



Figure 5 – Complete hardware-firmware-software reference design

**Customization, Packaging and System Integration**

To prove out and further develop the system, we created a security/surveillance demonstration along with all software layers, which allows users to rapidly integrate our product in their systems at various layers (see sidebar). The high-level block diagram of the complete SoC design, which encompasses hardware IP cores, firmware and software in a single reference design, is shown in Figure 4.

We can combine system integration with flexible customization at varying levels within the hardware, firmware and software components. The server-level customization can include tailor-made SoC designs in FPGA, while at the client (configuration) level, modifications are applied

to the WIN32 or .Net API layers. This scheme allows us and our customers to rapidly prototype various configuration and test interfaces.

Users can build client-server communication on UART or TCP/IP to provide flexible configuration management, performance fine-tuning, status monitoring and firmware updating.

Even though we've just finished our second-generation product, we've already begun to look at requirements for our third generation. Judging from our experience with this project, we'll strongly consider Xilinx for the new one, especially as the company introduces reliable, newer and more advanced devices and DSP capabilities on the most advanced process technologies.

**Accelerating Development Using the XtremeDSP Video Starter Kit, Spartan-3A DSP Edition**

As part of our development and demonstration strategies, Euteucus created an MVE Video Analytics Development Kit to give users a rapid development and prototyping platform for FPGA-based video systems. Our development kit is built upon the XtremeDSP Video Starter Kit–Spartan-3A DSP Edition ([http://www.xilinx.com/vsk\\_s3](http://www.xilinx.com/vsk_s3)), which includes an FMC video I/O daughtercard, CMOS camera, cables and Xilinx development software.

After migrating our MVE analytics engine, we were able to leverage this development platform and provide our MVE analytics solution to an existing community of video systems developers for evaluation and purchase with no added hardware costs. Developers who don't already have a Video Starter Kit can easily buy one from a Xilinx distributor. Once programmed into the FPGA, the VSK will boot and begin performing the Euteucus analytics operations. The result is to give developers a quick and easy way to evaluate the performance, capabilities and cost of an FPGA-based video analytics system.

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