This document describes version 2.9.0 (release 38) of the vtServer software package. vtServer is an emulation package for legacy HP/DEC Alpha and VAX hardware platforms that runs on 64-bit x86 processors. vtServer is installed on Bare Metal: that is, on a physical processor or virtual machine (VM) with no pre-installed operating system. The vtServer package consists of the following components:

- vtAlpha – Alpha system emulation component;

- vtVAX – VAX system emulation component;

- vtServer – the common infrastructure for the emulation components;

- vtMonitor – a web browser-based management and configuration interface.

For detailed information regarding these components, see the *vtAlpha Reference Manual* or the *vtVAX for Bare Metal Reference Manual*.

1   vtServer Installation and Update Procedure

The vtServer software may be installed on a new host platform, installed over an existing installation, or it may be updated incrementally. These options are described in more detail below.

1.1   Installation

The installation process installs a complete version of the vtServer software package on a server with no previous vtServer installation or it will overwrite an existing vtServer installation. When overwriting an existing installation, a backup of all software configuration values and all emulation configurations may be created using the vtMonitor BACKUP command prior to the installation. After installing vtServer the configuration data may be restored using vtMonitor.

The vtServer installation kit is available in three formats: on a DVD-ROM; as an .iso format file that can be burned to a DVD or used as a virtual DVD device when installing vtServer in a virtual machine; or on a USB thumb drive for those customers who have purchased the Carry-on Alpha or Carry-on VAX options. Detailed installation instructions are provided in the *vtAlpha Reference Manual* or the *vtVAX for Bare Metal Reference Manual*.

1.2   Incremental Update

The incremental update process is the preferred method for updating existing vtServer installations. A complete set of incremental updates is provided on the distribution media (DVD, .iso file, or Carry-on Alpha/VAX USB drive); individual update kits may also be uploaded to the host or provided on external disks. When the Update function is initiated, vtServer will automatically determine which update kits are needed and apply them, if available. When supplying individual update files, be aware that the update file for each version of vtServer between the current version and the target version must be provided.

For a detailed description of the update process, please see the *vtAlpha Reference Manual* or the *vtVAX for Bare Metal Reference Manual*.

1.3   Post-update Instructions

After installing or updating vtServer, the host system must be rebooted.

The cache should be cleared on any browsers that have been used with previous versions of vtMonitor. Failure to do so may result in unpredictable behavior.

2   vtServer 2.9.0 Release Highlights

Release 2.9.0 of vtServer contains several significant enhancements:

- Support for iSCSI disks.
- vtAlpha Floating Point instruction performance enhancements.
- vtVAX support for virtual network switch.
- Emulation of the DE600 Ethernet adapter.
- Logging capability for PBXDA serial line traffic.
- Auto-sensing of Fibre Channel device configuration changes.
- vtServer installation scripting capability.

These and other changes are described in the sections that follow.

3   Security Updates

The following components have been updated in vtServer version 2.9.0:

- OpenSSL to version 1.0.0m
- Apache HTTP (web) Server to version 2.2.27

These updates contain all security patches available at this time.

NOTE: No versions of the OpenSSL 1.0.0 thread were vulnerable to the Heartbleed (CVE-2014-0160) vulnerability.

3.1   Other Security-related Changes

3.1.1   Mask Webserver Passwords in Support Info File
User passwords are now masked in data copied to Support Info files.

3.1.2   Hide Password In SMTP Server Configuration
The password field in the vtServer SMTP configuration menu for alert notifications is now masked.

4   Host Platform Changes

4.1   Configuration

4.1.1   iSCSI Disks
iSCSI disks are now supported as vtServer host storage devices. iSCSI volumes are configured and managed under the vtMonitor Storage tab. See Chapter 4 of the *vtAlpha Reference Manual* or the *vtVAX for Bare Metal Reference Manual* for details.

4.1.2   FAT and EXFAT file systems
FAT and EXFAT files systems may now be mounted by vtMonitor.

4.1.3   SAS storage (VMware)
SAS storage is now supported when vtServer is running on a virtual host under VMware. SAS devices have been supported on physical servers.

4.1.4 LK4xx Keyboard Support

The vtServer keyboard configuration menu now contains an option for LK4xx keyboards. This setting allows for mapping of the F17-F20 function keys.

4.2 Administration

4.2.1 Install Auto-Pilot

An installation Auto-Pilot option has been added to the vtServer installation menu. The Auto-Pilot feature uses a template file to perform the installation and some post-installation tasks such as configuring vtServer settings and providing emulator configurations and logical disk container files. At installation time, the user selects from one or more pre-defined templates and the remainder of the process is completed automatically.

A manual describing how to use the Auto-Pilot facility may be obtained from your vtServer sales representative.

4.2.2 Customized Pre-Login Message

A customized message may be displayed on the vtServer and vtMonitor login screens where the password is entered. The message appears above the Password entry field on the vtServer login screen and in the main portion of the vtMonitor display, below the Username and Password entry fields.

The message to be displayed is provided by selecting the Change option in the vtServer Console Configuration menu (Configuration > console). Note that the default vtServer login prompt ("Please enter the system password (root)") will not be displayed if it is removed from the login message dialog box. Basic text formatting options are available.

4.2.3 New Alerts

Two new alert conditions have been defined:

- **Excessive swap area utilization** - This alert condition is triggered when utilization of the swap area exceeds 50%. The swap area is used when actual memory utilization exceeds the size of physical memory. The swap area is important to prevent system crashes when physical memory is exhausted; however, swapping has a negative impact on system performance: if this condition occurs repeatedly, it is recommended that additional memory be added to the server.

- **System partition usage exceeds 98%** - This alert condition is triggered when the disk/partition that vtServer is installed in has less than 2% free space remaining. If this condition occurs, unnecessary files should be deleted or plans should be made to re-install vtServer in a larger partition. When the free space reaches 0, vtServer will be unable to extend or create new log files or crash dumps and the system may crash.

These alert conditions are reported in the vtServer log file and may optionally be sent via Email.

4.2.4 Coredumps Compressed and Encrypted

When an emulator instance crashes, a log file and coredump file are created in the /support directory in the vtServer system partition. To prevent inadvertent exposure of potentially sensitive information, the coredump file is encrypted and can be read only by our support staff. Both files are compressed to reduce disk utilization.

If an emulator crash occurs, these files may be copied from the host using FTP or SMB (Samba). Once it has been confirmed the copies are good, the original files can be deleted to free space on the disk.

4.2.5   Option to Reboot From the Local Hard Disk

As a convenience for situations where the boot sequence in the vtServer host BIOS would cause a reboot to select a different drive, such as a DVD or USB device, the vtServer boot option menu now contains an item to boot from the local hard drive.

4.2.6   FibreChannel Device Autosensing

Previous versions of vtServer required a system reboot when the devices were added or removed in the physical FibreChannel storage structure. These configuration changes are now automatically detected and propagated to the vtServer storage configuration without having to reboot the system.

4.2.7   Samba Access using non-root Accounts

Prior to this release, only the root accounts could be used to transfer logical disk container files to/from the vtServer host system. This restriction has been removed.

4.2.8   Incorrect Server Time Disabling Date-Limited Licenses

Prior to this release, when the system clock of a vtServer host was incorrectly set past the expiration date of a date-limited vtServer license, the license was disabled and could not be used, even after the server time was corrected.

Effective in version 2.9.0, systems that are connected to the Internet will use the CodeMeter worldwide license server rather than the local system time as the time reference for validating date-limited licenses. If your system is not connected to the Internet and you encounter this prolem, please contact your vtServer support representative for assistance.

5   Emulation

5.1   vtAlpha

5.1.1   Floating Point Instruction Performance

Performance improvements in this release of vtAlpha have doubled the average execution speed of floating point instructions. The overall application performance improvement will vary, depending on the predominance of floating point execution time in the overall execution time.

5.1.2   Virtual DE600 Ethernet Adapter

Support for the DE600 Ethernet adapter has been added in this version of vtAlpha. The DE600 adapter configures as an EI device, whereas the previously available DE4xx and DE500 adapters configure as EW devices; otherwise, the configuration process is identical.

5.1.3   PBXDA Data Logging

The virtual PBXDA serial line adapter trace capabilities have been expanded to provide logging of all data transferred through a port. Configuration of the virtual PBXDA line tracing is described in Chapter 4 of the *vtAlpha Reference Manual*.

5.1.4   JIT Pool Size Adjustment

The JIT is a storage pool used internally by the vtAlpha emulator. On very rare occasions the JIT pool may become exhausted, resulting in some performance degradation. Prior to version 2.9.0 there was no mechanism to increase the JIT pool size.

If warning messages regarding JIT pool exhaustion are present in the emulator log file, please contact your vtAlpha support contact for assistance. Increasing the JIT pool size reduces the memory available to other portions of the emulator and may result in significant performance issues.

5.2 vtVAX

5.2.1 <u>Virtual Network Switches</u>

vtVAX now supports use of the vtServer virtual network switches.

5.2.2 <u>Instruction Caching Performance</u>

Changes have been made to improve performance when the Instruction Caching option is enabled.

5.2.3 <u>VAX 7000 BUILD EEPROM</u>

It is no longer necessary to execute the BUILD EEPROM command before booting a newly created VAX 7000 instance.

5.2.4 <u>Binary Mode Serial-Over-IP</u>

Several devices commonly used to implement serial data interfaces over an IP connection use TCP ports higher than 65000 for binary mode connections. Prior to this release, the vtVAX emulator would not allow raw socket connections to ports in this range. This restriction has been removed.

5.2.5 <u>Bug Fixes</u>

- Access violations (ACCVIO) on DSSI-based systems.

- System crashes on VAX 7000 systems with memory larger than 1 GB running DECnet/OSI.

- Lost connectivity, device hangs, and slow performance with physical tape drives.

- Problems with disk I/O buffering enabled. [See restrictions.]

5.3 Common Emulation Features

5.3.1 <u>Virtual Network Switch Option to Disable Spanning Tree Protocol</u>

An option to disable spanning tree protocol has been added to the vtServer network switch configuration menu (configuration > network > networkswitch).

Spanning tree protocol is used to detect and eliminate loops in network configurations. Some network administrators do not permit adding devices that run the spanning tree protocol to the network because it may negatively impact the larger network; in such situations, the protocol can be disabled on the virtual switches. When this is done the user should be careful to avoid adding loops to the network.

5.3.2 <u>Font Sets for X Windows</u>

Customers who use the embedded X Windows server now have the option to select one of three font sets: OpenVMS, Tru64 or Generic. The font set is selected in the vtServer font configuration menu (graphics > display > font).

5.4 Emulation Configuration and Control Changes

5.4.1 <u>Uniform Configuration Field Descriptions</u>

The vtVAX and vtAlpha configuration files occasionally used different names for similar fields. The field names have been synchronized in this release.

5.4.2 <u>Directory Sort Order</u>

The vtMonitor Storage display listed the content of directories in strict collating sequence, with subdi-rectories inter-mingled with files. In this release, directories are grouped before files and the sorting is case-insensitive.

5.4.3 <u>Configuration List Sort Order</u>

The vtMonitor configuration list sorting is now case-insensitive.

5.4.4 License Upgrade Errors

The license update process shows more meaningful information when an error occurs.

5.4.5 Emulator Configuration Renaming

The vtMonitor emulator configuration list options menu, displayed by right-clicking on a configuration name, now includes an option to rename the selected configuration. Previously, this required a two-step process: making a copy of the existing configuration with a new name, then deleting the original.

5.4.6 Multiple DNS servers

Up to three DNS servers may be configured for the vtServer host. Previously only one server could be configured.

5.4.7 System Disk Label

Effective with release 2.9.0, installing vtServer initializes the label of the system partition to **vtserver_hd**. The label for older installations remains vtAlpha_hd; the label is not changed by the incremental update process.

5.4.8 Bug Fixes

- Inconsistent disk space values were displayed. Some utilities were using a multiplication factor of 1000; other were using 1024. All now use 1024.

- The embedded console failed to connect when the HTTPS protocol was used.

- When displaying or editing an emulator configuration, the selected configuration was not highlighted in the configuration list. This now works for most common browsers except Microsoft Internet Explorer.

- The vtMonitor emulation configuration list, in the left panel of the vtMonitor display screen, contains a color state indicator for each defined configuration. Occasionally this indicator would briefly change color when the emulator state did not change. This problem has been corrected.

6 Restrictions

6.1 Current Release

- Enabling the vtVAX EcoMode option on virtual VAX systems with high CPU and/or I/O utilization can result in significant performance *degradation.* EcoMode should be used only on systems that are idle a significant portion of the time. *Note: This restriction does not apply the vtAlpha Eco App.*

- vtVAX requires the use of unbuffered I/O (the default) for physical disks and ext3 partitions as well as for all shared disks. The use of buffered I/O under other circumstances may provide a significant increase in I/O performance.

- Highlighting of the virtual Alpha or VAX configuration being displayed or edited does not work with Microsoft Internet Explorer.

6.2 Previously Documented

The following permanent restrictions have been previously documented:

- Physical Ethernet interfaces that are assigned an IP address in the device configuration may not be configured as a virtual interface for an emulation instance. These interfaces will not be presented in the Ethernet device configuration menus. Existing vtAlpha configurations with such devices assigned will ignore the IP address assignment in the device configuration. A similar change will be made for vtVAX in a future release; in the meantime, unpredictable results will occur when these interfaces are configured as virtual interfaces for a VAX emulation. (2.8.3)

- vtVAX filters all Ethernet packets with a frame size larger than 1518 bytes (jumbo packets). These packets will never be delivered to the emulated VAX system's OpenVMS device driver. (2.8.2)

- SCSI device identifiers larger than 32767 are not permitted. (2.8.2)

- The vtServer boot device or partition and any mounted partition may not be configured as a physical device for virtual Alpha or VAX configurations. These devices or partitions may be used to store logical disk container files. (2.8.2)