NOIRLab - ITOps

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SA3CC Meeting 2025

Agenda

- NOIRLab IT Operations (ITOps)
  - Enhancement infrastructure
- Backbone Networks Activities
  - La Serena Center, Tucson Center, Hilo Center
- NOIRLab Program Integration
  - CSDC - Gemini and MSO,
  - Rubin
- NOIRLab/ITOps Network Upgrade Project
  - Current Status : Gemini South and MSO (La Serena), and Tucson HQ

NOIRLab IT Operations

Infrastructure Enhancement

- Continue working on Systems and services locked down and hardened
- Deployed Privileged Access Management (PAM)
- Deployed End-Point Detection and Response (EDR)
- Multi-factor authentication (MFA) on all services, external **and internal (PingOne (Cloud, DaVinci) and Duo)**

NOIRLab IT Operations

Infrastructure Enhancement

- Network segmentation & Isolation: WIP
- Restricted inbound & outbound traffic flow (NGFW and ACL implementation on Core Switches)
- Limited outward-facing services - under the zero-trust principles!

NOIRLab IT Operations

Infrastructure Enhancement

- Remote Access
  - For Location (Keeper **KCM**,VPN)
    - Remote access solutions for staff to **restricted** resources
    - Remote access for external **collaborators** to internal resources
  - Remote access for vendors to **do specific tasks** only
- Outside of the box solutions to minimize risk
- Remote access requires supervisor approval and must be justified

NOIRLab IT Operations

Next Generation Firewalls

- Advance in Hardware/Software standardization : **Tucson Data Center**
- Increased number of **limited** Tunnel Profiles for Remote Observing Functionalities
- **Implementation 2FA / MFA : Using PingOne Cloud Service and NOIRLab / Duo**
- OmniSOC (Security Operations Center) (https://researchsoc.iu.edu/) (EDR,24/7 Monitoring and reporting, log ingest, dynamic blocking lists.)

Network Tasks on Backbone devices

- Implementing new Backbone devices at AURA/NOIRLab
  - Planning new Topology using HA implementation : TUC, **LSC** and HLC

Network Services & Collaborative Tools

- Implementing Automated Network administration - Infrastructure as Code (Ansible, GitHub)

Backbone Network activities

La Serena Center (LSC)

- Chile to USA links
- La Serena <-> Santiago
- Cerro Pachon <-> La Serena
- Planning new Topology

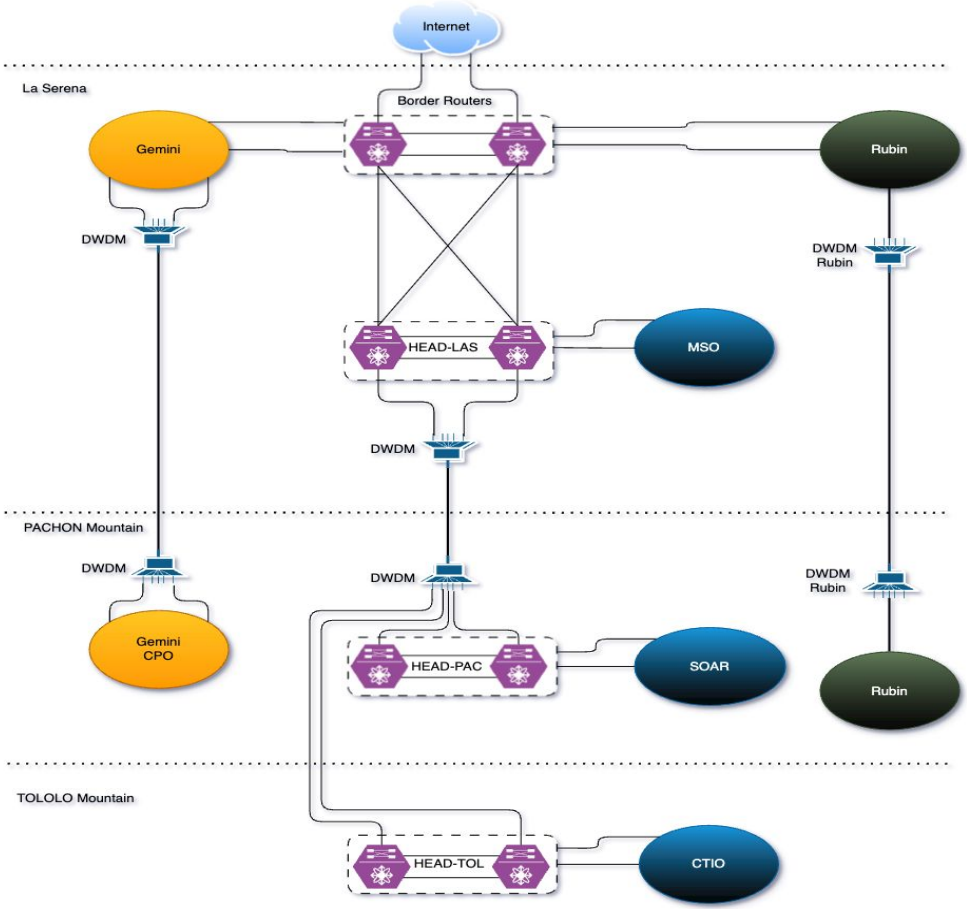
Tucson Center (TUC)

- **Internet 2 Link (Sun Corridor)**
- **Tucson <-> Kitt Peak (1Gb/s)**
- **Fiber Optic Planning**

Hilo Center (HBC)

- Internet 2 Link
- Hilo <-> Mauna Kea 10G link

Future Backbone NOIRLab LSC



To be Implemented 2025

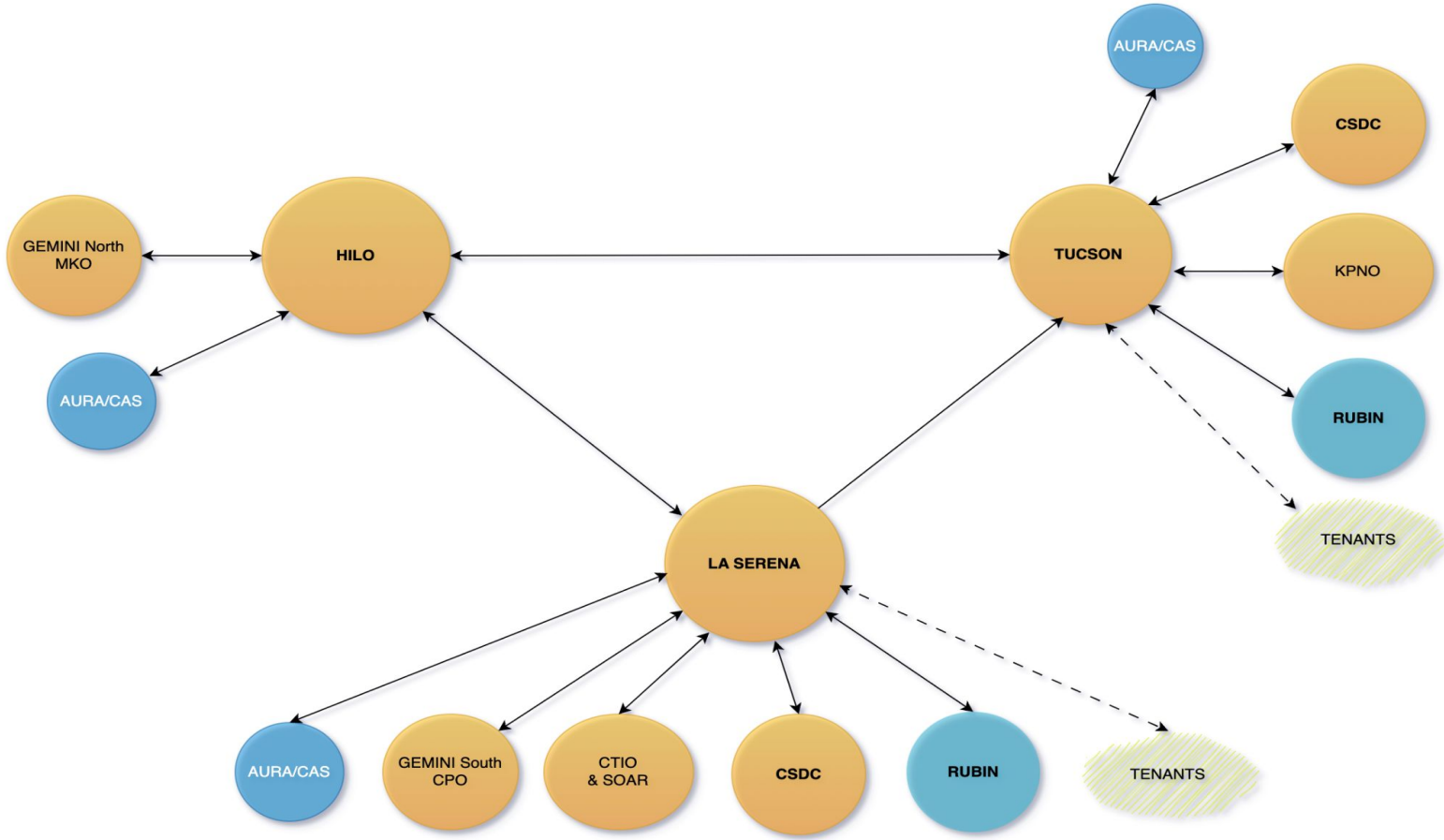
NOIRLab Program Integration

- CSDC (Community Science & Data Center)
  - https://noirlab.edu/science/programs/csdc
  - Working together to implement improvements to:
    - Improve Network Infrastructure to benefit service delivery
    - Establish high-availability, reliable, resilient and secure services (WIP)
    - Offload system administration to service teams
- Data Archive statistics
  - MSO (CTIO, SOAR and SMARTS) → **500** GByte per Night
  - KP (4m DESI and WIYN) → **200** GByte per Night
  - Gemini (GN and GS) → **20** GByte per Night (AWS)

NOIRLab Program Integration

- Gemini & MSO Integration
  - Continued implementation of secure interconnections between Programs
  - Leveraging new NOIRLab IT infrastructure to improve inward and outward-facing services.
  - WLC Integrations : Completed
- Gemini - MSO & Rubin
  - WLC Integration (In La Serena)
  - Zoom VoIP Cloud Service (Prototype working on Rubin Pachon)
  - Network alignment
  - Shared services Infrastructure administration
  - Aligned cybersecurity

NOIRLab Program Integration



NOIRLab Network Upgrade Project

NOIRLab Networking Upgrade Project

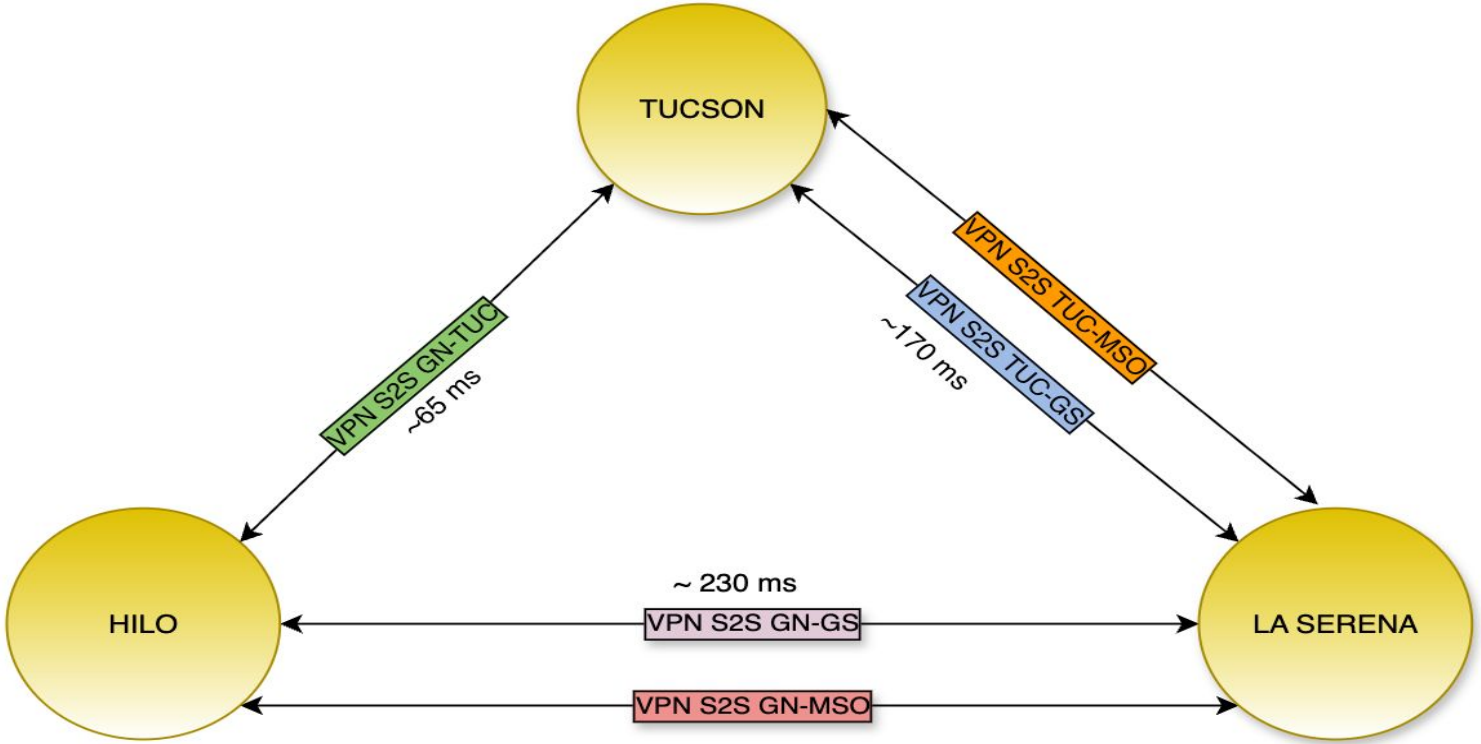
- LAN Design in all Locations : (Implementation in Progress in La Serena)
  - Priority : Tucson Base facilities (Design and Purchase equipment) **->DONE**
- WiFi Upgrade : Infrastructure completed in La Serena Center: adding new SSIDs
  - **New WLC on Tololo, SOAR and Facilities Cerro Pachon**
- WAN Design (VPN S2S Matrix updated, NGFW and Border routers standardization in HA) - continue to follow network upgrade plans

Implementing infrastructure based on standard technologies (LSC) :

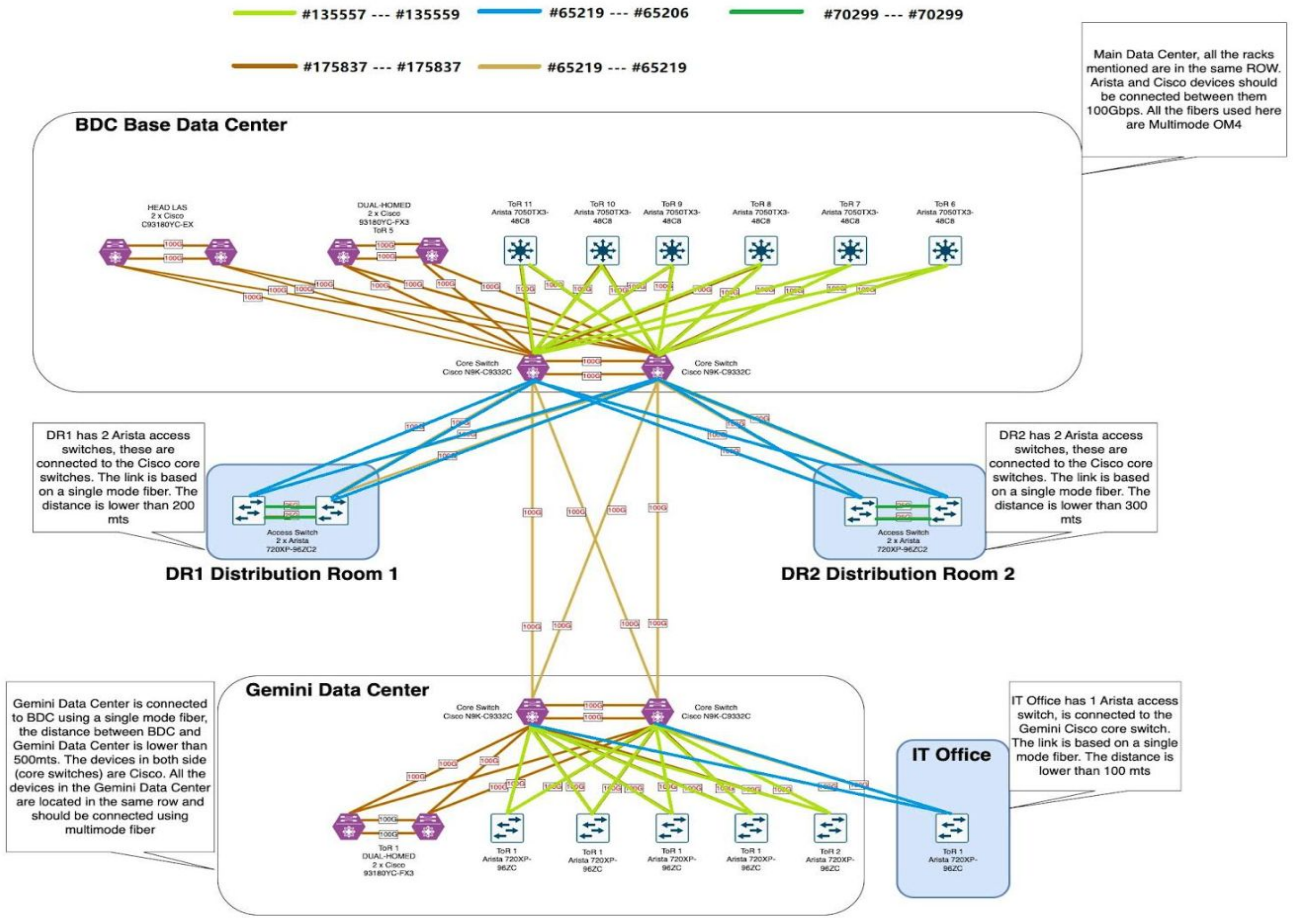
- Preparing Migration Setup in BDC La Serena (Optics Hardware / Unified Management Tools)

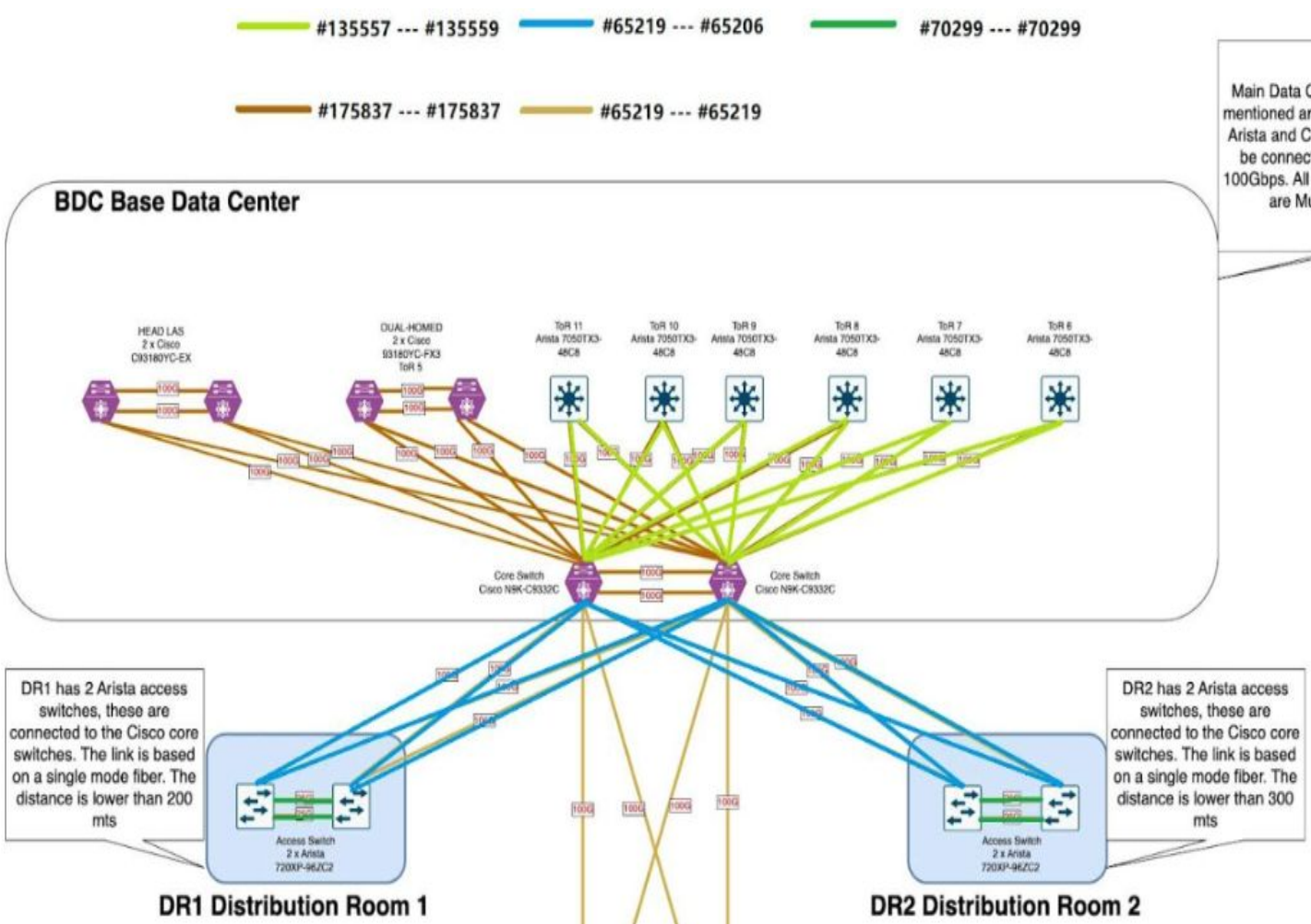
NOIRLab Program Integration

VPN S2S Matrix



NOIRLab LAN Design : Integrated with AURA Backbone

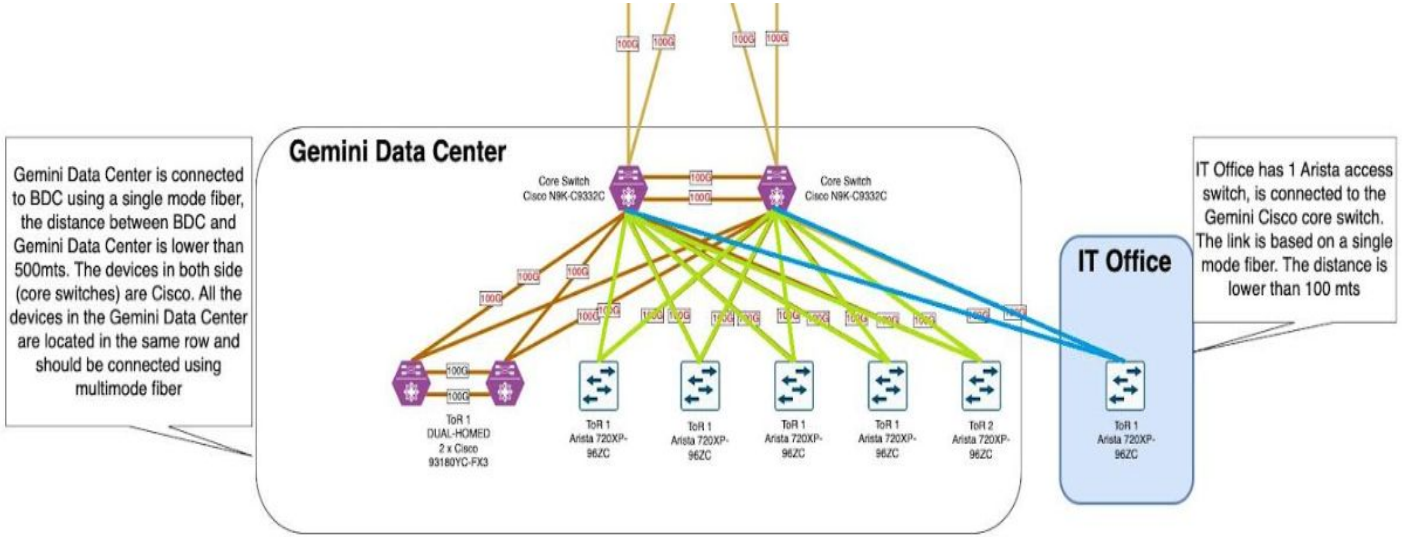




To be Implemented

June 20th,2025

NOIRLab LAN Impementation



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August 2025

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