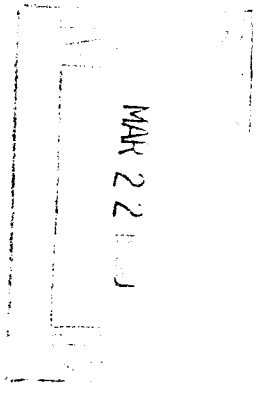
Bellcore
Bell Communications Research

Bellcore Practice
BR 007-206-254
Issue 2, January 1990

VMS
Standard Operating Environment



This document replaces BR 007-206-254, Issue 1, January, 1985.

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VMS STANDARD OPERATING ENVIRONMENT

CONTENTS

1. GENERAL

1.1 Purpose and Objective

This Bellcore Practice (BR 007-206-254) describes the Standard Operating Environment (SOE) for the VMS™ Operating System. The SOE is the interface between the users of Bellcore Centrally Developed Systems (CDSs) (who are generally Bellcore Client Companies (BCCs)) and the Bellcore designers of the systems. The existence of a standard hardware/software environment lowers the costs of designing, installing and maintaining CDSs. The SOE also helps facilitate multiple vendor involvement by identifying the hardware/software product base for VMS central development.

1.2 Reasons for Reissue

This document replaces BR 007-206-254, Issue 1, January, 1985, in its entirety.

1.3 Applicability

This practice is issued under the authority of the Computer Technology Advisory Group (CTAG). It applies to Bellcore CDSs and to the deployment of such systems when the following conditions apply:

a. The CDS is designed to use the VMS operating system.

b. The CDS is developed to be operated by a BCC in its local or regional environment.

At this time the only CDSs with approval to use the VMS SOE are the Intelligent Network Elements which run on the Service Control Point (SCP) Node Software Platform. The SCP and Network Services Node (NSN) are two Intelligent Network Elements that run the SCP Node Software Platform. The SCP and NSN offer many Intelligent Network Services. For example, the SCP offers 800 Service, Alternate Billing Service (ABS), and Private Virtual Network (PVN) Service. The NSN offers the Services Testing Evolution Platform and the Service Activation System (SAS). Each service operates as a subsystem on the SCP Node Software Platform and multiple services can run simultaneously. The VMS SOE defines the operating environment required to support the real time/fault tolerant technology to provide the necessary level of reliability, capacity and performance necessary for SCP applications. Therefore, the usage of the VMS SOE is not for general purpose computing, but for a real time/fault tolerant CDS.

The specifications within the VMS SOE are subject to frequent change. Release levels of existing software are upgraded by CTAG as the vendors make enhancements. On occasion, new software products and hardware devices may be added or existing products and devices replaced. This continuing evolution of SOE specifications makes the identification of software levels, hardware device types, and effective dates impractical in this practice. Only software products and hardware categories are included in this practice, and all other associated information is contained in the mechanized system called the *SOE Database*.

The information in the SOE database includes the following:

a. descriptions of the software products and hardware categories;

b. currently supported software release levels;

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c. planning information for future products or product level upgrades;

d. history of superseded or replaced products.

Access instructions for the SOE Database system are provided in Section 5.

2. SOFTWARE ENVIRONMENT

The software portion of the VMS SOE includes the following:

a. OPERATING SYSTEM SOFTWARE: VAX™/VMS

The VMS operating system was developed by DEC™ and was designed to run on any VAX computer. A number of functions are packaged with the operating system, including the following:

— I/O Device Drivers

— User Authorization Control Program

— Job Initiator and Symbiont Manager

— Account Manager

— Operator Communications Manager

— Error Logging Utility

— Sort/Merge Utility

— User Environment Test Package

— Software Installation Utility

b. CLUSTERING SOFTWARE: VAXcluster Software - Computer Interconnect (CI)-based, Local Area VAXcluster™ - Ethernet based

The VAXcluster software operates in the following VAXcluster configurations:

— Local Area VAXcluster systems, utilizing the Ethernet for cluster communications

— CI-based VAXcluster systems, utilizing the CI for cluster communications

— Mixed interconnect VAXcluster systems, utilizing both the Ethernet and CI for cluster communications

c. DATABASE MANAGER SOFTWARE: Record Management Services (RMS)

The RMS software provides the ability to do the following:

— Open and Close Files

— Read From and Write To Files

— Extend and Delete Files

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Local Area VAXcluster is a trademark of Digital Equipment Corporation

— Support Three Different File Organizations and Access

d. SYSTEM CONSOLE COORDINATION: VAXcluster Console System (VCS)

VCS software provides a central point for the coordination of VAX system console services and for logging of all console data received from connected VAXcluster systems or stand-alone VAX systems.

e. GRAPHICS SOFTWARE: VAX Graphical Kernel System (GKS)

VAX GKS is a subroutine library packaged as a VMS shareable image, which implements the International Standards Organization (ISO) (IS 7942) and American National Standards Institute, Inc. (ANSI) (ANS X3.124-1985) GKS standard for two-dimensional device independent graphics.

f. PROGRAMMING LANGUAGES: VAX C, VAX Macro

VAX C is an extended implementation of the C programming language developed at Bell Laboratories. It supports the ANSI C X3J11 standard features. VAX Macro is an assembly language that can be used for programming VAX computers using the VAX/VMS Operating System.

g. WINDOWING SOFTWARE: VAX Workstation Software (VWS)

VWS provides window manipulation, terminal emulation, and a menu-driven application that allows the programmer to create windows containing text and detailed graphics.

h. DISK SHADOWING: VAX Volume Shadowing

Volume Shadowing provides for data availability by duplicating all data written to disk onto two or three compatible disk drives. Automatic fail-over is initiated when necessary to provide high availability to all data.

i. TERMINAL COMMUNICATIONS MANAGEMENT: DECserver 200

The DECserver 200 software manages up to eight VT™241/VT341 emulation asynchronous terminals to one or more host nodes on an Ethernet.

j. REMOTE DECNET COMMUNICATIONS MANAGEMENT: DECnet Router Server

The DECnet Router Server software provides routing to nodes off of the Ethernet connected via synchronous or asynchronous lines.

k. COMMUNICATIONS PACKAGES: DECnet, VAX Packetnet System Interface (PSI)

DECnet enables communications between different networked systems that use the same Digital Network Architecture (DNA) protocols. VAX PSI allows systems to connect to and/or access Packet Switching Data Networks (PSDNs) which conform to the International Telephone and Telegraph Consultative Committee (CCITT) X.25 (1987, 1980, 1984) and/or ISO 7776/8208.

l. TERMINAL DATA MANAGEMENT: Terminal Data Management System (TDMS), Screen Management (SMG)

TDMS provides facilities for interactively creating customized forms, that have different kinds of fields and text characteristics, to manage terminal input and output. SMG is a set of routines designed to assist developers in designing, composing, and keeping track of complex images on a video screen.

VT is a trademark of Digital Equipment Corporation

3. HARDWARE ENVIRONMENT

The hardware portion of the VMS SOE specifies DEC central processing units and peripheral devices which are compatible with CDSs using this environment. Plug compatible hardware may be used, but it is the responsibility of the user to ensure compatibility.

This section provides detail on hardware products currently required to support the SCP CDSs. This information should not be used directly to purchase hardware products for deploying SCP software since this list will evolve over time as the technology changes. Actual configuration and capacity planning information will be provided by the Bellcore SCP development organization.

a. CENTRAL PROCESSING UNIT(s) (Configured As Follows):

   1. A Cluster of VAX Processors Which Support The VMS Instruction Set
   2. 16 - 68 MB of Main Memory
   3. CI Cluster or Local Area VAXcluster Support Required
   4. Two Ethernet Controllers
   5. One Multi-Function Communication Controller (Optional)
   6. One Local Tape Drive

b. MASS STORAGE DEVICES:

   1. Hierarchical Storage Controller (HSC) 50/70 or Digital Storage Systems Interconnect (DSSI) Storage Controller
   2. RA81 456-MB Fixed Disk (HSC Compatible Only)
   3. RA90 1.2-GB Fixed Disk (HSC Compatible Only)
   4. RA70 280-MB Fixed Disk (HSC Compatible Only)
   5. RF30 150-MB Fixed Disk (DSSI Compatible Only)
   6. RF71 400-MB Fixed Disk (DSSI Compatible Only)

c. MAGNETIC TAPE DRIVES:

   1. TU78/TA78 Tape Drive
   2. TU79/TA79 Tape Drive
   3. TU90/TA90 Tape Drive

d. CONSOLE TERMINALS:

   1. VAXstation™ Workstation (Includes fiber optic console connections to cluster members)
   2. VT241/VT341 Terminals

e. PRINTERS:

VAXstation is a trademark of Digital Equipment Corporation

1. LA210 Line Printer
2. LA75 Line Printer

f. TERMINAL SERVERS:

1. DECserver 200

g. COMMUNICATION ROUTERS:

1. DECnet Router/Server
2. Local Area Network (LAN) Bridge 100
3. Fiber Optic LAN Bridge 100
4. TransLAN Bridge
5. DECnet/Systems Network Architecture (SNA) Gateway for Synchronous Transport

h. ALARM DEVICES:

1. Kaye Model LK-4S, Digi-Link 4S Mainframe
2. C1024 Critical Indicator Panel (Manufactured By Process Control Systems)
3. DNS-330 Annuciator Panel (Manufactured by Datanet Systems)

i. VOICE PERIPHERALS:

1. VOTAN VMS-73E8
2. DECvoice
3. DECtalk

j. TRANSPORT INTERFACE SWITCH:

1. SUMMA FOUR SDS-1000

4. DATA COMMUNICATIONS ENVIRONMENT

1. For information pertaining to the Service Management System (SMS) - to - SCP BX.25 Communication Interface, see AT&T Technical Reference "Operations Systems Network Communications Protocol Specification BX.25" Issue 3, April 1982, Publication 54001.
2. For information pertaining to the Signal Transfer Point (STP) - to - SCP Signalling System 7 Communications Interface, see Bellcore Technical Reference "Bell Communications Research Specifications of Signalling System No. 7" TR-NPL-000246, Issue 1 1985, Revision 2 1987.
3. For information pertaining to the Public Packet Switched Network (PPSN) - to - SCP X.25 Communication Interface, see Bellcore Technical Reference "Public Packet Switched Network Generic Requirements (PPSNGR)" TR-TSY-000301, Issue 2 December 1988.
4. For information pertaining to Voice Peripheral - to - SCP Asynchronous Communication Interface, see VOTAN VMS Voice Library Reference Manual, 74000065, Revision A December 31, 1987.
5. For information pertaining to Switch - to - SCP Transport Interface, see SUMMA FOUR SDS-1000 Host Communications Guide, FIPS Pub. 78-ADCCP Implementation, Working Issue 2, September 1986.
6. For information pertaining to the MIZAR and Computer System for Mainframe Operations (COSMOS) - to - SCP Transmission Control Program/Internet Program (TCP/IP) Communication Interface, see Military

Standards documents #1777 and #1778 and Request For Comment (RFC) documents #791 and #793.

7. For information pertaining to the Service Order Retrieval (or Routing) and Distribution (SORD) - to - SCP LU6.2 Communication Interface, see IBM documents "Systems Network Architecture Format and Protocol Reference Manual: Architecture Logic for LU Type 6.2" (SC30-3269) and "Systems Network Architecture Format and Protocol Reference Manual: Architecture Logic" (SC30-3112).

5. ACCESS INSTRUCTIONS FOR THE SOE DATABASE SYSTEM

Contact your Regional/BCC Remote Computing Coordinator (RCC) to obtain access into the Bellcore SOE Database system. Provide the RCC with the names of the Bellcore Centrally Processed System (CPS), "SOE Database", and the operating system, "UNIX®."

6. GLOSSARY OF ACRONYMS

ABS	Alternate Billing Service
ANSI	American National Standards Institute, Inc.
BCC	Bellcore Client Company
CCITT	International Telephone and Telegraph Consultative Committee
CDS	Centrally Developed System
CI	Computer Interconnect
COSMOS	Computer System for Mainframe Operations
CPS	Centrally Processed System
CTAG	Computer Technology Advisory Group
DNA	Digital Network Architecture
DSSI	Digital Storage Systems Interconnect
GKS	Graphical Kernel System
HSC	Hierarchical Storage Controller
ISO	International Standards Organization
LAN	Local Area Network
NSN	Network Services Node
PPSN	Public Packet Switched Network
PSDN	Packet Switching Data Network
PSI	Packetnet System Interface

UNIX is a registered trademark of AT&T

PVN	Private Virtual Network
RCC	Remote Computing Coordinator
RFC	Request For Comment
RMS	Record Management Services
SAS	Service Activation System
SCP	Service Control Point
SMG	Screen Management System
SMS	Service Management System
SNA	Systems Network Architecture
SOE	Standard Operating Environment
SORD	Service Order Retrieval (or Routing) and Distribution
STEP	Services Testing Evolution Platform
STP	Signal Transfer Point
TCP/IP	Transmission Control Program/Internet Program
TDMS	Terminal Data Management System
VCS	VAXcluster Console System
VWS	VAX Workstation Software