

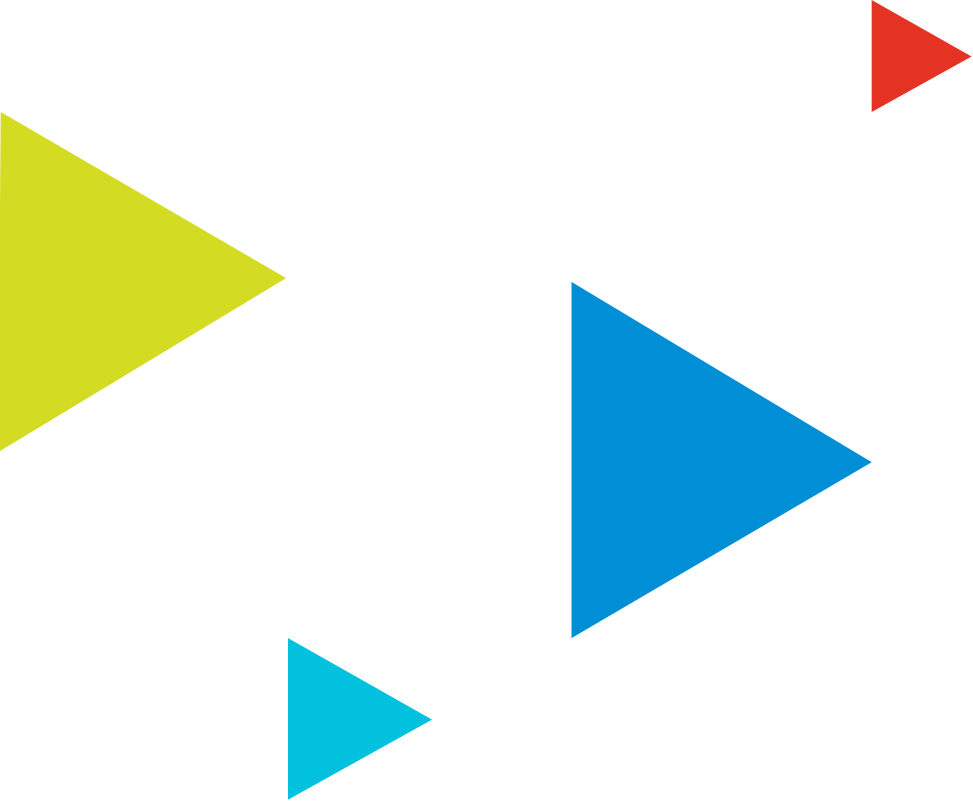
# An alternative approach to transport Time Sync over Telco Networks

Umut (Udo) Keten

WORKSHOP  
ON  
SYNCHRONIZATION  
AND  
TIMING SYSTEMS

Türk Telekom





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



# Turk Telekom builds efficient media transport network with DTM

Turk Telekom recently put in place a dynamic synchronous transfer mode (DTM) solution to run over its MPLS network to provide a better media infrastructure for broadcasters in Turkey. Typically, most broadcasters are based in western Turkey, and when they want to cover live events in the east, they have to dispatch trucks and SNGs at huge cost.



Umut Udo Keten, Senior Architect, Service and Product, Turk Telekom.

quite expensive. We're looking for a creative solution. The trouble with broadcast video is having to transport it over a network of late-1990s-era equipment.

Turk Telekom realized that transporting video over a network for live broadcast would be a challenge.

"We need a solution that explains the advantages of DTM."

## Umut (Udo) Keten Lead Architect

- 18 years of Telco Network and Broadcaster experience.



# Türk Telekom



Türk Telekom  
International



innova

ARGELA

sebit



ASSIST

# In numbers Türk Telekom



Serving

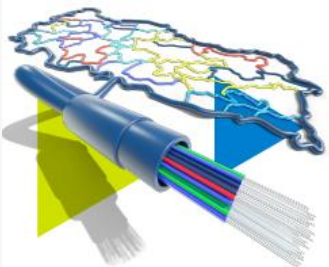
**47.8 mn**

**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 its 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

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## 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.



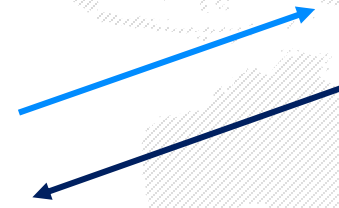
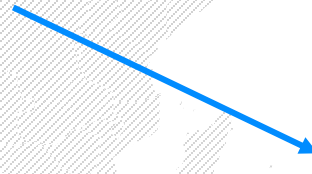
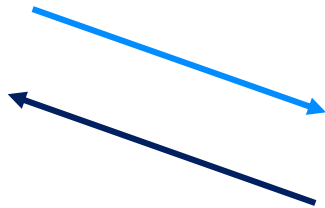
# The WAN Challenge

## Layers of Networks

Layers are unaware of each other

- 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.

Point A



Point B



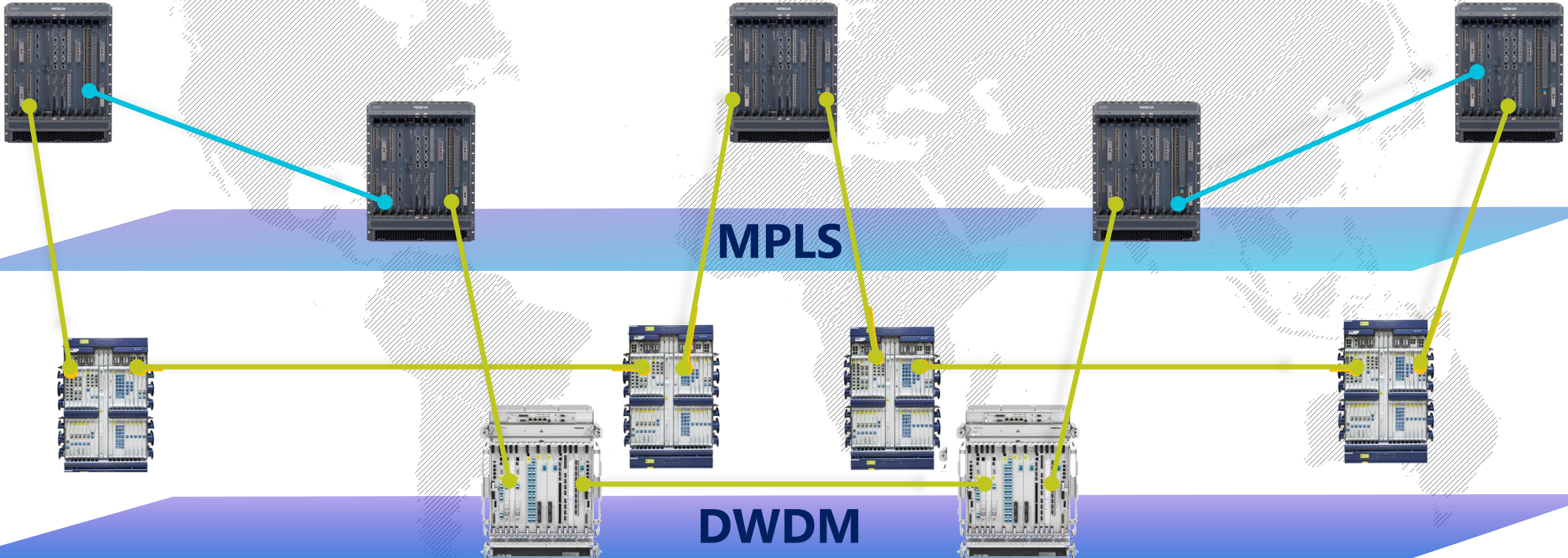
MPLS

# Layers of Networks

Layers are unaware of each other

Point A

Point B



# The TurSwe

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DTM

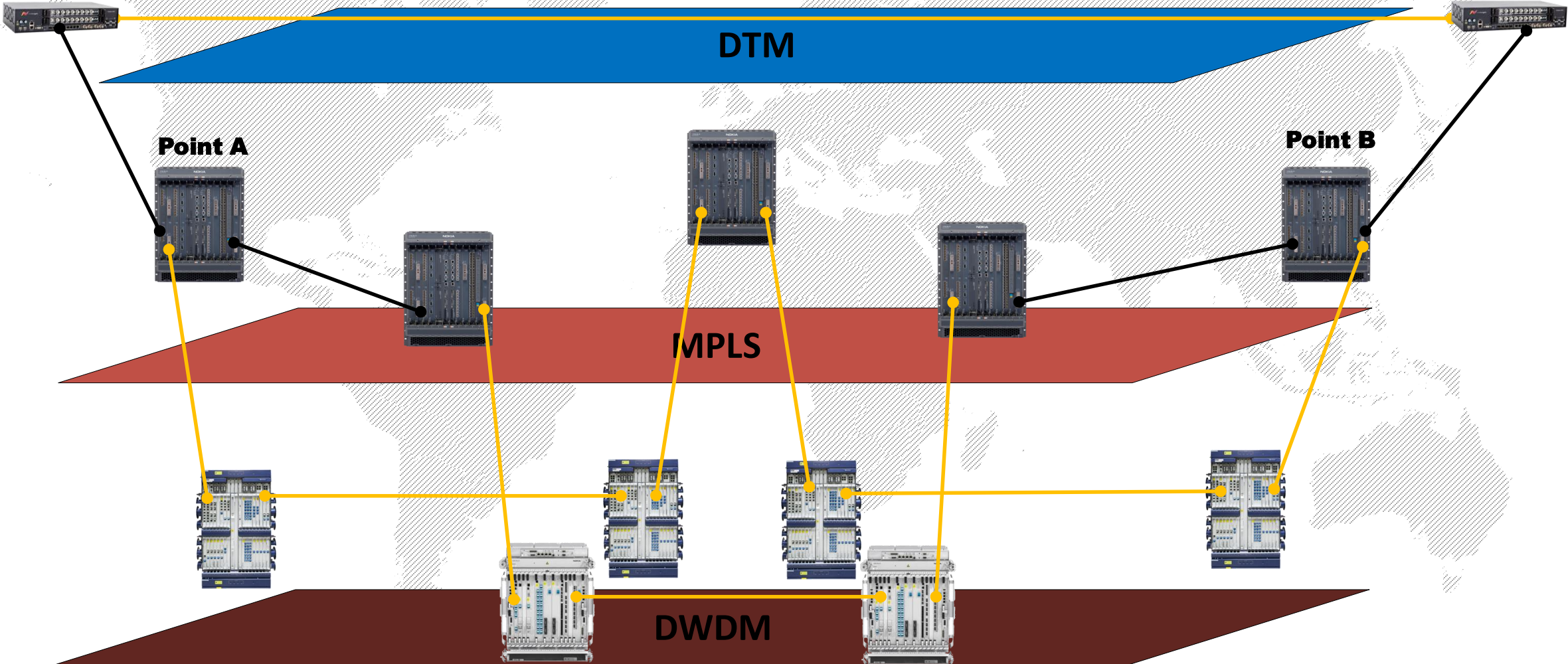
# Dynamic synchronous Transfer Mode





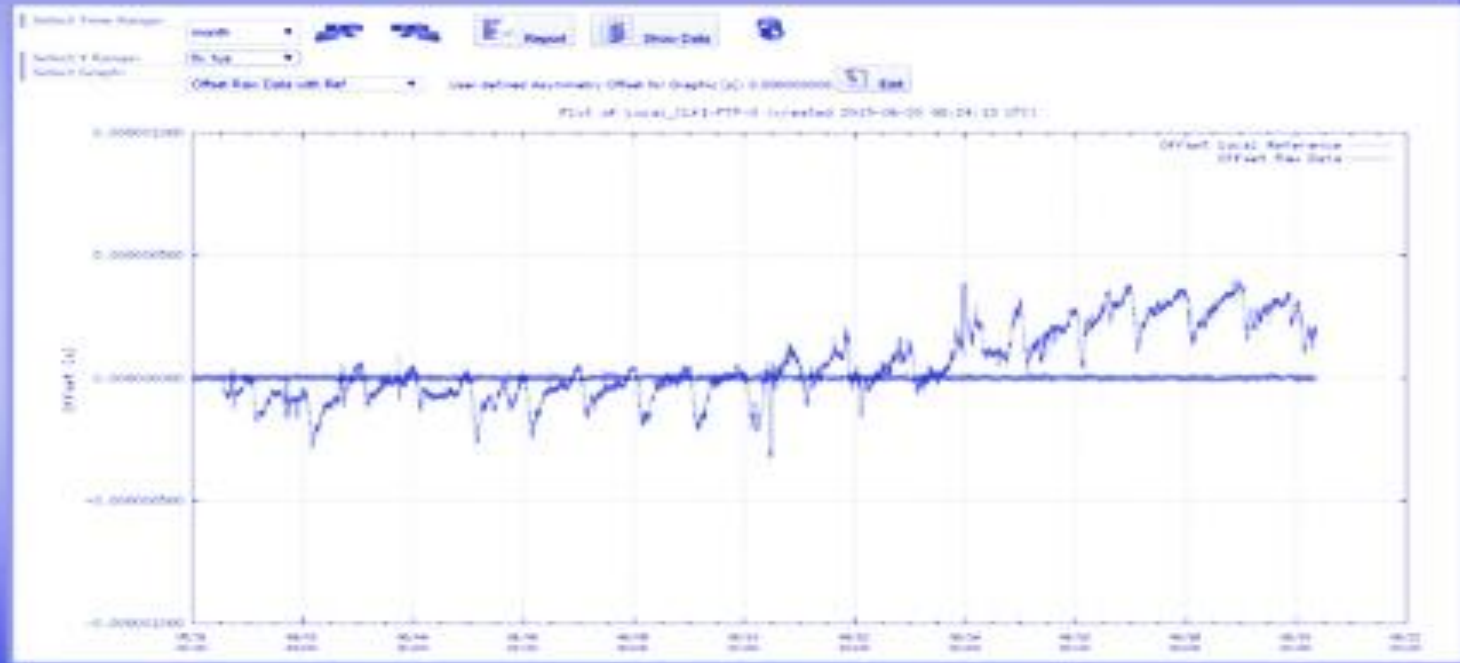
# DTM over IP

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



General Information	
Device Type	1575 - 1575 (1575) 1575
Device Location	1575 - 1575 (1575) 1575
Device ID	1575 - 1575 (1575) 1575
Device Name	1575 - 1575 (1575) 1575
Device Model	1575 - 1575 (1575) 1575
Device Manufacturer	1575 - 1575 (1575) 1575
Device Serial Number	1575 - 1575 (1575) 1575
Device IP Address	1575 - 1575 (1575) 1575
Device MAC Address	1575 - 1575 (1575) 1575
Device Vendor	1575 - 1575 (1575) 1575

All Test Results	
Test Name	1575 - 1575 (1575) 1575
Test Date	1575 - 1575 (1575) 1575
Test Duration	1575 - 1575 (1575) 1575
Test Status	1575 - 1575 (1575) 1575
Test Results	1575 - 1575 (1575) 1575

 Measured & Verified 



**Total Test Topology Live Network**

**Thank you...**