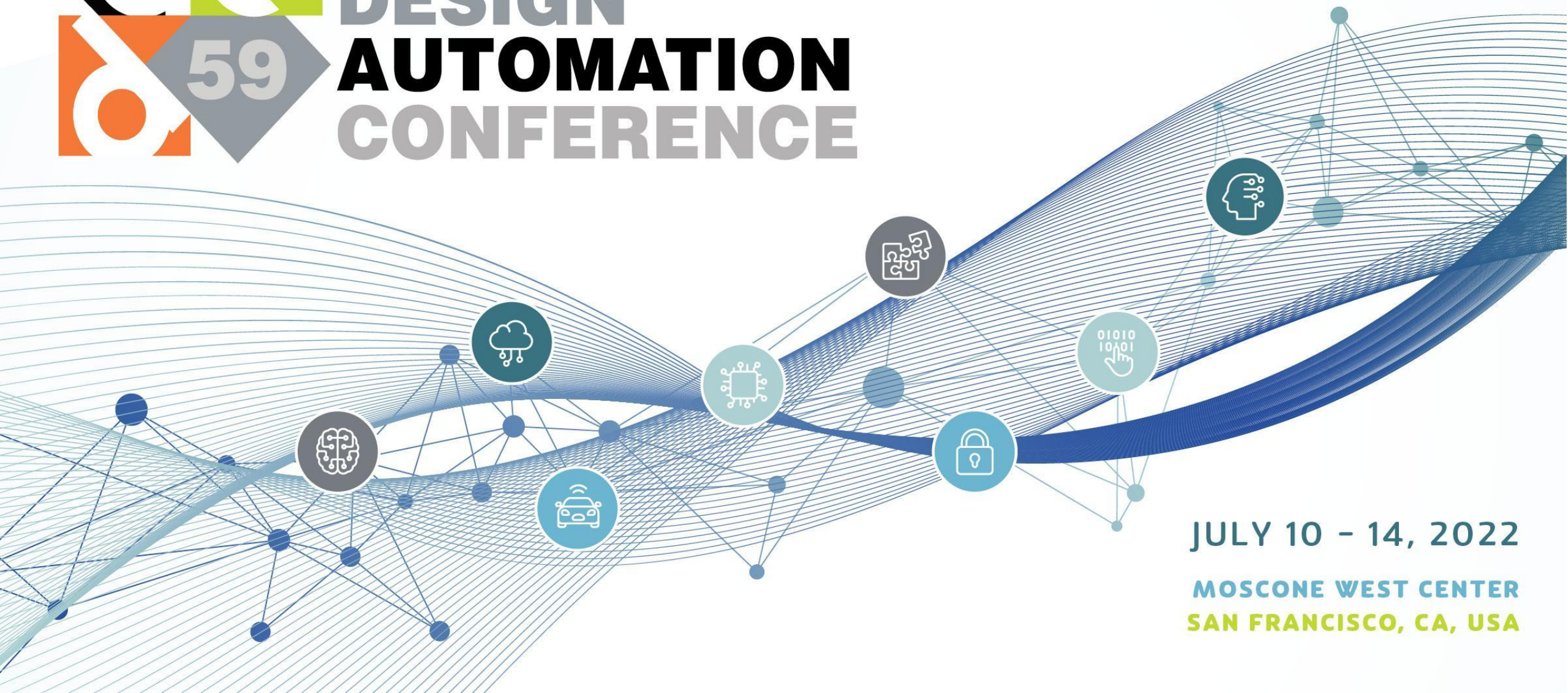




DESIGN **AUTOMATION** CONFERENCE



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MOSCONE WEST CENTER
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Early Android Software Verification With RISC-V Virtual Platforms

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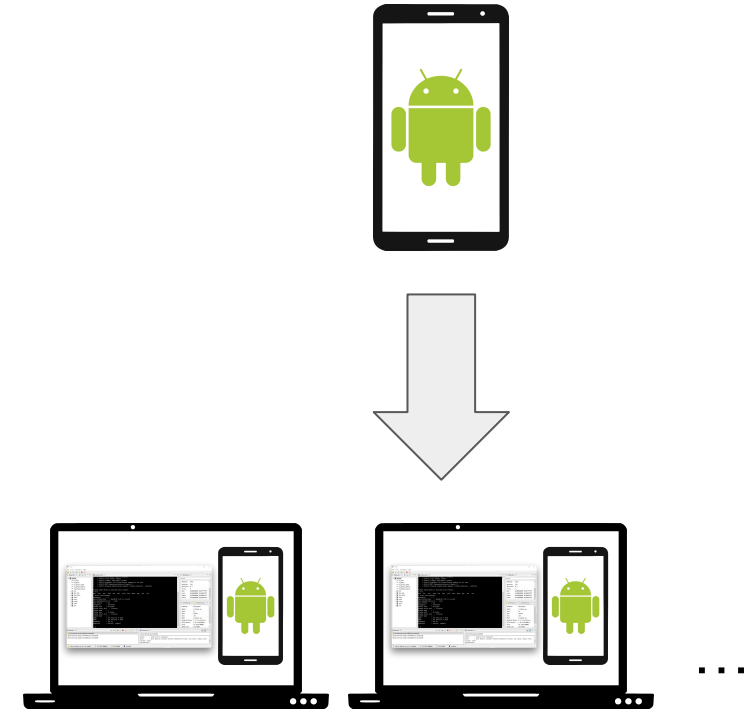


Motivation

- Android OS >70% market share
- RISC-V Android is new/untested
- Lack of Android-capable RISC-V HW
- RISC-V Android emulator not working
- Shift-left with Android RISC-V VP

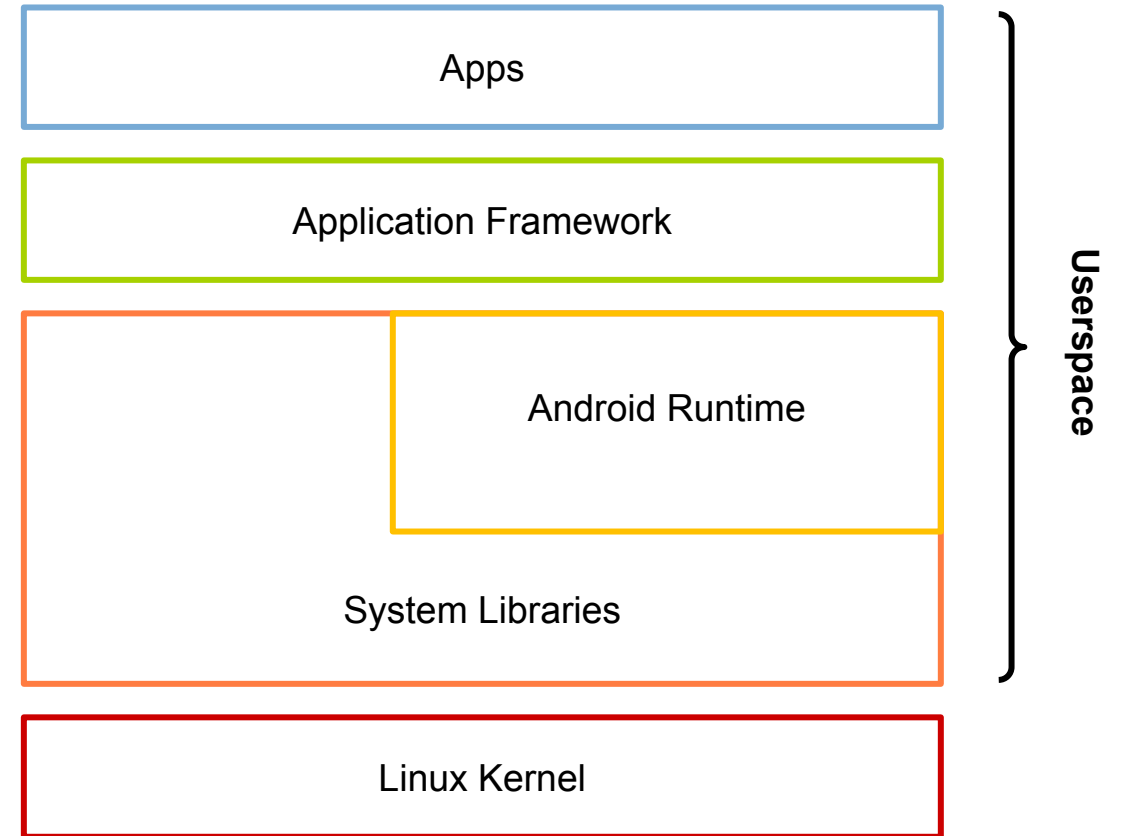
Challenge

- Android stack is huge
 - Boot: >100 billion instructions



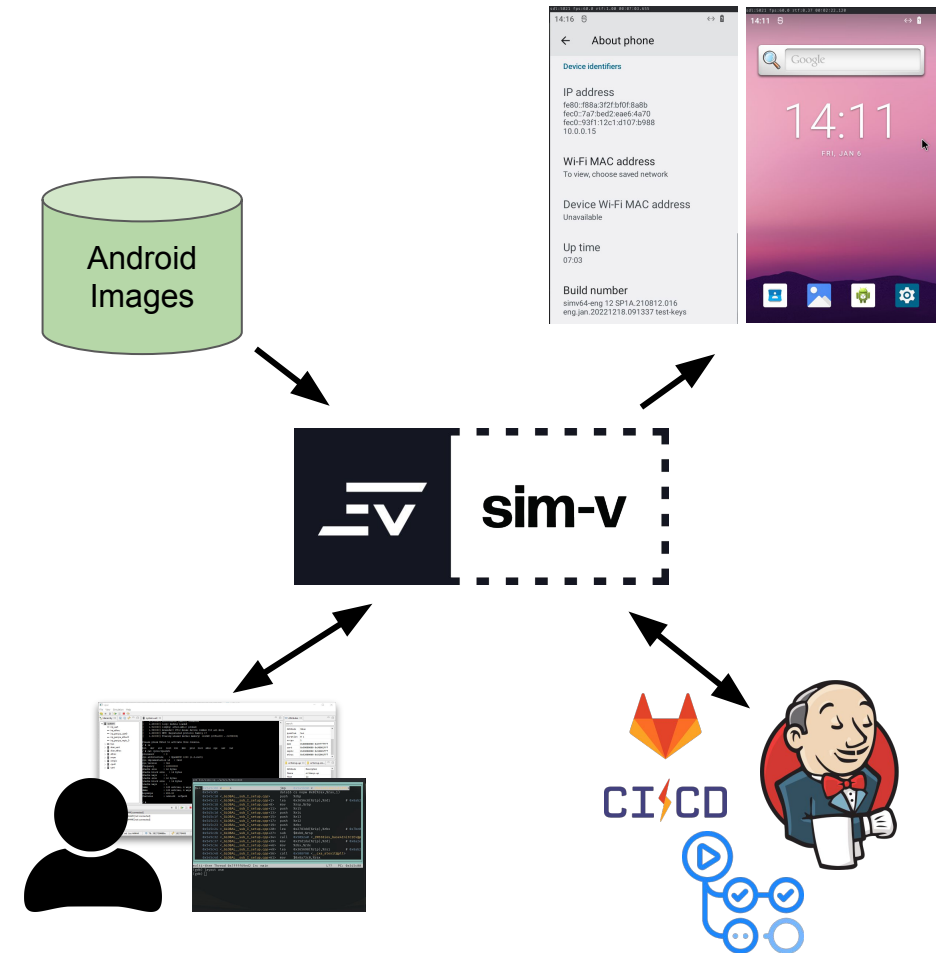
Android Software Stack

- Very complex architecture
- Linux boot + **many** user space applications
- Context switches expensive
- OpenGL graphics library is a requirement for Android
 - OpenGL requires 3D GPU



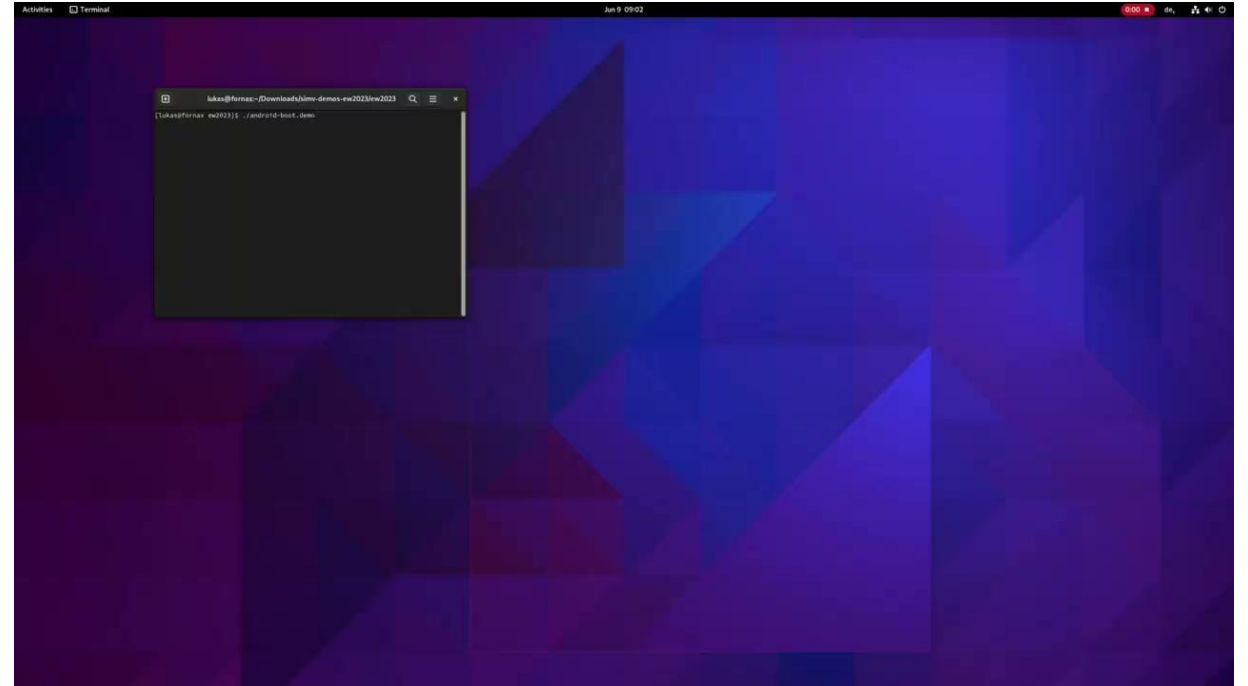
Android With SIM-V

- MW SIM-V is a fast RISC-V VP
 - SystemC TLM-2.0 compatible
 - OpenGL 3D GPU available
- Android 12 fully supported
- Interactive Android debugging
- Python CI integration

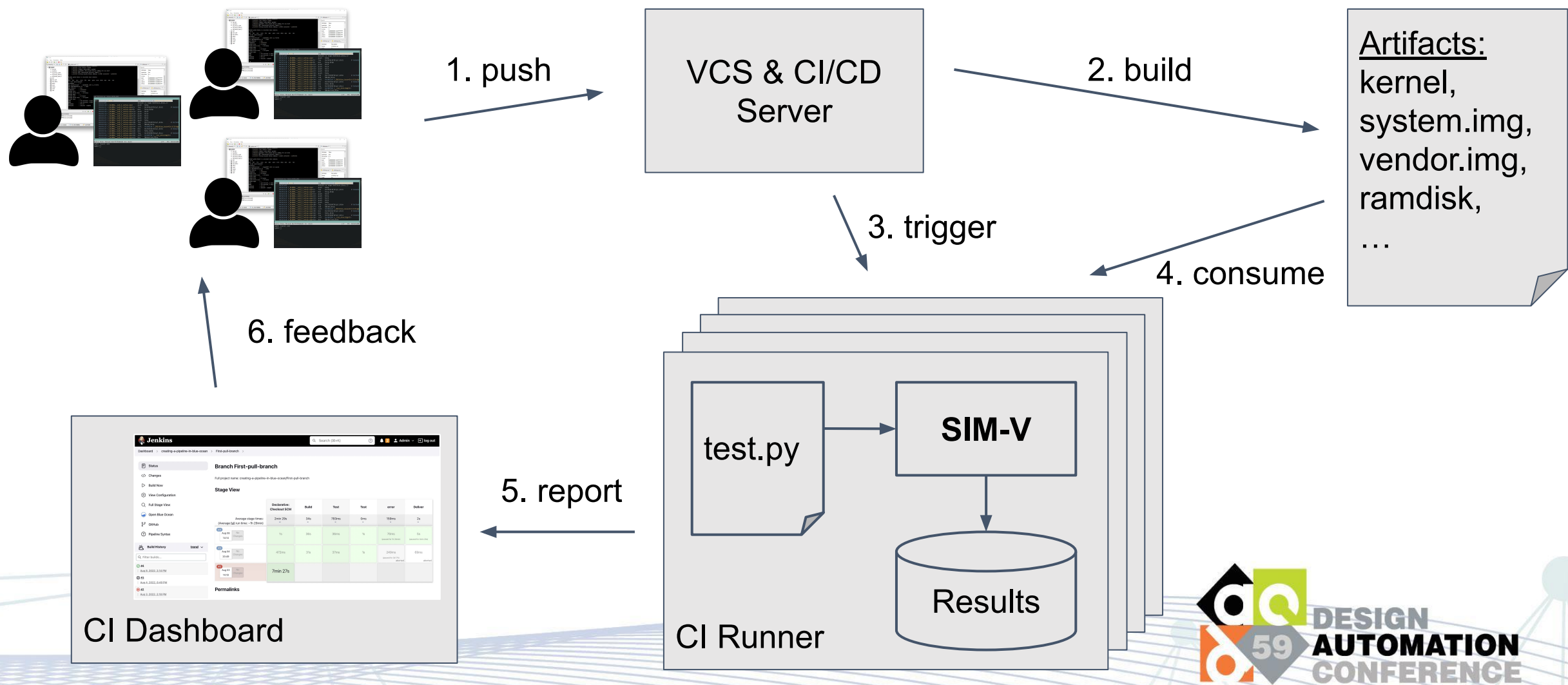


Demo

- Android 12 boot on SIM-V
- Boot time <5 minutes
- Interactive use possible



Android Virtual Device Verification



Summary

- SIM-V boots Android 12 in ~5 minutes
- 3D GPU acceleration supported
- Full introspection and debug

Future Work

- Improve simulation performance
- Android 13 bring-up

