

# VMM Methodology Overview

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Synopsys

# The Need for Verification Methodology

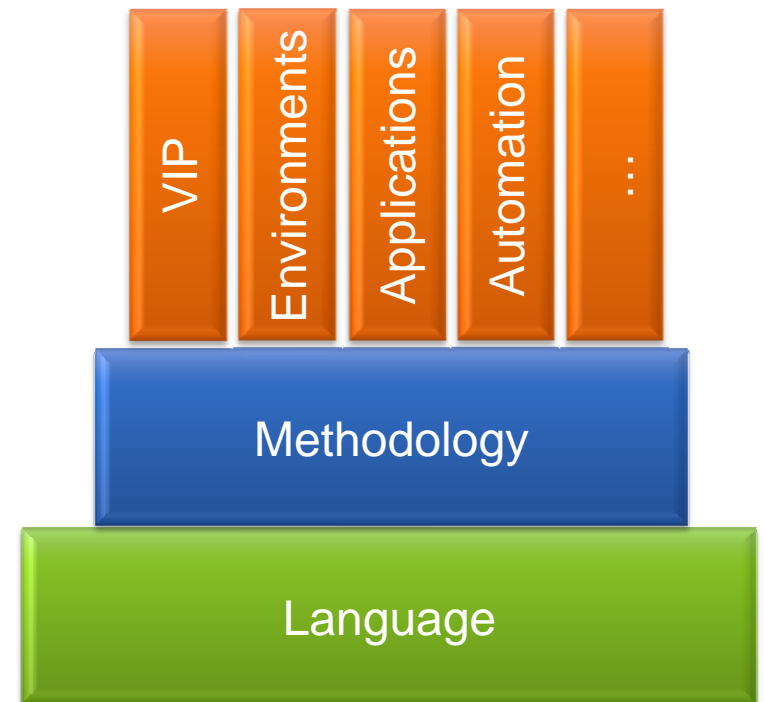
*Foundation for higher productivity and interoperability*

## Productivity

- Documented best practices
- Solid infrastructure
- Advanced features & automation

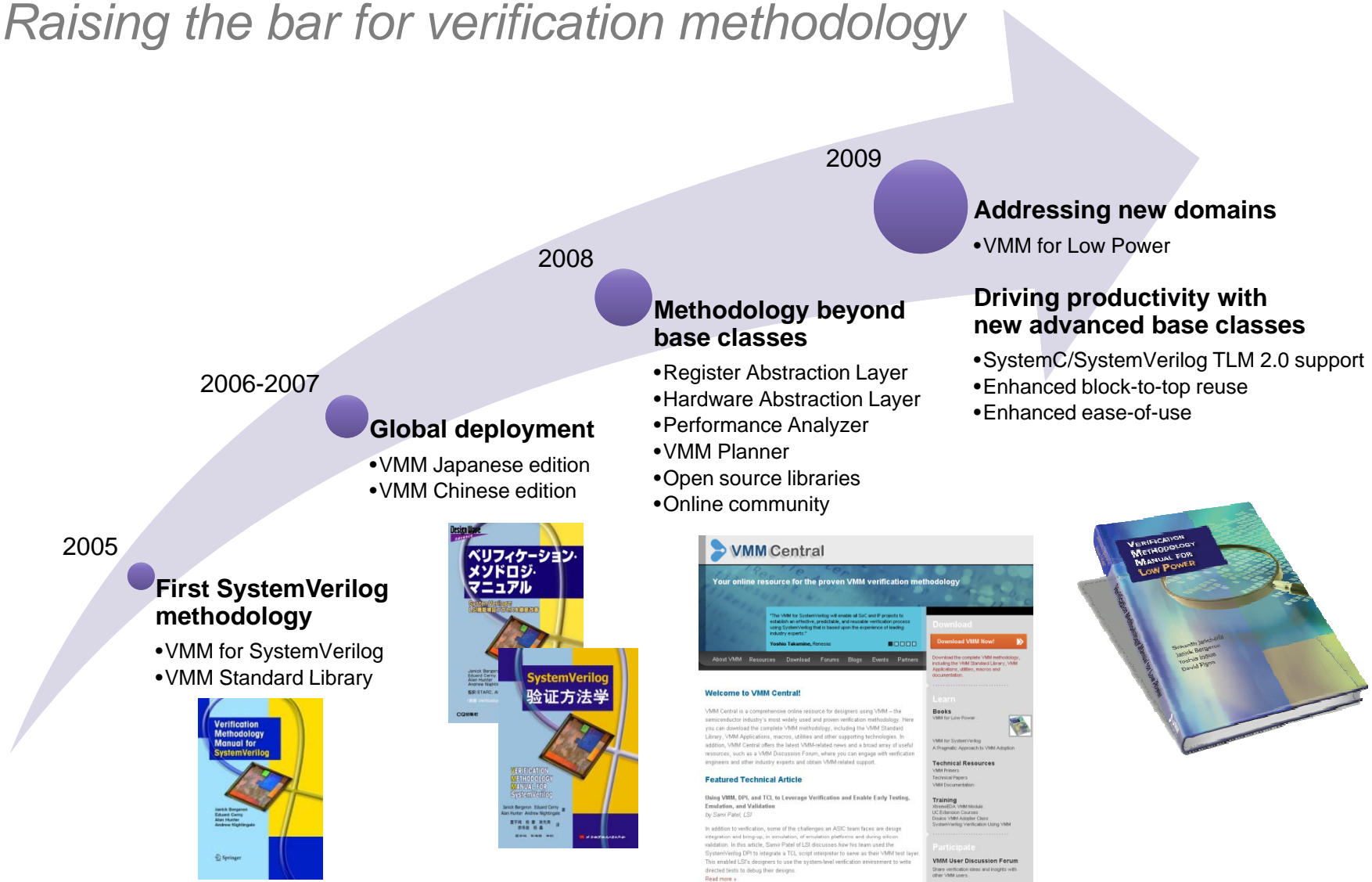
## Interoperability

- Consistency between teams
- Reuse
  - Within projects
  - Between projects
  - Between verification domains
  - Between tools



# Continuous Investment in VMM

*Raising the bar for verification methodology*



2005

## First SystemVerilog methodology

- VMM for SystemVerilog
- VMM Standard Library



2006-2007

## Global deployment

- VMM Japanese edition
- VMM Chinese edition

2008

## Methodology beyond base classes

- Register Abstraction Layer
- Hardware Abstraction Layer
- Performance Analyzer
- VMM Planner
- Open source libraries
- Online community

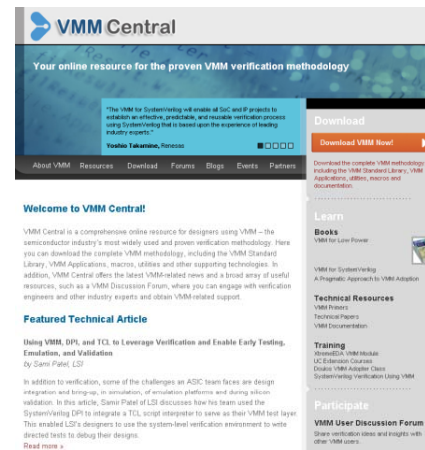
2009

## Addressing new domains

- VMM for Low Power

## Driving productivity with new advanced base classes

- SystemC/SystemVerilog TLM 2.0 support
- Enhanced block-to-top reuse
- Enhanced ease-of-use



# Proven Success with VMM

4+ years of production deployment

- 500+ successful projects
- 50+ SNUG papers

## Leading European Design Consulting Firms Standardize on VMM Verification Methodology

Chipright, CreVinn and Verilab Speed Chip Development with VMM Methodology

PRNewswire-FirstCall  
 MOL: **VMM Users Drive New Features in Expanded Release**  
 (NASDAQ) **Enhancements to Industry's Most Proven Verification Methodology Include New Base Classes and Performance Analyzer Application**  
 Aug

MOL: **Tego Standardizes on VMM and Synopsys VCS Solution to Speed Verification of Radio Frequency Identification Tags**  
 (NASDAQ) **Frequency Identification Tags**  
 Meth Dec

PRNewswire  
 enwi MOL: **Verivue Deploys VMM and Synopsys VCS Solution for Verification of Scalable Media Distribution Switch**  
 com (NASDAQ-NMS:SNPS)  
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VMM Ver PRNewswire  
 ease MOUNTAIN VIEW, Calif.  
 anat (NASDAQ-NMS:SNPS)  
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Methodol  
 verify thei *Combination of VMM Verification Methodology and VCS Enable Up to 4x Productivity Boost*  
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MOUNTAIN VIEW, Calif., April 30 /PRNewswire-FirstCall/ -- Synopsys, Inc., a world leader in software and IP for semiconductor design and manufacturing, today announced that Verivue, Inc. has standardized on the production-proven VMM verification methodology and VCS® functional verification solution, both key components of Synopsys' Discovery™ Verification Platform, for the verification of their flagship product, the MDX 9000 Series Media Distribution Switch. The VMM-based approach allows Verivue to implement a transaction-based verification methodology that provides reusable test environments for higher test coverage, ease-of-use and scalability from block to system-level. The combination of the VCS solution and VMM enables faster turn-around with accelerated compile times and optimized performance for system designs, contributing to a productivity boost of up to 4x over traditional approaches.

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**SNUG** Synopsys Users Group

What is SNUG | Worldwide Calendar | Proceedings

Learn. Interact. Participate.

**SNUG Papers and Presentations: Search Result**

The search for **vmm** in **all** produced **83** results.

**San Jose, 2009**

2nd Place - Best Paper			
Advanced VMM Transactor Development: Tips for Designing VIP You Wouldn't Mind Reusing	Kelly Larson - <b>MediaTek Wireless, Inc.</b>	<a href="#">Paper</a>	<a href="#">Presentation</a>

Technical Committee Award Honorable Mention			
Using the New Features in VMM 1.1 for Multi-Stream Scenarios	Jason Sprott, Sumit Dhamanwala, JL Gray - <b>Verilab</b> , Clifford Cummings - <b>Sunburst Design, Inc.</b>	<a href="#">Paper</a>	<a href="#">Presentation</a>

**For Publication Only**

Paper Title	Author(s)	Paper	Presentation
A Complete Verification Solution For Electro-Optical Devices Using Advanced VMM With RAL	Zygmunt Pasturczyk, Paul Lungu - <b>Nortel</b>	<a href="#">Paper</a>	N/A

**MA4 - Verification with VMM I**

Paper Title	Author(s)	Paper	Presentation
Performance Verification of a Complex Bus Arbiter Using the VMM Performance Analyzer	John Dickol, Kari O'Brien - <b>MediaTek Wireless, Inc.</b>	<a href="#">Paper</a>	<a href="#">Presentation</a>
Using the New Features in VMM 1.1 for Multi-Stream Scenarios	Jason Sprott, Sumit Dhamanwala, JL Gray - <b>Verilab</b> , Clifford Cummings - <b>Sunburst Design, Inc.</b>	<a href="#">Paper</a>	<a href="#">Presentation</a>

# Advanced Base Classes

*New extensions for productive verification*

- SystemC/SystemVerilog TLM 2.0 support
  - VMM Channel to TLM2.0 interface
  - Robust completion model
- Enhanced block-to-top reuse
  - Hierarchical phasing
  - Class factory
- Enhanced ease-of-use
  - Built-in and serial-test phasing
  - Parameterized channels and generators

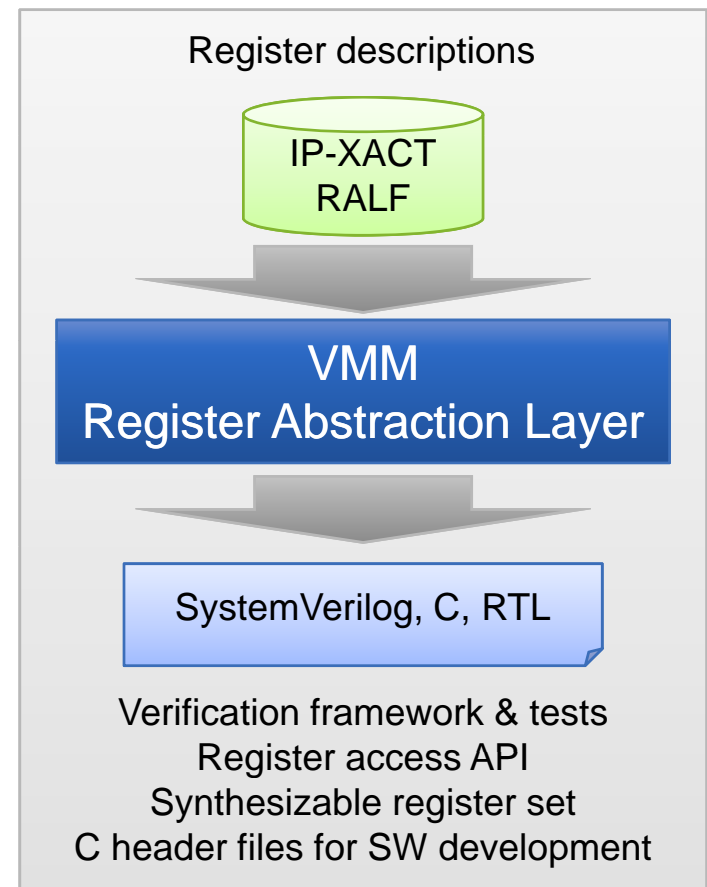


VMM Supports Accellera Interoperability Library

# Strong Investments Beyond Base Classes

*Addressing overall verification productivity and automation*

- VMM Register Abstraction Layer
  - New: IP-XACT input
  - New: RTL & C output
- VMM Performance Analyzer
- VMM Hardware Abstraction Layer
- VMM Planner
- VMM for Low Power



# Growing VMM Ecosystem

Active online and vendor communities

## VMMCentral.org

**Blogs**

**Discussion Forums**

Topics	Author	Replies	Views	Last post
VMM advanced tutorial	knightlord	9	363	Wed Jul 08, 2009 6:43 pm ju599
directed tests	blum	3	487	Sun Jul 05, 2009 10:35 am thukver
default behavior for DFMs	thinkver	2	50	Sat Jul 04, 2009 7:29 am thukver
why the generator need to wait so long time between transect	angelzhang	1	60	Mon Jun 29, 2009 5:07 am angelzhang
Paradigm Works Released VMM1.1 Testbench Generator	ningworks	0	77	Tue Jun 23, 2009 9:26 am ningworks
What does the vmm_notifyout_notification suppose to do	zouj	2	454	Fri Jun 19, 2009 10:27 am thukver
RAL: combining base addresses and offsets in PCI mode?	rschofield	2	158	Tue Jun 16, 2009 6:57 am rschofield
channel and vmm_data	angelzhang	4	220	Sat Jun 13, 2009 1:28 am angelzhang
Compilation issue for vmm1.1 with xoc on VCS 2009.06-SP2-9	eshokcj	1	213	Tue Jun 02, 2009 6:40 pm itanney
vmm1.1 example compilation error	vmm_aks	3	635	Tue Jun 02, 2009 4:34 pm itanney
array of interfaces	anca.buhus	3	290	Thu May 28, 2009 7:30 am adelshan_sops
				Tue May 19, 2009 6:33

## VMM Catalyst Program