

# **Embedded System Development with Wireless Connectivity to Cellular Networks, Using HSPA Modem, for Online Access to Remote Digital Systems**

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# Introduction

Motivation for the Developed System:

- Access, control and interact with remote devices
- Access or gather remote information

Examples:

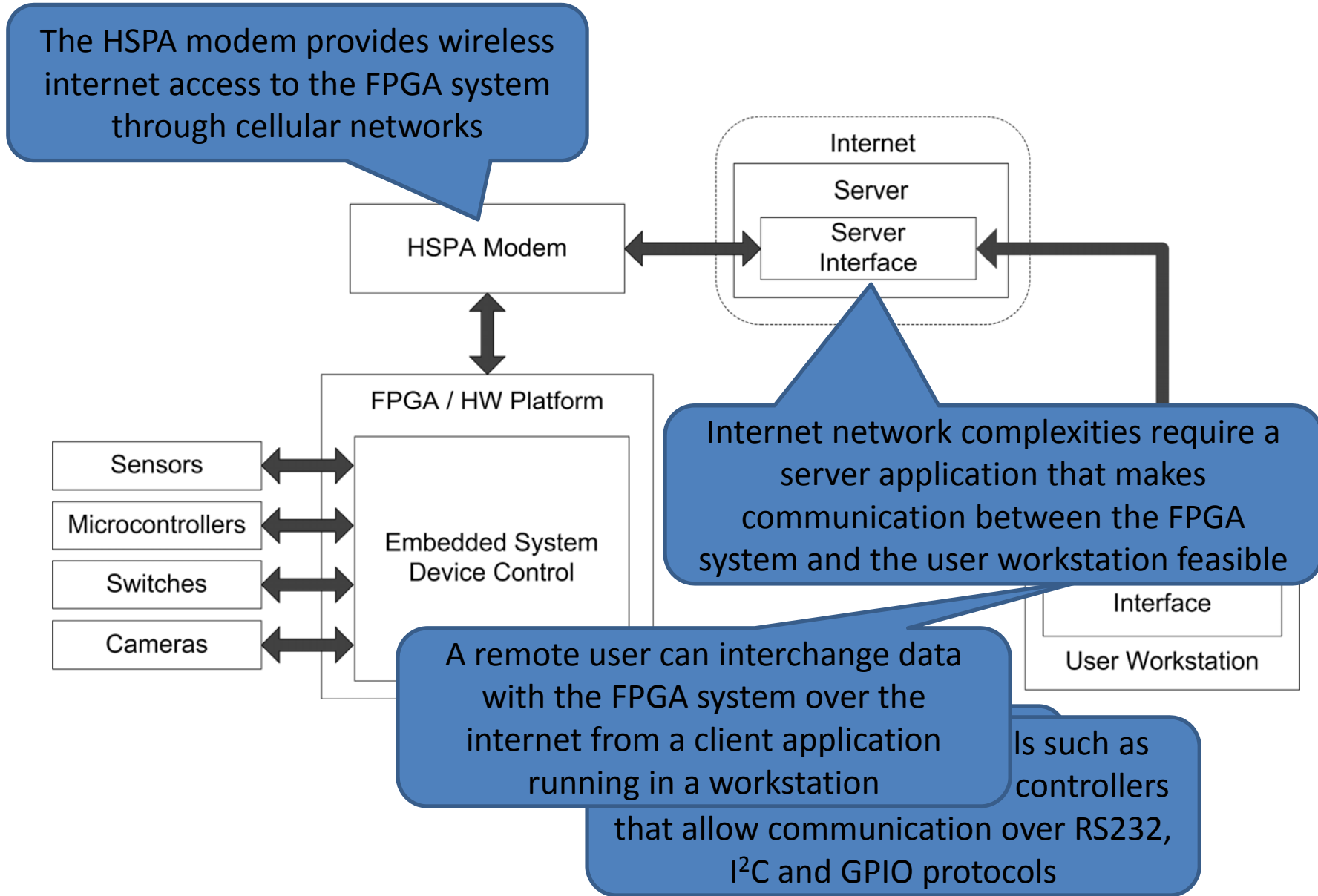
- Control of security systems
- Remote manipulation of vehicles
- Reception of remote sensor data
- Live monitoring of a moving target

# Introduction

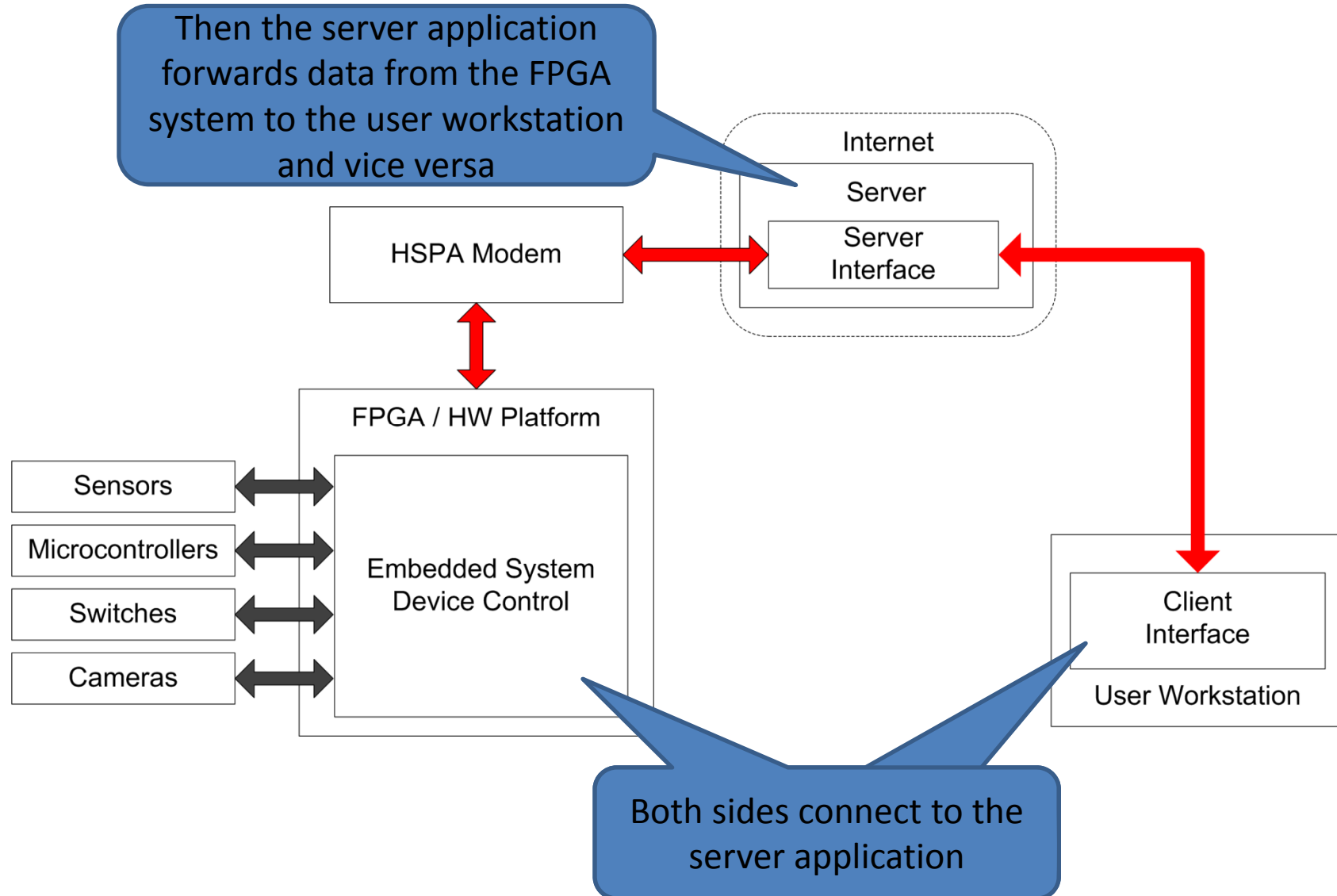
The Developed System:

- Consists of hardware and software implementations
- Aims to provide interaction wirelessly over the internet with:
  - Sensors
  - Microcontrollers
  - Cameras
  - Digital Switches
  - GPS modules

# System Overview



# System Overview



# Development Tools

Tools Used for the Hardware and Software Implementations:

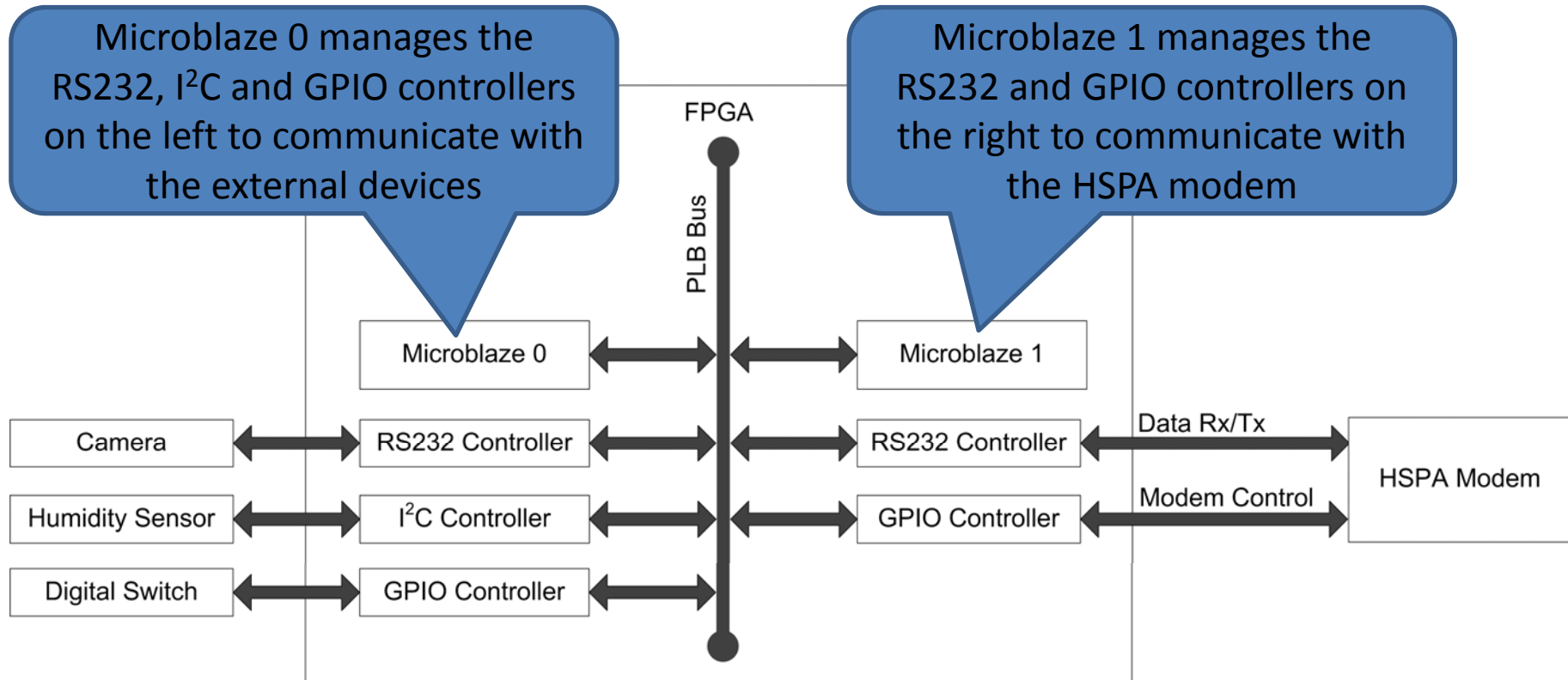
- Xilinx ML403 FPGA development platform (HW)
- Xilinx Platform Studio (SW & HW)
  - Development of the hardware embedded system
  - Software development for the embedded system processors
- Netbeans Integrated Development Environment (SW)
  - Development of the client application
  - Development of the server application

# FPGA Embedded System Architecture

Components of the Embedded System:

- Two Microblaze soft processors
- Communication controllers
- Memory controllers and memories
- Buses to interconnect the above hardware cores (PLB)

# FPGA Embedded System Architecture





## Conclusion

- Implementation of a system that communicates and interacts with remote devices and hardware modules
- Development of a flexible, reliable and fault tolerant system
- Supports administration of variant device types and variant communication protocols

**Thank You!**

Q & A