Simulators
Innovation Cell
Overview

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AFLCMC/WNS
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Innovation Cell Process

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**Awareness Phase**
- External
  - Identify potentially relevant technology development activities
- Internal
  - Identify MAJCOM requirements or needs

**Explore Phase**
- Refine Requirements
- Review & Revise
- Assess Options
- Implement Plan
- Build Plan

**Transition / Post-Implementation Phase**
- Facilitates integration
- Document lessons learned
- Monitor implementation
- Develops strategies for further application

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

**MAJCOMs, Operational Squadrons**
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

<table>
<thead>
<tr>
<th>Phase I (AFWERX Award)</th>
<th>Phase II (Sims PD/IC Award)</th>
<th>Phase IIe (Sims IC/IPT Award)</th>
<th>Phase III (Sims IPT or other program office Award)</th>
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<tbody>
<tr>
<td>90 Day Feasibility Study</td>
<td>12-18 Month Prototype</td>
<td>12-18 Month Extended Prototype</td>
<td>Production Effort  (<em>integrate into or become a Program of Record</em>)</td>
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Innovation Objectives 2020

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- 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

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GAMING INTEGRATION, VR INTEGRATION

Lightweight Simulator Ecosystem prototype for demonstration and exploration of Gaming Lab
Integration Challenge with Gaming

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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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- Integration w/ Real Time Systems ✗

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