



DHS SCIENCE AND TECHNOLOGY

PNT Program & Conformance Framework

PNT Advisory Board

November 20, 2019



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Brannan Villee
Program Manager

Ernest Wong
Technical Manager



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PNT Program Overview

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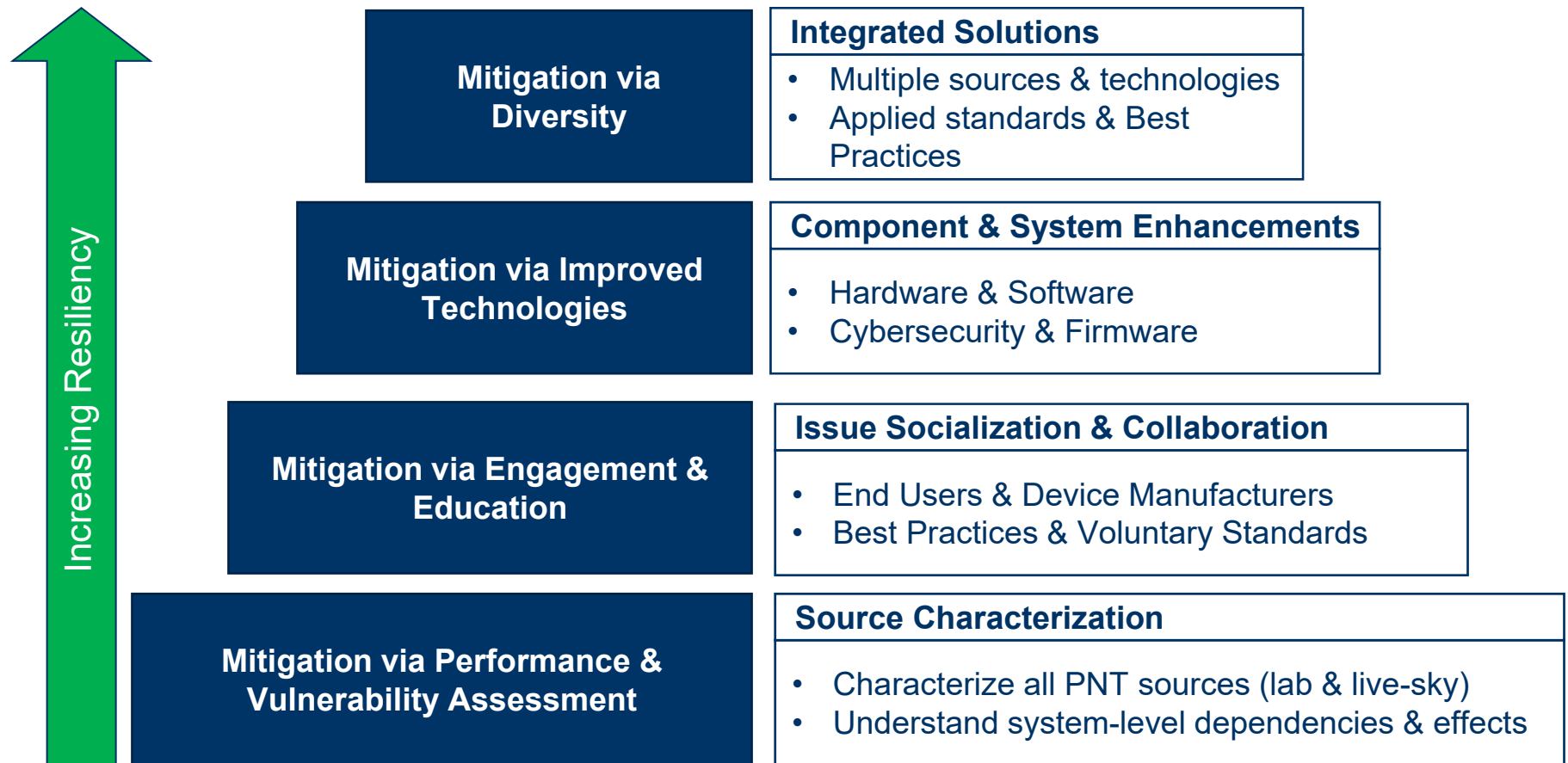
Brannan Villee

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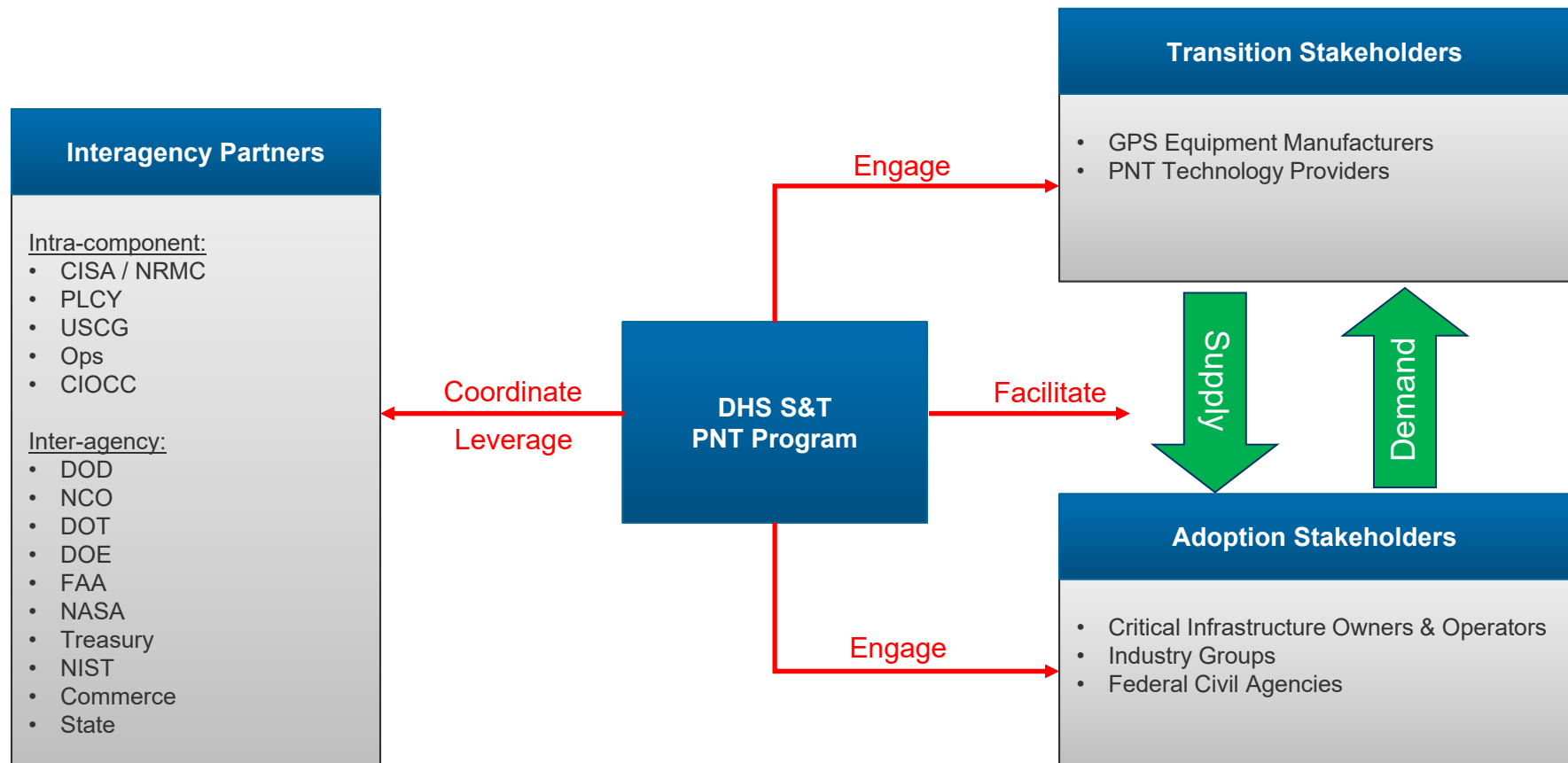
Office of Mission Capability Support

Science and Technology Directorate

Program Thrust Areas



Stakeholder Engagement & Collaboration





DHS SCIENCE AND TECHNOLOGY

Resilient PNT Conformance Framework

November 20, 2019



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Ernest Wong

Technical Manager

Office of Science & Engineering

Science and Technology Directorate

Overview

Overview

- Problem Statement
- Conformance Framework Vision
- Approach
- Framework Principles & Concepts
- Status
- Review Objectives

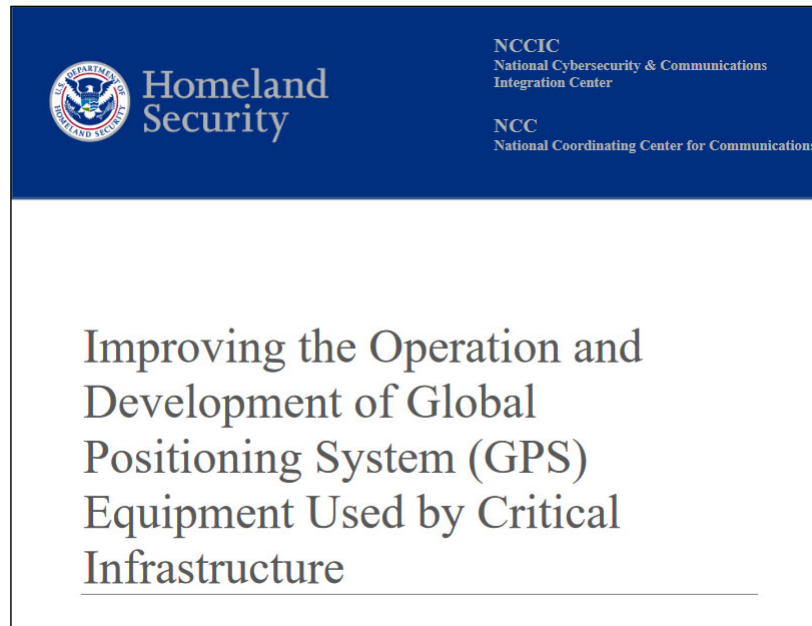
Presentation Objectives

- Solicit board feedback
- Raise awareness of this activity within industry
- Solicit more participation from critical infrastructure owners & operators

Problem Statement

Issue: “Resilient” PNT equipment becoming available, but what does it mean?

- DHS Best Practices document cited by some manufacturers, but it’s not a requirements or standards document. Not designed for classifying receivers.



Conformance Framework Vision

Vision: Develop common language for defining resilient PNT equipment

- Accomplished through defining multiple levels of resilience.

Will enable:

- Product differentiation for vendors
- Improved risk management and decision making by CI operators when acquiring new PNT equipment (or updating existing deployments).

Initial Focus: GNSS-based timing equipment

- To address most pressing PNT attack surface in critical infrastructure.
- Framework concepts applicable to non-GNSS sources and P/N.
- Intending to expand to position & navigation later.

Approach

Phases:

- Phase 1: Guidance documentation (targeting Spring 2020)
- Phase 2: Standards development (starting by 2021)

Reference Architecture:

- Reference Architecture documentation (FY20)
- Reference Implementation Demo (FY21)

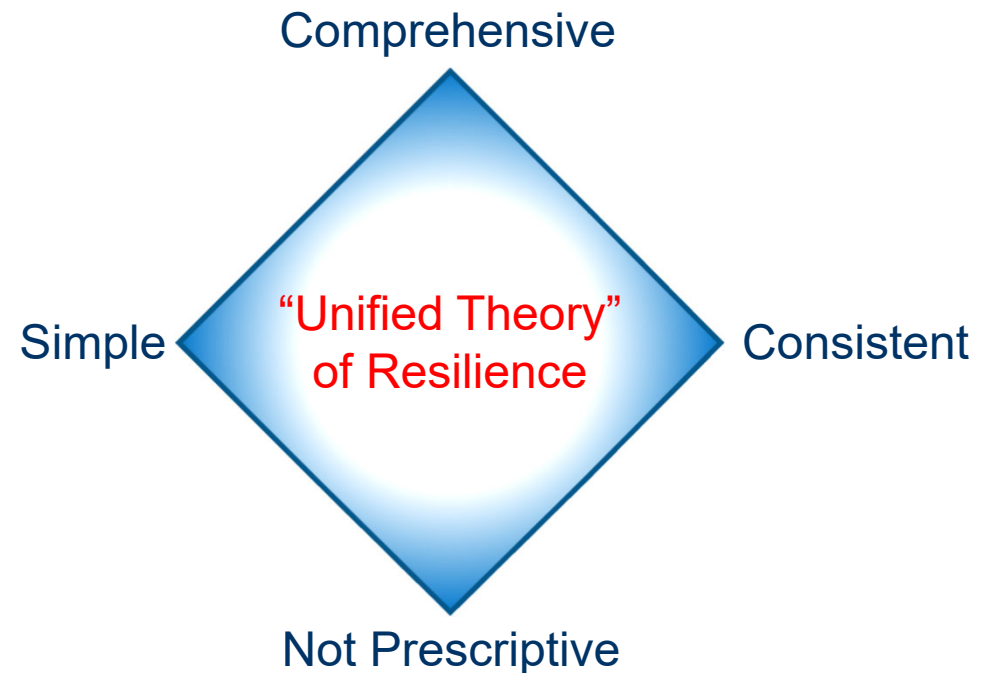
Industry Participation:

- Most major system integrators are part of working group (WG)
 - DOT and FAA also part of WG (to ensure extensibility to P/N)
- Looking for more end-user participation and input

Principles & Concepts (1)

- **Guiding Priorities:**

- Must be comprehensive
- Must be simple
- Must be consistent
- Must NOT be prescriptive



- **Challenge:** Iterative process to distill framework into something that fits this “quadruple constraint.”

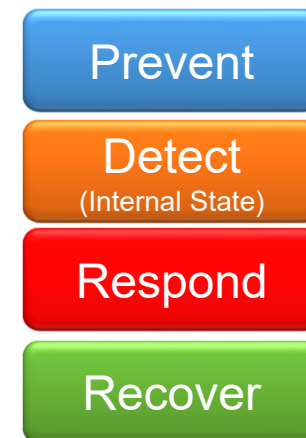
Principles & Concepts (2)

Key Concepts:

- Defense-in-Depth (2 dimensions)
- Resilience Levels
- Core Functions

Core Functions

*Blends NIST Cybersecurity Framework & PPD-21
National Preparedness System for Resilience*



Resilience Levels (Preview)

- **Level 1:** Robust Recovery



Have working definitions, but needs some refinement to better satisfy the four guiding priorities.

- **Level 4:** Operate through Threats

Status

Resilience Levels:

- Conceptual definitions defined.
- Expect they will be refined as WG moves forward on details.

Scopes of Applicability:

- Defined to allow flexibility through the supply chain and deployment chain (chipset → receiver → deployed system-of-systems)

Phase 2 Expected Challenges:

- Identifying most appropriate SDO and committee/subcommittee.
- Reducing timelines on standards process.

Presentation Objectives

- Solicit board feedback
- Raise awareness of this activity within industry
- Solicit more participation from critical infrastructure owners & operators
 - If interested, please email gps4critical-infrastructure@hq.dhs.gov



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DIVERSE PERSPECTIVES + SHARED GOALS = POWERFUL SOLUTIONS