System Support Addendum

PRODUCT NAME: VAX Packetnet System Interface (P.S.I.), Version 4.3 **SSA 25.40.15-A**

HARDWARE REQUIREMENTS

Processors Supported:

VAX: VAX 4000 Model 300,

VAX: VAX 6000 Model 200 Series,
VAX 6000 Model 300 Series,
VAX 6000 Model 400 Series

VAX 8200, VAX 8250, VAX 8300, VAX 8350, VAX 8500, VAX 8530, VAX 8550, VAX 8600, VAX 8650, VAX 8700, VAX 8800, VAX 8810, VAX 8820, VAX 8830, VAX 8840, VAX 8842, VAX 8974, VAX 8978

VAX-11/730, VAX-11/750, VAX-11/780, VAX-11/785

MicroVAX: MicroVAX II, MicroVAX 2000, MicroVAX 3100, MicroVAX 3300, MicroVAX 3400, MicroVAX 3500, MicroVAX 3600, MicroVAX 3800, MicroVAX 3900

VAXstation: VAXstation II, VAXstation 3200, VAXstation 3500, VAXstation 3520, VAXstation 3540

VAXserver: VAXserver 3100, VAXserver 3300, VAXserver 3400, VAXserver 3500, VAXserver 3600, VAXserver 3602, VAXserver 3800, VAXserver 3900

VAXserver 6000-210, VAXserver 6000-310, VAXserver 6000-410, VAXserver 6000-420

Processors Not Supported:

MicroVAX: MicroVAX I

VAXstation: VAXstation I, VAXstation 2000, VAXstation 3100 Series, VAXstation 8000

VAX: VAX- 11/725, VAX-11/782

Processor Restrictions

- At least 1.5M bytes of physical memory
- Non-paged dynamic pool computed as follows:

  At least:

  — 60K bytes for the VAX P.S.I. software and data storage, plus

  — 13K bytes if the VAX P.S.I. X.29 capabilities are required, plus

  — 1K byte for each local DTE, plus

  — 1.5K bytes for each virtual circuit, calculated as:

  <WINDOWSIZE>*<packetsize + 96>*2 + 700 bytes

  charged to the quota of the using process.
- Paged dynamic pool - VAX P.S.I. requires 50 bytes for each entry defined in the system DTE logical name table.

Communications Devices

One of the following communications devices is required for use with VAX P.S.I.:

- The KMS1P-A, KMS1P-B and KMS11-B (UNIBUS) products are DMA devices. The KMS communications controller executes character transmission, reception, and X.25 data link level protocol processing in microcode (LAPB only, for packets not larger than 1024 bytes). The VAX CPU then processes the X.25 packet level protocol. Optional link-level software products and tools available for the KMS devices are not required. The KMS1P-A and KMS1P-B were previously known as the KMS11-PX and KMS11-PY.

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In the case of the KMS11-B eight-line device, all lines in use must be connected to the same network and must be in the same mode (DTE or DCE).

- The DUP11 (UNIBUS) and DPV11-DA or DPV11-S (Q-bus) are character interrupt devices for LAPB or LAPBE datalink handling where CPU cycles are required for X.25 packet and data link level protocol processing, and for each character sent and received.
- The DMF32 (UNIBUS) and DMB32 (BI-BUS) are multi-function devices which include a single DMA line. The communications controllers perform character transmission, reception, and HDLC framing in microcode. The VAX CPU then processes the X.25 data link (LAPB or LAPBE) and packet level protocols.

  In the case of the DMF32, only rev. J and later are supported with the VAX P.S.I. software, and rev. M is required for simultaneous operation of the printer port with VAX P.S.I.. For the DMB32, rev.J is required.
- The DST32 (Busless) is a single line synchronous communications device for the MicroVAX 2000. The DST32 supports DMA transfers for bit oriented protocols. The communications controller performs character transmission, reception, and HDLC framing in the microcode. The MicroVAX 2000 CPU then processes the X.25 data link (LAPB or LAPBE) and packet level protocols.
- The DSH32 (Busless) is a multi-function device for the MicroVAX 2000 and MicroVAX 3100 which includes a single DMA line. The communications controller performs character transmission, reception, and HDLC framing in microcode. The MicroVAX CPU then processes the X.25 data link (LAPB or LAPBE) and packet level protocols.
- The KMV1A-A or KMV1A-SF (Q-bus) communications controller executes transmission, reception, and X.25 link level protocol processing in microcode (LAPB only, for packets not larger than 1024 bytes). The VAX CPU then processes the X.25 packet level protocol. Optional link-level software products, drivers and tools, available for the KMV1A device, are not required. The KMV1A device was previously known as the KMV11-A.
- The DSV11 (Q-bus) is a dual line synchronous communications device for Q-bus systems. The DSV11 supports DMA transfers for bit and character oriented protocols. The communications controller performs character transmission, reception, and HDLC framing in the microcode. Then, the VAX CPU processes the X.25 data link (LAPB or LAPBE) and packet level protocols.
- The DIV32 (Q-bus) is a single board, Basic Rate Access communications device for Q-bus MicroVAX systems running VAX ISDN software. The DIV32 supports one ISDN Basic Rate Access connection, providing two 64K bps bearer (B) channels for data transfer and one 16K bps (D) channel for signaling. The VAX ISDN software can establish a connection through the D channel, allowing VAX P.S.I. to establish an X.25 connection and transfer data via a B channel. Refer to VAX ISDN Software Product Description (SPD 31.23.xx) for more information about VAX ISDN software and the DIV32.
- The DSB32 (BI-bus) is a dual line synchronous communications device for VAXBI systems. The DSB32 supports DMA transfers for bit and character oriented protocols. The communications controller performs character transmission, reception, and HDLC framing in the microcode. The VAX CPU then processes the X.25 data link (LAPB or LAPBE) and packet level protocols.

Refer to Table 2 for details of processor and device combinations and configuration guidelines for VAX P.S.I.

Block Space Requirements

Block Space Requirements (Block Cluster Size = 1):

Disk space required for installation:	6,000 Blocks (3.1M bytes)
Disk space required for use (permanent):	8,000 Blocks (4.1M bytes)

These counts refer to the disk space required on the system disk. The sizes are approximations; actual sizes may vary depending on the user's system environment, configuration, and software options selected.

For VAX P.S.I. operating in multi-host mode, the system must, in addition, meet the requirements for DECnet-VAX; consult the DECnet-VAX Software Product Description (SPD 25.03.xx) for a complete description of that product's minimum hardware requirements.

OPTIONAL HARDWARE

Additional communications device(s) subject to the limitations described in Table 2 of this System Support Addendum are required.

CLUSTER ENVIRONMENT

This layered product is fully supported when installed on any valid and licensed VAXcluster * configuration. The *HARDWARE REQUIREMENTS* sections of this product's Software Product Description and System Support Addendum detail any special hardware required by this product.

* V5.x VAXcluster configurations are fully described in VAXcluster Software Product Description (29.78.xx) and include CI, Ethernet and Mixed Interconnect configurations.

On common disks, in order to configure some product specific attributes that must remain unique to each system, certain components of the product are stored in the system specific environment (SYS$SPECIFIC:[SYSxxx]) of the VAX computer on which the installation is being performed. The remaining components of the product, including some or all of the executable images, will be installed common to all accessing VAX systems.

Though some or all of the product's executable images will exist in the common system directory (SYS$COMMON:[SYSEXE]) and be executable by all VAX computers sharing this directory, it is essential that the product be installed separately on all VAXcluster or Local Area VAXcluster licensed VAX systems requiring access in order to uniquely configure the product for each.

The same version of VAX P.S.I. must be used on all systems in VAXcluster systems accessing a common disk and in Local Area VAXcluster configurations.

SOFTWARE REQUIREMENTS

VMS Operating System V5.1, V5.2 or V5.3.

For VAX P.S.I. Multi-host mode, or for any use of DECnet (DLM) circuits over a PSDN(s), DECnet-VAX V5.1, V5.2 or V5.3 (either end-node or full-function) is required (refer to SPD 25.03.xx).

For use with the synchronous communications interfaces, the appropriate device driver in the VAX Wide Area Network Device Drivers V1.1 software is required (refer to SPD 29.64.xx).

For use with the DIV32 Basic Rate Access communications device, VAX ISDN V1.0 software is required (refer to SPD 31.23.xx).

VMS Tailoring

For VMS V5.x, the following VMS classes are required for full functionality of this layered product:

- VMS Required Saveset
- Network Support
- Utilities
- Programming Support
- Bliss Require Files
- User Environment Test Package

For more information on VMS classes and tailoring, refer to the VMS Operating System Software Product Description (SPD 25.01.xx)

OPTIONAL SOFTWARE

For VAX P.S.I. Multi-host mode:

DECnet-VAX V5.1, V5.2 or V5.3 either full-function or end-node.

If you have more than one VAX P.S.I. Multi-host node, users in one Multi-host node can gain access to PSDN(s) connected to another Multi-host node if both VAX P.S.I. and VAX P.S.I. Access are installed on the same node.

Certain versions of these products depend upon a specific version of the operating system. Please refer to the System Support Addendum (SSA) of the product in question to determine which version is required.

GROWTH CONSIDERATIONS

The minimum hardware/software requirements for any future version of this product may be different from the requirements of the current version.

DISTRIBUTION MEDIA

Tape: 9-track 1600 BPI Magtape (PE), TK50 Streaming Tape

This product is also available as part of the VMS Consolidated Software Distribution on CDROM.

ORDERING INFORMATION

Software Licenses: QL-071A*-**
Software Media: QA-071A*-**
Software Documentation: QA-071AA-GZ
Software Product Services: QT-071A*-**

* Denotes variant fields. For additional information on available licenses, services and media, refer to the appropriate price book.

Supported Public Networks

Table 1 describes public PSDNs which are supported with VAX P.S.I. only in the countries shown. Connections to public networks outside this list are customer supported only. In addition to these public PSDNs, certain private PSDNs have been tested by Digital and appropriate profiles included in the VAX P.S.I. product.

Since the publication of this SPD, other configurations may have been tested. Please consult your local Digital office for any questions concerning other public PSDNs.

Table 1
Supported Public Networks

Country	Public Network and CCITT revision(s)	Comments and Restrictions
Argentina	Arpac	
Australia	Austpac	
Austria	Datex-P	
Belgium	DCS	
Brazil	Renpac	
Canada	Datapac (1976 or 1980)	
	Infoswitch	
Denmark	Datapak	
Ireland	Eirpac (1980)	
Finland	Datapak	
France	Transpac	
Hong Kong	Datapak	
	Intelpak	
Indonesia	SKDP	
Italy	Itapac	
Japan	DDX (1976, 1980)	See Note 1
	Venus-P (1980)	
	Tymnet	
Luxembourg	LUXPAC	
Malaysia	Maypac	
Mexico	Telepac	
Netherlands	Datanet 1	
New Zealand	Pacnet	
Norway	Datapak	
Portugal	Telepac	
Singapore	Telepac	
South Korea	Dacomnet	
Spain	Iberpac	
Sweden	Datapak	
Switzerland	Telepac (1978, 1980)	
Taiwan	Pacnet	
United Kingdom	PSS	
United States	Accunet	
	Autonet	
	Bell Atlantic	
	Compuserve	
	ConnNet	
	IMPACS	

Table 1 (Cont.)
Supported Public Networks

Country	Public Network and CCITT revision(s)	Comments and Restrictions
United States (cont.)	Infonet	
	Mark*Net Extended Service	
	Telenet	
	Tymnet	
	Western Union PTN-1	
	Worldnet	
West Germany	Datex-P	

Note:

1. Digital offices in Japan can supply the mandatory additional information that explains the special use of VAX P.S.I. with the DDX PSDN.

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Configuration Guidelines

Tables 2 and Table 3 describe the physical hardware configurations supported by VAX P.S.I. in terms of CPU type and communication interface. It is assumed that there are 128 bytes of user data per packet in a VAX P.S.I. Native mode configuration where data is being sent and received at maximum speeds in both directions. These tables indicate configuration numbers for certain VAX processors supported at the time of publication.

The numbers given in the tables are load costs. Load costs indicate the overhead of full-duplex packet transfer at the indicated speed. The load units are calculated for an application that does no work with transmitted/received data, and indicate a maximum packet rate for that configuration. An idle device incurs negligible load. Systems should be configured to sustain peak load rates.

Table 2
CPUs, Maximum Load and Supported Devices

CPU	Maximum load (in load units)	Supported Device(s)
MicroVAX 2000	100	DSH32, DST32
MicroVAX 3100	350	DSH32
MicroVAX II	160	DSV11, DPV11-DA, KMV1A-A, DIV32
MicroVAX 3300/3400	210	DSV11, DPV11-S, DIV32
MicroVAX 3500/3600/3602	330	DSV11, DPV11-S, KMV1A-SF, DIV32
MicroVAX 3800/3900	390	DSV11, DPV11-S, DIV32
VAXstation II	150	DSV11, KMV1A-A, DIV32
VAXstation 3200	300	DSV11, DPV11-S, KMV1A-SF, DIV32
VAXstation 3500	300	DSV11, DPV11-DA, KMV1A-A, DIV32
VAXstation 3520/3540	300	DSV11, DPV11-DA, DIV32
VAXserver 3100	290	DSH32
VAXserver 3300/3400	210	DSV11, DPV11-S, DIV32
VAXserver 3500/3600/3602	280	DSV11, DPV11-S, KMV1A-SF, DIV32
VAXserver 3800/3900	330	DSV11, DPV11-S, DIV32
VAXserver 6000-210	210	DSB32, DMB32
VAXserver 6000-310	250	DSB32, DMB32
VAXserver 6000 Model 400 Series	300	DSB32, DMB32
VAX-11/730	40	DUP11, DMF32, KMS1P-A/B, KMS11-B
VAX-11/750	70	DUP11, DMF32, KMS1P-A/B, KMS11-B
VAX-11/780	120	DUP11, DMF32, KMS1P-A/B, KMS11-B
VAX-11/785	180	DUP11, DMF32, KMS1P-A/B, KMS11-B
VAX 8600	400	DUP11, DMF32, KMS1P-A/B, KMS11-B
VAX 8650	500	DUP11, DMF32, KMS1P-A/B, KMS11-B
VAX 4000 Model 300	580	DSV11, DPV11-S, DIV32
VAX 6000 Model 200 Series	250	DSB32, DMB32
VAX 6000 Model 300 Series	350	DSB32, DMB32
VAX 6000 Model 400 Series	450	DSB32, DMB32
VAX 8200/8300	100	DSB32, DMB32
VAX 8250/8350	125	DSB32, DMB32
VAX 8500	360	DSB32, DMB32
VAX 8530	450	DSB32, DMB32

Table 2 (Cont.)
CPUs, Maximum Load and Supported Devices

CPU	Maximum load (in load units)	Supported Device(s)
VAX 8550	550	DSB32, DMB32
VAX 8700	700	DSB32, DMB32
VAX 8800/8810/882/ 8830/8840	700	DSB32, DMB32
VAX 8842	700	DSB32, DMB32
VAX 8978	700	DSB32, DMB32

Table 3
Load Units per Line at Various Speeds

Device Type	Number of Lines	Maximum Speed	Load Units used at speed (K bps) 4.8	9.6	19.2	48	64
DMB32	1	64.0	9	18	36	90	120
DSB32	2	64.0	9	18	36	90	120
	or 1	192.0					
DMF32	1	19.2	9	18	36	N/S	N/S
DPV11-DA or -S*	1	9.6	23	64	N/S	N/S	N/S
DST32	1	19.6	10	20	40	N/S	N/S
DSH32	1	19.2	10	20	40	N/S	N/S
DUP11*	1	9.6	23	46	N/S	N/S	N/S
DSV11	2	64.0	9	18	36	90	120
	or 1	256.0					
DIV32**	2	64.0	N/S	N/S	N/S	N/S	120
KMS1P-A	1	19.2	9	18	36	N/S	N/S
KMS1P-B	1	64.0	9	18	36	90	120
KMS11-BD/BE***	8	19.2	10	20	40	N/S	N/S
KMV1A-A or -SF	1	19.2	9	18	36	N/S	N/S

* For more than one character interrupt device, multiply the load units by 50% to allow for interaction between devices.

** The DIV32 supports 2 B-channels at 64K bps per ISDN line.

*** The KMS11-BD/BE are eight (8) line devices; the load units indicated above are the load units for each active line at the indicated line speed.

N/S The use of the device at this speed is not supported by VAX P.S.I.

How to Use Table 3

The maximum system configuration, with a mix of device types, is computed by adding the load costs (in load units) for each device up to the limit for a given processor type.

Example 1:

A VAX 8500 is being used to process VAX P.S.I. Native mode communications. If the system uses a DMB32 at 64K bps and another DMB32 at 19.2K bps, the load units total 156. Assuming these devices are fully active, they will consume 156/360 = 43% of CPU for communications processing. It is inadvisable to add more devices to this CPU, unless it is dedicated to the task of communications processing.

Example 2:

When one line of a DSV11 is fully utilized on a MicroVAX 3800 at 64K bps, it consumes 120/390 = 31% of the processor in processing VAX P.S.I. communications.

Factors to Consider

Other factors to consider when configuring hardware devices for use with VAX P.S.I. on a given processor are:

- Multi-host mode increases the CPU load of packets to or from VAX P.S.I. Access systems due to the additional cost of DECnet communications to the chosen VAX P.S.I. Access node.
- Hardware configuration limits, such as power supply, backplane space, bus throughput and mapping registers available, and any other restrictions on the number of devices per CPU or per bus, must be observed.
- Actual/average Packet size in bytes - generally, doubling the actual packet size will halve the load units consumed for DMA devices, but increase the load units for character-interrupt devices by approximately 30 percent.
- The above table assumes that data is sent and received in each direction of a full-duplex line in equal ratio. If the number of X.25 packets per second is predominantly one-way, the load units per line can be reduced proportionately up to a factor of 50%.

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