NIDays

WORLDWIDE GRAPHICAL SYSTEM DESIGN

CONFERENCE

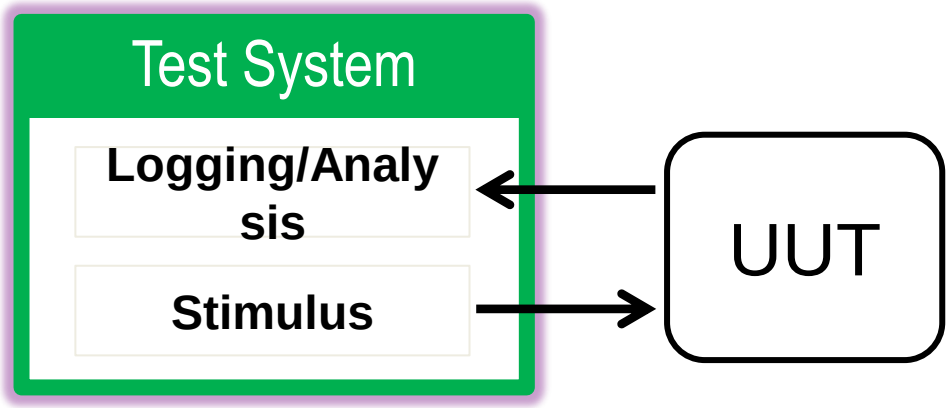
NATIONAL INSTRUMENTS™

Introducing NI VeriStand for creating Hardware In the Loop Test Systems

Presenter name

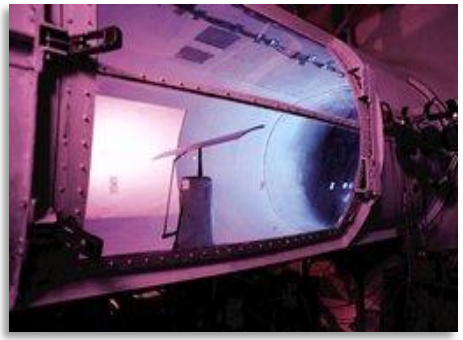
NI-Days 2010

What Is Real-Time Testing?

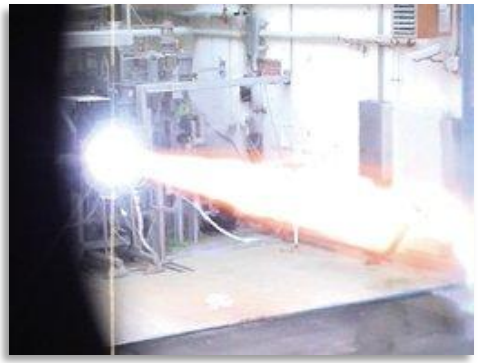


The use of a real-time environment as part of a test system to increase performance or reliability.

Real-Time Testing Examples



- Stimulus – Response Testing
- Durability Testing
- Environmental Testing
- Wind Tunnel Testing
- Dynamometer Testing
- Hardware-in-the-Loop (HIL) Testing
- Model-in-the-Loop (MIL) Testing



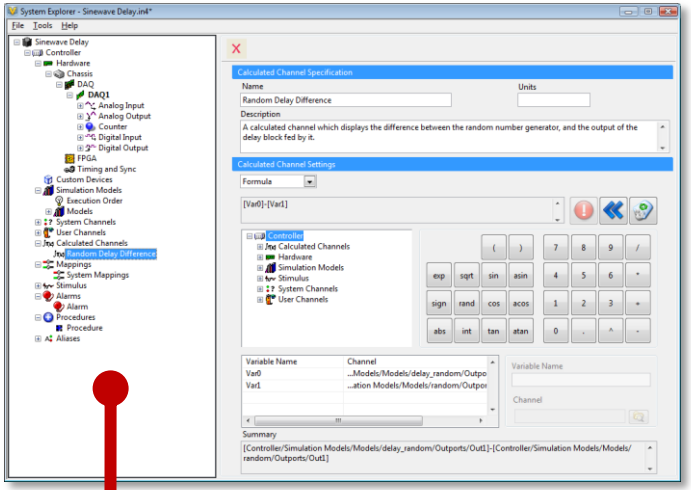
NI VeriStand™

Real-Time Testing and Simulation Software

- Stimulus Generation
- Data Logging
- Configurable I/O
- Alarming
- Calculated Channels

- Run-Time Editable User Interface
- User Management
- Multichassis Synchronization
- Closed-Loop Control
- Deterministic Model Execution

Configure Real-Time Application



I/O
Calc
Channel
Alarms
Controllers

Deploy Real-Time Stimulus/Logging Profiles

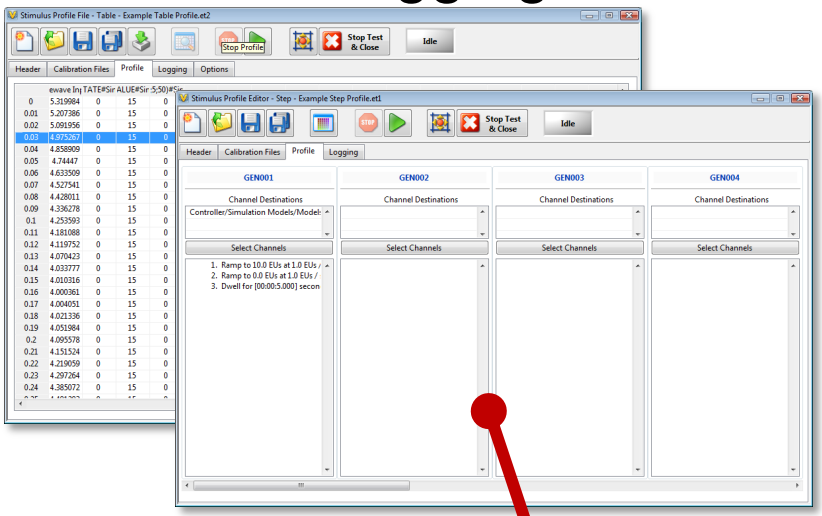
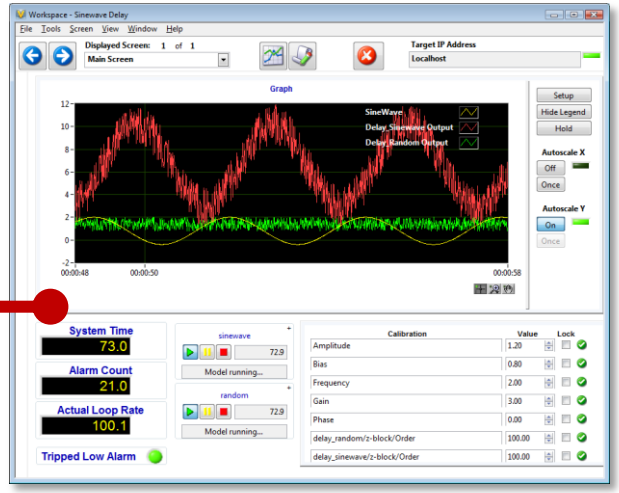


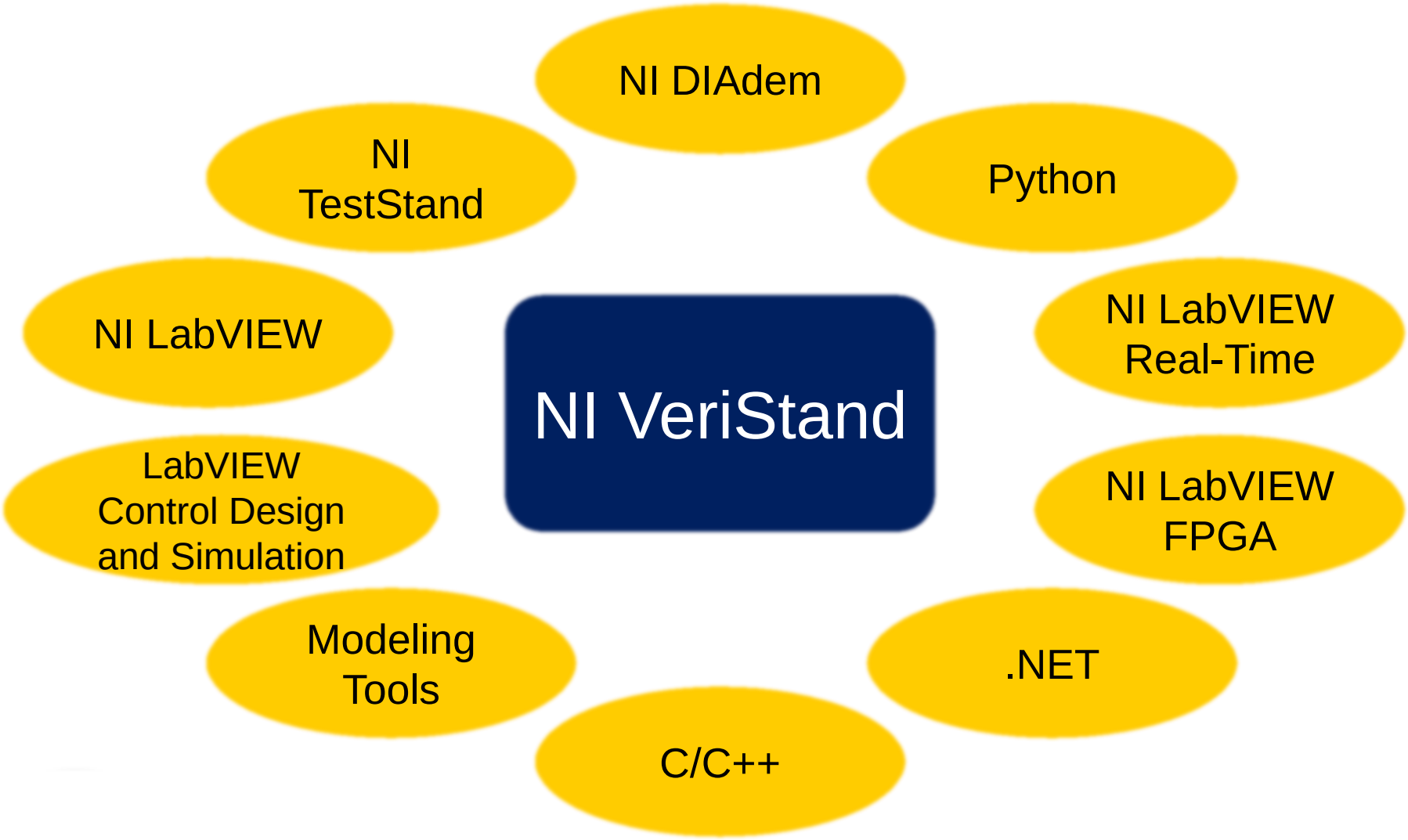
Table- and Step-Based Stimulus

Run-Time Editable



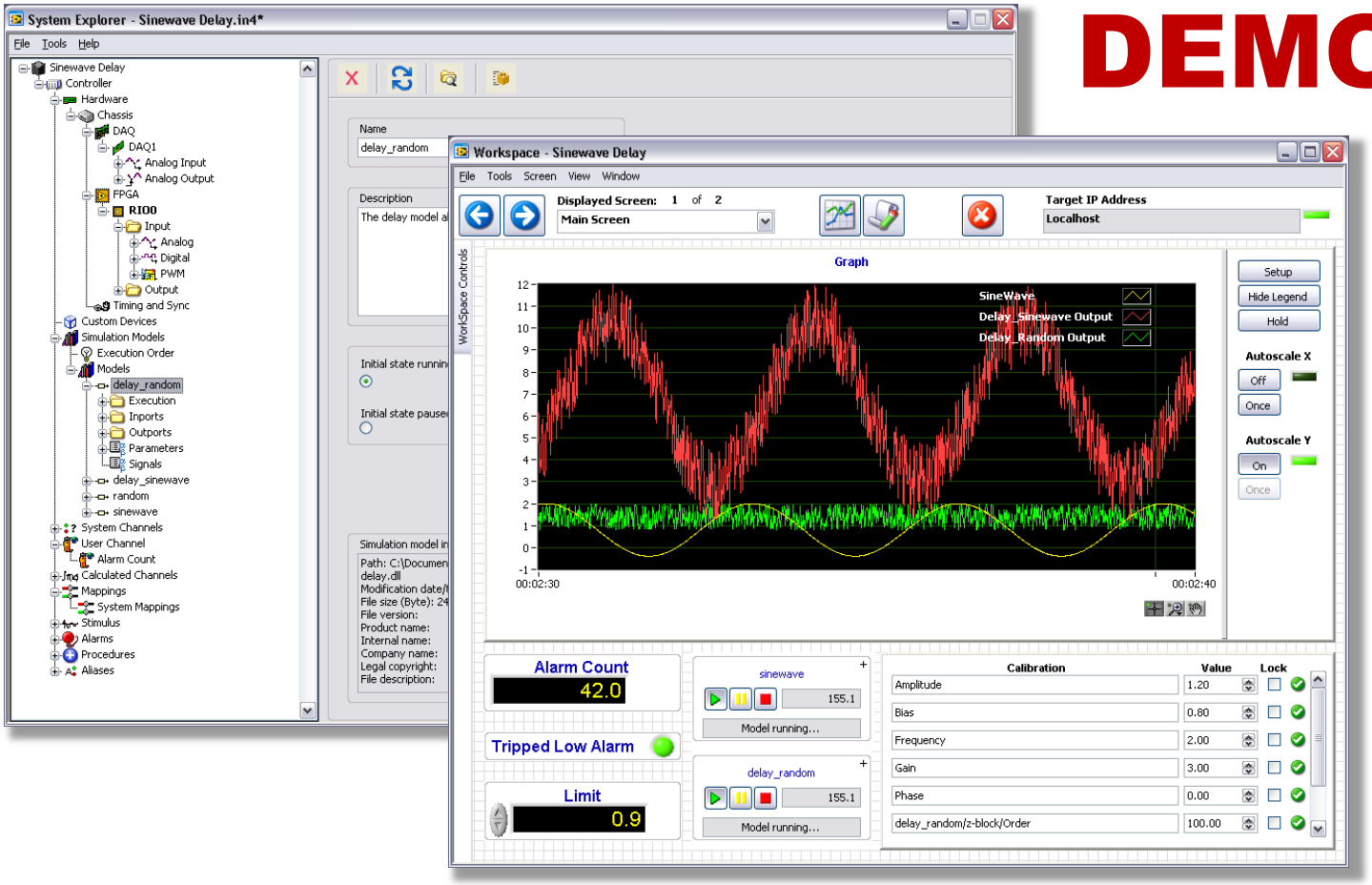
Create UI at Run Time

Open Software Environment



NI VeriStand™

Real-Time Testing and Simulation Software



DEMO

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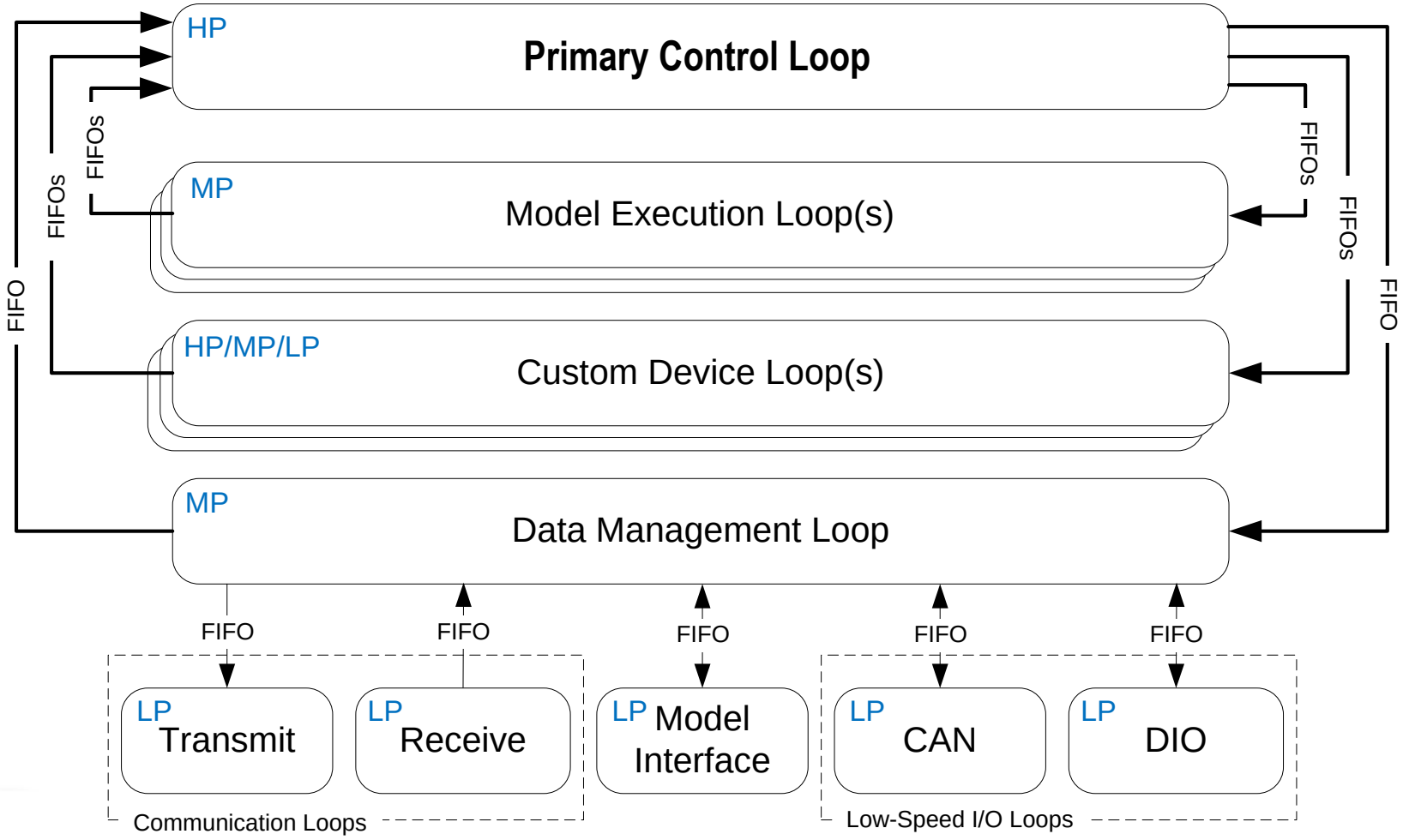
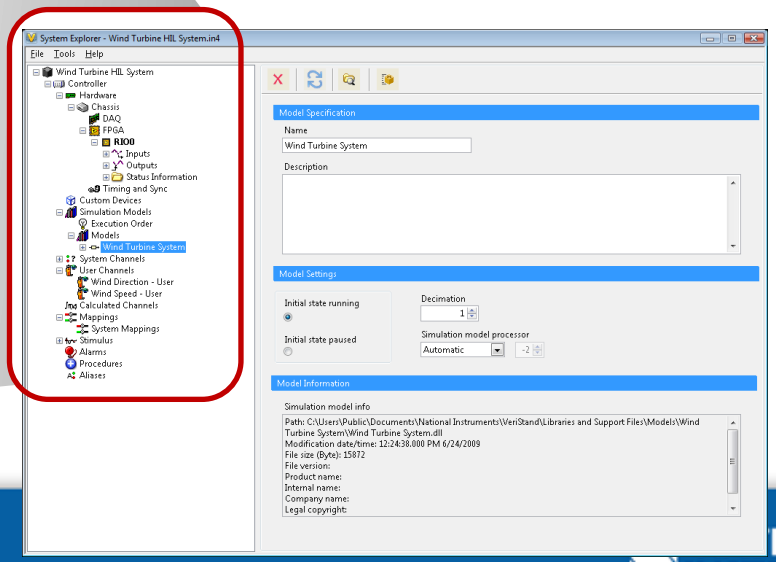
NI VeriStand Engine Architecture



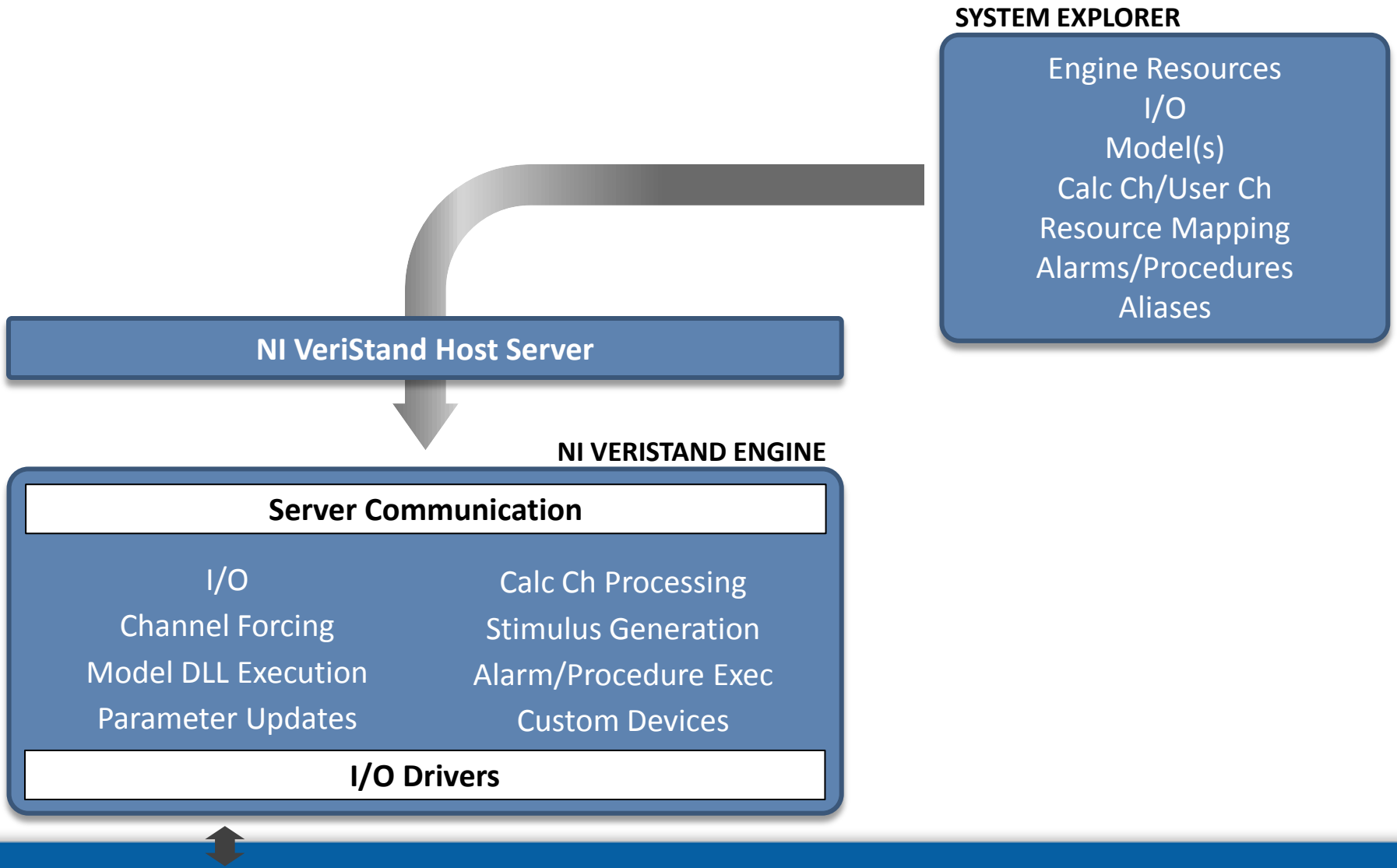
NI VeriStand Framework

SYSTEM EXPLORER

Engine Resources
I/O
Model(s)
Calc Ch/User Ch
Resource Mapping
Alarms/Procedures
Aliases

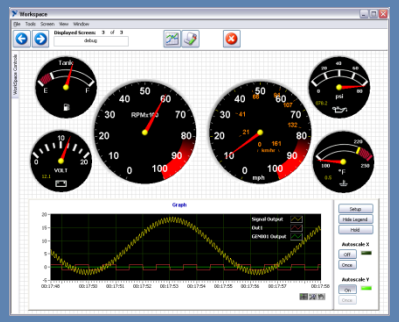


NI VeriStand Framework



NI VeriStand Framework

WORKSPACE



User Interface

NI VeriStand Host Server

NI VERISTAND ENGINE

Server Communication

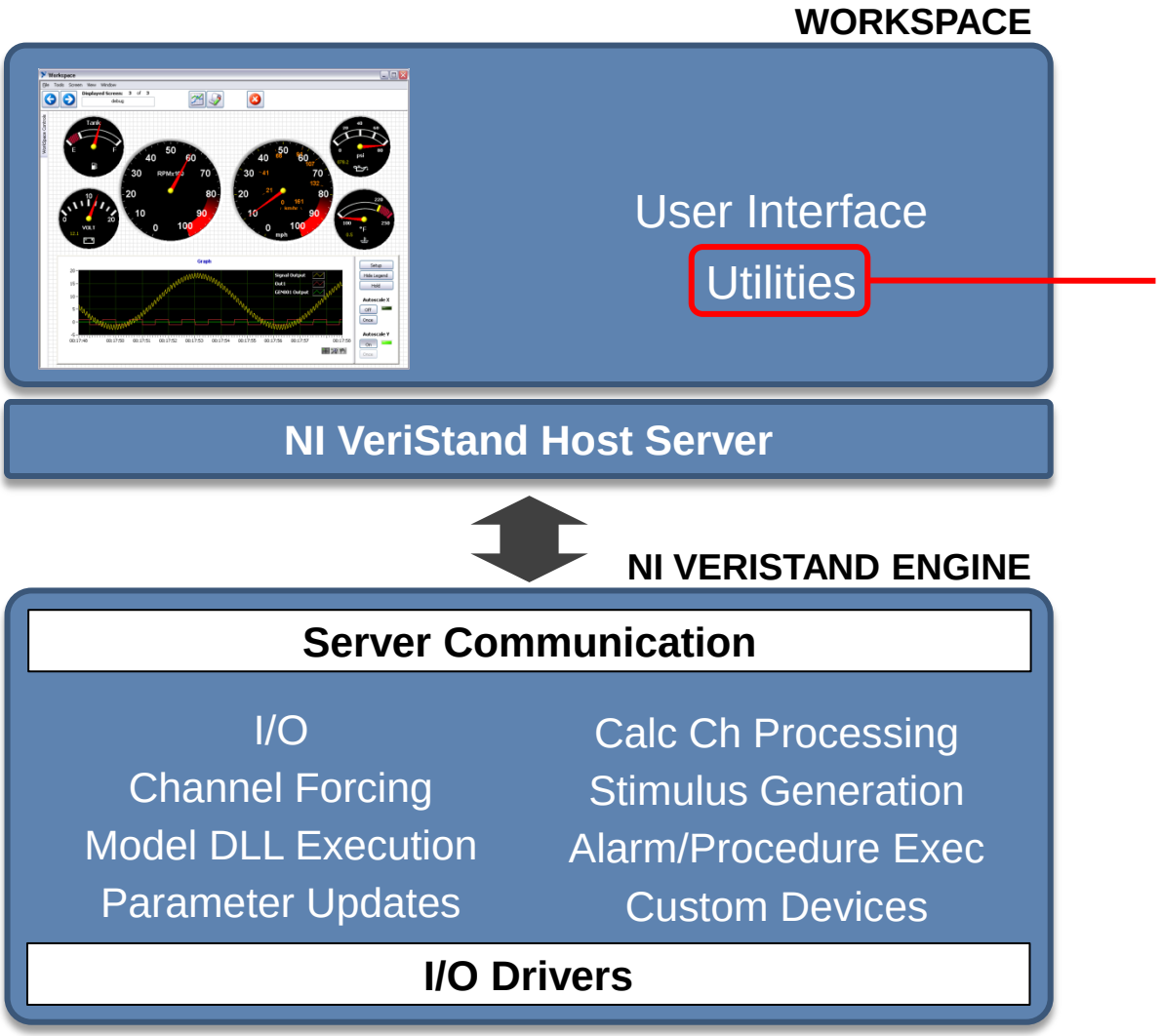
I/O
Channel Forcing
Model DLL Execution
Parameter Updates

Calc Ch Processing
Stimulus Generation
Alarm/Procedure Exec
Custom Devices

I/O Drivers

FPGA I/O

NI VeriStand Framework



OBSERVE

- Alarm Monitor
- CAN Bus Monitor
- Channel Data Viewer
- TDMS File Viewer
- Real-Time Consol Viewer

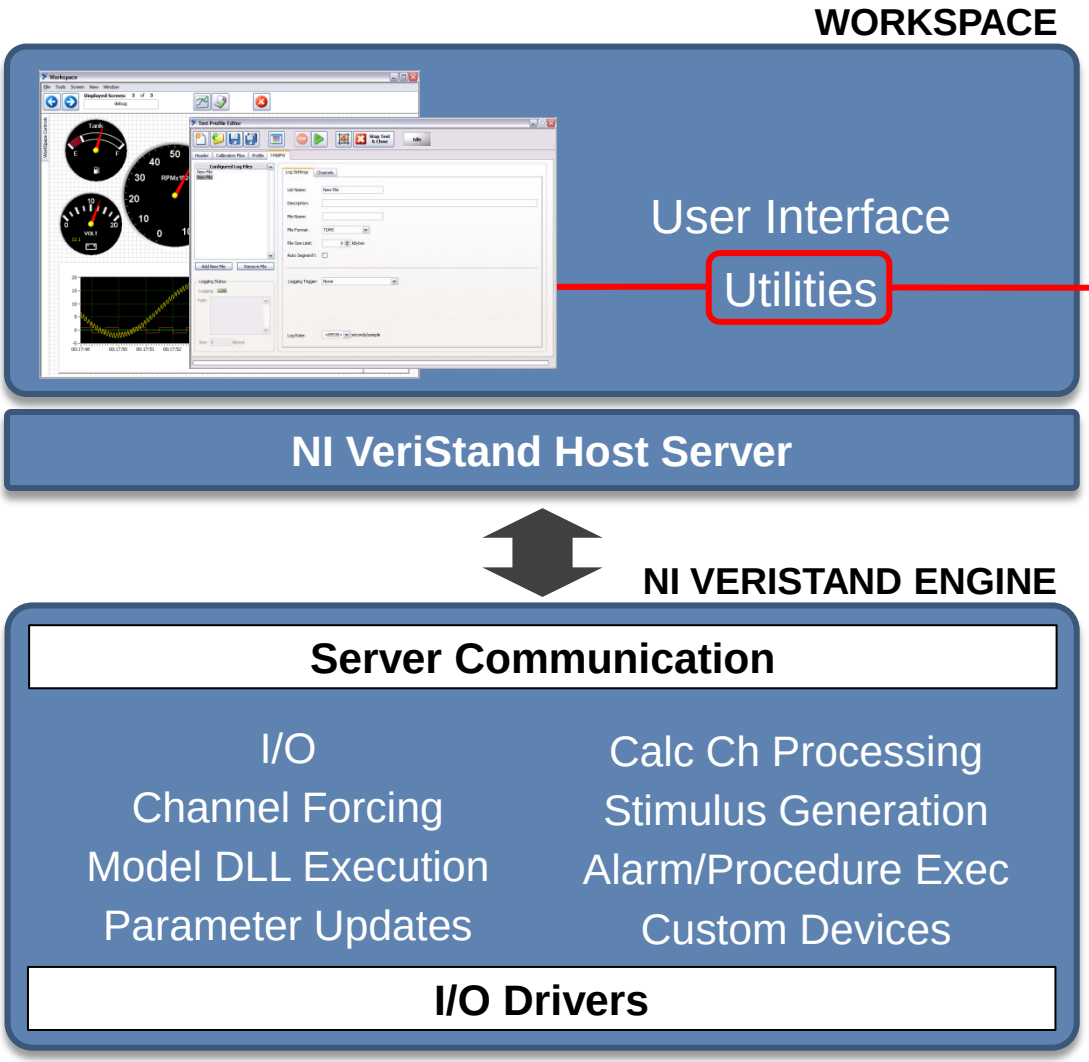
ACTION

- Channel Scaling and Calibration
- Channel Value Forcing
- Stimulus Profile Editor

CONFIGURATION

- Model Parameter Manager
- Alarm Manager

NI VeriStand Framework



STIMULUS PROFILE EDITOR

- Profile Setup
- Load Model Parameters
- Stimulus Profiles
- Data Logging

NI VeriStand Stimulus Profiles

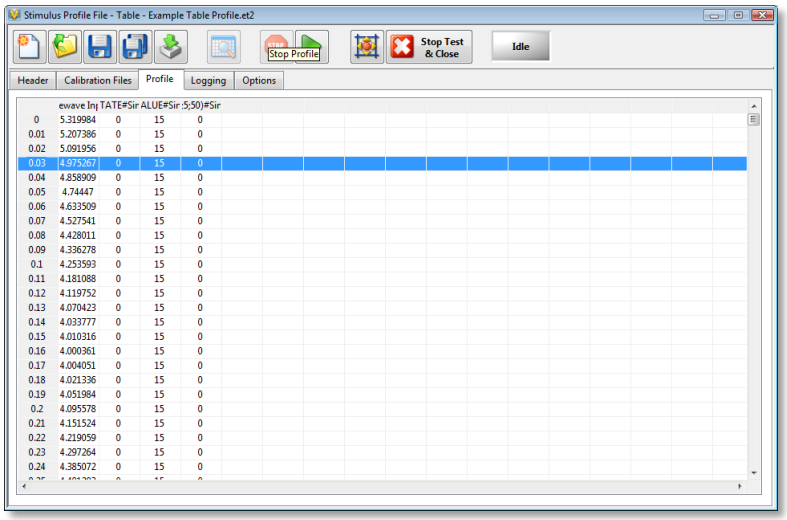
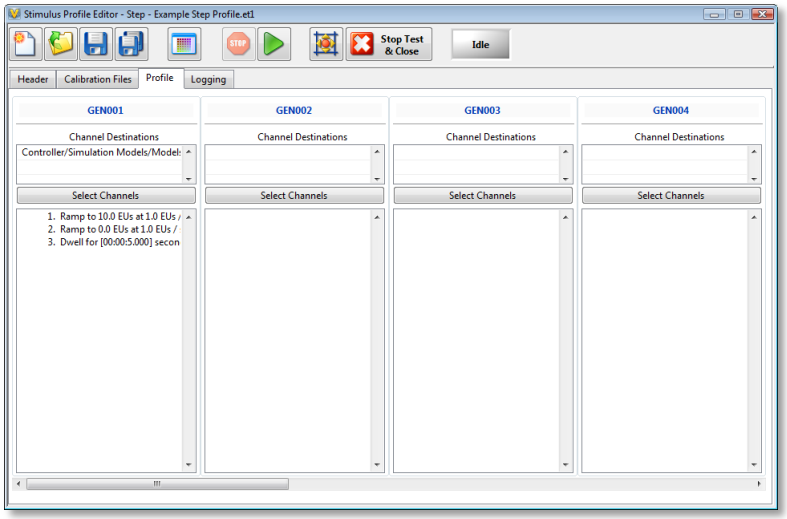
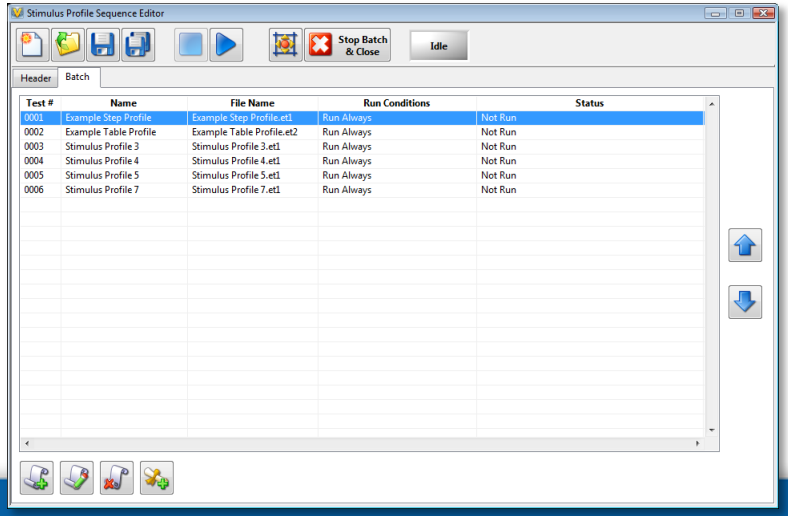


Table-Based Stimulus Profiles

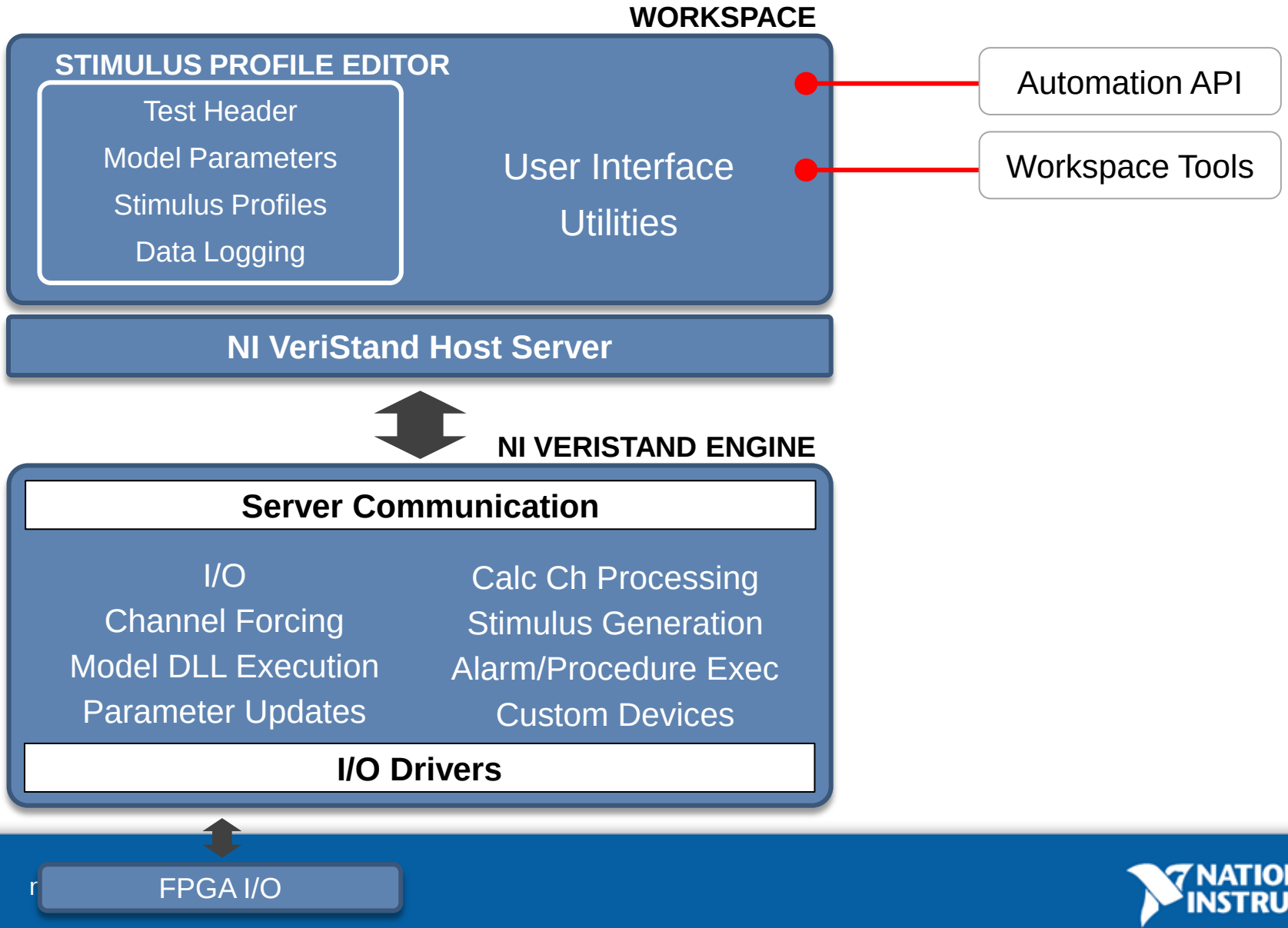


Step-Based Stimulus Profiles

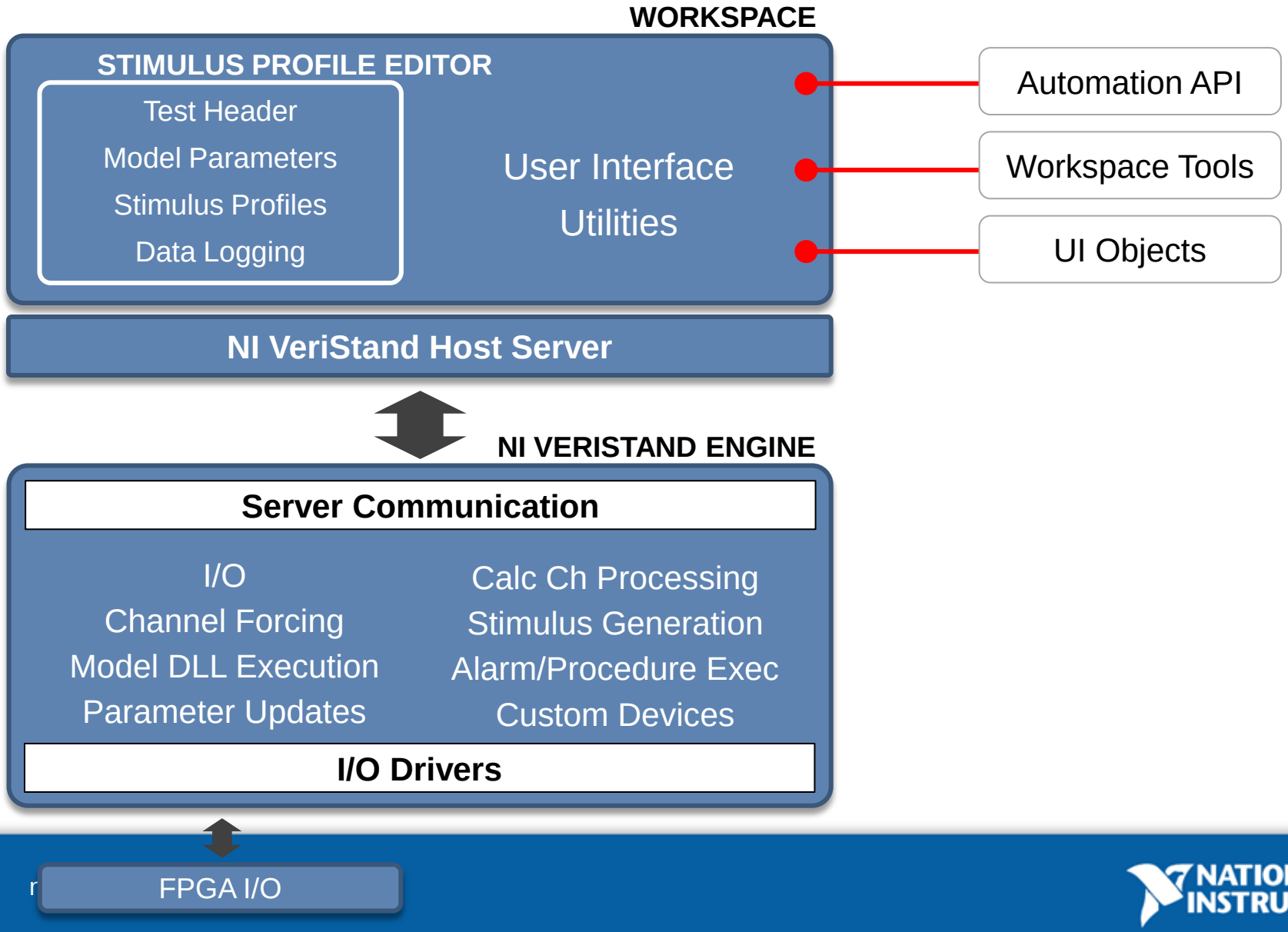


Stimulus Profile Sequence

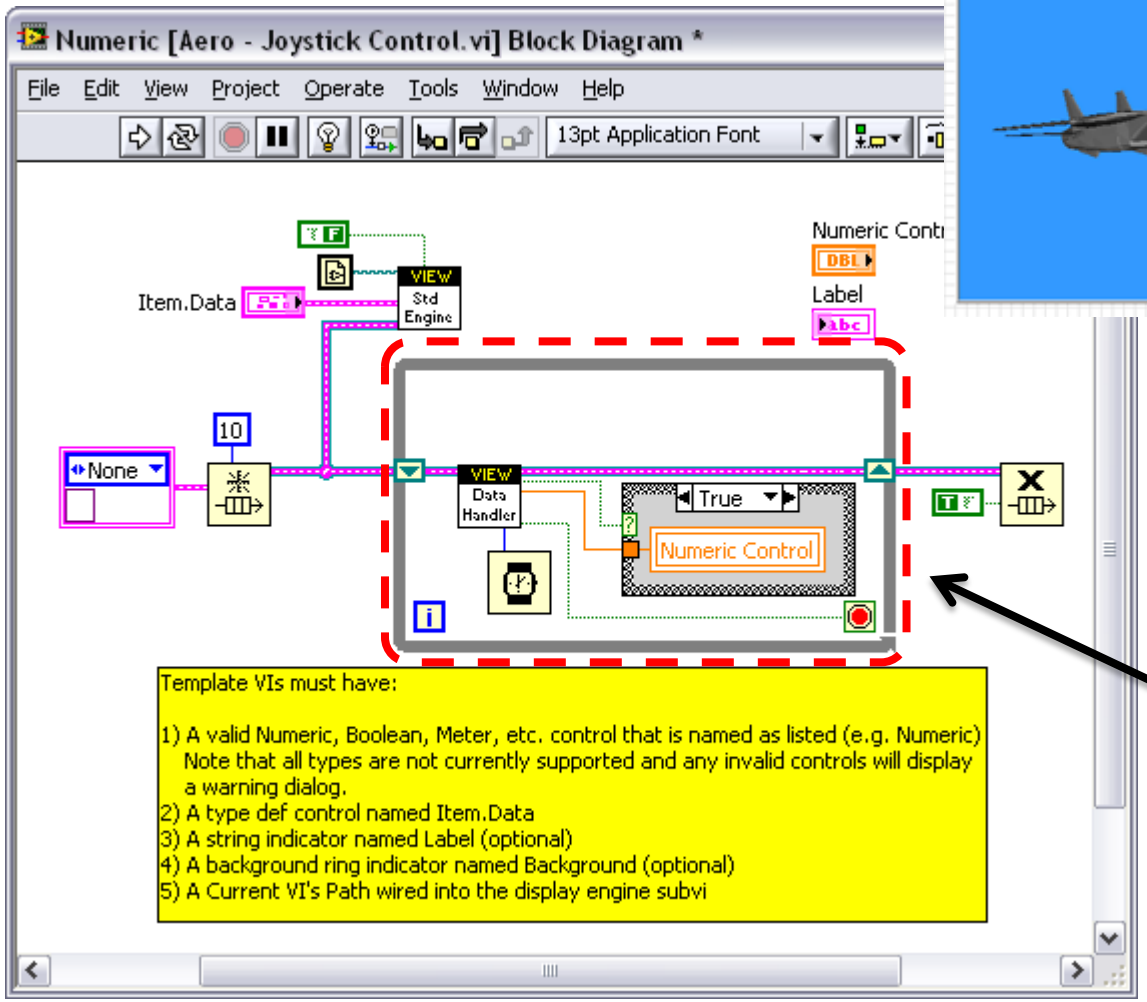
NI VeriStand Customization

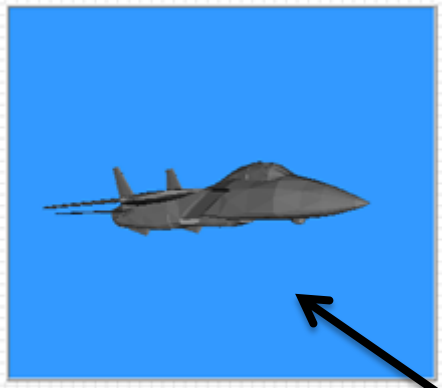


NI VeriStand Customization



Custom UI Object

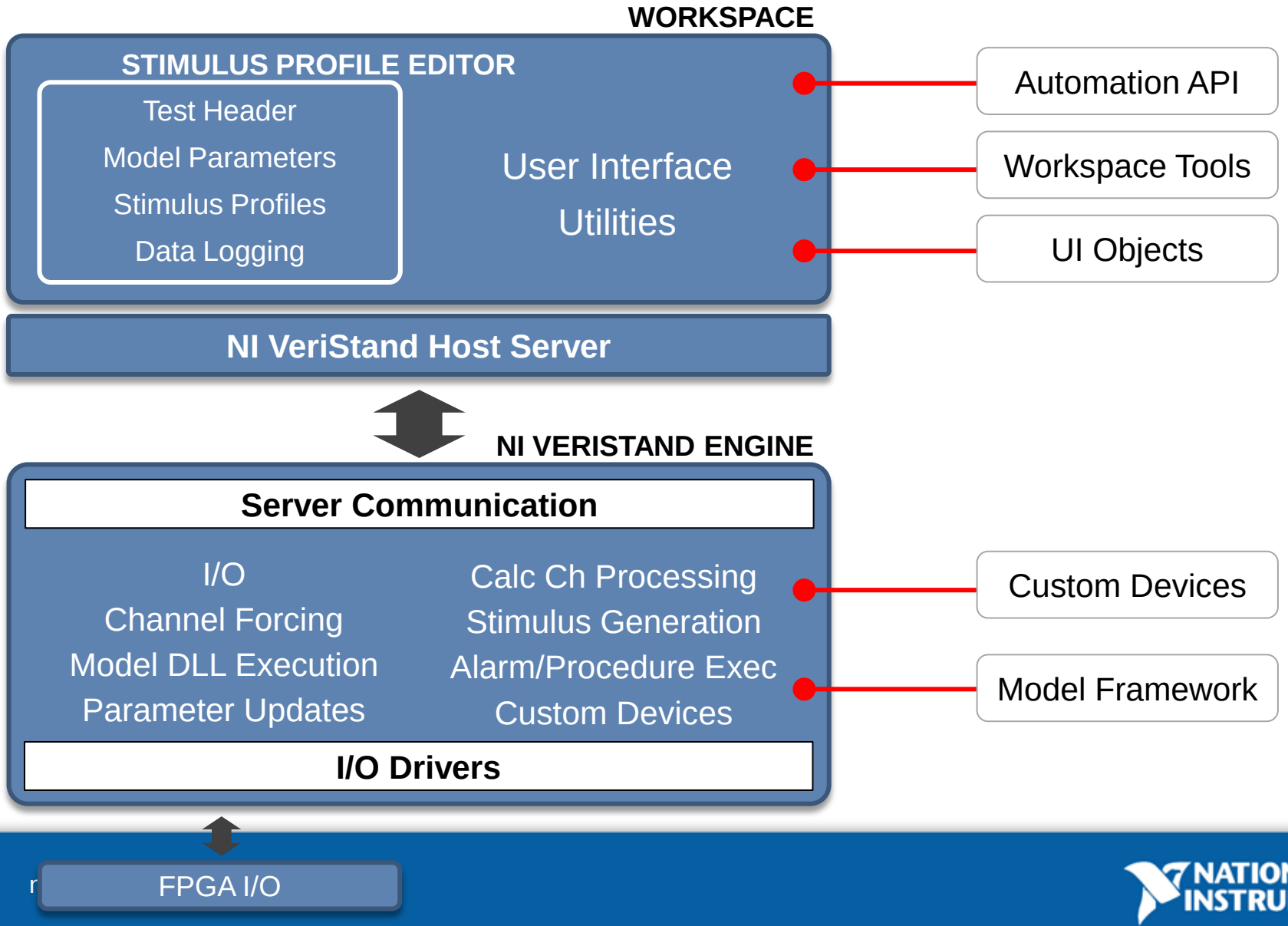




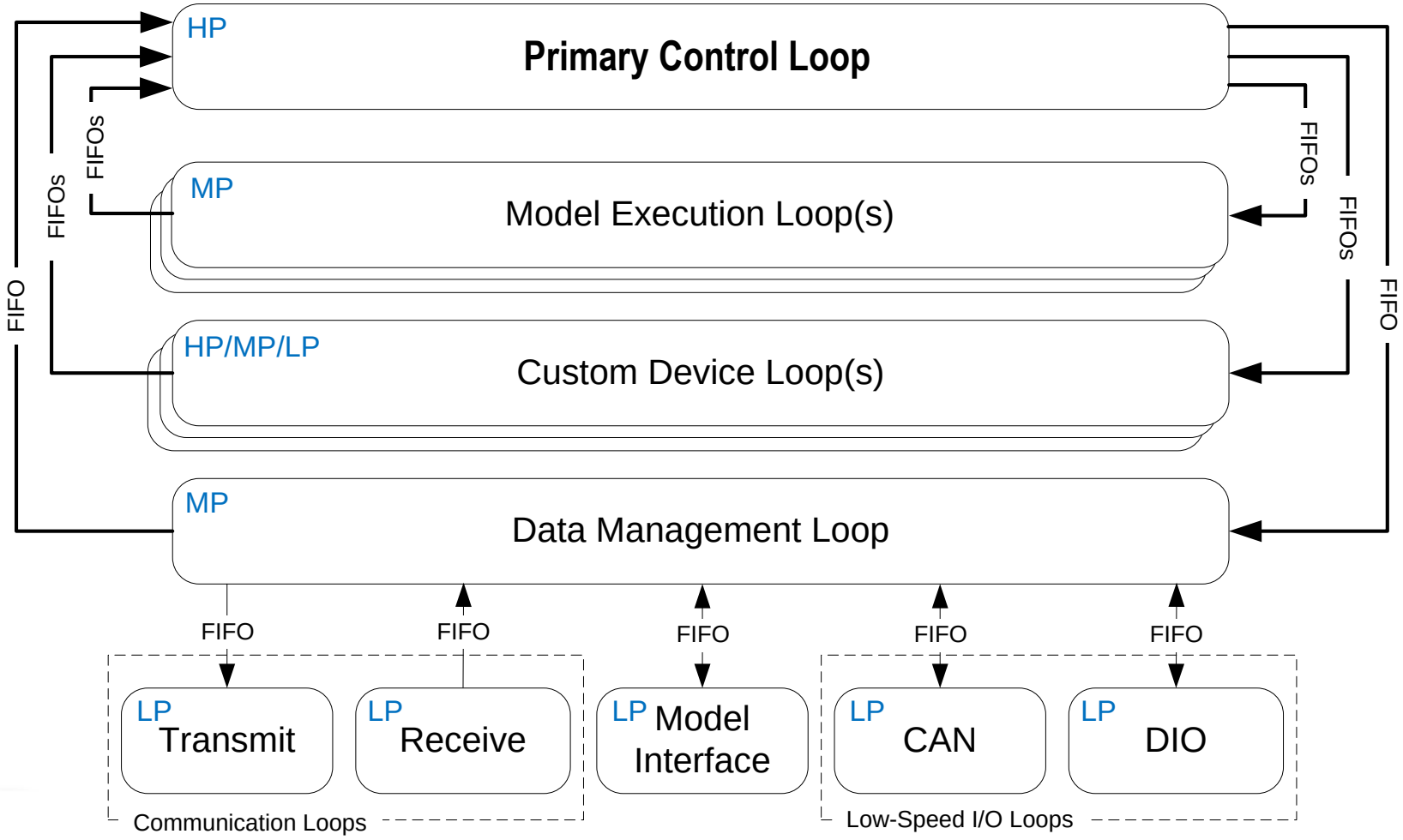
Create custom UI object

Add custom functionality

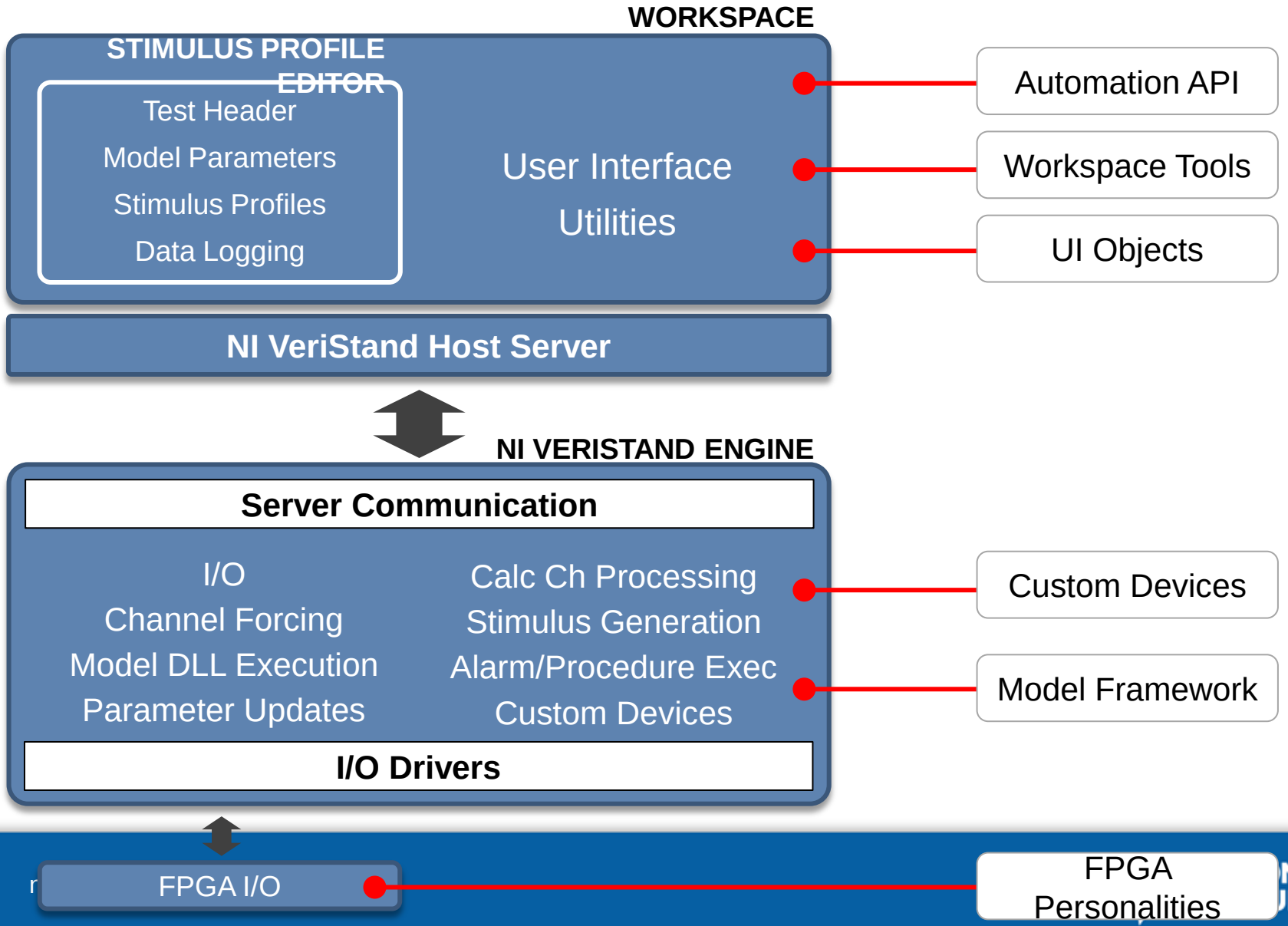
NI VeriStand Customization



NI VeriStand Engine Architecture

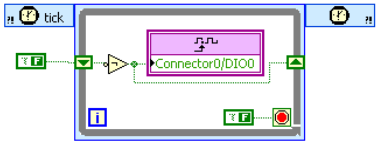


NI VeriStand Customization

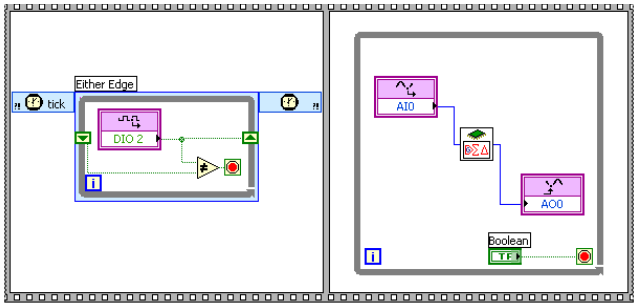


Custom FPGA Personalities

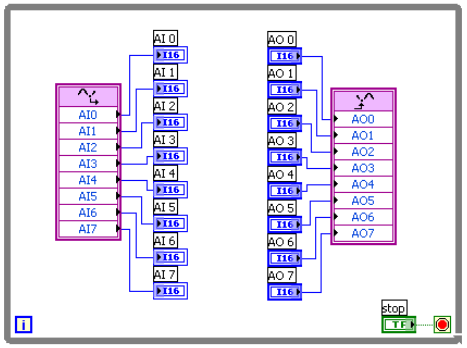
Clocks



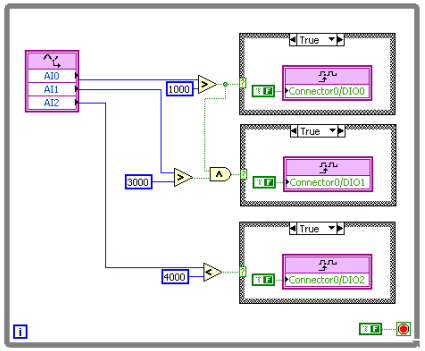
Timing and Synchronization



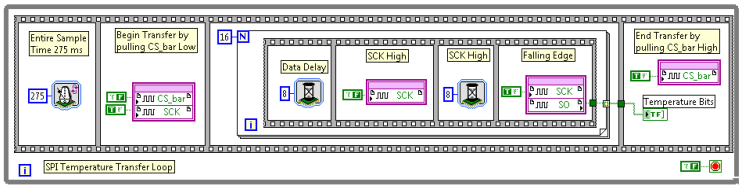
Analog I/O



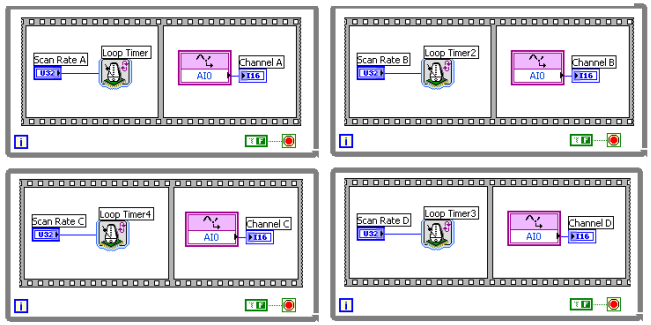
Triggering



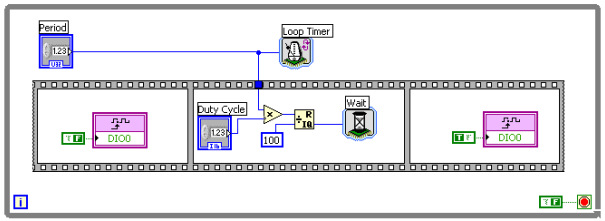
Digital Protocols



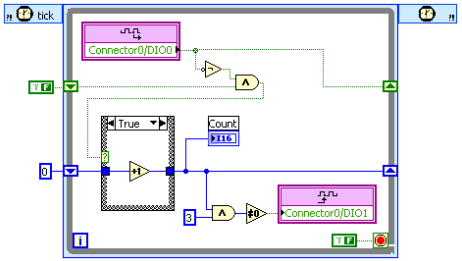
Multirate/Async I/O



PWM



Counters



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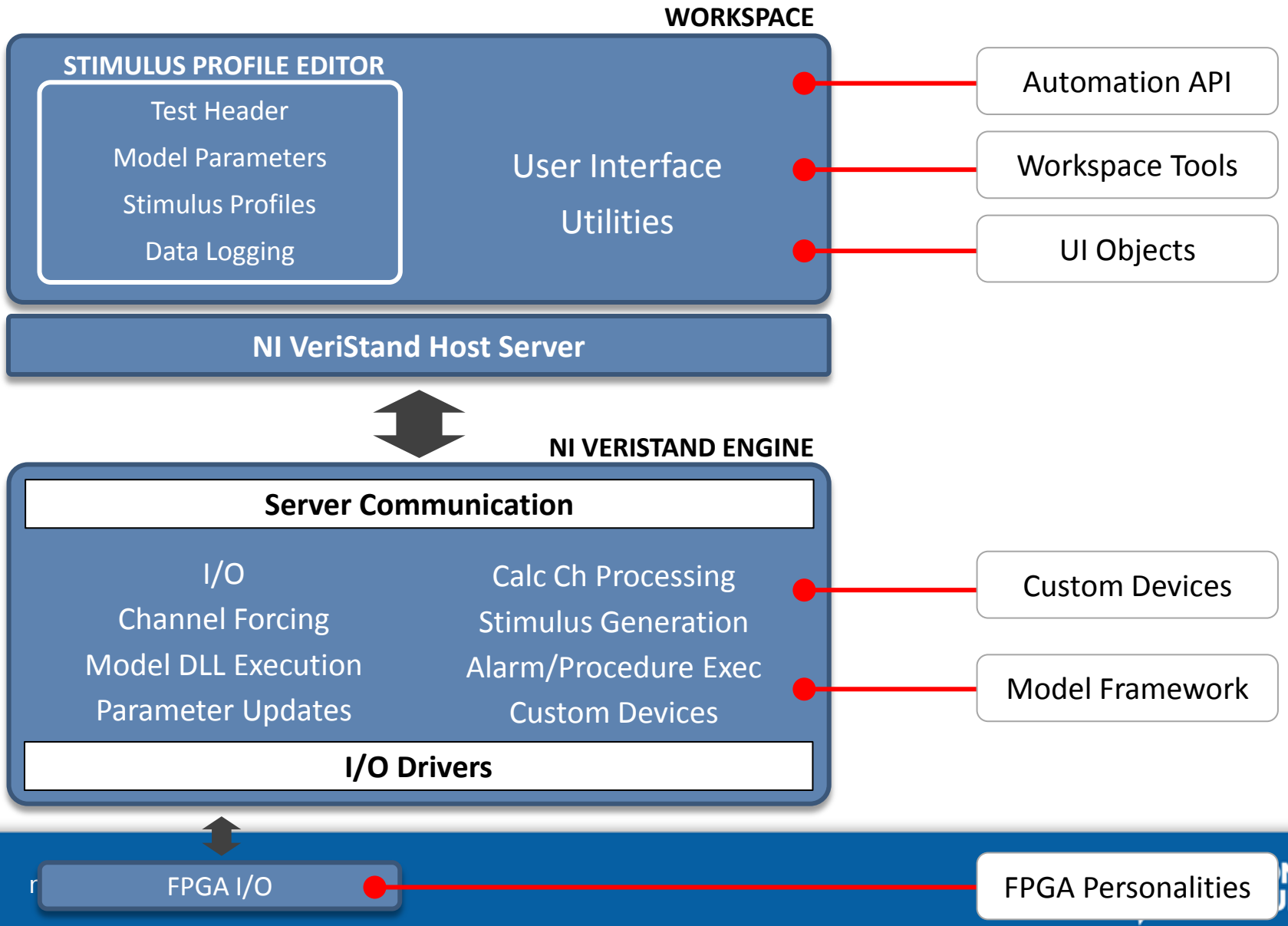

Hardware Support

Real-Time PXI

- Most NI-DAQmx Devices (inc NI X Series and SCXI)
- NI R Series Devices
- NI CAN Devices
- Goepel LIN Interface

Real-Time PC

Real-Time Industrial Controller

- Lambda Power Supply
- NI Timing and Sync
- NI-XNET Devices
- NI FIU Devices
- *Custom Devices*

Windows PC*

* I/O Support through *Custom Devices* only

Supported Modeling Environments

Supported

- The MathWorks, Inc. Simulink® software
- LabVIEW Control Design and Simulation
- MapleSim models from Maplesoft
- SimulationX from ITI
- Tesis DYNA models
- NI MATRIXx SystemBuild
- Esterel SCADE Suite
- C/C++
- FORTRAN

In Work

- CarSim from Mech Sim Corp.
- GT-POWER engine models from Gamma Technologies Inc.
- AMESim models from LMS
- WaveRT from Ricardo
- VI-grade models
- Visual Solutions (VisSim)
- Dynasim models from Dymola

Additional Resources

ni.com/veristand

- Demonstration Videos
- Getting Started Resources
- White Papers
- Add-Ons
- Download Evaluation Version

- NI-Days Hands-On session, starting at __:__