ifconfig lnen0 => what one you

ping

CUSTOMER SERVICES TRAINING

Protocol not supported
↑
need to rebuild kernel

① load package
② setup package
③ rebuild kernel - which creates links to TCP/IP

who -r
what run level

INIT 3
go to level 3

rc.tcpipport –
rc.tcpipserv / started at run level 3

STUDENT GUIDE

CBT's

OPEN SYSTEMS TROUBLESHOOTING

TCP/IP
System administration
UUCP
Network management
Scripts
88K I/O

Hayden Books
UNIX system library

88K PROCESSOR
UNIX

G3810

1 CBT on each AVIION MACHINE

CAVI - AVIION TROUBLESHOOTING
LAN

Open Systems Troubleshooting

Prerequisites:

Field Personnel who have successfully completed the P1042 Aviion Operations and P1090 Unix Communications.

Abstract:
This course is intended to assist Field Personnel, who have successfully completed the Aviion Operations and Unix Communications courses in troubleshooting and maintaining Aviion systems in a networked environment. The course consists of lecture and laboratory based training.

This FRU level course is designed to provide the student with the expertise to allow him/her to install or reconfigure an Aviion series machine in a networked environment and verify it's proper operation.

The course will include discussions of Aviion Hardware, VME/SCSI controller jumpering, hardware installation and reconfiguration and Aviion Diagnostics. The software discussion will include installation and configuration of Aviion hardware in a TCP/IP networked environment. A discussion of Unix commands available to the student for troubleshooting installation problems in a networked environment will be presented. These commands along with hardware diagnostics will subsequently be employed by the student in a troubleshooting lab.

Terminal Objective:

Upon completion of this course, the student will be able to install or modify Aviion Hardware configurations and will also be able to successfully troubleshoot Hardware and Software problems involving Aviion Equipment in a networked environment.

Enabling Objectives:

Given available documentation, tools and test equipment the student who completes this course will be able to do the following:

Identify the major FRU's and describe their functions.

Install and configure a Aviion system.

Enabling Objectives (continued)

Run selected diagnostics and self-tests.

Boot diagnostics as a tool to isolate faults to the FRU level.

Perform any adjustments and required preventive maintenance.

Use appropriate documentation, tools and test equipment.

Be able to list the products in the "TCP/IP family" of communications products.

Be able to describe the Internet addressing scheme.

Be able to install an Aviion system in a networked environment and verify it's ability to reach other hosts on the network.

Be able to install the Network File System and mount remote resources across the network.

Be able to list the various server processes that must be present on networked machines to provide communication ability.

Be able to list the various files used during network initialization to bring the network up.

Be able to utilize various Unix commands to troubleshoot and repair network problems.

Open Systems Troubleshooting

1) System board overview
   - single/double cpu population
   - board types 8/16mb
   - ecc controller
   - led stop lights
   - duart
   - printer
   - vme interface
   - switches and jumpers

2) System board block diagram
   - 88k major bus structure
   - pbus
   - mbus
   - badbus
   - vmebus
   - pexbus

3) Chassis discription
   - front panels
   - rear bulkhead connections
   - disk/tape removals
   - pcb to bulkhead connections
   - slot assignments
   - iack/bus grant jumpers

4) System block diagram
   - memory expansion
   - vlc controllers
   - esdi/smd controllers
   - scsi controllers
   - asyn/sync controllers
   - terminal srever controllers

5) Optional board jumpering
   - ciprico esdi/smd
   - ciprico scsi
   - systec async/sync
   - systec lan
   - systec cluster boxes

6) Boot paths

- scsi drive ids
- smd drive ids
- lan ids
- sync/async ids

7) SCM commands

8) Removal and replacement lab

9) Power up testing messages

10 Diagnostics

- acceptence testing
- status reports
- error codes
- tools menu
- disk media maintenence
- run tape adjustment
- tdr testing
- help menu
- scm return

11. Review of DG/UX TCP/IP

A. Reviewing Basic Terms

B. What is DG/UX TCP/IP?

1. Kernel-Level Protocols
   - a. IP
   - b. understanding internet Addresses
   - c. ICMP
   - d. TCP
   - e. UDP
   - f. ARP
   - g. RARP

Open Systems Troubleshooting
(continued)

2. User Commands and User-Level Protocols
   brief overview of applications
   with emphasis on telnet, rlogin
   a. telnet
   b. ftp
   c. tftp
   d. sendmail
   e. R commands

3. Servers to Start Daemons
   a. inetd
      1. ftpd
      2. telnetd
      3. tftpd
   b. smtp
   c. routed
   d. rwhod

12. Setting Up a DG/UX TCP/IP network

A. Determining Network Architecture
   1. Reviewing Basic Terms
   2. Choosing an Internet Address
   3. Connecting Networks: Some Examples
   4. Determining Network Routes
   5 Using the route command

B. Network Files and Databases used by TCP/IP
   1. Using the sysadm Program
   2. Editing /etc/hosts
   3. Editing /etc/networks
   4. Editing /etc/protocols
   5. Editing /etc/services
   6. Editing /etc/hosts.equiv
   7. Editing /etc/ethers
   8. Editing /etc/tcpip.params
      a. Setting the Hostname
      b. Setting the Hostid
      c. Setting Network Interface Devices
      d. Setting Security Parameters
      e. Setting Parameters for the Communications Board
      f. Setting Routing Parameters
      g. Starting Network Daemons
      h. Setting Parameters for Network Daemons
   10. Editing /etc/inetd.conf

13. **Reviewing the Network File System**
   - A. How NFS Allows File Sharing
     1. The Network Services Concept
     2. Maintaining Service When a Server Crashes
   - B. Understanding NFS Terms
   - C. How NFS Works
     1. Mounting a Remote File System
     2. Exporting a File System
     3. Establishing a Machine as an NFS Server
     4. How to Export Directories with exportfs
     5. How to Remote-Mount a File System
   - D. General Hints for Debugging NFS

14. **Reviewing Yellow Pages**
   - A. What Are Yellow Pages?
     1. Understanding YP Terms
   - B. Overview of the Yellow Pages
     1. The YP Map
     2. The YP Domain
     3. Servers and Clients
     4. Masters and Slaves
   - C. Commands for Maintaining YP
     1. How Administrative Files Are Consulted on a YP Network
   - D. How the YP Network Service Works
     1. How YP Stores Data
     2. How Servers Provide Information
     3. How Clients Obtain Information
   - E. Default YP Files
     1. Accessing Information from hosts Files
     2. Accessing Information from the passwd Files
     3. Accessing Information from Other YP Files
   - F. YP Administration
     1. How to Set up a Master YP Server
     2. Altering a YP Client's Files to Use YP Services
     3. How to Set Up a Slave YP Server
     4. How to Modify Existing YP Maps After YP Installation
     5. Propagation of a YP Map
     6. If You Do Not Use YP

15. Troubleshooting on a Network Running DG/UX TCP/IP

A. Troubleshooting: A Strategy
   1. Isolating a Problem After Setup
   2. Step 1: Check the Hardware
   3. Step 2: Determine If the Problem is with the Local Host
   4. Step 3: Determine If the Problem is with the Remote Host

B. Using Administrative Commands to Troubleshoot
   1. Using the ifconfig Command
      a. Activating the Communication Controller
      b. Troubleshooting When the Network Hangs
   2. Using the ping Command
   3. Using the netstat Command
      a. Checking Incoming and Outgoing Packets
      b. Checking Network Statistics
      c. Checking Network Connections
      d. Checking the Routing Tables
   4. Using the arp Command
   5. Interpreting Error Messages

C. Troubleshooting Specific Problems at the High Layer
   1. Troubleshooting Problems with telnet & rlogin
   2. Troubleshooting Problems with ftp
   3. Troubleshooting with the results from rwhod

AViion 300/400 SERIES STATIONS:PROGRAMMING SYSTEM CONTROL AND I/O REGISTERS (014-1800)

MAINTAINING AViion 300 SERIES STATIONS (014-1803)

SETTING UP AND STARTING THE AViion 300 SERIES STATION (014-1801)

USING THE SYSTEM CONTROL MONITOR (SCM) (014-1802)

SETTING UP AND STARTING THE AViion 400 SERIES STATION (014-1858)

EXPANDING AND MAINTAINING THE AViion 400 SERIES STATION (014-1859)

SETTING UP AND STARTING AViion 3000/4000 SERIES COMPUTER SYSTEMS (014-1872)

EXPANDING AND MAINTAINING THE AViion 3000/4000 SERIES COMPUTER SYSTEM (014-1874)

AViion 3000/4000 SERIES STATION:PROGRAMMING SYSTEM AND CONTROL REGISTERS (014-1878)

SETTING UP AND STARTING AViion 5000 SERIES COMPUTER SYSTEMS (014-1806)

EXPANDING AND MAINTAINING AViion 5000 SERIES COMPUTER SYSTEMS (014-1850)

AViion 5000/6000 SERIES STATIONS:PROGRAMMING SYSTEM CONTROL AND I/O REGISTERS (014-1805)

STARTING AViion 6000 SERIES SYSTEMS (014-1819)

SETTING UP AND INSTALLING VME OPTIONS IN AViion SYSTEMS (014-1867)

USING AViion SYSTEM DIAGNOSTICS (014-1863)

INSTALLING AND OPERATING THE 10565 PERIPHERAL HOUSING UNIT (014-1810)

MC88100 USERS MANUAL,REDUCED INSTRUCTION SET COMPUTER (RISC) (014-1809)

MC88200 USERS MANUAL,REDUCED INSTRUCTION SET COMPUTER (RISC) (014-1808)

MANUALS FOR VME HARDWARE

HPS DOWNLOADABLE CLUSTER CONTROLLER TECHNICAL MANUAL (014-1813)

HPS DOWNLOADABLE CLUSTER CONTROLLER INSTALLATION GUIDE (014-1814)

HPS VME BUS HOST ADAPTERS TECHNICAL MANUAL (014-1815)

HPS VME BUS MULTIPLEXOR (6236/6237) TECHNICAL MANUAL (014-1817)

V/ETHERNET 3207 HAWK LOCAL AREA NETWORK CONTROLLER FOR ETHERNET USER'S GUIDE (014-1818)

VME BUS DATA COMMUNICATIONS PROCESSOR (DCP-8820) TECHNICAL MANUAL (014-1816)

SOFTWARE MANUALS

LEARNING THE UNIX OPERATING SYSTEM (069-701402)

INSTALLING AND MANAGING THE DG/UX SYSTEM (093-701052)

PORTING APPLICATIONS TO THE DG/UX SYSTEM (069-701059)

WRITING A DEVICE DRIVER FOR THE DG/UX SYSTEM (093-701053)

USING THE DG/UX EDITOR (069-701059)

USING THE DG/UX SOFTWARE DEVELOPMENT TOOLS (093-70178)

USING THE DG/UX SYSYEM (069-70135)

USING THE KERNAL DEBUGGER (093-70175)

PROGRAMMING IN THE DG/UX APPLICATIONS ENVIROMENT (093-701076)

SETTING UP AND MANAGING DG/UX TCP/IP (093-701051)

PROGRAMMING WITH TCP/IP ON THE DG/UX SYSTEM (093-701024)

USING DG/UX TCP/IP (093-701023)

SETTING UP AND MANAGING X.25 ON THE DG/UX SYSTEM (093-701071)

MANAGING NFS AND ITS FACILITIES (093-701049)

SYSTEM MANAGERS REFERENCE FOR THE DG/UX SYSTEM (093-0701050

USER'S REFERENCE FOR THE DG/UX SYSTEM (093-701054)

DG/UX HELP NOTES WRITTEN BY G.BRUCE CHEWNING 01-30-91

BOOT PATHS FOR AV300,AV400,AV4000

```
DISK:
SCM>B SD(INSC(),)ROOT:/DGUX
SCM>B SD(INSC(),)USR:/STAND/DIAGS
SCM>B SD(INSC(),)ROOT:/STAND/DIAGS
TAPE:
SCM>B ST(INSC(),4)
```

DISKLESS CLIENT

```
SCM>B INEN()
SCM>B HKEN()
SCM>B INEN()/STAND/DIAGS
SCM>B HKEN()/STAND/DIAGS
```

BOOT PATHS FOR AV5000

```
DISK:
SCM>B CIED()ROOT:/DGUX
SCM>B CIED()USR:/STAND/DIAGS
SCM>B CIED()ROOT:/STAND/DIAGS
TAPE:
SCM>B ST(CISC(),4)
```

BOOT PATHS FOR AV6000

```
DISK:
SCM>B CIMD()ROOT:/DGUX
TAPE:
SCM>B ST(CISC(),4)
```

DIAGNOSTIC INFORMATION

RBOS - SYSTEM DIAGS

STEP 1 BOOT DIAGS FROM TAPE OR DISK
IF YOU HAVE TAPE USE:
SCM>B ST(0,4)

STEP 2 ENTER NEWLINE FOR THE DEFALTS UNTIL YOU ARE PROMPTED FOR THE TIME.

XDIAG - ROM BASED DIAG

```
SCM>R
SCM>XDIAG
ENTER PASSWORD>DGFEMODE
```

NOTE: IF YOU HAVE A 2ND PROCESSOR: SCM>A 1 TO CHANGE TO PROCESSOR 1

STEP 3 WHEN YOU ARE PROMPTED FOR THE CORRECT TIME ENTER: CTRL-P

STEP 4 YOU WILL BE PROMPTED: " ENTER PASSWORD: "
ENTER : DGREMOTEFE

STEP 5 YOU SHOULD HAVE SELECTION (2.VIEW SYSTEM EXERCISER MENU)
IF YOU DON'T HAVE THIS SELECTION, EXIT TO SCM AND START OVER.

BRINGING SYSTEM DOWN

STEP 1 # WHO -T
(THIS WILL LIST THE ACTIVE USERS)

STEP 2 IF YOU NEED USERS TO LOG OFF, USE THIS LINE. (5 MIN. DELAY)
SHUTDOWN -Y -G300
OR IF YOU CAN SHUTDOWN THE SYSTEM NOW, USE THIS LINE. (NO DELAY)
SHUTDOWN -Y -GØ

STEP 3 WHEN THE SYSTEM REACHES LEVEL S
HALT -Q
SCM>
AT THE SCM> PROMPT THE SYSTEM IS DOWN AND CAN BE POWERED OFF.

BRING THE SYSTEM UP TO RUN LEVEL 3 (MULITUSER, FULL TCP/IP AND NFS)

INIT 3

HELPFUL COMMANDS

PAUSE SCROLLING	CTRL-S
RESUME SCROLLING	CTRL-Q
ABORT - INTERUPT	CTRL-C
LOG OFF	EXIT
ERASE SCREEN	CLEAR
SET OR CHANGE PASSWORD	PASSWD
DISPLAY TEXT FILE	CAT [FILENAME]
DISPLAY FILE IN PAGE MODE	MORE [FILENAME]
DELETE FILE, VERIFY FIRST	RM -I [FILENAME]
COPY A FILE	CP [SOURCE FILE] [DESTINATION FILE]
DISPLAY DIR. IN PAGE MODE	LS -LA \ MORE
PRESENT WORKING DIRECTORY	PWD
CHANGE DIRECTORY	CD [DIRECTORY PATH]
RETURN TO HOME DIRECTORY	CD
ACTIVE USERS ON THE SYSTEM	WHO -T
YOURSELF (WHAT USER)	WHO AM I
WHAT RUN LEVEL	WHO -R
HELP (W/LIST OF COMMANDS)	HELP (NEWLINE) U (NEWLINE) P (NEWLINE)

DG/UX PANIC CODES

STEP 1 FROM UNIX PROMPT #

```
# CD /USR/RELEASE
# LS *.PANIC.*
DGUX_X.XX.PANIC.CODES
# VIEW DGUX_X.XX.PANIC.CODES
        (X.XX IS THE REV.)
```

STEP 2 USE VI COMMANDS:

CTRL-U FOR SCREEN UP
CTRL-F FOR SCREEN DOWN
SHIFT-Z SHIFT-Z TO EXIT

USING VI EDITOR

```
# VI [FILENAME TO EDIT]
```

COMMANDS:

SCROLL DOWN 1/2 PG	CTRL-D
SCROLL UP 1/2 PG	CTRL-U
SCROLL FORWARD	CTRL-F
SCROLL BACKWARD	CTRL-B
MOVE LEFT	CTRL-H
MOVE RIGHT	CTRL-L
MOVE UP	CTRL-K
MOVE DOWN	CTRL-J
MOVE NEXT WORD	W
MOVE BACK WORD	B
4 ARROW KEYS WORK IF SUPPORTED BY TERMINAL SET-UP IN UNIX.	
INPUT BEFORE CURSOR	I
INPUT AFTER CURSOR	A
OPEN BLANK LINE AT CURSER	O
REPLACE CHARICTER	R
UNDO PREVIOUS DELETION	U
DELETE CHARICTER AT CURSOR	X
DELETE CHARICTER AFTER CURSOR	X
DELETE LINE	DD
SET ALL OPTIONS	:SET ALL
REPORT CHANGED OPTIONS	:SET
SAVE CHANGES AND EXIT	SHIFT-Z SHIFT-Z
EXIT WITH NO CHANGES	:Q!

BUILDING / LOADING AVIION DIAG TAPE

(AVIION SYSTEM DIAGS - TAPE) TO DISK

```
# DD IF=/DEV/RMT/0 OF=/USR/STAND/DIAGS BS=16KB
```

(AVIION SYSTEM DIAGS - DISK) TO TAPE

```
# DD IF=/USR/STAND/DIAGS OF=/DEV/RMT/0 BS=16KB
```