



Next**GEN**

TBO Integrated Test Environment

Weather Information Services for Enterprise Research (WISER) – Weather Simulation Tool Suite

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Background

Trajectory Based Operations (TBO) Work Plan

In 2017 the Acting Assistant Administrator for NextGen requested that ANG-E ensure that the test environment is ready for TBO



Work Plan for Trajectory Based Operations

Section 8: Integrated T&E / V&V

Readiness Assessment Report (12/18)
TITE implementation Plan GAP Analysis (8/19)
Final TITE implementation Plan (9/19)

Federal Aviation Administration
September 28, 2018

Gap 1 – Limited Weather Simulation Capabilities for the Enterprise

Problem: Currently, there is limited capabilities to simulate weather scenarios for an enterprise environment, to access, integrate, and synchronize data is extremely labor intensive. Wx data is voluminous, varied, requires extensive storage resources, and is not well understood by non-weather organizations and programs. **This gap is significant to TBO V&V as many of the benefits occur during weather situations.**

Solution: Develop the Weather Information Services for Enterprise Research (WISER) microservice framework to support weather data collection, management, archiving, playback, integration and visualization. The WISER tool suite will provide the ability to develop integrated Air Traffic and Weather scenarios for simulation injection into large scale enterprise test environments.

Weather Information Services for Enterprise Research (WISER)

High Level Description - WISER is a microservice framework to support weather data collection, management, archival, playback, integration, and visualization

- **Weather Information Management (WIM) capability**

- Services that provide a single source for archived weather data, tailored specifically for the NAS
- Ability to create Weather Cases for specific ATC scenarios
- Library of Weather Cases



- **Weather Enterprise Playback (WEP) capability**

- Services that handle coordinating and synchronizing playback of weather information
- Integrated with ATC simulation capabilities
- Playback of Weather Cases to one or more NAS systems

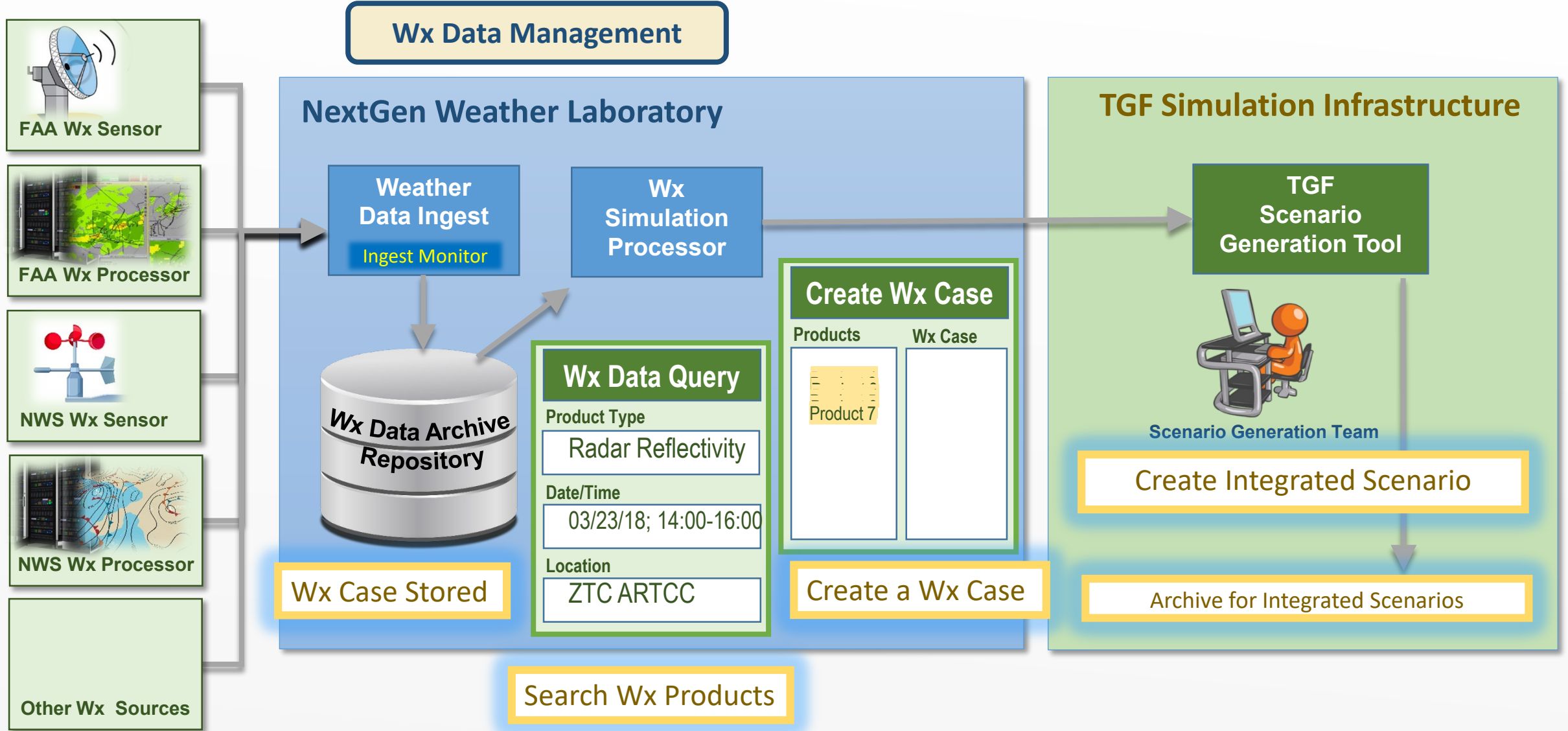
Weather Information Management (WIM) Capability

Scenario Development Concept – Test Prep

- The WISER Wx Data Management Function manages the ingest, organization, and archive of received weather data using the Wx Information Management (WIM) capability
- Provides an intelligent search capability of products by source, product type, location, and/or time
- A Weather Case is a collection of different weather products for a weather event of interest (e.g., storm cell) bounded by geography and time
- TGF Group will use the WIM Wx Data Management function to formulate an integrated ATC Wx scenario based on test user requirements



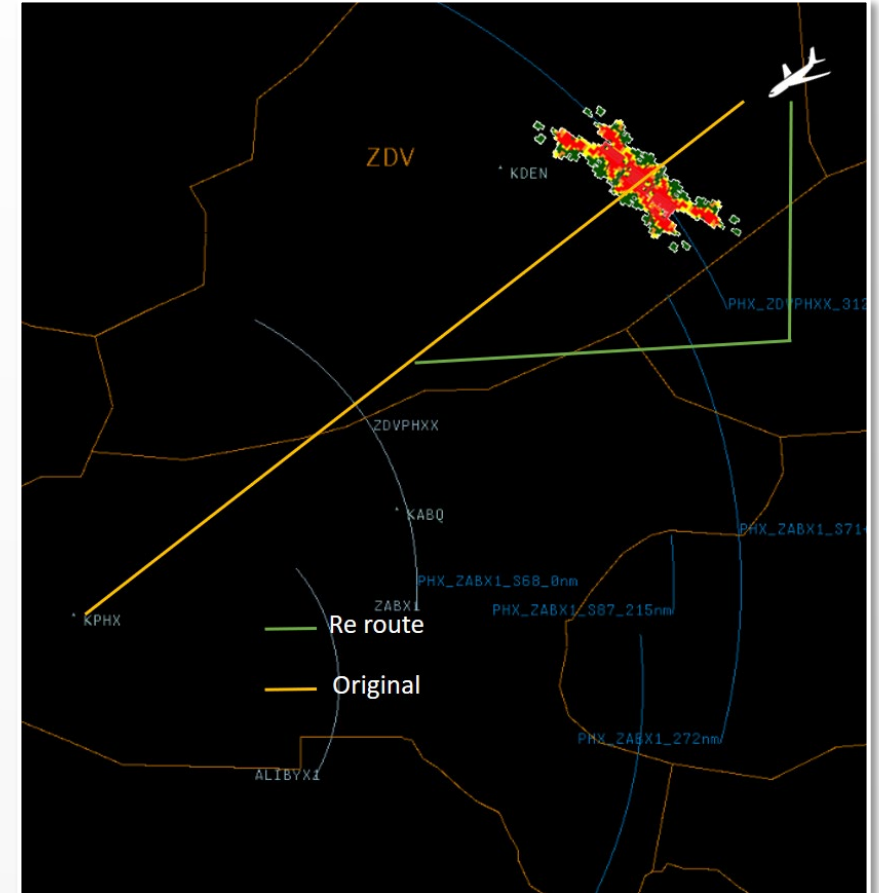
TGF Simulation Infrastructure for WIM Capability



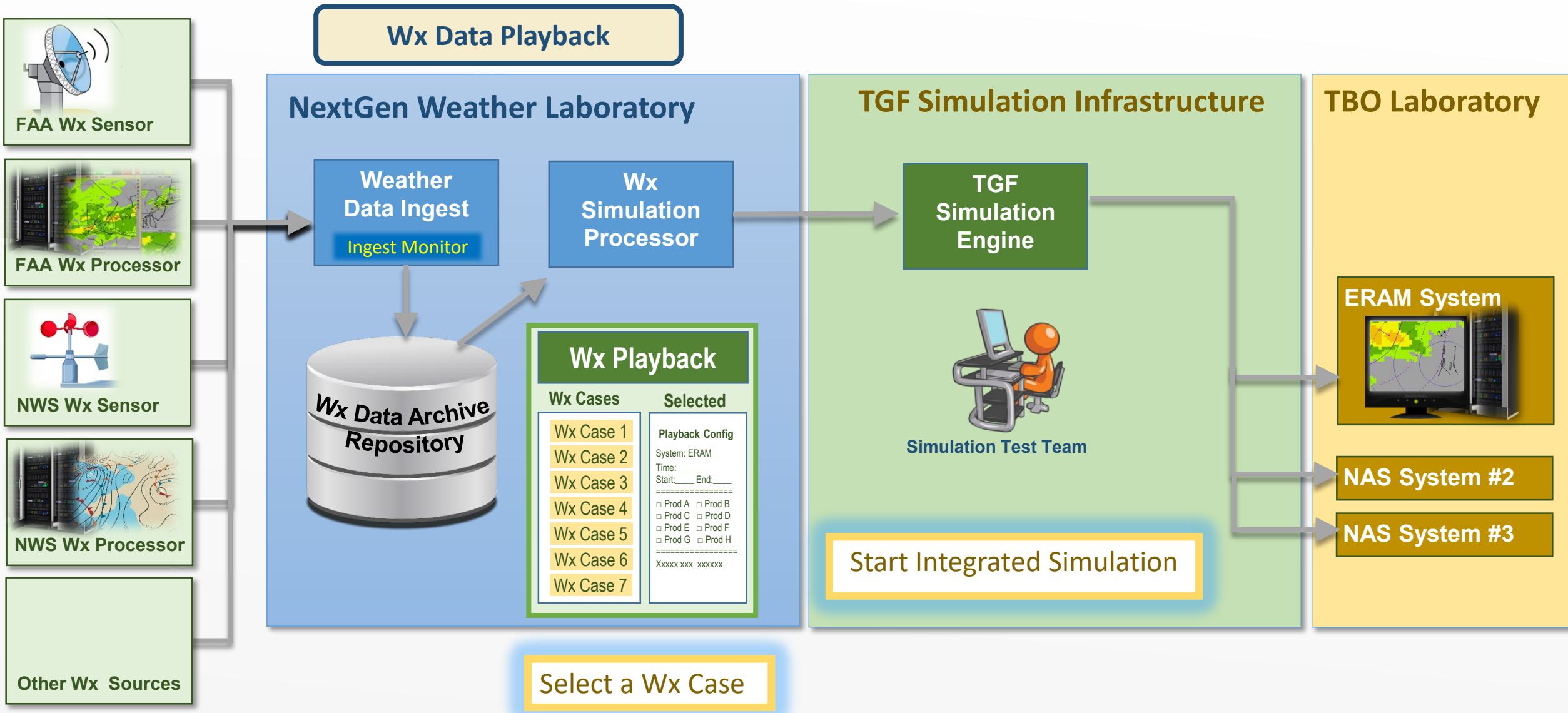
Weather Enterprise Playback (WEP) Capability

Simulation Playback Concept – Test Execution

- The WISER Wx Data Playback Function manages the selection, configuration and playback of Weather Cases to one or more systems using the Wx Enterprise Playback (WEP) capability
- Wx products are “*re-clocked*” to sync with the current system time
- Wx Cases can be configured to playback different product/data sets to one or more systems concurrently (e.g., ERAM, TFMS)
- Wx Cases can be configured to support different scenarios
- Can be subset to playback only select product/data types for specified time-frames



TGF Simulation Infrastructure for WEP Capability

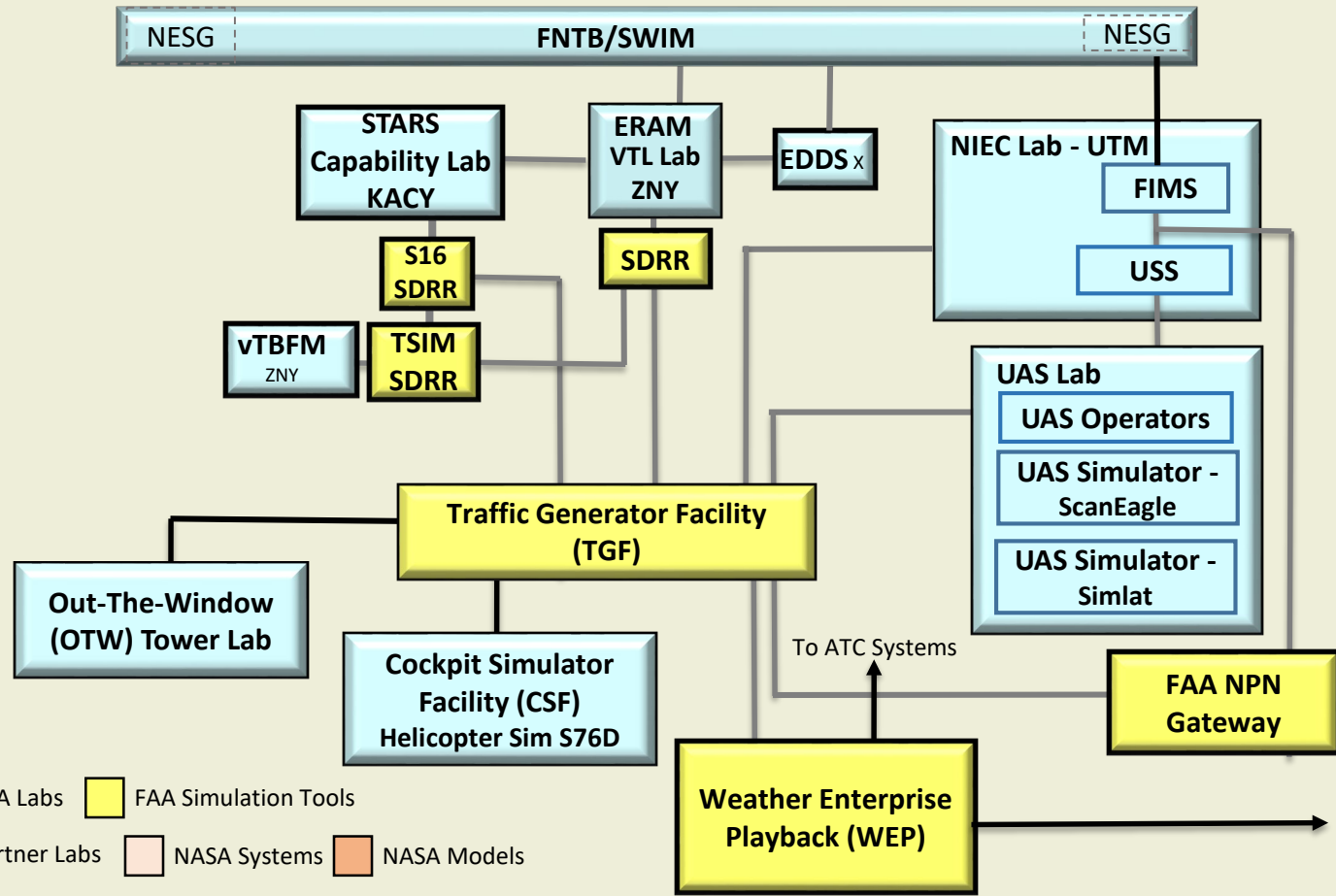




WJHTC/LaRC Integrated AAM Ecosystem Environment

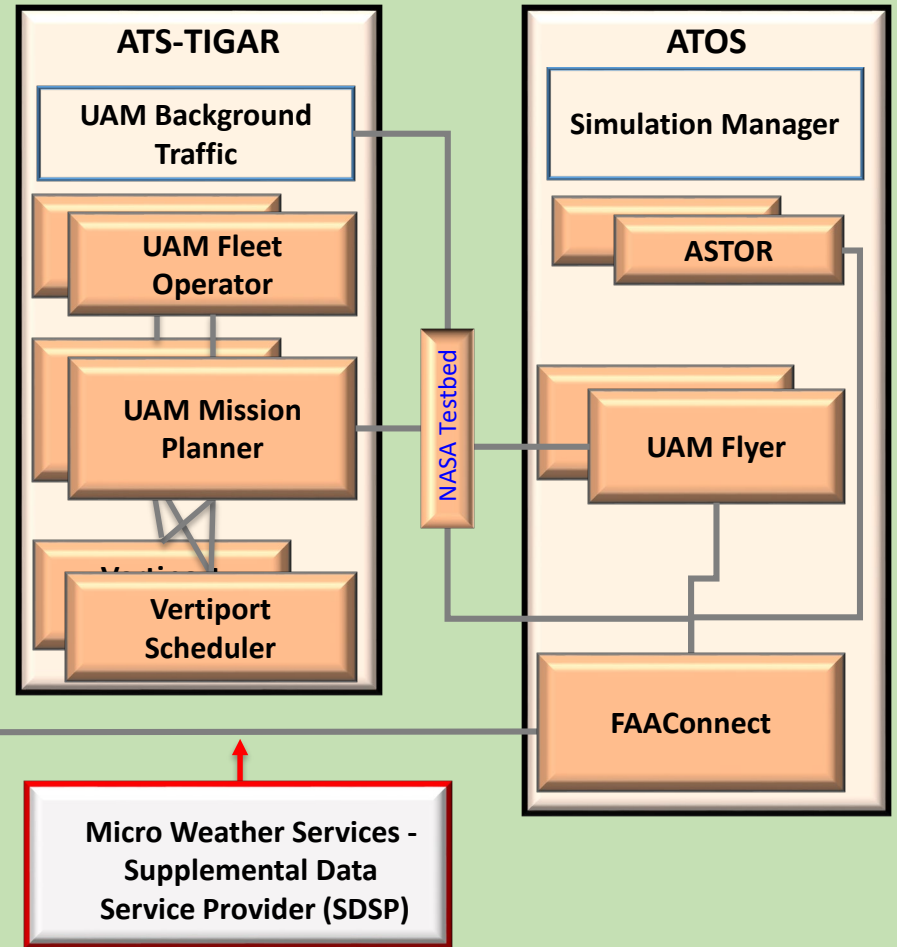


FAA WJHTC – TBO Integrated Test Environment (TITE) Hybrid



Key:
 FAA Labs FAA Simulation Tools
 Partner Labs NASA Systems NASA Models

NASA LaRC- Air Traffic Operations Lab (ATOL)



Lab Gaps:

- Micro Weather Services simulation capability is needed

Aviation Weather Branch

Aviation Weather Branch – ANG-C34 is developing the WISER Tool Suite capability. Below are other capabilities and services provided by this team.

- **Weather Data SMEs**

- Senior meteorologist with 25+ years of FAA weather data experience
- Engineering expert knowledge of the NAS weather systems

- **Weather T&E Services**

- Common Support Services – Weather (CSS-Wx) Program T&E Services
- NextGen Weather Processor (NWP) T&E Support

- **Weather Laboratory Capabilities**

- Resources for processing, storage and networking
- Daily weather data ingest from FAA weather sensors/systems, NOAA/NWS, and FFRDCs
- NEXRAD Radar Product Generator (RPG) Farm
- Weather data viewers and evaluation tools
- Connectivity to CASSIE virtual environment

Aviation Weather Branch - ANG-C34 Contacts

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