Overview of NWSC-3 HPC & PFS Systems
(Production & Test)

Michael Kercher, NWSC-3 Facility Infrastructure Lead

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Transportation and Delivery to NWSC

Loading dock hours
• 7:30am - 4:30pm

Current COVID19 Logistical Changes
• Equipment is quarantined for 14 days before handling / install
• PPE needed for all areas, and is provided by the vendor for their employees
• Changes in guidelines will be shared with vendors
NWSC Loading Dock

- Dock Levelers
- Large Turning Radius
  - Any truck length accepted
- (4) Dock Doors
- Same Elevation as Computer Rooms
NWSC Equipment Staging

Termed “Service Corridor”
Large Area - approx 3500 square feet
  De-crating
  Unpacking
  Acclimation
Directly adjacent to both Module A and B
NWSC-3 Move-in

Computer Room Floor Protection

1st level - 3/4” plywood
2nd level - staggered ¼” masonite

NWSC staff assistance and oversight will be provided
Floor capabilities

- Point load of 2500 pounds or a uniform load of 625 pounds per square foot
- Rolling loads are less, with a point load capacity of 2000 pounds (after 10,000 transits)
- NWSC uses ConCore® floor panels, filled with a structural cementitious material.
Expectations for installation teams

- Required site video
  - New visitors only
- NWSC Physical Security
  - Daily check in, badge issue
  - Daily check out, badge returned
- Flexible working hours available with prior authorization from NWSC management team
  - Eating and refrigerator space is available for onsite breaks
  - Multiple take-out, delivery, and other eating options in Cheyenne
PFS, HPC Test Systems

Module B is preferred location for both test systems

PFS and HPC test systems transition to production systems after final acceptance

• AMPS - Antarctic Mesoscale Prediction System - primary equipment
Cooling considerations – Test systems

Test PFS - Air Cooled Preferrable

Test HPC - Air Cooled or Water Cooled racks can be accommodated

Infrastructure installed without use of vendors, good comm needed
Site integration – UPS – Test Systems

All test systems will be powered via UPS

• 208 / 120v and 480 / 277 available

PFS Test System

• Fully redundant N+1 power supplies and PDUs required
• Infrastructure test
  • De-energize one UPS source, system must stay fully functional
  • 2nd UPS source de-energization will also be tested

HPC Test System

• Head end / critical equipment- redundant N+1 power supplies and PDUs required. Same infrastructure tests as with test PFS
• Compute Nodes do not require fully redundant PDUs
PFS Production - Module B

System will be located in South portion of Module B

Expected Cable Distances:

- Current PFS to NWSC-3 PFS (160 feet, 50 Meters)
- NWSC-3 PFS to Net Hub (130 feet, 40 Meters)
- NWSC-3 PFS to NWSC-3 HPC (130 feet, 40 Meters)
HPC Production System - Module A

System will be located in Module A

Expected Cable Distances:

- West Wall Mod B to East Wall of Mod A (160 feet, 50 Meters)
- NWSC-3 HPC to Net Hub (140 feet, 45 Meters)
- Casper Cluster to HPC (170 feet, 55 meters)
Electrical - NWSC-3 Production

NWSC-3 PFS - UPS Powered
- Fully Redundant N+1 Power Supplies and Power Distribution Units
- UPS functional test described earlier applies

NWSC-3 HPC Critical Equipment - UPS Powered
- Fully Redundant N+1 Power Supplies and Power Distribution Units
- UPS functional test described earlier applies

NWSC-3 HPC Compute Nodes
- Powered by Utility power only
- NWSC facility staff prefer an A/B configuration if possible
NWSC-3 PFS - Air Cooled
- 72 deg F supply air / 40% Humidity
- Hot Aisle Containment (built by NWSC facility staff) will be implemented for efficiency

NWSC-3 HPC Compute Nodes
- Water Cooled at Component Level, or Rear Door HX
- 65 deg F supply (adjustable)

NWSC-3 HPC Critical Equip
- 72 deg F supply air / 40% humidity
- Hot Aisle Containment (built by NWSC facility staff) will be implemented for efficiency
- Water cooling is also available for this equipment if so designed
Electrical / Mechanical Connection Methods
Located Under Computer Floor – Production

Electrical
• Pin and Sleeve Receptacles
• Disconnects
• National Electrical Code Compliant

Mechanical
• Flex Hose Connections
• Isolation valves
• Balancing Flow Sets
Monitoring Capabilities - NWSC Facility

Mechanical Monitoring / Building Automation System (BAS)

- Johnson Controls Metasys Protocols
  - BaCnet and BaCnet IP
  - Modbus TCP
  - LonWorks

Electrical Power Monitoring System (EPMS)

- Wonderware System Protocols
  - Modbus IP
  - Modbus TCP
  - DNP3
  - Other protocols can be added to translation server
CDU Monitoring and Maintenance

NWSC Infrastructure Staff Prefer Direct CDU Integration into BAS

- Bacnet or IP based
- Allows for 24/7 monitoring of CDU systems

CDU Maintenance Activities

- NWSC onsite staff is willing to assist in CRUs or FRUs associated with equipment where applicable
HPC Power Monitoring Capabilities

NCAR has interest in testing power data integration with NWSC-3

Things to think about -
1. Are Modbus or other Power Monitoring Protocols Available?
2. Is direct Integration to site Electrical Power Monitoring System (EPMS) possible?
3. Can this be accomplished via 2 wire bus, or IP connections?
QUESTIONS??