SYNOPSYS®
Accelerating Innovation

Synopsys and Lantiq

Lantiq Meets Aggressive Performance Targets for 300 Mbps Bonded
VDSL2 Home Gateway SoCs with DesignWare IP for PCI Express 2.0

> *Synopsys DesignWare IP enabled us to achieve the aggressive performance targets we required for our next-generation home gateway solution."*

Mario Traeber
Senior Director of R&D, Lantiq

Business

Lantiq is a leading supplier of broadband access and home networking technologies. Its holistic understanding of broadband technology, home networking connectivity, complete applications, communication standards, and legacy networks enables the company to offer a broad portfolio of highly integrated, flexible end-to-end semiconductor solutions for next-generation networks and the digital home. Lantiq's solutions are deployed by major carriers and found in access networks and home networks in every region of the world.

Challenges

▸ Meet aggressive performance targets for Home Gateway SoCs: 300 Mbps aggregated end–to-end system throughput in bonded VDSL2 applications
▸ Meet challenging time-to-market schedule
▸ Minimize integration and interoperability risk
▸ Reduce embedded software and firmware efforts

Synopsys Solutions

▸ DesignWare® Controller IP for PCI Express 2.0

Benefits

▸ Achieved aggressive performance targets
▸ Reduced integration and interoperability risk with high-performance, silicon-proven DesignWare PCI Express
▸ Received excellent technical support that helped accelerate tapeout

Overview

Lantiq's range of AnyWan™ XWAY™ GRX Network Processor and Gateway family, integrated and monolithic WLAN and Ethernet Home Networking and connectivity products, paired with a comprehensive software platform, address the carrier and consumer market's need for holistic low-cost and high-performance solutions. Their highly integrated devices reduce board space, BOM costs, and power consumption, while their focus on high-speed and error-free operation ensures an optimal consumer experience.

When combined with Lantiq's devices for broadband customer premises equipment (CPE), the home networking products are part of a complete home gateway solution — the "mission control" of the home. From basic home automation (lights, thermostats, and diagnostics) to next-generation HD voice and IPTV streams, the home gateway is becoming the central communications hub of the home.

> *After evaluating several IP providers, we choose Synopsys for its broad IP portfolio and depth of digital IP knowledge. In addition, our previous positive experiences with Synopsys gave us confidence that the IP would give us the performance we needed, and it did."*

Mario Traeber
Senior Director of R&D, Lantiq

Lantiq's powerful and highly integrated home gateway products offer outstanding performance and quality to support smart and intelligent applications. The AnyWan™ XWAY™ GRX Network Processor family, together with the new XWAY™ VRX318, offer full home connectivity and broadband services at up to 200 Mbps downstream plus 100 Mbps upstream in bonded VDSL2 scenarios. The chipset is vectoring ready to allow this service to be deployed for almost twice the loop length. Lantiq's gateway solutions are designed to be "future-proof," ready to handle the digital home of today and tomorrow.

High-Quality DesignWare IP

To meet their aggressive performance targets, Lantiq wanted a complete, high-quality IP solution from a provider with an excellent track record of success. After evaluating several IP vendors, Lantiq chose the DesignWare Controller IP for PCI Express 2.0 based on the performance and feature set. The integrated eDMA was an especially crucial feature, raising the Synopsys IP over other available solutions since it enables maximum performance and allows full utilization of the PCI Express interface in Lantiq's design.

Synopsys' comprehensive IP solutions as well as Lantiq's previous success with the DesignWare Controller IP for PCI Express was an additional criteria in the IP selection process.

Responsive Technical Support

The complicated data transfers across the link between the PCI Express peers and hosts while supporting the VDSL2 bonding application requirements was a big challenge. This required the tight integration of the eDMA and PCI Express IP to the high-performance system architecture of Lantiq's VDSL2 subsystem.

For each challenge, Synopsys' technical support and R&D teams quickly helped to analyze the behavior and suggest solutions fitting within Lantiq's system architecture needs. Through a combination of fast action and deep technical knowledge, Synopsys was able to quickly deliver solutions to Lantiq that enabled them to move forward with their product, resulting in silicon success and meeting their performance targets as well as achieving their time-to-market goals.

"We were impressed with the overall support we received from Synopsys, and especially impressed with the response we received throughout the whole design process even beyond the tape out," said Traeber. "From IP selection, integration, tapeout, and post silicon bring up, our experience with Synopsys has been excellent. We look forward to developing future designs that incorporate DesignWare IP."

> *"Although Synopsys is a large company with a deep IP portfolio, their support and R&D teams are very nimble and responsive.*

Mario Traeber
Senior Director of R&D, Lantiq