



Calnex Solutions Ltd



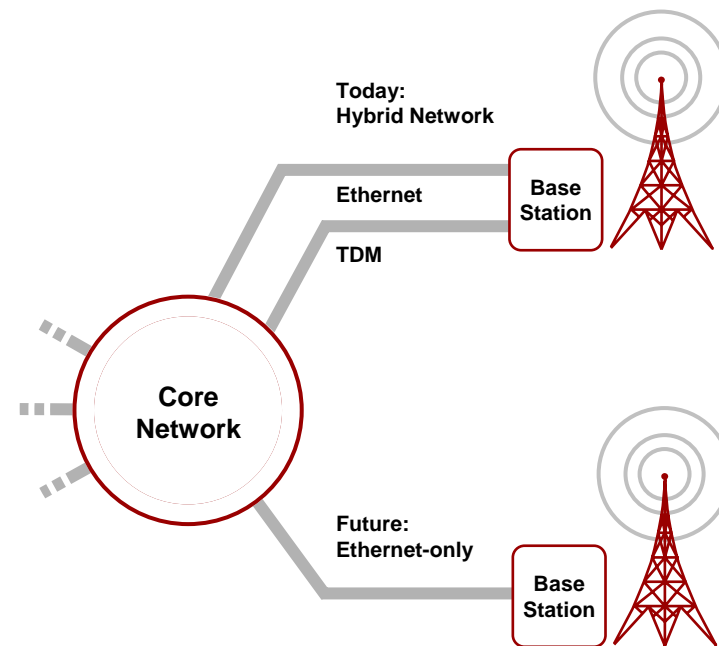
## Packet and Timing

Presenter: Tommy Cook, CEO Calnex Solutions Ltd



## Circuit Emulation: Industry Status

- CES is a critical in enabling the two worlds of packet and timing to come together.
- Industry needs;
  - Ability to evaluate and validate the performance of CES equipment.
  - To prove ability to deliver timing under all **real-world conditions** prior to deployment.





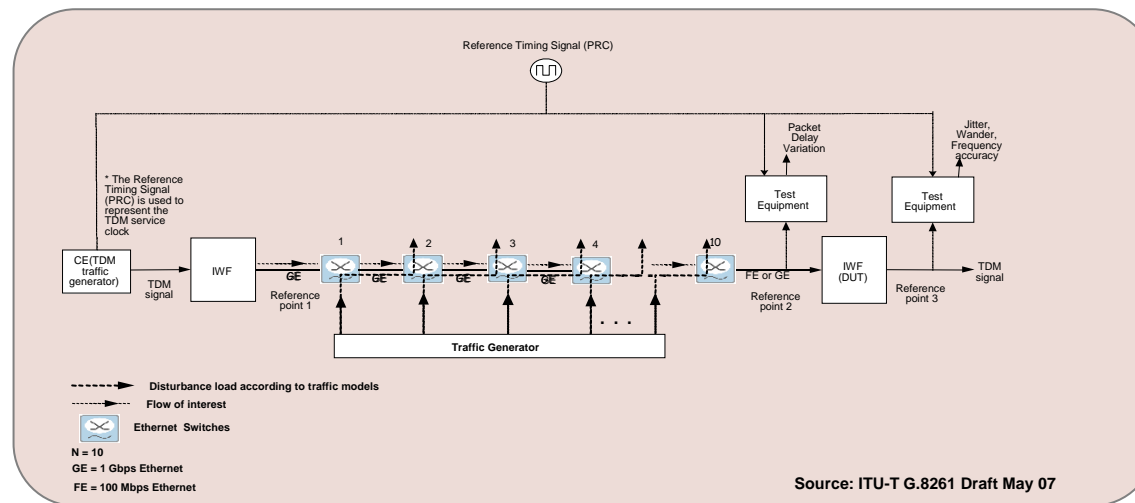
## ITU Standards Activity

- G.8261 Appendix V, Packet Reference Network Models.
- G.8261 Appendix VI, Measurement Guidelines.

Extract from Appendix VI:

**Note:** Although test cases in this Appendix provide useful guidance on the performance of Ethernet based Circuit Emulation techniques, evaluation in complex network scenarios that mimic the deployment profile is strongly recommended.

# Challenges using Reference Network



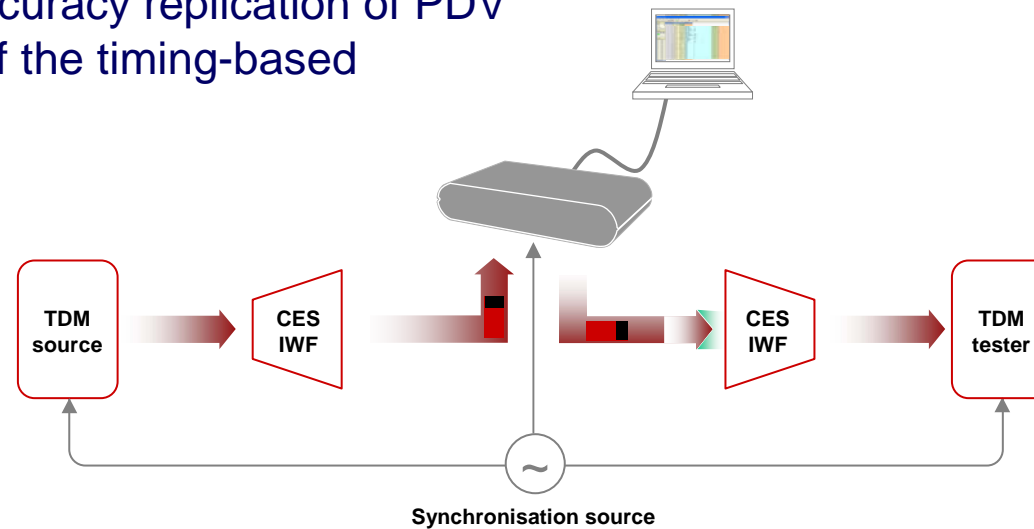
- Time and effort required to build, manage and execute tests.
- Repeatability – PDV impact on individual streams differs each time test is run.
- Does this represent my network?



## Alternative Test Method

Use test equipment to generate PDV.

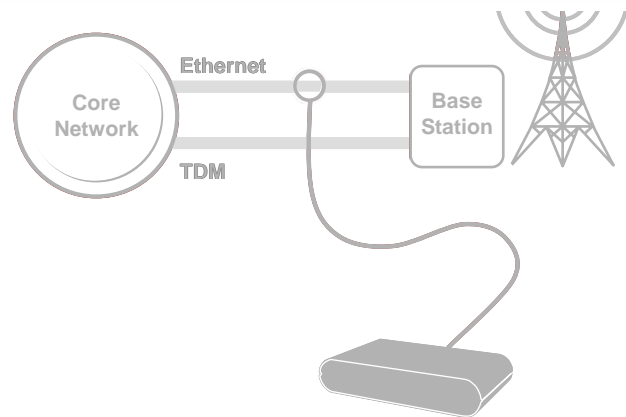
- PDV to IWF-under-test identical each time test is run.
- Must deliver high accuracy replication of PDV to meet the needs of the timing-based application.





# Real-world Replay

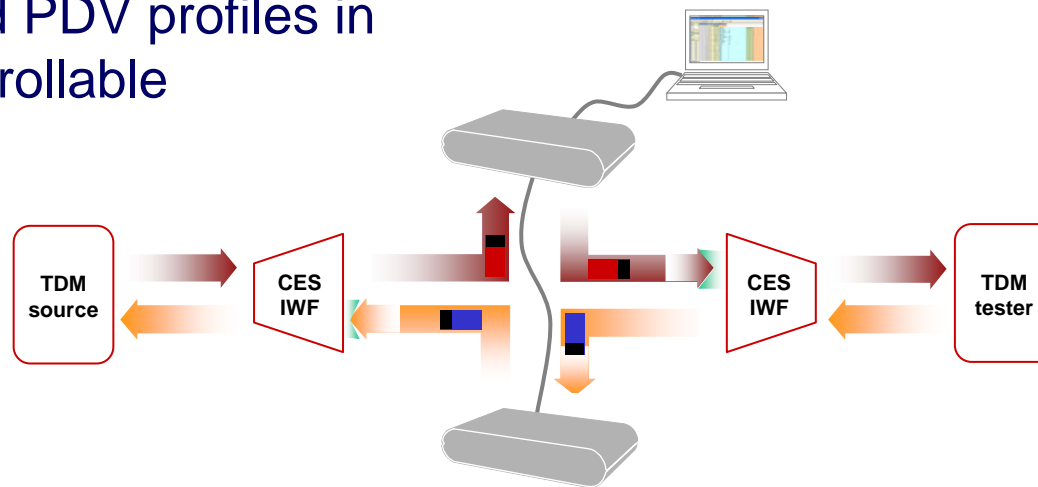
Capture PDV profiles from trial networks and/or real network . . .





## Testing Timestamp-based Systems

- Use test equipment to generate PDV and packet corruption events in both directions.
- Capture PDV profiles from trial networks and/or real network.
- Re-create real-world PDV profiles in repeatable and controllable environment.



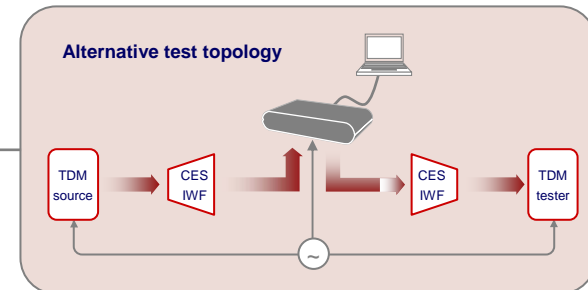


## Enhancing this Test Methodology

- What set of PDV profiles will prove a CES IWF is suitable for deployment?
- How do I compare / contrast / create PDV profiles?
- Does the G.8261 Reference Network adequately represent my current and future network?

- Create a library of profiles.
- Utilise real-world PDV profiles from your own network.

- Compare MTIE of PDV to MTIE from TDM clock.
- Capture and modify real-world PDV profiles.







[www.calnexsol.com](http://www.calnexsol.com)

Tommy Cook  
tommy.cook@calnexsol.com  
Tel: +44 (0) 1506-671-416

Calnex Paragon  
CES Test Solution

