

# Innovating Network Cyberinfrastructure through Openflow and Content-Centric Networking (CCN)

**Goal:** Increase the flexibility of UNL's network to support scientific users and network researchers

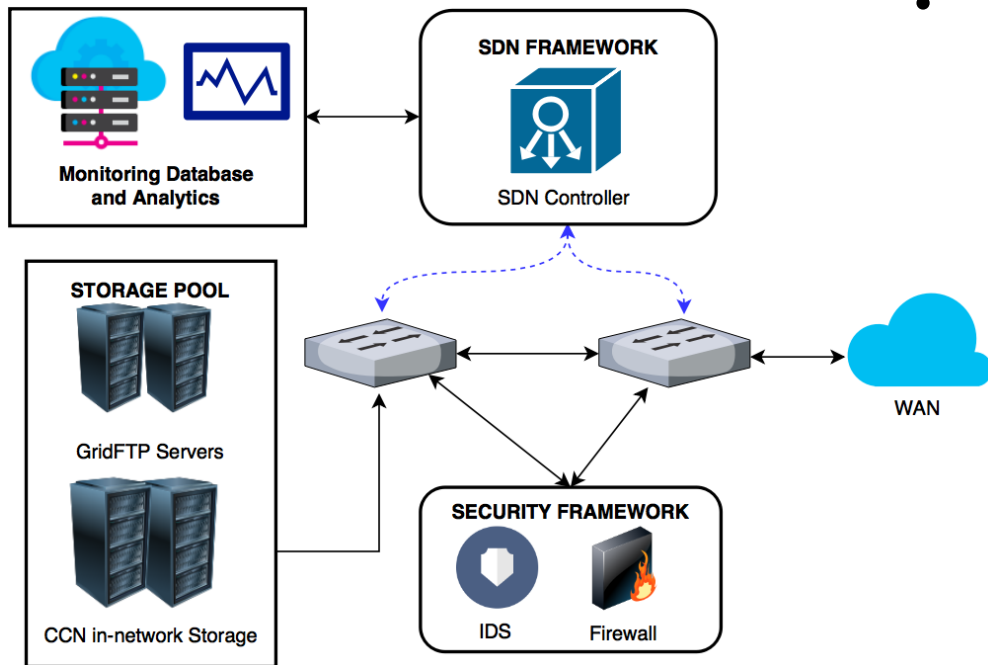


Fig: Solution Approach

- **Three focus areas:**

- Network resource management for GridFTP transfers using an SDN controller ⇒ Enables application-driven bandwidth provisioning.
- Network security with SDN-based dynamic routing ⇒ Enables automated reaction to security alerts raised by devices.
- Content-Centric Networking (CCN) techniques such as MobilityFirst and NDN to provide access to the Compact Muon Solenoid (CMS) experiment data ⇒ Enables in-network caching and content-based routing.

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- SDN Managed Network Architecture for GridFTP (SNAG) transfers proposed.
  - Allows SDN-based management and monitoring of CMS and LIGO Traffic.
  - Achieves Application and Network Layer collaboration to provide monitoring and network management views.
  - Integration with GridFTP Testbed underway to transition transfers from XRootD to SNAG.
  - Ongoing development of a QoS solution to prioritize CMS/LIGO transfers

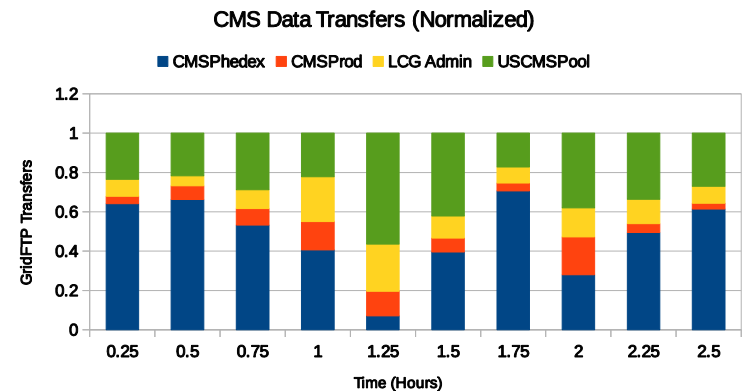


Fig 1: GridFTP Transfers of CMS Data

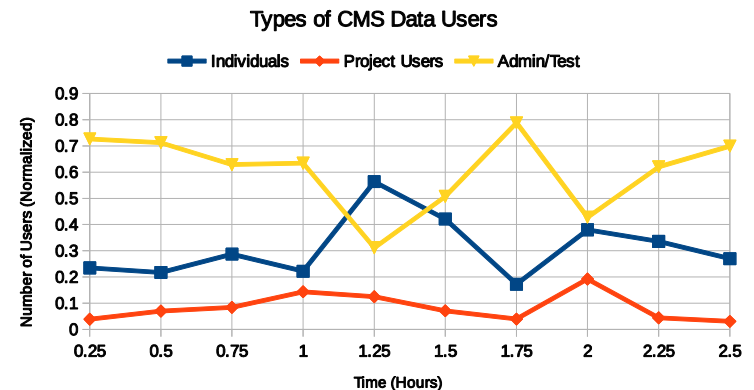


Fig 2: CMS User Classification