Simulators Innovation Cell Overview

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Innovation Cell Process

Awareness Phase

External
Identify potentially relevant technology development activities

Internal
Identify MAJCOM requirements or needs

Explore Phase

- Refine Requirements
- Assess Options
- Build Plan
- Implement Plan
- Review & Revise

Transition / Post-Implementation Phase

- Facilitates integration
- Document lessons learned
- Monitor implementation
- Develops strategies for further application
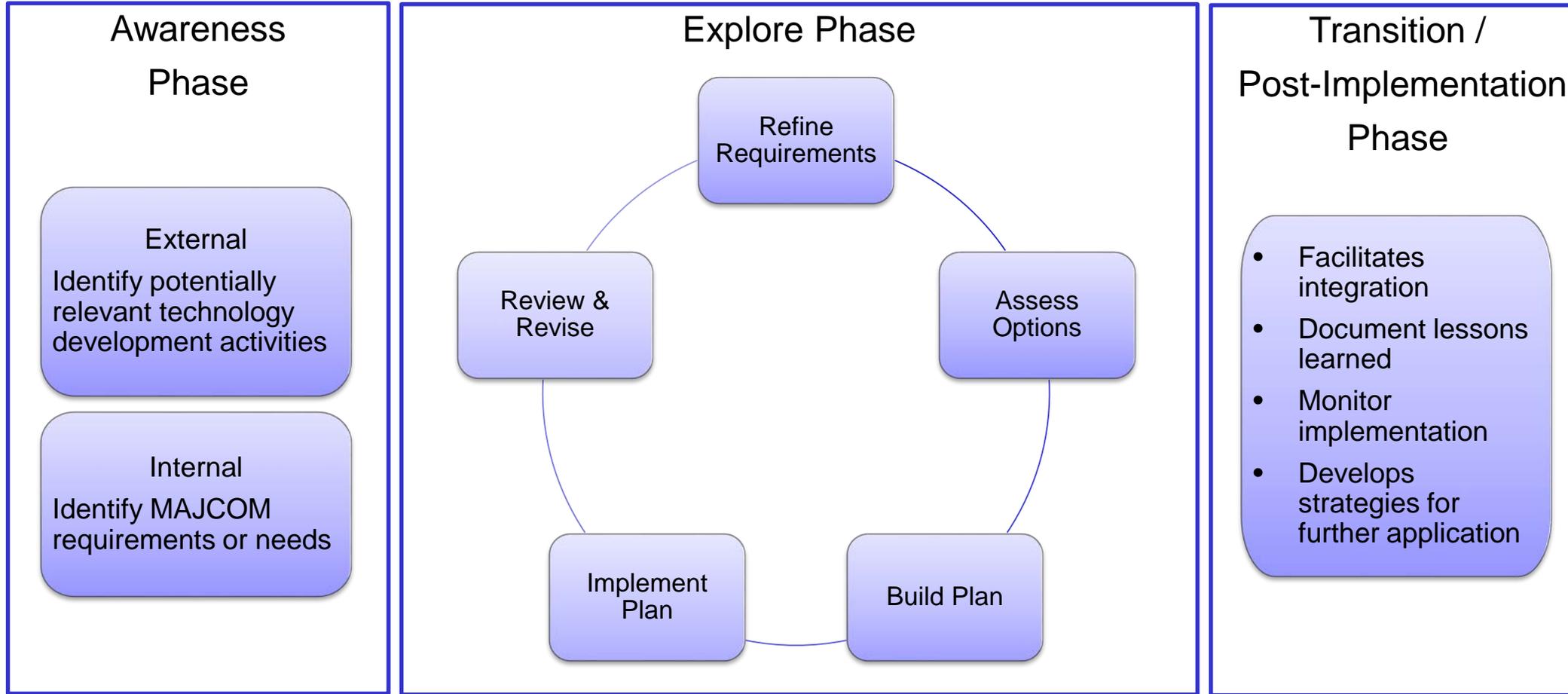
MAJCOMs, Operational Squadrons

Focus Areas: Gaming, Virtual/Augmented Reality, Artificial Intelligence, Display Systems, Cloud Computing

Innovation Cell Initiatives

- **Leverage Small Business Innovation Research (SBIR)**
  - **Phase 1 Feasibility Studies**
  - **Phase 2 Prototype Demonstrations**
  - **Phase 3 Implementations**
- **Steer other Sims Prototypes & Experiments**
- **Guide AFRL projects integration into Sims**
- **Coordinate with other Innovation Cells across Air Force on Projects**
- **Explore state of the art with Technology Demonstrations**

Phase I (AFWERX Award)	Phase II (Sims PD/IC Award)	Phase IIe (Sims IC/IPT Award)	Phase III (Sims IPT or other program office Award
90 Day Feasibility Study	12-18 Month Prototype	12-18 Month Extended Prototype	Production Effort *(integrate into or become a Program of Record)*

Innovation Objectives 2020

- **Gaming industry hardware, software, and learning tools**
  - Focus Areas for 20.2 SBIR Open Topic call are being adjusted to address gaming, and other inputs from MAJCOMS

- **DevSecOps and software factory techniques like PlatformOne**
  - In Focus Areas, in Lightweight Sim Prototype, and with future Holodeck

- **Prototyping, engagement with industry and rapid contracting with AF Ventures**
  - Leveraging the SBIR process to address Training/Simulation needs

- **An Open Systems Architecture approach for building and maintaining a training/simulator system**
  - Early exploration prototyping for SCARS

Build Lightweight Simulator Ecosystem

- Commodity Hardware – PTN-like 'sled', with simple IOS & debrief
- Modular Open Systems Architecture (MOSA) approach
- Emulated, containerized OFP – reduced dependency on OEM
- "Studio Quality" reusable 3D models of aircraft, optimized for VR
  - Build models once, reuse for many applications
- Parameterized data inputs, so development can be unclassified environment
- Service based architecture
  - Simulation Services: terrain, weather, threat entities, other trainers
  - Learning Services: IOS, Debrief, performance data collection & analytics, course creation & management
  - Control/backend Services: security, authentication, data management, configuration management

Target a fighter as initial aircraft, using a agile, continuous delivery approach, leverage ecosystem to reuse hardware and services to rapidly add new aircraft

Gaming & VR Integration
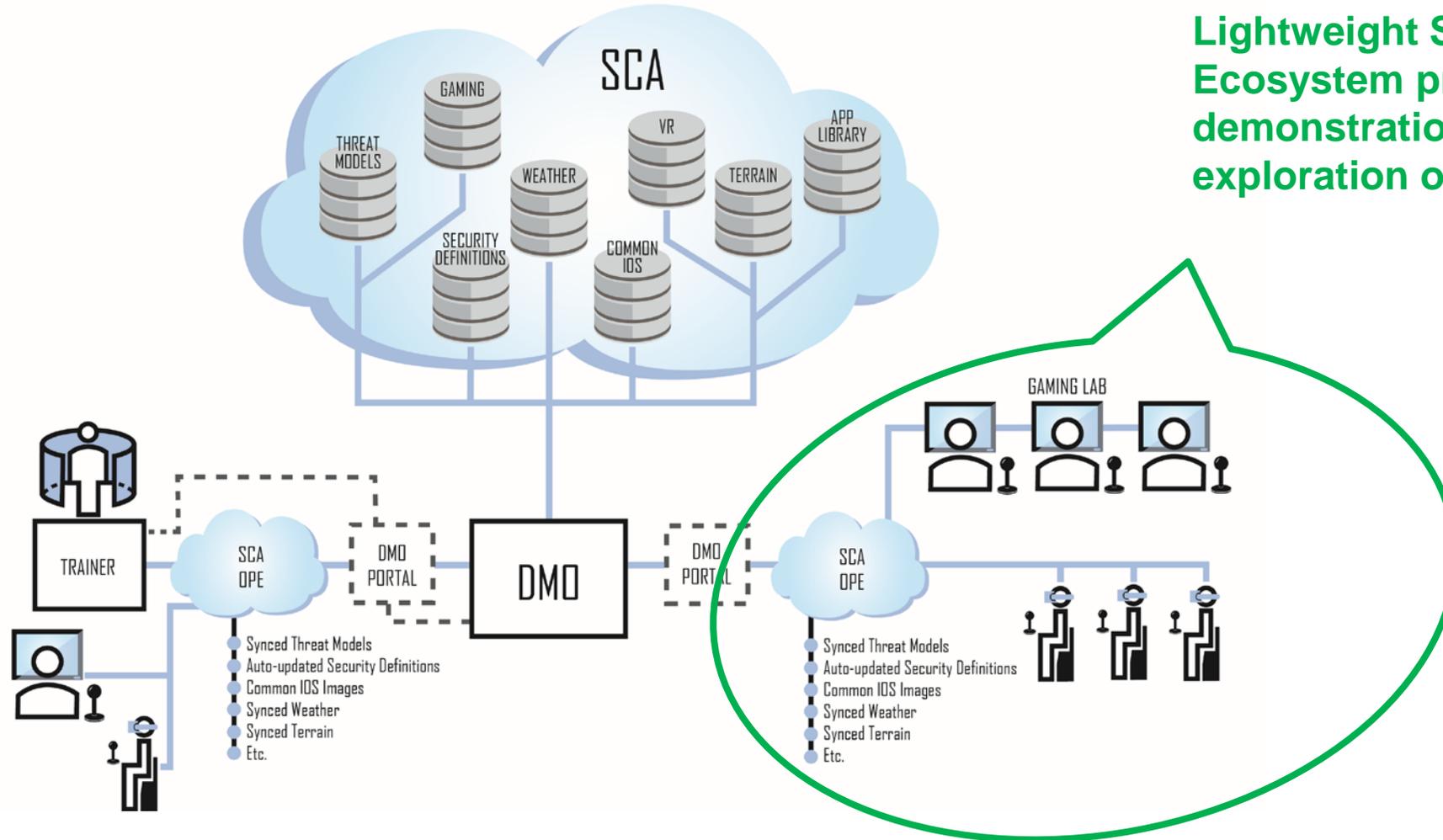
Lightweight Simulator Ecosystem prototype for demonstration and exploration of Gaming Lab

Integration Challenge with Gaming

Simulation Industry

– **Massive Multiplayer** ✗
– **Multi Platform** ✗
– **Distributed** ✗
– **Low Latency** ✗
– **Physics Based** ✓
– **Integration of Legacy Platforms** ✓
– **High Fidelity** ✓
– **Scenario Flexible** ✓
– **Integration w/ Real Time Systems** ✓

Challenge

– **Massive Multiplayer** ✓
– **Multi Platform** ✓
– **Distributed** ✓
– **Low Latency** ✓
– **Physics Based** ✓
– **Integration of Legacy Platforms** ✓
– **High Fidelity** ✓
– **Scenario Flexible** ✓
– **Integration w/ Real Time Systems** ✓

Gaming Industry

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Sim Industry & Gaming Industry teaming – working toward a common environment