End-to-End Systems Integration Testing to Improve Interoperability

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Civil Aviation Authority of Singapore

Outline

- Introduction
- Need for End-to-End Systems Integration Testing
- Setup of Dedicated End-to-End Systems Integration Testing Facility
- Conclusion

Introduction

- This presentation shares Singapore's plan in conducting end-to-end systems integration testing in the modernization of its Air Navigation Services (ANS) systems
- Singapore is modernizing its ANS systems which operate as a System-of-Systems (SoS), comprising a suite of complex and interdependent constituent systems that would interoperate seamlessly to function effectively as a collective whole

A new Paradigm for Integration Testing

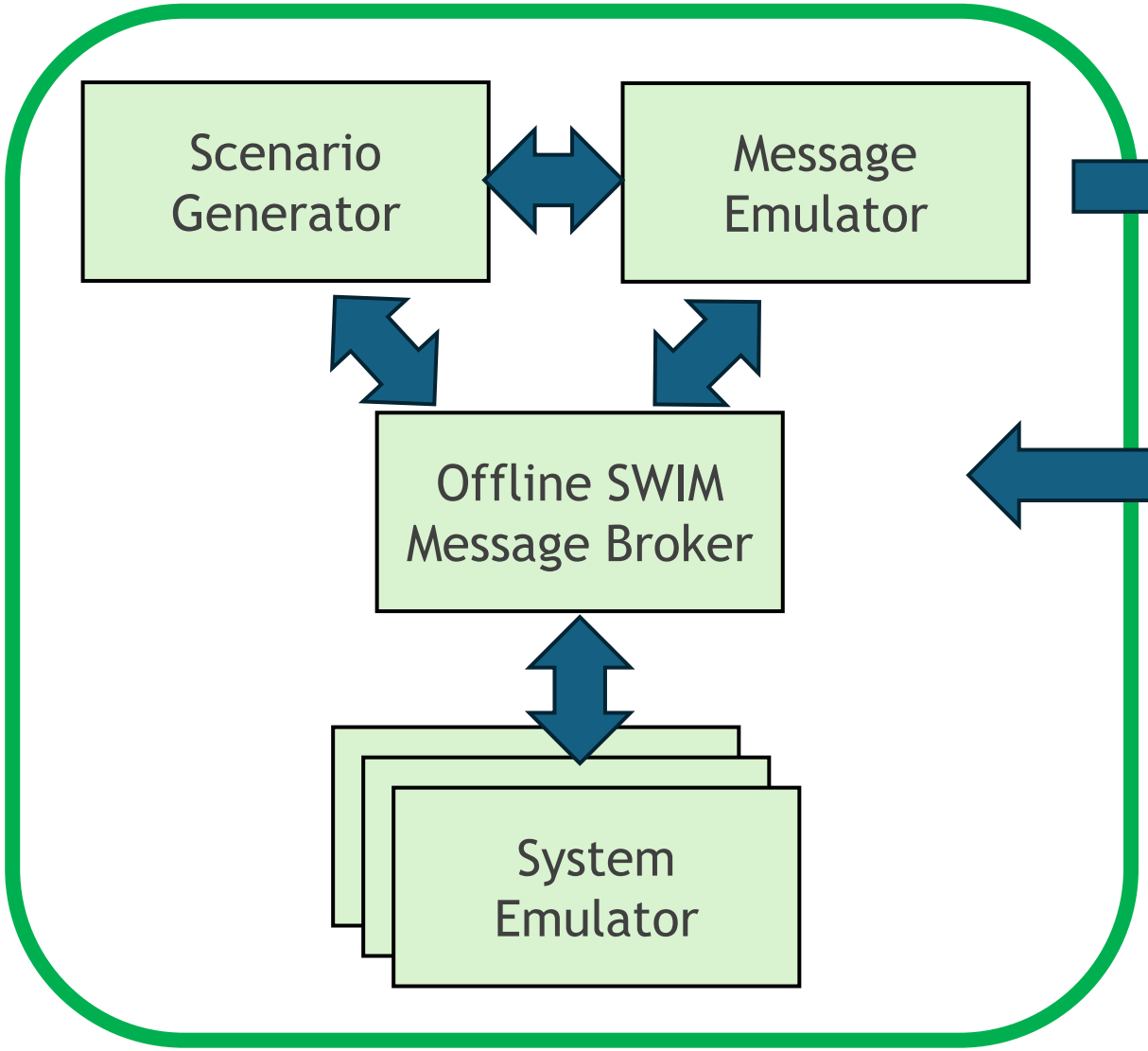
Sophisticated validation approaches

Existing system-level pair-wise testing setup and methodology may be insufficient to detect interoperability issues early

Ensure interoperability with non-tactical systems

Require effort to set up a comprehensive testing suite to iron out any issues before deployment for operations

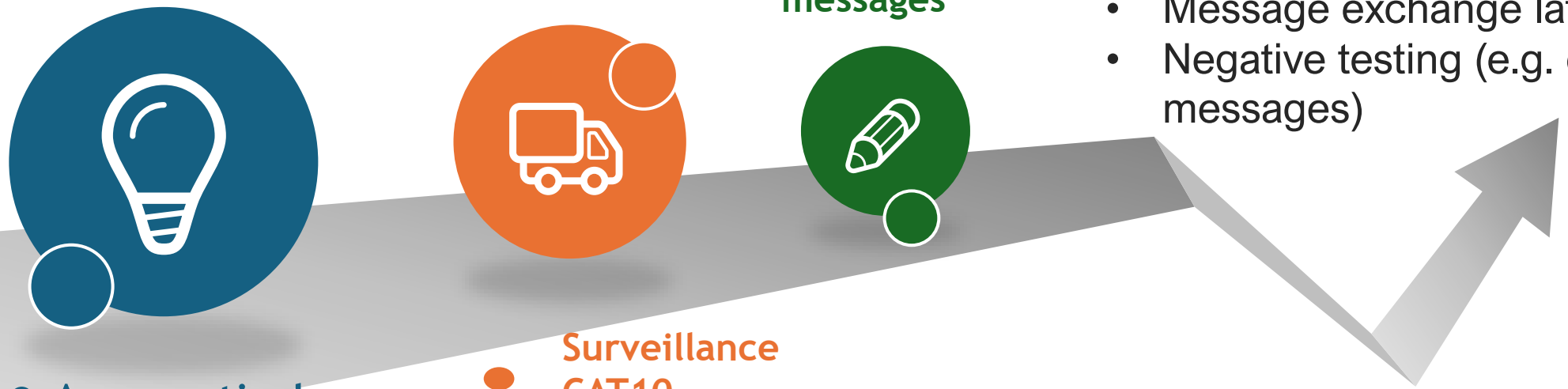
Setup of Dedicated End-to-End Systems Integration Testing Facility



- Generates scenario and messages
- Orchestrate message flows
- Validates messages from systems
- Analyses scenario test results

Systems Integration Testing - Open Interfaces and Common Data Exchange Standards

- Flight Plan
  FPL2012
  FIXM
- ATFM, A-CDM and other messages
- Aeronautical and Weather
  AIXM
  IWXXM
- Surveillance
  CAT10
  CAT21
  CAT34/38
  CAT62/65



- System interfaces
- Message conformance (syntax/semantics)
- Workflow checks (ordering, timing, correlation)
- Message exchange latency
- Negative testing (e.g. corrupted messages)

Conclusion

- Implementation of End-to-End Systems Integration Testing Facility is in progress
- Invite meeting to share experiences and potential challenges in conducting end-to-end systems integration testing
- Invite meeting to explore collaboration opportunities in integration testing

Thank you