

VisualAge COBOL for Windows NT



# Installing and Configuring OS/390 Components for Remote ECD

*Version 3.04*



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**Note!**

Before using this information and the product it supports, be sure to read the general information under "Notices" on page vii.

**Second Edition (November 2001)**

This edition applies to IBM VisualAge COBOL for Windows NT, Version 3.0.4 (program number 5639-I44), and to all subsequent releases and modifications until otherwise indicated in new editions. Make sure you are using the correct edition for the level of the product.

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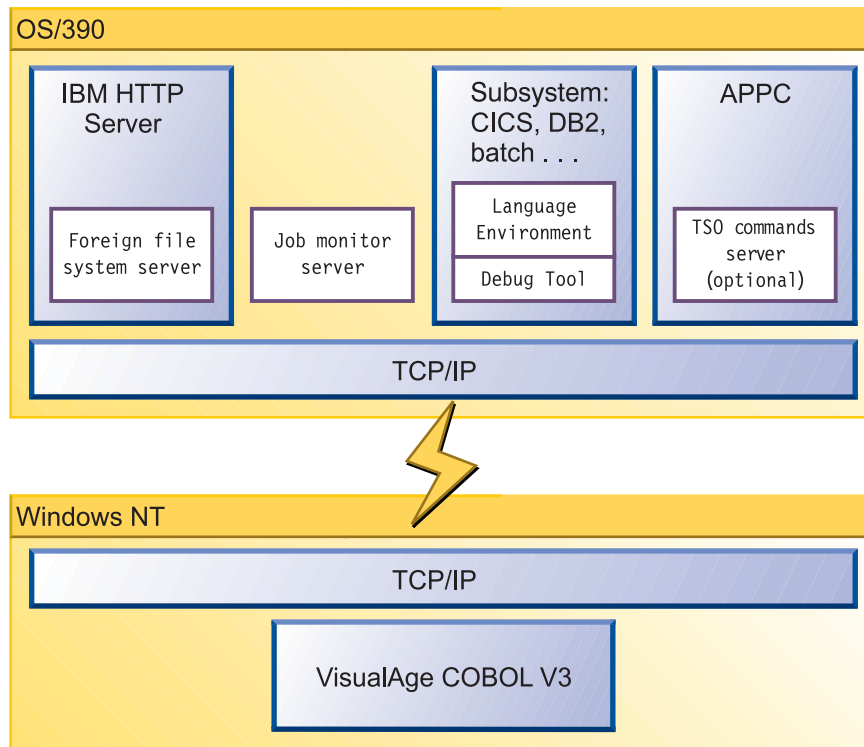
## Chapter 1. Configuring OS/390 for remote ECD: overview

**Important:** After you have installed the base version of the IBM OS/390 Foreign File System as instructed below, you must install the latest PTF, which is included on the VisualAge COBOL CD-ROM. See Installing updates for FFS for more information.

When developers use VisualAge COBOL to edit, compile, or debug files that are on OS/390, communications between the workstation and OS/390 are through Transmission Control Protocol/Internet Protocol (TCP/IP). In addition, VisualAge COBOL relies on four servers:

- Foreign file system server, which enables developers to work with their data sets on OS/390. The foreign file system server is a component of the OS/390 Foreign File System. The material required to install the OS/390 Foreign File System is included on the VisualAge COBOL CD-ROM.
- Job monitor server, which enables developers to view status, perform actions, and view output from their jobs on OS/390. The job monitor server is a component of the OS/390 Foreign File System. The material required to install the OS/390 Foreign File System is included on the VisualAge COBOL CD-ROM.
- TSO commands server, which enables developers to run TSO commands from the workstation. This server is required only if developers want to issue TSO commands from the workstation. This server is available with IBM COBOL for OS/390 & VM as a PTF. See “Installing the prerequisite OS/390 software” on page 3 for more information.
- Debug Tool, which acts as the server for remote debugging. Debug Tool is a separately orderable and installable feature of IBM COBOL for OS/390 & VM. See “Installing the prerequisite OS/390 software” on page 3 for more information.

The foreign file system server communicates between the workstation and the host through the HTTP protocol. The IBM HTTP Server (formerly Domino Go Webserver) runs under UNIX System Services (formerly Open Edition) in OS/390. The server must be installed under the hierarchical file system (HFS) of UNIX System Services and configured for the remote capability of VisualAge COBOL. This server communicates with the foreign file system server through the GoWebserver API (GWAPI).



Before developers can communicate with the host using TCP/IP, a system programmer must configure the host for remote edit-compile-debug. The general steps are shown in the checklist below.

Step	For details, see:	Done?
Make sure that the appropriate required software and service updates are installed: <ul style="list-style-type: none"> <li>• TCP/IP</li> <li>• OS/390 Language Environment</li> <li>• IBM HTTP Server</li> <li>• Resource Access Control Facility (RACF) or equivalent</li> <li>• IBM COBOL for OS/390 &amp; VM Full Function Offering (with Debug Tool)</li> </ul>	"Installing the prerequisite OS/390 software" on page 3	
Install the foreign file system server and job monitor server.	"Chapter 2. Installing the foreign file system server and job monitor server" on page 5	
Configure the IBM HTTP Server.	"Chapter 3. Configuring the IBM HTTP Server" on page 17	
Configure the software that comes with VisualAge COBOL for the host to support remote edit-compile-debug: <ul style="list-style-type: none"> <li>• Foreign file system server</li> <li>• Job monitor server</li> </ul>	"Chapter 4. Configuring the foreign file system server" on page 21  "Chapter 5. Configuring the job monitor server" on page 23	

Step	For details, see:	Done?
Install and configure the TSO commands server (optional) to support issuing TSO commands from the workstation.	"Chapter 6. Installing and configuring the TSO commands server (optional)" on page 25	
Configure Debug Tool for remote debugging under CICS.	"Chapter 7. Configuring OS/390 for remote debugging under CICS" on page 29	
Test the connections.		

## RELATED REFERENCES

TCP/IP V3R2 for MVS: Customization and Administration , SC31-7134

TCP/IP V3R2 for MVS Bookshelf

IBM HTTP Server: Planning, Installing, and Using , SC31-8690

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## Installing the prerequisite OS/390 software

Before you configure communications for remote editing, compiling, and debugging using IBM VisualAge COBOL for Windows NT, Version 3, you must install the following software:

- OS/390 Version 2 Release 6 or later, or z/OS, which includes the following required software:
  - TCP/IP
  - IBM HTTP Server (formerly known as Domino Go Webserver for OS/390), plus the appropriate PTF for APAR PQ29311
  - For job monitor support, the PTF for JES APAR 0W41734
  - For JES3 support, the PTF for APAR OW36022 and the PTF for APAR OW45210
  - OS/390 Language Environment. Apply the PTFs for the following APARs as appropriate: PQ088138, PQ05057, and PQ07402 for OS/390 V2R5; remote debug of programs with DBCS data requires OS/390 Language Environment V2R9.
- IBM COBOL for OS/390 & VM Version 2 Release 1 or later (5648-A25) Full Function Offering, which includes the following required software:
  - Debug Tool, plus the PTFs for APARs PQ30470 and PQ31829, which synchronize Debug Tool with IBM Distributed Debugger in VisualAge COBOL. In addition, the PTFs for APARs PQ43111 and PQ43112 are recommended; they bring the Debug Tool up to the current service level and provide support for remote debug of COBOL OS/390 applications running under UNIX System Services (USS).
  - The PTFs for the following APARs as appropriate: PQ21350, PQ36963, and PQ35436

The program directory provided with any of these host products details the installation process using SMP/E RECEIVE, APPLY, and ACCEPT commands. It also gives up-to-date service information, including PTFs or APARs that you need to apply.

Because of a defect caused by DB2 UDB for OS/390 Version 6.1 and later, programmers cannot use mixed SBCS and DBCS data in the REMARKS column of

an OS/390 DB2 stored procedure definition. To enable this use, you need to update the FOREIGNKEY column for the SYSIBM.SYSROUTINES table as follows:

```
UPDATE SYSIBM.SYSCOLUMNS SET FOREIGNKEY=' '  
WHERE TBNAME = 'SYSROUTINES' and NAME='REMARKS';
```

#### **RELATED TASKS**

“Chapter 1. Configuring OS/390 for remote ECD: overview” on page 1

IBM HTTP Server: Planning, Installing, and Using , SC31-8690

IBM HTTP Server Troubleshooting Guide

Domino Go Release 5.0 Webmaster’s Guide , SC31-8691

OS/390: Planning for Installation , GC28-1726

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## Chapter 2. Installing the foreign file system server and job monitor server

This material is intended for the system programmer responsible for installing and maintaining programs. It contains information concerning the material and procedures associated with the installation of the OS/390 IBM Foreign File System, which contains the foreign file system server and the job monitor server. You should read all of this material before installing the OS/390 Foreign File System and then keep it for future reference.

The material contains the following sections:

- “Program materials” on page 6 identifies the basic and optional program materials and documentation for the OS/390 Foreign File System.
- “Program support” on page 6 describes the IBM support available for the OS/390 Foreign File System.
- “Program and service level information” on page 7 lists the APARs (program level) and PTFs (service level) incorporated into the OS/390 Foreign File System.
- “Installation requirements and considerations” on page 7 identifies the resources and considerations for installing and using the OS/390 Foreign File System.
- “Installation instructions” on page 9 provides detailed installation instructions for the OS/390 Foreign File System. It also describes the procedures for activating the functions of VA COBOL V3, or refers to appropriate publications.
- “Notes: the OS/390 Foreign File System install logic” on page 15 provides the install logic for the OS/390 Foreign File System.

Before installing the OS/390 Foreign File System, read “Preventive service planning” on page 6. This section tells you how to find any updates to the information and procedures in this chapter.

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### Description of the the OS/390 Foreign File System components

The OS/390 Foreign File System has two major components:

- The foreign file system (FFS) server provides Windows NT and 2000 users with transparent access to their MVS data sets. Users can connect their MVS systems to their workstation as network drives, and seamlessly explore, edit, copy, delete, and create sequential data sets, partitioned data sets, and partitioned data set members. The FFS server on OS/390 functions as an extension of the IBM HTTP Server. The FFS client on the workstation functions as an installable file system.
- The job monitor server provides Windows NT and 2000 users with function similar to SDSF: the ability to view job status, view job output, and purge, cancel, and release jobs and job output.

The OS/390 Foreign File System and the associated clients are available with VisualAge COBOL V3.

### OS/390 Foreign File System FMID

The OS/390 Foreign File System consists of the following FMID:

HFBN100

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## Program materials

An IBM program is identified by a program number and a feature number. The program number for VA COBOL V3 is 5639-I44.

Basic machine-readable materials are materials that are supplied under the base license and feature code, and are required for the use of the product. Optional machine-readable materials are orderable under separate feature codes, and are not required for the product to function.

### Basic machine-readable material

The OS/390 Foreign File System is distributed on the VA COBOL V3 CD-ROM. The OS/390 Foreign File System is provided on the CD-ROM in a format that can be uploaded to the OS/390, expanded into SMP/E RELFILE format, then installed using SMP/E. See “Installation instructions” on page 9 for more information about how to install the program.

The following table describes the OS/390 file content of the CD-ROM:

Directory	Name	Description
Hfbn100	FBN.IBM.HFBN100.SEQ5JCL	Sample job to allocate sequential data sets on the OS/390 for the compressed RELFILES and SMPMCS
Hfbn100	FBN.IBM.HFBN100.F1.BIN	RELFILE in compressed form
Hfbn100	FBN.IBM.HFBN100.F2.BIN	RELFILE in compressed form
Hfbn100	FBN.IBM.HFBN100.F3.BIN	RELFILE in compressed form
Hfbn100	FBN.IBM.HFBN100.F4.BIN	RELFILE in compressed form
Hfbn100	FBN.IBM.HFBN100.SMPMCS	SMPMCS file

### Optional machine-readable material

No optional machine-readable materials are provided for the OS/390 Foreign File System.

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## Program support

This section describes the IBM support available for the OS/390 Foreign File System.

### Program services

Contact your IBM representative for specific information about available program services.

### Preventive service planning

Before installing the OS/390 Foreign File System, you should review the current preventive service planning (PSP) information. Contact the IBM Support Center or use S/390 SoftwareXcel to obtain the current PSP bucket.

PSP buckets are identified by upgrades, which specify product levels, and subsets, which specify the FMIDs for a product level. The subset value for the OS/390 Foreign File System is HFBN100. Check the IBM COBOL Web site for the upgrade value, as well as for additional support and preventive service information.

## Statement of support procedures

Report any difficulties you have using this program to your IBM Support Center. If an APAR is required, the Support Center will provide the address to which any needed documentation can be sent.

The following table identifies the component IDs (COMPID) for the OS/390 Foreign File System:

FMID	COMPID	Component name	RETAIN release
HFBN100	5639I4402	Foreign File System 1.0.0	100

---

## Program and service level information

This section identifies the program and any relevant service levels of the OS/390 Foreign File System. The program level refers to the APAR fixes incorporated into the program. The service level refers to the PTFs integrated.

### Program level information

No APARs have been incorporated into the OS/390 Foreign File System.

### Service level information

No PTFs against this release of the OS/390 Foreign File System have been incorporated into the product.

---

## Installation requirements and considerations

The following sections identify the system requirements for installing and activating the OS/390 Foreign File Systems. The following terminology is used:

- *Driving system*: the system used to install the program
- *Target system*: the system on which the program is installed

In many cases, the same system can be used as both a driving system and a target system. However, you may want to set up a clone of your system to use as a target system by making a separate IPL-able copy of the running system. The clone should include copies of all system libraries that SMP/E updates, copies of the SMP/E CSI data sets that describe the system libraries, and your PARMLIB and PROCLIB.

Some cases where two systems should be used include the following:

- When installing a new level of a product that is already installed, the new product will delete the old one. By installing onto a separate target system, you can test the new product while still keeping the old one in production.
- When installing a product that shares libraries or load modules with other products, the installation can disrupt the other products. Installing onto a test system or clone will allow you to assess these impacts without disrupting your production system.

### Driving system requirements

This section describes the environment of the driving system required to install the OS/390 Foreign File System.

## Machine requirements

The driving system can run in any hardware environment that supports the required software.

## Programming requirements

The following table shows the software requirements for the driving system:

Program number	Product name and minimum VRM/service level
Any <b>one</b> of the following:	
5647-A01	OS/390 SMP/E Version 2 Release 5 with PTF UR51068
5647-A01	OS/390 SMP/E Version 2 Release 6 with PTF UR51068
5647-A01	OS/390 SMP/E Version 2 Release 7 or higher

## Target system requirements

This section describes the environment of the target system required to install and use the OS/390 Foreign File System.

The OS/390 Foreign File System installs in the MVS (Z038) SREL.

## Machine requirements

The target system can run in any hardware environment that supports the required software.

## Programming requirements

### Mandatory requisites

A mandatory requisite is defined as a product that is required without exception; this product either **will not install** or **will not function** unless this requisite is met. This includes products that are specified as REQs or PREs. The mandatory requisite for installing

Program number	Product name and minimum VRM/service level
5647-A01	OS/390 Version 2 Release 5 or higher

### Functional requisites

A functional requisite is defined as a product that is **not** required for the successful installation of this product or for the basic function of the product, but **is** needed at run time for a specific function of this product to work. This includes products that are specified as IF REQs.

See “Installing the prerequisite OS/390 software” on page 3 for the list of functional requisites.

## DASD storage requirements

OS/390 Foreign File System libraries can reside on any currently supported DASD.

The following table lists the total space required for each type of library:

Library type	Total space required
Target	13 tracks
Distribution	31 tracks
HFS	18 tracks

For more information on the names and sizes of the required data sets, please refer to “Allocate SMP/E target and distribution libraries and paths” on page 13.

The following tables describe the target and distribution libraries and HFS paths required to install the OS/390 Foreign File System. The storage requirements of the OS/390 Foreign File System must be added to the storage required by other programs having data in the same library or path.

**Note:** The data in these tables should be used when you determine which libraries can be merged into common data sets. In addition, because some ALIAS names may not be unique, ensure that no naming conflicts will be introduced before you merge libraries.

The following table shows the storage requirements for the OS/390 Foreign File System target libraries:

Library DDNAME	Member type	Target volume	Type	Org	RECFM	LRECL	No. of 3390 tracks	No. of dir blocks
SFBNLOAD	LMOD	ANY	U	PDS	U	0	7	2
SFBNSAMP	Sample	ANY	U	PDS	FB	80	4	3
SFBNSAMV	Sample	ANY	U	PDS	VB	80	2	2

The following table shows the HFS paths for the OS/390 Foreign File System:

DDNAME	Path name
SFBNFBIN	usr/lpp/ffsserver/bin
SFBNFLIB	usr/lpp/ffsserver/lib
SFBNFSAM	usr/lpp/ffsserver/samples
SFBNFWEB	usr/lpp/ffsserver/WebServ

The following table shows the storage requirements for the OS/390 Foreign File System distribution libraries:

Library DDNAME	Type	Org	RECFM	LRECL	No. of 3390 tracks	No. of dir blocks
AFBNMOD1	U	PDS	U	0	8	2
AFBNSAMP	U	PDS	FB	80	6	3
AFBNSAMV	U	PDS	VB	80	2	2
AFBNFFSV	U	PDS	VB	255	15	2

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## Installation instructions

This section describes the installation method and the step-by-step procedures to install the OS/390 Foreign File System.

Please note the following:

- If you want to install the OS/390 Foreign File System into its own SMP/E environment, consult the SMP/E manuals for instructions on creating and initializing the SMPCSI and the SMP/E control data sets.
- Sample jobs have been provided to help perform some or all of the installation tasks. The SMP/E jobs assume that all DDDEF entries required for SMP/E execution have been defined in the appropriate zones.
- The SMP/E dialogs may be used instead of the sample jobs to accomplish the SMP/E installation steps.

## Installing the OS/390 Foreign File Systems

### SMP/E considerations

This release of the OS/390 Foreign File System is installed using the SMP/E RECEIVE, APPLY, and ACCEPT commands. The SMP/E dialogs may be used to accomplish the SMP/E installation steps.

### SMP/E options subentry values

The recommended values for some SMP/E CSI subentries are shown in the following table:

Subentry	Value	Comment
DSSPACE	300,150,250	Space allocation for SMPTLIB data sets
PEMAX	SMP/E default	IBM recommends using the SMP/E default for PEMAX.

Use of values lower than these may result in failures in the installation process. DSSPACE is a subentry in the GLOBAL options entry. PEMAX is a subentry of the GENERAL entry in the GLOBAL options entry. Refer to the SMP/E manuals for instructions on updating the global zone.

### SMP/E CALLLIBS processing

The OS/390 Foreign File System uses the CALLLIBS function provided in SMP/E to resolve external references during installation. When the OS/390 Foreign File System is installed, ensure that DDDEFs exist for the following libraries:

- SYS1.SCEELKED
- SYS1.CSSLIB

**Note:** The DDDEFs above are used only to resolve the link-edit for the OS/390 Foreign File System using CALLLIBS. These data sets are not updated during the installation of the OS/390 Foreign File System.

### Overview of the installation steps

Here are the steps required to install the OS/390 Foreign File System:

1. "Upload SEQ5JCL from the CD-ROM" on page 11.
2. "Upload the compressed RELFILES and SMPMCS from the CD-ROM" on page 12.
3. "Expand the RELFILES" on page 12.
4. "Allocate and initialize the SMP/E data sets (optional)" on page 13.
5. "Perform SMP/E RECEIVE" on page 13.
6. "Allocate SMP/E target and distribution libraries and paths" on page 13.
7. "Create DDDEF Entries" on page 14.
8. "Perform SMP/E APPLY" on page 14.

9. "Perform SMP/E ACCEPT" on page 14.

### Upload SEQ5JCL from the CD-ROM

There is a sample job provided on the CD-ROM that will allocate sequential data sets on the OS/390 for the four compressed RELFILES and SMPMCS contained on the CD-ROM. Do the following to upload it from the CD-ROM to the OS/390:

1. Allocate a data set for it on the OS/390. You can do this by submitting the job below. Add a job card and modify the parameters to meet your site's requirements before submitting.

```
//ALLOC1 EXEC PGM=IEFBR14
//*
//FTPALLO DD DSN=hlq.IBM.HFBN100.SEQ5JCL,
// DISP=(NEW,CATLG,DELETE),
// DSORG=PS,
// RECFM=FB,
// LRECL=80,
// BLKSIZE=6160,
// SPACE=(TRK,(2,1)),
// UNIT=SYSALLDA
//* VOL=SER=&TVOL1
```

2. Upload the file in binary format from the CD-ROM to the OS/390 data set. If the CD-ROM is attached to a Windows NT system, you can use FTP from a command prompt to upload the file. In the sample dialog shown below, commands or other information entered by the user are in bold, and the following values are assumed:

User enters:	Values
mvsaddr	TCP/IP address of the OS/390
tsouid	Your TSO user ID
tsopw	Your TSO password
d:	Your CD-ROM drive
hlq	High-level qualifier you used for the data set you allocated in the job above

```
C:\>ftp mvsaddr
Connected to mvsaddr.
220-FTPD1 IBM FTP CS V2R8 at mvsaddr, 07:18:16 on 2000-05-11.
220 Connection will close if idle for more than 60 minutes.
```

```
User (mvsaddr:(none)): tsouid
```

```
331 Send password please.
Password: tsopw
230 tsouid is logged on. Working directory is "tsouid".
```

```
ftp> cd ..
250 "" is the working directory name prefix.
```

```
ftp> cd hlq
250 "hlq." is the working directory name prefix.
```

```
ftp> binary
200 Representation type is Image
```

```
ftp> put d:\hfbn100\ibm.hfbn100.seq5jcl ibm.hfbn100.seq5jcl
200 Port request OK.
125 Storing data set hlq.ibm.hfbn100.seq5jcl
250 Transfer completed successfully.
```

8400 bytes sent in 0.34 seconds (24.63 Kbytes/sec)

```
ftp> quit
221 Quit command received. Goodbye.
```

## Upload the compressed RELFILES and SMPMCS from the CD-ROM

1. Edit and submit sample job SEQ5JCL to allocate data sets for these files on the OS/390. Consult the instructions in the sample job for more information.
2. Upload the files in binary format from the CD-ROM to the OS/390 data set. If the CD-ROM is attached to a Windows NT system, you can use FTP from a command prompt to upload the files:

```
C:\>ftp mvsaddr
Connected to mvsaddr.
220-FTPD1 IBM FTP CS V2R8 at mvsaddr, 07:18:16 on 2000-05-11.
220 Connection will close if idle for more than 60 minutes.
```

```
User (mvsaddr:(none)): tsouid
```

```
331 Send password please.
Password: tsopw
230 tsouid is logged on. Working directory is "tsouid."
```

```
ftp> cd ..
250 "" is the working directory name prefix.
```

```
ftp> cd hlq
250 "hlq." is the working directory name prefix.
```

```
ftp> binary
200 Representation type is Image
```

```
ftp> prompt
Interactive mode Off.
```

```
ftp> mput d:\hfbn100\ibm.hfbn100.f*
200 Port request OK.
125 Storing data set hlq.IBM.HFBN100.F1.BIN
250 Transfer completed successfully.
194960 bytes sent in 0.39 seconds (499.90 Kbytes/sec)
200 Port request OK.
125 Storing data set hlq.IBM.HFBN100.F2.BIN
250 Transfer completed successfully.
202720 bytes sent in 0.40 seconds (506.80 Kbytes/sec)
200 Port request OK.
125 Storing data set hlq.IBM.HFBN100.F3.BIN
250 Transfer completed successfully.
1280 bytes sent in 0.00 seconds (1280000.00 Kbytes/sec)
200 Port request OK.
125 Storing data set hlq.IBM.HFBN100.F4.BIN
250 Transfer completed successfully.
471200 bytes sent in 0.91 seconds (517.23 Kbytes/sec)
```

```
ftp> put d:\hfbn100\ibm.hfbn100.smpmcs
200 Port request OK.
125 Storing data set hlq.IBM.HFBN100.SMPMCS
250 Transfer completed successfully.
3760 bytes sent in 0.00 seconds (3760000.00 Kbytes/sec)
```

```
ftp> quit
221 Quit command received. Goodbye.
```

## Expand the RELFILES

You can expand the RELFILES by using the TSO receive command:

```

receive inda('hlq.ibm.hfbn100.f1.bin')
receive inda('hlq.ibm.hfbn100.f2.bin')
receive inda('hlq.ibm.hfbn100.f3.bin')
receive inda('hlq.ibm.hfbn100.f4.bin')

```

### Allocate and initialize the SMP/E data sets (optional)

You can install the VA COBOL OS/390 components in the same SMP/E zone as OS/390 Version 2 Release 5 (or later) or in a different zone.

- If you install into existing SMP/E data sets, make sure that you have enough space.
- If you plan to install into an existing zone, the cluster should have already been allocated and primed. You can go on to the next step to perform an SMP/E RECEIVE.
- To install into a new zone, you will need to allocate and prime the SMPCSI cluster.

### Perform SMP/E RECEIVE

The sample installation jobs to help you install the OS/390 Foreign File System are listed in the following table:

Job name	Job type	Description	RELFILE
FBNIRECV	RECEIVE	Sample RECEIVE job	IBM.HFBN100.F1
FBNIALLO	ALLOCATE	Sample job to allocate target and distribution libraries	IBM.HFBN100.F1
FBNISMKD	MKDIR	Sample job to invoke the supplied FBNIMKDR EXEC to allocate HFS paths	IBM.HFBN100.F1
FBNIDDDF	DDDEF	Sample job to define SMP/E DDDEFs	IBM.HFBN100.F1
FBNIAPPL	APPLY	Sample APPLY job	IBM.HFBN100.F1
FBNIACCP	ACCEPT	Sample ACCEPT job	IBM.HFBN100.F1

Before you edit and submit these jobs, you may want to copy them to another data set, so that you have the original to refer to.

Edit and submit sample job FBNIRECV to perform the SMP/E RECEIVE for the OS/390 Foreign File System. Consult the instructions in the sample job for more information.

**Expected return codes and messages:** You will get a return code of 0 if the jobs run correctly.

### Allocate SMP/E target and distribution libraries and paths

Edit and submit sample job FBNIALLO to allocate the SMP/E target and distribution libraries for the OS/390 Foreign File System. Consult the instructions in the sample job for more information.

**Expected return codes and messages:** You will get a return code of 0 if the jobs run correctly.

Edit and submit sample job FBNISMKD to allocate the HFS paths for the OS/390 Foreign File System. Consult the instructions in the sample job for more information.

If you plan to create a new HFS for this product, you should consider updating the BPXPRMxx PARMLIB member to mount the new HFS at IPL time. This may be helpful if an IPL occurs before the installation is complete.

**Expected return codes and messages:** You will get a return code of 0 if the jobs run correctly.

### Create DDDEF Entries

Edit and submit sample job FBNIDDDF to create DDDEF entries for the SMP/E target and distribution libraries for the OS/390 Foreign File System. Consult the instructions in the sample job for more information.

**Expected return codes and messages:** You will get a return code of 0 if the jobs run correctly. You may receive the following message for the first CHANGE command in the DEFPATH step: 'GIM2650W THE PATH SUBENTRY WAS NOT CHANGED.' This message is expected and can be ignored. If you receive this message, a return code of 4 is expected for the DEFPATH step.

### Perform SMP/E APPLY

Edit and submit sample job FBNIAPPL to perform an SMP/E APPLY CHECK for the OS/390 Foreign File System. Consult the instructions in the sample job for more information.

To receive the full benefit of the SMP/E Causer SYSMOD Summary Report, do *not* bypass the following on the APPLY CHECK: PRE, ID, REQ, and IFREQ. This is because the SMP/E root cause analysis identifies the cause only of **ERRORS** and not of **WARNINGS** (SYSMODs that are bypassed are treated as warnings, not errors, by SMP/E).

After you have taken any actions indicated by the APPLY CHECK, remove the CHECK operand and run the job again to perform the APPLY.

**Note:** The GROUPEXTEND operand indicates that SMP/E apply all requisite SYSMODs. The requisite SYSMODs might be applicable to other functions.

**Expected return codes and messages:** You will get a return code of 0 if the jobs run correctly.

### Perform SMP/E ACCEPT

Before you perform the SMP/E ACCEPT, you may want to do the configuration documented in "Chapter 4. Configuring the foreign file system server" on page 21. This includes a procedure for verifying the install.

Edit and submit sample job FBNIACCP to perform an SMP/E ACCEPT CHECK for the OS/390 Foreign File System. Consult the instructions in the sample job for more information.

To receive the full benefit of the SMP/E Causer SYSMOD Summary Report, do *not* bypass the following on the ACCEPT CHECK: PRE, ID, REQ, and IFREQ. This is because the SMP/E root cause analysis identifies the cause only of **ERRORS** and not of **WARNINGS** (SYSMODs that are bypassed are treated as warnings, not errors, by SMP/E).

Before using SMP/E to load new distribution libraries, it is recommended that you set the ACCJCLIN indicator in the distribution zone. This will cause entries produced from JCLIN to be saved in the distribution zone whenever a SYSMOD

containing inline JCLIN is accepted. For more information on the ACCJCLIN indicator, see the description of inline JCLIN in the SMP/E manuals.

After you have taken any actions indicated by the ACCEPT CHECK, remove the CHECK operand and run the job again to perform the ACCEPT.

**Note:** The GROUPEXTEND operand indicates that SMP/E apply all requisite SYSMODs. The requisite SYSMODs might be applicable to other functions.

**Expected return codes and messages:** You will get a return code of 0 if the jobs run correctly.

If PTFs containing replacement modules are being accepted with SMP/E, SMP/E ACCEPT processing will link-edit or bind the modules into the distribution libraries. During this processing, the Linkage Editor or Binder may issue messages documenting unresolved external references, resulting in a return code of 4 from the ACCEPT step. These messages can be ignored, because the distribution libraries are not executable and the unresolved external references will not affect the executable system libraries.

## **Notes: the OS/390 Foreign File System install logic**

### **SMP/E modification control statements**

The SMP/E modification control statements (SMPMCS) for the OS/390 Foreign File System are contained in the SMPMCS file uploaded from the distribution CD. The SMPMCS for each FMID in the product will be loaded to the SMPPTS data set, with a member name matching the FMID, when you receive the FMID with SMP/E RECEIVE. You can browse or print these members using TSO/E, ISPF, or IEBGENER (or IEBPTPCH).

### **SMP/E JCLIN**

The JCLIN for the OS/390 Foreign File System is contained in the RELFILES uploaded from the distribution CD. These files will be loaded to disk by SMP/E when you receive the product with SMP/E RECEIVE. You can browse or print these files using TSO/E, ISPF, or IEBGENER (or IEBPTPCH).

The files containing JCLIN are:

FMID HFBN100: hlq.IBM.HFBN100.F1(HFBN100)

**Note:** The high-level qualifier (hlq) is the qualifier specified as the DSPREFIX in the SMP/E OPTIONS.



---

## Chapter 3. Configuring the IBM HTTP Server

You will be setting up the server to run in nonsecure mode. Details are available in the IBM HTTP Server documentation. (We use IBM HTTP Server to refer to all the server versions, but you might be using Domino Go Webserver if you have OS/390 Version 2 Release 5 or 6.) Your installation may have additional requirements such as workload management and proxy caching, but the OS/390 Foreign File System does not need these.

You can configure the IBM HTTP Server to your specifications by setting permissions, configuring language, customizing the server environment, and so on. You must do this configuring from the OS/390 UNIX shell using the Web administration user ID and group, by either of these methods:

- Edit a copy of the configuration file (named `httpd.conf` by default).
- Use the Configuration and Administration forms (a combination of CGI programs and HTML forms).

Each method of configuring changes the statements (called directives) in the configuration file. Restart the server after you make changes to ensure that the changes take effect.

The following steps are based on the HTTP Server directions for installing it the first time (as opposed to migrating from a previous version of the server):

1. Create the IMWEB OS/390 UNIX System Services group ID and the WEBADM user ID. You will use these to configure the server.
2. Create the WEBSRV OS/390 UNIX System Services user ID. This user ID will run the server. Give this user ID permission to BPX.SUPERUSER and BPS.SERVER.
3. Turn on program control, by using code such as:  

```
RDEFINE PROGRAM * ADDMEM('SYS1.SCEERUN'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM * ADDMEM('CBC.SCLBDLL'//NOPADCHK) UACC(READ)
RDEFINE PROGRAM * ADDMEM('SYS1.LINKLIB') UACC(READ)
SETROPTS WHEN(PROGRAM) REFRESH
```

In this example, \* is all programs in the data set or a specified program in the specified data set.  
Indicate that the server and Language Environment LOADLIBs are trusted programs.
4. Make TCP/IP configuration adjustments. By default, both the HTTP Server and the OS/390 Foreign File System use port 80. You need not activate the simple network management protocol (SNMP) for the OS/390 Foreign File System.
5. Copy and customize the JCL for starting the server (IMWPROC). If you changed any of the default names, you need to make similar changes in this JCL.
6. Configure the installed files by using the configuration directives. If you installed the server in a different path, for example, than `/usr/lpp/internet/`, substitute your install path.

You can start the server using the start-up procedure IMWEBSRV. Make sure the procedure is a member in a PROCLIB data set. Enter the following command from the OS/390 operator console:

You can also start the proc when TCP/IP is started by adding START IMWEBSRV to the TCP/IP profile. Or you can use the httpd command, which is also documented in Appendix B of the IBM HTTP Server planning manual.

“Example: JCL for starting the IBM HTTP Server” on page 19

#### RELATED TASKS

“Installing the prerequisite OS/390 software” on page 3

IBM HTTP Server: Planning, Installing, and Using , SC31-8690

IBM HTTP Server Troubleshooting Guide

Domino Go Release 5.0 Webmaster’s Guide , SC31-8691

“Chapter 1. Configuring OS/390 for remote ECD: overview” on page 1

#### RELATED REFERENCES

“HTTP directives for the OS/390 Foreign File System”

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## HTTP directives for the OS/390 Foreign File System

You need to configure the following directives for the IBM HTTP Server to operate with the OS/390 Foreign File System. You can probably use the default settings for the other directives. However, review all the directives shown in the server documentation to make sure that the defaults are appropriate for your environment.

---

### Type: Tuning

The MaxPersistRequest directive specifies the maximum number of requests that the server will allow on a persistent connection. VisualAge COBOL requires a value of 5 or greater. Specify the MaxPersistRequest directive as follows:

```
MaxPersistRequest 5
```

---

### Type: GWAPI application processing

You need to enable the Go Webserver API (GWAPI) services used by VisualAge COBOL and provide the paths for the VisualAge COBOL server routines. The file /ffsserver/samples/fbnfconf contains sample configuration information for the foreign file system:

```
Enable FFS_WOPEN /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvr
Enable FFS_GET /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvr
Enable FFS_GETFILE /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvr
Enable FFS_GETFILEINFO /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvr
Enable FFS_DIR /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvr
Enable FFS_DELETE /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvr
Enable FFS_RENAME /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvr
Enable FFS_RMDIR /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvr
Enable FFS_ALLOCATE /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvr
Enable FFS_CONNECT /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvr
Enable FFS_STCMDSRV /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvr
ServerInit /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvrInit TRACE_ERRORS
ServerTerm /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvrTerm
Service /FFSDS* /usr/lpp/ffsserver/lib/fbnfmain.dll:ffssrvr*
Pass /FBN-PUB/* /usr/lpp/ffsserver/WebServ/*
```

If you did not install into the default path (usr/lpp/ffsserver), you need to change the paths accordingly.

Prepend these directives to the Web server configuration file

---

## Type: Directories

The settings for these directives control the kind of information presented in directory listings. The OS/390 Foreign File System requires the following settings:

DirAccess	on	DirShowBrackets	on
DirReadme	top	DirShowCase	on
DirShowIcons	on	DirShowHidden	off
DirShowDate	on	DirShowBytes	off
DirShowSize	on	DirShowMaxDescrLength	25
DirShowDescription	on	DirShowMinLength	15

### RELATED TASKS

“Chapter 3. Configuring the IBM HTTP Server” on page 17

IBM HTTP Server: Planning, Installing, and Using , SC31-8690

Domino Go Webmaster’s Guide , SC31-8691

---

## Example: JCL for starting the IBM HTTP Server

If you changed any of the default names while configuring the IBM HTTP Server, you need to make similar changes in this JCL.

```
//IMWPROC PROC LE Parm=,ICSPARM=
//*****
/* PARM='LE runtime opts/ICS parms'
/*
/* LE Parm ==> LE runtime opts
/* LE Parm='ENVAR("_CEE_ENVFILE=/etc/httpd.envvars.tmp")'
/*
/* ICSPARM ==> Internet Connection Server parameters
/* # Standalone HTTPD
/* ICSPARM='-p 8080
/* # WLM Queue Manager
/* ICSPARM='-SN WEBSN1 -p 8080
/* # WLM ApplEnv Queue Server
/* ICSPARM='-SN WEBSN1 -AE WEBHTML'
/*
/* Internet Connection Server Parameters:
/* -SN # WLM - subsystem name
/* -AE # WLM - Application Environment
/*
/* -fscp nnn # File system codepage - EBCDIC
/* -netcp nnn # net code page - ASCII
/*
/* -gc_only # clean cache & exit (garbage collect)
/*
/* -normalmode
/* -p nnnn # use port nnn (default 80)
/* -sslmode
/* -sslport nnnn # use port nnn (default 443)
/* -nosec # no security
/*
/* -nosmf # no smf processing on
/* -smf # smf processing on
/*
/* -r /etc/httpd.conf # use rule file xxxx
/* -restart
/* -v # trace to stderr
/* -vv # trace all to stderr
/* -vc # cache trace to stderr
```

```

/*
/* -version # show version and exit
/*
/* xxxxxx # ServerRoot xxxxxx; Pass /*
/*
/******
//WEBSRV EXEC PGM=IMWHTTPD,REGION=0K,TIME=NOLIMIT,
// PARM=('&LEPARM/&ICSPARM')
//*****
//SYSIN DD DUMMY
//OUTDSC OUTPUT DEST=HOLD
//SYSPRINT DD SYSOUT=*,OUTPUT=(*.OUTDSC)
//SYSERR DD SYSOUT=*,OUTPUT=(*.OUTDSC)
//STDOUT DD SYSOUT=*,OUTPUT=(*.OUTDSC)
//STDERR DD SYSOUT=*,OUTPUT=(*.OUTDSC)
//SYSOUT DD SYSOUT=*,OUTPUT=(*.OUTDSC)
//CEEDUMP DD SYSOUT=*,OUTPUT=(*.OUTDSC)

```

## RELATED TASKS

“Chapter 3. Configuring the IBM HTTP Server” on page 17

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## Chapter 4. Configuring the foreign file system server

To install the code for the foreign file system server, do the following steps:

1. Modify the Web server file `/etc/httpd.envvars` to point to the directories where the executables for the foreign file system server reside. To do this, append the paths as follows:

Append to this variable (in <code>httpd.envvars</code> file):	Path where the following files were installed:	Default value
LIBPATH variable	<code>fbnfmain.dll</code> and <code>fbnfdir.dll</code>	<code>/usr/lpp/ffsserver/lib</code>
PATH variable	<code>fbnflock</code> and <code>fbnfscmd</code>	<code>/usr/lpp/ffsserver/bin</code>

2. Add the environment variable `FFSPATH` to the `httpd.envvars` file, setting it to the path where `fbnflock` was installed. The default value is `/usr/lpp/ffsserver/bin`.
3. If your TCP/IP stack on the OS/390 does not have the default name `TCPIP`, you must identify the stack by putting the following line into `httpd.envvars`:  
`_BPXK_SETIBMOPT_TRANSPORT=tcpiptestackname`

Here *tcpiptestackname* is the name of your TCP/IP stack. See *UNIX System Services Planning* for a description of the `_BPXK_SETIBMOPT_TRANSPORT` environment variable.

4. Set the file permissions for UNIX System Services to `rxw r_x r_x` by issuing the following commands:

```
chmod +rx fbnfmain.dll
chmod +rx fbnfdir.dll
chmod +rx fbnflock
chmod +rx fbnfscmd
```

5. To mark the files as Program Controlled, issue the following commands:.

```
extattr +p fbnfmain.dll
extattr +p fbnfdir.dll
extattr +p fbnflock
```

6. The foreign file system server by default opens port 15000 for direct conversation with the workstation. If this port number cannot be used in your installation, add the environment variable `FFS_START_PORT` to the `httpd.envvars` file, setting it to a number to start looking for an available port.
7. The foreign file system server uses both the `AF_UNIX` and `AF_INET` socket domains. To support this use, make sure that both domains are identified in the `BPXPRMxx` parmlib member using `FILESYSTYPE` and `NETWORK` statements. For example:

```
FILESYSTYPE TYPE(UDS) ENTRYPPOINT(BPXTUINT)
NETWORK DOMAINNAME(AF_UNIX)
    DOMAINNUMBER(1)
    MAXSOCKETS(1024)
    TYPE(UDS)
FILESYSTYPE TYPE(INET) ENTRYPPOINT(BPXTIINT)
NETWORK DOMAINNAME(AF_INET)
    DOMAINNUMBER(2)
    MAXSOCKETS(1024)
    TYPE(INET)
```

In the example above, the MAXSOCKETS value has been increased from the default of 64 to 1024 for both the AF\_UNIX and AF\_INET domains. This is recommended. In particular, the foreign file system server makes extensive use of AF\_UNIX domain sockets to improve performance.

For more information about these statements and the BPXPRMxx parmlib member in general, see *UNIX System Services Planning*.

You can verify that the foreign file system server has been installed correctly without testing it through VisualAge COBOL. From a browser on the workstation, enter the following address:

`http://systemname:webserverport/FFSDS/`

Here *systemname* is the TCP/IP host name or address of the OS/390 system, and *webserverport* is the port number for the IBM HTTP Server (the default is 80). FFSDS must be uppercase, and the final slash (/) must be used. You should see the home page for the foreign file system server.

#### **RELATED TASKS**

“Installing the prerequisite OS/390 software” on page 3

“Chapter 1. Configuring OS/390 for remote ECD: overview” on page 1

#### **RELATED REFERENCES**

UNIX System Services Planning , SC28-1890 (about the \_BPXK\_SETIBMOPT\_TRANSPORT environment variable and BPXPRMxx parmlib member)

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## Chapter 5. Configuring the job monitor server

Using the earlier steps for installing the OS/390 Foreign File System, you installed the following data sets from the CD to your system:

Load module	SFBNLOAD(FBNJMON)
Configuration file	SFBNSAMV(FBNJCNFG)
JCL file	SFBNSAMP(FBNJJCL)

Use the following steps to configure the job monitor server on the host:

1. Accept the default port (6715), or change it in the configuration file as shown in the following sample:

```
AUTHMETHOD=RACF
CODEPAGE=UTF-8
HOST_CODEPAGE=IBM-1047
JES=JES2
JESNAME=JES2
LISTEN_QUEUE_LENGTH=5
MAX_DAEMONS=10
MAX_DATASETS=32
MAX_THREADS=200
SERV_PORT=6715
TIMEOUT_INTERVAL=1200
TIMEOUT=3600
TZ=PST5PDT
```

Both the client and the server must be configured with the same port number. If you change the server port number, the developers must also change the client port number by using the MVS connections manager.

2. Accept the default host codepage (IBM-1047), or change it in the configuration file. The workstation codepage is set to UTF-8 and should not be changed.
3. Use the JES parameter in the configuration file to indicate whether you use JES2 or JES3.
4. Modify the JCL for starting the job monitor server to ensure that the data set names match the installation names, specify the system for execution, and fit your installation.
5. Submit the JCL to start the job monitor. You can use the netstat command to check whether the job monitor is listening to the configured port.

In order to allow users to execute operations via the job monitor, they must be given access authority to the OPERCMDS class. This can be done conditionally, so that the users' access is only in effect when he or she is using the job monitor. To use this conditional access checking, you must have the CONSOLE class active and the JMON console defined in the CONSOLE class.

For example, you would issue the following RACF commands:

```
SETROPTS CLASSACT(CONSOLE)
RDEFINE CONSOLE JMON UACC(READ)
```

Then, to give conditional access (e.g. to permit users to issue JES2 commands only while running under the job monitor):

```
RDEFINE OPERCMDS JES2.** UACC(NONE)
PERMIT CLASS(OPERCMDS) JES2.** ID(userid or groupid) ACCESS(CONTROL)
WHEN(CONSOLE(JMON))
```

#### **RELATED TASKS**

“Installing the prerequisite OS/390 software” on page 3

“Chapter 1. Configuring OS/390 for remote ECD: overview” on page 1

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## Chapter 6. Installing and configuring the TSO commands server (optional)

The TSO commands server uses an APPC/MVS transaction to execute TSO commands. The FFS server starts the APPC transaction (IGYFSERV), which acts as a host server to execute TSO commands that are issued from the workstation through TCP/IP. APPC is not required on the workstation because it communicates with IGYFSERV through TCP/IP.

Each workstation can have an active connection to each host at the same time.

The following steps are in preparation for configuring the server on the host. You (the system programmer or APPC administrator) may already have done the first and third steps:

1. Install, configure, and start TCP/IP on your OS/390 system.
2. Verify access through TCP/IP by using the TSO command HOMETEST. TCP/IP must be able to respond to a GETHOSTBYNAME request. Therefore, a domain name server must exist and know the name of the MVS TCP/IP stack that has access to it, or the domain name must be defined to TCP/IP directly.
3. Install the remote edit-compile-debug component of COBOL for OS/390 & VM, and apply the PTF for APAR PQ21350.

The system programmer or APPC administrator needs to do the following steps to configure the command facility:

1. Start APPC and the APPC transaction scheduler (ASCH) subsystem, which handles incoming requests for local transaction programs.
2. Define the APPC transaction that will act as a command server for VisualAge COBOL. You can use the IGYFTPAD sample JCL to define this transaction.
3. Define the scheduling information for the APPC/MVS transaction scheduler by using the ASCHPMxx member of SYS1.PARMLIB. Include a definition of the class to be used by the transaction program IGYFSERV (in IGYFTPAD). For example:

```
CLASSADD
  CLASSNAME(DEFAULT)
  MAX(20)
  MIN(1)
  MSGLIMIT(5000)
```

```
OPTIONS
DEFAULT(DEFAULT)
```

```
TPDEFAULT
  REGION(2M)
  TIME(5)
  MSGLEVEL(1,1)
  OUTCLASS(9)
```

4. Control the dispatching priority of the IGYFSERV transaction program by using parameters for the systems resource manager (SRM) to associate IGYFSERV with a domain and performance group. Because IGYFSERV issues TSO commands, it should be assigned to a TSO performance group.
5. Define a default OMVS segment for the system or for each user who needs to use remote edit-compile-debug.

6. Make the following parts available on the host system:
  - IGYFTPAD (the JCL that defines the APPC server transaction), in SIGYSAMP
  - IGYFSERV (REXX CLIST for the command server), in SIGYCLST

If you cannot use the command facility, there are two main areas where problems can arise: connecting to MVS and starting the APPC server transaction.

If you do not see the messages about setting up APPC, check the system log for RACF messages or other messages related to the command that was issued or the user ID that issued it. Common causes of problems include:

- You do not have read authority to the SIGYCLST data set.
- TCP/IP is not active, or MVS is unreachable (not pingable) due to network problems, a bad IP address, or other problems.

If you see the messages about setting up APPC but do not see the message confirming that setup succeeded, the APPC server transaction was probably unable to start. If the error log (*userid.IGYFSERV.&TPDATE.&TPTIME.LOG*) for the conversation exists, check it. Some of the likely causes of problems are:

- The TCP/IP stack is not using the default name of TCPIP, and the SYSTCPD DD card has not been set or is pointing to the wrong data set.
- The server was unable to allocate SYSPROC or SYSTSPRT.
- The JCL points to the wrong SYSPROC. (SYSPROC needs to point to the SIGYCLST data set.)
- The server could not open or access the message\_data\_set.
- There are not enough APPC scheduler initiators available.
- APPC or ASCH address spaces are not active.
- The class named DEFAULT is not defined to the APPC scheduler ASCH.
- There is no default OMVS segment for the system, and the user does not have an OMVS segment.

“Example: JCL for defining the APPC transaction”

## RELATED TASKS

“Installing the prerequisite OS/390 software” on page 3

“Chapter 1. Configuring OS/390 for remote ECD: overview” on page 1

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## Example: JCL for defining the APPC transaction

For the TSO commands server, the job card and some of the JCL in IGYTPAD need to be modified to meet the requirements of your site. The user ID for the IGYTPAD job must be authorized to APPC before you run the job.

```

1 //IGYFTPAD JOB (XX,YY),CLASS=A,MSGCLASS=A,MSGLEVEL=(1,1)
2 /**
3 //TPADD EXEC PGM=ATBSDFMU
4 //SYSPRINT DD SYSOUT=*
5 //SYSSDLIB DD DSN=SYS1.APPCTP,DISP=SHR
6 //SYSSDOUT DD SYSOUT=*
7 //SYSIN DD DATA,DLM='QT'
8     TPADD
9         TPNAME(IGYFSERV)
10        ACTIVE(YES)
11        TPSCHED_DELIMITER(DLM1)
12        KEEP_MESSAGE_LOG(ERROR)
13        MESSAGE_DATA_SET(&SYSUID.IGYFSERV.&TPDATE.&TPTIME.LOG)
14        DATASET_STATUS(MOD)

```

(1)

```

15          CLASS(DEFAULT)                                (2)
16          JCL_DELIMITER(DLM2)
17 //IGYFSERV JOB                                          (3)
18 /**
19 //IKJACCNT EXEC PGM=IKJEFT01,DYNAMNBR=50,PARM='%IGYFSERV TIMEOUT=60' (4)
20 //SYSPROC DD DSN=IGYV2R10.SIGYCLST,DISP=SHR            (5)
21 //SYSPRINT DD SYSOUT=*
22 /** SYSTCPD DD DSN=SYS1.TCPIP.DATA,DISP=SHR            (6)
23 /** SYSTSPRT DD DSN=&SYSUID..IGYFSERV.OUTPUT,DISP=SHR
24 //SYSTSPRT DD SYSOUT=*                                  (7)
25 //SYSTSIN DD DUMMY
26 DLM2
27 DLM1
28 QT

```

1. The transaction name in IGYTPAD must match the transaction name in IGYFINIT. If you change the transaction name in IGYTPAD, you must also change it in IGYFINIT, but changing IGYFINIT is not recommended.
2. Define the transaction class as a class that has enough initiators to allow one for each user of remote edit-compile-debug in VisualAge COBOL. Here the transaction class is named DEFAULT; you probably need to change this to the appropriate transaction class.
3. Update the job card as needed for items such as output classes.
4. Adjust the timeout value to a positive whole number of minutes. By default, the transaction (IGYFSERV) is set to time out after 60 minutes of inactivity. If a user on the workstation tries to issue a TSO command after the server has timed out, there will be a delay of a few seconds while the server transaction is restarted.
5. Allocate SYSPROC to the SIGYCLST data set, which is where IGYFINIT and IGYFSERV reside.
6. SYSTCPD is needed only when your installation uses a nondefault ID for TCPIP. If you use a different stack name, then you need to activate this line and point it to the DSN=*hlq*.TCPIP.DATA, which specifies the user ID of the active TCPIP stack.
7. The output of SYSTSPRT is normally discarded. However, if there are problems, the output can be diverted to a data set (named in line 23) for analysis.

## RELATED TASKS

“Chapter 6. Installing and configuring the TSO commands server (optional)” on page 25



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## Chapter 7. Configuring OS/390 for remote debugging under CICS

Debug Tool consists of two partitioned data sets:

- SEQAMOD data set, which contains the Debug Tool load modules
- SEQASAMP data set, which contains samples for Debug Tool

The only configuring that Debug Tool needs is for CICS.

For a developer to use TCP/IP sessions to carry the communications for remote debugging of CICS applications, a systems administrator needs to take the following actions:

1. Update the CICS system definition (CSD).
  - a. Merge the supplied Debug Tool definitions into your existing job for maintaining the CSD. The statements for defining Debug Tool are in the member EQACCSO, which is in the sample library SEQASAMP.
  - b. Make sure that the CSD group that is used during CICS startup includes the CSD group that is associated with the Debug Tool library routines. The group name for the Debug Tool routines is EQA in the sample EQACCSO.
2. Update the CICS destination control table (DCT).
  - a. Merge the required Debug Tool definitions into your existing job for maintaining the DCT. The statements for defining Debug Tool are in the member EQACDCT, which is in the sample library SEQASAMP.
  - b. Make sure that EQACDCT contains definitions to create DCT entries for the transient data queues that Debug Tool uses. They are defined as extra partition data queues. Do not add DD statements to the CICS JCL startup deck for these queues. For information on the DFHDCT macro and on defining queues and associated buffers, see *CICS/ESA Resource Definition Guide*.
3. Update the CICS startup job.
  - a. Make sure that all of the Debug Tool modules that are defined in EQACCSO (as well as modules for language libraries, such as IBM OS/390 Language Environment, and any user modules that may be called during the debugging session) are in libraries that CICS can access. You can make the libraries accessible by including them in the concatenation for the DFHRPL DD in the CICS startup JCL. For an example of a CICS startup job, see *CICS/ESA Operations Guide*.
  - b. Put the SEQAMOD library in the DFHRPL concatenation.
4. Update the CICS authorized library.
  - a. Make sure that the Debug Tool module EQA00DYN resides in one of the authorized libraries that CICS can access. This access can be through authorized libraries in the STEPLIB concatenation, through a JOBLIB, or through an OS/390 LINKLST data set.
  - b. Depending on the method you choose, you might need to copy EQA00DYN from SEQAMOD to one of the authorized libraries.
5. Unless you already activated TCP/IP in the CICS region, activate it including setting up, configuring, and starting CICS TCP/IP.

For a detailed explanation on activating TCP/IP in the CICS region, see *CICS TCP/IP Socket Interface Guide and Reference*.

#### **RELATED TASKS**

“Installing the prerequisite OS/390 software” on page 3

“Chapter 1. Configuring OS/390 for remote ECD: overview” on page 1

#### **RELATED REFERENCES**

CICS TCP/IP Socket Interface Guide and Reference , SC31-7131

CICS/ESA Resource Definition Guide , SC33-1166

CICS/ESA Operations Guide , SC33-0668

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## Appendix. Notices

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## Glossary

The terms in this glossary are defined in accordance with their meaning in COBOL and cover all platforms where IBM COBOL is used. These terms may or may not have the same meaning in other languages.

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### A

**adapter.** Software or hardware that enables connecting systems or computers.

### C

**code page.** An assignment of graphic characters and control function meanings to all code points. For example, one code page could assign characters and meanings to 256 code points for eight-bit code, and another code page could assign characters and meanings to 128 code points for seven-bit code. For example, the usual IBM code page for English on the workstation is IBM-850 and on the host is IBM-1047.

**connection.** (1) In system communications, a line over which data can be passed between two systems or between a system and a device. (2) In TCP/IP, the path between two protocol applications that provides reliable data stream delivery service. In the Internet, a connection extends from a TCP application on one system to a TCP application on another system. (3) In SNA, the network path that links together two logical units (LUs) in different nodes to enable them to establish communications.

### D

**data set.** In MVS, a named collection of related data records that is stored and retrieved by means of an assigned name.

**Distributed Debugger.** A client-server application that enables you to detect and diagnose errors in programs that run on systems accessible through a network connection or that run on your workstation. The

Distributed Debugger uses a graphical user interface where you can issue commands to control the execution (remote or local) of your program.

### E

**environment variable.** Any of a number of variables that describe the way an operating system is going to run and the devices it is going to recognize.

### F

**fully qualified domain name.** In the Internet suite of protocols, the name of a host system that includes all of the subnames of the domain name. For example, `mycomputer.city.company.com` is a fully qualified domain name. Synonymous with *fully qualified name*. See also *host name*.

### G

**Go Webserver Application Programming Interface (GWAPI).** An interface to the Web server that allows you to extend the base functions of the server. You can, for example, write extensions to enhance the basic authentication or replace it with a site-specific process. The Go Webserver has been renamed IBM HTTP Server.

**GWAPI.** See *Go Webserver API (GWAPI)*.

### H

**host name.** In the Internet suite of protocols, the name given to a computer. Sometimes this term is used to mean the fully qualified domain name and sometimes it is used to mean the most specific subname of a fully qualified domain name. For example, if `mycomputer.city.company.com` is the fully qualified domain name, either that name or `mycomputer` may be considered the host name. See also *fully qualified domain name*.

**HTTP.** See *Hypertext Transfer Protocol (HTTP)*.

**Hypertext Transfer Protocol (HTTP).** In the Internet suite of protocols, the protocol that is used to transfer and display hypertext documents.

### I

**Internet Protocol (IP).** In the Internet suite of protocols, a connectionless protocol that routes data

through a network or interconnected networks and acts as an intermediary between the higher protocol layers and the physical network.

## J

\* **job.** A unit of work defined by a user that is to be accomplished by a computer. Loosely, the term *job* is sometimes used to refer to a representation of a job. This representation may include a set of computer programs, files, and control statements to the operating system.

**job control language (JCL).** A control language used to identify a job to an operating system and to describe the job's requirements.

## L

**link.** (1) The combination of the link connection (the transmission medium) and two link stations, one at each end of the link connection. A link can be shared among multiple links in a multipoint or token-ring configuration. (2) To interconnect items of data or portions of one or more computer programs; for example, linking object programs by a linkage editor to produce an executable file.

## N

**network.** (1) A configuration of data-processing devices and software connected for information interchange. (2) A group of nodes and the links interconnecting them.

## P

**password.** A unique string of characters that a program, computer operator, or user must supply to meet security requirements before gaining access to data.

**port.** (1) To modify a computer program to enable it to run on a different platform. (2) In the Internet suite of protocols, a specific logical connector between the Transmission Control Protocol (TCP) or the User Datagram Protocol (UDP) and a higher-level protocol or application. A port is identified by a port number.

**port number.** In the Internet suite of protocols, the identifier for a logical connector between an application entity and the transport service.

**procedure.** In MVS, a named collection of job steps that can be included in a job.

## Q

**qualifier.** (1) A modifier that makes a name unique. (2) All names in a qualified name other than the rightmost name, which is the simple name.

## R

**remote.** Pertaining to a system or program that is accessed through a connection that uses a communications protocol such as TCP/IP or APPC.

**remote debugger daemon.** A program that starts the Distributed Debugger for remote debugging by making a connection with Debug Tool on the host. Synonymous with *user interface daemon* and *remote debugger*.

**remote debugging.** Debugging on your workstation a program that runs on a system accessible through a network connection. The Distributed Debugger on the workstation uses Debug Tool on the host to debug the host code.

**remote edit-compile-debug (ECD).** Using the editor, compiler, and debugger on the workstation to edit, compile, or debug programs that reside on a host.

\* **run time.** The time at which an object program is executed. Synonymous with *object time*.

**run-time environment.** The environment in which a COBOL program executes.

## S

**server.** (1) A functional unit that provides shared services to multiple users or workstations over a network such as a file server. (2) In TCP/IP, a system in a network that handles the requests of a system at another site. (3) Software that provides functionality that can be requested by other software. (4) A platform on which software executes, such as an application server or a database server.

## T

**TCP/IP.** See *Transmission Control Protocol/Internet Protocol*.

**Transmission Control Protocol (TCP)).** A communications protocol used in the Internet and in any network that follows the Internet Engineering Task Force (IETF) standards for internetwork protocol. TCP provides a reliable host-to-host protocol between hosts in packet-switched communications networks and in interconnected systems of such networks. It uses the Internet Protocol (IP) as the underlying protocol.

**Transmission Control Protocol/Internet Protocol (TCP/IP).** The Transmission Control Protocol and Internet Protocol, which together provide reliable end-to-end connections between applications over interconnected networks of different types. See also *Transmission Control Protocol* and *Internet Protocol*.

## W

**Web server.** A server that is connected to the Internet and is dedicated to serving Web pages. Most Web servers provide the Common Gateway Interface (CGI), which is a programming interface allowing you to call on server resources such as databases or files while creating dynamic content. In addition, most Web servers offer more specialized application programming interfaces (APIs) that circumvent the limitations of CGI. See also *HTTP* and *Go Webserver Application Programming Interface (GWAPI)*.

**workstation.** A generic term for computers used by end users including personal computers, 3270 terminals, intelligent workstations, and UNIX terminals. Often a workstation is connected to a mainframe or to a network.



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## List of resources

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### VisualAge COBOL

*Fact Sheet*, GC26-9052

*Getting Started*, GC26-8944

*Language Reference*, SC26-9046

*Programming Guide*, SC27-0812

*Visual Builder User's Guide*, SC26-9053

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### Related publications

#### COBOL for OS/390 & VM

*Compiler and Run-Time Migration Guide*, GC26-4764

*Debug Tool Reference Summary*, SX26-3840

*Debug Tool User's Guide and Reference*, SC09-2137

*Diagnosis Guide*, GC26-9047

*Fact Sheet*, GC26-9048

*Installation and Customization under OS/390*,  
GC26-9045

*Language Reference*, SC26-9046

*Licensed Program Specifications*, GC26-9044

*Programming Guide*, SC26-9049

#### OS/390 Language Environment

*Debugging Guide and Run-time Messages*, SC28-1942

*Programming Guide*, SC28-1939

*Programming Reference*, SC28-1940

#### CICS/ESA

*Operations Guide*, SC33-0668

*Resource Definition Guide*, SC33-1166

#### IBM HTTP Server

*Planning, Installing, and Using*, SC31-8690

*Troubleshooting Guide*

*Domino Go Release 5.0 Webmaster's Guide*,  
SC31-8691

*OS/390: Planning for Installation*, SC28-1726

#### TCP/IP

*Customization and Administration*, SC31-1734

*CICS TCP/IP Socket Interface Guide and Reference*,  
SH31-7131



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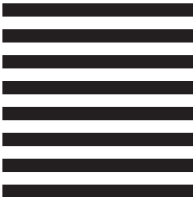
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