



Common Synthetic Training Environment for US Army Simulation

MSG-175 COTS workshop

26 Sep 2019

Pete Swan

Business Development, VTMAK

pswan@mak.com +1-407-314-0064



What is STE?

Synthetic Training Environment

The U.S. Army's next-generation solution for Collective Training and Mission Rehearsal

Based on a unified architecture

- Consistent experience on all systems
- Ability to upgrade core and have benefit extend to all systems

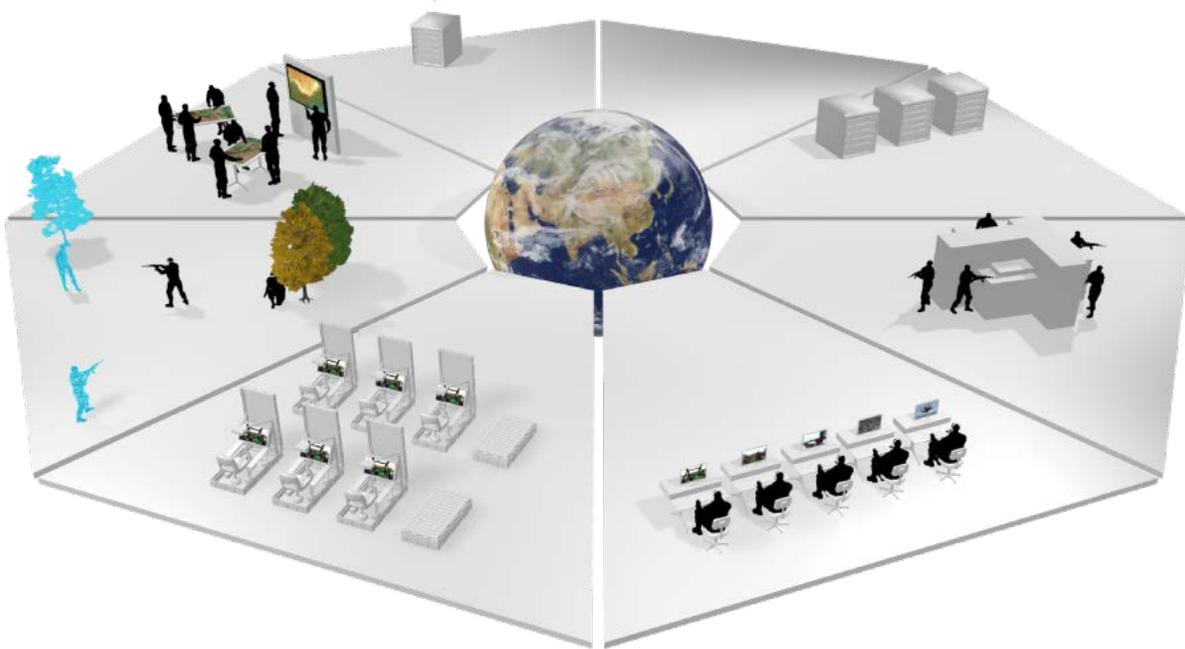
Scalable

- Point Of Need to large Distributed Exercise
- Multi Echelon – Squad to Brigade
- Local area to whole Earth
- Low fidelity game interfaces to high fidelity training devices

Technology Advances

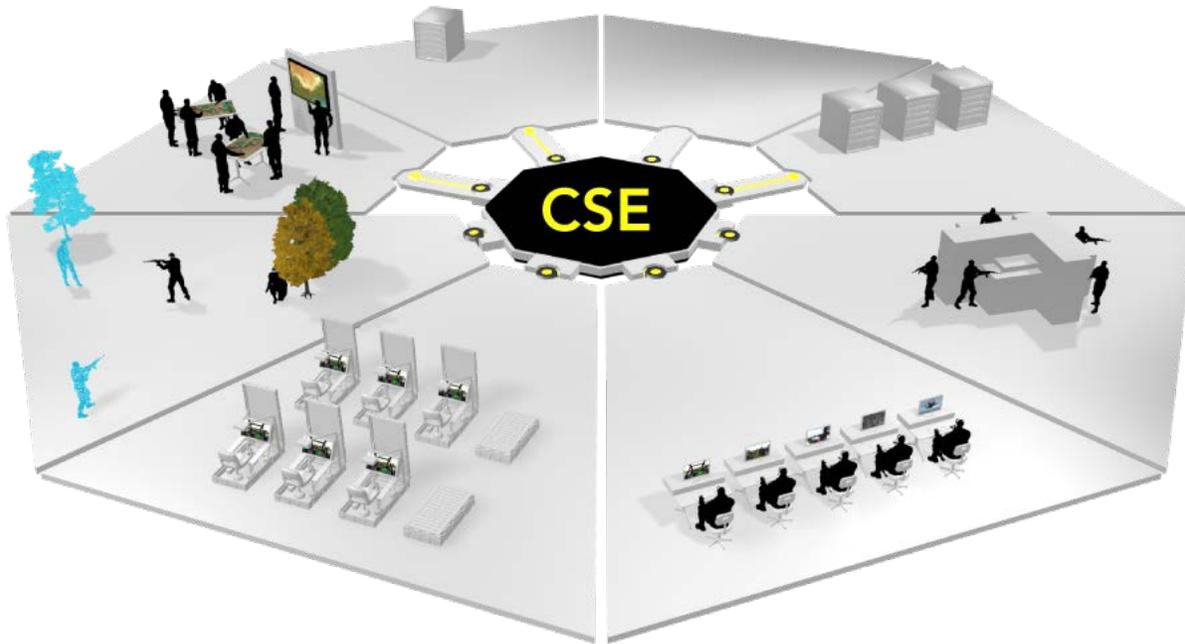
- Cloud Based – User Data, Sim Engines, Terrain, Interoperability
- Head Mounted Displays – AR/MR/VR
- Data Intelligence – Tools to minimize planning, preparation, execution, and assessment

A Single Unified System



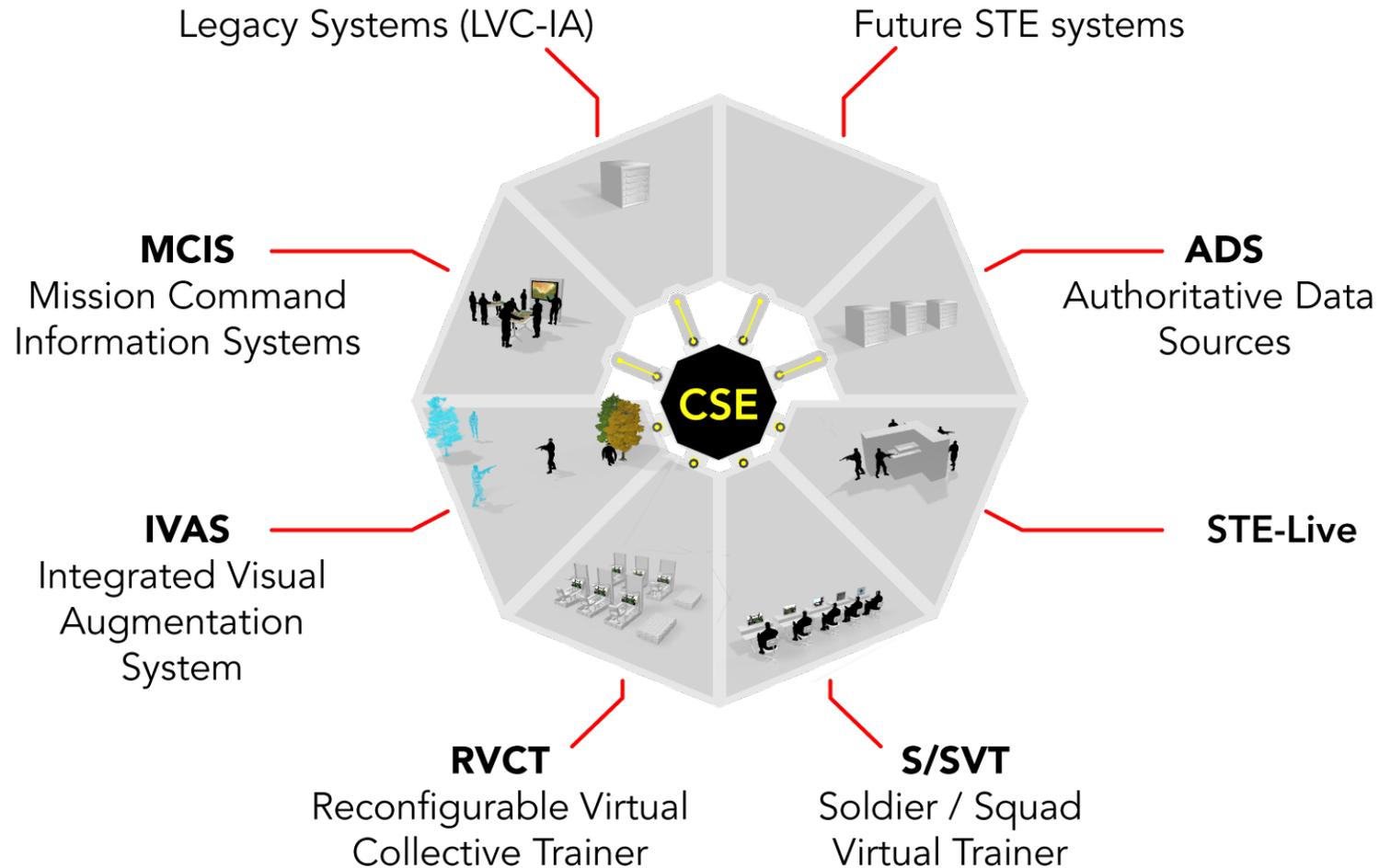
- Overcome challenges of federated approach
- Collective Training and Mission Rehearsal
- Dismounted, Ground and Aviation platforms
- Virtual, Constructive and Gaming
- Unified Action Partners (UAP)
 - Joint, multinational, Government
- Unified Land Operations in multiple domains
- (Land, Air, Sea, Cyber, and Space)

Common Synthetic Environment

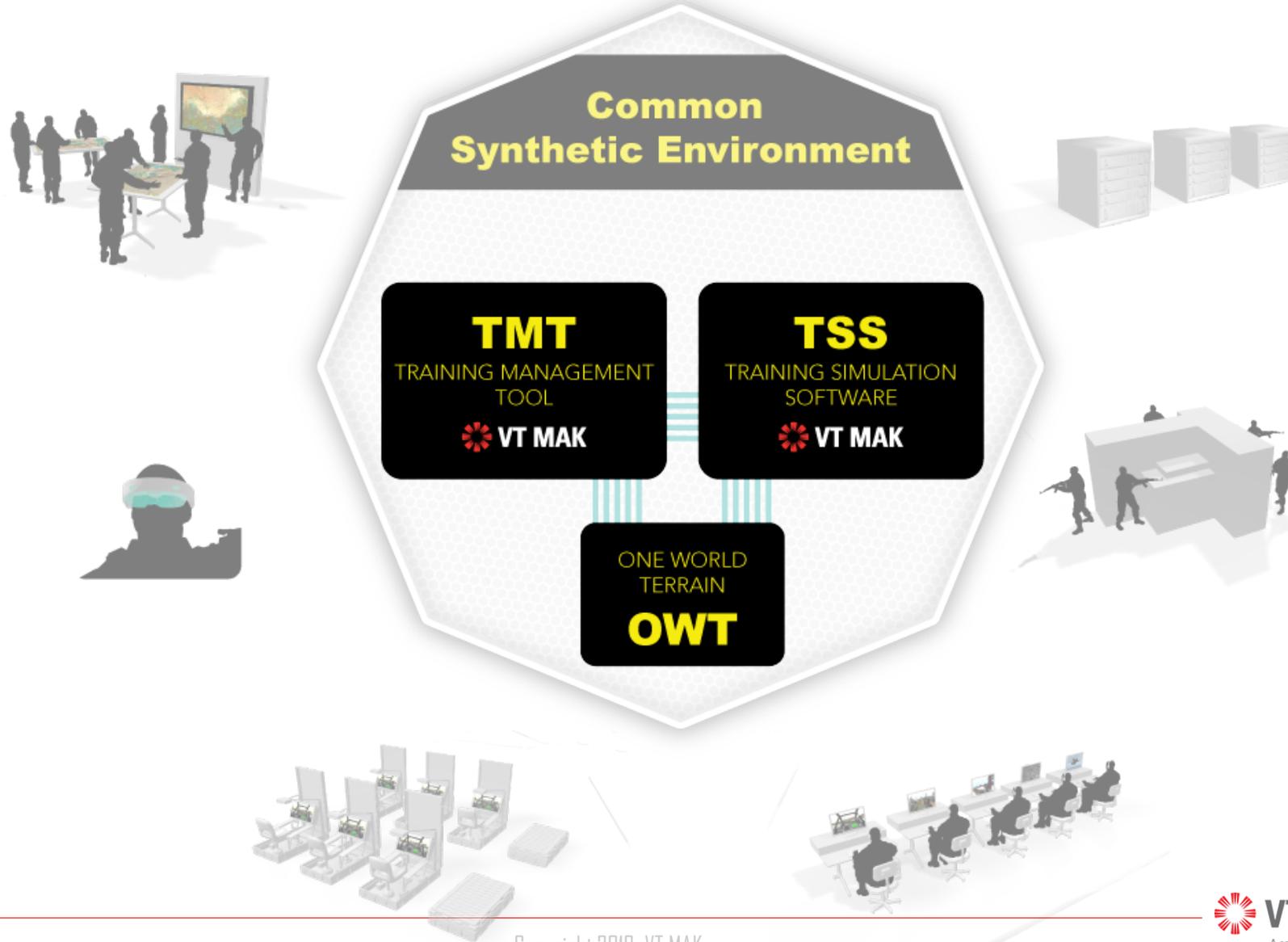


- Unified simulation environment
- One World Terrain
- Delivered to the Point of Need
- Scalable – Trainees, Entities, Terrain, devices
- Cloud Based – Army Enterprise Database
- Delivered over Army networks
- Intelligent Tutors – AI enabled Plan, Prepare
- Concurrency – Platforms & Technology
- Keeps pace with science & technology

Common Synthetic Environment



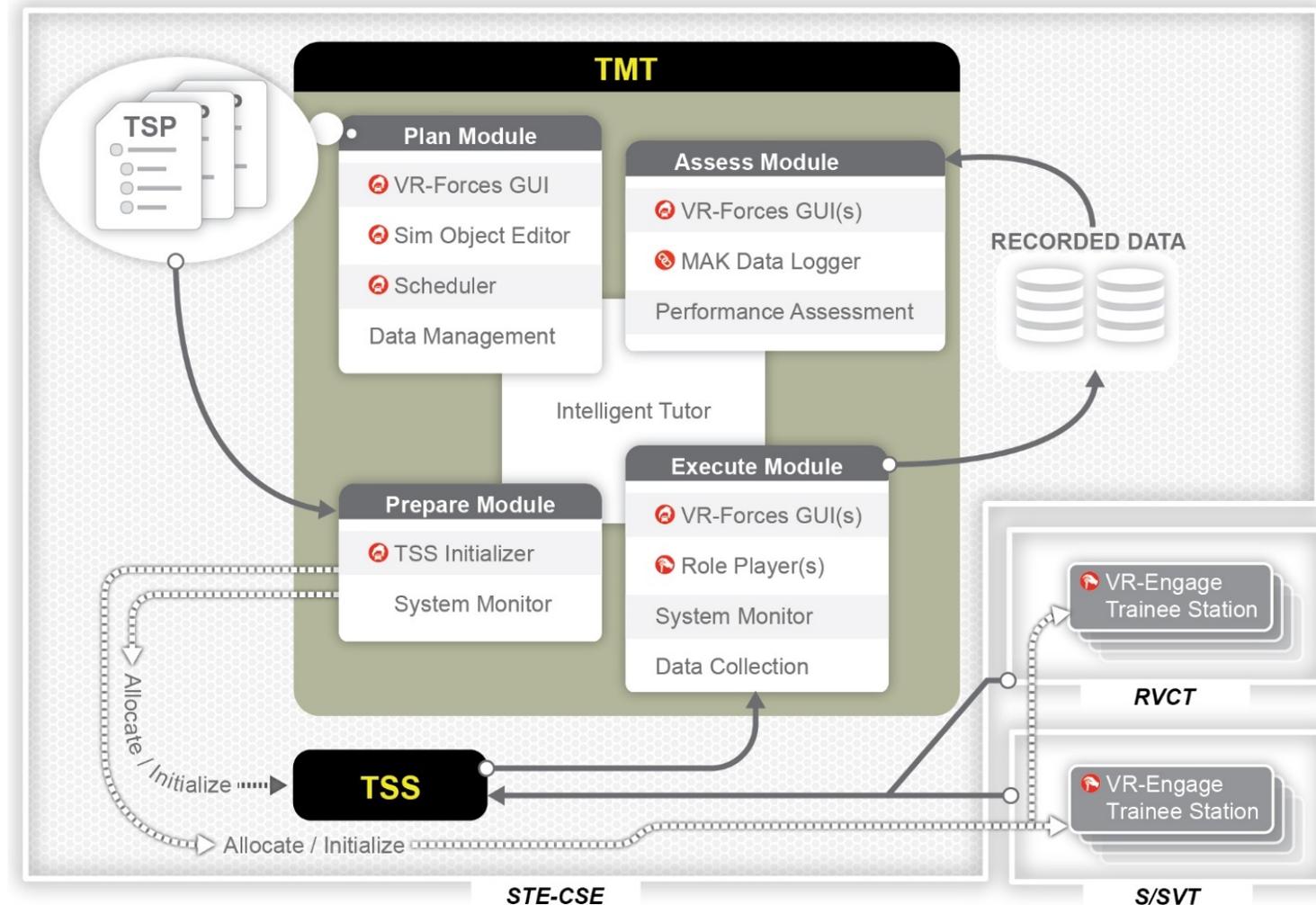
The CSE is comprised of three parts



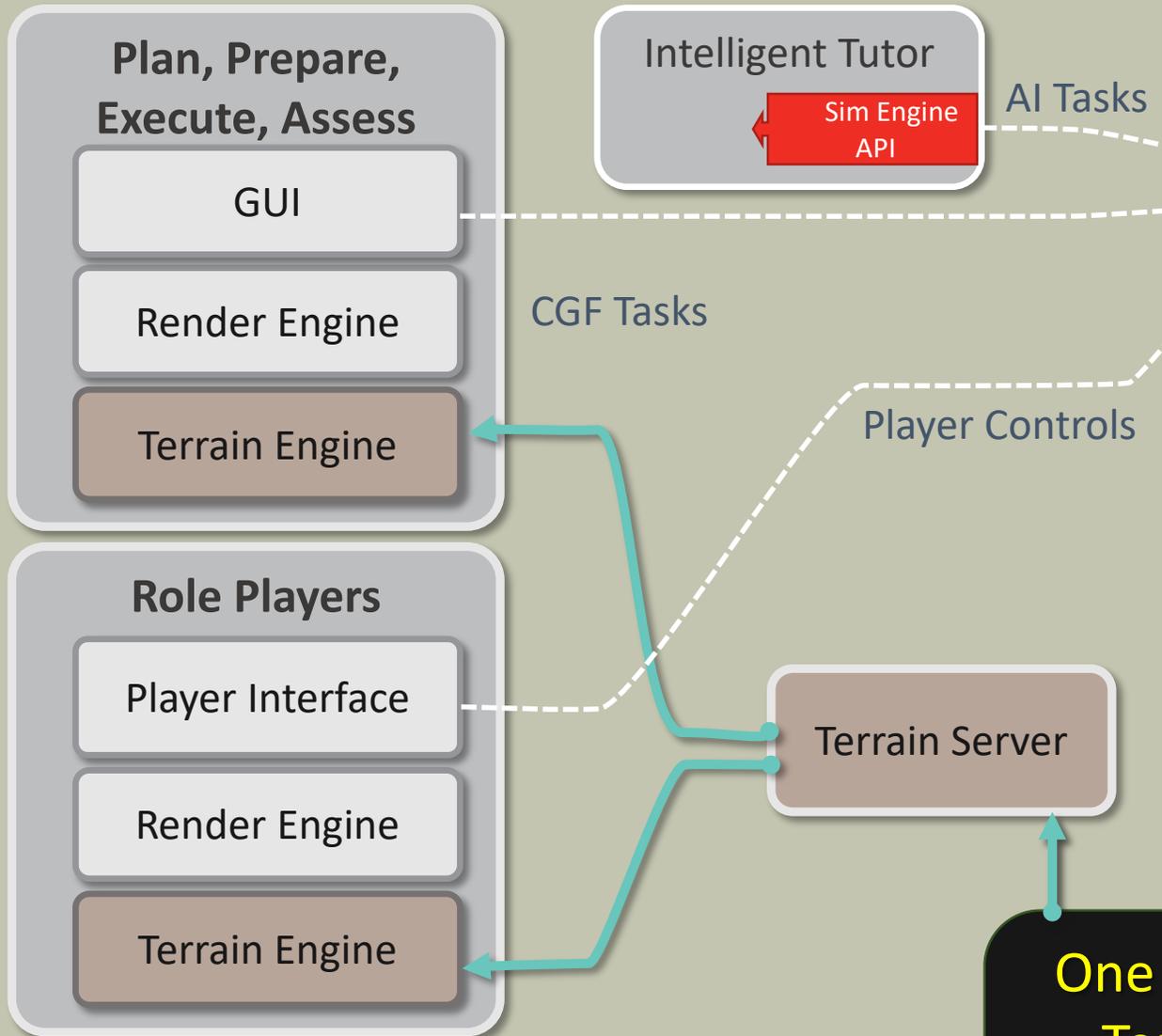
Single, Intuitive, Holistic TMT Tool

Information Sources:

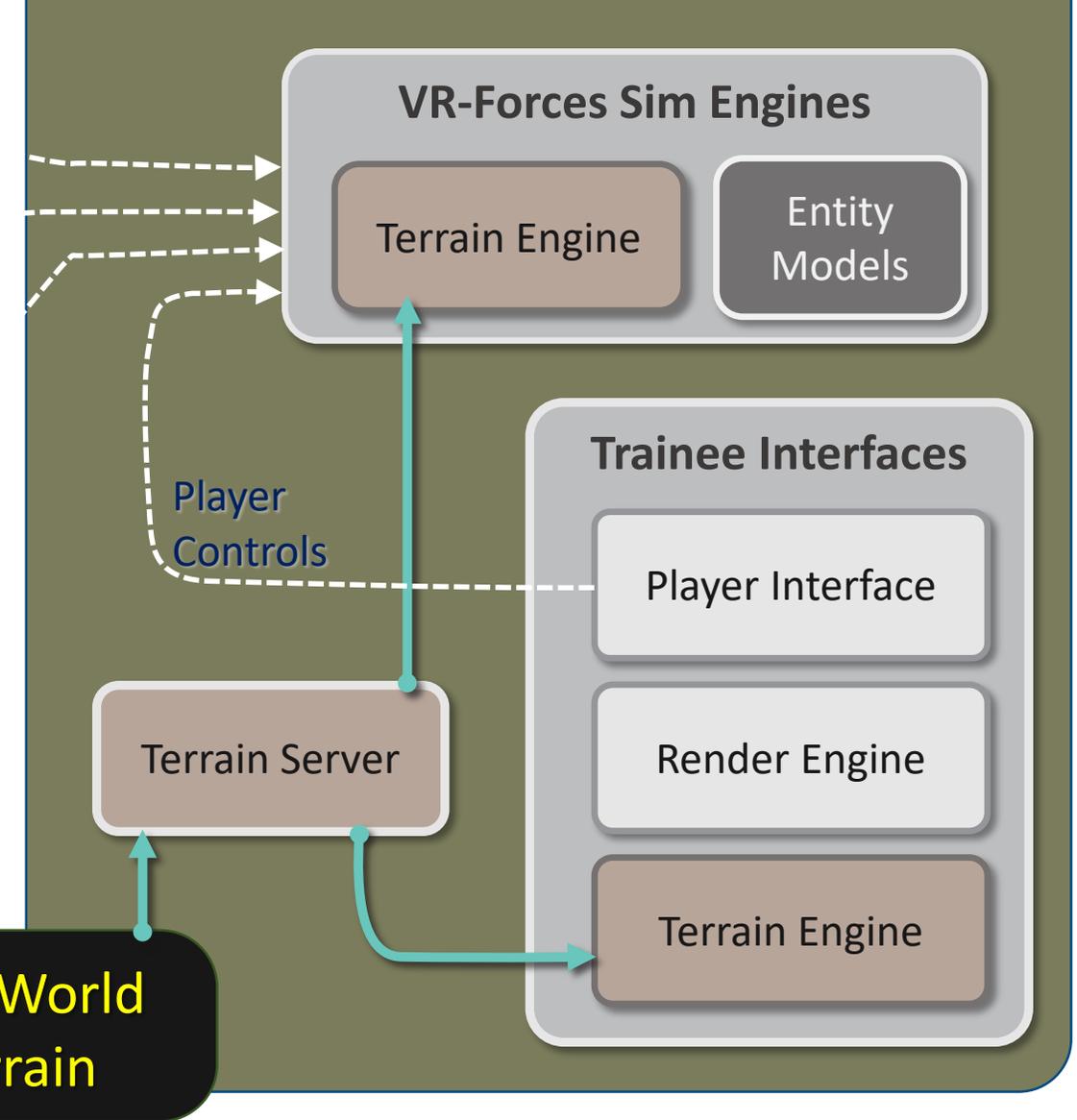
- Army Organization Server
- Army Training Information System
- AMSAA
-



Training Management Tool



Training Simulation Software



One World Terrain

What the US Army were looking for in a STE Solution

Common Simulation & Rendering Engine and tools for Live, Virtual, Constructive, and Gaming

Entity count unlimited
Visual channels multichannel, edge blended



at all layers of the

Streams One World Terrain data to all applications.

to use all sorts of display devices, terrain, and user interfaces.

MAK CAPABLE ONE
MAK SCALABLE ONE
MAK MODULAR ONE
MAK FLEXIBLE ONE
MAK EXTENSIBLE ONE
MAK AGILE ONE
MAK DEPLOYABLE ONE
MAK INTEROPERABLE ONE

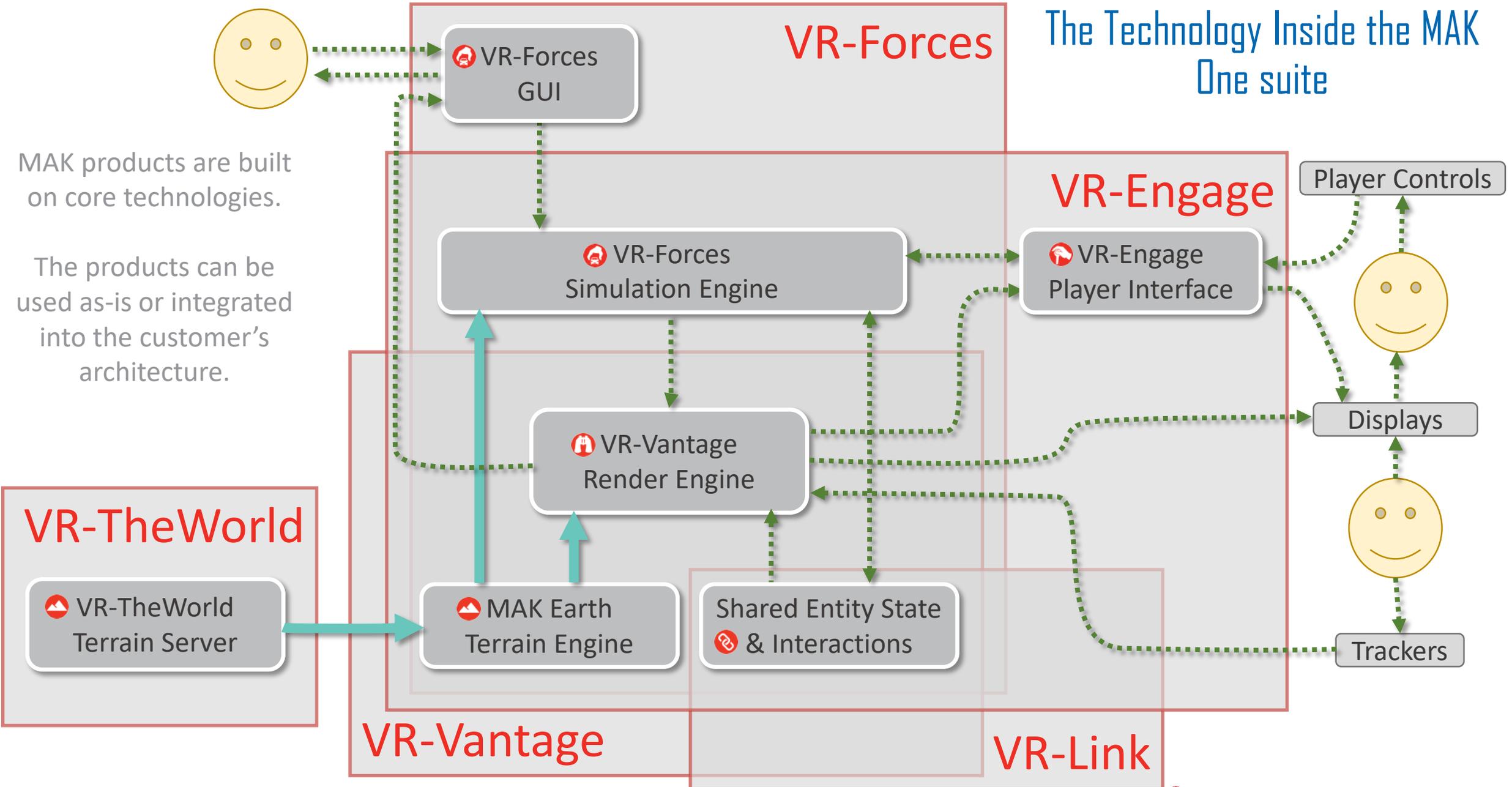


The MAK solution for the STE Common Synthetic Environment

The Technology Inside the MAK One suite

MAK products are built on core technologies.

The products can be used as-is or integrated into the customer's architecture.



VR-TheWorld

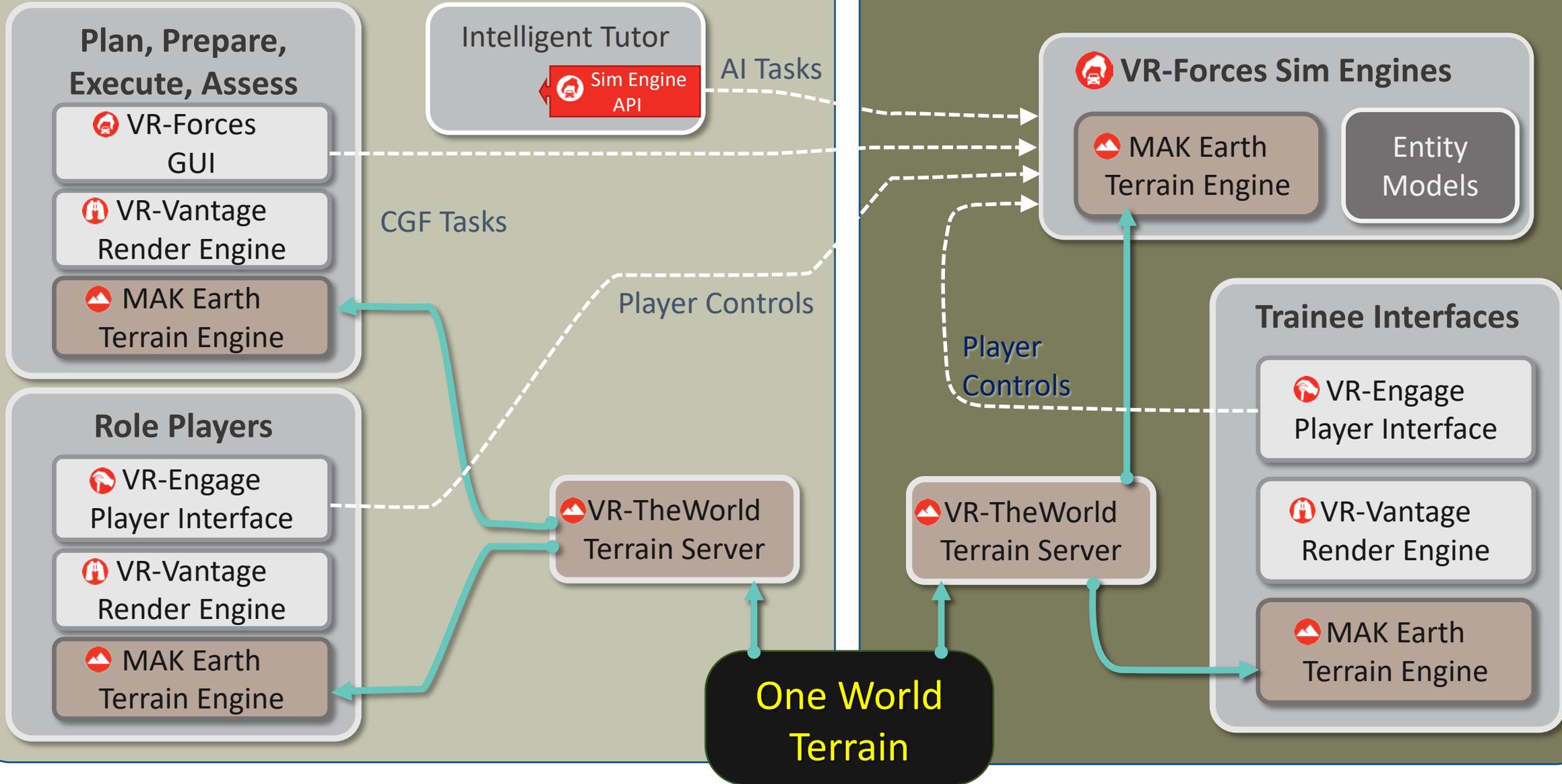
VR-TheWorld
Terrain Server

VR-Vantage

VR-Link

Training Management Tool

Training Simulation Software





VR-Forces

The Complete Simulation Engine

- Common Simulation Engine, Scenario Authoring, AI, and IOS
- Entity Level & Aggregate Level
- Multiple Simulation Engines
- MAK Earth Terrain Engine
- VR-Vantage Render Engine
- SDK & APIs





VR-Vantage

3D Simulation Visualization

Rendering Engine

- 2D Information & 3D realism
- Multi-channel displays
- Physically-Based Rendering (PBR)
- Forward+ lighting
- Full-scene shadows
- High-Dynamic Range (HDR)
- Camera/Sensor: CCTV, NVG, IR



VR-Engage

Multi-Role Virtual Simulators

Immersive & Semi-Immersive Virtual Trainers

- Multi-role, Multi-domain
- Desktop, VR Headset, RVCT
- VR-Forces Sim Engine
- VR-Vantage Render Engine
- MAK Earth Terrain Engine
- SDKs & APIs



VR-TheWorld & MAK Earth

Streaming Terrain Server

- World Coverage
- Multi layer, Multi resolution
- Open Geospatial Consortium

MAK Earth

- Procedural Terrain
- Geo-Specific w/ Micro Detail
- Feeds Render Engine & Sim Engine





MAK One Supporting Tools

VR-Link and VR-Exchange

- Interoperability with LVC-IA

DI-Guy

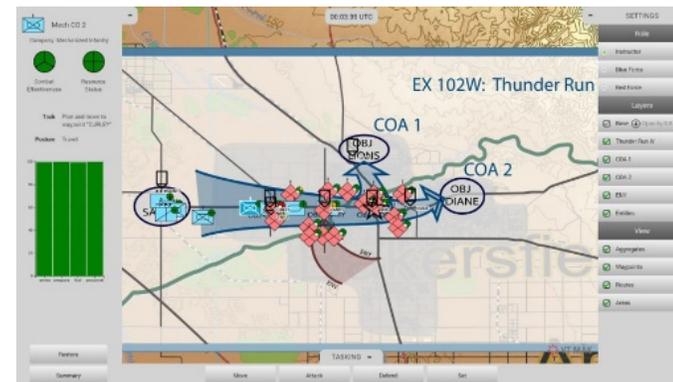
- Human character animation software

MAK Data Logger

- Recording and After-Action Review

MAK WebLVC Server

- Controlling the Synthetic Environment from Web Apps





Synthetic Training Environment

The US Army Architecture for the Next 30 Years