

Prototype Thin Client EDA Environment for Universities

Mark C. Johnson, Purdue University
David Carmichael, Purdue University
Heinz Jeorg Schwarz (Sun)
Jeffrey Turkstra, Purdue University

Client Terminals



Compute Cluster

Objectives

- ✍ **Evaluate thin client/cluster configurations in a university EDA environment**
- ✍ **Serve as pilot project for other universities considering thin client approach**
- ✍ **Maximize access to EDA computing resources for students**
- ✍ **Exploit unique features of thin client/cluster**

Timeline

Spring 2004

- ECN approached by Sun
- Purdue ASIC/VLSI laboratory selected as target

Summer-Fall 2004

- Equipment received, installation begins

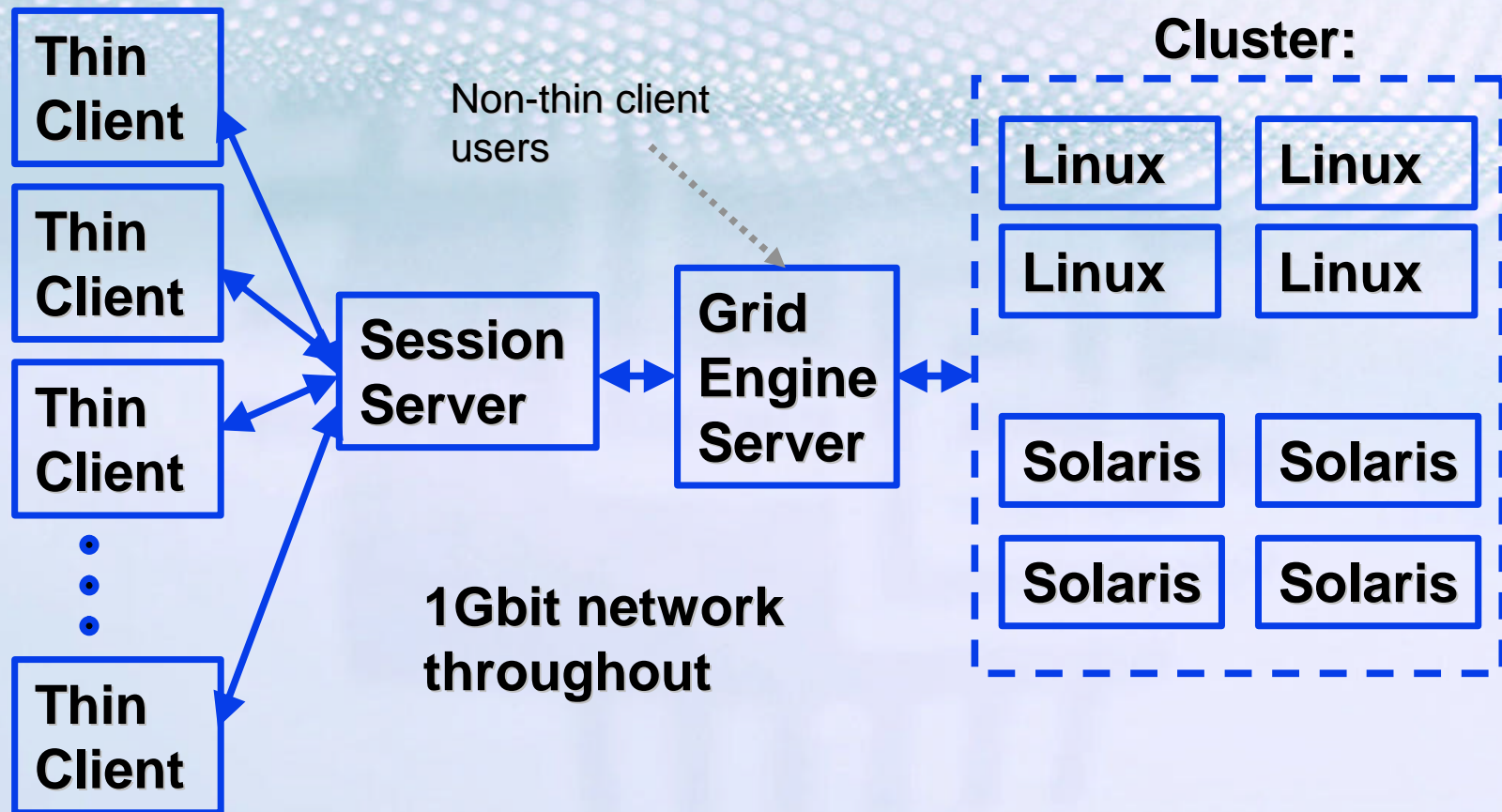
Spring 2005

- Equipment and EDA software ready to use
- ECE495D ASIC Design Laboratory makes switch

Spring-Summer 2005

- Collect performance data for various configurations
- Expand use of cluster

Thin Client Hardware Organization



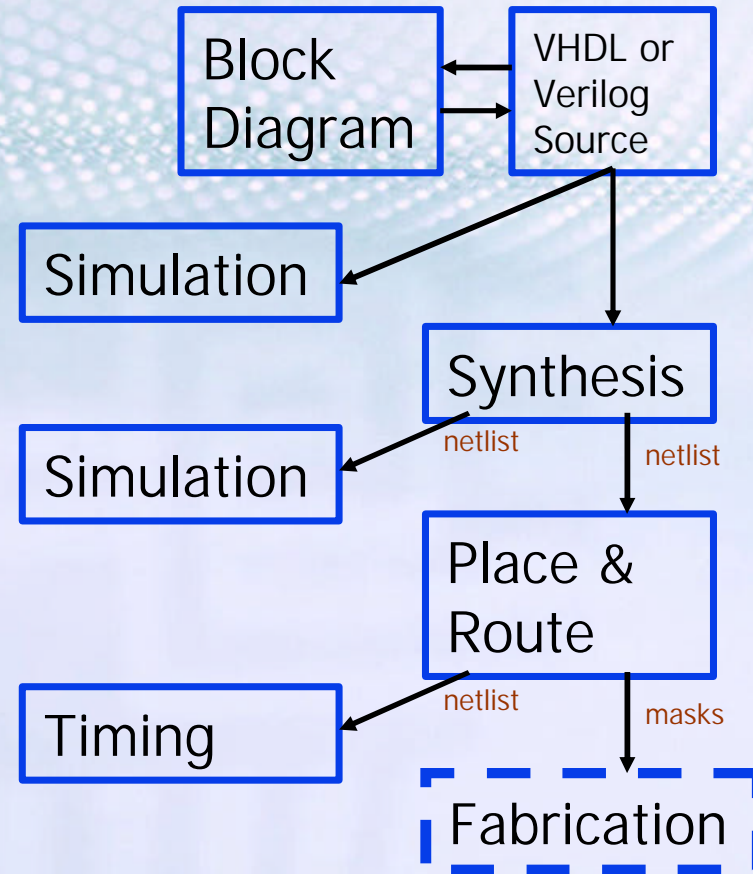
Supported EDA Design Flow

✍ Now:

- VHDL based standard-cell ASIC flow

✍ Fall 2005:

- VHDL based FPGA flow
- Schematic based full-custom flow

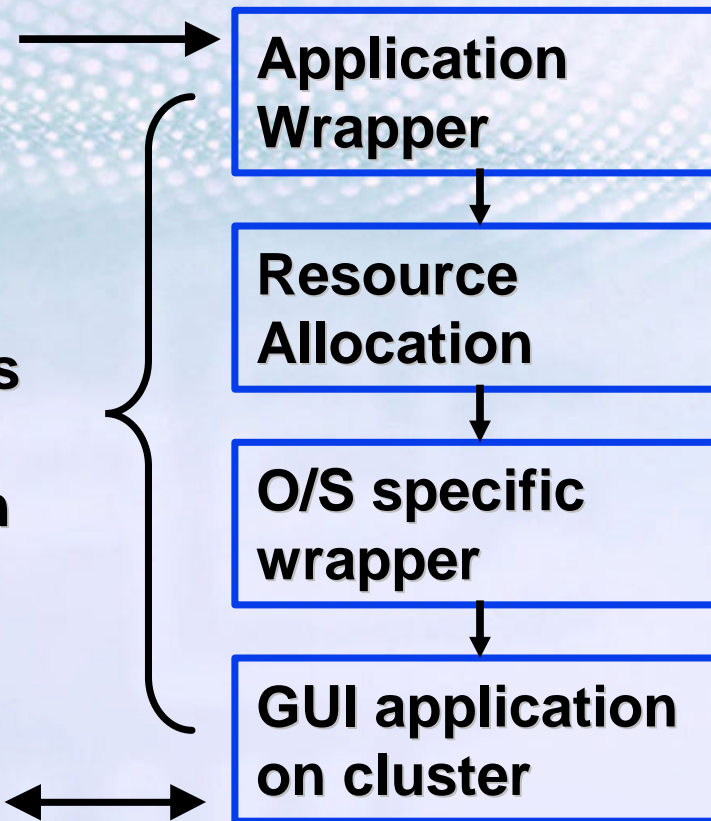


EDA Software Configuration (GUI apps)

**User invokes application
from thin client**

**transparent to user,
Grid Engine allocates
compute server and
starts the application**

**User interacts with GUI
application as if it were
running locally**

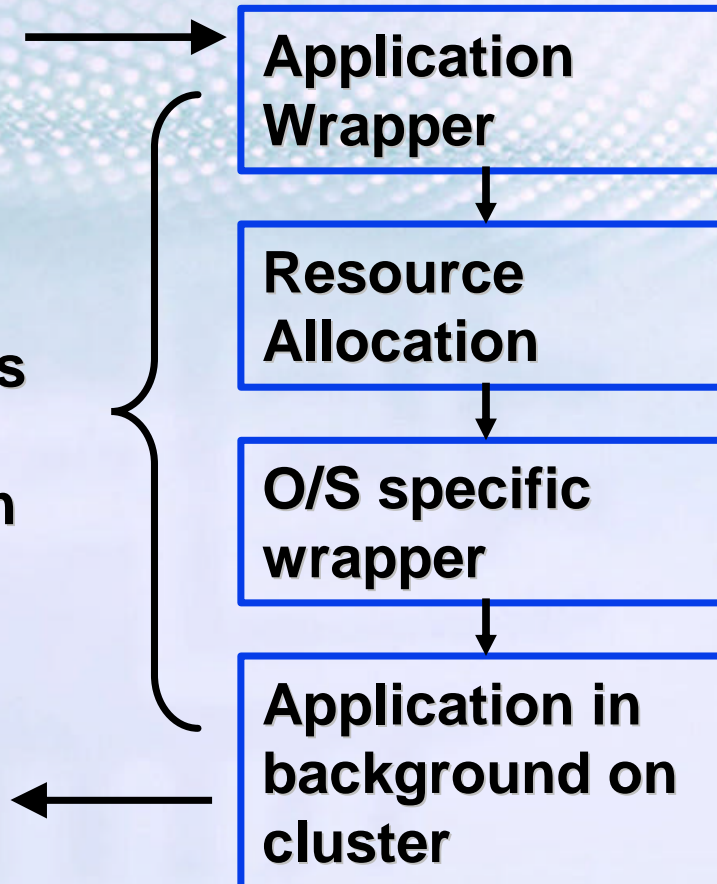


EDA Software Configuration (batch)

**User invokes batch job
(e.g., Place & Route,
Synthesis)**

**transparent to user,
Grid Engine allocates
compute server and
starts the application**

**User receives job
completion email**



Current Assessment

- ✍ **Solaris/Linux mix invisible to user, not to administrator**
 - requires equivalent Solaris & Linux applications
 - slight differences in O/S directory organization
- ✍ **Recommend transition before/after semester**
- ✍ **Network problems occasionally interfered**
- ✍ **Smart card functionality very nice**
 - nearly eliminates need to lock screen
- ✍ **Gaming the system**
 - repeated submission to get fastest machine
- ✍ **I would do it again**

Acknowledgements

- ✍ **James (Mike) Moya, ECN**
 - general O/S and cluster management configuration
- ✍ **Kevin Brooks, ECN**
 - hardware installation, maintenance
- ✍ **Jeffrey Turkstra, Research Assistant**
 - EDA software installation, wrapper scripts, performance data collection (machine performance)
- ✍ **All ECE495D teaching assistants and students**
 - Forbearance through a mid-semester transition

Questions?
