

Overview Of AMS POCC Infrastructure During Pre-flight and Initial Flight Phases

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Main POCC Functions

AMS POCC's provide:

- Preliminary storage and distribution of science and house-keeping data for monitoring and control;
- Communication links for commanding;
- Consoles for monitoring and control of sub-detectors;
- Access to NASA services for on-orbit operations;
- Voice communication;
- Means of communication between POCC's;
- Users' support.

Network Information Service (NIS) at POCC

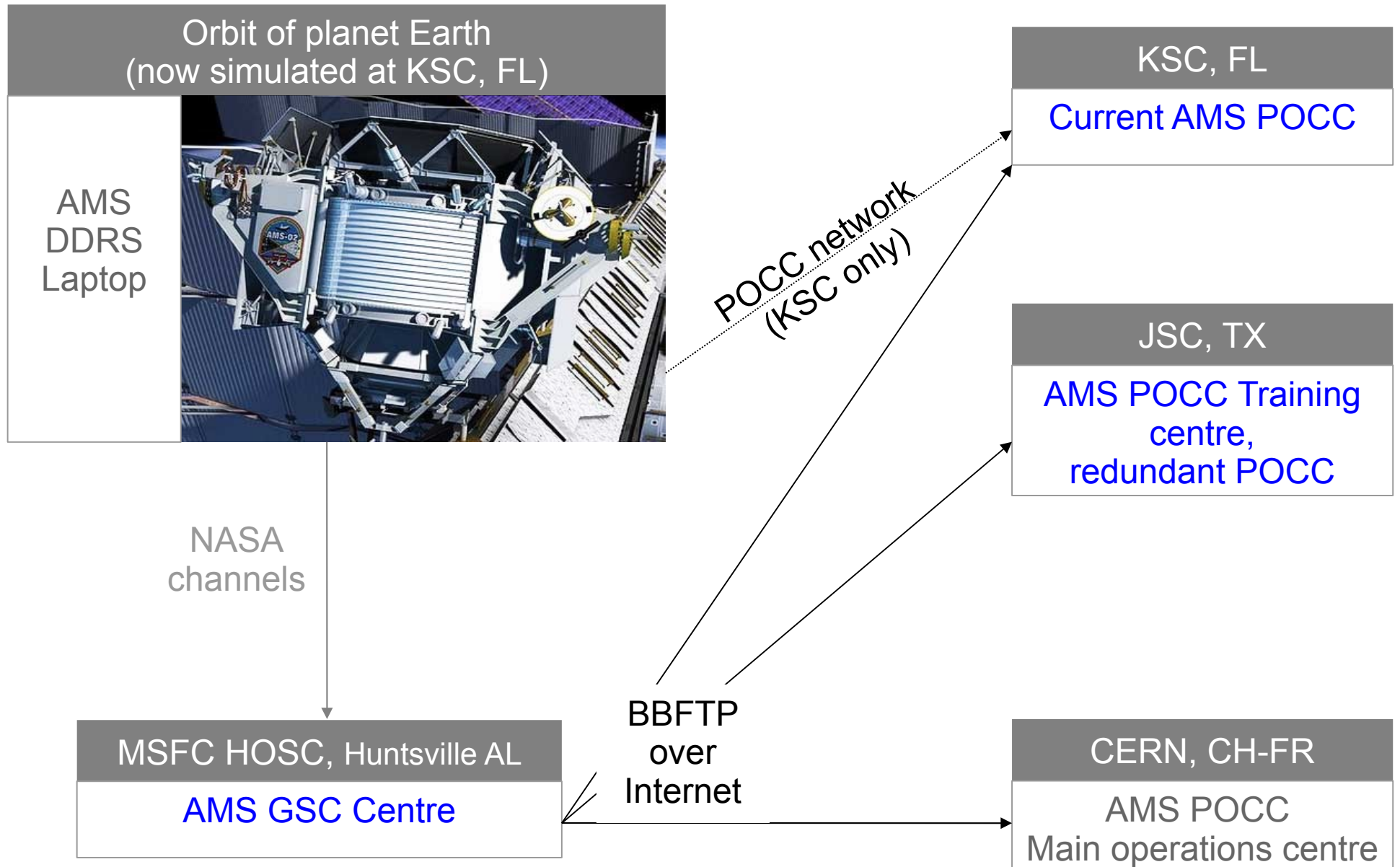
Network Information Service (NIS):

- Centralized user management;
- Single storage for users' home directories;
- AMS software repository;
- Homogenous management and user environment on POCC consoles.

For more information see

<https://twiki.cern.ch/twiki/bin/view/AMS/POCCNIS>

Basic Scheme Of Science Data Flow



AMS DDRS Laptop

AMS DDRS Laptop is scheduled for flight to ISS on STS133. Will be used for communication testing over NASA infrastructure.

Main features:

- Based on standard AMS Linux installation to support AMS software;
- Provides buffer data storage on hot-swappable hard drives;
- Astronaut-friendly interface for installation and operations.

AMS GSC Centre at HOSC



- AMS science and housekeeping data front-end;
- Located at NASA to minimize UDP data loss over long-distance data channels;
- Allows entire control of data distribution among POCC's;
- Enforced redundancy;
- Can be controlled remotely from any AMS POCC location.

AMS POCC at KSC



- Used for AMS shifts training and detector testing;
- Very close to the beam test configuration;
- Supports both local and PRCU modes.

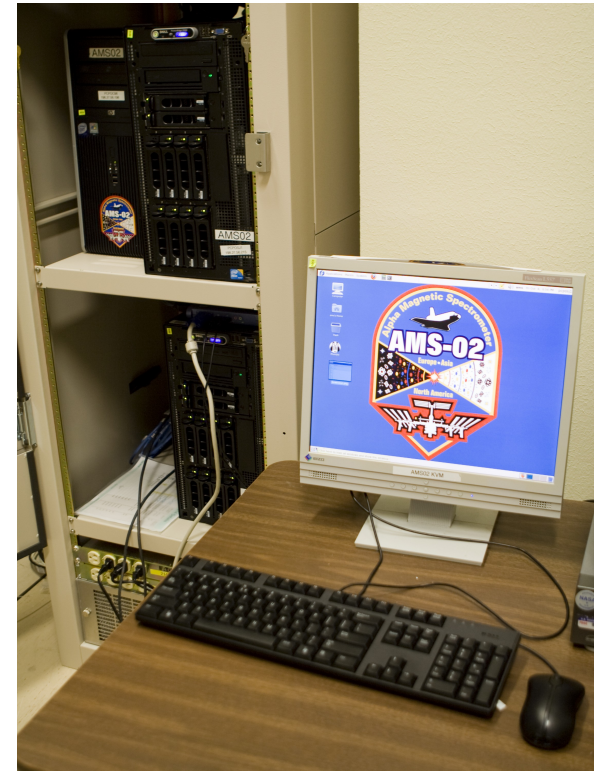
AMS POCC at JSC (1)

AMS02 flight POCC and redundant POCC while AMS collaboration is based at CERN.

October 2010 - ready for training in the POCC at Mission Control Center, JSC:

- Installed 8 POCC consoles and 2 servers;
- IVoDS and EHS are tested;
- Data services and AMS account management are set up (no data migrated yet);
- Connected to AMS mobile SOC;
- Additional services (WiFi, printing, etc.) are available;
- Accessible from CERN and KSC POCC's via IPSec tunnels.

AMS POCC at JSC (2)



AMS POCC at CERN (1)

AMS POCC at CERN is the main operations and control centre for AMS lifetime.

It is also the most preferred development and testing facility for AMS IT services due to flexibility and reliability of network environment at CERN.

CERN POCC shall be prepared for Certification of Flight Readiness (CoFR) well in advance before AMS move to CERN to ensure smooth transition of operations between US and Europe after launch.

AMS POCC at CERN (2)

CERN POCC will provide 24/7 operations support for **decades**. Following requirements apply:

- Full redundancy for power and network;
- 24/7 on-call support;
- Development capabilities for new equipment and software;
- Testing environment for changes in IT infrastructure scheduled for introduction;
- Robustness of network and servers.

AMS POCC at CERN (3)

Implementation plan:

- Purchase 3 rack-mounted servers with rack and fiber interfaces (2 for redundancy, 1 for staging of changes and tests). Configure servers, including NIS, NTP, DNS;
- Configure network and central POCC storage;
- Choose and purchase network routers based on test results (tests are yet to be run);
- Test commanding communication to NASA, incoming data links, voice loop operability, local network rates and robustness
- Test local services operation.