VAXELN Toolkit V2.0
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ANNOUNCING VAXELN V2.0

VAXELN Version 2.0 is now available from the Software Distribution Center (SDC). To show how VAXELN can form the basis of efficient solutions for more of your customers than ever before, the new capabilities of this major enhancement release are described below.

For answers to sales-related questions about VAXELN V2.0, please see the announcement article in the May 6th issue of Sales Update. It contains detailed ordering, pricing, and support information. For VAXELN licensing guidelines, please consult the October 8, 1984 issue of Sales Update.

What is VAXELN?

The VAXELN Toolkit is a VMS layered product for the development of dedicated, real-time VAXELN systems. The development tools run on a "host" processor under VAX/VMS or MicroVMS. A finished VAXELN system runs directly on a "target" processor without the presence of an operating system. Typical VAXELN applications are dedicated, real-time environments, where the application is standalone and runs in a local area network. Examples include industrial automation, robotics, scientific real-time environments, workstations designed for a particular profession, and in an Ethernet server network.

For additional information on VAXELN, you can obtain the VAXELN Technical Summary (currently being revised for Version 2).

New Features

New Processor Support

MicroVAX II is fully supported as a VAXELN development system and as a VAXELN target system. The VAX-11/785 and the VAX 8600 processors are now supported as development systems, and the VAX-11/725 is now supported as a target system in addition to being supported as a development system.

Magtape Support

Version 2 includes a device driver and an ANSI-standard tape file service for the TK50 magnetic streaming cartridge tape drive and the TU81 reel tape system. Tapes created by VAXELN are fully compatible

with V4.0 of VMS or MicroVMS. Support is included to allow the sequential mounting of multivolume tape sets on a single drive. Additional utility procedures supplied with VAXELN allow programs to dynamically initialize, mount, and dismount tape volumes. The MicroVAX II bootstrap supports booting from TK50 tapes, which may be an attractive arrangement for certain data collection applications.

Performance Enhancements

These enhancements include a 40% decrease of memory overhead required for a process, 50% increase of network message throughput, and a 30% increase of file system throughput.

C Run-Time Library Support

Version 2 supports VAX C as a development language for VAXELN. The VAXELN C Run-Time Library is included in the VAXELN Toolkit. It contains over 130 routines that implement the standard C run-time environment and the associated #include files. Remote debugging of C programs is supported by the VAXELN debugger (EDEBUG). Mixed C and PASCAL programs are supported as expected.

Note that VAX C Version 2 is a prerequisite if C is used for VAXELN program development. The new VAX C compiler when used in conjunction with VAXELN supports the new READ_REGISTER, WRITE_REGISTER, MTPR, MFPR, and ADD_INTERLOCKED inline functions.

AREA Object for Interjob Memory Sharing

The new AREA kernel object provides a mechanism for interjob memory sharing among jobs on a single node in a VAXELN network without the use of messages. A program can now map a region of memory of a specified size into a job's virtual address space with the CREATE_AREA procedure. AREA objects can be created, deleted, signaled, and waited on. A new procedure (INITIALIZE_AREA_MUTEX) is also supplied to create an efficient variant of mutex (mutual exclusion) semaphore used to synchronize access to shared data in areas.

System Security Features (Access Control)

Version 2 provides the capability to restrict node access to a specified list of users and for a program to determine the identity of a user issuing a network request. In addition to the capability for user applications to use the security features to restrict access to

applications data, the existing VAXELN Network and File Services also restricts access to VAXELN systems and resources. The Network Service running on a particular node only accepts incoming circuit connections from users that are authorized to do so. The File Service provides read, write, and delete protection for files on disk volumes that it controls, as well as callable utility procedures to create and maintain records in the authorization database. The new security features may be enabled on a node-by-node basis.

Dynamic Program Loading

Two new program loader utility procedures can be used to dynamically load and unload program images after the initial VAXELN system is built. This means that the total physical memory required by VAXELN systems taking advantage of the program loader is lower; program images may be unloaded after use and new images loaded in their place.

Shareable Image Enhancements

Version 2 supports shareable images that define their own read/write data. This opens the door for more customer-developed shared images, thereby reducing the total memory requirements of more applications systems.

New Device Drivers

Version 2 includes full-device support for the DZQ11 4-line asynchronous serial line controller and the RQDX2 MSCP disk controller.

New Device Driver Utility Procedures

Version 2 includes added support for the following devices:

- ADV11-C(*) and AXV11-C(*) A/D converters
- KWV11-C(*) programmable real-time clock
- DLVJ1 4-line asynchronous serial line controller
- DRV11-J(*) parallel line interface

Support for these devices is in the form of new utility procedures called to perform I/O with these devices. For example, the procedures named ELN$DRV_READ and ELN$DRV_WRITE, read and write data to a DRV11-J parallel interface.

NOTE

The devices marked with an asterisk (*) are "not supported" by DIGITAL in the sense that MicroVAX-based diagnostics for these devices are not available. For most users of these types of devices (e.g., OEMS), this lack of diagnostic support is not usually a concern.

Also, the DLVJ1 is not supported by the terminal driver. The DLVJ1 support provided is designed to allow communications with little or no character interpretation or translation, more suitable for dedicated serial device interconnect support than user terminal support.

Serial Line DDCMP Support

Support for point-to-point DDCMP communication over serial lines was added as well. Individual terminal lines may be specified as supporting DDCMP. Communication over the lines is accomplished by establishing a VAXELN circuit specifying that the communications port to use is a terminal line built with the DDCMP attribute.

New VAXELN PASCAL Language Features

In many instances, new optimizations added to the EPASCAL compiler resulted in speed improvements in the generated code. The BIT, BYTE, WORD, and LONG attributes can be used to more effectively control the size of program data items. A new REFERENCE attribute can be applied to a value parameter to indicate that its argument is passed by reference, rather than value, in the VAX argument list. New functions PROBE_READ, PROBE_WRITE, and MOVE_PSL allow the generation of the PROBER, PROBEW, and MOVPSL instructions, respectively.

Improved Documentation

The VAXELN documentation was restructured for Version 2. The following are the order numbers and descriptions:

VAXELN Documentation Kits	QL375-GZ
VAXELN Installation Manual	AA-EU37A-TE
VAXELN User's Guide	AA-EU38A-TE
VAXELN PASCAL Language Reference Manual	AA-EU39A-TE
VAXELN C Run-Time Library Reference Manual	AA-EU40A-TE

VAXELN Application Design Guide	AA-EU41A-TE
VAXELN Version 2.0 Release Notes	AA-Z454C-TE
VAXELN Version 2.0 SPD 28.02.02	AE-AU40C-TE

Many Other Features

This description is only a portion of the Version 2 enhancements. Additional File Service, System Builder, and Debugger enhancements are all described in more detail in the VAXELN Version 2.0 Release Notes (Order No. AA-Z454C-TE).

System Requirements

The VAXELN Version 2.0 Toolkit runs on any valid MicroVAX I, MicroVAX II, VAX-11/725, VAX-11/730, VAX-11/750, VAX-11/780, VAX-11/782, VAX-11/785, or VAX 8600 which is configured with at least 1 MB of physical memory, 2 MB of virtual page file quota per user, and a 250-page minimum working set per user. The Toolkit requires VAX/VMS V4.0 (or later) or MicroVMS V4.0 (or later).

A VAXELN Version 2.0 Target System can be loaded into any valid MicroVAX I, MicroVAX II, VAX-11/725, VAX-11/730 or VAX-11/750. A VAXELN Target System requires at least 256 KB of physical memory, depending on the size of the user's programs and the number of Toolkit components that are included in the system.