



*OneSAF Objective System
Users Conference:*

**Synthetic Natural Environment
Components**

04/13/2004



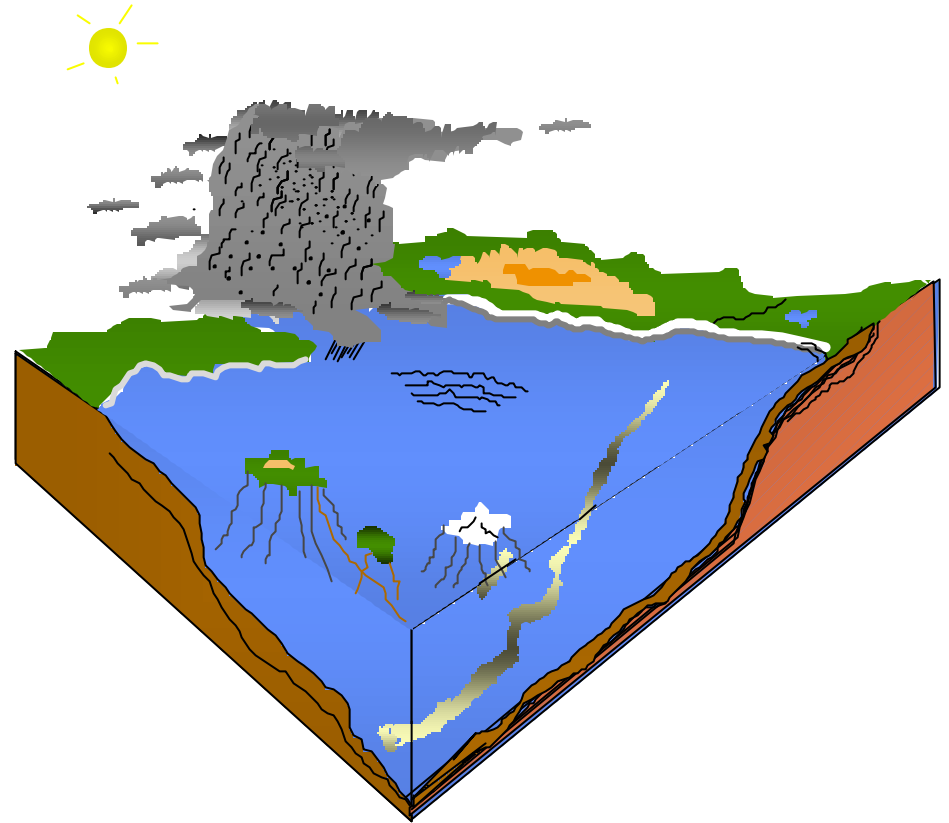
Overview

- **Scope**
- **Architecture**
- **Capabilities**
- **Standards**
- **Users**

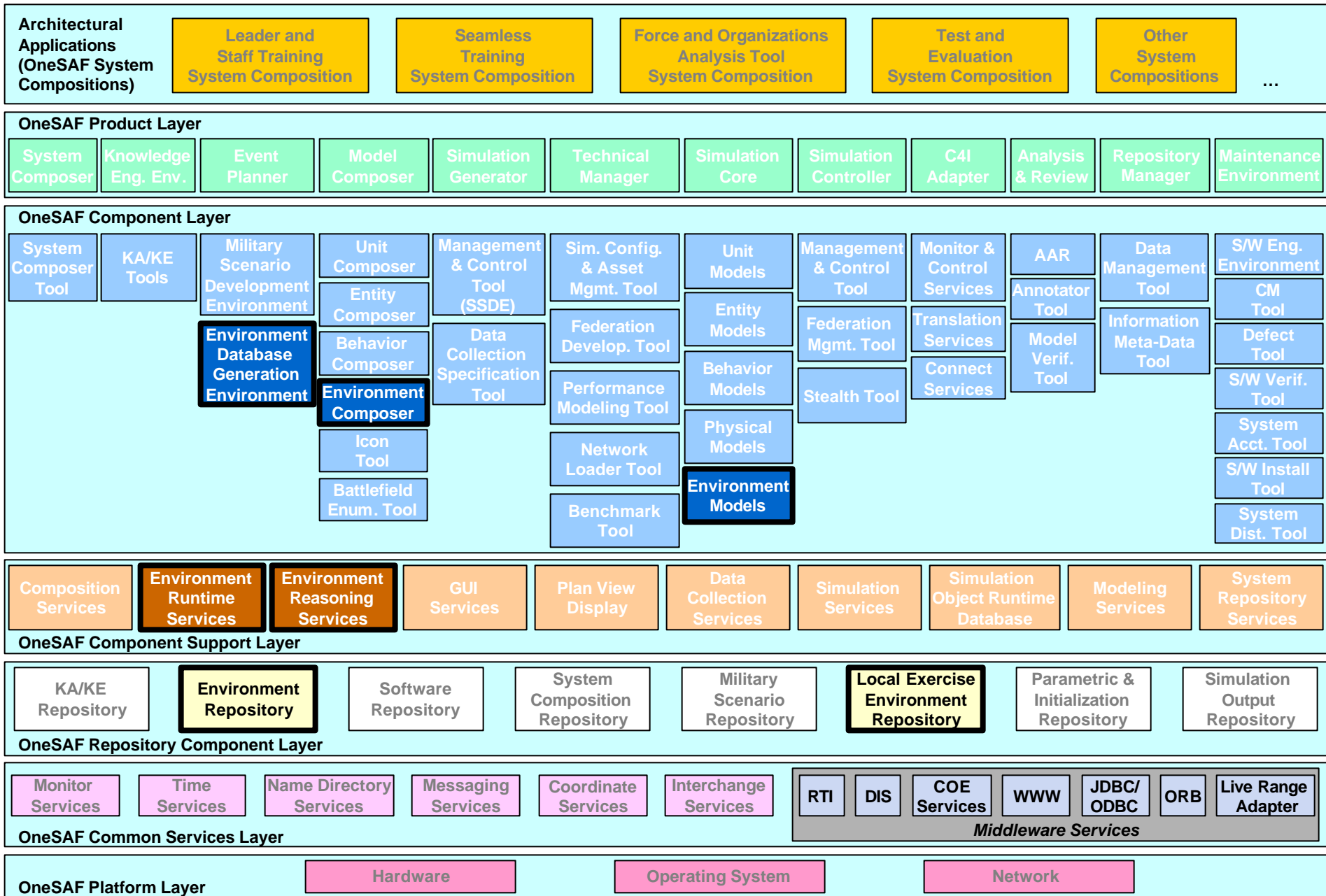


Scope

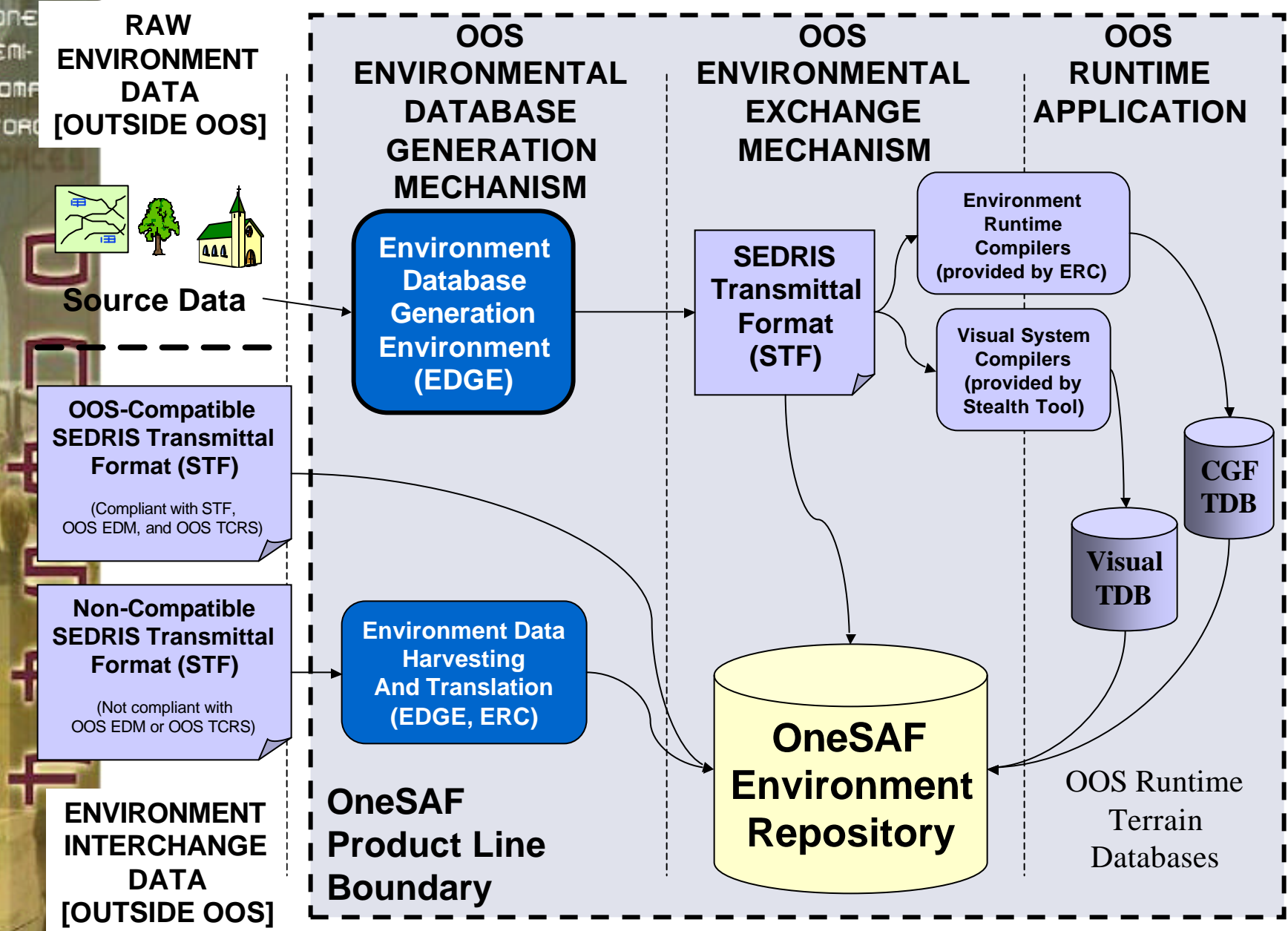
- **Terrain**
- **Cultural and Natural Features**
- **Atmosphere**
- **Ocean**
- **Weather**
- **Smoke,**
- **Obscurants**
- **Aerosols**
- **NBC Agents**
- **Urban Environments**
- **Buildings**
- **Building Interiors**



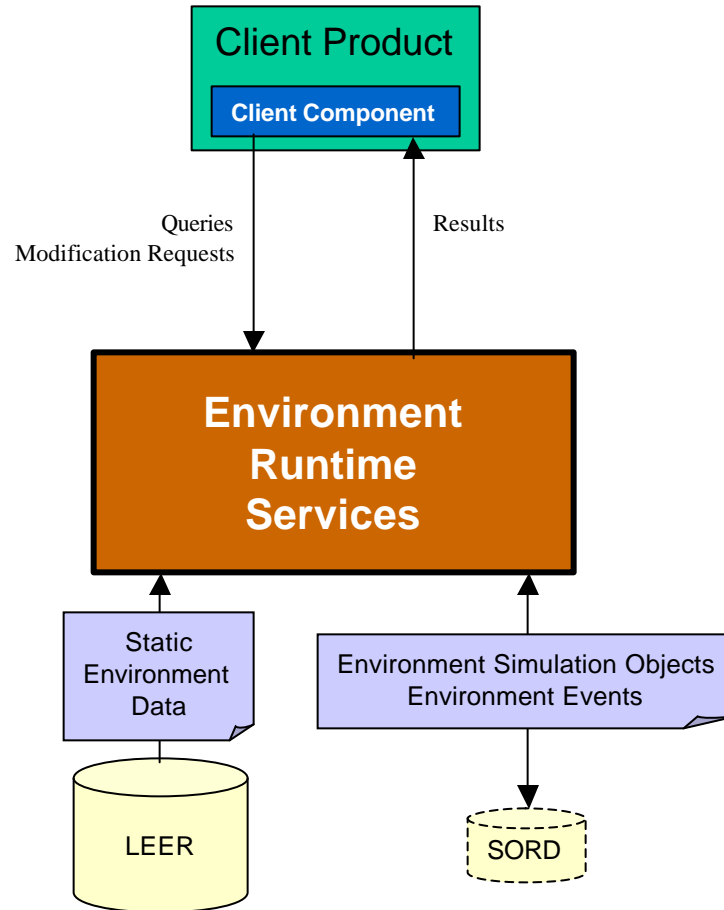
SNE Components of PLAF



EDGE Context

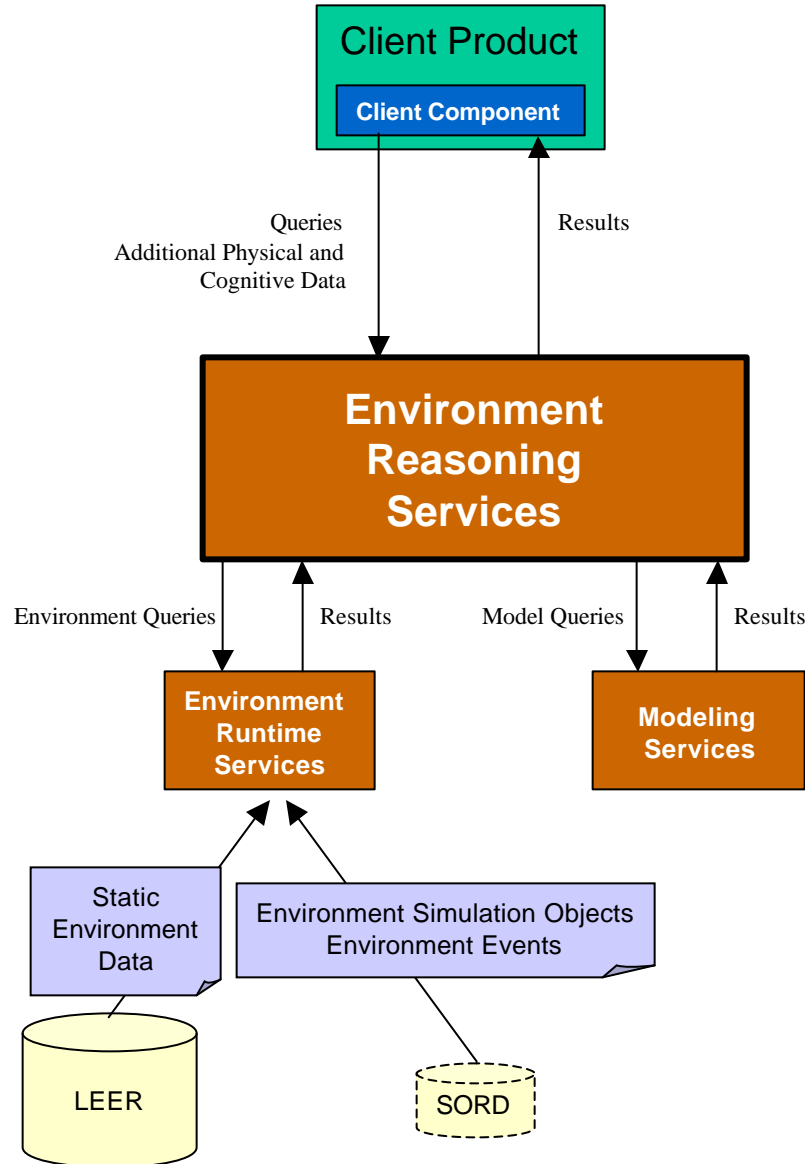


Environment Runtime Services Context





Environment Reasoning Services Context



Entry Capabilities – WARSIM SNE

Architecture & Infrastructure:

SEDRIS Compliance:

Build Process

Runtime Software

Coordinate Math & Conversion

Support

Terrain:

Round Earth Model

Ellipsoid & Geoid

Low-Res & Medium-Res

(1:1M , 1:250K)

Height Of Terrain

Slope

Trafficability Code

Soil Wetness

Triangles for Area

Cross Country Routing

Line of Sight

Full Transportation Network

Routing

Point, Line, and Areal Features

Feature Edits

Common Services

Terrain Viewing (PVD)

Editing Interface

METOC Viewing Interface

METOC Editing

Atmosphere & Space

A&S Values (Global METOC)

Solar Illumination data

Sunrise/Sunset data

Chemical/Biological Strikes

Smoke Modeling

Transmittance

Event Management

Detonation/Change Events

Ocean

Ocean Values (Global METOC)

Acoustics Datafile access (query)

Capability Enhancements Through Block B

Re-Engineering to OneSAF Architecture

- Java API
- Linux
- Windows
- Sun
- Java or C++ clients

High Resolution Terrain Database

- Tree and Building Features
- Model Templates
- Irregular Footprint Buildings
- Trees with correlated forest areals
- Integrated TINs
- High Resolution Terrain (1:50K) (JRTC)
- Very-High Resolution Terrain (1:12K) JRTC MOUT (Shugart)

High Resolution Terrain Services

- Ray-trace LOS through Terrain, Terrain Features, and Building Apertures
- Attenuated LOS
- Vehicle placement
- Nearest environment objects
- Area Intervisibility
- Presented Area for Targets
- Inherent Contrast for Targets
- Ground Vehicle Mobility
- PVD analysis views

Ultra High Resolution Buildings (UHRB)

- Interiors, Stairwells, and Furniture
- Services for Query and Analysis of UHRB Interiors
- Services for DI Reasoning and Movement Planning

Ultra-High Resolution Building Editor (compliant w/ UHRB EDM)

Dynamic Terrain

Illumination (lunar and solar continuous)

Performance Optimization

Services for Collision Detection with Environment Objects

Delivery of 'Common SNE' Baseline to WARSIM 2000

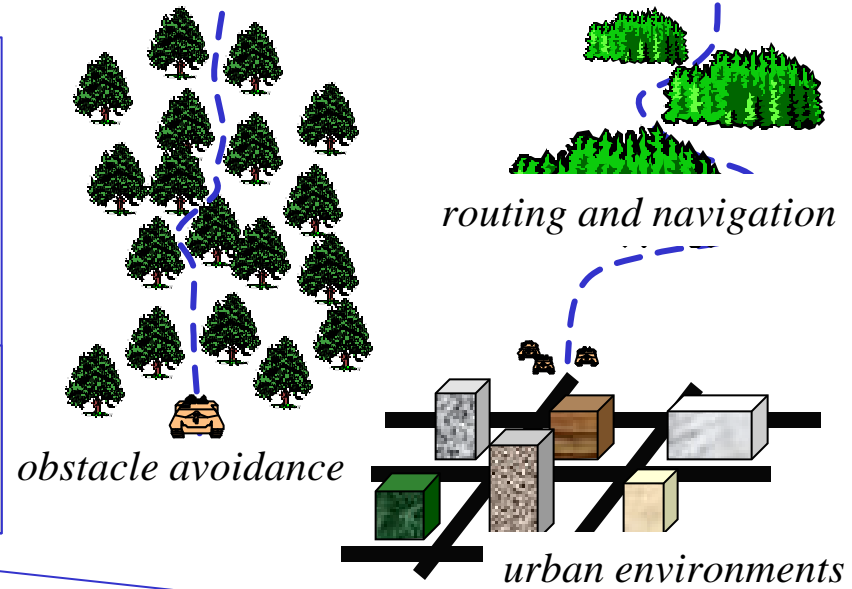
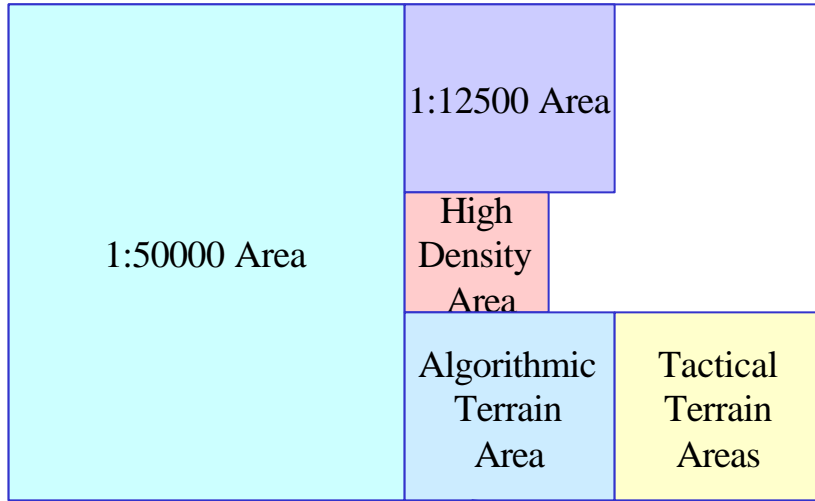
Dynamic Atmosphere Models

Process Enhancements:

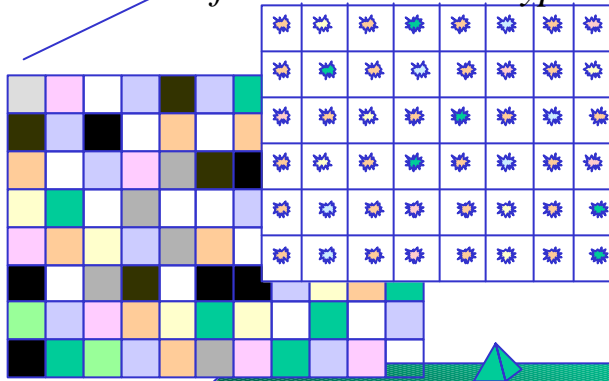
- Automated regression testing
- Prototype Repository
- Upgraded WARSIM databases
- Prototype Converted CCTT Ft. Hood Database
- Golden Environment Database

Golden Environment Database

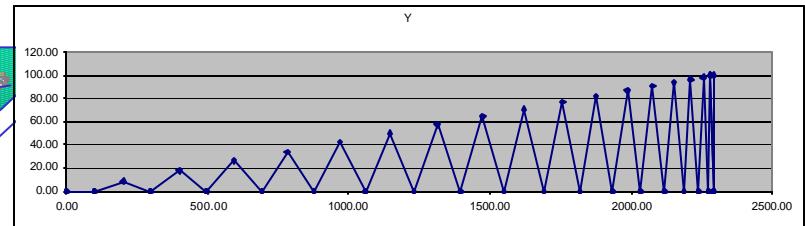
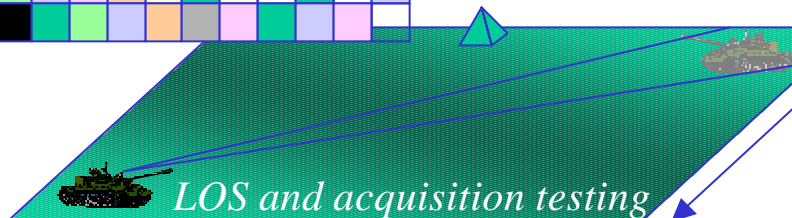
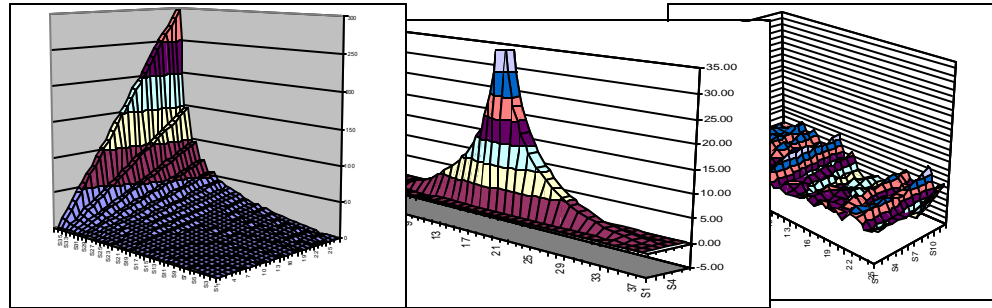
ONE
SEM-
AUTOMATED
FORCES



features and soil types

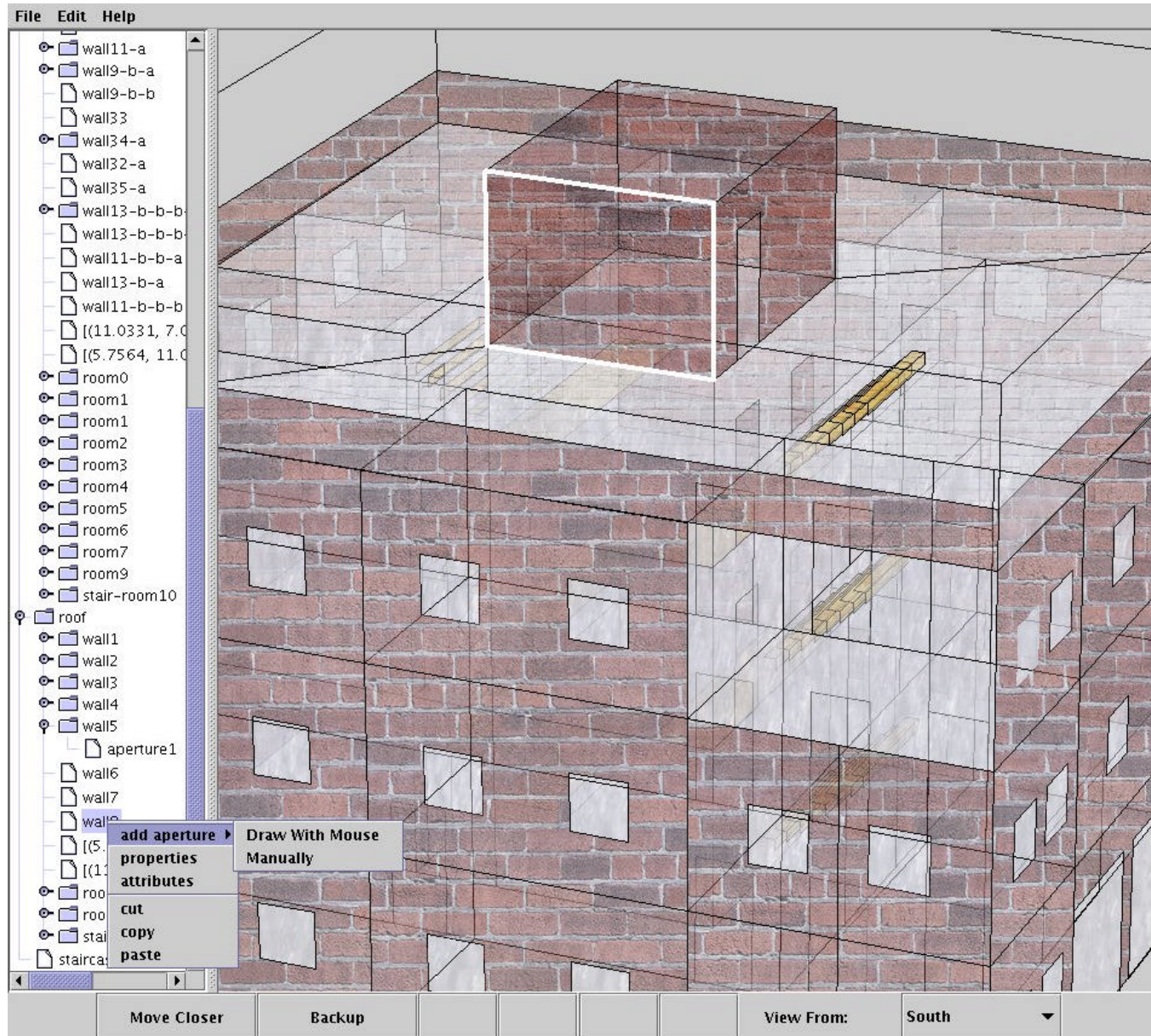


ramps and climbing performance

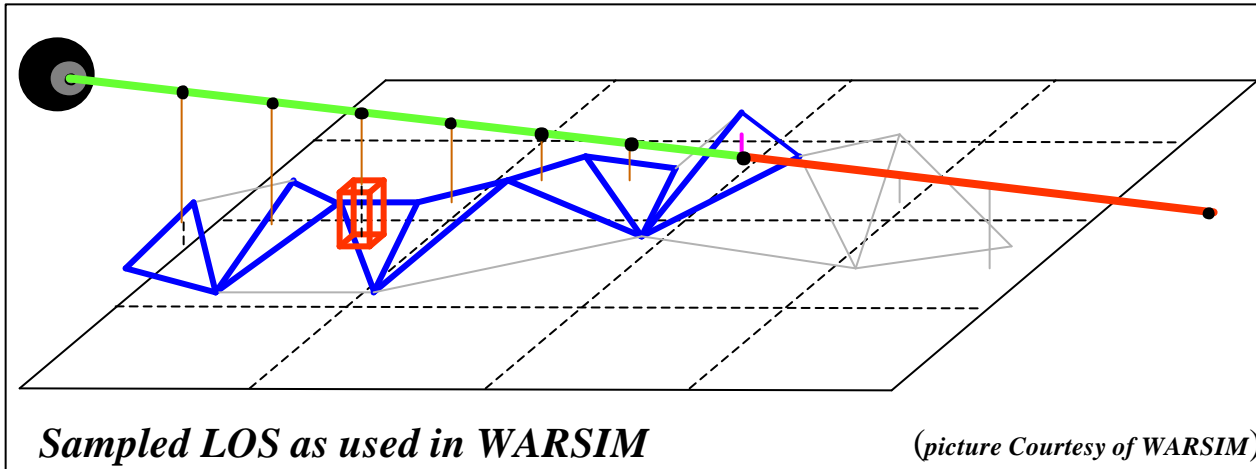


turning performance

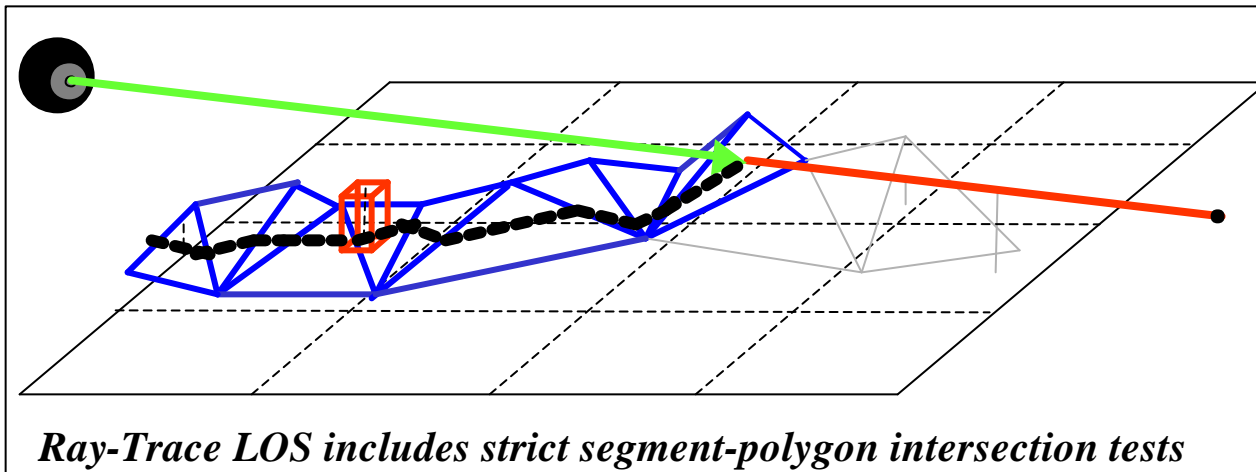
UHRB Editor (1/2)



Multi-Resolution Modeling Services



WARSIM reuse legacy gives us the sampled LOS model for use by OOS



OneSAF enhancements include exact ray-trace LOS model

Standards and Formats

(1) Objective Terrain Format (OTF)

Objective Terrain Format Specification (v0.4)

This standard documents the terrain database file format used by OOS.

(2) Ultra High Resolution Building XML Specification

XML Format for Ultra High Resolution Buildings in OneSAF, Build 15, 10 October, 2003

The XML Data Interchange Format used to interchange representations for individual UHRB buildings in OOS

(3) OTF Write API

OneSAF OTF Database API Users Guide, V0.1

Programmer's Manual for the OTF Database API which can be used to write out an OTF database file.

Current, Future, & Potential Users of OOS SNE

1. WARSIM 2000
2. Combat XXI-TRAC WSMR, (*integrating ERC into Combat XXI baseline*)
3. TRAC – Monterey (*integrating new technologies into ERC*)
4. OU Focus Area Collaborative Team
5. SBCCOM Aberdeen (*integrating NCBR II capabilities on ERC terrain*)
6. IEWTPT (Intell and Electronic Warfare Tactical Proficiency Trainer) (*integrating ERC into IEWTPT baseline*)
7. Cubic Corp. (*Support to DTRA. UHRB Editor, Build 14 version*)
8. TerraSim Corp. (*Support for MOUT FACT Project “Rapid Generation of Synthetic Urban Environments and Infrastructure for Modeling and Simulation Applications”. (UHRB Editor, Build 15 version)*)
9. USACE Engineer Research Development Center (ERDC). (*Support for Rapid Building Generator project in MOUT FACT*)
10. SEDRIS. POC: (*In support of SEDRIS utility to convert .xml to STF*)
11. Lockheed Martin. (*Support for MOUT FACT Project “Weapons Effects in Urban Terrain (Phase II)”. UHRB Editor, Build 14 version*)
12. University of North Carolina (*Support for RDECOM/DARPA project “Interactive OneSAF Computations Using COTS Graphics Hardware”*)
13. Future Combat Systems (*Support for FCS integration of SoSCOE environment with OneSAF. Build 12*)
14. USMC (*Collaborating as co-developer for OOS with the addition of USMC-specific models and behaviors.*)
15. NATICK Soldier Systems Center
16. JMASS (*reviewing ERC as terrain alternative*)
17. USAF Research Lab Munitions Effectiveness Vulnerability Assessment Smart Target Model Generator (MEVA STMG) (*UHRB Editor delivered to support model exchange*)
18. DTRA's Weapons Analysis and Lethality Toolset (WALTS) CRAM Tool (*UHRB Editor delivered to support building model exchange*)
19. MOVES Institutes X3D Modeling Tool
20. DTRA's Integrated Munitions Effectiveness Assessment (IMEA) Toolset (*UHRB Editor delivered to support building model exchange*)
21. JSIMS Software Support Facility (SSF). (*Investigating ERC as their Windows platform SNE solution*)
22. Urban and Underground Model Generator (U2MG). RDECOM-STTC BAA. Applied Research Associates. (*Investigating integrating project results with ERC terrain.*)
23. Interactive Distributed Engineering Evaluation System (IDEEAS). PEO STRI and Mounted Maneuver Battle Lab.
24. MITRE JSIMS Architecture Analysis Cell. (*Reviewed ERC as Linux alternative to JSIMS SNE*)