Infrastructure and computational resources

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Existing Capabilities

- Maximized computing power to provide flexible and unique solutions meeting CCMC's needs
  - Parallel systems supporting model runs up to 200-300 cores
  - Massive storages for RoR and iSWA archive
    - Increased storage requirement is driven by models' needs
  - Instant visualization for simulation analysis
  - Automatically updated centralized input data archives
  - Multiple web servers hosting CCMC web based tools/systems that require high availability
  - High speed connectivity serving the community
- Agile infrastructure to keep up with rapidly changing demands
- Semi-operational schedule with fast response time from the team
- Ensure all systems meeting Agency & Center security requirements
- IT refreshes every 3 years

Upcoming Hardware Upgrades

- Modernize CCMC applications with Container Technology (ex: Docker)
  - Convert existing applications to Containers
  - Restructure current infrastructure to support on premise container environment
- RoR archive storage and Beowulf cluster replacement
- Power upgrade which allows CCMC's power consumption to remain within the limit

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A Growing Need to Supplement CCMC In-House Computational Capabilities

- Turn-around for runs that require 200-300 procs and 5-8 days is not catching up with growing demands.
- CCMC is not offering runs that require 500+ procs.
- Examples of upcoming capabilities that require 800+ procs:
  - SWMF AWSom_R
  - C-SWEPA (CORHEL+EPREM)
  - High resolution global MHD, Hall MHD, end extended MHD with kinetic effects
  - PIC codes
- Particle outputs from PIC codes (needed to generate distribution functions on request in support of MMS) require a lot of storage.