RESILIENT TIMING FOR CRITICAL INFRASTRUCTURE - TELECOMS

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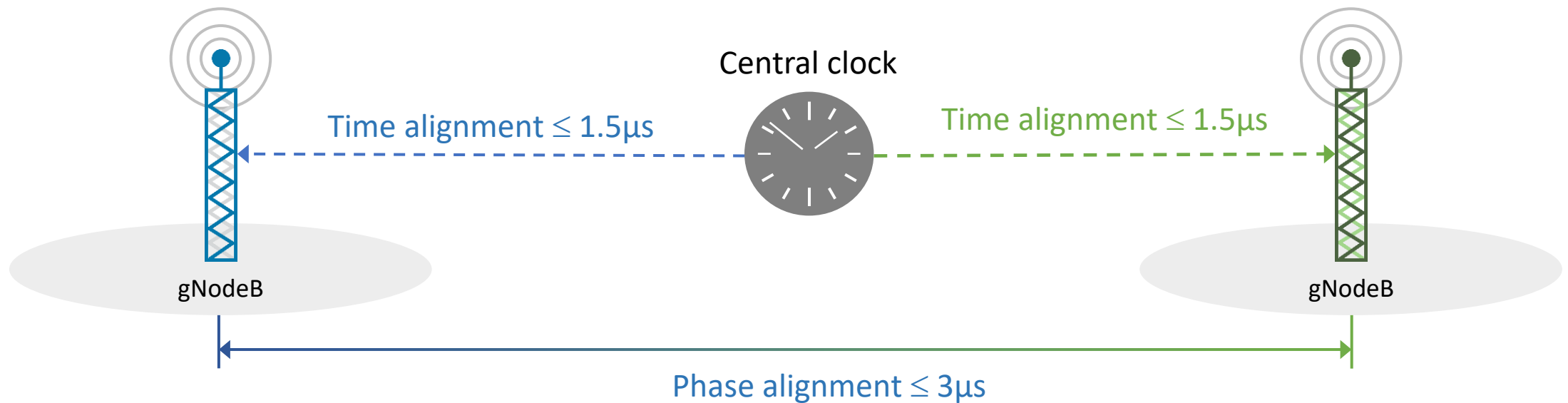
Resilient Timing for Critical Infrastructure

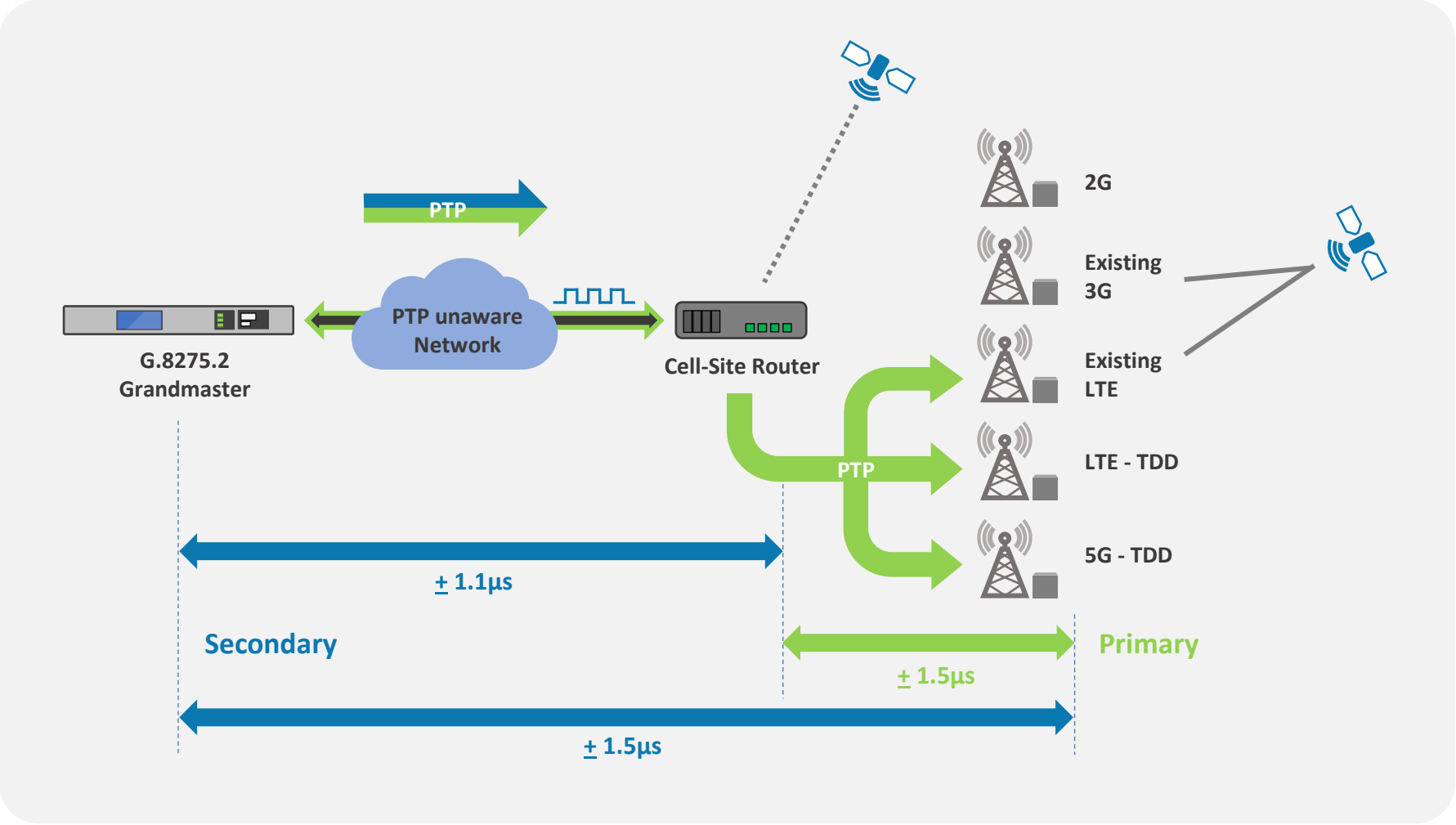|	Redundancy and Monitoring	Solutions for Backup Resiliency	Diversity of Sources (Beyond GNSS)	An Example of Resilience and Assurance
Media-Broadcast	Doug Arnold Principal Technologist Meinberg			
Finance and Data Center		David Chandler Product Line Manager Microchip		
Telecom- Mobile			Anand Ram Vice President, Business Development Calnex	
Smart Grid				Nino De Falcis Senior Director of Business Development Oscilloquartz

Mobile Network (TDD) Synchronisation Requirement

- "The cell phase synchronization accuracy measured at BS antenna connectors shall be better than 3 µs" *

- It is normally implemented as a *time requirement* to a *central clock.*
  - ITU-T requirements specify this as within 1.5µs of a common time reference (G.8271).

Central clock

Time alignment ≤ 1.5µs   Time alignment ≤ 1.5µs

gNodeB   gNodeB

Phase alignment ≤ 3µs

* 3GPP TS 38.133, section 7.4.2

Typical Mobile Network Deployment Model

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What You Don't Know Could Hurt You

- Primary Sync is usually reliable and has <u>some</u> holdover BUT
  - GPS/GNSS vulnerabilities growing
  - 'Last mile' is evolving and growing
- Secondary / Backup Sync is usually unqualified / untested
  - Is it really a backup?
  - Usually delivered via PTP-unsuitable network
- Recommendation – conduct audits of the Backup Sync

Redundancy	Holdover	Management	Monitoring
?	✓	✓	?