ABS Tech Note: AWS10 Apple Workgroup Server 95 Q&A (4/95)

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TOPIC ---

This article is the ABS Technical Note, AWS10 Apple Workgroup Server 95 Q&A.

DISCUSSION ---

Product Information

Question: What is the relative positioning of the Apple Workgroup Servers and AppleShare family of products?

Answer: The Apple Workgroup Server 60 runs AppleShare 4.0, uses System 7.1, and is targeted at small business and classroom lab environments.

The Apple Workgroup Server 80 runs AppleShare 4.0, uses System 7.1, and is targeted at medium-sized business environments and addressing communications server (that is Internet Router, SNA•ps, X.25, X.400 gateways) needs.

The Apple Workgroup Server 95 runs AppleShare Pro, uses A/UX 3.1 as the server operating system, and is targeted at large or data-intensive workgroups. The AWS 95 is also ideal for running relational database (RDBMS) products such as Oracle7 Cooperative Server.

Question: What is the positioning of the AWS 95 and AppleShare Pro against its competitors?

Answer: The AWS 95 with AppleShare Pro is a high-performance AppleShare file and print server. It is designed for Macintosh-mostly AppleTalk workgroups. Therefore, it is best to position it against AppleShare 3.0 as opposed to Novell NetWare or UNIX-based file/print solutions. AppleShare Pro on the AWS 95 has 4 times the throughput of AppleShare 3.0 on a Quadra 950 and will be up to 4 times faster for many operations. The AWS 9150 is somewhat below the AWS 95, while the 8150 is below that and about the same as a 8150, and AppleShare 4.0.2 on a AWS 60 will be close to performance of a 6150.

For those customers who thought that they needed to move to Novell NetWare or a UNIX-based AFP server to satisfy the performance needs of their Mac-mostly workgroup, the AWS 95 running AppleShare Pro is an ideal choice.

Question: What third party applications are available for the Workgroup Server 95?

Answer: Apple Business Systems has published a Workgroup Server Solutions Guide that details many of the third party client-server solutions available for Apple servers today. The solutions guide can be ordered from Apple Starting Line (S.LINE.ORDER). The phone number is 1-800-825-2145 and the cost is $6.25 per copy. Apple Starting Line is located in Colorado.

General Issues

Question: How does the AWS 95 fit into an AOCE environment?

Answer: Although the AOCE server will not run on A/UX 3.1, there are some advantages to having AOCE on a Mac OS-based server in the network with an AWS 95. The primary advantage is the "key chaining" concept which allows a single network logon.

Question: How do we setup the server if we want to use 4D Server?

Answer: 4D Server performs optimally when run with a large A/UX Buffer Cache and a large Macintosh virtual memory partition (at least 16 MB of real RAM). Therefore, 4D Server should be run in one of the three file/print configurations (as opposed to the database configurations) although it does not require AppleShare Pro.

Question: What type of caches are used by the on the AWS 95?

Answer: There are 3 levels of caching on the server: hardware, OS, and software. The hardware cache is called a Level 2 cache and is basically just fast RAM (15 ns). The OS cache, also called the A/UX Buffer Cache, is a backing cache for the entire file system. This means that all applications, including the local Finder, can take advantage of this cache. Files will remain in this cache until they are pushed out by another file. Therefore, the larger the buffer cache, the more likely a commonly used file will remain in the cache, and the better the performance will be. The AppleShare cache comes in 3 flavors: File Cache, Directory Cache, and Icon Cache. The Directory and Icon Caches store information found in the desktop database and information about file sizes, mod dates, and so on. Therefore, these caches are helpful in improving the navigation of the file system (especially with the Finder). The File Cache allows the server to "read ahead" and "write behind". An AppleTalk network sends data across the network in very small packets (about 4K). Since it is very inefficient for a server to continually go to disk for 4K chunks of data, the read-ahead cache gathers larger blocks of data (up to 128K) before sending it across the network. The write-behind cache does the same for writes by buffering data in the server's RAM before writing to disk. This greatly improves I/O efficiency thereby improving performance.

Question: What kind of network cabling systems are supported on the AWS 95?

Answer: The AWS 95 currently supports Ethernet and LocalTalk cabling systems. It does not currently support Token Ring networking interfaces. A third-party FDDI card manufacturer has announced FDDI support for the AWS 95 and A/UX.

AppleShare Issues

Question: Is there a way to import User Names, Groups, and Passwords from a text file to a File/Print AWS 95?

Answer: Third party developers of AppleShare management program, such as TechWorks, are incorporating tools for importing Users and Groups from text files into their products. These products will allow administrators to create text files in a specific format that can be transformed into a Users and Groups data file.

Question: Is the AppleShare Pro client software backwards compatible? Will it affect those users who try to access an AppleShare 3.0 server?

Answer: AppleShare Pro includes version 3.5 of the AppleShare Workstation. We chose the version number 3.5 so that it could live independently of the AppleShare version that it is bundled with. Workstation 3.5 is merely a bug fix of older AppleShare Workstations and is fully compatible with older versions of AppleShare. And, older versions of the AppleShare Workstation are fully compatible with AppleShare Pro. However, we recommend that users upgrade to the latest release.

Question: Can I run AppleShare Pro on any other Macintosh or Workgroup Server platforms?

Answer: AppleShare Pro will only run on the AWS 95. However, AppleShare 4.0 is essentially the same product as AppleShare Pro and is shipping now. AppleShare 4.0 uses all of the same caching algorithms as AppleShare Pro and runs on the following 6 platforms: Workgroup Server 60, Workgroup Server 80, Centris 610, Quadra 700, Quadra 800, and Quadra 950. Remember, AppleShare Pro gets some of its performance improvements from its own caches, but the rest comes from A/UX and the AWS 95 PDS card. AppleShare Pro 4.0.1 is required to operate on the RISC-based servers.

A/UX Issues

Question: What is the "Mac environment" in A/UX? How large is it?

Answer: The Mac environment (or virtual Macintosh) is a UNIX process that provides the operating system services required by Macintosh applications. These services include the System 7.0.1 Toolbox, so any well-behaved, 32-bit clean, System 7-aware application can run on the AWS 95 (A "well-behaved" application

does not access hardware directly; the A/UX security model prevents user-level access.). The default size of the Mac environment is 16 MB in all configurations, but all UNIX processes run in virtual memory so the available memory can be much larger. This default size of the Mac environment can be changed using the "Virtual Memory" setting in the Memory Control Panel.

Question: How is RAM allocated in A/UX for a File/Print configuration?

Answer: The UNIX kernel and core processes take approximately 7 MB of RAM. The remainder of dynamic RAM is divided between the buffer cache and the applications (like the Mac environment). There is also 51 MB of swap space available for virtual memory for UNIX processes. So, for a 32 MB configuration, 7 MB would be used by the Kernel, leaving 25 MB of dynamic RAM (and 51 MB of swap space). The A/UX Buffer Cache would then take 9 MB, leaving 16 MB of real RAM for UNIX processes. The Mac environment would then look for 16 MB of RAM, taking 16 MB of dynamic RAM and 2 MB of swap space. This would then leave 51 MB of swap space for other UNIX processes. The only caveat here is that the Mac environment does not allocate dynamic RAM for unused portions of it's 16 MB heap. Therefore, if only a portion of the 16 MB Mac Partition is being used at any one time, the remaining dynamic RAM will be available for other processes and Mac applications started later may wind up using swap space. See pages 8-10 of Chapter 2 of the Tuning Server Performance guide for more details.

Question: What about the Database configuration?

Answer: Since high-end databases like Oracle7 may maintain their own file system, they may not need a large buffer cache. Therefore all available dynamic RAM, not used by the Kernel, buffer cache, and the Mac environment, are used by Oracle 7.

Question: What version of AppleTalk runs on the Workgroup Server 95?

Answer: The AWS 95 uses a special version of AppleTalk, designed to run on A/UX. The version will report version 56 when polled but is actually compatible with the latest AppleTalk version 58. Do NOT try to install the latest Mac OS version of AppleTalk from the Network Software Installer (NSI) as it is not compatible with A/UX.

Hardware

Question: Describe the second-level memory cache on the AWS 95.

Answer: The second-level memory cache, which allows the microprocessor to gain significantly faster access to frequently accessed data or instructions, is located on the AWS 95 Processor Direct Slot (PDS) card. The cache uses 15 ns static RAM. 128 KB is on-board the PDS card. The second-level memory cache is expandable to 512 KB via SIMM upgrade kits. The second-level cache is a write-through, direct-mapped cache.

Question: Describe the SCSI DMA channels on the AWS 95.

Answer: Two SCSI DMA (Direct Memory Access) channels are located on the AWS 95 PDS card. SCSI DMA allows for more efficient data transfers between SCSI devices and DRAM (because data transfer is managed by the SCSI controller and SCSI DMA control logic instead of the microprocessor).

Question: How many SCSI devices can be attached to the AWS 95, and why?

Answer: Up to 20 SCSI devices can be attached to the AWS 95.
• Up to 7 SCSI devices can be attached to the PDS card's external SCSI port.
• Up to 7 SCSI devices can be attached to the main logic board's external SCSI port
• Up to 6 internal SCSI devices can be attached to the PDS card's internal SCSI port. NOTE: in order to attach 6 internal SCSI devices, special carriers would be required such as the 5 drive bracket for the AWS 95.

Question: Is the SCSI interface on the AWS 95 SCSI-1 or SCSI-2?

Answer: The SCSI interface is still SCSI-1. However, the AWS 95 supports the following SCSI enhancements:

Connect/disconnect is supported by A/UX and is available on all 4 SCSI channels. The benefit is more efficient use of SCSI bus (less contention). A SCSI device can momentarily disconnect from the SCSI bus while it is executing a time consuming operation (that is a full stroke seek on a CD-ROM drive). This permits other devices on the bus to execute SCSI commands until the slow device reconnects when it has data available for the initiator of the SCSI command. Applications such as Retrospect A/UX make good use of this feature.

Active termination and active negation technology is supported on the 2 SCSI DMA channels on the PDS card. The benefit is enhanced SCSI signal quality/integrity on the SCSI bus.

SCSI controllers on the PDS card are clocked at 33MHz.

SCSI performance is more efficient because of a combination of A/UX's asynchronous I/O capabilities and the hardware SCSI DMA. Multiple tasks can be queued up and data transfers finish quicker with SCSI DMA.

Question: Does the AWS 95 support fast or wide SCSI-2 options or synchronous transfers? Is there RAID support for the AWS 95?

Answer: The AWS 95 does not currently support either fast or wide SCSI-2 options. Synchronous transfers are also not currently supported. Work is being done with 3rd party providers for SCSI-2 options and RAID solutions. For more 3rd party information, please refer to the Apple Workgroup Server Solutions Guide.

Question: What kind of DRAM can I use with the AWS 95?

Answer: The AWS 95 ships with 4 MB parity DRAM (4 X 9), but non-parity DRAM can also be used (that is 1 X 8, 4 X 8, 16 X 8). The DRAM must be at least 80 ns and you add DRAM in the same way as you would for the Quadra 900/950 (that is you must fill a bank of 4 SIMM slots at a time, with the same DRAM density for each of the SIMMs in the bank). IMPORTANT: if you "mix and match" parity and non-parity DRAM in the AWS 95, make sure that parity checking is disabled in A/UX. To enable or disable parity checking, you should take the following steps, you should, from the Finder, choose Restart from the Special menu. Then, cancel the A/UX Startup process by either clicking the Cancel button or pressing Command-Period while the "Welcome" box is displayed. As a result, the A/UX Startup window opens and the Preferences menu appears in the menu bar. Choose General from the Preferences menu which gives you the check box for memory parity checking.

For more information, refer to Chapter 3, 'Configuring the Software' of "Setting Up and Managing Your Server" manual.

Question: How much data can the DDS-DC 4mm tape drive (sometimes called a DAT drive) back up?

Answer: The Digital Data Storage-Data Compression (DDS-DC) 4mm tape drive can typically back up 4-6GB of compressed data on a 90m tape. Exactly how much data can be backed up depends on the type of data being backed up. The DDS-DC drive can back up 2GB of uncompressed data.

Question: How should hard drives be formatted when they are attached to the AWS 95?

Answer: Hard drives should be formatted as UFS (Unix File System) drives instead of HFS drives. Be sure to use the A/UX version of HDSC Setup. This special version of HDSC Setup will automatically create a mount point for the hard drive.

Troubleshooting

Question: Why does the file system get "dirty" if the server is not shut down gracefully (that is, a power interruption)?

Answer: High performance servers gain most of their performance from caches. However, the data in the cache may not be the same as the data on the disk. It's the servers ability to schedule the writes to disk at a later time that gives the server a big performance boost. The side affect of this is that losing power before the caches are flushed can cause inconsistencies in data or even lost data. The FSCK (file system check) utility in UNIX allows the file system to rebuild itself and minimizes the possibility that data has been lost.

Question: Are there any guidelines in using or adding INITs and CDEVs to the A/UX Macintosh virtual machine?

Answer: Be extremely careful when using INITs or CDEVs that may be considered "hacks" and bypass the Macintosh toolbox interface. For example, applications such as SCSI Probe and Norton Utilities are not compatible with A/UX.

Question: I have been trying to remove INITs from A/UX by holding down the <shift> key as I do with Mac OS, but it doesn't seem to work, what am I doing wrong?

Answer: This works but is a question of timing. The <shift> key should ONLY be pressed after A/UX has loaded and is about to start up the Macintosh environment (that is, you see a spinning watch come up and the white menu bar is displayed). You have about 5 seconds to start holding down (and keep holding down) the <shift> key. INITs will not load, and the you can then go into the System Folder and remove the incompatible INIT.

Question: How do I rebuild the desktop with the Apple Workgroup Server 95, for example, if my icons become generic icons and the desktop needs to be rebuilt?

Answer: Right after A/UX has loaded and is about to start up the Macintosh environment (that is, you see a spinning watch come up and the white menu bar is displayed), press the <option> and <cmd> keys simultaneously and keep them depressed until you are asked via a dialog box if you want to rebuild the desktop or not.

Question: Why should I avoid pushing the RESET button on the AWS 95?

Answer: Reset the AWS 95 via the front reset button only as a last resort. If certain commands, such as hard disk writes, are occurring when there is a hardware reset, A/UX may detect a corrupted file system, and you may need to go into the A/UX Command Shell to manually check and/or rebuild the file system. Refer to the question above on 'dirty' file systems.

Question: How do I check or rebuild the file system?

Answer: If A/UX Startup says the file system is damaged or corrupt, choose AutoRecovery from the Execute menu to perform a file-system check (by executing fsck) on the root file system. Or, you may run fsck manually by executing the following command:

```
fsck /dev/default
```

and in general, answer "y" to any questions that come up. If you want to automatically answer "y" to all questions, use the following command:

```
fsck -y /dev/default
```

After A/UX has examined and fixed the file system, type <cmd> <L> to relaunch A/UX.

Question: An application running in the Mac environment of A/UX has hung or seems to have crashed. What should I do?

Answer: If a server application running in the Mac environment of A/UX seems to have hung or crashed, DON'T push the reset button! First, quit and restart the Mac environment by entering the command:

<control> <cmd> <e> [NOTE: type all 3 keys simultaneously]

Please be patient - wait 10-30 seconds for A/UX to quit and restart the Macintosh environment.

Question: Who should I contact if I have a question or find a problem with the Workgroup Server 95.

Answer: The normal chain of technical support should be used to report any problems. This allows the engineering and support teams to process the reports in the most efficient manner and ensure that nothing slips through the cracks.

Question: I've tried to install the drivers for the CD-ROM, and the Finder hangs. What do I do?

Answer: The CD-ROM drivers are actually part of the Unix Kernel on the AWS 95, and so the Mac OS-based drivers are not needed, and are in fact not compatible with A/UX. They should not be installed.

Question: I installed an extension into my System Folder and now my machine won't let me log in. How do I get rid of it?

Answer: First, try holding down the Shift Key during logon to disable inits. If this doesn't work, you can change your logon type to a terminal to eliminate the Macintosh environment and use the Unix shell to delete the files. Please be aware that the Unix environment is case sensitive and that spaces need to be quoted, so you have to use strings like 'cd "System Folder"'. Installing an INIT manager such as Now Startup or Extension Manager is also an option.

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