Salem Automation
Systems Integration Specialists

vtVAX Bare Metal

Virtual VAX Emulation Software

Overview

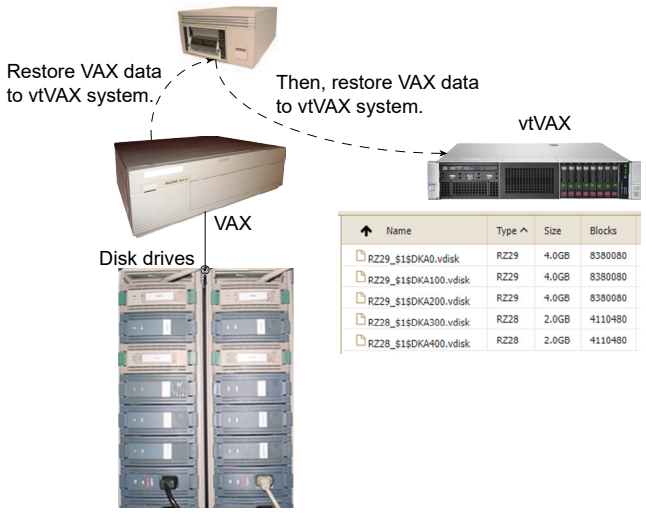
vtVAX software is a cost-effective replacement for almost any DEC VAX server or workstation. This VAX virtualization software runs on modern x86-64 hardware, virtual machines, or in the cloud.

The OpenVMS operating system, user interface, and layered applications run unmodified on vtVAX—without source code conversion, recompiling, relinking, or end-user retraining.

Compatibility with VAX hardware has been verified using DEC VAX diagnostics and architecture verification tools. Real-time process control applications in industrial environments are preserved thanks to vtVAX's compatibility with legacy DEC physical devices, including SCSI disks and tapes, serial ports (with full modem control), and Ethernet cards.

vtVAX also delivers significantly improved CPU, disk, and networking performance over original VAX hardware, improving user response times. The Instruction Caching (IC) option dramatically improves the performance of CPU-intensive applications such as floating point, statistical analysis, and data warehouse business analytics.

Figure 1—Data Migration of VAX or Alpha Disk to Container Files on Virtual Disk



Product Variants

Table 2—vtVAX Product Offerings

Product	CPUs	Memory	Supported VAX Model
vtVAXStation VMS 4.3–7.3	1	128 MB	MicroVAX II VAX Server 3600/3900
vtVAX VMS 4.3–7.3	1	128–512 MB	MICROVAX II VAX 3100-90/95 VAX 4000-90 VAX 4000-100/105/200 VAX Server 3600/3900
vtVAX IC Instruction Caching VMS 4.3–7.3	1	128–512 MB	MICROVAX II VAX 3100-90/95 VAX 4000-90 VAX 4000-100/105/200 VAX Server 3600/3900
vtVAX 76X0 VMS 5.5-2–7.3	1–6	3.5 GB	VAX 66X0/76X0

Storage

vtVAX supports virtual disks, CD-ROM drives, and tape devices. Virtual devices can be mapped to physical storage devices or container files on the host system. Container files may be located on any type of host-attached storage: SCSI, SATA, SAS, USB, SSD, CD/DVD, iSCSI, NAS, NFS, or SAN.

Multiple container files can be stored on a single host drive, providing storage consolidation without changing the OpenVMS file system. VAX tape operations using logical tape drives transfer data at disk speeds, avoiding the physical media errors often experienced with traditional tape storage.

SCSI Controllers

vtVAX systems that support SCSI controllers provide eight target devices and seven LUN devices (1–7) per bus. vtVAX uses Target ID 6 or 7 as its own SCSI ID, so each SCSI bus supports up to 56 usable devices. Systems running VMS V5.5-2H4 and higher can support two SCSI buses, for a total of 112 usable SCSI devices.

vtVAX also supports SCSI Passthru, which enables connections to special SCSI devices such as tape libraries with robotic control, GPIB interfaces, and other SCSI peripherals.

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DSSI Controllers (vtVAX 76X0)

vtVAX 76X0 systems can be configured with up to eight DSSI controllers. Each controller supports 32 devices—virtual and physical disks, tapes, and CD-ROM drives—for a total of 256 devices.

Networking

Ethernet Adapters

vtVAX supports virtual DELQA, DEQNA, SGEC, and DEMNA Ethernet interfaces, depending on the processor model being emulated:

- Up to four DELQA/DEQNA adapters or one SGEC adapter (all five may be configured when emulating a vtVAX 4000 system)
- Up to four virtual DEMNA adapters (vtVAX 76X0 systems)

All VAX-supported network protocols (TCP/IP, DECnet, LAT, MOP, etc.) run on vtVAX. Each virtual Ethernet adapter is mapped to a dedicated physical Ethernet interface on the host system.

Virtual Switches

On the Bare Metal platform, virtual switches can be configured to share physical network interfaces, provide redundant network connectivity, or connect multiple virtual VAX and Alpha systems running on the same host without connecting to the physical network. Virtual network switches support both VLANs and Spanning Tree Protocol.

Performance

Network interfaces are not limited by the 10 Mbps, half-duplex limitations of original VAX hardware. Physical interfaces can be configured in any mode supported by the host computer, typically 1 or 10 Gbps. In most cases, this allows the virtual VAX system to achieve much higher network throughput than the VAX it replaces.

Note: Care should be taken to prevent saturation of lower-speed physical interfaces that are shared by multiple virtual adapters.

Serial Lines

vtVAX emulates the DHQ11, DHV11, CXA16, CXB16, and CXY08 serial interfaces, supporting up to 32 ports. Each configured serial port requires a dedicated connection on the host: a serial COM port (on-board or PCI serial interface) or a Telnet connection. Telnet connections are presented as virtual devices. Only the virtual ports in use must be configured.

Serial ports can use physical serial devices via PCIe controllers or USB-to-serial adapters.

vtVAX also supports virtual serial ports that can be used with an Ethernet-to-serial converter, creating an IP tunnel that allows remote serial devices—such as PLCs and other serial equipment—to be connected to vtVAX.

Graphics

When emulating a Qbus-based system, a single virtual VCB02 graphics controller can be configured, allowing the host monitor to serve as the display device for the virtual VAX.

Clustering

vtVAX brings OpenVMS Clusters' well-established reputation for high availability and reliability into the modern data center, providing flexible, cost-effective disaster recovery options for organizations of all sizes.

vtVAX can be configured as a VAXcluster or OpenVMS Cluster member using Ethernet (NI) or emulated DSSI (shared disk) interconnects. The Maintenance Operations Protocol (MOP) is supported for maintenance operations and remote booting.

System Management

vtVAX includes an intuitive, browser-based management interface that allows authorized administrators to manage all bare metal virtual VAXes and Alphas from any PC on the network. System administrators can quickly create and modify vtVAX or vtAlpha configurations and manage the host environment.

Security

vtVAX ships with only three open ports: HTTP, HTTPS, and the license key port. The environment is configurable by the system manager to meet organizational security requirements. Key features include:

- Access roles and configurable security levels
- Secure communication protocols
- Encrypted environment in cloud deployments
- Configurable event logging and alerts

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