



High Definition Computing Strategy

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Enabling
Digital Brilliance

Presentation Overview

- Multi-core Processing
- PCI Express
- Memory
- Storage
- Core Logic Architecture

Multi-core Processing

- The rise of the Multi-Core Processor
 - Athlon™ 64 X2 & Pentium® D 840
 - Changing performance paradigms
 - Moving away from MHz
 - Focus on multi-tasking scenarios
- Challenges:
 - Finding SMP software that takes advantage of multi-cores
 - Balancing power and thermal requirements

Multi-core Processing: Core Logic Impact

- How to feed the multi-core processor
 - Gradual increase in FSB speeds
 - Looking beyond the 1066MHz FSB
 - Continued movement of processor architecture towards on-die memory controllers
- Processing cores taking over or enhancing processing requirements of other core logic related peripherals
 - Graphics
 - Security
 - Audio



PCI Express Graphics

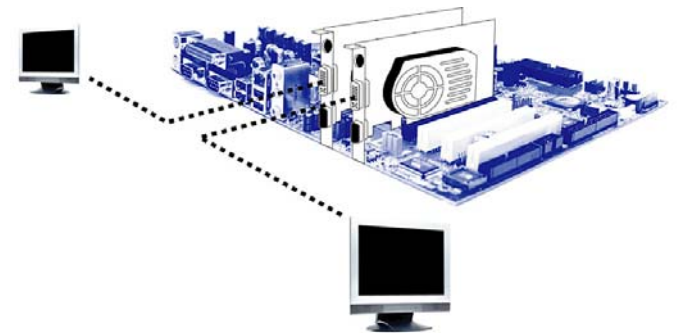
- Significant impact on graphics card market:
 - Support for multi-graphics card configurations
 - Gaming
 - Advanced multitasking
 - Using PCI Express Bandwidth to render in System Memory
 - ATI HyperMemory , Nvidia TurboCache, S3 ChomMAT

PCI Express Peripheral Devices

- Increasing availability of PCI Express peripheral devices
 - Networking (PCI Express x1 or x2)
 - TV Tuners (PCI Express x1)
 - Physics Processing Unit (PCI Express x4?)

PCI Express: Core Logic Impact

- More PCI Express bandwidth required
- More flexible configurations
 - User or auto configured lanes
 - Motherboard incorporating multiple PCI Express configurable connections
- Looking towards PCI Express 2.0 specification
 - Doubling of bandwidth
 - Increased delivery of power
 - More explicit, less misinterpretation

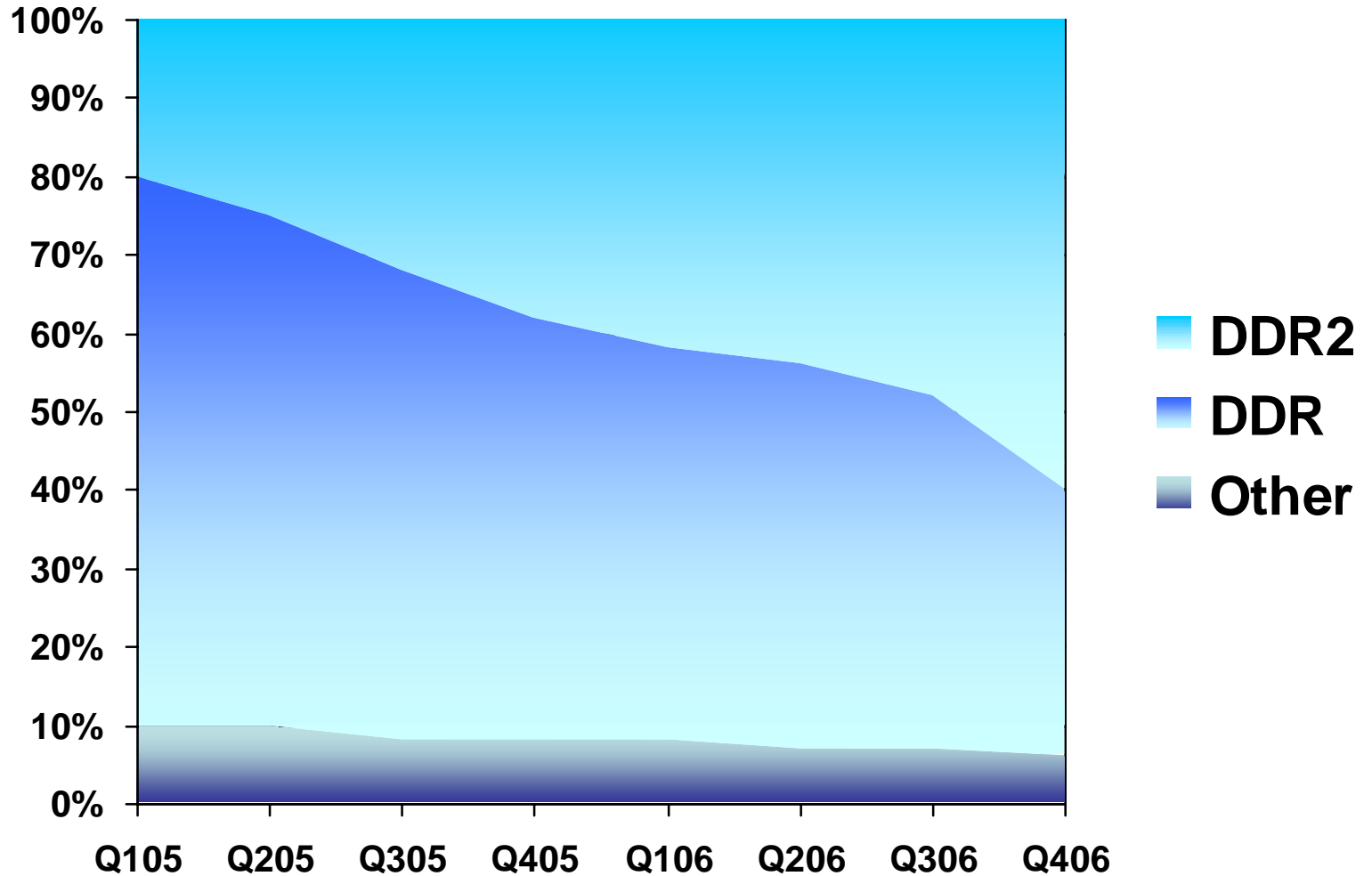


Memory

- DDR2 transition not going as smoothly as expected
 - High pricing
 - Lack of enthusiast interest
- Performance gains only being seen with low DDR2 memory timings that overcome added latency

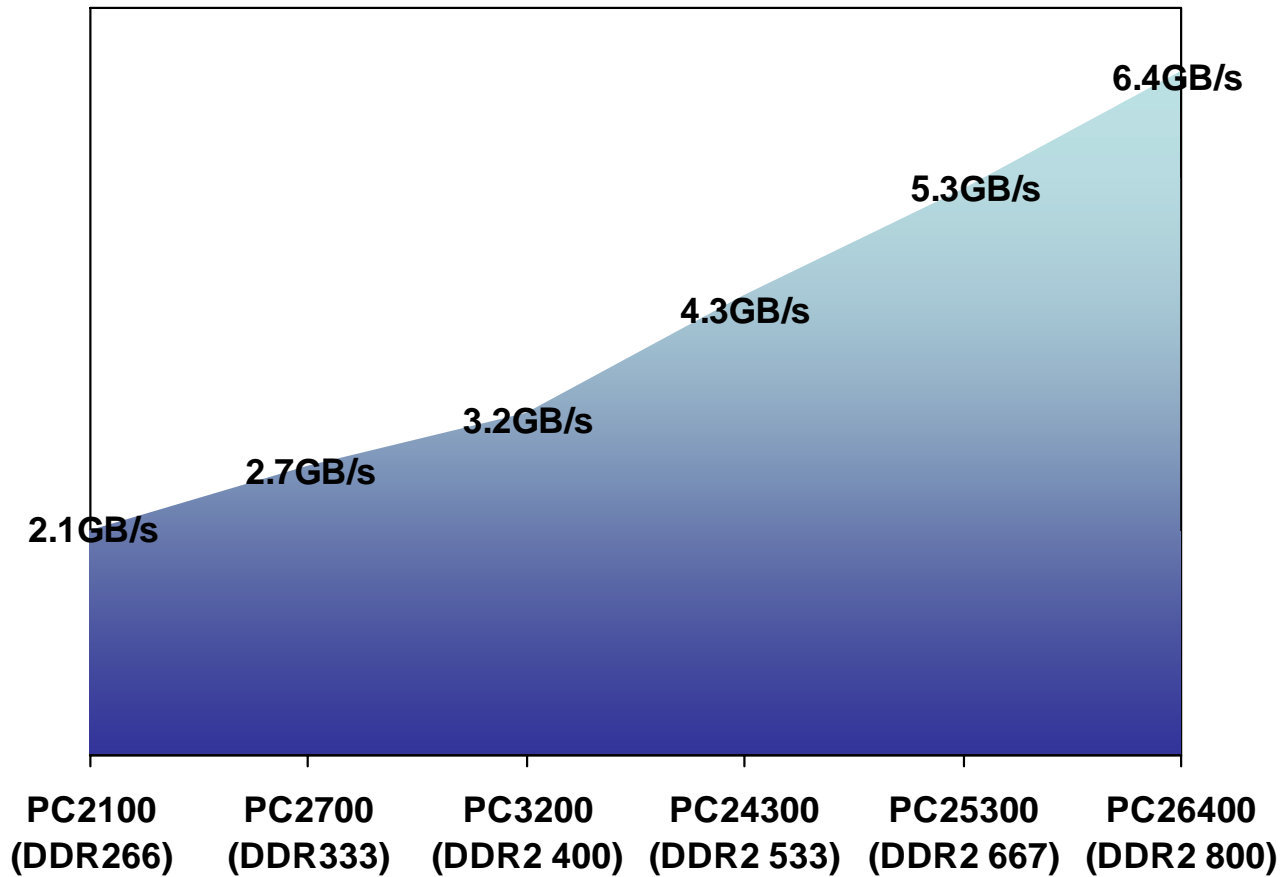
Memory

Forecast DDR Market Mix



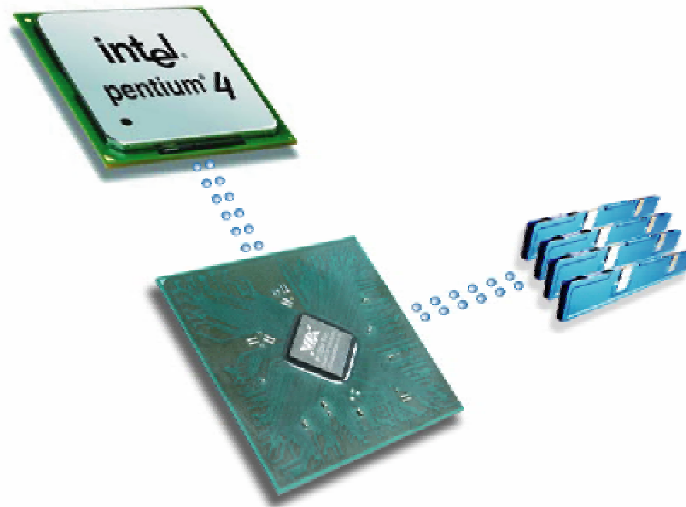
Memory

Memory Bandwidth



Memory: Core Logic Impact

- Future support for PC26400 (DDR2 800)
- Continued support for DDR until price parity draws closer
 - VIA StepUp technology enabling co-layout designs

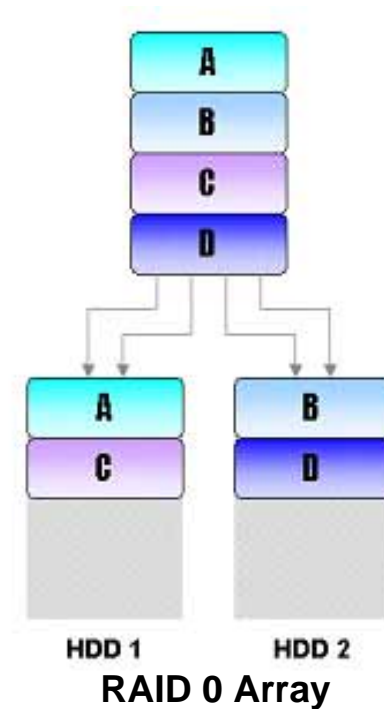


Storage

- Increasing storage requirements
 - Racing towards the 1 Terabyte Desktop PC
- Requirement for:
 - Performance
 - Redundancy
 - Expandability

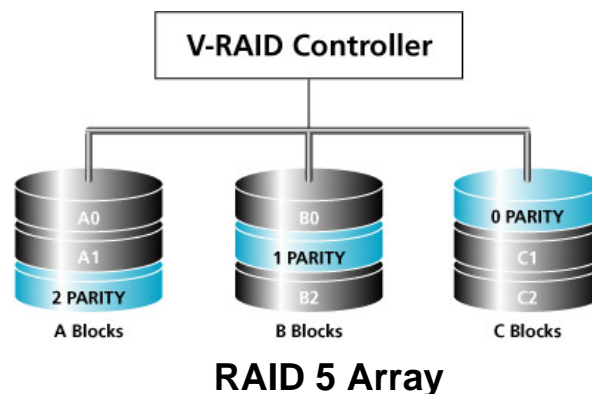
Storage

- RAID 0 Arrays gaining strength
- Crucial for RAID arrays to offer:
 - Performance
 - Ease of Setup
 - Easy Repair
- VIA V-RAID Technology



Storage: Core Logic Impact

- Continued support for SATA-II technologies and beyond
- Integrated hardware support for RAID Arrays to ensure maximum performance
- Support of new RAID array types:
 - RAID 5
 - RAID 10



Core Logic Architecture

- Hypothetical future bandwidth requirements:

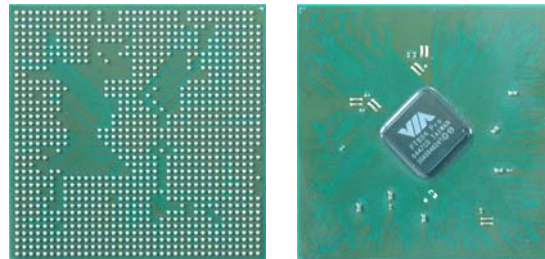
Device	Required Bandwidth
2 PCI Express Graphic Cards	8192MB/s (8GB/s)
2 HDTV Tuner Cards	500MB/s
Gigabit Ethernet	119MB/s
HD Audio	6MB/s
2 SATA II HDDs	715MB/s
Theoretical total required bandwidth	9532MB/s (9.3GB/s)

Core Logic Architecture

- Bandwidth impact
 - Continued increase of North Bridge / South Bridge interconnect speeds
 - Moving beyond Ultra V-Link (1066MB/s)
 - Movement towards single chip core logic designs for small form factor designs
 - Enhanced performance
 - Increased board real estate

Core Logic Architecture: Manufacturing

- Continued use of Flip Chip packaging
 - Reducing excess die area
 - High speed electrical performance
 - Reduction of inductance and capacitance
 - Reduction of bond wire coupling



VIA PT894

- Movement towards 0.11micron process technology

Thank You