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Amiga OS

The Amiga operating system was first introduced in 1985. It was developed by Commodore International. The ownership of the Amiga OS is now split between Amiga Inc., Cloanto, and Hyperion Entertainment. Everything created up until 1993 are owned by Commodore, then in 2001 Amiga Inc. contracted the development of Amiga OS 4 to Hyperion Entertainment. Once Commodore International died in 1994 a number of clones of the original Amiga OS were made. These include the Amiga OS4, MorphOS, AROS, and Amithlon. I will focus on the original Amiga OS3 and the more recent Amiga OS4.

The idea for the system was conceived by Jay Milner while he was working at Atari. He had an idea for a next generation product that would use the Motorola 68000 CPU to create a machine that would have been ahead of its time for graphic displays. His idea was rejected by Atari because of the cost being too high, so Milner left the company and began working on his idea for the next two years.

The original Amiga system required the Motorola 68000 series microprocessors for both 16 and 32 bits. This was one of the earlier operating systems being released in the 1980’s, many of its main features were set up to give users access to word processing, music creation, video editing, and gaming at a good price. Amiga’s decline happened as a result of Microsoft releasing Windows 95. Amiga was using multitasking in 1984, which took Windows and MacOS about another 10 years to do. It also had a fast and responsive GUI and good command line interface (Amiga, 2003).

An extremely important part of the Amiga operating system is the Workbench. The Workbench is the graphical file manager. This gave users the ability to have an interface to work with file systems and launch programs. The workbench can be compared to a modern day desktop, a way to organize files and programs. It requires a two clicker mouse as the left click is used for all purposes and the right click is used as a pull down menu. Workbench has the ability to launch multiple applications at the same time thanks to Exec (its multi-tasking kernel). Most of Workbenches underlying functionality is stored in ROM in Amiga’s firmware Kickstart. This makes it necessary to boot from a system disk to launch the file manager. The later versions of Workbench provide floppy disk input and the even more recent versions include a CD-ROM. The newer version Workbench 4.0 was released in 2006 and was rewritten to work for PowerPC. A new feature included being able to drag windows around the screen and even onto other screens.

Kickstart is the firmware the Amiga operating system uses, most Amiga products were shipped with the firmware stored on ROM chip. The first prototype was released in 1983 with 64 kb of ROM capacity and Kickstart was loaded from a floppy disk. The early models used a 1.4 BETA ROM as bootstrap. Kickstart had the ability to boot various versions of Amiga without extra tools, by selecting the correct Kickstart image at boot time. The Kickstart does many diagnostics and system checks at the start-up. Next it will check for any connected boot devices like a floppy disk, and then boot from whichever has the highest priority first.

After turning the system on, the screen color would show the results of its self-test. The results are as followed: dark grey is the hardware is working and registers are readable, light grey means the ROM was verified, and white shows the initialization is alright and ready to boot. The following colors show there has been some type of error: red means bad Kickstart, green: no RAM chip found, blue: custom chip problem, yellow: bad CPU or a bod expansion card, light green: CIA problem, light grey: (if stopped at light grey) CIA may be defective, black: no video output. Amiga was known for the amount of color used and controversial colorful backgrounds, so having errors show up as colored screens was the first time this has been used. The keyboard LED will use blind codes to show errors, one blink means the keyboard ROM has a checksum error, two blinks means RAM failure, and three blinks means watchdog timer failure.

Another key component to the Amiga operating system was the kernel which was called Exec. This was most well-known for the ability to multitask with as little as 256 kb of memory; it would be like a scheduler for all programs attempting to run on the system, using a prioritized round-robin type of scheduling. It used a scheduling algorithm that based its interrupt intervals on a clock. It also had a message sending system between different components to help with interrupt handling and handling of dynamic shared libraries. This really was the first of its kind as other major operating systems did not develop until years after. The kernel will usually operate in user mode although whenever supervisor mode is needed, the call to library functions Supervisor() or SuperState() are used.

One early issue with the multitasking was when a program had an issue it could disable multitasking for a long time. This is due to invoking Amiga Forbid() call with no later command of Permit() call, resulting in the system to run as a single operation.

The second generation kernel called Exec SG was used by Amiga OS 4. This was created by Hyperion Entertainment, similar to the upgrade in Workbench; Exec used many of the same functions and structures with some upgrades in speed and capacity, although now only runs on PowerPC CPUs.

An issue with the earlier operating system was its lack of memory protection. The absence of protection forces programmers to be more careful in testing as it will not close out and could cause the whole system to crash. The reason was the 68000 series processors did not have the capability for memory protection; it was a hardware issue not the operating systems. The 68010 series had a very limited memory protection; later the 68020 finally had the full ability to do memory protection in a safe way. Although an issue with this was when the Amiga was released the 68020 processors was too expensive initially. Then they had small backwards-compatibility issue, similar to issues seen with many operating systems at the time.

Another feature is the window system and user interface of Amiga known as Intuition. Intuition is the graphics system; it maintains the state of all elements independently from the program itself. Making it responsive as UI tools are live even when the program is busy, it uses I/O features like a mouse, and controls collisions with the mouse pointer and icons. From limitations in Intuitions widget set, other GUI tools can be installed to have a more interactive and attractive interface. Intuition is different from Workbench which is a file manager while Intuition helps for handling windows and input events.

Amiga DOS is the disk operating system portion of the operating system. It offers interface such as command redirection, scripting, and a system of global and local variables. In the original Amiga DOES was written in Basic Combined Programming Language (BCPL), then in the second version turned to C. It introduced a wildcard function known as “globbing” which specifies filenames with wildcard characters. For example is you input “mv \*.doc” it would then move all documents to where you choose. The character \* would be the wildcard character. The most recent DOS is written in 64-bit support.

Some other features the earlier version had include, BOOPSI (Basic Object Oriented Programming system for Intuition), this enhanced the OS to be able to define a class and program object oriented interfaces into Amiga. It also includes the Amiga Guide and hypertext markup scheme to provide online help for the system. Amiga OS 2.0 introduced an installer that would allow software installations.

The current version of Amiga is 4.1 and is now fully PowerPC compatible. PowerPC is an instruction set that was intended for personal computers in the 1990’s. It was used in many of Apple’s products including iMac up until 2006.

The newest version of Amiga 4 (which I downloaded) has many updated features from its previous versions, they now how integrated online operating software updates on a schedule. The desktop has become easier to manage with the newest version of Workbench. It allows users to access documents, pictures, etc. and gives the user more ability to customize it according to their preferences. Python scripting language has been added to the system, giving the user the ability to write scripts to automate tasks. It has intelligence to use memory paging to better control how the systems memory resources will be shared. The kernel uses a special swap disk partition when memory requirements are more than there are available. Since Amiga does not have a platform like Windows it is hard to cover all the necessary work to create a shared library system. So “instead, Amiga OS introduced a new shared object [.so] system which allows for the direct compilation of shared object libraries which are quite common” (Pierce, 2012).

The Amiga computer had over 2,000 applications and many more utilities, and known as a gaming machine in the 1980’s and early 1990’s. Over 12,000 games were available, and Amiga had the most advanced hardware at the time so games were usually developed on an Amiga then many of those games later were ported and continued onto other platforms. The Amiga was also known for early graphic design and music players. It is estimated that AmigaOS had around 10,000 avid users; many are believed to be fans of the original Amiga systems who continue to support the product. So the development and usage of the system is between a close group of people.

Many software programs were available for Amiga systems. Compatible internet browsers started with the early text only browsers including Mosaic and Lynx. Now they support all main browsers and applications including SSL, SSH, and Flash Player.

Around the mid-1990’s Amiga operating systems began its decline in the market, now necessarily because of a bad product but poor management and a lack of vision. Commodore the company in charge at the time, had “management that was oriented towards a commodity mentality and a sort of stock promotion philosophy in terms of their business plan” (Singh, 2012). They also cut research and development of the Amiga which led to Mac passing Amiga in sales. Then once Windows 95 was released, Commodore ended up going bankrupt, and Amiga had hugely dropped off.

Amiga is still around today, it is on its fifth company to own the Amiga operating system since its start-up. Now the company is using a partnership with the operating system Tao. They are still trying to include the classic Amiga emulation in all future development. One developer from Amiga said “There isn’t a huge amount of new hardware coming out to run AmigaOS but it is a steady flow. Keep your eye on ACub and A-EON because I don’t think they are stopping any time soon.” When asked to whether AmigaOS 5.0 will be released he said “it all depends on the fans” (Pierce, 2012).

In conclusion Amiga was an operating system that was ahead of its time when it was released. It was highly regarded as one of the most advanced operating systems in the 1980’s. It ran a multitasking kernel years before some of the largest companies in the world today. With its intuitive design of colors and design it was very user friendly, especially to those working with graphic design or music making. Its Workbench gave users an easy way to organize their files, and install programs. The firmware Kickstart would allow successful boot ups and updates. Unfortunately the fallout happened in the 1990’s when many managerial moves hurt the company and lost to super powers Apple and Windows operating systems which were on the rise. Overall Amiga was a high functioning intelligent operating system and if it weren’t for a few moves made in the company, it is very likely this OS could be a more commonly used system today.

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