TraCSS Space Situational Awareness (SSA) Research and Technology Development

Broad Agency Announcement (BAA) Community Day

April 3, 2025

For public release

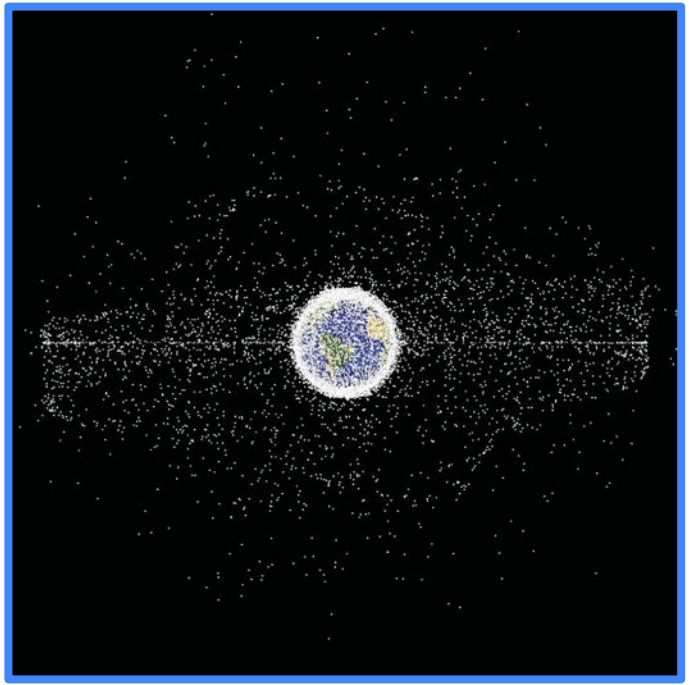
Space Situational Awareness (SSA) and the Office of Space Commerce

As space commerce grows, so too does the population of objects and debris in orbit - **potential collisions pose a major operational and safety risk**.

The Trump Administration's Space Policy Directive-3 (2018) directs a **transfer of responsibility from the DOD to DOC for providing basic "space situational awareness" (e.g., tracking) data and services** to space operators free of charge.

OSC is developing an SSA capability – the **Traffic Coordination System for Space (TraCSS)** – that leverages government and commercial capabilities to provide actionable SSA to space operators for spaceflight safety.

As an agile IT program, TraCSS is iteratively rolling out updated capabilities and services; **a Minimum Viable Product launched for beta users in September 2024.**



Credit: NASA ODPO

TraCSS Program Objectives

Relieve DoD of responsibility for SSA coordination of burgeoning global commercial space industry

Provide “Basic SSA Services” in a manner that promotes safer space operations

Encourage US Commercial SSA leadership and rely on commercial SSA providers to the greatest extent possible

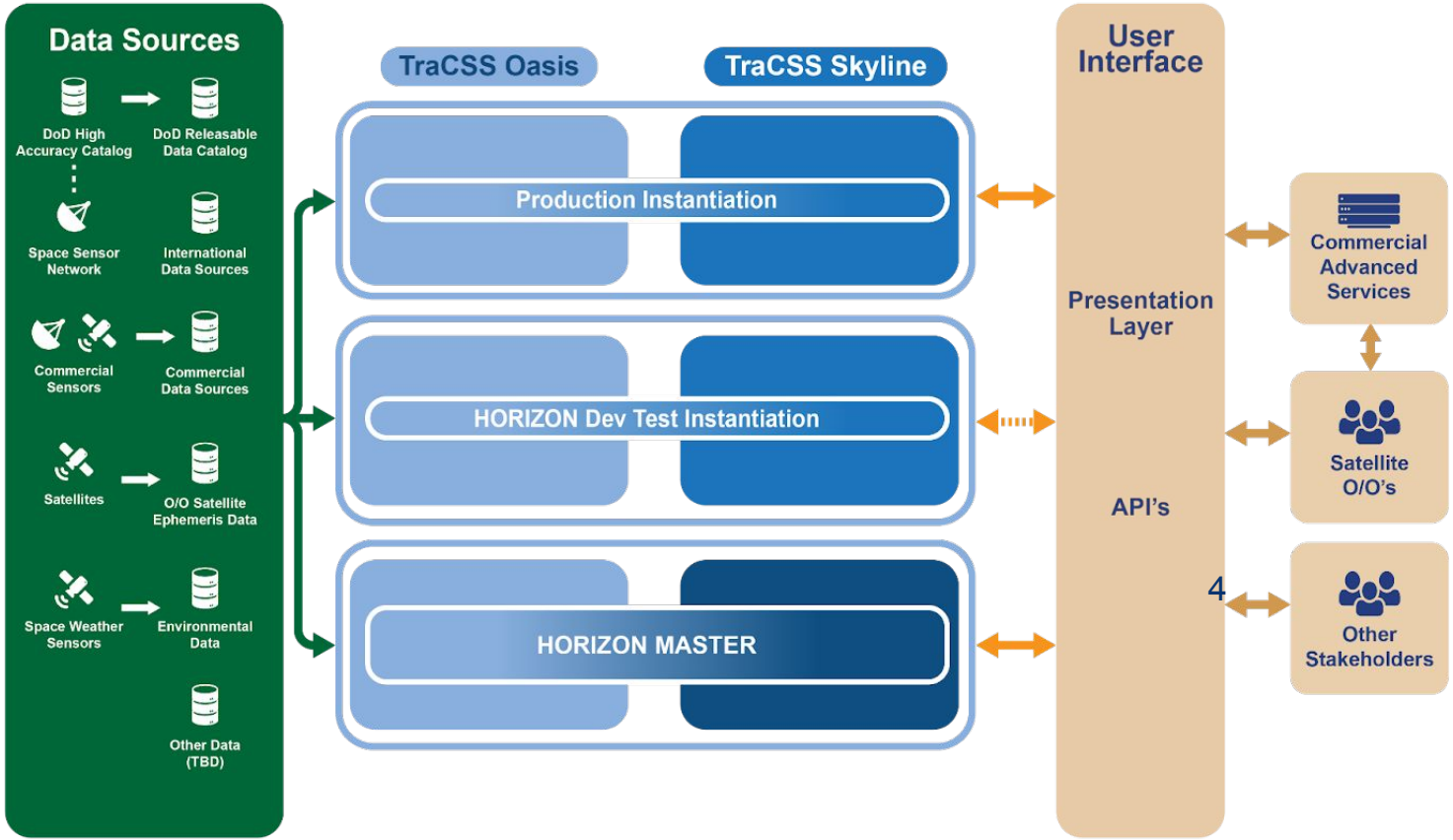
Establish and maintain a resident space object data repository from which all basic services will be derived and utilized for international coordination purposes

Conduct R&D activities that will advance the science and technology of SSA

Promote global SSA standards and best practices

Driven by spaceflight safety, space sustainability, and international coordination

TraCSS Architecture Overview



BAA Basics

General timeline:

- **BAA Issued:** March 14, 2025
- **Community Day:** April 3, 2025
- **Questions and Comments due:** April 17, 2025
- **Answers to questions posted to SAM.gov:** NLT April 30, 2025
- **White Papers due**: May 30, 2025 at noon, Eastern
- **Notifications of interest for proposals:** June timeframe
- **Proposals due/evaluation**: July/August timeframe
- **Notification of awards:** late FY25

***NOTE**: This BAA is subject to availability of funds and any current and future policies.*

BAA contains detailed information on formats and submission information.

BAA Research Interests

Topic: Space Situational Awareness Data:

Overall Goal: Improve the actionability of Conjunction Data Messages

Problem statement: Lack of accurate and precise information on object states, as well as different information about object states, results in ambiguous conjunction screening results

Sample Questions:

- General acceptance that data fusion at the sensor level is best approach but not always operationally or practically feasible. What other approaches are practical and useful?
- What level of covariance and covariance realism is good enough?
- What defines the “best” state to use for conjunction assessment?
- How can improved covariance be obtained?

BAA Research Interests

Topic: Conjunction Assessment

Overall Goal: Improve efficiency and operation performance of conjunction assessment algorithms.

Problem statement: Conjunction assessment approaches vary widely in their use of different variables and modeling techniques that result in ambiguous conjunction screening results. In addition, increasing maneuverability of satellites requires efficient and scalable conjunction screening algorithms that minimize compute time and resources.

Sample Questions:

- How should hard body radius definition be standardized? Should it? What are the impacts?
- What other variables/inputs into conjunction assessment should be standardized and how?
- Is it possible to bring conjunction assessments to edge computing on satellites?
- What does autonomous satellite to satellite conjunction assessment look like?

BAA Research Interests

Topic: Risk Assessment

Overall Goal: Establish approaches to managing risk in a diverse, highly congested space environment.

Problem statement: As space becomes increasingly crowded with a broader set of operational missions the difficulty in defining and managing the risk of maintaining the environment and minimizing conjunctions becomes more complex.

Sample Questions:

- What population density accelerates the potential for a Kessler Syndrome situation? Is there a knee in the curve where this risk increases?
- If collisions occur, what can be done to reduce risk of further collisions due to increased debris? How will SSA data requirements change as a result?

BAA Research Interests

Topic: General Category for Space Situational Awareness Technologies

Overall Goal: Advancing the state of the art of space situational awareness in the application of space safety and space traffic coordination.

Problem statement: OSC is tasked in advancing the state of the art of SSA and internally still working on a roadmap.

Sample Questions:
This is the opportunity for the community to provide ideas not otherwise captured elsewhere.

Future R&D Plans

- **Advanced Capabilities Roadmap development:**
  - Will engage with the broader community on inputs to first draft

- **Regular BAA cadence:**
  - Targeting a twice yearly cadence for white paper solicitations

- **HORIZON MASTER (Modeling and Simulation, Test, Evaluation and Research) environment:**
  - Modeling and simulation environment available for technology development and research

Question & Answer Session

Questions will be posted on SAM.gov
NLT April 30, 2025

Connect with OSC

https://www.space.commerce.gov/

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TraCSS

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