

# Workshop

## Designing with Ethernet MAC Controllers

The Ethernet protocol is used in a variety of applications. XILINX offers various software and embedded hardware implementations for this, which require comprehensive knowledge for quick and effective use. The 2-day PLC2 workshop “Designing with Ethernet MAC Controllers” trains designers in the practical use of these XILINX-specific Ethernet solutions. Starting with the basics of the Ethernet standard, the workshop covers protocol description and the OSI layer model. It describes the application of XILINX specific Ethernet solutions and reinforces this with exercises.

Participants learn the hardware-design and software-development skills they need for successful implementation. To complete the workshop, an example will be imple-

mented and tested in real hardware (XILINX evaluation board with Virtex-4 FPGA).

### Applicable technologies

XILINX FPGAs: Spartan-3, Virtex-II, Virtex-4, Virtex-5

### Requirements

Basic knowledge of VHDL and FPGA Implementation with ISE and EDK and Programming with C will be provided

### Duration and Cost

Duration: 3 days

Cost: € 1850, – net per person, including detailed training material, drinks in the breaks and lunch.

## Agenda

- Ethernet Basics
- Networking Standards
- Ethernet Frames
- MAC: Media Access Control
- Network Protocols
- Ethernet Hardware
- Physical Layer
- Ethernet Interfaces
- LocalLink Interface
- Flow Control
- Management Interface
- XILINX EMAC Solutions
- 10/100 EMAC
- GEMAC
- XGEMAC
- TEMAC

### Labs

- Analyzing Ethernet packets
- VLAN and Jumbo Frames
- Implementation using CoreGen
- EMAC peripheral in loopback mode using EDK (OPB EMAC peripheral and OPB bus)
- GEMAC peripheral using the interrupt mechanism using EDK (PLB EMAC peripheral and PLB bus)
- TEMAC based Web-Server using EDK (hard TEMAC and soft PLB TEMAC wrapper)