Prototype USSF Enterprise Satellite Operations

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…From GSAW 2023

Started with a Private Cloud

Successfully launched and continued operations

Announced We Were Going to a Commercial Cloud

ATO'd Environment

Mission Unique Requirements

Same End Goal but Different Path
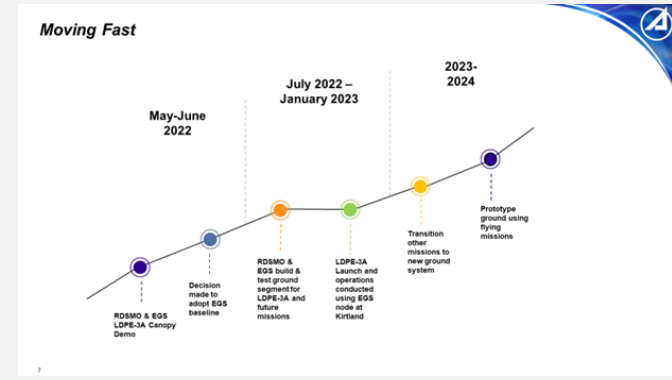
Not to plan

Maintained timeline and objective

1

Stronger Together

- SSC/SZI is the Innovation & Prototyping Delta for space and ground capabilities and has a legacy of on-orbit experiments and enterprise ground capability development
  - SZI is commanded by Colonel Joseph Roth

- Space RCO is the acquisition org tackling first-of operational capabilities and critical enablers that defend space assets or protect the Joint Force from adversary attacks using space.
  - R2C2 is the Combined Program Office that combined Space RCO's Ground Command Control and Communication (GC3) and SSC's Enterprise Ground Service (EGS)
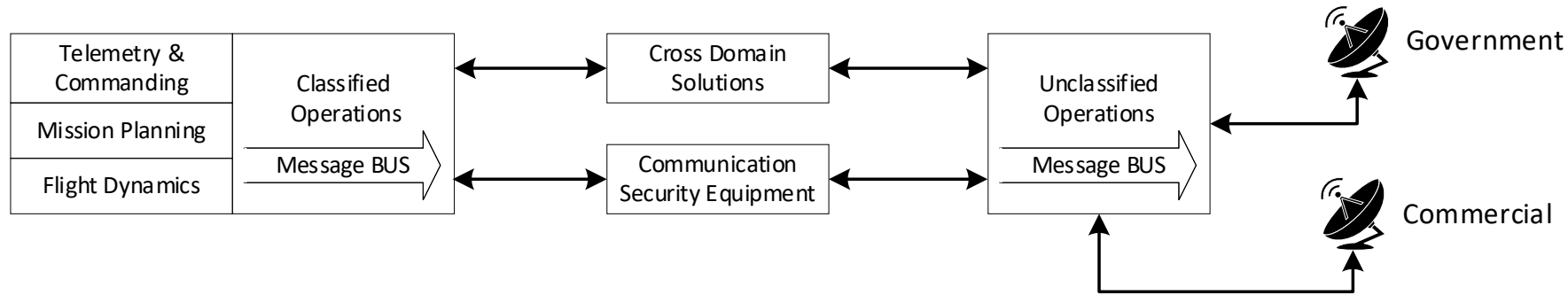 - PEO for R2C2 is Dr. Kelly Hammett at Space RCO

Element Highlights

- Standardized Architecture Elements (Representative)

- Leverage the Public Cloud Infrastructure and Services
  - Unclassified and Classified AWS platform to increase resilience and decrease ownership cost
  - Inherited physical and infrastructure security controls, alleviating years of program work
  - Secure Authority to Operate in 3 months of project start

- Leverage proven CI/CD Pipeline
  - Big Bang based pipeline deployment (provides secondary inheritance of security controls)
  - Focus on automated testing to increase speed and consistency of deployments (updated in days/not months)
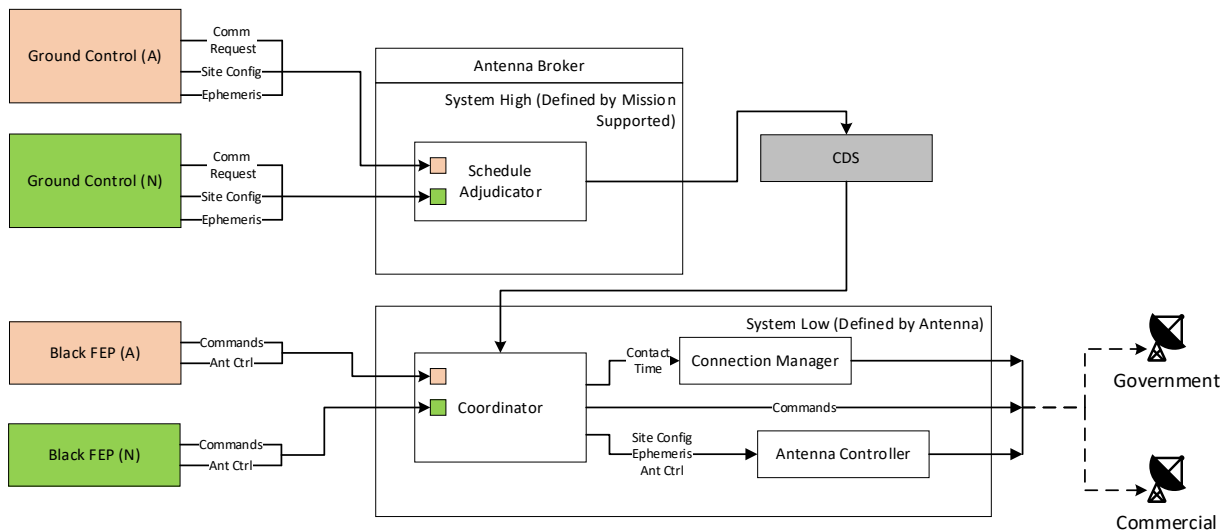 - Proven deployment model

Element Highlights

- Common Scheduler
  - Single scheduler to communicate across multiple antenna networks
  - Standardized interface to the Missions
  - Modular design to adapt to antenna architectures

- Common Telemetry & Commanding
  - Allows for standardized look and feel across multiple mission customers
  - Modular design for implementation across different satellite architectures
  - Scripted procedures for test and operations

USSF ROOSTER-4 Ground Segment Progress

MISSION

- ROOSTER-4, Rapid On-orbit Space Technology Evaluation Ring,
  - Own Power, Avionics, Propulsion
  - Maximize launch vehicle payload capacity
  - Up to 6 payloads

WHY EVEN GO TO THE CLOUD

- DoD service ATOs are the biggest challenge
- Able to leverage the work of others
- Easily and quickly replicated

PROGRESS

- DoD ATO'd environment at the appropriate classification
- Plug-Ins developed and validated against mission simulator
- Moving to on-orbit demonstrations

The new challenge of adapting a new C2 application was born after embracing another organization's ATO'd environment

What have we learned and where are we going…

- What have we learned
  - Early ATO approval is a must and can either accelerate your program or hinder it
  - Avoid stovepipe solutions ensures simpler integration disparate satellite architectures
  - Demonstrations with relevant missions positively engages leadership and removes hurdles

- Where are we going…
  - Simulation demo will transition into full flight operations in 2024
  - Integration of other satellites into the R2C2 Ground Segment
  - Continued collaboration between SZI and R2C2 for more prototypes

Opportunity to Collaborate

Aerospace SSC/SZI Support

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Aerospace R2C2 Support

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SSC Front Door

https://www.ssc.spaceforce.mil/Connect-With-Us/Space-Systems-Command-Front-Door

Space RCO Front Door

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Thank you