Configuring FTP

This chapter provides guidelines to help you customize Cisco IOS for S/390 for your site. The topics covered in this chapter include

- File Transfer Protocol (FTP) Service Statement

  Describes how to use the SERVICE statement to configure your FTP Statement.
- FTP Configuration Parameters—FTP Statement

  Describes how to use the FTP statement to define the configuration parameters for the server.
- Generic Attributes Table (GAT)

  Describes how to use the Generic Attributes Table (GAT) statement to specify data set attributes by data set type to be used by the FTP site command.
- FTP Support for SMF Activity Reporting and User Accounting

  Describes how account data is defined on logon and exit from FTP.
- FTPSRC and FTPLOGIN Exits

  Describes how to define global user exits.

File Transfer Protocol (FTP) Service Statement

The SERVICE statements define the user-level services provided by Cisco IOS for S/390 and the well-known port numbers. The most common ones are TELNET, VTAMAPPL, FTP, LPR, and USMTP/SSMTP. Refer to Chapter 10, Protocol Service Segment (SERVICE) for a complete description of the SERVICE statement.

FTP SERVICE Statement Syntax

SERVICE NAME (*FTP***)**
MODULE (FTPS)
PORT (*number***)**
[QLISTEN (*number***)]**
[TCP | UDP]

Syntax Description

NAME (**FTP**) Provides the FTP server.

Default: None

MODULE (**FTPS**) Specifies the name of the primary load module (1 to 8 characters) to be started as the user-level protocol process (ULPP). FTPS is controlled by Component Key Authorization.

Default: None

PORT (*number*) Specifies the well-known port number for the ULPP (1:4095).

Default: None

QLISTEN (*number*) Specifies the number of entries to be allocated in the Queued Listen Table. This value indicates the number of unspecified (wild) listens to be queued for determination as to whether the connection should be accepted or rejected.

Default: 5

TCP | UDP Specifies the higher-level protocol module that provides the transport service for the ULPP. The only valid UDP service is UDPSERV.

Default: TCP

Example

Standard Server FTP (Port 21)

```
SERVICE   NAME(FTP)
   MODULE(FTPS)
   PORT(21)
   TCP
```

FTP Configuration Parameters—FTP Statement

Use the FTP statement to define the configuration parameters for the File Transfer Protocol (FTP) server.

FTP Statement Syntax

FTP [ABORT | NOABORT]

[ACCOUNT (*userid account* **)]**

[ACCTREQ | NOACCTREQ]

[APPEND | NOAPPEND]

[AUTORECALL | SITERECALL | NORECALL]

[CD | NOCD]

[CHARSET (*sbcs dbcs* **{CHAR | DBCS | MIX})]**

[CONDDISP (CATLG | DELETE)]

[DATACLOSE (*time***)]**

[DATAIDLE (*number*) **| IDLE** (*number*)**]**

[DATAOPEN (*time*)**]**

[DATAPORTTOS (*tos_value*)**]**

[DATASETMODE | DIRECTORYMODE]

[DEBUG]

[DEFGAT (*name*)**]**

[DEFPRFX (TSOPREFIX | NONE | USERID | *userid*)**]**

[EXPDTCHK | NOEXPDTCHK]

[GUEST (*logonid password*)**]**

[HSM (*number1 number2*)**]**

[IBUF (*numbuf bufsize max_numbuf max_bufsize*)**]**

[ISPFENQ | NOISPFENQ]

[ISPFRES | NOISPFRES]

[LABEL (BLP | NOBLP, NL | NONL)]

[LISTFMT (OLD | IBM | SHORT)]

[LKEDRES | NOLKEDRES]

[MIGRATEVOL (*volser*)**]**

[MOUNT (*def_wait_time*, *max_wait_time*)**]**

[NDAB (*number1 number2*)**]**

[NLSTCASE (UPPER | LOWER)]

[NOPERSIST | PERSIST]

[OBUF (*numbuf bufsize max_numbuf max_bufsize*)**]**

[OUTLIM (*number*)**]**

[OVERWRITE | NOOVERWRITE]

[PAD (B | O | Z | C | *hex1* **[B | O | Z | CC |** *hex2*]**)]**

[PORT (*number*)**]**

[RDW/NORDW]

[RELEASE | RLSE | NORELEASE | NORLSE]

[SITEALLOC (NEW | ALL)]

[SITEREPLY (200 | 500)]

[SITEOVERWRITE]

[STRIP | NOSTRIP]

[TABS (*nN*)**]**

[TRANTBL (*tranname*)**]**

[UNIT (*name*)]

[WRAPRECORD | NOWRAPRECORD]

[VOLUME (*volser*)]

Syntax Description

ABORT | NOABORT

Selects data connection termination when a permanent I/O (exception) error is detected during data transfer.

NOABORT—Causes a TCP FIN to be sent.

ABORT—Causes a TCP RESET.

Use caution when selecting ABORT because some remote hosts close the control connection as well as the data connection.

Default: NOABORT

ACCOUNT (*userid account*)

Specifies the user ID and account number in sublist notation (1 to 8 characters each) to be used for FTP overhead accounting.

Default: (OVERHEAD 0000)

ACCTREQ | NOACCTREQ

Specifies whether FTP is to prompt for account data at login.

NOACCTREQ—FTP does not require account data at login.

ACCTREQ—FTP prompts for account data at login.

Default: NOACCTREQ

APPEND | NOAPPEND

Specifies whether an APPEND operation to an existing MVS data set is allowed.

Default: APPEND

AUTORECALL | SITERECALL | NORECALL

Specifies the HSM recall environment.

AUTORECALL—Migrated data sets are recalled automatically when referenced.

SITERECALL—User is required to issue the SITE RECALL command before a migrated data set can be recalled.

NORECALL—All requests for migrated data sets fail.

NORECALL and HSM() are mutually exclusive.

Default: AUTORECALL

CD | NOCD

Specifies whether to allow directory commands.

Certain client FTP processes (for example, Novell LAN workplace) do not work properly with directory commands enabled.

Default: CD

CHARSET (*sbcs dbcs* {**CHAR | DBCS | MIX**})

Specifies single and double byte character set, and default Server translation mode for the Data Transfer port.

SBCS—Defines the single-byte character set used for ASCII to EBCDIC and EBCDIC to ASCII single-byte translation.

dbcs—Defines the double-byte character set used for ASCII to EBCDIC and EBCDIC to ASCII double-byte translation.

CHAR—Defines the default character translation mode as single byte.

DBCS—Defines the default character translation mode as double byte.

MIX—Defines the default character translation mode as single byte and/or double byte.

Use the TRANTBL parameter for the control port.

For more information about special translate tables, read Chapter 19, Translation Tables.

Default: ENGLISH single-byte character set. No double-byte character set CHAR mode.

CONDDISP (CATLG | DELETE)

Specifies the default conditional disposition of new data sets when a STOR operation fails.

Default: CATLG.

DATACLOSE (*time*)

Specifies the time, in seconds, the server will wait for a data connection to close. Minimum value = 30 seconds. Maximum value =1439 minutes.

Default: 60

DATAIDLE (*number*) | **IDLE** (*number)*

Specifies the maximum amount of time (60:86340), in seconds, that FTP should wait for transfer of one buffer (see the descriptions of the IBUF and OBUF operands in the Usage Notes following this description). This is used to detect a failed remote host during data transfer.

Default: 60

DATAOPEN (*time*)

Specifies the time, in seconds, the server will wait for a data connection to open. Minimum value = 30 seconds. Maximum value =1439 minutes.

Default: 1800

DATAPORTTOS (*tos_value*)

Specifies a value to be used as the TOS (type of service) in the IP header of FTP traffic on the data port.
Range 0 to 255. Alias(es) DPTOS, TOS.

Default: unless the IP statement contains an overriding TOS default.

DATASETMODE | DIRECTORYMODE

Specifies whether directory output (LIST/NLST) will be displayed in data set mode or directory mode.

Default: DATASETMODE

DEBUG

Activates the debugging option to provide tracing information on commands submitted during the FTP session.

The DEBUG option can be used interchangeably with the TRACE and DEBUG commands.

DEFGAT (*name*)

Specifies a data set type in a GAT (Generic Attributes Table) statement to be used as a default attribute entry. Read the description of the GAT statement.

Default: None

DEFPRFX (TSOPREFIX | NONE | USERID | *userid*)

Specifies installation default prefix (high level qualifier(s)) when data sets are not fully qualified.

TSOPREFIX—Specifies that the TSO prefix from the security system's database be used as the default working directory. Use this option only if the security system supports TSO profile information (specifically, the data set name prefix) and supports the SAF interface to retrieve it.

NONE—Prefixing is not performed.

USERID—User's sign on ID is used as a prefix.

userid—Installation defined character string.

Default: USERID

EXPDTCHK | NOEXPDTCHK

Specifies that FTP perform expiration date checking (EXPDTCHK). NOEXPDTCHK specifies that no date checking is performed.

If you do not set up an automated response to IBM WTOR IEC507D, you should code EXPDTCHK or let it default to that value. Otherwise Cisco IOS for S/390 will hang until WTOR IEC507D receives a reply from an operator.

Default: EXPDTCHK

GUEST (*logonid password*)

Specifies the logon user ID and password in sublist notation (1 to 8 characters each) to be used for anonymous logons. This is passed to the security system in lieu of the default user ID, ANONYMOUS, and the default password, GUEST.

Default: (GUEST XXXXXXXX)

HSM (*number1 number2*)

Specifies the default and maximum wait times for an HSM recall.

number1—Defines the default wait time in minutes an HSM recall has to complete before the request is cancelled. The integer value specified in the SITE RECALL command overrides the default.

number2—Defines the maximum amount of time in minutes an HSM recall can wait before the request is cancelled. This number is used to validate the integer specified in a SITE RECALL command. Must not exceed 1439.

See Usage Notes for information about timeouts and FTP to Tape.

Default: (5 1439)

IBUF (*numbuf bufsize max_numbuf max_bufsize*)

Specifies in sublist notation the number of network input buffers (*numbuf*) and the buffer size (*bufsize*) to be used as defaults, and the maximum buffer number (max_numbuf) and buffer size (*max_bufsize*) that may be specified on the SITE command. If the maximum values are not specified or are set to zero, the SITE IBUF command is not permitted.

Each number must not exceed 32767.

Default: 16 2048

ISPFENQ | NOISPFENQ

Specifies that the ISPF enqueue facility be activated (ISPFENQ) or deactivated (NOISPFENQ).

Read Generic Attributes Table (GAT) for more information to support PDS enqueue.

Default: NOISPFENQ

ISPFRES | NOISPFRES

Enables (ISPFRES) or disables (NOISPFRES) the RESERVE logic for the SPFEDIT ENQ, if the volume on which the PDS resides is shared by Multiple Systems (UCB shared bit ON). This assures data integrity while the PDS you are accessing is being simultaneously accessed by an ISPF user from another system.

Read Generic Attributes Table (GAT) for more information to support PDS enqueue.

Default: NOISPFRES

LABEL (BLP | NOBLP, NL | NONL)

Controls the types of label processing permitted.

BLP—Bypass label processing permitted.

NOBLP —Bypass label processing not permitted.

NL—Non-label tapes permitted.

NONL—Non-label tapes not permitted.

Default: NOBLP, NONL

LISTFMT (OLD | IBM | SHORT)

Specifies whether output from the data set LIST command will be in the old Cisco IOS for S/390 format, in the IBM-standard format, or in a shortened IBM-compatible format. The short format leaves out data set extents and tracks allocated, but improves LIST response time.

Certain PC-based client FTP packages expect the LIST output from a host configured as OS/MVS to be in standard IBM format.

Default: OLD

LKEDRES | NOLKEDRES

Enables (LKEDRES) or disables (NOLKEDRES) the RESERVE logic for the SYSIEWLP ENQ, if the volume on which the PDS resides is shared by Multiple Systems (UCB shared bit ON). This assures data integrity while the PDS you are accessing is being simultaneously accessed by the linkage editor from another system.

Read Generic Attributes Table (GAT) for more information to support PDS enqueue.

Default: NOLKEDRES

MIGRATEVOL (*volser*)

Specifies the default volume serial number for migrated data sets.

Default: MIGRAT

MOUNT (*def_wait_time*, *max_wait_time*)

Indicates tape mounts are supported if the *def_wait_time* parameter has a non-zero value. Omission of this parameter, or specifying MOUNT(0), turns off tape support.

def_wait_time—Indicates the default time in minutes that FTP allows for any operation involving operator intervention on a tape unit.

max_wait_time—Indicates the highest value permitted on the **SITE MOUNT()** command.

When a tape drive unit is not available FTP will retry the request every 30 seconds until this time expires.

See Usage Notes for more information about timeout considerations.

Default: (0,1439)

NDAB (*number1 number2*)

Specifies the number of DASD (DISK) buffers used by FTP for reading or writing disk data sets by default (*number1*), and the maximum buffer number permitted on the SITE NDAB command (*number2*). If *number2* is not specified or is set to zero, the SITE NDAB command is not permitted. The size of each buffer is the block size of the data set. At least two should be specified to overlap I/O. MVS has an upper limit of 99 buffers.

Default: 4

NLSTCASE (UPPER | LOWER)

Specifies whether the output from an NLST command will be upper- or lowercase. If LOWER is specified and the data set or member list is part of the current directory, the names are returned in lower case.

NLSTCASE(LOWER) is supplied to facilitate MGET functions from FTP clients on systems that use lowercase file names.

Default: UPPER

NOPERSIST | PERSIST

Specifies whether SITE parameters will be reset following data transfer. If NOPERSIST is used, all SITE parameters are reset after each data transfer. If PERSIST is used, all SITE parameters remain in effect until explicitly changed via subsequent SITE commands, or reset with SITE RESET.

Default: NOPERSIST

OBUF (*numbuf bufsize max_numbuf max_bufsize*)

Specifies in sublist notation the number of network output buffers (*numbuf*) and the buffer size (*bufsize*) to be used as defaults, and the maximum buffer number (*max_numbuf*) and buffer size (*max_bufsize*) that may be specified on the SITE command. If the maximum values are not specified or are set to zero, the SITE OBUF command is not permitted.

Each number must not exceed 32767.

Default: 16 2048

OUTLIM (*number*)

Specifies the maximum number of records which can be submitted to the MVS internal reader in one file transfer (SITE SUBMIT). This parameter is used for the OUTLIM parameter to JES.

Default: 250000

OVERWRITE | NOOVERWRITE

Specifies whether a file transfer to an existing MVS data set can write over that data set.

Default: OVERWRITE

PAD (**B | O | Z | C |** *hex1* [**B | O | Z | CC |** *hex2*])

Pad character(s) to pad network records or lines to fixed-length logical records when data is stored (via STOR or APPE) or deleted from fixed- length logical records when data is retrieved (via RETR). The first value is the sbcs pad character; the second value is the dbcs pad character.

B—Pad with blanks.

O—Pad with all ones.

Z—Pad with zeros.

C—A one byte character other than B, O, or Z (sbcs).

CC—A two byte character other than B, O, or Z (dbcs).

hex1—Any valid one byte hex value (sbcs), represented by 2 hex digits.

hex2—any valid two byte hex value (dbcs), represented by 4 hex digits

Default: (B Z)

PORT (*number*)

Specifies the port for the control connection. Normal usage is port 21.

Default: 21

RDW/NORDW

Specifies whether (Record Descriptor Word) RDWs will be sent as data for RECFM=VB and RECFM=VBS files. If RDW is selected, the RDW will be sent for binary, ASCII, or EBCDIC transfers.

Default: NORDW

RELEASE | RLSE | NORELEASE | NORLSE

Specifies whether unused space in an MVS data set being written to should be released.

Default: RELEASE

SITEALLOC (NEW | ALL)

Specifies whether certain SITE command data set allocation parameter will be applied to all data sets or only to newly-allocated data sets. If NEW is specified, the SITE command parameters VOLUME, UNIT, LRECL, BLKSIZE, RECFM, and DCBDSN will be applied only to the newly-created data sets.

Default: ALL

SITEREPLY (200 | 500)

Specifies whether a 200 or a 500 reply code will be used when errors occur in processing a SITE command.

Default: 500

SITEOVERWRITE

SITEOVERWRITE specifies that files will not be overwritten unless a SITE OVERWRITE command is received.

STRIP | NOSTRIP

Specifies whether pad characters will be stripped from fixed-length logical records when data is retrieved (via RETR).

Default: STRIP

TABS (*nn*)

Specifies the tab skip value, where *nn* is a digit 0 to 25.

Default: 8

TRANTBL (*tranname*)

Specifies the translate table load module to be used by the control port. tranname can be one of the following:

- ENGLISH
- DANISH
- FCANADA
- FRENCH
- GERMAN
- GSWISS
- ITALIAN
- SPANISH
- SWEDISH

Use the CHARSET parameter for the data port translation.

Default: Translate table specified by TRANTBL parameter on GLOBAL statement in APPCFGxx configuration member.

UNIT (*name*)

Specifies a generic unit name of default direct access volumes to be used for dynamic allocation.

Default: None

WRAPRECORD | NOWRAPRECORD

Specifies whether, when storing, the server will wrap or truncate network records that exceed LRECL.

Default: WRAPRECORD.

VOLUME (*volser*)

Specifies the default volume serial.

Default: None

Usage Notes for the FTP Statement

FTP Parameters of Note

You may need to change these parameters on the FTP statement:

GUEST If you want to allow anonymous/guest capability, enter a valid id and password combination that is known to your security system.

ACCOUNT If you are implementing FTP accounting, enter a user ID and account number to be used for overhead accounting.

UNIT Enter a generic unit name to be used when FTP creates new data sets.

CHARSET Enter the default FTP character translation table to be used. Read Next the logon/welcome displays, as a typical VTAM application logon screen. for a list of the available tables.

ACCTREQ Required for FTP accounting to prompt for the account number.

NOCD If you use Novell LAN Workplace, you must disable the CD/CWD facility.

Customizing the FTP Greeting

You can customize the Server FTP greeting for your site. When you sign on to Server FTP, this is the normal display response:

```
230 Logged in - Host nnn.nnn.nnn.nnn. User uuuuuuuu
```

The Cisco IOS for S/390 administrator can implement a custom login greeting by placing a member named FTPGREET in the HELP data set. Cisco IOS for S/390 searches for this member on the first login to the FTP server after startup. If it is found, its contents are displayed after each successful login to Server FTP.

This is how the greeting displays:

```
230--- GREETINGS ---
 text_of_FTPGREET_member
230 Logged in - Host nnn.nnn.nnn.nnn. User uuuuuuuu
```

Anonymous Logons

Server FTP supports anonymous logon using the standard ANONYMOUS/GUEST user name and password. The logon ID and password provided via the GUEST operand is the user id/password combination supplied to the security system for such logons. In other words, network users logging on to Server FTP using the ANONYMOUS/GUEST logon procedure assume the identity and privileges of the user ID specified in the GUEST operand. If anonymous logon is used, the user must be defined to your security system with specific access privileges.

Timing Out

FTP will timeout a data transfer request if the remote does not complete the data connection in a certain time. If the remote is another MVS system using tapes, or recalling a data set, it will require a tape mount on the remote system before it can complete the data connection. For this reason, FTP will use the *longer* of MOUNT or HSM times, or 30 minutes if neither tape support nor HSM support is configured.

The problem of a remote system using tape data sets should also be considered when configuring DATAIDLE time. If a remote is reading a multivolume data set, for instance, it may have to stop the data transfer between volumes while the next tape is mounted. The DATAIDLE time may expire while this is happening.

For previous users of IBM TCP/IP for MVS FTP Server, these configuration parameters must be specified for product transparency:

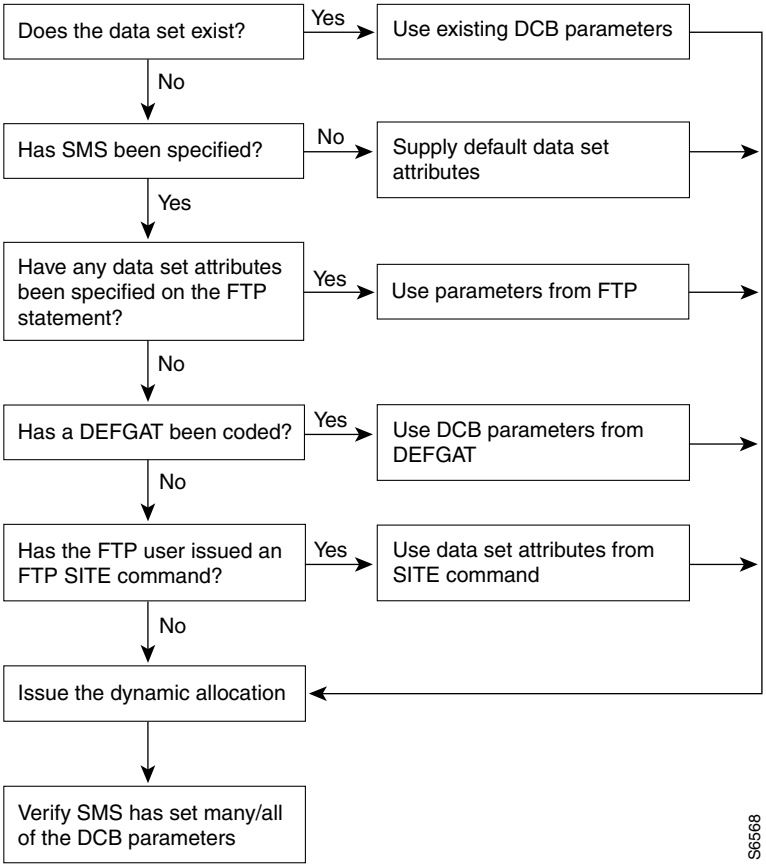
```
FTP SITEALLOC(NEW)
    DEFPRFX(TSOPREFIX)
    SITEREPLY(200)
    DATACLOSE(120)
    DATAIDLE(120)
    DATAOPEN(60)
    TABS(0)
    PERSIST
```

SMS Control Via GLOBAL Statements

When the SMS parameter is specified on the GLOBAL statement of the APPCFGxx member, the Server FTP will not supply default data set attributes. Instead, it gives SMS the ability to control the allocation of data sets. The Server FTP only provides DCB parameters that the System Administrator specified on the FTP DEFGAT statement, or that the user has explicitly specified with the SITE command.

For example, if SMS is specified, only allocation parameters from the FTP of DEFGAT statements or the SITE command are used for dynamic allocation of new data sets. If SITE RESET is sent, the values default to either your APPCFGxx-supplied values or to the specified defaults. See the following diagram for more details.

Figure 11-1 Flow of FTP when SMS Parameter Specified on HOST Statement



Buffers

The IBUF and OBUF values are negotiated by FTP with the API before the data port is opened. If the values exceed the API maximum values as specified in the TCP Statement, they will be reduced. For instance, the actual buffer space that will be allocated for the receiving data from the network will be equal to the lower of the TCP MAXRCVBUF value, or to the following:

```
lower(FTP IBUF(numbuf), TCP MAXQRECV)
x lower(FTP IBUF(bufsize), TCP MAXLTRCV)
```

For more information and recommendations on IBUF, OBUF, and NDAB parameters, see the chapter on tuning in the *Cisco IOS for S/390 System Management Guide*.

PDS Enqueue Parameters

Use the PDS enqueue parameters ISPFENQ, ISPFRES, and LKEDRES to comply with the MVS/ISPF conventions that ensure data set integrity when opening partitioned data sets in an UPDATE mode.With this feature, FTP provides for simultaneous access to a Partitioned Data Set (PDS) during data transfer. That is, a user can browse or edit any members in the PDS while an FTP data transfer is in progress.

The PDS enqueue mechanism is activated whenever you execute an FTP STOR, APPEND, DELETE, or RENAME operation on members of PDS or PDS/E data sets. This mechanism allows concurrent FTP users to simultaneously access data stored as members of the same PDS.

Normal member locking mechanisms will be in place. If a member is open in edit mode and FTP attempts to access it, an error message is returned to the user with a notice that the member is in use.

The PDS enqueue mechanism follows the conventions described in the IBM document *Interactive System Productivity Facility (ISPF) Planning and Customizing*. This information is in Appendix B of Version 4 Release 1 for MVS.

FTP Examples

This example shows the usage of the FTP statement:

```
FTP  GUEST(DEMO1 NOPASSWD)
  ACCOUNT(ACCES 0000)
  UNIT(SYSDA)
  IBUF(10 2048)
  OBUF(10 2048)
  ACCTREQ
  NORECALL
  NDAB(8)
  OUTLIM(400000)
```

This example shows how to configure the FTP statement to support PDS Enqueue:

```
FTP  ISPFENQ
  ISPFRES
  LKEDRES
```

This example demonstrates the usage of additional parameters:

```
FTP  GUEST(GUEST XXXXXXXX)
  ACCOUNT(OVERHEAD 0000)
  PORT(21)
  IBUF(20 2048)
  OBUF(20 2048)
  LABEL(NOBLP NONL
  MOUNT(def_wait_time, max_wait_time)
  DEFGAT(FILE)
  AUTORECALL
  PAD(B B)
  UNIT(SYSALLDA)
  CHARSET(ENGLISH)
  TRANTBL(ENGLISH)
```

Generic Attributes Table (GAT)

The Generic Attributes Table (GAT) statements are a series of predefined attributes for certain types of file transfers. Use the GAT statement to specify data set attributes by data set type to be used by the FTP SITE command.

You must retain all the GAT statements distributed because Cisco IOS for S/390 expects them. New ones can be added and referenced in the FTP SITE parameter or the DEFGAT parameter of the FTP statement. The FTP SITE command is documented in the *Cisco IOS for S/390 User's Guide.*

GAT Statement Syntax

GAT TYPE (*name*)

[BLKSIZE (*number*) **]**

[COMPACT]

[CONDDISP (CATLG | DELETE)]

[DATACLAS (*data_class_name*)**]**

[DCBDSN (*data_set_name*)**]**

[EXPDT (*expiration_date*) **| RETPD** (*retention_period*)**]**

[ISPFENQ | NOISPFENQ]

[ISPFRES | NOISPFRES]

[LABEL (*type*)**]**

[LKEDRES | NOLKEDRES]

[LRECL (*number*) **]**

[MANAGEMENTCLAS (*management_class_name*) **]**

[PARALLELMOUNT]

[PDSE]

[PRIVATE]

[RECFM (F | FA | FB | FBA | V | VB | VM | VS | VBA | VBS | VBSA | U)]

[SPACE ({ CYL | TRK | BLK } ([*pri* **] [** *sec* **] [** *dir* **]))]**

[STORCLAS (*storage_class_name*) **]**

[UNIT (*unitname*) **]**

[UNITCOUNT (*count*) **]**

[VOLUME (*volser*) **]**

Syntax Description

BLKSIZE (*number*)	Specifies the physical block size (0:65535) associated with the TYPE data set. Default: 6080
COMPACT	Specifies IDRC compaction for 3480 tapes.

CONDDISP(CATLG | DELETE)

Specifies the conditional disposition of new data sets when a STOR operation fails.

Default: CATLG.

DATACLAS (*data_class_name*)

Specifies the SMS data class.

DCBDSN (*data_set_name*)

Specifies the name of a data set to use as a model for DCB attributes when allocating new data sets.

Default: None.

EXPDT (*expiration_date*) |
RETPD (*retention_period*)

Specifies expiration date and retention period for a new data set.

expiration_date—Format: expiration_date = yyyyddd or yyyy/ddd Where yyyy is a year from 1900 to 2155, ddd is a julian date from 1 to 366. You must include any leading zeroes in the ddd value.

retention_period—Specifies a number of days between 1 and 9999.

EXPDT and RETPD are mutually exclusive.

ISPFENQ | NOISPFENQ

Specifies that the ISPF enqueue facility be activated (ISPFENQ) or deactivated (NOISPFENQ). Read FTP Configuration Parameters—FTP Statement for more parameters for using PDS enqueue.

Default: NOISPFENQ

ISPFRES | NOISPFRES

Enables (ISPFRES) or disables (NOISPFRES) the RESERVE logic for the SPFEDIT ENQ, if the volume on which the PDS resides is shared by Multiple Systems (UCB shared bit ON). This assures data integrity while the PDS you are accessing is being simultaneously accessed by an ISPF user from another system.

Read FTP Configuration Parameters—FTP Statement for more parameters to use PDS enqueue.

Default: NOISPFRES

LABEL (*type*)

Specifies tape label type. These label options are supported:

SL—Standard labels.
NL—No labels.
BLP—Bypass label processing.
LTM—Leading tape mark.
AL—ASCII labels.

Default: SL

LKEDRES | NOLKEDRES

Enables (LKEDRES) or disables (NOLKEDRES) the RESERVE logic for the SYSIEWLP ENQ, if the volume on which the PDS resides is shared by Multiple Systems (UCB shared bit ON). This assures data integrity while the PDS you are accessing is being simultaneously accessed by the linkage editor from another system.

Read FTP Configuration Parameters—FTP Statement for more parameters to use PDS enqueue.

Default: NOLKEDRES

LRECL (*number*)	Specifies the logical record length (1:65535) associated with the TYPE data set. Default: 80
MANAGEMENTCLAS (*management_class_name*)	Specifies the SMS management class.
PARALLELMOUNT	Specifies that each volume of a data set be mounted on a separate device (mutually exclusive with UNITCOUNT). PARALLELMOUNT can be abbreviated to PARALLEL.
PDSE	Allocates PDSEs instead of PDSs.
PRIVATE	Requests private volume.
RECFM (**F** | **FA** | **FB** | **FBA** | **FBS** | **FBSA** | **V** | **VB** | **VM** | **VS** | **VBA** | **VBS** | **VBSA** | **U**)	Specifies the RECFM to be associated with the TYPE data set. Default: FB
SPACE ({ **CYL** | **TRK** | **BLK**} ([*pri*] [*sec*] [*dir*]))	CYL | TRK | BLK—one of these must be coded as shown; specifies allocation unit in cylinders, tracks, or blocks pri—Specifies the number of allocation units in the first allocation request for the TYPE data set. sec—Specifies the number of allocation units for secondary requests for space, used when the primary request is exceeded. dir—Specifies the number of 256-byte directory blocks to be reserved for a partitioned data set (PDS) directory. One block holds from 7 (load module) to 16 (source module) member entries. This parameter indicates a TYPE data set is a PDS. Default: None
STORCLAS (*storage_class_name*)	Specifies the SMS storage class.
TYPE (*name*)	Specifies a data set type (1-8 characters) corresponding to the string that must be specified with an FTP SITE command. If TYPE(TAPE) is used, FTP MOUNT parameters must be set appropriately. The characteristics of this GAT can be changed, particularly the BLK and SPACE parameters. You may also create a new GAT statement and make it the default by pointing to it with DEFGAT. Default: None
UNIT (*unitname*)	Specifies a generic unit to be associated with the TYPE data set. Default: None

UNITCOUNT (*count*) — Specifies the number of devices to be allocated to the data set (mutually exclusive with PARALLELMOUNT). UNITCOUNT can be abbreviated to UCNT.

Default: 1

VOLUME (*volser*) — Specifies an explicit volume to be associated with the TYPE data set.

Default: None

Usage Notes for the GAT Statement

GAT Parameters of Note

You may need to change these parameters on the GAT statement:

TYPE(FILE) This is the default GAT pointed to by the DEFGAT parameter in the FTP statement and it allows you to set the DCB and SPACE parameters. Read Generic Attributes Table (GAT) and Read User/Server SMTP Segment (SMTP) for more information.

PATH The high-level qualifier for the PATH parameter must not be the same high-level qualifier that was used for the Cisco IOS for S/390 data sets.

RECFM, LRECL, and BLKSIZE DCB parameters

Standard rules apply for the relationship between RECFM, LRECL, and BLKSIZE DCB parameters. These are validated in the GAT statement.

Necessary Types

GAT statements must be provided for these types: SOURCE, CARDS, FORTRAN, OBJECT, LOADLIB, TAPE, PRINT. Other statements/types can be added as desired.

DEFGAT parameter

If a DEFGAT parameter is specified on the FTP statement, a GAT statement with the corresponding TYPE must be coded.

TYPE(INTRDR)

A special GAT entry, TYPE(INTRDR), can be coded to implement an installation default for allocation parameters for the internal reader. When a SITE SUBMIT is received, FTP scans the GAT table for a TYPE(INTRDR) entry. This entry provides the file attributes for the internal reader. Only RECFM, LRECL, and BLKSIZE are taken. Other parameters are ignored. If no TYPE(INTRDR) entry is found, the Cisco IOS for S/390 defaults apply (RECFM=FB,LRECL=80,BLKSIZE=20000).

TYPE(LIBRARY)

A special GAT entry, TYPE(LIBRARY), can be coded to provide allocation defaults for the server FTP MKD (make directory) command.

SMS Control of Default Data

In order to have the default data under SMS control, the system administrator must configure the SMS parameter on the GLOBAL statement and must add the following to the GAT statement:

```
GAT   DATACLAS(xxx)        /* all default */
  STORCLAS(XXX)        /* allocations */
  MANAGEMENTCLAS(XXXX)       /* SMS parameters */
  PDSE        /* all PDSs as PDSEs */
```

ISPFENQ, ISPFRES, and LKEDRES Parameters

The GAT parameters ISPFENQ, ISPFRES, and LKEDRES enable the PDS enqueue feature of Cisco IOS for S/390. Read FTP Examples for information and more parameters to use PDS enqueue

GAT Examples

This example shows the usage of the GAT statement:

```
GAT TYPE(SOURCE)    RECFM(FB)   LRECL(80) BLKSIZE(3120)
GAT TYPE(OBJECT)    RECFM(FB)   LRECL(80) BLKSIZE(2960)
GAT TYPE(LOADLIB)   RECFM(U)    LRECL(0) BLKSIZE(6144)
GAT TYPE(CARDS)     RECFM(FB)   LRECL(80) BLKSIZE(3120)
GAT TYPE(PRINT)     RECFM(VBA)  LRECL(137) BLKSIZE(19069)
GAT TYPE(ASM)       RECFM(FB)   LRECL(80) BLKSIZE(3120)
GAT TYPE(CNTL)      RECFM(FB)   LRECL(80) BLKSIZE(3120)
GAT TYPE(PL1)       RECFM(FB)   LRECL(80) BLKSIZE(3120)
GAT TYPE(FORTRAN )  RECFM(FB)   LRECL(80) BLKSIZE(3120)
GAT TYPE(SPECIAL    RECFM(VBS)  LRECL(1000) BLKSIZE(5004)
    UNIT(ADRIVE)       SPACE(BLK(100 200))
GAT TYPE(LOAD2)     RECFM(U)    LRECL(0) BLKSIZE(6144)
    VOLUME(ABC123)     SPACE(TRK(31 45))
```

This example shows how to provide a facility for all data to be under SMS control:

```
GLOBAL SMS   /* Turn on SMS system wide */
GAT TYPE(SOURCE)
    RECFM(FB)
    DATACLAS(xxxx)
    STORCLAS(yyyy)
    MANAGEMENTCLAS(zzzz)
    PDSE
```

This example shows the setting for PDS enqueue.

```
GAT TYPE(FILE) ISPFENQ
GAT TYPE(FILE) ISPFRES
GAT TYPE(FILE) LKEDRES
```

FTP Support for SMF Activity Reporting and User Accounting

Cisco IOS for S/390 collects information about user access and protocol data activity, and records and formats this information for presentation to two different media. The first presentation is in the hard copy log that displays activity using messages and codes. The second presentation uses IBM's System Management Facility (SMF) data collection feature. Cisco IOS for S/390 uses user-provided parameters in IJTCFGxx to determine the degree, if any, of the SMF data recording desired. The SMF records provide useful information that can be displayed or analyzed by the SMF report writer program, T00SMFWR, or by programs provided by other suppliers.

The SMF Accounting Facility provides for the generation of SMF records by the Cisco IOS for S/390 FTP server component. The facility also allows the validation of account data that can be entered at any time using the ACCOUNT command or can be required at user logon through a parameter in APPCFGxx. (Before the SMF Accounting Facility was added to Cisco IOS for S/390, password was the only user identification required when the logon sequence requested use of FTP.) A required account exit routine is provided with the Cisco IOS for S/390 software. An installation can choose to refuse a logon request in the exit routine, and call or load tables or other routines to assist in validating the logon request.

SMF record subtypes support the NLST, LIST, RETR, APPE, and STOR data transfer operations and RNFR/RNTO and DELE commands. User information, such as user identification and accounting information, is provided.

Defining SMF

To support generation of SMF records, use the SMF parameter in IJTCFGxx to set SMF recording on or off, SMF record type, and Cisco IOS for S/390 record subtypes desired. Read FTP Support for SMF Activity Reporting and User Accounting for a description of this statement.

Defining FTP to Require Account Data

To specify that account data is required at user logon (in addition to password), add this ACCTREQ parameter on the FTP statement:

```
ACCTREQ | NOACCTREQ
```

If ACCTREQ is specified...	You are prompted for account data at logon.
If NOACCTREQ is specified...	Account data at logon is not required.

Running an SMP/E APPLY CHECK

You should run an SMP/E APPLY CHECK against any USERMOD that you are trying to install, as there may be additional PREs on your system that are not accounted for. Once you gather this information, add the SYSMOD list(s) to the ++PRE(xxxxxx) statement. Then SMP/E REJECT the USERMOD to remove the invalid entry from the SMP/E CSI. You can then RECEIVE/APPLY the USERMOD with success.

Defining SMF Account Exit

Both source and object code are provided for the Cisco IOS for S/390 account exit, ACEXIT00. The source code is fully documented and annotated and located in the SAMP data set.

The exit program is loaded by Cisco IOS for S/390 at start-up and resides in memory for the life of the Cisco IOS for S/390 job. It is called when a user has provided account information and the ACCTREQ parameter is coded on the FTP statement. The exit can use IBM assembler data management macro calls to load tables or other routines. The default exit is installed in the LINK data set and receives a 144-byte accounting field, SMFACACT, to record the accounting information.

The exit must have the CSECT name ACEXIT00. Use member UMODEX00 in the CNTL data set to install a new or modified exit. Here is an example of UMODEX00:

```
//UMODEX00 JOB
//*
//*    SAMPLE JCL TO RECEIVE AND APPLY USERMOD TO REPLACE
//*    THE SUPPLIED ACCOUNTING EXIT ACEXIT00 WITH USER'S OWN.
//*
//*    GLOBALLY CHANGE THE FOLLOWING STRINGS TO REFLECT THE
//*    CORRECT SMPE DATASETS AND FMID.
//*
//*    'SMPINDX'    <SMP DATASETS HIGH LEVEL QUALIFIER
//*     XXX       < SMPE FMID IDENTIFING MVS TCP/IP FMID
//*
//*    VERIFY THAT THE JOB CARD AND NAMING CONVENTIONS MEET
//*    YOUR SITE'S JCL REQUIREMENTS, THEN SUBMIT THIS JOB.
//*
//SMPE     EXEC PGM=GIMSMP,REGION=4096K,TIME=960,
//         PARM='CSI=SMPINDX.CSI,PROCESS=WAIT'
//SMPHOLD  DD  DUMMY
//SMPLOG   DD  DSN=SMPINDX.SMPLOG,DISP=MOD
//SMPOUT   DD  SYSOUT=HOLDCL
//SMPPTFIN DD  *
++ USERMOD (MU0EX00) .
++ VER (Z038)
   FMID(T000XXX)  /* CHANGE TO CORRECT TCP/IP FMID */ .
++ SRC  (ACEXIT00)  TXLIB(TCPSAMP) DISTMOD(ATCPLOAD) DISTLIB(ATCPSAMP) .
/*
//SMPCNTL  DD  *
 SET BDY(GLOBAL) .
 RECEIVE S(MU0EX00) .
 SET BDY(TCPTZN) .
 APPLY   S(MU0EX00) .
/*
```

FTPSRC and FTPLOGIN Exits

Cisco IOS for S/390 allows you to define global user exits. The FTPRSRCE exit point is used when an FTP command has been received which will cause a data set allocation. The FTPLOGIN exit is defined for when an FTP login is received.

For more information on these exits, read the *Cisco IOS for S/390 Planning Guide*.