RPC BROKER
TCP/IP SUPPLEMENT

Patch XWB*1.1*35

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Department of Veterans Affairs
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Revision History

Document Revision History

The following table displays the revision history for this document. Revisions to the documentation are based on continuous dialog with the Infrastructure and Security Services (ISS) Technical Writers and evolving industry standards and styles.

Date	Description	Author
1/2005	Initial documentation created. RPC Broker TCP/IP Supplement, Patch XWB*1.1*35.	Wally Fort, Oakland OIFO; Andy Lashley, Birmingham OIFO; Susan Strack, Oakland OIFO
3/10/05	Edited the command lines beginning with CCONTROL to CSESSION in "Figure 4: Sample DCL Command Procedure" to prevent the spawning of a sub-session.	Wally Fort, Oakland OIFO; Susan Strack, Oakland OIFO
3/31/05	Changed user (UAF) and directory names to VISTATCPSVC. Updated the XWBSERVICE_START.COM to include $ csession examples in the Caché section for Test and Production accounts and for Production Data Centers.	Wally Fort, Oakland OIFO; Susan Strack, Oakland OIFO
3/25/05	Included a "_UAF> /batch -" command line in the example showing the creation of the VMS User in Figure 2.	Susan Strack, Oakland OIFO
3/29/05	Change the following: • UAF entry from VISTATCPSVC to BROKER • directory from VISTATCPSVC to RPCSERVER	Andy Lashley, Birmingham OIFO; Susan Strack, Oakland OIFO
11/30/05	Update the XWBSERVER_START.COM file in Figure 4, replacing the pipe command with individual commands to avoid a MAX SUB-PROCESS LIMIT.	Wally Fort, Oakland OIFO; Susan Strack, Oakland OIFO; Jack Schram, Project Manager, Oakland OIFO

Table 1: Documentation history

Patch History

For the current patch history related to this software, please refer to the Patch Module (i.e., Patch User Menu [A1AE USER]) on FORUM.

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This is the Veterans Health Information Systems and Technology Architecture (**V**_IST_**A**) Remote Procedure Call (RPC) Broker Transmission Control Protocol/Internet Protocol (TCP/IP) Supplement exported with Patch XWB*1.1*35. This supplement uses several methods to highlight different aspects of the material:

- Various symbols are used throughout the documentation to alert the reader to special information. The following table gives a description of each of these symbols:

Symbol	Description
	Used to inform the reader of general information including references to additional reading material.
	Used to caution the reader to take special notice of critical information.

Table 2: Documentation symbol descriptions

- Descriptive text is presented in a proportional font (as represented by this font). "Snapshots" of computer online displays (i.e., character-based screen captures/dialogs) and computer source code are shown in a *non*-proportional font.

Assumptions About the Reader

This manual is written with the assumption that the user has OpenVMS system privileges and is familiar with the following:

- **V**_IST_**A** computing environment (e.g., Kernel Installation and Distribution System [KIDS]).

- Remote Procedure Call (RPC) Broker.

- M programming language.

- Open Virtual Memory System (OpenVMS)

- M operating systems (i.e., Caché on NT, Caché on OpenVMS), Digital Standard MUMPS (DSM) for OpenVMS, GT.M on Linux, or GT.M on OpenVMS).

Reference Materials

Readers who wish to learn more about the **V**_IST_**A** Remote Procedure Call (RPC) Broker software should consult the following:

- Remote Procedure Call (RPC) Broker documentation is made available online in Adobe Acrobat Portable Document Format (PDF) at the following web address:

  http://vista.med.va.gov/vdl/Infrastructure.asp - App23 .

- Installation Instructions can be found in the description for Patch XWB*1.1*35, located in the National Patch Module (i.e., Patch User Menu [A1AE USER]) on FORUM.

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1 Introduction

A Service Request (RPC Broker—Firewall Issue, service request #20021001) has been made for an enhancement to the RPC Broker that will allow local sites the ability to control the range of ports used in connecting to joint and/or contracting facilities. As a security measure, participating sites or joint facilities (i.e., DoD and universities) have firewalls set up to prevent intrusion. Lack of access to clinics outside the firewall is preventing session connections from thin clients to Computerized Patient Record System (CPRS). With the use of the broker, which enables clients to communicate and exchange data over the network, sites could minimize security risks by controlling the range of available ports that would be open for connection.

In response to this request to operate with firewalls and other network security measures, the Remote Procedure Call (RPC) Broker is eliminating the callback portion of the system. The Broker has been changed to work more like other Transmission Control Protocol/Internet Protocol (TCP/IP) programs. This is the RPC Broker TCP/IP Supplement. It outlines the details of the work involved in setting up and managing RPC Broker TCP/IP services for all currently supported M operating systems.

This documentation is intended for use in conjunction with RPC Broker Patch XWB*1.1*35. Patch XWB*1.1*35 sets the groundwork for the next Broker Patch XWB*1.1*36, which implements a new Broker Developer Kit (BDK). This will allow V*IST*A developer's access to this new RPC Broker server side TCP/IP service through the Broker client. Existing RPC Broker applications will work with this new server side code, which will eventually replace the current Broker listener, XWBTCPL.

The intended audience for this documentation is V*IST*A developers and VA facility Information Resources Management (IRM) personnel.

1.1 Managing TCP/IP Services

The RPC Broker uses a TCP/IP service to "listen" on a particular port for incoming TCP/IP connections from other systems. Listeners are necessary whenever RPC Broker Clients need to initiate a connection to the V*IST*A system over TCP/IP.

1.2 RPC Broker Service

TCPIP service is only available for the OpenVMS operating systems.

- Caché on OpenVMS).

    For more information, see the section titled "TCPIP (UCX) Multi-threaded Service on OpenVMS."

- DSM for OpenVMS.

    For more information, see the section titled "TCPIP (UCX) Multi-threaded Service on OpenVMS."

- GT.M on OpenVMS.

  For more information, see the section titled "TCPIP (UCX) Multi-threaded Service on OpenVMS."

- GT.M on Linux.

  No documentation available for GT.M on Linux at this time.

2 Multi-threaded Service for Caché on NT

The Windows NT OS does not provide an equivalent service to OpenVMS TCPIP service. Kernel Patch XU*8*78, released in April of 1998, provides a way to provide a multi-threaded service for TCP/IP messaging for Caché on NT systems.

2.1 Setting up a Multi-threaded Service

1. Define an entry for it in the RPC BROKER SITE PARAMETERS file (#8994.1).

2. Set or change the value of the TYPE OF LISTENER field (#.5) to "New Style" in File #8994.1.

3. Use the TaskMan option Schedule/Unschedule Options to verify that XWB LISTENER STARTER is scheduled. You are then presented with the Edit Option Schedule, which is a ScreenMan form. Enter the value "STARTUP" in the SPECIAL QUEUEING field.

2.2 Starting and Stopping the Service

- START SERVICE—To start a service outside of scheduling it through TaskMan, enter the following through programmer mode:

    DO RESTART^XWBTCP

    Or JOB ZISTCP^XWBTCPM1(port#)

- STOP SERVICE—To stop the listener, enter the following through programmer mode:

    DO STOPALL^XWBTCP

3 TCPIP (UCX) Multi-threaded Service on OpenVMS

Multi-threaded listeners are implemented using OpenVMS's TCPIP (a.k.a. Digital TCPIP Services for OpenVMS, formerly known as UCX). The TCPIP service uses a cluster wide database. The TCPIP Multi-threaded Service on OpenVMS permits multiple TCPIP clients to connect and run as concurrent processes up to the limits established by the system. TCPIP listens on a particular port and launches the specified RPC Broker handler process for each client connection.

> The following names, found in a typical RPC Broker Handler process, are referenced throughout this chapter:
>
> - BROKER—OpenVMS account name for TCPIP RPC Broker handler.
>
> - [RPCSERVER]—Name of home directory.
>
> - XWBSERVER_START.COM—Name of template DCL command procedure.

For the TCPIP RPC Broker handler process, you need to create the following:

- OpenVMS account.

  > For more information, see the section titled "Set Up OpenVMS User Account."

- Home directory.

  > For more information, see the section titled "Set Up Home Directory for the RPC Broker Handler Account."

- Digital Command Language (DCL) login command procedure.

  > For more information, see the section titled "Create a DCL Login Command Procedure for the RPC Broker Handler."

3.1 Set Up OpenVMS User Account

The easiest way to configure an OpenVMS account for the RPC Broker handler is to use a current account like the VA MailMan or HL7 and adjust its parameters. The other way is to create a new OpenVMS account for the RPC Broker handler.. The following steps illustrate how to do this.

Step 1.   Determine an unused User Identification Code (UIC).

This is selected from the same UIC group as other DSM or Caché for OpenVMS accounts, depending on which version of M you are using.

Step 2.   Use the OpenVMS Authorize Utility to create a BROKER account with the unused UIC.

⚠ **You must be running from a system administrator account to set up an OpenVMS user account.**

⚠ **Since the TCPIP is node-specific, make sure you set up the TCPIP service for each node on which you want the service to run.**

The following two examples illustrate different ways to set up an OpenVMS User account to execute the RPC service COM file.

a. Copy your existing XMINET (TCP/IP MailMan) account to a new account with an unused UIC. Figure 1 contains the recommended settings and assumes you already have an XMINET account on OpenVMS.

> This example assumes that UIC [51,45] is an unused UIC. Substitute an unused UIC on your system. Set the owner according to your system policy. Please note that [51,45] is used as and example, only.

```
$ MCR AUTHORIZE
UAF> COPY XMINET BROKER/UIC=[51,45]/DEVICE=USER$/DIRECTORY=RPCSERVER
%UAF-I-COPMSG, user record copied
%UAF-W-DEFPWD, copied or renamed records must receive new password
%UAF-I-RDBADDMSGU, identifier BROKER value [000051,000045] added to
rights database
UAF>
```

Figure 1: Copy your XMINET (TCP/IP MailMan) account to a new account with an unused UIC

b. Create the new BROKER VMS account. Figure 2 illustrates how to create an OpenVMS User account from scratch with the recommended settings. You must adhere to minimum account quota recommendations from the AXP/VMS Technical Support Team.

ℹ For more information on recommended account quotas, see the AXP/VMS Technical Support Team Web site at: http://vaww.va.gov/custsvc/cssupp/axp/default.asp .

> This example assumes that UIC [51,45] is an unused UIC. Substitute an unused UIC on your system. Set the owner according to your system policy. Please note that [51,45] is used as and example, only.

```
$ MC AUTHORIZE
UAF> ADD BROKER /UIC=[51,45]/OWNER="<cache>or<DSM>" -
_UAF> /DEVICE=USER$/DIRECTORY=[RPCSERVER] -
_UAF> /NOACCESS/NETWORK/FLAGS=(DISCTLY,RESTRICTED,NODISUSER) -
_UAF> /PRIV=(NETMBX,TMPMBX) –
_UAF> /batch -
_UAF> /DEF=(NETMBX,TMPMBX)/LGICMD=NL:
%UAF-I-ADDMSG, user record successfully added
%UAF-I-RDBADDMSGU, identifier BROKER value [000051,000045] added to
rights database
UAF>
```

Figure 2: Create an OpenVMS User from scratch

Step 3. Verify the settings for your new BROKER account or the account you are going to use.

Now you want to see what the parameters look like. Figure 3 contains the settings for your new BROKER account. Verify that your settings are the same as they appear in Figure 3; or if they are different, verify that the impact of the different settings is acceptable for your system.

The example in Figure 3 assumes that you've just completed the steps illustrated in either Figure 1 or Figure 2.

```
$ MCR AUTHORIZE
UAF> SHOW BROKER
```

> This example assumes that UIC [51,45] is an unused UIC. Substitute an unused UIC on your system. Set the owner according to your system policy. Please note that [51,45] is used as and example, only.

```
Username: BROKER                                    Owner:  (DSM or Cache)
Account:                                            UIC:    [51,45] ([BROKER])
CLI:     DCL                                     Tables: DCLTABLES
Default: USER$:[RPCSERVER]
LGICMD:  NL:
Flags:  DisCtlY Restricted
Primary days:    Mon Tue Wed Thu Fri
Secondary days:                         Sat Sun
Primary   000000000011111111112222  Secondary 000000000011111111112222
Day Hours 012345678901234567890123  Day Hours 012345678901234567890123
Network:  ##### Full access ######              ##### Full access ######
Batch:    ##### Full access ######              ##### Full access ######
Local:    -----  No access  ------              -----  No access  ------
Dialup:   -----  No access  ------              -----  No access  ------
Remote:   -----  No access  ------              -----  No access  ------
Expiration:    (none)    Pwdminimum: 6   Login Fails:     0
Pwdlifetime:   90 00:00    Pwdchange:     (pre-expired)
Last Login:    (none) (interactive),          (none) (non-interactive)
Maxjobs:         0  Fillm:        600  Bytlm:        200000
Maxacctjobs:     0  Shrfillm:       0  Pbytlm:            0
Maxdetach:       0  BIOlm:        600  JTquota:        8192
Prclm:           2  DIOlm:       2048  WSdef:          2048
Prio:            4  ASTlm:       4096  WSquo:          4096
Queprio:         0  TQElm:         50  WSextent:      65535
CPU:        (none)  Enqlm:       4096  Pgflquo:      200000
Authorized Privileges:
  NETMBX     TMPMBX
Default Privileges:
  NETMBX     TMPMBX


UAF> EXIT

%UAF-I-DONEMSG, system authorization file modified
%UAF-I-RDBDONEMSG, rights database modified
```

Figure 3: Verify the settings for your new BROKER account

As a security precaution, make sure that the DisCtlY and Restricted flags are set.

3.2 Set Up Home Directory for the RPC Broker Handler Account

You need to create a home directory for the RPC Broker handler account. This directory will house the DCL command procedures, which are executed whenever a client connects. Make sure that the owner of the directory is the BROKER account.

For example, to create a home directory named [RPCSERVER] with ownership of BROKER:

```
$ CREATE/DIR USER$:[RPCSERVER]/OWNER=BROKER
```

3.3 Create a DCL Login Command Procedure for the RPC Broker Handler

Create a DCL command procedure in the home directory for the handler account. Make sure the command procedure file is owned by the RPC Broker handler account.

Copy the sample COM file: XWBSERVER_START.COM, from any V*IST*A anonymous directory. Create a local copy to edit, you will need one file for each TCP/IP service (port). All nodes of the cluster share the same COM file.

Make sure that you don't have a current XWBSERVER_START.COM file being used buy your M2M Broker Service. XWBSERVER_START.COM is a template file. Make a copy to edit for each service you setup.   You want to give your service a name that helps make the link with the account and port that it uses.

```
$COPY XWBSERVER_START.COM VAH9200.COM
```

Edit your local copy of the COM file as follows:

1. Adjust the command line (environment, UCI, and volume set) to match your system. In the command line section of the COM file for each vendor, there are parameters in the angle brackets (<>) that need to be replaced with the correct values for your site. Example, for DSM copy the following sample line, keeping in mind to replace the <dsmmgr>, <vah> and <rou> with the correct values for your site:

    ```
    "DSM/ENV=<dsmmgr>/UCI=<vah>/VOL=<rou>/data="''dev'"  DSM^XWBTCPM"
    ```

    See Figure 4 for the specific changes that need to be made for Caché or GT.M.

2. If you are running DSM and access control is enabled, ensure that the BROKER account has access to this UCI, volume set, and routine.

    You can run the same TCPIP service processes on multiple nodes. This depends on your sites configuration and needs. For instance, the impersonator VMS feature allows for the possibility of all nodes in the cluster to become the surrogate, permitting the listening process to continue uninterrupted if one node stops. This requires that the RPC BROKER TCPIP service be enabled on all nodes in the cluster. For this reason, it is recommended that you enable the RPC BROKER TCPIP service on most or all of the nodes in the cluster.

For more information on DSM and access control, see the section "Access Control List (ACL) Issues."

```
$!XWBSERVER_start.COM - for incoming tcp connect requests
$! Revision History:
$! Patch XWB*1.1*35
$! Add code to get remote IP address.
$!----------------------------------------------------------------
$ set noon        !Don't stop
$ set noverify    !change as needed
$! set verify     !change as needed
$ say :== write sys$output
$! Purge at end
$ set prot=(s:rwed,o:rwed,g:rwe,w:rwe)/default
$!
$ dev=f$trnlnm("sys$net")  !This is our MBX device
$ NODE=F$EDIT(F$GETSYI("SCSNODE"),"COLLAPSE,TRIM") !Node Name
$!
$ say "Opening " + dev !This can be viewed in the log file
$!
$! With TCPIP Services for OpenVMS 5.3 ECO #2 or higher,
$!      the below section can be removed.
$!
$! Check status of the BG device before going to VistA
$ cnt=0
$ CHECK:
$ stat=f$getdvi("''dev'","STS")
$ if cnt .eq. 100
$ then
$ say "Could not open ''dev' - exiting"
$ goto EXIT
$ else
$       if stat .ne. 16
$       then
$       cnt=cnt+1
$       say "Stat: ''stat' Cnt:''cnt' Dev: ''dev' not ready!"
$       wait 00:00:01 !Wait one second to assure connection
$       goto CHECK
$       else
$       endif
$ endif
$! End of TCPIP Services for OpenVMS 5.3 ECO #2 or higher, removal
$!
$!----------------------------------------------------------------
$ bg == f$extract(1,f$locate(":",dev)-1,dev)
$ pid = f$getjpi("","PID")
$ assign /user pipe1_'pid'.tmp sys$output
$ TCPIP SHOW DEVICE 'bg'
$ search pipe1_'pid'.tmp 'bg' /output=pipe2_'pid'.tmp
$ open/error=err_exit/end=err_exit host pipe2_'pid'.tmp
$ read host line
$ close host
$ delete /noconfirm /nolog pipe1_'pid'.tmp;*,pipe2_'pid'.tmp;*
$ port = f$edit(f$extract(24,5,line),"TRIM")
$ ip = f$edit(f$extract(55,15,line),"TRIM")
$!
$ define VistA$IP "''ip'"
$!----------------------------------------------------------------
$ say "''dev' from host ''ip' is now ready for use."
$!----------------------------------------------------------------
$! **Be sure the command line(s) in the COMMAND LINE SECTION
$! **below is correct for your system and if access control is enabled,
$! **that this account has access to this uci,vol & routine.
$!
$!----------------------------------------------------------------
$! COMMAND LINE SECTION:
$! ====================
$! anything in <x> needs to be replaced including the <> with local data
```

```
$!------------------------------------       DSM      ----------------
$! for DSM
$! dsm/env=<dsmmgr>/uci=<vah>/vol=<rou>/data="''dev'" DSM^XWBTCPM
$!--------------------------------------------------------------
$! for Cache                                              Caché
$! Edit only one of the three 'csession' lines below.
$!
$  assign  'f$trnlnm("SYS$NET")' SYS$NET
$!
$! #1 -- For Test Accounts
$! if the configname is not the same as the node name, usually a test
$! account, edit/use the 'csession' line below
$! Remove the comment character '!' from the beginning of the line.
$! Replace <PREFIX>, including the <>, with the proper Test account
$! prefix.
$!  Usually this is T or TST
$! Replace <namespace>, including the <> with the correct namespace.
$!  Usually the namespace is TST for a Test account.
$!
$! an Example -- $ csession "T''NODE'" "-U" "TST" "CACHEVMS^XWBTCPM"
$!
$! csession "<PREFIX>''NODE'" "-U" "<namespace>" "CACHEVMS^XWBTCPM"
$!
$! #2 -- For most Production Accounts.
$! OR if your configname is the same as your node name, usually a non-data
$! center production site, edit/use the 'cesssion' line below.
$! Remove the comment character '!' from the beginning of the line.
$! Replace <namespace>, including the <> with the correct namespace,
$!  Usually the namespace is "VAH" for production.
$!
$! an Example -- $ csession "''NODE'" "-U" "VAH" "CACHEVMS^XWBTCPM"
$!
$! csession "''NODE'" "-U" "<namespace>" "CACHEVMS^XWBTCPM"
$!
$! #3 -- for Data-Center Production Accounts
$! OR, for a production Data Center site, edit/use the 'csession' line below.
$! Remove the comment character '!' from the beginning of the line.
$! Replace <NSP>, including the <>, with the proper site prefix.
$! Replace <namespace>, including the <> with the correct namespace.
$!  Usually the namespace is the same as the value used for NSP.
$!
$! an Example -- $ csession "BRX''NODE'" "-U" "BRX" "CACHEVMS^XWBTCPM"
$!
$! csession "<NSP>''NODE'" "-U" "<namespace>" "CACHEVMS^XWBTCPM"
$!$!------------------------------------------------------
$! for GT.M                                              GT.M
$! assign  'f$trnlnm("SYS$NET")' SYS$NET
$! Depending on how your command files are set up, you may need to
$! run the GT.M profile file.
$! @<user$:[gtmmgr]>gtmprofile.com
$! forfoo="$" + f$parse("user$:[gtmmgr.r]ZFOO.exe")
$! forfoo GTMUCX^XWBTCPM("''dev'")
$!
$!
$ exit:
$ purge/keep=100 sys$login:*.log !Purge log files only
$ logout/brief
```

Figure 4: Sample DCL Command Procedure

3.4 Set Up and Enable the TCPIP Service

After you've created the RPC Broker account, created the TCPIP service to listen for connections, and launched the RPC Broker handler, perform the following three steps:

Step 1.   Select the OpenVMS Nodes Upon Which to Run the Service.

Designate the nodes on which you want to run the resulting M jobs to handle incoming RPC Broker connections. You will need to set up the TCPIP service on each node that you want the service to run.

Step 2.   Select the Port Upon Which the New Service Should Listen.

This will be the port you are currently using for the Broker listener.

Step 3.   Specify the user account and command file name (see the section "Set Up OpenVMS User Account" in this documentation) invoked when a connection is received.

3.4.1 Create a TCP/IP Service

Prior to setting up the TCP/IP service in production, it is recommended that you create a test TCP/IP service that uses a different port to listen on, which sends connections into an M test account. This test TCP/IP service can use the same OpenVMS account and directory that the production TCP/IP uses. However, it is recommended that you create a different DCL command file (e.g., TST9900.COM) for the UCI and port for the test account.

The steps to set up a TCP/IP service for the RPC Broker are listed as follows:

Step 1.   Set up the RPC BROKER TCP/IP service.

Since the TCP/IP service database is cluster-wide, sign onto one node in the production cluster and create the service.

The LIMIT must be set high enough to allow access for all your CPRS and other RPC Broker users that you want to run on that node.

You will need to provide unique names on each node for each account because all files will be located in a common directory. Each RPC service on a node must have a unique name. The TCPIP SERIVCE is named VAH9200 for the purposes of this documentation only.

```
$ TCPIP
```

```
TCPIP> SET SERVICE VAH9200/USER=BROKER/PROC=VAH9200/PORT=9200-
_TCPIP> /PROTOCOL=TCP/REJECT=MESSAGE="#Signon Limit Reached#" –
_TCPIP> /LOG=ADDRESS/LIMIT=500/FILE=VAH9200.COM

TCPIP> SHO SERVICE VAH9200/FULL

Service: VAH9200
                          State:      Disabled
Port:            9200     Protocol:   TCP              Address:  0.0.0.0
                          User_name:  BROKER           Process:  VAH9200
```

Figure 5: Set up the VAH9200 TCPIP service

Set the port number to match the port number in use by your site.

Step 2.   Enable and set boot status for the RPC BROKER TCP/IP service on every node where you need to run the service.

Figure 6 shows that ENABLE SERVICE enables the service immediately and SET CONFIG ENABLE SERVICE sets the service to enable at boot.

On the same node:

```
TCPIP> ENABLE SERVICE VAH9200
TCPIP> SET CONFIG ENABLE SERVICE VAH9200
TCPIP> SHO SERVICE/FULL VAH9200

Service: VAH9200
                           State:     Enabled
Port:               9200   Protocol:  TCP            Address:  0.0.0.0
Inactivity:            5   User_name: BROKER         Process:  VAH9200
Limit:               500   Active:      0            Peak:        0

File:          VAH9200.COM
Flags:         Listen

Socket Opts:   Rcheck Scheck
 Receive:             0      Send:                    0

Log Opts:      None
 File:         not defined

Security
 Reject msg:   #Signon Limit Reached#

 Accept host: 0.0.0.0
 Accept netw: 0.0.0.0

TCPIP> SHO CONFIG ENABLE SERVICE

Enable service
     FTP, FTP_CLIENT, VAH9200, MPI, TELNET, XMINETMM
TCPIP> EXIT
```

Figure 6: Enable and set boot status for the RPC BROKER TCPIP service

3.5 Access Control List (ACL) Issues

Some sites use DSM's ACL feature, which controls access explicitly to each OpenVMS account needing to enter that specific DSM environment. If your site is using ACL, you should set up the BROKER account with PROGRAMMER access, then specify the Volume set and UCI name that the BROKER user account has authorization to access. Ensure that the OpenVMS BROKER account:

- Prohibits the following logins:
    - Batch
    - Local
    - Dialup
    - Remote
- Allows only Network logins.

An example of setting this level of access for a BROKER account is provided in Figure 7:

```
$ DSM/ENV=<dsmmgr>/MAN ^ACL

Environment Access Utilities

    1.  ADD/MODIFY USER                    (ADD^ACL)
    2.  DELETE USER                        (DELETE^ACL)
    3.  MODIFY ACTIVE AUTHORIZATIONS       (^ACLSET)
    4.  PRINT AUTHORIZED USERS             (PRINT^ACL)

Select Option > 1  <Enter>  ADD/MODIFY USER

OpenVMS User Name:   >  BROKER

ACCESS MODE     VOL        UCI         ROUTINE
-----------     ---        ---         -------

No access rights for this user.

Access Mode ([M]ANAGER, [P]ROGRAMMER, or [A]PPLICATION):   >  P
Volume set name:   >  ROU
UCI:   >  VAH
UCI:   >  <Enter>
Volume set name:   >  <Enter>
Access Mode ([M]ANAGER, [P]ROGRAMMER, or [A]PPLICATION):   >  <Enter>

USER            ACCESS MODE    VOL        UCI         ROUTINE
----            -----------    ---        ---         -------

BROKER          PROGRAMMER     ROU        VAH

OK to file?    <Y>    <Enter>

OpenVMS User Name:   >    <Enter>

OK to activate changes now?   <Y>    <Enter>

Creating access authorization file: SYS$SYSDEVICE:[DSMMGR]DSM$ACCESS.DAT.
```

Figure 7: Access Control List (ACL) for BROKER

3.6 How to Control the Number of Log Files Created by TCPIP

The TCPIP service automatically creates log files in the RPCSERVER directory named VAH9200.LOG;xxx (where "xxx" is a file version number).

i TCPIP does this, and it cannot be prevented.

The XWBSERVER_START.COM template file will purge extra log files as part of its running. New versions of the log file will be created until that file version number reaches the maximum number of 32767. This can be used to limit the number of log files by explicitly setting the log file to the highest version number (32767) on the VAH9200.LOG file. This results in the VAH9200.LOG file being renamed to VAH9200.LOG;32767, and no further versions of this log file are created. If a system manager needs to see the log file contents of new connections, they can rename that file to a lower version such as VAH9200.LOG;32760 and let new log files be created.

⚠ **It is recommended that you not limit the number of versions of the log file until you know that your VAH9200 service is working correctly; keeping the log files can help when diagnosing problems with the service/account.**

3.7 Starting and Stopping the Service

Because this is a TCPIP service, use TCPIP to enable and disable it, shown in Figure 8:

```
TCPIP> ENABLE SERVICE VAH9200
TCPIP> DISABLE SERVICE VAH9200
```

Figure 8: Start and Stop the TCPIP service

i Figure 8 shows that ENABLE SERVICE starts up the TCPIP service and DISABLE SERVICE stops the TCPIP service.

3.8 Starting and Stopping the Service Cluster-wide

Use the OpenVMS command SYSMAN to run the TCPIP command on each member of the cluster, shown in Figure 9:

```
ISFVA2$ MC SYSMAN
SYSMAN> SET ENV/CLU
%SYSMAN-I-ENV, current command environment:
        Clusterwide on local cluster
        Username SYSTEM      will be used on nonlocal nodes

SYSMAN> DO TCPIP ENABLE SERVICE VAH9200
```

Figure 9: Start and Stop the TCPIP service cluster-wide

4 Migration Considerations

This chapter addresses issues and considerations involved in moving from the platforms listed below, to Caché/VMS:

- Migrating from DSM/VMS to Caché/VMS as documented in the topic section "DSM/VMS to Caché/VMS."

- Migrating from Caché/NT to Caché/VMS involves only one step related to the NT platform prior to migrating to Caché/VMS. This is documented in the topic section "Caché/NT to Caché/VMS."

4.1 DSM/VMS to Caché/VMS

If your site is running DSM/VMS and you are migrating to Caché/VMS, it is recommended that you read these instructions to make the necessary VMS configuration changes.

> These changes MUST ONLY be done after shutting down DSM and prior to migrating to Caché/VMS.

Disable Any RPC BROKER Service(s)

Step 1.   Disable all user access:

Check the existing BROKER user and ensure that the User Identification Code (UIC) is correct for Caché/VMS.

Step 2.   Modify the existing VAH9200.COM file to start Caché in place of DSM.

Step 3.   You are now ready to migrate to Caché. Perform the necessary steps for migration including any backups, disk conversions and the shutdown of DSM.

Step 4.   After the migration is complete and Caché is activated for use, remember to enable the RPC BROKER service.

4.2 Caché/NT to Caché/VMS

If your site is running Caché/NT and you are migrating to Caché/VMS, follow these instructions to remove the multi-threaded service and create the TCPIP service.

Step 1.   Remove the entry for it in the RPC BROKER SITE PARAMETERS file (#8994.1).

Step 2.   Use Schedule/Unschedule Options in TaskMan to remove the option XWB LISTENER STARTER from the schedule.

Step 3. **Follow the instructions documented in chapter <u>" TCPIP (UCX) Multi-threaded Service on OpenVMS"</u> in this documentation.**

Glossary

ACL	**A**ccess **C**ontrol **L**ist
DCL	Digital Command Language
DEPARTMENT OF VETERANS AFFAIRS (VA)	The Department of **V**eterans **A**ffairs, formerly called the **V**eterans **A**dministration.
DHCP	**D**ecentralized **H**ospital **C**omputer **P**rogram of the Veterans Health Administration (VHA), Department of Veterans Affairs (VA) is the former name for Veterans Health Information Systems and Technology Architecture (V*IST*A). V*IST*A software, developed by VA, is used to support clinical and administrative functions at VA Medical Centers nationwide. It is written in M and, via the Kernel, runs on all major M implementations regardless of vendor. V*IST*A is composed of packages that undergo a verification process to ensure conformity with namespacing and other V*IST*A standards and conventions.
FIELD	In a record, a specified area used for the value of a data attribute. The data specifications of each VA FileMan field are documented in the file's data dictionary. A field is similar to blanks on forms. It is preceded by words that tell you what information goes in that particular field. The blank, marked by the cursor on your terminal screen, is where you enter the information.
FILE	Set of related records treated as a unit. VA FileMan files maintain a count of the number of entries or records.
FILE MANAGER (VA FILEMAN)	V*IST*A's Database Management System (DBMS). The central component of Kernel that defines the way standard V*IST*A files are structured and manipulated.
FORM	Please refer to the Glossary entry for "ScreenMan Forms."
IRM	**I**nformation **R**esource **M**anagement. A service at VA medical centers responsible for computer management and system security.
KERNEL	Kernel is V*IST*A software that functions as an intermediary between the host operating system and other V*IST*A software applications (e.g., Laboratory, Pharmacy, IFCAP, etc.). Kernel provides a standard and consistent user and programmer interface between software applications and the underlying M implementation.

MENU   List of choices for computing activity. A menu is a type of option designed
                         to identify a series of items (other options) for presentation to the user for
                         selection. When displayed, menu-type options are preceded by the word
                         "Select" and followed by the word "option" as in Select Menu Management
                         option: (the menu's select prompt).

MENU SYSTEM   The overall Menu Manager logic as it functions within the Kernel
                         framework.

OPTION   An entry in the OPTION file (#19). As an item on a menu, an option
                         provides an opportunity for users to select it, thereby invoking the
                         associated computing activity. Options may also be scheduled to run in the
                         background, non-interactively, by TaskMan.

PROMPT   The computer interacts with the user by issuing questions called prompts,
                         to which the user issues a response.

ROUTINE   Program or a sequence of instructions called by a program that may have
                         some general or frequent use. M routines are groups of program lines,
                         which are saved, loaded, and called as a single unit via a specific name.

RPC Broker Clients   Any Windows application that makes use of the RPC Broker to do the
                         connection with the **V**_IST_**A** system.

TCP/IP   Transmission Control Protocol/Internet Protocol

TCPIP   Digital TCPIP Services for OpenVMS, this used to be called UCX). TCPIP
                         permits multiple TCPIP clients to connect and run as concurrent processes
                         up to the limits established by the system. TCPIP listens on a particular
                         port and launches the specified RPC Broker handler process for each client
                         connection.

VA FILEMAN   Set of programs used to enter, maintain, access, and manipulate a database
                         management system consisting of files. A software application of online
                         computer routines written in the M language, which can be used as a
                         standalone database system or as a set of application utilities. In either
                         form, such routines can be used to define, enter, edit, and retrieve
                         information from a set of computer stored files.

V_IST_**A**   **V**eterans Health **I**nformation **S**ystems and **T**echnology **A**rchitecture
                         (**V**_IST_**A**) of the Veterans Health Administration (VHA), Department of
                         Veterans Affairs (VA). **V**_IST_**A** software, developed by the VA, is used to
                         support clinical and administrative functions at VHA sites nationwide.
                         Server-side code is written in M, and, via Kernel, runs on all major M
                         implementations regardless of vendor. **V**_IST_**A** is composed of software that
                         undergoes a quality assurance process to ensure conformity with
                         namespacing and other **V**_IST_**A** standards and conventions.

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