

Java Based Simulation Content in E-Learning

Development & Deployment Issues and Options

Presenter

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Presentation Outline

- E-Learning Overview
- E-Learning Content Assets
 - Issues
 - Options
- Available Technology
- Java – A Viable Option
- Conclusion

Presenter Background Information

- Christopher P. Giordano
 - DiSTI, Orlando, FL U.S.A.
 - Worldwide Director of Software Support
 - Product Manager and Instructor
 - Worked in Simulation Industry since 1997
 - Program Manager & Lead Software Engineer for Visual Development on 42 Unique Airframes
 - Courseware (CBT), Visual Simulations, HMI Development and Prototyping, Virtual Maintenance Training
 - Class Designer and Instructor
 - PHP, MySQL and Apache Architecture
 - GL Studio HMI Toolkit

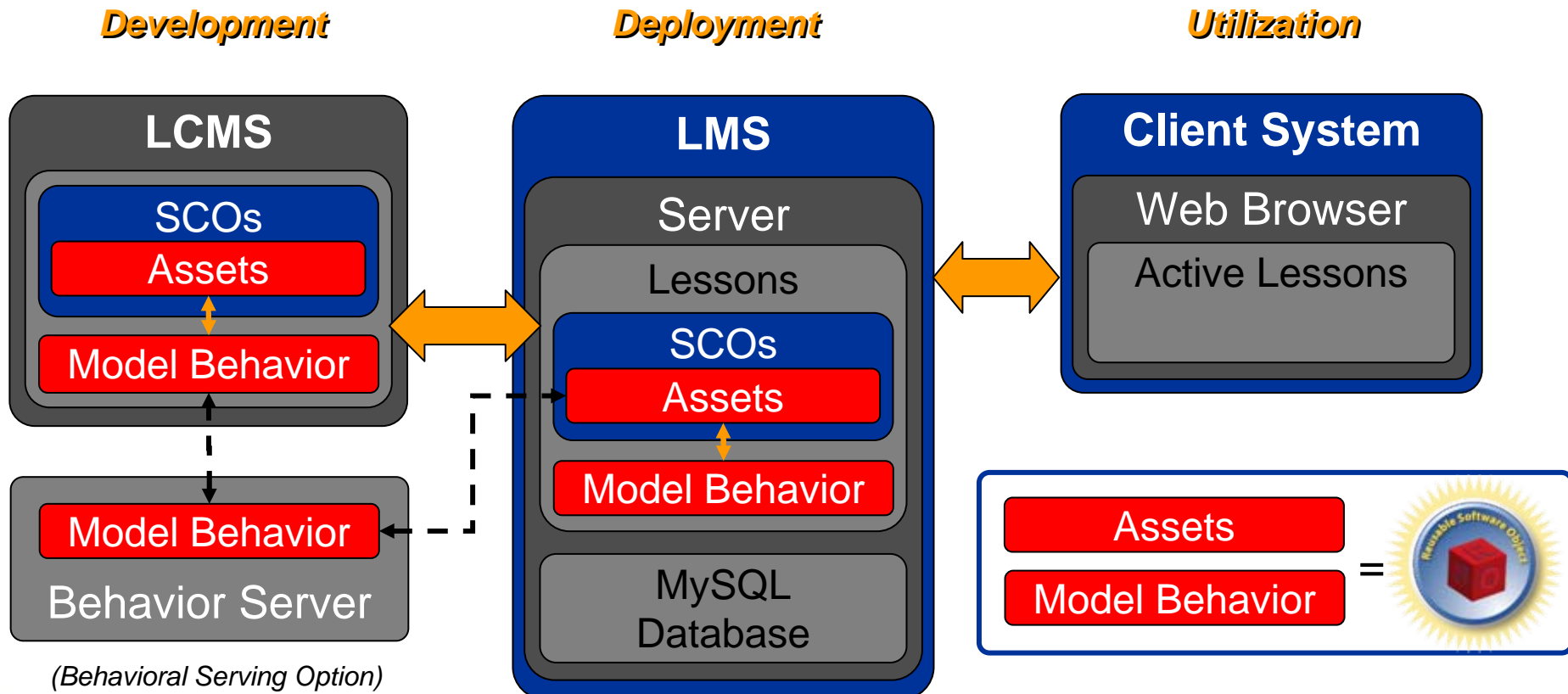
E-Learning Overview

- Computer Based Training for the Enhancement, Retention or Utilization of a Required Skill Set
 - Courseware
 - Maintenance Training
 - Operational / Procedural Training
- Types of E-Learning
 - Classroom
 - Web Based
 - Portable (Mobile)
- Automated or Instructor Assisted



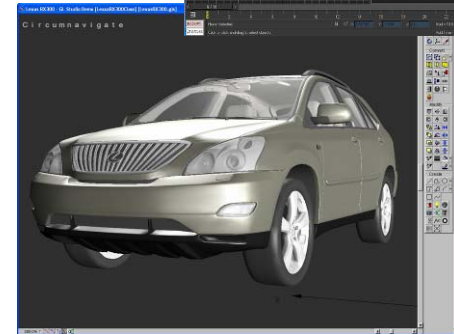
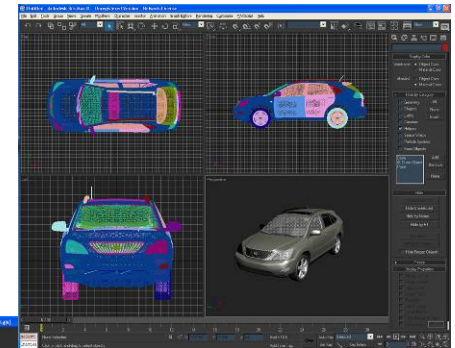
E-Learning Overview

- Anatomy of a Learning System Architecture



E-Learning Overview

- U.S. DoD's Drive for Higher Fidelity
 - Simulation Content vs. Animations
- Deeper Immersion into Lesson Assets
 - Fully Interactive 3D Content
 - Reuse Existing Source Data
- Natural Navigation
 - Free Play Environment
 - Realistic Movement



E-Learning Overview

- Reusable Software Objects (RSOs)
 - Easily Maintainable Human Machine Interfaces (HMI)
 - Vertical Reuse
 - Horizontal Reuse



E-Learning Content Assets

- Development Issues
 - Hardware Concerns
 - Object Size Constraints
 - Learning New Proprietary Coding Solutions
 - Proprietary Players in Secure Environments
 - “Sunset Technology” Active-X®

E-Learning Content Assets

- Deployment Issues
 - Bandwidth Constraints
 - Security Constraints
 - Code Signing & Trusted Servers
 - Proprietary Web Players
 - Rendering Performance
 - LMS Integration Inconsistencies

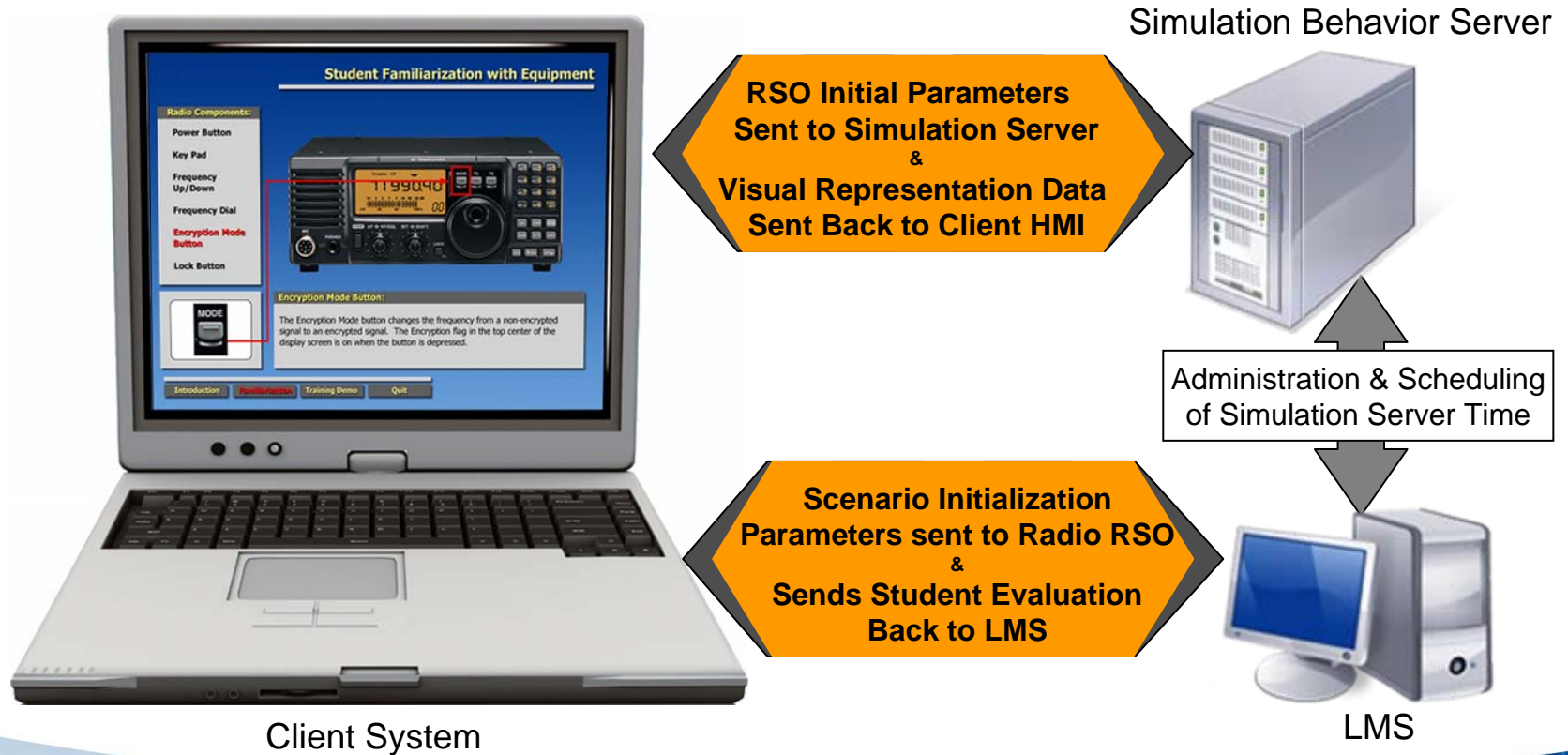
E-Learning Content Assets

- Development Options
 - Hardware Smaller Faster and Less Expensive
 - Smaller HMI RSOs with More Detail
 - Non Proprietary Development
 - Use Industry Standard Content Player
 - Use Cross Platform Graphics Layer



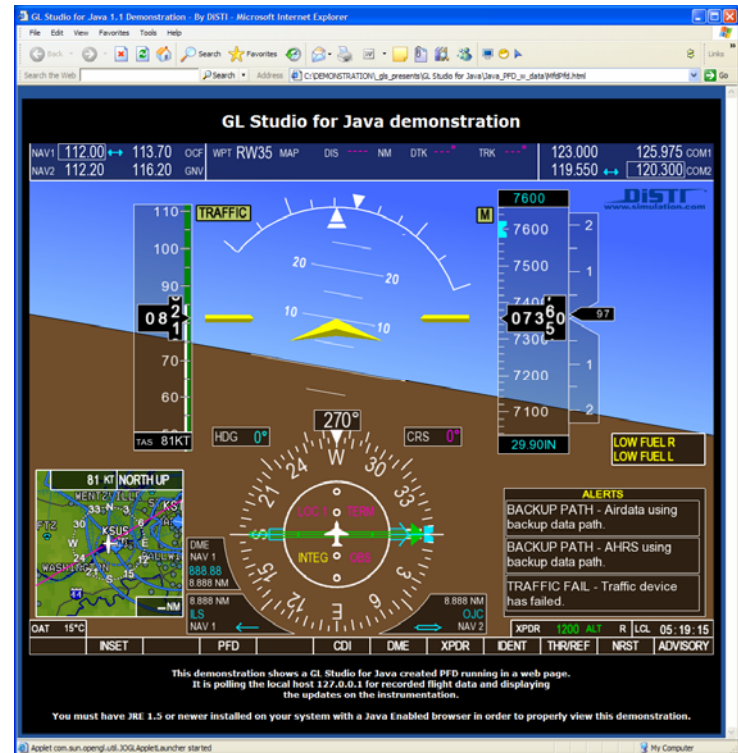
E-Learning Content Assets

- Deployment Options
 - Separate & Centralize Model Behavior from Asset



E-Learning Content Assets

- Deployment Options
 - Deploy Safe Interpreted Byte Code
 - Let GPU do the Processing with OpenGL
 - LMS Independent Integration



Ex: Java Based PFD Applet with Behavior Model Separate from RSO, Running at 60 Hz via web

Available Technology

- COTS Development Tools
 - Non-Proprietary Format
 - Cross Platform (OpenGL)
- Superior Hardware Available Today
 - Smaller, Faster, Less Expensive
- Today's Software Does More
 - Non-proprietary, Human Readable, Object Oriented Code Generator
 - Java OpenGL Bindings (JOGL)

Java – A Viable Option

- What is JOGL?
 - Java OpenGL Binding
 - OpenGL Rendering
 - OpenGL API (JSR-231)
 - Superb performance
- Historical Concerns of Java
 - Versions Control by Sun
 - Performance Limitations
 - Hardware Demands
 - Ease of Integration



Ex: Commercial Diesel Engine Trainer in Java

Conclusion

- Secure Deployment
- Simulation Content vs. Animations
- Easy Integration and Maintenance
- Great Performance through Java
- Reusable, Non-Proprietary Content Development
- Allows More Effective Blended Solutions
 - MT CBT Crossover E-Learning

