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Programmable World 2003

The Forum For The New Era Of Systems Design

New Product Introduction

Spartan-3 Platform FPGAs:

What Designers Have Been Asking For

Celoxica · Synplicity · Texas Instruments · The MathWorks · Mentor Graphics · Synopsys · Nallatech · Wind River · CMP Electronics Group · Xilinx · IBM · Agilent Technologies · cadence · intel · Altium

Solving the Designer's Dilemma

Commonly-heard requests:

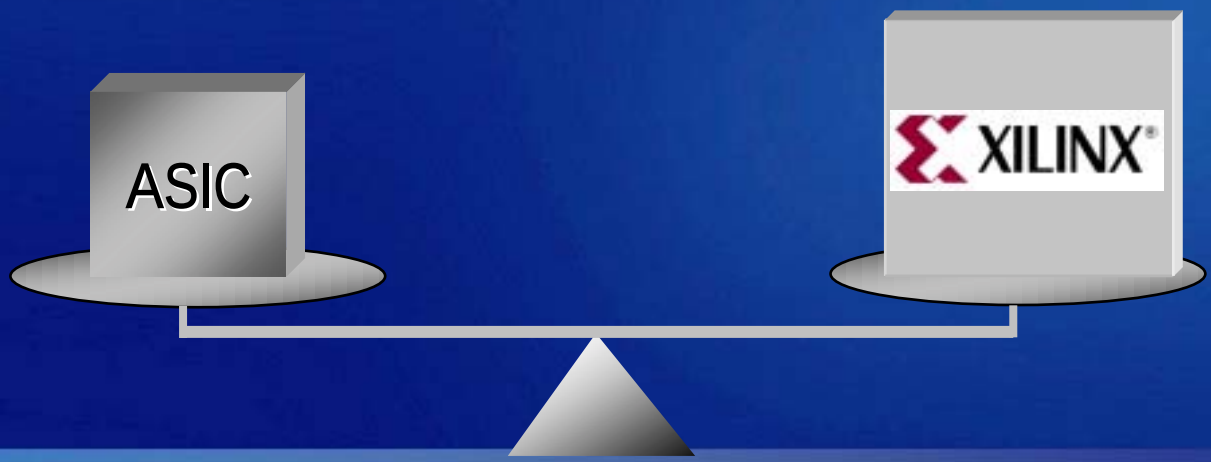
- I need platform level features to get my design done
- I need a solution I can use from prototyping to production
- I need a solution that meets my cost goals

Solving the Designer's Dilemma

Let's Weigh the Options

Use a gate array or mid-range standard cell?

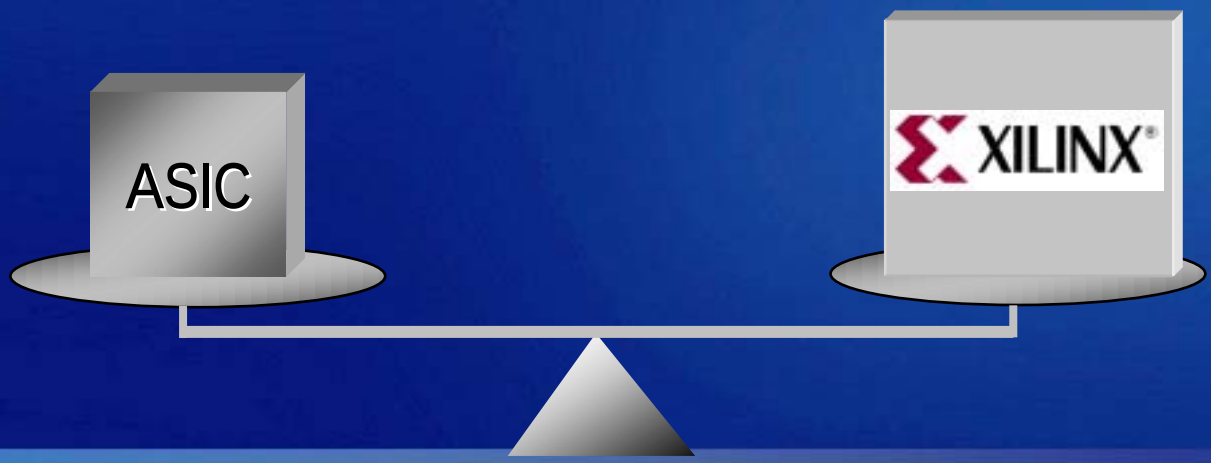
Use an FPGA?



Weighing ASIC vs. FPGA Value

$10M engineering cost

1/10 the development cost



Weighing ASIC vs. FPGA Value

$10M engineering cost
Long development cycle

1/10 the development cost
1/2 the development time

Weighing ASIC vs. FPGA Value

$10M engineering cost
Long development cycle
High volume commitment

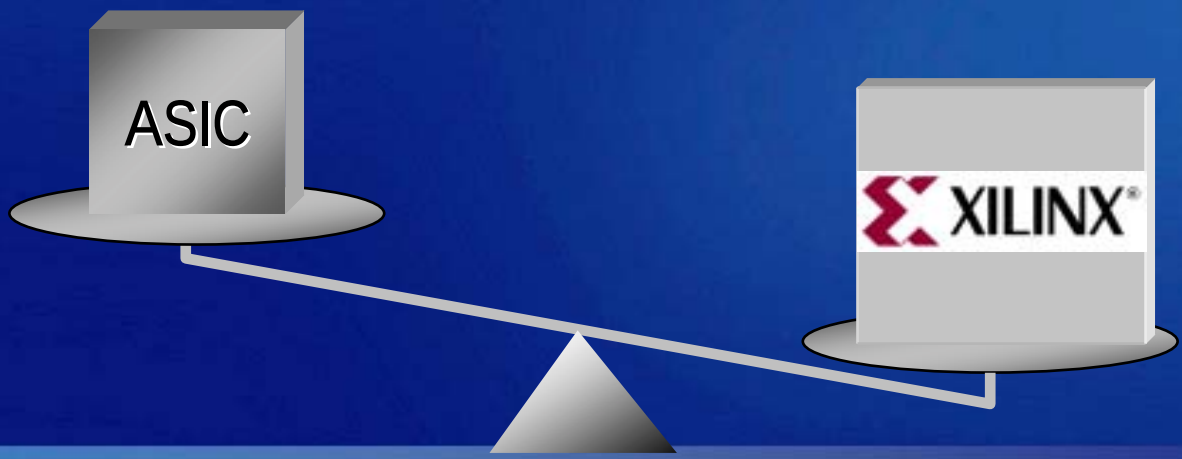
1/10 the development cost
1/2 the development cycle
Re-programmable

Weighing ASIC vs. FPGA Value

I like FPGAs, but can I get the density and performance I need at the right cost?

- $10M engineering cost
- Long development cycle
- High volume commitment
- Lowest flexibility

- 1/10 the development cost
- 1/2 the development time
- Re-programmable
- Easiest to use



Spartan-3 Platform Addresses The Needs of High-Volume Products

Wide product range
5M System Gates
780 I/O pins
2M bits RAM

Lowest Cost FPGA
Low cost per gate
Low cost per pin

Platform Capability
Connectivity
DSP
Embedded µP

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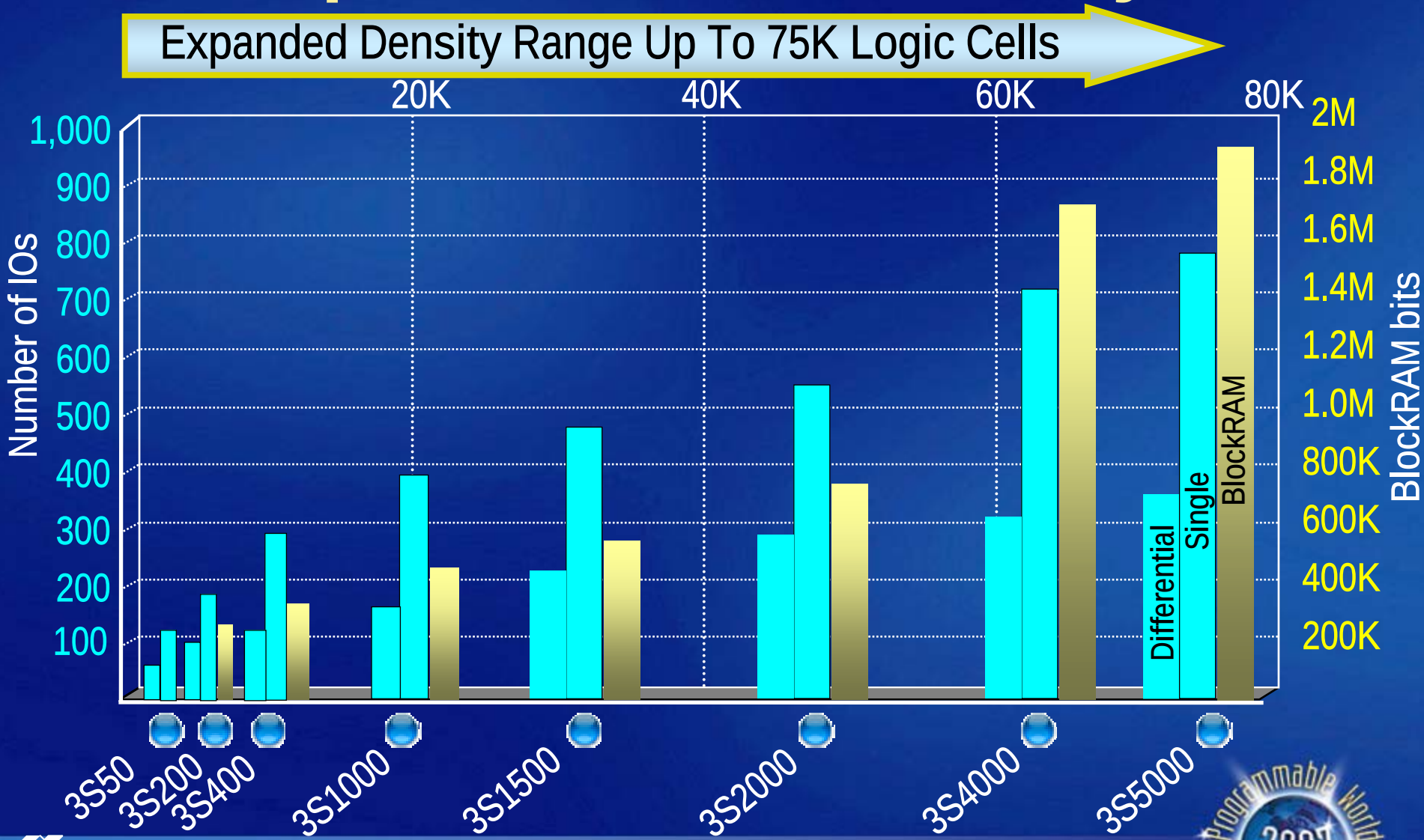
Spartan-3 FPGA Family



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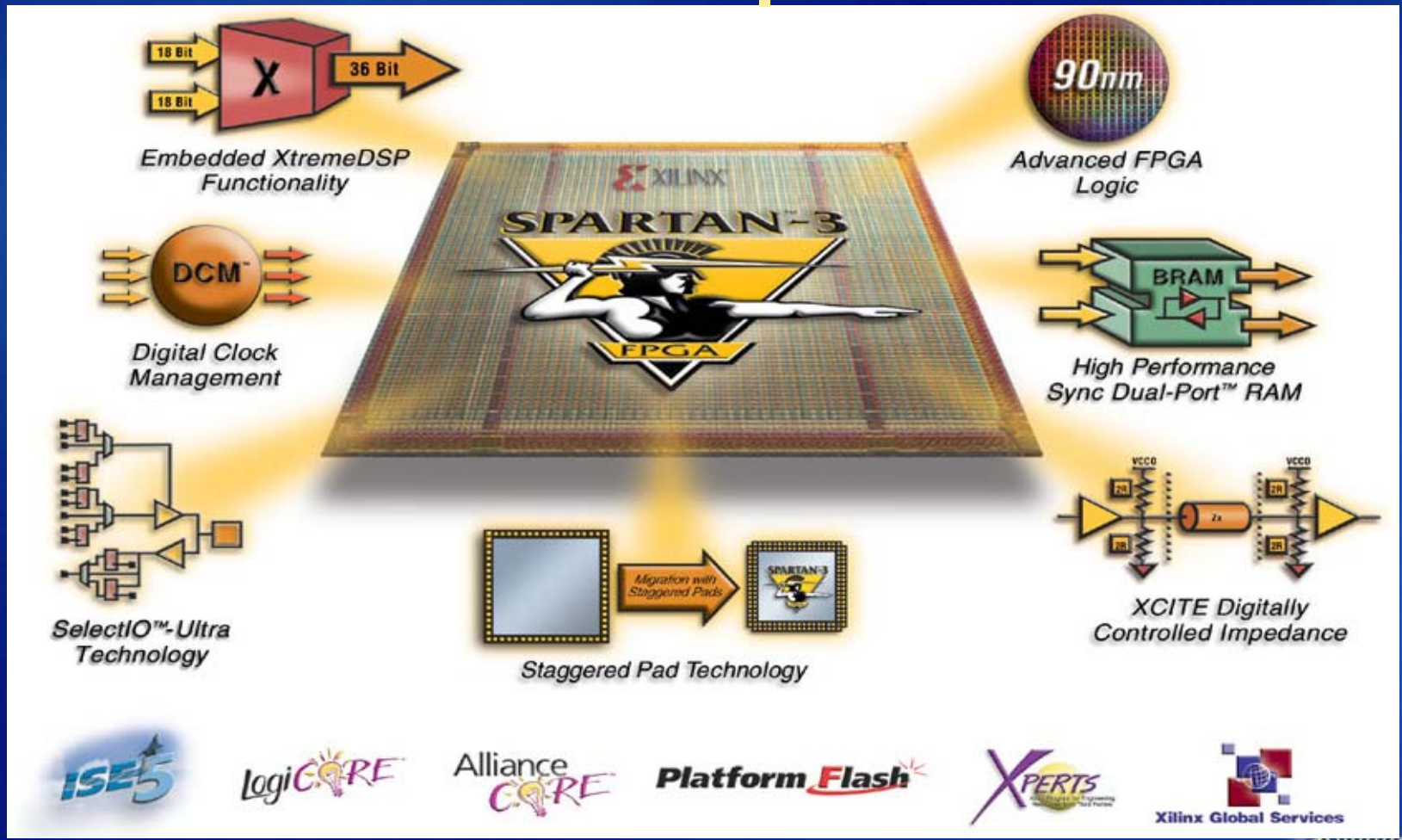
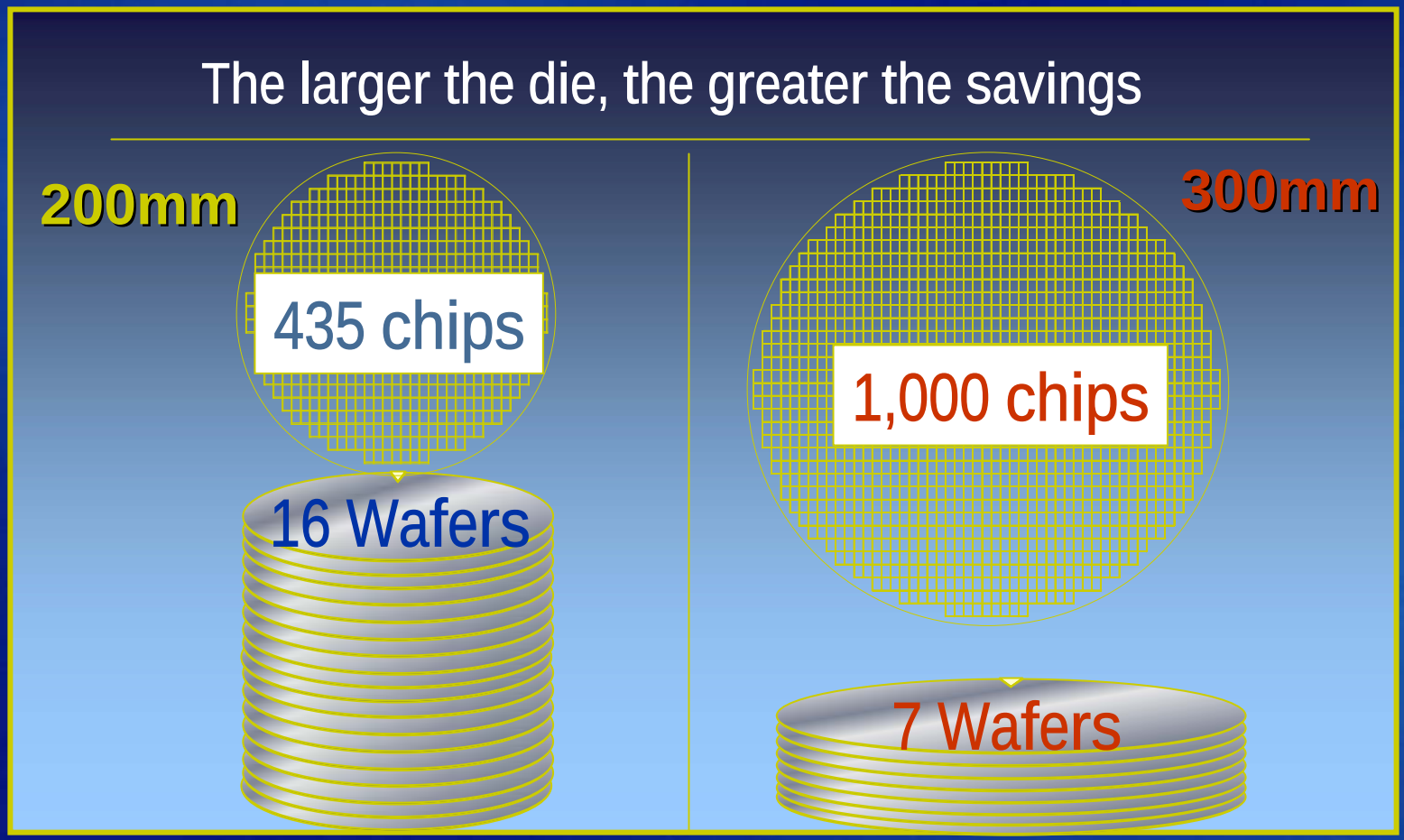
The Spartan-3 Platform: A New Class of Spartan FPGAs



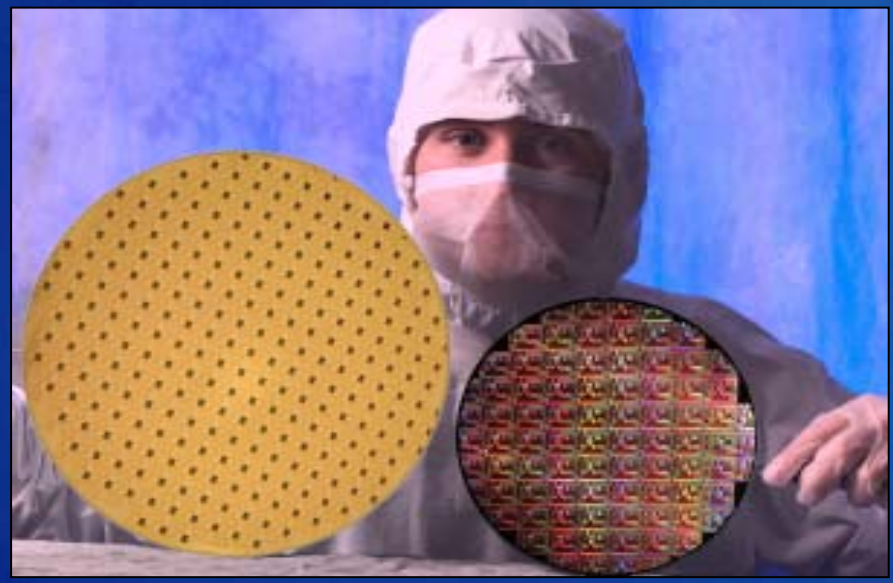
Spartan-3 Process Leadership

Resulting in Significant Cost Savings



Xilinx Delivers 90nm FPGAs

- Xilinx ships world's first 90nm FPGA - March 2003
  - Working devices from both IBM & UMC fabs
- 50% smaller die size than 130nm technology
- Increased manufacturing efficiencies from increased die per wafer
- Results in industry's lowest cost per gate and per I/O pin
- Will allow new high volume applications to utilize FPGA advantages



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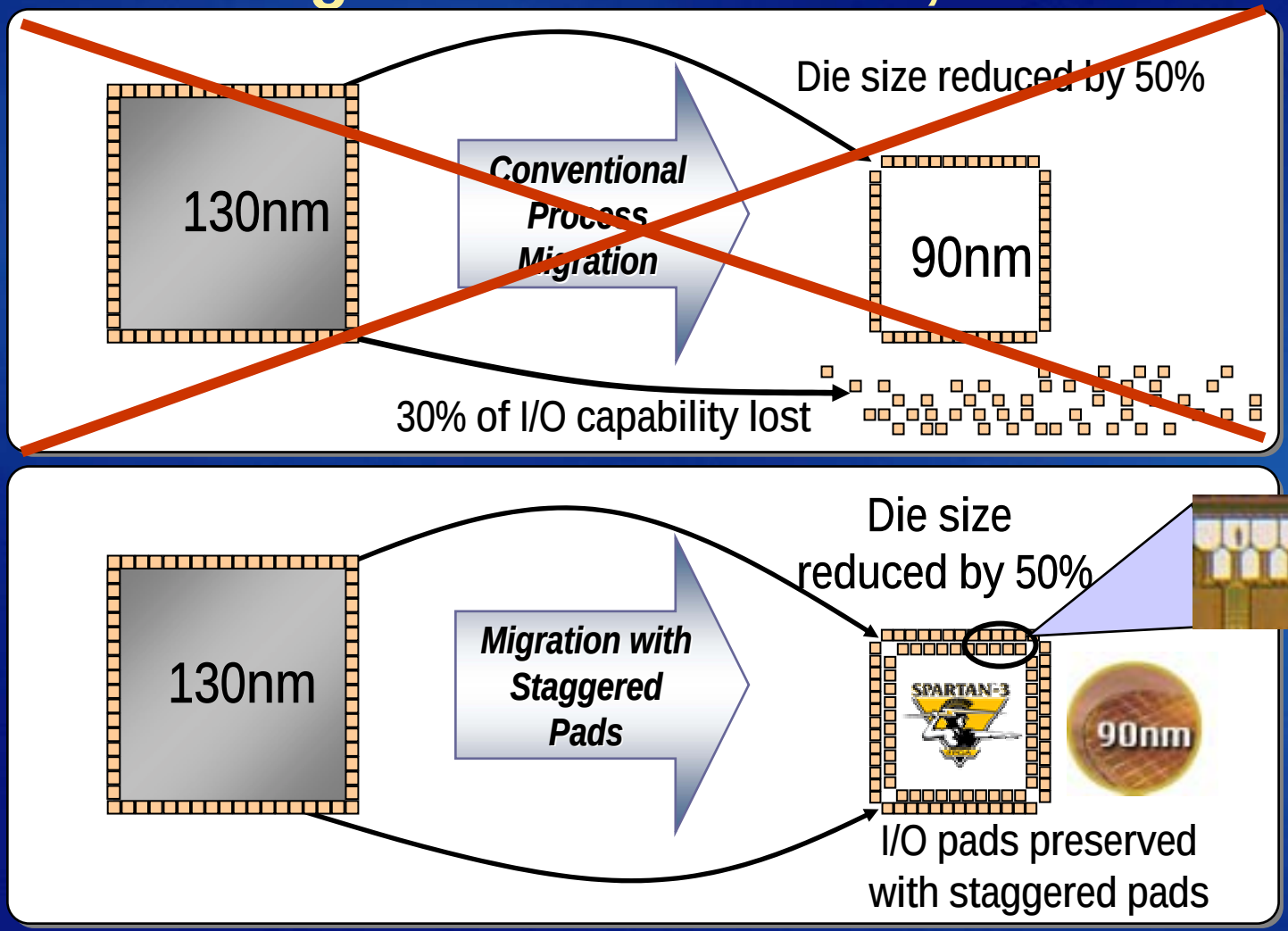
Maximizing I/O Advantages

Delivering minimum die size, maximum I/Os

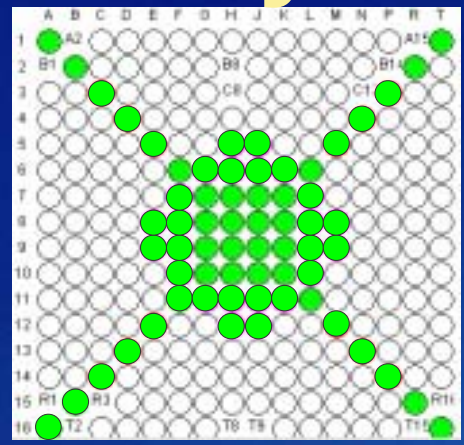


The Spartan-3 FPGA Advantage

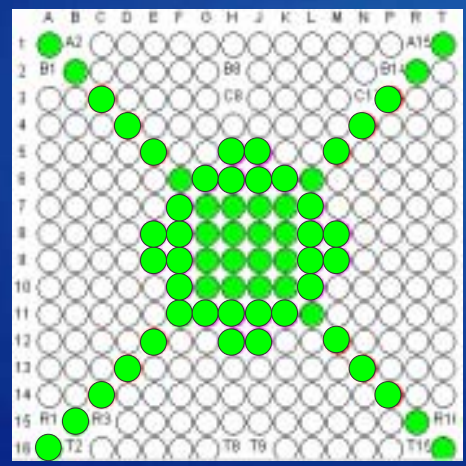
- Spartan-3 devices meet mid-range ASIC requirements
  - Density, I/O pins, and memory
- The Spartan-3 solution delivers flexibility and capability beyond competing FPGA solutions
  - Package and density migration flexibility
  - Industry-leading software and partner support
  - Powerful platform design capabilities
    - Connectivity, DSP, embedded processing

Guaranteed Density Migration I/O Connectivity

- Seamless migration across densities
- No expensive re-layout
- Position of VCC & GND remains the same
- Higher I/O count for higher density



FT256 package



● VCC & GND ● User I/O

200 K System Gates

5X Density Range

1 Million System Gates

Migration Over a Wide Density Range

100X Density Range

Device	XC3S50	XC3S200	XC3S400	XC3S1000	XC3S1500	XC3S2000	XC3S4000	XC3S5000
VQ100	61	61						
TQ144	97	97	97					
PQ208	124	141	141					
FT256		173	173	173				
FG456			264	333	333			
FG676				391	487	489		
FG900						565	633	633
FG1156							712	784

TQ144	3 devices, **8x** density range
PQ208	3 devices, **8x** density range
FT256	3 devices, **5x** density range
FG456	3 devices, **3x** density range
FG676	3 devices, **2x** density range
FG900	3 devices, **2x** density range

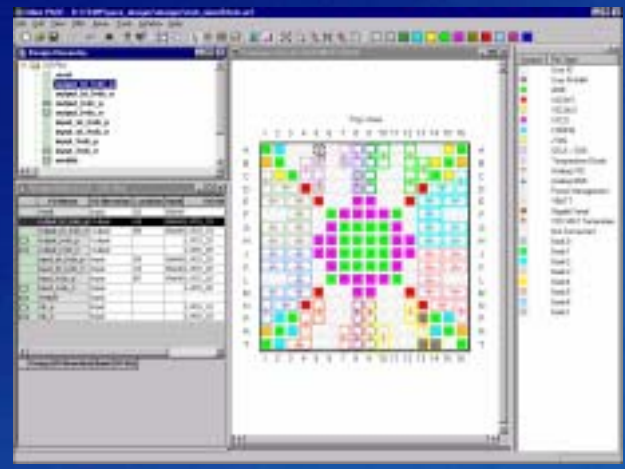
Density range over million gate devices!

The ISE Design Tool Advantage

- Xilinx Integrated Software Environment (ISE) tools
  - Continuous technology advancements since 1998
  - 2X runtime improvement every year
    - Now at 3 million gates per hour!
  - Over 150,000 registered users
- Common architecture and tools minimize learning curve
  - Spartan-3 and Virtex-II Pro families both derived from Virtex-II architecture
  - Leverage designer's knowledge and design IP

Prevalent Design Methodology for Rapid Adoption

- Lower project costs
  - Design & verification times slashed up to 50% compared to ASICs
  - Achieve up to 20% better performance - a “virtual” speed grade advantage
- Redefining “ease-of-use”
  - Streamline critical design bottlenecks
  - Easy access to advanced device features
  - Real-time, in-system debug capabilities with ChipScope Pro



The Value of Partner Leadership

- Partners deliver their best - first for Xilinx
- Design advances through active collaboration
  - Physical synthesis with incremental design
  - Formal verification
  - HDL rule checking
  - Power analysis
- Offering FPGA design technology once available only for ASIC design

Lowest Cost Parallel Interconnect Solutions

- Best value in popular cores
  - PCI 32/33 effective cost as low as $0.75*
- Physical interfaces and system elements
  - 23 I/O standards, DDR I/O registers, DCMs
- Pre-engineered solution
  - Drop-in functionality
  - Pre-verified and fully compliant

PCI 32/33 and PCI 64/33

Real-PCI™

SPI-3.1 (POS-PHY Level 3)

SPI-4.2 “Lite” (2.5Gbps)

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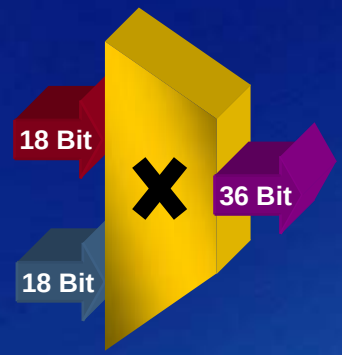
* Based on pricing for end-2004, 250K units

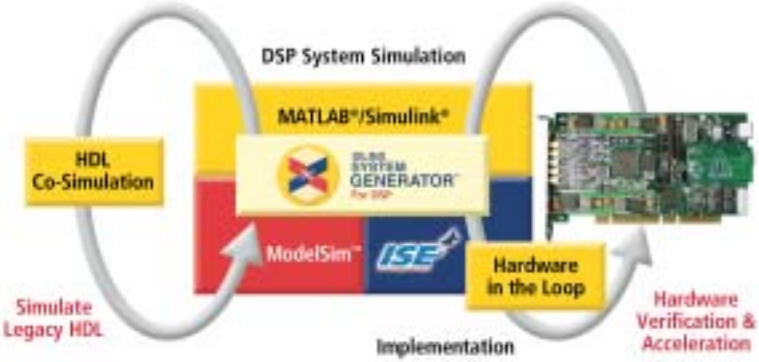
Unrivaled Cost Points for High Performance DSP

- Up to 330 billion MACs/sec
  - Spartan-3 device under $100* delivers up to 276B MACs/sec
- Ideal solution for traditional ASIC-based DSP applications:
  - Digital communications, video/Imaging, & industrial control
- Simple design flow
  - MathWorks (MATLAB/Simulink)
- Complete DSP solution
  - Silicon, software, IP, services, specialists & development systems



Embedded DSP Capability With Up to 104 18bit Multipliers!

Simple and Familiar DSP Design Flow



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MicroBlaze & Spartan-3 FPGAs: Industry's Lowest Cost Soft Processor Solution

- Effective cost as low as $1.40*
- Customized controller and peripheral set to meet exact and evolving design requirements
- Complete solution includes HW, SW, tools and design examples
  - Embedded Development Kit (EDK) support offering common development environment with Virtex-II Pro PowerPC-based solutions

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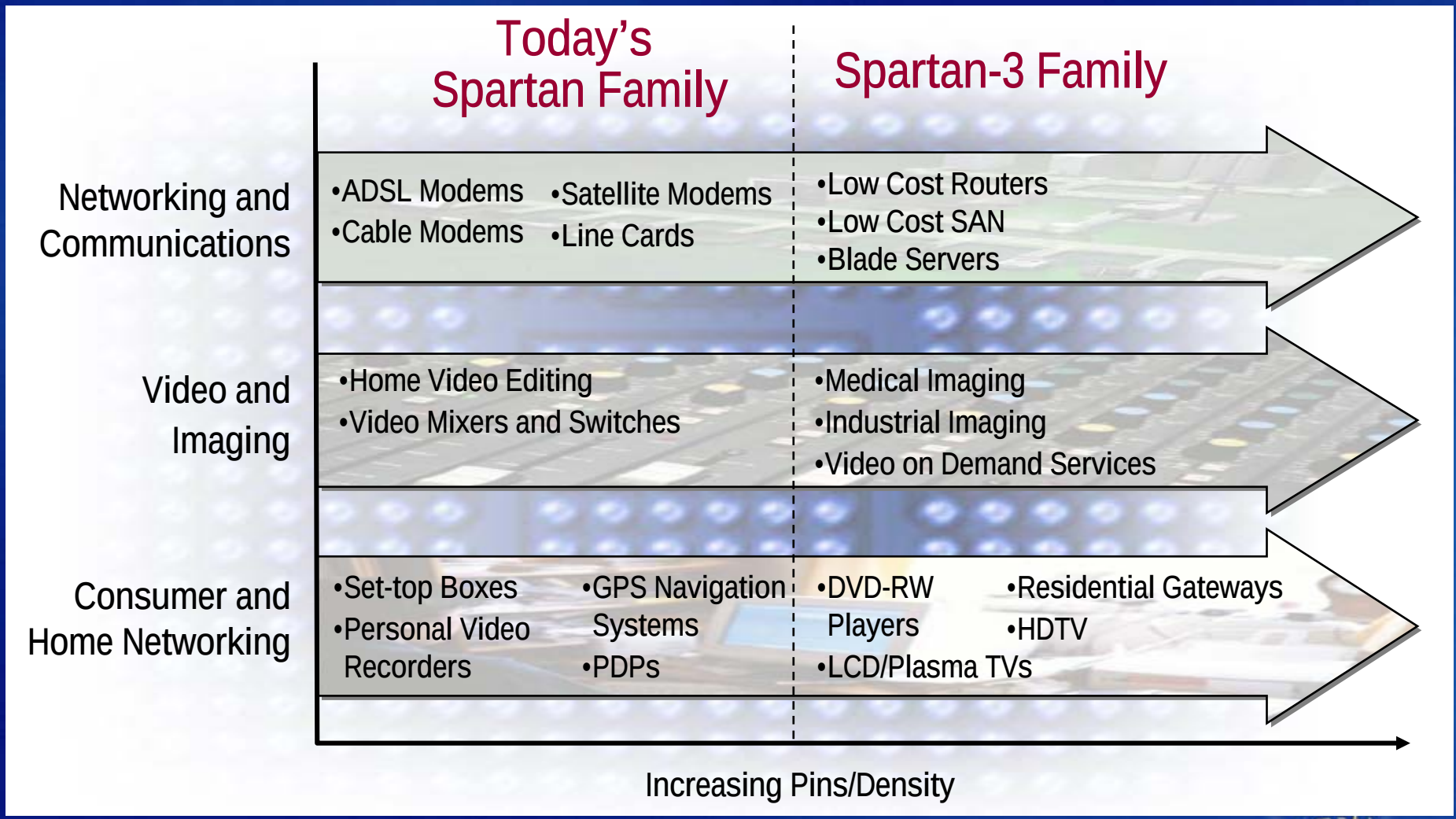
Wider Range of Markets & Applications



Summary

- Spartan-3 platform delivers 50K to 5M system gates with lowest cost per gate and cost per I/O
  - 4 Million system gates and 712 I/Os for under $100*
  - World's first 90nm FPGA, shipping today
- Spartan-3 delivers platform capabilities in connectivity, DSP, and processing
- Radical increase in density and capability will open up new applications to FPGAs

Spartan-3 FPGAs: What designers have been asking for

* Based on pricing for end-2004, 250K units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2003
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Thank You!
Celoxica
Synplicity
Texas Instruments
The MathWorks
Mentor Graphics
synopsys
NALLATECH
WIND RIVER
CMP
Electronics Group
XILINX
IBM
Agilent Technologies
cadence
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