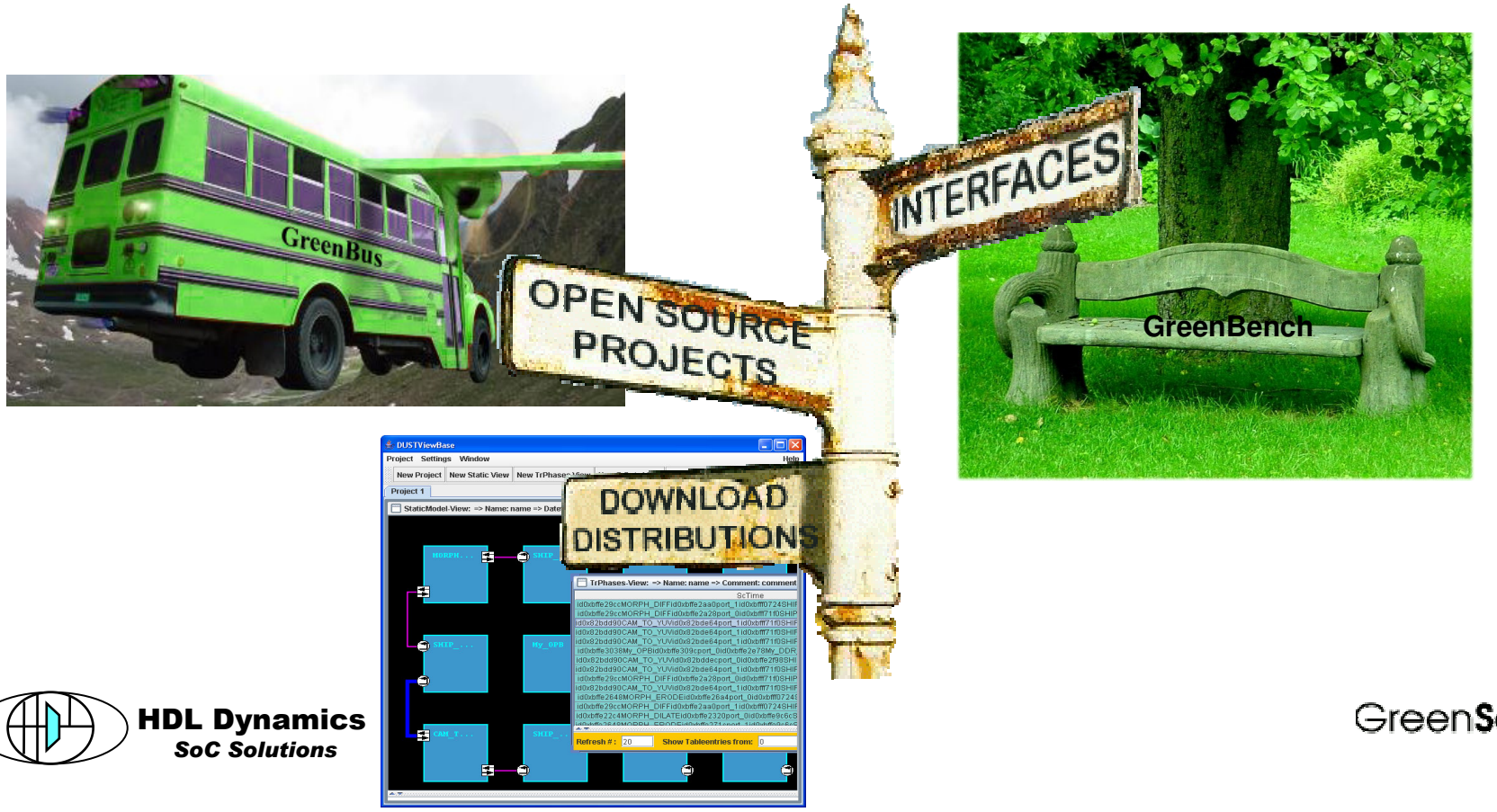
GreenSocs Overview
www.greensocs.com

ESL = Models + GreenSocs + Tools



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Who is GreenSocs

GreenSocs wears 2 hats

- **Developer, supplier, contractor of SystemC infrastructure solutions**
  - **partner for value added SystemC development**
  - Infrastructure/tools/IP solution development
  - Customized solutions to ESL problems
  - Manage, facilitate, and productize ESL research
- **Maintains Open Source based SystemC *infrastructure* project**
  - Distribution of tool packages to SystemC community
  - Maintained and funded by subscriptions and contracts with GreenSocs
  - Open to all to contribute/join/use

GreenSocs Business Model

- **SystemC environment differs from other EDA tools**
  - Based on standard C++ environment
    - Tool infrastructure based on Open Source Development
    - Proprietary info is typically company specific models
- **However Open Source does not mean simple or integrated**
  - Still many missing pieces, interfaces, tools, documentation
  - Like Linux, there is need for supported package solutions
- **GreenSoCs develops and productizes SystemC infrastructure**
  - Ensures quality tools and IP releases to reduce in-house support burden
  - Peer reviewed for quality, supported Wiki, SourceForge repository
  - Customization and enhancements
    - Subscriber (tool, IP, silicon distributor) fee or end user license
  - Ongoing support for developers and users.

GreenSocs Business Model

- **Key Differentiator for tools development**
  - Getting customized rather than off the shelf solutions
  - Customers get access to customized source code
  - Raw Packages may be released back to Open Source community
  - **GreenSoCs maintains and augments customized solutions**

- **Why ? open source = flexibility in evolving solutions**
  - Simpler to update and customize tools for future needs
  - Allows choices - what do you support internally vs. what is maintained through GreenSoCs
  - Facilitates research efforts for improved SystemC tool infrastructure

- GreenSoCs is involved and advocates users to standards groups
  - **OSCI, OCP-IP, ECLIPSE, SPIRIT,…**

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So why not just use the Open Source Code

You can, but consider the alternatives and tradeoffs

- **In House development and integration**
  - SystemC tools are complex Open Source Solutions
  - Support is needed, key pieces is missing
- **Ongoing in-house costs for specific tools and infrastructure?**
  - Learning curve in using/supporting raw 3rd party code?
  - Costs/risks associated with in-house development
  - Diverted resources better used for company IP value added models
- **ROI in GreenSoCs contracted turnkey SystemC development**
  - Debugged, documented "Working out of the box" working solutions
  - Developer value – Access to best in class SystemC developers
  - Value to Users - packaged and supported user friendly solutions

Available today from the GreenSocs repository

- **Supported Architectures:**
  i386, x86_64, Cygwin, Mac OS X (ppc and i386)

- **Packages:**
  - apt_0.5.28.6-gs3_i386.deb
  - archc2.0+beta3-gcc4.0.3.deb
  - cdt_3.1.0-gs3_i386.deb
  - dpkg_1.10.28-gs1_i386.deb
  - dust1.0-gcc4.0.3-systemc2.2.deb
  - eclipse_3.2-gs2_i386.deb
  - gcc4.0.3_4.0.3_i386.deb
  - jre_1.5.0-gs2_i386.deb
  - libboost-dev_1.33.1-4_i386.deb
  - modules_3.2.3-gs2_i386.deb
  - pdesigner_1.0.2-gs2_i386.deb
  - pdlibrary_1.0.1-gs1_i386.deb
  - scv1.0p2-gcc3.3.1-systemc2.1-gs2_i386.deb
  - scv1.0p2-gcc3.3.1-systemc2.2-gs2_i386.deb
  - scv1.0p2-gcc4.0.3-systemc2.1-gs2_i386.deb
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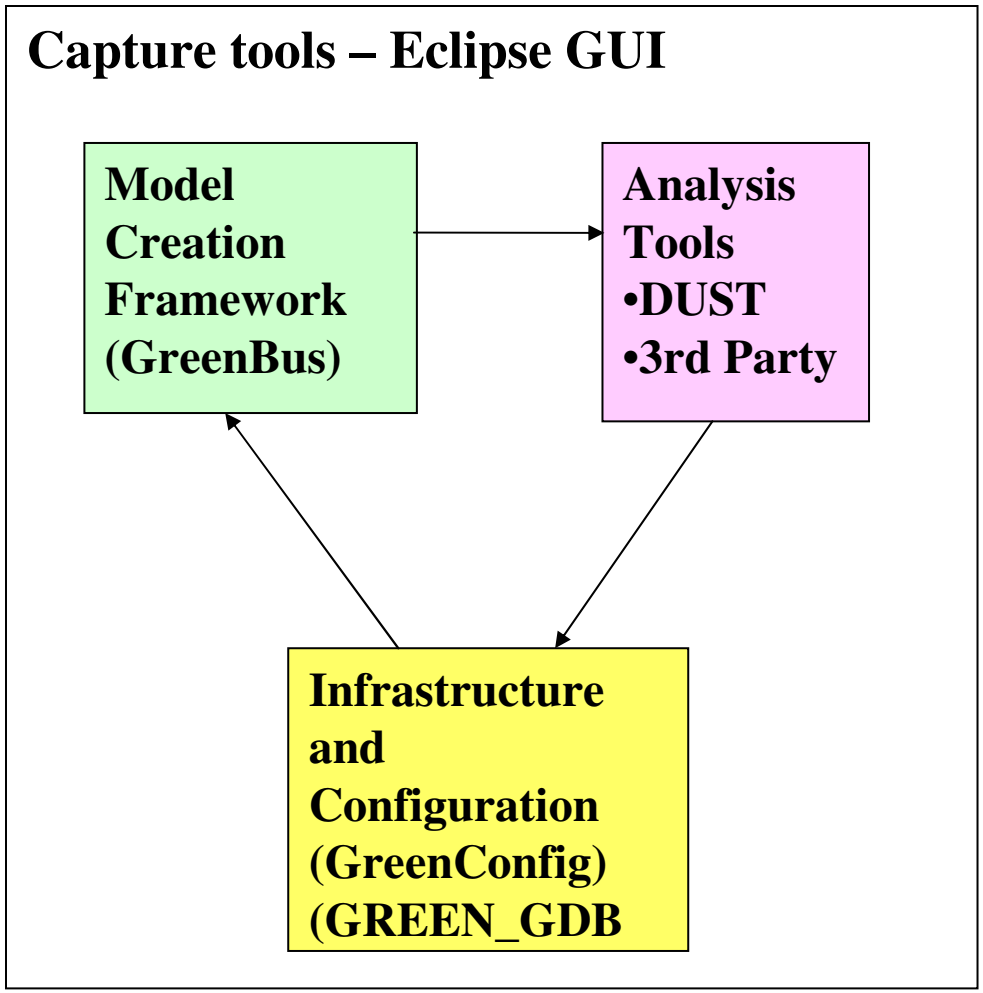
  - systemc2.2-gcc4.0.3-gs2_i386.deb

GreenSocs Tools

- GreenBus
- DUST analysis framework
- Greenbench
- GreenConfig
- GReenControl
- ... What else?
  - Subscriber defined
  - Open Source contributed
  - GreenSocs Developed and Supported



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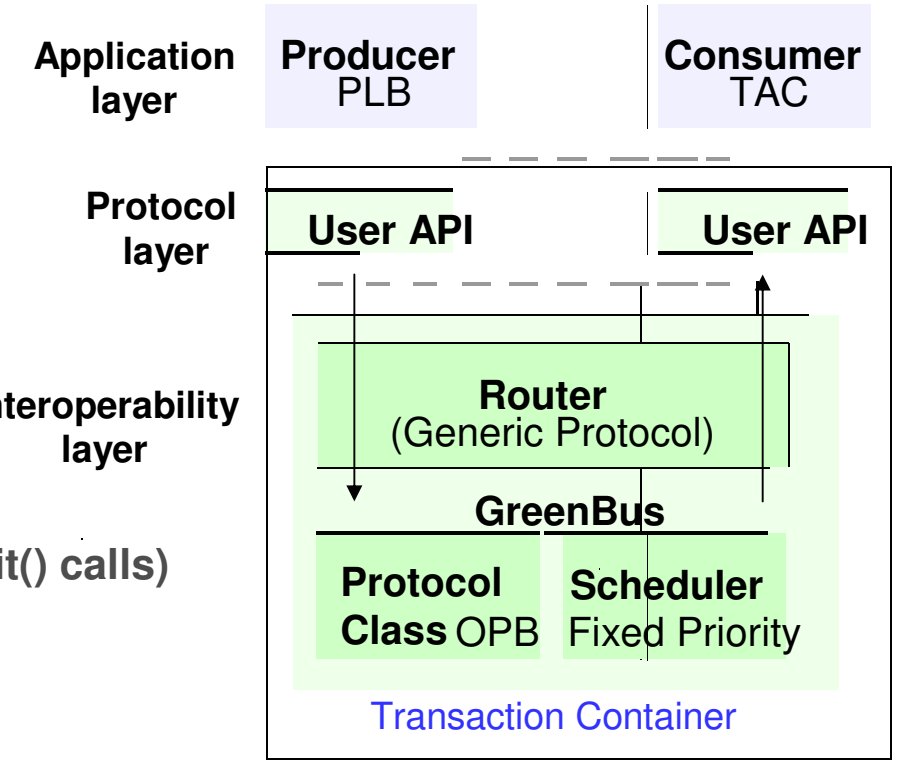
GreenBus Overview

- **Simple System level Inter-operability**
  - Simple API between models
  - Defined Data structures
- **Safe Operation**
  - Automatic data structures management
  - Event semantics between models.
- **High Simulation Speed**
  - Data passed by Shared pointers
  - Only required events used
  - Model can use methods (rather than wait() calls)
- **Other features**
  - Built for/on proposed TLM 2.0 standard
  - Efficient (0.5 million atoms per second)
  - Multiple abstraction levels
  - Integrated analysis tools (DUST)
  - Customized support for other user API's (OCP-IP etc)



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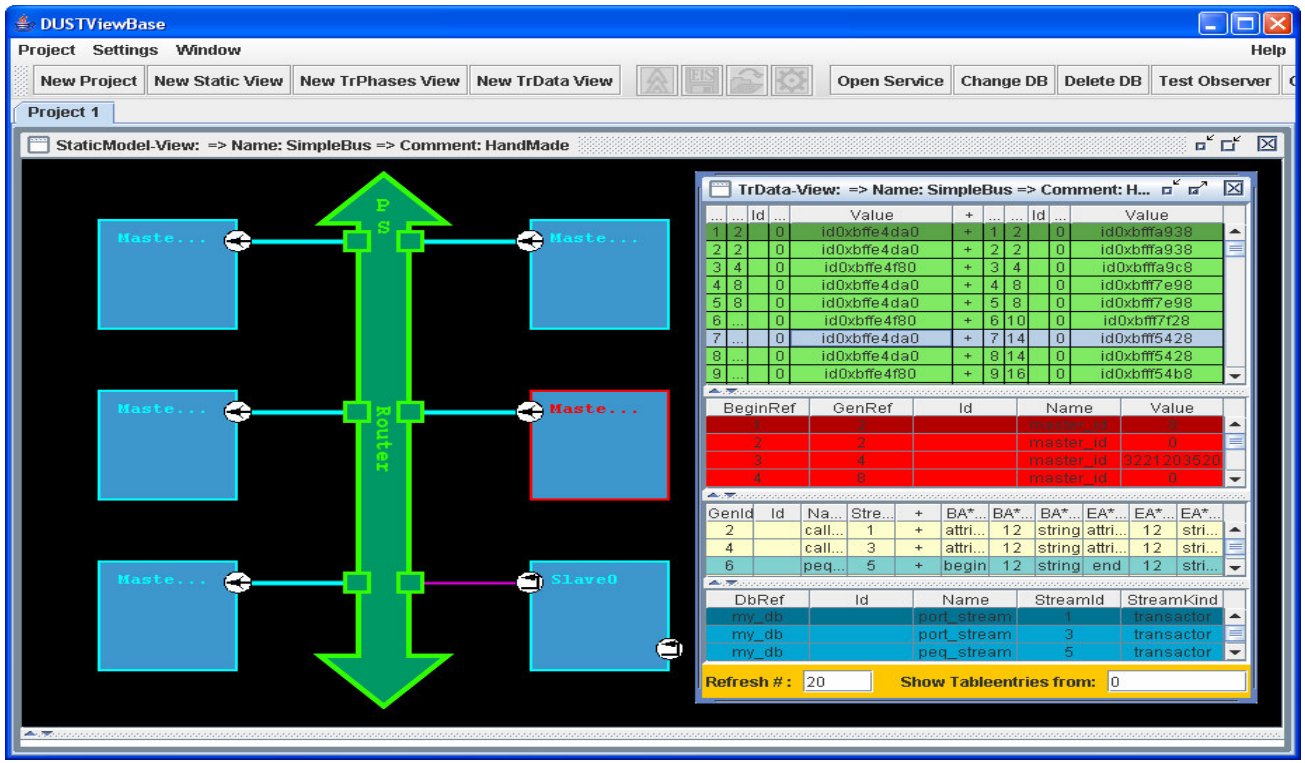
DUST Overview

Dynamic and Universal SystemC Transaction Analyzer

- Non-intrusive analysis and debugging of SystemC designs
- Easy to use (#include "utils/dust.h")
- Customizable visualization front ends
- Extensible architecture (add custom debug services, views, …)
- Full GreenBus support today

Enhanced SystemC simulation

Analysis backend, SQL database



Visualization, Monitoring, Debugging

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DUST JAVA-based GUI for GreenBus integrated analysis

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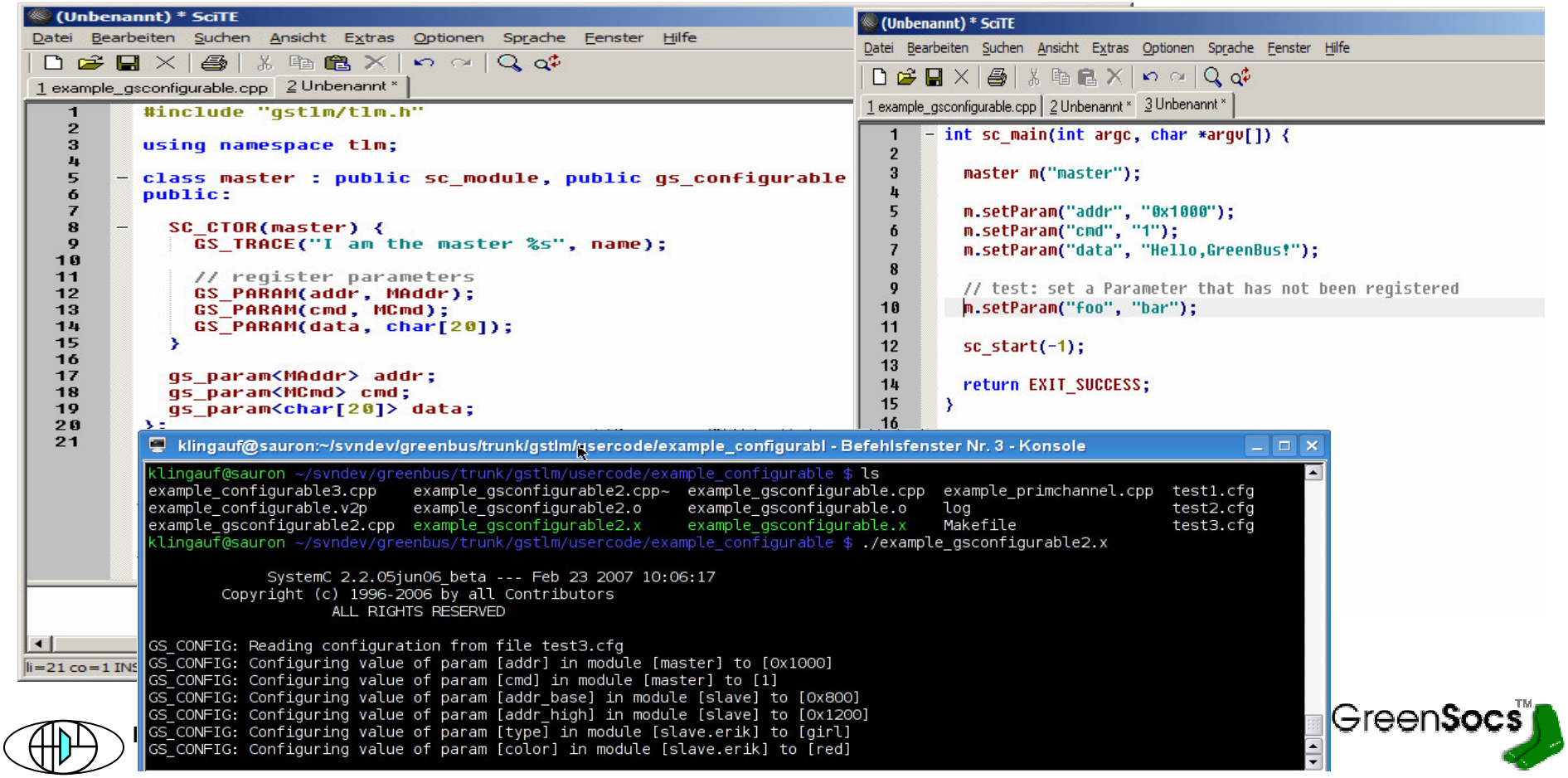
GreenSocs – GreenBench

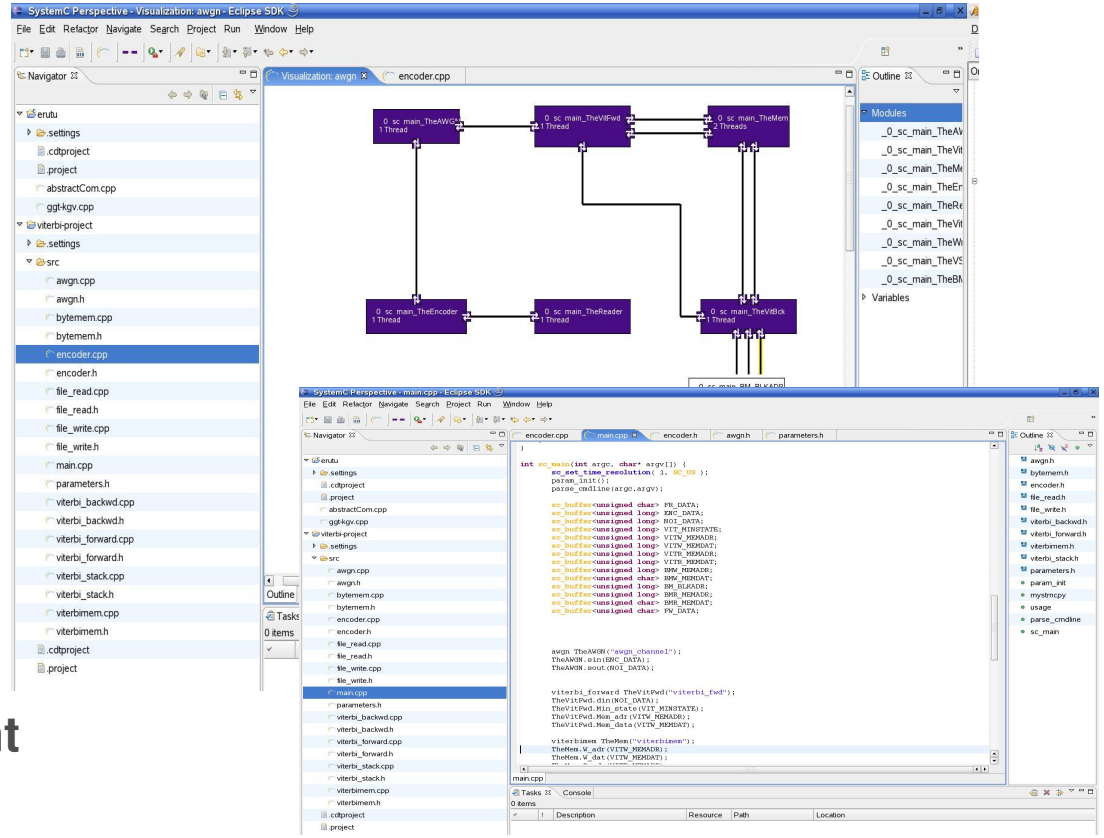
Configuration Framework – Critical to Proper Large Systems Operation

- GS_PARAM wrapper makes module parameters configurable
  - Configure parameters from within models…or via configuration file
  - Configure parameters or communication architecture by config file



Eclipse Environment

- **Modular and extensible SystemC designs IDE**
- **SystemC-specific features and extensions**
  - Project management
  - Configuration
  - Visualization
  - Model execution
  - Inherited CDT functionality
  - Syntax highlighting
  - Module tree viewer
  - Structural representation
  - GSPM integration



- **Availability**
  - Under subscriber agreement
  - Flexible Licensing
  - Customer-specific extensions and integration

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GreenSocs SystemC Sandbox – Come Play With Us

Requirements identification

Open Source Community code

Subscriber funded development

GreenSocs Engineering

De-Facto Standards Support

Passed to WG (e.g.) OSCI, OCP-IP

Released Packages to users

GreenSoCs Package Management, Repository, Wiki,

in Americas - Neal Stollon neal.stollon@greensocs.com

in Europe - Mark Burton mark.burton@greensocs.com

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