Portable Stimulus Working Group
Authored by the PSWG
Presented by Tom Fitzpatrick
Portable Stimulus Working Group Vice Chair
Portable Stimulus Working Group (PSWG)

- **Our goals**
  - Enable value and automation for individual teams
  - Allow sharing and executing scenarios across teams and platforms
  - Define a clear and robust semantic for consistent implementation of multiple tools by multiple vendors

- **Group Info**
  - Was officially formed on December 15, 2014 by the Accellera board of directors
  - Chair: Mr. Faris Khundakjie, Intel Corporation
  - Vice-Chair: Mr. Tom Fitzpatrick, Mentor Graphics
  - Secretary: Mr. Tom Anderson, Breker Verification Systems
  - Multiple participating companies
PSWG Active Members

- Agnisys
- AMD
- AMIQ EDA
- Analog Devices
- Breker
- Cadence
- Cisco
- IBM
- Intel
- Mentor Graphics
- NVIDIA
- NXP Semiconductors
- Qualcomm
- Semifore
- Synopsys
- Vayavya Labs
PSWG Vision

Proposed Portable Stimulus Diagram

Scope (Integration)
- Middleware (Graphics, Audio, etc.)
- OS & Drivers
- Bare Metal SW
- System on Chip (HW + SW)
- Sub-System
- IP

User
- Architect
- HW Developer
- Analog Developer
- SW Developer
- Verification Engineer
- SW Test Engineer
- Post-silicon Validation Engineer

Abstract Portable Stimulus Model
- Syntax/Concepts/Semantics
- Use Case Verification
- Visualization
- Runtime Portable Semantics

Tools (Secret Sauce)

Verification Environment
- UML/SysML
- SystemC
- HVL/UVM (SV, e)
- C/C++
- AMS

Platform
- Virtual Platform
- Simulation
- Emulation
- FPGA Prototype
- Silicon Board

APIs
Solution Requirements and Scope

User Requirements

- Collected and prioritized by the proposed working group
- A list of **117** unique solution requirements
- Examples include constraints, inheritance, reuse across platforms, coverage and more

Usage examples to define the problem space

- 17 Concrete use-case examples to help scope the requirements and assess the contributions
- Users and vendors collected both typical and critical challenges
- Meant to be universally recognized as important and also representing a whole class of use cases with similar challenges
Covering the Spectrum with Usage Examples

- DMA allocation for peripherals
- Stimulus portability across pad selection connectivity
- Memory to memory system data paths
- Exhaustive exercise of power states
- System aggregated power state validation
- Portability multi-view deployment

PSS Standard Scope
PSWG Standardization Status and Timeline

- **PSWG Face to Face Oct. 12-14 Complete, Next Step:**
  - Cadence, Mentor, Breker and Vayavya to work on exploring options 2 & 3 (and their deltas), consult with user companies

### Timeline

- **Q2 2016**
  - Initial Draft & Compliance Examples
- **Q4 2016**
  - PSS Version 1
- **Jan 2017**
  - Refine and Close
Options to Explore – Food for Thought

"Option 2"

PS as C++ add-on syntax with:

1. Mostly declarative (procedural where needed)
2. Confined in compilation units isolated from non-PS code
3. Follows 2 stage processing: generation of target compilation units by new tool linked with non-PS compilation units by new tool linker or off-the-shelf linker

"Option 3"

PS as declarative language, including:

1. Large rigorous interoperability gen and run time with non-PS C/C++ modules
2. Improved procedural support within overall declarative theme
3. Improved measures for scalability and reactive stimulus
Contributions and Collaboration

Cadence and Mentor
- Domain-specific language that combines C++ and SV intuitions
- Includes scenario specification and coverage
- Foreign language integration for legacy C++ and/or SV...

Breker
- Declarative C++ proposal
- Brings value constraints and path constraints into C++

Vayavya
- Complementary syntax to generate register sequences, firmware and driver routines from a canonical/standard HW/SW interface description
- Compatible with either language proposal
PSWG Next Steps

- Define process to select baseline for the portable stimulus standard
  - Option 2 or Option 3 proposal

- Proposal updates to be 100% complete including updates from member comments and questions by mid March
Summary

- The Portable Stimulus Working Group is assigned to capture portable stimuli, coverage and checking
  - Driving toward milestones to have a draft for internal review on May 2016 and 1.0 release in Jan 2017

- There are multiple existing commercial and internal technologies that address this problem space

- Join us in Accellera to ensure that your needs are addressed by the upcoming standard

- To learn more about the Portable Stimulus Working Group, visit the Accellera web site