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Proliferated LEO Architecture Enabling Beyond Line of Sight Fires (pLEO BLOS Fires)

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Monterey, California: Naval Postgraduate School

<https://hdl.handle.net/10945/71802>

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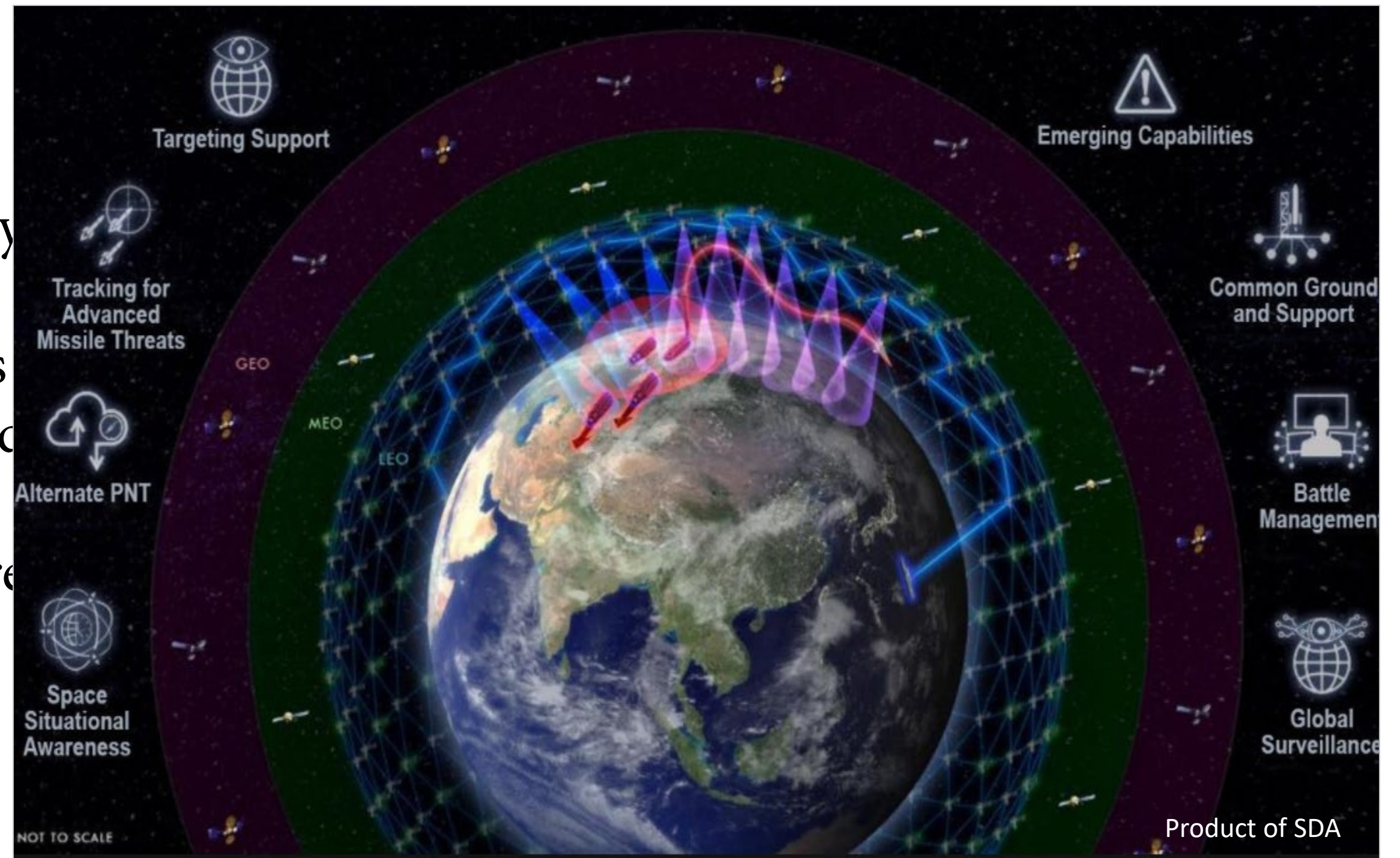
National Defense Space Transport Layer Architecture



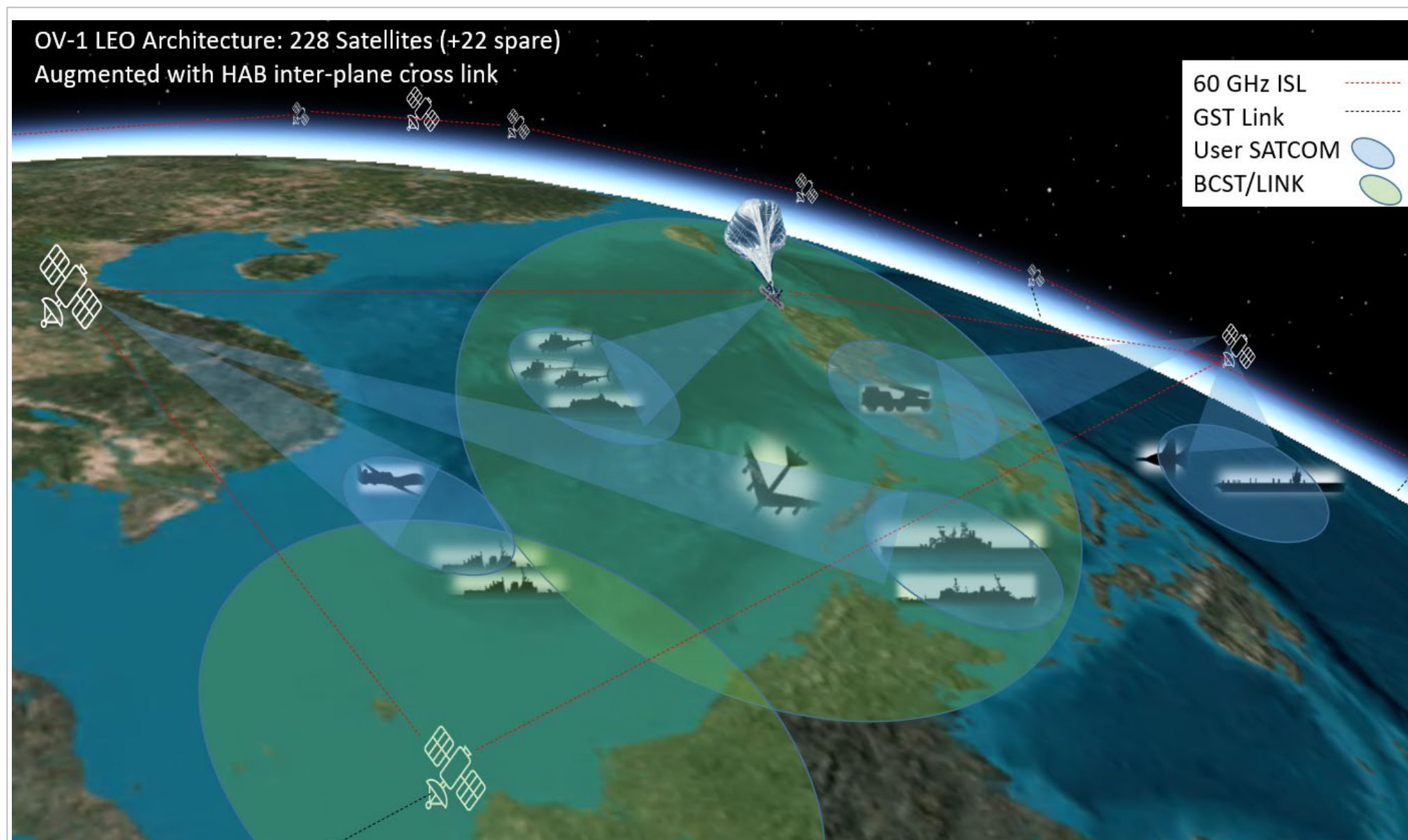
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Background

The Space Development Agency (SDA) is currently developing the National Defense Space Architecture (NDSA) which will include hundreds of Earth-orbiting satellites that gather targeting and tracking information and instantly transmit it to warfighters and weapons systems. The architecture involves seven layers: transport, tracking, custody, deterrence, navigation, battle management and support.



Space Development Agency Capability Layers



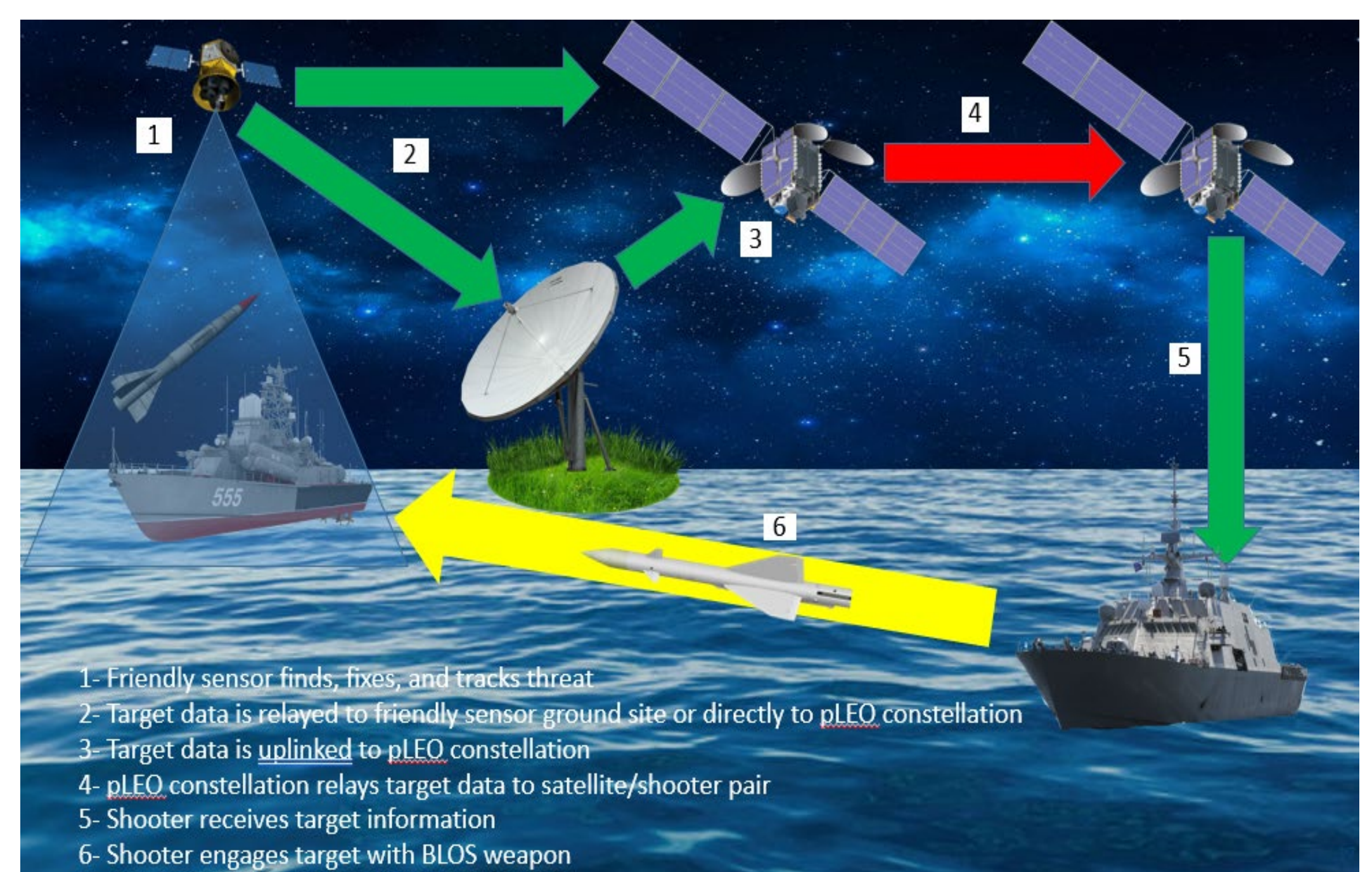
Notional Transport Layer OV-1

Mission Statement

- The purpose of the project is to provide a space-based capability for resilient, low latency military data and global connectivity to facilitate persistent and high-capacity battle management for Beyond Line of Sight (BLOS) communications in support of long-range targeting and advanced missile detection and tracking.
- This project focuses on the Transport Layer of the NDSA.

Beyond Line-of-Sight Architecture

- 250 Satellites (228 Operational/22 Spares)
- Global Coverage
- 10,000 Simultaneous Users
- Data Rate: 100 Mb/s
- Latency: < 50 ms
- Autonomous Command and Control
- Anti Jam Capability
- Broadcast & Tactical Data Link Capable



Kill Chain - F2T2EA

Future Work & Recommendations

- Optimize model to use less satellites, but meet all objectives and requirements
- Model and observe long term perturbations over constellation lifetime
- More research in autonomous command and control systems.
- Analyze benefits of different architecture configurations.



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Topic Sponsor: CD&I Capabilities Development Dir

NRP Project ID:
NPS-22-M255-B