ePIC Resource Request from BNL (FY26-27)

Key Milestones

- **March 2026 - FY2026:** Full deployment of 750 TB production storage and complete configuration as an RSE under JLab Rucio server.
- **October 2026:** Demonstrate **BNL PanDA-JLab Rucio** operation with existing instance at BNL. Match or better throughput delivered by the current OSG infrastructure (100k CH/day, 5000 concurrent jobs).
- **November 2026:** Begin migration to production PanDA Instance

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1. Storage Infrastructure & Access Protocols (By March 2026)

- **Production: * Disk:** Deploy 750 TB of new storage for production use.
  - **Tape Archive:** Up to 2 PB per year through the end of 2027.
- **Access Control:** Configure storage for dual-mode access via the XRootD protocol:
  - **Public:** Unauthenticated read access.
  - **Write/Update:** Secure write access via X.509 authentication.

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2. Rucio Integration (By March 2026)

- **Server Connectivity:** Establish full integration with the JLab Rucio server.
- **Rucio Storage Element Configuration:** The following RSEs at BNL will need to **operate under the JLab Rucio server**:
  - **Existing Test Storage:** Current 250 TB dCache instance utilizing the XRootD protocol.
  - **ePIC Production Storage**
  - **ePIC Tape Archive**
- **Multi-Site Replication:** Demonstrate functional data movement between JLab and BNL via Rucio Replication Rules.

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3. Workflow Management & Evolution (PanDA & iDDS)

For ePIC productions, our primary goal is the full automation of workflows; therefore, when referring to **PanDA**, we refer to the integrated **PanDA and iDDS (intelligent Data Delivery Service)** ecosystem configured with **JLab Rucio server** that will serve both production efforts and streaming testbed development.

- **Phase 1 (March 2026 – FY 2026):** Maintain and improve the stability of the existing **PanDA/iDDS instance at BNL configured with BNL Rucio server** in order to demonstrate smooth production operations.
  - Preparation for Phase 2:
    - catalog sync between BNL and JLab Rucio to facilitate smooth transition of BNL Rucio users to JLab Rucio which will be the PanDA/Rucio configuration in Phase 2.
    - functional and integration test between BNL PanDA and JLab Rucio, so to make a smooth cutover later (downtime will be required)
- **Phase 2 (October, 2026): Current PanDA instance using JLab Rucio server** comes available
- **Phase 3 (November, 2026):** Begin migration to **production PanDA instance** from current infrastructure.
  - We are ready to be guided by SCDF preferences on how this instance should be deployed: Kubernetes, VMs, DB service at SCDF etc
- **Logging Infrastructure (Open Question):** We are currently evaluating the requirement for a dedicated **logging server that serves up internet-accessible logfiles**. Input from PanDA and ATLAS experts is needed to determine if this should be a formal request for the **FY26–27** window or deferred. This is another infrastructure question for which we are happy to have SCDF guidance.