# NASA IV&V and REATSS Simics Overview

April 16, 2009

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# What is Simics®?

**Simics® - an adaptive simulation platform that enable customers to define, develop and deploy electronics systems more efficiently**






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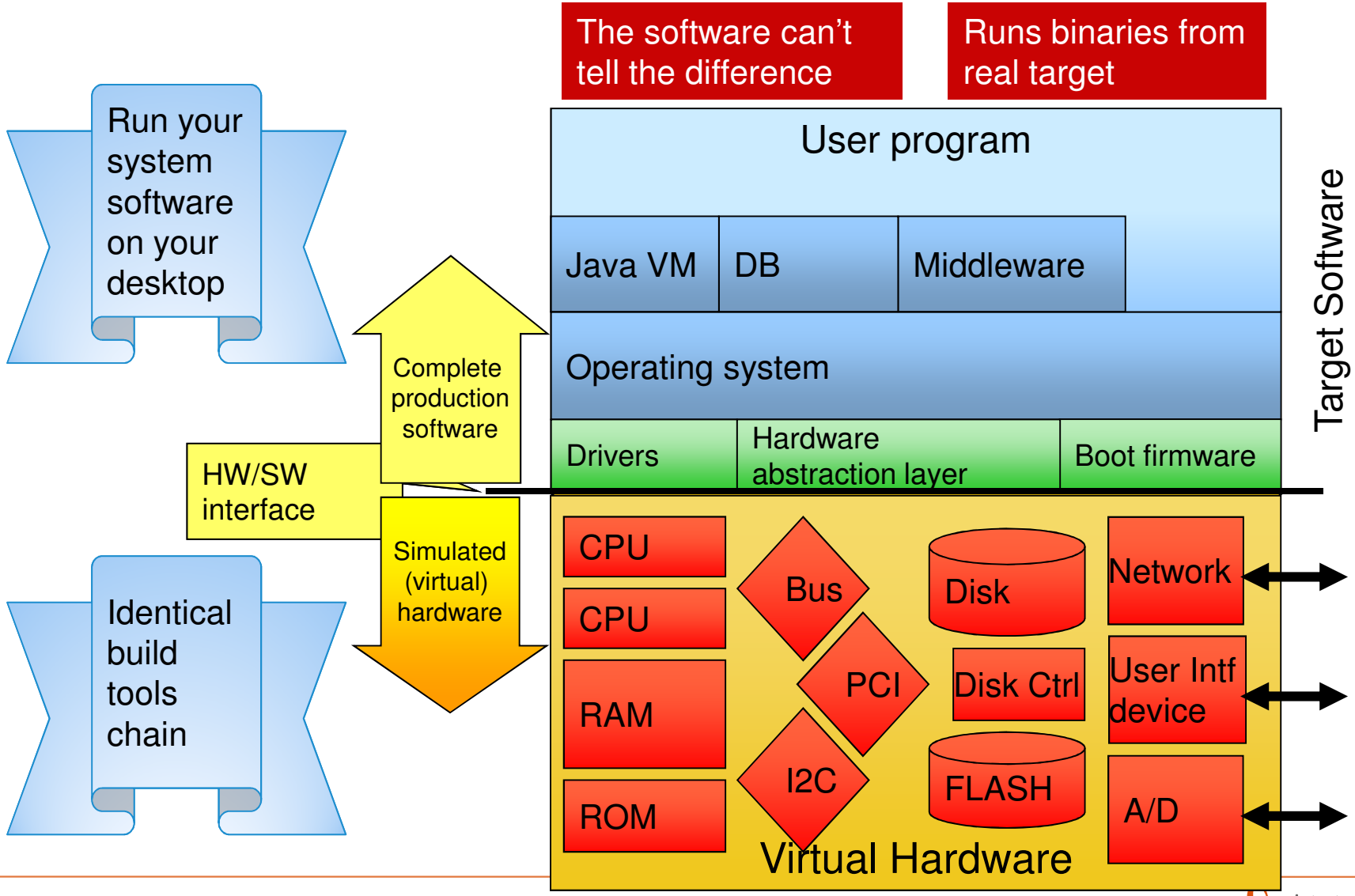
# No Impact on the Target Software





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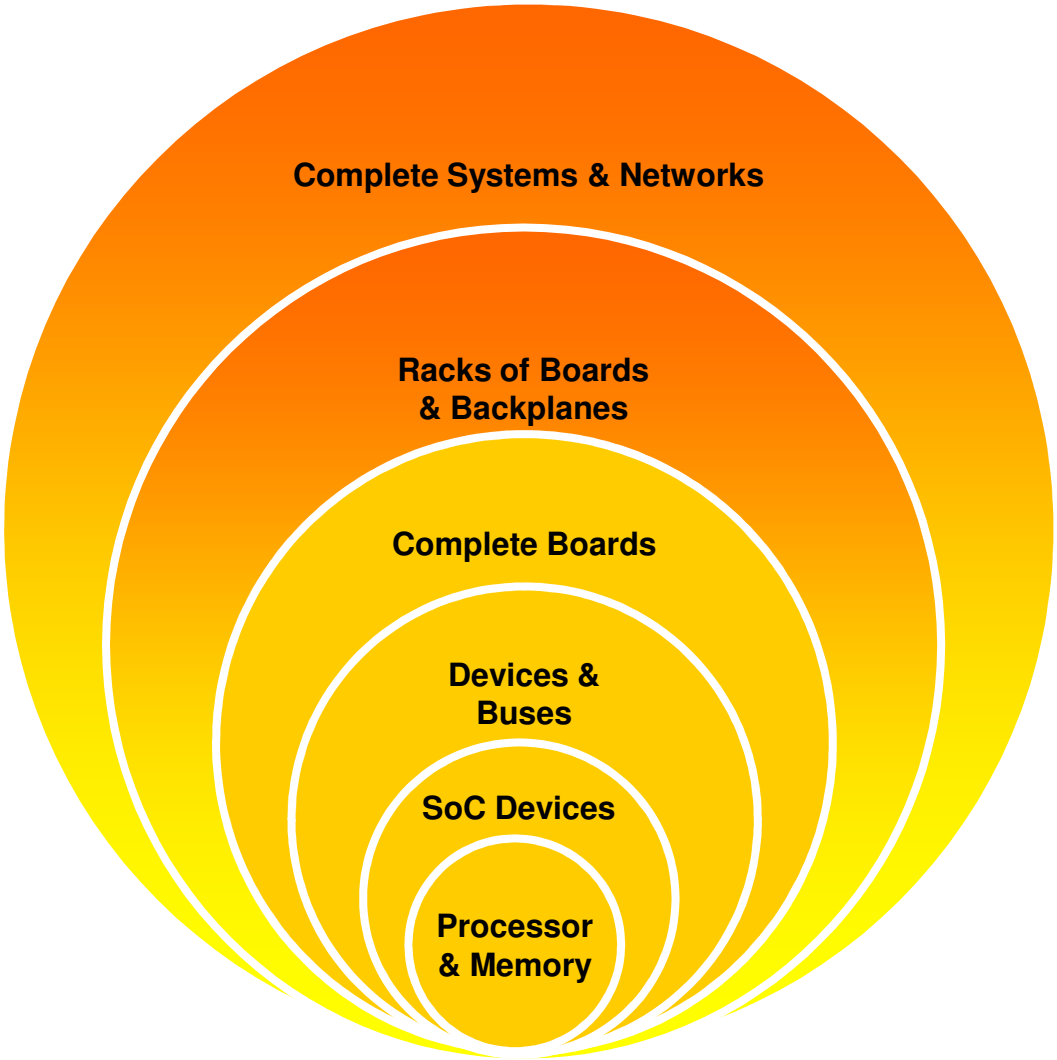
# Simics Scales




## Examples

- Satellite constellation, telecom network
- Telecom rack, avionics bay, blade server
- MPC8572DS board, standard PC, DSP farm
- PCIe, RapidIO, $I^2C$, Custom FPGA
- PPC440GP, P4080, OMAP, Octeon CN3860
- PPC750, Core 2, e500mc, POWER6 , MIPS64



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# Major Pr pleted In Blue-Chip Customers

If datacom/ntw account

**Communications (Data & Telco)**





**Defense Aerospace Space**










**Semiconductors**




**High-End Systems Office Systems Application Tools**










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# How is Simics Used?

- **System Development and Integration**
- **Large Systems Modeling**
- **Training platform**
- **Product Support platforms**

- **As a new, disruptive platform for Product Life Cycle process change:**
  - System/architecture definition
  - Software development
  - Deployment
  - Integration and test
  - Demo, support and training
  - Communication between groups

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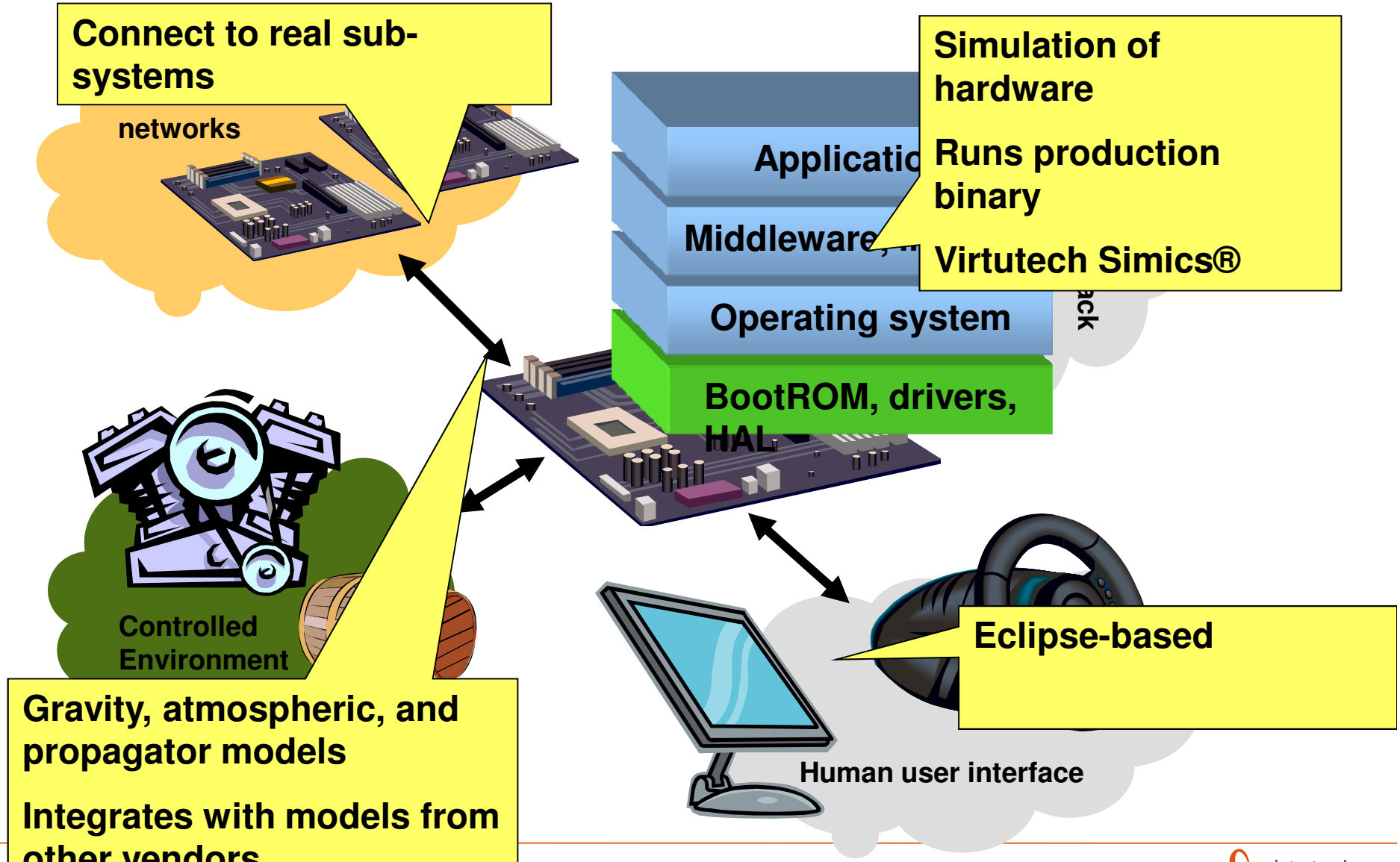
# REATSS

- **Reconfigurable Environment for Testing of Software Systems**
- **Dynamic simulation environment**
- **Capabilities**
  - Create standalone simulation environment
    - Simulate entire vehicle environment – including analog inputs
  - Scalable simulation – up to 100s of CPUs
- **Includes Simics abilities**
  - Scriptable test scenarios
  - Automated
    - Batch mode testing
  - Post-processed results

# REATSS Contains





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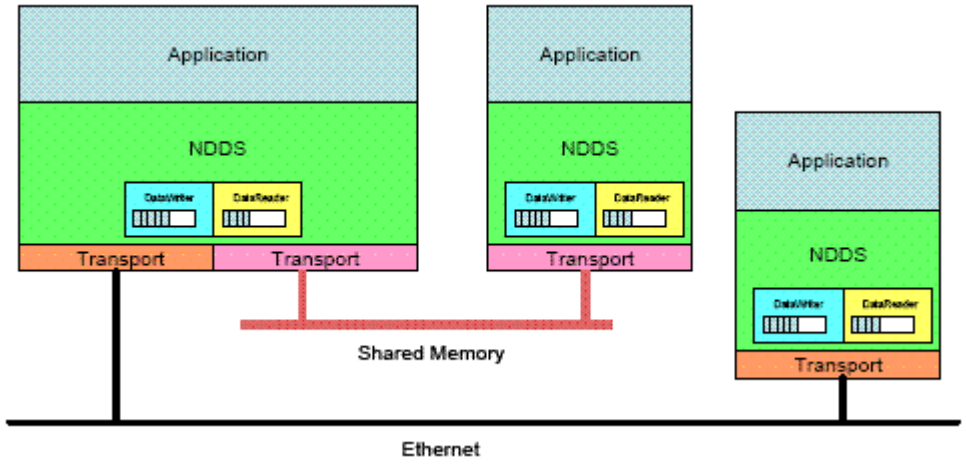
# Network Interface Components

- **Allows simulation to be distributable**
- **DDS - Generic Reconfigurable Interface Manager (GRIM) NDDS Interface**
  - Allows distribution using several difference services



# REATSS Capabilities

- **Eclipse perspectives**
- **SDE – Service Development Environment**
  - Critical for creating REATSS capable simulation
    - Define simulation components (services)
      - Interfaces
      - Requirements
      - Visual Studio build files
    - Eclipse based
- **ADE – Application Development Environment**
  - Allows you to plug services/components together
    - Drag ‘n drop
    - Displays various component metadata
- **SCM – Simulation Control and Modeling**
  - Start/pause/stop simulation
  - Breakpoints, checkpoints, and fault injection
  - Python-base scripting engine (automate all tests)

# Flight Software Testing

- **Avionics Test Bench**
  - Uses real hardware
  - Most accurate, most expensive
- **Functional Test Bed**
  - Hybrid between hardware/simulation
  - Still expensive.  Limited control/visibility
- **Engineering Simulation**
  - Completely software simulation based
  - Lower-fidelity than real hardware
  - Complete control/visibility
  - Lower cost and extremely scalable

# Conclusions

- **Integrated NDDS communications backplane**
- **Rapidly reconfigurable architecture**
- **Systems management dashboard**

- **All technologies extensible to other target systems**

- **REATSS enables you to**

  "Test as you fly, fly as you test"



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# Contact Us

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