Towards Achieving Interoperability

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Open Service Interoperability

System Level Interoperability

Receiver Level Interoperability
Receiver Level Interoperability

- Ten years ago it was complex and costly for receivers to combine the signals from two different systems (GPS/Glonass)
- today it is routine
- there is no barrier to incorporate other systems
- this is the current preferred Galileo position on achieving interoperability between systems
System Level Interoperability

The key requirement is to know the timing offsets between two systems

• an example is the Galileo-GPS Timing Offset (GGTO)
• allows Galileo to transmit the timing offset in its signal to achieve tighter interoperability
• this took considerable time and resources to implement at EU and US level
• adds system complexity
• as a system, Galileo prefers not to add further complexity at this point, no other TOs planned
System Level Interoperability

- GGTO is there, Galileo has invested in the infrastructure and will make use of it

- Other systems already have scope within their signals for a similar xGTO

- Unclear how using UTCr would work, and who manages?

- What if...
System Level Interoperability - the Easy Way?

- ICG should consider whether using an existing common timing reference or source would allow systems to achieve interoperability without adding further complexity.

- Ideally, such an existing common reference would already be ubiquitous and widely used.
GPS as an intersystem common offset?

- Most, if not all, GNSS already plan to have a defined timing offset to GPS - 'xGTO'
- We should consider whether combining these xGTOs would allow system level interoperability between all GNSS
- Could minimise the cost and complexity for all systems - only one xGTO required per system
- Should work, even if GPS satellites are not in view, provided the xGTO is well defined
- (Systems also free to implement a second xyTO, in addition to their xGTO)
Risk of a common failure mode?

- Potentially yes, but, GPS has been generally very reliable
- the benefits and cost/complexity savings could outweigh the potential negatives
- especially as only the open signals are considered
- receiver level interoperability is always available as the backup
- the idea for each system to specify their xGTO should be considered further, if multi-system level interoperability is the aim
Recommendation

ICG should consider investigating whether using a timing offset GPS as an the common timing offset for each system would allow full system level interoperability to be more easily and cost-effectively achieved.