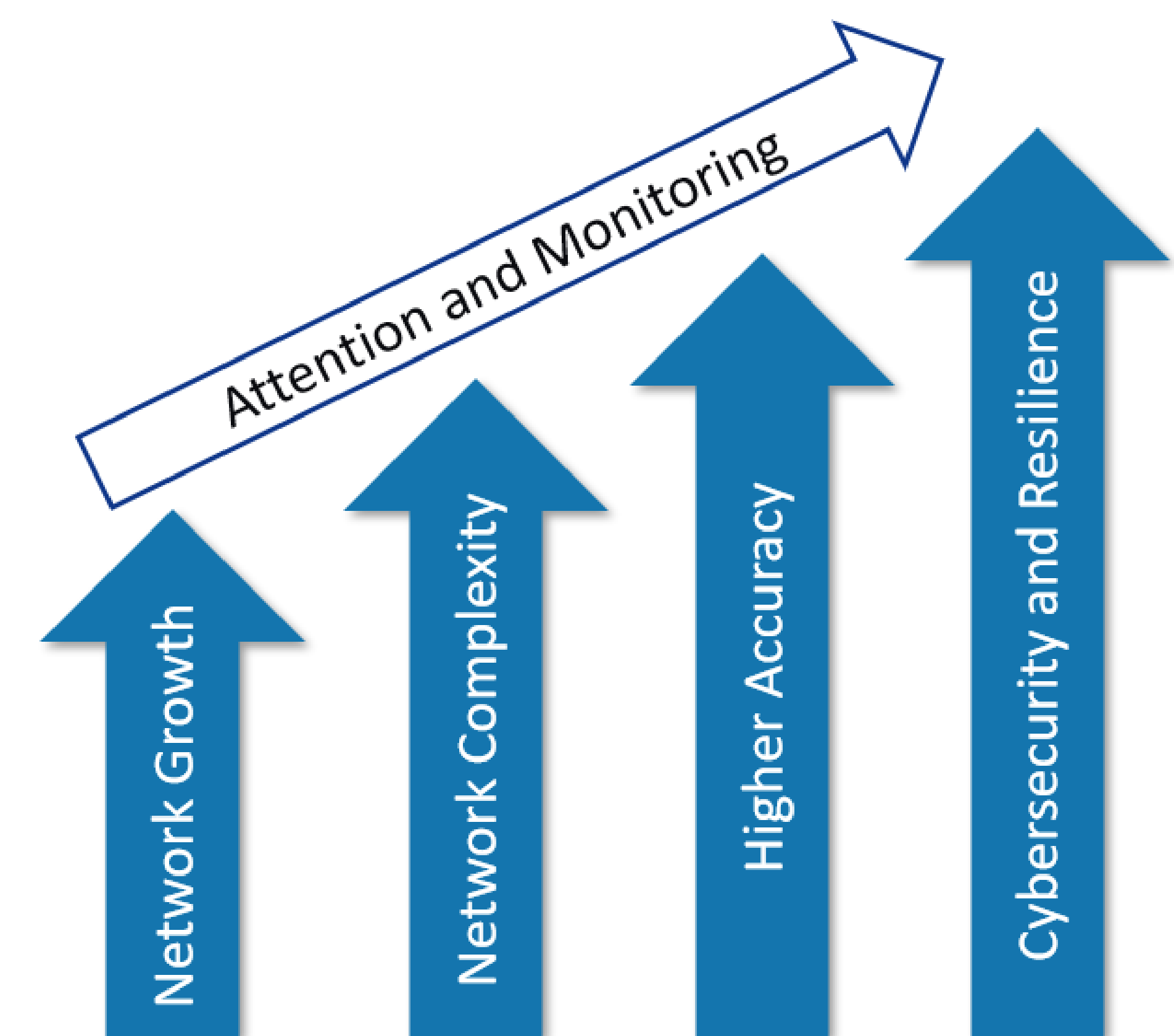


## What is Driving the Need for Unified Management of Live Sky and Terrestrial Time?

Critical Infrastructure is more dependent on the timing network

- More complexity
- Tighter margins
- Cybersecurity threats

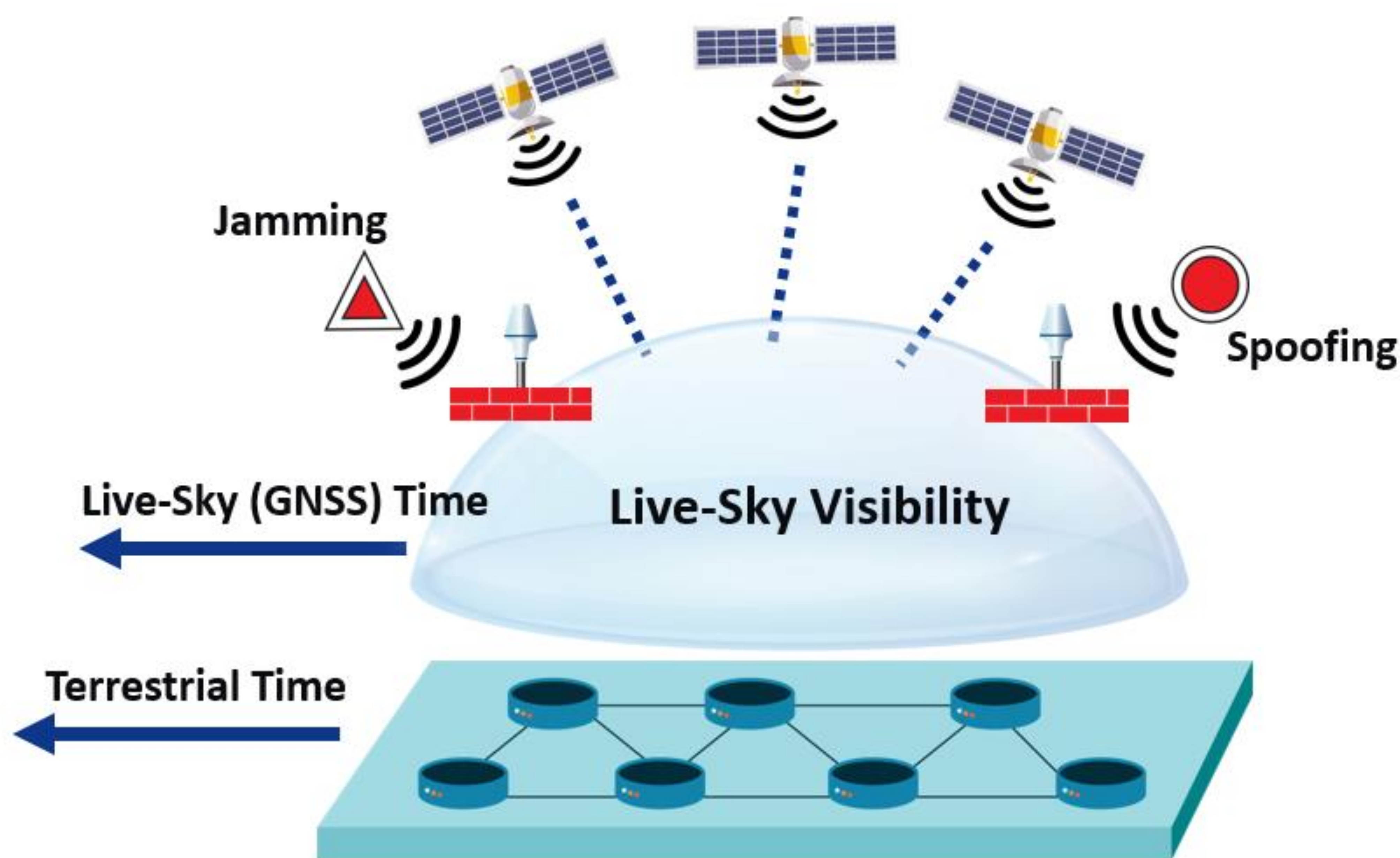
- Don't blink
- You'd better be watching closely



GNSS Observable	Expected Characteristic To Be Observing
Tracked Satellite Count	Are the expected number of satellites in view?
Position Dispersion	Is the position data coming from the sky moving too much relative to surveyed antenna position?
Phase Time Deviation	Is the sky received "time" moving? (suddenly, gradually, periodically, etc.?)
Carrier-to-Noise	Is the GNSS signal strength of the visible satellites in the expected range?
RF Power	Is the RF power level within expected threshold?

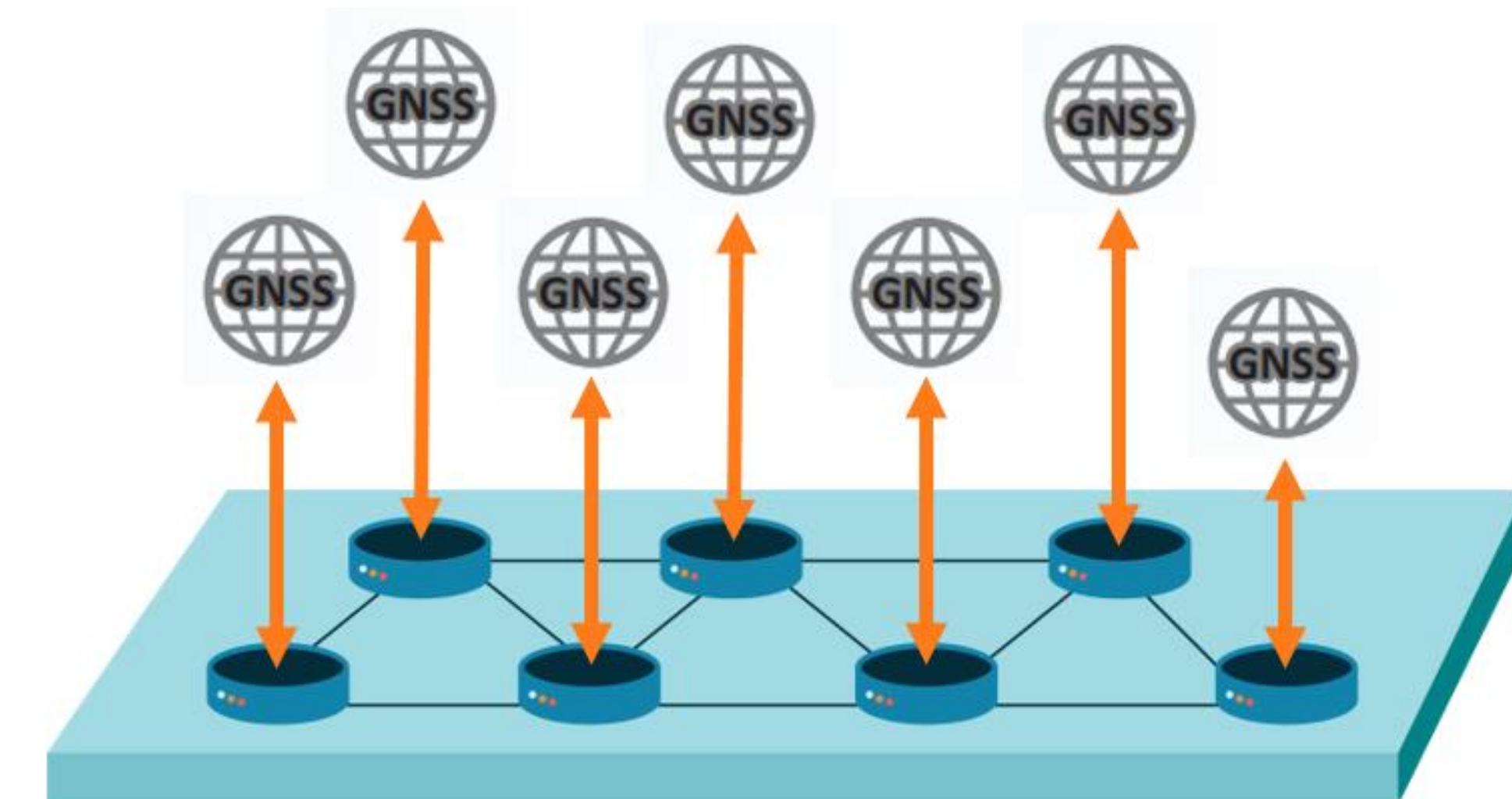
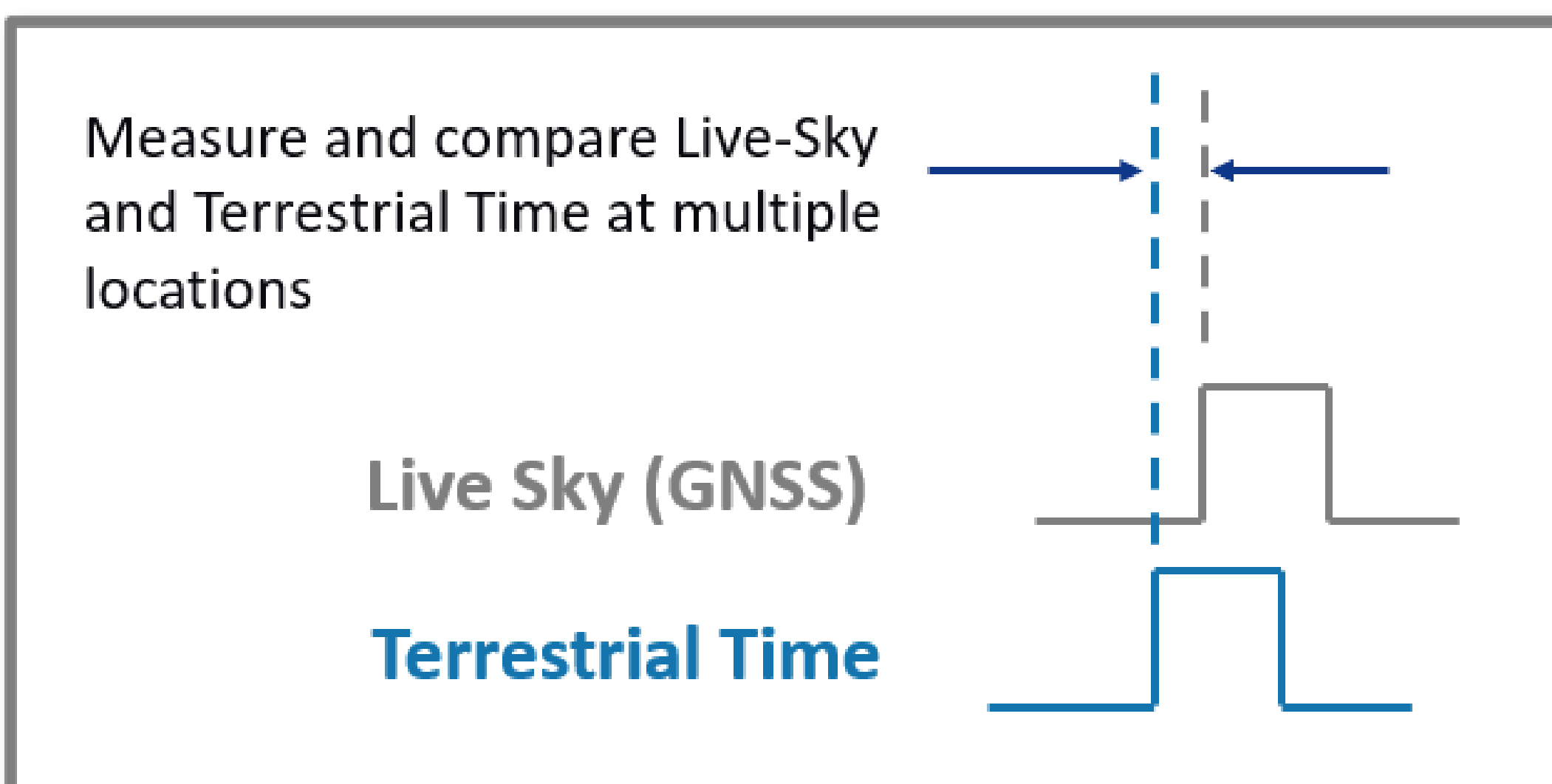
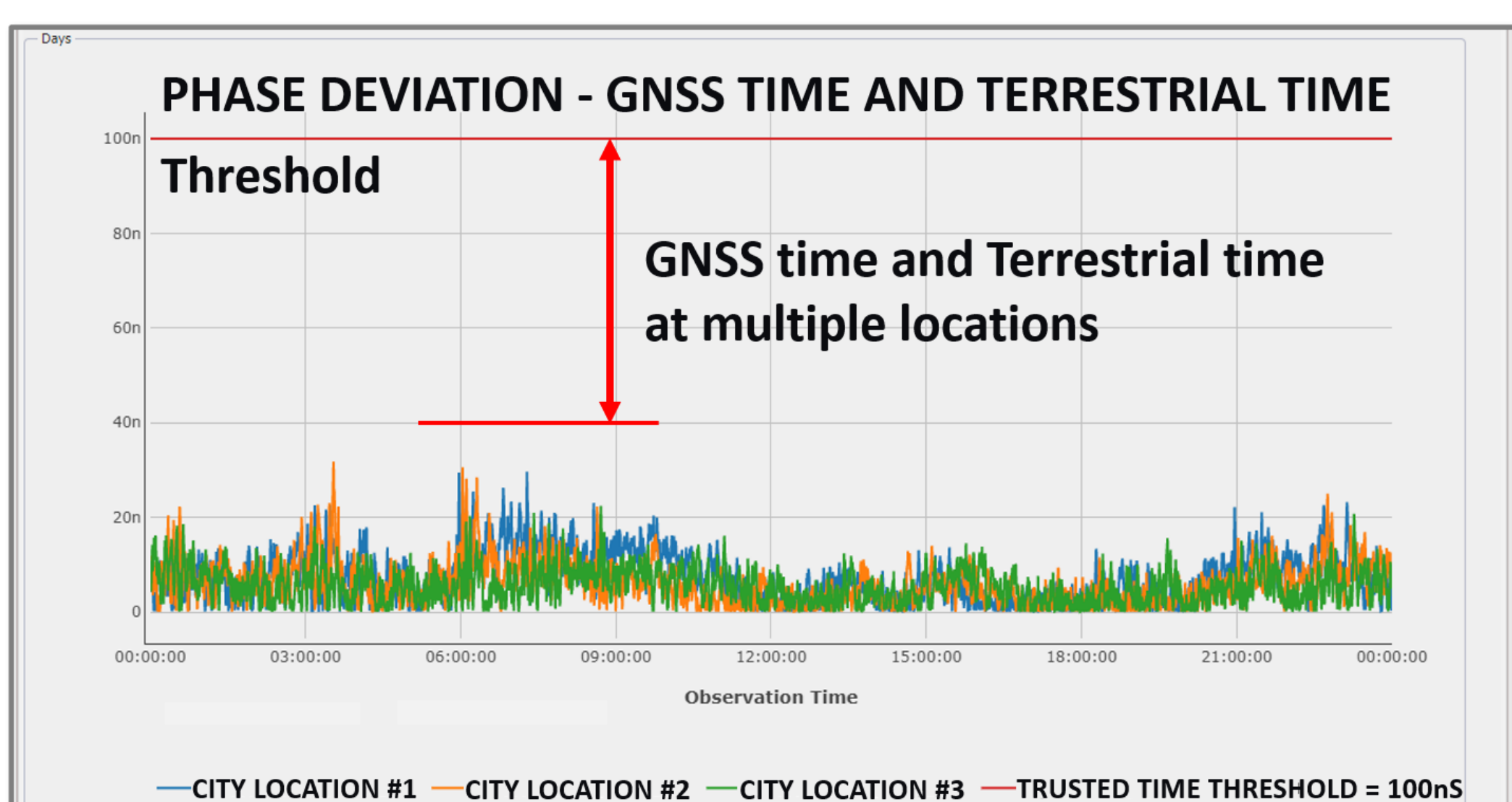
Terrestrial Time Observable	Expected Characteristic To Be Observing
MTIE – Maximum Time Interval Error	The maximum error committed by a clock under test for a given period of time.
TDEV – Time Deviation Error Variance	A standard deviation type of measurement to indicate the time instability of the timing signal.
cTE – Constant Time Error	The mean of the time error function and typically indicating the accuracy of the timing signal.
PDV – Packet Delay Variation	Akin to clock jitter, this is the time of arrival variation as timing packets traverse the network.
FPP – Floor Packet Percent	Evaluation of the PDV percent of packets that do not fall within the required phase threshold range.

## Live-Sky and Terrestrial Time Observables



Critical Infrastructure operators are ultimately in need of network wide resiliency, which can be achieved using both GNSS and terrestrial time at multiple locations simultaneously.

## Measuring Live-Sky and Terrestrial Time across the network



**Conclusion:** Unified management and monitoring of Live-Sky and Terrestrial Time provides visibility to better protect and secure timing for critical infrastructure.