DEC
SYSTEMS, ARCHITECTURES AND NETWORKS
A Detailed Examination of
Digital Equipment Corporation's Products.

ANDOVER, MA
NEWPORT BEACH, CA

MORRISTOWN, NJ
SCOTTSDALE, AZ
Digital Equipment Corporation (DEC) is the second most influential vendor in the computer marketplace today. The company developed a strong image by successfully selling minicomputers to scientists and engineers, but in recent years it has greatly expanded its commercial business. Growing numbers of customers have installed Digital's VAX computers in departments, branch offices and laboratories. The key advantage Digital has achieved is the ease of networking among Digital's products, and the ability to communicate with products made by other vendors, especially IBM.

This strategy has been enormously successful. During the computer slump of 1985-87, Digital has been one of the few bright spots in the industry. The company's increasing sales and profitability caused the value of its stock to skyrocket and made Digital the darling of Wall Street. This achievement has given the company the hubris to challenge IBM in the area of IBM's greatest strength: large scale mainframe computers. In January, 1987, Digital announced the VAX 8978, which is intended to offer the same computing capacity as the largest IBM 3090 ("Sierra") systems. This move may have more symbolic than technical significance: it confirms Digital's commitment to a strong presence in virtually every aspect of the world computer industry.

Intelligent computer users do not normally base their product acquisition plans on the opinions of stock market analysts, industry pundits or salespeople. They must assess their computing needs and search the market for products that meet those needs at a reasonable cost. They need objective information about the capabilities, strengths and weaknesses of available products. Digital has many attractive products intended for the sophisticated user. These products change continuously, and complete product information is sometimes difficult to obtain.

This seminar gives you current technical facts about Digital's most important products, and explains the technical approaches and strategies for interconnection and integration of Digital products with IBM and other vendor product lines.

Seminar Description

DEC: Systems, Architectures and Networks has been developed with today's widely distributed networks in mind. It is presented by instructors who have a high level of expertise in Digital's product lines as well as an understanding of the nuances and implications of the latest announcements. The seminar presents networking and communications concepts with a strong focus on "real world" situations including practical solutions and realistic alternatives.

The seminar starts with a detailed introduction to the basic hardware configurations. It discusses the most important system software products including operating systems, compilers, languages, database management systems and office automation products. DECNET, Ethernet and associated products are described thoroughly. After homogenous (single vendor) networks are introduced, the seminar covers the diverse options for integrating products of other vendors. Attendees will learn several approaches for creating a coherent network containing diverse brands of hardware and software to meet a wide variety of computing needs in commercial, scientific and engineering environments.

Each attendee will receive a detailed workbook which serves as an excellent reference.

Goals Of The Seminar

- Provide a complete and detailed technical description of the most important DEC computing, networking and office automation products.
- Acquaint attendees with the concepts and terminology associated with DEC's full range of products and architectures to enable them to read and understand product literature more effectively.
- Prepare attendees to design networks containing Digital products at a conceptual level. Provide an understanding of product relationships within the company's product line, as well as with other vendor products.

Who Can Benefit

Anyone who is considering or planning a Digital system or is anticipating expansion of an existing product line will find this seminar highly informative. All technical concepts are carefully explained. This seminar is essential for users who are new to the Digital environment, as well as for managers attempting to keep pace with the rapid change in the minicomputer market.

Course Director

Carl Malamud has extensive experience as a seminar leader on topics ranging from relational database systems to network architectures. He has planned and implemented Management Information Systems, Local Area Networks and Computer Literacy Programs for a wide variety of clients in Unix and VMS computing environments. Some organizations he has worked with include the Office of Technology Assessment (U.S. Congress), the Office of the Secretary for Defense, the Board of Governors of the Federal Reserve System, Indiana University and numerous firms in the computer industry.
INTRODUCTION
DEC Hardware and Operating Systems
Applications Software
Networking DEC Equipment

DIGITAL HARDWARE PRODUCTS
CPUs, BUS Structures and Memory
BI Bus Processors: 8000 Series
Unibus Processors: 11/7XX and 8600
Workstations and MicroVAXs
Floating Point and Attach Processors
Mass Storage Peripherals
Digital Storage Architecture
DEC Disks, Controllers and Tape Drives
Optical Storage: CD-ROM and WORM
Other Peripherals
VT and Other Terminals
Printers and Laser Print Servers
DECTalk Voice Output Systems
Future Hardware Directions
DEC Titan and Firefly Projects
RISC Technology
Parallel Processing and BI Bus
DEC Vector Processor Research
Exercise: Configuring a VAX System

VMS OPERATING SYSTEM
The Basic Instruction Set and Common System Calls
Operating System Internals
Digital Command Language User Interface
Program Development Environment
Code Management System
Module Management System
Language Sensitive Editor
Debuggers and Performance Analyzers
System Administration
Security Features
Performance Monitoring

ULTRIX AND UNIX
Evolution and Convergence of UNIX Derivatives
Basic UNIX Concepts
Redirection and Pipes
Pattern Searches and Editors
User Interfaces
C-Shell Interface (4.2BSD)
Bourne Shell (V.2)
X-Windows Interface
VMS and UNIX Comparison
Interaces
Security and Performance

DIGITAL NETWORK ARCHITECTURE: PHASES I-IV
The ISO Reference Model
Summary of DNA Phases I-IV
DECnet Phase IV Protocol Stack
X.25 and Wide-Area Networks

IMPLEMENTING ETHERNET NETWORKS
Ethernet Media
Broadband, Baseband, Thinwire and Twisted Pair
Transceivers, Controllers and Cables
Terminal and Print Servers
Routers, Bridges and Gateways
Exercise: Planning an Extended Ethernet

VAX CLUSTERS AND LOCAL AREA VAX CLUSTERS
Cluster Hardware
Star Couplers
CI Bus and Controllers
HSC Controllers
Cluster Software
System Communications Services (SCS)
MSCP Protocols and Servers
Cluster Connection Manager
Distributed Queue Manager
Local Area VAX Clusters
SCS Implementation over Ethernet
LAVC Configuration Options
LAVC Performance Implications
Exercise: Configuring a Cluster

WIDE AREA SYSTEMS
Traditional DDCMP Point-to-Point Systems
Modems and Multiplexers
PBXs and Data Switches
X.25 and Packet Switched Networks
Transmission Options
Exercise: Banks, Branches, and Home Banking

DATABASE MANAGEMENT AND APPLICATIONS DEVELOPMENT
VAX Information Architecture Overview
VAX Common Data Dictionary
DBMS (Cohesive Standard Network Model)
Rdb Relational Database
TDMS and FMS Forms Systems
ACMS Transactions Management System
DEC Presentation Systems: Graphics and Reports
Other Approaches
General Purpose Software Products: Ingres, Oracle
Database Machines: Britton Lee
Hybrid Implementations: SyBase
Distributed and Heterogeneous Databases
The Digital Standard Relationship Interface
Interbase and Heterogeneous DBMS Systems
Ingres, Oracle and Distributed Databases

OFFICE AUTOMATION
Communications Products
X.400 Message Handling Protocols
MAILBUS and Message Routing
Mail User Interfaces
VTX and VAX Notes
Document Production
DEC WPS Word Processing
Other Word Processing Products
Desktop Publishing: Pagemaker and Interlax
dx and DDIF Document Interface Formats
Exercise: Designing a Distributed Office Architecture

CONNECTING TO THE IBM ENVIRONMENT
Basic SNA Concepts
SNA v, ISO v, DNA
SNADS, DCA, DIA, SAA Architectures
DEC SNA Products
SNA Gateways and VMS/SNA
3270 Emulation and Access Routines
APPC Interface
Connecting IBM-compatible PCs
Netbios and Token Ring Concepts
DECnet DOS Services
DECnet DOS and Netbios
Bisync and Old-Style Connection Methods
Exercise: Connecting to the Corporate Data Center

TCP/IP AND INTERCONNECTING WITH UNIX ENVIRONMENTS
TCP/IP and Ethernets
ARPANET and Berkeley TCP/IP Services
Ultranet TCP/IP/DNA Gateways

DECNEXT PHASE V AND OSI
OSI and DNA Convergence
OSI Lower Layer Protocols
OSI Presentation and Application Layers
DEC OSAK and VOTS Products
MAP and DEC
Phase V Architecture Implementation and Conversion
Registration Information  Call (703) 370-8103 — 9:00 a.m. - 5:00 p.m. Eastern Time

Course Fee: The registration fee includes seminar, course workbook and all materials as well as:
— Coffee, tea, juice and danish, in the morning
— Lunch, and
— Refreshments throughout the day.
The registration fee is $845.

Registration: To register, mail the registration form or call (703) 370-8103. Registrants will be notified if a course is over-subscribed or cancelled.

Discount Schedule: One of every four registrants pre-registered (as a group) by their company is free. Separate enrollments and/or payments do not qualify.

Cancellations: Fees are fully refunded if notification is received at least 10 business days prior to the session. Cancellations made later than 10 business days before the seminar starting date are subject to a $200 service charge. The full fee is due for failure to attend, or cancel in writing.

Substitutions & Transfers: Prior to the session are allowed without additional charge; however, discount groups must attend the same session.

CEUs: 0.7 Continuing Education Units for each day will be earned by participants who successfully complete the seminar. The CEU is the nationally recognized standard unit awarded for participation in qualified programs of continuing education. A certificate will be issued to each participant.

Tax Deduction: All expenses for continuing management education (including registration fees, travel, meals and lodging) undertaken to maintain and improve professional skills are deductible (Treas. Reg. 1-162-5, Coughlin vs. Commissioner, 203 F2d 307).

Course Schedule: Classes are held from 9:00 A.M. to 5:00 P.M. each day. No evening classes are scheduled. Registration begins at 8:30 a.m. on the first day.

Hotel Accommodations: Contact the hotel directly to reserve a room. A block of rooms will be held at most hotels listed above until two weeks prior to the seminar. For preferred treatment, when making your reservation please indicate that you are attending an Information Engineering Institute conference.

On-Site Training Sessions: A complete listing of all of our seminar topics available for private training to groups within an organization is available upon request.

The Institute and the Center: The Information Engineering Institute and the Center for Advanced Professional Education are sponsoring this conference. Both organizations are experienced and respected companies, noted for providing excellent training to the computer and communications industries.

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