

# **Service Director for RS/6000**

## **Information Guide**

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# Chapter 1. Introduction to Service Director for RS/6000

This package will introduce you to Service Director for RS/6000. Throughout this guide, Service Director for RS/6000 may also be referred to as just Service Director, or sometimes as SD/6000. Many of the features of Service Director are dependent on the AIX/6000 operating system.

This document is primarily intended for use by trained IBM servicers or RS/6000 system administrators. They should be familiar with, or have a working knowledge of, AIX and RISC architecture as it pertains to basic operation of IBM RISC System/6000. Working knowledge of the communication topology is beneficial, but is not mandatory. An understanding of AIX bottom line commands, System Management Interface Tool (SMIT), SMIT fast path, or smitty will be needed for installation and execution of Service Director.

## Objectives

You should attain a preliminary, high-level understanding of how Service Director interacts with the error log and diagnostics of an RS/6000.

Upon completion of this guide you should be able to:

1. Understand the major features of Service Director.
  - Thoroughly explain the features included with Service Director
  - Recognize the "value add" of Service Director
2. Recognize how Service Director interacts with the error log and the IBM Diagnostics Report file
3. Obtain and install Service Director code on customer's RS/6000
4. Support operations of Service Director user interface

## Description

- Chapter 2, Installing Service Director for RS/6000  
This chapter outlines the items necessary to obtain code and complete a successful installation of Service Director for RS/6000.
- Chapter 3, Registering Service Director  
In order for Service Director to electronically analyze and submit a problem to IBM, it must be registered. This chapter covers the high-level steps necessary to complete registration.
- Chapter 4, Using Service Director  
This chapter reviews and defines the options from the Service Director user interface.
- Chapter 5, Security, Support Structure, and Removal  
This chapter covers Service Director for RS/6000 security, the support structure, and the process of removing Service Director code.
- Chapter 6, Technical Overview  
This chapter reviews how Service Director interacts with the RS/6000, some of the possible configurations, and how High Availability (HA) environment is supported.
- Chapter 7, Detail Registration Process  
This chapter gives the detail screens and information necessary to support the detailed registration steps.
- Chapter 8, Network and Modem Problem Determination  
This chapter covers problem determination (PD) on modem and tty port, followed by the remote procedure call (RPC) for network communication. It also covers procedures for starting the callhome process in the foreground to aid in PD.

- Appendix A, Service Director tty Port and Modem Setup  
This appendix shows how to set up tty port from SMIT, and how to properly install and set up IBM supported modems.
- Appendix B, Transfer Packages from VM to a PC  
This appendix covers various ways to download code from VM to a PC to support servicer-obtained code.
- Appendix C, International Language Environments  
Service Director is not National Language Support (NLS) compliant, but will support NLS-configured machines. Appendix C explains the procedure for changing the token diagnostic message to a language other than English.
- Appendix D, Service Director Error Messages  
This appendix lists all application return codes and error messages with description and actions required to recover.

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## 1.1 Service Director Overview

Service Director for RS/6000 is an application program that operates on a customer's IBM RS/6000. It is invoked by the proper installation of the program and successful registration, set up, customizing, and distribution of entitlement data and application code.

**Service Director for RS/6000 is offered as a part of the IBM Warranty or IBM Maintenance Service package for no additional charge.** Due to entitlement checking at the IBM server, machines not on IBM Warranty or Service **can not** be entitled for this service.

The Service Director for RS/6000 includes the following three major components:

- **Product Support Application (PSA).** The PSA determines appropriate error disposition, then captures and passes information required to resolve any problem identified on a particular product or option to the analysis engine.
- **Analysis Routine.** The analysis routine within Service Director schedules the execution of the PSAs. They may be configured to run constantly or on a specific time schedule. When the analysis routine runs, it monitors errors or events identified by a PSA.

Errors or events are logged and depending on customer configured options, the analysis routine may notify a person or persons within the customer account and automatically transmit hardware errors and associated problem information to an IBM support center for remote analysis and action. If necessary, an IBM Service Representative is dispatched to the customer site with the parts needed to correct the problem reported.

- **Display Routine.** The display function is the user's interface to Service Director for RS/6000. It provides a structured view of problem management information, such as:

- Status of recent hardware events logged by Service Director
- History of hardware events
- Remote viewing of client event logs
- Configuration and run options
- Lock and reset functions



## Advantages of Service Director for RS/6000

The Service Director application can automatically report hardware related problems to IBM for service by the modem on the local server. The Service Director application can also automatically do problem analysis on those problems before calling for service. This level of Service Director supports all classic RS/6000 machine types and the 9076. Classic RS/6000 refers to machines that have concurrent diagnostics installed. Some of the PCI-based PowerPC machines had diagnostics on CD-ROM, and were not concurrent.

Service Director aids IBM Service Representatives in problem source identification, and it may be used to automatically place service calls to IBM for most hardware errors. System errors are dynamically monitored and analyzed; no customer intervention is required. Service Director for RS/6000 further simplifies error analysis for some errors once the Service Representative is onsite by using the Service Director event log. Customers' hardware error logs can now be reduced, because errors are being maintained within Service Director event logs.

In summary, the advantages of Service Director for RS/6000 include:

- Automatic problem analysis
- Manual creation of problem reports
- Automatic customer notification
- Automatic problem reporting
  - Service calls placed to IBM without operator intervention
  - Vital Product Data reported to IBM
- Common focal point for service interface
- Problem-definable threshold levels for call placement
- Reduced hardware error logs
- High-availability cluster multiprocessing (HACMP) support for full fallback; includes high-availability cluster workstation (HACWS) for 9076
- Simple and complex environment support with minimum analog lines

## Automatic Problem Reporting

Service Director has the capability to report problems that it detects for automatic problem reporting to Remote Technical Assistance Information Network (RETAIN), the IBM problem management system. The problems are generated from errors reported in the error log and diagnostic data files. The errors detected in the error log must meet a preset threshold number before a service call is placed. Diagnostics or diagela must produce a valid Service Request Number (SRN) under analysis and save it properly. More about the threshold settings is discussed later in this guide.

The 9076 system complex errors are posted to the 9076 RETAIN queues for support, while the classic RS/6000 system errors are directed through RS/6000 support structure.

## Manual Problem Reporting

Service Director allows you to create manual hardware reports to RETAIN. From a motif environment SD/6000 "smit" menu allows you to create an immediate or deferred hardware call. Fast path may be used; **smitty servdir\_man** also invokes the **Manual Call** option. Machine type/serial and host name are automatically filled in from the host. You must enter an error code and the description of the problem to be reported.

## Automatic Problem Analysis

Service Director does some automatic problem analysis before it places a service call. When a system has logged an error, Service Director allows the system to run diagnostics against the failing resource or diagela against the error log.

The first PSA to be run is the `ibm.psa`. It is dependent on the RS/6000 diagnostic structure to provide a valid SRN against the failing resource. Not all errors result in SRN generation; this is dependent on diagnostic thresholds. The next PSA is the `ibmelh.psa` (error log hardware). It is dependent on the Service Director parameter tables. These parameter files are defined by the product service support requirements, and basically support devices not supported by the diagnostics or diagela structure.

## Problem Definable Threshold Levels for Call Placement

Service Director automatically reports problems based on default settings. The customer may (1) modify these default settings to prevent Service Director from placing a service call by the **SD LOCK** option for all error log machine problems, or (2) restrict specific devices/adapters from placing the service call to IBM by using the ignore resource. A particular SRN or error label may have added threshold values to prevent or delay service call generation.

There are default settings for the threshold values of errors which are logged to the Service Director event log before a service call is made. These values and where to change them are discussed in "Setup Menu - PSA Hold Files" on page 4-36.

## Problem Reporting

Each client machine with Service Director for RS/6000 installed will report its own problems to IBM either through a modem or a network attached server.

Additionally, the **Notify** option of Service Director can send an e-mail message to a maximum of three contacts relating all or limited machine problem information. The e-mail function must be active and configured on each of the client host that Service Director is running on for notification to be utilized. Some customers may prefer to manage all problems from one location, and Service Director will work within that philosophy.

The server option provides for the establishment of a local reporting machine on the network to become the reporting machine that forwards the service call to IBM. The local server host reporting by modem to IBM may be any valid RS/6000 on the network. The server/forwarded host allows client machines on the network to forward calls to the local server with the modem, minimizing required analog phone lines to support the account.

## Service Focal Point

The current release allows for a single focal point for the Service Representative to view errors reported from remote client machine which are on the network. Any Service Director client host on the network with remote copy function active may have its event log viewed from another Service Director host user interface.

---

## 1.2 Service Director Function

**Service Director for RS/6000 only works on AIX/6000 Version 3.2 or above. Further, the 9076 Parallel System Support Program (PSSP) code must be at Release 1 Version 2 or above to properly support the error log PSA for spmon and HiPS or SPswitch.**

Service Director is driven on a timed cycle or error notify. After a preset interval, the Service Director application checks the diagnostic results, failed or pending transmission events. However, Service Director is virtually asleep until its next scheduled check unless a hardware event is logged to the system Error Log. When this occurs **errnotify** invokes Service Director.

The time interval at which Service Director repeats its checking is set during installation. This auto run interval defaults to the shortest time allowed once every hour. This crontab entry is distributed to the client host with a five-minute stagger within the hour range, thereby reducing a possible modem overload. Each client host user interface has a utility option that allows additional modification of the crontab if necessary.

When Service Director is notified of a fault in the Error Log, it automatically starts actions to prepare and send a request for service.

The Event Log records the problem with an Open status, provided all communications have been successful and a Problem Management Record (PMR) has been completed. If notification is active, the call status and data are e-mailed to all users listed under call notification from the failing client. Service Director for RS/6000 continues to go to sleep and wake up to monitor the system for other problems.

If the Error Log entry that "woke it up" is not a duplicate problem, Service Director automatically analyzes the problem and immediately places a service call. Service Director for RS/6000 works in real time with errors detected from the error log.

In order to prevent sending too many calls, Service Director sends a service call only once for any problem which has an open PMR with IBM. A duplicate condition is posted in the Event Log. If the PMR is closed, then a new call is generated. If the same error occurs on the same host within a 24-hour period, no additional calls are made. This can be changed in the Service Director configuration.

Ideally, the Service Representative receives the machine type/serial number, host name, and SRN of the faulted machine. The PMR is analyzed by the Support Center, which provides the most likely field replaceable units (FRUs) required to correct the customer problem.

More specifics about how Service Director handles problem preparation and reporting are covered in Chapter 6, "Technical Overview."

An additional unique feature of Service Director for RS/6000 is the ability to assist in ensuring maintenance service continuity by providing the customer early warning notification of upcoming Warranty or Maintenance expiration. Service Director gives the customer renewal reminders at 90, 60, and 30 days prior to expiration. This is an automatic feature that is built into Service Director and is activated after the customer performs registration with IBM.

## Service Director Limitations Based on Type of Error

The following types of errors are ones for which Service Director **is able** to initiate a service call:

- Any machine or input/output (I/O) generated hardware SRN in the diagnostic data report files.
- Any IBM PSA that generates a problem in the Event Log, provided the default has not been reset to HOLD "Y," which prevents the PSA from running and reporting the problem to the Event Log.
- Any PSA of an original equipment manufacturer (OEM) device/peripheral that interfaces with the IBM diagnostic software routines.
- Selected error log entries for High Performance Switch (HiPS) or SPswitch faults on 9076.
- Selected error log entries for 9076 supervisor faults.
- Any machine check or check stop logged to the error log which may lock up the machine and require an initial program load (IPL). After IPL diagnostics, if a valid error log entry is produced, a service call is generated by Service Director for RS/6000.

The following types of errors **never** initiate an automatic service call:

- Any device attached to the system that does not produce diagnostic SRNs for faults, and for which there is not a valid PSA activated in Service Director for RS/6000.
- Any PSA that has been marked inactive by a HOLD "Y" in the Setup menu.

## Automatic or Manual VPD Calls

Service Director at release 3.0 provides an automatic or manual Vital Product Data (VPD) call in for all configured machine types. The VPD PSA checks at configured intervals to see if the VPD has changed since it was last reported. If change is detected Service Director will automatically call in the complete VPD file to IBM. The Service Director SMIT menu provides a manual method to call in VPD at any time needed. The "SMIT or smitty fast path" `smitty servdir_vpd`.

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## Chapter 2. Installing Service Director for RS/6000

This chapter outlines the items necessary to obtain code and complete a successful installation of Service Director for RS/6000. It covers:

1. The prerequisites for the customer's account and the various methods to obtain the code.
2. The actual procedures to do the install on the local server.
3. A registration checklist along with various action list for registration activities.

This section of the guide includes detailed installation instructions for Service Director for RS/6000. Although Service Director for RS/6000 was designed to be completely customer installed, in the 9076 and high end server arena the Service Representative may be the one to install it.

### Objectives

On completion of this section of the guide you should be able to:

1. Recognize the proper procedure for the initial installation of Service Director
  - Obtain code and documentation for Service Director for RS/6000
  - Identify the machine prerequisites to install Service Director for RS/6000
  - Install Service Director for RS/6000
  - Know the steps needed to update Service Director for RS/6000
2. Prepare the customer environment for Service Director

### Service Time Reporting

Any time spent installing, updating, or talking to a customer about the Service Director for RS/6000 should be coded as Service Code 48 with Activity Code 31, account management time. The words SERVICE DIRECTOR should be entered in the narrative/comments section.

EMEA/LA/AP should record the time according to local procedures.

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## 2.1 Service Director for RS/6000 Prerequisites

Remember that Service Director can only be installed on classic RS/6000 running V3.2 of AIX/6000 operating code or above, with concurrent diagnostics installed.

Service Director should be applied at the customer's convenience. Install, registration, and client code distribution, may be done concurrently with daily operations. Once the registration key has been installed, the Service Director User Interface may be invoked concurrently.

Service Director requires the installer to have root authority on the local server machine where the install is done. You do not have to know the root password, but must have access to a root-authorized window. If complex does not have remote shell capabilities (rsh and rcp), then you will need to have access to a root authorized ID and password for steps 4 and 5 of registration process.

## Disk Space Necessary

Check system disk space for /usr for less than 98% used. **df /usr** The 98% can be reconfigured. On machines with 'rsh' the 98% check is done automatically upon the first remote access from the registration application. A warning message is issued in the case of insufficient disk space.

The amount of disk space necessary for installation and use of Service Director is around 4.5MB for full installp. The client machine needs only 1.3MB of free disk space.

## TTY Requirement

A tty device must be available to the local server that will attach to the modem. The characteristics of this tty should be 9600 baud, no parity, 8 bits, with 1 stop bit. **See Appendix A, "Service Director tty Port and Modem Setup" on page A-1 if setup or changes are required.**

## Modem Requirements

Service Director for RS/6000 requires an asynchronous 9600 baud or greater with error correction in the United States. Please refer to local procedures in your country to see what the modem requirements are for Service Director

Initial requirements of any 1200 baud or greater asynchronous has been dropped due to no error correction capabilities below 9600 baud.

**See A.1, "Modems to Support Service Director" on page A-4 for additional information.**

The modem is tested during the registration process, step 2. This is the first time the application should be in the proper configuration to successfully communicate to the IBM Service Director server.

Customers who wish to use their own modems should have them tested with a previous application before use on Service Director for RS/6000.

**Note:** If modem configuration assistance is required, the customer should contact the modem vendor for assistance. Assistance with IBM modem configuration issues can be obtained for a fee by registering for IBM Support Family Services. For additional information or registration information for IBM Support Family Services, please call 1-800-CALL-AIX (1-800-225-5249) and select option 2, select option 1.

**Or use your local support structure.**

Information regarding modem standards, general modem setup, and specific configuration tips for IBM Asynchronous Adapters can be found in the MODEMS PACKAGE on AIXSERV.

Some Product Divisions are shipping modems with the products for use of Service Director for RS/6000; please utilize these modems when applicable. Remember, these modems are considered to be assigned to the product serial number, so if the machine moves, the modem goes with it. In the United States the local Availability Services (AS) may procure or supply the modem or equivalent if necessary.

## Diagnostics

IBM diagnostics must be installed on the system with Error Logging and Error Log Analysis enabled. In the 9076 arena this is standard. During the setup process of installp or step 5 of registration, these items are verified and appropriate messages are presented. Service Director for RS/6000 is dependent on diagnostic structure, and concurrent diagnostics must be available for proper analysis.

---

## 2.2 Questions to Ask

**What machine would best serve as the local server?** The following items should be considered for the local server (the machine where the modem will be attached):

- Has an available serial port.
- Has dotted IP addressability from all client and client/server machines.
- Has remote shell capabilities to all clients.
- Needs at least 5 MB of available hard disk space.
- Machine is on Warranty or MA with IBM.

**Which "rsh" and "rcp" commands are used at local server?** The default to /bin for BOS rsh (Remote SHell) and rcp (Remote CoPy) and for SP Kerberos /usr/lpp/ssp/rcmd/bin directory for rsh and rcp commands. If any other remote directory is used for these two commands, you will have to enter the appropriate directory when prompted in the registration application and on the Service Director remote menu. Make sure **Kerberos ticket for rcmds is valid** when working on the SP.

You do not need the remote capability to install or use Service Director, but during distribution of code in steps 4 and 5 you will need to have the password entered for each client, during transfer and execute process, at the prompts.

**Do all the client machines have IP addressability to the local server?** In Release 2.0 only simple configurations were supported, which meant that all clients had to see local server. At Release 2.1 complex configurations are supported and isolated IP address networks can be supported by the client/server running "callhome" daemon forwarding to the local server.

**Do you require a backup of the local server?** A secondary local server with another modem attached and IP addressability to the client machines may be implemented. Reference + entry at 7.3, "Build Communication Topology Detail (Step 3)" on page 7-25 for details. This will provide backup callhome capability in the event of primary server failure.

**Do all machines have sufficient /usr file system space?** Service Director installs and executes in /usr file system. The default max % is 98, but this can be configured for more or less space under Service Director configuration menu. If /usr space meets or exceeds max %, Service Director will not do functional analysis or create additional files. Technical notification will occur.

**At what e-mail address or alias does the customer want notification?** E-mail notification comes from each machine that executes Service Director and not just from the local server. The machine that takes the event, sends the mail. If the e-mail structure is not setup at the account, then do not make any notification entries on the setup menu.

**Are there any resources that should NOT report to IBM?** OEM resources may be ignored by the IBM.PSA using the PSA HOLD FILE of the setup menu.

**Are there any hardware SRNs used for notification?** Some applications produce a hardware SRN to inform the operating system of actions needed. Some hardware produces an SRN for application notification of action. If these SRNs are not events that Service Director should call home on, then they should also be entered in the PSA HOLD FILE.

**What are the primary HOSTNAMES of all client machines?** You will need to know the hostname of the client to build a machine list. If you do not have "rsh" ability you will need to know the 'uname -m' number of each client. You will also need the Type and serial number of all machines in the list. If you are doing a 9076 complex with dsh capabilities, you do not need to know any of the hostnames or processor ID numbers, Service Director will obtain them for you.

---

## 2.3 Obtaining Service Director Code

### Mail

Contact IBM via 1-800-IBM4FAX in the U.S. only, and request document number 1715. Both Internet and mail instructions are included with this fax document. To receive the Service Director for RS/6000 application diskette, you will be required to fax information to a designated IBM fax number: 1-303-924-6287.

### Preloaded on RS/6000

RS/6000 machines that come from the factory with preloaded AIX code, may have the Service Director code already installed. This practice is being discontinued because, as it is difficult to make sure the latest Service Director code is installed. Please obtain the latest Service Director by using one of the following procedures.

## Obtain Latest Service Director Code from the Internet, CORE, or AIXTOOLS

### Internet

You may obtain the code from the Internet to download Service Director for RS/6000 electronically. Point your browser to [ftp://ftp.software.ibm.com/aix/servdir\\_client\\_code/](ftp://ftp.software.ibm.com/aix/servdir_client_code/). Select the file you wish to download and then "Save As" whatever the file name should be on your local system.

To transfer Service Director for RS/6000 via FTP, follow these directions:

1. Log in (or su) to root if on RS/6000 or open a terminal window if on a PC.
  - cd /tmp
  - ftp ftp.software.ibm.com or
  - ftp 198.17.57.66
2. Login name: **anonymous**
3. Login password: **your e-mail address**

Once logged in, set the file transfer type to Binary and get the Service Director install file named "servdir.installp.Z". Type the following:

- bin
  - cd /aix/servdir\_client\_code
  - get servdir.installp.Z  
get sd6k.emt
  - get sd6kug.ps.Z  
get sd6kug.pdf
  - quit
4. Go to 2.5, "Uncompressing the Code" on page 2-7 if you are on the local server where Service Director is to be installed.
  5. Go to the appropriate procedure to build a diskette for transport. The installp code go to "Build TAR Diskette at RS/6000" on page 2-7 and for EMT step 2 at "Transfer Code from VM to PC for RS/6000 for EMT Diskette TAR Image" on page 2-6.



## CORE (Current Object REpository)

9076 Scalable POWERparallel System code is provided in EMT4WIN format, while documentation is in HTML and PDF formats in the package listed under RS/6000 Product Family, M/T 9076 or Common Manuals.

The CORE package is found under RS/6000 Product Family, RS/6000-Common Manuals or M/T 9076. The files are:

- SD6KUG.HTM (HTML format document)
- SD6KUG.PDF (acrobat format document)
- SD6K.EMT (TAR code diskette image in EMT4WIN format)

**Producing the code diskette for installation from CORE Package.:** The diskette that is produced with this procedure is in a format that the servicer or customer can use directly with a computer that is using AIX as it's operating system. This diskette once produced on the MoST platform will be a tar image of the compressed servdir.installp.Z file. These instructions assume that they will be followed from beginning to end.

1. On the IBM WorldWide MoST Platform ,start Lotus Notes
2. Next Open the CORE database application on Lotus Notes
3. Select the '**Product Family**' button on the left
4. Select the '**RS/6000**' entry in the list
5. Scroll to the list entry '**9076**' or '**RS/6000-Common Manuals**'
6. Select the item to expand
7. Scroll to the list entry 'Service Director for RS/6000, Code'
8. Select the listed entry  
**Note:** It is recommended that you create the diskette from a '**local image**'. If you do not have a local image or a copy of image on a CD press '**Make a local copy**' on the Server line.
9. Place a 1.44 MB diskette into your 'A' Diskette drive
10. Press '**Launch**' on the line that is for the '**LOCAL**' or '**CD**' image.  
This will bring up the EMT4WIN application, follow the prompts to build diskette.
11. Use the diskette and follow the appropriate procedure steps under 2.4, "Obtain Code from Diskette" on page 2-7 to install at account.

**Producing the documentation from CORE Package.:** From the previous procedure select the format of the documentation you wish to utilize. The PDF for viewing with acrobat viewer on a laptop or PC, or the HTML for viewing from any browser. Try the HTML you have hot links directly to the detail for assistance.

1. Scroll to the list entry 'Service Director for RS/6000 Information Guide'
2. Select the listed entry
3. Press '**Launch**' on the line that is for the '**LOCAL**' or '**CD**' image.  
This will bring up the proper application to display the selected documentation.

## AIXTOOLS

As a Service Representative, you may request the code from AIXTOOLS. From VM, issue the following command: **OMNIDISK AIXTOOLS GET SD6K PACKAGE**

The package contains a README file, SD6K ZBIN (access to code), and SD6KUG TERS3820 (User Guide).

- Receive SD6K ZBIN to your VM virtual disk for DOSREAD image.
- Or receive SD6K EMTBIN to your VM virtual disk for EMT tar image.
- Receive SD6KUG TERS3820, un-terse, and print to VM system printer.

### Transfer Code from VM to PC for RS/6000 DOSREAD Diskette Image

To transfer Service Director for RS/6000 from your VM system to a PC, using the **receive** command, follow the instructions below. Or, reference Appendix B, "Transfer Packages from VM to a PC" on page B-1 for other methods to download.

1. Go to a PC session and download binary code to a diskette by typing:  
receive a:sd6k.ipz SD6K ZBIN A
2. Use this procedure for RS/6000 that have **DOSREAD** capability.
3. Then type: dosread sd6k.ipz /tmp/servdir.installp.Z

If you download to a PC, use the **DOSREAD** command on AIX to load the RS/6000. Rename the file to "servdir.installp.Z" when you do the **DOSREAD**.

4. Go to 2.5, "Uncompressing the Code" on page 2-7.

### Transfer Code from VM to PC for RS/6000 for EMT Diskette TAR Image

Use this procedure from IBM CE portable Mobile Solutions Terminal (MoST) to create installp **TAR** image for Service Director.

1. Go to a PC session and download binary code to a diskette by typing:  
receive c:\\$user\sd6k.EMT SD6K EMTBIN A  
Reference Appendix B, "Transfer Packages from VM to a PC" on page B-1 for other methods to download.
2. Start **EMT4WIN** from **PROGRAMS** using **UTILITIES** folder.  
Or, type **EMT4WIN** at the **RUN** prompt and press **Enter**.
  - Click on the **Setup** pushbutton at the bottom of the screen.
  - Click on the **Force Formatting** check box then the **Apply** pushbutton, then **OK**.
  - Click on the **Write diskette from Diskette Image** icon on the main menu
  - Make sure a good diskette is in the target drive.
  - Enter the **path, filename, and filetype (c:\\$user\sd6k.emt)** of the Service Director installp file then click on the **OPEN** pushbutton.
  - The diskette will be formatted as the code image is written to the diskette.
3. Use this diskette and follow the appropriate procedure steps under 2.4, "Obtain Code from Diskette" on page 2-7.

## FTP Code from VM to RS/6000 or between RS/6000

To transfer Service Director for RS/6000 from your VM system to a RS/6000, or from one RS/6000 to another RS/6000, follow these instructions:

1. **ftp** *risc\_hostname* (dotted address or target host).

- Name: **valid user ID**
- Password: **ID's password**

Once logged in, set the file transfer type to Binary and get the Service Director install file named "servdir.installp.Z". Type the following:

- `bin`
- `cd /tmp`
- `put sd6k.zbin.a servdir.installp.Z` or just `put servdir.installp.Z` for between RS/6000
- `quit`

2. Go to 2.5, "Uncompressing the Code."

## Build TAR Diskette at RS/6000

With the Service Director compressed file down to the RS/6000 workstation, you may transfer the /tmp/servdir.installp.Z to other systems via ftp or archive it to a single 1.44 MB diskette. Make sure you are in the directory where installp file exist, then do.

```
tar -cvf /dev/fd0 ./servdir.installp.Z
```

With the compressed file archived to diskette, you may follow the appropriate steps under 2.4, "Obtain Code from Diskette."

---

## 2.4 Obtain Code from Diskette

To obtain Service Director for RS/6000 code from an archive or tar format diskette, follow these directions:

1. Log on to the local CPU host, as root.
2. Type `cd /tmp`
3. Type `tar -xvf /dev/fd0`  
This copies servdir.installp.Z to /tmp.
4. Go to 2.5, "Uncompressing the Code."

---

## 2.5 Uncompressing the Code

- Type `cd /tmp` if you are not already in /tmp.
- Enter the following:  
`uncompress servdir.installp.Z`  
`inutoc /tmp`

Once you have issued the **uncompress** command, servdir.installp.Z becomes servdir.installp. (Uncompress is looking for capital Z.)

To complete the installation, follow the installation procedures in 2.6, "Installation Procedure" on page 2-8.

---

## 2.6 Installation Procedure

### Installing Service Director

There are two methods to install Service Director for RS/6000: the AIX smit tool, as described below, and the **installp** command, described in "Installp from Command Line."

You may install this release of code over the previous Service Director versions and machine list and communications files will remain the same. Then do step 5 of the registration application to distribute new code to clients. You may also wish to remove the old version with the **/usr/lpp/servdir/servdir.remove** command before installing new code.

If your current code is Release 2.0 or greater, you may save your old configuration files using "Backup/Restore Process" on page 7-23. Use the null entry to save configuration in the /tmp directory while you remove the old code and install the new code, then use the restore option from null to load the configuration to the new code.

#### Service Director installp on Service Agent CD

Service Agent is the next generation of Service Director and will be delivered on CD install media and ftp web site. The CD install media may also contain the latest Service Director installp image in a non-compressed format. Installation from smit has CD media added to steps. This documentation may also be selected in either PDF or HTML format from the CD. Follow the mount instructions listed on the CD label and select the sd6kUG.pdf or the sd6kUG.html level of documentation.

#### Installp from Command Line

To install Service Director via installp do the following:

1. Log on to the local CPU host as root or a root authorized ID. The local host is where the modem is attached, and where the registration application is to be executed.

2. Enter: `installp -aqXd /tmp/servdir.installp all`

If installp was not loaded into the /tmp directory then please enter the appropriate directory name in the command in place of /tmp.

If you are reinstalling Service Director, or have not removed Service Director completely then use the following command:

```
installp -FaqXd /tmp/servdir.installp all
```

3. Check the "Installp Summary" message; see step 4 on page 2-9 for successful completion.

4. **Go to Section 3 "Registration Introduction" on page 3-1.**

Review registration introduction then start registration application.

## Installp from SMIT

**Note:** If you are replacing Service Director with the **same level, use the command line** entry to force "-F", SMIT will not force, it will only fail.

To install Service Director via "smit" do the following:

1. Log on to the local CPU host as root or a root authorized ID. The local host is where the modem is attached, and the registration application is to be executed on.

2. Enter: smit or smitty if you don't like GUI.

If you use fast path enter `smit install_latest` and continue at step 3e.

3. Go to the "Software Installation and Maintenance"

a. "Install and Update Software"

b. "Install and Update (Selectable) Software (Custom Install prior 4.2)"

c. "Install Software products at Latest Available Level"

d. "Install New Software products at Latest Level" (4.1)

e. "INPUT device/directory for software"

- Input full Service Director path and file name of installp.

- /tmp/servdir.installp **OR**

- If installing from CD, then select CD device.

- Press Enter key or the DO or OK button.

f. "SOFTWARE to install"

Input `serv_dir` or PF4 for prompt and select **serv\_dir**.

Set OVERWRITE to yes if you are forcing the same code level.

g. Press Enter key or the DO or OK button.

h. Press Enter key or the OK button to pass the ARE YOU SURE? prompt.

4. The following 3.2.5 "Installp Summary" message will indicate successful installation.

NAME	STATE
serv_dir.obj	applied
serv_dir.obj	committed

The Installation Summary for later levels will look like:

Name	Level	Part	Event	Result
serv_dir.obj	3.1.0.0	USR	APPLY	SUCCESS

During the installation there will be a continuous scrolling of the screen ending with the Installp Summary message, provided Service Director encountered no problems. An error message will show any problems and actions can be found in Appendix D, "Service Director Error Messages" on page D-1 of this guide.

5. After installation is complete, select DONE and then CANCEL back to System Management.

6. Service Director registration application can now be invoked from SMIT.

7. **Go to Section 3 "Registration Introduction" on page 3-1.**

Review registration introduction then start registration application.

---

## 2.7 Service Director Registration Checklist

The Service Director registration process is required to associate the processor ID number with a machine type/serial number for IBM entitlement purposes. Since Service Director can be placed on multiple machines at the customer location, the registration process has been set up to execute in steps. Detailed execution of all five steps is shown in Chapter 7, "Detail Registration Process" on page 7-1, while Chapter 3, "Registering Service Director" on page 3-1 shows a high-level flow for installation.

Not all steps have to be executed if only a single RS/6000 is being setup. Only steps 1 and 2 are required now at level 3.0 to activate a fully entitled key for a single RS/6000. The 9076 is considered to be a cluster of RS/6000 and all five steps must be completed to fully implement Service Director on the single serial number.

### Need to Add More Clients or Machines to Service Director

All five steps are required to fully implement Service Director on additional machines or nodes. If a donor image was used from another Service Director machine, then omit step 5, since code is already on the client.

### Need to Update Code to New Release

Obtain new release of code, uncompress it, and do the installp on the local server.

1. Invoke Service Director Registration process.
2. Do registration step 3. Reply yes to callhome prompt to start new callhome process.
3. Complete registration step 3.
4. Do registration step 5. Send new code out to client.
5. Exit Service Director Registration process.

### Need to Remove Code from Complex

1. Invoke Service Director Registration process.
2. Use option **d** to delete application code from client machines.
3. Exit Service Director Registration process.
4. Use SMIT or smitty Service Director menu to delete application code on local server if required.

### Need to Correct Registration Data Customer Information Only

If customer contact, phone number, customer number, or customer location changes, then the IBM database needs to be updated to correctly dispatch and track problems. If any of this data needs to be changed, do the following:

1. Invoke Service Director Registration process.
2. Do registration step 1. Update option to correct information.
3. Do registration step 2. Re-register updated machines with IBM to update entitlement database.
4. Do registration step 1. Save backup image of registration database.
5. Exit Service Director Registration process.

## Need to Correct Machine Type, Machine Serial Number, or Processor ID

### *New Processor ID Due to Manual Update, Parts or Machine Replacement*

#### ***Machine Type or Machine Serial Number was incorrect***

If the 12 digit processor ID number has changed, machine type or serial number initially assigned to processor ID number needs correcting, then do following

1. Invoke Service Director Registration process.
2. Do registration step 1. Update option on hostname with new processor number. If rsh is applicable, enter hostname and new processor ID will automatically be filled in on Build2 menu. Otherwise enter new 12 digit number on option **2**.  
If type or serial number needs updating, use option **3** or **4** to correct.
3. Do registration step 2. Re-register updated machine to get a new entitlement key.
4. Do registration step 4. Send new key out to client.
5. Exit Service Director Registration process.

## Restore Clients from Another Machine Donor Image

A previously installed Service Director client that has been given another machine entitlement key by donor image, only has to have its original key resent from the local server. To do this:

1. Invoke Service Director Registration process.
2. Do registration step 4. Send the original key out to the affected client.
3. Exit Service Director Registration process.

## Change tty Port, Modem Configuration File, or Modem Dial-Out Number

To add or change the modem configuration file, the 1-800-830-1041, or if the customer has requested you to change the tty port being used by the local server. Validate tty port or modem is properly configured. See Appendix A, Service Director tty Port and Modem Setup. Then follow these steps:

1. Invoke Service Director Registration process.
2. Do registration step 1. Update option to correct information on local server.
3. On Build2 menu, select option **o** to update communication data.
4. On Build3 menu, correct tty port # or enter **d** to scroll down.
5. On Build4 menu, enter item **14** and select the correct modem file, or item **21** and correct phone number.
6. Enter save **s** option and **NO** to overwrite prompt.
7. Enter save **s** option from Build2 menu to complete save function.
8. Return to Main Menu and use step 2 to make test call or do registration step 4 option **e** and send new data to local server.
9. Exit Service Director Registration process.

## Need to Check Installed Level of Service Director

Use the following command to verify the installed level of Service Director.

```
ls1pp -l serv_dir.obj
```

---

## 2.8 Service Director Quick Checklist

The following list of the items needs to be completed in order to activate Service Director in the customer environment.

### PRE-INSTALL SETUP.

- Have SD Code and Documentation available.
- Have 9600 or greater async Modem and cables ready.
- See A.1, "Modems to Support Service Director" on page A-4.
- Analog phone line available for Modem connection.
- tty port configured reference. tty# \_\_\_\_\_
- See Appendix A, "Service Director tty Port and Modem Setup" on page A-1.
- List of HOSTS with uname -m, Machine Type and S/N.

Connect and set up tty, Modem, phone line to Local Server Host.

### CONCURRENT AIX INSTALL AND SETUP PROCEDURES.

Installp Service Director code on Local Server Host.  
See 2.6, "Installation Procedure" on page 2-8.

Invoke SD Registration application.  
See "Starting Service Director Registration Application" on page 3-1.

- Step 1, Build complex machine list.
- Step 2, Register machines.
  - Generate test PMR. Verify CAD primary Service Representative.
- Step 3, Build reporting topology and set cron entries.
- Step 4, Distribute registration Keys to clients.
- Invoke SD User Interface application.
  - Setup Menu Options.
  - (Set up common files for distribution in step 5.)
  - Notify User
  - SD Configurations
  - PSA Hold File update if required  
(local SRN that are not to call in)
- Step 5, registration Distribute SD Code to Clients.

**Note:** Service Director is now running on this list of clients.

Complete Complex configuration procedures for each additional client/server Host.  
Review 6.6, "Complex Environment" on page 6-10.



---

## Chapter 3. Registering Service Director

### Registration Introduction

In order for Service Director to electronically analyze and submit a problem to IBM, it must be **registered**. Registration takes place by executing the registration program and following the instructions provided in the program. Steps 1 through 5 may be executed at either the local or client server.

The registration program requires Service Director to be installed, and a local modem attached to the server machine intended to be the gateway to IBM in a network environment. This is the single machine that will report/place all service calls to IBM by modem for all the machines on the network.

You can register one or more machines from this registration program. Registration can be performed at anytime on the local gateway host (where modem is attached). Until a key has been generated and distributed to each host, Service Director analyze engine and user display interface will not execute.

The generated key, whether temporary or full-function, is unique to each CPU unit that is covered by Warranty or a maintenance agreement with IBM. You should have the 4-digit type, uname -m number, and the last five digits of the Serial Number available for each CPU (node) you wish to register. Machines with multiple processors under a single serial number can and must have all uname -m numbers registered to that machine type/serial number.

After completion of this section you should understand the complete process required to register Service Director for RS/6000. The registration process includes:

- License agreement
- Introduction to the registration program
- Building list of machines to register
- Registration of all machines
- Building communications topology.
  - Local Server - establishing which machine communicates to IBM
  - Clients - establish client machines communications to local server
- Distribution - sending the enabling files and client code to all machines
- Removal of code - how to remove Service Director code

### Starting Service Director Registration Application

After installation of Service Director for RS/6000, a registration button is available in **SMIT** under **Problem Determination/Service Director/Service Director Registration Session**, or from the command line `/usr/lpp/servidr/servdir.reg`, "SMIT or smitty fast path" `smitty servdir_reg`.

---

### 3.1 Registration Process

Figure 7-1 on page 7-1 will be referred to as the Main Menu throughout this section. The following flow is a list of steps to complete for a simple cluster registration process. References will be made to detail for these steps.

## License Acceptance and Information Screens

Initial acceptance of the licensing agreement must be entered on the fourth licensing screen. Enter the customer Contact name or group name to be contacted, this only has to be done once. See Figure 7-44 on page 7-42 through Figure 7-47 on page 7-43 for details. Refer to Figure 7-52 on page 7-46 for how to correct or replace the contact name.

This application is setup to allow you to complete the steps necessary to register and setup Service Director from a single gateway machine. These steps are set up in sequence on the Main menu Figure 7-1 on page 7-1, steps 1–5. The Main Menu options include:

- Option **d** allows you to remove SD/6000 code from machines that are in the current machine list.
- Item **p** allows you to print the current machine list.
- The **r** allows you to review the introductory help screens.
- Option **I** allows global locking of SD/6000 on all clients with remote capabilities.
- Option **x** is the only proper way to exit the registration program.

To register and activate Service Director, review the overall sequence of events as follows:

### Registration Process Sequence Overview

- Install on the control workstation with the modem attached
- Invoke Service Director Registration Session
  1. Build List of Machines for Registration
  2. Register Machines with IBM
  3. Build Reporting Topology Files
  4. Distribute Registration Files
- Invoke Service Director User Interface on local gateway host
  - Setup local Service Director configuration
- Re-enter Service Director Registration Session
  5. Build and distribute Service Director client code
- Complex is running Service Director on all machines in list
- Exit Service Director Registration Session

Please review the note and continue with step 1 at 3.2, “Step 1 Build List” on page 3-3.

**Registration Build Process:** The build process is used to validate that the machine configurations can properly enable and define the Service Director server/client reporting structure. It will define the unique properties associated with each machine in the configuration, including:

- Machine Type
- Machine Serial Number
- Processor Unique Number (uname -m) All alpha characters are in upper case.
- Processor Host Name (uname -n)

The first three items will be used to validate warranty and maintenance agreement entitlement during registration. This will return a valid activation key for the associated machine or node host. The entitlement end date is part of the activation key. If this date is extended a new key will be distributed on the next service request. If the activation key expires, then the analyze and user interface portions of the code will not activate. Complex will have to be re-registered if the key expires.

**Note:** Within a 9076 complex, all nodes and all control workstations, should be registered under the 9076 type and serial number, if multiple serial numbers are in a complex, make sure nodes have the correct number assigned. This will ensure that the call is under the 9076 support structure and not the RS/6000 structure.

---

## 3.2 Step 1 Build List

Reference Chapter 7, "Detail Registration Process" on page 7-1 for detailed registration procedures if necessary.

- Enter **1** from the Main Menu. See Figure 7-1 on page 7-1.
    - Enter **1** from Build1 menu. See Figure 7-2 on page 7-2.
    - Enter **1** from Build8 menu. See Figure 7-3 on page 7-3.
  - On Build2 menu, enter **i**. This will insert the hostname and processor ID number in items 1 and 2. See Figure 7-4 on page 7-4 through Figure 7-9 on page 7-9.
  - Enter a **3** and then enter machine type, (if 9076 this will stay active, CWS is part of 9076).
  - Enter last **5 digits** of machine serial number after entering a **4** from the menu selection. Make sure nodes are under the correct 9076 serial number if a complex contains multiple systems.
  - Enter option **5** to flip the server bit to **YES** for the local server.
  - Item **6** should have been filled in from the License agreement. Change now if necessary.
  - Item **7** contact phone number must be filled in, which is the number required to dispatch the correct servicer and to call back to account. If this number is changed later you must do step 2 again to correct the IBM registration database.
  - Item **8** is not required, but may be used as a call back number. Put **CB** in front of phone number.
  - Fill in the rest of the customer location information.
  - The United States is entry 174 on item **14**. Please enter the appropriate country number for other locations. You may scroll the list of countries up and down until the number is found, or enter the correct number at anytime.
  - Enter an **o** to change the communication parameters for the local server.
    - Build3 menu
    - Enter **3** to flip to TTY
    - If tty is other than tty1, then enter correct tty in item **5**
    - Enter **d** to scroll down to build4 menu
    - Build4 menu
    - If you are using 7855, 7857, 7858, 7852-400, or any other modem that requires a modem initialization string enter option **14**. This will list any modem cfg files and allow you to enter by selecting the associated number. You may enter the modem file name if it is not shown. Entering a 0 will reset this entry to null.
    - Correct item **21** if prefix access is required or if it is a different country number. 1-800-830-1041
    - Enter an **s** to save the build3 and build4 menu changes.
- Note:** The overwrite default has been moved to the Build4 menu option.
- Enter a **s** to save the build2 changes.
  - New Build2 menu is displayed:

If this was a single RS/6000 installation you would cancel this menu return to Main Menu and complete step 2, and your installation would be complete. If additional machines or nodes are to be registered then they may be added the following two ways:

1. Enter hostname of remote client or node. Reference "Remote Access Authority" on page 7-40.
  - If processor ID can be accessed remotely, item **2** will fill in automatically, otherwise, enter the 12 digit number.
  - Fill in the new machine type and serial number if necessary.
  - Save Build2 menu and cancel last new Build2 menu when no more machines are to be entered.

- Return to Main Menu and continue with Step 2.
2. Cancel Build2 menu and return to Build1 menu.
- Machines may be added by list after first machine is built.
  - Select option **5** for building by list, see “Option 5” on page 7-10 for details if required.
  - 9076 systems that support "dsh" will have an **a** option to build list automatically. See the text following Figure 7-11 on page 7-11 for details.
  - RS/6000 clusters may also use manually built lists. Enter full path and filename at prompt.
  - Execute list with the **c** option.
  - Remote access checking is done on each hostname in the list, see “Remote Access Authority” on page 7-40.
  - Additional lists may be added.
  - Return to Main Menu and continue with step 2 after list is completed.

---

### 3.3 Step 2 Register with IBM

- This is the initial utilization test for the modem on Service Director.
- Enter **2** from the Main Menu, 7.2, “Detail Registration of Machines with IBM (Step 2)” on page 7-16.
- Enter **e** and register a single machine.
  - Select 1 which should be your local server and press Enter. Reference Figure 7-18 on page 7-18, "Register2 Menu," through Figure 7-20 on page 7-19, "Register4 Results Menu" for detail flow.
  - If registration attempt failed, see Figure 7-21 on page 7-20.
    1. Use the help key to display detail of return codes if needed.
    2. If RC = 10, 11, 101, or modem hang occurs, analyze communication fault 8.1, “Modem Failure Analysis” on page 8-1.
    3. For all other codes, follow action suggested from help screen Figure 7-22 on page 7-21 and Figure 7-23 on page 7-21, then continue with step 2 when corrected.
  - If machine registered OK:
    1. If only the local server machine is in the registration list, then the registration is complete. The entitlement key was automatically copied to the working directory. Continue with “Service Director Setup Procedure” on page 3-6.
    2. If only a few clients exist, return and continue to register each.
    3. If more than four machines exist, return back to Register1 menu and use the **all** option to register all of the machines. It is not a problem to re-register machine #1.
    4. If more than 16 clients exist, you may first want to run test call from Register1 menu. See “Registration Test Call” on page 7-21. Then use the **all** option to complete registration.
  - If all machines registered OK, return to Main Menu and continue with step 3.
  - If any machines failed to register with other than RC=10, 11, 101, then the correct problem and re-register with step 2.
  - If RC=10, 11, 101, use the **e** option and register each one separately until all have been registered.
  - After getting all machines registered properly you may want to use the backup process to save this image. Reference “Backup/Restore Process” on page 7-23 for details.
- Return to Main menu and continue with Step 3.

---

## 3.4 Step 3 Topology

- Refer to 7.3, "Build Communication Topology Detail (Step 3)" on page 7-25 for detail of topology.
- Enter **3** from the Main Menu.
- Enter **c** to continue. If you wish to add a backup IP address for the second local server, enter **+** at this point and follow the prompt. Enter the full dotted address of the backup local server.
- The paragraph that is now displayed, says that you can start the callhome process by entering a "yes" response. Enter **y**.
- If you got the message that no server was available, then go back to step 1 and do an update (option **3** on Build1 menu) for the machine that is to be your local server. Make sure item 5 shows "Y" for the server option. Now select option **o** and check that Build3 has item **3** set to tty. Save any screens if you changed any data, return to step 3, and continue.
- Crontab prompt should appear after starting the callhome process. Enter a **y** if you wish to set crontab to other than every hour every day.
  - Follow the menu prompt to change the crontab fields.
  - See Figure 7-30 on page 7-28 for details of initial setting.
  - New entry will be reflected as you enter the various options.
  - See Figure 7-31 on page 7-29 for details.
  - Enter the **e** option to execute the crontab entry that you have just built. You will see the Active Crontab Entry change if the command was successful.
  - The crontab entry made here will be rolled every five minutes around the hour when distributed to the client machines. This prevents multiple clients from trying to use the modem at the same time.
  - Enter the **c** option to continue.
- The last screen for the Topology is to verify the local server dotted IP address and the client hostnames.
  - The top of the display is the dotted IP address of the local server, and is followed by any secondary or backup dotted IP address if **+** was entered.
  - The hostnames for all the clients are listed.
    - If any client is not listed, then they were not added to the list properly.
    - Go to step 1 and do update or add for missing client.
    - Make sure client does not have server option **5** set to "Y."
    - In a complex environment the client\_servers will be listed under this machine as just clients.

**Note:** You must run registration at the client\_servers to make them the servers for the isolated clients.
- Once a probrephosts file exists, you will get added menu options that will affect the total client list. Normally you just hit Enter to utilize the current list being displayed. But new list could be ignored or added to an active list.

**Note:** These are the hostnames that the callhome process will allow. If clients cannot call home, then check that correct communication interface hostname is listed here.
- Pressing Enter will accept the new list and return to the Main Menu. Continue with step 4.

---

## 3.5 Step 4 Distribute Registration Files

- Enter **4** from the Main Menu.
- Refer to 7.4, "Detail Distribute Registration Files (Step 4)" on page 7-31 for details.
- Select option **a** and send registration key to all clients.
  - If remote copy is enabled, then the associated files will be copied to the appropriate directories. The key file `msglog.index` and `customer.dat` to `/usr/lpp/servdir`, the `callhomehost` and `ProbrepAt` to `/usr/lib/ras`.
  - If remote copy can not be executed to the client, then the files will be sent via FTP process. You will be prompted to enter the root password for the client.
  - If you get the message that distribution cannot be done because not all required files are available, then you must do steps 1 and 2 again for the failing client. See page 7-33 for analysis and action for missing files error message.
  - There is no verification if the FTP process is used to transfer files, although a key sent flag may be shown on the detail list. The only sure method to verify correct operation is to test from the client machine after doing step 5.
- If any clients fail, correct problem and use option **e** to send key files to individual machines.
- Return to Main Menu and exit or use another window to setup the local servers SD/6000 options.

## Service Director Setup Procedure

This procedure ensures that all common data to Service Director will be setup properly for distribution in step 5. For example e-mail notification is executed at each machine or node and each machine could have a different list, but if all machines are going to the same notification list, then set it up now and the list will be automatically distributed. Check with administrator to find out if the client wants to have e-mail notification and whether or not each node can do the mail function.

Open or select another window.

Change directory `cd /usr/lpp/servdir` then enter `servdir`, or "smitty fast path" `smitty servdir_exec` to start Service Director. Select the following from the user interface Main Menu, Figure 4-4 on page 4-5:

- Setup, see Figure 4-25 on page 4-25
  - Notify User List, see Figure 4-28 on page 4-28
  - Configuration, see Figure 4-31 on page 4-30
  - PSA Hold Files, see Figure 4-36 on page 4-36
- F3 to exit SETUP

Now that these items have been set in the local host Service Director, you may exit using F10, and return to the registration application. The files just setup can now be distributed to the clients in step 5 so all configurations will be the same.

For HACWS or HACMP machines review 6.8, "High Availability Environment" on page 6-11.

If this was a single machine registration, Service Director activity is complete.

Continue with step 5 from the registration Main Menu.

---

## 3.6 Step 5 Distribution of Client Code

- Enter **5** from the Main Menu.
- See 7.6, “Service Director Detail Code Distribution Menu (Step 5)” on page 7-35 for detail operations.
- If Service Director is properly set up, then enter a **c** to continue.
- Enter the **s** option to set up the proper code to be distributed.
- Enter the **c** option and watch the tar file being built from the client list.
- Return with the **r** once the tar file has been created.
- Now select the **a** option to distribute the code to all clients in the list.
  - If remote commands are active the tar file will be copied to the client, and then commands to extract the files and set up SD/6000 will scroll past the screen. If commit is completed, see step 4 on page 2-9, then SD is running on that client.
  - If remote commands are not active, the tar file will use FTP process to transfer to client and you will be prompted for the password.
  - You will be prompted again for the password to execute the remote exec command to extract the files and set up SD/6000.
- If any clients failed to install code properly, then fix the problem and run step 5 with option **e** for individual machine.
- Service Director should be running on all client machines.
- Now with complex fully installed you may want to use the backup process to save this image. See “Backup/Restore Process” on page 7-23 for details.
- Return to Main Menu and exit registration application.

## Test Client Communication

Now that code and key has been distributed to client machines, you need to verify that clients can call IBM through the callhome process.

- Log on to client machine as root.
- Start SD/6000 user interface from SMIT or smitty.
- Select **utilities** menu from the Main Menu.
- If e-mail is being used, test notification to user IDs.
- Test communications to IBM SD server:
  - An immediate Unknown RC=0 indicates you are having problems calling the callhome process on the local server. See 8.2, “Troubleshooting RPC Network” on page 8-4.
  - The modem should dial out to the network and test the IBM server. This test will not make a RETAIN incident.
  - You should receive a TEST OK message upon a good completion.
- This communication test can be done from the local server if remote commands are available. `rsh hostname /usr/lpp/servdir/servdir.analyze ctest:`
- RC=14 is a good communication test completion code.
- All clients should be tested, but in large complex selected machines from different networks, the test should prove topology integrity.

---

## 3.7 Complex Registration

A complex configuration exists when there are additional RPC client/server forwarders in the network with the local server driving the modem. See 6.6, "Complex Environment" on page 6-10 for both examples. The client/servers may be required because of isolated clients not being able to address the local server.

### Segmented Example

Do **installp** at the local server machine. All initial registration must be done from this local server with the modem. Once a client/server has been setup from the local server, the client/server may now do registration step 2 over the network.

- Build base registration list including all client and client/server machines that report directly to the local server host (segment 1).
- Register and save this base list on the local server.
- Do steps 3 and 4 on the local server Main Menu.
- Start Service Director User Interface and set up notify user and configuration.
- Distribute the client code on step 5 to the client machines on the list.
- Do step 5 set up and distribute client/server code to segment 2 client/server host.

At this point all these machines in segment 1 on this list will be executing Service Director.

Now move to the first client/server host (segment 2) and start registration application.

- Start with step 1 from the Main Menu.
  - Delete unnecessary local server hosts from the segment 2 list.
  - Update segment 2 client/server host as the reporting server (Build2 option 5).
  - Add segment 2 clients to build list.
  - Register and save this new list on the client/server.
- Do steps 3 and 4 on the client/server Main Menu.
- Distribute client code on step 5 to the client machines on the list.

Repeat the above process for all client/server hosts until full complex is running.

### Full Complex Example

Another method would be to build and register (steps 1 and 2) the complete complex of all host machines, then distribute configuration to all client/server hosts. On remote client/server do step 1 delete unnecessary hosts from list, including the original local server. Set and save Reporting Server for the remote host (flip option 2 on Build2 menu). Skip step 2 (not necessary for machines already registered), and complete steps 3-5 on the Main Menu. Complete this process for all remaining client/server complexes.



---

## Chapter 4. Using Service Director

This chapter reviews and defines the options from the Service Director user interface. It also goes through the screens you will encounter within Service Director while taking a service call or setting up Service Director configuration. Some of the functions which control automatic problem reporting are also reviewed. Finally, this chapter covers the procedures for a shutdown or a restart of Service Director.

### Objectives

On completion of this section of the guide you should be able to:

1. Recognize the available options from each Service Director menu.
2. Identify the purpose of each column in the Events screen.
3. Identify the purpose of the Remote Events screen.
4. Identify how to determine proper functioning of the automatic service call feature.
  - Identify the required actions needed for shutdown or restart of Service Director.
  - Identify when Service Director should be locked and reset.
5. Identify how to enter PSA hold information.

**Time Reporting:** Any time spent installing, updating, or talking to a customer about Service Director for RS/6000 should be coded as **Service Code 48**, activity code **31** account management time, and the words SERVICE DIRECTOR should be entered in the narrative/comments section. Time spent using Service Director as part of a regular service call or preventive maintenance call should be coded under the respective service codes for those activities.

**Note:** Service Director is not intended to be a replacement for the RS/6000 Maintenance Package. All service calls should start with use of the standard Maintenance Package. Service Director is to be used as an additional service tool for the system.

**Print Function:** There is a print function available as a function key within the Events-All detail screens which can be used by the customer or you, and may be helpful in diagnosing or documenting hardware problems. Any other screens which are needed for reference should be printed individually with the Print key.

The Manual Custom PMR motif screen will be reviewed first. In order for the Manual PMR screen to function correctly the DISPLAY variable must be set to a valid X-window server.

The Service Director Main Menu screen can be accessed from either SMIT or via the AIX command set. For the remainder of this section let's consider that all activities will be started from the Service Director Main Menu and access is via SMIT, **Problem Determination/Service Director/Invoke Service Director User Interface** reference Figure 4-1 on page 4-2. This will automatically select the curses or motif interface. The bottom line command is `/usr/lpp/servdir/servdir`, or SMIT, or smitty fast path `smitty servdir_exec`.

To force the **CURSES** Main Menu screen select **Curses Service Director User Interface**. The bottom line command is `/usr/lpp/servdir/servdir -C`, or SMIT, or smitty fast path `smitty servdir`.

Each one of the six Main Menu options and their respective sub-screens will be reviewed.

## 4.1 SMIT Menu for Service Director

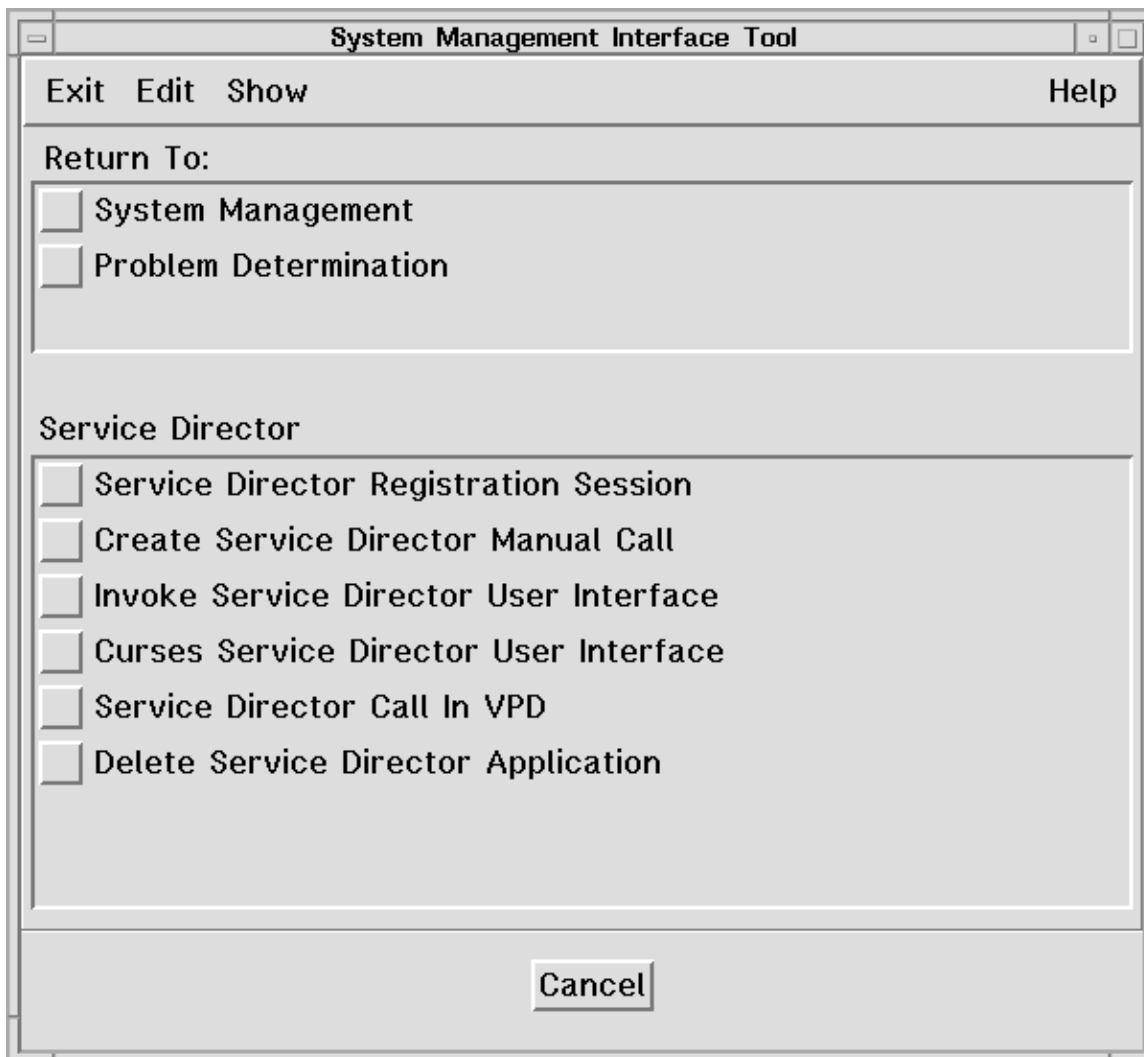


Figure 4-1. Service Director SMIT Menu

In order for the SMIT Graphical User Interface (GUI) screen to function correctly the DISPLAY variable must be set to a valid X-window server. This is true for the SMIT windows, the Manual PMR, and the normal GUI Service Director User Interface. If smitty tty interface is displayed when SMIT was entered, then your DISPLAY is not set for the Motif interface. Use the following example to find out what the local.host.server display is set to, then export your DISPLAY variable back to the local.host.server window.

On your local.host.server machine.

```
xhost +  
access control disabled, clients can connect from any host
```

On your client machine.

```
export DISPLAY=local.host.server:0
```

## 4.2 Custom PMR or Manual Create

The screenshot shows a window titled "SERVICE DIRECTOR - MANUAL PROBLEM REPORTING". At the top left is an "Exit" button. Below it are input fields for "TYPE:", "MODEL:", and "SERIAL:". A "HOSTNAME:" field follows. The "SUPPORT" section has a radio button selected for "Hardware". Below that is an "ERROR:" field. A large text area labeled "DESCRIPTION:" occupies the middle of the window. At the bottom, there are five buttons: "Send Now", "Send Later", "Cleanup", "Cancel", and "Help".

Figure 4-2. Custom PMR Menu

Manual or Custom PMR may be created from the **Motif supported display**, once the host is registered and the key file has been distributed. The SMIT and smitty Service Director menu selection will allow you to create a PMH record for the IBM RETAIN system against the machine type/serial number that the manual PSA is invoked on. SMIT or smitty fast path `smitty servdir_man` or the bottom line command of `/usr/lpp/servdir/custpmr` is used to initiate the custom PMR creation window. The creating host initializes Machine type, serial number, and hostname. The ERROR: field should be the error number that you wish to report. If no error number is involved, then a short description of fault should be entered. Machine type and serial number may be changed on the manual PSA window, but a call will be placed against the machine that the call was created on. The full description should be entered under the DESCRIPTION: label. You may use the **Cut & Paste** function to insert text in to the description area.

By selecting **Send Now** the call will be immediately called into IBM. Using the Send Later pushbutton will stage the call to be called in on next execution of the Service Director analyze routine.

**Cancel** will delete the current call creation only. If you wish to remove any staged calls that may be outstanding, you must use the Cleanup pushbutton. The online **Help** option will explain all fields and pushbutton definitions.

**Note:** This facility may NOT be used to update current RETAIN incidents, only to create the new PMR.

## 4.3 Service Director Main Menu

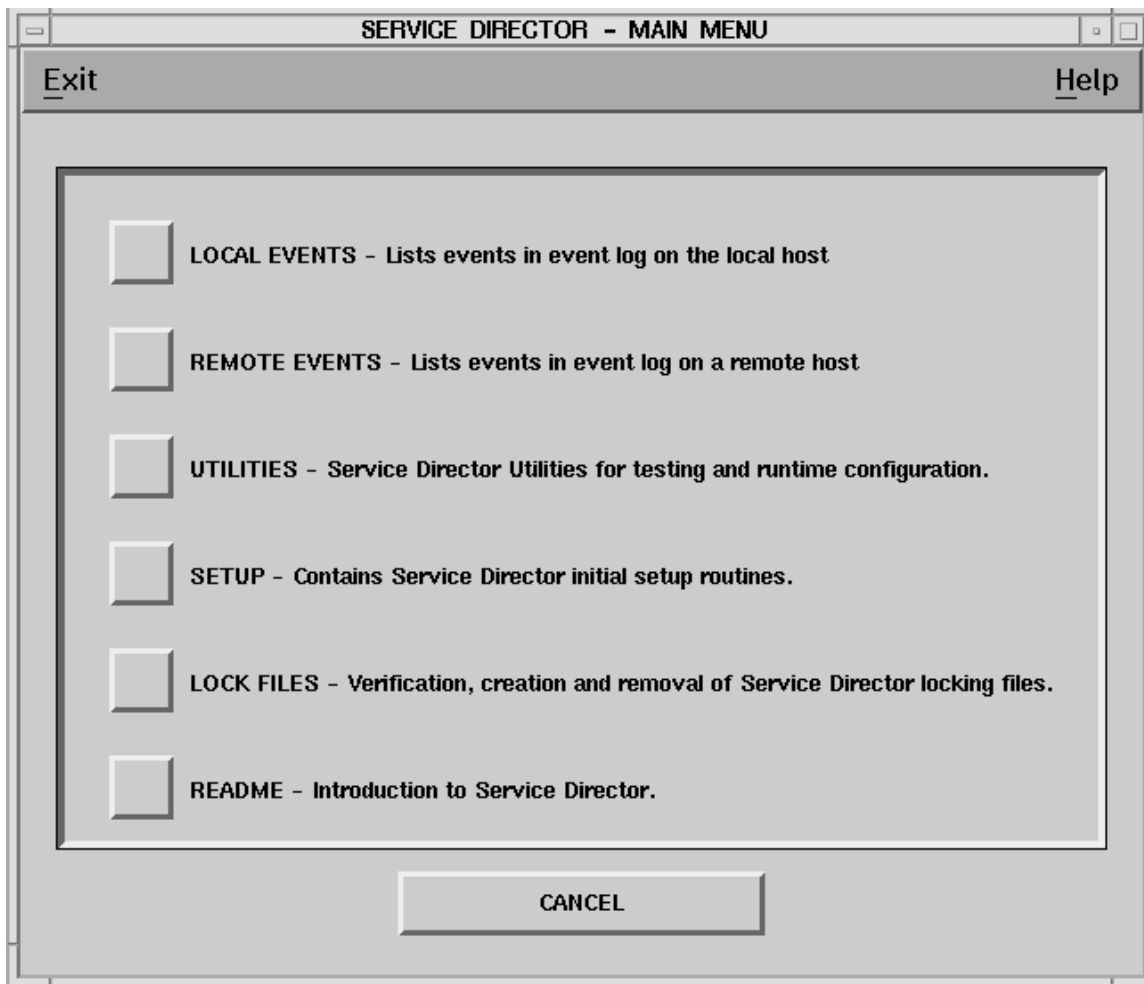


Figure 4-3. Main Menu - Motif

Motif Main Menu of Service Director's user interface. This interface is designed to allow the use of your pointing device along with the keyboard for input. The window selections can also be executed from the keyboard. See the window help menu (PF1) for the individual keyboard functions that are applicable to the unique windows.

**Note:** If initial motif display does not show the **Continue** push button, the window must be re-sized to show push button.

Selecting the menu pushbutton for the desired action will take you to the secondary menus and additional selections. Use the Cancel pushbutton to return to the previous menu, except on the Main Menu. The Main Menu cancel will exit the Service Director user interface application.

The selection of the motif or curses interface is automatic depending on the machines setting of the DISPLAY variable. If available the motif interface is used with Service Director. If the setting is not correct or Display is not motif capable, then the curses interface will be invoked. The curses interface may be forced by using the **servdir -C** command from the /usr/lpp/servdir directory.

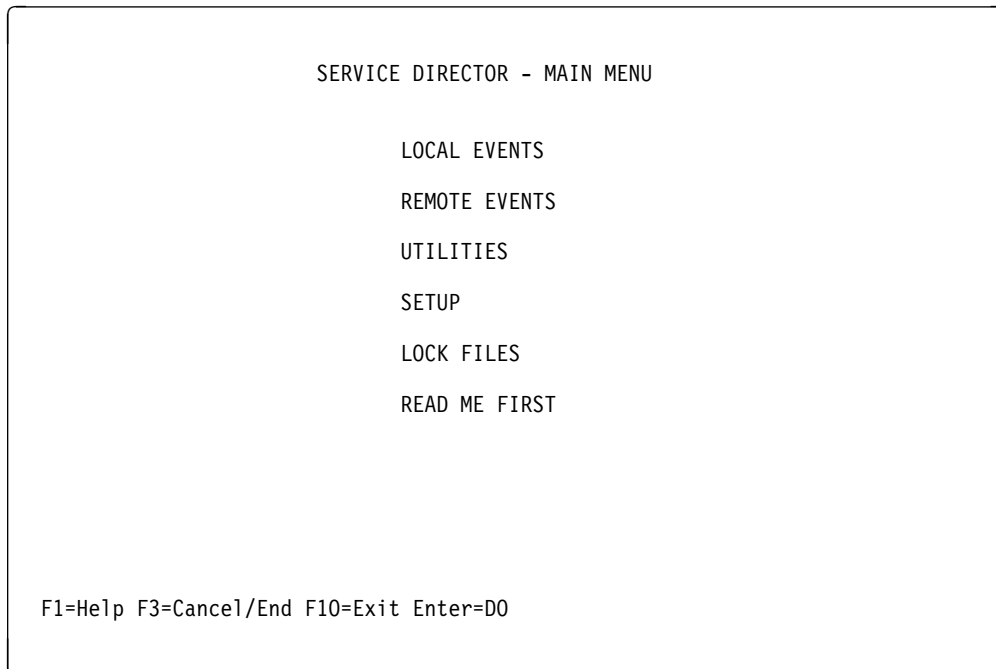


Figure 4-4. Main Menu - Curses

**Note:** Help can be obtained on most screens within Service Director by pressing the F1 key.

## Main Menu Definitions

<b>LOCAL EVENTS</b>	Lists events in the local host event log.
<b>REMOTE EVENTS</b>	Lists events in a remote host event log or server forwarder log, if applicable.
<b>UTILITIES</b>	Contains Service Director Utilities for testing and run-time configuration.
<b>SETUP</b>	Contains Service Director setup routines.
<b>LOCK FILES</b>	Allows the verification, creation and removal of the Service Director locking files.
<b>READ ME FIRST</b>	Lists the latest fixes and Message definitions for Service Director.
<b>ENTER=DO</b>	Execute the desired highlighted entry.
<b>PF3 or PF10</b>	Will EXIT the Service Director user interface.

---

## 4.4 Service Director Events Menu

To get to the Events Menu from the Service Director Main Menu place the highlight bar on LOCAL EVENTS and press the Enter key (See Figure 4-4 on page 4-5).

The SERVICE DIRECTOR LOCAL EVENTS MENU will be the next screen.

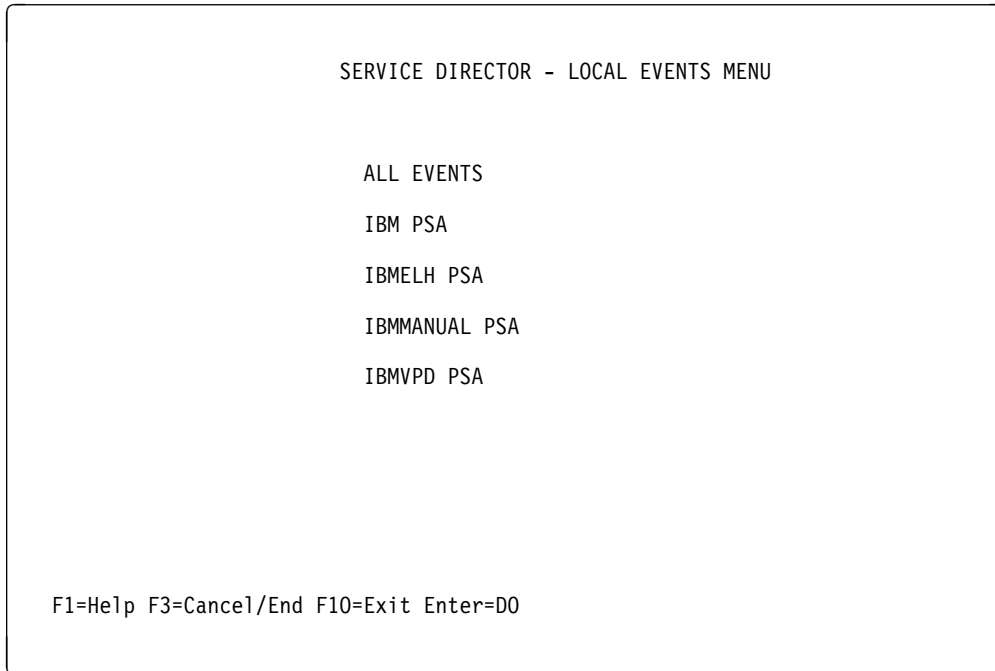


Figure 4-5. Events Menu

### Events Menu Definitions

<b>ALL EVENTS</b>	Displays all events in the Event Log. This includes all problems reported from the PSAs and the raw error information captured from the local system error log.
<b>IBM PSA</b>	Displays only those problems reported by the IBM PSA.
<b>IBMELH PSA</b>	Displays only those problems reported by the IBMELH PSA.
<b>&lt;psa&gt; PSA</b>	The name of all configure PSAs will be displayed and selectable in order to display problems. This is a dynamic selection list which increases as new PSAs are configured. See Setup help for details.
<b>ENTER=DO</b>	Executes the desired highlighted entry.

## Local Events Screen

Each problem on this screen will be listed with the record number, date and time the problem occurred, failing resource, PMR, the status and description of the problem.

The LOCAL EVENTS screen must be accessed and viewed from the specific machine on which the failure occurred. All machines must have at least Service Director client code installed and be operational. In most cases you will be responding to a particular customer problem reported by Service Director for RS/6000. Service Director events can be of significant benefit to problem resolution when viewing from the failing machine.

The LOCAL EVENTS screen will show a chronological list of all the events and reported problems. This will include all problems reported from all of the configured PSAs. They will be marked by up to a nine digit PSA generated event record number. Normal errpt events will display a 0 record number. You should be able to match the errpt event to the PSA generated event. For this session let's follow the token ring problem reported on this machine. Line two in Figure 4-6 shows that a problem was called into IBM by Service Director for this problem. The failing SRN is 850-902 with an open status code and PMR #X5828.

SERVICE DIRECTOR - LOCAL EVENTS MENU (ALL)						
Record	Date	Time	ResName	T ERROR	PMR	S Description
0	12-18-95	14:53	fd0	P	none	DISKETTE ERR3
789769438	11-10-95	14:23	tok0	P 850-902	X5828	0 Not able to set toke
789753596	11-10-95	09:59	SIMM	P 812-285	X5805	0 The S3 Memory card t
0	11-10-95	09:55	hdisk0	T	none	DISK ERR4
0	10-18-95	09:25	ent0	T	none	ENT ERR2
0	09-05-95	11:21	tok0	T	none	TOK RCVRY EXIT
0	09-05-95	11:21	tok0	T	none	TOK RCVRY ENTER
0	09-05-95	11:21	tok0	P	none	TOK WIRE FAULT

F1=Help      F3=Cancel/End      F8=Print      F10=Exit  
F4=DETAIL    F5=CALL-DATA    F6=DELETE

Figure 4-6. Local Events Screen

The following information provides an explanation of the EVENTS column headings and is included here to show the versatility of the data available to perform hardware problem management.

Normally it can be accessed by selecting **F1** from this screen. There are several screens available for this help session, whenever a Scroll = Up/Dn is available within Service Director this function should be used to view all of the screens.

The Events screen presents the opportunity to view or print the detail screen information shown in Figure 4-6, by using the F4=Detail or F8=Print keys respectively. You can also view the complete error log and call detail information sent to IBM, by using the F5=CALL DATA key. All data after the CALLHOMESTART: tag will be transmitted to IBM and inserted in the PMR.

## Events Menu Screen Definitions

### COLUMN HEADERS:

- Record - Record number of the error generated by a PSA. If the value is 0 then the problem is an errpt entry not one generated by a PSA.
- Date - Date the record was created.
- Time - Time the record was created.
- ResName - Resource Name of the failing component.
- (T)ype - Error type (P)ermanent, (T)emporary, (U)nknown.
- ERROR - Failing Symptom Code generated by the PSA.
- PMR - Problem Management Report Number returned from IBM for this problem.
- (O)pen - Problem was opened/transmitted to Service Director Server.
- (C)losed - Problem was closed/transmitted to Service Director Server.
- (H)eld - Problem was held and never transmitted.
- (D)uplicate - Problem record is a duplicate of an existing PMR.
- (F)ailed - Transmission of record failed for some reason.
- (P)ending - Transmission of record failed and is in a pending state.  
Transmission of pending records will be attempted each time the Service Director Control Engine is executed until a success or failure state occurs.
- (R)eported - Problem transmission was successful but status of the creation of the problem is not known. The problem was reported only. The problem will be put into a pending state and transmitted again. If creation of the problem was successful the first time but unknown, a duplicate status will be returned the second time when the status becomes known.

### Additional status results: (used on event detail screen)

- (1) Problem Create      (2) Duplicate Problem      (3) Duplicate APAR
- (4) Too many hops      (5) Entitlement authorization error
- (6) Retain communication error      (7) Retain authorization error
- (8) Other Retain error      (9) Format error
- (10) Remote system unavailable      (11) Problem reported only
- (12) RPC transmission timeout      (13) Message Format error
- (14) Test Received OK      (15) tty\_DEAD      (16) tty\_TRIED
- (17) tty\_LONGTIMEOUT      (18) Problem valid      (19) TOP received OK
- (20) Problem not found      (21) History But no retain
- (22) Problem closed      (23) Reserved      (24) Reserved
- (25) No Local Host Name      (26) Reserved      (27) Reserved
- (28) Country # bad      (29) PE data OK      (30) PE data checksum

Description - Short 21 character description of the problem.

### FUNCTION KEYS:

- F4=DETAIL - Displays additional detail information about the highlighted entry.
- F5=CALL-DATA - Displays the complete call file associated with the highlighted entry. Note: Only the information displayed after the "CALLHOMESTART:" line in the call file is actually transmitted to the Service Director server. Information above the "CALLHOMESTART:" line is utilized internally by Service Director.
- F6=DELETE - Deletes the highlighted or selected event from log.
- F8=Print - Prints the complete error log to the default printer.



## Events Detail Screen

```
                SERVICE DIRECTOR - EVENTS MENU (ALL)

RECORD #: 789769438      DATE: 01-10-95      TIME: 14:23
TARGET HOSTNAME: eraser
PMR #: X5828      PMR STATUS: 1      ERROR ID:
FAILING SYMPTOM CODE: 850-902
FAILING MACHINE ID: tokenrin      FAILING RESOURCE NAME: tok0
SERIAL #: 214916
ERROR TYPE [(P)erm, (T)emp, (U)nknown]: P
ERROR COUNT: 0      MAX ERROR LIMIT: 000000
CALLHOME? (0 = NO, 1 = YES): 1
LOCAL HOST TYPE: 9076      LOCAL HOST SERIAL: 0076101
PRODUCT SUPPORTED APPLICATION: IBM
SHORT DESCRIPTION:
Not able to set Toke

LONG DESCRIPTION:
  850-902: Not able to set Token-Ring speed to 16 MB.

##### PRESS ANY KEY TO RETURN! #####
```

Figure 4-7. Events Detail Screen

## Events Call Data Screens

```
                SERVICE DIRECTOR - EVENTS MENU (ALL)

INDEXNUMBER:789769438
SDSTART:
ERRID=
DATE=01-10-95
TIME=14:23
MACHID=tokenrin
SERIAL=214916
RESNAME=tok0
NODEID=eraser
DESCRIPTION=Not able to set Toke
FSC=850-902
ERRTYPE=P
COUNT=0
THRESHOLD=000000
PSANAME=IBM
COMMENT= 850-902: Not able to set Token-Ring speed to 16 MB.
HW=1
CALLHOME=1
SENSE_START=-1
CALLHOMESTART:

#### Scroll = Up/Dn Arrows, Enter = Continue. ####
```

Figure 4-8. Events Call Data Screens

```

CALLHOMESTART:
#####
CONTACT=Travis Lake
PHONE=512-838-0000
IBM CUSTOMER #99999999
COMPANY=Service Inc.
STREET=IBM
CITY=Austin
STATE=TX
ZIP=78758
COUNTRY=UNITED STATES

#####
TARGET HOSTNAME= eraser
A PROBLEM WAS DETECTED ON Tue Jan  3 11:17:30 1995      801
014

The Service Request Number or Numbers:
  850-902:  Not able to set Token-Ring speed to 16 MB.

Probable Cause or Causes:

- 60% tok0          00-02          Token-Ring High-Performance
                                Adapter
- 40% sysplanar0   00-00          CPU Planar

To continue, press Enter.
  DEVICE          LOCATION          DESCRIPTION

  tok0            00-02          Token-Ring High-Performance Adapter

    Network Address.....10005AC95A44
    Displayable Message.....TOKEN RING
    EC Level.....C24551
    FRU Number.....000G2579
    Manufacturer.....VENOCLT96G
    Part Number.....093F1277
    Serial Number.....214916
    ROS Level and ID.....0000
    Loadable Microcode Level....00

  DEVICE          LOCATION          DESCRIPTION

  sysplanar0     00-00          CPU Planar

    Part Number.....051G7940
    EC Level.....00D18174
    Processor Identification...00007328
#### Scroll = Up/Dn Arrows, Enter = Continue. ####

```

Figure 4-9. Continuation Call Data Screen 2

**Note:** The complete data information can only be viewed by scrolling through the associated screens.

```

DEVICE          LOCATION      DESCRIPTION
sysplanar0     00-00          CPU Planar

Part Number.....051G7940
EC Level.....00D18174
Processor Identification...00007328
ROS Level and ID.....IPLVER1.1 LVLO.04,051G7831
Processor Component ID.....0201004100000000
Device Specific.(Z0).....000000
Device Specific.(Z1).....000000
Device Specific.(Z2).....000000
Device Specific.(Z3).....000000
Device Specific.(Z4).....000000
Device Specific.(Z5).....000000
Device Specific.(Z6).....000000
Device Specific.(Z7).....000000
Device Specific.(Z8).....000000
Device Specific.(Z8).....00000041000000004,051G7831nce Adapter 801
Device Specific.(Z9).....000000
ROS Level and ID.....OCS(00000000)
ROS Level and ID.....SEEDS(00000322)

Summary of Entries

Errors on Resource Type
Error OPMSG      (AA8AB241) on resource OPERATOR appeared 7 times
hdisk0 : error log Analysis has detected error(s) that may require your
attention.
Error ERRLOG_ON  (9DBCFDDE) on resource errdemon appeared 15 times
Error logging turned on

Errors on Resource Type tokenring
Error TOK_BEACON2 (AEC7B1B0) on resource tok0 appeared 1 times
Tok auto remove
Error TOK_RCVRY_EXIT (DD0E4902) on resource tok0 appeared 1 times
Signal TossRY_EXIT (DD0E4902) on resource tok0 appeared 1 times
Error TOK_RCVRY_ENTER (7BDD117A) on resource tok0 appeared 1 times
Signal Toss
Error TOK_WIRE_FAULT (20188DE1) on resource tok0 appeared 2 times
Signal Toss
Error TOK_BEACON2 (AEC7B1B0) on resource tok0 appeared 2 times
TOKEN-RING INOPERATIVE
Errors on Resource Type 857mb
Error DISK_ERR4 (1581762B) on resource hdisk0 appeared 89 times

#### Scroll = Up/Dn Arrows, Enter = Continue. ####

```

Figure 4-10. Continuation Call Data Screen 3

**Note:** The last half of this figure from Summary of Entries was produced by the **dsense** command. The dsense command was part of the AIX diagnostic package until AIX 4.2 or greater. It is still available to the IBM servicer to install if they so desire. On systems that do not have dsense available because of the AIX level, Service Director will post the following message.

**The dsense command was not available for execution, due to AIX level.**

If dsense is available to run, it will be executed against the error log and posted at the end of the call file. At release level 3.0 the dsense command was limited to the first 40 lines of data. If dsense was not found on an AIX level that should have it, then an error message is posted to the end of the call file. In no instance will the dsense messages cause Service Director to create the call file, but is only an indication of why the "Summary of Entries" was not appended.

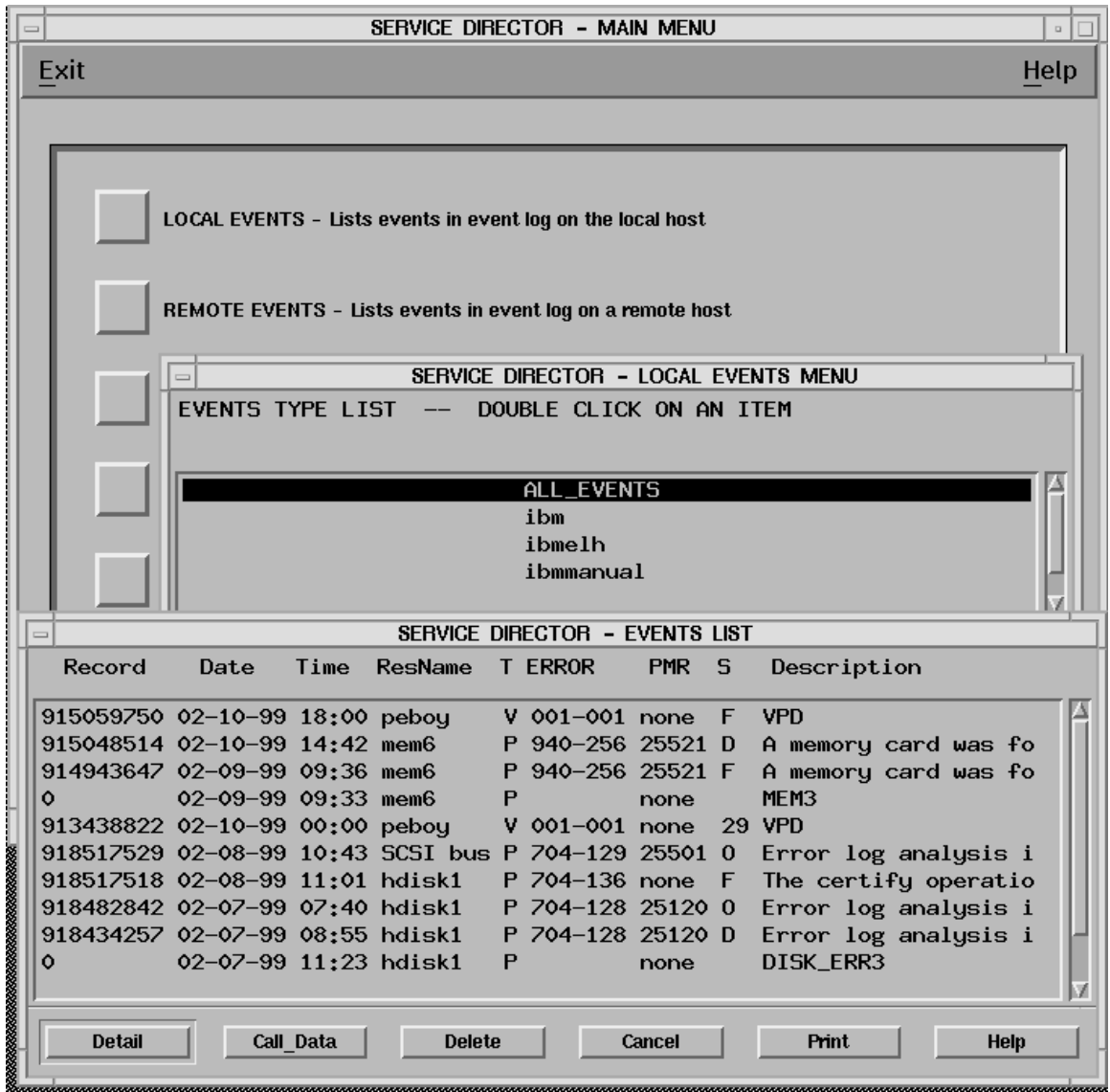


Figure 4-11. Motif Local Events

On the motif Local Events menu, you must double-click for the events type filter. Double-clicking your selection will automatically bring up the complete events list in a scroll-bar window, with the latest event on top. You must select the event that you want to work with. Once selected the line will highlight and remain highlighted until it is selected again. The selected or highlighted event can now be acted on by action pushbuttons listed at the bottom of window. The Detail pushbutton will post a window showing event header information (see Figure 4-7 on page 4-9). The Call\_Data button will bring up a scroll-bar window containing the complete event data that was sent to IBM on this event. There will be no call data associated with a "Record 0" event, only header information showing a trip of Service Director resulting in no call data.

Multiple data windows may be displayed by selecting another event and pressing the appropriate pushbutton. Be careful with the Delete pushbutton, because it will delete all of the events that are currently highlighted. The selection of a highlighted entry will de-select and un-highlight the event. Once you are confident an event has been completed, you may want to delete it from the Service Director Event Log. Remember at this time you cannot update or close PMRs from Service Director, you must call or use RETAIN access to work with PMRs.

---

## 4.5 Service Director Remote Events

To review an Events List on a Remote Host, or the log file of a Forwarding Server host, select the **Remote Events** option on the Main Menu. **AIX RCP** and **RSH** system commands are used to access the remote files. Due to security and access requirements required by these two utilities, root access permission must be set up before making this selection. Otherwise this option will fail on execution. Refer to your System Administrator and/or system documentation for RCP and RSH access configuration on remote hosts.

The following menu selection will be displayed upon selection of **REMOTE EVENTS**.

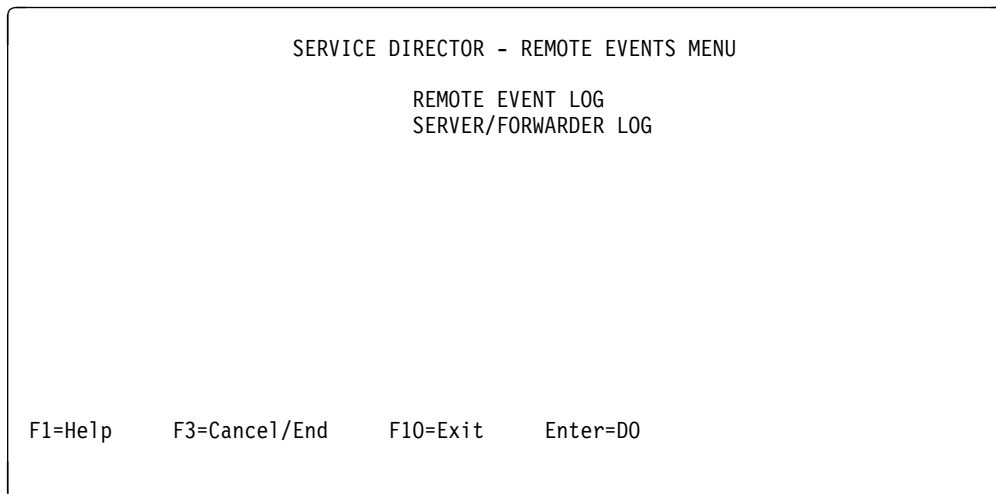


Figure 4-12. Remote Events Menu

To review an event log located on another host select the **REMOTE EVENT LOG** option of the Remote Events Menu. See Figure 4-16 on page 4-17.

A list of remote hosts that you wish to access must be built. This will be done automatically from the registration list on the local server. To do this use F7 at the prompt for each machine you wish to add to the list. The next screen to be displayed will prompt you for the *hostname*, *userID*, and *path* associated with the remote host you wish to access and the location of the Event Log. An additional entry is the **RCP PATHNAME** which defines where the **RCP** and **RSH** commands are located on the local host. The default access user ID is **root**. The default path for the Remote Event Log is `/usr/lpp/servdir,` but the Event Log filename is not specified in this entry. The default command path is `/usr/bin,` with automatic backup of `/usr/lpp/ssp/rcmd/bin` for 9076 Scalable POWERparallel System Kerberos commands. Only if some other remote command directory is used by the server, do you have to enter the sub-directory in the **RCP PATHNAME**. Enter the hostname and enter key for each line shown, until prompt to save entry. Verify the entry before saving. If the item is incorrect, do not save, cancel and add it again with F7. If the bad entry is saved, it may be marked for deletion from the list by using F6 while the entry is displayed. Additional hosts may be added to the list by using F7 and typing over the displayed data with new data, usually only the hostname. When you hit enter key for the line the new data will be displayed. You do not need to delete or space out old data.

When the Remote Event Log is displayed the format and screen layout is the same as that in the Local Events Log. Refer to the Local Events Log section in this document, or the help function under the Local Events selection for additional information.



Figure 4-13. Remote Events Log Setup Panel

This screen allows the selection of the remote host containing the Service Director Events Log. When a host is selected and the "Access Log" is pressed, a copy of the Event log is copied to this local host using the "RCP" command. Security requirements for utilizing the remote copy command on remote hosts apply and should be in place prior to executing this selection. Refer to RCP documentation for your system on setting up RCP access.

### **SERVICE DIRECTOR REMOTE EVENTS LOG**

- HOSTNAME:** The name of the remote host you wish to access.
- Up/Down ARROWS** Scroll thru list of remote forwarding host by utilizing the UP/DOWN arrows.
- USERID:** The *userid* to be used with the RCP command. Default is "root."
- LOG PATH/FILENAME**  
The location of the remote Service Director Event file. Enter the file path only when adding hosts if it is different from the default path of /usr/lpp/servdir/.
- RCP PATHNAME** The location of the local RCP command. If the RCP command fails then two default local paths will be tried before returning with an error. The default paths are "/usr/bin" and "/usr/lpp/ssp/rcmd/bin".
- ENTER=DO** Execute the desired highlighted entry.
- FUNCTION KEYS:**
- F1=Help** Help provides help information pertaining to the currently displayed screen.
- F3=Cancel/End** Will exit current screen and END Service Director.
- F5=Access Log** Get the remote event log from the indicated host.
- F6=Delete** Mark the current host entry for deletion from the Service Director remote host file.
- F7=Edit/Add** Add a hostname to the Service Director remote host file . To accept the entry already display press enter. You must press the enter key on every line until the save file prompt is displayed before you can save the record.
- F8=Print** Print the contents of the Service Director remote host file on the default printer.
- F10=Exit** Will exit Service Director directly from current screen .

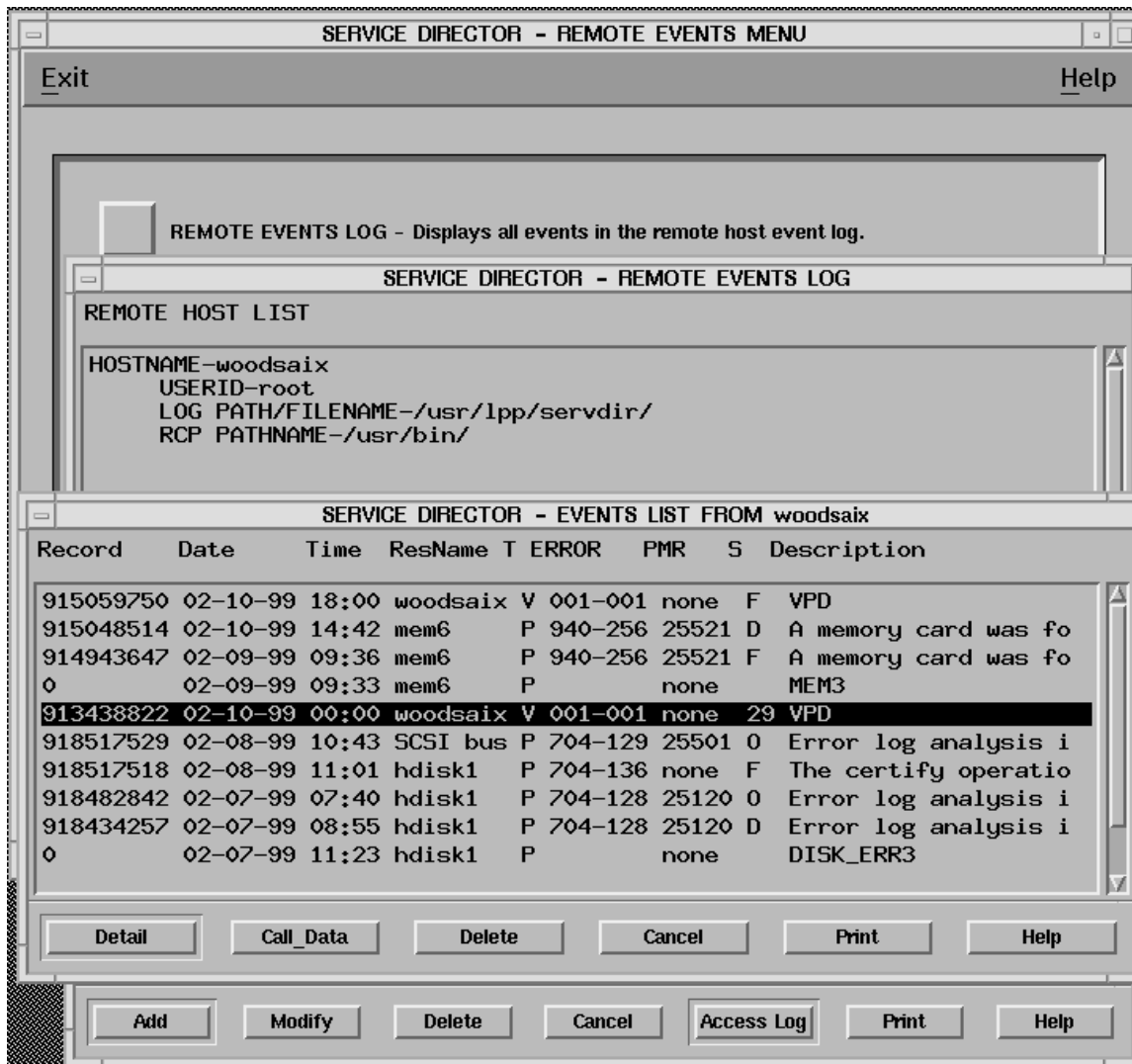


Figure 4-14. Motif Remote Events Screens

Remote Event Logs work just like an "ALL" local Event Log, and you may even have this local machine listed as a remote host. The remote copy command is still used to get a copy of the event file, so the local host must RCP to itself. The Remote Host List will be built from the registration data file. Hosts may be added, modified, or deleted from this list manually at any time. If the remote host list file /usr/lpp/servdir/sdrhost is removed, it will be built from the registration list on the next selection of the remote events log from the remote events menu.

To list events, select remote host, then activate "Access Log" pushbutton. Service Director will use default remote commands directory of /usr/bin for base RS/6000 and /usr/lpp/ssp/rcmd/bin for 9076 Scalable POWERparallel System Kerberos remote commands. If your account uses a different set of remote commands, you must modify the remote host list to reflect the proper path statement. Once the events window is displayed, actions are the same as the local events window.

**Note:** The complete data can now be viewed by scrolling the window.

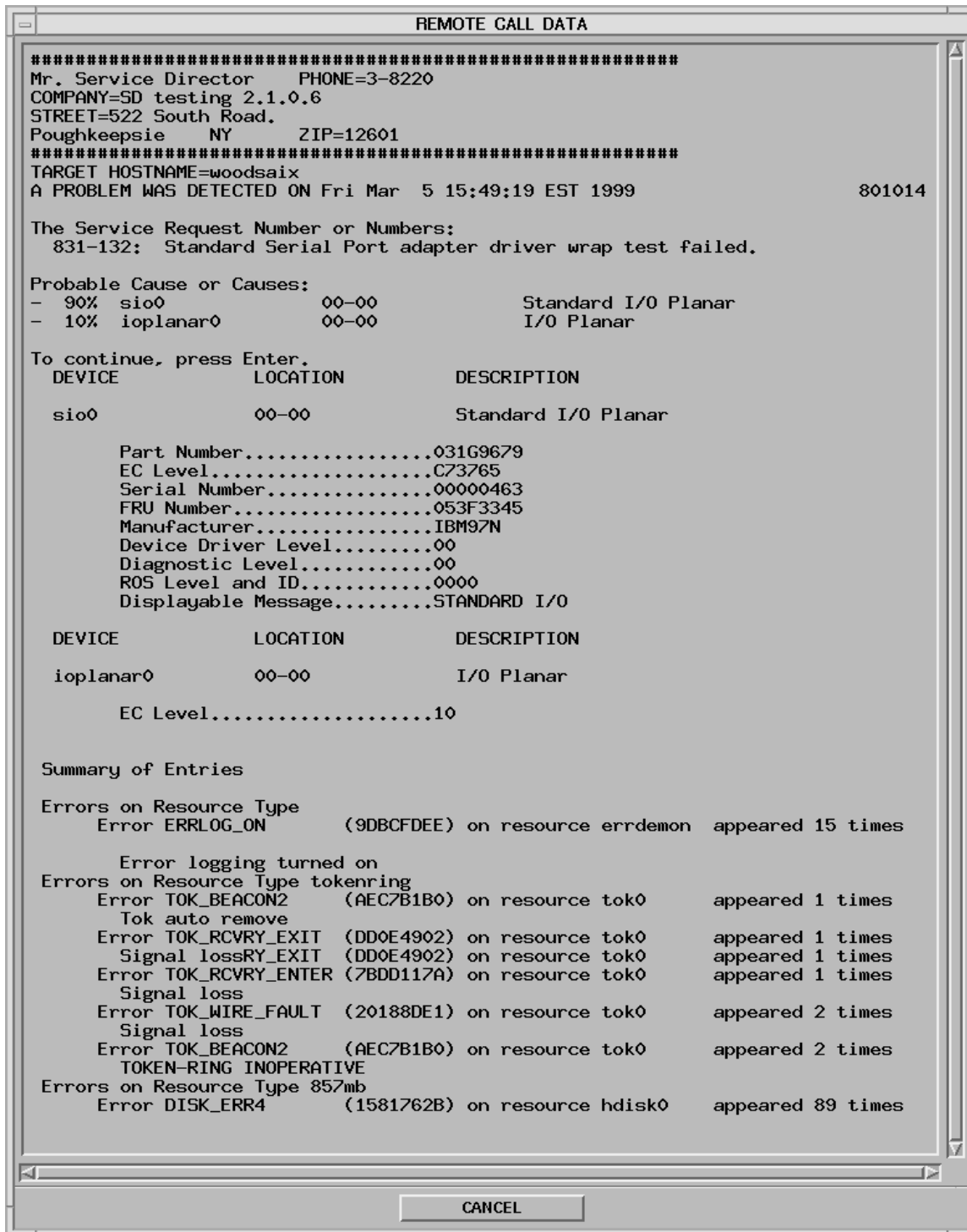


Figure 4-15. Motif Call Data



## Server/Forwarder Log

The CALLHOME process must have been running on a Forwarder host, with logging enabled to produce a forwarder log initially. See registration "Callhome Logging" on page 7-27 for automatic setup or for manual setup, see 8.3, "Manual Entry Options" on page 8-7.

To review the log file of a forwarder host, select the SERVER/FORWARDER LOG option of the Remote Events Menu. Initially a list of server host must be built as were the Remote Event Log entries. Use F7 to add each server host to the list.

The next screen to be displayed will prompt you for the *hostname*, *userID*, and *path* associated with the forwarder log file you wish to access. An additional entry is the RCP PATHNAME which defines where the **RCP** and **RSH** commands are located on the local host. The default access user ID is *root*. The default command path is */usr/bin*. Although this screen is similar to the Remote Event Log, it should be noted that the filename along with the complete path of the forwarder log is required in the LOG PATH/FILENAME: entry. There is no default forwarder log. The forwarder log name is defined when the forwarder or callhome process is started. See the section on "Client/Server Call Forwarding" for additional information.

When the F5 key "Access Log" is pressed, a copy of the forwarder log will be copied to the local host to a file in the /tmp directory and displayed. The following screen is an example.

SERVICE DIRECTOR - REMOTE SERVER/FORWARDER LOG						
MSG-TYPE	TRANSMISSION-DATE	CLIENT-REC	ERROR	PMR	TYPE	SERIAL
CALL	Dec 29 08:08:27 1998	820171551	850-902	568X4	7011	0031239
TEST	Dec 29 08:07:41 1998	*****	*****	*****	7011	0031239
CALL	Dec 01 04:08:28 1998	920171721	850-902	558X4	7011	0031239

F1=Help    F3=Cancel/End    F8=Print    F10=Exit  
F4=DETAIL    F6=DELETE

Figure 4-16. Server/Forwarder Log

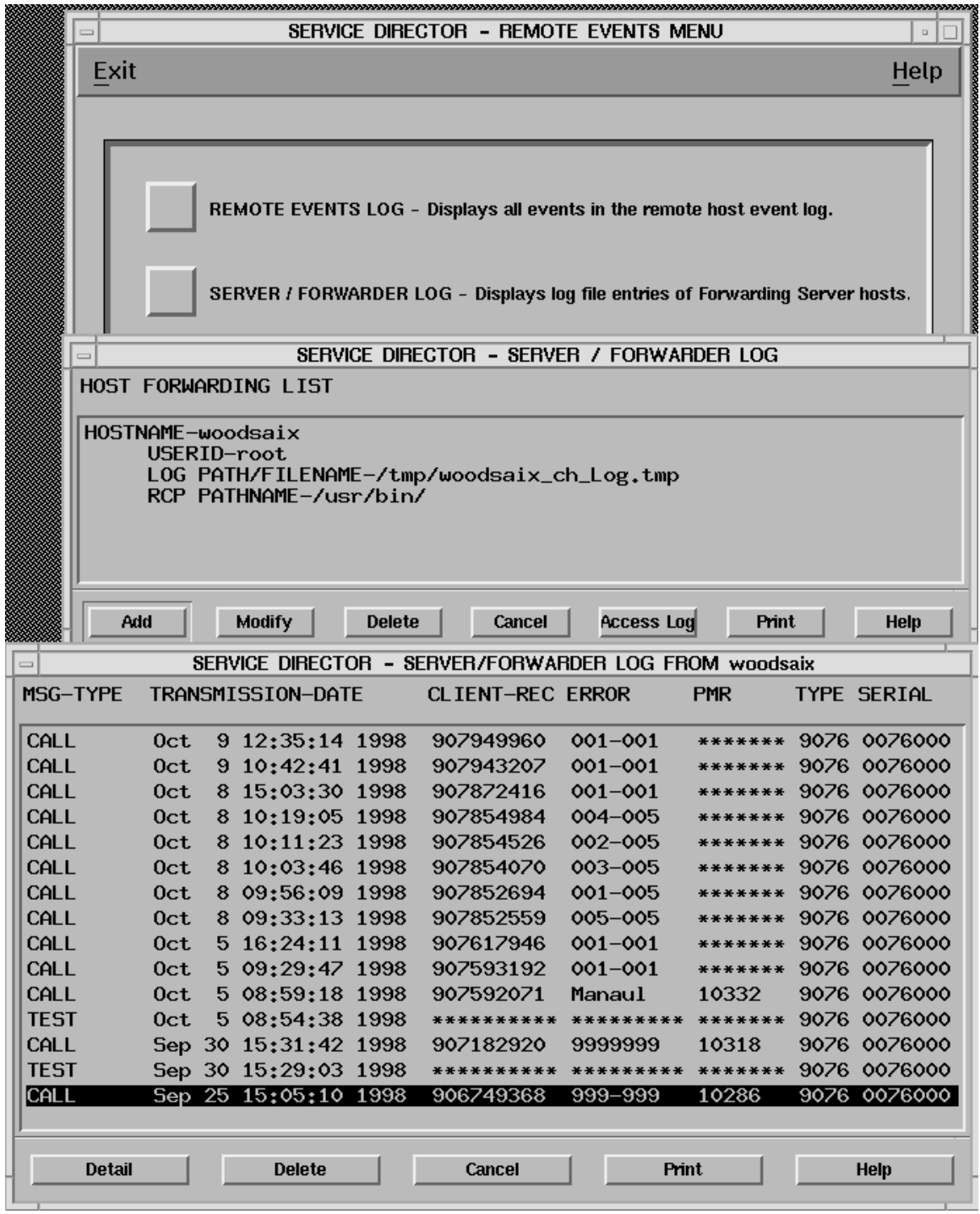


Figure 4-17. Motif Server/Forwarder Screen.

The following explains the various column headings and function keys associated with the screen above.

## SERVICE DIRECTOR - REMOTE SERVER/FORWARDER LOG:

**MSG-TYPE** Indicates the type of transmission logged. An entry of "CALL" indicates an actual call was forwarded. An entry of "TEST" indicates that a test call was received and forwarded. An entry of "DELETE" indicates this record is marked for deletion.

### TRANSMISSION-DATE

Date and Time stamp of when the transmission was logged.

**CLIENT-REC** The unique record number received from a client for the call. Duplicate record numbers at different time stamps indicate the client retried the transmission due to a possible transmission failure.

**PMR** Indicates the Problem Management Report (PMR) number returned from IBM for this transmission.

**TYPE** Indicates the CPU model type the error occurred on.

**SERIAL** Indicates the CPU serial number the error occurred on.

### ADDITIONAL INFO:

**UNAME:** Unique CPU number of client host.

**COMPONENT SN#:** Serial number of the failing component.

**COMMENT:** A short error description. 50 character max. Due to the short line length descriptions may be chopped off in mid-sentence.

**STATUS:** The return status of the forwarded call. See Local Event help for return status definitions.

**BRANCH:** IBM service support branch the PMR was assigned to.

**COUNTRY:** IBM service support country the PMR was assigned to.

**FUNCTION KEYS:** Applicable keys on screens.

**F1=Help** Help provides help information pertaining to the currently displayed screen.

**F3=Cancel** Will exit current screen. If records are marked for deletion a prompt will be displayed.

**F4=DETAIL** Will display additional information about the highlighted entry.

**F6=DELETE** Will mark the highlighted record for deletion.

**F8=Print** Print the contents of the Service Director forwarding host file on the default printer.

**F10=Exit** Will exit Service Director directly from current screen.



Figure 4-18. Motif Server Log Detail Screen.

This Log Detail screen shows all of the data that is captured by the callhome process per call forwarding event. This is where you can usually see the hostname that the call was from on a 9076 complex that has all the same serial number. In a clustered RS/6000 environment the machine type and serial of the summary page would point to the calling machine, but the hostname is not shown on that page.

The STATUS of the call is shown and the additional break out you need to reference the summary screen HELP window or see "Events Menu Screen Definitions" on page 4-8.

The number in the lower right corner is the country number if posted.

---

## 4.6 Service Director Utility Menu

The Utility Menu options will generally be used to manage the Service Director program. Communication paths to notify the customer specified e-mail contacts and the customer to IBM can be tested. The AIX crontab time and the current system setup configuration can be viewed or changed from this utility.

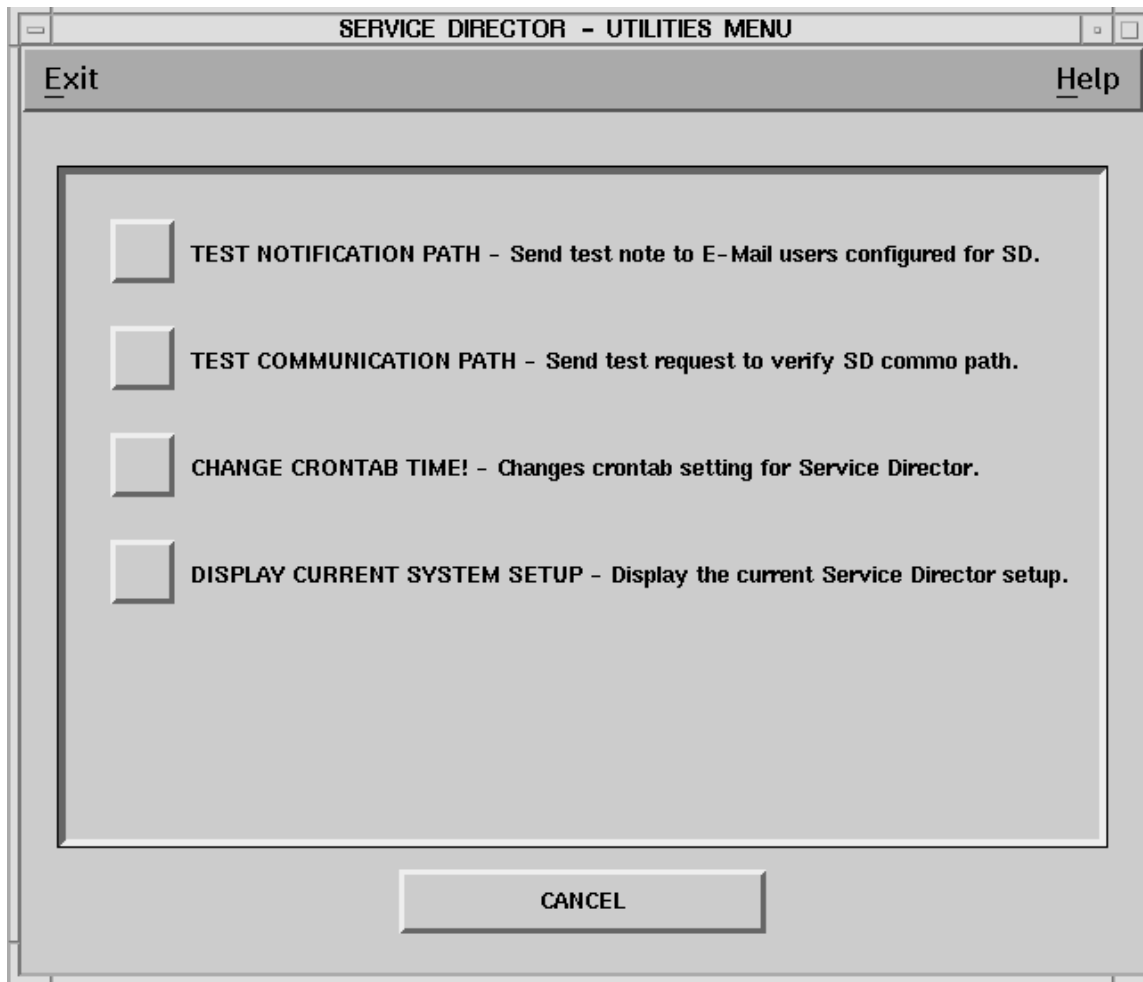


Figure 4-19. Motif Utility Menu

The above **TEST COMMUNICATION PATH** option will only test from this client through all call forwarders to local modem, and to the IBM server, but not to RETAIN. This communication test can be done from a bottom line command as follows:

```
/usr/lpp/servdir/servdir.analyze ctest:  
RC=14 is a good communication test completion code.
```

The Motif change crontab entry is much easier than the tty version. You can use the mouse to Cut & Paste the script part of the command.

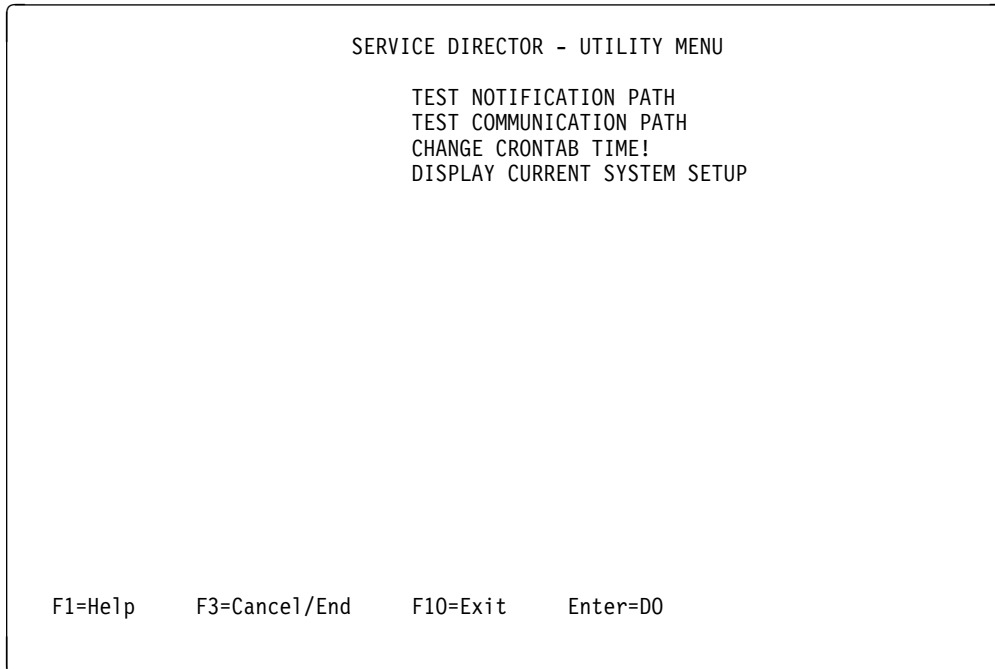


Figure 4-20. Utility Menu

## Utility Menu Descriptions

### TEST NOTIFICATION PATH

This routine will send a test note to all e-mail users configured to receive notification from Service Director. See Setup Menu for details.

### TEST COMMUNICATION PATH

This selection will send a test request to the Service Director, which in turn sends it to IBM Server reporting system. This verifies only that the electronic communication path ways are working from the client machine, local server, and modem to the IBM Server system. This selection will not create a PMR in RETAIN.

### CHANGE CRONTAB TIME!

This selection will allow the current crontab setting for Service Director to be changed. The crontab entry kicks off the Service Director Analyze engine upon entry of `servdir.timer`. The first line displayed is the CURRENT ENTRY, which is the current crontab entry. Then second line displayed is the suggested entry, which takes the current working path of Service Director and makes a suggestion as to what and how to enter the new crontab entry. The third line is for entering the new crontab entry. Persons should be familiar with the crontab entry format and enter the complete line when making changes. Otherwise Service Director may fail to execute.

### DISPLAY CURRENT SYSTEM SETUP

This selection will display the current Service Director setup for the default configuration, crontab entries, and Object Data Manager (ODM) entries. See SETUP for details.

```

                                SERVICE DIRECTOR - UTILITY MENU

                                NOTIFY USER LIST SCREEN!

root@servhost
EVENTS-N CALLS-Y PROBLEMS-Y VERSION-Y CALL HELD-Y

<name>@<address>
EVENTS-N CALLS-Y PROBLEMS-Y VERSION-Y CALL HELD-Y

<name>@<address>
EVENTS-N CALLS-Y PROBLEMS-Y VERSION-Y CALL HELD-Y

### CHECK MAIL FOR USERS LISTED ABOVE! Press any key to continue.###

```

Figure 4-21. Test Notification Path Panel

```

                                SERVICE DIRECTOR - UTILITY MENU

                                TESTING COMMUNICATION PATH PLEASE STANDBY.

```

Figure 4-22. Test Communication Path Panel

The above option will only test from this client through all call forwarders to local modem, and to the IBM server, but not to RETAIN.

This communication test can be done from a bottom line command as follows:

```
/usr/lpp/servdir/servdir.analyze ctest:
RC=14 is a good communication test completion code.
```

```

SERVICE DIRECTOR - CRONTAB CONFIGURATION

CURRENT ENTRY:
0 0,4,8,12,16,20 * * * /usr/lpp/servdir/servdir.timer 1>/dev/null 2>/dev/null
SUGGESTED ENTRY:
0 * * * * /usr/lpp/servdir/servdir.timer 1>/dev/null 2>/dev/null
NEW ENTRY:

#### ENTER COMPLETE LINE IF YOU WISH TO CHANGE! ####

F1=Help    F3=Cancel/End    F10=Exit    Enter=D0

```

Figure 4-23. Change Crontab Time Panel

The crontab entry is most difficult to change using this tty interface. The complete line entry must be typed correctly, you can not use Cut & Paste, backspace, or use arrows to move within the text line. It is much easier to use bottom line command to edit the crontab entry, or export your DISPLAY and use the motif interface.

Reference “Setting Crontab Entry” on page 7-28 for more information on crontab.

The following screen can be viewed when selecting DISPLAY CURRENT SYSTEM SETUP from the utility main menu.

```

##### SERVICE DIRECTOR CONFIGURATION #####

WORKPATH=/usr/lpp/servdir/
MAX. % DISK LIMIT WARNING=98
DUPLICATE INTERVAL (HRS)=24
KEEP EVENTS MAX DAYS=30
MAX FILE RECORDS=100
COMMUNICATIONS PATH=/usr/lib/ras
SECONDS BETWEEN CALLS=5
RETRY ON TRANSMISSION FAILURES (Y/N/#)=5:3
DIAGNOSTIC DIRECTORY PATH=/etc/lpp/diagnostics
OPENED PROBLEM STATUS UPDATE INTERVAL (HRS)=24

##### SERVICE DIRECTOR CRONTAB ENTRIES #####

0 0,4,8,12,16,20 * * * /usr/lpp/servdir/servdir.timer 1>/dev/null 2>/dev/null

##### SERVICE DIRECTOR ODM ENTRIES #####

##### SERVICE DIRECTOR COMMUNICATION PARAMETERS #####

#### Scroll = Up/Dn Arrows, Enter = Continue. ##

```

Figure 4-24. Display Current Configuration



---

## 4.7 Service Director Setup Menu

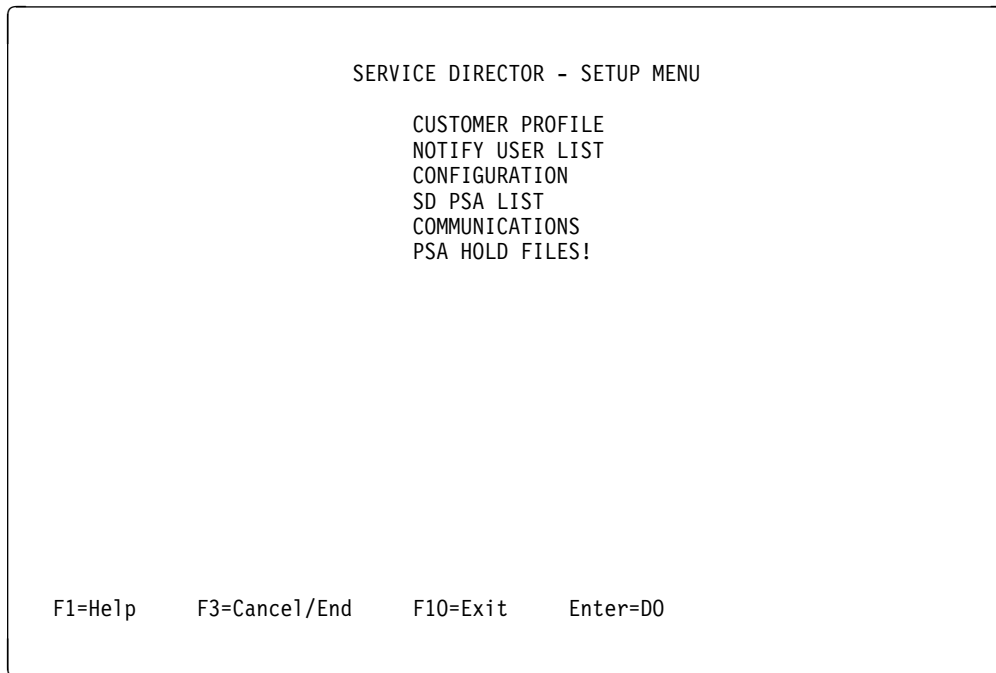


Figure 4-25. Setup Menu

These selections contain routines for configuration and setup.

### **Service Director**     **SETUP MENU**

#### **CUSTOMER PROFILE**

This selection opens the customer profile data file. If a customer profile data file does not exist this should be selected prior to executing Service Director. The customer contact information is sent along with the call home data so that the latest customer contact data is always available in the event of a problem.

**NOTIFY USER LIST** This selection allows up to three electronic mail users to be notified when an event occurs. The mail stops defined should be of those personnel that are designated as system contacts in the event of a problem. A mail protocol must be active on each machine or node.

**CONFIGURATION** This selection allows default configurations used by Service Director, such as maximum files sizes and default working paths, to be changed.

**SD PSA LIST** This selection allows Product Supported Applications (PSA) to be configured. All PSAs that are to be executed must be defined. They are executed in the order that they appear in this list.

**COMMUNICATIONS** This selection allows changes to the "ProbrepAt" configuration file used by the Service Director's Client/Server code. Configurations such as the "Report problems (Y/N)" or protocol type such as "RPC or tty" can be selected.

**PSA HOLD FILES** This selection allows customizing the defined PSAs. Items such as Max Error Counts, or ignore particular errors can be entered at this selection.

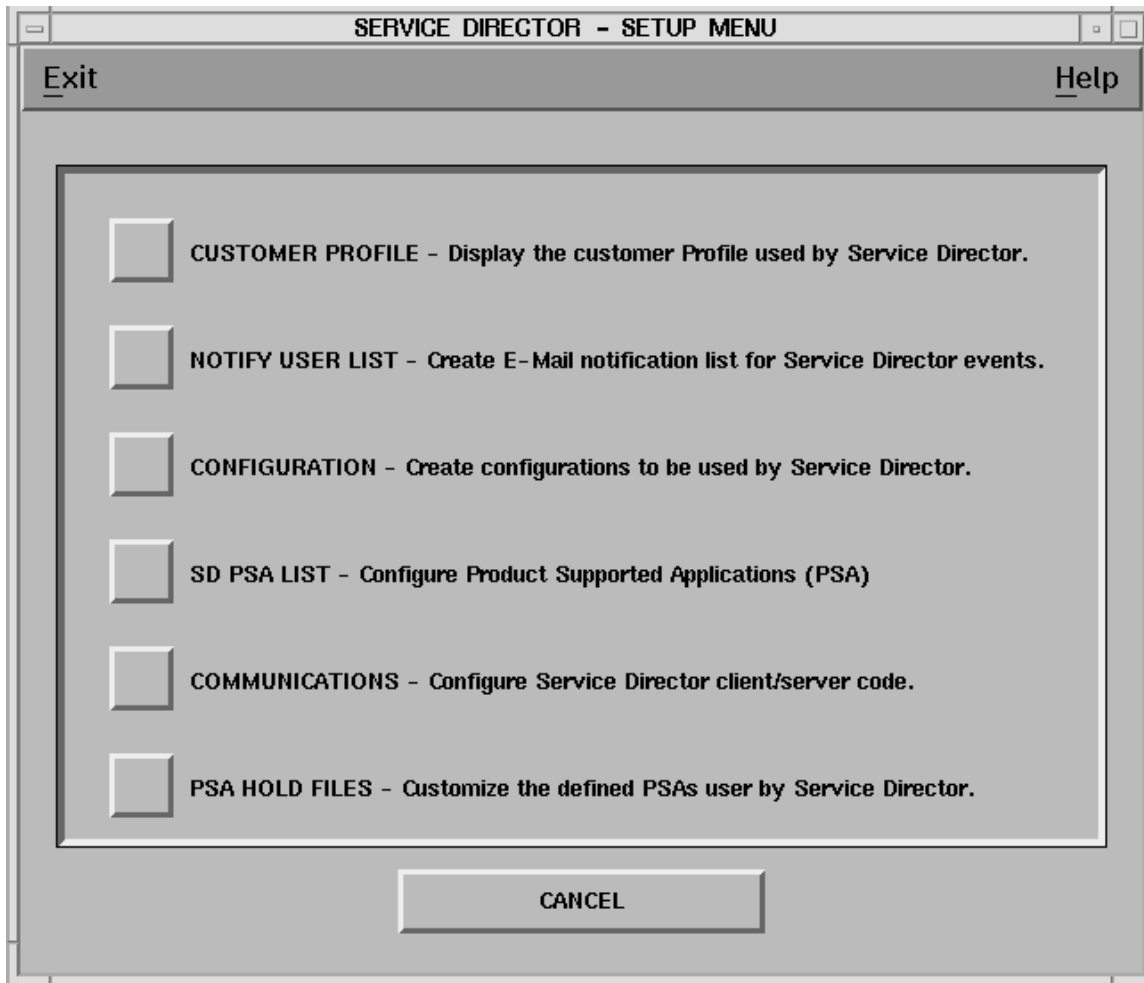


Figure 4-26. Motif Setup Menu

The motif menus will not be invoked if the DISPLAY variable is not exported to a valid X-server.

## Setup - Customer Profile

```

                SERVICE DIRECTOR - SETUP (CUSTOMER PROFILE)

CONTACT=Travis Lake
PHONE=512-838-0000
IBM CUSTOMER #=
STREET=Floating Point Cove
CITY=Austin
STATE=TX
ZIP=78758
COUNTRY=UNITED STATES

F1=Help    F3=Cancel/End    F10=Exit    Enter=D0
```

Figure 4-27. Setup - Customer Profile

### Setup Configuration - Customer Profile Definitions

The following information is necessary to ensure all contact data records are up to date.

<b>CONTACT</b>	Enter the name of the technical person to contact if a problem is reported.
<b>PHONE</b>	Enter the full area code and phone number of the contact person.
<b>IBM CUSTOMER #</b>	Enter the IBM CUSTOMER number used for this site.
<b>STREET</b>	Enter STREET address where this Service Director host is located.
<b>STATE</b>	Enter STATE where this Service Director host is located, if USA.
<b>ZIP</b>	Enter ZIP CODE where this Service Director host is located, if USA.
<b>COUNTRY</b>	Enter Country Name.

This data should have been initially set by the registration program.

This data will only appear in the body of the PMR in the IBM problem management system. The customer number is not included in the data, but is obtained from the entitlement database maintained from the initial registration.

**Note: IMPORTANT** If any of the data, especially the contact name or phone number has changed, please update the registration application step 1. After updating the required machines, use step 2 to re-register and to make the changes in the entitlement database at the IBM SD server.

## Setup Menu - Notify User List

```

                                SERVICE DIRECTOR - SETUP MENU

                                NOTIFY USER LIST SCREEN!

root@servhost
EVENTS-N CALLS-Y PROBLEMS-Y VERSION-Y CALL HELD-Y

<name>@<address>
EVENTS-N CALLS-Y PROBLEMS-Y VERSION-Y CALL HELD-Y

<name>@<address>
EVENTS-N CALLS-Y PROBLEMS-Y VERSION-Y CALL HELD-Y

F1=Help    F3=Cancel/End    F10=Exit    Enter=D0
```

Figure 4-28. Setup - Notify User List

Unless you wish to be notified of all events that trigger Service Director (Hardware Perm & Temp), set **EVENTS = N**.

```

                                SERVICE DIRECTOR - SETUP MENU
SERVICE DIRECTOR - SETUP MENU (NOTIFY USER LIST SCREEN!)

This selection allows up to three electronic mail users to be notified when
an event occurs. Those mail stops defined should be of those personnel that
are designated as system contacts in event of a problem.

These three electronic mail users may be alias list.

Enter the mail stop address in the normal mail format. For example:
"austin@akn.aix.ibm.com"
"john@johnscpu"

NOTE: If new overlaid address entered does not cover old entry no
      problem will be encountered, proper address will be saved.

Each mail stop entry can be customize as to which events it gets notified
for by entering a Y/N for the following entries..

EVENTS      - Notify the mail stop whenever any event occurs that invokes
              Service Director. This is normally set to NO to prevent the
              excessive mail notifications.
CALLS       - Notify the mail stop whenever a problem transmission report
              is attempted.
PROBLEMS    - Notify the mail stop whenever a technical problem with the
              Service Director is encountered such as no resources.
VERSION     - Notify the mail stop whenever a new version of SD/6000 is
              available, key extension, or VPD information is posted.
CALL HELD   - Notify the mail stop whenever a problem report is held due
              to the current Service Director configuration.
```

Figure 4-29. Setup Menu - Notify User List Help Screen

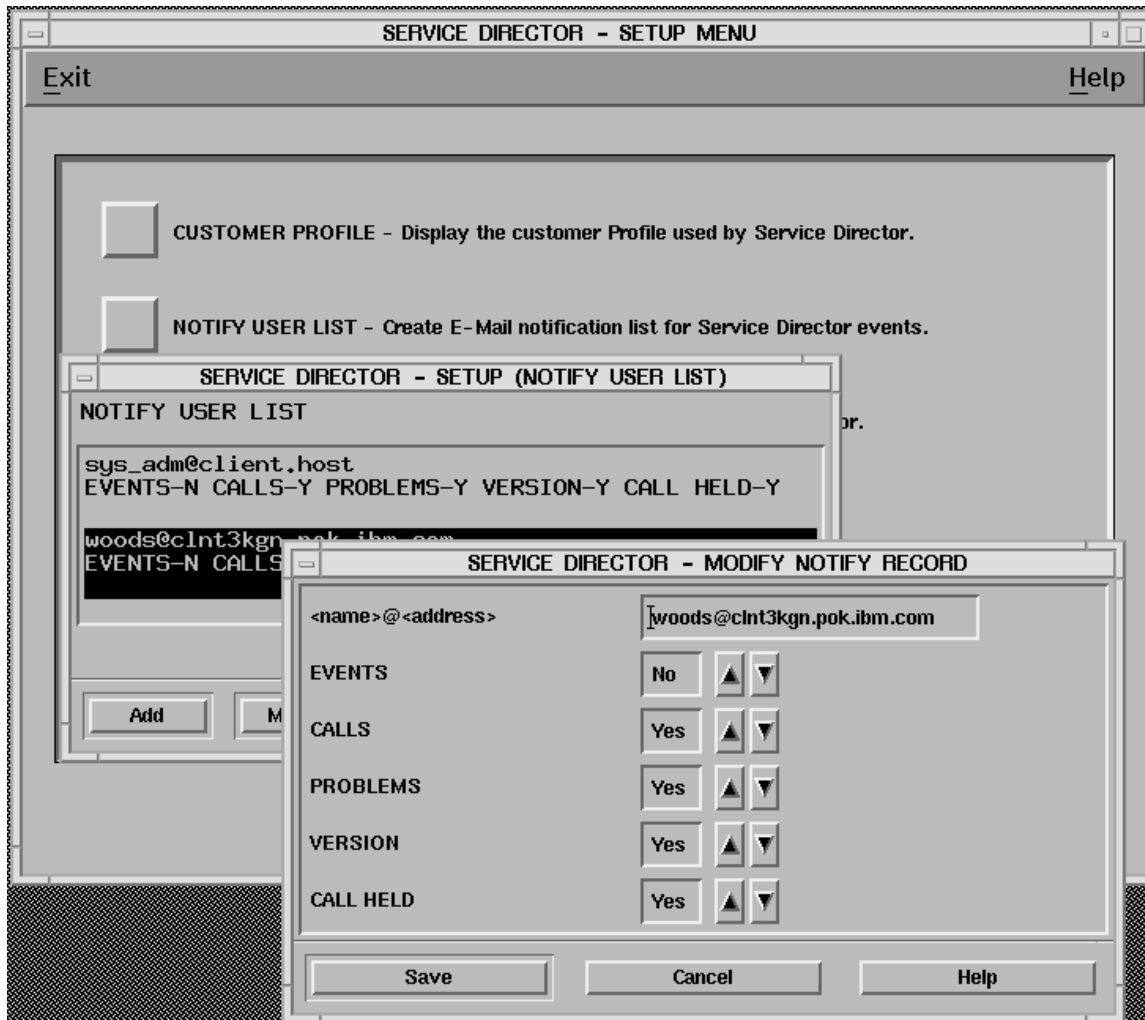


Figure 4-30. Motif Notify User List Screens

With windows user interface you are not restricted to just three entries on the user list, but under curses interface you can only work with three entries. Entries will be dropped to three if updated under curses.

**Note: Remember, every hardware event to the Error Log, be it permanent or temporary, will cause e-mail to be sent if EVENTS is set to Yes. Consider using the default No option.**

Notification of VPD information being transmitted to IBM SDserver has been placed under VERSION mail stop. Problems encountered with vpd transmissions will still be under PROBLEMS mail stop but will no longer have vpd data appended to notification message. If you do not wish to be informed of when VPD data is transmitted, and the SD/6000 is fix level 3.0.0.5 or greater. Then please set VERSIONS = **N** to prevent notification.

The registration entitlement key is set for warranty end date or one year from the registration month. On each call attempt the warranty and maintenance agreement ending dates are returned to the client, and if it is greater than the entitlement key ending date the key will automatically be extended. Notification of this key extension or failure will be posted to all mail stops. At the fix level of 3.0.0.5 this is also moved to the VERSIONS notify flag.

## Setup Menu - Configuration

```

SERVICE DIRECTOR - SETUP (CONFIGURATION)

WORKPATH=/usr/lpp/servdir/
MAX. % DISK LIMIT WARNING=98
DUPLICATE INTERVAL (HRS)=24
KEEP EVENTS MAX DAYS=30
MAX FILE RECORDS=100
COMMUNICATIONS PATH=/usr/lib/ras
SECONDS BETWEEN CALLS=5
RETRY ON TRANSMISSION FAILURES (Y/N/#)=5:3
DIAGNOSTIC DIRECTORY PATH=/etc/lpp/diagnostics
OPENED PROBLEM STATUS UPDATE INTERVAL (HRS)=48

F1=Help    F3=Cancel/End    F10=Exit    Enter=D0
```

Figure 4-31. Setup Menu - Configuration

### Setup Menu - Configuration Screen Definitions

This selection allows the default configuration for Service Director to be customized on a system to system basis. The following list of entries is not all inclusive of the defaults that may be displayed.

**WORKPATH=** This is the working path for Service Director. All files used and/or generated by Service Director must be located in the directory specified in the working path. Default = /usr/lpp/servdir.

**MAX. % DISK LIMIT WARNING=** This is the maximum used file space percentage of the working disk that Service Director will execute on. When this percentage of used space is reached Service Director will issue a error notification and then exit without analyzing errors. This prevents Service Director from filling up the disk space of the working system with files it generates. Default = 98

**DUPLICATE INTERVAL (HRS)=** This is the minimum number of hours between duplicate errors created by the PSA. This prevents a run away situation when duplicate errors are produced due to system outages. A value of zero will generate a transmission call report every time a problem event is generated. Default = 24

**KEEP EVENTS MAX DAYS=** The is the maximum number of days kept in the various files maintained by Service Director, once the MAX FILE RECORDS is met. Default = 30

**MAX FILE RECORDS=** This is the maximum number of records allowed in the various files kept by Service Director, such as the Event Log. Default = 100

**COMMUNICATIONS PATH=** This is the path (location) of the communication programs that are used by Service Director to call in problems. These files are installed by default in the /usr/lib/ras directory. If the files are moved to another directory this entry should be changed to reflect the new path.

**SECONDS BETWEEN CALLS=** This entry sets the sleep time between calls that are placed to the IBM Retain system. Increasing this value on offending client nodes will help balance call-in access on the Service Director local server (forwarder) for all nodes on the network. Default = 5

**RETRY ON TRANSMISSION FAILURES (Y/N/#)=** This entry determines if Service Director should continue to call in a problem that failed to make a connection to the IBM Retain system (the problem management system). If this entry is set to (Y)es then those calls that failed to make a connection will be retried the next time Service Director executes. A number may also be entered to set the number of times Service Director will attempt to call in the problem. Otherwise the call will be moved to a failed status.

A ":#" added to this entry such as "Y:2", "N:1", or "4:3" defines the attempts per session for each call. For every execution of Service Director or session that number of attempts will be made for each call, if a failure occurs. The internal default for attempts per session is 5. Default = 5:3

**DIAGNOSTIC DIRECTORY PATH=** This reflects the working path for the system diagnostics. Normally this entry should not be modified. Default = /etc/lpp/diagnostics.

**OPENED PROBLEM STATUS UPDATE INTERVAL (HRS)=** This defines the interval to wait before calling into the IBM Reporting System and getting an update status on problems that are open. To turn this feature off, set the value to 0 and status updates will not be requested. Default = 48

## Motif Windows Configuration Display Screen

The image shows a Motif window titled "SERVICE DIRECTOR - SETUP (CONFIGURATION)". The window contains a list of configuration parameters, each with a text input field to its right. The parameters and their values are:

Parameter	Value
WORKPATH:	/usr/lpp/servdir/
MAX. % DISK LIMIT WARNING:	98
DUPLICATE INTERVAL (HRS):	24
KEEP EVENTS MAX DAYS:	30
MAX FILE RECORDS:	100
COMMUNICATIONS PATH:	/usr/lib/ras
SECONDS BETWEEN CALLS:	5
RETRY ON TRANSMISSION FAILURES (Y/N/#):	5:3
DIAGNOSTIC DIRECTORY PATH:	/etc/lpp/diagnostics
OPENED PROBLEM STATUS UPDATE INTERVAL (HRS):	24

At the bottom of the window, there are three buttons: "Save", "Cancel", and "Help".

Figure 4-32. Motif Configuration Panel

## Setup Menu - PSA List

SERVICE DIRECTOR - SETUP (PSA LIST)						
PSA Name	Hold Psa	Threshold	Call IBM	Log	All	EVENTS
IBM	N	000000	Y			Y
IBMELH	N	000000	Y			Y
IBMMANUAL	N	000000	Y			Y
IBMVPD	N	000800	Y			Y

F1=Help    F3=Cancel/End    F6=Delete    F10=Exit

Figure 4-33. Setup Menu - PSA List

## Motif Windows Item Selection Requires Double-Click

### Setup Menu - SD PSA List Definitions

This selection is the configuration of the Product Support Applications. All PSAs that are to be executed must be defined here or they will not be executed. PSAs are executed in the order they are listed. If you do not want ibmvpd to execute then set the "Hold Psa" to "Y", and it will not be executed. Press the "Enter" key after typing all the data, then save with F3.

#### **COLUMN HEADINGS**

**PSA Name** Enter the name of the PSA. DO NOT enter the extension of the PSA. Default extension is ".psa".

**Hold PSA** No (N) means to execute this PSA. Yes (Y) means you want to bypass or hold this PSA and DO NOT want to execute it.

**Threshold** This is a six digit field entry of minutes, hours, days (MMHHDD). It determines how often this PSA should be executed. Default is 000000 and indicates that it should be executed every time Service Director is executed. If Service Director is executed within the time lapse indicated, the specific PSA will be ignored until the time lapse has been reached. In the listed case, ibmvpd will execute only after 8 hours has passed from the last time it was executed.

**Call IBM** This indicates if the Service Director should make a problem report transmission whenever a call problem report is generated by the PSA. A (N) indicates that all call problem reports should be held and the problem not transmitted to the Service Director IBM Server. This is the correct way to prevent SD/6000 from reporting calls to IBM.

#### **Log All Events**

Indicates if all events should be logged into the Event Log or only those events indicated by the PSA as being a call problem report.

**The correct way to prevent SD/6000 from reporting calls to IBM is to set all "CALL IBM" to NO.** The e-mail notification path may be utilized to inform of all calls that are held.



## Setup Menu - Communications

```

SERVICE DIRECTOR - SETUP (COMMUNICATIONS)

HOST REPORT PROBLEMS? ((Y)es/(N)o)      Y
HOST FORWARD PROBLEMS? ((Y)es/(N)o)    N
COMM. METHOD (RPC or TTY)                RPC
FILE CONTAINING RPC TARGET              /usr/lib/ras/callhomehost
tty DEVICE                              tty1
PARENT tty ADAPTER
PORT NO. ON PARENT ADAPTER
AIXServ LOGIN ID
AIXServ PASSWORD
AIXServ CUSTOMER NO.
FORWARDING METRIC                       5
NOTIFICATION MAIL ADDRESS               joe@systemname
FILE CONTAINING RPC CLIENTS             /usr/lib/ras/probrephosts
MODEM FILE'S NAME
REMOTE LATENCY DELAY                   0
REMOTE TIMEOUT                         300
RETRY COUNT                             2
RESPONSE TIMEOUT                       600
tty RETRY TIMEOUT                      86400
BAUD RATE                               9600
DIAL OUT PHONE NO.                    1-800-830-1041
PHONE NUMBER TO CALL BACK TO
LOCAL OPERATOR VOICE PHONE
HUB PHONE
DUPLICATE PROBLEM TIMEOUT              86400
DIAL TONE, (P)ulse/(T)one              T

Scroll = Up/Dn Arrows, F3 = Cancel/End, F10 = Exit, Enter = Continue
```

Figure 4-34. Setup Menu - Communications for Client Host

### Setup Menu - Communications Definitions

**Note:** Any changes made to these screens should also be made to the registration database for this hosts.

1. HOST REPORT PROBLEMS? ((Y)es/(N)o) Default = Y  
This field specifies if this host will report its own local problems. A No selection will prevent this host from calling in a problem to IBM.
2. HOST FORWARD PROBLEMS? ((Y)es/(N)o) Default = N  
This field specifies if this host will forward problems to a Service Director gateway server or if it is a Service Director gateway local server and it should make a connection/call to the IBM problem reporting system. Client machines will be set to No, while callhome forwarders are set to Yes.
3. Comm. method (RPC or TTY) Default = RPC  
This field specifies the reporting protocol mechanism, either RPCs on TCP/IP, or via RS-232 (TTY) using xmodem. The TTY method only allows a connection to the IBM problem reporting system. Problems can be forwarded via RPC to the Service Director local server that is set up as a tty.
4. File containing RPC target: Default = /usr/lib/ras/callhomehost  
This file specifies the file containing a list of target hosts to forward problems to when the reporting mechanism is set to RPC. If the first host in the list is not available then problems will be reported to the next one in the list. The dotted IP address of the callhome local server or client/server that this client calls is what is actually in the file.

5. TTY device: Default = tty1  
Name of the tty device. Required when the reporting mechanism is set to tty.
6. Parent tty adapter: Optional field specifying the parent tty adapter.
7. Port number on parent adapter: Optional port number on the specified parent tty adapter.
8. AIXServ login id: AIXServ server login id. **Currently not implemented.**
9. AIXServ password: AIXSERV server login password. **Currently not implemented.**
10. AIXServ customer number: The customer's AIXServ customer number. **Currently not implemented.**
11. Forwarding metric: Default = 5  
Indicates the maximum number of hops or hosts a problem can be forwarded through via RPC.
12. Notification mail address: Default = joe@systemname  
E-mail address to notify whenever a call is made to the Service Director server. This should be set to the system administrator's e-mail address or a technical contact. **Currently not implemented**, Use Notify User List from SETUP Menu.
13. File containing RPC clients: Default = /usr/lib/ras/probrephosts  
This field specifies the name of a file and its path. The file contains a list of hosts, that are allowed to send problems via RPC to the Service Director gateway server or client server.
14. Modem file name: Optional modem configuration file. Used when reporting mechanism is set to tty on the local server. IBM 7855, 7857, 7858, and 7852-400 modems all require the use of this file.
15. Remote latency delay: 0  
Reserved for future use.
16. Remote timeout: Default = 300  
This field specifies how long in seconds a remote client (RPC or TTY), should wait for a connection to the Service Director server before timing out. If error messages consistently indicate a connection failure it may be due to a remote timeout value set too low for the local network traffic.
17. Retry count: Default = 2  
This field specifies how many times to retry establishing a connection.
18. Response timeout: Default = 600  
This field specifies how long in seconds a remote client should wait for a response from the Service Director Server. **Currently not implemented.**
19. tty retry timeout: Default = 86400  
This field specifies how long in seconds to wait for the tty port to become available if the reporting method is tty. 86400 = 1 day.
20. BAUD rate: Default = 9600  
This field specifies the maximum value the tty modem will be set at for connection.
21. Dial out phone number: Default = 1-800-830-1041  
This field specifies the number for the modem to dial out to, and report problems to IBM.
22. Phone number to call back to: **Currently not implemented.**
23. Local operator voice phone: Optional customer contact voice number. It is highly suggested this field be filled with the area code and number of the customer contact in the event of problems.
24. Hub phone: Optional customer service hub phone number. **Currently not implemented.**
25. Duplicate problem timeout: Lag time between duplicate problem calls. **Currently not implemented.**
26. Dial Tone, (P)ulse / (T)ime: Default = T  
The phone line dial structure of tone or pulse.

SERVICE DIRECTOR - SETUP (COMMUNICATIONS)	
HOST REPORT PROBLEMS? ((Y)es/(N)o)	Y ▲ ▼
HOST FORWARD PROBLEMS? ((Y)es/(N)o)	N ▲ ▼
COMM. METHOD (RPC or TTY)	TTY ▲ ▼
FILE CONTAINING RPC TARGET	/usr/lib/ras/callhomehost
TTY DEVICE	tty1
PARENT TTY ADAPTER	
PORT NO. ON PARENT ADAPTER	
AIXServ LOGIN ID	
AIXServ PASSWORD	
AIXServ CUSTOMER NO.	
FORWARDING METRIC	5
NOTIFICATION MAIL ADDRESS	joe@systemname
FILE CONTAINING RPC CLIENTS	/usr/lib/ras/probrephosts
MODEM FILE'S NAME	
REMOTE LATENCY DELAY	0
REMOTE TIMEOUT	30
RETRY COUNT	2
RESPONSE TIMEOUT	500
TTY RETRY TIMEOUT	66400
BAUD RATE	9600
DIAL OUT PHONE NO.	1-800-830-1041
PHONE NUMBER TO CALL BACK TO	
LOCAL OPERATOR VOICE PHONE	
HUB PHONE	
DUPLICATE PROBLEM TIMEOUT	66400
DIAL TONE, (P)ulse / (T)one	T ▲ ▼

Save      Cancel      Help

Figure 4-35. Motif Communication Panel

## Setup Menu - PSA Hold Files

```

SERVICE DIRECTOR - SETUP (PSA HOLD FILES)

ibm
ibmelh
ibmmanual
ibmvpd

F1=Help    F3=Cancel/End    F10=Exit    Enter=D0
```

Figure 4-36. Setup Menu - PSA Hold Files PSA Selection Menu

### Select the PSA List You Wish to Modify

#### Motif Windows Item Selection Requires Double-Click

The `ibm.psa` works from the diagnostic results file and the SRN is the error number that will be utilized. The `ibmelh.psa` works with the error log and the ERROR LABEL is the item that will be compared on, NOT the error ID number.

There are additional entries in the SETUP Menu which are utilized for customizing the Service Director system. However, defaults are in place to allow normal execution on a fully IBM supported system. If there are nonsupport resources in the host that Service Director is resident on then do the following to have Service Director ignore those resources.

```

SERVICE DIRECTOR - SETUP (PSA HOLD FILES)
ERROR #      Create PMR MAX. HITS Time Interval  IGNORE RESOURCE
762-996      N          0          000000
762-998      N          0          000000
968-110      N          0          000000
844-405      N          0          000000
801-102      N          0          000000
850-902      Y          3          000400
              N          0          000000          hdisk22

F1=Help    F3=Cancel/End    F6=Delete    F10=Exit
```

Figure 4-37. Setup Menu - PSA Hold Files Data Entry Screen

**Note:** If there are unsupported OEM components or components that are not covered by an IBM Maintenance Agreement, Service Director for RS/6000 must be configured to ignore those resources or products so that a problem will not be reported to IBM relating to an unsupported resource.

## Setup Menu - PSA Hold Files Definitions

This selection allows modification of the individual Product Support Application error hold files. A dynamic list of defined PSAs will be displayed on selection of this entry.

**ERROR #** Under ibm enter the SRN you wish to monitor, under ibmelh enter the error label. This field will scroll up to 50 characters.

**Create PMR** Yes means to create a problem report when the error occurs or threshold is met. No means never create a call for this error.

**MAX HITS** Number of maximum hits before creating a PMR.

**Time Interval** Six Digit field indicating minutes, hours, days, (MMHHDD). Time Interval allows creation of PMR if MAX HITS occurs within this time.

(MMHHDD) = minutes-hours-days, max 999999

(000000) = take action on MaxHits

(001500) = act on Max Hits within 15 hrs.

(000007) = act on Max Hits within 7 days

**Ignore Resource** If a resource name is entered in this field the resource specified will be ignored. Any errors that occur against the resource will NOT be reported. For example to ignore all errors that occur on token ring card 0, enter the resource name "tok0" for the token card.

**Note:** To selectively report errors leave this field blank and enter the error numbers you wish to either ignore or selectively report.

Check the SRN default list and enter any local SRNs that you want to ignore or threshold. Enter the SRN exactly as it would occur in the Error Log or diagnostic report file (850-902 or 48000).

## Ignore Resource

To enter a resource that is to be ignored and not called in, do the following from the curses interface:

- Enter a SPACE and then the Enter key to clear the ERROR # field.
- Enter an N for no PMR creation.
- Press the Enter key to move the cursor over to the field that is titled "IGNORE RESOURCE".
- Enter the exact name of the resource that would be logged into the error log. For example, "tok1" is a common name for the second token ring adapter.
- Then press Enter to go the next line. After making your entries press "F3" to get out, and enter (Y)es to save the entries.

On the motif interface, select Add or Modify pushbuttons, then enter or change the selected fields. Make sure you save the panel after entries are completed.

---

## 4.8 Service Director Main Menu - Lock Files

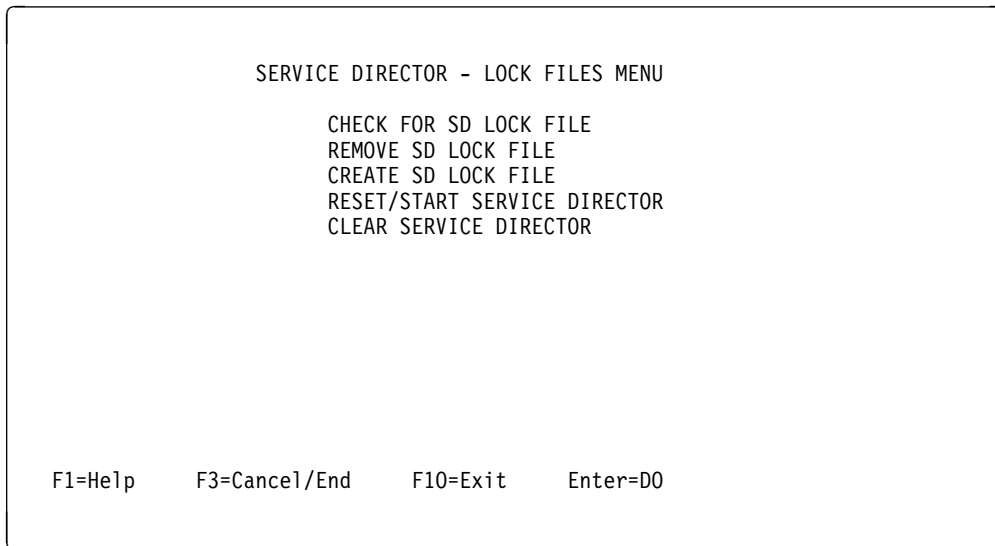


Figure 4-38. Lock Files Menu

### Lock Files Definitions

#### CHECK FOR SD LOCK FILE

This selection will check for the existence of the Service Director lock file. If the file exists, Service Director analyze engine and some selected display options will be inhibited.

#### REMOVE SD LOCK FILE

This selection will remove the existing Service Director lock file, and execute Service Director reset.

#### CREATE SD LOCK FILE

This selection will create a Service Director lock file. The lock file will prevent Service Director from executing. This function is now available from the main menu of the registration process. The lock and unlock / reset actions may be invoked against all machines in the registration list or the working collective on the 9076.

#### RESET/START Service Director

This selection will reset the Service Director time stamps to the current time. The Service Director time stamps are used by Service Director and the PSAs for determining the last time an error occurred. By resetting the time stamps all errors occurring before the current system time will be ignored.

#### CLEAR Service Director

This selection will remove the svcdctr.event file and the sd\_calls sub-directory from the Service Director work path /usr/lpp/servdir. Use this function if the local events menu will not display correctly.

**Note:** *Service Director should always be locked before diagnostic activity is executed, or at least Reset/Start after diagnostics have created a valid SRN. Service Director should also be locked on the 9076 control workstation before removing a node or servicing the rs232 to frame cable.*

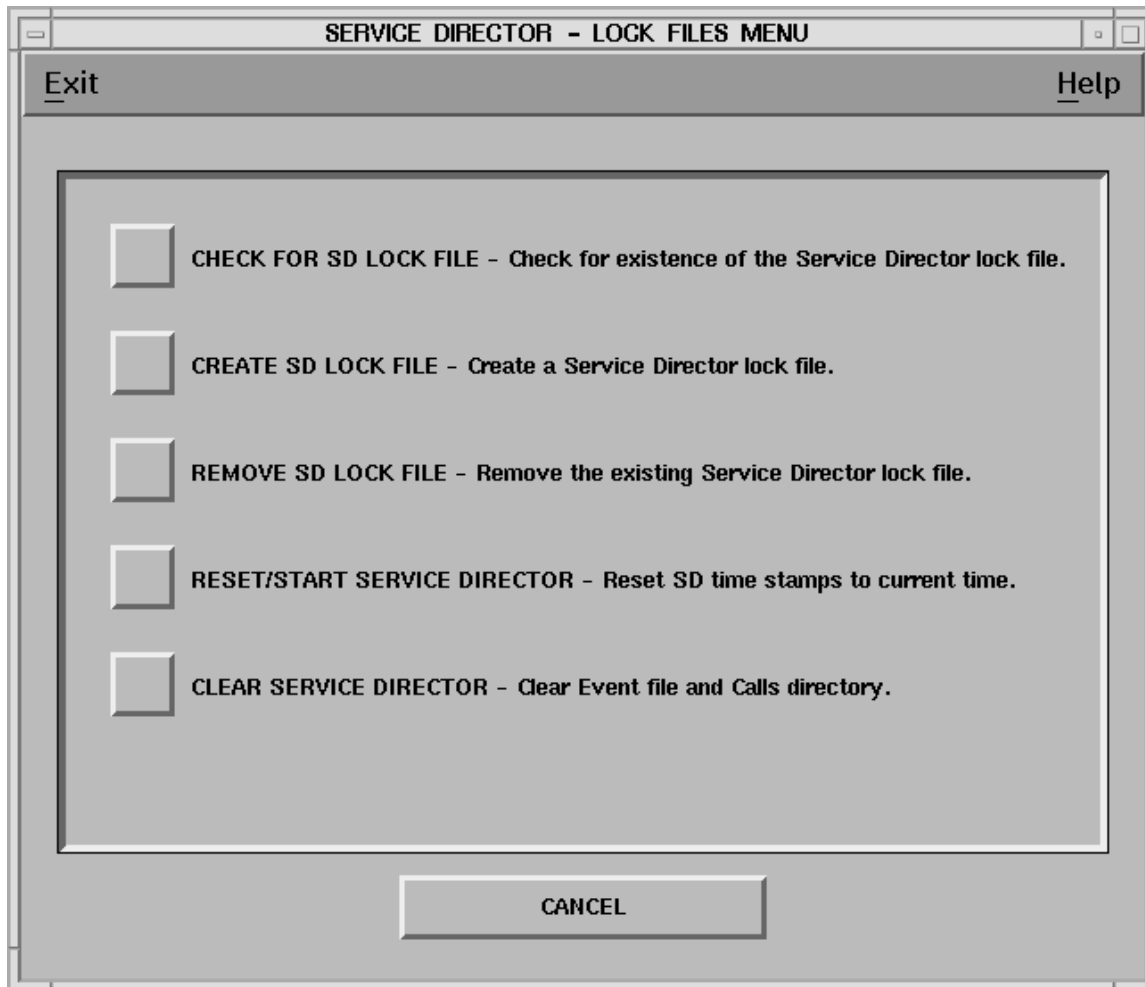


Figure 4-39. Motif Lock Menu

The registration application Main Menu also has a global lock and unlock/reset function, that allows the invocation of the lock file to all or selected machines from the registration list. In the 9076 arena the "dsh" function is used to issue the lock to the current working collective. By selecting the unlock function all the selected machines will have the lock file removed and SD/6000 reset. Remote shell access must be implemented for this function to be used on normal RS/6000 machines.

If the customer wishes to create script executable or use bottom line commands for lock and unlock/reset functions, the following examples may be used:

```
To lock touch /usr/lpp/servdir/servdir.lck
To reset and remove lock use:
    /usr/lpp/servdir/servdir.analyze reset:
    rm /usr/lpp/servdir/servdir.lck
```

The registration menu has a lock/unlock option on the main menu. This option allows one to lock machines in the registration list or if the "dsh" command is available, to lock all machines in the working collective plus the local server.

---

## 4.9 Service Director for RS/6000 Main Menu - READ ME FIRST

Selecting **READ ME FIRST** off the Main Menu will present you with a flat file that contains latest items of Service Director along with the error messages that are also shown in the appendix.

Further, the User's Guide is available in ASCII format:

```
/usr/lpp/servdir/UG.ASCII
```

---

## 4.10 Service Director for RS/6000 Vital Product Data PSA

Automatic or Manual Vital Product Data (VPD) call in function has been added. If SD/6000 detects that the VPD has changed, the new VPD will automatically call in. Manual VPD call can be initiated via SMIT, smitty, or fastpath `smitty servdir_vpd` command.

Not all RS/6000 are supported by this command structure. Currently only the 9076 SP machines are reporting and they should be at PSSP code level of 2.3 or higher, although 2.2 is supported with a PTF.

If you are making a manual VPD call after FRU replacement, make sure the node has had time to update the CWS VPD information.

If you are on a node, it will get the SP node information per `ibmSPNode.Infocmd` script for inclusion in RETAIN PMR following the contact information.

A status message is sent to the e-mail notify drops which should contain what files were sent to IBM, but they will not contain all of the VPD information. A return code of 29 is a notification that the data was received OK. RC=30 means that a check sum fault occurred and the call will be completely re-processed.

For additional information of this function see 6.3, "Service Director for RS/6000 Vital Product Data PSA" on page 6-4.



---

## Chapter 5. Security, Support Structure, and Removal

This section covers Service Director for RS/6000 security, the support structure, and the process of removing Service Director code.

### Objectives

On completion of this section of the guide you should be able to:

1. Recognize the safeguards built into Service Director for RS/6000 associated with security.
  - Expiration date of Service Director
2. Identify the support structure for Service Director.
3. Understand the correct procedure for removing Service Director from a system.

---

### 5.1 Security

#### Media

To install Service Director for RS/6000, the proper type of media is required depending on the customer's particular RS/6000 diskette drive. Currently the Service Director install code will compress to fit on one 1.44MB compatible diskette.

All media is marked **COPYRIGHTED BY IBM** and must be handled accordingly.

The code belongs to IBM and RS/6000 Service Director is **copyright** protected. This includes all Service Director screens. The customer is free to make as many copies (tape, diskette, etc.) as necessary to perform their specific installation. To duplicate the program, use the appropriate AIX command for the media being used for this purpose.

#### Expiration Date

There is no direct expiration date for Service Director for RS/6000. Function is determined by valid customer MA or Warranty service entitlement.

During the registration process the customer will receive a generated key file that becomes part of the customer's resident Service Director for RS/6000 program. This key file is used by the program each time Service Director places a call for service. The KEY in the file is validated for valid date and if met, the service call is passed to IBM. IBM server will again check the current customer service status from the IBM database, if this reveals that the customer is not on MA or Warranty, then the service call is refused and posted back to the customer via e-mail. If the current call shows that the MA ending date is greater than the key file indicates, then the KEY is extended to the new date. The customer will also receive a message of service coverage extension.

There is an additional feature to the Service Director program that notifies the customer automatically 90, 60 and 30 days prior to warranty expiration, if e-mail is active on the machine.

Please remember the importance of security measures in your involvement with Service Director. In today's competitive environment for service business, Service Director should be one more advantage that IBM Service can offer.

## Customer Complex Security

Service Director is automatically invoked by two different items; either a crontab entry, or the errnotify on hardware (perm or temp) fault. It can also be invoked manually with a bottom line command, but that command is not documented for use.

The errpt command is used to gather information from the error log and the diagnostics or diagela are run against the failing unit, with the results being in one of the /etc/lpp/ldiagnostics/data/diagrpt\*.dat files. These dat files are utilized by Service Director to obtain SRN failure information.

The following four /var/adm/SPlogs files are gleaned for data pertaining to the fault. The sphwlog at /var/adm/SPlogs/SPdaemon.log is tailed for up to the last 20 sphwlog entries for the supervisor detected faults. The HiPS and SPswitch will check for data in the following three logs:

```
/var/adm/SPlogs/css/cable_miswire  
/var/adm/SPlogs/css/daemon.stdout  
/var/adm/SPlogs/css/rc.switch.log
```

Service Director accesses only system data from the above mentioned files, diagnostic, system error log, /usr/lib/ras/checkstop files, and VPD information files. NO unique customer data is ever accessed. All accessed data that is transmitted to IBM Problem Management System is also sent to the e-mail user ID assigned to the CALL type user notify option.

The tty port and modem security are both configured to not auto-answer the modem or allow login access from the tty port. Service Director/6000 only allows outbound calls to be created from the customer's location. At no time will this application attempt to call the customer's account electronically.

The Service Director for RS/6000 application from the client end executable servdir.analyze, through callhome daemon, the tty port and modem, to the IBM modem, outside IBM catcher, to the IBM inside SDserver machine and into the RETAIN system is an IBM Certified Secure Network. Network data might be monitored but due to internal passwords and fixed responses, application will not allow unauthorized access.

The Service Director callhome process can be accessed through a firewall complex to maintain a secure environment. The firewall lowest available port socket and the portmapper 111 socket must be made available for two way communications. When the callhome process is started on the server it will bind to the lowest available network socket on the interface identified by the server's hostname. The available socket will vary depending on the communications adapters available to the operating system. The client and client/servers will check with the server's portmapper to see what port has been assigned to the callhome process. The client will then access the dotted IP address in the file /usr/lib/ras/callhomehost calling for the assigned socket. No other network services are requested by this forwarding application.

## Service Processor

Be careful not to confuse the Service Processor Remote functions that are built into the SMP RS/6000 machines with Service Director for RS/6000 functions that run on the AIX operating system. The Service Processor remote console mirroring or dial-in functions are defined to work on tty port 0 of the Service Processor, and communicate only with the Service Processor, **NOT AIX**. The Service Processor remote callhome function defined for tty port 1 on the Service Processor is an engineering emulation of the Service Director and is configured to call the same 800 number, but will not make a service call on an AIX detected fault.

---

## 5.2 Support Structure—U.S. Only

- For the IBM Service person, the phone number to call to assist with usage or installation questions, or to report a defect with Service Director is the National Availability Support Centers.
- Any time spent installing, updating, or talking to a customer or support groups about Service Director for RS/6000 should be coded as **Service Code 48**.
- Customers may receive complementary installation and configuration assistance for Service Director for RS/6000 by calling 1-800-CALL-AIX (1-800-225-5249) and selecting option **1** twice for technical assistance. Please provide the customer number of **SRV6000** when calling. Assistance under this special customer number will be provided for Service Director for RS/6000 **ONLY**. Hours of support are Monday through Friday, 8:00 am to 5:00 pm Central Time, excluding holidays.

**Note:** Service Director for RS/6000 requires an operational outbound modem connection. **NO MODEM CONFIGURATION ASSISTANCE CAN BE PROVIDED THROUGH THIS COMPLEMENTARY SERVICE.** If modem configuration assistance is required the customer should contact the modem vendor for assistance. Assistance with IBM modem configuration issues can be obtained for a fee by registering for IBM Support Family Services. For additional information or registration information for IBM Support Family Services, please call 1-800-CALL-AIX (1-800-225-5249) and select option **2**, followed by option **1**.

---

## 5.3 Permanent Removal of Service Director from a System

There are three ways to remove the Service Director code from the system.

1. SMIT menu to Delete Service Director Application.
2. Registration program option **d** to delete remote client Service Director code.
3. Execute the `servdir.remove` script located in `/usr/lpp/servdir/`.

Any of these selected methods delete the Service Director for RS/6000 programs and data.

**Warning:** If system problems or corruption occur during execution of this script, unwanted deletion, loss, or corruption of data may occur. **USE WITH CAUTION.** A **backup** of your system should be done prior to executing this script.



---

## Chapter 6. Technical Overview

This chapter reviews how Service Director interacts with RS/6000 for data capture, how some of the PSAs function, and how to create a custom PSA. It also explains how some of the possible configurations, and how High Availability (HA) environment are supported.

---

### 6.1 Error Data Capture

Service Director is triggered by crontab entry, or by errnotify on a hardware permanent or temporary fault. If Notify User List has EVENTS set to Yes, then every time errnotify triggers Service Director, it will send e-mail to that user ID. This is usually too much e-mail for users and events should normally be set to No.

Service Director currently uses two different methods to obtain and analyze error data within RS/6000. The `ibm.psa` utilizes the diagnostic result files while the `ibmelh.psa` gets its data from the error log.

The RS/6000 diagnostic structure, including `diagela`, was designed to do detailed analysis against a failing hardware component or error log and produce a valid Service Request Number (SRN) if service action was required. The `ibm.psa` is completely dependent on the diagnostic result files for making calls to service. So any adapter or attachment that supports the RS/6000 diagnostic structure is supported under `ibm.psa`. The SRNs or resource may be ignored or additional threshold applied from the `ibm.psa` hold file to prevent calls from being generated. See "Ignore Resource" on page 4-37 for details.

If the diagnostic result files at `/etc/lpp/diagnostics/data` have a later time stamp than `ibmpsa.lasterror` file, then the file is checked to see if a valid result is posted. If SRN is detected, then the results file along with the vital product data for the failing resource, if posted, is put into a call file. If the diagnostic `dsense` command is available, the detail sense data summary from `errpt` is added to the call file. If the statement "No trouble was found" is contained in the result file, then no action is taken. Setup automatically corrects "No trouble was found" to proper language.

The second method used by `ibmelh.psa` works directly from the error log. The error log resource type and name are used by the PSA to check if a parameter file needs to be analyzed against the recorded fault label. If a match is found in the resource table (`ibmelh.rtbl`), then the **ERROR LABEL:**, not the ERROR ID:, is matched against parameter table. If no match is found then no action is taken. The parameter files contain up to three levels of threshold per label, most faults only have 1. Once a threshold is met the associated message and action is added to the captured "errpt -a" entry, and if VPD exists for the resource it too is added to the call file. The resource or error label may be ignored or additional threshold applied in the `ibmelh.hold` file. The current resources being checked under the `ibmelh.psa` are the "Machine Check," "CHECKSTOP," 9076 "sphwlog" (supervisor), and the HiPS and SPswitch faults. Early SSA faults may also be monitored by adding "ibmelh.ssa.tbl" to the `ibmelh.rtbl` entries.

From the Service Director User Interface additional control of these PSAs can be executed under the SETUP menu **SD PSA LIST** option. Removal of the PSA from the list will prevent it from being executed. The correct way is to set the **HOLD PSA** to a "Y." You can set how often the PSA is executed, and if you want it to place calls to IBM. If you set **Call IBM** to an "N" then analyze will put the call in hold status. If **Notify User List** is set up for notification on calls held, then call is e-mailed to user ID.

One of the latest PSAs is the `ibmmanual.psa`, which allows the user to enter freelance faults that might go undetected. This PSA has a deferred option which will allow the calls to be placed later.

After all PSAs have been run, analyze checks if any call files were produced. If none exist then Service Director exits. If a call file exists, then an attempt will be made to call it into IBM SD server. If this was successful then the PMR number is posted in the Event Log, and the user ID under notify on call will be sent e-mail of call. If a problem prevented Service Director from completing the call then notify on problem is informed. If the problem being called in already has an OPEN call in the RETAIN database then this call will be posted as a duplicate and no new PMR will be generated.

---

## 6.2 Service Director Errnotify Flow

### Service Director Hardware Permanent Fault

1. Error occurs and is captured in error log 1-a.
2. Errnotify activates `diagela` and `servdir.analyze`.
3. `Diagela` runs against the error log, using the failing resource 3-a and stores the diagnostic results at `/etc/lpp/diagnostics/data` directory 3-b. The results could be "No trouble found" or a valid SRN.  
The Analyze engine captures data from the `errpt` event and then schedules the PSAs to be run as soon as diagnostics have completed 4-a.
4. The `ibm.psa` is the first to run and it looks at the diagnostic results files at 4-b to see if a valid SRN was created. If so, then an `ibm#.call` file is created 4-c. If only an NTF was found, then no call file is generated.
5. The `ibmelh.psa` captures the `errpt` event 5-a and checks the failing resource type and name 5-b against the parameter files. If the type and name are found in 5-b then the error level from 5-a is checked against the 5-b parameter and if a match is found, then the `ibmelh#.call` file is made in 5-c.
6. The Analyze engine now checks for any generated call files. If none are found, then data from step 3 is posted to the event log as 0. But if call file was created by one of the PSAs, then an attempt is made to call it into IBM. The call file is moved to the `sd_calls` directory as a pending (`pnd`) call.
7. The Analyze engine attempts 3 times to create PMR to IBM by using the modem or, if Analyze is on a client machine, by forwarding the call to the `callhome` process on the local server. The `callhome` would run the modem in that case instead of the Analyze engine.
8. The call results are placed in the event log under a 9 digit number showing that SD/6000 created an event for this action. The pending file extension (`pnd`) is changed to open (`opn`) if a PMR was created successfully.
9. If notify list is available and e-mail is running on the failing machine, the notification of event status is sent.

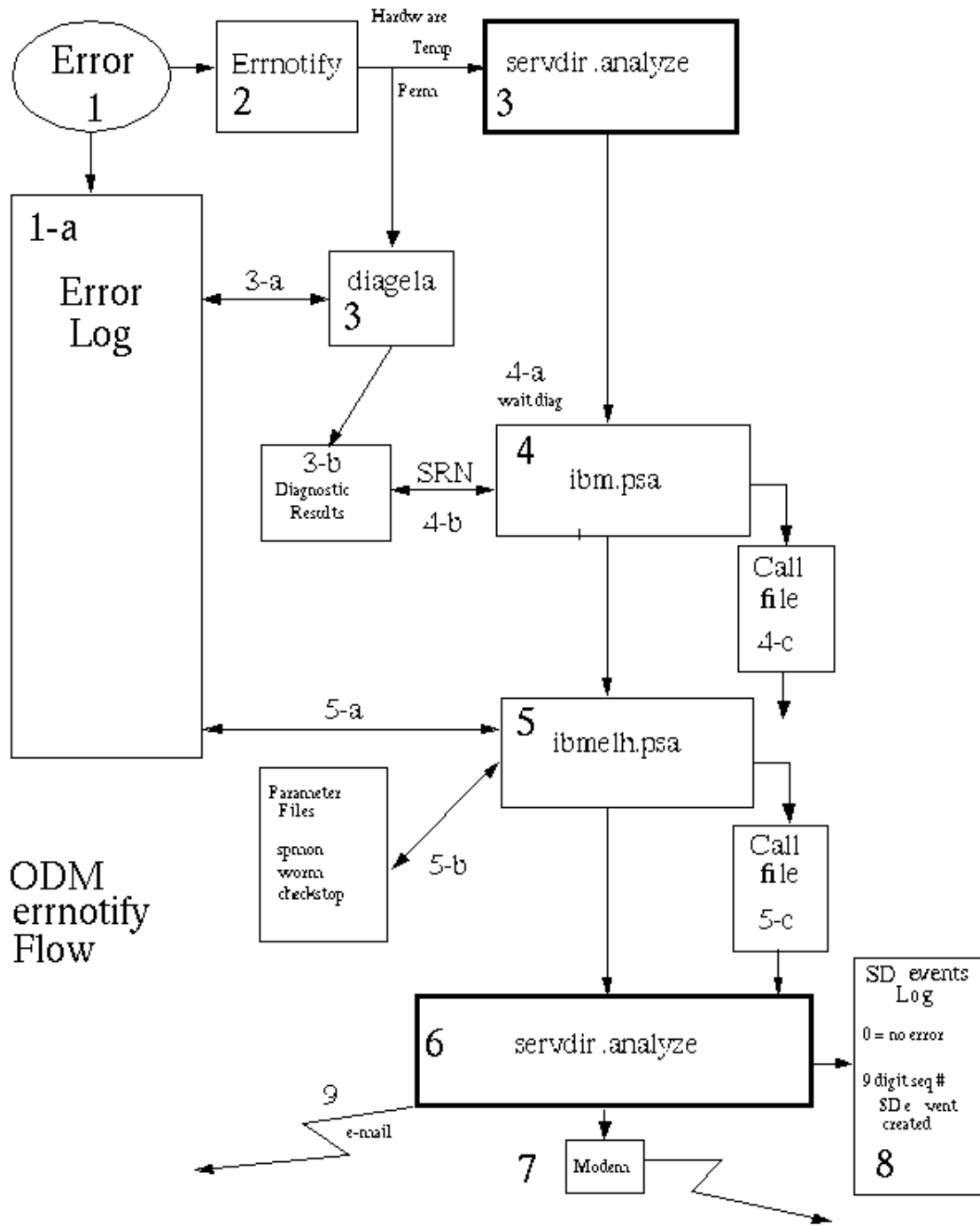


Figure 6-1. Service Director Error Notify Flow

---

## 6.3 Service Director for RS/6000 Vital Product Data PSA

The manual Vital Product Data (VPD) call can be initiated via SMIT, smitty, or fastpath smitty `servdir_vpd` command. If Service Director VPD PSA detects that the VPD has changed, the new VPD will automatically call in.

Automatic VPD call in will occur if the `ibmvpd.psa` detects a change in the VPD check sum from the previous value maintained in `ibmvpd.lastsum` file. The `ibmvpd.psa` will process after an eight hour threshold has expired. If executing on a 9076 CWS it does `get_vpd` command and checks the results for change. If on a node it will get SP node information per `ibmSPNode.Infocmd` script for inclusion in RETAIN PMR following contact information.

The `ibmvpd.command` file controls what machine types report, what command to use, and where to find the resulting VPD information. See "IBMVPD.COMMAND FILE" on page 6-5 for break down of file. Not all RS/6000 are supported by this command structure. Currently only the 9076 SP machines are reporting and they should be at PSSP code level of 2.3 or higher, although 2.2 is supported with a PTF. The VPD is packaged into a type 4 call file and reported to the IBM server. If the VPD is greater than 150K bytes in size, it is broken down into multiple call files of 150K plus the last residual file. These files are then re-combined at the IBM server and sent to the IBM VPD database system.

The `get_vpd` command should only be executed on the primary CWS for a 9076 complex. When the `ibmvpd psa` executes on a 9076 node it will attempt to obtain SDR data (see `ibmSPNode.Infocmd`) and put it in `Node_info.data` file. The `Node_info.data` file will then be added to the normal call files just after the customer contact data. This will assist the support structure in knowing what type of a node they can work with.

A status message is sent to the e-mail notify drops which should contain what files were sent to IBM, but they will not contain all of the VPD information. A return code of 29 is a notification that the data was received OK. RC=30 means that a check sum fault occurred and the process will be completely re-processed. The VPD call files are not maintained, but erased once a `rc=29` has been received or the file has gone to a failed state (`rc=99`). If a technical problem occurs during transmission of a VPD call file then the technical notification will contain up to 150K of the VPD data in the e-mail. This technical notification should be corrected in a later fix level of code (after 3.0.0.4).



## IBMVPD.COMMAND FILE

<b>Device Type</b>	Use 0000 for Default (Must be last in file)
<b>VPD Command</b>	Use full path statement from root / Must use valid command syntax. Use N/A for not applicable.
<b>Parameter</b>	Number of parameters to be used by the listed command. If no parameters are required for command then enter zero (0).
<b>Flag</b>	Actual parameter flag used by the listed command -m.
<b>Data Type</b>	Type of data to be inserted behind flag in command structure. <ul style="list-style-type: none"><li>• model_number</li><li>• serial_number</li><li>• serial_type-model</li></ul>
<b>Flag n</b>	Additional parameter flags as required by command.
<b>Type n</b>	Additional flag data as required by command.
<b>VPD output</b>	Use full path statement from root of file name where command results will reside. Use N/A for not applicable results.
<b>model_number</b>	The actual model number of the machine type the code is executing on, for the 9076 it is defaulted to 000. It is calculated at the IBM SD server or uses the model from the entitlement database.
<b>serial_number</b>	The actual machine serial number that is assigned to the machines entitlement key.
<b>serial_type-model</b>	The actual machine type and serial number that is assigned to the machines entitlement key, with a default 000 model number.
<b>Default</b>	Must be the last entry in file and have the following structure. 0000 N/A 0 N/A

---

## 6.4 Create PSA executable for Service Director

Service Director has the capability of executing custom psa executable every time SD/6000 is triggered. The following items are facts about the current psa's used with SD/6000 and may prove helpful in interfacing with the custom application.

If a psa has left a call file for servdir.analyze to handle, it will have the name convention of psa name, followed by a number (1-99), then a period followed by the file extension of call ( ibm1.call or ibmelh1.call ), and will be in /usr/lpp/servdir directory.

The files will contain the following header and all of the data after CALLHOMESTART: tag will be called into IBM.

```
SDSTART:
ERRID=          8 hex digit error code from errpt
DATE=          MM-DD-YY date time stamp of fault
TIME=          HH:MM time stamp of fault
MACHID=
SERIAL=
RESNAME=       resource name assigned to fault
NODEID=        usually hostname
DESCRIPTION=   a short 20 characters of fault description
FSC=          SRN number or error number of manual call
ERRTYPE=      P=perm, T=temp, C=custom, V=vpd
COUNT=       the number of times this fault appeared
THRESHOLD=
PSANAME=       the psa that created this call file
COMMENT=      full 80 characters of fault description
HW=           hardware call = 1
CALLHOME=     call type 0=hold notify, 1=callhome, 4=vpd
SENSE_LENGTH=
SENSE_START=
CALLHOMESTART:
```

After all the listed PSAs have run, analyze will handle each call file left by the PSAs. It will build an index number, a time stamp that is converted to ASCII and is placed into the header (example INDEXNUMBER:902791326). This index number then becomes part on the call naming conventions when it is moved to the sd\_calls directory. The example would be labeled sd902791326.pnd and would remain that extension until a successful call was made. According to what call action is discovered, the appropriate extension is placed on the file. The index number is also how Service Director keeps track of the event.

```
sd_calls = Calls sub-directory once analyze has handled the call file.
sd<seq_number>.extension_as_follows
.pnd      = sd_calls (PENDING) file extension call is pending
.hld      = sd_calls (HELD) The CALLHOME header flag was a 0 (no call)
.opd      = sd_calls (OPENED) Call successfully opened with IBM
.dup      = sd_calls (DUPLICATED) Call already open with IBM
.clo      = sd_calls (CLOSED) Status check of call showed it was closed
.fal      = sd_calls (FAILED) Call attempts have exceeded the configured
           5:3 retry setting and no further attempt.
```

## Setup psa in Service Director

Setup PSAs by using the following name convention on the executable "exe\_name.psa" placed in /usr/lpp/servdir sub-directory. Note: the file extension ends in 'psa'. Use the Service Director user interface to do SETUP, SD PSA LIST, and then reference "Setup Menu - PSA List" on page 4-32 to enter the custom psa name only in the list and set 'Hold PSA' to a **N**. The Call IBM and Log All EVENTS should also be set to **N**. The PSAs will be executed in the order as they appear in the SD PSA LIST.

Make sure that the PSA executable and the SD PSA LIST are on all of the client host machines that you wish the PSA to work on.

### Example PSA

Customer wishes to notify TIVOLI if Service Director wants to make a call. Build a script file called **tivnote.psa** that checks for any call files in /usr/lpp/servdir directory. If call file exist, then redirect call file through the TIVOLI mail template. Wait 5 minutes for operator action and then exit. This would give operations time to remove call file if they did not want the call to go through, or if no action is taken the analyze would call in the problem.

Using the SETUP procedure see "Setup Menu - PSA List" on page 4-32 the **PSA Name** would be **tivnote**. The **Hold Psa, Threshold, Log All Events** would be the default setting and **Call IBM** would be set to **N**.

If this PSA was inserted after the first two PSAs but in front of the IBMMANUAL & IBMVPD PSAs, it would only notify IBM if the call was generated by the IBM or IBMELH PSAs and not on manual or VPD calls.

---

## 6.5 Client/Server Call Forwarding

### Simple Environment

#### Forwarding Calls

When the Reporting Topology files are built and the communications parameters have been set to be a forwarding host, the registration program will prompt for the utilization of the forwarding daemon. If accepted, the registration program will then start the background process called "callhome", which does the forwarding tasks.

The forwarding system consists of five major components, they all normally reside in /usr/lib/ras directory:

- "ProbrepAt" communication object structure (Do Not edit)
- "callhome" executable
- "probrepconf" the communication object configuration executable
- "callhomehost" ASCII file, dotted IP address of client's forwarder
- "probrephosts" ASCII file, list of valid forwarder's client hostnames

The "ProbrepAt" communication object is located in the /usr/lib/ras directory on every host running Service Director. This file is a structured file containing communication parameters for local modem access or client to server RPC communication. See the Service Director Setup section if changes to this file are desired. The "probrepconf" configuration executable is used to make the necessary changes to the communication object. Do not attempt manual changes to the communication object.

The "callhome" executable is the program that runs in the background as program number 35791394 on the forwarding host. This program is only required on the hosts that are intended to be forwarders and is located in /usr/lib/ras. This file along with "probrephosts" is not distributed to client machines. In a simple configuration there is only one local server, the one with the modem attached to the tty port. All clients machines must have IP address connectivity to the local server.

The "callhomehost" ASCII file contains a list of hosts that the client is to send calls to. This file will usually contain the one IP address of the forwarding local host. During step 3 (Topology) the callhomehost file is created for each client and then distributed at step 4 (Key) to the client machine. If a backup or secondary forwarding local host is required then additional IP addresses can be added, one address per line. By using the + sign at the initial continue prompt of step 3, you will be allowed to enter an additional dotted IP address during the build cycle of callhomehost. When there are multiple forwarders shown in this file, Service Director will attempt to place a call with the first host IP in the list. If the host is unavailable the second host address will be tried. This process continues until either a connection is established with an available host or the list is exhausted. This file "callhomehost" is located in /usr/lib/ras on every Service Director host, except for the local server, which uses the modem to call IBM.

The "probrephosts" ASCII file is used by the forwarder to determine if calls from a client will be accepted. If the client(s) hostname or IP address is in the "probrephosts" list, then calls will be accepted, and if not they will be rejected. The "probrephosts" file is only required on those hosts that are to be forwarders and is located in /usr/lib/ras. This file can be edited.

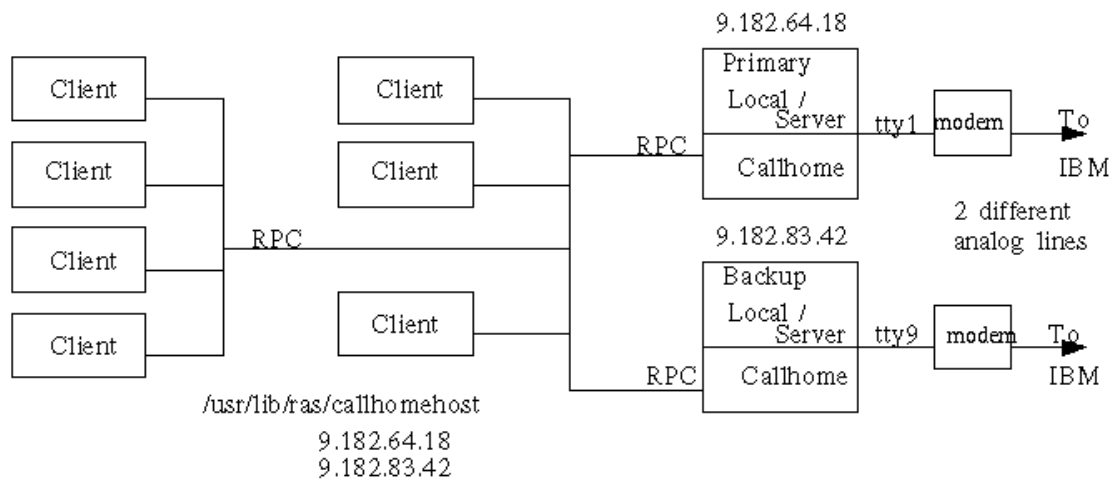
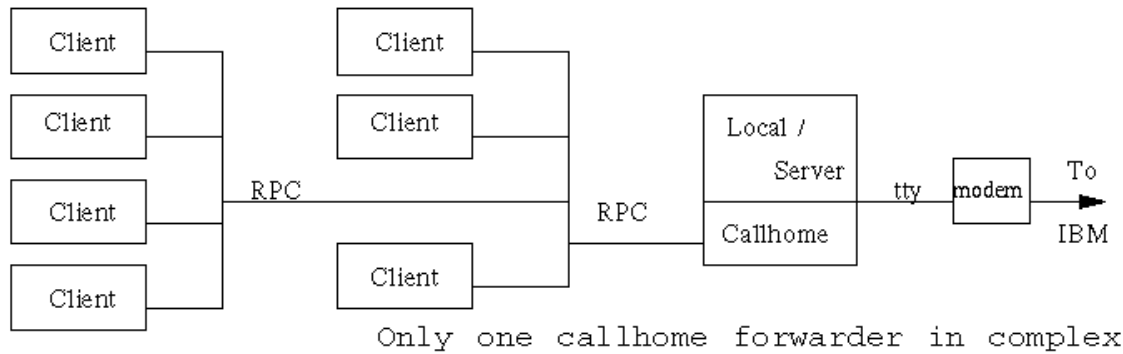


Figure 6-2. Simple Configuration for Service Director

The two simple configurations show that there are only local servers with attached modems and no client/servers in the configuration. All clients can address the local server. In the backup configuration, all clients can address both of the local servers. If the primary callhome process becomes unavailable then the client will automatically try the second IP address in the callhomehost ASCII file. If a client can establish a link with the callhome process, it will use that process even if it times out, and not fallback to the secondary address.

If the callhome process is active on the primary local server and its tty port or modem is down or defective, then the callhome process will fail. The backup process will not be attempted unless the primary call forwarder is down and the callhome process cannot be contacted.

New functions for the callhome process on Release 3.1, will allow you to have multiple callhome processes running on the same server. Using new callhome flags the monitored interface can be controlled and more than one callhome daemon can be run. The -h hostname flag allows you to set which interface is monitored, while the -np # allows you to define a different process number allowing multiple callhome daemons. Also due to 3.2.5 restrictions the socket can be controlled up to 9999 with the -s ##### flag setting. Reference 8.3, "Manual Entry Options" on page 8-7 for additional information.

## 6.6 Complex Environment

A complex configuration exists when there are additional RPC client/server forwarders in the network with the local server driving the modem. The client/servers may be required because client machines do not have IP addressability to the local server. This environment of multiple "callhome" forwarders is not supported under Release 2.0, but is **supported at Release 2.1**.

The registration program can build this environment; see Chapter 3, "Registering Service Director" on page 3-1 under "Complex examples." Prior to release 3.0, all machines must be registered from the local server. Now you can **Register from a client/server host**. One suggested way to build a complex configuration is to use the segmented approach. There are other ways to arrive at the final configurations (see full complex example).

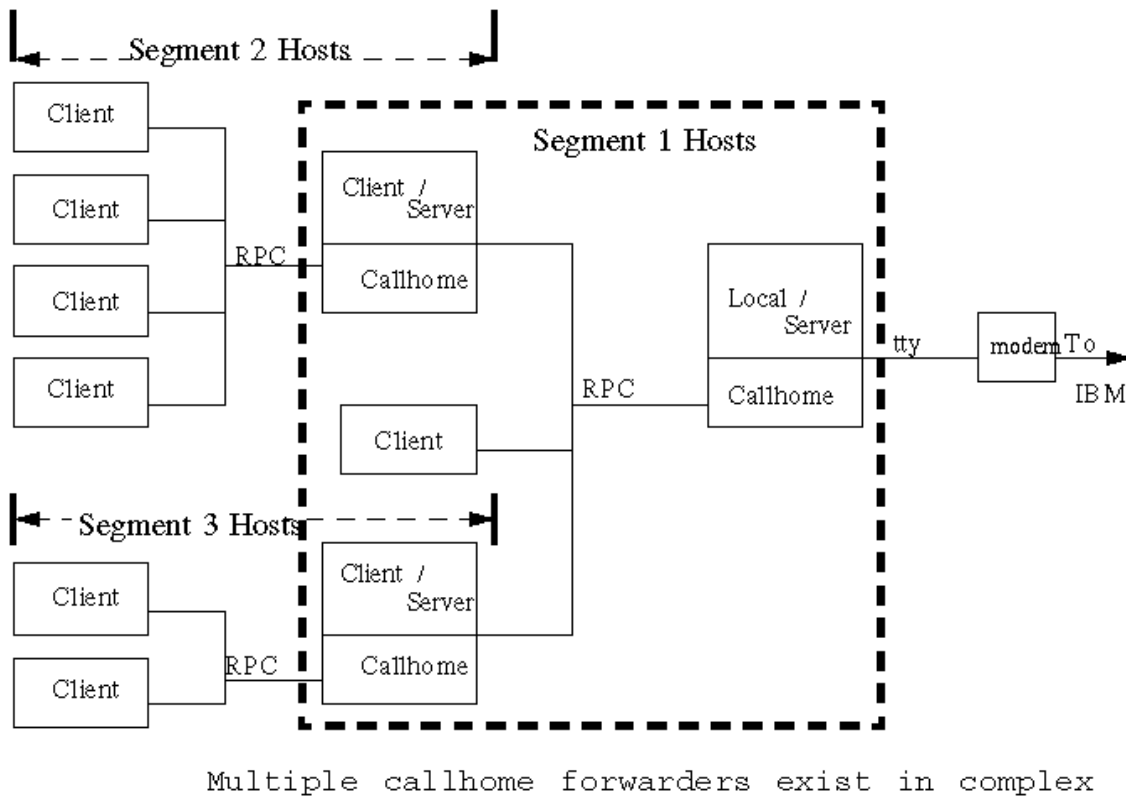


Figure 6-3. Complex Configuration for Service Director

The callhome process, when started or restarted by inittab entry, will bind to the communication adapter IP dotted address pointed to by the active hostname of the server. If multiple communication adapters are installed on the callhome forwarder host, each adapter will have its own hostname assigned when configured. The default hostname of the machine will be the last communication adapter configured. The hostname may be set to any name that the customer wishes by using the command `hostname <name>`, where name equals the desired hostname. Communications from any other system will still find or resolve to the communication adapter configured hostname or IP dotted address. If the local hostname is not one of the configured network hostnames then Service Director callhome process will not bind to any unique dotted IP address, but will listen to all interfaces. The `netstat -n` entry will show `*.*`. This condition will allow Service Director to forward calls from different interfaces on the server, instead of binding to just one dotted IP address. If server hostname points to one interface and you need to listen to all or multiple interfaces, the callhome process has a `-call_all` option that can be set, reference "Callhome Multiple Interfaces" on page 7-27.

---

## 6.7 Forwarder Logging

To clarify some of the terms used in Service Director for forwarder:

- The callhome process is the forwarder process, so any machine or workstation running the callhome process is a forwarder.
- The server is a machine that handles request for clients and Service Director `servdir.analyze` runs on clients.
- To forward a Service Director request the server must be running the callhome process.
- If the callhome process drives a modem attached to a tty port then it is a local/server.
- If the callhome process forwards to another network then that forwarder is known as a client/server.
- All servers running callhome are considered forwarders.

The callhome process has the capability of logging every transmission. When the registration program installs the callhome process it is installed with logging turned off. There are several logging options that can be added to the callhome execution line. Although you can set the maximum log file size, the default maximum log size is 80000 bytes, which will contain up to 300 records. Once the maximum file size is reached the log will be cleaned up and half of the records will be removed starting with the oldest records first.

The registration program under step 3 "Topology" allows you to set the logging option to all events going to a default file. Reference paragraph following Figure 7-28 on page 7-26 for the entry of a capital "A" at the callhome prompt. Reference 8.3, "Manual Entry Options" on page 8-7 for additional options.

---

## 6.8 High Availability Environment

### HACWS or HACMP

If HA environment with FULL-FALLBACK exists or HACWS is on control workstations, and the `/usr` file system is taken from the primary workstation that fell back. Then you must manually give all nodes involved in fallback environment the other machines `msglog.index` file. If the `/usr` is not overlaid then **No Action** is required.

This environment is where all of the code running on the primary machine falls back to another machine. The backup machine now assumes the full identity of the primary machine, network addresses and all function. In this environment the backup machine is trying to run Service Director for RS/6000 with the primary machine `msglog.index` file. If this case continues Service Director will fail expecting a different processor ID number. To solve this problem you have to give the primary machine the `msglog.index` file of the backup machine. So the Service Director on the primary machine must have its own `msglog.index` and the `msglog.index` of any backup machine. Since two files with the same name can not exist in the same directory, Service Director will look for multiple `msglog*.index` files and check all files found for a valid key before posting an error.

Currently Service Director has no way of detecting which machines are in this environment. So this has to be a manual process of giving the backup machine key file to the primary machine. Whenever the file is copied to other machines `/usr/lpp/servdir` directory please add a number to the `msglog#` portion of the file ID (e.g., `msglog1.index` or `msglog3.index`).

If this machine is a local or client server, check to make sure that the callhome process is running on the backup machine and has the same `probephosts` file as the primary machine. The tty port does not have to be the same if the `/usr` directory is not replaced on fallback.

---

## 6.9 Manually Create Call Forwarding Files

To create a forwarding host manually, execute the following steps.

1. Create the "probrephosts" file with vi or some other editor. Enter the hostname(s) of each client host that will be sending calls to the forwarder. If name resolution is not available or communication cannot be established between the forwarder and client, use the dotted IP address instead. This file will reside on the forwarding host in /usr/lib/ras.
2. Verify that the "ProbrepAt" communication parameters on the forwarding host indicate that it is to be a forwarder.  
**Service Director User Interface / SETUP / Communication** option and check item #2 for a **Y**.
3. Verify that the "ProbrepAt" communication parameters on the forwarding host indicate that the COMM METHOD is set to "TTY" if a local modem is attached or "RPC" if the forwarder is to forward calls to another forwarder. If the COMM METHOD is set to "TTY," verify the communication parameters for the tty port, baud rate, dial out number, and so on are correct.  
**Service Director User Interface / SETUP / Communication** option and check item #3.
4. Create the "callhomehost" file with vi or some other editor and enter the hostname of the forwarder. If name resolution is not available or communication cannot be established between the client and forwarder, use the IP dotted address of the forwarder instead. Put this file in the /usr/lib/ras directory of every Service Director client listed in the Probrephosts file.
5. Verify that the COMM METHOD communication parameter for every Service Director client is set to "RPC."
6. If callhome process has never been started on this host, use the following command to register the process:  

```
mkssys -s callhome -p /usr/lib/ras/callhome -u0 -a " /usr/lib/ras"
```
7. Add the following line to the "/etc/inittab" file on the forwarding host.  

```
callhome:2:respawn:/usr/lib/ras/callhome -p /usr/lib/ras
```
8. Execute the following command to start the forwarder.  

```
telinit q
```
9. Verify that the callhome process is executing on the forwarder. At this time the Service Director Clients should be able to send their calls to the forwarder who in turn will dial out to IBM and return the response. Refer to the Service Director "Utilities" selection for verifying communication between the client, forwarder, and IBM.



---

## Chapter 7. Detail Registration Process

The following screens will present you with the actual Service Director registration program screens. To get to the initial license screen in Figure 7-44 on page 7-42, use "smit" or command line entry shown at "Starting Service Director Registration Application" on page 3-1. Follow the screen prompts and continue after Figure 7-47 on page 7-43 with customer contact.

Contact entry will be maintained and additional entries into the registration application will go directly to the MAIN menu.

This detail section should be able to guide you through a cluster RS/6000 or 9076 install environment for registration and distribution of Service Director for RS/6000. Example screens with detail descriptions of options are provided to assist you in this endeavor. **Please read and follow the bold highlighted items** to complete this activity. The other items are there for additional clarification. Please utilize this section whenever you do not feel comfortable with Chapter 3, "Registering Service Director" on page 3-1.

### Main Menu

```
SERVICE DIRECTOR REGISTRATION 3.0          (MAIN)
-----
STEP
1. Build/Update List of Machines for Registration
2. Register Machines with IBM
3. Build Reporting Topology Files
4. Distribute Registration Files
5. Service Director Code Distribution

d) Delete/remove Service Director code from Client
l) Lock/Unlock Service Director function at Client
p) Print current machine list
r) Review introductory help screens
x) EXIT                                h) HELP

Please enter a Step number or a menu selection: 1
```

Figure 7-1. Registration Application MAIN Menu

If data conversion is required from previous install see "Conversion" on page 7-46 and follow the prompt, then return here.

**To begin the registration process select 1** from this menu. In order to execute, enter, or change items on registration menus, please enter the menu selection number or character first at the menu prompt, then press the enter key.

## 7.1 Registration Build Configuration (Step 1)

```
BUILD LIST OF MACHINES FOR REGISTRATION                (Build1)
-----

You may register one or more machines with Service Director at a time.
The following selections allow you to CREATE, ADD, UPDATE, or DELETE
the machine list which is used to register Service Director for each
configured host.

1. CREATE/SAVE machine list
2. ADD machine(s) to the current machine list
3. UPDATE machine(s) in the current machine list
4. DELETE a machine from the current machine list

g. GLOBAL update of customer data
r. RETURN to parent menu

Please enter menu selection: 1
```

Figure 7-2. Registration - Build List (Build1)

**Note:** If you are planning to have client/server hosts forwarding calls to the local server with the modem, please review 6.6, “Complex Environment” on page 6-10 before continuing.

The initial selection is option 1 on menu (Build1), Figure 7-2, to create a build list of machines for registration. If this is the first time after doing the installp, then option 2 would take you to the Build2 menu, Figure 7-4 on page 7-4, quicker, and then you would continue after Figure 7-4 on page 7-4. But if List has been started then option 1 must be used.

**Note:** This screen can also be used to add, update or delete machines in the future depending on the changes to the customer’s environment (Figure 7-10 on page 7-10).

You will be returning to this screen for additional selections later.

If you are NOT restoring a previously saved machine list from I/O **continue after Figure 7-3 on page 7-3 with create selection.**

If you are restoring from a saved machine list, select option 1, then use option 3 on Build8 menu to restore a saved machine list from an I/O device. Enter fd0 to restore from diskette, rmt1 to restore from tape device 1, or null to restore from /tmp file. After the tar file has been restored, return to the Main Menu. Complete any remaining steps to complete update process.

**Note:** If machine list now shows a capital R, you should not have to do step 2. Registration already has the entitlement key restored.

```
BUILD LIST OF MACHINES FOR REGISTRATION                (Build8)
-----

NOTE:  It is recommended that selection 4 be completed after the
       machine list has been created.

1. Create NEW machine list
2. BACKUP current machine list
3. RESTORE backed up machine list
4. SAVE Service Director image to I/O device

h. HELP
r. RETURN to parent menu
Messages:

Please enter menu selection:  1
```

Figure 7-3. Registration - Create (Build8)

Again the selection is option **1** to create the first build list of machines for registration, this will take you to Figure 7-4 on page 7-4. All customer data, all machine configuration data, and sub-directories are cleared if this is not the initial entry and build list has been started. There is a fail safe message to prevent inadvertent loss of data.

If list already exist then option **1** must be used and the appropriate prompts followed.

If you wish to start as if it is the initial entry, reply "y" to first prompt. If you want to keep customer information and only redo the machine list then, skip or "n" on first prompt and "y" to the second prompt. You will only see these prompts if you are working with a previously built list.

On entering option **1** two conditions are reset to default. First the user ID is reset to "root" and initial use will allow you to change it again if necessary. Second the remote "rsh" access to the machine listed will be reset, and then new testing will be done on first access. This test includes the status of the /usr file system.

If you only want to reset user ID then selecting option **1** and replying **n** or just press Enter to both fail safe prompts will accomplish this task. This is useful if other than root IDs are used in the account.

The remaining three options, **2-4** will be discussed in a later topic. Basically they are for saving and restoring client configurations, or copies of Service Director. See Figure 7-26 on page 7-23 under "Backup/Restore Process" on page 7-23 for more details.

```
BUILD LIST OF MACHINES FOR REGISTRATION                (Build2)
-----

1. Hostname:
2. uname -m:
3. Type:
4. Serial:
5. Is this a Reporting Server? (y/n): n
6. Contact:                John Doe
7. Voice phone:
8. Data phone:
9. Company name:
10. Street:
11. City:
12. State:
13. Zip:
14. Country:

i. INSERT this machine's hostname and uname number
o. OVERRIDE default configuration data, for this machine
s. SAVE this machine's data, move to next machine
c. CANCEL this entry, do not save it, return to calling menu

Please enter menu selection:
```

Figure 7-4. Initial Build List of Machines (Build2)

Here is where you start filling in the customer common data for the machines. All customer data and all machine configuration data fields need to be entered except for item 8 (Data phone:).

State and ZIP options are required for United States registration only, other country codes do not require entries in these fields.

The control workstation for the 9076 is considered an integral part of the 9076 complex and therefore, should be registered to callhome as part of the 9076. If you are registering from an attached RISC workstation as a call forwarder, then register this machine normally using the correct machine type/serial number.

**Option i** may be used to fill in this machine's hostname and uname number, that is, the machine where the registration program is currently running. This option will only appear on initial (1st) machine in build list, or later when working with the machine configuration that you are running on. You can get the **i** option by entering option **1**, Hostname, of this host, if not the first entry in the build list,

**OR**

**Items 1 and 2:** This data may be entered manually with options **1** and **2**. If the complex has "**rsh**" remote shell capabilities enabled to access to client machines (nodes) without using passwords, 9076 complex normally has this function, then the uname -m number will be automatically filled after option **1** is entered. If you have "rsh" access, the code will also validate the amount of disk space available on the remote machine's "/usr" file system. A warning will be posted if insufficient disk space exists as compared to the "MAX. % DISK LIMIT WARNING" which is defaulted to 98%. See "Remote Access Authority" on page 7-40 for additional information.

If item **2** is not filled when the hostname is entered and checked, then you probably do not have the "rsh" capability and will have to manually enter the data.

**Items 3 and 4** should reflect the machine type of 9076, 7013, or 7017 and the last five digits of the associated machine serial/number. If more than one 9076 serial number is included in the complex, be sure the correct node is under the proper 9076 serial number. Just select the appropriate option and enter the new data.

**Item 5** will flip reporting server from "n" and "y." This menu option will affect the communications configuration data that will be accessed later with option o. See item 2 of Figure 7-6 on page 7-6.: Do item 5 now; this will set the local gateway server to y.

**Item 6** "Contact:" was automatically inserted from license agreement approval entry Figure 7-47 on page 7-43. This may be changed now if necessary and will remain changed during this build cycle.

**Item 7** is a required phone number entry, this is the number that is sent with any callhome data. This data goes into the header of the hardware problem management record. It is used by dispatch to assign machine to customer account. This is also the number that the support centers will call the customer on for CALL Screening or Remote Support.

**Item 8 (data phone:)** is currently not required, but may be used as a call back number if customer contact point is different than item 7. Put **CB** in front of phone number.

**Items 9–13** are required and should reflect this customer's location.

**Item 14** is required and will take you to country selection screens Figure 7-5. You may scroll through these many screens to find the correct number to enter, or if you know the correct number you may enter it on any of the country selection screens.

```
COUNTRY SELECTION
-----
151. SOMALIA
152. SOUTH AFRICA
153. SOUTH YEMEN
154. SPAIN
155. SRI LANKA
156. ST LUCIA
157. SUDAN
158. SURINAME
159. SWEDEN
160. SWITZERLAND
161. SYRIA
162. TAIWAN
163. TANZANIA
164. THAILAND
165. TOGO
166. TRINIDAD
167. TUNISIA
168. TURKEY
169. UGANDA
170. UNITED ARAB EMIRATES
171. UNITED KINGDOM
172. UK LABS
173. UKRAINE REPUBLIC
174. UNITED STATES
175. URUGUAY
176. RUSSIA
177. VANUATU
178. VENEZUELA
179. WALLIS ET FUTUNA
180. WEST AFRICA BRANCH

d. SCROLL DOWN, for other values
u. SCROLL UP, for other values
c. CANCEL, return to calling menu

Please enter menu selection: 174
```

Figure 7-5. Country Selection

After entering the correct country number, the country name will be inserted on the Build2 item 14 entry. See Figure 7-8 on page 7-8.

Now that you have completed the customer portion of this machine definition, you need to verify the communication portions. Select **OVERRIDE** default configuration data option **o**, for this machine to verify and change if necessary.

```
BUILD LIST OF MACHINES FOR REGISTRATION                (Build3)
-----
For Machine with Type: 9076 Serial: 0076000

1. Host reports problems? (N/Y)      Y
2. Host forwards problems? (N/Y)    Y
3. Comm. method (RPC or tty)         RPC
4. File containing RPC target:       /usr/lib/ras/callhomehost
5. tty device:                        tty1
6. Parent tty adapter:
7. Port number on parent adapter:
8. AIXServ login id:
9. AIXServ password:
10. AIXServ customer number:
11. Forwarding metric:                5
12. Notification mail address:       joe@systemname
13. File containing RPC clients:     /usr/lib/ras/probrephosts

d. SCROLL DOWN, for other values
s. SAVE these values (may replace default configuration, too)
c. CANCEL, discard any changed values
h. SHOW explanations for data fields (uses pg command)

Please enter menu selection:
```

Figure 7-6. Machine Communications Screen - First Half (Build3)

On Build3 Figure 7-6 you need to verify that items **1 = Y**, **2 = Y**, and **3 = RPC**

Now make sure this machine's communication configuration meets the requirements for a local gateway server.

## Requirements for a Local Gateway Server

**Note: The machine with the local modem is the only machine that you can register from.** The machine requirements are as follows:

- tty set for communications method
- A valid tty# (tty port number) that the modem is attached to (default tty1)
- A serial port (s1, s2), or any valid multiport adapter available
- Valid phone line access

Follow these procedures:

Enter a 3, and the **RPC** will flip to **tty** as shown in Figure 7-14 on page 7-14.

If "tty device:" has the correct tty port set, then you do not have to do item **5**. Enter the correct tty device at the option "5" prompt if required.

No other entries are required on this menu. Use the **d** option to scroll down to the second page of the communication configuration screen Figure 7-7 on page 7-7.

```
BUILD LIST OF MACHINES FOR REGISTRATION                (Build4)
-----
For Machine with Type: 9076 Serial: 0076000

14. Modem file name:
15. Remote latency delay:          0
16. Remote timeout:                30
17. Retry count:                   2
18. Response timeout:              600
19. tty retry timeout:             86400
20. BAUD rate:                     9600
21. Dial out phone number:         1-800-830-1041
22. Phone number to call back to:
23. Local operator voice phone:
24. Hub phone:
25. Duplicate problem timeout:     86400
26. Dial Tone (P)ulse/(T)one:     T

u. SCROLL UP, for other values
s. SAVE these values (may replace default configuration, too)
c. CANCEL, discard any changed values
h. SHOW explanations for data fields (uses pg command)
O. Overwrite default values to this configuration

Please enter menu selection:
```

Figure 7-7. Machine Communications Screen - Second Half (Build4)

**Note:** Use **h** help option from these screens if you want a more detailed description of the individual communication fields.

If you are using 7855, 7857, 7858, 7852-400, or any other modem that requires a modem initialization string, enter option **14**. This will list any modem cfg files and allow you to enter by selecting the associated number. Use 7857 file for 7858 modems. You may enter the modem file name if it is not shown. Entering a 0 will reset this entry.

All other defaults as shown on Figure 7-6 on page 7-6 and Figure 7-7 should be OK. Verify that the dial out phone number has all the necessary prefix numbers to obtain an outside line. An account might have to dial a 9 to get an outside line, and therefore you would change item **21** to reflect **9,1-800-830-1041**. Insert a comma (,) after the 9 to allow a delay to be set into the dialing sequence. The dashes are ignored and are there for ease of reading. Now the last item to check is **26**, make sure it reflects which type of line is being used.

If changes were made to these screens, then use **s** to save all communication data for this machine.

You should no longer see the following prompt, it has been moved to a menu option "O" for overwrite default communication data. Do you wish to overwrite the default configuration (Y/N) ? **n**

**Again** you must **SAVE s** on Build2 screen to save all changed data on any of the three Build (2, 3, or 4) screens. If you cancel this build2 screen all changed and saved data on the configuration screens will be canceled.

If you wanted to change the default configuration data only (Figure 4-35 on page 4-35), then after setting up the Build3 and Build4 options you would enter **O**, reply "yes" to overwrite the default, and then cancel the Build2 screen. This would only change the default configuration for any new machines configured.

```
BUILD LIST OF MACHINES FOR REGISTRATION                (Build2)
-----
1. Hostname:                sp_server
2. uname -m:                000022651C00
3. Type:                    9076
4. Serial:                  0076000
5. Is this a Reporting Server? (y/n): n
6. Contact:                 John Doe
7. Voice phone:             (914) 432-9551
8. Data phone:
9. Company name:           Service Company Inc.
10. Street:                 South Rd
11. City:                   Poughkeepsie
12. State:                  NY
13. Zip:                    12601
14. Country:                UNITED STATES

i. INSERT this machine's hostname and uname number
o. OVERRIDE default configuration data, for this machine
s. SAVE this machine's data, move to next machine
c. CANCEL this entry, do not save it, return to calling menu
Changes to the configuration data require that this panel also be saved.

Please enter menu selection: s
```

Figure 7-8. Build List of Machines with Completed Entries

Now that the first machine in the list has been saved, you will get a build menu for the next machine, as shown in Figure 7-9 on page 7-9. You may continue to manually fill in the machine data for all your machines you wish to register, by using the procedure following in Figure 7-9 on page 7-9.

If this is the only machine you wish to register, then cancel out of the second Build2 menu with the **c** option. Return to the main menu and complete steps 2 and 4 only. Otherwise continue for additional machines or nodes.

If you have only a few machines to register and have the "rsh" access, then the manual process is quick.

**But there is a time saver option**, if a list of machines to be registered exists or the "dsh" (D shell) capability of the 9076 Scalable POWERparallel System is available. Cancel out of the second machine Build2 screen with the **c**. This will return you to the Build1 screen as shown on Figure 7-10 on page 7-10. **Continue with "Option 5" on page 7-10.**



```
BUILD LIST OF MACHINES FOR REGISTRATION                               (Build2)
-----
1. Hostname:
2. uname -m:
3. Type:                               9076
4. Serial:                              0076000
5. Is this a Reporting Server? (y/n): n
6. Contact:                             John Doe
7. Voice phone:                         (914) 432-9551
8. Data phone:
9. Company name:                        Service Company Inc.
10. Street:                             South Rd
11. City:                               Poughkeepsie
12. State:                              NY
13. Zip:                                12601
14. Country:                            UNITED STATES

o. OVERRIDE default configuration data, for this machine
s. SAVE this machine's data, move to next machine
c. CANCEL this entry, do not save it, return to calling menu

Please enter menu selection: c
```

Figure 7-9. Build List for Second Machine

Notice that the customer portion of the entries remains unchanged and only the new machine data items 1–4 to be entered. If the machine type is 9076, then the machine type and serial number will also be carried over, just re-select if either needs changing. If you know the hostname (option 1) and have "rsh" then the uname number will be automatically filled. Also notice that the insert option *i* has disappeared.

Items 1–4 must be manually entered for each machine in build list and saved with **s**.

Cancel out of the machine Build2 screen with the **c** after the last machine is saved. If necessary enter **r** on Build8 menu, this will return you to the Build1 screen as shown Figure 7-10 on page 7-10. Or if you are on Main Menu select option **1** to get to Build1 screen.

From the Build1 screen select one of the following options:

1. If you have a list of machines to be added, then use option **5** "ADD machine(s) from an input list file" to the current machine list. Continue at "Option 5" on page 7-10.
2. If not initially configured, use option **3** "UPDATE machine(s) in the current machine list" to set up this machine as the registration server, or any other machine that might need updates or changes. Continue with REGISTRATION UPDATE PROCESS before Build5 screen, which is shown on Figure 7-12 on page 7-12.

If no other machines in the list require changes at this time, one more return **r** and you are back to the Main Menu ready to continue with **step 2 at 7.2, "Detail Registration of Machines with IBM (Step 2)" on page 7-16** .

```
BUILD LIST OF MACHINES FOR REGISTRATION                (Build1)
-----

You may register one or more machines with Service Director at a time.
The following selections allow you to CREATE, ADD, UPDATE, or DELETE
the machine list which is used to register Service Director for each
configured host.

1. CREATE/SAVE machine list
2. ADD machine(s) to the current machine list
3. UPDATE machine(s) in the current machine list
4. DELETE a machine from the current machine list
5. ADD machine(s) from an input list file

g. GLOBAL update of customer data
r. RETURN to parent menu

Please enter menu selection: 5
```

Figure 7-10. Registration Menu - Build Add by List

**Option 2** is used to add additional machines to the current machine list, after the list has been initially built. This is the manual add where you must enter the machine data, but the customer data will be added automatically. The communication data will be picked up from the default entry. The machine will be added to the end of the machine list.

**Option 3** is used to update machines in the current machine list.

**Option 4** is used to delete machines from the current machine list. All associated data will be lost including registration data.

**Option 5** on the Build1 menu is used to add machines for registration by using a list of machines. This list may have been manually created, (see Figure 7-11 on page 7-11 for the list structure), and placed on this host for use. With dsh capabilities and a working collective, the 9076 system will produce a list.: Using a pre-built list of machines will eliminate the manual entry of the data for each machine, and will build machine registration lists much faster. See Figure 7-11 on page 7-11 for file structure.

**Option g** you may need to update your customer data later and this option will allow you to change all or part of the customer data at once. The change can be applied to all of the listed machines or just part of the list.

**Note:** If you change customer contact data you must re-register the machines with IBM, before RETAIN will reflect new information.

You might want to keep your registration list to small clusters, and use option 1 (of Build1) "Create NEW machine list," then option 2 (of Build8) "BACKUP current machine list" to maintain separate registration lists.

```

ADD LIST OF MACHINES FOR REGISTRATION                               (Build7)
-----

Please enter the name of the ASCII file that contains the machines to
be added to the registration list. Full path and filename is required.

The format of the file should be as follows, all fields are required
separated by a space, with one machine per line:
nnnnnnnn uuuuuuuuuuuu sssss tttt
nnnnnnnn uuuuuuuuuuuu sssss tttt
nnnnnnnn uuuuuuuuuuuu sssss tttt
nnnnnnnn uuuuuuuuuuuu sssss tttt

The nnnnnnnn is the Hostname and uuuuuuuuuuuu is the "uname -m" CPU
number unique to that host.
Where "sssss" is the LAST FIVE DIGITS of the Machine Serial Number and
"tttt" is the 4-digit Machine Type.

a. ADD machines to the current machine list using dsh.
r. RETURN to parent menu
Messages:

Please enter filename or menu selection:

```

Figure 7-11. Registration Menu - List Add

If you are building from a 9076 control workstation with dsh capabilities you will get an **a** option on the menu as shown in Figure 7-11. Selecting option **a** will allow the control workstation to do the **dsh -av uname -mn | awk '{print \$2" "\$3}' > /tmp/dshreg.lst** command to all machines in the working collective and return them to a file "/tmp/dshreg.lst". Verify that the file does not have extra fields, such as, dotted host name or other text. The list must match fields shown on the Build7 display menu.

**Note:** If the registration program hangs at this point, it is probably because one of the machines is not responding or the control workstation does not have authorization to execute the **dsh** command.

If dsh completed or you have entered a valid filename including path statement, the menu will have an option **c** continue added. Selecting the continue **c** option will now start adding entries to the registration list. As these machines are added they will take on the attributes of the default configuration. The initial default settings from installp are correct for an RPC client machine. Address resolution and proper reporting hostname will be done on each host added from the list. See "Remote Access Authority" on page 7-40 for additional information.

As machines are added to the registration list, the associated data is displayed, a final count of the new machines added, and the total number of machines is posted. You may now enter another list if more machines need registering.

Now that you have completed adding machines to your registration list, you have a couple of options:

- You may go back to Build1 Figure 7-10 on page 7-10 with the **r** RETURN to the parent menu. Continue with REGISTRATION UPDATE PROCESS on the next page, if you have to configure the local server, or wish to check or change any of the newly added machines.
- No other machines in the list require changes at this time. One more return and you are back to the Main Menu ready to continue with **step 2 at 7.2, "Detail Registration of Machines with IBM (Step 2)" on page 7-16** .

## Registration Update Process

Use option **3** "UPDATE machine(s) in the current machine list" on the Build1 menu (Figure 7-10 on page 7-10) to set up this local machine as the registration server.

```
UPDATE LIST OF MACHINES FOR REGISTRATION                (Build5)
-----

You asked to update the current machine list. Please give the number
of the entry you wish to change (only give one number at a time).

Rec      Processor      R=Full key  K=Key sent
#  Hostname  ID Number  T=Temp key  C=Client code sent
1 - sp_server 000022651C00
2 - fr1n01   000156677000
3 - fr1n03   000156647000
4 - fr1n05   000154617000
5 - fr1n07   000155097000
6 - fr1n09   000240855700
7 - fr1n10   000241895700
8 - fr1n11   000241695700
9 - fr1n12   000242235700
10 - fr1n13  000242245700

f. FIND hostname or number in list
d. SCROLL DOWN, for other values
r. RETURN to parent menu

Please enter menu selection: 1
```

Figure 7-12. Registration Menu - List Update

This is the first time that you have seen the list of machines that is in your current machine list. This format will be followed any time that you will be working with individual machines. The menu name will reflect which type of operation you will be doing. The list will be posted with 10 machines per page and you can scroll down or up the pages to see all listed machines. The machine that you wish to work with must be displayed in order for you to select it. The Hostname and Processor number are posted next to the menu selection number, if Hostname is blank then only the Processor number will be displayed.

**Option f.:** The find option will allow the machine quickly by either hostname or processorID. This option will be posted if list is greater than 10 machines. Making a valid entry will display the group of machines containing the requested information.

As shown in Figure 7-12 and Figure 7-8 on page 7-8 **sp\_server** was the Hostname that was built first. This should have been the machine with the modem attached. **The machine with the local modem is the only machine that you can register from.** It has to have tty set for communications media (Build3 #3), with the tty# (valid tty port number) that the modem is attached to (e.g., tty1).

Enter the menu number 1 to select sp\_server, which takes you to Build2 (Figure 7-13 on page 7-13).

```
BUILD LIST OF MACHINES FOR REGISTRATION                (Build2)
-----
1. Hostname:                sp_server
2. uname -m:                000022651C00
3. Type:                    9076
4. Serial:                  0076000
5. Is this a Reporting Server? (y/n): n
6. Contact:                 John Doe
7. Voice phone:             (914) 432-9551
8. Data phone:
9. Company name:           Service Company Inc.
10. Street:                 South Rd
11. City:                   Poughkeepsie
12. State:                  NY
13. Zip:                    12601
14. Country:                UNITED STATES

o. CHANGE configuration data, for this machine
s. SAVE all changes to this machine's configuration data
c. CANCEL this entry, do not save it, return to calling menu

Please enter menu selection: 5
```

Figure 7-13. Build List Set Reporting Server

Option **5** will now automatically toggle Reporting Server to a yes (y) setting and change Build3 (Figure 7-14 on page 7-14 item 2 "Host forwards problems?") to a (Y). This one option **5** took care of the server setup for you on both screens, but it did not change or select the tty selection. You must use the menu option **o** CHANGE configuration data to actually change the tty options for this machine.

On Build3 you can see that items 1 = Y, 2 = Y, and 3 = RPC showing option 2 has flipped to a "Y." Entering a 3 will flip the RPC to tty as shown in Figure 7-14 on page 7-14.

If "tty device:" has the correct tty port set, then you do not have to do item **5**. Enter the correct tty device at the option **5** prompt if required.

No other entries are required on this menu. Use the **d** option to scroll down to the second page of the communication configuration screen (Figure 7-15 on page 7-14).

BUILD LIST OF MACHINES FOR REGISTRATION (Build3)

-----  
For Machine with Type: 9076 Serial: 0076000

1. Host reports problems? (N/Y) Y
2. Host forwards problems? (N/Y) Y
3. Comm. method (RPC or tty) tty
4. File containing RPC target: /usr/lib/ras/callhomehost
5. tty device: ttyl
6. Parent tty adapter:
7. Port number on parent adapter:
8. AIXServ login id:
9. AIXServ password:
10. AIXServ customer number:
11. Forwarding metric: 5
12. Notification mail address: joe@systemname
13. File containing RPC clients: /usr/lib/ras/probrephosts

- d. SCROLL DOWN, for other values
- s. SAVE these values (may replace default configuration, too)
- c. CANCEL, discard any changed values
- h. SHOW explanations for data fields (uses pg command)

Please enter menu selection: 3

Figure 7-14. Update Machine Communications First Half

BUILD LIST OF MACHINES FOR REGISTRATION (Build4)

-----  
For Machine with Type: 9076 Serial: 0076000

14. Modem file name:
15. Remote latency delay: 0
16. Remote timeout: 30
17. Retry count: 2
18. Response timeout: 600
19. tty retry timeout: 86400
20. BAUD rate: 9600
21. Dial out phone number: 1-800-830-1041
22. Phone number to call back to:
23. Local operator voice phone:
24. Hub phone:
25. Duplicate problem timeout:
26. Dial Tone (P)ulse/(T)one: T

- u. SCROLL UP, for other values
- s. SAVE these values (may replace default configuration, too)
- c. CANCEL, discard any changed values
- h. SHOW explanations for data fields (uses pg command)
- 0. Overwrite default values to this configuration

Please enter menu selection:

Figure 7-15. Update Machine Communications Second Half

If you are using 7855, 7857, 7852-400, or any other modem that requires a modem initialization string enter option **14**. This will list any modem cfg files and allow you to enter by selecting the associated number. You may enter the modem file name if it is not shown. Entering a 0 will reset this entry to null.

Item 16 "Remote timeout:" should have changed to 30 which is the default setting for the registering server, (it was at 300 for the client environment). This setting is checked during step 3 from the Main Menu "Build Reporting Topology Files" and each client of a server should have a value that is twice/three times the setting of its server. Twice because of server retry = 2. If retry is greater, then delay must be greater. 300 is a good default, because it allows a 30–50 second delay range for the local server. The three times is set up for the network delay from server to client. The result is for the client to wait for all the server communications to complete before client request times out.

All other defaults as shown on Figure 7-14 on page 7-14 and Figure 7-15 on page 7-14 should be OK. You need to verify that the dial out phone number has all the necessary prefix numbers to obtain an outside line. The account might have to dial a 9 to get an outside line, and therefore you would change item **21** to reflect 9,1-800-830-1041. Insert a comma (,) after the 9 to allow delay to be set into the dialing sequence. The dashes are ignored and are there for ease of reading. Now the last item to check is **26** to make sure it reflects which type of line is being used.

With all the necessary changes made to these files, use the **s** to SAVE the changes.

Now back to Build2 Figure 7-13 on page 7-13. Enter an **s** to SAVE this data. This returns you to Build5 Figure 7-12 on page 7-12 where you entered the update routine. **r** returns you to Build1 Figure 7-10 on page 7-10.

No other machines in the list should require changes at this time. You may wish to select one of the client machines to validate that it was built as expected. One more return and you are back to the Main Menu ready to continue with **step 2 at 7.2, "Detail Registration of Machines with IBM (Step 2)" on page 7-16** .

The overwrite default configuration has been moved to a menu option of a capital "O". This will set the default data for NEW builds being created. If changes were made to the communications data, such as Remote timeout = 600, and the changes are to be in all new built machines, you would use the **O** to change the default data. Then you would reply **y** (yes) to the overwrite prompt. Any new machines being added to the list would now get the new default configuration data.

Refer to Figure 4-35 on page 4-35 and "Setup Menu - Communications Definitions" on page 4-33 for original default configuration settings.

## 7.2 Detail Registration of Machines with IBM (Step 2)

```
SERVICE DIRECTOR REGISTRATION 3.0          (MAIN)
-----

STEP
1. Build/Update List of Machines for Registration
2. Register Machines with IBM
3. Build Reporting Topology Files
4. Distribute Registration Files
5. Service Director Code Distribution

d. Delete/remove Service Director code from Client
1. Lock/Unlock Service Director function at Client
p. Print current machine list
r. Review introductive help screens
x. EXIT                                     h) HELP

Please enter a step number or a menu selection: 2
```

Figure 7-16. Registration - Main Menu

You are now ready to register this list of machines with the Service Director communication modem link to IBM. You are only able to do step 2 from the local modem attached server. When you have properly setup the client server machine from the local server, you will also be able to complete step 2 from that client server using the RPC forwarder.

This is the first point at which the modem will be utilized or tested. All appropriate communication files, tty ports, and modem init files are in place to allow use of the modem. This guide will follow a single machine registration initially, then the registration of the full list. The test with a single operation is a very good option for initial test of modem.

Select number **2** "Register machines with IBM."



```
REGISTER MACHINES WITH IBM:                                (Register1)
-----

At this point, you should have finished creating the Service Director
registration list. If this is not correct, please choose Return, and
select the Build/Update selection to complete the list.

Otherwise, make sure your connection to IBM is
operational, then choose the appropriate Register action.

There may be a fairly long delay while sending and receiving data.
Please do not interrupt this program unless absolutely necessary.

e. REGISTER ONE machine at a time
a. REGISTER ALL machines in the current machine list
n. REGISTER Only NEW machines in the current machine list
t. PLACE PROBLEM TEST CALL for registered Reporting Server
r. RETURN to parent menu

Please enter menu selection:
```

Figure 7-17. Registration - Register Menu

The Register1 menu statement "connection to IBM is operational" means that the modem is connected and powered on, the modem tty port is configured properly, and the local gateway server is defined properly in the current machine list. If registering from the client/server, the local server callhome process is active.

The process for multiple machine registration can be accomplished by selecting **a**, or **n** for just new machines. If you wanted to validate the list before registering or testing the modem, use the single option and continue at the note.

With the automatic registration of all machines in the list selected, the first informational line will show the registering server that you are running on, which tty, and the phone number that it is trying to register to, see Figure 7-19 on page 7-19 (Register3). Starting with the first machine in the list four data sectors for each machine will be sent. Then validation of registration will be posted in the return code for that machine. If communication errors are received, application will retry accordingly to the error detected. If registration for one machine fails, the next machine in the list will be attempted, until list is exhausted. All machines that failed will be shown on the summary screen (Register4), and will not reflect the "R" Registered flag on (Register2) screen. If all machines registered OK (Figure 7-20 on page 7-19), then they will all reflect the "R" flag on (Register2) screen.

If machines failed to register, then you should follow the guide to register those machines singularly. Some failed machines will get a temporary 30 day demo key marked with "T" flag.

Service Director will make a call for each machine in the list, it takes between a minute to a minute and a half if no problems are encountered. Time out conditions will cause the modem to re-dial and try again. Up to three attempts will be made to register each machine.

If option **a** or **n** was used and ALL machines registered OK, then continue after Figure 7-20 on page 7-19.

If this is a **single registration** of just a local server, only one machine in the list, when a valid key is returned for this machine, the registration process is completed if Service Director is at 3.0.0.4 level or higher. The key file will automatically be copied into the Service Director working directory.

**Note:** For this guide assume registration of a single machine.  
Select **e. REGISTER ONE machine at a time.**

```
REGISTER MACHINES WITH IBM                                (Register2)
-----

You asked to register machines singularly. Please give the number of
the entry you wish to register (only give one number at a time.)

Rec      Processor      R=Full key  K=Key sent
#  Hostname  ID Number  T=Temp key  C=Client code sent
1 - sp_server 000022651C00
2 - fr1n01   000156677000
3 - fr1n03   000156647000
4 - fr1n05   000154617000
5 - fr1n07   000155097000
6 - fr1n09   000240855700
7 - fr1n10   000241895700
8 - fr1n11   000241695700
9 - fr1n12   000242235700
10 - fr1n13  000242245700

f. FIND hostname or number in list
d. SCROLL DOWN, for other values
r. RETURN to parent menu

Please enter menu selection: 9
```

Figure 7-18. Registration - Register Individual Machine

The Registration process may be lengthy depending on the speed of the customer's modem and the list of machines to be registered. Once completed and no errors occurred (refer to Appendix D, "Service Director Error Messages" on page D-1), the list of machines has been validated by IBM to be either on warranty or maintenance. The enabling "key" has been generated and needs to be distributed to the list of machines registered so that when a problem occurs and Service Director places a call, the key enables the call to be completed for the appropriate machine(s).

The next two figures reflect what screens you would go through while registering each machine. The (Register3) screen shows detail about the registering server machine which has the modem attached. If you have problems getting to the modem, check the header information and make sure the modem is attached properly to the port shown.

Machine number 9 was selected and the Processing Host line reflects that machine data. After posting the ODM entry, which points to the proper communication file sub-directory, the modem should dial out. IBM links to the modem and "Connection established" is echoed to the screen followed by the four sectors. Usually, if there is a bad phone line, bad data connection, or if the modem is causing problems, you will see retry come up before the sectors are sent. If all four sectors are sent and registration fails, it probably has to do with machine data and not modem or connection. Some delay will occur while the machine is checking the entitlement data base, building key, and returning key back to your registering host. If all is correct, you will get a return code of 0 with no errors.

If any other return codes are posted as failures on a machine, you may still have received a registration key. Return codes that give you a temporary key, which is good for a month, will allow Service Director to

function in Local mode. Local mode will not call IBM problem tracking system, but will put all calls in Hold mode and issue mail messages to notify user. This temporary key can be upgraded to a full key once the problem is corrected and step 2 has been rerun on the machine. Return code 2 will issue a full function key, but will not open problems with IBM problem tracking system, until the problem is resolved. See Appendix D, "Service Director Error Messages" on page D-1 for detail.

```
REGISTER MACHINES WITH IBM                               (Register3)
-----

Sending registration data ... please wait.

Using dial out number 1-800-830-1041 from host sp_server on port tty1

Processing Host=fr1_n12, Uname=000242235700, Type=9076, Serial=0076000
ODM path is /usr/lib/ras
Connection established
Sector 1 sent
Sector 2 sent
Sector 3 sent
Sector 4 sent
Returned status is 0
No Errors Reported
```

Figure 7-19. Registration - Sending Registration Data

If you are running AIX 4.1 or greater with a down-level SD/6000 code, you may see an error message before the "Connection established" as follows:

```
Device /dev/tty# not in available state.
0481-053 No action was taken.
```

This is not a problem with the tty port, but instead with a coding fault, fixed at 3.0. You do need to verify that the selected tty port is disabled. This may be done with the **pstart** command. If the selected tty port shows enabled, then issue **pdisable tty#** command from the bottom line command prompt.

```
REGISTER MACHINES WITH IBM                               (Register4)
-----

All machines registered OK.
(Choose the Return option to return to the previous menu.)

Machines that have valid registration files will now be marked "R."

r. RETURN to parent menu

Please enter menu selection:
```

Figure 7-20. Registration - Completion Screen

After all machines in this list have been registered successfully, and have posted their "R" flag, you may return to the Register 1 menu.

If there are any failures during registration, you will see the summary screen posting the failing host or hosts that failed and the return code that Service Director posts for each host.

```
REGISTER MACHINES WITH IBM                                (Register4)
-----
REGISTRATION FAILED FOR THE FOLLOWING CPU(s):

rc=10 host=fr1_n11 uname=000241695700 type=9076 serial=0076000

You may choose option "h" below to understand the meaning of the "rc"
field and how you should respond to each error. When you are done
reviewing the results, choose the Return option to return to the
previous menu.

h. SHOW explanations for error codes
r. RETURN to parent menu

Please enter menu selection:
```

Figure 7-21. Registration - Completion Failure Screen

Here machine 8 in the list host fr1\_n11 has posted a failure. It could not get to the IBM server during the registration step.

Some failed machines will get a temporary 30 day demonstration key marked with a "T" flag (this can be updated to full authorization once the underlying problem is fixed and the registration program has been successfully registered to the host). You are not able to report problems to IBM at this time. Return codes 1, 4, and 5 should give you the temporary demo key. Return code 2 will issue a full function key, but will not open problems with IBM problem tracking system, until the problem is resolved.

The customer number to which this failing machine type/serial number is currently assigned is returned for your convenience on return code of 2. An automated IBM process should allow the RETAIN Common Customer Profile record to be updated. Check with the marketing assets service representative to make sure the returned customer number is applicable to this customer. If this number does not point to the customer where the machine is located, then calls may be improperly reported.

If there are any failures during registration you may display the help screens by entering the **h** option, see Figure 7-22 on page 7-21 and Figure 7-23 on page 7-21. Or refer to Appendix D, "Service Director Error Messages" on page D-1 for the message definition.

```

REGISTER MACHINES WITH IBM                               (Register6)
-----
Check the error code received against this list to understand how to respond
to each error. If you cannot fix the problem, report it to IBM via your normal
problem reporting methods. Machines receiving temporary key will be marked "T".

Temp - You have been authorized for a one month local demonstration trial of
Key   Service Director (this can be updated to full authorization once the
      underlying problem is fixed and re-execute the registration program).
      You are not able to report problems to IBM at this time.

rc=1 - There is no record of this machine's Type and/or Serial within the IBM
      Service Director server entitlement database. If field was incorrect,
      correct and try again. If information is correct and problem continues,
      please contact your local branch or 1-800-IBM4YOU and verify that the
      machine type and serial number(s) you entered are valid and on warranty
      or IBM MA. If machine proves valid, then contact IBM marketing rep and
      have AAS system updated, or call 1-800-CALLAIX for further assistance.

rc=10 - The Service Director Server is not available. Please try again later.

rc=11 - Communications could not be established with the Service Director
rc=101 IBM Server. Please try again later.
(Press enter to see more error codes.)

```

Figure 7-22. Registration - Failure Return Codes (Register6)

```

REGISTER MACHINES WITH IBM                               (Register7)
-----

rc=2 - The IBM problem tracking system either does not have a record of your
      customer number or is not responding. You have been authorized to use
      Service Director. If the IBM Problem Tracking system problem continues,
      refer to the SUPPORT STRUCTURE section of the User's Guide and request
      verification of the Service Director link to the IBM tracking system.

rc=4 - The Service Director Server experienced an internal error. Please try
      later. If the problem persists, contact 1-800-CALLAIX (1-800-225-5249)
      for assistance or use your local procedures to report the error.

rc=5 - Service Director for RISC System/6000 entitlement system cannot find a
      Warranty or Maintenance Agreement for your machine. You have been given
      a one month authorization to use Service Director locally, but problems
      will NOT be reported to IBM's problem management system. Please contact
      the local branch office or 1-800-IBM4YOU (1-800-426-4968) for assistance
      in verifying or obtaining IBM Warranty or Maintenance Service Agreement.

<any other code> - The Service Director Server experienced an internal error.
      Please try again later. If the problem persists, contact IBM.

(Press enter to return to the registration menu.)

```

Figure 7-23. Registration - Failure Return Codes (Register7)

## Registration Test Call

**Note: Make a test call now and validate CAD Primary Service Representative record.** Now is a good time to test your "CAD primary Service Representative record." Use the **t** option and place a problem test call on the registering server.

If the Test Call option is not selected now, then continue with **Step 3 at 7.3, "Build Communication Topology Detail (Step 3)" on page 7-25** .

```
TESTING PROBLEM CALL PLACEMENT WITH IBM
-----

PLEASE NOTE: Response Contact for Registration Test Calls Will
              ONLY be made during normal IBM working hours (8am-5pm).

Press Enter key to continue.

Sending test call data ... please wait.
Using dial out number 1-800-830-1041 from host sp_server on port tty1

Processing Host=fr1_n12, Uname=000242235700, Type=9076, Serial=0076000
ODM path is /usr/lib/ras
Connection established
#####
TEST PROBLEM NUMBER 125X6 IS A DUPLICATE for BRANCH 754
#####

Press Enter key to return to previous menu.
```

Figure 7-24. Registration - Problem Test Call

This test call will generate a PMH into RETAIN, which should be re-queued to the Service Representative assigned the machine type/serial number for the machine that has the modem attached. This call should be dispatched to the servicer who is responsible for the customer account, and the incident should be closed by the Service Representative.

If the test call does not dispatch to the correct Service Representative, then you need to check that the branch, territory number, customer number, and associated data is correct. Your **Top Gun** or branch specialists should be able to assist you if **Primary Service Representative CAD** record needs updating. If all field data is correct then place a call to the support group.

**Note:** This test call function will work from a remote client/server registration through the local server "callhome" daemon running the modem.

Now that all our machines are registered, you need to save this machine list and the configuration data. Return to the Main Menu with **r**, and continue with the **Backup** option Figure 7-25 on page 7-23.

If neither of the options are selected at this time, then continue with **Step 3 at 7.3, "Build Communication Topology Detail (Step 3)" on page 7-25** .

## Backup/Restore Process

Select **1** to go to (Build1) again, option **(1)** CREATE/SAVE machine list this time to save this machine list.

```
BUILD LIST OF MACHINES FOR REGISTRATION          (Build1)
-----

You may register one or more machines with Service Director at a time.
The following selections allow you to CREATE, ADD, UPDATE, or DELETE
the machine list which is used to register Service Director for each
configured host.

1. CREATE/SAVE machine list
2. ADD machine(s) to the current machine list
3. UPDATE machine(s) in the current machine list
4. DELETE a machine from the current machine list
5. ADD machine(s) from an input list file

g. GLOBAL update of customer data
r. RETURN to parent menu

Please enter menu selection: 1
```

Figure 7-25. Registration Menu - Save Machine List

```
BUILD LIST OF MACHINES FOR REGISTRATION          (Build8)
-----

NOTE: It is recommended that selection 4 be selected after a new
machine list has been created.

1. Create NEW machine list
2. BACKUP current machine list
3. RESTORE backed up machine list
4. SAVE Service Director image to I/O device

h. HELP
r. RETURN to parent menu
Messages:

Please enter menu selection: 2
```

Figure 7-26. Registration Menu - Backup Current Machine List

Now use option **2** to save the registered configuration, then return to do the next step. You might want to configure this machine's Service Director before using **4** to save the complete Service Director to I/O.

**Option 1** will allow you to build complete new machine list and sub-directories, build new machine list keep directories and customer profile data, or just reset remote access list. Replying y (yes) to the first prompt after entering a 1, will completely remove and build the "SERDIR\_REGISTRATION\_DATA" directory. Entering anything besides "y" will give a second prompt, allowing you to keep customer data and previous registration directories. The "y" must be entered to go to the Build2 menu with data restored and machine list set to first machine. Any other response to the second prompt will result in only rsh access and the root prompt being reset.

**Option 2** will save current machine list and directories in the backup directory to the filename entered (enter only filename). If you wish to transfer the data by I/O, then just enter the device name to which you wish to go (rmt0, fd0). Entering null for the I/O device will create the tar file at /tmp/SDcfg\_hostname.tar. By using this option you may save one configuration while working with another set of machines.

If you have saved your machine list and registration data by backing up your data to diskette or tape, then restoring the list is easy. If the customer removes Service Director code from this server, the backup directory along with the registration data directory will be deleted. Now you restore the code, and if you have backed up to I/O you can use option **3** to restore from I/O and you will have your list and registration data back.

**Option 3** will allow you to restore a configuration that has been backed up by option **2**. All associated data will be restored from the previously saved list. The old machine list directory will be deleted and then replaced by the restored data. This option lists all files in the backup directory. Select the file by entering the name only (no path or .tar extension required).

devs may be restored from I/O device by entering the device name only (rmt0), which will allow the transport of registration data from the local server. You can restore from "null" device, or execute **tar -xvf /tmp/SDcfg\_hostname.tar** command, where the hostname is the unique configuration data file, and where the file was initially backed up with the null device from option 2.

You may need to complete additional registration steps to restore your machine to operational status. Complete new registration Step 4 to send key data to current machine, if required.

**Option 4** will save all Service Director directories /usr/lpp/servdir and the communications directory /usr/lib/ras in a tar formatted file to the selected I/O device. If customer image has to be rebuilt on this server, then Service Director could be restored from the I/O tar file.

Entering null for the device name on this option will create a /tmp/servdir\_bkup.tar tar file. Use **tar -xvf /dev/device\_name** or **tar -xvf /tmp/servdir\_bkup.tar** command to restore manually.



## 7.3 Build Communication Topology Detail (Step 3)

```
BUILD REPORTING TOPOLOGY                (Gateway1)
-----

When using RPC connections between machines, the call forwarding
feature needs to know the machine name of the partner node(s).
This step creates the required name list files and stores them
locally for eventual distribution to the correct machines.

It also verifies that the Remote timeout values on the partner
nodes are set to (3 X Remote timeout X Retry Count)
values found on the Reporting Server host.
Adjustment of this Server to Remote timeout ratio may be required
depending on your network system load.

Select Continue to build the files, Return to return to the previous
menu.

c. CONTINUE
r. RETURN to parent menu

Please enter menu selection:
```

Figure 7-27. Registration - Build Reporting Topology Screen

Enter **3** from the **Main** menu.

Now that all the pertinent information has been identified for all of the machines and a server configured, the gateway or reporting machine needs to build the files necessary for reporting problems. Enter **c** **CONTINUE** option now, and the files will be generated that will allow RPC connectivity.

**The following overview of the topology process needs to be understood, especially in a complex environment.** Please read at your convenience, but continue now to the callhome process following the next figure.

This process will check if the machine list contains a defined server, either a local tty or client RPC. If a server is detected then you will be given the option of starting the "callhome" process. Next you are able change the Crontab entry for this machine if the default setting of every hour does not fit your installation requirements. This crontab will then be distributed to the client host at step 5. Finally the resulting topology files will be displayed for your verification. If any entry needs to be corrected step 3 may be repeated as needed to correct the condition.

In a complex environment, where more servers than the local tty server exist, this process has to be repeated at each client/server machine. This will ensure that the "callhome" process and topology files are properly configured at each server.

Backup forwarder may be implemented if the network connectivity exists and two local gateway hosts with modems are available. The secondary forwarder's dotted IP address must be placed after the primary forwarder's address in the "callhomehost" file that is distributed to the client machines. If the backup address is known, it may be entered manually by using a **+** on the Gateway1 menu prompt. No validation is made on this entry, so verify your entry on the topology completion screen at Figure 7-32 on page 7-30. You will notice that, if a backup entry is made, it may not appear on the second line. If incorrect, re-run topology step.

**Note:** This backup activity may be inputted on any machine that will be the forwarder machine either a local modem tty connection or RPC.

This Reporting Server (woodsai.x.pok.ibm.com) can forward problem reports from client hosts using the "callhome" process.

A positive reply will register the 35791394 process with the portmapper, an entry will be made in the /etc/inittab file, and the callhome process will be started. If the process is already running, the old process will be killed and a new process started with any new options.

Entering an "A" will start the "callhome" process with full logging of all calls.

Entering "all" will set the -call\_all flag and allow the callhome process to listen on all local interfaces. This flag no longer changes the fixed hostname, but now registers the process with portmapper as SD6k\_callhome\_all.

You must make sure that all reporting clients have the proper hostname, for the interface they are reporting on, listed in the /usr/lib/ras/probrephosts file on this server. Also make sure the correct IP dotted address or server hostname is in the clients /usr/lib/ras/callhomehost file.

Enter (y)es or other valid option to start callhome  
Pressing Enter or invalid option will just continue, no action taken.

*Figure 7-28. Registration - Build Report Server (Start Callhome Process)*

This screen is prompting you to start the callhome process. The call forwarding process will be set up to respawn by the inittab entry to run in the background. This is the Remote Process Call (RPC) that is referenced whenever the clients communication method was set to RPC.

You must reply "yes" to this prompt at some time before the remote clients expect to call home. Once this process has been registered with the portmapper you no longer need to reply "yes." You will not start a second copy of callhome if you reply "yes" after you have started it. The old callhome process is killed and a new inittab entry replaces the old inittab entry. The new callhome process is then started.

**The following text pertains to complex environment and problem determination of network.** Please read if necessary, but continue now to the Crontab entry following the next figure.

This "callhome" process will use the same communication configuration file as used by registration and servdir.analyze. You must understand that changes made to Service Director's communication setup, and changes made under registration, "CHANGE configuration data," will affect the same file "/usr/lib/ras/ProbrepAt" the communications module.

## Callhome Logging

For PD of Service Director call forwarding process, a trace facility has been incorporated in the "callhome" module. More information will be discussed about the trace facility in another chapter of this document (see "Server/Forwarder Log" on page 4-17). The normal callhome process will not have this logging facility enabled. This implementation of topology can automatically set up the "callhome" module to log all events to a defined file in the /tmp directory. The file name will default to "hostname\_ch\_Log.tmp", where hostname is the server hostname that callhome is executing on. To invoke this logging enter a capital **A** at the previous "y" prompt. The logging may be reset by running topology "step 3" again and entering the **y** (yes) option response. This action will remove the old callhome inittab entry, kill the old callhome process, make a new inittab entry, and restart a new callhome process.

## Callhome Multiple Interfaces

**Make sure the customer is aware of this setting and the name change conditions if prior to release 3.1.**

Entering "all" will set the -call\_all flag in the callhome inittab entry. This will allow the callhome process to listen on all communication interfaces. Prior to Release 3.1, when the callhome process is started the hostname is saved using the hostname command and then restored back to the original hostname after portmapper registration is completed. The hostname is set to SD6k\_callhome\_all while the RPC is being registered with portmapper. If this flag setting is the condition that your account requires, then make sure you are updated to Service Director 3.1.

**Callhome process updates and additions for release 3.1.**

The -call\_all flag no longer changes the assigned hostname, but still allows the callhome daemon to listen on all available communications interfaces.

A new -h hostname flag allows the daemon to bind to the communication interface pointed to by the entered hostname, rather than the machines assigned hostname as default.

A new -np number flag allows multiple daemons to be running on the same forwarder. By adding the -np flag to the callhome inittab entry, the default process of 1 can be overridden. This will allow multiple callhome processes to be active monitoring different interfaces for client forwarding request. If you use different communications parameters for the additional callhome processes, then you will need to manually build a different directory to hold the ProbrepAt communications module, the probrephosts, and the callhomehost if applicable. Use step 3 of registration to initially build files in /usr/lib/ras and then move them to the new directory. Remember to change the communications parameters at number 4 and 13 to point to the correct new directory.

```
/usr/lib/ras/ch2/probrephosts
```

You must make sure that all reporting clients have the proper hostname, for the interface they are reporting on. That hostname must be listed in the /usr/lib/ras/probrephosts file on this server. Also make sure the correct IP dotted address or server hostname is in the clients /usr/lib/ras/callhomehost file. Both files are ASCII flat files and may be manually edited.

Use 8.3, "Manual Entry Options" on page 8-7 to start the callhome process in a foreground window. The preceding pages from the manual entry will show what messages should be posted for normal operation.

## Setting Crontab Entry

The next prompt is for setting the Crontab entry on the this server. The current Service Director entry is displayed if it exists, and the option to change it is allowed by responding yes to the prompt (Figure 7-29).

You may wish to change the Crontab entry now so this setting can be sent to all other clients during code distribution, Step 5. The Crontab minutes setting is incremented by 5 minutes as the code is distributed to the clients, this is to an attempt to relieve busy modem pressure.

```
The following is the current Service Director Crontab entry.

0 * * * * /usr/lpp/servdir/servdir.timer 1>/dev/null 2>/dev/null

Do you wish to add or change the current Service Director Crontab entry?
Enter (y)es to change entry:
y
```

Figure 7-29. Registration - Topology Crontab Entry

The Crontab entry is what starts the Service Director, if no error notify event has occurred. This Crontab cycle will check for any new problems that have occurred from periodic diagnostic daemon or the run\_ssa\_ela process, which checks the error log each morning. Also, the Crontab cycle checks to see if a pending or failed call file needs to be retried, or an open call needs a status check. These functions do not need to occur every hour every day, but could be done during normal weekly working hours. The default setting is to check on every hour, you may want to consider changing this entry.

If Crontab is OK, entering anything besides the "y" will continue with topology at Figure 7-32 on page 7-30.

```
Each of these fields can contain the following:
- A number in the specified range
- Two numbers separated by a dash to indicate an inclusive range
- A list of numbers separated by commas
- An * (asterisk); meaning all allowed values

0 * * * * /usr/lpp/servdir/servdir.timer 1>/dev/null 2>/dev/null
X ----- The minute           ↑Active Crontab Entry↑
X ----- The hour
X ----- The day of the month
X ----- The month of the year
X ----- The day of the week
<----- The shell command to execute ----->
0 * * * * /usr/lpp/servdir/servdir.timer 1>/dev/null 2>/dev/null
↑New Crontab Entry↑

1. Enter the minute
2. Enter the hour
3. Enter the day of the month
4. Enter the month of the year
5. Enter the day of the week
e. Execute the Crontab entry.
c. Continue with topology processing.
Messages: Validity of new entry is checked at execution time.
Please enter menu selection:
```

Figure 7-30. Crontab - Initial Crontab Setting

From this screen you can set any of the first five fields of the Crontab entry for Service Director. The shell script command cannot be changed at this time. As menu selections are entered the new entry will reflect the data you have entered. The actual changing of the Crontab will not happen until the execute **e** option has been selected.

At this point if all fields are valid, the active Crontab entry will update to show your changes. If there is an error or problem with new data, the update will fail and the active entry should not change. An error message will be posted and you must correct the improper data field.

```

Each of these fields can contain the following:
- A number in the specified range
- Two numbers separated by a dash to indicate an inclusive range
- A list of numbers separated by commas
- An * (asterisk); meaning all allowed values

0 * * * * /usr/lpp/servdir/servdir.timer 1>/dev/null 2>/dev/null
X ----- The minute           ↑Active Crontab Entry↑
X ----- The hour
X ----- The day of the month
X ----- The month of the year
X ----- The day of the week
<----- The shell command to execute ----->
0 7-20 * * 1-5 /usr/lpp/servdir/servdir.timer 1>/dev/null 2>/dev/null
                               ↑New Crontab Entry↑

1. Enter the minute
2. Enter the hour
3. Enter the day of the month
4. Enter the month of the year
5. Enter the day of the week
e. Execute the Crontab entry.
c. Continue with topology processing.
Messages: Validity of new entry is checked at execution time.
Please enter menu selection: e

```

Figure 7-31. Crontab - Changing Crontab Entry

If you wish to set the Contab entry so it will not activate Service Director off-shift use option 2. Enter a 7-20 for hours 7 AM thru 8 PM and press Enter key. The New Crontab Entry will now reflect the change in the hours column. Use option 5 to enter the days of the week 1-5 for Monday to Friday so calls are not placed on weekend. Use the **e** option to execute the new entry and the Active Crontab Entry will now show the commented out entry. Service Director will continue to be triggered by the errnotify ODM entry if a fault occurs.

Once the Crontab is set up correctly you may continue with the topology by entering **c** continue option.

```

#####
THE BUILD REPORTING TOPOLOGY FILES STEP HAS COMPLETED!

The "RPC Target" file that will reside on the clients and is usually
known as "/usr/lib/ras/callhomehost" contains the following:
9.117.16.56

The "RPC Client" file that will reside on the Server and is usually
known as "/usr/lib/ras/probrephost" will contain the following:
fr1n01, fr1n03, fr1n05, fr1n07, fr1n09, fr1n10, fr1n11, fr1n12, fr1n13,
fr1n14, fr1n15, fr1n16

Verify all Client hostnames are listed in the "RPC Client" list and that
the Server IP address and backup are listed in the "RPC Target" file.

  a. To append current list to old RPC Client file.
  l. List old RPC Client file.
  q. Quit no change, use old RPC Client file.

Enter menu option or press Enter to build new Client file.

```

Figure 7-32. Registration - Topology Completion Screen

This Topology Complete screen shows what data is placed in the callhomehost file (see item **3** of Figure 7-14 on page 7-14) that is distributed to all the client machines attached to this server. This is who the clients will RPC to.

The second list of hostnames shows who this server will listen to for the callhome process. This is the data that is in the probrephosts file (see item **13** of Figure 7-14 on page 7-14). If you have run this topology option with a different list of machines than the ones that this server will be forwarding, then you will have the wrong data in the probrephosts file. This will cause the server to get invalid requests for valid calls to the callhome process. The client will get an unknown host rc=0 message if the client hostname is not correct or is not in the /usr/lib/ras/probrephosts file.

If this is the first time the topology step has been run, you will only get the following prompt.  
(if /usr/lib/ras/probrephosts file does not exist)

Press Enter to return to the Main Menu.

Enter the appropriate response. The List option will display the old /usr/lib/ras/probrephosts file and return. The Append option will append the current displayed list of hostnames to the old /usr/lib/ras/probrephosts file. The Quit option will drop the current displayed list and allow the old list to continue unchanged, use this for customized file. All options besides List will execute and return to the Main Menu. Just pressing the **Enter** key will replace the old list with the current displayed list of hostnames.

Topology process has completed and will return you to the Main Menu to continue with **step 4 at 7.4, "Detail Distribute Registration Files (Step 4)" on page 7-31.**

---

## 7.4 Detail Distribute Registration Files (Step 4)

The necessary registration files have been built, now these files need to be distributed to the individual machines to ensure connectivity via the Service Director reporting/enabling process.

Select **4** from Main Menu.

```
SERVICE DIRECTOR REGISTRATION 3.0          (MAIN)
-----

STEP
1. Build/Update List of Machines for Registration
2. Register Machines with IBM
3. Build Reporting Topology Files
4. Distribute Registration Files
5. Service Director Code Distribution

d. Delete/remove Service Director code from Client
1. Lock/Unlock Service Director function at Client
p. Print current machine list
r. Review introductive help screens
x. EXIT                                h) HELP

Please enter a Step number or a menu selection: 4
```

Figure 7-33. Registration - Main Menu Distribute Registration Files

```
DISTRIBUTE FILES                          (Distribute1)
-----

At this point, you should have finished registering your machines
with IBM and creating the reporting topology files. If this is not
correct, please choose Return, to return to the appropriate step.

Otherwise, make sure you have TCP/IP connectivity to the remote
machine(s) that need the Service Director enabling files sent to them,
then choose the appropriate Distribute action.

There may be some delay while sending and receiving data.
Please do not interrupt this program unless absolutely necessary.

e. DISTRIBUTE files to ONE machine at a time
a. DISTRIBUTE files to ALL machines in the current machine list
n. DISTRIBUTE files to Only NEW machines in the current machine list
r. RETURN to parent menu

Please enter menu selection:
```

Figure 7-34. Registration - Distribute Key Files

For this activity let's select **e**.

If you select option **a** continue at "Option a" on page 7-34.

```
DISTRIBUTE FILES          Key      (Distribute2)
-----

You asked to distribute file to machines singularly.
Please give the number of the host you wish to distribute files to.
(only give one number at a time.)

Rec      Processor      R=Full key  K=Key sent
#  Hostname  ID Number  T=Temp key  C=Client code sent
1 - sp_server  000022651C00 R
2 - fr1n01    000156677000 R
3 - fr1n03    000156647000 R
4 - fr1n05    000154617000 R
5 - fr1n07    000155097000 R
6 - fr1n09    000240855700 R
7 - fr1n10    000241895700 R
8 - fr1n11    000241695700 R
9 - fr1n12    000242235700 R
10 - fr1n13   000242245700 R

f. FIND hostname or number in list
d. SCROLL DOWN, for other values
r. RETURN to parent menu

Please enter menu selection: 9
```

Figure 7-35. Registration - Distribute Key Menu

This menu will provide the capability to eliminate any machine that you may not want to distribute data to. A machine is currently powered down or does not have network connectivity functioning. The local host that you are currently running on is the only machine in the list that does not need the network. The registration files are copied to the appropriate directories. This registration data must be distributed to the clients before it is functional.

On entering the number of a client host, remote connectivity will be checked to the selected host. If "rsh" remote shell and remote copy "rcp" capabilities exist, then these commands will be used to set up /usr/lpp/servdir directory and transfer unique registration files to client host. Completion of action will display on (Distribute6) status screen. Select the host number that you wish to distribute to and press Enter to continue.

If this is the first time that the "rsh" has been tested, then the "/usr" file system validation check may also occur. This step will complete, but if the 100% warning is displayed for the selected host, then this step should be repeated after taking corrective action on the remote host file system.

If "rsh" permission is denied, you will be requested to enter some information about the client that will allow remote FTP (File Transfer Protocol) to distribute the data across the network. If you are working with a root authorized ID other than "root," you will be allowed to change to that ID by entering a yes or y at the prompt. Any other entry will default to "root" ID. You will also need the password for the authorized ID during the FTP, it will have to be entered for each transfer process.

FTP transfer will start to the selected host. This transfer should not take long. Follow the prompts. If you have entered the password incorrectly, or if communications to a selected host is down, this process may hang. To end a hung FTP process use the **quit** or **bye** FTP commands. Just type in the command and hit Enter, you may have to enter quit a couple of times. This will give you a false completion and transfer needs to be re-executed with the problem corrected to properly transfer the registration data files.



With the normal completion of transfer, you will see (Distribute6) status screen. This will show you the results of the FTP process. If a failure occurred during the transfer, the error and response files are copied to the /tmp directory. A prompt will give the name of the file containing the information. You should be able to verify the fault by editing the files. Press Enter to continue.

After a good completion of the "key" data, the singular machine screens will reflect a "K." This will allow you to easily maintain which machines have received their registration data.

```

DISTRIBUTE FILES          Key      (Distribute2)
-----

You asked to distribute file to machines singularly.
Please give the number of the host you wish to distribute files to.
(only give one number at a time.)

Rec      Processor      R=Full key  K=Key sent
#  Hostname  ID Number  T=Temp key  C=Client code sent
1 - sp_server 000022651C00 R K
2 - fr1n01   000156677000 R K
3 - fr1n03   000156647000 R K
4 - fr1n05   000154617000 R K
5 - fr1n07   000155097000 R K
6 - fr1n09   000240855700 R K
7 - fr1n10   000241895700 R K
8 - fr1n11   000241695700 R K
9 - fr1n12   000242235700 R K
10 - fr1n13  000242245700 R K

f. FIND hostname or number in list
d. SCROLL DOWN, for other values
r. RETURN to parent menu

Please enter menu selection: 9

```

Figure 7-36. Registration - Distribute Completed Menu

**Error message:** If you get the following message:  
Current host (hostname) does not have all necessary files for Step 4.

Then check the listed files and do the appropriate action for the **missing** file or files.

**Missing File    Recovery Action**

**msglog.index** Do step 2 from the registration Main Menu and successfully register failing host.

**customer.dat** Do step 2 from the registration Main Menu and successfully register failing host.

**ProbrepAt** Do step 1 from the registration Main Menu, then option **3** (update and save the failing host).

**callhomehost** Do step 1 from registration Main Menu, then option **3** (update the failing host). Check to make sure item **5** on Build2 menu is No. Use option **o** to check communication Build3 (should be 1-3 Y, N, RPC). Correct and save if necessary, reply No to overwrite, then save Build2 menu. Run step 3 topology and verify that the failing host is shown as client.

**Note:** The local server will not have the callhomehost file, only clients and client/server.

**Note:** At this point you have completed enough registration to allow execution of Service Director Interface to the user, on the local host. You cannot execute Service Director on "clients," but to have those clients properly set up to reflect this customer's environment, you need to configure Service Director.

**Option a:** If you elected to use option **a** distribute to ALL, the selection process would be automatic, starting with the first machine in the list and proceeding to the last. You would have seen the same ID and password prompts, followed by the progress indicators of each machine. When the list is complete you will see a total status on (Distribute6) of all of the transfers. Press Enter to continue.

Select **r** RETURN to the parent menu, until you are at the Main Menu. You do NOT have to exit the registration program to configure Service Director. You may exit and then re-enter later, but any password or ID data will be lost and have to be re-entered.

---

## 7.5 Service Director Detail Setup Procedure

This procedure ensures that all common data to Service Director will be set up properly for distribution in step 5. For example, e-mail notification is executed at each machine or node and each machine could have a different list, but if all machines are going to the same notification list, then set it up now and the list will be automatically distributed. Check with the administrator to find out if the client wants to have e-mail notification and whether or not each node can do the mail function.

Open or select another window.

Change directory `cd /usr/lpp/servdir`, then enter `servdir`, or "smitty fast path" `smitty servdir_exec` to start Service Director. Select the following from the user interface Main Menu (Figure 4-4 on page 4-5):

- Setup (see Figure 4-25 on page 4-25)
  - Notify User List (see Figure 4-28 on page 4-28)
  - Configuration (see Figure 4-31 on page 4-30)
  - PSA Hold Files (see Figure 4-36 on page 4-36)
- F3 to exit SETUP

Now that these items have been set in the local host Service Director, you may exit using F10, and return to the registration application. The files just setup can now be distributed to the clients in step 5 so all configurations will be the same.

For HACWS or HACMP machines review 6.8, "High Availability Environment" on page 6-11.

Continue with step 5 from the registration Main Menu.

## 7.6 Service Director Detail Code Distribution Menu (Step 5)

```
SERVICE DIRECTOR REGISTRATION 3.0          (MAIN)
-----

STEP
1. Build/Update List of Machines for Registration
2. Register Machines with IBM
3. Build Reporting Topology Files
4. Distribute Registration Files
5. Service Director Code Distribution

d. Delete/remove Service Director code from Client
1. Lock/Unlock Service Director function at Client
p. Print current machine list
r. Review introductive help screens
x. EXIT                                h) HELP

Please enter a Step number or a menu selection: 5
```

Figure 7-37. Registration - Main Menu Code Distribution Selection

Select **5** from the MAIN Menu.

```
SERVICE DIRECTOR CODE DISTRIBUTION          (Distribute3)
-----

This selection will distribute the Service Director execution code,
"Notify User List," Crontab entry, and other setup items on this host
to the client machine(s) in the current machine list. Once distributed
further installation and basic setup procedures will not be required on
client. In order to insure the clients are properly set up you must
complete the following steps prior to making this selection.

1. Completed steps 1, 2, and 3 of the Main Menu.
2. Distribute the registration files to this local host (Main Menu 4).
3. Exit registration session and "Invoke Service Director User Interface".
   Setup the "Notify User List," Crontab, and any other customized
   features you require of Service Director. You MUST setup notify user
   list so remote clients will be able to notify the System Administrator
   when a problem is reported. EXIT Service Director session.
4. Make sure you have TCP/IP connectivity to the remote machine(s). (FTP)
5. Re-invoke registration program and continue with distribution options.

Please enter "r" to return, or enter "c" to continue.
```

Figure 7-38. Service Director - Code Distribution Reminder

This is the reminder menu that the local host setup needs to be done. You should be able to select **c** to continue now.

```
SERVICE DIRECTOR CODE DISTRIBUTION                (Distribute4)
-----
For proper distribution the previous 5 items should have been completed.

If you have not done so please invoke "SETUP Service Director Distribution
files" selection "s." This selection will allow you to determine which
type of client you wish to distribute to: a "Reporting Only Client" or a
"Forwarding Server Client."

- "Reporting Only Client" Service Director session code Only
- "Forwarding Server Client" Service Director and Registration session
  code that can also forward calls from his clients.

s. SETUP Service Director Distribution files
r. RETURN to parent menu
Messages:

Please enter the menu selection: s
```

Figure 7-39. Service Director - Setup Type Code Selection

**First** you must select what code is being distributed. Do this with the **s SETUP** option, which will take you to (Distribute5) menu (Figure 7-40 on page 7-37).

### CODE SELECTION PROCESS

The Distribute5 menu has two major options and one secondary function. The primary function you are interested in here is to select what Service Director code will be set up for distribution to the other selected machines from the machine list.

Building a reporting client will transfer only the portion of Service Director code necessary for complete execution of Service Director on the remote client. About 1.5MB of code is required for the client-only application. This selection will be used for all machines that have network connectivity to the local server host (one with modem).

Building a forwarding server requires much more code to be distributed. The "callhome" forwarder along with the configuration files of the machine list and the registration application, must all be sent to the new server host. The process of distributing key and code to the remote server's client host would have to be executed at that server's registration session. Select **s** server option **ONLY** for complex configurations where client hosts do NOT have communication with the local server host.

## SERVICE DIRECTOR CODE DISTRIBUTION

(Distribute5)

-----  
When the option to "BUILD Client" is selected, the associated files are selected and a remote exec is built to set up the remote client(s). This remote exec will execute after the Service Director file transfer has completed successfully. Service Director should be active and if the registration files have been distributed, fully executable.

Files other than those defined for the BUILD Client Code may be sent to /usr/lpp/servdir directory of the machines in the current machine list by doing either of the following:

1. Manually copy files into SERVDIR\_UPDATE subdirectory.  
/usr/lpp/servdir/SERVDIR\_UPDATE
2. By entering an ASCII copy list file name at menu prompt.

c. BUILD Reporting Only Client

s. BUILD Forwarding Server Client

r. RETURN to parent menu

Messages: Please enter the full path for the copy file list (/tmp/update.list).

Please enter copy list filename or menu selection: c

Figure 7-40. Service Director - Code Selection

## Client Code Option

Select the **c** option and watch the client code be built. Only the files necessary for client execution are sent, no server or registration files are included. This build step also sets up a remote exec which will automatically execute after the files have been transferred. If files are missing on tar build, it is probably files like sdnofity.bin that would have been made if the Service Director had been setup in step 4. Files that should have been included will be listed in the client.list file in the working sub-directory.

After the build has completed select the **r** RETURN to parent menu. See Figure 7-41 on page 7-38.

## Server Code Option

Select the **s** option to build the necessary server transfer. All files required to do "call forwarding" and "client code distribution" are contained. Files that are included will be listed in the client\_server.list file in the working sub-directory. Again the remote executable will automatically set up Service Director on the remote server after the files are transferred.

This option will be used for advanced configurations with multiple servers, where call forwarding may be required, because client machine or nodes do NOT have address resolution to the local server. After server code has been distributed to the client/server machine, then registration steps may be executed from that client/server.

## Update Option

If files in /usr/lpp/servdir sub-directory need updating, two methods are available as shown on menu (Distribute5).

The second option, using a copy list file, would be entered at the menu prompt. This would build the "SERVDIR\_UPDATE" sub-directory and copy the files listed in the ASCII file to the update sub-directory. Use the return r option to Figure 7-41 and select distribution option.

If the first option was used, where files to be transferred are manually placed in "SERVDIR\_UPDATE" sub-directory, then Figure 7-41 would not have been necessary. The allowed distribution selection on Figure 7-41 would be present because "SERVDIR\_UPDATE" sub-directory existed.

After exiting (Distribute4) menu (Figure 7-41) the "SERVDIR\_UPDATE" sub-directory will be automatically deleted. If manual update option was used, you must rebuild the update sub-directory again before additional distribution can occur.

```
SERVICE DIRECTOR CODE DISTRIBUTION                (Distribute4)
-----

For proper distribution the previous five steps should have been completed.

If you have not done so please invoke "SETUP Service Director Distribution
files" selection "s." This selection will allow you to determine which
type of client you wish to distribute to: a "Reporting Only Client" or a
"Forwarding Server Client."

- "Reporting Only Client" Service Director session code Only
- "Forwarding Server Client" Service Director and Registration session
  code that can also forward calls from his clients.

s. SETUP Service Director Distribution files
e. DISTRIBUTE files to ONE machine at a time
a. DISTRIBUTE files to ALL machines in the current machine list
n. DISTRIBUTE files to Only NEW machines in the current machine list
r. RETURN to parent menu
Messages:

Please enter the menu selection:
```

Figure 7-41. Service Director - Code Distribution Menu

This screen now has all options shown. Select the **e** option to take you to Figure 7-42 on page 7-39 menu. The **a** option would continue at "Option a" on page 7-39.

| You may notice that Client/Update appears on the (Distribute2) menu along with the status flags.  
| Selecting the machine that you wish to distribute code to, and the status of the individual machines should  
| now be reflected. On completion of transfer and setup of code to machine, the "C" flag will be added to  
| the list. Selection of the local host will not transfer code, but will post completion menu without the "C."

| On entering the number of a client host, the remote shell capabilities are verified and the "rsh/rcp" is  
| executed to transfer and build the client code.

```

DISTRIBUTE FILES          Client/Update      (Distribute2)
-----

You asked to distribute file to machines singularly.
Please give the number of the host you wish to distribute files to.
(only give one number at a time.)

Rec      Processor      R=Full key  K=Key sent
#  Hostname  ID Number  T=Temp key  C=Client code sent
1 - sp_server 000022651C00 R K
2 - fr1n01   000156677000 R K
3 - fr1n03   000156647000 R K
4 - fr1n05   000154617000 R K
5 - fr1n07   000155097000 R K
6 - fr1n09   000240855700 R K
7 - fr1n10   000241895700 R K
8 - fr1n11   000241695700 R K
9 - fr1n12   000242235700 R K
10 - fr1n13  000242245700 R K

f. FIND hostname or number in list
d. SCROLL DOWN, for other values
r. RETURN to parent menu

Please enter menu selection: 9

```

Figure 7-42. Service Director - Code Distribute Individual Machine Selection

**Note:** If you have exited the registration application and then re-initiated, this may be the first test for "rsh" capability. If so, you will get the root user prompt, which will allow you to change IDs if required. Then the "/usr" file system will be checked on the remote host, and compared to the configuration setting for "MAX. % DISK LIMIT WARNING." If a warning is given, then this step may have to be repeated to properly transfer the code to the Client. If you don't get the 100% warning then the chances are good that the code will transfer alright, but Service Director will not execute properly, and will post a Technical Problem mail message to the Notify User list.

Again if "rsh" is not allowed then the remote "FTP" and remote exec are executed. If "rsh" exists, then follow the completion and skip the next paragraph.

FTP transfer will start to the selected host if remote access was denied, but now the transfer should take longer. Follow the prompts. You will have to enter the password twice during this operation, first for the FTP then for the rexec. If you don't see the end of the FTP transfer and the beginning of the remote exec after a few minutes then the process may be hung. To end the FTP process use the **quit** or **bye** FTP commands. This will give you a false completion and the transfer needs to be re-executed with the problem corrected to properly transfer the code and do the remote exec to build the client.

With the normal completion of transfer and build exec, you will see (Distribute6) status screen. This will show you the results of the process. If a failure occurred during the transfer or execution of the remote exec, the error and response file are copied to the /tmp directory. A prompt will give the name of the file containing the information. You should be able to verify fault by editing the files.

Press enter key to continue with additional machine selection.

*Option a:* If you elected to use **a** distribute to ALL, the selection process is automatic. Starting with the first machine in the list and proceeding to the last, you will see the same ID and password prompts, followed by the progress indicators of each machine. When the list is completed, you will see a total status on (Distribute6) of all the transfers. Press enter key to continue from the Distribute 6 menu.

During the all selection or if you selected the local host machine number, no code transfer will take place. This machine already has the code.

With either option selected after good completion of the code and rexec, the singular machine screens will reflect a "C." This will allow you to easily maintain which machines have received code and are running. At this point the client hosts are set up and ready to execute in the event of an error, or if cron entry triggers. The Crontab entry that was distributed with the code distribution will be set at a five-minute stagger from the previous machine in the machine list, starting from the local host entry made during topology setup.

Select **r** RETURN to the parent menu, until you are at the Main Menu.

**Note: At this point all machines that have code completion are now running Service Director.**

You may exit the registration session now.

---

## Remote Access Authority

The server will do some checking for remote capabilities any time a remote access is required.

- The first entry requiring remote access after the registration application is started will allow updates to default information if required. If the default entry is OK, just press Enter to continue.
  1. If some other ID is used instead of root, the first prompt will allow you to change to that ID by entering a "yes" response.
  2. The second prompt will allow a common password to be used for all of the FTP processes if needed. Review all prompts if yes is selected.
  3. The third prompt is necessary if the remote copy or rsh access is something beside basic or SP Kerberos commands.
- The server will now check if there is address resolution on the entered hostname. If no resolution is found then you are prompted to enter a valid hostname or a capital "C" to cancel remote checks and use the name entered during build list process.
- Hostname is checked for an "alias" entry, if so the correct hostname is entered, and you are informed of this change.
- The remote host is now checked for remote access, and the uname is returned and placed in item 2 automatically. If rsh capabilities do not exist, it may be a long time before control is returned. Code will automatically try both rsh accesses before quitting. If item 2 is not filled, then rsh access is not active to this host.
- If remote access exists, then registration will try to get the correct reporting hostname for the remote host by issuing a ping with routing flag set from the remote host to the server. The returned hostname will be compared to the original, and automatically updated if different. This method will ensure that the correct hostname is given to the callhome process in step 3. The ping routing can only carry eight routes back, so if the route is longer than four hops to the local server, this process will not validate client network hostname.



## 7.7 Service Director Code Removal Process

```
SERVICE DIRECTOR REGISTRATION 3.0          (MAIN)
-----

STEP
1. Build/Update List of Machines for Registration
2. Register Machines with IBM
3. Build Reporting Topology Files
4. Distribute Registration Files
5. Service Director Code Distribution

d. Delete/remove Service Director code from Client
1. Lock/Unlock Service Director function at Client
p. Print current machine list
r. Review introductive help screens
x. EXIT                                     h) HELP

Please enter a Step number or a menu selection: d
```

Figure 7-43. Removal of Service Director Client Code

Service Director for RS/6000 provides three ways to remove the Service Director code installed on the system. **SMIT** or **smitty** menu to **Delete Service Director Application**, or bottom line commands shown:

```
/usr/lpp/servdir/servdir.remove
"SMIT or smitty fast path" smitty servdir_del
```

The listed commands must be executed on the machine from which you wish to remove the code.

The third method is to use the registration application option **d. Delete/remove Service Director code from Client**. This process, again similar to the key and code distribution, allows you to select which machine to remove from. It uses the remote exec process to execute the `servdir.remove` application. This will completely remove all the Service Director application code, and any active processes. You will be prompted through root ID and password setup if this is a new entry into the registration session.

Follow the prompts, follow the code removal steps, and enter final judgment of the completion of code removal. Upon confirmation of completion of the code, the application will remove the "K" and "C" flags.

If you select the local host, the remote removal application will not be executed. This will prevent the accidental removal of the application that you are running.

On the local host you must use one of the first two removal procedures.

**Note:** If removal is executed from a motif window, please use scroll bar window or enlarge window vertically. This will allow you to confirm deletion easier. If applications are not found during removal do not view this as a failure of code removal. Not all clients have all functions active.

## License Agreement Screens

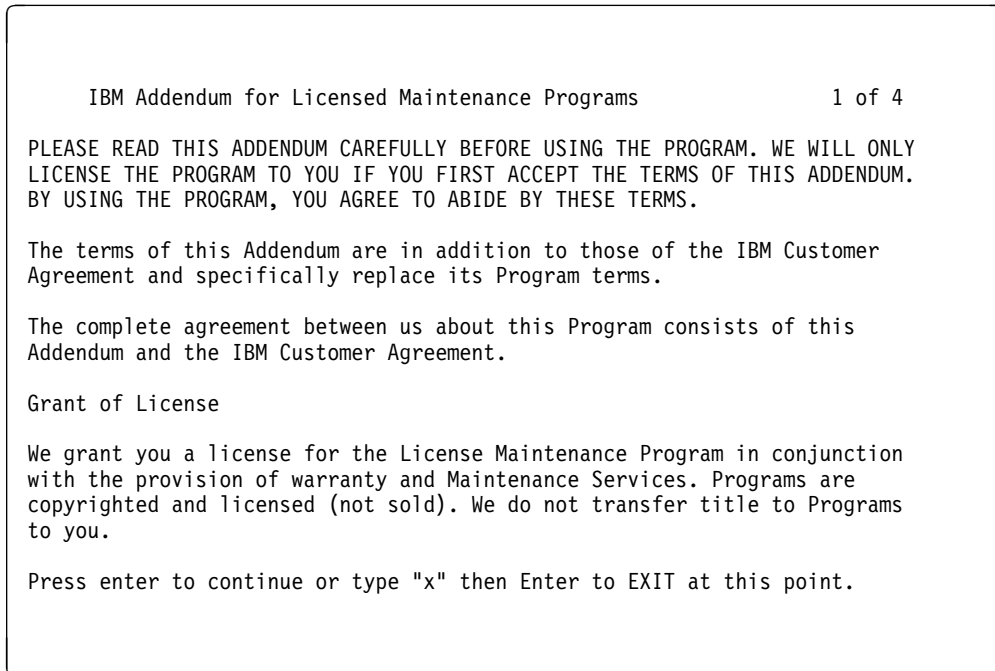


Figure 7-44. IBM Addendum for Licensed Maintenance Programs 1 of 4

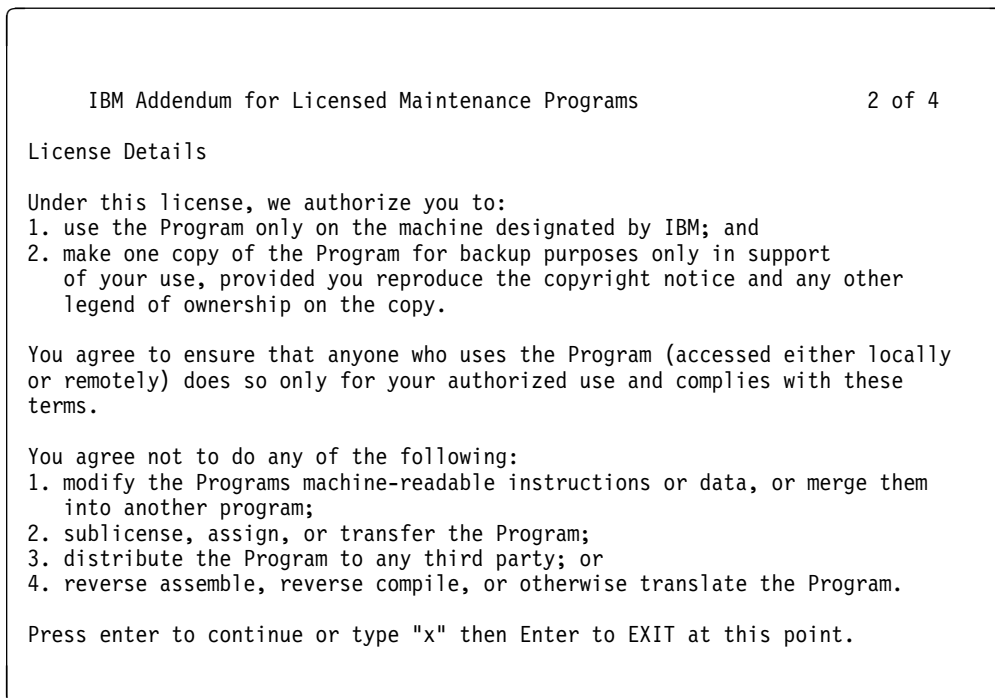


Figure 7-45. IBM Addendum for Licensed Maintenance Programs 2 of 4

```
IBM Addendum for Licensed Maintenance Programs          3 of 4

Use of Data

You authorize us to use the data collected by the Program for problem
determination and to assist you with performance and capacity planning.

License Termination

This license terminates when the machine designated by IBM is 1) no longer
covered by IBM warranty or Maintenance Services or 2) removed from productive
use within your Enterprise.

We may terminate a license we grant in this Addendum if you do not meet your
obligations regarding the Program

Upon termination, you agree to destroy the Program and any backup copies
you made of it.

You may print this license agreement at any time in the future by printing
the file "/usr/lpp/servdir/IBM_license". If you wish to print the license
agreement now enter "p" to print or Enter to continue.
```

Figure 7-46. IBM Addendum for Licensed Maintenance Programs 3 of 4

```
IBM Addendum for Licensed Maintenance Programs          4 of 4

Please indicate your acceptance of the terms of this license by typing
your name and pressing Enter to continue. If you do not accept the terms
of this agreement type *NO* and press Enter to exit.
```

Figure 7-47. Acceptance by Contact Name Entry (May Not Be an Individual)

The customer contact name should be entered on the screen in Figure 7-47 for approval of Service Director use. This name should be the customer contact point for calls. It does not have to be an individual's name (e.g., IP OPS Center). This entry will automatically be inserted in the customer information screens on the registration menu, and will be included in the PMH header record.

Once you have entered the customer contact name it is maintained, and registration will go directly to the Main Menu. This name may be changed by entering the license option I on INTRO5 menu. See Figure 7-52 on page 7-46.

## Registration Introduction Screens

If you are familiar with the introduction screens, you may bypass the next five screens by entering an **m**. This will take you directly to Main Menu, Figure 7-1 on page 7-1. From the Main Menu, option **r** will allow you to review these introductory help screens.

```
SERVICE DIRECTOR REGISTRATION                (Intro1)
-----

This registration program will present you with several menus that
will define the data needed to register and run "Service Director
for RS/6000." You may register one or more machines from
this one execution of the registration program.

NOTE: It is expected that the machine running this registration
program will be configured as a "Reporting Local Server"
when the registration list of machines is created later.
Please become familiar with the following informational
screens prior to entering the main menu screen.

To execute the registration process complete steps 1-5 of main menu.

Please enter and verify the proper contact, phone number, and address
for the Account of each machine during registration build step 1.
The dispatched resources depend on the accuracy of this information.

Press Enter to continue, "x" then Enter to EXIT, "m" for main menu.
```

Figure 7-48. Registration Introduction Screen 1 of 5

```
SERVICE DIRECTOR REGISTRATION                (Intro2)
-----
-- PREREQUISITES --
1. Service Director can only be used on machine(s) that are under an IBM
hardware warranty or maintenance agreement.

2. You must know the machine type, serial number, and "uname -m" number
or hostname, for each machine to be registered.
(SEE THE EXTERNAL LABELS OF THE CPU BOX FOR TYPE AND SERIAL NUMBER.)
USE ONLY the last five digits of the Serial Number. DO NOT include MFG code.
Example: Machine Label on CPU      = 7011-26-99998 (Type-MFG-Serial)
      Model Type to be entered    = 7011
      Serial # to be entered      = 99998
      Result of the "uname -m" = (12 digit number)

3. You must have a modem attached to the registering machine's tty port
and properly connected to a telephone line.

If you need help fulfilling these prerequisites, please contact 1-800-IBM4YOU
(1-800-426-4968), your local IBM Branch Office, or use local procedures.

Press Enter to continue, "x" then Enter to EXIT, "m" for main menu.
```

Figure 7-49. Registration Introduction Screen 2 of 5

SERVICE DIRECTOR REGISTRATION

(Intro3)

-----  
Service Director is designed to execute in a standalone or Client/Server configuration. The following overviews are examples of those configurations.

STANDALONE CONFIGURATION: (main menu steps 1, 2, and 4 only)

1. Host has a modem attached with Service Director installed.

Customer SD/6000 Host --> (async/modem) --> IBM receiving Host

CLIENT/SERVER CONFIGURATION: (main menu steps 1 - 5)

1. Customer Service host also known as the "FORWARDER" has modem attached with Server Director installed.
2. Customer Client hosts have Service Director installed and pass problems detected to the Server host (forwarder) via TCP/IP.

Client Host(s) -->(tcp/ip)--> Customer S.D. Server Host -->(async/modem)  
Client Host(s) -|  
Client Host(s) -' IBM receiving Host <--'

Press Enter to continue, "x" then Enter to EXIT, "m" for main menu.

Figure 7-50. Registration Introduction Screen 3 of 5

SERVICE DIRECTOR REGISTRATION

(Intro4)

-----  
Service Director requires a number of facts about your environment and about the individual machines to be registered. The first time you use this program, you will see a number of "sample" values entered in the data fields. Please be sure and change all those that refer to addresses, phone numbers, etc., to reflect your organization. For the other items, you may or may not need to make changes, depending on your environment.

It is recommended that you do the registration activities in the order in which they are presented on the Main Menu (steps 1 through 5). While in step 1 of the Main Menu (Build/Update ...[build2] ), you should select the "o" option and verify that the communication parameters are correct for each host prior to saving. A common user problem is when a required outside access number/code such as the number "9" is omitted in the "dial out phone number" parameter of the Reporting Server host. (i.e.: 9-1-800-830-1041)

Each major activity will give you some help information.

Press Enter to continue, "x" then Enter to EXIT, "m" for main menu.

Figure 7-51. Registration Introduction Screen 4 of 5



---

## Chapter 8. Network and Modem Problem Determination

This chapter covers PD on modem and tty port, followed by the remote procedure call for network communication. It also covers manual procedures for starting the callhome process in the foreground to aid in PD. By running the callhome process manually you will be able to see the messages posted by the application, these messages will aid you in fault analysis.

---

### 8.1 Modem Failure Analysis

The local server will drive the modem during the registration process. The code is not elaborate and error handling is retry if it does not work. Modem process is invoked from step 2 of registration. The register single machine option is the quickest call to use, plus it will give you an indication of sectors transferred. No other call process will give this information. The following bullets will step you through the events that occur after selecting the machine you wish to use for this registration step.

- Connect to tty port. If the port is locked, wait until the port is available.
- See AIX 4.1 not in available state message. (N/A with SD 3.0 code)
- Connect to modem and send optional modem file or init string.
- You should see modem lights flash at this point.
- Wait for carrier detect, then send dial string.
- You should hear the modem dial out and start the connection process.
- If you **don't see lights flash or hear modem dialing**, go to "If RC=11 or 101?" on page 8-2.
- Time out (30 seconds) if you do not get the connection.
- Print Connection established message.
- Application uses xmodem protocol to run the modem, which uses positive ACK response to continue and NAK or negative to retry. The initial setting is NAK, so no response will result in a NAK condition.
- Start sending 128 byte sectors (should see four sectors sent).
- Good communications should not have any NAK messages posted during sector transfer. Remember this is using the public switched network to communicate, but at 9600 baud this should be pretty clean.
- If a lot of NAK messages are posted and no sectors are sent, it means that the modem is not communicating correctly with the IBM Service Director server. The modem is defective or mis-configured, go to "If RC=11 or 101?" on page 8-2.
- After four sectors are sent, the end of transmission is sent and the write operation is complete from the client.
- Application re-connects with a I/O read operation to the tty port and modem to receive status and customer data.
- After receiving the returning data and the end of transmission from the IBM server, the read operation is completed at the client.
- Code issues ioctl to drop DTR, which should hangup the modem and drop the carrier.
- Post the returned status and the return code.
- End of registration sequence. Continue with the next machine in the list or go to Register4 menu.

## If RC=10?

Then the problem is usually the modem configuration or phone lines, but check, because you may have a getty against the tty port stealing the return data causing timeouts.

1. Check the tty port and the modem for primary items. See Appendix A, "Service Director tty Port and Modem Setup" on page A-1, swap tty ports.
2. Do **ps -ef | grep tty#** and check if any applications or getty is on the tty port that you are trying to use.
3. Call the support group and make sure the IBM server is available. If they can register their machine, then it is probably your problem.
4. You might have a bad receive line from your modem to the tty port, if you get timeout waiting for a NAK.

## If RC=11 or 101?

It is usually local to the customer configuration.

1. Do a **pstart** command and the tty should be listed as disabled.
  - If the tty port is not shown, then it is probably not configured properly. Please use SMIT or smitty to configure it.
  - If the port is shown as enabled, then execute the **pdisable tty#** command and retry operation. The registration code should have successfully disabled the tty port, but it may have failed.
2. Check the tty port configuration. See Appendix A, "Service Director tty Port and Modem Setup" on page A-1. Some of the problems have been isolated to the tty port configurations. It looks OK, but when the port is removed and reconfigured with defaults, the problem is solved. Make sure to remove the port from the configuration database.
3. Check the modem configuration. Use **cu -m1 tty#** to access the modem directly.
  - The **cu** command requires an entry in `/etc/uucp/Devices` for the tty port being accessed.
  - You may have to `chmod 644 /etc/uucp/Devices` before you can vi the file.
  - Use `vi /etc/uucp/Devices` and un-comment, copy, or add the port statement.
  - Like: `Direct tty1 - 9600 direct`
  - Use capital ZZ to save and exit vi, or :wq to write and quit.
  - If you had to chmod before, **chmod 444 /etc/uucp/Devices** back to read only.
4. Also the port cannot be in use, so do a **pdisable tty#** before using cu command.
5. Enter **cu** command `cu -m1 tty#`.
  - Once cu has connected to the modem, view the configuration by issuing one of these commands:  
**AT&V** normal Hayes-compatible view configuration  
**AT+C** for IBM 7857-017 & 7858-336 configuration  
**AT\$H1** for IBM 7852-400 configuration **ATL5L6L7** may also be used  
**ATI4** for US Robotics configuration
  - Things to look for are:  
echo, command response, compression = OFF  
error correction = ON  
DTR, CD = Normal  
(see flag settings at end of list)



These are USA country SD server setting. You may need to check with your local procedures to get the appropriate country modem settings.

- Do a modem reset command **ATZ** and modem lights should flash if you are getting to the modem.
  - If you can not see the configuration data after entering the proper AT commands, enter this AT command **ATE1Q0**.  
This will make sure the Echo & Command response is active.
  - If you still can not see the configuration data,
    - Then possible the wrong tty port is selected
    - Port to modem is cabled incorrectly
    - Port to modem cable is defective on the receive line
  - AT&W0 will write the active profile to profile 0.
  - ATDT1-800-830-1041 will cause modem to dial the USA catcher. Remember you might have to put a 9, to get external line. This should aid you if line does not seem to be dialing out. You will probably loose carrier (CD) after a few seconds, because you are not sending in the correct information that the catcher must see to maintain the connection.
  - Use the tilde (~) followed by a period(.) to end the cu connection to the modem.
6. If you get good data and then garbage or just garbage data, then delete the tty port using smit, remove definition from database. Now add tty port back to system. If port cannot be removed because it is busy, then administrator remove all processes working with tty. You may have to re-boot to clear tty port.
  7. Check the connecting serial cable (a cocked cable has caused problems).
  8. Try connecting to another modem that is attached to the system if available. Use **ate** or **cu** commands to connect to a system with a getty spawn on the tty port that you are calling **penable tty#**. You should get a clean login herald.
  9. If connecting to another modem that is attached to the system works correctly, then the problem is with the configuration of the modem or the tty port with the IBM SD server. You do not have bad equipment, just a bad configuration.

## Modem Flag settings Service Director

E0 Echo off, do not echo keystrokes back to tty.  
Q1 Response off, do not return response codes back to tty (OK error).  
&C1 Carrier detect normal, must not be forced on  
&D2 DTR normal operation  
&K3 Is usually what is needed, on US Robotics it disables compression  
&E5 MNP error correction on 7857 & 7858 modems  
&E2 &E14 Is error correction no compression for 7852-400  
&Q5 IBM and Hayes error correction enabled.  
&M4 US Robotics error correction enabled.  
S0=0 Disables Auto Answer at the modem.

## 7852-400 Modem Failing while others work.

Add the following modem configuration data to the modem init string in the `ibm7852_400.cfg` file.

**\$BA1\$MB9600\$SB9600** This will set speed conversion off \$BA1 and modem baud rate \$MB and serial port baud rate \$SB to 9600.

---

## 8.2 Troubleshooting RPC Network

If communications cannot be established between the Service Director clients and the callhome forwarder, you get the Unknown Status response immediately. Make sure that the `/usr/lib/ras/callhomehost` file has the correct **IP dotted address** for the server that is running the callhome process. Make sure that the "callhome" process is running to the server. Enter the following command: `ps -ef | grep callhome`. You should see a root process running besides the "grep callhome" that you just created. The process should have the command script that started the callhome process and should look something like this: `/usr/lib/ras/callhome -p /usr/lib/ras`. If no callhome process is found, then use registration 3.4, "Step 3 Topology" on page 3-5 to initiate callhome on the server.

If the callhome process is running on the server, then from your failing client "ping" the IP dotted address for the server to make sure that you have connectivity on the network. Make sure you are pinging the correct IP address, use the host `server_hostname` to verify the correct address. If you can't ping the server, then get the system administrator to verify the network.

If the ping works, then use the following ping to get the correct client hostname for the communication interface that the client machine will be calling the server callhome process on.

### **ping -R -c 1 server.dotted.ip.address**

The last entry after the **RR:** should be the client's interface hostname followed by its dotted IP address. This hostname must appear in the server's `/usr/lib/ras/probrephosts` ASCII file, or the callhome process will reject the caller as an invalid client.

Use the **rpcinfo** and **netstat** commands to find out the status of the callhome process that was started on the server.

- Enter `rpcinfo -p hostname` to find out what processes are installed on the server (enter the server's hostname, not *hostname*).

```
# rpcinfo -p sp_server
  program vers proto  port
  100000    2   tcp   111 portmapper
  100000    2   udp   111 portmapper
  300201    1   tcp  1024 executiond
  35791394  1   tcp   1041
```

- The first **rpcinfo** command showed "callhome," program number 35791394, and was registered with portmapper.
  1. If 35791394 was not listed under the server hostname, then registration step 3 "topology" was not executed properly for the server.
  2. If 35791394 was listed then remember the tcp port that was assigned to it for later analysis. Here it was port 1041. You need to do the next `rpcinfo -t` command to see if the process is still active or ready.
- Enter `rpcinfo -t hostname 35791394 1` to find out the current status of the callhome process.

```
# rpcinfo -t sp_server 35791394 1
program 35791394 version 1 ready and waiting
```

**Note:** If the process is not available, it will be deleted from the program list on earlier versions of AIX. On later versions you must use the `rpcinfo -d 35791394 1` to delete.

- The following example shows what these commands look like on a system that does not have "callhome" process activated.

```
# rpcinfo -t sp2rsf1 35791394
rpcinfo: RPC: Program not registered
program 35791394 is not available
# rpcinfo -p sp2rsf1
  program vers proto  port
    100000    2  tcp   111  portmapper
    100000    2  udp   111  portmapper
    300201    1  tcp  1024  executiond
    33333332  1  tcp  1025  comp_ed
```

- The final step if the program is active on server is to validate that the port attached to the application is available and not blocked.
- Enter `netstat -n | pg` from the server with callhome active, or `| grep 1041` `grep` the port number assigned to the process if server is real active with network. Use `netstat -a | grep 1041` if listening to all interfaces.

```
Active Internet connections
Proto Recv-Q Send-Q Local Address           Foreign Address         (state)
tcp        0      2 9.118.26.56.23         9.118.80.239.1029     ESTABLISHED
tcp        0      0 193.1.1.1.1045        193.1.1.2.23         ESTABLISHED
tcp        0      0 9.118.26.56.1041     *.*                   LISTEN
```

- Here port 1041 is in Listen mode, waiting for any remote to access the port. Access must come to the dotted IP address "9.118.26.56" or from a hostname that equates to that dotted IP address.
- If there is not an available 1041 port in the net, or if the port is established to some other host, get the program administrator or network person to assist you in debugging the network.

If network looks OK, but communications cannot be established between the Service Director clients and the forwarder, or you wish to monitor transactions going to the forwarder, the callhome process will display process status messages if executed in the foreground. Remove all background "callhome" processes (see 1 on page 8-7), and execute the foreground command as shown in 2 on page 8-7.

Here is what a good connection should look like for a client sp2rsf1 making a communication test request to the callhome process running in the foreground window. Note that when the client gets the message "Established as a client of dotted.IP.address.server". this is the first indication of a good linkage. The first indicator at the callhome process is the decode of the "text length" of the call request. This is zero in the test call case. Once the callhome process has validated the caller, it will post the "Forwarding request" message and spawn a child process to handle the request. The parent callhome process then goes back to monitoring interface for any other calls, and will spawn another child for each additional request it receives.

The child code then post a "Making call" message containing the uname number of the client and the sequence number of the call (1 for test) which is the record number from the client's event log. The child will check the communication method to see if it is using RPC or TTY. If RPC is used, then it will post a connection to the next callhome process. If TTY is used, then the child will check to see if the port is available or if it is locked. If the port is locked by a valid process, a locked message would appear and the child would wait until the lock is removed, then continue to use the port. In our case the port is available for use and the "Port has become available" message is posted with the child's process ID number. The child then initializes the modem and dials out, and you should see or hear the connection process take place. If all goes well the only message that will be posted is the "Data Transmission Complete", when the returning status is sent back to the client. At this point the child process will have hung up the modem, removed it's tty port lock before exiting. If another child process had been waiting to use the modem, you would see it pickup at the "Port has become available" message and continue.

Remember the following is a good normal operation, some of the failing conditions are posted in the later examples.

**Note:** Make sure you are in the /usr/lib/ras/ directory when the callhome command is executed.

```
# callhome -p /usr/lib/ras &
[1]      8085
# CREATION DATE: 10/25/98 Rev 3.0
| CRPC: port 0 (CRPC entries removed on Rev 3.1)
CRPCServiceRegister: port 0
Running the forwarder
Using TTY for forwarding on port tty0
Other text length = 0
Forwarding request from sp2rsf1
Making call, uname = 000088031000, sequence = 1
Port has become available, 12730 active
Data Transmission Complete, 12730 exiting
```

The following command was issued while the previous request was being handled. Note that you have the two callhome processes listed, if more children were requested you would also see their processes waiting for the modem.

```
# ps -ef | grep callhome
root  8085  9096  0 11:38:38 pts/1  0:01 callhome -p /usr/lib/ras
root 12730  9096  0 12:13:38 pts/1  0:00 callhome -p /usr/lib/ras
root 12990  9096  2 12:13:58 pts/1  0:00 grep callhome
```

In the following example a call is received from a client that its communications hostname does not appear in the ASCII file /usr/lib/ras/probrephosts with all the other client hosts. Also note that any hostnames in the probrephosts file that cannot be accessed is also listed, these names should be removed from the file.

```
Other text length = 0
Unable to access host pebay
Unable to access host sp2rsf1e
Invalid caller
```

The example above would be listed 3 times usually, but it is controlled by how many retries are configured at the client.

In the following example callhome can not get to the modem. It is honoring a forwarding request but it can not run the modem. It retries but still times out and finally returns a transmission complete with a rc=10 back to the client.

```
Other text length = 0
Unable to access host pebay
Forwarding request from sp2rsf1
Making call, uname = 000088031000, sequence = 1
Port has become available, 12944 active
Unable to raise DTR
Connection timed out
Connection attempt timed out
Retrying connection, attempt = 2
Unable to raise DTR
Connection timed out
Connection attempt timed out
Retries exceeded
Data Transmission Complete, 12944 exiting
```

---

## 8.3 Manual Entry Options

### Manual Callhome Options

The following is a list of the callhome command line options. Make sure that you are in the correct directory when executing foreground the commands. Do `cd /usr/lib/ras` before entering command. **The server or forwarder must be set on in the communication module.**

1. Remove the callhome from inittab and stop callhome process.

```
rmitab "callhome"
```

2. Execute the callhome process without logging.

```
INITTAB ENTRY: "callhome:2:respawn:/usr/lib/ras/callhome -p /usr/lib/ras"
```

```
FOREGROUND COMMAND LINE:
```

```
./callhome -p /usr/lib/ras/
```

3. Execute the callhome process and log call transmissions. Topology Step 3 using capital **A** entry.

```
INITTAB ENTRY:
```

```
"callhome:2:respawn:/usr/lib/ras/callhome -p /usr/lib/ras -l /tmp/log1"
```

```
FOREGROUND COMMAND LINE:
```

```
./callhome -p /usr/lib/ras/ -l /tmp/log1
```

4. Execute the callhome process, log call transmissions, and set the maximum log file size.

```
FOREGROUND COMMAND LINE:
```

```
./callhome -p /usr/lib/ras/ -l /tmp/log1 -ls 4000
```

5. Execute the callhome process on a defined socket up to 9999 (3.2.5 socket restriction) instead of default first available socket.

```
INITTAB ENTRY:
```

```
"callhome:2:respawn:/usr/lib/ras/callhome -p /usr/lib/ras -s 3525"
```

6. Execute the callhome process on a different interface than hostname is assigned.

```
INITTAB ENTRY:
```

```
"callhome:2:respawn:/usr/lib/ras/callhome -p /usr/lib/ras -h interface_hostname"
```

7. Execute the callhome process and log call and listen to all communication ports.

```
INITTAB ENTRY:
```

```
"callhome:2:respawn:/usr/lib/ras/callhome -p /usr/lib/ras -l /tmp/log1 -a -call_all"
```

8. Run two callhome processes on a different interfaces one as default.

```
INITTAB ENTRIES:
```

```
"callhome:2:respawn:/usr/lib/ras/callhome -p /usr/lib/ras"
```

```
"callhome2:2:respawn:/usr/lib/ras/callhome -p /usr/lib/ras -h 2nd_hostname -np 2"
```

Clients communicating with the second callhome process would have to have their callhomehost file updated **2.nd.IP.address 2**.

**Note:** Registration topology step 3 can restore the callhome inittab entry and restart the callhome process automatically for you. If you wish to have full forwarder logging, enter a capital A instead of a yes response on step 3. See registration "Callhome Logging" on page 7-27 for automatic setup.



## Appendix A. Service Director tty Port and Modem Setup

It may be necessary to add or change the tty device to the local server configuration before installation of Service Director.

Use **SMIT** or **smitty** then Device/tty/option, to get to the proper tty selection. Select "Add a tty" or "Change/Show Characteristics of a tty" from the tty menu. This example will be using the "Add" selection. The "tty Type" selection will be "tty rs232 Asynchronous Terminal" followed by the Parent Adapter selection, which in this example was "sa0 Available 00-00-S1 Standard I/O Serial Port 1," but could be any available serial port.

```

                                Add a tty

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

                                [Entry Fields]
tty type                        tty
tty interface                   rs232
Description                     Asynchronous Terminal
Parent adapter                   sa0
PORT number                      [s1]                                +
BAUD rate                        [9600]                               +
PARITY                           [none]                                +
BITS per character               [8]                                  +
Number of STOP BITS             [1]                                  +
TERMINAL type                   [dumb]
STATE to be configured at boot time [available]                          +
DMA                             on                                             +
Read Trigger                     [3]                                  +#
Transmit Buffer Count             16                                    +
Name of initial program to run   [/etc/getty]
Enable program?                  off                                       +
Run level                        2                                         +

Note: The following attributes are only
      applicable if /etc/getty is specified
      as the initial program to run.
Enable LOGIN                      disable                                  +
TIME before advancing to next port setting [0]                                +#
Stty attributes for RUN TIME      [hupcl,cread,brkint,icr>
Stty attributes for LOGIN        [hupcl,cread,echoe,cs8,>
Optional LOGGER name             [Optional]

F1=Help      F2=Refresh      F3=Cancel      F4=List
F5=Reset     F6=Command     F7=Edit       F8=Image
F9=Shell     F10=Exit        Enter=Do

```

Figure A-1. SMIT Add a tty under AIX 3.2.5

The primary items to focus on are the following:

- Baud rate                    9600
- PARITY                        none
- BITS per character        8
- Number of STOP BITS      1
- Enable program            off
- Enable LOGIN                disable

```

[Entry Fields]
tty type          tty
tty interface     rs232
Description       Asynchronous Terminal
Parent adapter    sal
PORT number       [s2] +
Enable LOGIN      disable +
BAUD rate         [9600] +
PARITY            [none] +
BITS per character [8] +
Number of STOP BITS [1] +
TIME before advancing to next port setting [0] + #
TERMINAL type     [dumb]
FLOW CONTROL to be used [xon] +
OPEN DISCIPLINE to be used [dtropen] +
Stty attributes for RUN time [hupcl,cread,brkint,icr> +
Stty attributes for LOGIN [hupcl,cread,echoe,cs8] +
LOGGER name       []
STATUS of device at BOOT time .available +
TRANSMIT buffer count [16] + #
RECEIVE trigger level [3] + #
STREAMS modules to be pushed at OPEN time [ldterm,tioc] +
INPUT map file     [none] +
OUTPUT map file    [none] +
CODESET map file   [sbc] +
POSIX special control characters:
INTERRUPT character [^c]
QUIT character      [^\\]
ERASE character     [^h]
KILL character      [^u]
END OF FILE character [^d]
END OF LINE character [^@]
2nd END OF LINE character [^?]
DELAY SUSPEND PROCESS character [^y]
SUSPEND PROCESS character [^z]
LITERAL NEXT character [^v]
START character     [^q]
STOP character      [^s]
WORD ERASE character [^w]
REPRINT LINE character [^r]
DISCARD character   [^o]
Apply change to DATABASE only no +

F1=Help          F2=Refresh          F3=Cancel          F4=List
F5=Reset         F6=Command         F7=Edit           F8=Image
F9=Shell         F10=Exit           Enter=Do

```

Figure A-2. SMIT Add a tty under AIX 4.1

Not all SMIT screens are shown for each release of AIX, but just a few of the ones that are different.

If you are adding a tty port, just take the default settings. The only things that may need to be changed are shown following the Figure A-1 on page A-1.



```

                                Add a TTY

Type or select values in entry fields.
Press Enter AFTER making all desired changes.

[TOP]                                [Entry Fields]
tty type                            tty
tty interface                        rs232
Description                          Asynchronous Terminal
Parent adapter                        sal
PORT number                          [s2]                                +
Enable LOGIN                         disable                              +
BAUD rate                            [9600]                              +
PARITY                               [none]                              +
BITS per character                   [8]                                  +
Number of STOP BITS                 [1]                                  +
TIME before advancing to next port setting [0]                                +#
TERMINAL type                        [dumb]
FLOW CONTROL to be used              [xon]                                +
OPEN DISCIPLINE to be used           [dtropen]                            +
Stty attributes for RUN time         [hupcl,cread,brkint,icr>          +
Stty attributes for LOGIN            [hupcl,cread,echoe,cs8]          +
LOGGER name                          []
STATUS of device at BOOT time        [available]                          +
REMOTE reboot ENABLE                 no                                    +
REMOTE reboot STRING                 [#@reb@#]
TRANSMIT buffer count                [16]                                +#
RECEIVE trigger level                [3]                                  +#
STREAMS modules to be pushed at OPEN time [ldterm]                             +
INPUT map file                       [none]                                +
OUTPUT map file                      [none]                                +
CODESET map file                    [sbcsc]                              +
POSIX special control characters:
INTERRUPT character                  [^c]
QUIT character                       [^\]
ERASE character                      [^h]
KILL character                       [^u]
END OF FILE character                [^d]
END OF LINE character                [^@]
2nd END OF LINE character            [^?]
DELAY SUSPEND PROCESS character      [^y]
SUSPEND PROCESS character            [^z]
LITERAL NEXT character               [^v]
START character                      [^q]
STOP character                       [^s]
WORD ERASE character                 [^w]
REPRINT LINE character               [^r]
DISCARD character                    [^o]
[BOTTOM]

F1=Help          F2=Refresh      F3=Cancel      F4=List
F5=Reset         F6=Command     F7=Edit       F8=Image
F9=Shell        F10=Exit       Enter=Do

```

Figure A-3. SMIT Add a tty under AIX 4.3

On some RS/6000 boxes the TTY port has to be deleted and then added back to make the modem communications work properly. If you remove a tty port make sure to remove it from the database so a new image is added.



Use the following procedure to place the modem in a known configuration and utilize the optional modem file `ibm7857_017.cfg`. This modem file goes only on the local server where the modem is attached and should be configured at item **14** (Build4) of change configuration data option **o** during build list (Build2).

After modem is powered ON and local test have completed, there should be two lines of configuration information displayed on the 7857 LCD screen. At this point:

```

Press the down arrow key until the CONFIGURATIONS message is displayed.
↓
CONFIGURATIONS D12
Press -->
Press the right arrow key until the SELECT FACTORY message is displayed.
→
CONFIGURATIONS D12
Select Factory_
Press the Enter key to select the option.
Press the up arrow key until 0 is displayed.
↑
CONFIGURATIONS D12
Select Factory 0
Press the Enter key to load the predefined factory configuration.
IBM 7857 AT CMD aa␣
td_rd_dsr_ec␣ ll_
Press the down arrow key until the CONFIGURATIONS message is displayed.
↓
CONFIGURATIONS D12
Press -->
Press the right arrow key until the Store User Conf. message is displayed.
→
CONFIGURATIONS D12
Store User Conf._
Press the Enter key to select the option.
Press the up arrow key until 0 is displayed.
↑
CONFIGURATIONS D12
Store User Conf. 0
Press the Enter key to select location zero.
Press the Enter key to save.
CONFIGURATIONS D12
Press -->
Press the Enter key to return to main display panel.

IBM 7857 AT CMD aa␣
td_rd_dsr_ec␣ ll_

```

␣ = Shows LCD as on.

Figure A-5. 7857 & 7858 Modem Setup Procedures for Service Director Link

The above setup places the 7857 or 7858 modem into the proper configuration for use with the RETAIN modem pool, used for Service Director for RS/6000 and SP. The baud rate is set for 9600 asynchronous with the modem not executing any of the AT commands, but receiving all the commands from the callhome application.

If the following `ibm7857_017.cfg` file exists, then enter it as the optional modem file. Otherwise, the following information should be placed in an ASCII file at `/usr/lpp/servdir/ibm7857_017.cfg` and then the full file path and name put in the local server's communication configuration at item **14** "Modem file name."

Enter the following command:

```
vi /usr/lpp/servdir/ibm7857_017.cfg
```

Type an `i` then hit the Enter key.

Type `ATF8E0Q1&E5*E0*I8*Q0S0=0` then hit the Esc key.

Shift and type a `ZZ` then hit the Enter key.

## 7855-10 Modem

The 7855 is not the modem of choice for Service Director. These procedures are here to aid the Service Representative in the proper configuration of the 7855-10 if it is being used. Use the following procedure to place the modem in a known configuration and utilize the optional modem file structure shown below. This modem file goes only on the local server where the modem is attached and should be configured at item **14** (Build4) of change configuration data option **o** during build list (Build2).

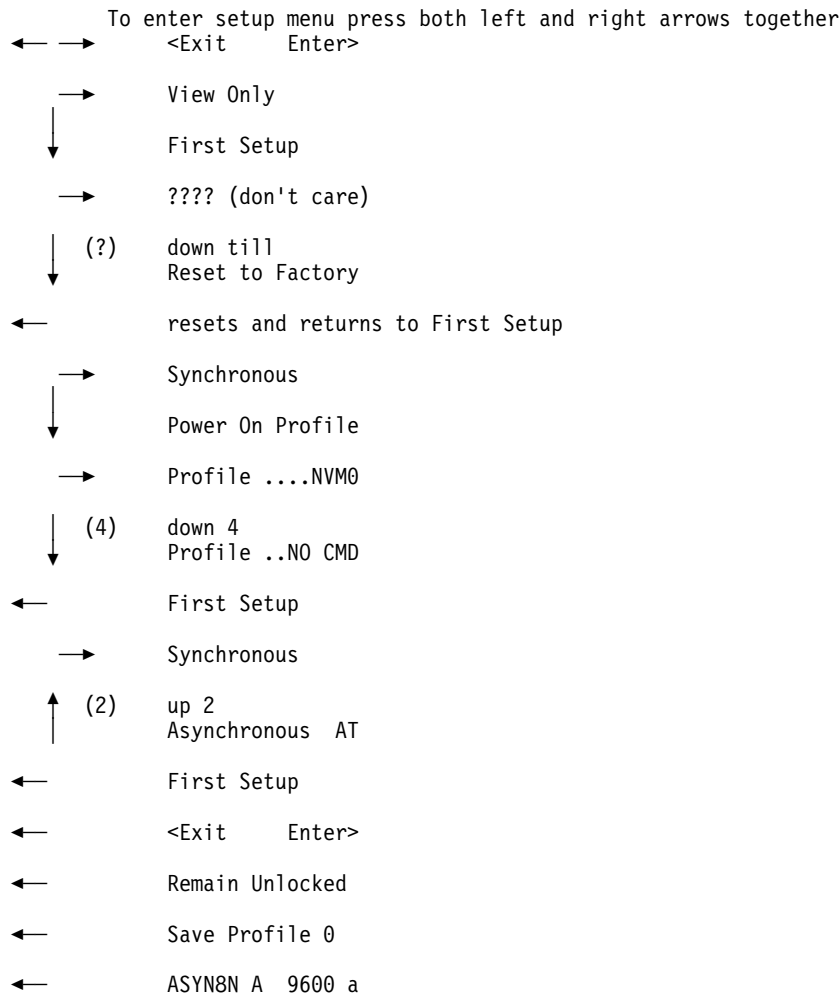


Figure A-6. 7855 Modem Setup Procedures for Service Director Link

The above setup places the 7855 modem into the proper configuration for use with the RETAIN modem pool used for the Service Director for RS/6000. The baud rate is set for 9600 asynchronous with the 7855 not executing any of the AT commands, but receiving all the commands from the callhome application.

The following information should be placed in an ASCII file at /usr/lpp/servdir/ibm7855\_010.cfg if not already there, and then the full file path and name put in the local server's communication configuration at item **14** "Modem file name."

```
AT&F0E0Q1S0=0&B8N1&M0%C1%E0\A2\N3\C0
```

---

## A.2 Optional Modem Files

On the host with the local modem attached, both the Service Director process and the "callhome" forwarder process, utilize the "ProbrepAt" ODM file settings, when they access the modem. Although the two processes use the same parameter file they are two independent processes and do not use common communication routines or procedures.

Since the two processes are independent of each other, they also have different internal default values for initialization the local modem. This difference may allow one or the other processes to work with the local modem and the other may fail due to timing or initialization requirements unique to the modem. The default modem initialization string used by the local Service Director process is "ATQ1" while the "callhome" forwarding process uses "ATZ Q1 M1 E0" for its modem initialization string.

If the Service Director process and/or the "callhome" process does not seem to attempt to dial out or work properly on the selected modem and all other possible reasons (such as wrong tty port; ProbrepAt not set to tty; etc.), have been eliminated, it may be the default modem initialization string failing with the local modem. To fix the problem you must create an ASCII modem file that contains an initialization string that the local modem will understand and accept. Service Director is designed to use a simple Hayes-compatible modem string by default. However, more and more of today's complex modems, even specified as Hayes-compatible, require initialization strings specific to the modem in order to work properly. You should refer to your modem documentation to determine the initialization string that works best with your modem and put it in the ASCII modem file. Once the file has been created you must enter the complete path and filename in the "ProbrepAt" entry called "Modem filename." The ASCII modem file is only required on the host that will utilize the local tty modem. Other Service Director processes and forwarders throughout the network using RPC communications do not.

The **cu** command may be used to interrogate the modem configuration if you have a tty statement in the /etc/uucp/Devices file. Using `cu -m1 tty1` you would be able to use AT commands to view the configuration, change the settings and save in the user profiles. The **&V** displays the configuration data on some IBM and Hayes-compatible, while **I4** or **I7** shows data on US Robotics. The 7857 & 7858 use **AT\*C** to view its configuration data. So if you plan to do more than view configuration you need the AT command set for your modem. To end the **cu** command and disconnect from the modem, you enter a tilde (~) followed by a period (.) at the beginning of a new line.

**AT&V** normal Hayes-compatible view configuration  
**AT\*C** for IBM 7857-017 & 7858-336 configuration  
**AT\$H1** for IBM 7852-400 configuration **ATL5 L6 L7** may also be used  
**ATI4** for US Robotics configuration

The primary settings for the modem are as follows:

- **E0** Echo off, do not echo keystrokes back to tty.
- **Q1** Response off, do not return response codes back to tty (OK error).
- **&C1** Carrier detect normal, must not be forced on
- **&D2** DTR normal operation
- **&K3** Is usually what is needed, on US Robotics it disables compression
- **&E5** MNP error correction on 7857 & 7858 modems
- **&E2 &E14** Is error correction no compression for 7852-400
- **&Q5** IBM and Hayes error correction enabled.
- **&M4** US Robotics error correction enabled.
- **S0=0** Disables Auto Answer at the modem.

The following information should be placed in an ASCII flat file at /usr/lpp/servdir/modem.cfg and then the full file path and name should be put in the local server's communication configuration at item 14 "Modem filename." If filename extension is ".cfg" then enter posted number for item 14 on Build4 menu.

## Modem File Initialization String Examples (Do Not Include Quotes)

1. General modem string: "AT&FE0Q1&D2&C1S0=0"
2. IBM 7852 400 modem string: "AT&E2E0&E12&E14&SF1&S0S9=1V0\$BA1\$MB9600\$SB9600S0=0"
- | 3. IBM 7857 017 modem string: "ATF8E0Q1&E5\*E0\*I8\*Q0S0=0"
- | 4. IBM 7858 336 modem string: "ATF8E0Q1&E5\*E0\*I8\*Q0S0=0"
5. IBM 7855 010 modem string: "AT&F0E0Q1S0=0&B8N1&M0%C1%E0\A2\N3\C0"
6. US ROBOTICS 28800 string: "AT&F&B1&C1&D2&H1&I0&R2&K3&M4&N0Q2S0=0"
7. US ROBOTICS COURIER HST: "ATE0Q1&B1&H1S0=0"

---

## Appendix B. Transfer Packages from VM to a PC

---

### B.1 Receive Files from Your Reader

Once you have requested the Service Director package from AIXTOOLS, they will be in your VM reader. You need to receive them to your A mini disk. If you don't have enough room on your A disk, you will have to create a temporary disk and receive the files to it. You can then proceed with the download from VM (Host) to the PC.

- Enter `RL` (Reader List) on the command line.

This will display the files in the reader. The `README` file will give directions for downloading the package files. You should receive and print this file first.

- Move the cursor to the file to be received and press the `PF` key for `RECEIVE` or `STORE`. This will store the file to your A minidisk.
- Enter `RECEIVE / = = A`.

**Note:** Use the drive letter of your temporary disk instead of the "A" (if you set one up). You can either enter the command for each file or use an "=" for each file to be received from your reader to the mini-disk.

---

### B.2 Transfer Files from a Host to a PC

There are many ways to download from a host session to diskette using a PC. Here are a few:

#### Passport/2

- Select the **TRANSFER FILE** option from the `TERMINAL` pull-down menu.
- Enter the Host file name (example `SD6K ZBIN A`). Host files are referenced as `FILENAME FILETYPE FILEMODE`. In the example, `SD6K` is `FILENAME`, `ZBIN` is `FILETYPE`, and `A` is `FILEMODE`.
- Enter the local (PC) file name (example `A:sd6k.ipz`). PC files are referenced as `Drive:FILENAME.EXTension`. In the example, `A:` is the Drive, `sd6k` is the `FILENAME`, and `ipz` is the extension.
- Select the direction. Download to PC.
- Select the type of file (Binary or Text). If the filetype ends with `BIN`, it is a binary file.
- Make sure the VM/CMS button under Host System is highlighted.
- Click on `OK`.

#### ACPM

ACPM is a utility loaded on the MoST terminal (located in the Utility folder). It is a graphical front-end to the popular `ALMCOPY` program, which makes it very easy to use.

- Click on the **Actions** pull-down.
- Select **Download**.
- Enter the Host filespec (with wildcards if desired), then click on **Refresh** (`FILENAME FILETYPE FILEMODE`).
- Highlight the file or files to be downloaded.
- Take all the defaults or modify the options as desired. Ensure that **Binary** is selected for a binary file such as `ZBIN`.
- Select **Download**.
- To change the target drive, double-click on the drive or directory desired.
- Select **OK**.

## CM2 (Communications Manager) Transfer

1. Select the **Transfer** menu from the action bar.
2. Select the host type **VM/CMS**.
3. Select the **Transfer** menu again.
4. Select the **Receive file from host** option.
5. Click on the **Edit** pushbutton at the bottom of the screen.
6. Type the Host Filename and Filetype using no period (.) between them.
7. Type the PC Filename and Filetype with a period (.) between them. Include the drive path (A:). Use only a three digit Filetype.
8. Select whether to use **BINARY** or **TEXT** Transfer type.
9. Click on **Add to list**.
10. Click on the **Receive** pushbutton at the bottom of the screen.
11. After the transfer is complete double click on the system icon in upper left to quit.
12. You will be asked to save or discard in the next window. Select **Discard** and you will have finished the file transfer.

## Receive Command

Be sure to leave your host session at a Ready: prompt.

At the PC session, use the following syntax:

```
RECEIVE A:Filename.XXX Y:Filename XXX
|       |           |   |           |
|       |           |   |           | This is the host Filetype
|       |           |   |           | This is the host Filename
|       |           |   |           | The host session i.e. A:, B: etc.
|       |           |   |           | The Filetype
|       |           |   |           | The name of the file to be written to the A: drive diskette
|       |           |   |           | The A: drive
```

**Note:** Notice that the second Filename and Filetype are the same as the first, but with no period (.) between. The first set is the PC Fn.Ft and the second set is the host Fn Ft. It will default to binary. If the file is a text file "ASCII crlf" must be added after host filetype (without the quotes).

## ALMCOPY

Be sure to leave your host session at a Ready: prompt.

**Note:** This entry will take the file that is on the host session and transfer it to the PC using the same Filename. The transfer will default to binary.

At the PC session, use the following syntax:

```
ALMCOPY hY:fn ft fm a:=.XXX
|       |   |   |   |
|       |   |   |   | This is the PC Fn.Extension
|       |   |   |   | The A: drive
|       |   |   |   | This is the host Fn Ft Fm
|       |   |   |   | The host session i.e. A:, B: etc.
```



---

## Appendix C. International Language Environments

Service Director is not NLS-compliant. All messages displayed are hardcoded in the English language. When the Service Director Product Support Application (PSA) called "ibm.psa" reviews the reports generated by the concurrent diagnostics, it looks for the following token message:

No trouble was found

If the PSA does not find the expected token message in the report it is scanning, a call file is generated and a copy of the diagnostic report is put into it. Service Director will then process the call file and attempt to open a Problem Management Report on the IBM RETAIN system.

Although Service Director is not NLS-compliant it will work on systems that have a Language Environment setting that is not English. Service Director at 2.1 automatically updates the file `ibmpsa.data` to the selected language during setup of each machine. The manual procedure has been left here for reference purposes only.

This is accomplished by modifying the `ibmpsa.data` file found in the `/usr/lpp/servdir` directory. This file is an ASCII file and can be modified using `vi` or some other equivalent text editor. To allow the Service Director PSA, `ibm.psa`, to properly scan diagnostic reports generated in a language other than English, do the following steps.

1. Look at the ASCII report files found in `/etc/lpp/diagnostics/data`.
2. Get the EXACT translation for `No trouble was found` from the diagnostic report files. Upper and Lower case characters are significant.
3. Edit the `ibmpsa.data` file found in `/usr/lpp/servdir`.
4. Change the not commented line containing `No trouble was found` to the language translation found in the diagnostic report files.

Once the token line has been changed to match the same token message generated by the concurrent diagnostics, the Service Director PSA will use the token message in the native language of the local host.

**Warning:** If the token line in the `ibmpsa.data` file does not match the native translation of `No trouble was found` found in the diagnostics reports or the file was modified incorrectly, then Service Director will assume there is a problem call to generate and act accordingly.



---

## Appendix D. Service Director Error Messages

---

### D.1 Registration Return Codes

***rc=1 There is no record of this machine's Type and Serial on the Server.***

**DESCRIPTION** IBM's records indicate that the machine that is being registered is not on any of Service Director for RS/6000 entitlement system databases. Temporary key issued.

**ACTION** If either field was mis-typed, correct and try again, or else contact IBM. You have been authorized for a one month local demonstration trial of Service Director (this will be updated to full authorization once you get the underlying problem fixed and re-register). If machine is on warranty or IBM maintenance agreement, please contact the local marketing representative to get the AAS system corrected. Service Director supports machine type 9076 and classic RS/6000 70xx. You are not able to report problems to IBM at this time.

---

***rc=2 The IBM problem tracking system either does not have a record of your customer number or is not responding.***

You have been authorized to use Service Director. If the IBM Problem Tracking system problem continues, refer to the SUPPORT STRUCTURE section of the User's Guide and request verification of the Service Director link to the IBM problem tracking system.

**DESCRIPTION** IBM's RETAIN system does not have a record of your customer number and will not allow Service Director to report problems until it knows of the customer number.

**ACTION** Please contact the local marketing representative to verify that the customer number returned during registration, is properly assigned to this account, and that a RETAIN CPU or CUS entry is generated for that failing customer number. This is an automated Field process.

If the IBM Problem Tracking system problem continues, refer to the SUPPORT STRUCTURE section of the User's Guide, and request verification of the Service Director link to the IBM problem tracking system.

---

***rc=4 The Service Director Server experienced an internal error. Please try again later.***

If the problem persists, contact 1-800-CALL-AIX (1-800-225-5249) for assistance, or use local support structure. This is an IBM Catcher/SDserver problem, and should be cleared whenever systems are restarted.

**DESCRIPTION** Some unknown communication error occurred. Temporary key issued.

**ACTION** Try again later. Ensure the modem and communication links work and that communication noise is at a low level. If the problem persists, contact 1-800-CALL-AIX (1-800-225-5249) for assistance, use local procedures or support structure, EMEA use RISC Countries Support Centers.

---

---

***rc=5 The Service Director for RS/6000 entitlement system cannot find a Warranty or Maintenance Agreement for your machine.***

You have been given a one month authorization to use Service Director locally, but problems will NOT be reported to IBM's problem management system. For assistance in verifying or correcting IBM's records regarding your Warranty or Maintenance Service Agreement, please contact 1-800-IBM4YOU (1-800-426-4968), use local procedures or support structure, EMEA use RISC Countries Support Centers for assistance.

**DESCRIPTION** Records indicating your MA or Warranty status were not found. Temporary key issued.

**ACTION**

1. Try again in 24 to 36 hours after resolving this problem with 1-800-IBM4YOU (1-800-426-4968), use local procedures or support structure, EMEA use RISC Countries Support Centers. This will allow IBM's Service Director records to be updated.
2. Get a Maintenance agreement for the machines that are being registered.

---

***rc=10 The Service Director Server is not available.***

**DESCRIPTION** The IBM Service Director Server is not available when trying to register a machine with the Service Director registration program. This is the catch-all return code whenever communications cannot be established with the IBM server. During initial registration it is usually a mis-configured modem or tty port, or a getty spawn on the tty stealing the returned data.

**ACTION** Make sure that the tty port and modem are configured for 9600 baud, the modem is in error correction mode, and no getty against the tty port. Try again later. If it persists the Service Representative should use use local procedures or support structure. The customer should call 1-800-CALL-AIX (1-800-225-5249), or EMEA use RISC Countries Support Centers.

---

***rc=11 and rc=101 Communications could not be established with the Service Director Server.***

**DESCRIPTION** A communications error occurred when trying to register a machine with the Service Director registration program. These codes usually suggest a local account problem verses the rc=10. These codes may also suggest a bad or mis-configured tty port, bad or loose serial cable, a bad modem configuration.

**ACTION** Check for the correct dial out phone number, baud rate, and Comm method in the communication configuration, from within the registration program, for the host that is defined as the reporting local server. Make sure cables are properly connected and the local configurations are correct. Try a different port or modem, remember this is usually a local problem return code.

---

***<any other code> - The Service Director Server experienced an internal error. Please try again later.***

If rc is from registration test call, refer to Problem Call Return Codes.

If the problem persists, contact IBM. Refer to RC=4 **ACTION** under D.1, "Registration Return Codes" on page D-1.

---

***rc>100 These are usually AIX system return codes and not produced by Service Director.***

If the problem persists, use system documentation to analyze problem.

---



---

## D.3 Problem Call Return Codes

***rc=1 PMR was successfully opened with IBM.***

**DESCRIPTION** A problem call was called in to the IBM and a PMR was created OK.

---

***rc=2 An open PMR already exist with IBM.***

**DESCRIPTION** A problem call was called in to the IBM and an open problem was found that matches this call description.

---

***rc=4 Too many HOPS to the IBM Service Director server.***

**DESCRIPTION** There are too many callhome forwarder processes in the network to the IBM Service Director server.

**ACTION** A maximum of 4 callhome processes are allowed within the complex client environment of the account. Each callhome process is counted as 1 hop, normal network bridges and gateways are not counted. You must reduce the number of callhome forwarder processes from the failing client machine to the local server with the modem.

---

***rc=5 The Service Director for RS/6000 entitlement system cannot find a Warranty or Maintenance Agreement for your machine. Or the system does not have a valid key file.***

**DESCRIPTION** Records indicating your MA or Warranty status is no longer in a valid service status.

### **ACTION**

1. Lock the failing machine's Service Director.
  2. Try again in 48 to 72 hours after resolving this problem with 1-800-IBM4YOU (1-800-426-4968), use local procedures or support structure, EMEA use RISC Countries Support Centers. This will allow IBM's Service Director records to be updated.
  3. Get a Maintenance agreement for the machines that are being registered.
- 

***rc=6, 7, 8 The IBM problem management system is having a problem***

**DESCRIPTION** A problem exist between the IBM Service Director server and the IBM problem management system.

**ACTION** The call will be retried again until it goes to a failed state. If the problem persists, contact 1-800-CALL-AIX (1-800-225-5249), use local procedures or support structure, EMEA use RISC Countries Support Centers for assistance.

---

***rc=9, rc=13 A format problem was detected at the IBM Service Director server.***

**DESCRIPTION** A format problem exist on a call file or a status check of the posted sequence number.

### **ACTION**

1. Use the local or remote events file to delete the failing record number from the event log of the failing machine.
  2. If the failure is on a registration or communication test call, check the communications fields using registration step 1 option 3 or check the User Interface, Setup, and Communications, reference "Setup Menu - Communications Definitions" on page 4-33 for communications fields.  
Clear any fields marked **Currently not implemented**.
-

---

***rc=10 The Service Director Server is not available.***

**DESCRIPTION** The IBM Service Director Server is not available when trying to register a machine with the Service Director registration program. This is the catch-all return code whenever communications cannot be established with the IBM server.

**ACTION** Make sure that the tty port and modem are configured for 9600 baud, modem is in error correction mode, and no getty against the tty port. If it is on a client machine, check that the callhome process on the forwarding server is running and that the hostname has not changed on the client machine for the communication interface linking to the call home process.

Try again later. If it persists the Service Representative should use use local procedures or support structure. The customer should call 1-800-CALL-AIX (1-800-225-5249), or EMEA use RISC Countries Support Centers.

---

***rc=11 Problem reported only to the IBM Service Director server.***

**DESCRIPTION** A problem exist on the problem management system and the Service Director server will send problem into IBM problem management system later.

**ACTION** No action required, the PMR should be created later.

---

***rc=12 RPC timeout has occurred.***

**DESCRIPTION** A Remote Procedure Call timeout has occurred trying to forward a client request to the callhome process.

**ACTION** If the problem persists, the communication timeout parameter may not be long enough for the client request to be forwarded and status then returned.

Use the client's user interface Setup Menu, and select Communication option. Increase the "REMOTE TIMEOUT" in seconds to allow proper response to the client request. Normal default setting is 300 seconds. If additional callhome hops are in the network, the timeout will need to be extended.

---

***rc=14 The communication test was received OK***

**DESCRIPTION** The proper return code for the communication test (ctest:). The test was received OK at the IBM Service Director server, entitlement was verified OK.

---

***rc=15,16,17 A problem was detected with the local modem.***

**DESCRIPTION** A modem timeout or hang condition exist on the local servers modem.

**ACTION** Use Chapter 8, "Network and Modem Problem Determination" on page 8-1 to trouble shoot modem problem.

---

***rc=29 Product Engineering Data received OK***

**DESCRIPTION** VPD data was received OK at IBM Service Director server.

---

---

***rc=30 Product Engineering Data posted checksum fault***

**DESCRIPTION** All VPD data was received OK at IBM Service Director server, but checksum of original client information did not match final data file.

**ACTION** If the failure was on a manual transmission, you must do the manual call again. On automatic VPD detection calls, Service Director will automatically attempt the call on the next activation of Service Director.

---

***rc=95 ERROR!: SD CONFIGURATION, FULL DISK LIMITREACHED! .***

**DESCRIPTION** The maximum space configured for Service Director to use has been reached. Reference Figure 4-31 on page 4-30. No additional Service Director functions will be executed until the problem is rectified.

**ACTION** Have system administrator add more space to Service Director working directory disk. Or increase the Service Director "MAX. % DISK LIMIT WARNING" value from the current setting if possible.

---

***rc=96 Problem status of close or Problem closed .***

**DESCRIPTION** A status check of an existing call returned problem closed.

---

***rc=97 General PSA Problem Event status from PSA .***

**DESCRIPTION** A PSA has failed to execute properly and a support message should have been posted. Notification of fault should have occurred.

**ACTION** Correct fault if possible, if problem persists, contact IBM. The PSA maybe taken offline by setting the PSA HOLD flag to Y from the user's interface setup menu, reference the "Setup Menu - PSA List" on page 4-32, selecting SD PSA LIST option.

---

***rc=98 General Problem Held status for event .***

**DESCRIPTION** A call file was placed on hold status for some reason, the problem will not be called in to IBM.

---

***rc=99 General Failure status for event .***

***NULL SYSTEM STATUS RETURNED .***

**DESCRIPTION** A PSA has failed to execute properly and a support message should have been posted. Notification of fault should have occurred.

**ACTION** Correct fault if possible, if problem persists, contact IBM. The PSA maybe taken offline by setting the PSA HOLD flag to Y from the user's interface setup menu, reference the "Setup Menu - PSA List" on page 4-32, selecting SD PSA LIST option.

---

***rc>100 These are usually AIX system return codes and not produced by Service Director.***

If the problem persists, use system documentation to analyze the problem.

---



---

**UNKNOWN STATUS CODE .**

**<any other code> - The Service Director Server experienced an internal error. Please try again later.**

If the problem persists, contact IBM. Refer to RC=4 **ACTION** under D.1, "Registration Return Codes" on page D-1.

---

**THIS IS A SERVICE DIRECTOR CALL NOTIFICATION TEST FROM <HOST>**

**DESCRIPTION** The Call Notification test utility was executed. This message is sent to all e-mail addresses defined for the Service Director as a test.

**ACTION** None.

---

**SDAnalyze (failing routine) ERROR - COULD NOT CALLOC (request) MEMORY Analyze - COULD NOT MALLOC**  
**IBM.PSA (Main-infiline) - CANNOT malloc MEMORY BUFFERS!**  
**IBMELH.PSA (Main-infiline) - CANNOT malloc MEMORY BUFFERS!**  
**IBMELH.PSA (Main-ibmelh.hold) - CANNOT malloc MEMORY BUFFERS!**  
**Service Analysis (Compress) MALLOC ABEND. Call for Service WARNING!(failing routine) - Cannot MALLOC request!**

**DESCRIPTION** Service Director could not reserve enough memory for execution. Other processes may be executing at the time, which are taking up all available memory. Service Director will exit the program when it cannot calloc memory. This is usually not a consistent problem but will occur from time to time when other processes are running or kicked off by the crontab.

**ACTION**

1. Determine what processes are occurring at the time the error occurs and eliminate the processes that are using memory.
2. Extend the crontab time entry so that Service Director will not execute as often and possibly not during the time the other processes are executing.

---

**Can't alloc enough space for <display data>**

**DESCRIPTION** Service Director could not reserve enough memory for Motif user interface display, using XtMalloc request.

**ACTION** Determine what processes are occurring at the time the error occurs and eliminate the processes that are using memory.

---

**Can not obtain memory for errArray**  
**Can not obtain memory for t\_Array**

**DESCRIPTION** The ibmelh psa could not reserve enough memory for error array or threshold array data to be contained within.

**ACTION** Determine what processes are occurring at the time the error occurs and eliminate the processes that are using memory. If error log is extensive then get excessive faults removed.

---

---

**Service Director Key Not Installed on this machine!**

UNAME expected: xxxxxxxxxxxx

**DESCRIPTION** The Service Director key file msglog.index is not installed in the Service Director working directory.

**ACTION**

1. If the host has not been registered then do the following steps.
  - Registration step 1 option **3** update host, check that the host is in the registration list.  
If not, add with option **1**.
  - Step 2 register the host with IBM to get a new msglog.index file.
  - Step 4 send the host the new msglog.index file.
2. If the host has been registered then do the following step.
  - Step 4 send the host a new key file.

---

**- SERVICE DIRECTOR NOT AUTHORIZED FOR THIS CPU/SERIAL NUMBER**

UNAME expected: xxxxxxxxxxxx, Key file shows yyyyyyyyyyy  
Please refer to the README file for Service Director Registration

**DESCRIPTION** The Service Director key is incorrect for the host it is executing on. The msglog.index file is specific for each host that the Service Director is registered for. This key file is distributed during step 4 of the registration process. Multiple key files may be supported to allow the code to run on multiple machines for HA environment.

**ACTION**

1. If the host processor number has been changed, please re-register the host.
  - Registration step 1 option **3** update the host with a new processor ID.
  - Step 2 register the host with IBM to get a new msglog.index file.
  - Step 4 send the host a new key file.
2. If the donor image was loaded on this host, do step 2 and send original msglog.index file.
3. If HA environment with FULL-FALLBACK exist or HACWS on control workstations, then you must manually give all nodes involved in fallback environment the other machines msglog.index file.  
Whenever the file is copied to other machines /usr/lpp/servdir directory, please add a number to the msglog# portion of the file ID (e.g., msglog1.index or msglog3.index). SD/6000 will examine all listed index files until a valid one is found for the host processor ID.

---

**OUR RECORDS INDICATE THAT THE WARRANTY FOR SYSTEM XXXX, SERIAL NUMBER ## AND UNAME ## WILL EXPIRE WITHIN THE NEXT # DAYS.**

**ACTION** For uninterrupted IBM Maintenance Service and Service Director monitoring on this machine, please contact your local branch office, call 1-800-IBM4YOU (1-800-426-4968), use local procedures or support structure, EMEA use RISC Countries Support Centers to obtain information and assistance in purchasing an IBM Maintenance Services Agreement.

---

---

***SD OPERATIONAL ACCESS FAILED DUE TO NO MAINTENANCE AGREEMENT OR WARRANTY ON THIS HOST!***

**DESCRIPTION** The Maintenance Package with IBM for the machine Service Director is executing on either does not exist or has been cancelled. Service Director prior to fix level 2.1.0.6 would post this message due to a coding fault not properly detecting the warranty indicator for machines not on warranty.

**ACTION** Obtain a Maintenance Package with IBM for the machine the Service Director is executing on and register the Service Director. Update to latest level of Service Director.

---

***SDAnalyze (failing routine) ERROR - COULD NOT CHANGE \$ODMDIR***

***ERROR - COULD NOT CHANGE \$ODMDIR***

**DESCRIPTION** Service Director attempted to change the environment variable ODMDIR and received an error. The ODMDIR environment variable is used by the communication routines.

**ACTION** Ensure the environment variable can be changed or added to the environment table.

---

***THE SERVICE DIRECTOR LICENSE EXPIRED! - License Date is <date>***

**DESCRIPTION** Service Director License has expired. Service Director must be registered and a new key generated before Service Director can execute. Fix code above 2.1.0.4, Service Director will automatically update the key file to the latest warranty or MA ending date.

**ACTION**

1. If `lspp -l serv_dir.obj` shows below fix code, obtain and install new code on local server and use registration 5 to distribute new code to client machines.
  2. If you are at the latest code, then obtain a Maintenance Package with IBM and re-register the machine the Service Director is executing on.
- 

***OUR RECORDS INDICATE A NEW REVISION OF SERVICE DIRECTOR IS AVAILABLE***

Call 1-800-IBM4FAX and select document 1715 for information on how to obtain the most current version of Service Director for RS/6000

**DESCRIPTION** This is a one time notice to the customer notifying that a new revision of Service Director is available.

**ACTION** Get the latest revision of Service Director from your local IBM Branch Office or via Internet. For Internet instructions call 1-800-IBM4FAX and request document number 1715.

---

***ERROR (failing routine) Could not read SDREVDATA***  
***ERROR (failing routine) Could not write to SDREVDATA***

**DESCRIPTION** A file containing the latest revision of Service Director was found. However it could not be opened in order to validate the current revision, or written if the write failure was posted.

**ACTION** Ensure the file descriptors of `/usr/lpp/servdir/sdrevdate.msg` file show read/write.

---

---

***SD OPERATIONAL ACCESS EXTENDED UNTIL WARRANTY DATE <wedate>  
SD OPERATIONAL ACCESS EXTENDED UNTIL <wedate>***

**DESCRIPTION** IBM's records show the warranty period is longer than defined during the registration of the Service Director. The Service Director key has been extended accordingly.

**ACTION** None.

---

***SD OPERATIONAL ACCESS EXTENDED UNTIL MA DATE <maedate>***

**DESCRIPTION** IBM's records indicate the Maintenance Package has been extended and the Service Director key has been updated accordingly.

---

***FAILED SD OPERATIONAL ACCESS EXTENSION UNTIL MA DATE <maedate>***

**DESCRIPTION** Service Director attempted to extend the Service Director execution time and failed in the attempt.

**ACTION** Ensure the file descriptors of the msglog.index file show read/write.

---

***A SERVICE DIRECTOR PSA PROBLEM WAS CREATED BUT NOT CALLED IN, Record <event#>  
A SERVICE DIRECTOR VPD CALL WAS CREATED BUT NOT CALLED IN, Record <event#>***

**DESCRIPTION** Service Director has been configured to not call a problem into IBM when a problem generated by a Product Supported Application has been created.

**ACTION**

1. Configure the PSA in the SD PSA LIST to call home when an error occurs.
2. Configure the Call Notify List to not send an e-mail message when a call is held.
3. None, this is a normal action whenever a call is held.

---

***A SD/6000 REPORTED PROBLEM (sequence #) WAS OPENED, Record <event#>***

**DESCRIPTION** A problem was opened on IBM's RETAIN system.

**ACTION**

1. None.
2. Configure the Call Notify List to not send an e-mail message when a call is generated.

---

***A SD/6000 PROBLEM REPORT (sequence #) RETURNED AS A DUPLICATE, Record <event#>***

**DESCRIPTION** A problem opened on IBM's RETAIN system for the current host already existed. As long as the PMR has an open status in RETAIN a new problem will not be created for the same fault on the same host.

**ACTION**

1. None. RETAIN.
  2. Configure the Call Notify List to not send an e-mail message when a call is generated.
-

---

***A SERVICE DIRECTOR REPORTED PROBLEM WAS CLOSE! Record <event#>***

**DESCRIPTION** Service Director reported problem was closed in the IBM Service Director server and the IBM problem management system. This information is posted from a call status check of open problems.

**ACTION** None

---

***SERVICE DIRECTOR REPORTED VPD 001-003 OK. Record <event#>***

**DESCRIPTION** Service Director reported Product Engineering Data to the IBM Service Director server OK. In this case it was the first of 3 VPD files to be called in to IBM.

**ACTION** None

---

***A SERVICE DIRECTOR (psa name) PSA TECHNICAL PROBLEM OCCURRED! Record # Execution Failure on PSA (psa name) rc = 99***

**DESCRIPTION** The listed psa failed to execute properly, there should be additional text to explain the failure in more detail.

**ACTION**

1. Correct the failing condition listed, if possible.
  2. Configure the listed PSA to a HOLD state using SETUP - PSA LIST and setting "PSA Hold" to "Y".
- 

***A SERVICE DIRECTOR APAR PROBLEM REPORT RETURNED AS A DUPLICATE! Record <event#>***

**DESCRIPTION** An APAR opened on IBM's RETAIN system for the current host already existed.

**ACTION**

1. None.
  2. Configure the Call Notify List to not send an e-mail message when a call is generated.
- 

***A SERVICE DIRECTOR PROBLEM WAS REPORTED ONLY - STATUS UNKNOWN! WILL KEEP TRYING! Record <event#>***

**DESCRIPTION** A problem was sent to the IBM RETAIN system but the status was not returned. This problem could be due to slow system response on the remote system. The current problem will be present the next time Service Director executes and will be considered a duplicate if the problem managed to get opened on the previous transmission.

**ACTION**

1. None.
  2. Configure the Call Notify List to not send an e-mail message when a call or problem with Service Director occurs.
-

---

**THE FOLLOWING SERVICE DIRECTOR PROBLEM TRANSMISSION FAILED DUE TO UNAVAILABLE SYSTEM! WILL TRY AGAIN LATER! Record <event#>**

**DESCRIPTION** The local server, tty port, modem, or the IBM Service Director server was not available when a transmission was made. This is a timeout, no response condition catch all rc=10.

**ACTION** Refer to return code = 10 action.

---

**THE FOLLOWING SERVICE DIRECTOR PROBLEM TRANSMISSION FAILED DUE TO A RETAIN COMMUNICATION ERROR. WILL TRY AGAIN LATER Record <event#>**

**DESCRIPTION** The IBM RETAIN system was not available and a problem could not be opened.

**ACTION** See return code = 8 action.

---

**THE FOLLOWING SERVICE DIRECTOR PROBLEM TRANSMISSION FAILED DUE TO A FORWARDER RETURNED A NULL STATUS. WILL TRY AGAIN LATER! Record <event#>**

**DESCRIPTION** The host is attempting to pass a problem to a forwarder that is not responding, or the callhome daemon process is not active.

**ACTION**

1. Ensure the client hosts can communicate with the forwarding or local server hosts.
2. Increase the Communication time out variables REMOTE TIMEOUT, RESPONSE TIMEOUT, and tty RETRY TIMEOUT under COMMUNICATION SETUP.

---

**A SERVICE DIRECTOR PROBLEM REPORT TRANSMISSION FAILED! Record <event#>**

**DESCRIPTION** A transmission to IBM's RETAIN failed because of some communication problem between the current host and IBM's Service Director server.

**ERROR = FORWARDER RETURNED A NULL STATUS, WILL TRY AGAIN LATER!**

**ERROR = NULL STATUS RETURNED.** See the description and action of previous error message above.

**ERROR = TOOMANY HOPS RC=4.** The original call has gone through more than 4 forwarders before getting to the IBM Server. Reduce the number of callhome forwarders.

**ERROR = AUTHORIZATION RC=5.** You are attempting to make a call to IBM using a temporary key.

**ERROR = RETAIN AUTHORIZATION RC=7.** The calling machine does not have a valid customer number in the RETAIN customer database.

**ERROR = GENERAL RETAIN RC=8.** There was a fault detected between the IBM Server and the RETAIN database. This is usually an internal IBM problem.

**ERROR = MESSAGE FORMAT RC=9.** The machine Service Director database has a corrupted entry that is making the message call format to be invalid. Execute the CLEAR function from SD Locks menu on failing machine.

**ERROR = FAILED CHECK SUM RC=29.** The VPD has lost data information during transmission and reconstruction of the original VPD file. If problem persist, then check modem or communications lines.

**ACTION** Refer to the action listed under referenced Call return codes.

---

---

**A SERVICE DIRECTOR EVENT occurred! Record <event#>**

**DESCRIPTION** An event occurred and was noted in the Event Log. This notification is not necessarily a problem report but could just be status indication supplied by a PSA.

**ACTION**

1. None. SD/6000 will send notice every time error notify triggers SD.
2. Configure the "Call Notify List" to not send an e-mail message when an event occurs.

---

**### WARNING!### CONFIGURED MAX DISK USAGE OF <MAXUSEDISKLIMIT> REACHED - (No SPACE)! Cannot create new files!**

**DESCRIPTION** Service Director will not execute if its configuration for maximum percentage of used disk space is set to a value that is less than the actual percentage of useable disk space.

**ACTION** Either clean up the disk Service Director resides on, to lower the amount of used disk space, or increase the maximum percentage in the Service Director configuration.

---

**WARNING! (failing routine) ERROR - COMPRESSING EVENT LOG!**

**DESCRIPTION** Service Director got an error when it tried to compress or cleanup the event file.

**ACTION**

1. Check the file descriptors of the svcdctr.event and ensure that the file is read/write enabled.
2. Ensure there is enough file space available on the disk.

---

**WARNING! No PSAs in /usr/lpp/servdir/servdir.hld to run!**

**DESCRIPTION** Service Director must have a Product Supported Application (PSA) in order to execute. It comes with the "ibm.psa and ibmelh.psa" PSA applications configured. If there are no PSAs available or not defined then the message above will be displayed.

**ACTION** Ensure a Product Support Application exists and is defined in the Service Director "SD SETUP PSA LIST" section. From the Service Director user interface, select "SETUP," then SD PSA LIST option. If PSAs are shown, ensure that the executable exists in /usr/lpp/servdir/. If executable is missing reload code from installp or step 5 from the local server.

---

**WARNING ! Cannot read <filename>  
CAN NOT OPEN <filename>  
CAN NOT OPEN FILE <filename>  
Cannot Open Local Log File <filename>**

**DESCRIPTION** Service Director could not read a file that it expected to find. If this was a temporary file, it was probably removed by the SD/6000 and you will not be able to verify why it could not be read. Usually the SD/6000 requests temporary files to allow another function to redirect data back to this application. This message occurs whenever the other function fails and does not return the expected data.

**ACTION** Ensure that there is available space in the file systems /tmp, /usr, /var. Verify that errpt is not extremely large, and that SD reads in an ASCII and a binary image to work with in /var/tmp.

---

---

**TEST FAILED! CAN'T READ <filename>**  
**DELETE FAILED! CAN'T READ <filename>**  
**SD CLEAR FAILED! CAN'T READ <filename>**  
**RESET/LOCK FAILED! CAN'T READ <filename>**

**DESCRIPTION** Service Director often uses temporary work files to capture command results in, so application can see the results. The application makes a request to AIX for a temporary file to be assigned. Then servdir.analyze will redirect it's output into that temporary file so it can be captured by the display routines.

In these listed cases the temporary file was probably not created, because the application did not execute properly.

**ACTION**

1. Ensure that temporary work files can be established by operating system.
2. If other message indicates routine failure, then analyze that fault.
3. Execute /usr/lpp/servdir/servdir.analyze ctest: bottom line command. Verify **rc=14** is received.

---

**WARNING ! Cannot create <filename>**  
**Service Director Cannot Create Temporary Work Files on the Host (hostname). Aborting!**

**DESCRIPTION** Service Director often uses temporary work files to capture command results in, so the application can capture the results. The application makes a request to AIX for a temporary file to be assigned then analyze or psa will redirect output into that temporary file so it can be captured.

**ACTION** Ensure that temporary work files can be established by the operating system.

---

**Error attempting to open <filename>**  
**Invalid crontab entry.**

Check <filename> for any additional messages.

**DESCRIPTION** Service Director issued a crontab command and nothing was returned to the temporary work file.

**ACTION** Make sure you are authorized to make crontab changes and the entry is a valid entry for crontab command.

---

**Warning: may not have read entire file!**

**DESCRIPTION** Service Director is in the process of scrolling a file to the display and a fault occurred before EOF was detected.

**ACTION** Make sure you are not scrolling the file improperly. Retry the operation that failed. If failure persists reload Service Director code.

---

**ibm.psa (getMachID) ERROR -- command string**

**DESCRIPTION** Use action shown on previous System Command error.

**ACTION** Have customer install diagnostics if they are not installed.

---



---

**Service Director Encountered ERROR with System Command**

(list the failing command)

return code = (should be the return code of the failing command)

**(psaname.psa) Error on System Command -- ###,**

(list the failing command) (###, is return code if captured)

**DESCRIPTION** Service Director issued a system command and return code was something besides zero (0).

- If on the errpt command, check the crontab entry for errclear.
- The PSAs fail on move command for the hold temporary file back to the original filename. This may be due to large errlog file using up too much /usr file space with temporary error.log files.

**ACTION**

1. Validate the reported command is a valid command.
2. Analyze the return code if available for why command failed.
3. Check crontab and inittab entries for time occurrences with fault.  
Move Service Director crontab entry to different time activation.
4. Remember these codes are from the attempted execution of the command and not from Service Director.

If problem can not be rectified, please report failing command and the return code to IBM Service Director development.

---

**ibm.psa ERROR- STAT failed on ibm.hold.tmp FILE****ibm.psa ERROR- COULD NOT UPDATE ibm.hold FILE****ibmelh.psa ERROR- COULD NOT UPDATE ibmelh.hold FILE**

**(ibm.psa) Error - ibm.hold.tmp not found, k= rc, cmdstr = command string**

**Can not create LASTERRFILE** (/usr/lpp/servdir/ibmelhpsa.lasterror)

**DESCRIPTION** The psa hold files are where threshold values are maintained, and in order to preserve the file, the original file is copied to a temporary file. At the completion of the psa, if no action was taken against the hold file, the temporary file is moved back to the original hold file name. This failure has occurred because the application could not create or update the files listed.

**ACTION** The failing psa can be executed as a stand-alone module. To run:

1. Change directory to /usr/lpp/servdir
2. Enter failing command: ./ibm.psa or ./ibmelh.psa
3. PSA should complete without posting failing message.
4. Make sure /usr file system has enough available space to run.
5. Analyze the return code if available for why command failed.

If problem can not be rectified, please report failing psa and the return code to IBM Service Director development.

---

**ERROR detected trying to obtain input file.**

Possible causes -- Non existent file or access permission denied

**DESCRIPTION** Service Director issued a remote copy command to another host and either the event file does not exist or you do not have remote access authority.

**ACTION** Validate that you should have a valid remote access authority.

---

---

**IBM.PSA ERROR - Cannot Find Directory - /usr/lpp/diagnostics/bin**  
**IBM.PSA ERROR - Cannot Find Directory - /etc/lpp/diagnostics/bin**

**DESCRIPTION** This indicates the DIAGNOSTIC programs are either not installed or in a different directory. Diagnostics are required for full function of this PSA, the directory is associated to the AIX level, but should be in /usr.

**ACTION** Have customer install diagnostics if they are not installed. If they are installed in a different directory, use SETUP - Configuration to set the correct diagnostic path.

---

**SERVICE DIRECTOR LOCK FILE EXISTS. CANNOT CONTINUE.**  
**servdir.lck exists! Cannot continue!**

**DESCRIPTION** Service Director has been locked, and you are trying to execute a user interface command that uses servdir.analyze.

**ACTION** Remove Service Director lock from the user interface LOCK menu, or the registration main menu with the I lock option.

---

**PRIOR COMMUNICATIONS TEST STILL RUNNING. CANNOT CONTINUE.**

**DESCRIPTION** Service Director communication test has been requested, but the servdir.analyze ctest: is currently running.

**ACTION** Wait until the current servdir.analyze has ended and then try the test again.

---

**Multiple instances of Service Director are not supported.**

**DESCRIPTION** Service Director analyze application is already running and a second request for servdir.analyze has been made.

**ACTION** Wait until first image of servdir.analyze has terminated.

---

**PSA IBMVPD (action or problem message) rc = 97**

**DESCRIPTION** The VPD psa post many different messages in the above format, they all start with PSA IBMVPD and end with rc = 97. The message in the middle should explain what the problem is, or why it occurred.

**ACTION** Analyze message and resolve cause, remember this psa normally executes without error messages being posted.

1. There should be enough disk space to build working files.
2. If VPD command file is missing or defective, it may be restored from another working Service Director image or from the installp.
3. Refer to "IBMVPD.COMMAND FILE" on page 6-5 for description of command file.

---

**Clearing the event log (command)**  
**Clearing call files directory (command)**

**DESCRIPTION** Service Director clear has been executed from the LOCKS menu, or bottom line command "/usr/lpp/servdir/servdir.analyze Clear:" was issued.

**ACTION** None, informational message only showing progress of request.

---

# Notices

---

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---

# Glossary

## A

**AAS.** Marketing Advanced Administrative System

**APAR.** Authorized Program Analysis Report

**API.** Application Program Interface

**Auto Run Interval.** Service Director Crontab timer entry.

## B

**B/O.** Branch Office

## C

**CCPF.** RETAIN Common Customer Profile File

**CD.** Modem Carrier Detect indicator

**Classic RS/6000.** RS/6000 machines that have concurrent diagnostics installed.

**Client.** Client is typically referred to as the individual system, node, or workstation.

**Client/Server.** A server workstation controlling the individual workstations LAN environment, while forwarding request to another network server.

**CORE.** Current Object REpository database on MoST platform.

**CPU.** Central Processing Unit/Host

**Crontab.** AIX command that is used to submit, edit, list, or remove commands to be run by the cron daemon at regularly scheduled intervals.

**CSR.** Customer Service Representative

**CSU.** Customer Set Up

**CWS.** Control Workstation

## D

**daemon.** A task, process or thread that intermittently awakens to perform some chores and then goes back to sleep (software)

**DASD.** Direct Access Storage Device

**DIAGELA.** Diagnostic Error Log Analysis

## E

**EC.** Modem Error Correction Indicator

**EMEA.** Europe, Middle East, Africa

**Error Log.** On the RS/6000, the error log contains all hardware errors which have occurred.

**Event Log.** The Service Director log which contains those errors reported by Service Director for RS/6000

## F

**Forwarding Server.** A server workstation running the callhome process to forward client request to any communication media (network, web, tty).

**FRU(s).** Field Replaceable Unit(s)

## G

**GA.** General Availability

**GUI.** Graphical User Interface

## H

**HTML.** Hypertext Markup Language

## I

**IBM.** International Business Machines

**ID.** Identification, as in user or uname ID

**I/O.** Input Output

**IPL.** Initial Program Load

## K

**K.** Kilo or 1000

**Kerberos.** A service for authenticating users in a network environment

## L

**LAN.** Local Area Network

**LIC.** Licensed Internal Code

**Local Server.** A server workstation running the callhome process to forward client request to tty and a modem.

## M

**MA.** Maintenance Agreement

**MB.** Megabyte, a million bytes

**MoST.** IBM CE portable computer, Mobile Solutions Terminal

## O

**ODM.** Object Data Manager (AIX)

**OEM.** Other Equipment Manufacturer

## P

**PA.** Problem Analysis

**PD.** Problem Determination

**PDF.** Portable Document Format

**PM.** Preventive Maintenance

**PMH.** Problem Management Hardware

**PMR.** Problem Management Report

**P/N or PN.** Part number

**PSA.** Product Support Application

**PSSP.** 9076 Parallel System Support Program code

**PT.** Portable Terminal (also see MoST)

**PTF(s).** Program Temporary Fix(es)

## R

**RC.** Return code that reflects results of commands or functions.

**RCP.** Remote copy command, allows files to be copied to and from remote host file systems.

**RD.** Modem Receive Data Indicator

**RETAIN.** Remote Technical Assistance Information Network

**RPC.** Remote Procedure Call-Communication language utilized between network nodes.

**RSF.** Remote Support Facility

## S

**SD or Service Director.** The Service Director for RS/6000 is an IBM application program which runs free of charge on a IBM MA or warranty RS/6000.

**SDR.** System Data Repository (AIX)

**SMP.** Symmetric MultiProcessors

**S/N.** Serial Number

**SRN.** Service Request Number. Diagnostics or diagela has determined that resource requires service action or service request.

**SERVDIR.** Name for both the Service Director controlling subsystem and the directory where the Service Director code and files reside.

**Server.** Typically a RS/6000 that is used as the controller for a LAN environment.

**SSR.** System Services Representative (former Customer Engineer career path)

## T

**TD.** Modem Transmit Data Indicator

**TP.** Teleprocessing

**TTY or tty.** Communication port identifier

## U

**userid or user ID.** RISC user profile name

**USR.** U.S. Robotics

## V

**V.** Version, as in V2

**VPD.** Vital Product Data

---

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