

CCF/NET

Design Note 101.0

GCC Tape Robots Catalyst 6509

by

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Abstract:

A tape robot facility is being established in the GCC to provide location diversity for tape storage. The proposed network support for the tape robot facility is a Catalyst 6509, with a 10/100/1000B-T module for mover node connections and a 10Gb/s Ethernet module for uplink support. The switch would satisfy future GCC tape robot facility expansion needs, and provide high bandwidth network capability for tape storage data movement. The 6509 would serve a secondary role as an auxiliary source of switch port capacity for CDF, D0, or CMS as GCC Computer Room A fills up.

I. Network Support in the FCC for the Tape Robots:

There are two general categories of network support for tape robot mover nodes on the FCC 1st and 2nd floor computer rooms. For the general use STKen mover nodes, switch ports on the FCC1 & FCC2 general use Catalyst 6509s are provided. A dedicated subnet (131.225.13.0/25) is provided for the STKen movers. A VLAN for that subnet is supported on both switches, with a dedicated 10Gb's link between the switches to support intra-VLAN connectivity. The result is that STKen mover nodes can be located on either FCC1 or FCC2 (tape mezzanine) without concerns about their network connection point. Figure 1 (magenta) depicts the network support for STKen.

The Run-II experiments have dedicated tape robot facilities. The mover nodes for their robots are connected directly into the core switch (FCC) for their respective work group LANs. There is no dedicated subnet for the mover nodes of either experiment. The mover nodes are integrated into the off-line analysis subnet for each experiment. Figure 1 (blue) depicts the network support for CDFen, the mover nodes for the CDF tape robots in the FCC. D0's tape robot mover node support would be virtually identical to CDFen, except within the D0 FCC work group LAN.

CMS utilizes the STKen tape robot mover nodes natively, without requiring dedicated mover nodes within the CMS work group LAN.

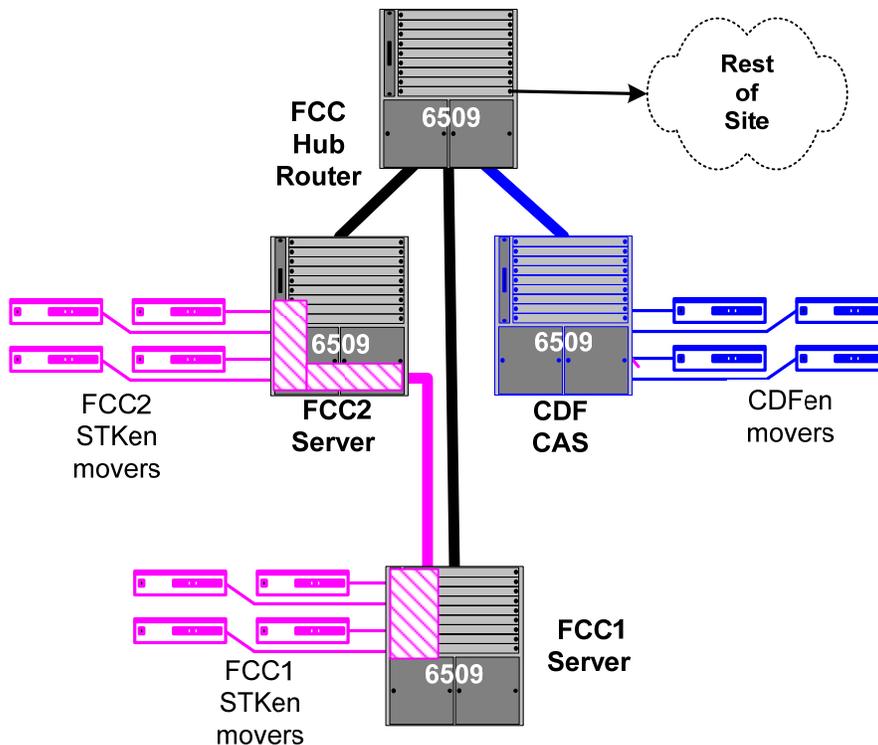


figure 1.

II. GCC Tape Robot Network Support Requirements:

The expansion of the Laboratory's tape robot facilities includes a requirement for location diversity. The initial instance will be a new STK robot in the GCC. Future plans include additional STK tape robots in the GCC, potentially up to four new robots. The initial mover node switch port requirement is for 15-16 movers. In conjunction with projected expansion of tape robot facilities in GCC, the number of GCC mover nodes is projected to increase at a rate of ~15 nodes per year over the next five years. A 10Gb/s uplink to the rest of the facility network would be required initially. With individual mover nodes expected to be capable of moving data out of the tape robot at ~500Mb/s, a capability of aggregating multiple 10Gb/s links together for an uplink will also be required in the future.

III. Proposed GCC Tape Robot Network Support:

A new 6509 for the GCC tape robot facilities is proposed. The 6509 would support GCC STKen mover nodes in a new subnet, 131.225.13.128/25. A 10Gb/s uplink would connect the GCC 6509 to the FCC hub router. While specific GCC mover nodes may be allocated to (for example) CDF, those mover nodes would reside within the GCC STKen subnet, not within the CDF work group LAN. Initially, the network path between CDF work group systems and the new GCC mover nodes would be via the FCC hub router and the GCC STKen 10Gb/s link. As network traffic between the CDF work group and the GCC STKen mover nodes becomes heavy, a dedicated 10Gb/s link could be implemented.

The 6509 would be procured with one 48-port 10/100/1000 module for mover node support, as well as one four-port 10Gb/s module for uplink support. Figure 2 (below) depicts the proposed GCC tape robot network support.

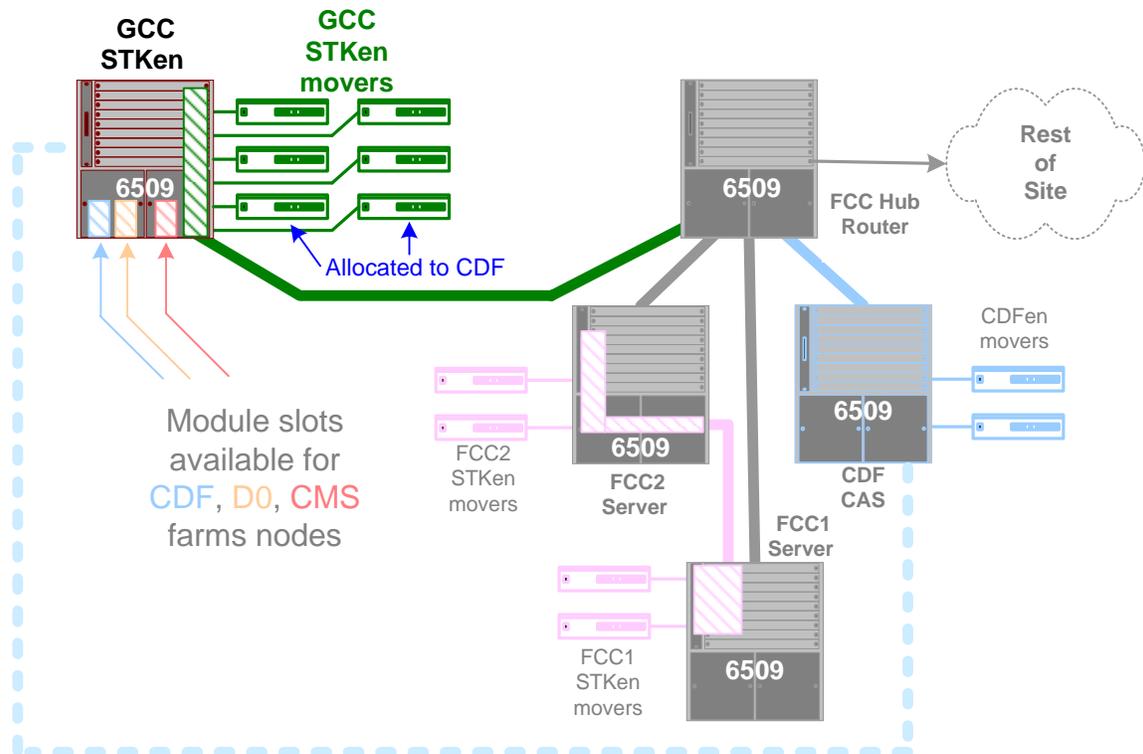


Figure 2

An additional role for the GCC STKen 6509 will be to provide support for CDF, D0, & CMS farms nodes as Computer Room A fills up. It will be uneconomic for any of the experiments to augment their own dedicated switch infrastructure supporting GCC Computer Room A with another 6509, if the number of new nodes being added is relatively small. An experiment could simply procure a couple additional 10/100/1000 modules for the GCC STKen switch, connect that switch into their own GCC switch infrastructure, and support an additional 96 systems in GCC without having to procure a whole new 6509.

Cost of the GCC 6509, as spec'ed, is estimated at ~\$46k.

IV. Other Options Considered:

With an initial requirement of 15 mover nodes, and a 10Gb/s uplink, a small, non-modular switch could be procured. The Catalyst 3750, with 10Gb/s uplink, would provide 16 1000B-T ports, for ~\$16k. However, that switch would have no spare ports available for additional mover nodes, and no expansion path for aggregating multiple 10Gb/s channels.

V. Implementation Issues:

The new Catalyst 6509 would be configured, staged, and brought into production within two weeks of delivery. The installation process will include 30A/220v power preparation. The switch would be mounted in a new rack on the north side of the GCC network switch room that's being installed specifically for GCC Tape Robot Room network support.