# Accellera Systems Initiative SystemC Standards Update

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accellera SYSTEMS INITIATIVE



2015 DESIGN AND VERIFICATION™ DVCON CONFERENCE AND EXHIBITION EUROPE

# Presentation Overview

- Accellera Overview
  - Membership list
  - How to join a WG
  - Global SystemC events
- Number of IEEE-1666 standard downloads
- Accellera SystemC Working Group updates
  - Language & Transaction-Level Modeling
  - Configuration, Control & Inspection
  - Synthesis
  - Analog/Mixed-Signal
  - Verification

# All Members Can Join SystemC WGs!

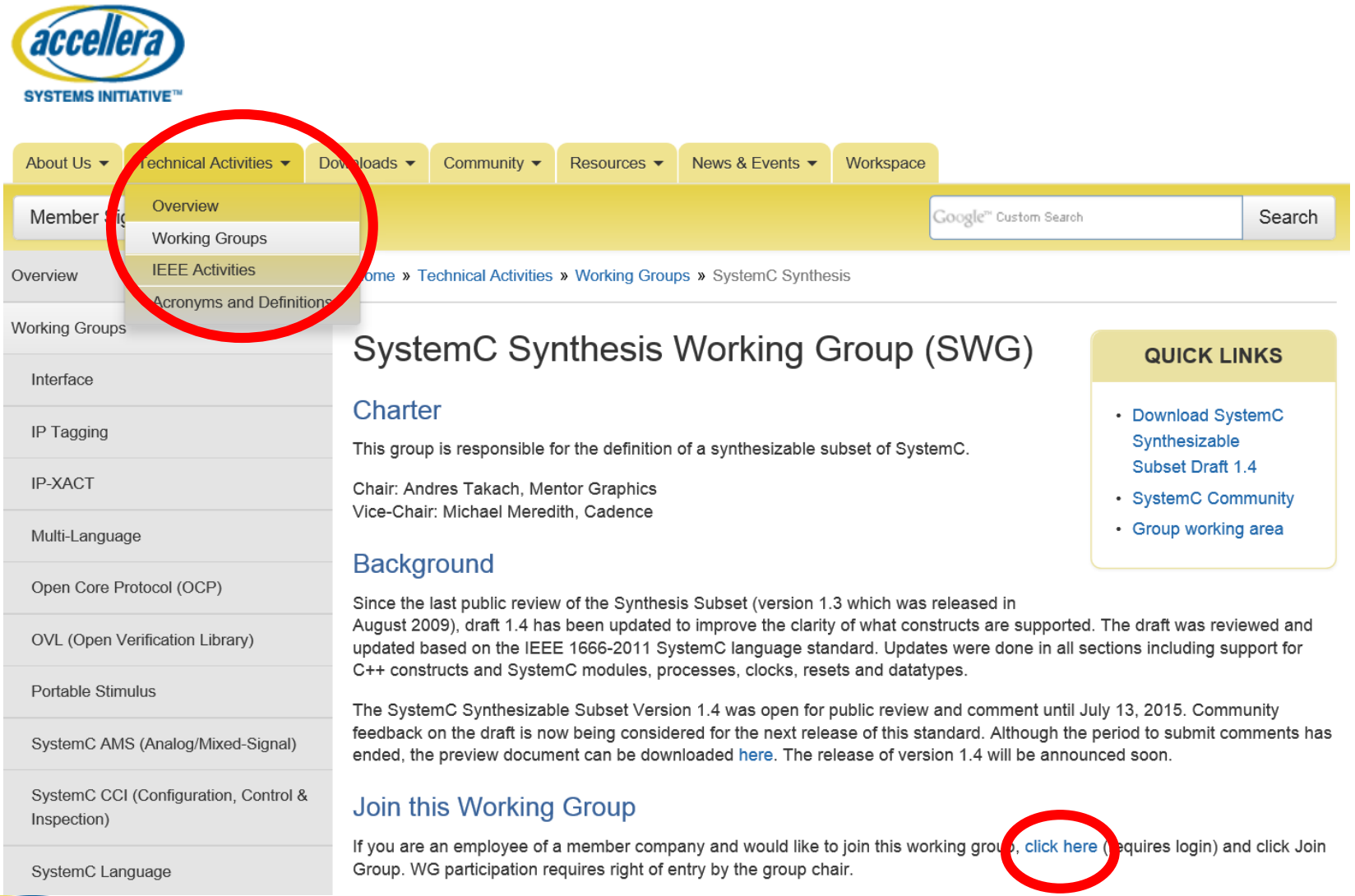
## Corporate Members

AMD
ARM
cadence
ERICSSON
freescale semiconductor
intel
Mentor Graphics
NXP
QUALCOMM
SONICS
life.augmented
SYNOPSYS
Texas Instruments

## Associate Members

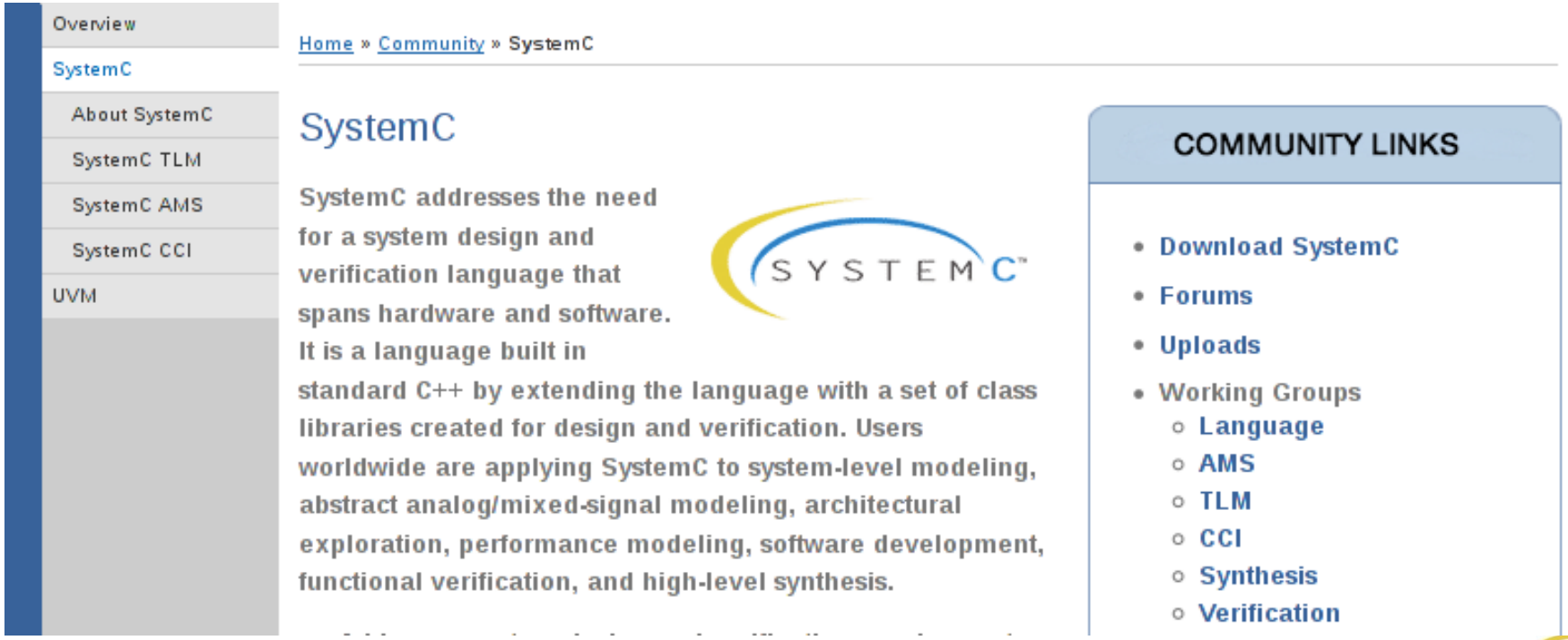
AGNISYS
ALDEC
ALTERA
AMIQ
ANALOG DEVICES
astc
BOEING
BOSCH Invented for life
BREKER
BROADCOM
CAVIUM
CISCO
dialog SEMICONDUCTOR
DOULOS
ENCORE SEMI
IBM
Imagination
infineon
magillem
NATIONAL INSTRUMENTS
NEC
NVIDIA
OFFIS INSTITUTE FOR INFORMATION TECHNOLOGY
OneSpin SOLUTIONS
Vayavya Labs Pvt. Ltd.
XILINX
XtremeEDA
Semifore The address map experts

# Join A Working Group And Contribute!



# SystemC Community

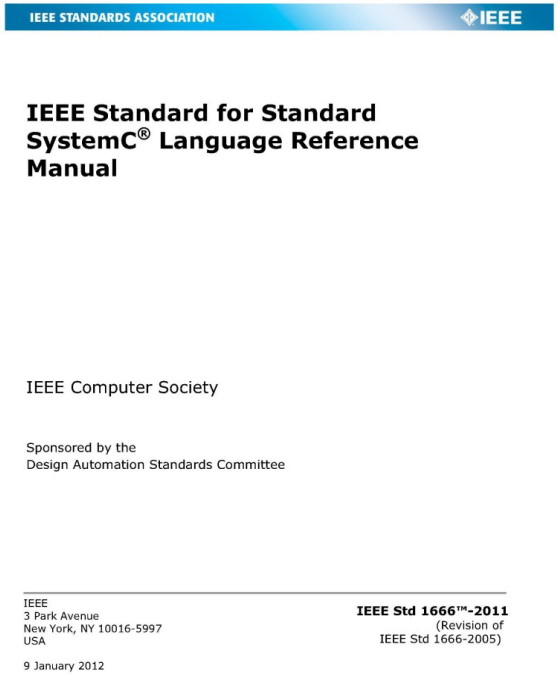
- Online at http://accellera.org/community/systemc
- Community forums, upload area for contributions, SystemC news



# Global SystemC Presence 2015+

- DVCon US March in Silicon Valley
- DAC June in San Francisco
- SystemC Japan June in Shin-Yokohama
- DVCon India September in Bangalore
- DVCon Europe November in Munich
- Accellera Day Taiwan December, location TBA

# IEEE 1666 SystemC Downloads


IEEE STANDARDS ASSOCIATION IEEE

**IEEE Standard for Standard SystemC® Language Reference Manual**

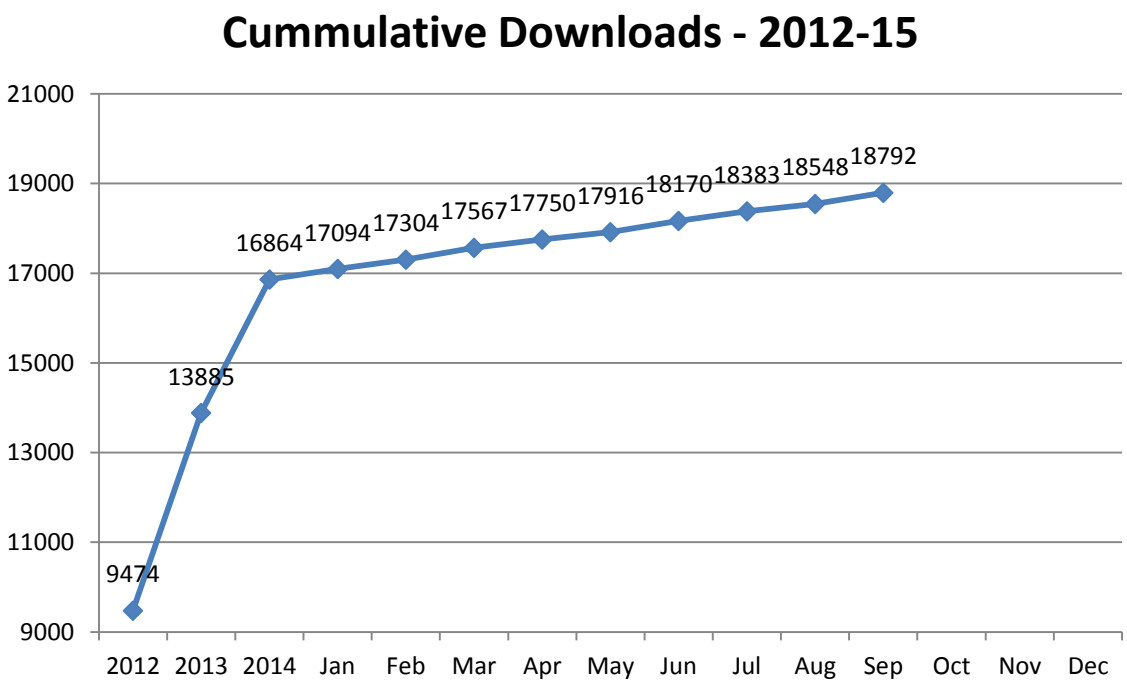
IEEE Computer Society

Sponsored by the
Design Automation Standards Committee

IEEE
3 Park Avenue
New York, NY 10016-5997
USA

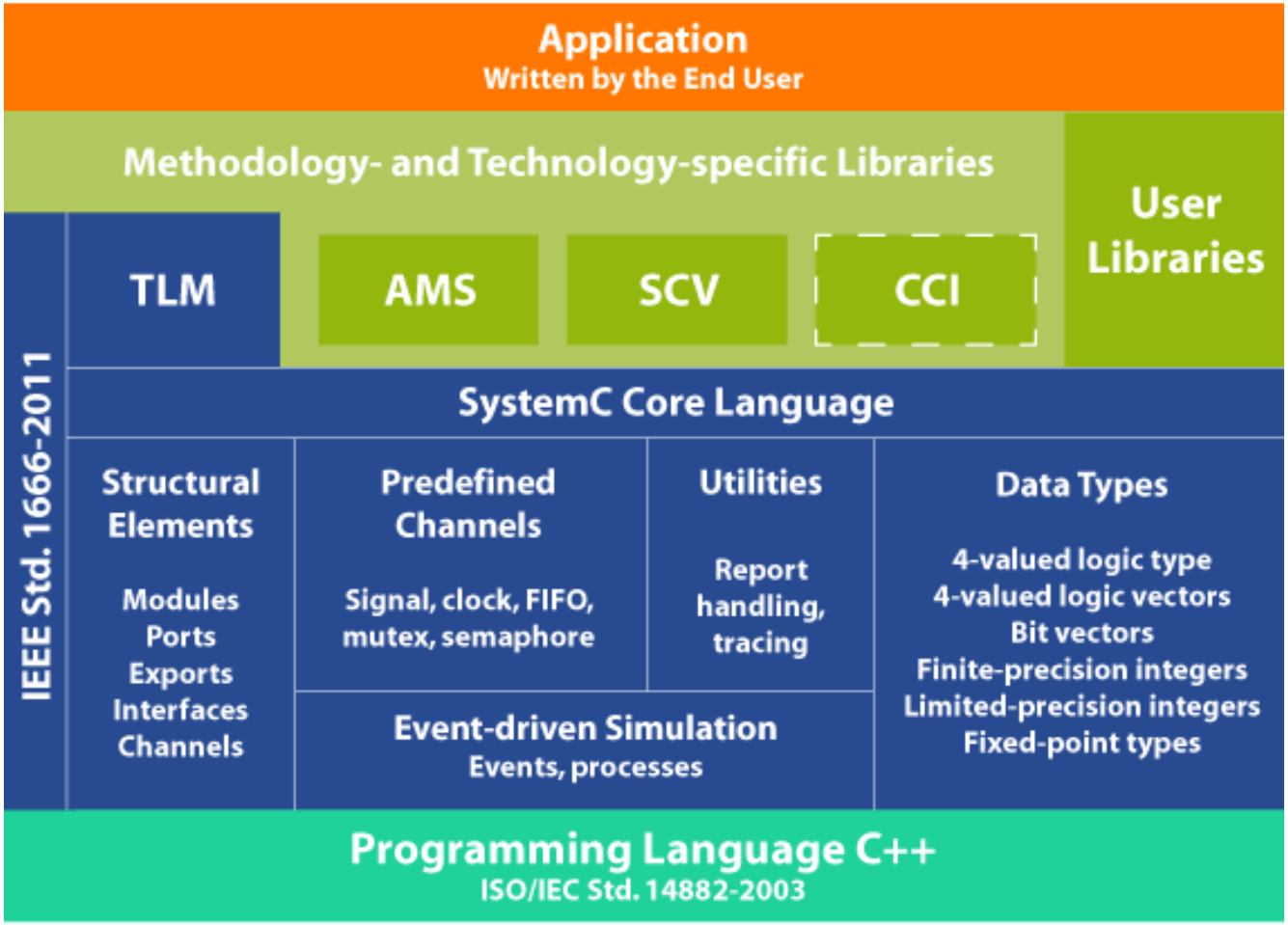
9 January 2012

**IEEE Std 1666™-2011**
(Revision of
IEEE Std 1666-2005)




http://standards.ieee.org/getieee/1666/download/1666-2011.pdf

# SystemC Overview



# SystemC Language Working Group

- **Charter:** Responsible for the definition and development of the SystemC core language, the foundation on which all other SystemC libraries and functionality are built.
- **Current status**
  - SystemC/TLM 2.3.1 released in April 2014
  - Currently collecting, addressing, refining proposals and errata towards IEEE 1666-201x
  - Adding extensions to the core language (e.g. as needed by other SystemC-related WGs)
- **Plans for 2015/2016**
  - Continue work on necessary standards extensions for parallelization of SystemC simulations (contributors wanted!)

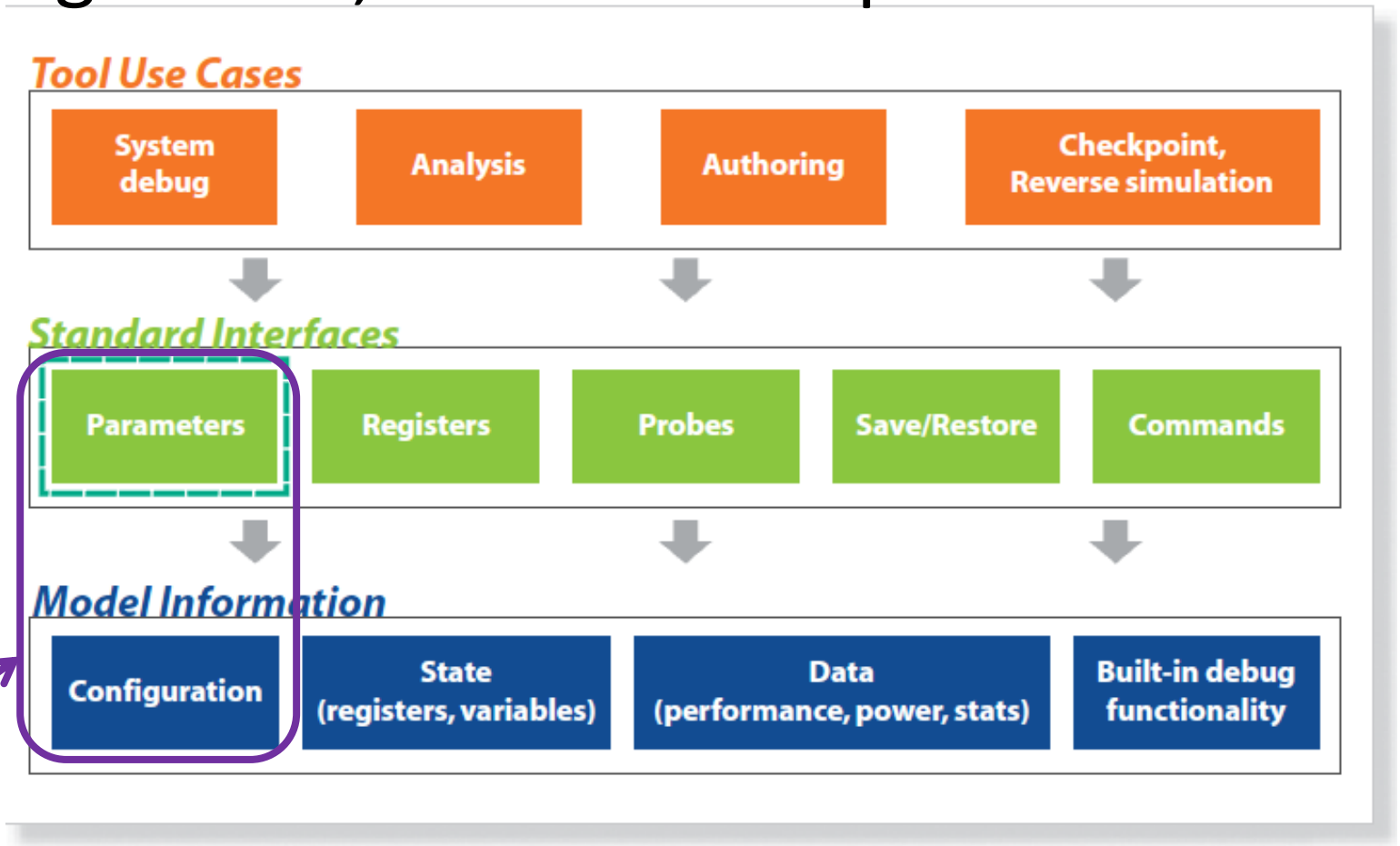
# SystemC TLM Working Group

- **Charter:** The Transaction-level Modeling Working Group (TLMWG) is responsible for the definition and development of methodology and add-on libraries for transaction-level modeling in SystemC.
- **Current status**
  - Accellera TLM-2.0 became part of IEEE 1666-2011, PoC implementation 2.0.3 bundled with SystemC 2.3.1
- **Plans for 2015/2016**
  - Work on TLM interfaces, extensions, and guidelines to improve modeling of protocols beyond memory-mapped I/O
  - „TLM signals“; serial, bi-directional communication, ...

# SystemC Synthesis WG

- **Charter:** To define the SystemC synthesis subset to allow synthesis of digital hardware from high-level specifications.
- **Current status**
  - Public review of SystemC Synthesizable Subset 1.4 completed in **July 2015**
  - Processing feedback from review
  - http://workspace.accellera.org/apps/org/workgroup/swg
- **Plans for 2015/2016**
  - Release of standard targeted for **Q4 2015**
  - Start work on new topics for the second version of the standard

# Configuration, Control & Inspection WG




Goal: Standardizing interfaces between models and tools

# CCI WG Status

- Configuration standard status
  - Requirements specification, available on Accellera web site
  - Proof-of-Concept Implementation, educational examples
  - Key improvements identified
  - Technical previews available:
    ISCUG '13: http://www.iscug.in/iscug2013_agenda_tutorials
    DVCON '13:
    http://events.dvcon.org/events/proceedings.aspx?id=144-2-T
- Working to prepare a 2016 draft standard public review
  - Make identified improvements
  - Complete the Library Reference Manual (LRM)

# SystemC Analog/Mixed-Signal WG

- **Charter:** The SystemC AMS Working Group is responsible for the standardization of the SystemC AMS extensions, defining and developing the language, methodology and class libraries for analog, mixed-signal and RF modeling in SystemC
- **Current status**
  - IEEE P1666.1 SystemC AMS Working Group completed draft for ballot in IEEE-SA (October 2015)
  - New features under development (e.g. piece-wise-linear modeling, tracing customization, analog solver parameters)
- **Plans 2015/2016**
  - Approval of IEEE 1666.1-2016 by IEEE-SA
  - Publish User's Guide update based on SystemC AMS 2.0

# SystemC Verification WG

- **Charter:** The Verification Working Group (VWG) is responsible for defining verification extensions to the SystemC language standard, and to enrich the SystemC reference implementation by offering an add-on libraries (SystemC Verification (SCV) library, etc.) to ease the deployment of a verification methodology based on SystemC.
- **Current Status**
  - Released version 2.0 of SystemC Verification library (SCV) in April 2014
- **Plans for 2015/2016**
  - Integrate the UVM verification methodology in SystemC
  - Standardization of coverage APIs (coverage groups, bins, etc.)
  - Further explorations of needs regarding SystemC/TLM

# UVM in SystemC

- Native UVM implementation in SystemC
- Language Reference Manual finished
- Open source proof-of-concept implementation in public beta later this year
  - Already available to working group members
  - Please join us if you are interested!

- See Fraunhofer's tutorial (coming up next here!) *"UVM Goes Universal - Introducing UVM in SystemC"*

# Advancing Standards Together

- Share your experiences
  - Visit www.accellera.org and register to post on community forums at forums.accellera.org
- Show your support
  - Record your adoption of standards
- Become an Accellera member
  - Join working groups
- Join **SystemC Birds-of-a-Feather Meeting** today!
  - 18:30 – 19:30, room **forum 8**
  - Current and future needs for SystemC/TLM, SystemC and C++14, … and your **favorite topics**!

# Questions