

The Power of Innovation

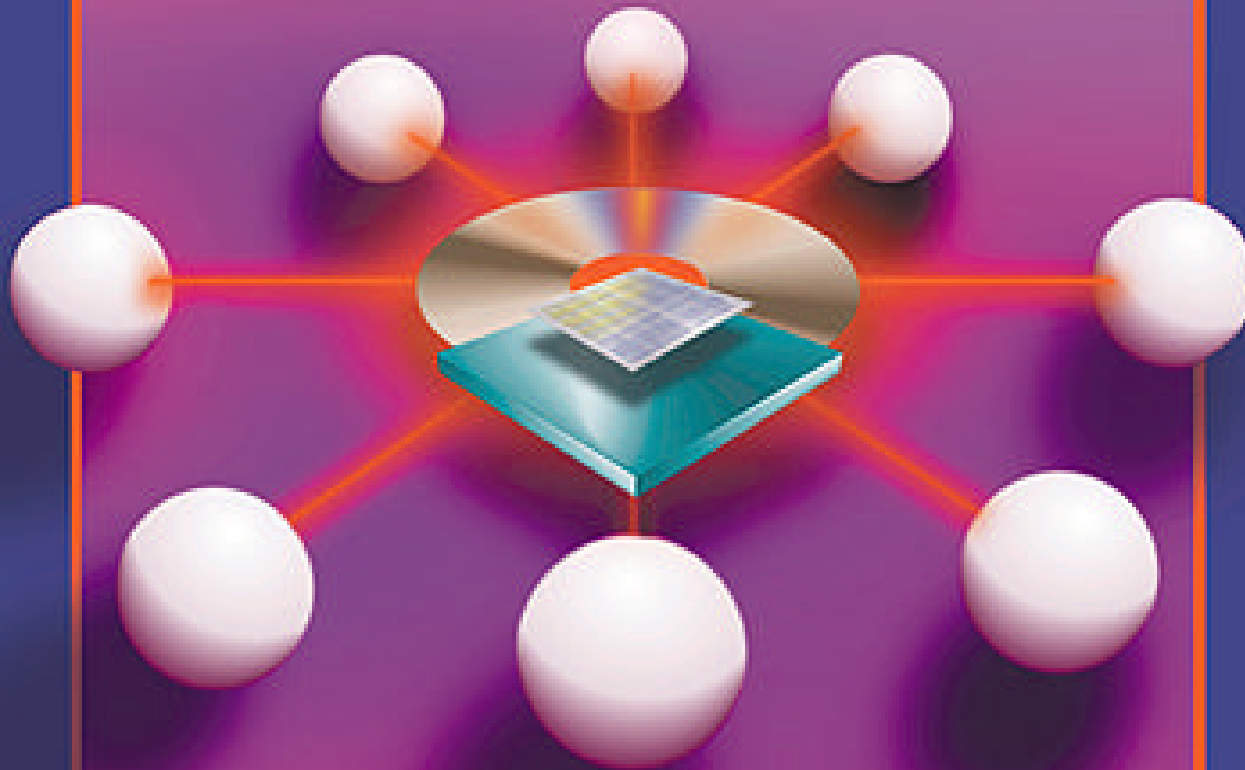


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Why Programmable Logic?

To get the benefits of full custom...

- Proprietary design**
- Small physical size**
- Low power consumption**
- High reliability**

With the advantages of standard products...

- Fast time-to-market**
- No NRE**
- No test issues**
- No ASIC re-spin risk**
- Process-driven cost reduction**

What's Been Holding You Back?

You may have thought that programmable logic devices were

too small,

too slow,

too expensive, or

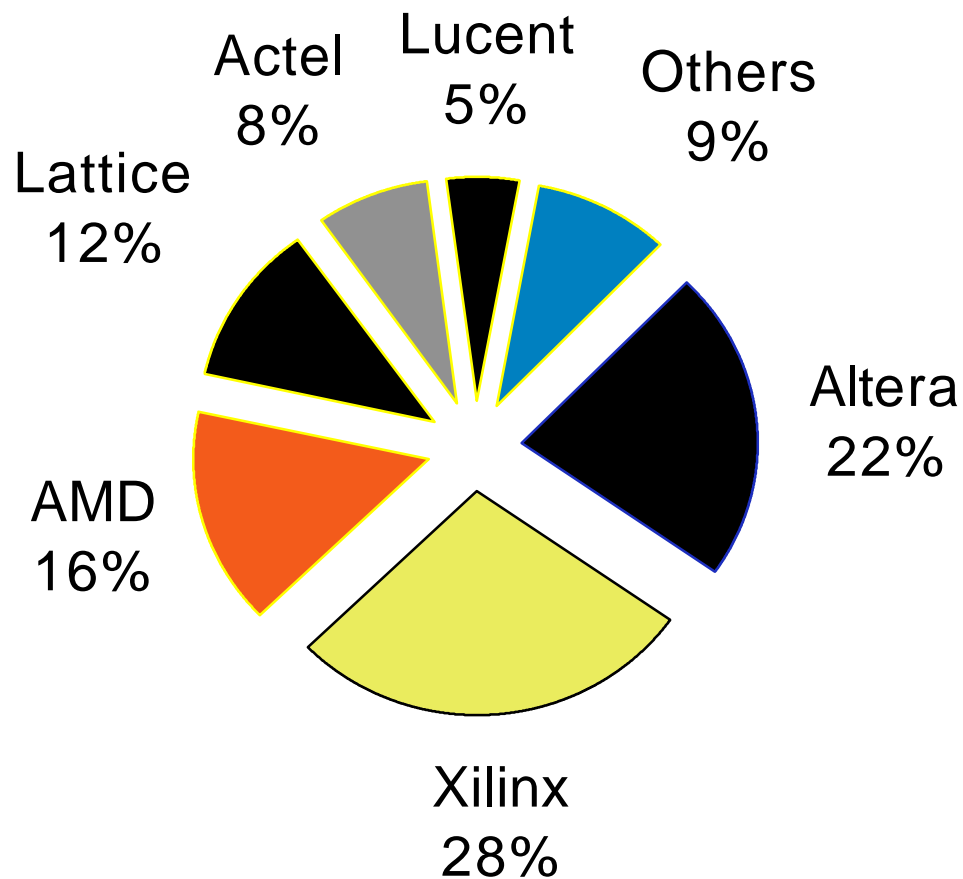
too hard to use ...

See how Xilinx has changed all that !

Agenda

- **The Future of Programmable Logic**
- Product Overview
- Design Methodology Case Studies
- The Next Generation
- Summary / Q&A

1996 CMOS Programmable Logic Market



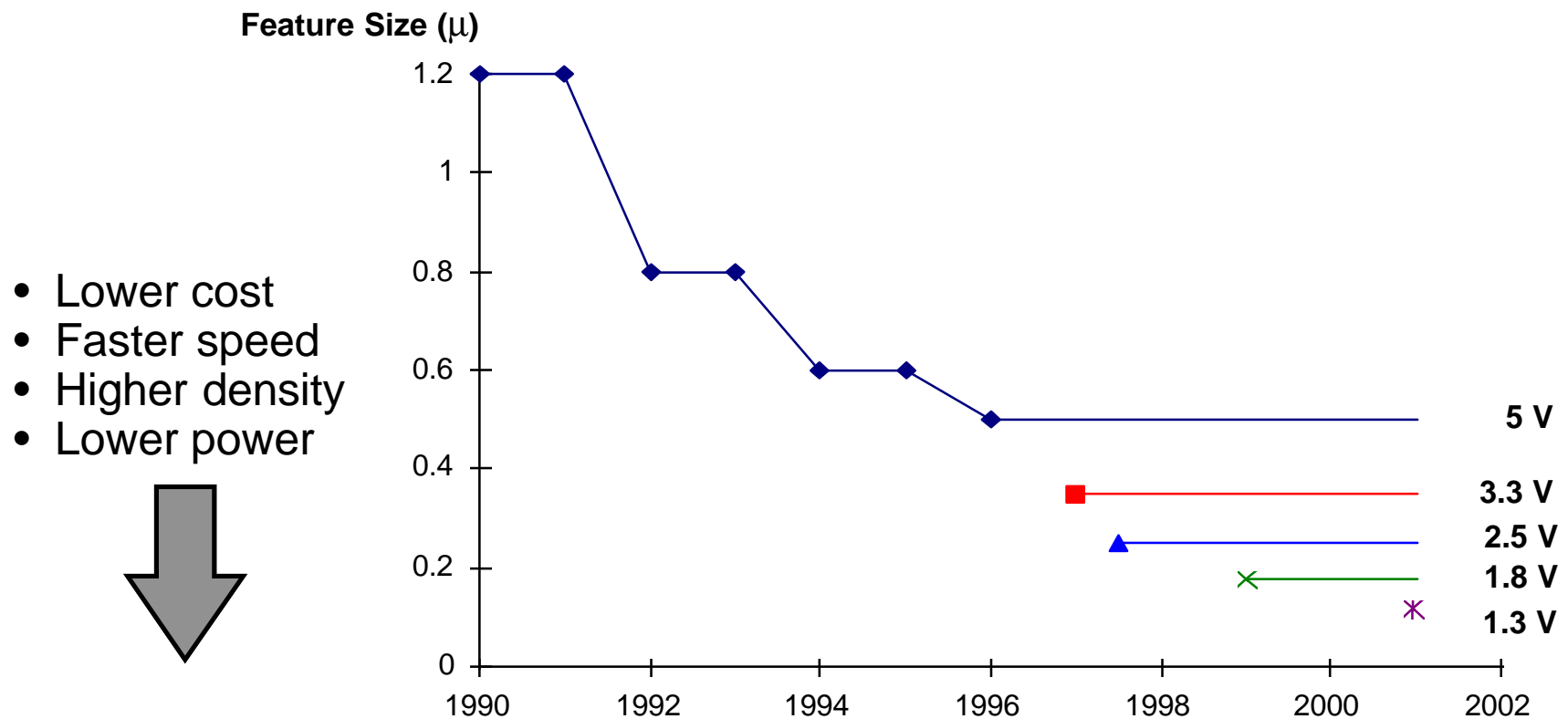
Source: InStat

Xilinx Provides the Complete Solution for Programmable Logic

Programmable logic requires a combination of:

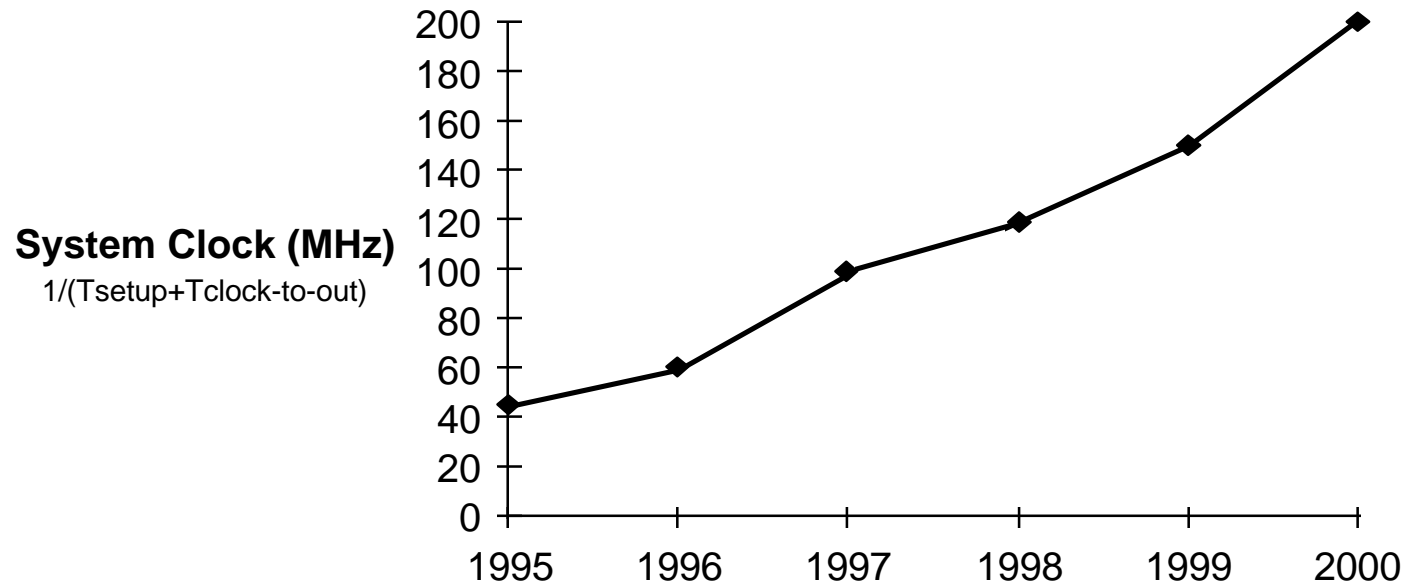
- Process technology
- Device architecture
- Circuit design
- Software
- Verified COREs
- Low-cost migration path (HardWire)
- Technical support

Process Technology and Supply Voltage



Xilinx fab partners use FPGAs to drive their process

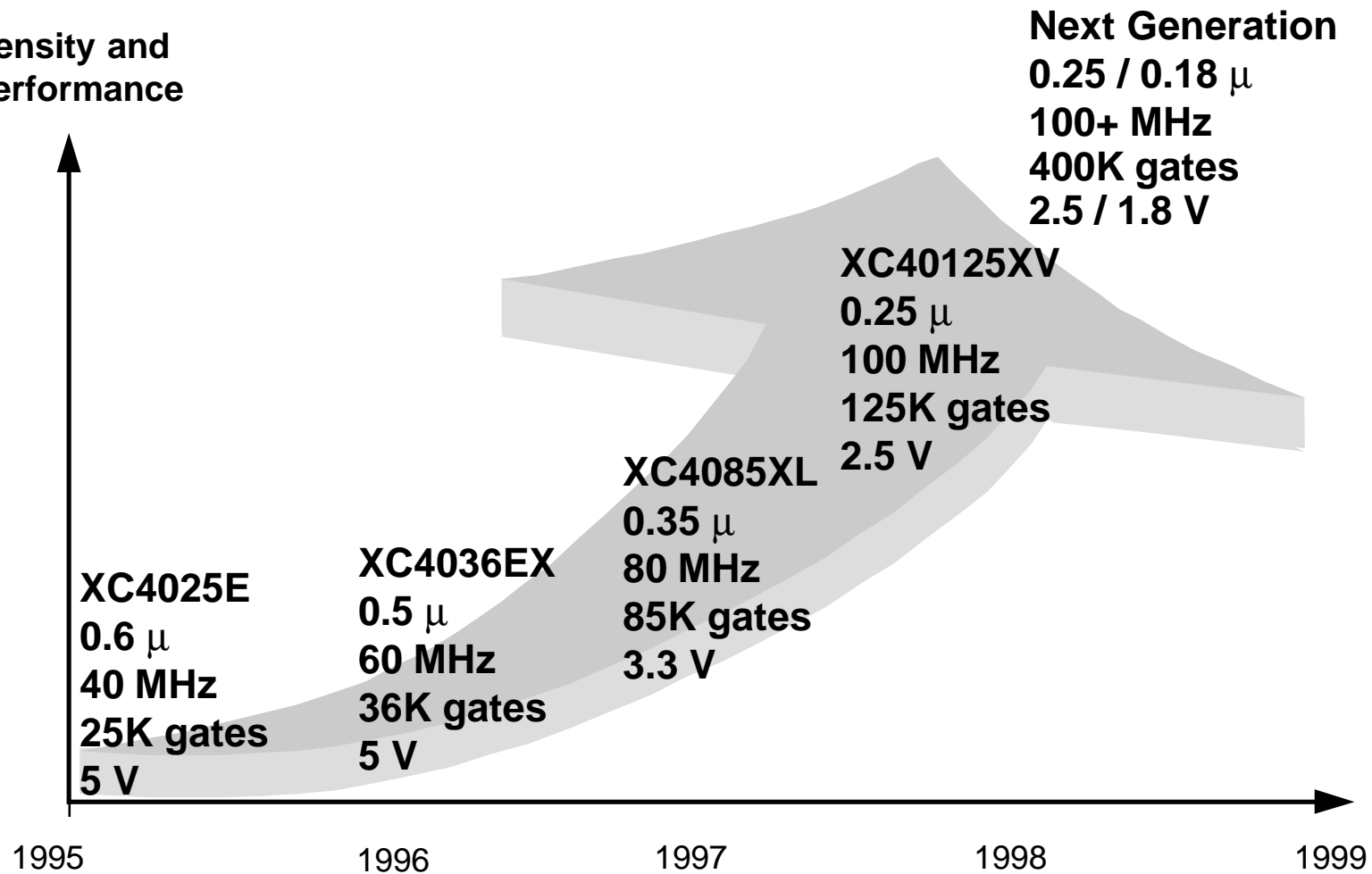
Speed



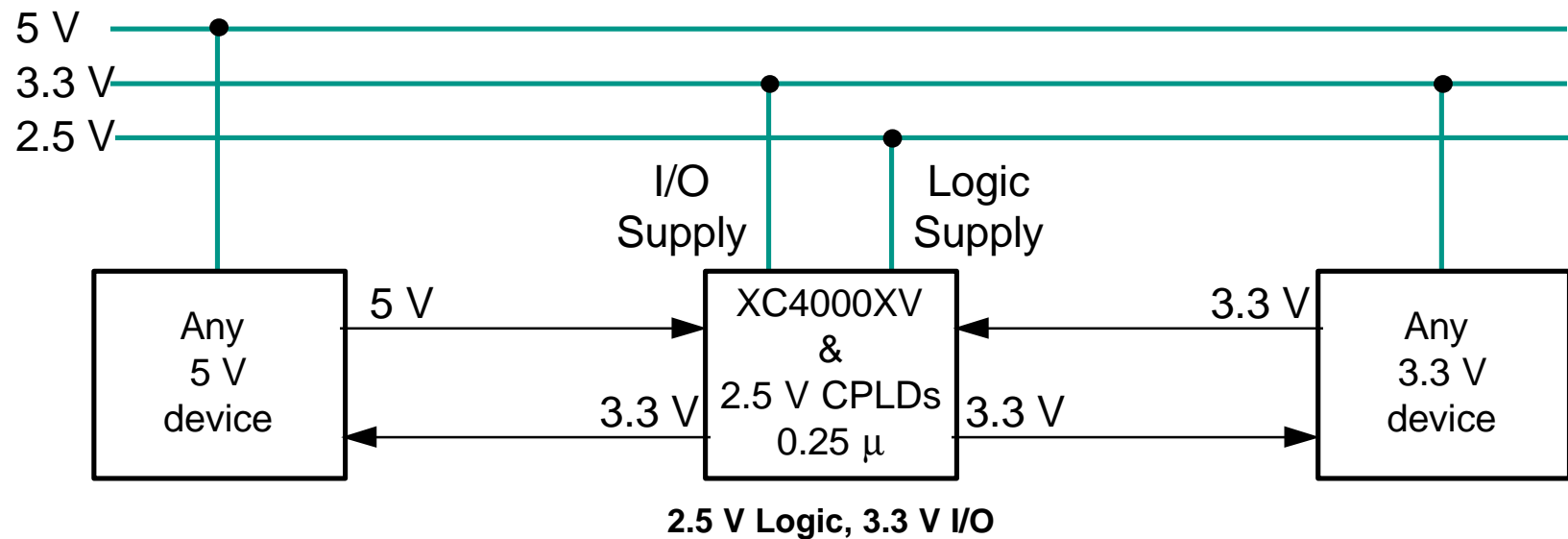
- **Speed improvement through process technology and architectural advancements**
 - Advanced clock trees
 - Phase-Locked Loops (PLL)
 - New signal standards
- **5-times speed improvement in 5 years**

Technology, Speed, Size

Density and
Performance



Xilinx PLDs Support Mixed-Voltage Designs

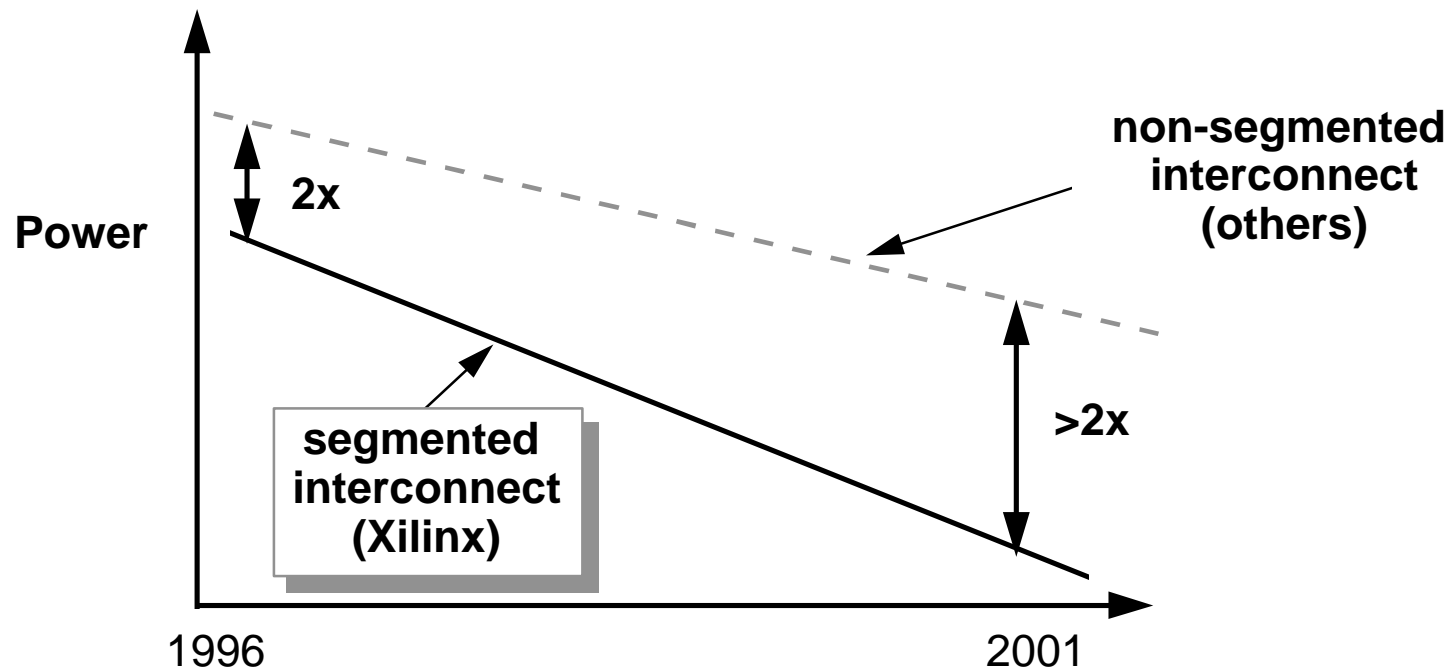


- Accept 5 V inputs
- Drive standard TTL levels
- Totally compatible in 5 V environment
- Separate I/O & logic supplies

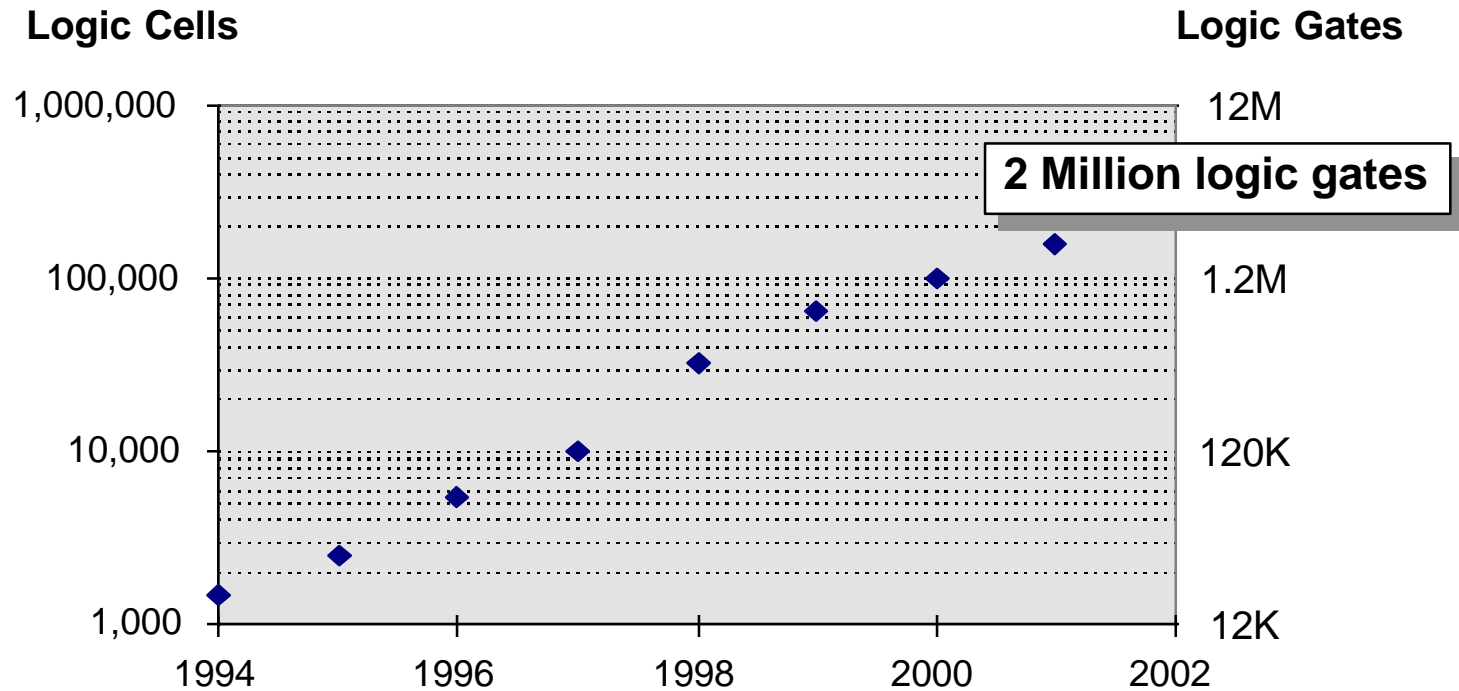
Power Dissipation

(for given logic and frequency)

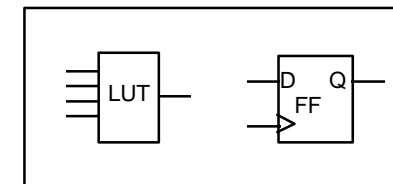
- $\text{Power} = CV^2f$
- Less capacitance \rightarrow less power and higher performance
- Lower power \rightarrow lower temperature \rightarrow higher reliability



Exponential Growth in Density



- 175,000 Logic cells = 2.0 million logic gates in 2001
- 1 Logic cell = 4-input LUT + FF



The Next Two Years

1997

- 11,000 logic cells (125k gates)
- Fastest RAM
- 5 V tolerant I/Os
- Buffered quad line
- VersaRing I/Os
- 6 ns pin-to-pin

1998

- 32,000 logic cells (400k gates)
- Programmable I/Os
- Advanced clocking
- 100 MHz system speed
- Fast reconfigure
- Hierarchical memory solution

1999

- 65,000 logic cells (800k gates)
- Built-in logic analyzer
- D/A & A/D support
- Custom COREs
- 500 MHz differential interface

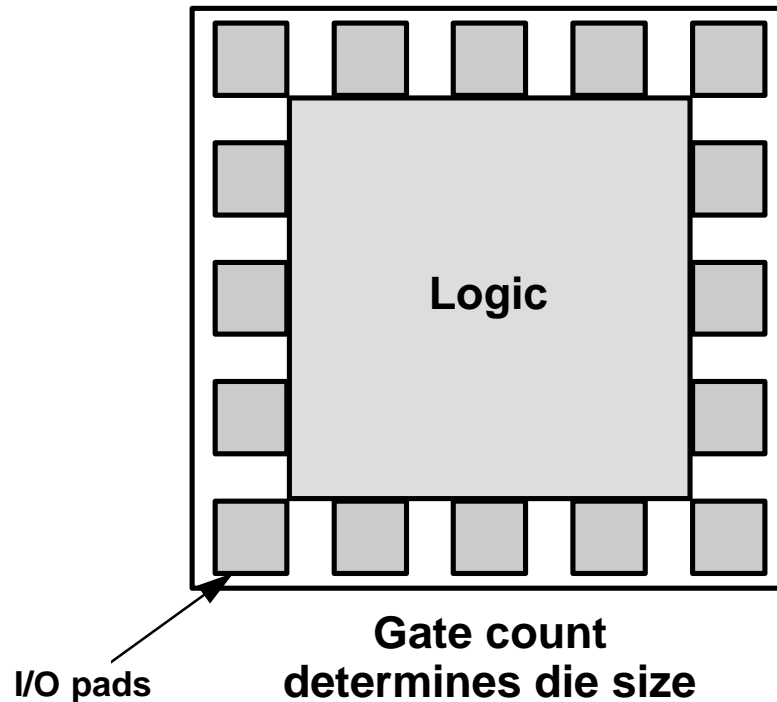
- Efficient segmented routing
- Lowest power

Shrinking Transistor Geometries

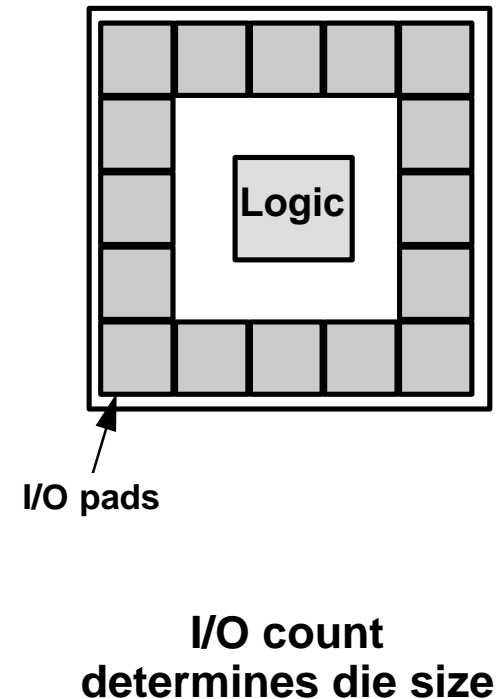
FPGA Die Size = Gate Array Die Size

FPGA Cost = Gate Array Cost

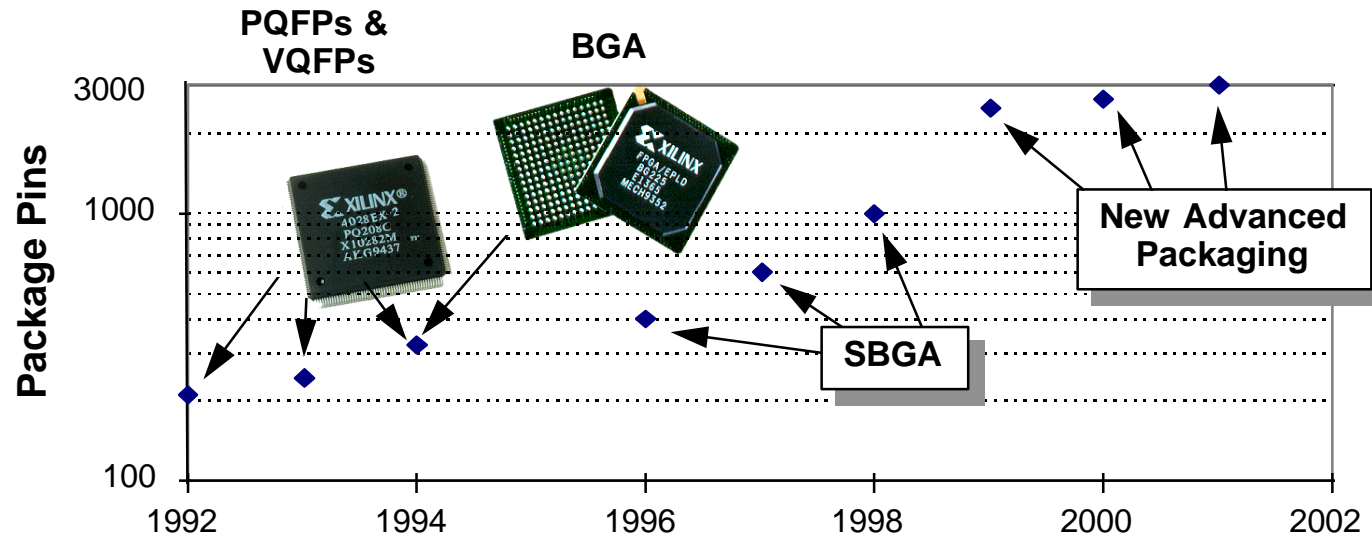
Logic-limited die size



Pad-limited die size



Xilinx Pioneers PLD Packages



- First to use PQFP and VQFP
- First to use BGA and SBGA (Super BGA)

More pins, smaller, thinner, more rugged, thermally enhanced

Xilinx Supports Evolving Design Methodologies

**Methodology
Evolution**

**Logic cells
(logic gates)**

**Behavioral
Synthesis**

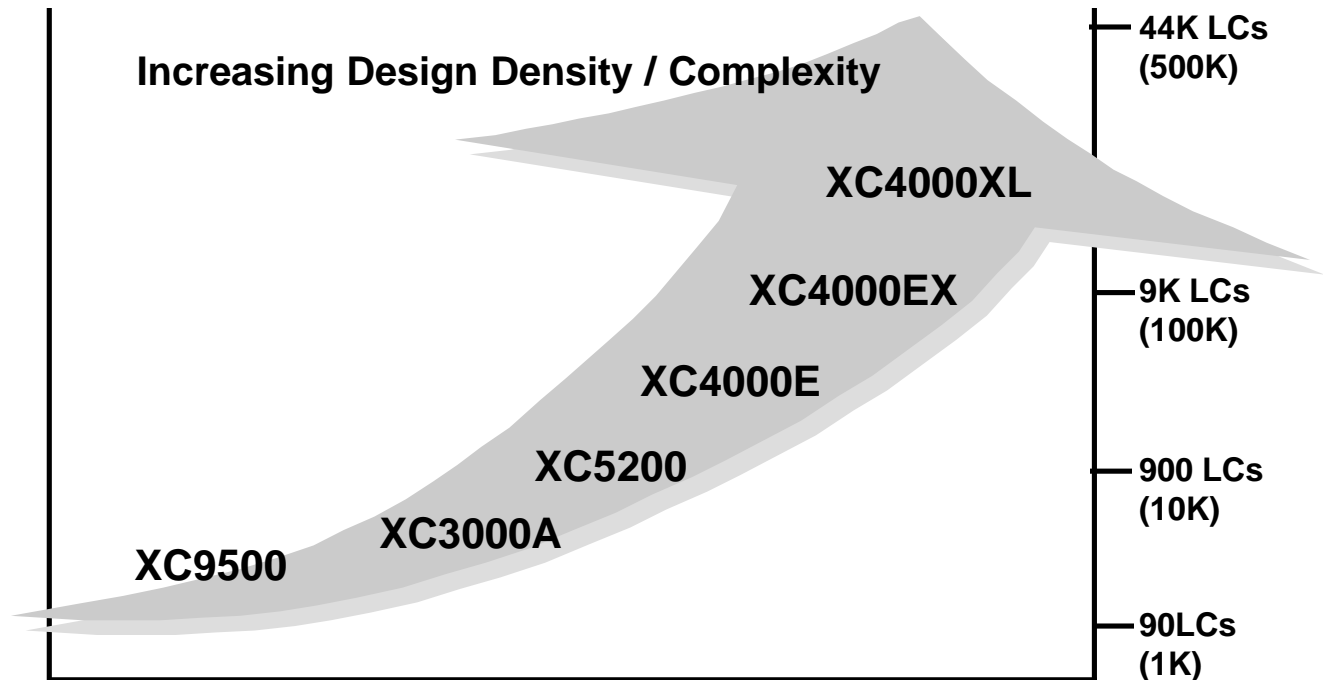
COREs

**RTL Level
Synthesis
(VHDL/Verilog)**

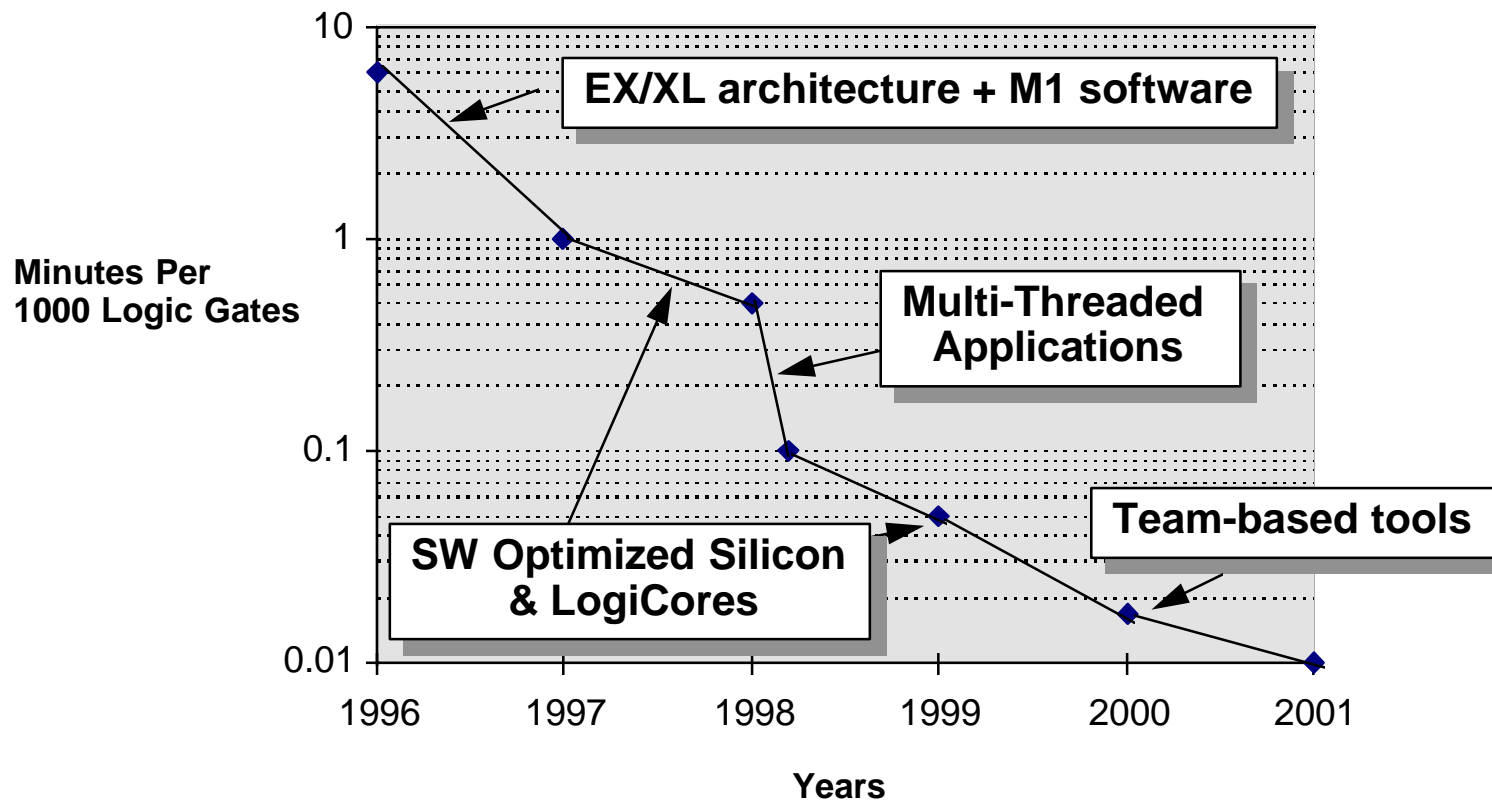
**Schematic
Design**

**Simple HDLs
(ABEL)**

Increasing Design Density / Complexity



Software Roadmap Focuses on Reducing Time-to-Market



Technical Support

- Worldwide technical resources
 - Regional support centers
 - Local FAEs (Xilinx and partners)
- Timely and accurate issue resolution
- Specialized local expertise
 - High-density, high-performance, COREs, and DSP
- Web-based information access and retrieval
 - Application notes and product information
 - First industry-wide programmable logic search
 - Integrated file download
 - Answers database (FAQs, tips, bugs & workarounds)

Xilinx Uses the Technology of Tomorrow to Bring You Complete Solutions Today

Silicon

Software

Intellectual Property (LogiCOREs)

Support