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An ADVA Optical Networking Company

orange™

Case Study

Small Macro cell Sync Solution

Speakers

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Orange – Egypt (i.e. Mobinil)

➤ 1st and biggest Mobile Operator in Egypt

➤ 2G/3G/4G/LTE mobile operator

➤ Entity of Orange Group since 2012 → 100% shares

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OSA & ORANGE : Long-Term Relationship !

➢ OSA & Orange met in 1997 thanks to NEC

➢ OSA Products deployed in Orange Network:

  ➢ Cesium

  ➢ SSU : OSA 5548C with PTP cards

  ➢ GNSS receivers : OSA 5240, OSA 5210

  ➢ PTP Grand Masters : OSA 5421 (recently)

  ➢ Probing solution

  ➢ Network Management systems: Sync View+ and FSP NM

➢ Network Design Services and Others

OSA 3230B

TCC-PTP Card

OSA 5548C

OSA 521X

OSA 5210

OSA 5240

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Heading towards Carrier Ethernet Networks!

- Rapid deployment of Small-cells solutions that is compatible only with IP Backhauling

- Existing plan to Shift all existing RAN to IP with accordance to IP-2020 Program.

- In accordance with the above plan, Transport Network deployments moves from legacy SDH, PDH towards IP-MPLS Network deployment

- Existing TDM synchronisation using legacy PRC/SSU architecture was not suitable any more!

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Network Restrictions & explored solutions

- Backhauling capability to handle such Small cell deployment is only through 3rd party HDSL (i.e. Telecom Egypt).

- Part of IP-MPLS cloud is also 3rd Party with unknown PDV performance

- Network is PTP UNaware Network (brown field Network)

> **Which Solution for best sync performances : SyncE vs PTP ?**

- SyncE → **Not suitable** for such Small Cell deployment over HDSL, can only be used for Macro Site Deployment

- PTP 1588-V2 → **Suitable** for Small Cell deployment but with Unknown Performance over PTP unaware Network/3rd Party leased lines

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Adopted Sync Solution

"**Proof Of Concept**" is necessary to validate achieved Sync.

performance over each Scenario

PTP 1588 -V2 Tests & results

**Test 1**: Macro Node-B Through MW link chain with ITUT **G.82651** (Frequency Synchronization) ✔
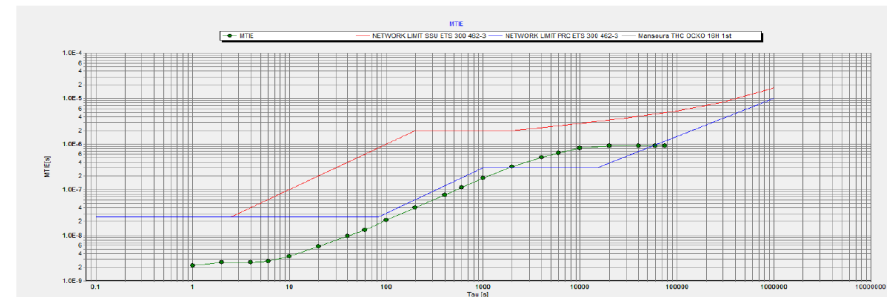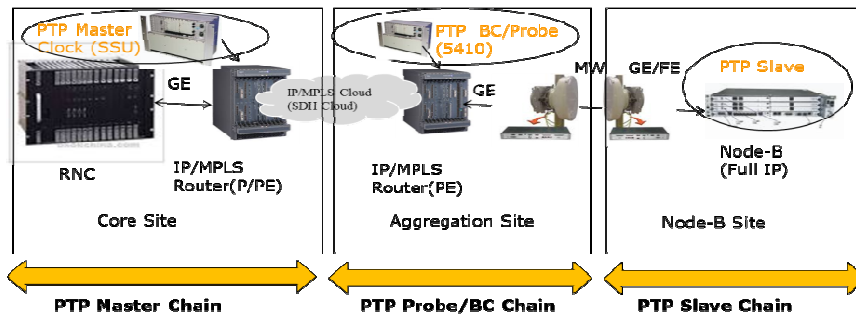
Test 2: Huawei ATOM Cell Through HDSL 3rd party (TE) with ITUT **G.82671** (Phase Synchronization) ✔

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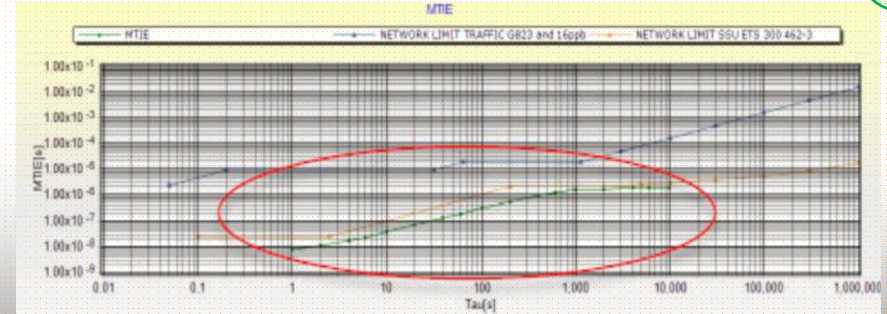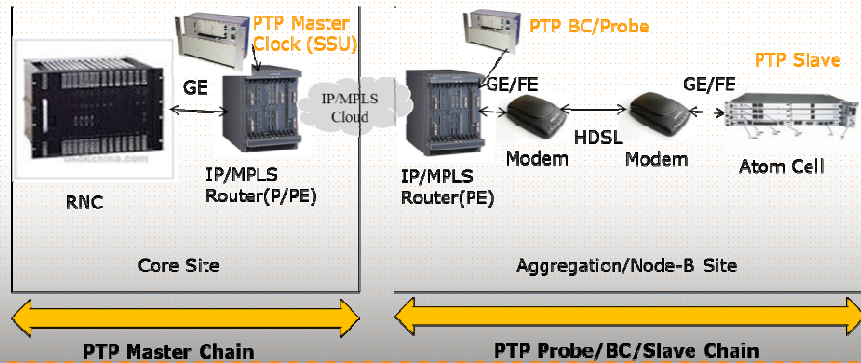
Conclusion

- Successful testing and best approach determined & approved

- Adopted product is **OSA 5421**

    ➢ **PTP Delivery** (Freq. & phase with 512 slaves capacity) with latest ITU-T standards

    ➢ 16X **BITS** outputs

    ➢ **Probing** or real-time monitoring included

    ➢ **NTP** server capabilities

- Solution currently under deployment (phases-based)

- Ongoing 4G design & OSA 5421 may be massively deployed in future **ISA**
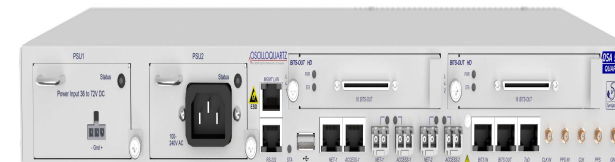
Orange Egypt is satisfied with OSA solutions as "USUAL" 🙂

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Thank you for your attention

Any Questions?

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PTP 1588 -V2 Tests & results (2)

PTP Master Clock (SSU)

PTP BC/Probe (5410)

MW   GE/FE   PTP Slave

GE

IP/MPLS Cloud (SDH Cloud)

GE

RNC

IP/MPLS Router(P/PE)

IP/MPLS Router(PE)

Node-B (Full IP)

Core Site

Aggregation Site

Node-B Site

PTP Master Chain

PTP Probe/BC Chain

PTP Slave Chain

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PTP 1588 -V2 Tests & results (3)

PTP Master Clock (SSU)

GE

IP/MPLS Cloud

RNC

IP/MPLS Router(P/PE)

Core Site

PTP BC/Probe

PTP Slave

GE/FE

GE/FE

HDSL

Modem

Modem

Atom Cell

IP/MPLS Router(PE)

Aggregation/Node-B Site

PTP Master Chain

PTP Probe/BC/Slave Chain

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