



NRE Presentations at INDIS

SuperComputing 2022
Dallas, Texas
November 2022

Gauravdeep Shami
Ciena Booth #2344

NRE#17: Optimizing Big Data Transfers Using AI Strategies

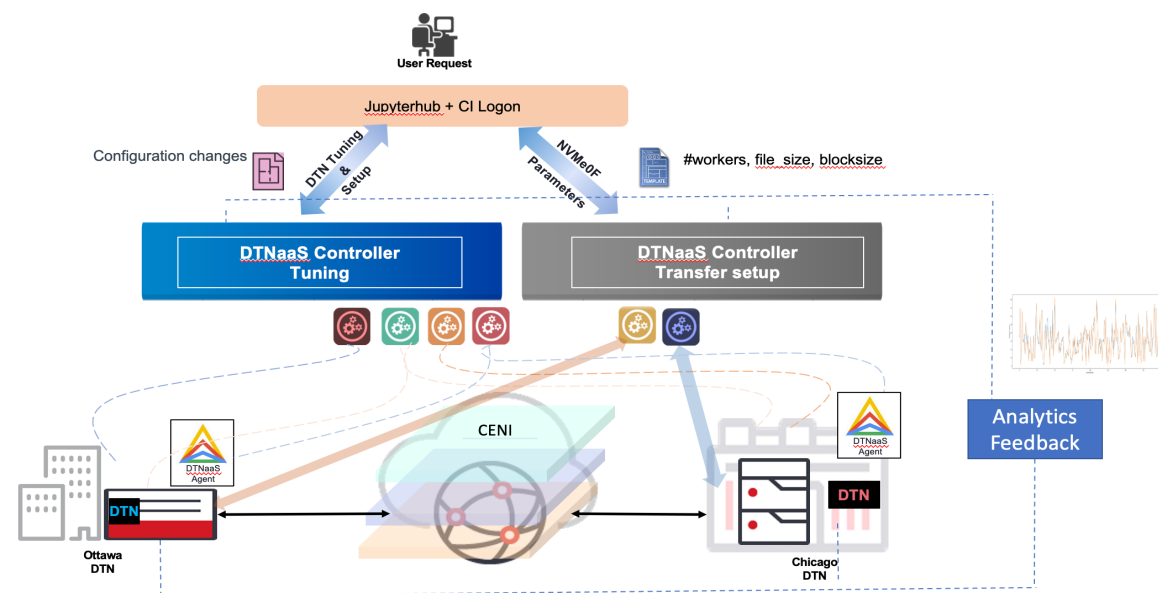
Ciena, iCair, UETN

The Challenge:

- Big Data flows are fragile and time-sensitive.
- Many hardware and software parameters need tuning.
- No one size fits all.
- Access to metrics between nodes not possible always.
- No obvious correlation between tunable parameters.

The Solution:

- An Analytics module that creates a high-bandwidth transfer strategy.
- Tested live between Ottawa-Chicago DTNs on CENI with over 12K transfers.
- ~4Gbps Mean Squared Error on predicted transfers with trained models.



Optimized DTN as a Service

Some Takeaways:

- Some parameters impact transfers more than others.
- ML models can be used to ballpark expected throughput.
- Optimal choice of parameters can result in predictably higher transfer speeds.

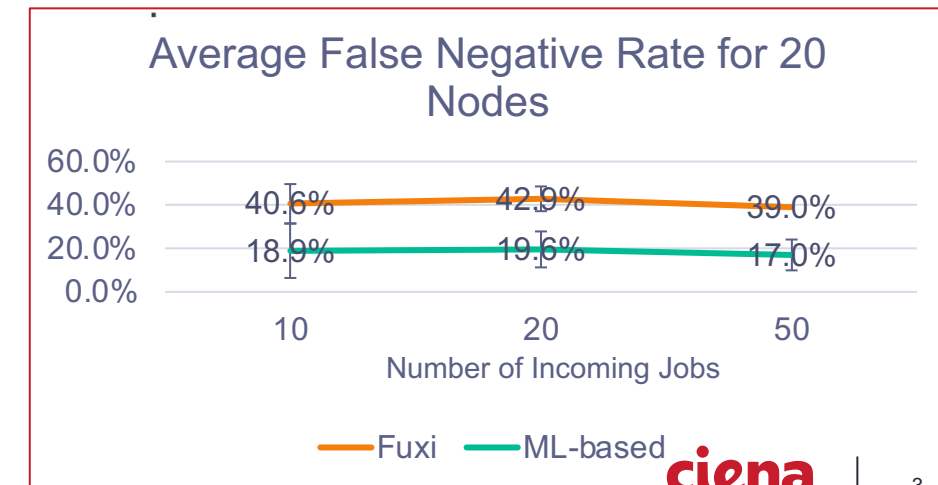
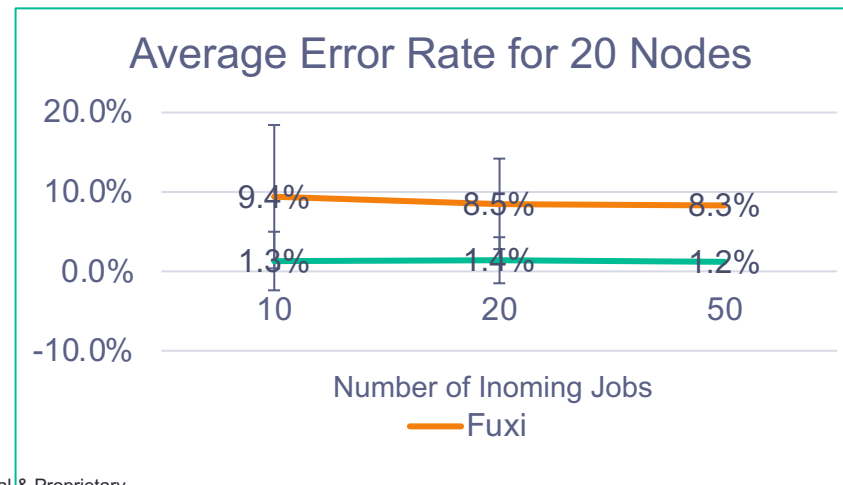
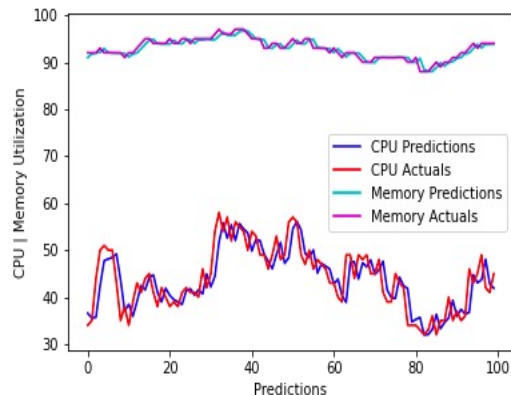
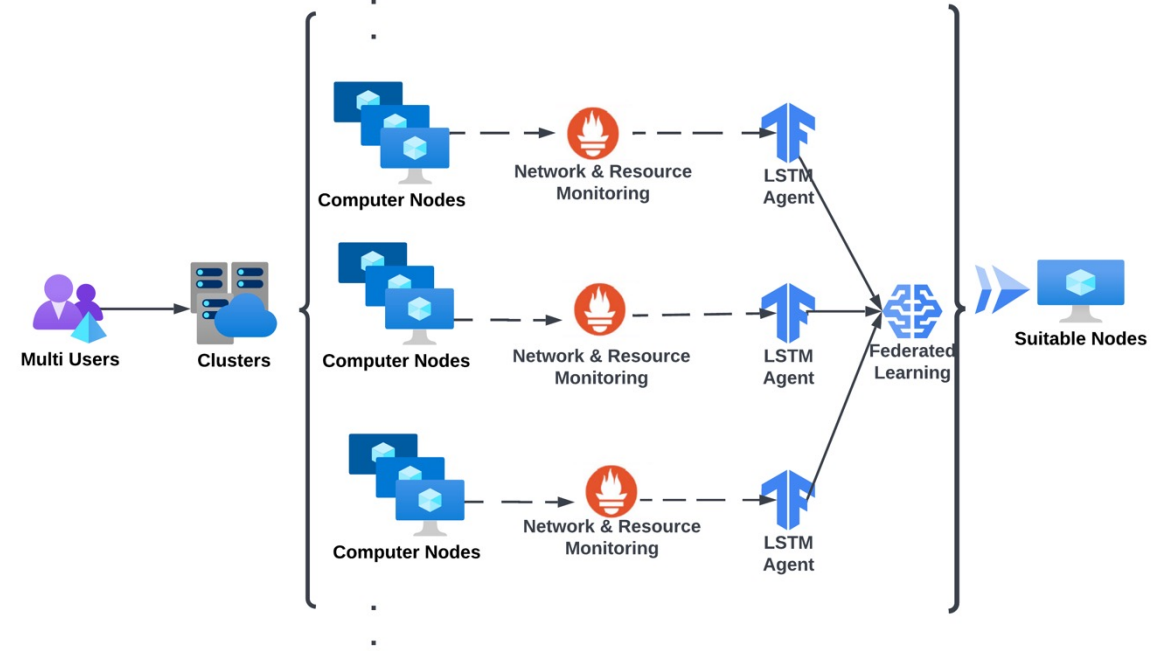
NRE#18: Federated Machine Learning Controller Framework for Optimizing Service Function Chains in a Cloud-Native Environment

Problem Statement:

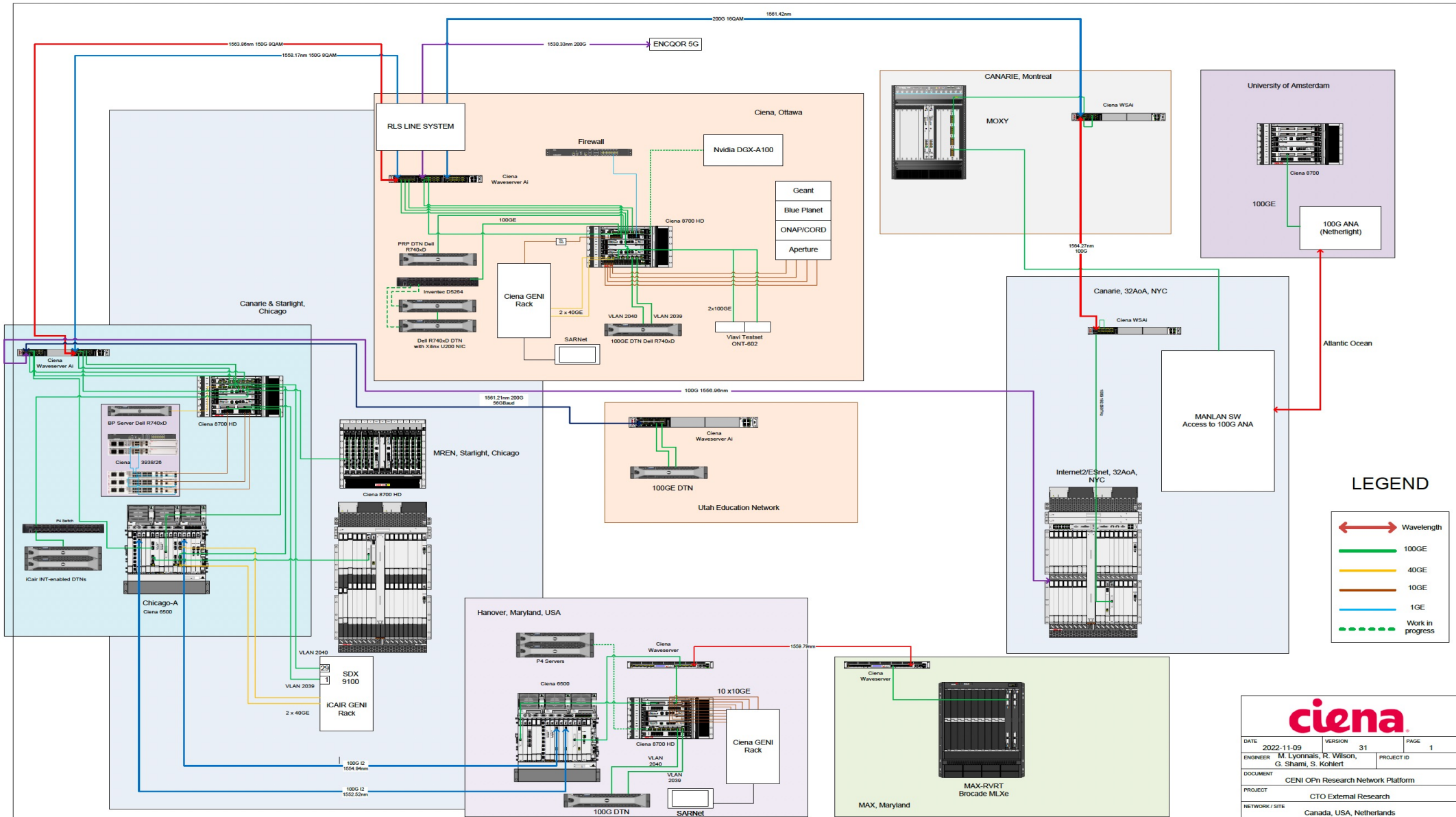
- All major applications → Cloud Native
- SFC: Jobs with specific and special needs
- Efficiency and reliability remain key issues.

Methodology:

- Create SFC-specific scheduler.
- Use ML to study long-term resource utilization patterns
- Rank and Score nodes best fitted to do the job



Ciena Environment for Network Innovation Map





Thank you!

Booth # 2344

Gauravdeep Shami (gshami@ciena.com)

Ziqiang Wang (ziwang@ciena.com)

Marc Lyonnais (mlyonnai@ciena.com)

Scott Kohlert (skohlert@ciena.com)