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Continuity in Computing

Avanti™ & AvantiFlex™ SPD

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Digital Emulator Collection

Software Product Description



Avanti is a virtual AlphaServer 400 designed to be hosted on **Windows x64** systems. AvantiFlex is a customer configurable version of Avanti. Avanti and AvantiFlex offer the following key features:

- OpenVMS support
- Tru64 UNIX support
- Simple configuration
- Flexible pricing
- Commercial licensing and support
- Multiple instances on a single host

Avanti is designed to virtualize legacy Digital Equipment Corporation (DEC), Compaq, and HP Alpha hardware. The product is *binary compatible* with real Alpha hardware, allowing the resident operating system and software to be ported to Avanti without modification or the need for source code. Avanti offers a simple way to upgrade existing Alpha systems to new, commodity hardware.

Avanti is designed for critical system use. It is capable of providing on par performance with DEC 3000, AlphaStation 200, AlphaStation 400, and AlphaServer 400 machines when hosted on appropriate hardware. It can serve as a replacement for any Alpha system where performance is not a key criteria.

Each Avanti instance supports 32MB to 3.0GB¹ of virtual memory, up to 45 storage devices, including physical CD/DVD-ROMs, three 100Mb NICs, one virtual serial console, and one virtual or physical serial port.

¹ Tru64 Unix systems current limited to 1.0GB of memory.

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HOST SERVER REQUIREMENTS

Single Avanti Instance

These are *minimum* recommended host system requirements. Faster hardware will provide better performance. Use quality hardware to ensure long term reliability. When running multiple instances of Avanti on a single host system, an additional CPU is required for each Avanti instance.

- Windows 64-bit O/S: XP, Vista, 7, Server 2003, Server 2008
- Dual core processor
- Memory
 - 2GB: Windows XP, Server 2003
 - 4GB: Windows Vista, 7, Server 2008
- 2 NICs
- Sufficient disk space to support virtual disk image files.

Multiple Avanti Instances

Multiple copies of Avanti and Avanti*Flex* can be run on a single host server simultaneously. Sufficient license units are required to support more than one virtual Alpha system, along with an additional host server CPU core for each additional virtual Alpha.

Running multiple virtual Alphas under Avanti requires robust host hardware. Sufficient CPUs, additional memory, and a fast I/O bus will be required to achieve adequate performance. The following table provides *minimum* host system configuration guidelines.

CPUs	3/2: 3 host CPU per 2 Avanti instances
Memory	2GB for Windows + 2GB for JIT + 2 * Avanti Memory. See section Error! Reference source not found. for additional information.
Disks	<ul style="list-style-type: none">• One disk dedicated to Host O/S.• At least one disk per Avanti instance.

AVANTI SOFTWARE PACKAGE

The Avanti software package can be ordered from Migration Specialties. The [Avanti User Guide](#) and [Release Notes](#) can be downloaded from the Migration Specialties virtual Alpha home page. The kit includes the Avanti emulator, configuration utility, WinPcap²-based NDIS network driver, and PuTTY² terminal emulator.

Avanti Home Page: <http://www.migrationspecialties.com/Emulate-Alpha.html>

² Avanti includes software developed by the Computer Systems Engineering Group at Lawrence Berkeley Laboratory and Simon Tatham. See the Avanti license agreement for additional details.

AVANTI VIRTUAL HARDWARE SUMMARY

CPU	1 EV4
Memory	32MB – 3.0GB ³
Disk Controllers	1 - 3*
Disks per Controller	7 (KZPAA) or 15 (KZPCA)
Maximum Disk Size	1 TB (limit determined by operating system)
NICs	1 - 3*
Serial Ports	2 virtual and/or physical
CD-ROM	45**
PCI slots	4*

*Avanti allows up to four virtual PCI devices. Each PCI slot can contain either a NIC or a disk controller. As a system without at least one NIC and one disk controller is not very useful, a maximum of three NICs or three disk controllers is allowed. An Avanti system can be configured with 1 to 3 NICs and 1 to 3 disk controllers, with a combined maximum of 4 PCI devices.

** In theory, each disk on each controller could be a virtual or physical CD/DVD-ROM drive. There is a maximum of 45 SCSI drives.

BASE AVANTI*FLEX* VIRTUAL HARDWARE SUMMARY

The following table outlines the base components provided with an *AvantiFlex* license. *AvantiFlex* can be upgraded through the purchase of license units to the full capabilities of Avanti. The *AvantiFlex* base package includes 10 license units.

CPU	1 EV4
Memory	128MB
Disk Controllers	1
Disks per Controller	7 (KZPAA)
Maximum Disk Size	1 TB (limit determined by operating system)
NICs	2
Serial Ports	2 virtual
CD-ROM	7 (physical or virtual)
PCI slots	3

LICENSE UNITS

Avanti features are controlled by license units. A full Avanti license provides 175 license units. An *AvantiFlex* base license provides 10 license units. *AvantiFlex* allows the user to select desired Avanti features without purchasing a full Avanti license. The following table outlines the units required for individual Avanti components.

Avanti Component	Required License Units
EV4 CPU	20
512MB Memory	10
Narrow SCSI Disk Controller (7 disks)	10
Wide SCSI Disk Controller (15 disks)	10
NIC	5
2 x Physical Serial Ports	10
Enhanced Performance (JIT)	60

³ Tru64 Unix systems current limited to 1.0GB of memory.

License unit pricing is covered in the Migration Specialties [Virtual Alpha Pricing Guide](#).

License Unit Utilization

An AvantiFlex base package includes 10 license units. Thus, a customer could immediately create one of the following configurations using the base package:

- Virtual Alpha configured with 512MB of memory.
- Virtual Alpha configured with two Narrow SCSI controllers.
- Virtual Alpha configured with 3 NICs.
- Virtual Alpha configured with 2 physical serial ports.

To add additional Avanti features, additional license units are required. Here are two sample AvantiFlex configurations and the *additional* license units required to create them. Remember, AvantiFlex already includes 10 license units in the base package.

Configuration	Additional License Units	Total License Units
Virtual Alpha configured with 1GB of memory	10	20
Virtual Alpha configured with: <ul style="list-style-type: none"> • 512MB of memory (10 units) • JIT (60 units) • Physical Serial Ports (10 units) 	70	80

CPU

Avanti provides a virtual EV4 CPU. Symmetric Multiprocessing (SMP) is not supported.

MEMORY

Avanti supports 32MB to 3.0GB⁴ of memory. A real AlphaServer 400/166 supported a maximum of 384MB of memory.

The base version of AvantiFlex supports 128MB of memory. Additional memory can be licensed in 512MB increments to the maximum supported by Avanti. The base 128MB of memory included with AvantiFlex does not accumulate with 512MB units. I.e, you cannot have an AvantiFlex system with 10 license units and 640MB of memory. It would be allowed 512MB of memory. An AvantiFlex system would be allowed 1GB of memory, and so on.

Memory is mapped to match the three memory banks available in a real AlphaServer 400. The user need only specify the total memory desired in the Memory field. The following table describes how legal memory values are calculated.

⁴ Tru64 Unix systems current limited to 1.0GB of memory.

Table 1: Legal Memory Values

Total Memory	Bank 1	Bank 2	Bank3
32MB	16MB	16MB	-
48MB	16MB	16MB	16MB
64MB	32MB	32MB	-
96MB	32MB	32MB	32MB
128MB	64MB	64MB	-
192MB	64MB	64MB	64MB
256MB	128MB	128MB	-

Total Memory	Bank 1	Bank 2	Bank3
384MB	128MB	128MB	128MB
512MB	256MB	256MB	-
768MB	256MB	256MB	256MB
1024MB (1.0G)	512MB	512MB	-
1536MB (1.5G)	512MB	512MB	512MB
2048MB (2.0G)	1024MB	1024MB	-
3072MB (3.0G)	1024MB	1024MB	1024MB

STORAGE

Controllers

Avanti supports up to three KZPAA (narrow) and KZPCA (wide) SCSI controllers. Which controller is available for use is dependent upon the O/S version installed. For example, VMS 7.2 does not support the KZPCA SCSI controller.

The base version of Avanti*Flex* supports a single KZPAA narrow controller. Additional controllers can be licensed to the maximum supported by Avanti.

KZPAA SCSI Controller

The virtual KZPAA supports up to 7 virtual disks or CD/DVD-ROMs.

KZPCA SCSI Controller

The virtual KZPCA supports up to 15 virtual disks or CD/DVD-ROMs.

Internal Storage

Virtual disk drives are supported as image files under the host operating system. File location is limited only by the host system. Avanti limits virtual disk size to 1TB per disk. Disk size is further limited by the operating system running on Avanti. For example, Avanti running OpenVMS version 6.2 would be limited to virtual disk sizes of 9GB. Check the Software Product Description (SPD) for the O/S version you are using to determine actual limits.

Removable Media Devices

Avanti supports physical CD and DVD-ROM device. CDs and DVDs can also be copied as ISO files and accessed as virtual media.

External Expansion

Virtual disks can be created on external storage devices accessible to the host system.

CONSOLE

Avanti provides SRM console access via a serial port (OPA0). The serial port can be virtual or physical.

COMMUNICATIONS

- Up to three virtual 10/100Mb DE435 or DE500 NICs. External performance is driven by the host system and may exceed 100Mb.
- One virtual or physical serial console (OPA0).
- One virtual or physical serial port (TTA0 or /dev/tty01).

Virtual serial port access is by telnet via a user defined Telnet port. Physical serial port access is supported via a physical serial (COM) port on the host system.

PRINTERS

- Network printer support dependent upon O/S running on Avanti.
- Serial printer support via TTA0 or /dev/tty01 and host system serial port.

CONFIGURATION

Avanti is configured via a simple Windows interface.

SOFTWARE

Operating Systems

- OpenVMS V6.1-1H1 and higher.
- Digital OSF/1 V3.2C and higher.
- Tru64 UNIX V3.2C and higher.

Avanti implements the Alpha SRM firmware, limiting O/S support to those O/S's that can boot from SRM. Thus, Avanti does not support WindowsNT. Avanti implements a virtual serial console, but does not implement a graphics card, so O/S's requiring a graphical interface are not supported. Avanti has not been tested against O/S's such as Red Hat Linux, NetBSD, FreeBSD, and OpenBSD, which utilize the Alpha SRM firmware.

Terminal Emulator

- PuTTY: Free implementation of Telnet and SSH for Windows and UNIX platforms. A copy of PuTTY is provided with Avanti. The software is also available from this link:

<http://www.chiark.greenend.org.uk/~sgtatham/putty/>

TESTED O/S

Avanti has been tested under the following 64-bit operating systems:

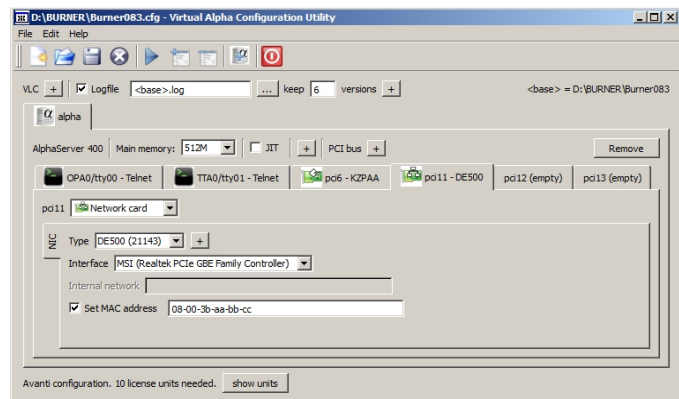
Windows XP

Windows Server 2003

Windows Vista

Windows 7

Windows Server 2008



Avanti Configuration Utility

VIRTUAL MACHINES

Avanti has also been hosted on Windows O/S running under VMware®, Sun VirtualBox, Apple Parallels, and Apple Boot Camp.

WARRANTY

Avanti is provided with a 30-day factory warranty. Annual software support contracts are available for purchase.

UNSUPPORTED OPTIONS

- Avanti has not implemented the EV4 CPU on-chip performance counters. Code profiling applications such as kprofile and uprofile will not work correctly on the emulator.

SUPPORT

Avanti customers under warranty or holding a valid support contract may contact their Avanti supplier with questions and problem reports. Support contact information is provided with the Avanti kit.

UPDATES

Migration Specialties may post updates to Avanti at any time. Notices of updates will be posted to Avanti customers, Avanti suppliers, on the Migration Specialties web site, and in various Alpha related publications.

COUNTRY OF ORIGIN



Avanti was developed by an international team with members from the USA, Canada, The Netherlands, and the UK. Avanti is owned and controlled by Migration Specialties International, Inc., a US corporation.