

eSP Solutions at Your Fingertips

The Xilinx eSP Initiative™ brings it all together for designers of high tech consumer products.

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The digitization of consumer products has greatly accelerated the rate at which products and standards become obsolete. For manufacturers of consumer products, being able to quickly design and deliver a product to market – and keep it there – can have a direct impact on their ability to survive.

Moreover, consumer manufacturers must be able to design a product that can operate with multiple standards, and maintain the ability to rapidly upgrade to new standards or add new features. The ability to be interoperable and upgradeable will prove critical for manufacturers to either increase market share or simply maintain market share. For example, cellular phone manufacturers that offer one cellular phone to meet the different standards all across the globe have been able to gain market share.

Because time to market is of the essence, Xilinx has launched the eSP Initiative – a Web-based project to collect, share, discuss, track, and develop programmable logic system solutions to comply with emerging standards and protocols (eSP). Key to the eSP Initiative are Xilinx IP (Intellectual Property) cores and Spartan-II™ FPGAs (Field Programmable Gate Arrays).

The Absolute Need for Programmable Solutions

As digital convergence becomes reality instead of theory, programmable logic solu-

tions become a necessity instead of an alternative. This is why:

Multiple Standards

Typically, there is not just one single alternative (or standard) available to address any given design challenge. Rather, there are several emerging standards and protocols. This introduces tremendous risk for manufacturers in selecting a solution, because not every contender will succeed in the long term. Programmable logic solutions are not exempt from this risk, but they are far better positioned to convert and adapt should the chosen architecture falter.

Complexity

The scope and complexity of these emerging technologies are immense – and, their specifications are correspondingly large, not to mention being subject to ambiguity and error. Further, they are, by definition, new and to some extent unproven. This often mandates a chaotic development cycle where the implementation is cycled through numerous prototype, test, and debug iterations before it becomes stable. The versatility of reprogrammable logic is virtually the only way to effect such rapid design changes efficiently and quickly.

Rapid Specification Changes

Emerging standards are seldom static. They are often updated on an irregular basis. And, as much as designers may try to maintain transparent backward compatibility, this cannot be guaranteed. Reprogrammable logic solutions are virtually the only platform that can perform rapid response to specification changes.

Shrinking Product Development Cycles

ASICs and ASSPs cannot react fast enough to keep up with the changing of consumer

market requirements. Short product life cycles do not make designing ASICs a cost-effective proposition. To achieve maximum success in the marketplace, manufacturers must be able to send upgraded, updated products to market early. There is no superior alternative to designing with reprogrammable logic to get your product to market on time.

Changing standards, multiple standards, and rapidly evolving features make programmable logic the natural fit for the con-

- Streaming communications technologies for Internet audio and video content distribution
- Interactive conferencing
- And more.

All of this technology is progressing very quickly, placing extraordinary challenges and pressures on new product development.

Another challenge in deploying products for emerging standards is simply finding the appropriate resources. Because many of these technologies are so new, there is no critical mass of talent, IP cores, and tools to draw upon. Further, what resources are available are most likely decentralized and diffused. This all magnifies the challenge of developing a product using these technologies in a timely and efficient manner.

The Xilinx eSP Initiative is a program designed and tailored to address the issues. It is targeted

at system architects and ASIC/FPGA designers with the intent to:

- Help them understand these technologies.
- Promote the benefits of programmable solutions and deploy them.
- Provide support resources for Xilinx-based solutions.

Figure 1 illustrates how the eSP program will help manufacturers further accelerate the time to market for emerging standards and protocols. The traditional time-to-product advantage of FPGAs is well known. Where the eSP Initiative kicks in is with tools and resources to help accelerate the time-to-learn and time-to-design components of product development.

Tutorials/White Papers

Standards

- Home PNA
 - Home RF
 - Wireless LAN
 - Bluetooth
 - HomePlug, LONWorks
 - Ethernet, USB
 - FireWire/IEEE 1394/HAVI
- Technology/Market Review**
- Broadband Access
 - Residential Gateways
 - Home Networking Technologies
 - Information Appliances

**Spec. Changes Identified
Technology Summits**

- Home Networking Industry Forum
- International Seminars

Glossary

Frequently Asked Questions

Block Diagrams

- Discussion Forum
- Consultants Directory
- Intellectual Property
- Industry Links



**Strategic Alliances
Reference Designs**

- Broadband Access: xDSL
- Residential Gateways
- Home Networking Technologies: 1394 adapter, USB 2.0, Bluetooth, HomePNA 2.0
- VoIP, WLAN, HomeRF
- Information Appliances: MP3 player, power meter

Figure 1 - eSP program details

sumer world. The prices offered by Spartan-II™ FPGAs from Xilinx are perfect for this cost-sensitive and quickly evolving market.

Introducing eSP – Extending the Traditional Value of FPGAs

The digitization and convergence of consumer and communications technologies are driving new products based on emerging standards and protocols. The consumers’ desire to gain faster and easier access to the Internet – and from anywhere – is already leading to new standards such as:

- Wireless communications standards like IEEE 802.11, HomeRF™, and Bluetooth™
- Serial digital communications standards like IEEE 1394 (FireWire) and USB 2.0

eSP Overview

The Xilinx eSP Initiative is the industry’s first Web portal dedicated solely to addressing the challenges of developing products contingent upon emerging standards and protocols. Simply put, eSP delivers complete suites of solutions to accelerate product development time in the face of emerging standards and protocols.

Standards Tutorials

eSP tutorials give designers a high level of the various specifications, and help them understand the complexities associated with each specification. The tutorials are carefully crafted to contain enough detail to inform – but not overwhelm – designers.

The material also addresses to a wide audience ranging from the curious hobbyist to the serious system architect. As an example, every major aspect of the home networking market segment is covered by more than 2,600 carefully documented pages. The topics covered include:

- Market research
- Overview of various technical specifications
- Hurdles faced by designers
- Projections on the future
- System block diagrams
- Industry links
- FAQs
- Detailed glossary.

It’s all available directly through the Internet at www.xilinx.com/esp/.

Keeping Current on Changes

Another key feature of the eSP Initiative is to allow you to learn about the changes to standards and protocols when they happen – and to help you understand how they impact your product design. Truly, eSP is a one-stop shop to get an update on all the specifications related to a specific consumer market segment.

Ask the Experts

Xilinx has put together a panel of experts to answer your most pressing questions. Each market segment explored and discussed under the eSP Initiative has its own discussion forum. Staffed by some of the industry’s leading experts, these forums have the answers to the toughest design challenge questions.

As an example, the home networking effort has more than 10 experts on the panel who have a very strong understanding of the home networking industry.

System Block Diagrams

If you’re trying to figure out the best way to build your next product, simply peruse the system block diagram pages. The eSP website has an extensive set of system block diagrams. The home networking market segment offers more than 60 block diagrams that cover broadband access devices, residential gateways, home networking technologies, and information appliances.

Intellectual Property

Xilinx is the first programmable logic company to embrace the concept of cores for FPGAs through the LogiCORE™ program. Today, LogiCORE products form the most successful core program in the programmable logic industry. As a result, Xilinx has gained considerable experience developing and selling cores, and servicing FPGA core customers.

The AllianceCORE™ program is a cooperative effort between Xilinx and independent third-party core developers to expand and share the availability of the highest quality cores for use in Xilinx programmable logic devices. Today, Xilinx offers more than 60 different IP cores, which can be accessed from www.xilinx.com/ipcenter/.

Strategic Alliances – The Ecosystem Era

System designers face many obstacles to designing consumer products in an environment where standards continue to evolve. This makes the selection of critical system components extremely challenging. Therefore, Xilinx has introduced the eSP Ecosystem™ – a new approach to creating complete cutting-edge systems solutions that offer you a sustainable competitive advantage. The eSP Ecosystem consists of Xilinx and industry partners striving jointly to provide complete system solutions to enhance productivity. Of course, the solutions will comply with the relevant emerging standards and protocols. Because this is an integral part of the eSP Initiative, the ecosystem is committed to providing an update path to future standards and protocols. An example of a typical eSP ecosystem is shown in Figure 2.

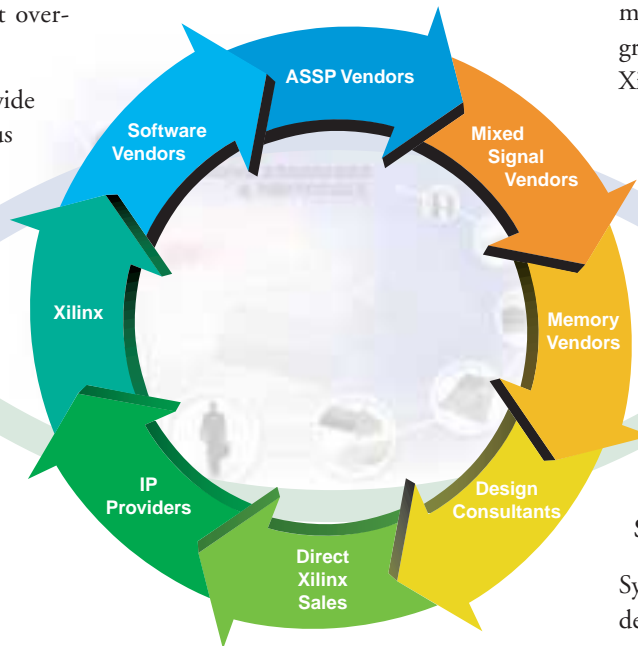


Figure 2 - The Xilinx Ecosystem

Application Notes, White Papers, and Glossary

Whether you need to learn more about a standard or protocol, or you are simply trying to figure out what a term means, eSP can help. You are likely to find an application note or white paper on the very topic you’re looking for. The eSP website contains up-to-date application notes and white papers, as well as current market and technical analyses. The website also hosts a glossary of more than 1,000 terms, many of them as new as the emerging standards and protocols they describe.

Home Networking – An Ecosystem Example

The home networking market provides a great example of how effective the eSP Ecosystem can be. There are many home networking standards, which are currently evolving, for example, IEEE 1394a to IEEE 1394b, HomeRF™, HomePNA™, HomePNA 2.0, and HomePlug™, among others.

Let's take an example of a residential gateway. To design a successful residential gateway, a manufacturer must decipher and comprehend complex standards. There are many decision points:

- Should the residential gateway support:
 - Cable modems?
 - xDSL modems?
 - Satellite modems?
 - Wireless modems?
- What home networking technology should the gateway support:
 - IEEE 1394a?
 - IEEE 1394b?
 - HomePNA?
 - HomePlug?
 - IEEE 802.11b?
 - HomeRF,
 - Bluetooth?
 - WirelessLAN?
 - USB 1.1?
 - USB 2.0?
 - Ethernet?
 - FOLS (Fiber Optics LAN Section of the Telecommunications Industry Association).

To make the problem more complex, the technology required for each solution is typically available from more than one vendor. And one vendor's solution is not

always optimized to interface with another vendor.

Xilinx and the eSP Ecosystem are the solution to the problem. The ecosystem involves strategic alliances with industry leaders to jointly provide a proven residential gateway design that meets and conforms to all of the industry standards. Moreover, the very nature of programmable logic, allows the eSP Ecosystem to construct the residential gateway so that it can be upgraded in the field to support fast implementation of changing standards. Of course, the eSP Ecosystem also works very closely to insure that all solutions provide transparent interoperability.

However, the solution doesn't stop there. The eSP Ecosystem is also committed to providing all the necessary support, whether it is hardware or software. You can use the proven design as is, or make any modifications for product differentiation by utilizing the “spare programmable logic gates” or by using vertical migration (a method of using higher density programmable logic devices in the same package, without changing the pinout).

The real advantage of the eSP Ecosystem, is that every member of the ecosystem benefits. Each ecosystem member also gains expanded market coverage, because all ecosystem members will promote proven designs through their own sales and marketing channels.

Reference Designs – Tying It All Together

As part of the eSP Initiative, Xilinx has partnered with a wide range of industry experts, application specific standard product manufacturers, and intellectual property providers to develop, deliver, and support hardware reference designs for specific emerging standards. These reference designs will accelerate product development while addressing the flexibility and price constraints of the targeted end application.

These are not just reference designs, however. They are complete system solutions designed to conform to all of the necessary standards and protocols.

The reference designs are tested to comply with industry consortia specifications as well as the relevant standards bodies. These system solutions contain everything necessary to build the final product (except the cover). The reference designs include:

- Bill of materials
- Gerber files
- Software
- Software drivers
- Hardware
- VHDL or Verilog code
- Programming software
- Design tools
- IP cores
- Datasheets
- Schematics
- Applications notes
- License agreements.

Because the system solutions are based upon the low-cost Spartan-II™ FPGA family, the reference design can be easily customized for product differentiation or to add extra features.

eSP – Solutions at Your Fingertips

The eSP Initiative extends the traditional benefits of flexibility and time-to-market offered by FPGAs. Moreover, the initiative helps with the learning and design phases of product development. The eSP Initiative provides revolutionary solutions for products dependent on emerging standards and protocols. Because eSP takes the guesswork out of understanding these standards, you can focus on the important matters like product marketing. You'll find everything you need to get ahead and stay ahead of emerging standards and protocols at www.xilinx.com/esp/.