An alternative approach to transport Time Sync over Telco Networks

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Türk Telekom

- Turk Telekom Group
- The Problem(s)
- The Solution
- The TurSwe Approach (Turkish, Swedish)

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Lead Architect

- 18 years of Telco Network and Broadcaster experience.

Türk Telekom

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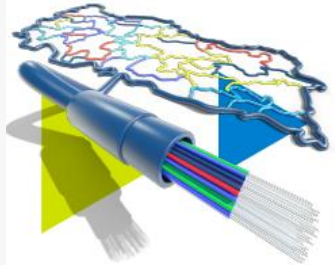
In numbers
Türk Telekom

Serving
47.8 mn
Subscribers

Most valuable
telco brand for
11 CONSECUTIVE YEARS



304K km
fiber network in
81 cities

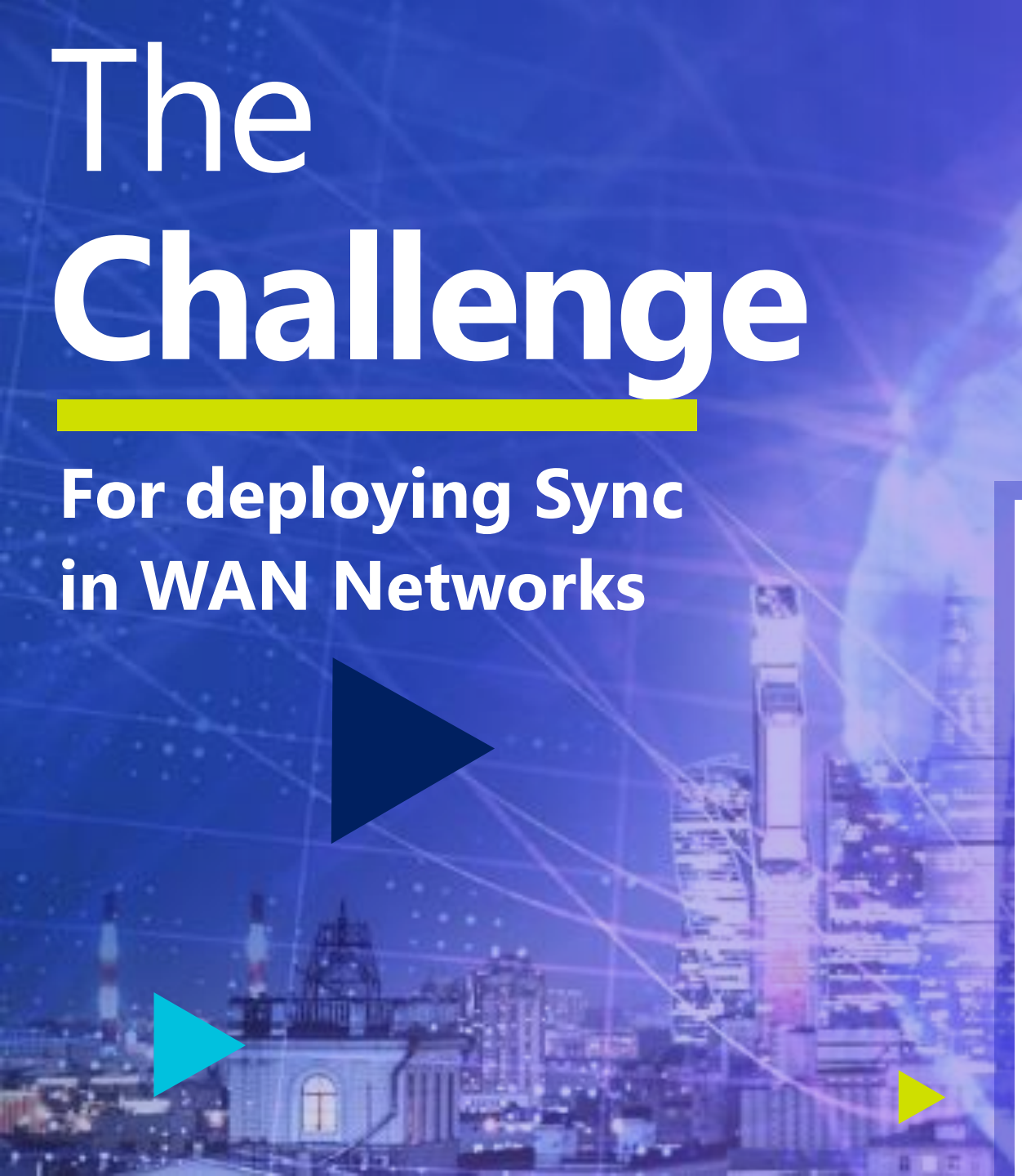
32.180
EMPLOYEES
Turkey's
largest employer

21.9 mn
Fiber Homepass*

*Homepass includes FTTC & FTTH/B

The **Challenge**

For deploying Sync in WAN Networks



- There are challenges and threats to using only **GPS/GNSS**.
- PTP provides an alternative/additional solution, deployment of PTP in WAN type of operation brings other challenges, risks and costs.

The Problem

GPS/GNSS

- Most of us will consider that overall GNSS provides a high degree of reliability, that is not the issue here.
- But this degree of reliability is not applicable at the Mobile LTE TDD/5G domain.
- The main issue is that each individual base station and it’s GNSS receiver becomes a challenge.
- Malfunction of the antenna/receiver, a limited view of the sky(dark clouds), or jamming activities are common threats.

The Challenge

Deployment PTP in WAN

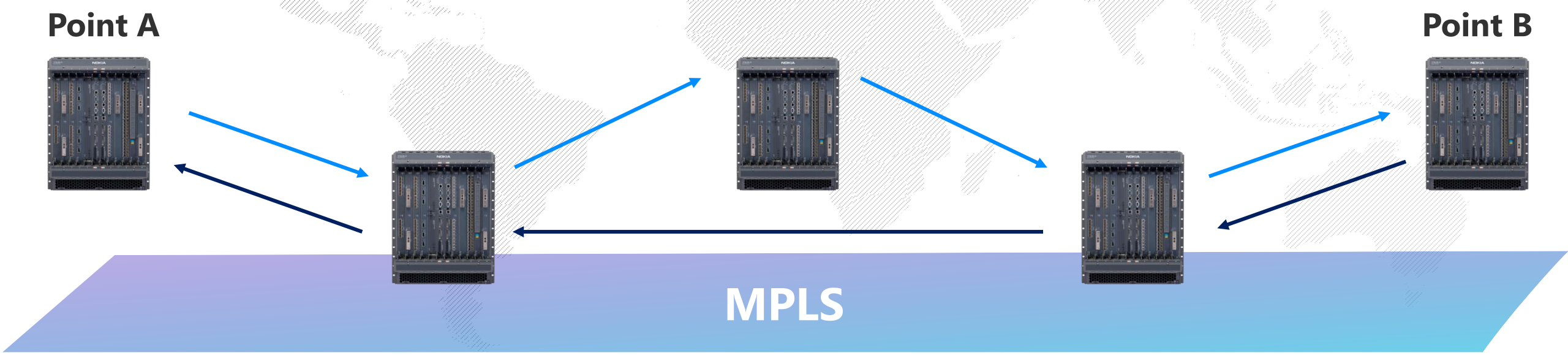
- **8275.1** is very hard to accomplish in a WAN.
- **8275.2** is relying too much on Satellite signals which is previous advised problem and there is still a portion of WAN.

The WAN **Challenge**

- All networks require an end to end design engineering on all the layers.
- Any change in any of the layers has the risk not being design engineered as all operations of each network layer is separate from the other.

Layers of Networks

Layers are unaware of each other



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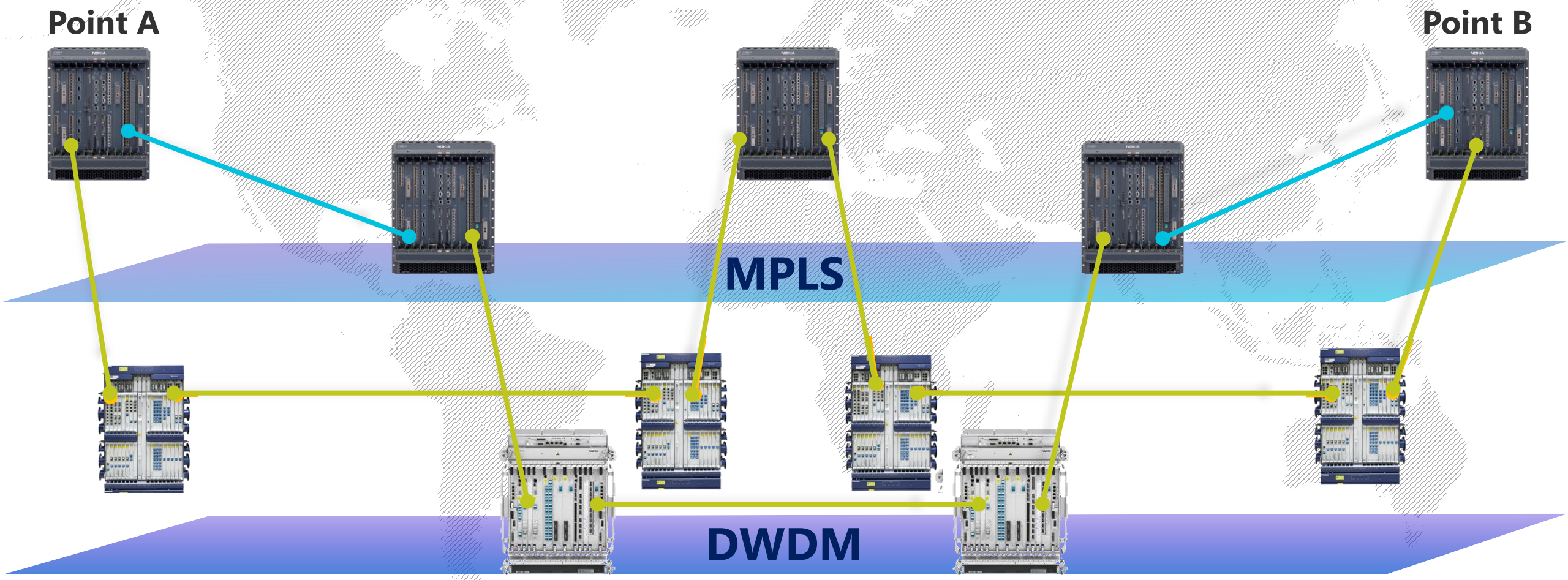
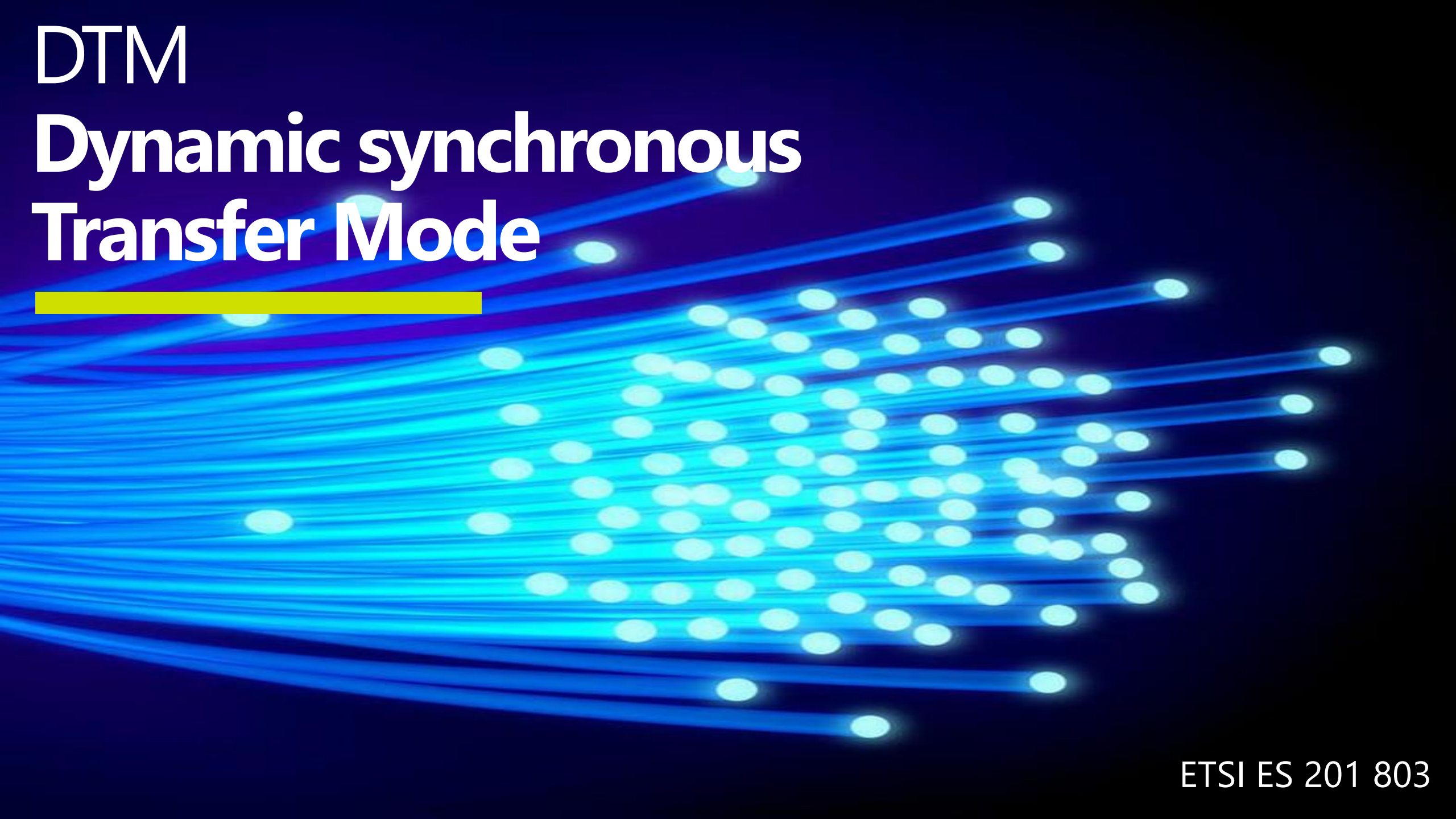


The TurSwe

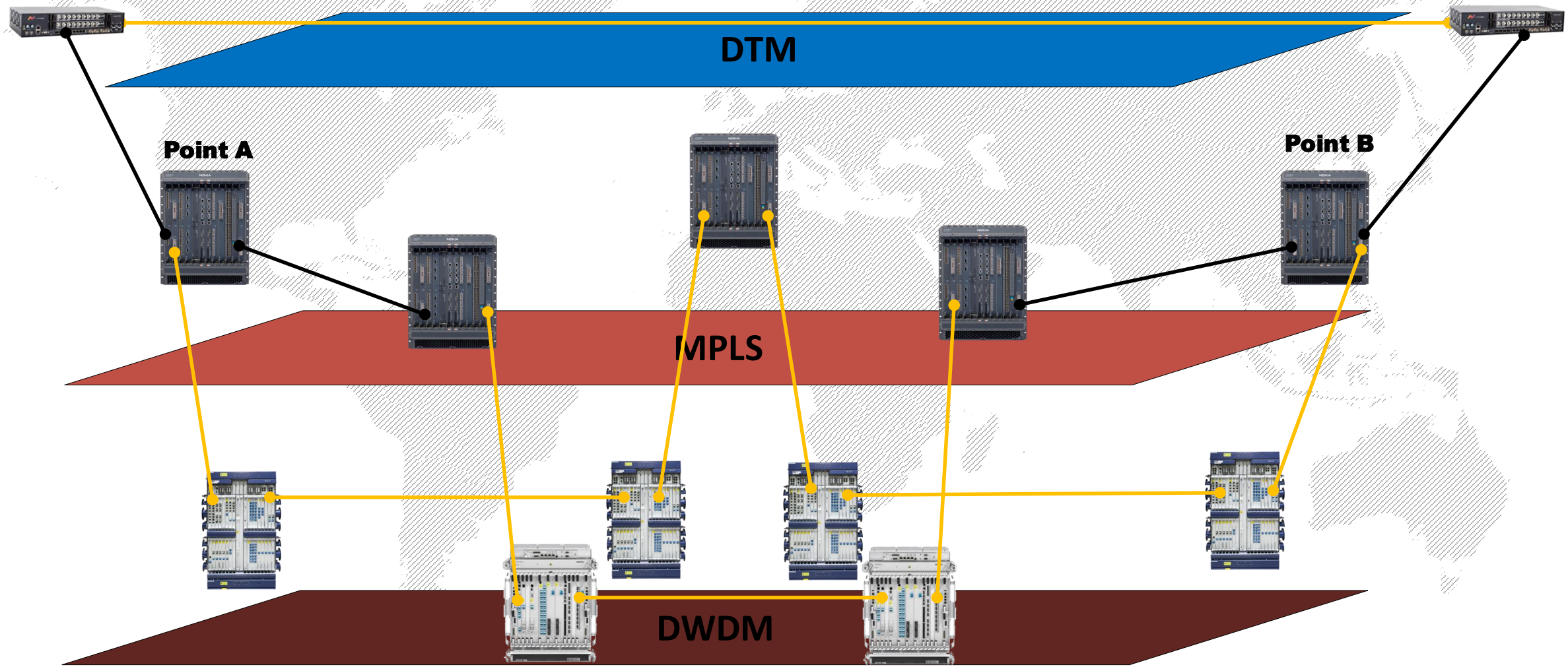
DTM
Dynamic synchronous Transfer Mode



ETSI ES 201 803

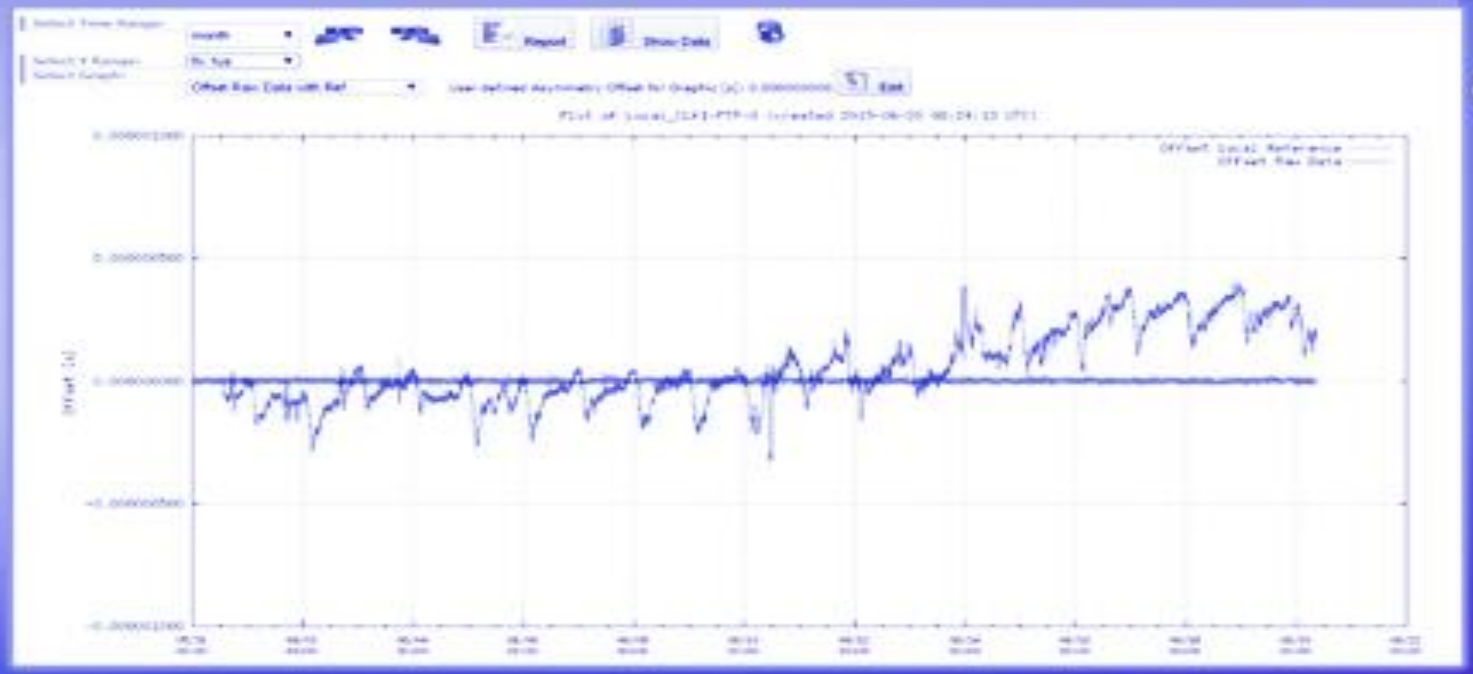
DTM over IP

A new layer to transfer Time



GPS Independent Time Distribution

- GPS Independent
- No Full Timing Support
- No Partial Timing Support
- No Asymmetry Issue
- Only IP Connectivity
- No PDV Issue



Calnex

Measured &Verified

Total Test Topology Live Network

Thank you…