



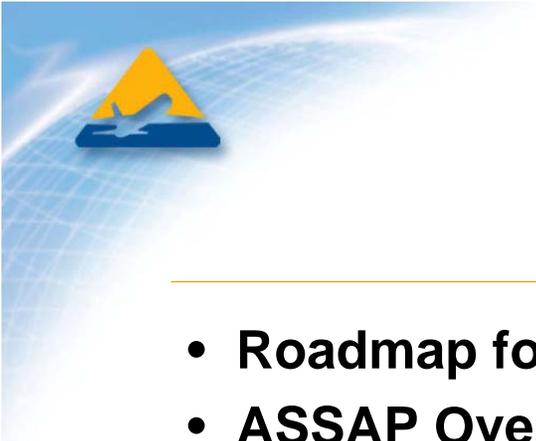
CENTER FOR ADVANCED AVIATION SYSTEM DEVELOPMENT (CAASD)

ASSAP Simulation Overview and Roadmap in Support of MOPS

MITRE/CAASD

Roxaneh Chamlou

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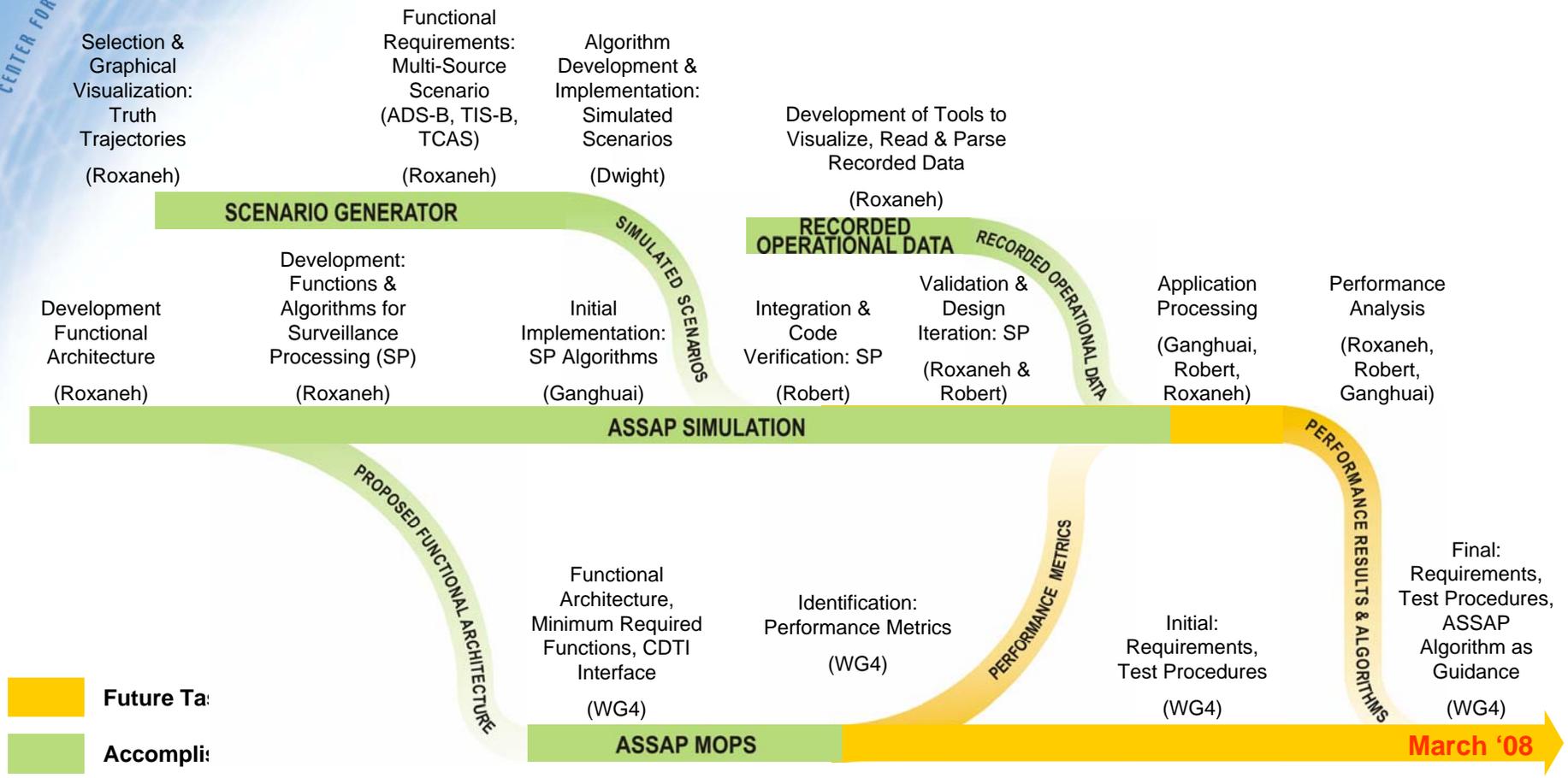
Outline

- **Roadmap for ASSAP Simulation in Support of MOPS**
- **ASSAP Overview**
 - **Functional Architecture**
 - **Major Functions Implemented**
 - **Demo of Simulated Scenario**
 - **Demo of Recorded Scenario**



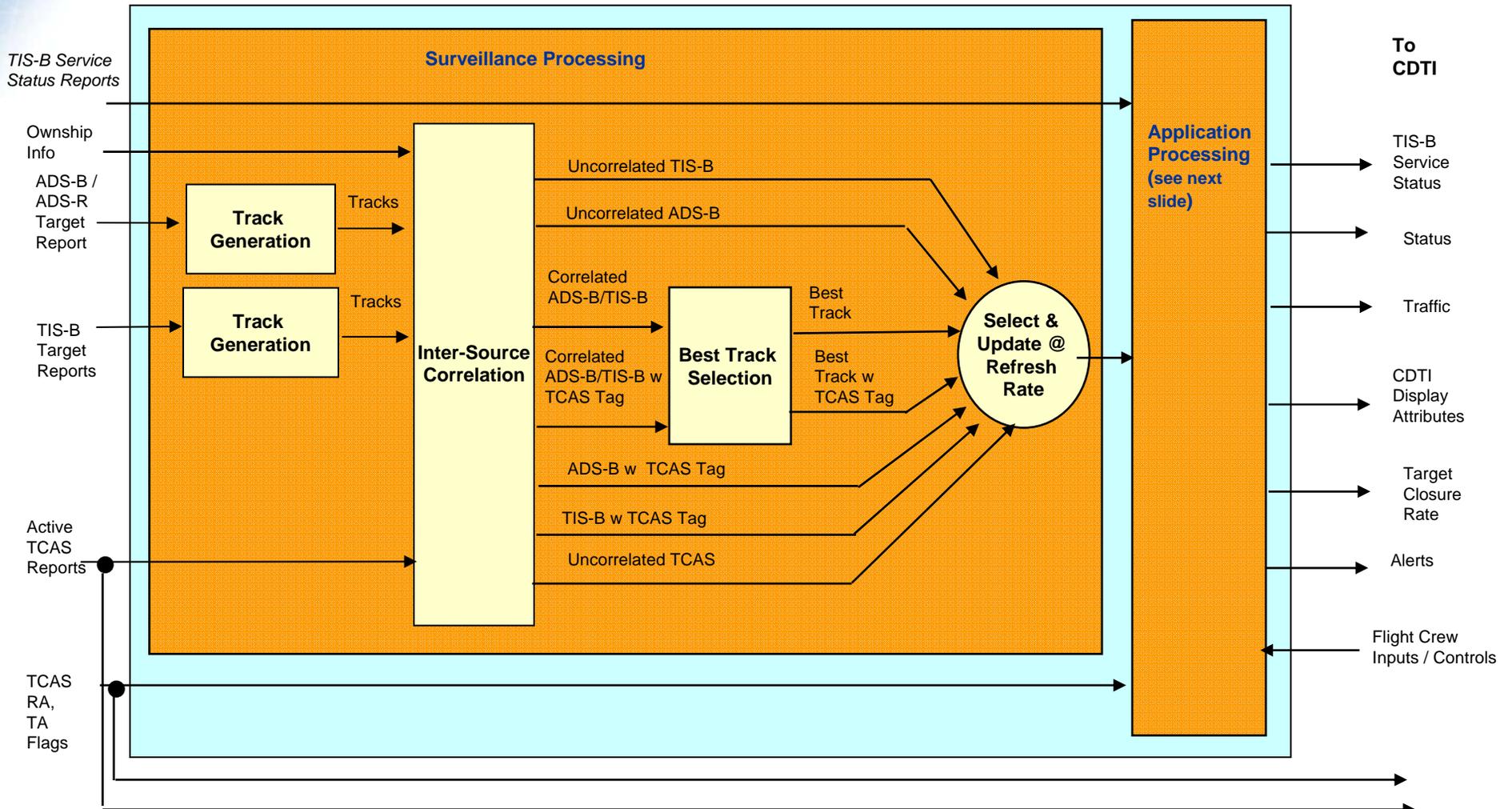
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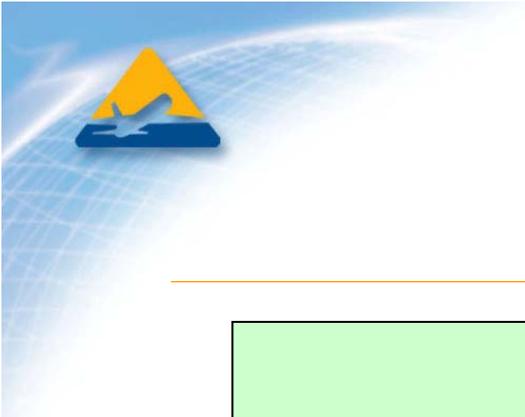
ASSAP Roadmap (cont'd)



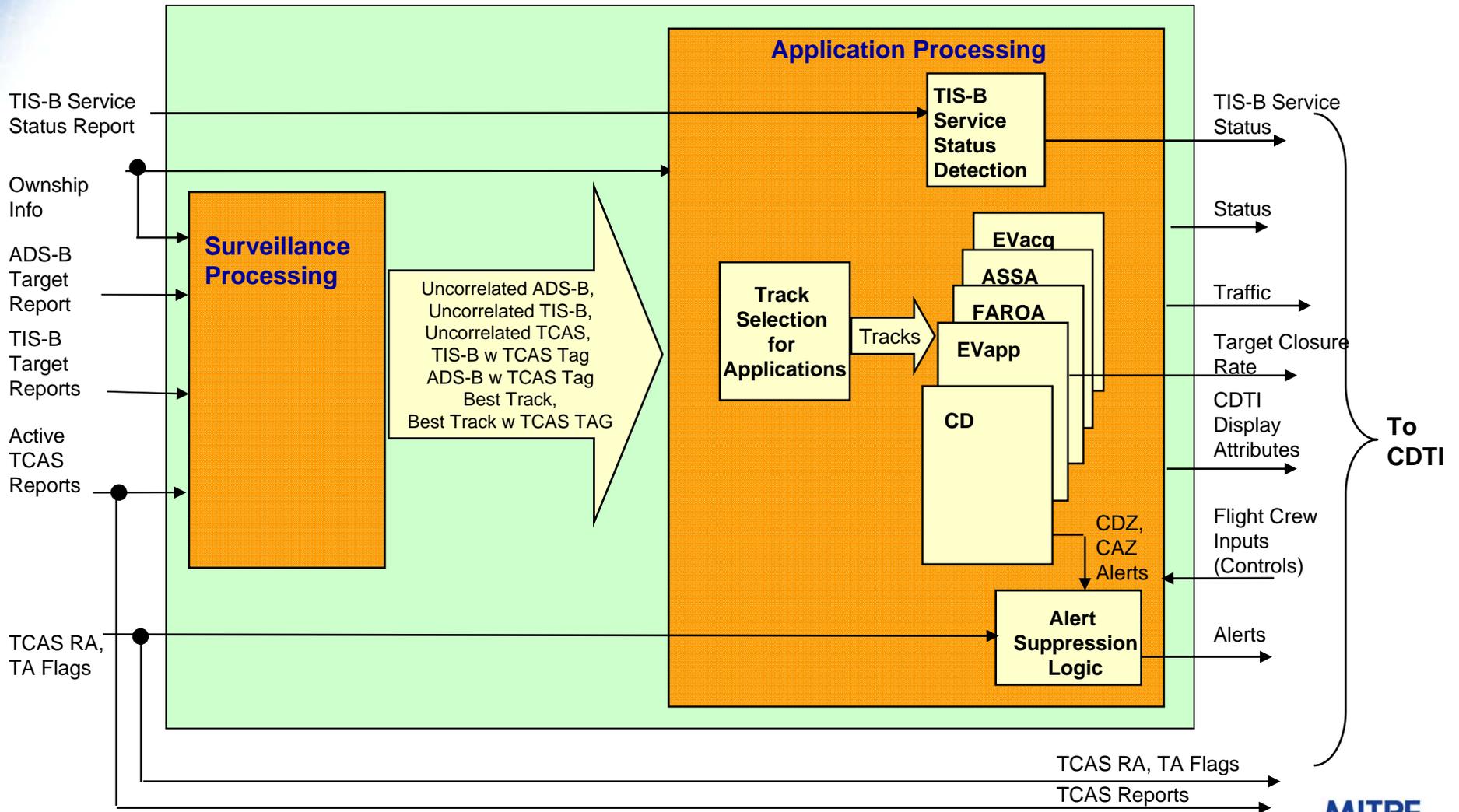


Architectural Approach – Surveillance Processing





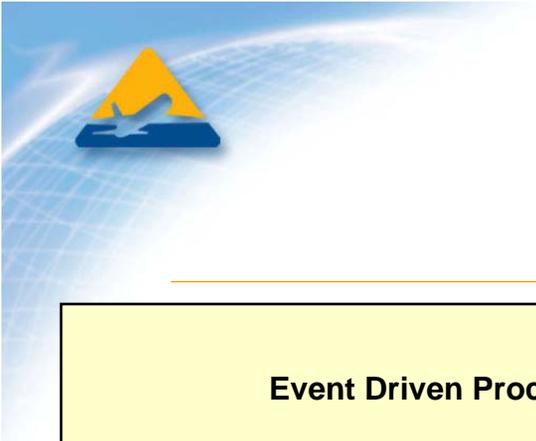
Architectural Approach – Application Processing



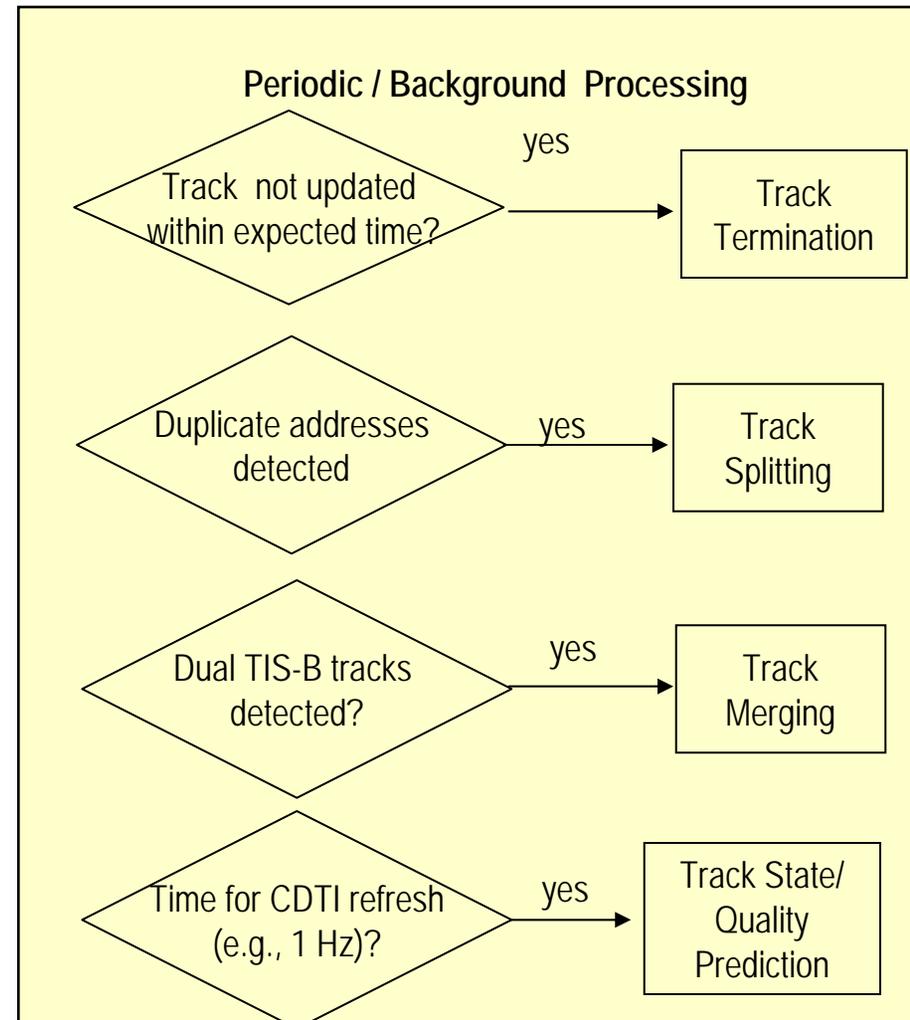
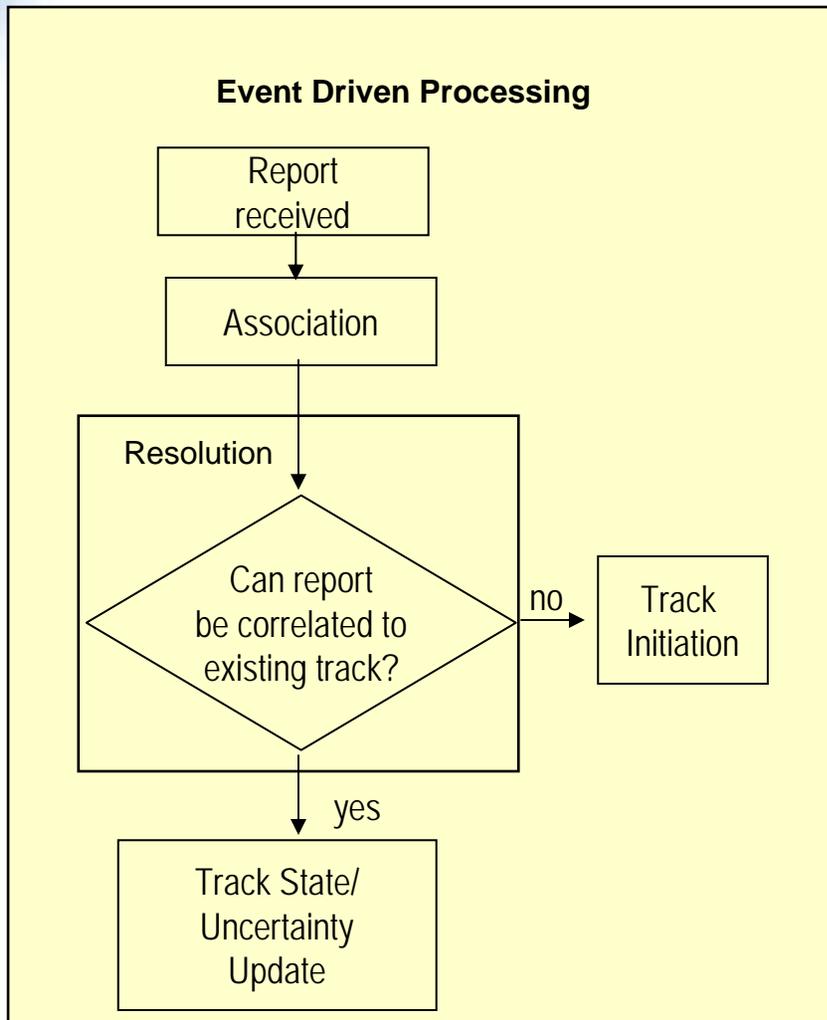


Major Functions Implemented

- **Establish tracks from ADS-B and TIS-B sources separately (Track Generation).**
 - The report-to-track association function employs spatial correlation. (i.e., not based solely on a match between Report ID and existing Track ID).
 - Spatial correlation is accomplished with two types of windows
 - Candidate Window - a coarse window referenced to the position of the new Report that bounds the volume where the target could have been when it was last updated.
 - Association Window - a finer window that predicts candidate tracks to the TOA of the Report and takes into account the uncertainty of both the report and the candidate track may be employed to further define the validation region.
- **Perform correlation between source-level tracks (ADS-B and TIS-B tracks) to detect when an A/V is tracked by multiple sources (Inter-Source Correlation).**
- **Select the best track when source-level tracks from ADS-B and TIS-B sources correlate (Best Track Selection).**
- **Perform correlation between ownship track and TIS-B track to remove “shadow” on ownship (Inter-Source Correlation).**
- **Perform correlation between TCAS reports and current source-level tracks and tag the source-level tracks with the correlation status (Inter-Source Correlation).**
- **Predict all active track states at the refresh rate (adaptable, currently set to 1 Hz) using a degenerate Kalman Filter.**
- **Display Closure Rate for selected targets (Application Processing)**
- **Terminate track records when reports are no longer received (Surveillance Processing).**
- **Detect duplicate target IDs (i.e., multiple A/Vs erroneously assigned the same address) and assign unique track IDs.**
- **Detect dual TIS-B tracks (i.e., one A/V assigned multiple addresses) and merge into one track (optional).**



Track Generation Flow





Demo of Simulated Scenarios

- **Run demo on simulated scenarios**



Demo on Recorded Scenarios

- **Run demo on recorded scenarios**