3A/channel
    - Clock: 1 channel @ 1A/channel
    - JTAG: 1 Channel @ 1A/channel
  - ROC 5.0V regulated
    - Pulser: 2 channels @ 2A/channel
    - Opto-isolator: 1 Channel @ 1A/channel

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Constraints

- Opto-isolation and digital ground same and separate from Pulser ground
- PHENIX distribution limited to:
  - 10A/channel
  - 10 Channels/mmodule
- Vicor bulk supplies:
  - MegaPak has 10 slots
  - Single slot qPac has 50A rating
  - Double slot qPac has 100A rating
  - Can mix and match qPacs limited by slot count

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An Alternative Plan

- Minimize switching capabilities for the ROC
  - Group ROC FPGA power (2 channels/ROC)
  - Group Slow Control FPGA Power (4 ROC/Channel
  - Group Fiber Optic/Clock power (1 ROC/Channel)
  - Group JTAG power (8 ROC/channel)
  - Share PHENIX modules between ROCs (4 ROC/module)

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Module Assignment

- ROC FPGA:
  - Channel 0:
  - Channel 1: ROC 1 FPGA A/B/SC (9A)
  - Channel 2: ROC 1 FPGA C/D (6A)
  - Channel 3: ROC 2 FPGA A/B/SC (9A)
  - Channel 4: ROC 2 FPGA C/D (6A)
  - Channel 5:
  - Channel 6: ROC 3 FPGA A/B/SC (9A)
  - Channel 7: ROC 3 FPGA C/D (6A)
  - Channel 8: ROC 4 FPGA A/B/SC (9A)
  - Channel 9: ROC 4 FPGA C/D (6A)
- 6 Total Modules, 60 A per module

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Module Assignment

- ROC Fiber Optic/Clock Power (3.3V)
  - 1 ROC per channel (7A)
  - 6 Channels per PHENIX module
  - 3 Modules at 49A per PHENIX module
- Optical isolation (5V)
  - 4 ROCs per channel (4A)
  - 1 PHENIX Module (6 channels), 24A
- Pulser (if not distributed through FVTX modules)
  - 4 ROCs per channel (8 A)
  - 1 PHENIX Module, (48 A)

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Component Requirements

- PHENIX Distribution:
  - 1 Crate
  - 1 Crate controller
  - 11 Distribution modules
  - Cost: ~$5500 + cables and connectors
- Vicor:
  - 2 MegaPaks fully loaded
  - Cost: ~2 x $5200
  - Note: Several qPacs operating at 98% capacity

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Wedge Power Distribution

- Have not started looking at details
- However looks like-
  - 8 PHENIX distribution modules
    - Share the same crate?
    - ~$3200 (add $1K for crate/controller)
  - 2 Mega-Paks
    - Partially loaded
    - Gives some flexibility
    - Cost 2 x $5200

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Other Issues

- Quote from Wiener/ISEG received
  - 1 crate + controller
  - 4 16 channel distribution modules
    - I was think 1-> 8 fan out, but is that correct?
    - 16 channel module is ~$7K
    - PO still be processed, asked Steve to put hold on it pending verification of module number
      - 1-> 16 Fan out?
      - Or 1 channel/ROC?
      - Requires only 2, share a spare w/ VTX (still not ordered).

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