

Clean-slate Multi-hop Wireless Networks Using WARP

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<http://warp.rice.edu>



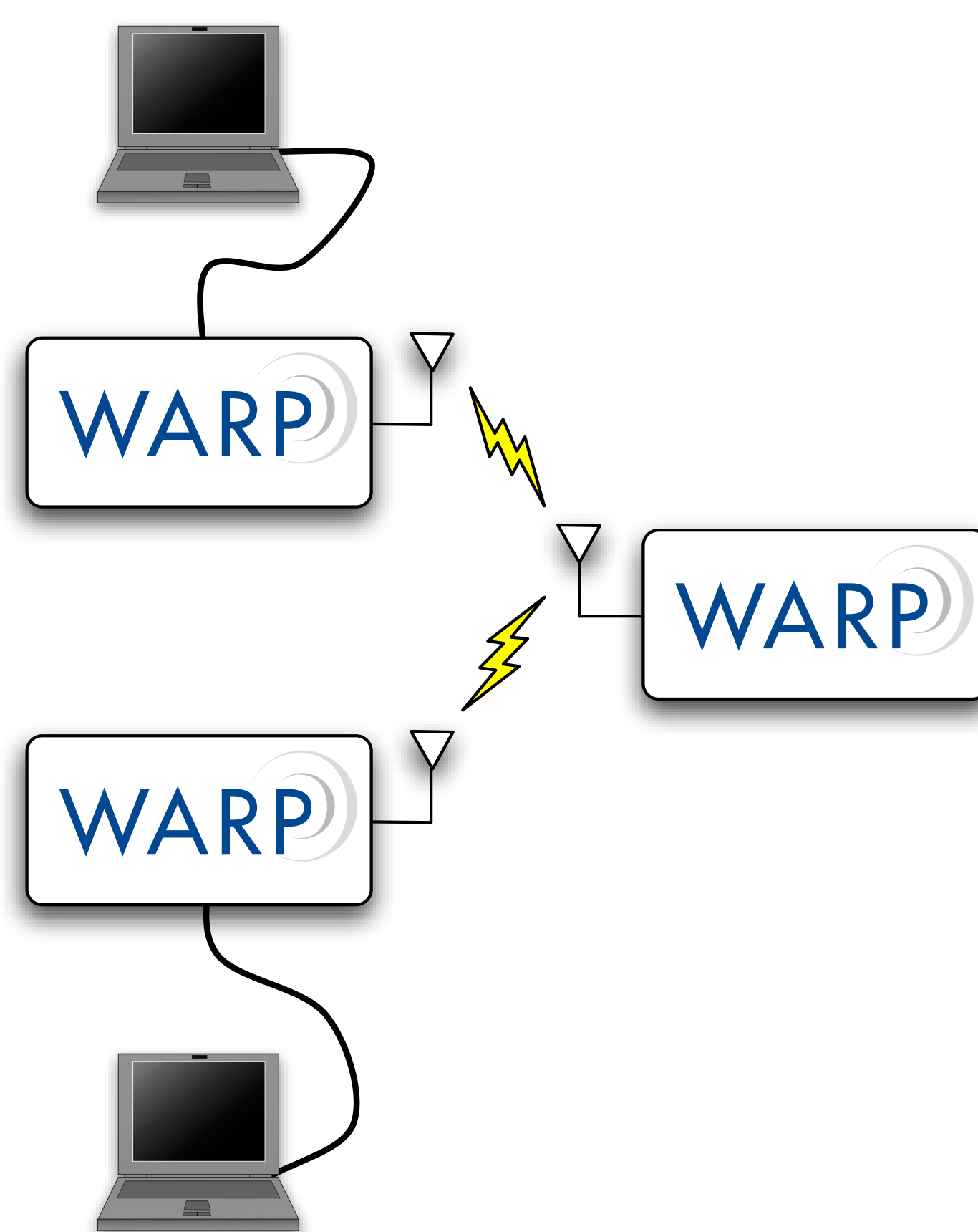
Summary

Rice University's Wireless Open-Access Research Platform (WARP) is a platform designed to enable flexible research and prototyping at all layers.

- Real-time Physical Layers (PHYs)
 - High-Throughput MIMO Interfaces
- Flexible Medium Access Control (MAC)
 - Mesh Applications

Demonstration

Multi-hop streaming video

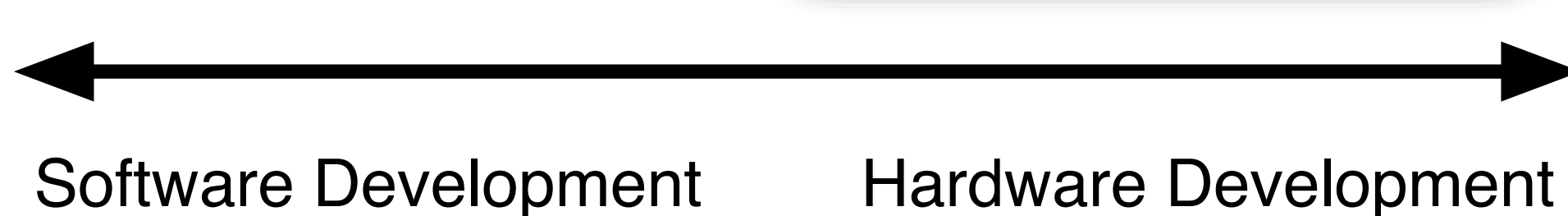


Development

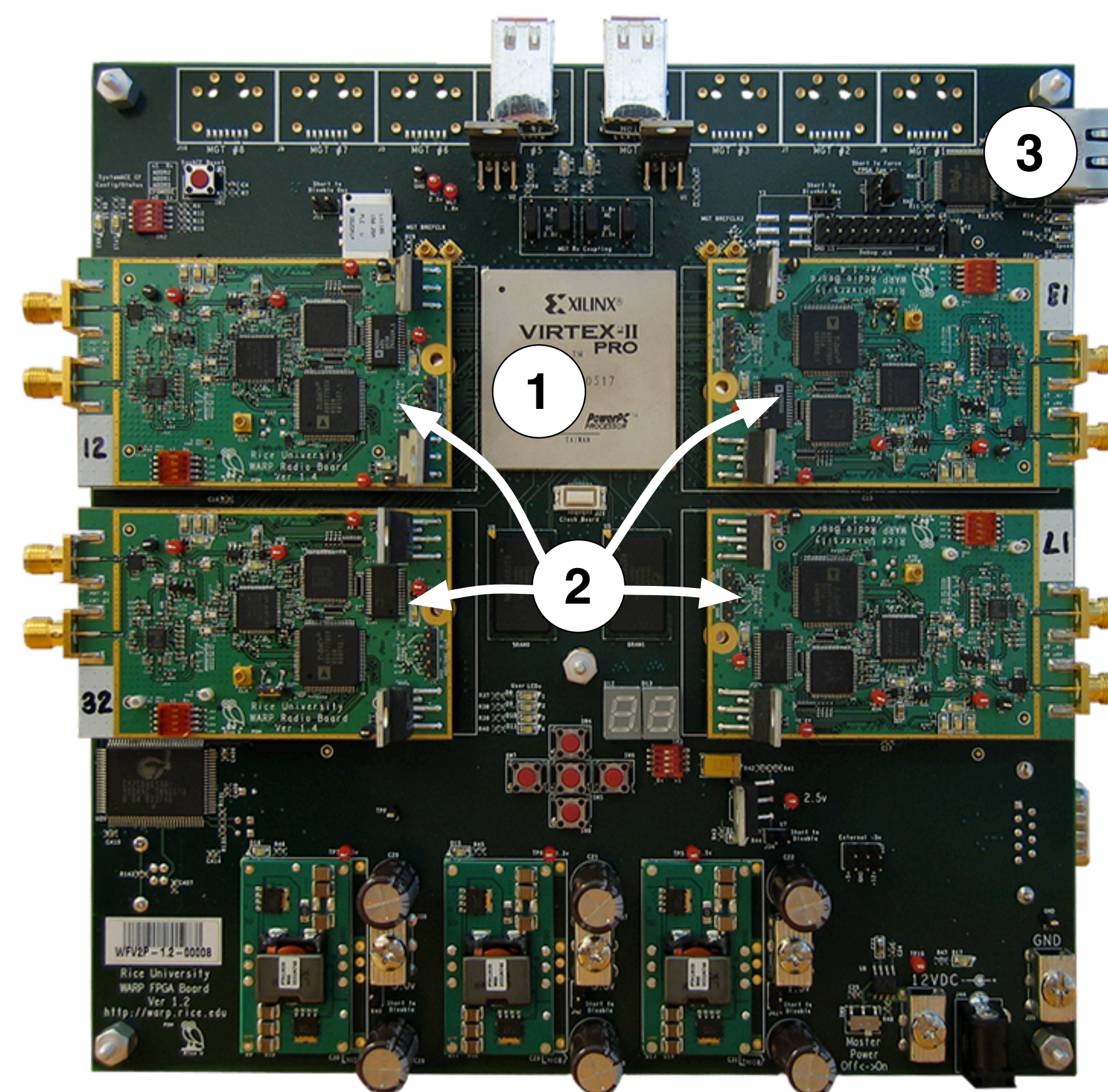
MAC/Router Layer
Research Applications

Physical Layer
Research Applications

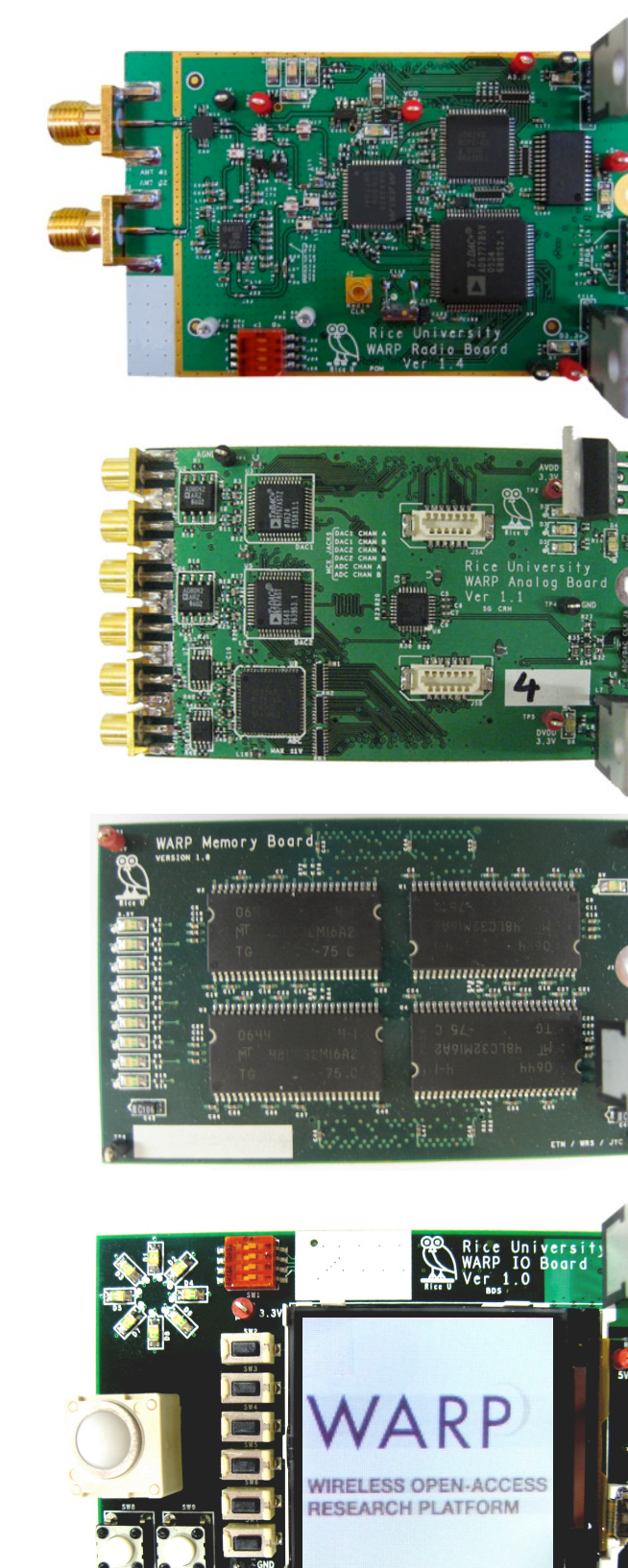
Architecture
Research Applications



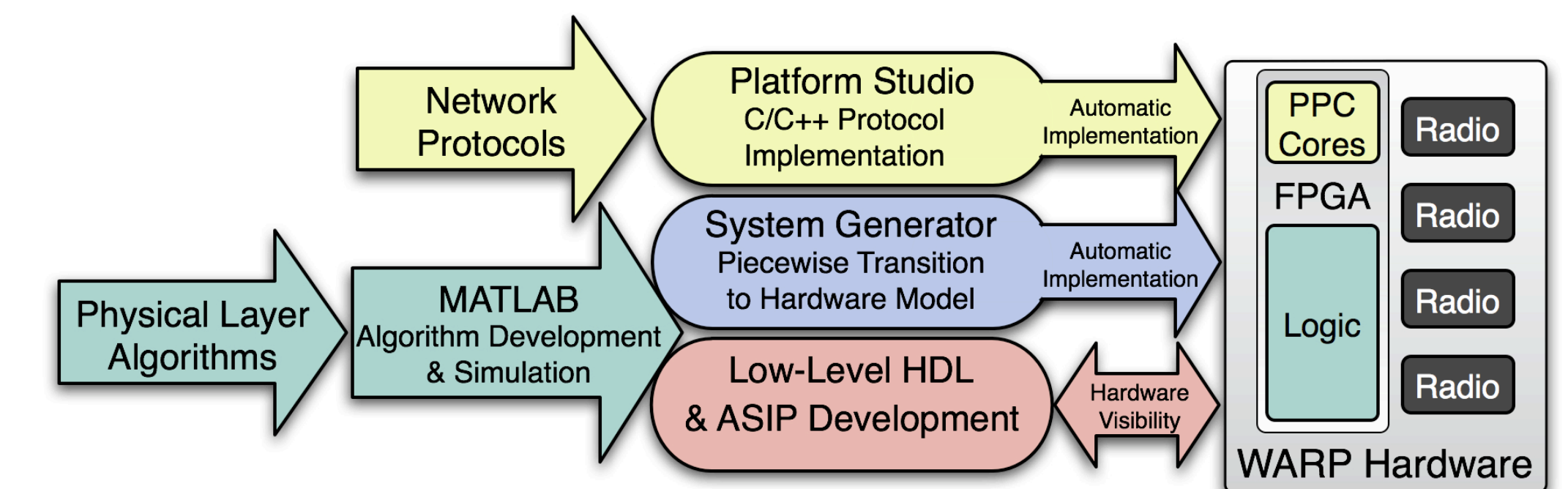
Custom Hardware Platform



- Virtex-II Pro FPGA
 - DSP-centric resources for PHY construction
 - 2 PowerPC cores for MAC development
- Daughter Cards
 - MIMO Radios
 - 2.4 GHz and 5 GHz
 - 40MHz Bandwidth
 - Analog Debug Board
 - 4 DACs, 2 ADCs
 - Memory Board
 - 256MB
 - User I/O
 - 128x128 LCD
 - Trackball
- Ethernet
 - 10/100 Mbps Operation
 - Xilinx MAC Core



Design Flow



Current Applications

Custom Physical Layers:

- SISO OFDM
- 2x2 MIMO Alamouti OFDM
- 2x2 MIMO Multiplexing OFDM

Custom Medium Access Layers:

- ALOHA
- Carrier Sensing (CSMA)
- Medium Reservation (RTS/CTS)

Current WARP Users

- Polytechnic University
- University of California, Irvine
- University of California, San Diego
- Nokia-Siemens Networks
- Xilinx

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