Accelerated Graphics Port-Characteristics and Applications

Nilam Verma*

Department of Computer Science & Engineering, HR Institute of Technology, Pune, India

*Corresponding author: Nilam Verma, Department of Computer Science & Engineering, HR Institute of Technology, Pune, India, E-mail: nilam.verma.ak@gmail.com

Description

An Accelerated Graphics Port (AGP) is a point to point channel that is used for high-speed video output. This port is used to connect graphic cards to a computer's motherboard. It increases the speed at which machines can render graphics while using the system's resources more efficiently. The primary purpose of an AGP is to convey 3-D images much more smoothly than is possible on a regular PC. It was originally designed as a successor to PCI-type connections for video cards.

Short for accelerated graphics port, AGP is an advanced port designed for video cards and 3D accelerators. Developed by Intel and introduced in August 1997, AGP introduces a dedicated point-to-point channel that allows the graphics controller direct access to the system memory.

The AGP channel is 32-bits wide and runs at 66 MHz, which is a total bandwidth of 266 MBps and much greater than the PCI bandwidth (up to 133 MBps). AGP also supports two optional faster modes, with a throughput of 533 MBps and 1.07 GBps. It also allows 3-D textures to be stored in main memory rather than video memory.

AGP is available in three different versions, the original AGP version mentioned above, AGP 2.0 that was introduced in May 1998, and AGP 3.0 (AGP 8x) that was introduced in November 2000. AGP 2.0 added 4x signaling and was capable of operating at 1.5 V, and AGP 3.0 was capable of double the transfer speeds.

Characteristics of AGP

• It has high quality and very fast performance.

• It has a direct path to the PC's main memory.

• It connects to the CPU and operates at the speed of the processor bus.

• It sends video information more quickly to the card for processing.

• It uses the main memory to hold 3D images.

• It provides the graphics card with two methods of directly accessing texture maps in system memory: pipelining and sideband addressing.

• The port is identified by its brown colour.

Applications of AGP

• It enabled to develop new classes of applications on the PC such as 3D CAD/CAM, data visualization and 3D user interfaces.

• Direct Memory Execution of textures-The texture maps are directly accessed from the system memory instead of pre-loading the texture data into the Graphic card's own memory and then accessing it. It eliminates the extra work by allowing the texture to remain in system memory where it can be directly executed on by the graphics chip.

• Creation of 3D images-The CPU must perform intensive 3D calculations. The graphics controller processes the texture data and bitmaps. In many cases, the controller has to read elements from 7 or 8 different textures and combine them into a single pixel on the screen. When this calculation is performed, the pixel must be stored in the memory buffer. The memory occupied by these textures are so large, they cannot be stored on the video card's buffer. With APG they are stored in the main system memory.

Advantages of AGP over PCI

AGP was introduced as a replacement for the slower Peripheral Component Interconnect (PCI) interfaces. AGP provides a direct line of communication to the CPU and RAM, which in turn allows for quicker rendering of graphics.

Official extensions

• AGP Pro

• 64-bit AGP

Unofficial variations

A number of non-standard variations of the AGP interface have been produced by manufacturers.

• Internal AGP interface

• Ultra-AGP, Ultra-AGPII

PCI-based AGP ports

• AGP Express

• AGI

• AGX

• AGR

AGP Pro is an AGP interface extension specification for advanced workstations. This specification delivers additional power to video cards, includes an extended connector, thermal envelope, mechanical specifications, I/O bracket, and motherboard layout requirements.