



SURF @ TNC23

SURF Networkers

15 August, 2023

| Sessions by SURF

Paul Dekkers

Geteduroam, development for easy and secure onboarding of eduroam and other roaming networks

Sandy Janssen

Vendor risk management – a challenging debate with tech companies on compliance

John Walker

Simulations in Education and Research: A Public Values Perspective

Joost Gadellaa

Cyber Threats of Shadow IT in Higher Education and Research

Evelien Renders

World-class education? Interoperability is key! Enhancing education infrastructure and learner mobility through NRENs

Koos Kruihof

Driving collaboration & innovation between NRENs

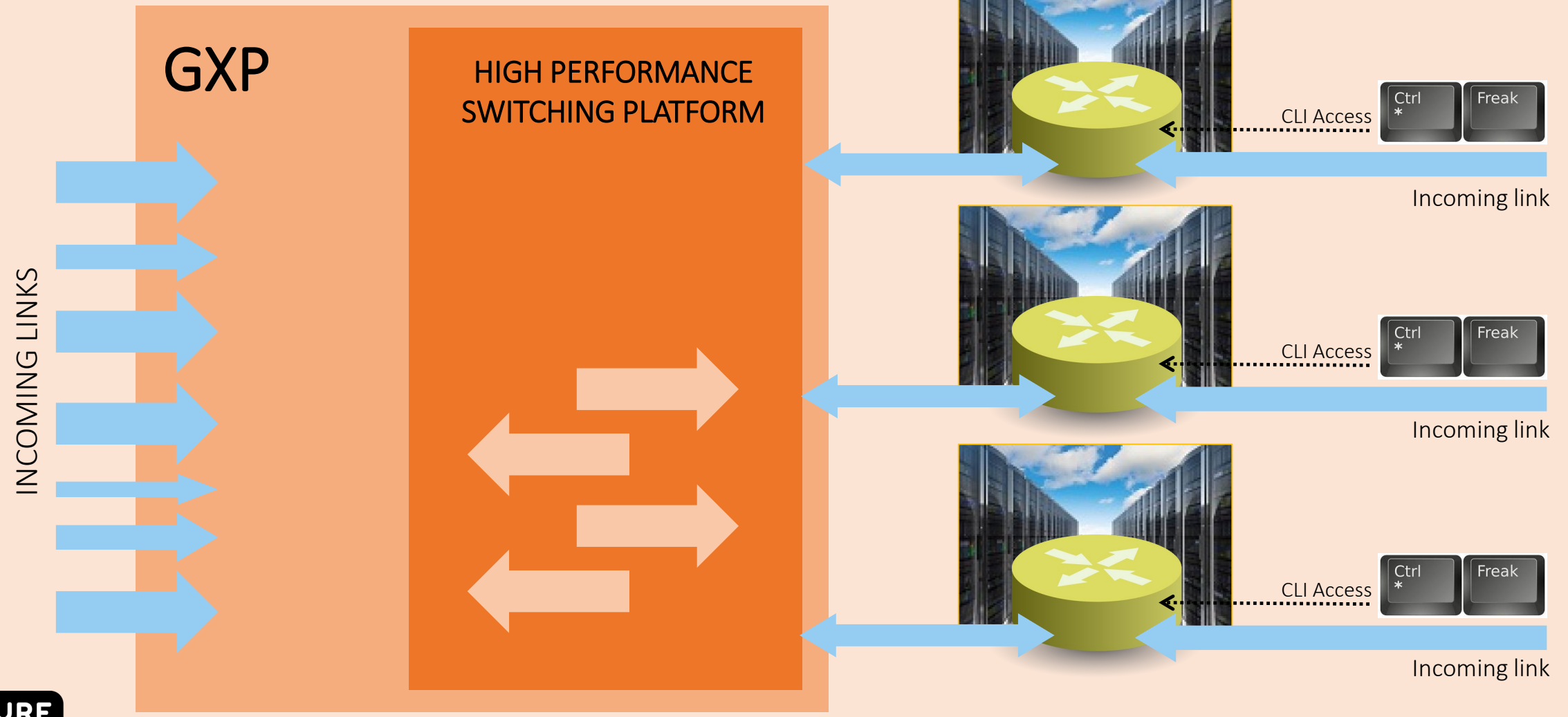
Daminan Podareanu

AI in operations at SURF

Rogier Spoor

Sustainable software development at NRENs: the example of the economics of eduVPN

Routing at GXP

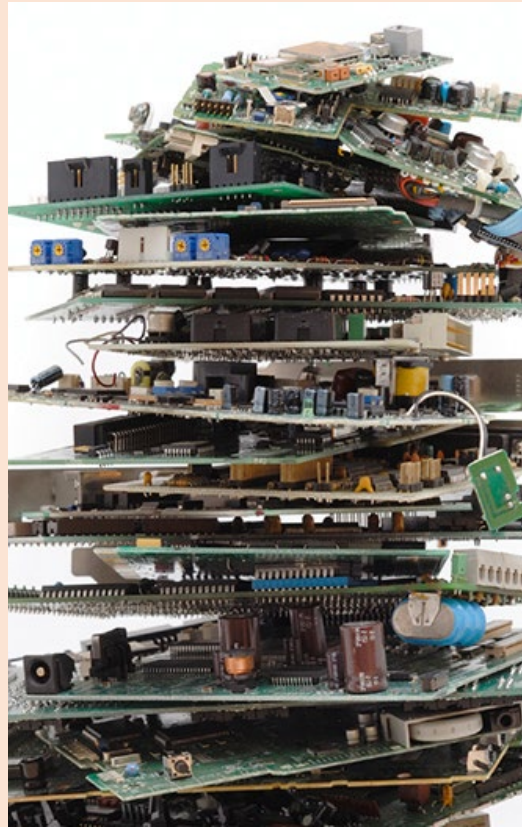


| For that we are all:

Adventures with
customs



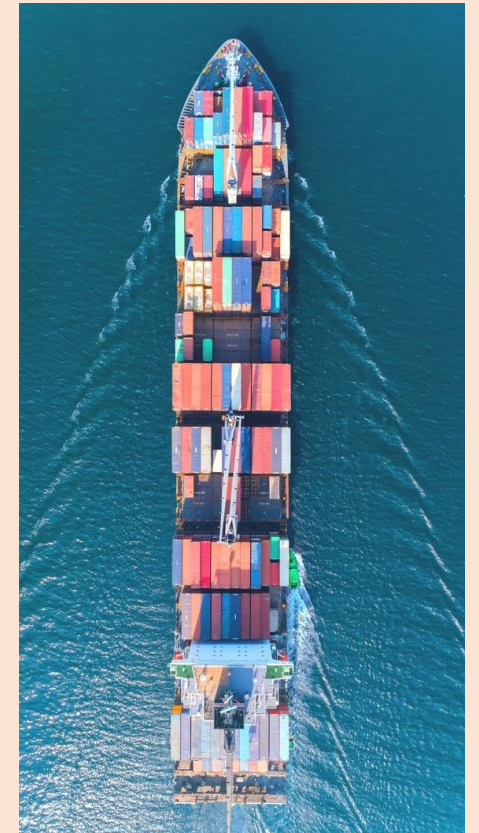
Storing spare parts
abroad



Spending big money on housing

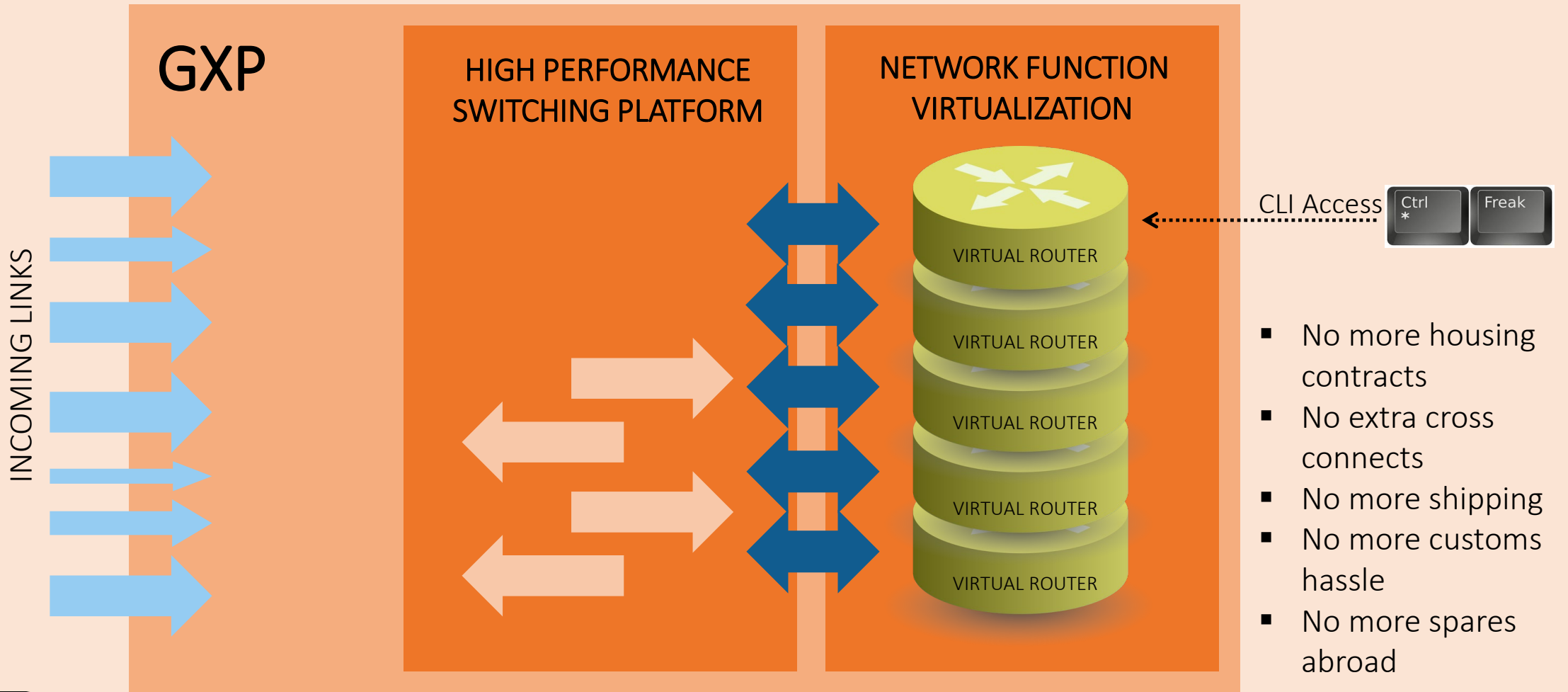


Shipping equipment



SURF

Virtual Routers at GXP

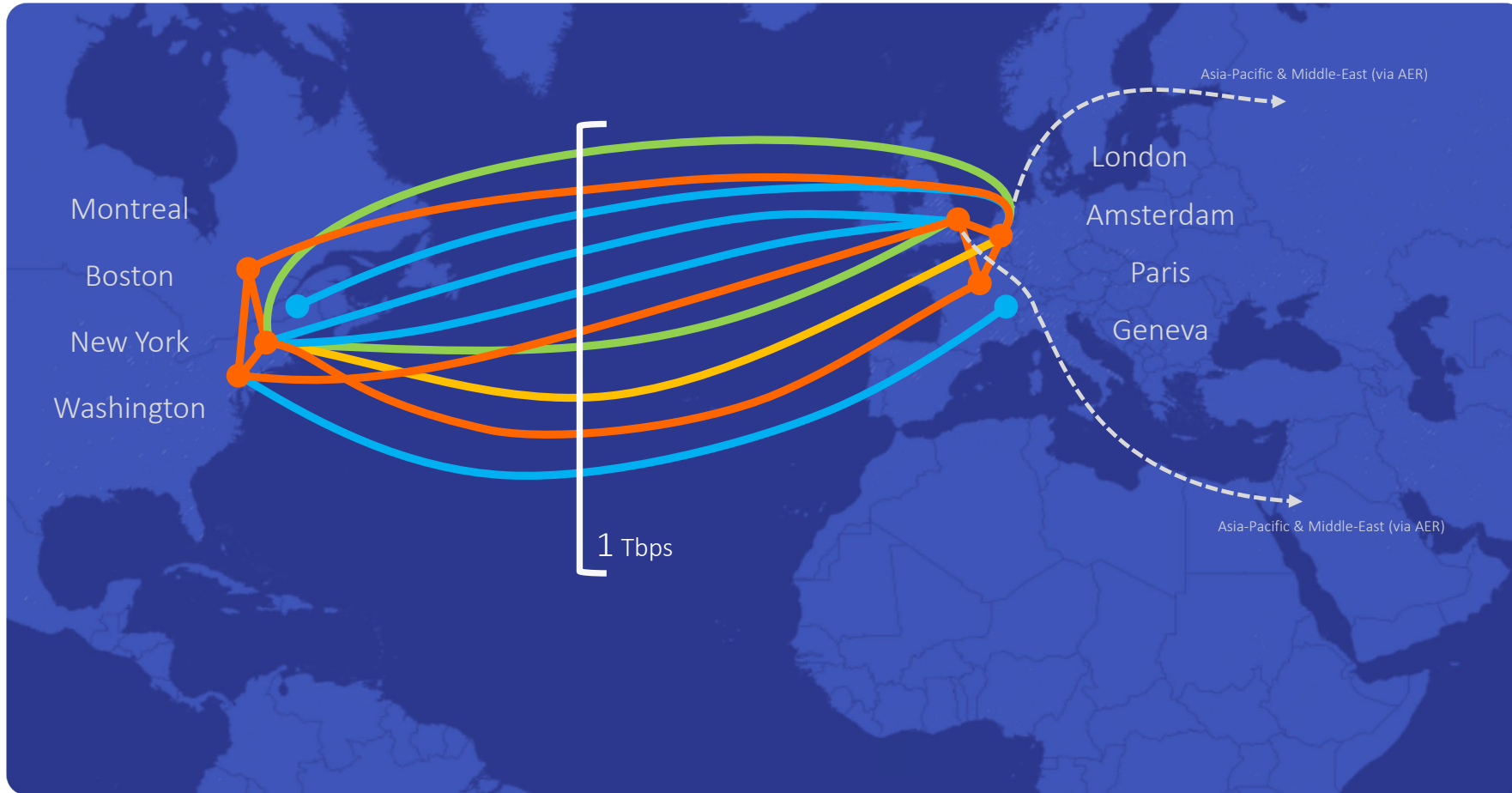


- No more housing contracts
- No extra cross connects
- No more shipping
- No more customs hassle
- No more spares abroad

| Virtual Routers at GXPs

- We all ship hardware across the world
- High CA/OPEX (remote hands, spares, support, etc)
- Software solutions see significant rise in performance (see: <https://csit.fd.io/trending>)
- Pay As You Grow possibilities
- No remote hands, spares, shipping, waiting times

ANA System 2023



- IU
- ESnet
- NII
- GÉANT, SURF, NORDUnet, Internet2 & CANARIE

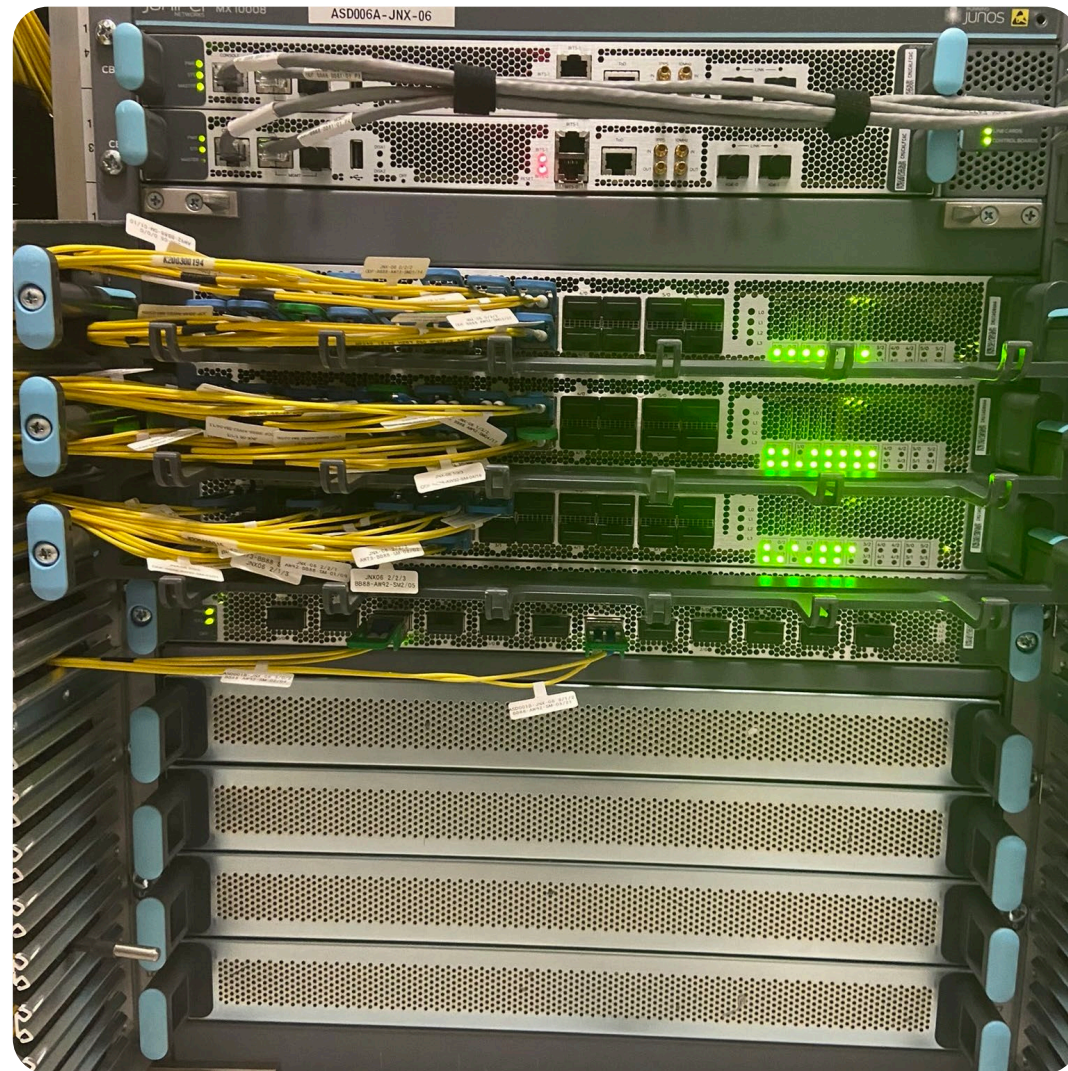
Available: NetherLight 400G

Juniper LC9600 in MX10008

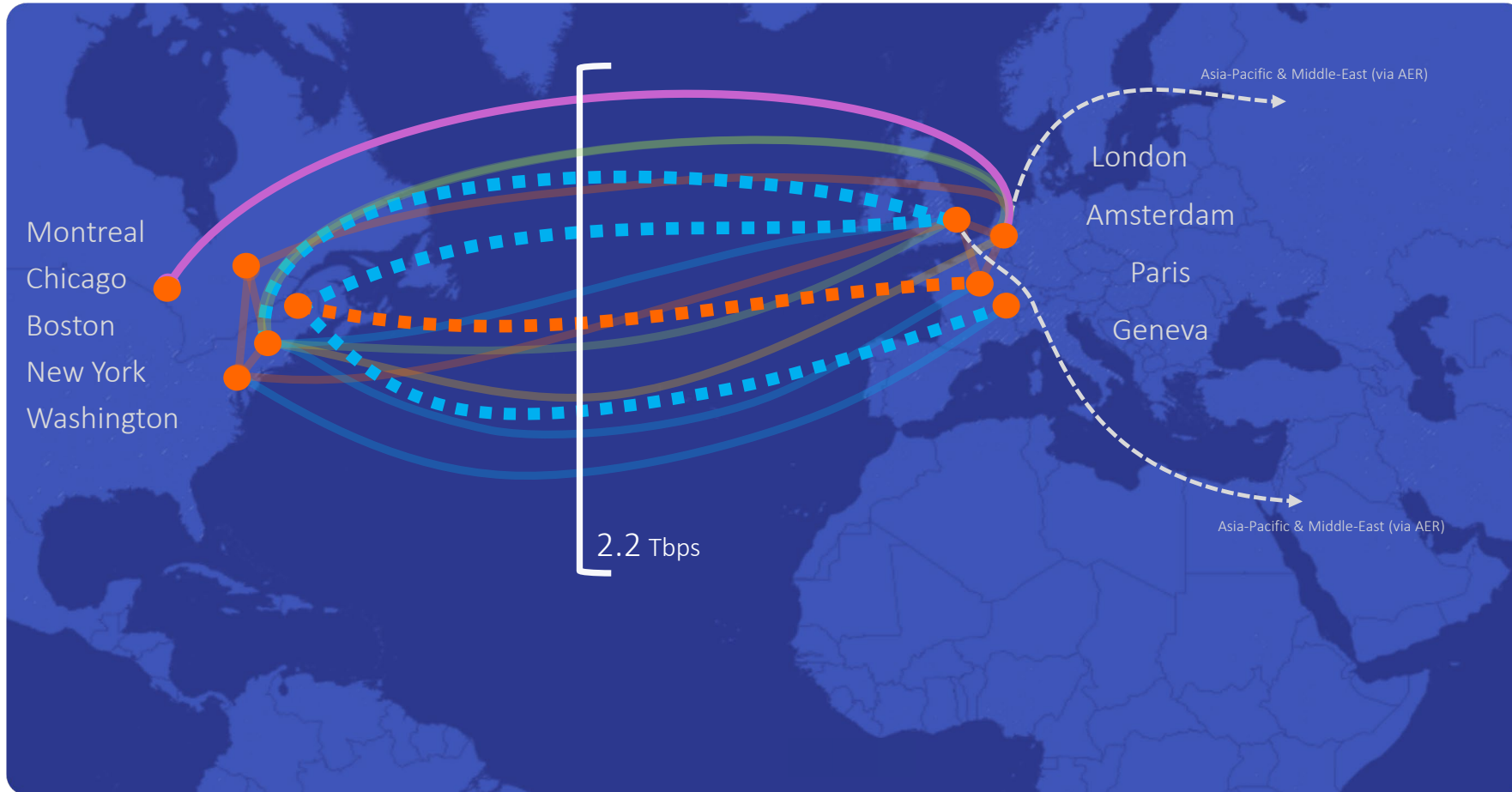
Parties to upgrade soon:

- NL-T1
- CERN

3000 Euro p/month



ANA System beyond 2023



- IU
- ESnet
- NII
- GÉANT, SURF, NORDUnet, Internet2 & CANARIE
- KISTI

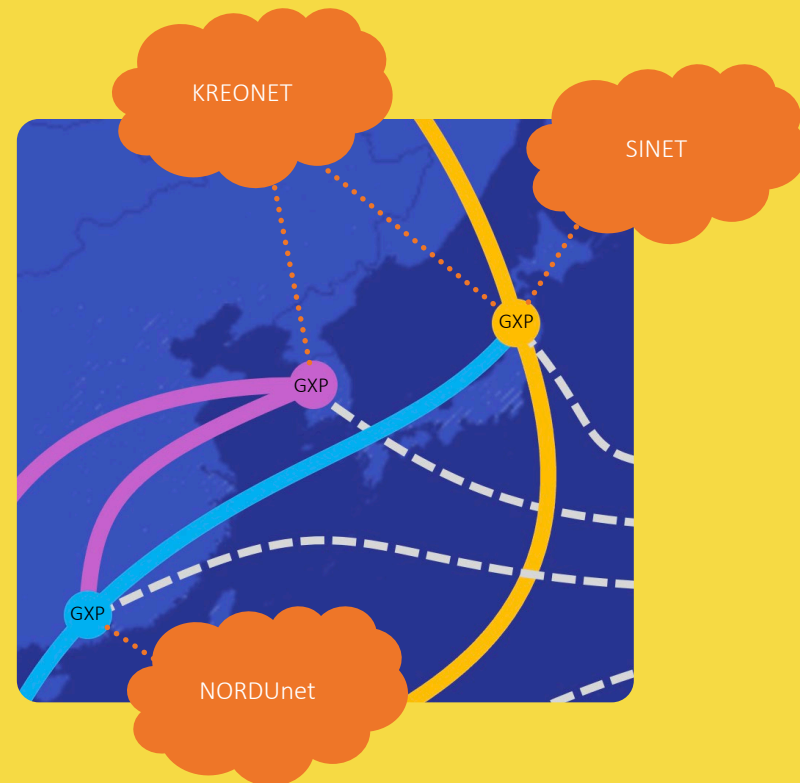
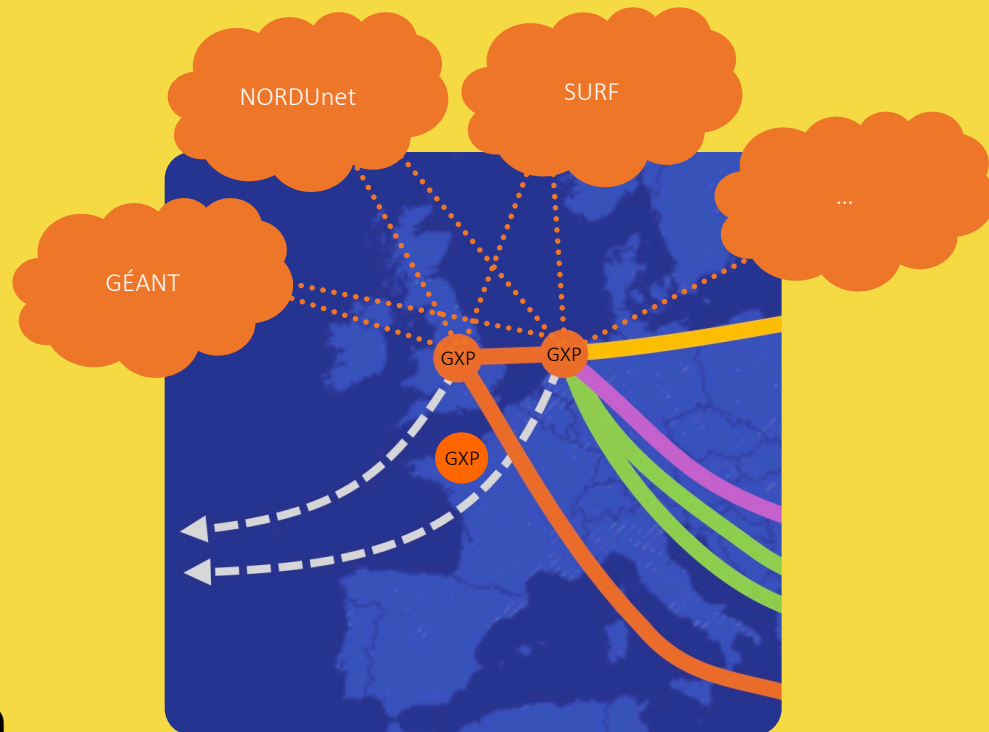
- 100G
- - -● 400G



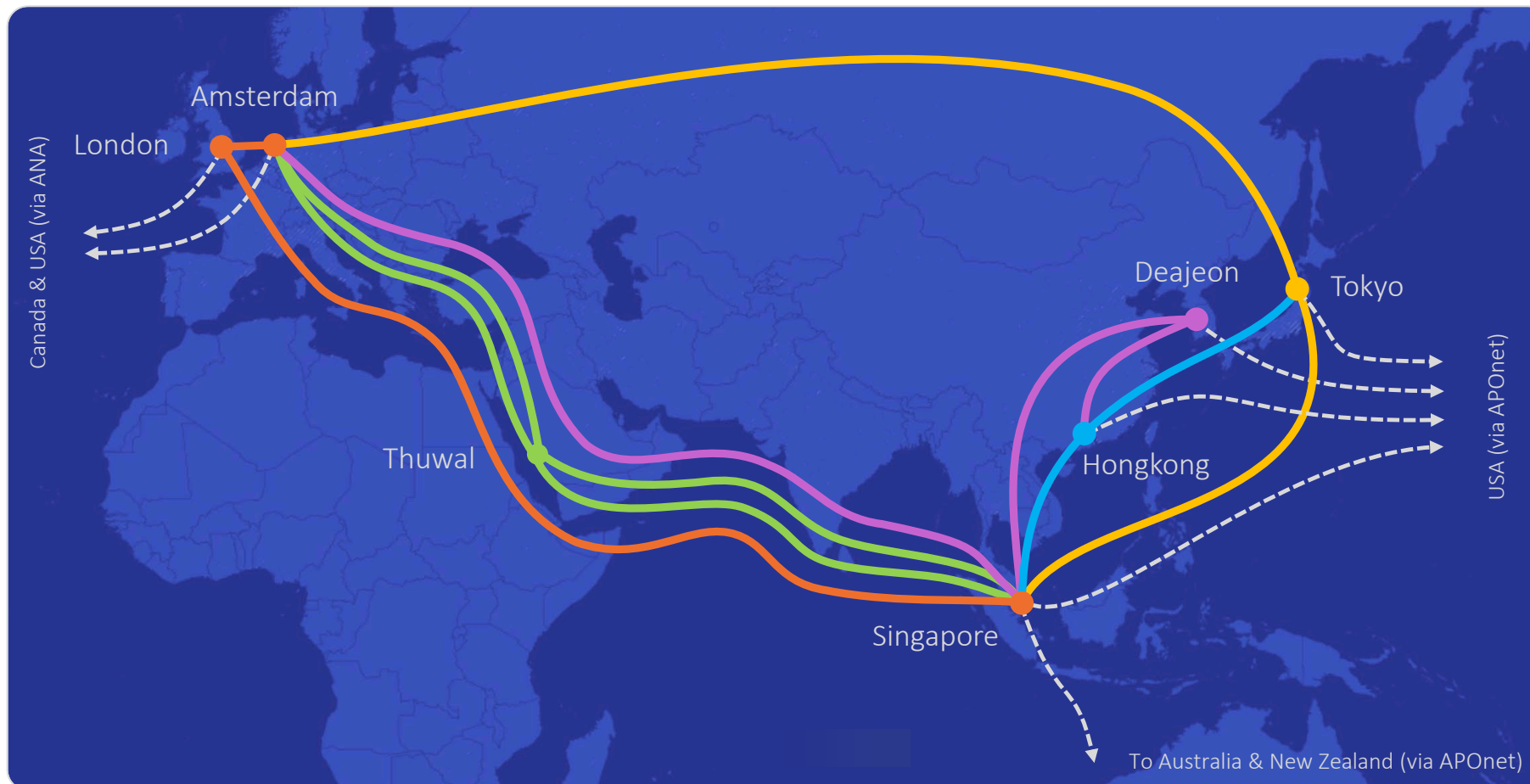
Global Network Architecture: GXPs as connection points

GXPs are the 'points of gravity' for connecting networks and intercontinental links.

By connecting intercontinental links and networks into neutral GXPs we lay the foundation for the Global Research and Education Network (GREN)



AsiaPacific Europe Ring (AER)



Blue line: HARNET, NICT & SingAREN

Yellow line: NII

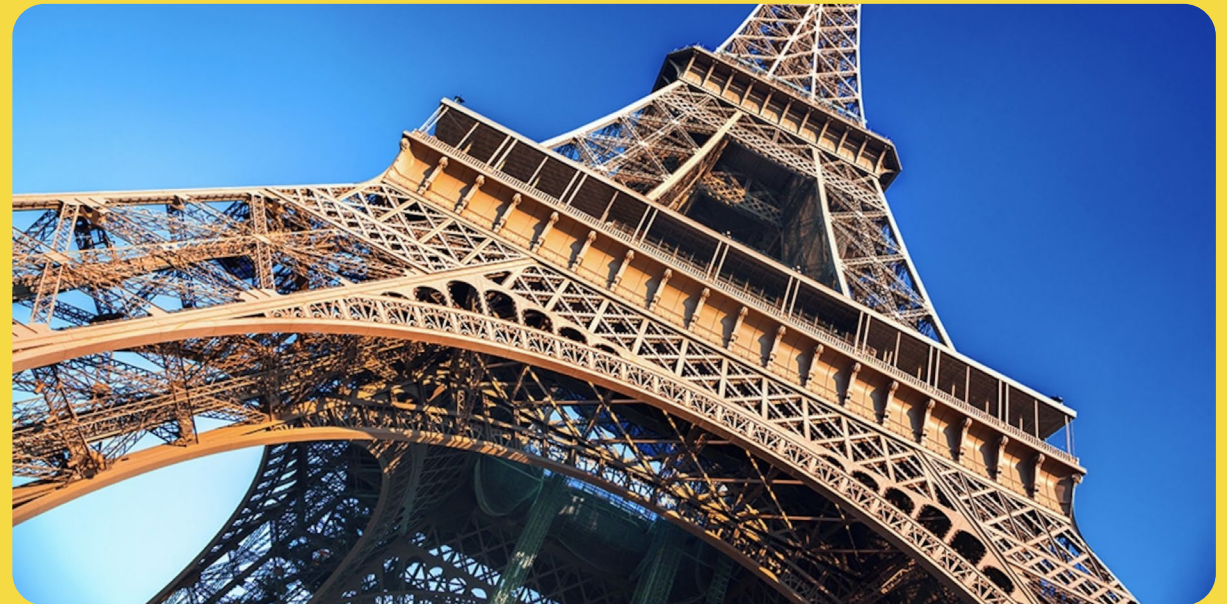
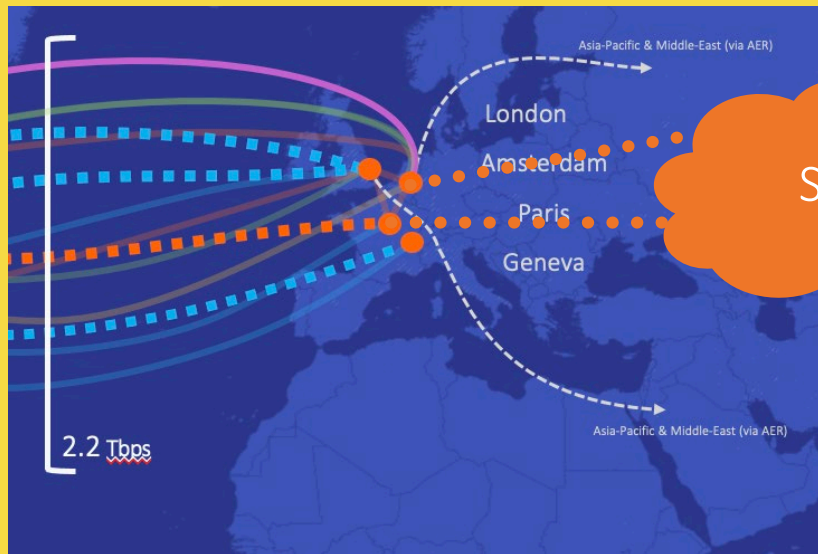
Orange line: GEANT, SURF, NORDUnet, AARnet, SingAREN & TEIN*CC

Green line: KAUST

Pink line: KISTI

| SURF's 400G GÉANT Open Paris in December 2023

400G in Paris to connect optimally to the ANA-System



800G AMS-GEN

Working on pushing the limits with industry to optimize for LHC.



- ROADM site
- Amplifier site
- FOADM site
- Raman span (current)
- Raman span (planned)



| Workflow Orchestrator

- **Open source orchestration framework** actively developed by SURF and ESnet via the Workflow Orchestrator programme (<https://workfloworchestrator.org/>).
- The Workflow Orchestrator facilitates the management of **product lifecycles for your customers**.
 - Create and maintain your own **domain models** and **workflows**.
 - Integrate with your favorite BSS/OSS tools like **Jira, Netbox, VC4 IMS, NSO**, etc.
- Currently in use in production at **SURF** and **ESnet**. **GÉANT** is onboarding. **BELNET** is actively testing. **CANARIE** is ready to get started onboarding.
- Community effort – sharing models, code and examples, but also organising workshops and sharing knowledge.

| SURF-network: next generation

With the next generation of the network, SURF will offer **high-quality, reliable, flexible** and **intelligent** network infrastructure that **optimally supports** Dutch education and research, both nationally and internationally.

- Composed services (integrated network services, R&E ecosystem)
- Diverse customer base (research groups vs institutions)
- Less is more (simple fit-for-purpose models, protocols, etc...)
- Bring out the best in suppliers (autonomy, open standards)
- Sustainability (replacements, integration, smart algorithms)
- Extensive orchestration and virtualization
- Intelligent network functions (improving network management and optimizing network performance, security and efficiency)



Renewal plans SURFnet8 --> SURFnetNG

- SURF is required to tender according to the European Procurement Act. End of current contract is Q4-2025.
- Scope: Providing network equipment to deliver L2 services (P2P, MP2MP) and L3 services (IP transit, VPN), software to configure and manage these services, maintenance and support, and consultancy.

Period	Description
2023-Q2	Project initiation and preparation
2023-Q3	Drafting RFI + RFI process
2023-Q4	Drafting RFP
2024-Q1 + Q2	RFP process
2024-Q3	Verification + contract
2024-Q4	Start implementation

