



Assisted Partial Timing Support in Telecom (A-PTS)

Bipin Kumar

Vinoth Gowthaman

MIG Group

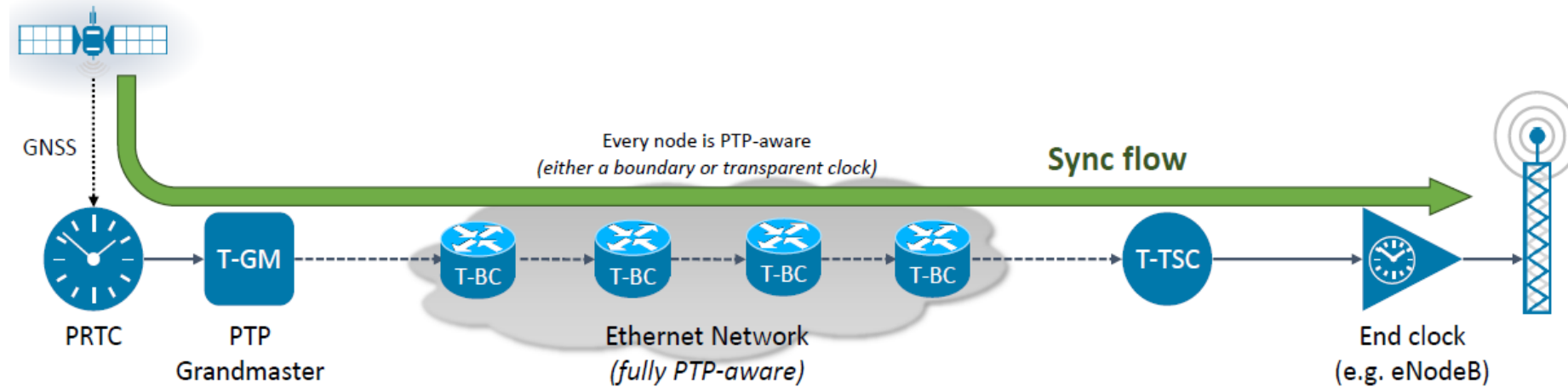


Agenda

- PTP with full timing support
- PTP with Partial Timing support
- Use cases
- Failover Scenarios
- Clock models
- Deployment
- Supported profiles
- APTS Compliance G8273.4



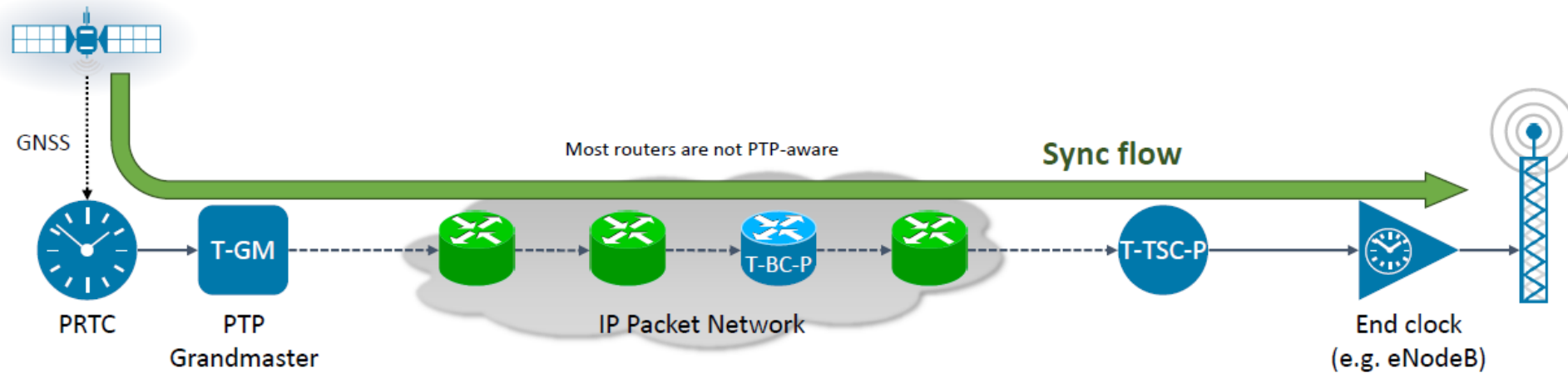
PTP with Full Timing Support



- Every element in the path must be “PTP aware”
- Operates from node-to-node at the Ethernet layer
- Uses both SyncE and PTP, where SyncE provides the frequency and PTP the phase/time



PTP with Partial Timing Support

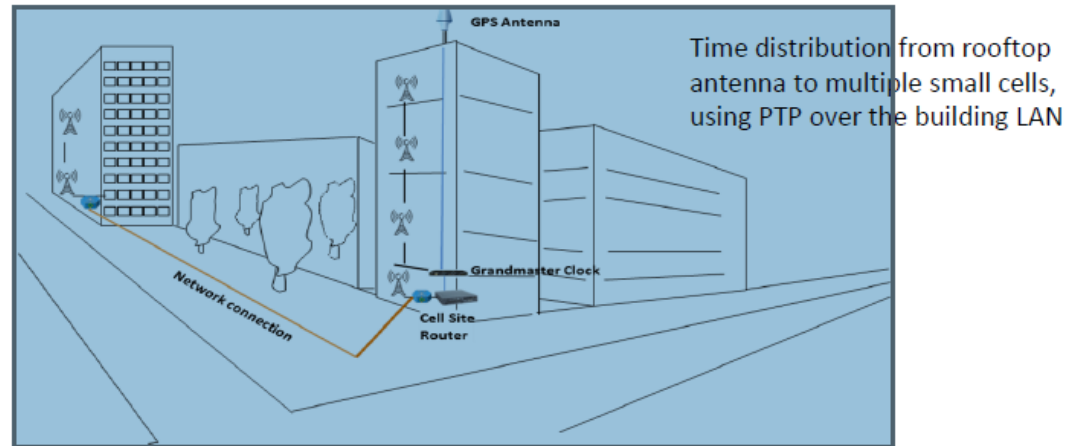


- Most routers are not PTP-aware, and do not provide timing support
- Operates end-to-end over an IP network, rather than at the Ethernet layer
- Main objective is to operate over existing networks



Partial Timing Support – Use case 1

PTP distribution over a local LAN (*“partial” or “no timing support”*)



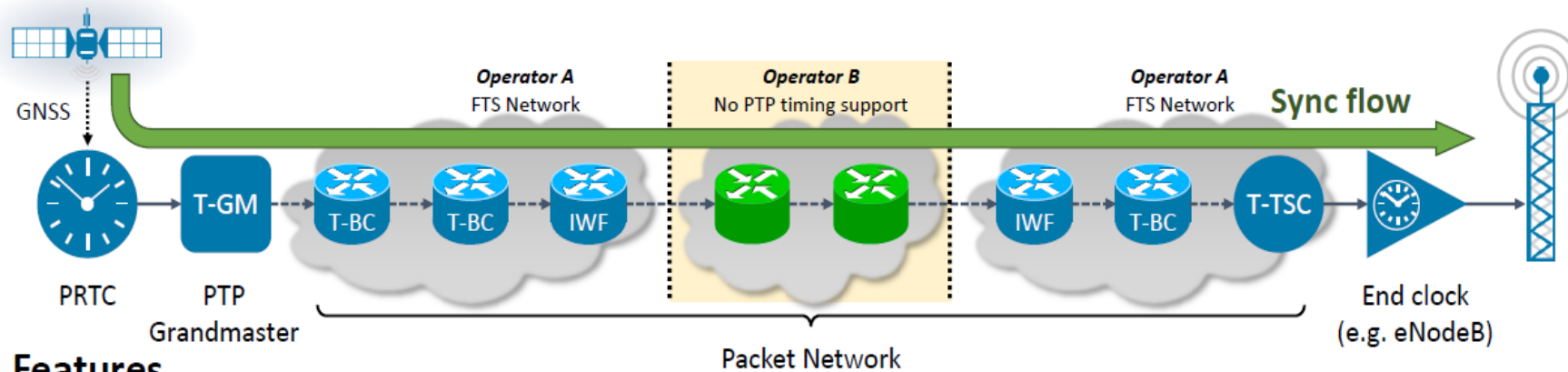
Features

- Objective is to distribute time over a small PTP-unaware (or partially unaware) network
- Small network, potentially only a single in-building network
- Places GNSS source as close to the end clock as possible



Partial Timing Support – Use case 2

Network Bridging



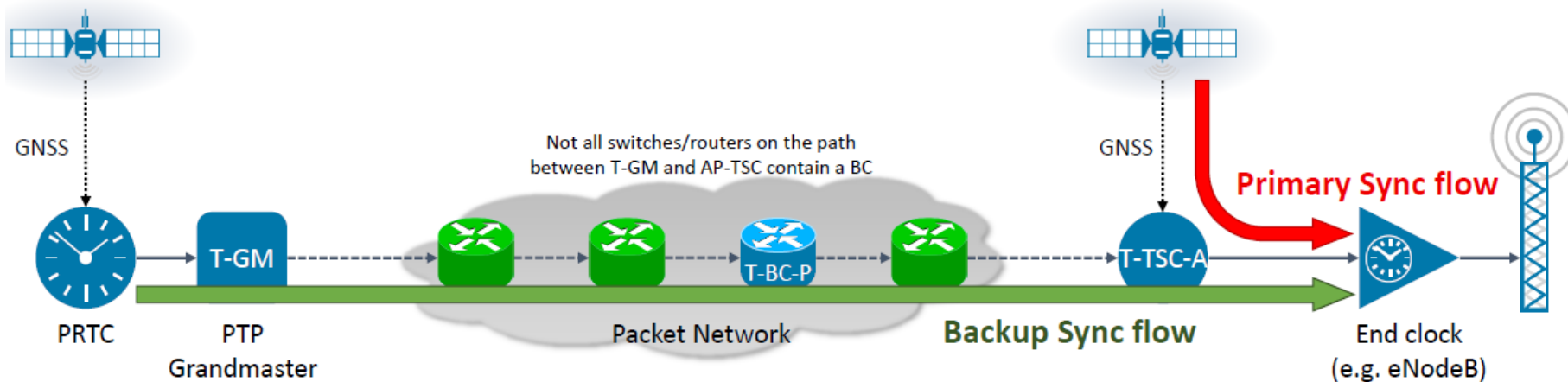
Features

- Objective: bridge between two full timing support networks
- Example: a mobile operator may not own the access network, and need to bridge across a third party network
- Requires inter-working functions (IWF) to link between the networks



Partial Timing Support – Use case 3

PTP backup to GNSS (*“assisted partial timing support”, or APTS*)

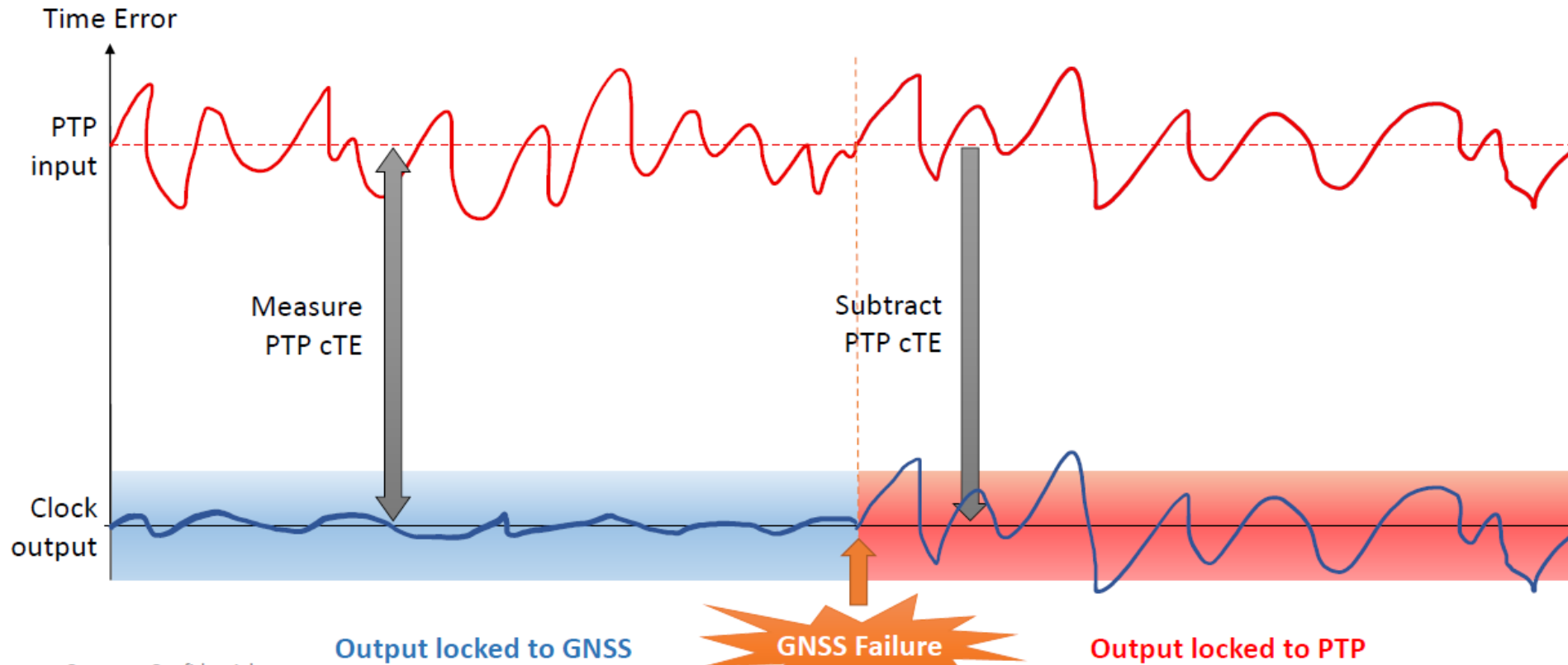


Features

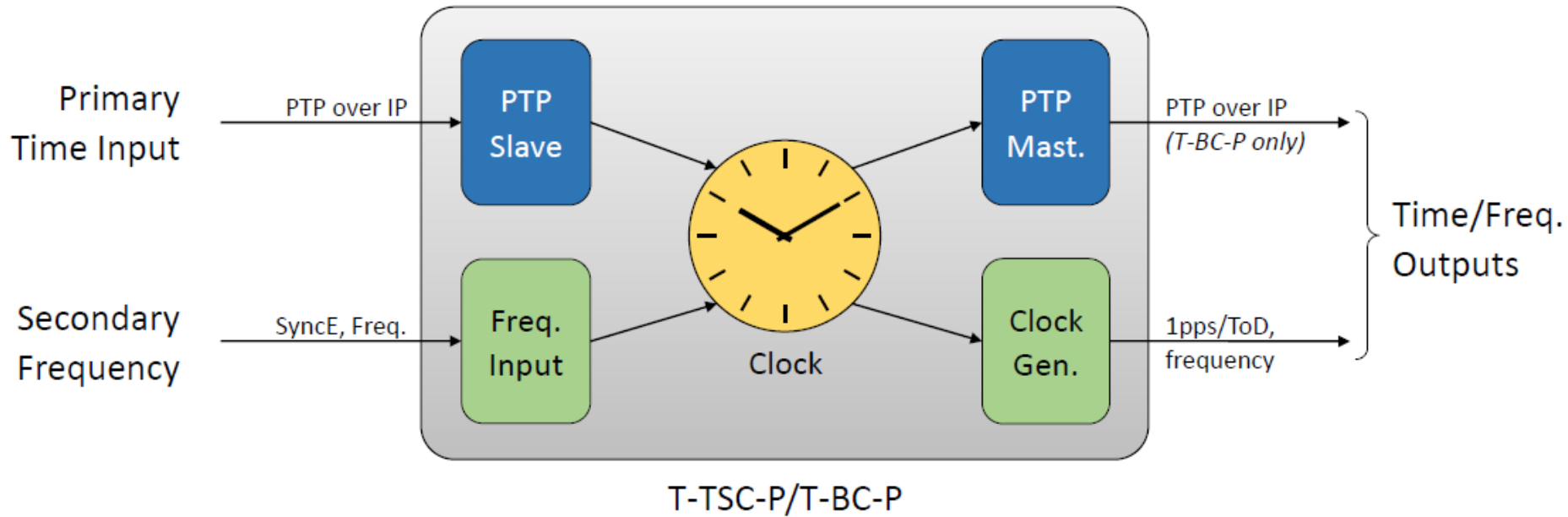
- Objective is backup to GNSS, i.e. “assisted holdover”
- GNSS monitors PTP service quality and network asymmetry
- PTP can maintain timebase when GNSS is out of service



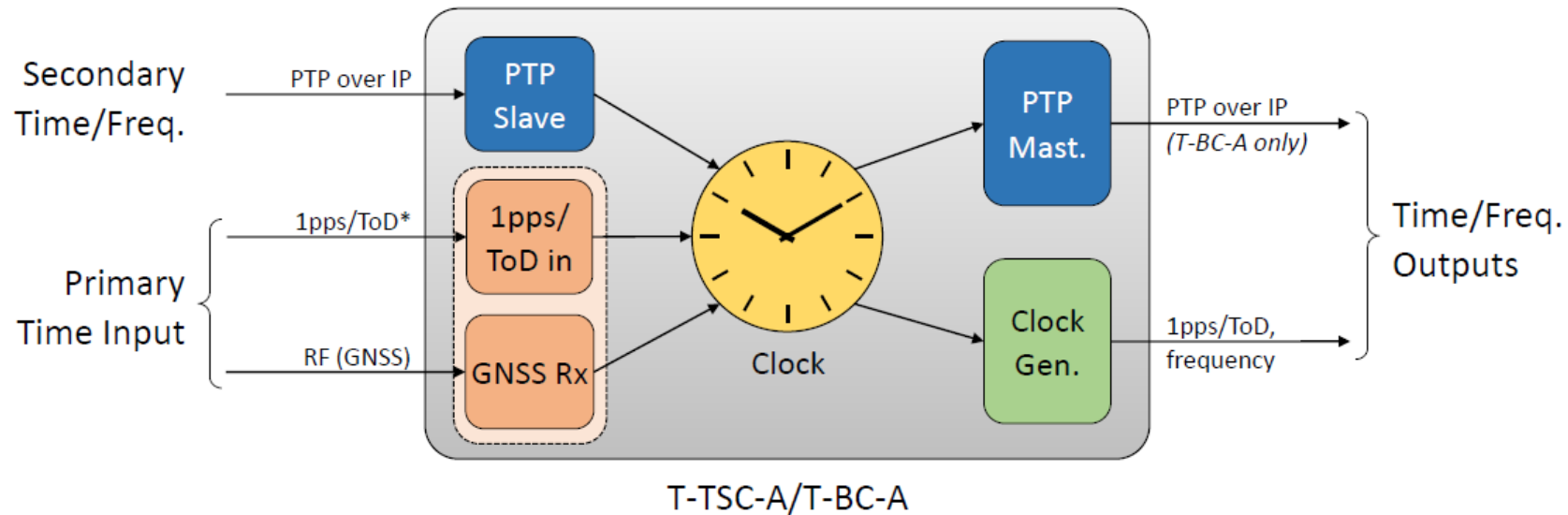
Failover from GNSS to PTP



PTP Clock Functional Model



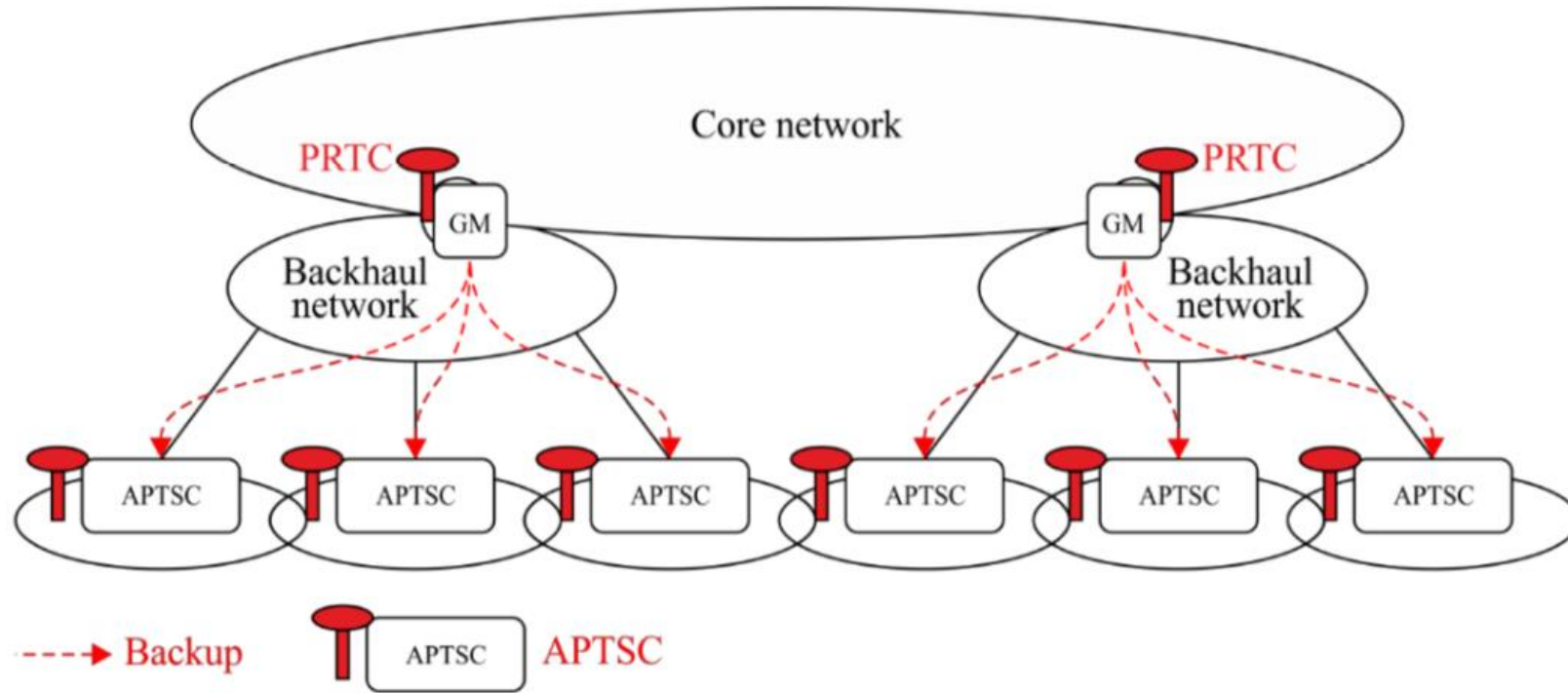
A-PTS Clock Functional Model



* 1pps/ToD used when GNSS Receiver is in a separate device



Deployment Scenarios



NOTE – T-GM are connected to the PRTC in this architecture

G.8275-Y.1369(13)-Amd.1(15)_F05b



PTP Profile Support and Compliance

- G.8275.2
- G.8273.4

DUT Class	Time Input	cTE	dTE _L
Class A	1pps	±50ns	50ns pk-pk
	GNSS	–	–
	PTP	–	200ns pk-pk
Class B	1pps	±20ns	50ns pk-pk
	GNSS	–	–
	PTP	–	200ns pk-pk



Thank You !!!

