JUST IN REAL TIME

Hardware in the loop testing systems generally require a real-time capability to fulfill test and simulation requirements. There are various activities with respect to retrofits and new designs of hardware in the loop systems including changes of hardware backplanes and the software environments. On the hardware side 'traditional' test system backplanes like VME are progressively being replaced by PCIe and PXIe for different reasons.

With such architectural changes in the hardware, the software environment is also impacted, since these backplanes are typically controlled from PC architectures. AIM has recently introduced board software packages for the RTX64 RTOS extension for Windows allowing users applications control over the AIM ARINC429, MIL-STD-1553 and serial interfaces (with special protocol on the RS485 physical layer) in real-time to support a customer migration onto PCIe platforms for future test system implementation (see figure 1). In this case AIM's portfolio of native PCIe products along with XMC interface boards for various avionics data buses offer a suitable hardware interface baseline for HIL test systems.

Another approach from the software point of view is to use real-time Linux based PXIe platforms for hardware in the loop test system implementation. Again, AIM serves such environments by a set of available native PXIe based interface boards for ARINC429, MIL-STD-1553, ARINC664P7/AFDX and STANAG3910, all of which can be operated in PXIe systems in a real-time Linux environment. Compatibility to a National Instruments-based target system with real-time Linux has been recently proven, allowing the use of AIM interface boards via C-Programming or even from LabViewRT applications based on real-time Linux-based target systems (see figure 2).

When envisaging a new test system architecture, AIM can offer a wide range of products for different backplanes with compatibility to the above mentioned real-time software environments, but not only limited to these. \\

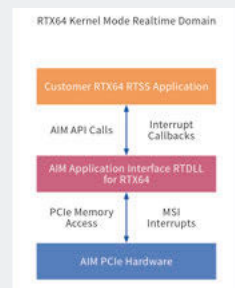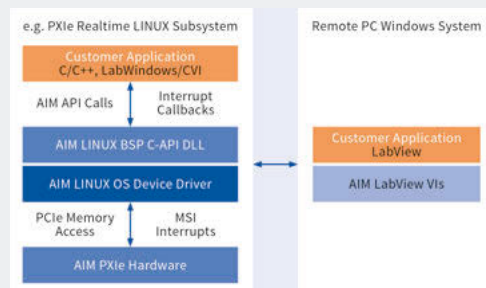Figure 1: Application Interfacing in RTX64 environment

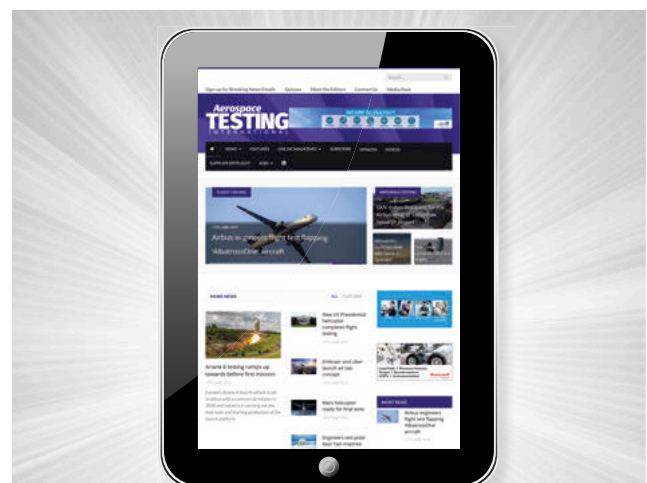Figure 2: Application Interfacing in a PXIe Realtime LINUX environment

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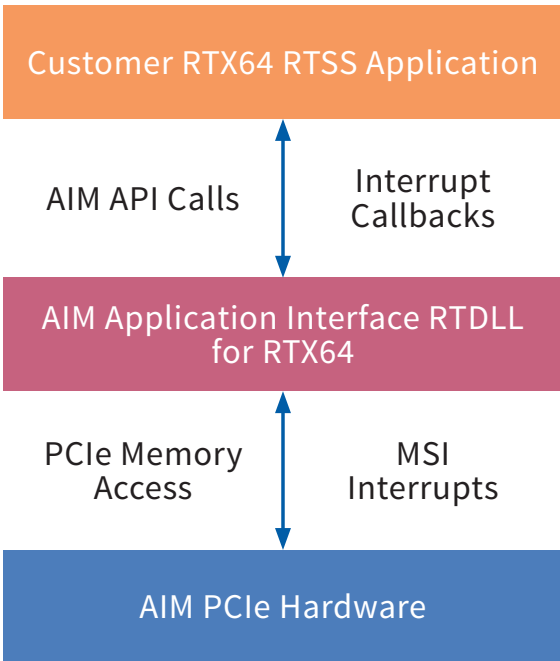
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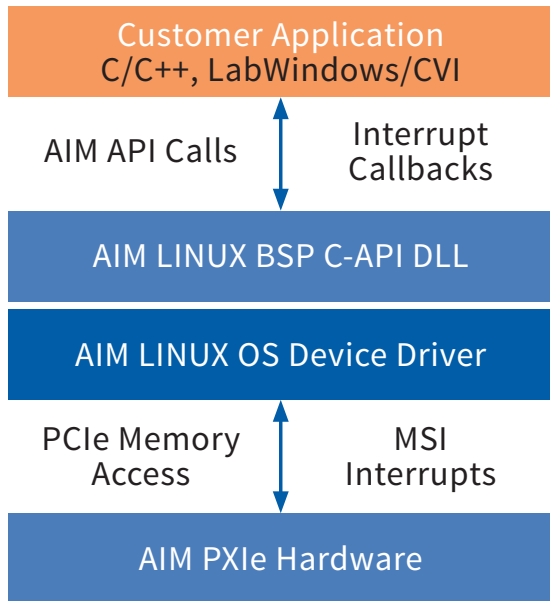All the latest news · Exclusive features · Industry interviews
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RTX64 Kernel Mode Realtime Domain

Customer RTX64 RTSS Application

AIM API Calls   Interrupt
                       Callbacks

AIM Application Interface RTDLL
for RTX64

PCIe Memory   MSI
Access   Interrupts

AIM PCIe Hardware

e.g. PXIe Realtime LINUX Subsystem

Customer Application
C/C++, LabWindows/CVI

AIM API Calls   Interrupt Callbacks

AIM LINUX BSP C-API DLL

AIM LINUX OS Device Driver

PCIe Memory Access   MSI Interrupts

AIM PXIe Hardware

Remote PC Windows System

Customer Application
LabView

AIM LabView VIs