Positioning, Navigation, and Timing Systems for Critical Infrastructure

Resilient PNT Reference Architecture Implementation Plan

Science and Technology

IMPROVED RESILIENCE FOR CRITICAL INFRASTRUCTURE

Positioning, Navigation, and Timing (PNT) services play a pivotal role in numerous critical applications across various sectors. Essential infrastructure, including communications networks, financial systems, emergency response, utilities, and transportation, heavily rely on PNT data to deliver services globally. Natural disasters, accidents, or attacks can disrupt PNT services, leading to adverse consequences for individuals, businesses, and nations alike. To counteract these threats, the Department of Homeland Security Science and Technology Directorate (S&T) is researching ways to bolster PNT resilience, including safeguarding existing services and developing alternative PNT systems.

STAKEHOLDER ENGAGEMENT – A KEY TO CRITICAL INFRASTRUCTURE RESILIENCE

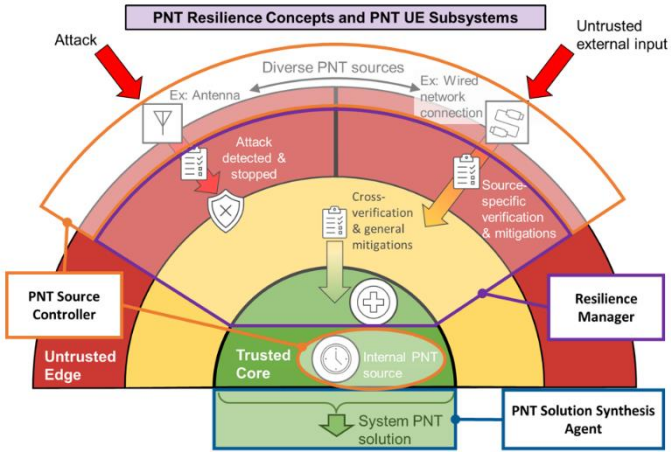
The Resilient PNT (RPNT) Reference Implementation (RI) is designed to demonstrate the value of the RPNT Reference Architecture's (RA) resilience concepts, aimed at motivating RPNT user equipment component manufacturers and integrators to incorporate these resilience concepts into their user equipment designs and to encourage operators to incorporate RPNT user equipment into critical infrastructure applications.

Developing RPNT products that follow the Conformance Framework resilience guidelines framework will require a paradigm shift for integrators and developers. Commercial suppliers may not have sufficient return-on-investment motivation to meet government expectations for resilience.

Stakeholders in many industries benefit from a reference implementation, which helps product developers implement threshold performance levels, enabling their further innovations for market differentiation. For the government, it sustains institutional knowledge through the transition to standards development organizations.

A HOLISTIC APPROACH FOR NEXT GENERATION RESILIENT PNT

This effort aims to demonstrate the feasibility of the Resilient PNT Reference Architecture, providing a holistic cybersecurity-based approach for Next Generation Resilient PNT user equipment focusing on the ability of the RPNT RA to reduce supply chain development risk by implementing exemplar from the RPNT RA, motivate end-users to seek technologies using resilience concepts and standards, and result in responsible use of PNT in critical infrastructure sectors.



RECENT ACCOMPLISHMENTS

- Initial Demonstration Plan completed and being socialized with industry through stakeholder engagement and conferences.

MILESTONES

Completed:

- Reference Implementation Design Readiness Review
- Reference Implementation Demonstration Plan
- Reference Implementation Design Description Document

Upcoming:

- Reference Implementation Conference Presentation

PROJECT PERFORMERS & PARTNERS

Performer: HSSEDI ™ FFRDC, MITRE Corp.

Partner(s): DHS CISA, DHS Enterprise, and other federal agencies

Stakeholders: GPS equipment manufacturers, PNT technology providers, critical infrastructure owners and operators, industry groups, and federal civilian agencies.