

Avanti Virtual Alpha Release Notes

for the Avanti Virtual Alpha suite

Version 5.1.0



Migration Specialties Europe

1-OCT-2026

Avanti Virtual Alpha Release Notes

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Inquiries

Please direct all inquiries regarding this document or the products described therein to:

Migration Specialties Europe
Slawijkseweg 1
7077AM The Netherlands

www.migrationspecialties.nl

camiel@migrationspecialties.nl

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1 Introduction

These release notes cover the Avanti product, including configurations previously known as FreeAXP or AvantiFlex.

Avanti can operate without a license key when the selected configuration requires zero license units. Paid license keys enable configurations that require additional units. Support is not included with either form of operation; annual paid support can be purchased separately for any Avanti installation.

For community assistance, visit VSI's [Hardware Emulators forum](#).

1.1 Read Before Upgrading

Avanti V5.0 will not work with USB-key based licenses. If you are upgrading from an earlier version of Avanti or AvantiFlex, please contact Migration Specialties Europe to obtain your new registry-based license keys before installing.

Stop every Avanti instance, including services, before installing version 5.1.0. The new installation replaces the previous version and uses an updated process-database protocol; mixed-version operation on the same host is not supported.

Service failures are now reported without waiting for an interactive acknowledgement; check the Windows Application event log for the failure. Telnet action commands longer than 999 bytes are rejected instead of silently truncated. Administrators must protect service configuration files and their directories from ordinary-user changes because the LocalSystem service may launch a configured action during startup.

Shared process-database operations now check mutex acquisition, validate complete mapped accounting state before use, and roll back changes when an operation throws an exception. Invalid state is poisoned before it can be copied as a transaction snapshot. If a running instance finds inconsistent, abandoned, or incompatible state, it logs one quarantine warning and keeps its already-admitted guest running without further shared-database access. New instances are refused until every Avanti process, including services, has stopped; Windows then removes the unusable mapping and the next start creates a fresh one. An existing mapping is attached at its actual size before its leading protocol version is checked, so a smaller mapping left alive by an older emulator produces this incompatibility diagnostic rather than a Windows mapping error.

Processor-core allocation now uses the full 64-bit processor-group mask, correcting selection of cores numbered 31 and higher without accidentally clearing other available cores. This correction does not expand the supported host configurations. The first process also validates the complete forbidden_cpus list before initializing the shared core pool: malformed, duplicate, overflowing, out-of-range, and nonexistent CPU IDs are rejected instead of accepting stray characters or allowing numeric wraparound.

A missed heartbeat no longer returns a live emulator's license units or dedicated cores to the shared pool. Suspended instances retain their claims. Avanti reclaims abandoned claims only after confirming that their owning process has exited, and repeated cleanup cannot return the same resources twice.

Paid-license validation now takes place only at startup. Running instances retain their admitted claims despite later key replacement, removal, unreadability, or expiry. Each new paid start uses the currently installed valid key's capacity less all running claims; capacities from different keys are never added. Zero-unit starts remain keyless. Runtime license information shows the startup key rather than rereading the installed key.

Process-database heartbeat and cleanup scheduling now use elapsed host uptime instead of the calendar clock. Adjusting the host date or time no longer delays these

checks or makes their displayed elapsed ages jump. After a long pause, Avanti performs a due check without replaying every missed interval; only confirmed process exit permits reclamation. Startup license-date validation still uses the host's current local calendar date.

Version 5.1.0 rejects configuration files containing more than one emulated Alpha, including systems in separate control blocks. Split an old multi-system file into one file per Alpha and start a separate Avanti process for each. Preserve required session definitions and check file paths and host ports. Configurable internal Ethernet segments have also been retired. Replace a formerly shared internal network with a common external Ethernet connection, check unique guest MAC and network addresses, preserve any required network isolation, and verify peer communication as described in the manual's multiple-instance migration guidance. There is no extra base-instance license charge; optional-feature units from all running instances still count cumulatively against the host-wide pool.

The emulator and Configuration Utility automatically migrate the simple internal-network forms generated by older Configuration Utility versions: direct NIC connections remain direct, a generated host-adapter bridge becomes a direct adapter selection on each attached NIC, and an empty Dummy network becomes a disconnected NIC. Configurations containing reflectors, multiple external bridges, missing network references, or other ambiguous hand-authored topology are rejected instead of being changed silently. Open and save a migrated configuration with the Configuration Utility to write the current format. Dummy network now leaves each selected NIC independently disconnected; it no longer creates a shared isolated segment.

SCSI device identifiers now require complete unsigned decimal bus and target numbers in disk<bus>.<target> form. Both supported controllers use bus 0; KZPAA accepts targets 0-6 and KZPCA accepts 0-6 and 8-15, with ID 7 reserved. Malformed, overflowing, unsupported, and duplicate addresses are rejected before device initialization. If an older file relied on a partially parsed name or repeated a target, correct the name or assign an unused target without losing its device settings. Review guest device names and boot selections after changing a target. Leading-zero aliases count as the same address. License-unit charges are unchanged.

Virtual-tape READ and WRITE commands now reject transfers above 16 MiB, WRITE FILEMARKS rejects more than 1,024 marks per command, and virtual-disk READ and WRITE commands reject transfers above 64 MiB, to protect host resources. Total image-file sizes are unchanged. Adjust unusually large guest I/O requests to use smaller records, mark batches or transfer counts. The advanced control settings `extra_threads` and `fixed_threads` now accept 0 through 256, and the resulting actor-worker count must be 1 through 256 and exceed the blocking-actor count. Correct oversized or undersized hand-edited values before upgrading.

Virtual-disk reads and writes now obey the same 2 TiB or 32-bit-LBA guest-visible ceiling reported by READ CAPACITY, even when the backing device is larger. SYNCHRONIZE CACHE waits for earlier disk writes and a Windows flush, reporting a guest I/O error if flushing fails; a write-back RAM disk also persists its complete image on this command. A RAM disk with `write_back` disabled remains intentionally volatile. Review unusually large backing devices and guest assumptions about cache synchronization before upgrading.

Version 5.1.0 validates PCI topology before initializing devices. Each Alpha may have only one dc21071da PCI-bus block; consolidate duplicate bus definitions into that single supported bus. NICs and SCSI controllers must use unique slots `pci6`, `pci11`, `pci12` or `pci13`, with at most three of each type and four cards in total. Slot numbers must be complete unsigned decimal numbers; leading-zero aliases occupy the same slot. ISA positions `isa2`, `isa3` and `isa4` cannot coexist with `pci13`, `pci12` and `pci11` respectively. Correct invalid or conflicting older configurations before starting; preserve required

card settings and disk definitions, choose unused supported slots, and review guest device names, boot selections and network configuration after moving a card. Unit charges are unchanged.

Npcap is now the preferred network backend and `use_npcap_driver` defaults to true. When a compatible Npcap installation is available, Avanti uses it for every NIC in the process; otherwise Avanti falls back to its bundled msipcap driver. Npcap is not supplied or licensed by Migration Specialties. If an installed Npcap copy is not licensed for Avanti use, add `use_npcap_driver = false` to the top-level control component with a text editor before first opening an older configuration that omits the property. The former per-NIC `driver` property is now ignored, hidden, and removed when the Configuration Utility saves an older file.

Five-port ISA serial cards now reject malformed or duplicate card/port identifiers, overlapping I/O ranges and conflicting IRQs before initialization. Use one each of isa0 through isa4 and, per card, serial0 through serial4. Normally omit iobase and irq for automatic name-derived assignment. Retained explicit I/O overrides must be aligned to 8 bytes and leave 48 contiguous bytes free, without overlap with another card or either onboard base UART, even when no host connection is configured for that UART; IRQs must be distinct and IRQ 2 is reserved. Zero requests automatic allocation. ISA/PCI exclusions still apply, and this remains OpenVMS-only at 10 units per card. Back up older hand-edited configurations, preserve each port's connection settings while correcting names or resources, and update firmware ISACFG entries and OpenVMS startup commands from the new log if assignments change. See the manual's five-port serial-card section for exact limits and examples.

CPU affinity now respects Windows process and job restrictions rather than expanding the process to all system CPUs. Avanti requires one active Windows processor group and enough allowed CPUs for its dedicated emulation claim plus I/O. Starting another instance must not consume the last eligible I/O CPU of an existing instance. Unsupported topology, failed discovery and thread-affinity failures produce errors; failed updates roll back, or invalidate the shared database if Windows prevents restoration. Stop all instances before installing the updated protocol, and set CPU restrictions before starting them. See the manual's CPU allocation section. License-unit charges and startup-only key validation are unchanged.

1.2 Avanti Links

Avanti information and downloads are available from the [Migration Specialties Europe website](#). For community assistance, visit VSI's [Hardware Emulators forum](#).

1.3 Document Conventions

This document uses the following conventions:

Throughout these release notes, Avanti Virtual Alpha is the full name of the product and Avanti is used as its short name. The former FreeAXP and AvantiFlex names are used only when a historical or upgrade distinction requires them.

1.4 Migration Specialties Products & Services

Product	Description
Avanti	AlphaServer 400 emulator; zero-unit configurations require no license key
OpenVMS Consulting	OpenVMS consulting and programming services
Tru64 UNIX Consulting	Tru64 UNIX consulting and programming services

2 Documentation Updates

The Avanti User Guide received substantial updates as part of the Avanti version 5.0 release. These are some of the highlights.

- All sections related to licensing were completely rewritten to reflect the new licensing mechanism.
- The documentation (user guide as well as these release notes) is now being maintained and produced using different software. As a result, its layout has changed substantially.

3 Host O/S and Testing

3.1 Avanti Host Environments

Avanti supports 64-bit (x64) Windows hosts. The minimum supported client baseline is Windows 8 x64 and the minimum supported server baseline is Windows Server 2012 x64. The following table distinguishes the exact host evidence retained by the project from legacy family-level reports. Inclusion is not 5.1.0 recertification or a blanket guarantee for every edition, build, driver, or virtualization configuration; complete package compatibility must be established separately for each release.

Host family	Retained evidence	Scope
Windows 10	Legacy family report; exact edition and build evidence was not retained.	Historical report only; not 5.1.0 release-package validation.
Windows 11	Windows 11 Pro 64-bit, version 10.0.26200, tested 18 September 2026.	Licensed lifecycle and core-affinity suite only; not complete 5.1.0 release-package validation.
Windows Server 2012 / 2012 R2	Legacy family report; exact edition and build evidence was not retained.	Historical report only; not 5.1.0 release-package validation.
Windows Server 2016	Legacy family report; exact edition and build evidence was not retained.	Historical report only; not 5.1.0 release-package validation.
Windows Server 2019	Legacy family report; exact edition and build evidence was not retained.	Historical report only; not 5.1.0 release-package validation.
Windows Server 2022	Legacy family report; exact edition and build evidence was not retained.	Historical report only; not 5.1.0 release-package validation.

3.2 Legacy Host O/S

The Avanti production executable is built with Microsoft Visual Studio 2026 and its Clang/LLVM toolchain, using O3 optimization, full link-time optimization (LTO), and IR profile-guided optimization (PGO). The emulator build selects the Microsoft v142 C++ libraries (14.29.30133) and Windows SDK 10.0.19041.0 independently of the Clang compiler. The following legacy Windows operating systems remain unsupported:

- Windows XP
- Windows Vista and Windows 7
- Windows Server 2003
- Windows Server 2008 and Windows Server 2008 R2

4 Product Updates

4.1 Hybrid-Core CPU Placement

Avanti now uses Windows physical-core, hardware-thread, processor-domain, and efficiency-class information when selecting a logical processor for the Alpha-CPU thread. The new per-emulator `cpu_core_preference` advanced setting accepts automatic, performance, or efficiency. Automatic and performance prefer the highest available Windows efficiency class; efficiency prefers the lowest. If the preferred class is unavailable or exhausted, Avanti falls back through the remaining eligible classes. Supported Windows hosts that do not report efficiency classes retain physical-core and topology ranking without a class preference.

The setting is a placement hint within the process/job affinity and `forbidden_cpus` boundaries already applied to the emulator. It does not reserve a physical core from Windows or other applications and does not guarantee guest performance, host power use, or energy savings. Existing I/O-capacity, concurrent-instance, and license-unit rules remain in effect. See Allocation of Virtual Alpha CPUs and VLC [+] in the Avanti User Guide.

4.2 Avanti 5.1.0 Reliability and Compatibility

Avanti 5.1.0 brings together reliability and compatibility work completed after version 5.0.1. Changes that can require configuration-file or installation action are described separately under Read Before Upgrading.

Communications and I/O

Network, Telnet, and firmware-facing input paths now validate reported lengths before copying or parsing data. Asynchronous network and serial operations handle failed completions without consuming invalid completion data.

Telnet sessions and physical serial ports now shut down by cancelling or closing their I/O and waiting for their workers to finish. These paths no longer rely on forced worker-thread termination, reducing the risk of retained resources or an incomplete stop.

Telnet output is sent asynchronously. A slow client is disconnected if its pending output exceeds 256 KiB or a send makes no progress for five seconds; the emulator records CTS-W-SLOWCLIENT. Reconnect the terminal and check the connection if this occurs.

The `msipcap` transmit path now keeps its overlapped-send state valid through completion. Ethernet checksum/offload processing rejects incomplete or internally inconsistent captured IPv4 packets before inspecting or repairing their headers.

Storage error paths now reject incomplete image creation and RAM-disk write-back instead of publishing partial backing files. A RAM-disk write-back failure makes graceful shutdown fail, including when Avanti runs as a Windows service. Virtual tape UNLOAD reports a failed finalization to the guest, and unsupported SPACE-to-end-of-data returns a check condition rather than false success. Configuration saves stage a complete replacement before replacing the active file.

The virtual CD-ROM READ TOC response now respects the guest's requested allocation length, preventing extra DATA IN bytes on short requests.

Virtual tape SPACE now rejects truncated records and mismatched record trailers before advancing, and a short READ leaves the virtual tape positioned at the failed record for diagnosis or retry. Host tape-image write failures are reported as I/O errors rather than

invalid commands; incomplete records are removed at the last complete boundary. SIMH records marked as erroneous now report a read error to the guest.

OpenVMS startup now handles the firmware-advertised but unsupported floppy interface without mistaking inactive ISA bus lines for an endless result stream. This prevents the resulting INCONSTATE bugcheck while retaining pulled-up responses for genuinely unclaimed ISA memory and I/O reads.

The two onboard serial UARTs now remain present to Alpha firmware even when a configuration omits one or both host-side serial connections. This prevents early firmware from repeatedly reading an unclaimed COM2 port as if receive data were always ready, while other unclaimed ISA reads retain their pulled-up values.

The Npcap backend now uses event-driven receive processing, bounded packet batching, conservative destination filtering, and faster Ethernet CRC processing. These changes reduced receive overhead and improved throughput in local testing; actual performance depends on the host, network adapter, and driver. Npcap is preferred, now defaults on when a compatible installation is available, and normally attaches directly to the physical adapter without a TAP bridge. Set `use_npcap_driver=false` to prevent Avanti from loading an installed Npcap copy or to select MsiPcap for compatibility testing. The MsiPcap backend remains available; its receive worker now cancels pending input and exits on shutdown even when no packets arrive.

Print to File

Print to File now validates configuration and naming rules, normalizes serial line endings, selects collision-safe timestamped filenames, reports output errors, retains accepted data after a failed write, and retries the write. Active jobs larger than 1 MiB are temporarily spooled to disk to bound emulator memory use while retaining one output file and complete-job naming rules. See [Print-to-File Serial Output](#) and the [Avanti User Guide](#) for the complete behavior and configuration.

Configuration and production build

The Configuration Utility has moved to Qt 5.15.2. The Avanti production build has moved to the Visual Studio 2026 Clang/LLVM toolchain; the Host O/S and Testing section records the supported host baseline separately from the build-tool change.

The Configuration Utility omits a physical disk from the raw-device list when Windows cannot provide a complete disk identity. This prevents an unknown disk from being mistaken for an available one; run the utility as administrator and check device permissions and storage drivers if a disk is unexpectedly absent.

The Configuration Utility also bounds Windows CD-ROM enumeration retries. A failed optical-device query no longer leaves the utility in a retry loop; other available raw devices remain selectable.

The Configuration Utility preserves Windows code-page characters in disk and tape image paths, expanded default file paths, PuTTY actions, and configuration shortcuts. Configuration parsing also accepts braces inside quoted property values. The utility does not create a raw-device entry when no usable host device is available.

4.3 Windows System File-Cache Limit

Avanti 5.1.0 no longer limits the Windows system file-cache working set by default. Existing configuration files that do not specify `win32_limit_cache_yn` therefore leave the Windows setting unchanged. Avanti also restores a previously disabled Windows limit correctly after an explicitly enabled limiter shuts down normally.

If sustained emulated-disk I/O allows the Windows file cache to consume enough memory to degrade system performance, set `win32_limit_cache_yn` to true in one Avanti

configuration on the host. The default `win32_limit_cache_size` value of zero then selects 25% of physical memory. Monitor host memory use and application performance with a representative workload; an unsuitable limit can itself reduce performance. Set `win32_limit_cache_yn` back to false if enabling the limiter makes performance worse. Because the limit is system-wide, do not enable it in more than one simultaneous Avanti process.

4.4 Physical Serial Line Settings Validation

Avanti now validates a complete physical serial linesettings value before reading its individual fields. Empty, incomplete, malformed, overlong, or unsupported values produce a startup diagnostic and retain the host port's existing baud, data-bit, parity, and stop-bit framing rather than applying a partial setting.

The documented baud/data-parity-stop combinations and the case-insensitive host setting remain unchanged. The guest setting remains reserved but unimplemented and continues to retain the host framing with a diagnostic.

4.5 Serial Input Delay Validation

Serial-port chunktime values are now limited to 0 through 2147483647 milliseconds, and conversion to the scheduler's microsecond delay uses wide arithmetic. Previously large values could wrap when stored or converted, causing an incorrect retry delay. The default and automatic timing behavior are unchanged.

4.6 Logfile First-Line Timestamp

The first nonempty line of log output now consistently follows the timestamp setting. Previously an uninitialized state could omit its timestamp when enabled or add one when disabled. Subsequent-line formatting, blank lines and log headers are unchanged.

4.7 Installer Firewall Profiles

The installer now manages an application-specific inbound Windows Firewall rule for Domain and Private networks, including on Windows 8 and Windows Server 2012. Public access is no longer enabled automatically. If remote console connections are required on a Public network, ask your administrator to create a separate, appropriately restricted rule before upgrading.

Upgrade and repair disable legacy inbound allow rules named Avanti for the installed executable, retaining the disabled records. Repair restores the managed rule to Domain and Private; uninstall removes it. Separately named administrator rules and rules for other executable paths are left unchanged. Organizational policy may override local rules. Setup warns if firewall configuration fails and continues; inspect and correct the rules manually or retry with Repair. See the manual's Installation Details for failure and cleanup guidance.

4.8 PIC Interrupt Acknowledgement

The emulated interrupt controller no longer acknowledges a withdrawn device request as a real interrupt merely because another device has an interrupt pending. Other pending requests remain available for delivery, respecting the guest's interrupt masks and end-of-interrupt handling. This corrects a shared device-model defect that could produce stray guest interrupts; no configuration changes are required.

4.9 Unified Avanti Product

FreeAXP and AvantiFlex are retired as current product names. All supported configurations are now called Avanti. Configurations requiring zero license units continue to run without a license key, and existing license keys remain valid. The included first SCSI controller may be a KZPAA with up to seven targets or a KZPCA with up to fifteen targets; other device types retain their separately stated unit rules.

The fixed 175-unit package is no longer offered. License keys may contain the unit count stated in the customer's quote; no fixed purchase or key increment applies.

4.10 RAM Disk Support

RAM disks are documented as supported, included SCSI targets with no per-device license-unit charge. They are suitable for disposable data such as swap or pagefiles, not as a replacement for durable storage.

Avanti now rejects empty or non-512-byte-aligned backing images and aborts startup if the complete image cannot be read. With write-back enabled, it reports failures to reopen or completely rewrite the image during graceful shutdown. Abnormal termination can still lose unwritten changes; with write-back disabled, runtime changes are not persisted.

4.11 Base Serial Port Configuration Validation

When a hand-edited configuration defines a base UART component, Avanti requires the name to be exactly `serial0` or `serial1`, with each name used at most once. An omitted component leaves its onboard UART idle without a host-side connection. Empty, signed, malformed, overflowing, duplicate, and above-limit identifiers are rejected before startup instead of being allowed to register an overlapping I/O range or interrupt bit.

Before upgrading, remove duplicate base-port definitions and rename each retained base port to `serial0` or `serial1`. This change does not alter the `serial0` through `serial4` child identifiers used by a five-port ISA serial card.

4.12 Strict Numeric Configuration Values

Avanti now validates every numeric property while loading a configuration. Numeric values must contain digits before each optional K, M, G, or T suffix. Leading or consecutive suffixes, signs, trailing text, arithmetic overflow, and values outside a property's declared range or step are rejected before hardware is created or license units are calculated.

Hand-edited main-memory values must be between 32MB and 3GB inclusive and in 16MB steps. Before upgrading, correct malformed or out-of-range values; for example, replace 33M with a supported 16MB-aligned value. Compound values such as 1G512M remain supported.

File-backed disk values now enforce their runtime-safe ranges. `autocreate_size` is limited to 2 TiB in 512-byte steps; heads and sectors are limited to 255, cylinders to 65,535, and `read_delay` and `write_delay` to 2,147,482,648 microseconds. Raw-device and RAM-disk geometry use the same heads, sectors, and cylinders limits; tape-image `read_delay` and `write_delay` use the same delay maximum. Correct larger values in older hand-edited configurations before upgrading. Use zero for automatic geometry or no added delay.

4.13 License Unit Simplification

Prior to version 5.0, 40 additional license units were required to run any emulator beyond the first emulator on a host system. This additional license unit requirement was removed in version 5.0. Identical emulator configurations now always require the same number of license units, regardless of whether they are the first emulator instance on a host or not.

4.14 Additional Idle Loop Signatures

Idle loop detection signatures were added for additional versions of OpenVMS and Tru64 UNIX:

- OpenVMS V8.4 (patched)
- Tru64 V4.0 (various kernel variants)

4.15 Registry-Based Licenses

Avanti V5.0 no longer uses USB dongles for its licenses. Instead, it uses software-based licenses which are loaded into the Windows Registry.

Current releases accept only version 4 registry-based license keys. Earlier registry-key formats, including expired version 3 keys, are no longer supported and are rejected during license validation.

Newly issued version 4 keys include a compact `.sv1.` digital-signature section. Avanti validates that section when it is present and rejects a key if its signed license details or signature have been changed. Unsigned version 4 keys remain accepted during the announced compatibility period so existing keys continue to work.

License validation now opens an installed registry key read-only, allowing a standard-user emulator process to use a key installed by an administrator. Missing, inaccessible, wrong-type, and malformed registry values are reported as distinct conditions. The configuration utility verifies explicit license installation and removal operations and attempts to restore the previous registry value if verification fails.

The configuration utility no longer rereads and decrypts the installed license key on every 100 ms screen update. Its status uses a snapshot refreshed when the utility opens, when Show License Key is selected, or after a confirmed install/removal attempt. Use Show License Key to refresh after an external key or local-date change. Emulator startup validation remains independent.

License-unit reconciliation now includes every active process record independently of the host's processor count.

Process-status diagnostics now keep executable and configuration names within their reserved fields if a shared process entry is damaged.

The temporary-license countdown now reports calendar days correctly across month and year boundaries, including leap years. The expiration date remains the final valid local calendar day.

4.16 Updated Version of PuTTY

PuTTY, the terminal emulator software that ships with Avanti, has been updated to version 0.85.

4.17 Print-to-File Serial Output

Avanti can capture output from an emulated serial port as host text files. The Configuration Utility now exposes the output directory, optional naming-rule file, and inactivity interval used to separate print jobs. Each configured Print to File session requires 10 license units.

The print engine normalizes line endings, validates naming rules when the configuration is loaded, retains buffered output after write failures, and retries failed writes. See the Print to File section of the Avanti User Guide for configuration, naming rules, and troubleshooting.

4.18 Avanti 5.0.1

Avanti 5.0.1 was released on 4 April 2025. It corrected Print to File serial-output processing and customer-supplied naming rules.

A naming-rule search below an `if` rule now starts at the text matched by that rule. The `vmsdate` option accepts VMS dates with either a one-digit or two-digit day. If rule processing does not select a filename, Avanti uses the default timestamp-based filename.

Print to File added Windows CR/LF conversion for serial output and represents a form feed by three CR/LF sequences. In 5.0.1, conversion of a leading line feed was unreliable; complete line-ending normalization was added later and will be documented with Avanti 5.1.0.

5 Known Issues

This section covers issues impacting Avanti.

5.1 OpenVMS Issues

5.1.1 Auto-Idle Restart on Bug Check

Historical reports state that, after an OpenVMS bug check and automatic guest reboot, Auto-Idle sometimes did not re-engage until Avanti was shut down and restarted. This sequence has not been reproduced on the 5.1.0 candidate, and it is not expected for every OpenVMS release or bug-check path. If host CPU use no longer falls during guest idle periods after an automatic reboot, perform a full Avanti shutdown and restart before investigating further.

5.2 Tru64 Unix Issues

5.2.1 Tru64 Unix Panic Recovery

Historical reports indicated that an automatic guest reboot could hang after a Digital UNIX or Tru64 UNIX panic even when the Alpha firmware option `AUTO_ACTION` was set to `BOOT`. This behavior has not been reproduced across the guest releases supported by Avanti 5.1.0 and must not be assumed to affect every panic or operating-system version. If an automatic reboot hangs, preserve the panic and console diagnostics, perform a full Avanti shutdown and restart, and follow the installed guest release's normal console-recovery procedure.

5.3 Windows Issues

5.3.1 End Point Security Issues

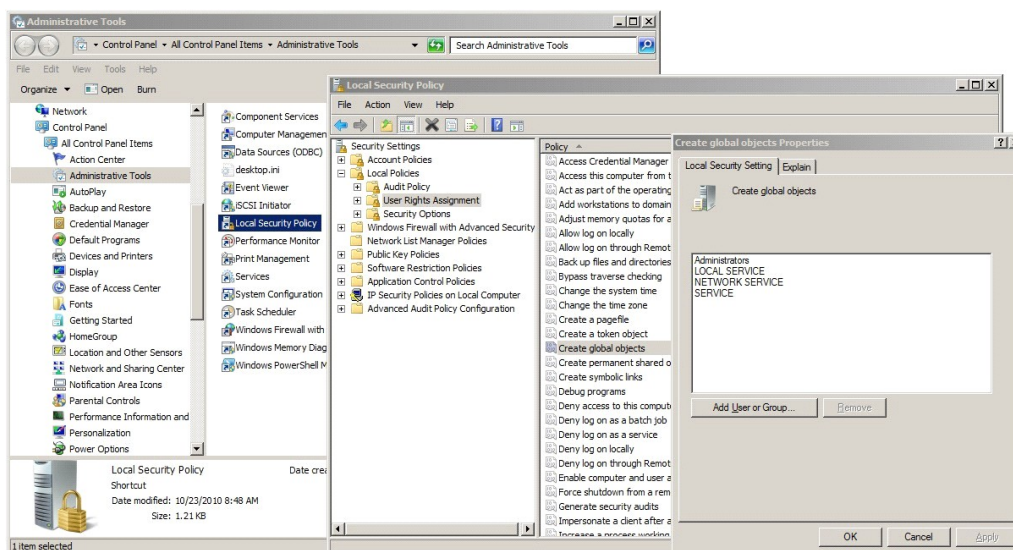
If Avanti unexpectedly stops after running for a period of time, inspect the endpoint-security product's logs and policy before changing any protection. If that investigation confirms interference and your organization's security policy permits an exception, configure the narrowest available process or executable-path exception for the current Avanti executable (`dec.exe`). Do not disable endpoint protection or exclude the Avanti installation or data directories generally. Apply the same narrow guidance to a compatible earlier installation that still uses `freeexp.exe`.

5.3.2 Running Avanti From a Non-Administrator Account

Attempts to start Avanti as a non-administrator user have historically failed with the error message "Could not initialize mapped file for IPC" on Windows Server 2008 and Windows 7. Those operating systems are no longer supported; this report is retained as historical context, not current compatibility guidance. If the same error occurs on a supported host, grant the "Create Global Objects" privilege to the Avanti user account. To grant the privilege, log into an administrator account and complete 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.



5.3.3 Avanti Service Will Not Launch

If Avanti is installed as a service but does not launch or produce a log file, open the service in the Windows Services management console and inspect its Path to executable command line.

- Confirm that the configuration file named by the `/CO` argument exists and that the service account can read it.
- Confirm that the service name is `Avanti_` followed by the configuration file's base name. For example, service `Avanti_Alpha01` must use `Alpha01.cfg`.

5.4 Network Issues

5.4.1 Windows 10 Version 1709 msipcap Issue

Earlier Avanti release notes reported an intermittent conflict with the NDIS msipcap driver on certain builds of Windows 10 version 1709. Starting Avanti or the configuration utility immediately after Windows boot could hang the application and require a Windows reboot to recover. Those release notes identified upgrading to version 1803 as the resolution at that time.

This is a historical issue report, not validation of Windows 10 version 1709 or 1803 for Avanti 5.1.0. For an affected installation, plan an upgrade using the current Avanti host requirements; do not select version 1803 solely because it appears in this historical note. No command-line workaround is provided here.

5.4.2 Checksum Fixed Warnings

A nonzero Checksum Fixed total in the Avanti log means that Avanti repaired a checksum in a host-originated packet before delivering it to the emulated NIC. This does not by itself mean that the guest lost data.

In a physical Intel I226-V/Npcap test, disabling transmit IPv4, TCP, or UDP checksum offload individually removed only the corresponding repair count. The tested TCP and

UDP file transfers completed with matching SHA-256 hashes under every tested setting. Results can vary by adapter and driver.

If the count is repeatable, record the adapter, driver, packet backend, and workload. In the Windows adapter Advanced properties, disable one applicable transmit checksum-offload setting at a time and repeat the same workload:

- IPv4 Checksum Offload
- TCP Checksum Offload
- UDP Checksum Offload

Restore settings that do not address the observed case. This test does not identify Large Send Offload or receive-only features as causes of checksum repair, and it does not establish a cause for an unrelated communication failure.

5.5 X-Client Color Mapping

Historical reports indicated that some third-party X server products did not display 8-bit OpenVMS or Tru64 UNIX X client output correctly. No particular X server, version, or color mode is qualified for Avanti 5.1.0. If the symptom is observed, consult the X server's release-matched documentation and, when supported, test its 8-bit PseudoColor or colormap mode. This report does not by itself establish an Avanti display defect.

5.6 Third Party Emulators

5.6.1 Container File Compatibility

Avanti can attach flat disk-image files created by other emulators when their guest-visible sector layout is compatible with the selected Avanti disk model and their contents are usable by the Alpha guest operating system. This includes compatible data-disk images created under SimH VAX; it does not make a VAX system disk bootable on Alpha or imply VAX emulation. Back up an image before attaching or modifying it with a different emulator.

5.6.2 Charon Idle Loop / Powersave Driver Support

Avanti 1.0.6.271 and subsequent releases support the Charon idle loop/Powersaver driver. 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$V_LOAD_SYS_IMAGES`) prevents `SYS$IDLE` from being loaded during boot.

5.6.3 PersonalAlpha & Charon Container File

Historical migration reports identified the following possible changes when booting a PersonalAlpha or CHARON-AXP disk image with Avanti. No particular third-party emulator version or image is qualified for Avanti 5.1.0, and these reports do not guarantee that every image is compatible. Preserve an unchanged backup and a fallback boot path, make only the changes that apply to the guest, and validate the guest boot and network services before relying on the migrated image:

- If the guest contains a CHARON-specific accelerator extension and it prevents a normal boot, follow the release-matched CHARON and OpenVMS instructions to disable or remove that extension. Avanti does not qualify a particular accelerator version.
- A PersonalAlpha image may have network services configured for ESA0, while Avanti's emulated NIC is normally EWA0. Use the installed guest operating system's procedures to inspect and, when required, reconfigure LAT, DECnet, and TCP/IP for the detected device; retain the original configuration as a fallback.