

# Network Audit - Time

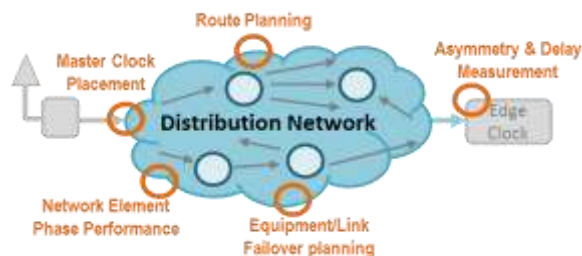


*A Network Ready for Phase Dissemination*

## The Issue

Network synchronisation is no longer a requirement of your transport (SDH/SONET) infrastructure, but also a requirement for many edge applications.

Whether you need time slot alignment in a TDD network; video broadcast over your LTE network (eMBMS); or urban Small Cell operation in the same frequency range as your Macro layer (eICIC), the edge of your network will need microsecond phase synchronisation.



How do you plan to deliver this microsecond performance? How deep in your network will this phase come from? What will happen to that microsecond performance when a route fails?

## Phase Budget

A PRTC (Primary Reference Time Clock) will be accurate to UTC better than 100ns; each network path will have a degree of asymmetry introducing phase error; every network element will introduce a phase error (whether you have on-path support or not); and your edge application will have a known phase requirement. For example many applications require  $\pm 1.5\mu\text{s}$  phase coherence at the air interface; requiring  $\pm 1.1\mu\text{s}$  at the edge element to guarantee this.

Surely then it's just a case of a budget "count back" from the edge to either ensure that the path between your PRTC and edge can deliver this phase performance, or to determine to location of your PRTC to deliver this?

## Network Audit -Time delivers:

- PRTC placement support
- Network element phase error measurement
- One way path delay measurement
- Asymmetry and latency data correlation
- Tools for failover performance planning
- Ongoing Asymmetry and latency monitoring

But how do you know these phase errors? And how do you know the asymmetries, especially in third party networks?

## A Premium Service

Chronos has over 30 years' experience in delivering and supporting frequency synchronisation systems for both fixed and wireless carriers. In fact our engineers may have installed the very systems you now use for frequency synchronisation today.

Chronos' "Network Audit - Time" gives you the confidence that your network infrastructure is fit for time and phase; delivers the performance you need at the edge in all routing scenarios, including the use of third party services; and employs adequate traceable PRTC devices to deliver appropriate performance.

Chronos' unique understanding of your network and your requirements make us ideally placed to give professional independent advice and consultancy at the design stage; accurate measurements at the lab and field trial stage; confidence in performance at the commissioning stage; and a suite of services, tools and trusted data to allow verification and validation of your day to day network management tools vital to maintaining edge phase performance.