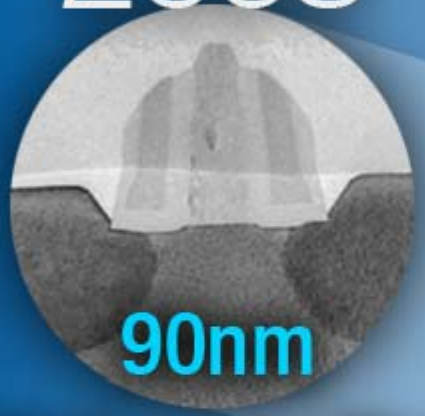
Architectural Innovation for the Future of Computing

Antonio D'Acosta Rivera

1962
1965
1970
1970
Relative Manufacturing Cost per Component
10^4
10^3
10^2
10
1
1
10
10^2
10^3
10^4
10^5
Number of Components per Integrated Circuit

2003



90nm

1st Generation
Strained Silicon

2005

65nm

2nd Generation
Strained Silicon

Up to 30%
performance increase

Up to 5X
leakage reduction

65nm CPU Shipments

8,000,000,000,000,000 transistors

July 27, 2006

intel

Game Performance	Audio Performance	Video Encoding	Power Usage
82% BETTER	39% BETTER	35% BETTER	20% LESS

Core™ 2 Extreme x6800 compared to Pentium® Extreme Edition 965

"Jaw Droppingly Fast"

PC MAGAZINE

Source: PC Magazine, September 5, 2006

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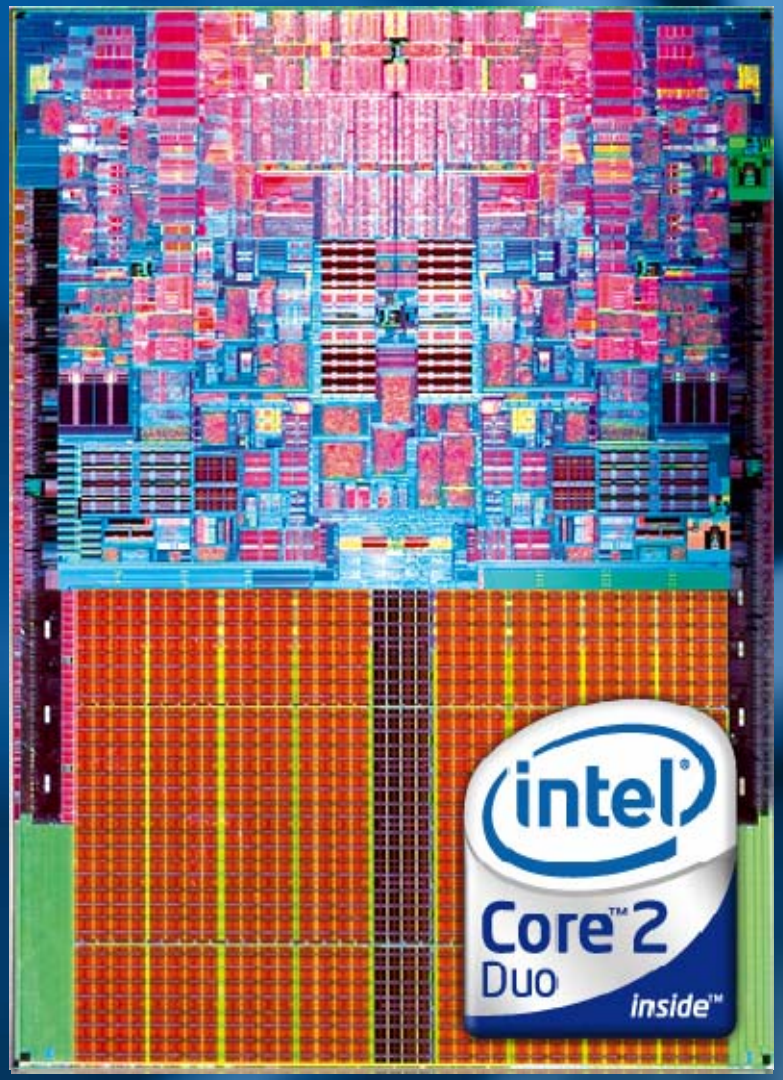

Over
5,000,000
in less than
60 days

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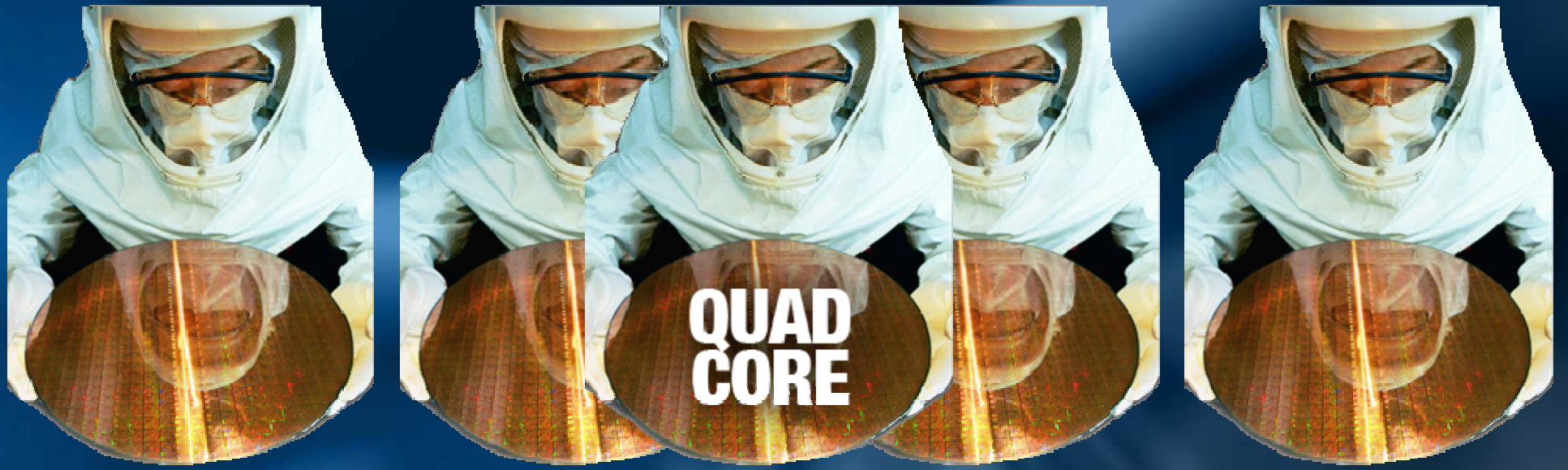
Delivering World's Best Performance and Energy Efficiency

WHAT'S NEXT?



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Quad-Core: Coming November 2006 Q1’07

“It’s like being catapulted a year into the future”

TOMS HARDWARE

SPECint_rate

70%

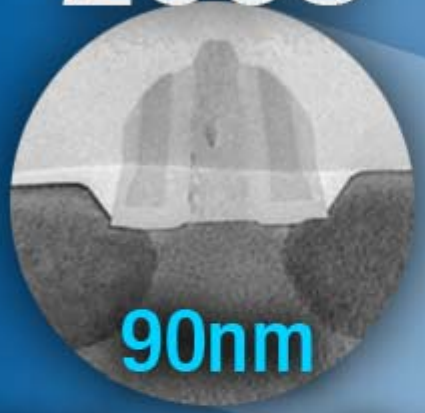
BETTER

Core™ 2 Extreme QX6700 compared to Core™ 2 Extreme x6800

intel

Based on estimated SPECint*_rate_base2000 performance. SPECint* is a registered trademark of the Standard Performance Evaluation Corporation. For more information see

2003



90nm

1st Generation Strained Silicon

2005

65nm

2nd Generation Strained Silicon

Up to 20%
performance increase

Up to 5X
leakage reduction

2H'07

45nm

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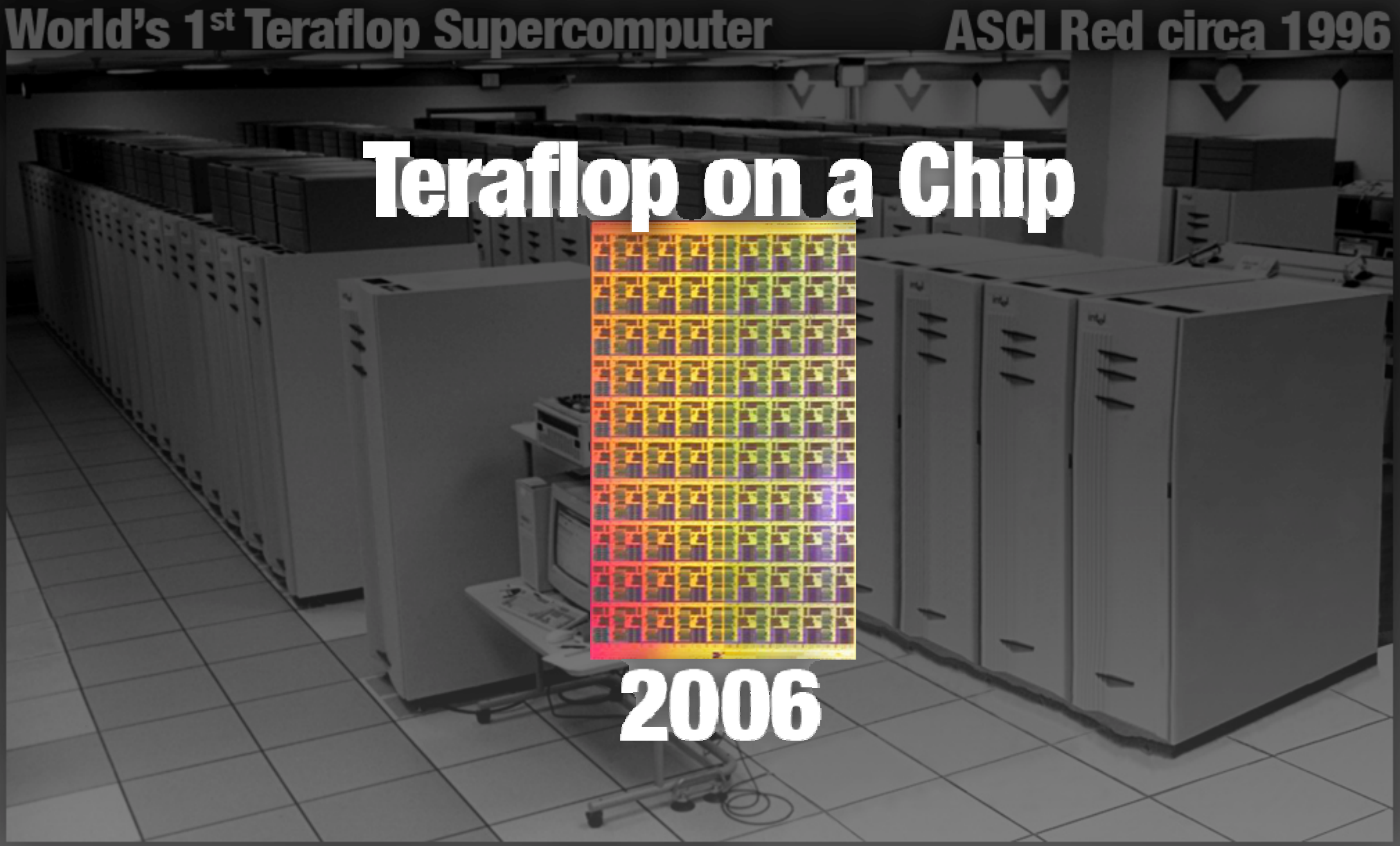
15
45nm
PRODUCTS in
DEVELOPMENT
intel
45nm

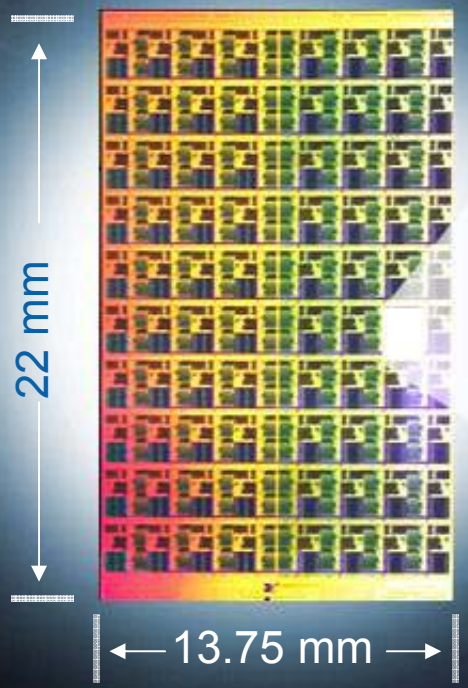
World's 1st Teraflop Supercomputer

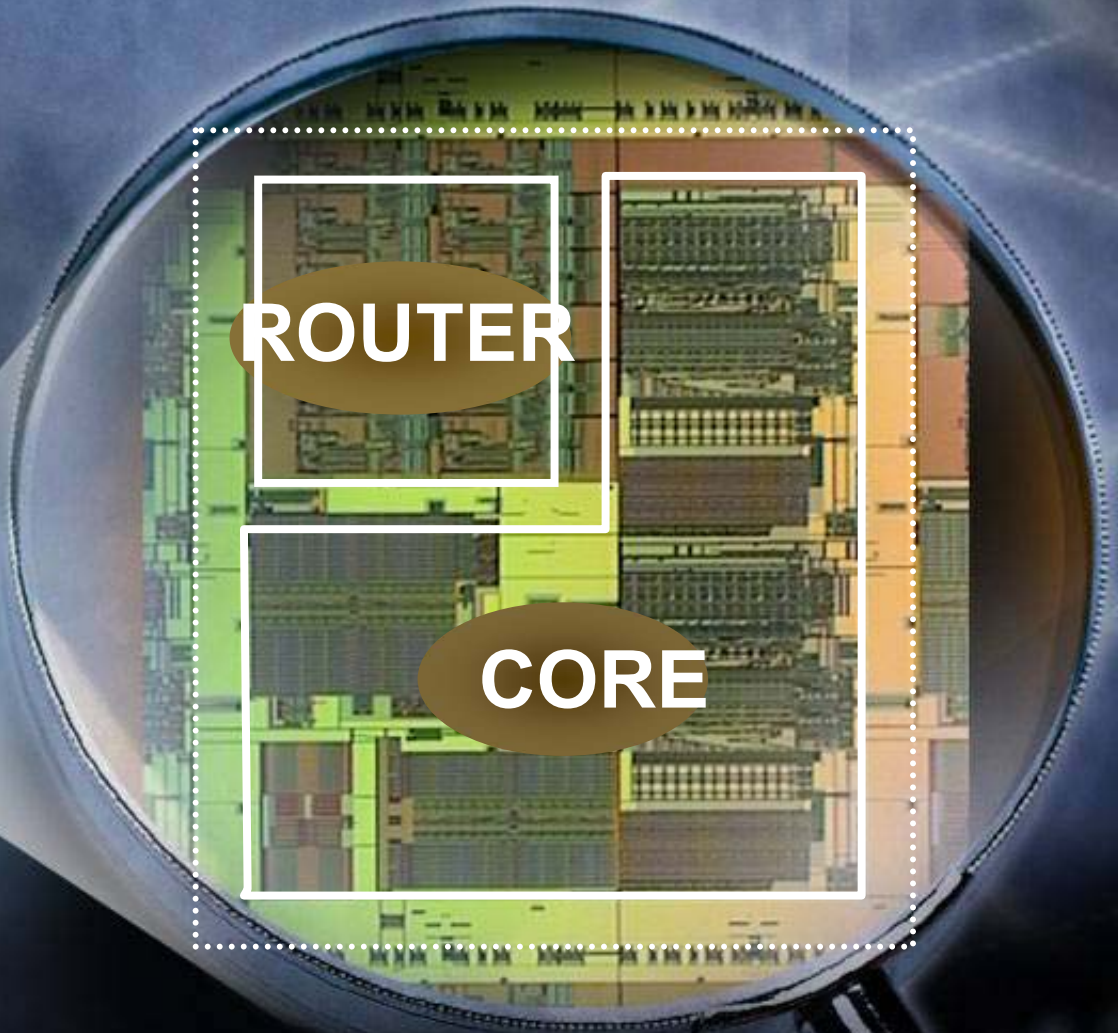
ASCI Red circa 1996


World's 1st Teraflop Supercomputer
ASCI Red circa 1996
Teraflop on a Chip
2006

TERAFLOP OF PERFORMANCE

80 CORES





Grid Computing

The coordinated use of a large number of servers and storage acting as one computer

- Scalable
- Fast – high performance
- Fault tolerant
- Use low-cost components
- Provide computing power on demand

intel
Leap ahead™