“Toughen” Team

10 December 2014
“Toughen” Scope

• “Toughen” is the ability for satnav receivers to reject or operate through contaminated or invalid inputs, including:
  – In-band or out-of-band interference
  – Invalid signals transmitted by satellites
  – Invalid signals transmitted by unauthorized sources (spoofers)
  – Space weather (e.g., scintillation)

• Toughen applies to all satnav signals
December 2014 Focus

• Speakers: financial transactions, agriculture, telecommunications & a leading receiver manufacturer.

• Pre-loaded questions for all:
  – What kind of toughness do you think is important for the applications you serve?
  – How do you measure the toughness of the product (conceptually, but also spec and test)?
  – What kind of feedback do you get from customers about the need for toughness?
  – Do you see a need to be tougher, and if so what approaches are you thinking about?
  – What negative aspects (performance, cost, reliability) are associated with making your product tougher?
Common Themes

• Many critical SatNav applications are fixed-station timing-applications.

• Today,
  – Need ~ 1 ms time
  – Fall back to high quality clocks and/or NTP
  – Tend towards gradual service degradation when SatNav is lost.

• Tomorrow,
  – They will need better time accuracy to support regulation, security & next level of capabilities. (e.g. syncho-phasors for power and time stamps for all steps in financial transactions.)
  – These need ~ 1 usec time.
  – Fall back to PTP, dedicated fibre, Ru, CSC,
  – Should also toughen the use of SatNav.

• We have time to do it, but lets start
Recommendations

• NCO: document & disseminate best practices for toughening: (e.g. antennas, receiver processing, inertial measurements, smarter integration with augmentations.)

• DoD and DoS: re-evaluate ITAR limitations on deployment of well-known toughening techniques. For example, we need consideration of AJ & AS antenna technologies for aviation.

• FAA: ask NIST to examine the use of Schnorr signatures for SBAS/GPS authentication.
  – signature length compatible with SBAS & GPS
  – reputed to be unbreakable through 2030