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Space and Missile Systems Center



SNAP: MONA's Foundation at SMC

Lt Garrett Ellis, SNAP Project Lead

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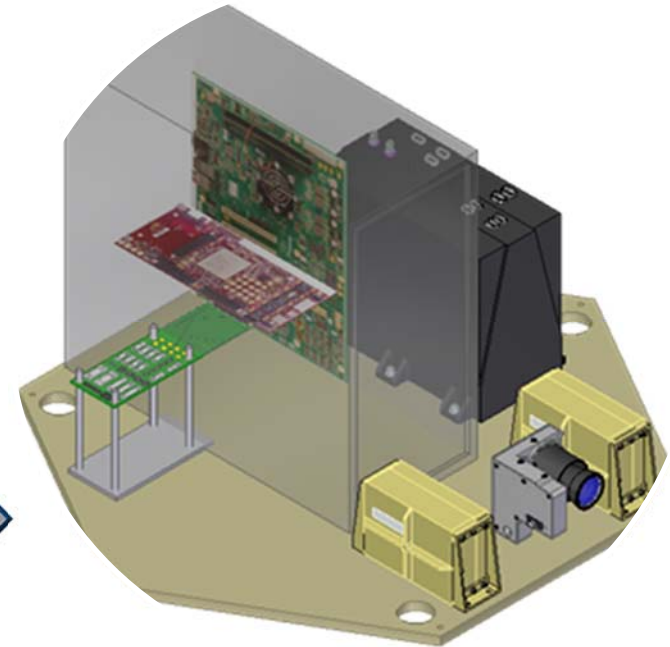


SNAP Motivation

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MONA

“MONA Progression”
“Role Models/Pilot Programs”
“Creating Short-term Wins”



Objective 1: Reduce to practice a MONA approach for a hosted payload adapter
Objective 2: Demonstrate with multiple payload and multiple spacecraft interfaces

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SNAP Background

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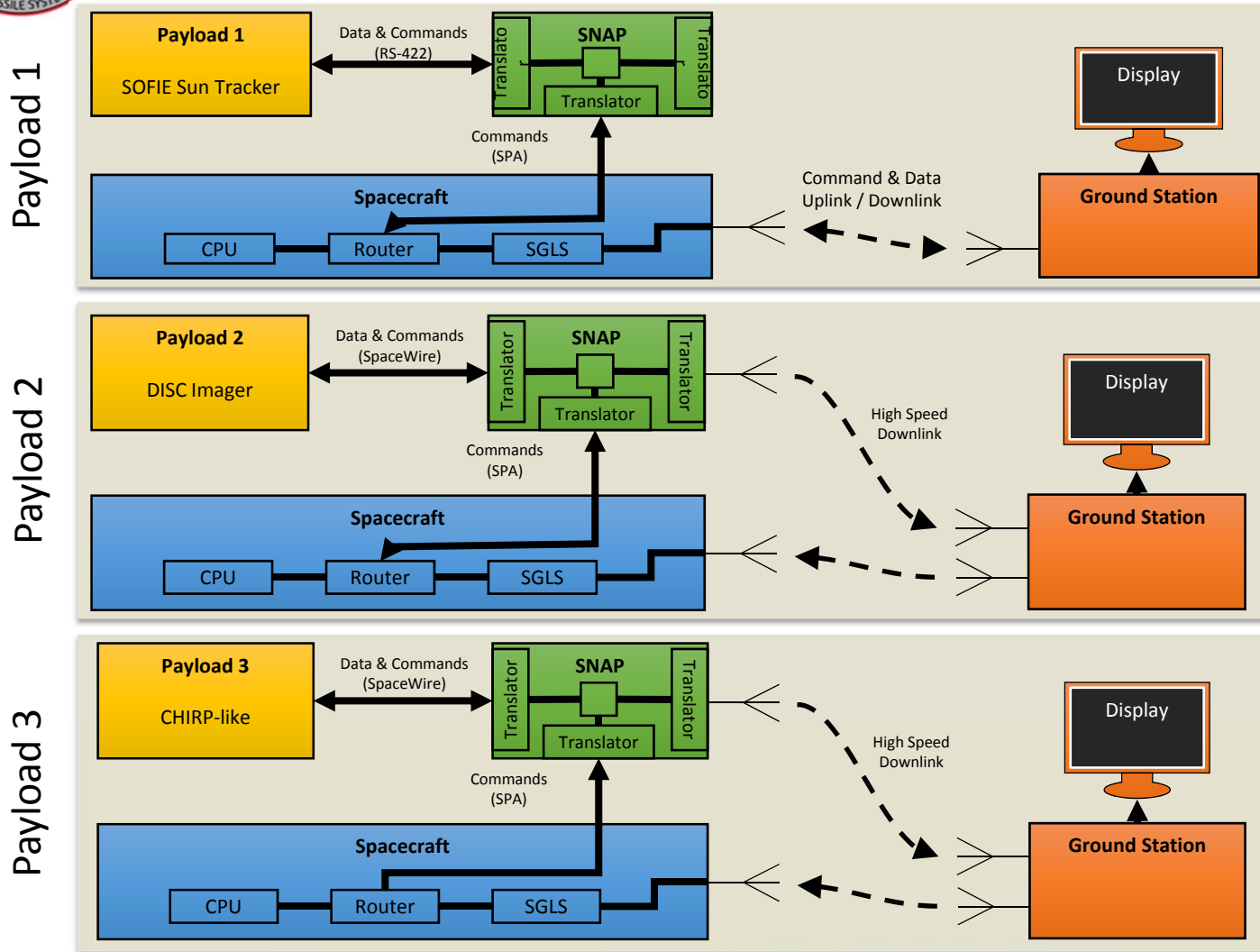
- **Rapid, Low-Cost Development**
 - Leveraged past work done by AFRL, ORS, DAPRA, NASA, ODNI
 - Planning phase enabled socialization before creation
 - Tasked Space Dynamics Laboratory who had relationships and expertise with previous open architecture efforts
- **SNAP's Building Blocks**
 - Software built on AFRL-sponsored standards
 - SNAP unit based on BAE F6TP Breadboard
 - ORS' MSV engineering model spacecraft used for demo



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Data Flow Diagram

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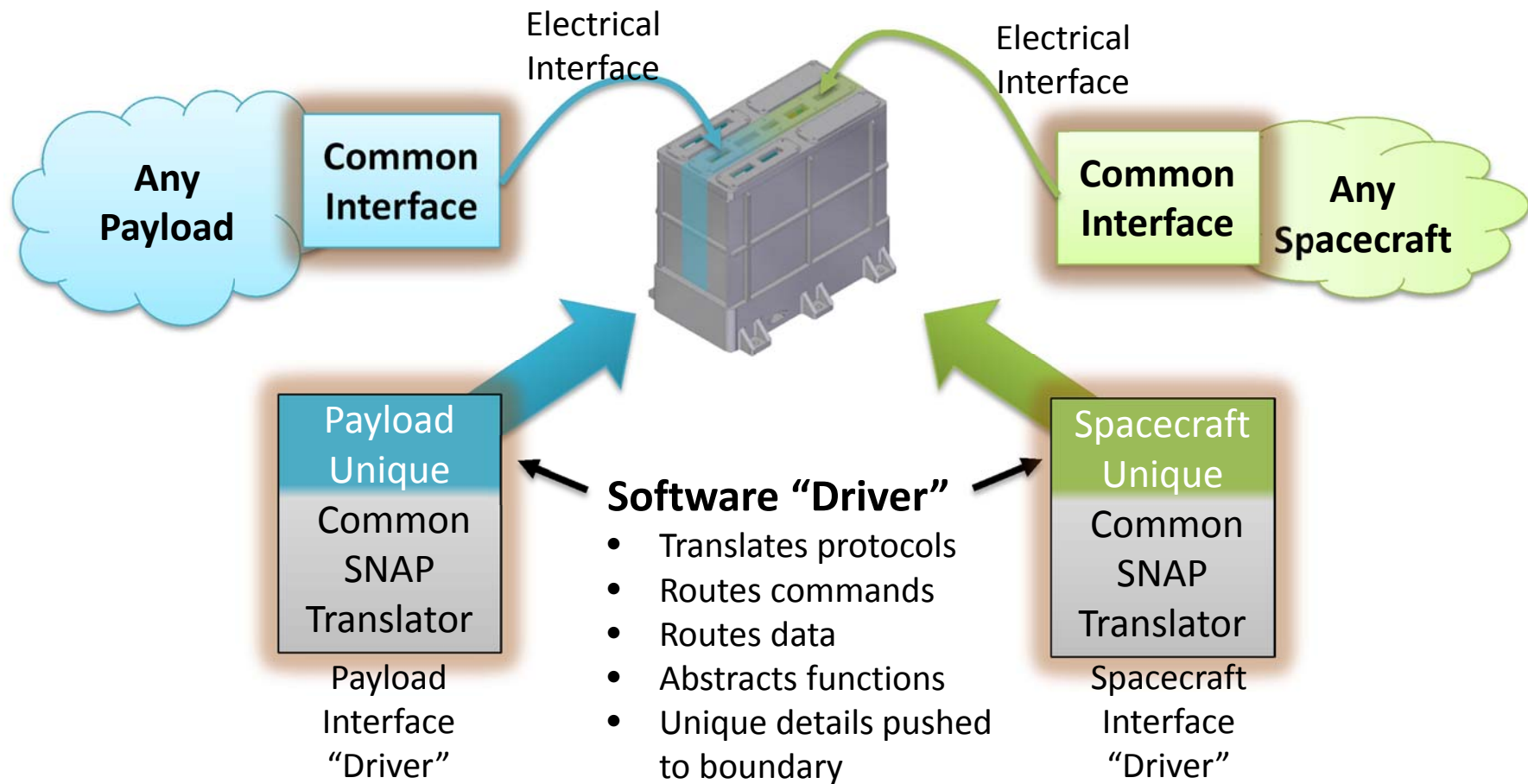


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Adapting to MONA

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The “Secret Sauce” is the Modular Open Network Architecture (MONA)



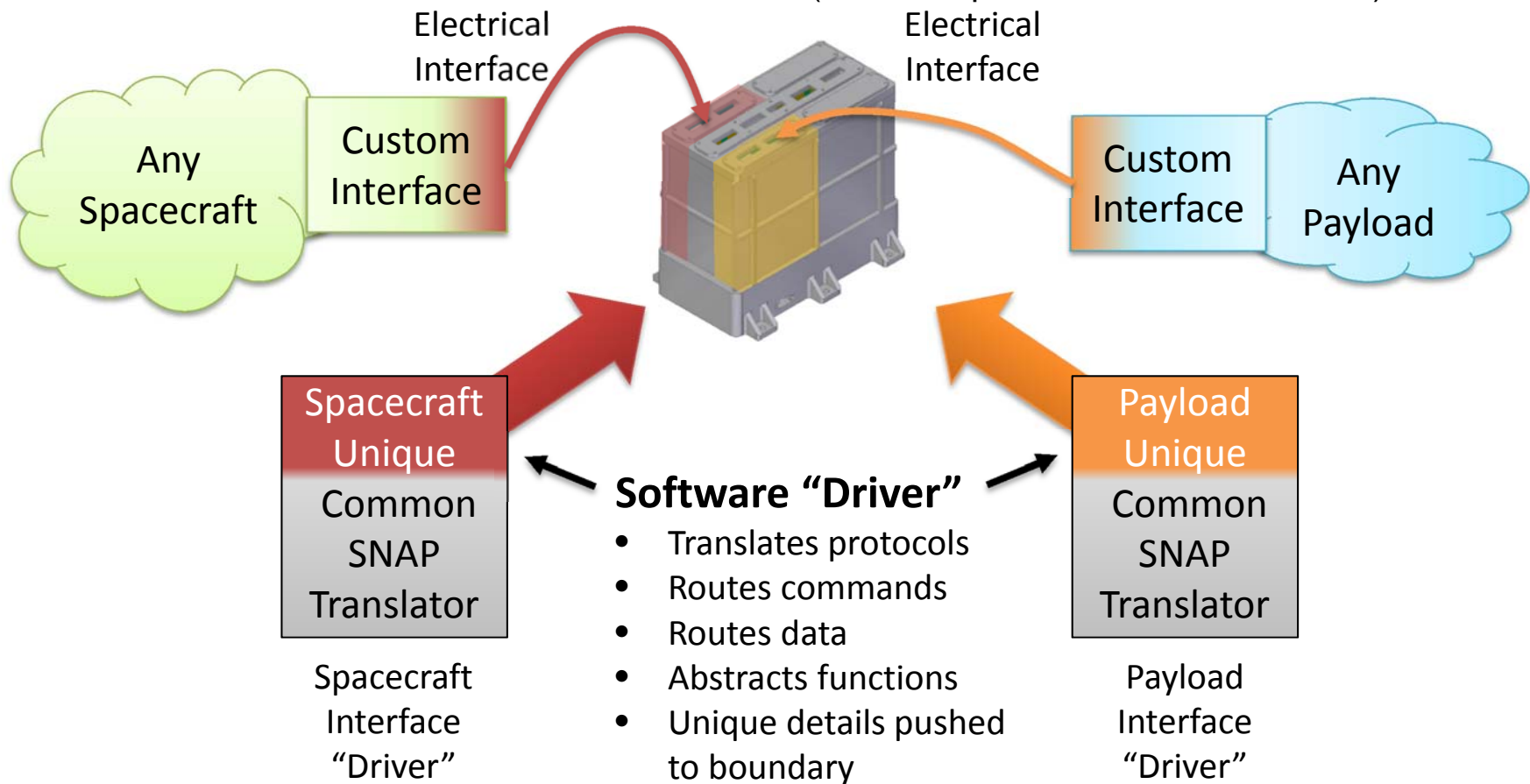


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SNAP: Custom Interfaces

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- Custom interfaces can be supported:
 - Design and build an interface module for a custom interface (new electronic board)
 - Create a “driver” to talk to the interface module (same scope on new software driver)





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SNAP Architecture Reduces Cost & Time

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80% software reuse / **100%** re-test



Higher Cost

Adapting to new hardware



80% software reuse / **20%** re-test



SNAP Services

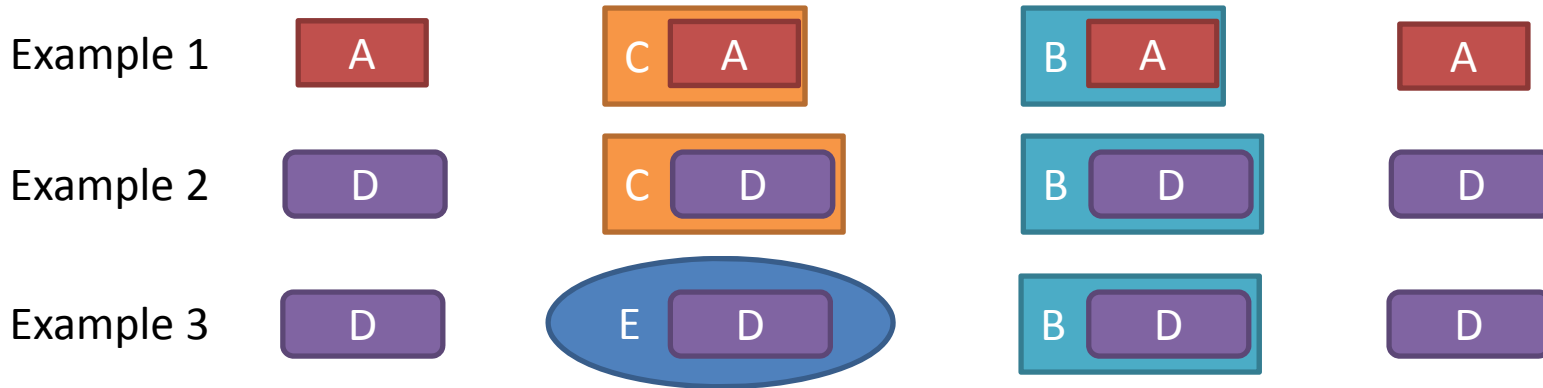
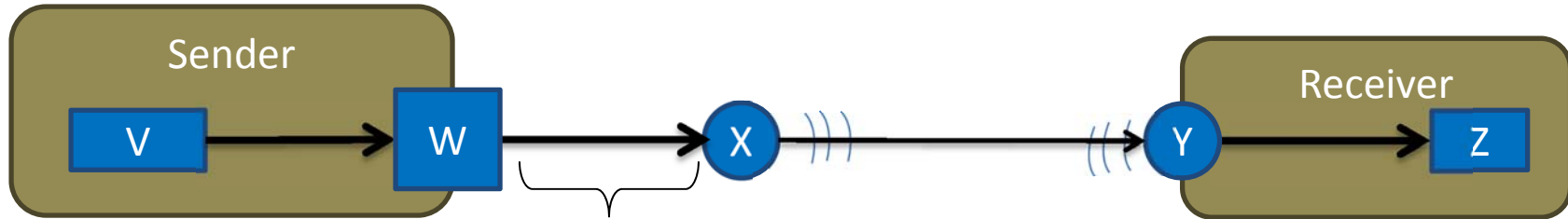
Lower Cost



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Modular Open Network Architecture

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- SNAP uses packet encapsulation to **minimize change propagation**
- Packet encapsulation enables modularity in network communication
- Packet formats can change, other formats stay the same
- This is the “N” in MONA



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Transportation Uses a Similar Modular System

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10010110100011
 01101110101001
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A



B A



C A



D A



E A



F A



G A



A



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Setting the Foundation

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The letters 'S', 'N', 'A', and 'P' are stacked vertically in a bold, black font. They are surrounded by a dynamic splash of blue water droplets and bubbles, with a reflection visible on the surface below.

• SNAP's Future Direction

- Demo's success indicates interest from industry attendees at MONA/SNAP Industry Workshop
 - All SNAP material accessible to attendees
 - Government/Industry collaboration to initiate standards development
- Develop plans to address issues related to cyber security/information assurance in a MONA atmosphere

- SNAP's "ripple" effect

- 1) enables government program managers to leverage prior knowledge
- 2) creates atmosphere for collaboration, competition, and cost reduction
- 3) provides starting point to influence future space acquisitions