

Powerful AMD Athlon™ 64 Solution



**Silicon Integrated Systems Corp.
Integrated Product Division**

Oct. 2003



- ❑ **SiS AMD Athlon™ 64 Products Positioning**

- ❑ **SiS755 System Architecture**

- ❑ **SiS760 System Architecture**

- ❑ **SiS Propriety Leading Technology**

- ✓ SiS760 Local Frame Buffer
- ✓ Ultra256 DirectX8.1
- ✓ MuTIOL® 1G
- ✓ HyperStreaming Engine

- ❑ **Performance Comparison**

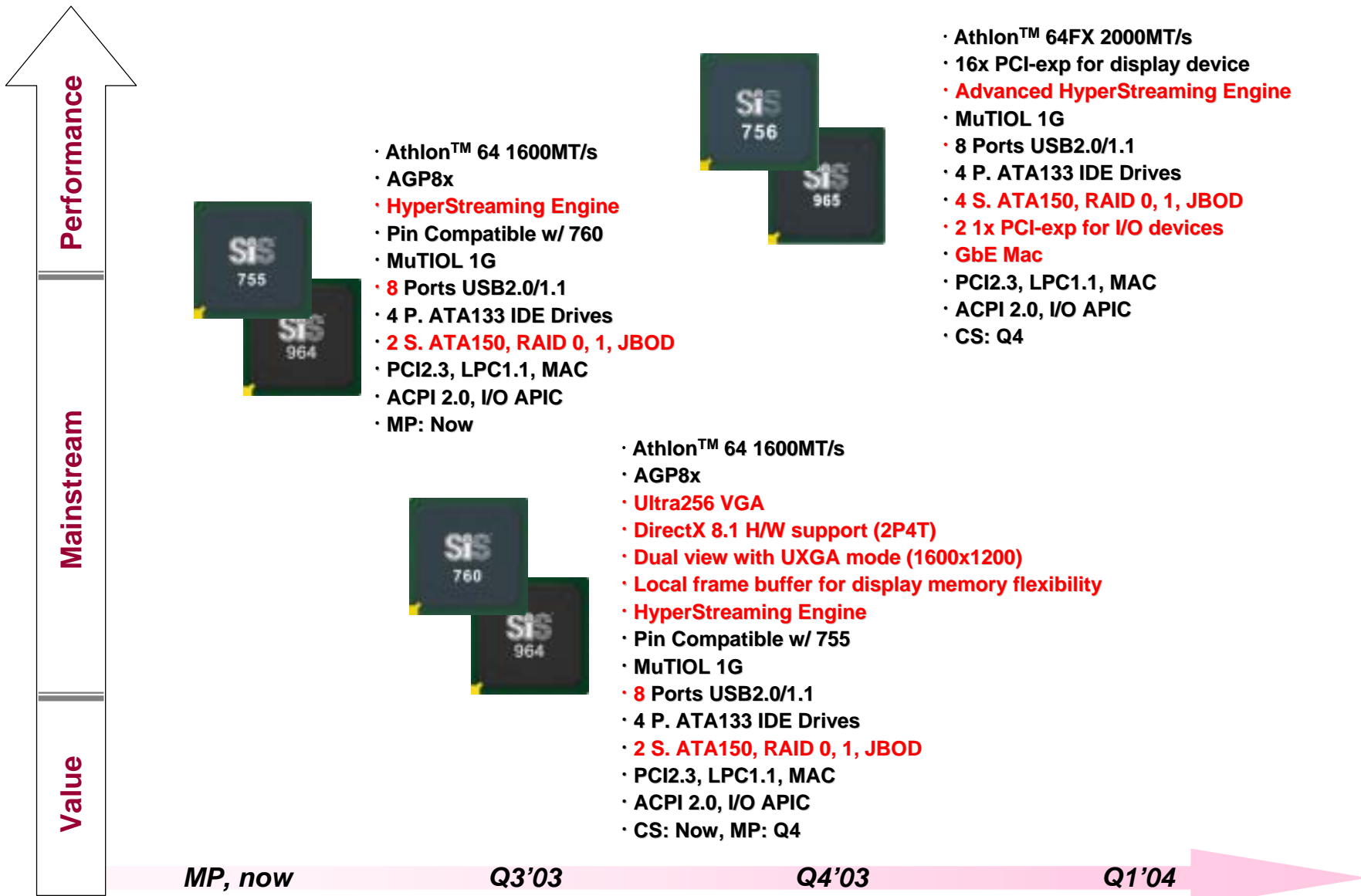
- ❑ **Backup Information**

- ✓ Summary and Key Features for SiS755/760/964

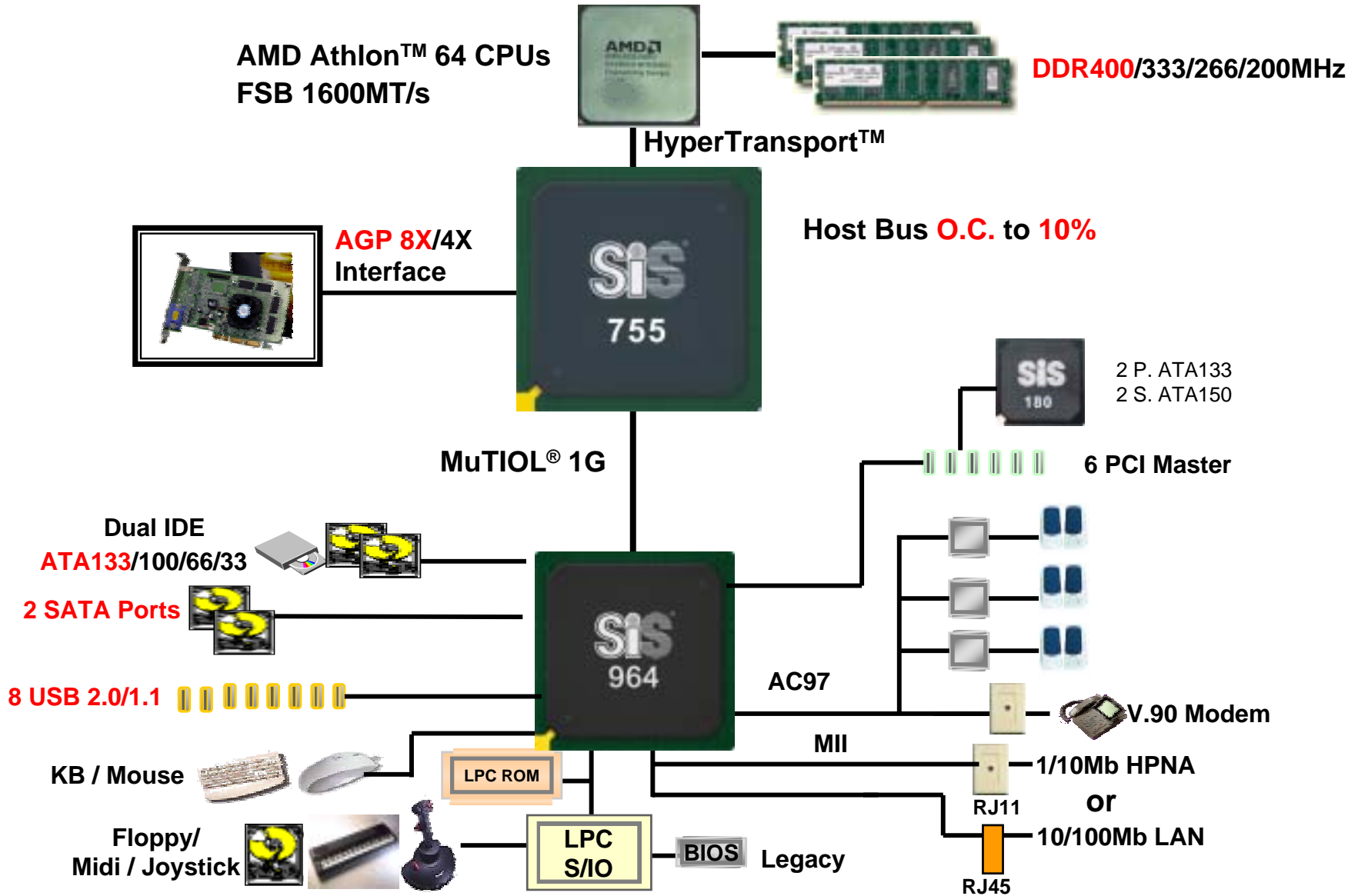
SiS AMD Athlon 64 Products Positioning



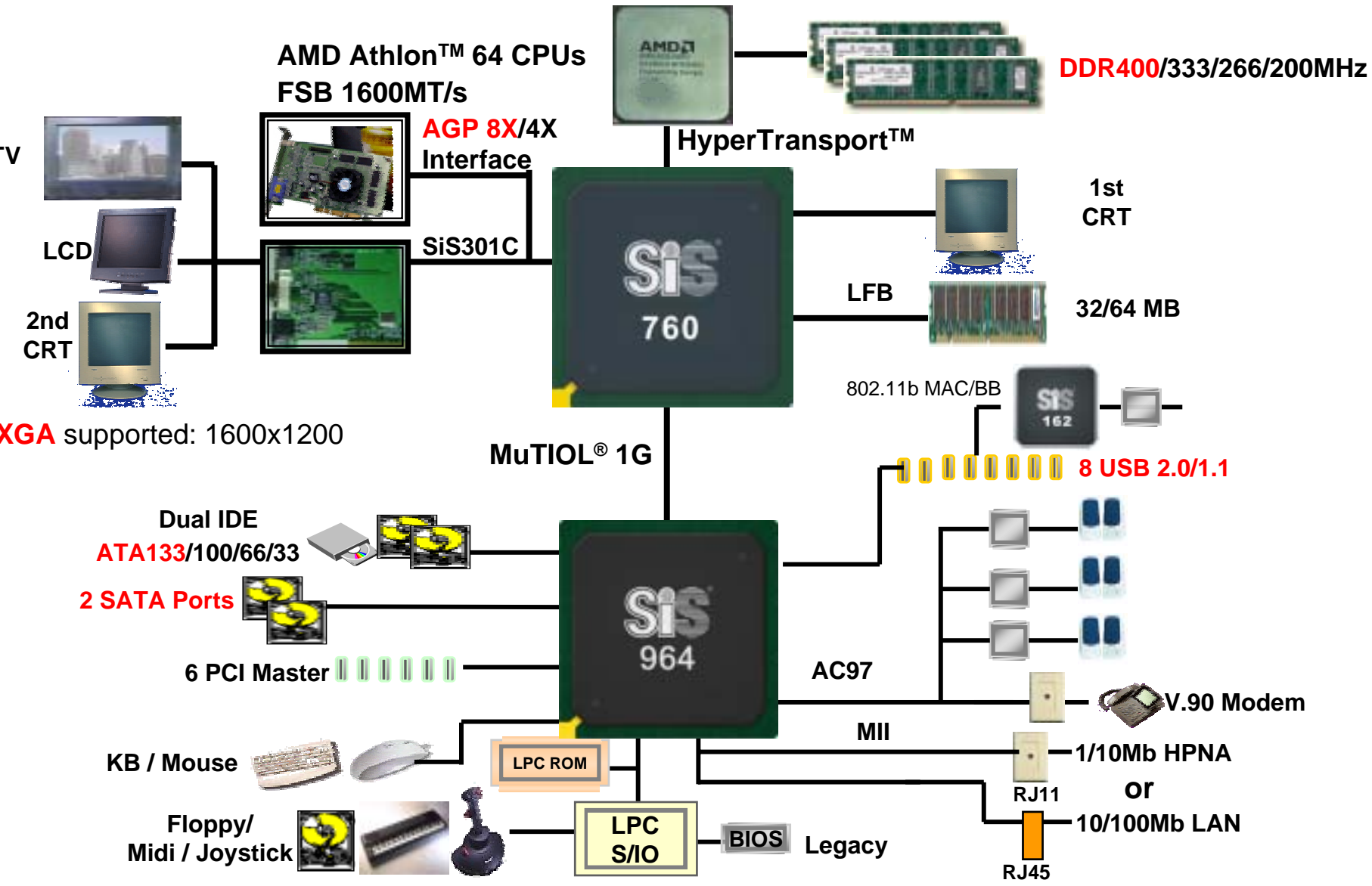
Full Product Lines for Value PC, Mainstream PC, and Performance PC!!



755/964 System Architecture



760/964 System Architecture



SiS Propriety Leading Technology

- SiS760 Local Frame Buffer
- SiS760 Ultra256 DirectX 8.1
- MuTIOL[®] 1G
- HyperStreaming Engine

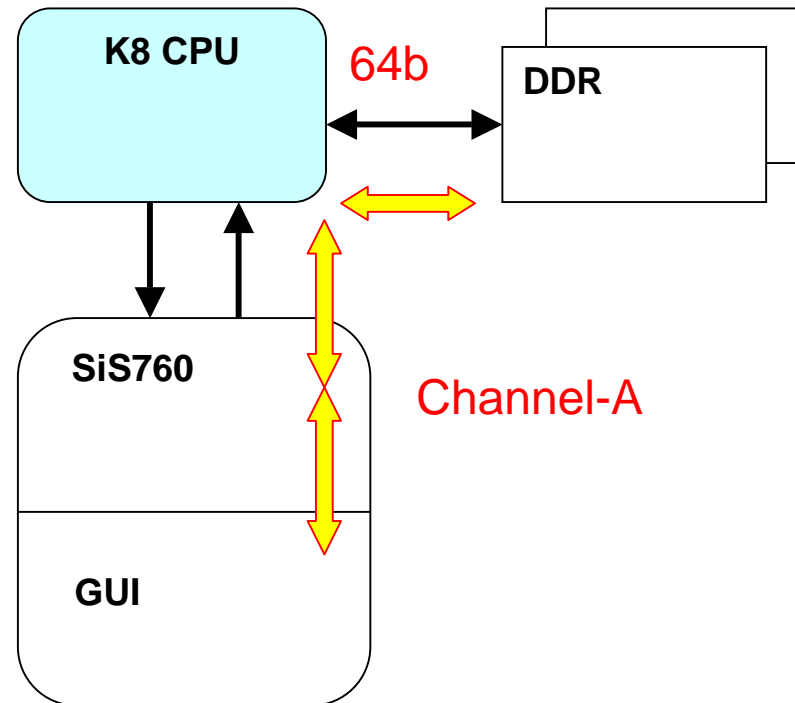


SiS760 Local Frame Buffer

--Optimize Graphic Memory Utilization and Flexibility



Case 1: Single-channel(A), use K8-UMA(64b-DDR) only



System Performance
(3200+, DDR400)

3DMark2001SE: **2200**

3DMark2003: **210**

C.C. Winstone2002: **48**

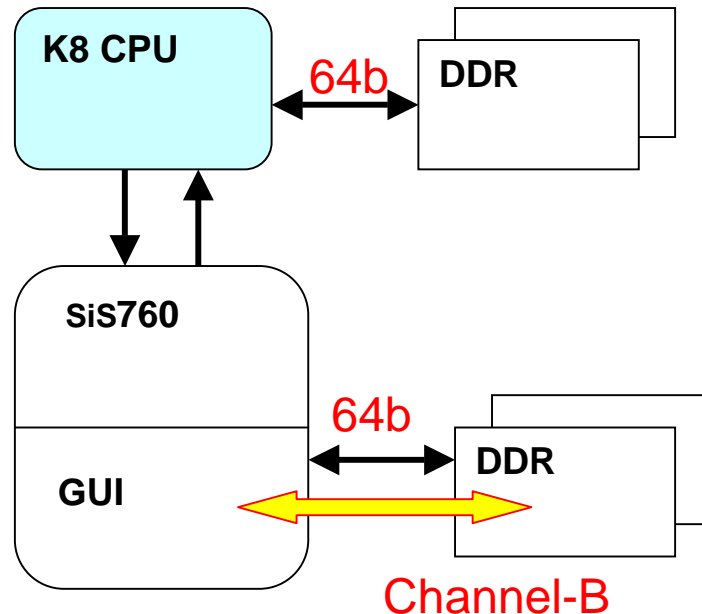
Share memory(UMA) size supports: 32MB, 64MB, 128MB

SiS760 Local Frame Buffer

--Optimize Graphic Memory Utilization and Flexibility



Case 2: Single-channel(B), use 64-bits interface GUI LFB only



System Performance
(3200+, DDR400)

3DMark2001SE: **4150**

3DMark2003: **340**

C.C. Winstone2002: **51.5**

DRAM type/size support modes: (only one CSN pin)

a. 32MB: (4Mx16 X4, 4Mx32 X2)

b. 64MB: (8Mx16 X4)

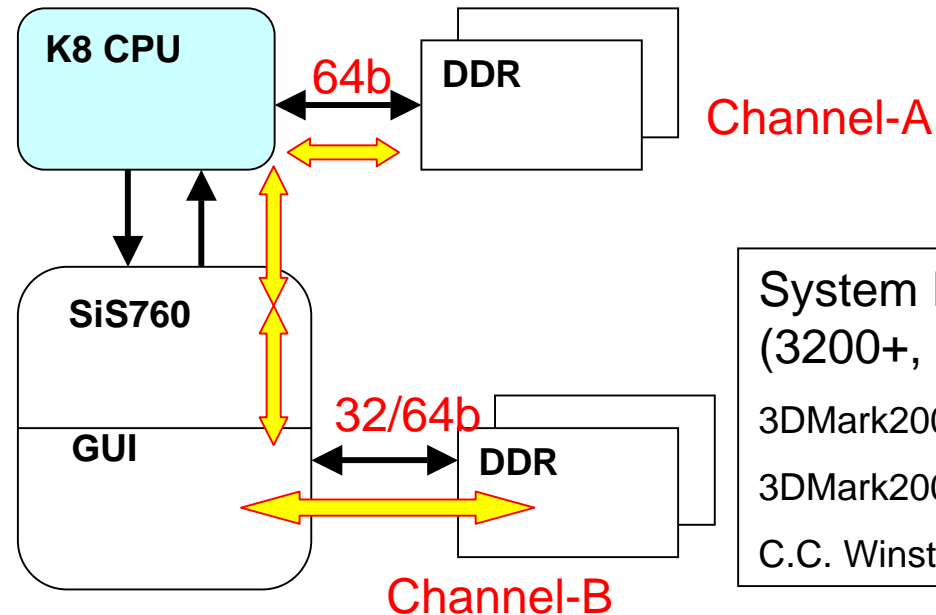
Support both tile & linear address mode.

SiS760 Local Frame Buffer

--Optimize Graphic Memory Utilization and Flexibility



Case 3: Dual-channel(A&B), use 32/64-bits interface GUI LFB & K8-UMA



System Performance
(3200+, DDR400, 32/64b)

3DMark2001SE: **2500/4150**

3DMark2003: **230/340**

C.C. Winstone2002: **50/51.5**

Channel-A share memory size supports: 32MB, 64MB, 128MB

Channel-B DRAM type/size support modes: (only one CSN pin)

a. 32MB: (8Mx16 X2)

b. 64MB: (8Mx16 X4)

The Total memory should equal or be less than 128MB

Only channel-B support both tile & linear address mode, channel-A just support linear mode.

Pixelizer Engine Effect

--Texture Come True by Pixel instead of Triangle



W/O pixel Shader

With pixel Shade



Competitive Analysis

--3D Mark2001SE GAME4

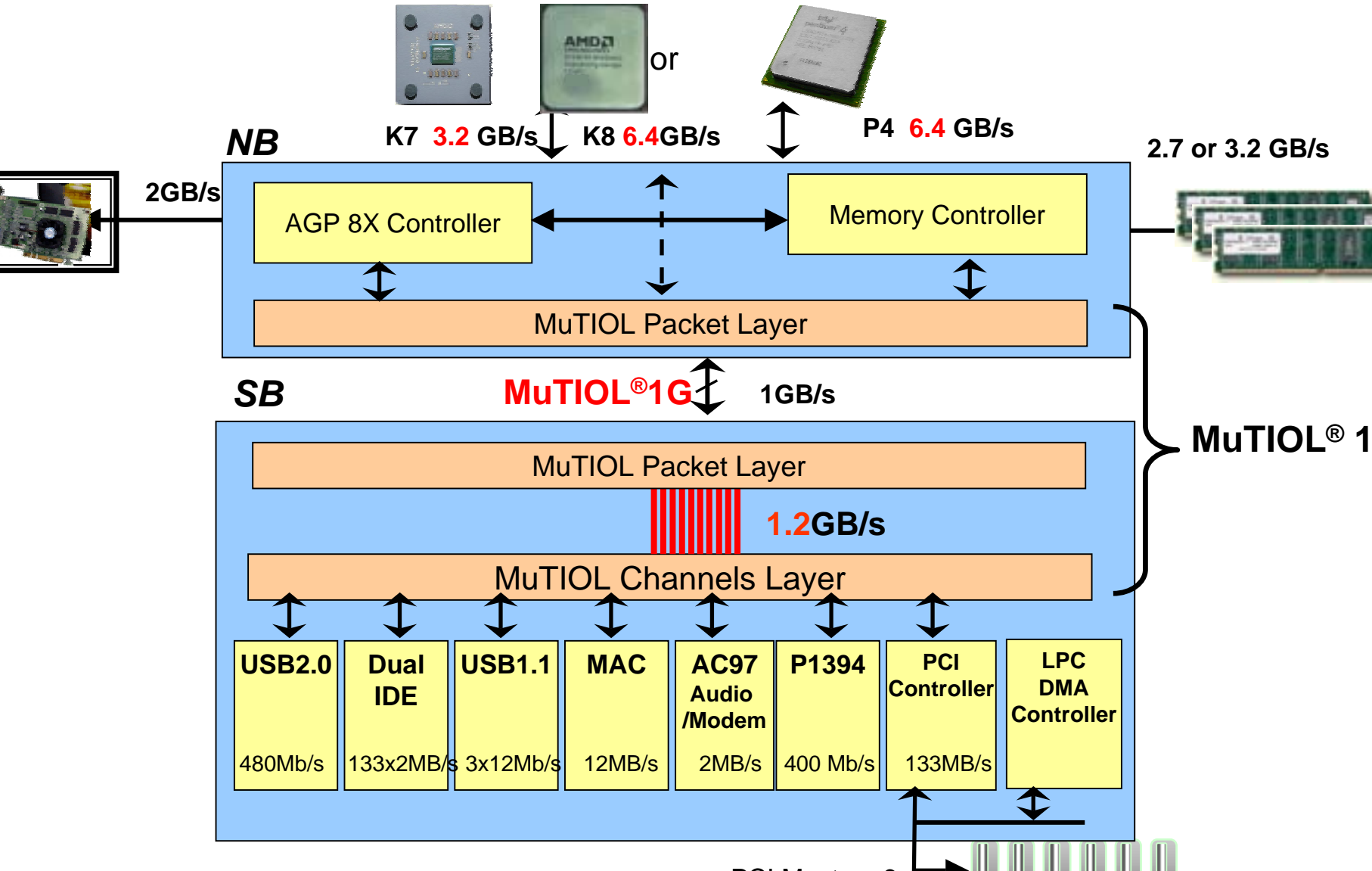


SiS760 Support Pixel Shader

MuTIOL[®] 1G Technology (Multi-Threaded I/O Link)



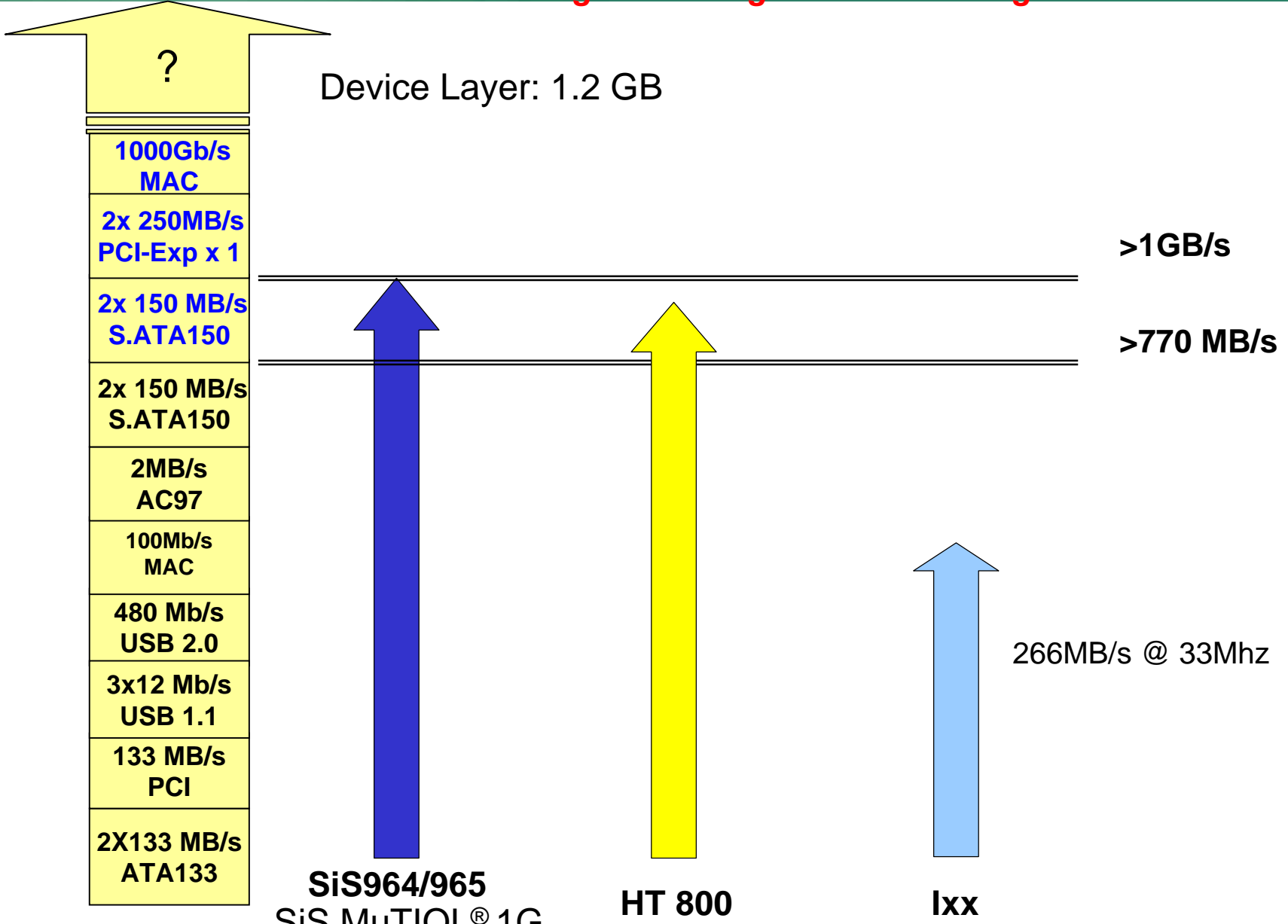
--Sufficient Bandwidth for All DMA Master Devices Concurrent Accessing



MuTIOL[®] 1G Technology Advantage



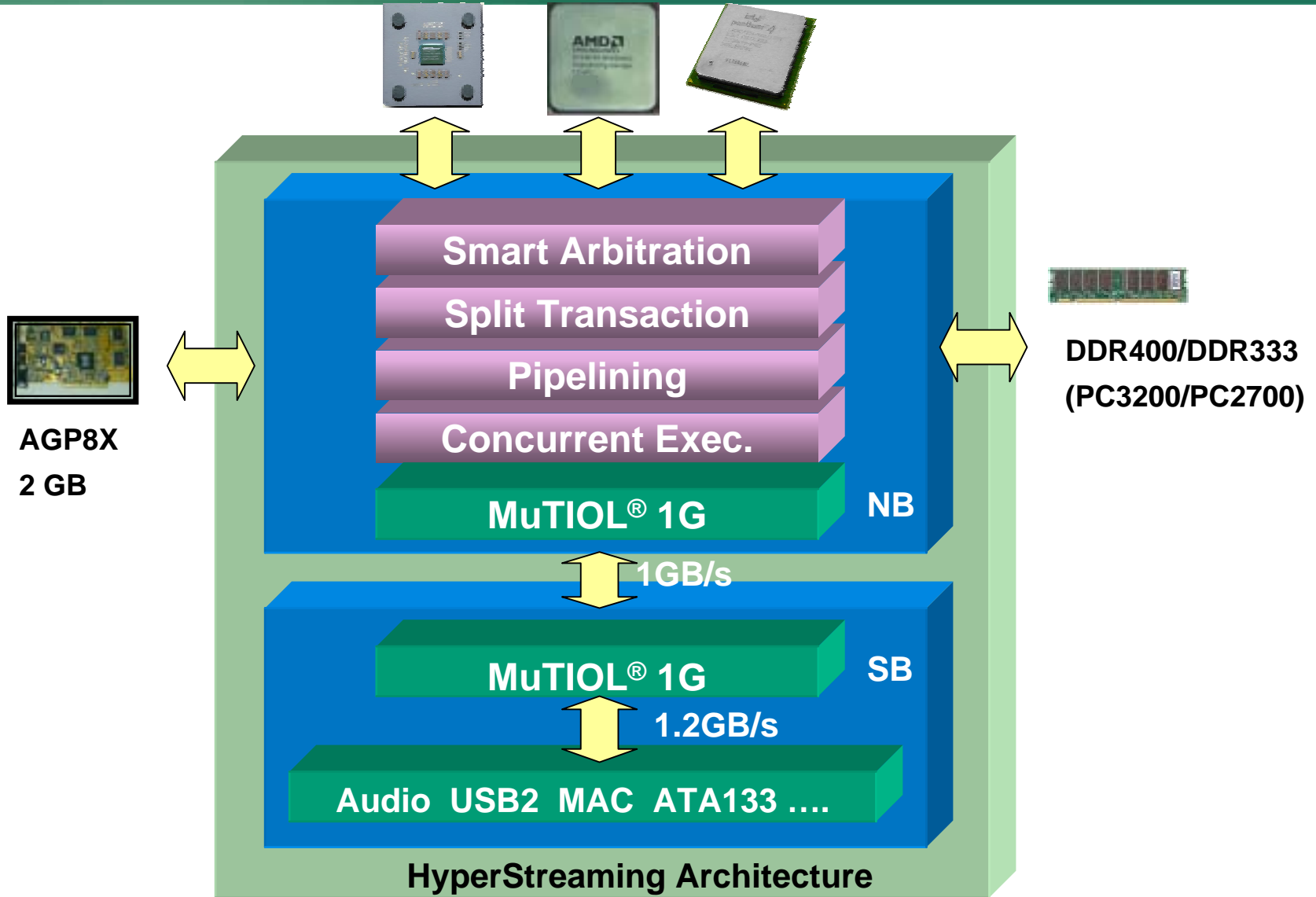
--Sufficient Bandwidth for connecting Northbridge and Southbridge



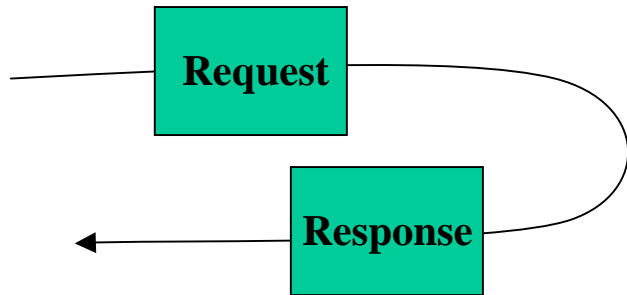
- **“HyperStreaming” is SiS Proprietary Technology**
 - **Makes Streams of Data Flow All Over the Paths**
 - ✓ Efficiently
 - ✓ Concurrently
 - ✓ Smoothly
 - ✓ Intelligently
- **Optimizing System for**
 - **“Low Latency”** with Single Stream
 - **“Pipelining”** and **“Concurrent Execution”** with Multiple Stream
 - **“Prioritized Channel”** with Specific Stream
 - **“Smart Flow Control”** and **“Intelligent Arbitration”** with Smart Stream
- **Satisfying Desire of End Users**



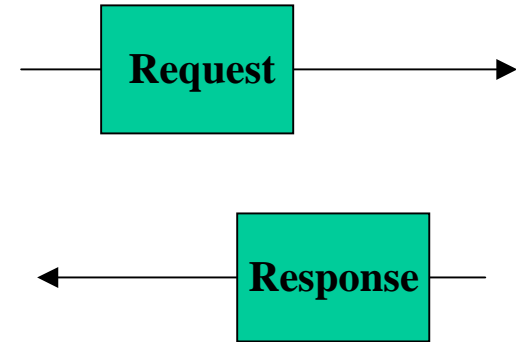
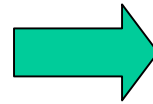
HyperStreaming Architecture (I)



Split Transaction:

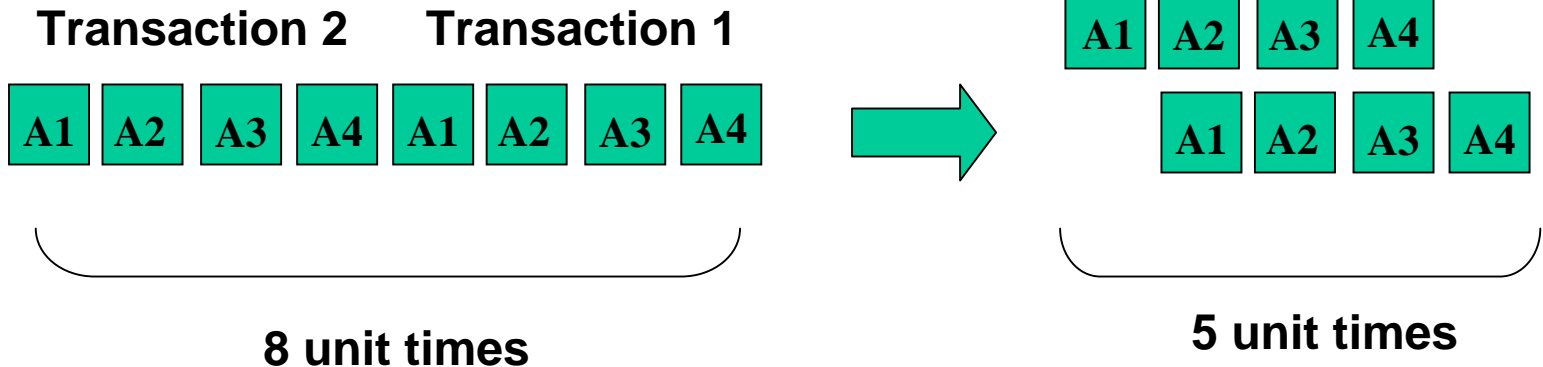
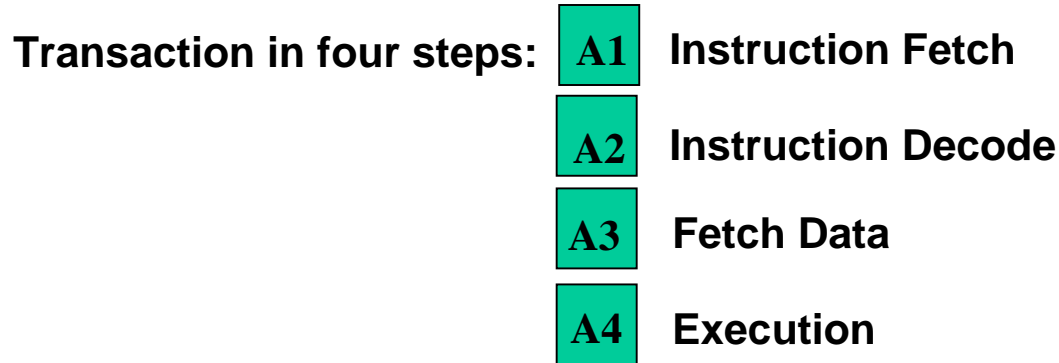


Bus occupied until “Response” is returned. Bus can not be released until the request and response phase completed.

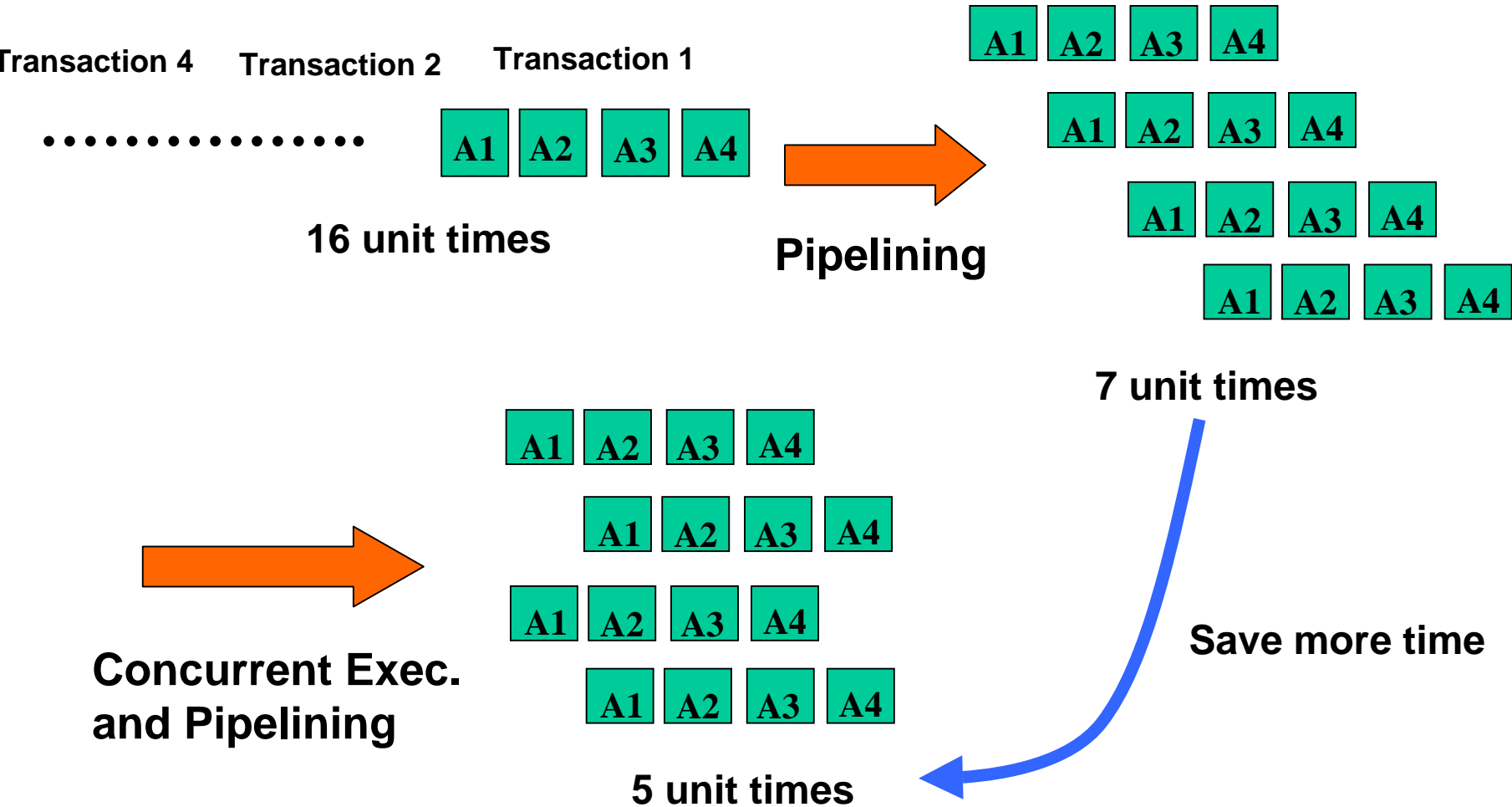


Bus released after “Request” phase and Bus can be used by next transaction (either request or response), then be occupied while the response is return. The Bus utilization is better.

Pipelining Transaction:



Concurrent Exec. and Pipelining Transaction:



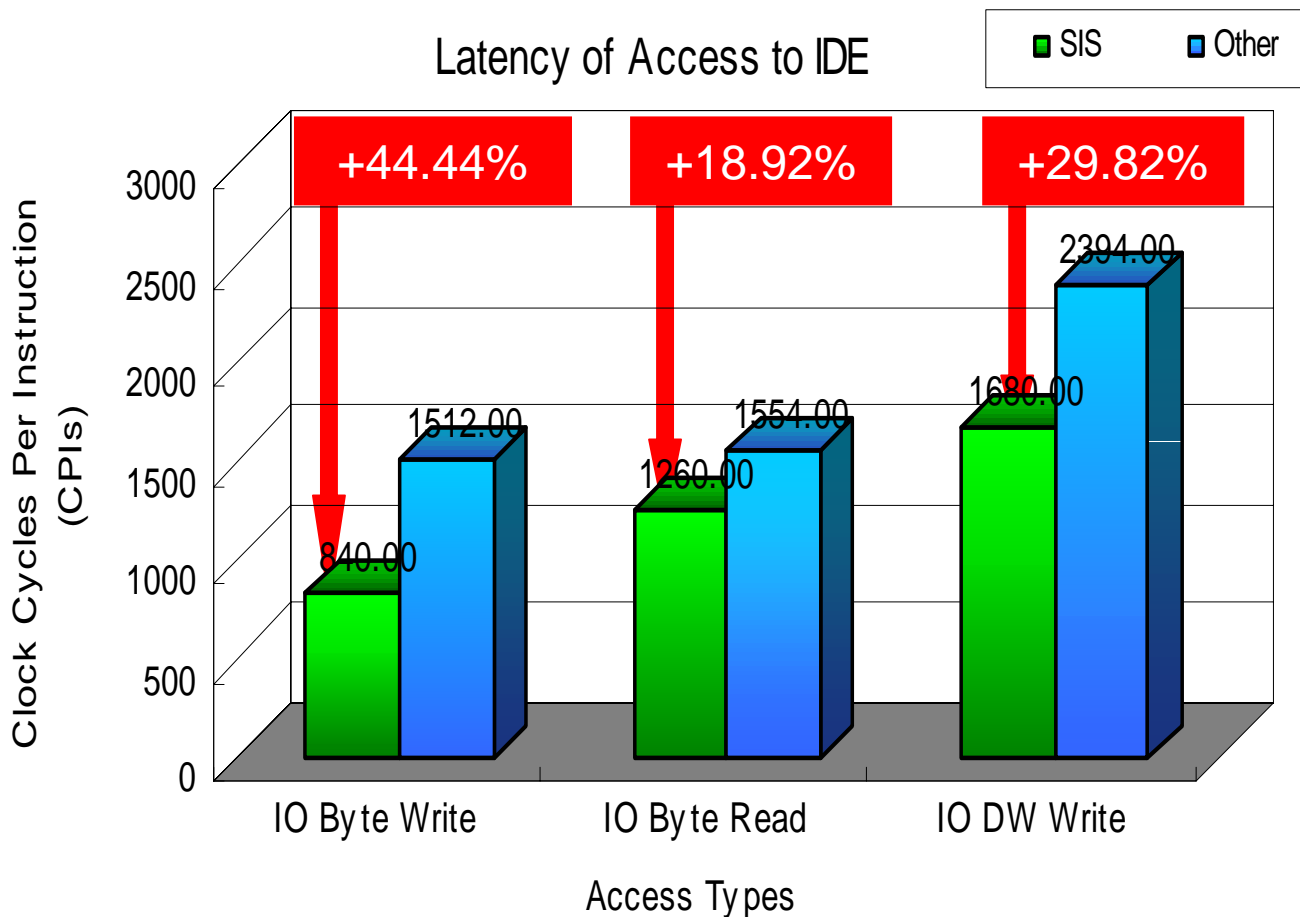
Performance Advantages w/ Single Stream



-- Hardware: AMD Athlon™ 64 1.4GHz, DDR 333 256MB; Software: RTOS



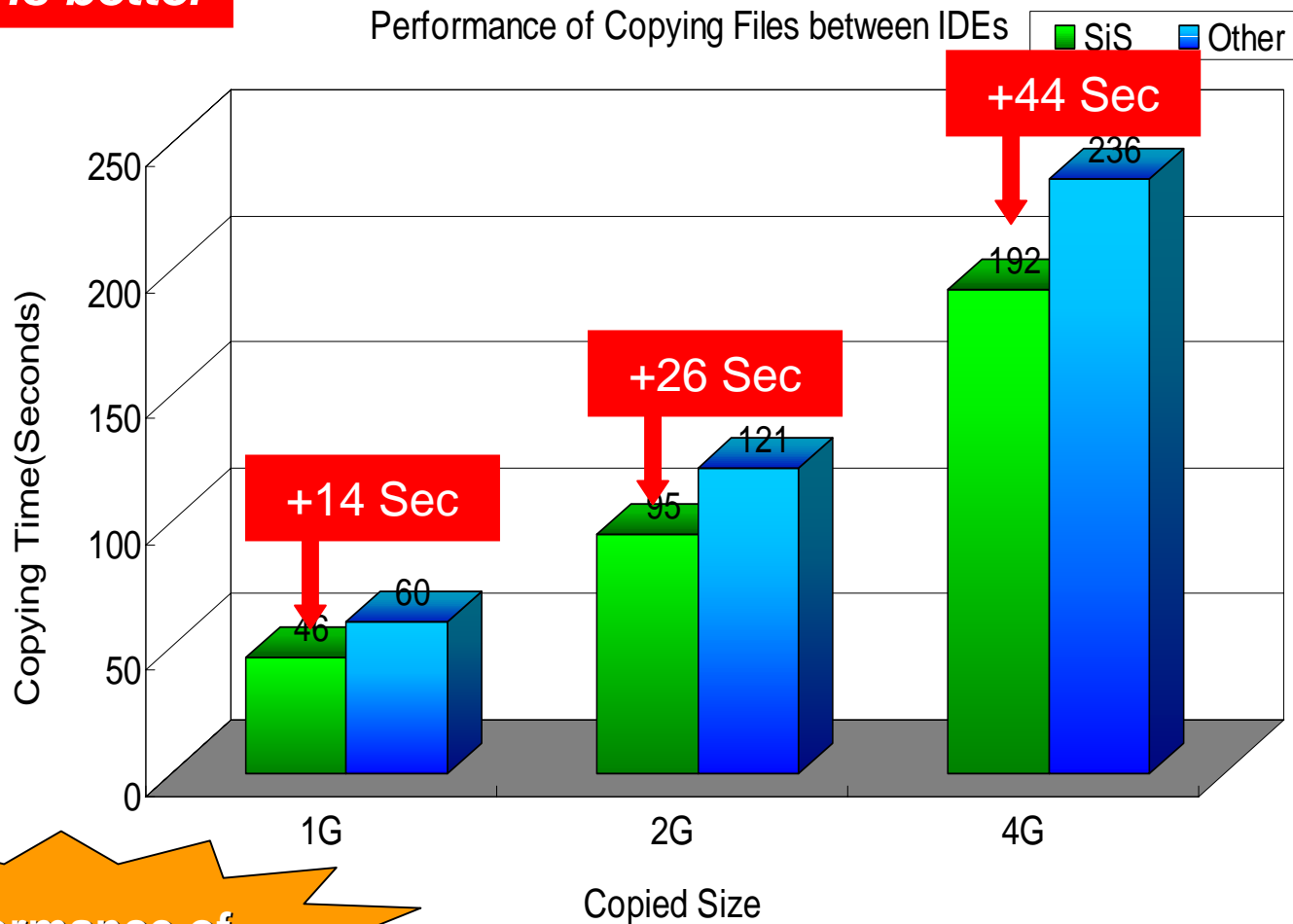
Lower is better



Performance Advantages w/ Multiple Streams



Lower is better



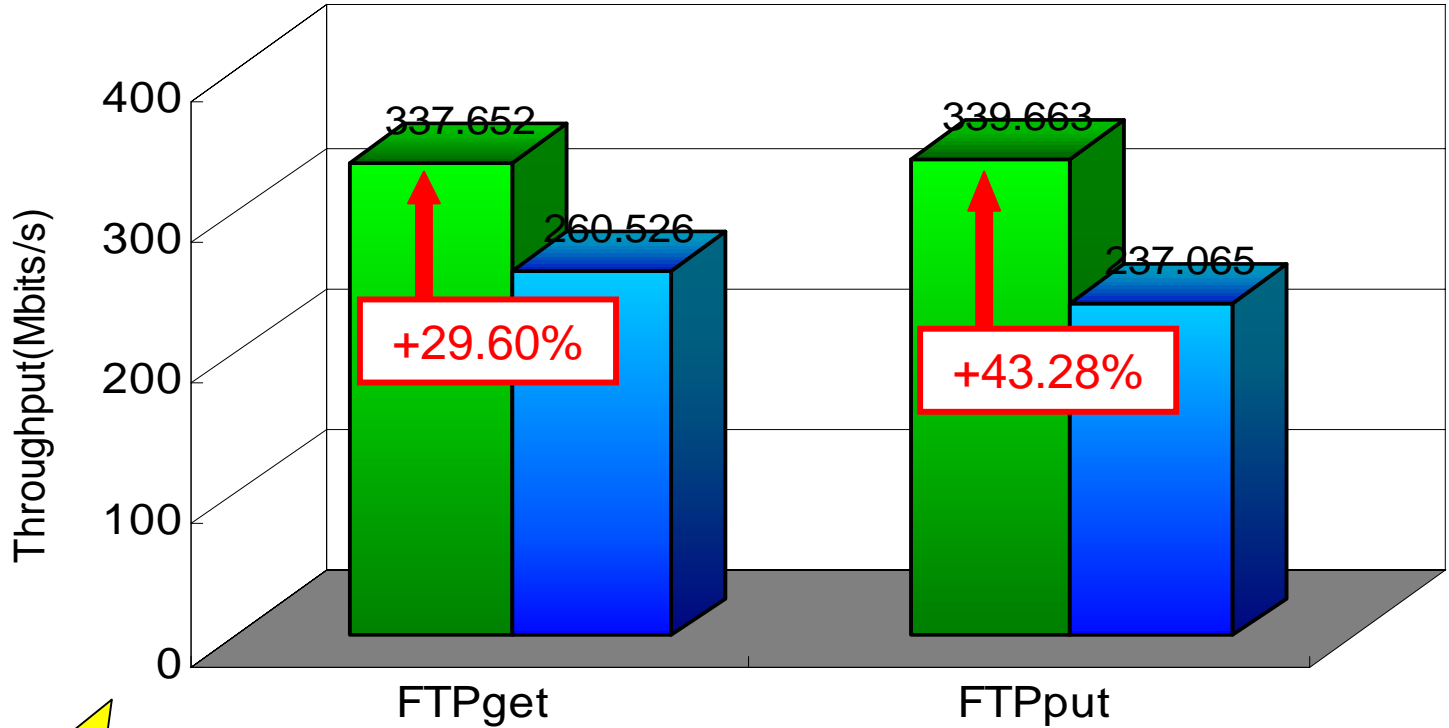
**Performance of
File Copying**

Performance Advantages w/ Specific Stream



 **Higher is better**

Internet FTP Benchmark Performance



High Throughput

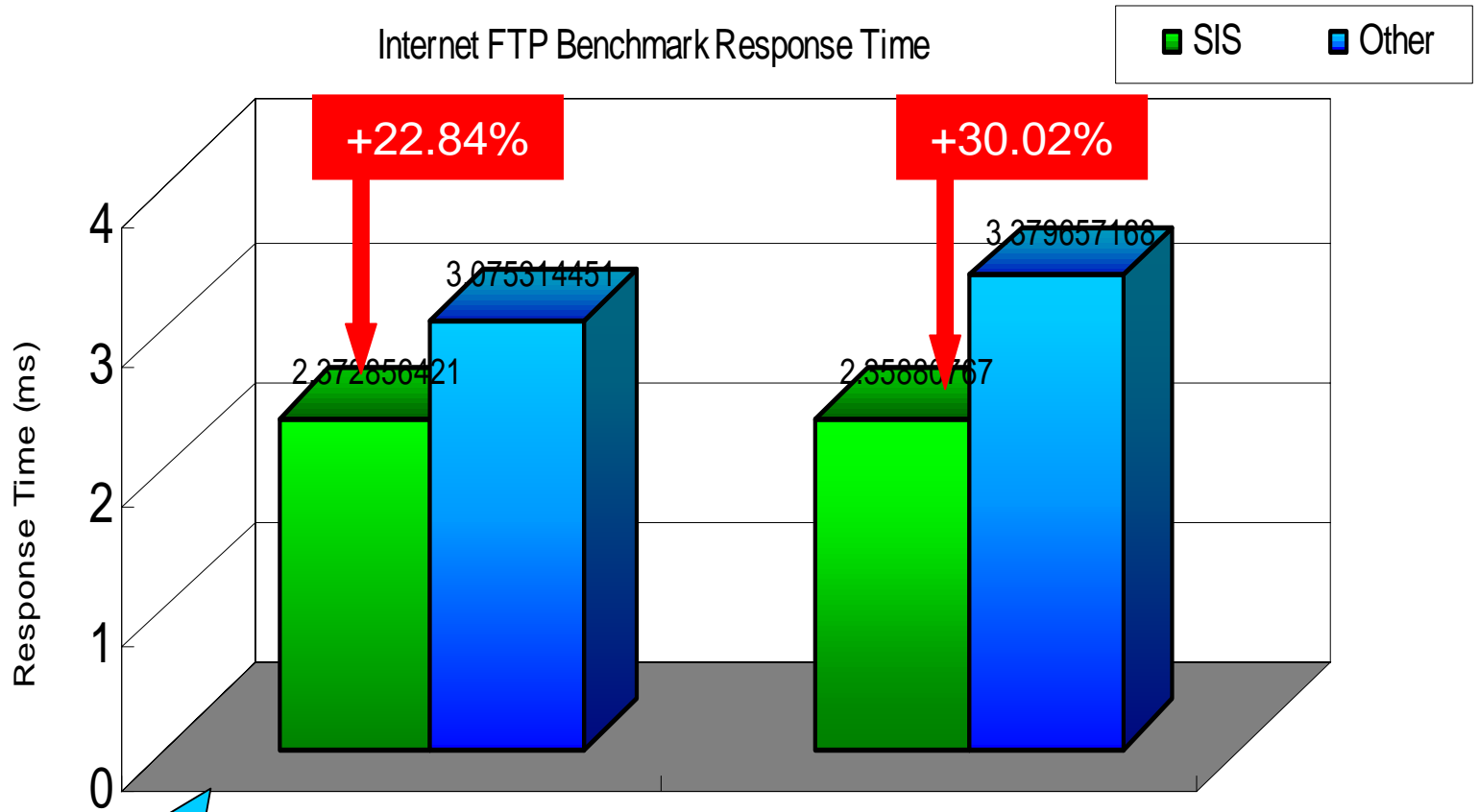
Benchmark Types

• Measuring Software
NetiQ

Performance Advantages w/ Specific Stream



➡ Lower is better



Low Response Time

Benchmark Types

•Measuring Software
NetiQ

Performance Comparison

– SiS755 vs. V Brand AMD Athlon™ 64 Chipset

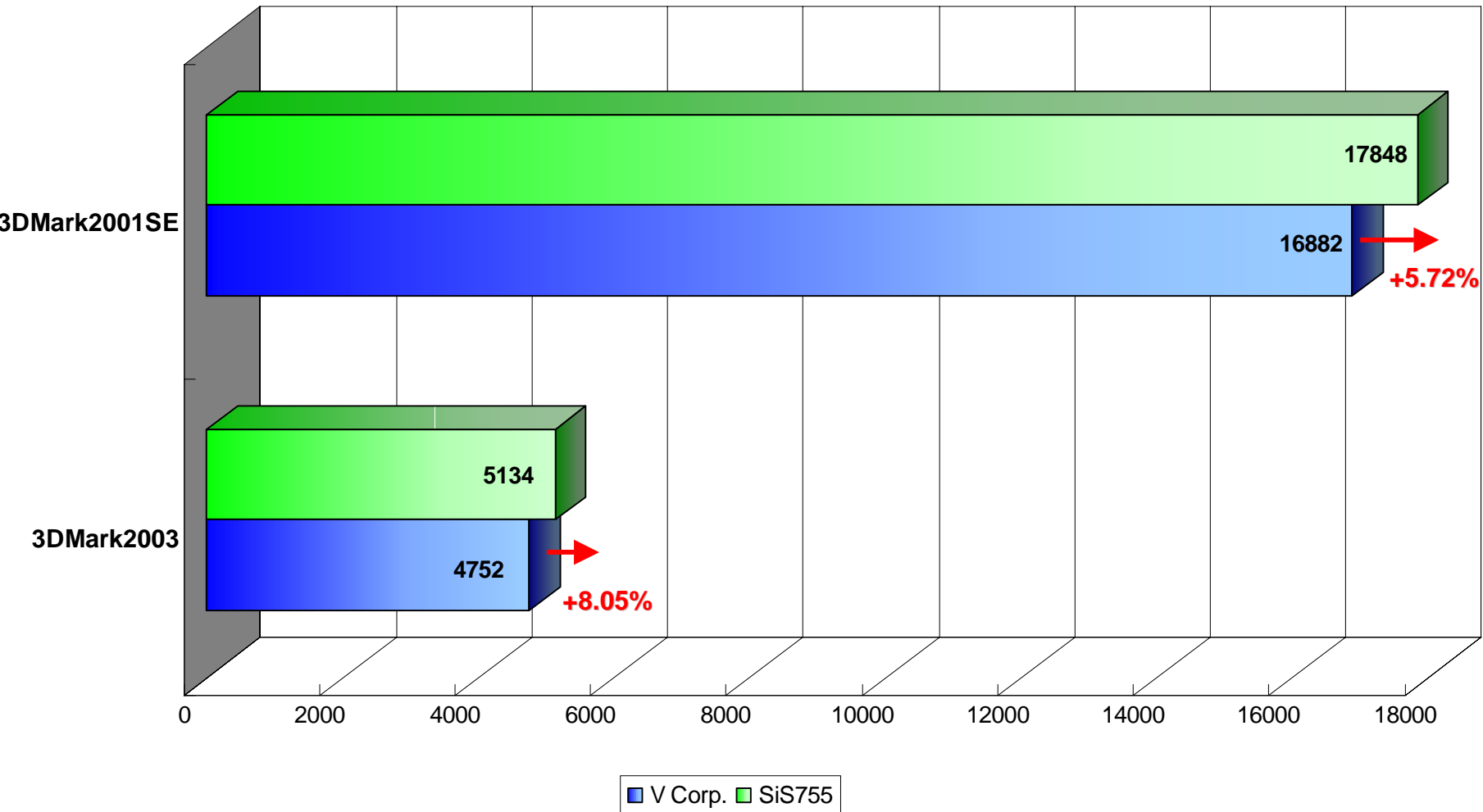
System Configuration



Hardware Configuration		
Chipset	SiS755	V Brand
CPU	AMD Athlon 64 3400+ (FSB800) ver. C0	
VGA Card	Tti 9700 Pro @1024x768@32bpp	
DRAM	DDR400 Samsung 256MB SSx1	
HDD	Maxtor ATA133 40GB 7200RPM	
Software Configuration		
OS	WindowsXP Professional	
VGA Driver	ATi VGA Driver 6292	
AGP Driver	SiS AGP 1.16.01	V Brand
IDE Driver	SiS IDE 2.04	Hyperion_4_in_1_1446p2

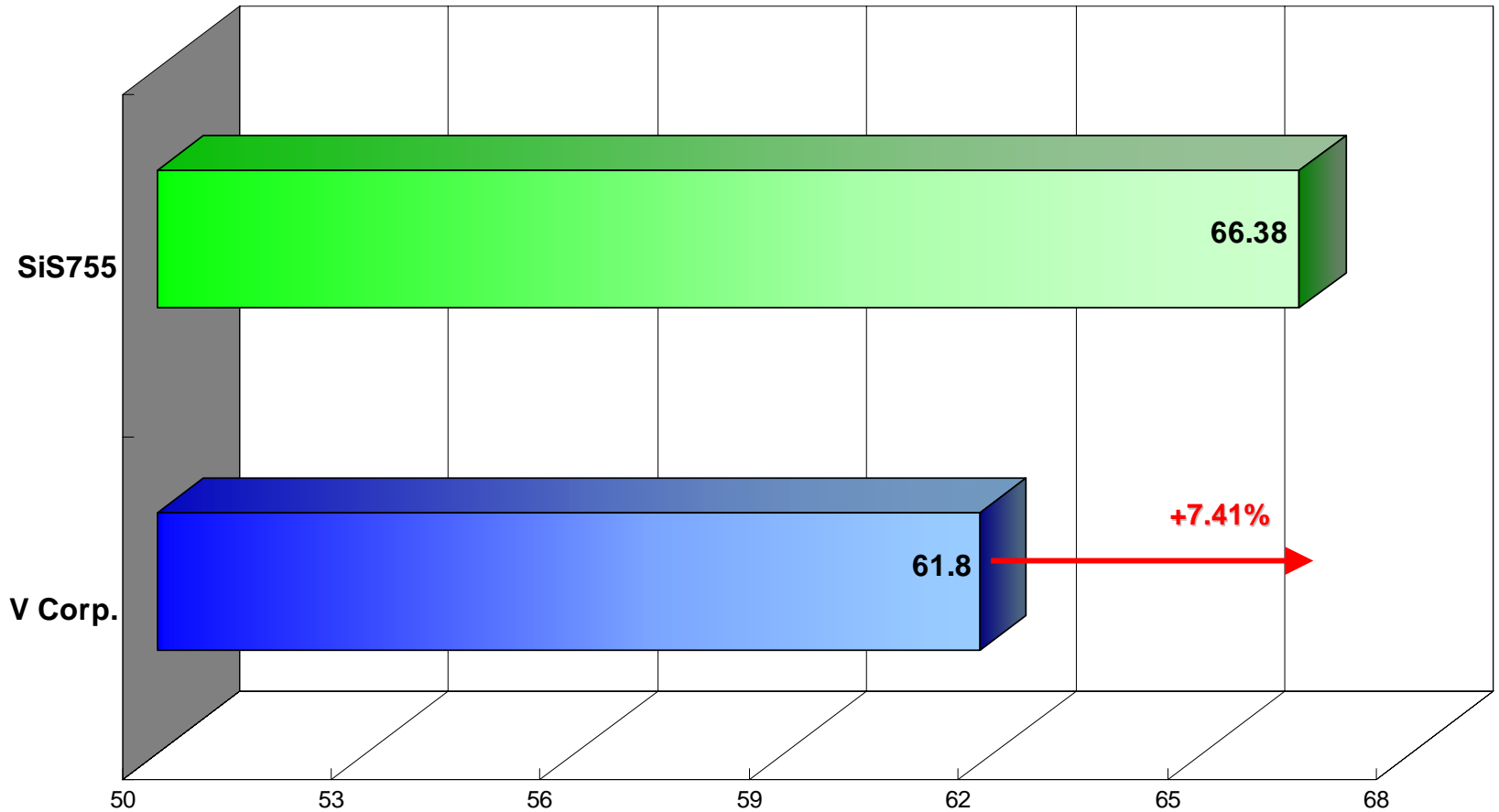
Graphic Performance (I)

-- 3DMark2001 SE build330/ 3DMark2003



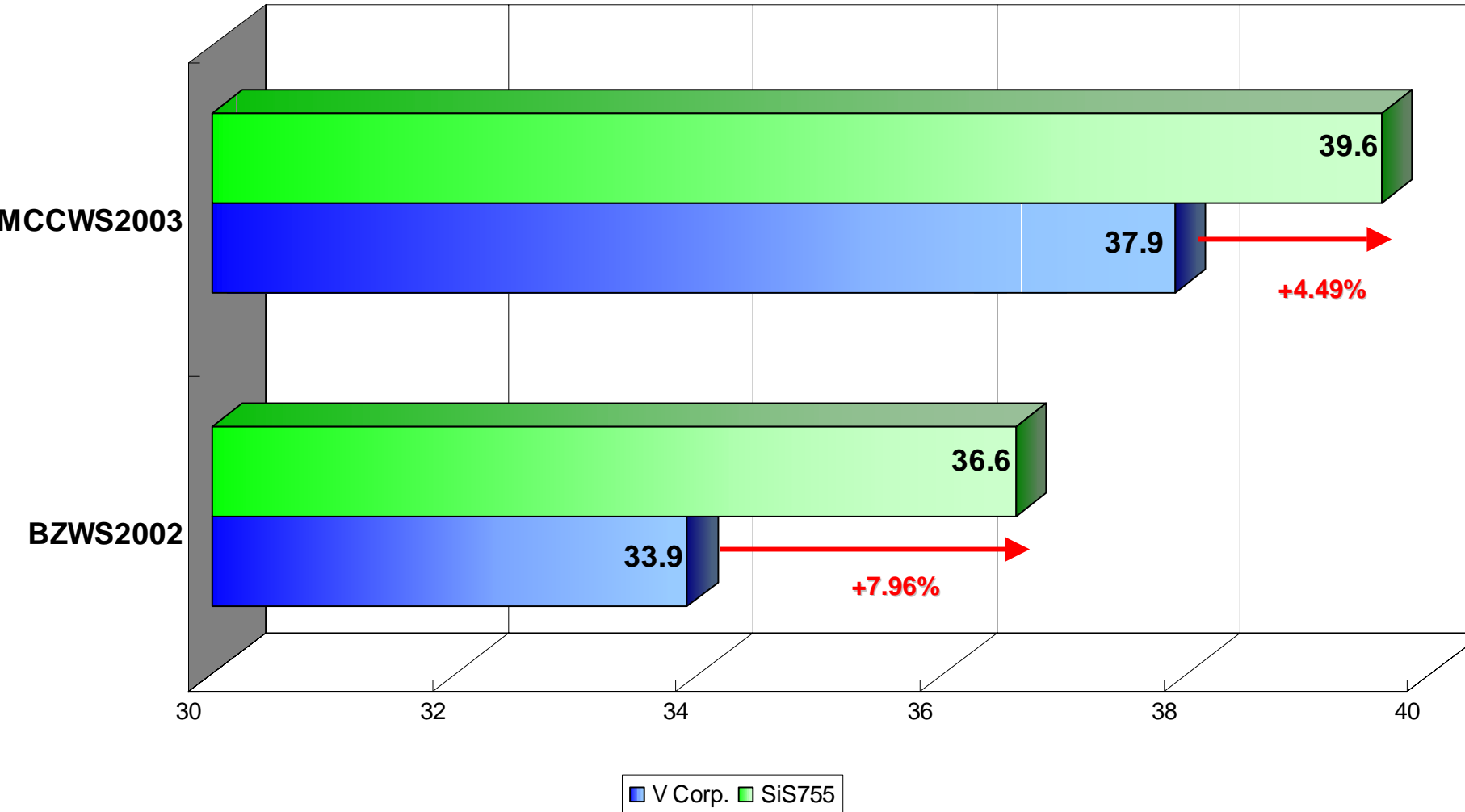
Graphic Performance (II)

-- Comanche4



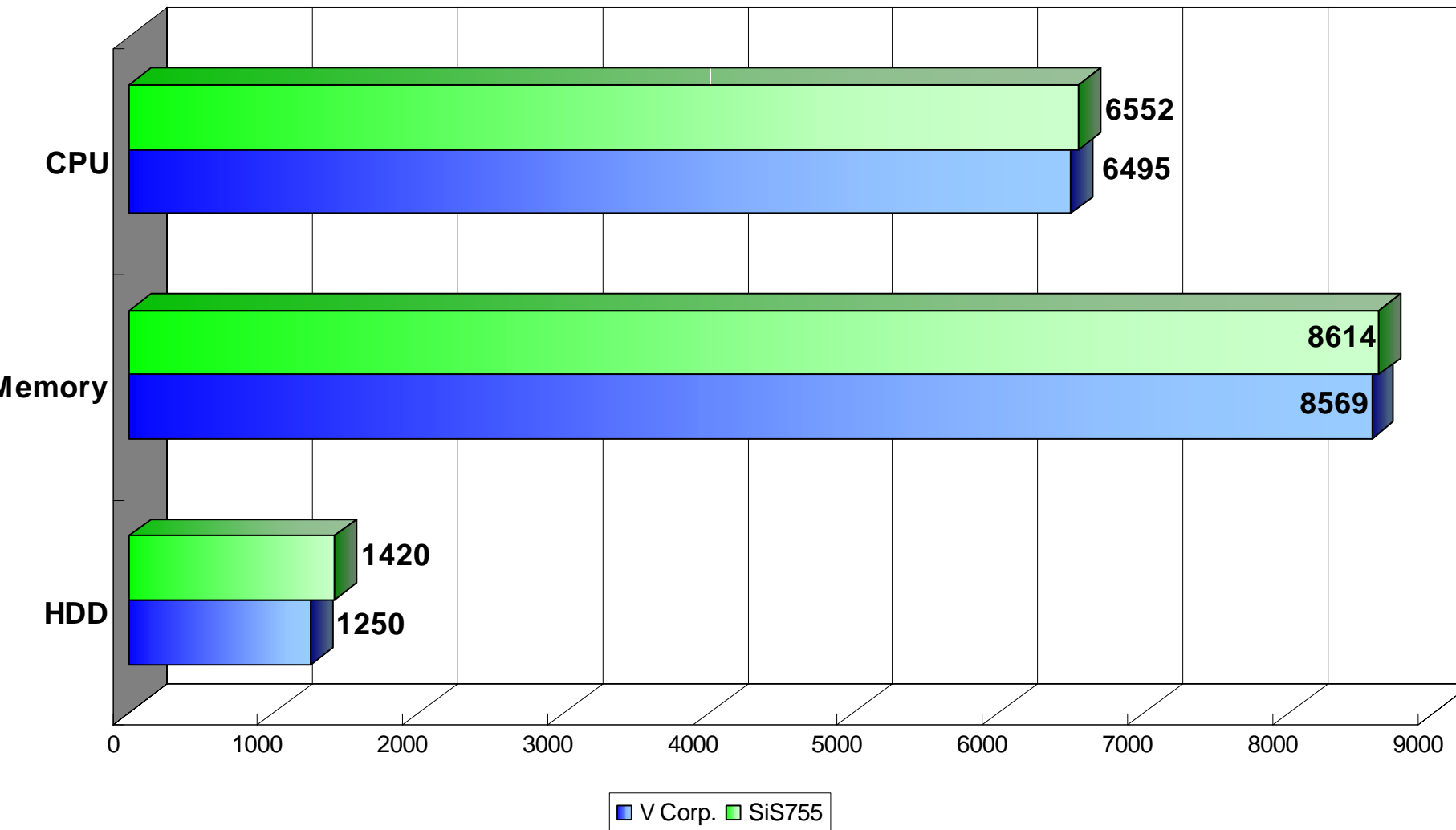
System Performance (I)

-- MCCWS2003 / BZWS2002



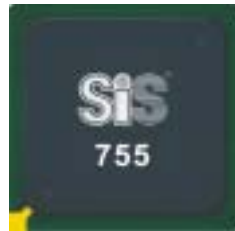
System Performance (II)

-- PCMark 2002

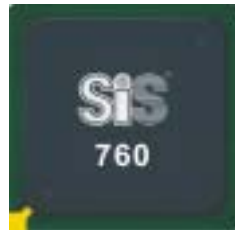


- **Best Performance and Features for AMD Athlon™ 64 Platform**
 - AGP8X, Hyper Streaming, MuTIOL® 1G, USB2.0, SATA w/ RAID, ATA-133
- **HyperStreaming Engine**
 - Efficiently
 - Concurrently
 - Smoothly
 - Intelligently
- **MuTIOL® 1G Technology**
 - Providing the widest data bandwidth for various I/O peripherals
- **High Performance Graphic core**
 - SiS760 H/W supports Dx8.1, Pixel Shader v.1.3
- **Optimize Graphic Memory Utilization and Flexibility**
 - SiS760 Dual DDR400 Gfx memory for UMA corporate w/ LFB
- **Pin Compatible Design**
 - Saving customers' development resources
 - Time to Market
 - Targeting to different market segments by one design

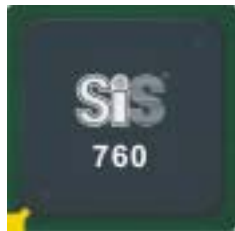
One M/B Design for Full Segments



- Athlon™ 64 1600MT/s
- SiS755
- Named AGP Graphic
- Display Memory: LFB on AGP Card
- Performance: 3DMark2001: 1xxxx; 3DMark2003: 5xxx



- Athlon™ 64 1600MT/s
- SiS760
- Integrated Ultra256 VGA
- Display Memory: LFB for common AP, Hybrid mode for large memory demand AP
- Performance: 3DMark2001: 4150; 3DMark2003: 340



- Athlon™ 64 1600MT/s
- SiS760
- Integrated Ultra256 VGA
- Display Memory: UMA by CPU
- Performance: 3DMark2001: 2200; 3DMark2003: 210

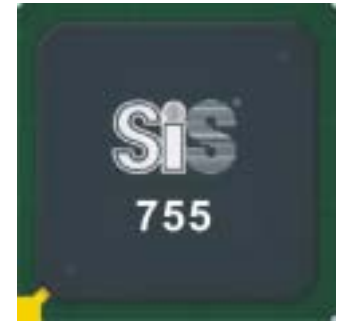
Q&A

Thank You

Backup Information



SiS755 North Bridge Architecture



Host Interface

AGP
Interface

MuTIOL[®] Interface

- 800/600/400/200MHz Front Side Bus
- Support AGP 8X/4X interface
- MuTIOL[®] 1G Interface
 - 1GB/s Bandwidth
 - Bi-Directional 16-bit Data Bus

- **Host Interface**

- Support AMD Athlon 64 CPUs
- 200/400/600/800MHz Front-Side Bus
- HyperTransport Technology with 8/16 links support
- HyperTransport Technology up to 1600MT/s Bandwidth

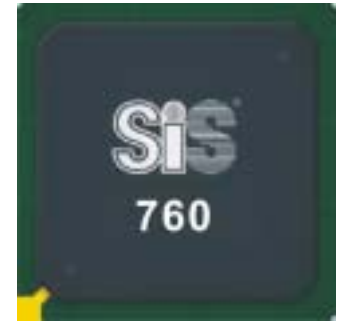
- **AGP 3.0 Compliant**

- External Slot for 8X/4X Mode Support
- Fast Write Support

- **SiS MuTIOL Technology**

- Delivering **1GB/s** Bandwidth
- Concurrently Access Embedded DMA Devices Including IDE, USB, Audio, S/W Modem

SiS760 North Bridge Architecture



Host Interface

AGP Interface

Video Bridge

Local Frame Buffer

Ultra256 DX8.1 Gfx

MuTIOL[®] Interface

- 800/600/400/200MHz Front Side Bus
- Support AGP 8X/4X interface
- Ultra256 DirectX8.1 Gfx integrated
- Video Bridge Interface
- Local Frame Buffer Interface
- MuTIOL[®] 1G Interface
 - 1GB/s Bandwidth
 - Bi-Directional 16-bit Data Bus

- **Host Interface**

- Support AMD Athlon 64 CPUs
- 200/400/600/800MHz Front-Side Bus
- HyperTransport Technology with 8/16 links support
- HyperTransport Technology up to 1600/s Bandwidth

- **AGP 3.0 Compliant**

- External Slot for 8X/4X Mode Support
- Fast Write Support

- **Integrated Ultra256 2D/3D Graphics**

- Local Frame Buffer : **32/64MB**
- Built-in a High Performance 256-bit 3D Engine
- **DirectX 8.1 Compliant**
- Support Digital Video Interface for TV or LCD Display

- **SiS MuTIOL Technology**

- Delivering **1GB/s** Bandwidth
- Concurrently Access Embedded DMA Devices Including IDE, USB, Audio, S/W Modem

SiS964 South Bridge Architecture



MuTIOL Interface

IDE
Controller

Power
Management

Serial ATA
Controller

AC97
Interface

PCI
Controller

USB
2.0/1.1
Controller

Ethernet
Controller

DMA
Controller

Keyboard
Controller

- Support 4 ATA133/100/66/33 ports
- Support 2 Serial ATA150 ports
- Support RAID 0, 1, JBOD
- USB2.0 for up to 8 ports
- 6 channels of AC97 v2.3 outputs
- Support V.90 HSP Modem
- ACPI 2.0 Compliance
- PCI 2.3 Specification Compliance
- MuTIOL[®] 1G Interface

- **USB 2.0 /1.1 Support**
 - Support a maximum of **8** USB Ports. Dynamic connection to USB 1.1 or USB 2.0.
- **Serial ATA Controller**
 - Dual Independent ports with **Ultra DMA 150** support
- **IDE Controller**
 - Dual Independent IDE Channels with **ATA133/100/66** support
- **Integrated MAC Controller with Standard MII Interface**
- **Integrated Audio Controller w/ AC97 2.3 Compliance Interface**
 - Support 5.1 channel of Audio output and V.90 HSP Modem
 - Support 4 Separate SDATAIN Pins for 3 x 2 ch Audio Codec + 1 Modem Codec
- **PCI 2.3 Compliant**
 - Support up to 6 PCI Masters
- **LPC Interface 1.1 Compliance**
- **ACPI 2.0 Compliance**
- **I/O APIC Support**
- **PC2001 Compliance**
- **SiS MuTIOL Technology Delivering 1GB/sec Bandwidth**