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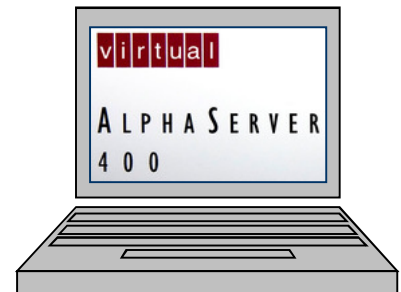


*Continuity in Computing*

## Avanti™ Release Notes

Version 3.0

06-SEP-2018



This document provides the latest information on the current release of Migration Specialties Avanti™, AvantiFlex™, and FreeAXP™ Alpha emulators. It includes recent enhancements, bug fixes, known problems, and usage tips.

**Avanti** and **AvantiFlex** are commercial products that can be purchased through Migration Specialties. **Avanti** and **AvantiFlex** provide features and performance beyond those offered by **FreeAXP**. **FreeAXP** is a free product available for personal and commercial use. **FreeAXP** is unsupported without purchase of a support contract. **FreeAXP** users without a support contract can post questions and search for answers at the [FreeAXP User Forum](#) at the [OpenVMS Hobbyist](#) web site.

### Avanti & AvantiFlex Links

- Product Info:** <http://migrationspecialties.com/Emulator-Alpha.html>
- User Guide:** [http://migrationspecialties.com/pdf/VirtualAlpha\\_UserGuide.pdf](http://migrationspecialties.com/pdf/VirtualAlpha_UserGuide.pdf)
- Release Notes:** [http://migrationspecialties.com/pdf/VirtualAlpha\\_ReleaseNotes.pdf](http://migrationspecialties.com/pdf/VirtualAlpha_ReleaseNotes.pdf)
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- Pricing Guide:** <http://migrationspecialties.com/pdf/VirtualAlphaPricingGuide.pdf>

### FreeAXP Links

- Product Info:** <http://migrationspecialties.com/FreeAXP.html>
- User Guide:** [http://migrationspecialties.com/pdf/VirtualAlpha\\_UserGuide.pdf](http://migrationspecialties.com/pdf/VirtualAlpha_UserGuide.pdf)
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- Download:** <http://migrationspecialties.com/FreeAXP.html>

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# Contents

<b>1. Naming Conventions</b>	<b>4</b>
<b>2. Documentation Updates</b>	<b>4</b>
<b>3. Host O/S and Testing</b>	<b>4</b>
3.1 FreeAXP & Avanti Host Environments	4
3.2 Legacy Host O/S	4
<b>4. Product Updates</b>	<b>5</b>
4.1 AlphaServer 400/166 Performance	5
4.2 FreeAXP as a Service	5
4.3 TCQ Bug Fixes	5
4.4 Disk Serial Number Update (Tru64 UNIX)	5
4.5 Windows 10 Pcap Signature	5
<b>5. Known Issues</b>	<b>6</b>
5.1 WinPCAP 4.1.3 Issue	6
5.2 VMware USB Key Support	6
5.3 OpenVMS Alpha V8.4-2L2	6
5.4 Windows 10 Version 1709 msipcap Issue	6
5.5 Running Avanti From a Non-Administrator Account	6
5.6 End Point Security Issues	7
5.7 Network Issues	7
5.7.1 Marvel Yukon NIC and Samsung Laptops	7
5.7.2 ADMtek AN995 PCMCIA NIC	7
5.8 AMD Processor Timing Issue	8
5.9 Remote Desktop and Avanti Icon	8
5.10 X-Client Color Mapping	8
5.11 License Key Conflicts	8
5.11.1 AlphaVM License Conflict	8
5.12 AnywhereUSB Reboot Issue	9
5.13 Windows XP Physical CD and Serial Devices	9
5.14 Charon Idle Loop Support	9

## 1. NAMING CONVENTIONS

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Throughout this document **Avanti** will be used to represent the Migration Specialties virtual Alpha products **Avanti**, **AvantiFlex**, and **FreeAXP**. Most installation, configuration, and runtime tasks are the same for all three products. Where distinctions are necessary, the products are referenced by name.

## 2. DOCUMENTATION UPDATES

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The following sections have been added or updated in the [Virtual Alpha User Guide](#). The User Guide encompasses Avanti, AvantiFlex, and FreeAXP.

- **Chapter 2: Quick Start**
- **Section 3.1: Transitioning from FreeAXP to Avanti**
- **Section 4.1.5.3: Installation Log**
- **Section 3.6: USB License Key Troubleshooting**
- **Chapter 15: OpenVMS Specific Notes**
- **Chapter 17: Miscellaneous Notes**

## 3. HOST O/S AND TESTING

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### 3.1 FreeAXP & Avanti Host Environments

FreeAXP supports both 32-bit (x86) and 64-bit (x64) Windows host O/S. Avanti and AvantiFlex support 64-bit (x64) Windows host O/S only. We test **FreeAXP (F)** and **Avanti (A)** under the following Windows O/S and virtual machines:

Host O/S	x86	x64	VMware
Windows 2019 Beta		F A	F A
Windows Server 2016		F A	F A
Windows Server 2012 R2		F A	F A
Windows Server 2012		F A	
Windows Server 2008 R2		F A	F A
Windows 10 (64-bit only)		F A	F A
Windows 8.1	F	F A	F A
Windows 8		F A	F A
Windows 7	F	F A	F A

### 3.2 Legacy Host O/S

Avanti 3.0 is built using the latest Windows Visual Studio and Intel C++ compiler. This development environment does not support the following legacy Windows O/S:

- Windows XP
- Windows Vista
- Windows Server 2003

- Windows Server 2008 Std

Migration Specialties maintains a legacy development environment to support customers with software support contracts running under these retired Windows O/S.

## 4. PRODUCT UPDATES

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### 4.1 AlphaServer 400/166 Performance

Avanti 3.0 runs 350% faster than a real AlphaServer 400/166 when tested on a quad-core Intel(R) Xeon(R) CPU E31230 @ 3.2GHz host server. The 64-bit edition of FreeAXP 3.0 runs 50% faster than the real Alpha running on the same host hardware. Host CPU speed corresponds directly to emulator Alpha CPU speed, so providing a faster host CPU will have a direct impact on emulator performance.

### 4.2 FreeAXP as a Service

FreeAXP 3.0 adds the option to install FreeAXP as a service. See [Section 8.14.1: Service Creation](#) in the [Virtual Alpha User Guide](#) for details.

### 4.3 TCQ Bug Fixes

Tagged command queuing support is required to designate a disk as a quorum disk under OpenVMS. Avanti 3.0 fixes a problem with TCQ support under OpenVMS 6.1-1H3 thru OpenVMS 7.0. The driver checks for TCQ are difference for versions of OpenVMS prior to 7.1.

### 4.4 Disk Serial Number Update (Tru64 UNIX)

Avanti allows serial numbers to be assigned to each disk or CD drive in the advance disk options. OpenVMS and Tru64 UNIX 3.x and 4.x ignore the disk serial numbers. Tru64 UNIX 5.x requires them. If a serial number is not present, Avanti generates one for each disk.

Versions of Avant prior to 3.0.0.620 had three potential problem with disk serial numbers.

1. User defined CD device serial numbers are ignored. The Avanti generated serial number is always used.
2. Avanti generated serial numbers for disk devices are not unique across SCSI adapters. A disk on adapter 0 and a disk on adapter 1 may receive the same generated serial number. The workaround is to manual set the serial numbers.
3. The generated serial numbers for all HSZ22 disks was the same, resulting in system hangs under Tru64 UNIX 5.x. The workaround is to manual set the serial numbers.

These problems have been corrected in Avanti 3.0.0.620.

### 4.5 Windows 10 Pcap Signature

Windows 10 Version 1709 Build 16299.371 and higher object to the msipcap signature in Avanti 614 and 617 and will not install Pcap, leaving Avanti without network access. Avanti 598 installs and runs without issue. Windows 10 Version 1709 Build 16299.309 and older do not have this problem.

The issue came about because Windows 10 now requires registration of kernel mode drivers with Microsoft. Avanti 3.0.0.620 addresses the problem. If you encounter the pcap license error, downgrade to Avanti 598 or upgrade to Avanti 620.

## 5. KNOWN ISSUES

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### 5.1 WinPCAP 4.1.3 Issue

Installation of the WinPCAP 4.1.3 NDIS driver disables the Avanti NDIS driver. If running applications the use WinPCAP, such as SimH VAX or Wireshark, used the WinPCAP 4.1.2 NDIS kit.

### 5.2 VMware USB Key Support

When configuring a USB device to support the Avanti license dongle in a VMware instance, avoid enabling USB 3.0 support. Set the port up for USB 1.1 and USB 2.0 support only.

### 5.3 OpenVMS Alpha V8.4-2L2

VSI's OpenVMS V8.4-2L2 Performance Release for Alpha requires Avanti version 3.0.0.617 or higher.

### 5.4 Windows 10 Version 1709 msipcap Issue

We have seen an intermittent issue with Windows 10 version 1709 where if Avanti or the Configuration Utility is started immediately after booting Windows, they will hang. Windows must then be rebooted to recover. The issue is a conflict with the Avanti NDIS msipcap driver unique to certain builds of Windows 10 v1709. The fix is to upgrade Windows 10 to version 1803.

If you encounter this problem, a work around is to run the following commands from the Windows Command Prompt prior to launching Avanti or the Config Utility. Be sure to use "Run as administrator" when launching the Windows Command Prompt.

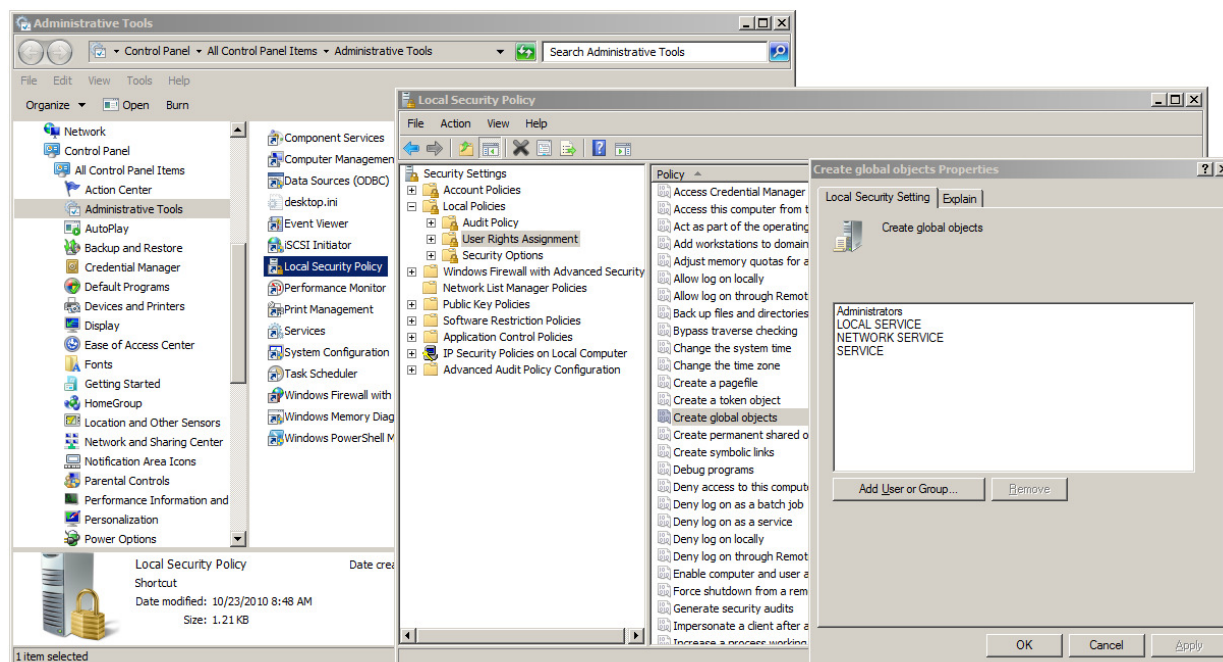
```
C:\> net stop msipcap  
C:\> net start msipcap
```

### 5.5 Running Avanti From a Non-Administrator Account

On some versions of Windows, an attempt to start Avanti as a non-administrator user may fail with the error message "Could not initialize mapped file for IPC". This is known to happen under Windows Server 2008 and Windows 7. To resolve this issue, the "Create Global Objects" privilege needs to be granted to the Avanti user account. To grant the privilege, log into an administrator account and execute the following steps:

- 1) Start> Control Panel> Administrative Tools> Local Security Policy
- 2) Open Local Policies and select User Rights Assignment.

- 3) Double click **Create Global Objects** and click **Add User or Group** to grant this privilege to the user that needs to run Avanti.



## 5.6 End Point Security Issues

If Avanti mysteriously halts or disappears after running for a period of time, check that end point security products are not interfering with the process. We have had reports of Tanium ([www.tanium.com/](http://www.tanium.com/)) products blocking Avanti because of its 100% utilization of a single host CPU. Wherever possible, place the Avanti executable (dec.exe, freeexp.exe) on security and anti-virus exclusion lists.

## 5.7 Network Issues

### 5.7.1 Marvel Yukon NIC and Samsung Laptops

There is a known problem with Samsung laptops using Marvell Yukon chip set in the onboard NIC. Assigning this NIC to the virtual Alpha may cause a NETDLLERR crash under OpenVMS. A detailed problem description can be found in the [FreeAXP forum](http://FreeAXP forum) at this link:

[http://vmshobbyist.org/forum/viewthread.php?forum\\_id=163&thread\\_id=1341](http://vmshobbyist.org/forum/viewthread.php?forum_id=163&thread_id=1341)

We have been unable to reproduce the problem on other systems using a NIC with a Marvell Yukon chip set. Possible workarounds for the problem include:

- Use the DE435 instead of the DE500 virtual NIC in the Avanti configuration file.
- Update the NIC drivers.
- Use a different NIC for Avanti

### 5.7.2 ADMtek AN995 PCMCIA NIC

The WinPCAP driver does not appear to work at all with PCMCIA-based ADMtek AN985 10/100Mbps Fast Ethernet Adapters.

## 5.8 AMD Processor Timing Issue

### Symptoms:

- **OpenVMS:** The login prompts go by too fast to enter anything.
- **Tru64:** Response time at console slows sporadically when system has no load.

On Windows versions prior to Windows 7, there is a known problem on AMD Athlon X2 systems that may cause various timing issues under Avanti. The problem is caused when the timestamp counters in each of the AMD CPU's drift apart over time since the last power-on. This drifting of the timestamps causes a higher timer-interrupt rate on the emulated Alpha. The fix is to install an updated processor driver from AMD that ties the Windows time routines to a single CPU core. The update is available at

<http://support.amd.com/us/Pages/AMDSupportHub.aspx>

This problem appears to have been corrected under Windows 7 and higher.

## 5.9 Remote Desktop and Avanti Icon

When managing a server running multiple instances of Avanti via Windows Remote Desktop, the Avanti icon right-click menu does not always clear as expected. It is sometimes possible to have one Avanti icon menu obscure another. This is an issue with Remote Desktop, not Avanti.

## 5.10 X-Client Color Mapping

Some X-windows clients may not display OpenVMS and Tru64 UNIX 8-bit color mapping correctly. Ensure the client has an 8-bit color mapping mode. For example, the *Reflection X Advantage* help file contains the following advice:

"If you attempt to run the X client `xfishtank` with **TrueColor, 24-bit depth** selected as the **Default Visual Type**, the following error message appears:

```
"Don't know how to format image for display of depth 24"
```

Some clients do not return an error message. Instead, gray, hatched patterns are displayed in place of the correct colors. If you are running an X client that does this, select **PseudoColor, 8-bit depth** as the **Default Visual Type**."

## 5.11 License Key Conflicts

Avanti utilizes a Keylok USB license dongle. Other software providers may also utilize this dongle. If a host system runs two different software products utilizing the same license dongle technology, there may be license conflicts.

### 5.11.1 AlphaVM License Conflict

AlphaVM products install a license service named `EmuVMLicense`. The `EmuVMLicense` service will interfere with an Avanti key. The `EmuVMLicense` service needs to be disabled via the Windows Service Manager before using Avanti. Also check all processes under Task Manager and make sure that an executable named `keylok_service.exe` is not present. If `keylok_service.exe` is present, kill the process before using Avanti.

AlphaVM license facilities do not affect FreeAXP.



## 5.12 AnywhereUSB Reboot Issue

Several customers have reported that when doing a soft reboot on an AnywhereUSB device that holds an Avanti key, the device does not always re-serve the key to the VMware session. A hard reboot of the AnywhereUSB device is required to restore access to the license key. We have reported this issue to the vendor. Running Avanti 2.4.1.502 or higher greatly reduces the risk of running into this problem.

When the license key doesn't come back, the Windows Device Manager shows a warning triangle for the "AnywhereUSB Root Hub" devices, with a warning message "Device cannot start". In that case, restarting the emulator also doesn't fix the problem (the port stays down). The "AnywhereUSB Remote Hub Configuration Utility" doesn't show any errors, but the Windows Device Manager does.

What does fix the problem when the system is in this state is disabling the "Network Attached USB Enumerator" device, after a few seconds the devices will come back, or disconnecting and reconnecting to the AnywhereUSB device using its configuration utility.

After rebooting the AnywhereUSB device, open the Windows Device Manager and check the status of the AnywhereUSB Root Hub devices. If these have a warning triangle, use the AnywhereUSB configuration utility to disconnect from the AnywhereUSB device, then reconnect. After the connection is complete, verify that the AnywhereUSB Root Hub devices are working.

## 5.13 Windows XP Physical CD and Serial Devices

When running Avanti under Windows XP, if physical serial or CD devices are not displayed by the Configuration Utility, ensure XP Service Pack 2 is installed. Versions of XP prior to SP2 contain a bug that inhibits display of CD and serial devices.

## 5.14 Charon Idle Loop Support

Avanti 1.0.6.271 and subsequent releases support the Charon idle loop. VMS system disks with the Charon idle loop driver installed will boot and run without issue under Avanti.

The Charon idle loop can be enabled and disabled using the system parameter `LOAD_SYS_IMAGES`. The default is 7. Changing it to 6 (clearing bit 0 = `SGN$V_LOAD_SYS_IMAGES`) prevents `SYSS$IDLE` from being loaded during boot.