**INTRODUCTION**

- The Cryogenic Underground Observatory for Rare Events (CUORE) is a neutrinoless double-beta decay experiment currently under construction at the Laboratori Nazionali del Gran Sasso (LNGS).
- The experiment is comprised of 988 TeO$_2$ bolometric crystals arranged into 19 towers and operated at a temperature of 10 mK. The active mass of the detector is 206 kg.
- We have developed slow monitoring systems to monitor the cryostat during detector installation, commissioning, data taking, and other crucial phases of the experiment.

**DATA FLOW**

- Three-tiered network security structure enables easy and reliable access to internal monitoring data.
- Green zone (private) can only be accessed onsite or through VPN. Underground servers on the private network interface directly with hardware.
- These servers collect log files from various systems (e.g., Radon Monitoring, Detector Calibration System, Thermometers, Pulse Tubes, etc.).
- Nagios monitors servers and key processes on the CUORE networks: 18 hosts, 159 services.
- Orange zone (DMZ) provides an isolated and controlled interface between the private network and all public networks. Mostly comprised of above-ground servers.
- If DMZ servers are compromised, private servers are unaffected.
- New data is written into a MongoDB Database, which is then presented on the front-end.
- The CUORE gateway public machine allows access to various services in the orange zone network, including the CORC slow monitoring interface.

**IP CAMERAS AND STREAMING**

- Two high-resolution Axis Network Cameras inside detector cleanroom.
- Onsite and remote shifters can adjust alignment and settings on web interface.
- Streams rebroadcasted through DMZ monitoring server using VLC, and displayed on website for collaboration-wide access.
- Streams recorded and stored on a NAS server within the green zone (private) for documentation and protection.
- Implemented and used for detector installation.

**LABVIEW CONTROL**

- Sound-enabled alarms connected to LabVIEW Monitors for particle count, radon levels, radon abatement, and backup power and water.
- Viewed by onsite and remote shifters, and by cleanroom workers to ensure rapid response and safety.

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