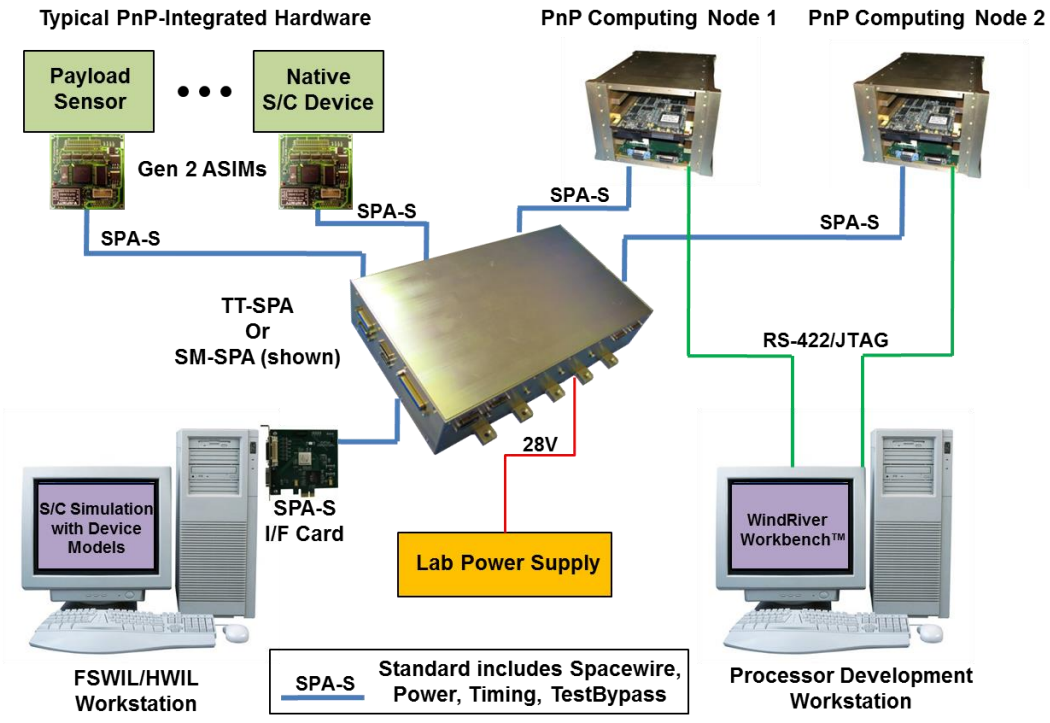
PnP Innovations, Inc

PnP Computing Testbench

Integrated Development, Debugging, and Test Environment for Plug-and-Play Computing

The PnP Computing Testbench is an integrated bench-top environment to allow application developers to author, debug, and test PnP software modules. The heart of a physical setup consists of TT-SPA or SM-SPA units. These contain the electronics to support routing of SpaceWire data, distribution of 28V power to endpoints, time synchronization, and TestBypass. TT-SPA is a low-priced lab-grade option, while SM-SPA is intended to mount on a satellite using a standard mechanical grid. PCIe SPA-S host interface cards, ASIM Endpoint Simulators, and PnP Computing Nodes are then incorporated into the network to build tailored PnP-based development and test systems. The host machine facilitates early code prototyping with Flight Software In the Loop (FSWIL) capabilities allowing code modules to be tested against virtual spacecraft devices presented by the *Spacecraft Design Tool* (SDT). Fundamental issues such as proper component registration, data query convergence, and component message interconnection can be verified using a comprehensive set of interactive tools.

Once prototype code is validated to satisfaction, those code modules may be migrated to a flight-like processing environment. Wind River's Workbench™ platform is fully integrated with PnP Innovations' SPA Computing Nodes. Applications may be dynamically loaded, debugged on flight-like targets while interacting with SPA devices over a SPA-S (SpaceWire) data network, and profiled with COTS Interactive Development environments such as Windriver's Workbench™ – providing full visibility into the system operation at the kernel, application, and processor levels. Because all network transactions occur across a system comprised of components that have a direct path to flight. The PnP Computing Testbench can be used to validate flight code with a high degree of certainty before it is transitioned to the satellite system.



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