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HiCommand® Mainframe Agent User's Guide

MK-96HC130-01

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Document Revision Level

Revision	Date	Description
MK-96HC130-00	June 2006	Initial Release
MK-96HC130-01	June 2007	Revision 1, supersedes and replaces MK-96HC130-00

Preface

This manual explains how to use the following program product:

- HiCommand Mainframe Agent

Hereinafter, this product is abbreviated to *Mainframe Agent*.

This manual is intended for system administrators who install, set up, operate, or troubleshoot Mainframe Agent.

The readers of this manual should have a basic knowledge of:

- The communication servers
- The operating system on which Mainframe Agent is installed (OS/390 or z/OS)
- A knowledge of HiCommand Device Manager

Software Version

This document revision applies to HiCommand Mainframe Agent version 5.7 and higher.

Convention for Storage Capacity Values

Storage capacity values for logical devices (LDEVs) on the Universal Storage Platform are calculated based on the following values:

1 KB (kilobyte) = 1,024 bytes
1 MB(megabyte) = $1,024^2$ bytes
1 GB (gigabyte) = $1,024^3$ bytes
1 TB (terabyte) = $1,024^4$ bytes

Referenced Documents

This manual is part of a related set of manuals. The manuals in the set are listed below:

A manual related to HiCommand:

- *HiCommand Device Manager Command Line Interface (CLI) User's Guide*, MK-91HC0007

Manuals related to OS/390

- *Communications Server: IP User's Guide and Commands*, GC31-8514
- *Program Directory for IBM Library for REXX on zSeries Alternate Library*, GI10-3243
- *MVS Initialization and Tuning Reference,* SC28-1752
- *MVS System Codes*, GC28-1780
- *MVS System Commands*, GC28-1781

- *SecureWay Security Server RACF Security Administrator's Guide*, SC28-1915
- *TSO/E REXX Reference*, SC28-1975
- *eNetwork Communications Server: IP API Guide*, SC31-8516
- *Communications Server IP Configuration Guide*, SC31-8725
- *Communications Server IP Configuration Reference*, SC31-8726

Manuals related to z/OS:

- *Program Directory for IBM Library for REXX on zSeries Alternate Library*, GI10-3243
- *MVS Initialization and Tuning Reference*, SA22-7592
- *MVS System Codes*, SA22-7626
- *MVS System Commands*, SA22-7627
- *Security Server RACF Security Administrator's Guide*, SA22-7683
- *TSO/E REXX Reference*, SA22-7790
- *Communications Server IP Configuration Guide*, SC31-8775
- *Communications Server IP Configuration Reference*, SC31-8776
- *Communications Server IP User's Guide & Commands*, SC31-8780
- *Communications Server IP API Guide*, SC31-8788

Comments

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This chapter explains the purpose of Mainframe Agent. The chapter also lists Mainframe Agent installation requirements, and provides a system configuration example.

- Why Use Mainframe Agent? (section 1.1)
- Installation Requirements (section 1.2)
- System Configuration Example (section 1.3)

1.1 Why Use Mainframe Agent?

Mainframe Agent is a product you can use to display information about mainframe system storage on the Web Client for Device Manager. Mainframe Agent collects information about mainframe system storage in response to a request from Device Manager, and then passes the collected information to Device Manager.

Mainframe Agent allows you to manage both open system and mainframe system storage by using Device Manager only, thus reducing the amount of work involved and the cost of storage management.

1.2 Installation Requirements

This section explains the requirements for using Mainframe Agent.

1.2.1 Operating System Requirements

Mainframe Agent can be used with the following operating systems:

- OS/390 V2R10
- z/OS V1R1 to V1R8

Note: VM environments are not supported.

1.2.2 Application Software Requirements

The following lists the programs required to use Mainframe Agent.

Table 1.1 Programs Required to Use Mainframe Agent

Program Name	Remarks
Device Manager	--
IBM Communications Server (standard OS component)	Mainframe Agent requires two sockets. You must ensure that the total number of sockets does not exceed the maximum value permitted by IBM Communications Server, including the number of sockets for other services that are processed by IBM Communications Server. For details about the maximum number of sockets in IBM Communications Server, see the *Communications Server IP Configuration Guide*.
TSO/E REXX (standard OS component)	--
TSO/E (standard OS component)	--
IBM Library for REXX on zSeries Release 4 (FMID HWJ9140) or IBM Library for REXX on zSeries Alternate Library (FMID HWJ9143)	If neither of the libraries exists, a REXX alternate library (FMID HWJ9143, JWJ9144) is required.

Figure 1.1 shows the relationship between Mainframe Agent and its prerequisite programs.

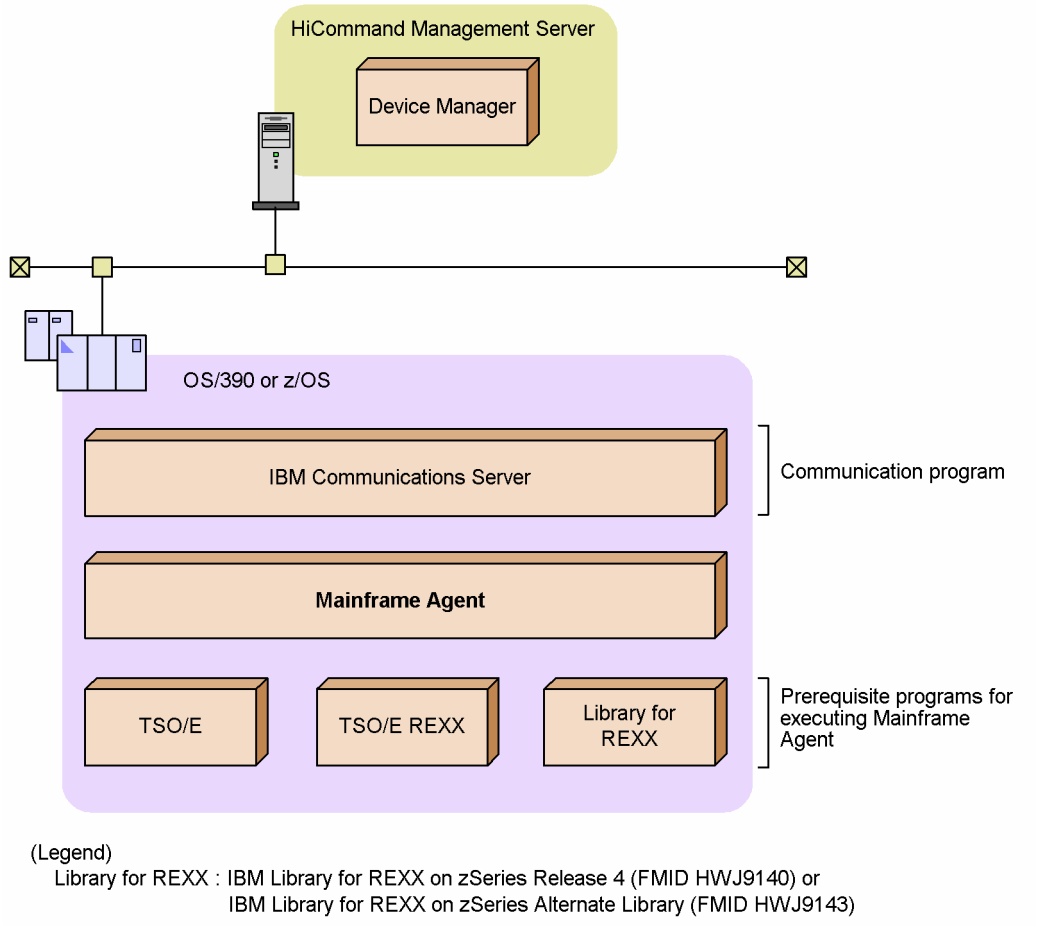

Figure 1.1 Relationship Between Mainframe Agent and Prerequisite Programs

1.2.3 Hardware Requirements

Mainframe Agent can be used with the following Hitachi disk subsystems:

- Lightning 9900V Series
- TagmaStore USP
- TagmaStore NSC
- Universal Storage Platform V

Hereinafter, TagmaStore USP and TagmaStore NSC are generically called *TagmaStore USP*.

1.3 System Configuration Example

By linking with Device Manager, which is a HiCommand management server, Mainframe Agent is able to display, on a Web Client, storage information managed by mainframe hosts.

Figure 1.2 shows a configuration example of using HiCommand to view storage information managed by mainframe hosts.

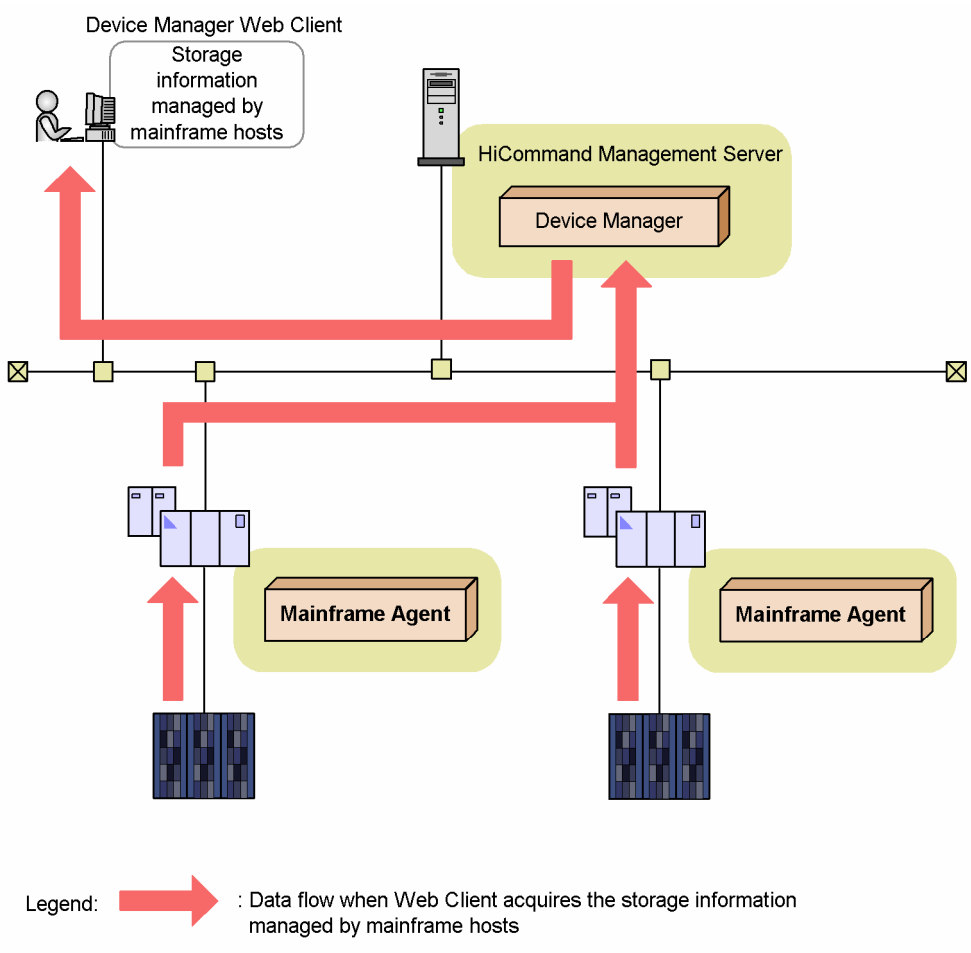

Figure 1.2 Mainframe Agent Configuration with HiCommand

Chapter 2 Installing Mainframe Agent

This chapter explains the preparations for installing Mainframe Agent, the installation procedure, and the upgrade procedure.

- Before You Install (section 2.1)
- Installation Procedure (section 2.2)
- Upgrading Mainframe Agent (section 2.3)

2.1 Before You Install

This section explains the preparations for installing Mainframe Agent.

2.1.1 Storage Attributes

Table 2.1 shows the storage attributes of the library datasets required to install Mainframe Agent.

Table 2.1 Storage Attributes

Library Type	DSORG	RECFM	LRECL (bytes)	BLKSIZE (bytes)
SAMPLIB (sample library)	PO	FB	80	3,120
LINKLIB (load library)	PO	U	--	6,144
LPALIB (load library)	PO	U	--	6,144
PROCLIB (cataloged procedure library)	PO	FB	80	3,120
EXECLIB (REXX Exec library)	PO	FB	80	3,120

Legend:

PO: Partitioned dataset

FB: Fixed length block record

U: Unfixed record

2.1.2 REXX Libraries

To use Mainframe Agent, you must have one of the following REXX libraries:

- IBM Library for REXX on zSeries Release 4 (FMID HWJ9140)
- IBM Library for REXX on zSeries Alternate Library (FMID HWJ9143)

If neither of the above libraries is installed, be sure to install one of the REXX alternate libraries (FMID HWJ9143 or JWJ9144) from the installation CD-ROM.

The MCS (Modification Control Statements) data corresponding to these FMIDs is stored in the dataset indicated in item 6 of Table 2.2.

2.1.3 Memory Requirements

The following shows the memory requirements to execute Mainframe Agent:

- For a user region of less than 16 MB: 2,048 KB
- For an extended user region of 16 MB or more:

3,072 KB + *D* KB +↑(64×*number-of-specified-DEVN-parameters*)÷1,024↑ KB

- Where *D* is the largest number of devices specified among the `DEVN` initialization parameters.
- Where "↑A÷B↑" indicates rounding up the decimal numbers from the result of A÷B.

2.2 Installation Procedure

Table 2.2 lists the datasets that are on the installation CD-ROM. All datasets that have a O in the Required column in Table 2.2 are required when you use the REXX alternate library.

Table 2.2 Datasets Stored on the Installation CD-ROM

No.	Name of Dataset on Installation CD-ROM	Library Type	Description	Required
1	MFAGENT.V*nnnn*.SAMPLIB.XMIT	SAMPLIB	Sample file provided in the standard package (the initialization parameters and startup cataloged procedures for Mainframe Agent)	R
2	MFAGENT.V*nnnn*.LINKLIB.XMIT	LINKLIB	Load module for Mainframe Agent	R
3	MFAGENT.V*nnnn*.LPALIB.XMIT	LPALIB	SVC module	R
4	MFAGENT.V*nnnn*.PROCLIB.XMIT	PROCLIB	Cataloged procedure	R
5	MFAGENT.V*nnnn*.EXECLIB.XMIT	EXECLIB	REXX Exec for Mainframe Agent	R
6	MFAGENT.V*nnnn*.SMPMCS.XMIT	REXX alternate libraries	SMP/E control statements for REXX alternate libraries	O
7	IBM.HWJ9143.F1.XMIT		REXX alternate library linkage parameters and built-in sample JCL	O
8	IBM.HWJ9143.F2.XMIT		Object module for REXX alternate libraries	O
9	IBM.HWJ9143.F3.XMIT		Message library for REXX alternate libraries	O
10	IBM.JWJ9144.F1.XMIT		Japanese language functionality for REXX alternate libraries	O
11	YKAGALLO.JCL (uncompressed text file)	Installation JCLs	Installation JCL for Mainframe Agent (allocates space for the datasets to be transferred)	R
12	YKAGINST.JCL (uncompressed text file)		Installation JCL for Mainframe Agent (allocates space for the execution data sets and extracts the datasets to the space allocated for them)	R

Legend:

R: Required

O: Optional

Note: In the above table, the *nnnn* portion of V*nnnn* varies depending on the version.

2.2.1 Installing Mainframe Agent

Figure 2.1 shows the workflow of installing Mainframe Agent.

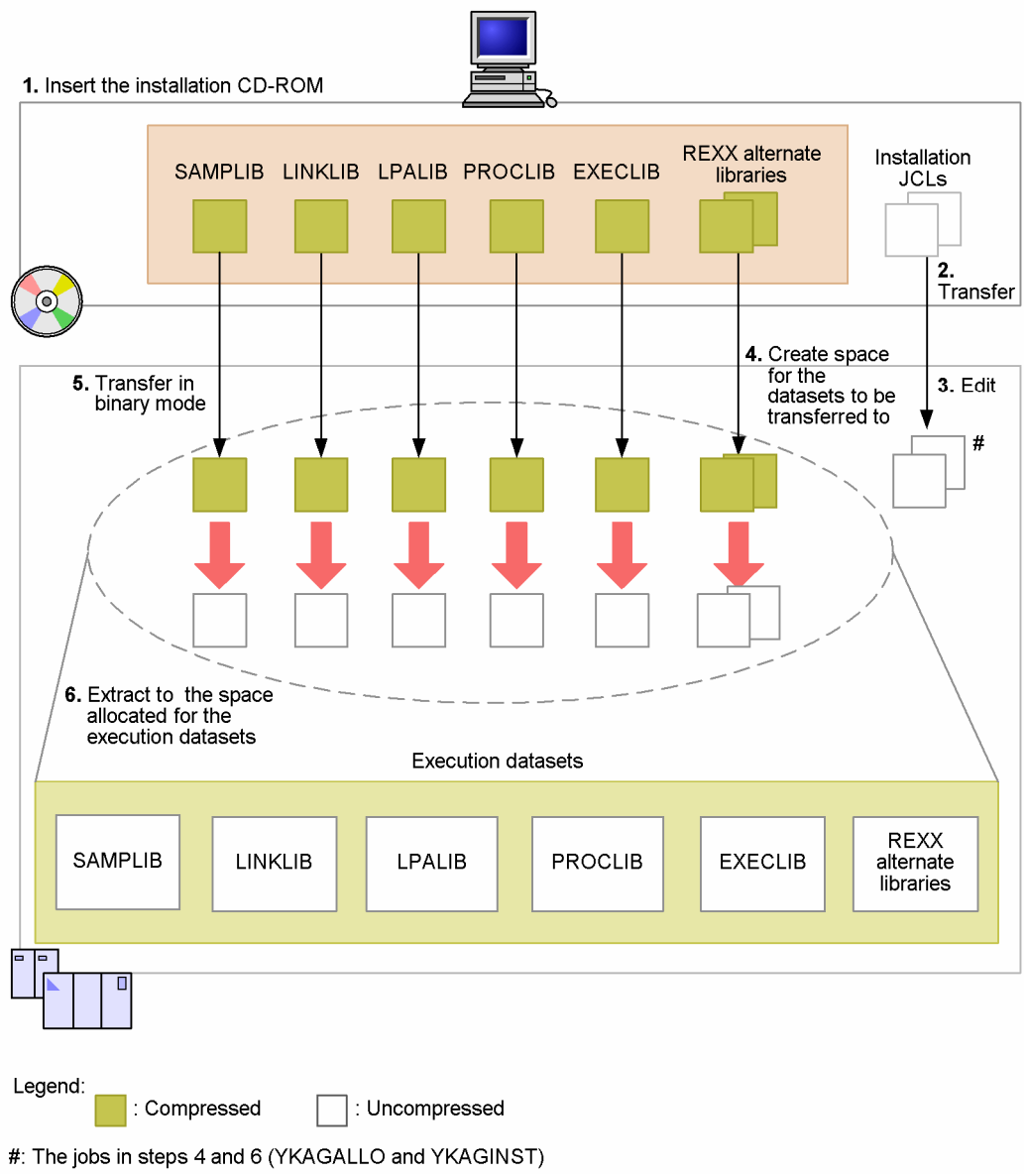

Figure 2.1 Workflow of Installing Mainframe Agent

The following describes how to install Mainframe Agent. The numbers in the procedure correspond to the numbers in Figure 2.1.

To install Mainframe Agent:

1. Insert the installation CD-ROM.
2. From the PC and using ASCII, transfer the following installation JCLs to a host machine:
   - JCL (`YKAGALLO`) for allocating space for the datasets on the CD-ROM that are to be transferred.
   - JCL (`YKAGINST`) for allocating space for and extracting the datasets to be executed.
3. Edit the JCLs transferred in step 2 to match your installation environment.

   For details, see the header comments in the JCLs.

4. Create space for the datasets to be transferred (execute the edited YKAGALLO job).

   The YKAGALLO job creates the sequential dataset space for transferring the Mainframe Agent object archive and the REXX alternate library archive to the host machine.

5. From the PC, transfer in binary mode the Mainframe Agent object archive and the REXX alternate library archive to the transfer dataset space allocated on the host machine.

   You need to transfer the REXX alternate library archive only if you plan to install a REXX alternate library.

6. Extract objects and libraries to the space allocated for the execution datasets (execute the edited YKAGINST job).

   The YKAGINST job allocates the execution dataset space, and extracts the objects and libraries from the transfer dataset archives to the execution dataset space.

2.2.2 Installing the REXX Alternate Libraries

If you do not have one of the following REXX libraries, you need the REXX alternate library (FMID: HWJ9143, JWJ9144).

- IBM Library for REXX on zSeries Release 4 (FMID HWJ9140)
- IBM Library for REXX on zSeries Alternate Library (FMID HWJ9143)

For details on how to install the REXX alternate library, see Chapter 6 of the *Program Directory for IBM Library for REXX on zSeries Alternate Library* (GI10-3243-01).

2.2.3 Using the YKALCSVC Command

The YKALCSVC command registers the user SVC, and is started by the OS START command.

To use the YKALCSVC command:

1. Define the LINKLIB library (the load library of Mainframe Agent) in the PROG***xx*** parmlib member, and then register APF authorization by using the SETPROG APF,ADD command.
2. Specify the LINKLIB library (the load library of Mainframe Agent) in the cataloged procedure of the YKALCSVC command by using the STEPLIB DD statement.
3. Perform either of the following:
   - Link the cataloged procedure library of Mainframe Agent to the IEFPDSI dd name of the MSTJCL***xx*** parmlib member.
   - Copy the YKALCSVC member from the cataloged procedure library of Mainframe Agent to the user PROCLIB.

Once you have added the YKALCSVC command in the COMMND***xx*** parmlib member, it is automatically executed at the time of an IPL.

The following shows the YKALCSVC command format. For details on the symbols used to explain the command syntax, see Table A-1. For details on the command syntax elements, see Table A-2.

Syntax

```
START YKALCSVC[,PARM='{SVC-number|DELETE}']
```

Function

Registers or deletes a user SVC.

Parameters

SVC-number ~<3-digit numeric> ((200 to 255))

Specifies an SVC number to assign to a user SVC.

DELETE

Specified to delete a user SVC.

If you omit the optional `PARM=` part of the command, an unused SVC number between 200 and 255 is assigned.

Return Codes

Used to indicate task status, as shown in Table 2.3.

Table 2.3 YKALCSVC Command Return Codes List

Return Code	Meaning
0	The command ended normally.
4	The SVC number is already registered.
16	Registration or deletion of the SVC number failed.
20	Processing stopped due to an error (the specified value or execution environment is invalid).

2.2.4 Registering a User SVC

You must use one of the following methods to register the user SVC:

- Registration using in the `IEASVC`***xx*** `parmlib` member
- Registration using the `YKALCSVC` command

If you use the `IEASVC`***xx*** `parmlib` member to perform registration, you must reload the system (that is, perform an initial program load (IPL)). If you are unable to perform an IPL while the system is running, use the `YKALCSVC` command to perform registration.

Note: When Hitachi Business Continuity Manager is installed, do not register a user SVC.

2.2.4.1 Using IEASVCxx parmlib Member to Register

To register the user SVC:

1. Choose a number between 200 and 255 to assign to the user SVC.

2. Insert the following SYMDEF statement (&YKSVCNO system symbol) into the IEASYM*xx* parmlib member:

```
SYMDEF(&YKSVCNO='SVC-number')
```

   For the *SVC-number*, specify a decimal number between 200 and 255.

3. Use one of the following methods to link the LPALIB library of Mainframe Agent to LPALST:
   - Define the LPALIB library of Mainframe Agent in the LPALST*xx* parmlib member. For details, see the *MVS Initialization and Tuning Reference*.
   - Use the SETPROG LPA command to dynamically link the LPALIB library of Mainframe Agent to LPALST. For details, see the *MVS System Commands*.
4. Define the following SVCPARM statement in the IEASVC*xx* parmlib member.

```
SVCPARM    SVC-number,REPLACE,TYPE(3),EPNAME(JYUASVC)
```

5. Perform re-IPL with the CLPA parameter specified.

Note: For details about steps 2 and 4, see the *MVS Initialization and Tuning Reference*.

2.2.4.2 Using the YKALCSVC Command To Register

The following shows how to execute the YKALCSVC command. For details on the format of the YKALCSVC command, see section 2.2.3.

When the system starts or before you use Mainframe Agent, execute the YKALCSVC command to register a user SVC.

Execute the command as follows with the SVC number specified:

```
START YKALCSVC,PARM='SVC-number'
```

An error is returned if another user SVC is already assigned to the SVC number specified here.

By omitting the PARM parameter, an unused SVC number between 200 and 255 is assigned. For example:

```
START YKALCSVC
```

To delete a user SVC, specify DELETE as the parameter and execute YKALCSVC command. For example:

```
START YKALCSVC,PARM='DELETE'
```

Note:

- If you delete a user SVC using the YKALCSVC command while Mainframe Agent is running, storage information may not be sent to Device Manager correctly.
- If you register a user SVC using the YKALCSVC command while Mainframe Agent is running, any already-executing CLI command will continue to execute in the user SVC defined in the IEASVC*xx* parmlib member. The newly registered user SVC becomes available once a request is issued from Device Manager.

- The user SVC registered with YKALCSVC command is lost when an IPL is performed. Before you perform another IPL, we recommend you specify one of the following settings:

  - Add the YKALCSVC command to the COMMND***xx*** parmlib member; so that the user SVC is automatically registered each time an IPL is performed.

  - Define the user SVC in the IEASVC***xx*** parmlib member, and then, from the next IPL, use the registered user SVC.

- If you delete a user SVC routine registered with the YKALCSVC command of an earlier Mainframe Agent version, use the YKALCSVC command of an earlier Mainframe Agent version. You must be careful when upgrading Mainframe Agent in a system containing multiple Mainframe Agent versions.

2.3 Upgrading Mainframe Agent

This section explains how to upgrade Mainframe Agent.

2.3.1 Checking Before Upgrading

2.3.1.1 Checking Whether to Upgrade Device Manager

Because Mainframe Agent is provided with Device Manager, make sure that you upgrade the server and mainframe hosts at the same time.

2.3.1.2 Checking the User SVC Number

Check the user SVC number because you must assign the same number after upgrading. The method of checking the user SVC number varies depending on whether the user SVC was registered with the YKSETENV command or the IEASVC***xx*** parmlib member.

- When the user SVC was registered by using the YKSETENV command

  Check the value specified in the YKALCSVC command parameter.

- When the user SVC was registered by using the IEASVC***xx*** parmlib member

  Check the value set in the &YKSVCNO system symbol.

2.3.2 Backing Up Datasets

2.3.2.1 Backing Up the Startup Cataloged Procedure and Initialization Parameters

Back up the startup cataloged procedure (standard member name: YKAGENTD) and initialization parameters (standard member name: YKPRM00) before upgrading.

2.3.2.2 Backing Up the Program Before Migration

Before migration, acquire a backup of the dataset where Mainframe Agent has been installed.

2.3.3 Pre-Upgrade Procedure

2.3.3.1 Deleting the User SVC

When you upgrade Mainframe Agent, you must delete the user SVC of an earlier Mainframe Agent version before installing the new version.

If the user SVC was registered by using the YKALCSVC command, use the YKALCSVC command to delete the user SVC.

If the user SVC was registered by using the IEASVC*xx* parmlib member, you cannot use the YKALCSVC command to delete the user SVC. To delete the user SVC, perform the following procedure.

1. Disable (comment out) the SYMDEF statement for the &YKSVCNO system symbol in the IEASYM*xx* parmlib member as follows:

```
/* SYMDEF(&YKSVCNO='SVC-number') */
```

2. Use the IEASVC*xx* parmlib member to disable (comment out) the SVCPARM statement for the JYUASVC module.

```
/* SVCPARM    SVC-number,REPLACE,TYPE(3),EPNAME(JYUASVC) */
```

3. Perform IPL with the CLPA parameter specified.

For details on steps 1 and 2, see the *MVS Initialization and Tuning Reference*.

2.3.3.2 Cataloged Procedure Library

Remove the dataset concatenation of the library shown in the table below.

Table 2.4 Library for Which the Dataset Concatenation Must Be Removed Before Installation

dd Name	Concatenated Library
IEFPDSI	Cataloged procedure library PROCLIB

If you copied the PROCLIB library members to a user PROCLIB, delete the copied members.

2.3.3.3 Load Library

Remove the LPALIB load library linked to LPALST.

2.3.4 Installing Mainframe Agent

As described in section 2.1 and section 2.2, install a new version of Mainframe Agent.

If the installation of IBM Library for REXX on zSeries Release 4 (FMID HWJ9140) or IBM Library for REXX on zSeries Alternate Library (FMID HWJ9143) has been completed, you do not need to perform the procedure described in section 2.2.2.

2.3.5 Checking Settings After Upgrading

After upgrading Mainframe Agent, make sure that the new settings are the same as those checked in section 2.3.1.

Chapter 3 Setting Up Mainframe Agent

This chapter describes how to set up the environment to acquire storage information using Mainframe Agent.

- Setting the TCP/IP Port Number (section 3.1)
- Setting the Security (section 3.2)
- Creating Initialization Parameters (section 3.3)
- Creating a Startup Cataloged Procedure (section 3.4)
- Setting Up the Device Manager Environment (section 3.5)

3.1 Setting the TCP/IP Port Number

Before performing this procedure, you need to reserve a port number for communicating with Device Manager.

For a job that starts Mainframe Agent, set the UNIX service's usage attributes (open a port for receiving). For details, refer to the *Communications Server: IP Configuration Reference*.

Set the port number in the TCP/IP environment settings file (`PROFILE.TCPIP`, the definition file related to server functions in the TCP/IP address space).

In the `PORT` definition of the `PROFILE.TCPIP` profile, specify the member name or identification name of the Mainframe Agent start job. For details about the identification name, see section 4.2.1.2.

For the port number to be used by the `YKAGENTD` job, you cannot specify a number that is already being used by another job. Specify a port number that is not being used in the system.

Example:

```
24042 TCP YKAGENTD ;YKAGENTD START NAME
```

`24042`: Port number

3.2 Setting the Security

This section describes how to set the security.

To enable Mainframe Agent communications, you must set an environment for the security program (RACF).

To enable use of UNIX services, use the `RACF` command from TSO/E to define the management user and management group IDs held by the OMVS segment in the RACF `STARTED` class of the Mainframe Agent startup cataloged procedure.

Example of setting using the TSO/E command:

```
->SETROPTS GENERIC(STARTED)
->RDEFINE STARTED YKAGENTD.* STDATA(USER(user-ID) GROUP(group-ID)
  TRUSTED(YES))
->SETROPTS RACLIST(STARTED) REFRESH
```

3.3 Creating Initialization Parameters

This section describes how to create the initialization parameters for setting up the environment required to start Mainframe Agent. YKPRM00 is a member of the initialization parameter samples registered in the sample library during initialization. Adjust the parameters to fit your environment.

Create a dataset to hold the initialization parameters by specifying the following attributes:

- LRECL: 80
- BLKSIZE: Multiple of 80
- RECFM: Fixed-length or blocked fixed-length record
- DSORG: Sequential or partitioned dataset

3.3.1 Format of Command Explanations

This section explains the format of the SETINIT command that sets the initialization parameters. For details about the symbols used in command explanations, see Table A.1. For details about the command syntax elements, see Table A.2.

```
Δ0SETINIT[Δ1parameter]...
```

Specify a SETINIT command and parameters in columns 1 through 71. Any information specified in a column after column 72 is ignored.

You can specify more than one SETINIT command. You can specify different parameters for one SETINIT command, but cannot specify the same parameter more than once. If you specify the same parameters more than once for one SETINIT command, the last specified parameter is applied.

To specify the same parameter more than once, use a separate SETINIT command. If a parameter that cannot be specified more than once in separate SETINIT commands is specified in that way, the last specified parameter is applied.

For details about the specifiable parameters and whether those parameters can be specified more than once by using separate SETINIT commands, see section 3.3.2.

Example of specifying the same parameter more than once for one SETINIT command:

If you specify the same parameter more than once for one SETINIT command, the last specified parameter is applied. Do not specify parameters as shown in this example.

In the following example, only DEVN(7500,750F) is applied, and DEVN(7300,730F) and DEVN(7400,740F) become invalid:

```
SETINIT DEVN(7300,730F) DEVN(7400,740F) DEVN(7500,750F)
```

Example of specifying the same parameter more than once for separate commands:

- If the parameter can be specified more than once for separate commands:

  All the specified parameters are applied.

If you specify parameters as follows, `DEVN(7300,730F)`, `DEVN(7400,740F)`, and `DEVN(7500,750F)` are applied:

```
SETINIT DEVN(7300,730F)
SETINIT DEVN(7400,740F)
SETINIT DEVN(7500,750F)
```

- If the parameter cannot be specified more than once for separate commands:

  The last specified parameter is applied.

  If you specify parameters as follows, `RECVWAITTIME(180)` is applied:

```
SETINIT RECVWAITTIME(65535)
SETINIT RECVWAITTIME(180)
```

3.3.1.1 How to Continue onto the Next Line

To continue a parameter onto the next line, enter a continuation symbol at the end of the line. The following table shows the continuation symbols.

Table 3.1 Continuation Symbols

No.	Continuation Symbol	Continuation Method
1	Hyphen (–)	The hyphen is removed, and the parameter is continued in the leftmost column of the next line, retaining any contiguous spaces.
2	Plus sign (+)	The plus sign is removed, and the parameter is continued on the next line, removing any contiguous spaces.

Coding example for continuing parameters that contain contiguous spaces:

```
SETINIT-
ΔΔDEVN(7300,730F)
```

If you continue to specify parameters by using a hyphen (–) as shown above, the command will be interpreted as follows:

```
SETINITΔΔDEVN(7300,730F)
```

Coding example for continuing parameters, removing contiguous spaces:

```
SETINIT DEVN(7300,+
ΔΔ730F)
```

If you continue to specify parameters by using a plus sign (+) as shown above, the command will be interpreted as follows:

```
SETINIT DEVN(7300,730F)
```

3.3.1.2 How to Enter Comments

Enclose a comment in `/*` and `*/`. No comment can be entered inside a parameter.

Example of a valid comment:

```
/* COMMENT */
SETINIT PORT(24042)      /* COMMENT */
```

Example of invalid comment:

If you specify a comment as follows, the text /* ERROR COMMENT */ will be interpreted as a part of the parameter instead of being interpreted as a comment:

```
SETINIT DEVN(7300, + /* ERROR COMMENT */
               730F)
```

3.3.1.3 Notes During Creation of Initialization Parameters

Do not specify an empty member as an initialization parameter when you start Mainframe Agent. Although empty members do not result in an error, information cannot be returned to Device Manager.

3.3.2 Details of Initialization Parameters

The following table shows whether each initialization parameter can be specified more than once for separate SETINIT commands:

Table 3.2 Whether the Initialization Parameter Can Be Specified More Than Once

Parameter	Multiple specification
PORT	N
RECVWAITTIME	N
HOSTNAME	N
DEVN	Y
LOGLEVEL	N

Legend:

Y: Permitted

N: The last specified parameter is applied.

3.3.2.1 Format

```
SETINIT
[Δ1PORT(port-number)]
[Δ1RECVWAITTIME(reception-wait-time)]
[Δ1HOSTNAME(host-identification-name)]
[Δ1DEVN(start-device-number,end-device-number)]
[Δ1LOGLEVEL(output-level)]
```

3.3.2.2 Function

The SETINIT command sets the environment required for the startup of Mainframe Agent.

3.3.2.3 Parameters

PORT(*port-number*) ~ <1-5 numeric characters> ((1-65535)) <<24042>>

Specifies the Mainframe Agent port number to be used for TCP/IP communication with Device Manager. You cannot specify a port number that is being used by another job. Specify a port number that is not being used in the system.

RECVWAITTIME(*reception-wait-time*) ~ <1-5 numeric characters> ((0-65535)) <<180>>

When TCP/IP communication with Device Manager is being performed, specifies the wait time in seconds from when a receive request is initiated to when data is received. A value of 0 means that Mainframe Agent is to wait for data indefinitely.

HOSTNAME(*host-identification-name*) ~ <1-50 alphanumeric characters> <<value of &SYSNAME system symbol>>

Specify this parameter when Device Manager needs to identify the Mainframe Agent. When Mainframe Agent is running on more than one host, and a HOSTNAME (host identification name) value is duplicated in these hosts, Device Manager cannot identify the host on which the target Mainframe Agent is running. To ensure that Device Manager can identify the host on which the Mainframe Agent is running, specify a unique HOSTNAME value for each host.

When this parameter is omitted, the value of the &SYSNAME system symbol is assumed. For details about the &SYSNAME system symbol, refer to the *MVS Initialization and Tuning Reference*.

When Mainframe Agent runs on more than one host and an &SYSNAME system symbol value is duplicated in these hosts, Device Manager cannot distinguish between the hosts. When the &SYSNAME system symbol value is duplicated, make sure that HOSTNAME values are unique among the hosts.

Notes about Specifying the HOSTNAME Parameter

When you specify the host name for reporting to Device Manager, do not specify the name of a host that is already being managed by Device Manager (including external connection ports that are being managed by Device Manager as hosts). To ensure that you do not specify such a host name, use one of the following methods:

- Ensure that DNS can resolve the host name you specify.
- If a host name that DNS can resolve is identical to a host name already managed by Device Manager, set the host identification name of the mainframe host for the HOSTNAME parameter, and then set the same host identification name in Device Manager.
- If neither of the above methods allows you to set a unique host name, change the host name of the host managed by Device Manager.
- If none of the above three methods allows you to set a unique host name, you can specify any host name.

DEVN(*start-device-number,end-device-number*) ~ <4 hexadecimal characters>

Specifies a range of devices from which to collect information when filtering the host volume information to be passed to Device Manager. Specify the *start-device-number* and *end-device-number* in the ascending order of hexadecimal characters. If the DEVN parameter has not been specified before, DEVN(0000,FFFF) is assumed.

Notes about Specifying the DEVN Parameter

- To reduce the access time required for requests and replies from Device Manager, we recommend that you specify a range of target devices from which information is collected.
- When you specify more than one DEVN parameter, even if there are duplicate devices, they are not eliminated, so make sure you avoid specifying such duplications.

LOGLEVEL(*output-level*) ~ <1 numeric character> ((0-2)) <<2>>

Specifies the log output level.

0

Logs are not output. If 0 is specified, it is difficult to determine the cause of a communication failure or an error that occurs during execution of a Mainframe Agent command.

1

Communication-related messages (YKY300I, YKY301I, YKY304I, and YKY307I) are output.

2

In addition to the messages that are output when LOGLEVEL(1) is specified, a YKY680I message indicating an error during execution of a Mainframe Agent command is output.

The following table shows the LOGLEVEL specification and the messages that are output.

Table 3.3 LOGLEVEL Specification and the Output Messages

LOGLEVEL	Output messages
0	No output
1	YKY300I, YKY301I, YKY304I, and YKY307I
2	YKY300I, YKY301I, YKY304I, YKY307I, and YKY680I

3.3.3 Usage Examples of Initialization Parameters

This section provides usage examples of initialization parameters for linking to Device Manager.

This example specifies the operating environment below. Figure 3.1 shows the configuration when the operating environment is as follows:

- Level of the log data to be output: `2`
- Connection port number: `24042`
- Device number: `X'7300'` to `X'730F'`, `X'7400'` to `X'740F'`

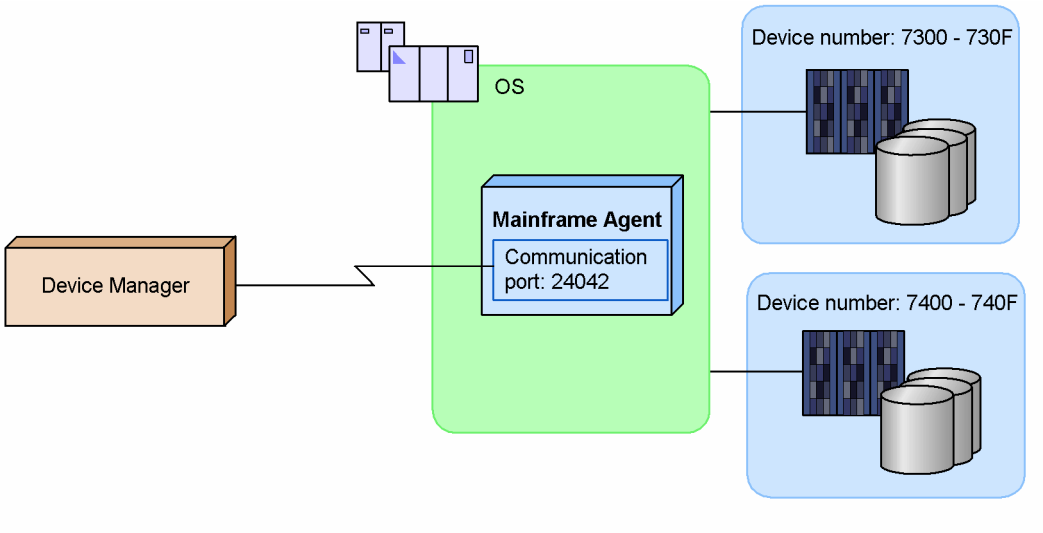

Figure 3.1 Configuration Example for Connecting to Device Manager

The following shows a specification example for connecting to Device Manager in the above operating environment:

```
SETINIT LOGLEVEL(2)
SETINIT PORT(24042)
/* DEVN */
SETINIT DEVN(7300,730F)
SETINIT DEVN(7400,740F)
```

3.3.4 Examples of Initialization Parameter Analysis Results

When Mainframe Agent starts, the initialization parameter analysis result is output to the dataset specified in the `YKLIST DD` statement.

The following example shows results. In the result list, the *nn-nn* portion varies depending on the Mainframe Agent version.

- Result list with no error

```
*** AGENT nn-nn LISTING INFORMATION ***  DATE=2006-02-03 TIME=13:34:35 PAGE=0001

SETINIT PORT(24042)                                                  00010001
/* DEVN */                                                           00020001
SETINIT DEVN(7300,730F)                                              00030001
SETINIT DEVN(7400,740F)                                              00040001
```

- Result list with an error

  This example indicates an error due to the missing end device number that is required for the first `DEVN` parameter. The `YKY002I` message is displayed.

```

```

```
*** AGENT nn-nn LISTING INFORMATION ***  DATE=2005-07-11 TIME=16:09:53 PAGE=0001

SETINIT PORT(24042)                                                     00010001
/* DEVN */                                                              00020001
SETINIT DEVN(7300)                                                      00030003
YKY002I INVALID INITIALIZATION PARAMETER: DEVN
SETINIT DEVN(7400,740F)                                                 00040001
```

3.4 Creating a Startup Cataloged Procedure

This section describes how to create a cataloged procedure for starting Mainframe Agent.

3.4.1 Standard Startup Cataloged Procedure

This section presents the standard startup cataloged procedure that is registered into the sample library during installation. Copy the standard startup cataloged procedure to the PROCLIB dataset of the JES (Job Entry Subsystem) startup procedure, and then modify the procedure to fit your environment.

3.4.1.1 Standard Startup Cataloged Procedure in the Expanded Format

- Member name: `YKAGENTD`

```
//YKAGENTD PROC MEMBER=YKPRM00
//************************************************************
//*
//*  ALL RIGHTS RESERVED. COPYRIGHT (C) 2006, HITACHI, LTD.
//*
//************************************************************
//IEFPROC EXEC PGM=IKJEFT01,PARM=YKAGENTD,
//           TIME=1440,REGION=4096K
//YKPARM   DD DSN=MFAGENT.Vnnnn.SAMPLIB(&MEMBER),DISP=SHR
//YKLIST   DD DDNAME=IEFRDER
//SYSTSPRT DD DUMMY
//SYSTSIN  DD DUMMY
//SYSABEND DD SYSOUT=*
//SYSEXEC  DD DSN=MFAGENT.Vnnnn.EXECLIB,DISP=SHR
//STEPLIB  DD DSN=MFAGENT.Vnnnn.LINKLIB,DISP=SHR
```

In the sample JCL, the *nnnn* portion of V*nnnn* varies depending on the version.

3.4.1.2 Cataloged Procedure Element Description

1. `PROC` statement

   Specifies the member name of the initialization parameter that is used during the startup of Mainframe Agent. The member specified in this statement is the default value. To use a non-standard member, execute the `START` command to change the member during the startup.

2. `EXEC` statement

   Specifies the following operands:

   - `TIME` (CPU cut-off time) whose value is `1440`
   - `REGION` (region size). To calculate this value, section 2.1.3.

3. `YKPARM DD` statement

   Specifies the name of the dataset that contains the initialization parameters, and a member name for a partitioned dataset.

4. `YKLIST DD` statement

Specifies the dataset to which the initialization parameter analysis result is to be output. The specified dataset must have the following attributes:

- LRECL: 121
- BLKSIZE: Multiple of 121
- RECFM: FBA
- DSORG: Sequential dataset (and a member name for a partitioned dataset)

5. SYSTSPRT statement

   Specifies DUMMY.

6. SYSTSIN statement

   Specifies DUMMY.

7. SYSABEND DD statement

   Specifies the location to which the dump is output when Mainframe Agent terminates abnormally. SYSOUT=* is specified in the standard startup cataloged procedure. If the DUMMY output class is assigned as the output destination class for system messages in a job that is started by the START command, we recommend that you specify SYSOUT=*SYSOUT-class-enabled-for-output*, since the dump is not output with SYSOUT=* specified.

8. SYSEXEC DD statement

   Specifies the dataset that contains the REXX exec library.

9. STEPLIB DD statement (optional)

   Specifies the dataset that contains the Mainframe Agent's load library. If Mainframe Agent's LINKLIB dataset is linked to the system's LINKLIB, you do not need to specify the STEPLIB DD statement.

3.4.1.3 Operating Notes

- Because Mainframe Agent is a resident program that waits for client requests, specify TIME=1440 in the EXEC statement so that no timeout occurs Additionally, specify Purge as the output class of the job log and system messages so that the output messages do not cause a shortage of spool space.
- If z/OS V1R3 or later is running, use the JOB statement keyword of the START command to specify that the JESLOG dataset is to be output using the SUPPRESS setting.

3.4.2 Changing the Startup Cataloged Procedure

You can change the contents of the standard startup cataloged procedure according to the system environment and create a separate startup cataloged procedure for Mainframe Agent. The cataloged procedure (member) can have any name.

In some versions of the operating system, you may have to add a DD statement related to IBM Communications Server. For details on defining the dataset for configuring a TCP/IP environment of Communications Server, refer to the explanations on a basic TCP/IP system in the *Communications Server IP configuration Guide*.

3.5 Setting Up the Device Manager Environment

This section describes the environment settings required for Device Manager.

3.5.1 Displaying Mainframe Storage Information

The following procedure shows how to set up a Device Manager environment that enables Web Client to display mainframe storage information.

3.5.1.1 Registering the Mainframe Host in Device Manager

To use the `AddHost` command to register the mainframe host in Device Manager:

1. Execute the `AddHost` command to register the mainframe host in Device Manager.

   When you execute the command, specify the following parameters:

   - `hostname`: In this parameter, specify the host name of the mainframe host (the value you specified for the parameter in section 3.3.2.3).
   - `hosttype`: In this parameter, specify `2`.

2. In the result of the `AddHost` command, make sure that the specified information is correctly output to the `name` and `hosttype` parameters.

   Notes on executing the `AddHost` command:

   - If the host name specified during mainframe host environment setup and the host name specified during Device Manager environment setup do not match, information registered in Mainframe Agent cannot be acquired.
   - Do not specify the `wwnlist` parameter when registering the mainframe host in Device Manager. If you do, an error occurs.
   - Record the `objectID` value output when the `AddHost` command is executed. You will need this value for the subsequent procedures and operations.
   - Although the IP address specified in the `ipaddress` parameter of a command is registered as an attribute of the mainframe host, the IP address registered using the `AddHost` command is not used for communication with Mainframe Agent. The information necessary for communication with Mainframe Agent will be specified in section 3.5.1.2.

   Action to be taken if an error occurs during the execution of the `AddHost` command:

   Use the `GetHost` command to check whether the mainframe host is registered. If the mainframe host is not registered, register it by using the `AddHost` command. If the mainframe host is registered incorrectly, use the `ModifyHost` command to correct the registered information. For details on how to correct the registered mainframe host information, see section 3.5.7.

Command format:

```
HiCommandCLI AddHost "hostname=mainframe-host-name" "hosttype=2"
```

Example of executing the command:

```
HiCommandCLI AddHost -o "D:\logs\AddHost.log" "hostname=toro2" "hosttype=2″
```

Example of command output:

```
RESPONSE:
An instance of Host
  objectID=HOST.1
  name=toro2
  capacityInKB=0
  hostType=2
```

3.5.1.2 Registering the Mainframe Agent Running on the Mainframe Host in Device Manager

To use the `AddURLLink` command to register the mainframe host in Device Manager:

1. Execute the `AddURLLink` command to register the Mainframe Agent running on the mainframe host in Device Manager.

   When you execute the command, specify the following parameters:

   - `url`: Specify the IP address of the mainframe host on which Mainframe Agent is installed, and the port number used by Mainframe Agent. For the port number, specify the port number that you specified when setting up the mainframe host environment `PORT` parameter in section 3.3.2.3).
   - `name`: Specify the character string `MainframeAgent`, which indicates Mainframe Agent. This parameter is case-sensitive.
   - `linkedid`: Specify the object ID of the mainframe host that was output when the mainframe host was registered using the `AddHost` command.

2. From the execution result of the `AddURLLink` command, make sure that specified information is correctly output to the `url`, `name`, and `linkedid` parameters.

   Notes on executing the `AddURLLink` command:

   If the `name` parameter is specified incorrectly, it is not registered, and mainframe storage information cannot be acquired. If you specified the `name` parameter incorrectly, use the `DeleteURLLink` command to delete the Mainframe Agent information, and then use the `AddURLLink` command to register the information again. For details on how to delete the Mainframe Agent information, see section 3.5.5.

   Action to be taken if an error occurs during the execution of the `AddURLLink` command:

   Use the `GetURLLink` command to check whether Mainframe Agent is registered. If Mainframe Agent is not registered, register it by using the `AddURLLink` command. If Mainframe Agent is registered incorrectly, use the `AddURLLink` command to correct the registered information. For details on how to correct the registered Mainframe Agent information, see section 3.5.4.

Command format:

```
HiCommandCLI AddURLLink "url=http://mainframe-host-IP-address:port-number"
"name=MainframeAgent" "linkedid=mainframe-host-object-ID"
```

Example of executing the command:

```
HiCommandCLI AddURLLink -o "D:\logs\AddURLLink.log" "url=http://192.168.99.114:24042"
"name=MainframeAgent" "linkedid=HOST.1"
```

Example of command output:

```
RESPONSE:
An instance of URLLink
  objectID=URLLINK.HOST.1.1
  name=MainframeAgent
  url=http://192.168.99.114:24042
  linkedID=HOST.1
```

3.5.1.3 Acquiring Mainframe Storage Information

Use the `AddHostRefresh` command to acquire mainframe storage information. The acquired information is not included in the command execution results. Use Web Client to check this information.

When you execute the command, specify the following parameters:

`objectid`: Specify the object ID of the mainframe host that was output when the mainframe host was registered using the `AddHost` command.

Action to be taken if an error occurs during the execution of the `AddHostRefresh` command:

1. Check whether Mainframe Agent is operating normally.

   If it is not operating normally, check the Mainframe Agent settings, and restart Mainframe Agent.

2. Check whether the mainframe host and Mainframe Agent are registered correctly.

   If they are registered correctly, use the `AddHostRefresh` command to acquire the mainframe storage information again. If they are not registered correctly, register them correctly using the procedures described in section 3.5.1.1 or 3.5.1.2.

Command format:

```
HiCommandCLI AddHostRefresh "objectid=mainframe-host-object-ID"
```

Example of executing the command:

```
HiCommandCLI AddHostRefresh -o "D:\logs\AddHostRefresh.log" "objectid=HOST.1"
```

Example of command output:

```
RESPONSE:
An instance of Host
  objectID=HOST.1
  name=toro2
  capacityInKB=0
  hostType=2
  sysplexID=RSDPLEX
```

3.5.2 Refreshing Mainframe Storage Information

To refresh the mainframe storage information displayed in Web Client, use the `AddHostRefresh` command. This command is the only means of refreshing the mainframe storage information.

When you execute the command, specify the following parameter:

`objectid`: Specify the object ID of the mainframe host that was output when the mainframe host was registered using the `AddHost` command.

Action to be taken if an error occurs during the execution of the `AddHostRefresh` command:

1. Check whether Mainframe Agent is operating normally.

   If it is not operating normally, check the Mainframe Agent settings, and restart Mainframe Agent.

2. Check whether the mainframe host and Mainframe Agent are registered correctly.

   If they are registered correctly, use the `AddHostRefresh` command to acquire the mainframe storage information again. If they are not registered correctly, register them correctly using the procedures described in section 3.5.1.1 or 3.5.1.2.

Command format:

```
HiCommandCLI AddHostRefresh "objectid=mainframe-host-object-ID"
```

Example of executing the command:

```
HiCommandCLI AddHostRefresh -o "D:\logs\AddHostRefresh.log" "objectid=HOST.1"
```

Example of command output:

```
RESPONSE:
An instance of Host
  objectID=HOST.1
  name=toro2
  capacityInKB=0
  hostType=2
  sysplexID=RSDPLEX
```

3.5.3 Acquiring Mainframe Agent Information Registered in the Device Manager

To acquire Mainframe Agent information registered in the Device Manager server, use the `GetURLLink` command. By executing this command, you can acquire the IP address and port number of the mainframe host from the `url` information in the execution results.

Example of executing the command:

```
HiCommandCLI GetURLLink -o "D:\logs\GetURLLink.log" "objectid=URLLINK.HOST.1.1"
```

Example of command output:

```
RESPONSE:
An instance of URLLink
  objectID=URLLINK.HOST.1.1
  name=MainframeAgent
  url=http://192.168.99.114:24042
  linkedID=HOST.1
```

3.5.4 Changing Mainframe Agent Information Registered in the Device Manager

To change Mainframe Agent information registered in the Device Manager server, use the `AddURLLink` command. You can change the IP address or port number of the mainframe host by specifying a new IP address or port number in the `url` parameter in URL format.

In the name parameter, specify MainframeAgent. If the name parameter is specified incorrectly, it is not registered as Mainframe Agent information, and mainframe storage information cannot be acquired. If you specified the name parameter incorrectly, use the DeleteURLLink command to delete the Mainframe Agent information, and then use the AddURLLink command to correct the registered Mainframe Agent information.

Example of executing the command:

```
HiCommandCLI AddURLLink -o "D:\logs\AddURLLink.log"
 "url=http://192.168.99.100:24042" "name=MainframeAgent" "linkedid=HOST.1"
```

Example of command output:

```
RESPONSE:
An instance of URLLink
  objectID=URLLINK.HOST.1.1
  name=MainframeAgent
  url=http://192.168.99.100:24042
  linkedID=HOST.1
```

3.5.5 Deleting Mainframe Agent Information Registered in the Device Manager

To delete Mainframe Agent information registered in the Device Manager server, use the DeleteURLLink command.

Use this command when you want to delete only Mainframe Agent registration information. For example, you may want to execute the command if you specified the name parameter incorrectly.

Example of executing the command:

```
HiCommandCLI DeleteURLLink -o "D:\logs\DeleteURLLink.log" "objectid=URLLINK.HOST.1.1"
```

Example of command output:

```
RESPONSE:
(Command completed; empty list returned)
```

3.5.6 Acquiring Mainframe Host Information

To acquire information about a mainframe host registered in the Device Manager server (such as the host name), use the GetHost command.

If you do not know the object ID of a mainframe host, use the following procedure to acquire the object ID.

1. Execute the GetHost command with no object ID specified to acquire a list of all hosts registered in Device Manager.
2. In the displayed host information, find the name of the mainframe host you are looking for.
3. Acquire the object ID based on the information related to the mainframe host you found in step 2.

Example of executing the command:

```
HiCommandCLI GetHost -o "D:\logs\GetHost.log" "objectid=HOST.1"
```

Example of command output:

```
RESPONSE:
An instance of Host
  objectID=HOST.1
  name=toro2
  capacityInKB=0
  hostType=2
  sysplexID=RSDPLEX
```

3.5.7 Changing Mainframe Host Information

To change the information of a mainframe host registered in the Device Manager server, use the `ModifyHost` command. You can change the name of a mainframe host by specifying the new host name in the `hostname` parameter.

When you change the host name, specify the host name that was set in the initialization parameter for Mainframe Agent. If you specify a host name that differs from the host name set during Mainframe Agent environment setup, you cannot acquire information from Mainframe Agent.

The `ModifyHost` command cannot be used to modify the `hosttype` parameter information. To modify the `hosttype` parameter information, use the `DeleteHost` command to delete the target mainframe host, and then re-register the mainframe host.

Example of executing the command:

```
HiCommandCLI ModifyHost -o "D:\logs\ModifyHost.log" "objectid=HOST.1" "hostname=snow"
```

Example of command output:

```
RESPONSE:
An instance of Host
  objectID=HOST.1
  name=snow
  capacityInKB=0
  hostType=2
  sysplexID=RSDPLEX
```

3.5.8 Deleting a Mainframe Host

To delete a mainframe host registered in the Device Manager server, use the `DeleteHost` command.

If you delete a mainframe host, the Mainframe Agent information registered in Device Manager is also deleted, and the mainframe storage information displayed in Web Client is no longer displayed.

Example of executing the command:

```
HiCommandCLI DeleteHost -o "D:\logs\ DeleteHost.log" "objectid=HOST.1"
```

Example of command output:

```
RESPONSE:
(Command completed; no data returned)
```

Chapter 4 Using Mainframe Agent

This chapter describes how to use Mainframe Agent to acquire storage information.

- Operating Procedure (section 4.1)
- Operation Commands (section 4.2)

4.1 Operating Procedure

This section describes the procedure for operating Mainframe Agent.

4.1.1 Overview of Mainframe Agent Operation

When you execute information collection for Device Manager, Mainframe Agent collects storage information managed by mainframe hosts, and then provides this information to Device Manager.

Figure 4.1 provides an overview of Mainframe Agent operation.

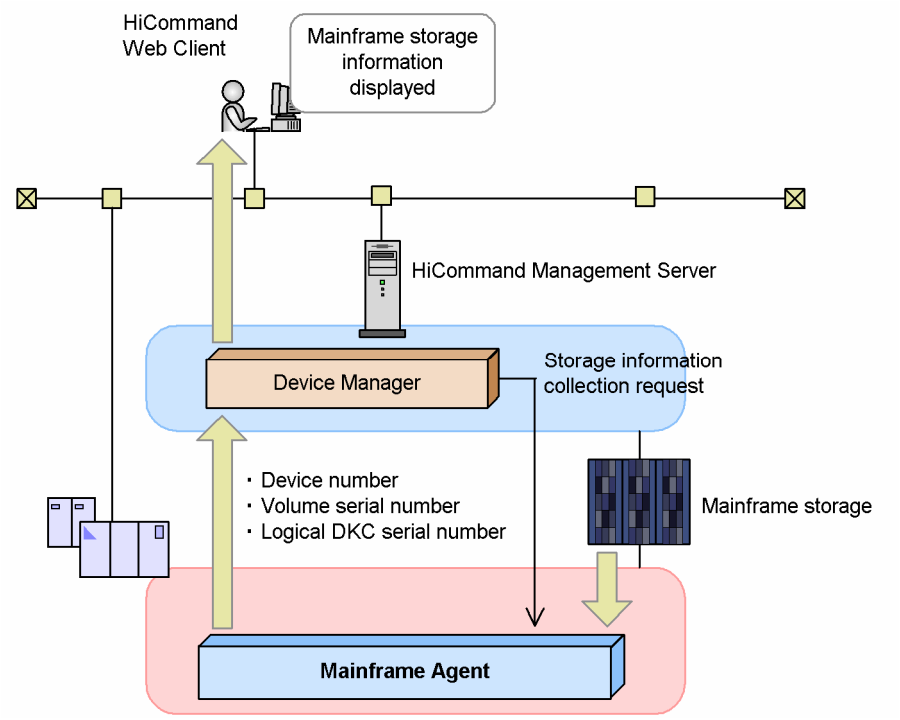

Figure 4.1 Overview of Mainframe Agent Operation

4.1.2 Operating Procedure During Installation

Figure 4.2 shows the operating procedure when installing Mainframe Agent.

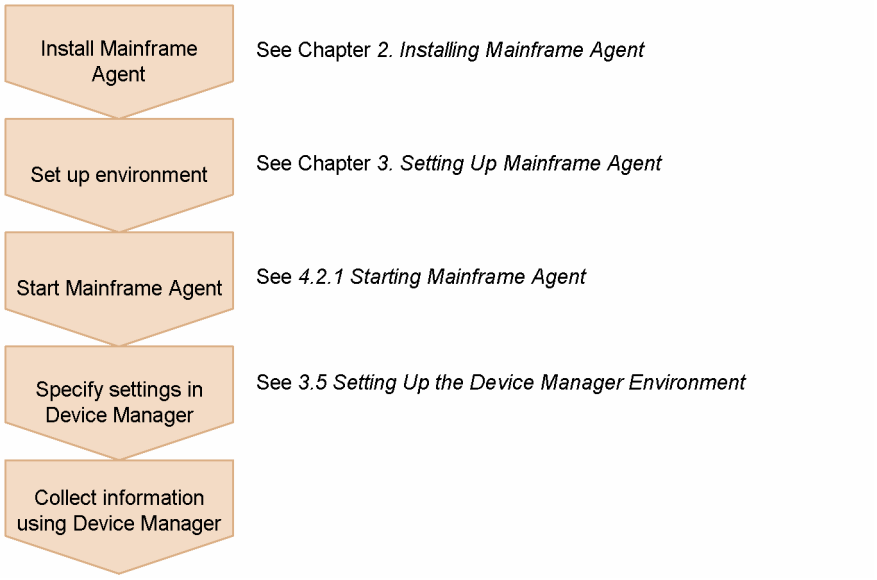

Figure 4.2 Flow of Operations for Installation

4.1.3 Operating Procedure for Changing a Configuration

Figure 4.3 shows the operating procedure when changing the Mainframe Agent configuration.

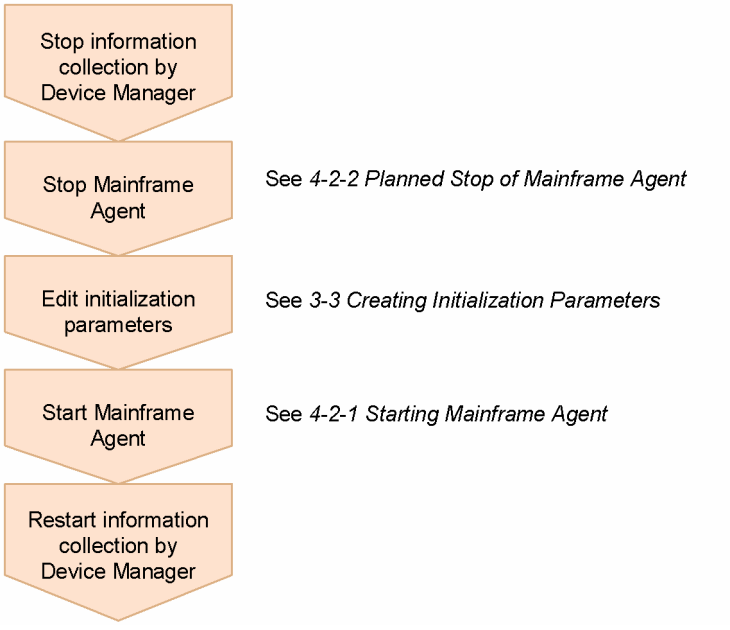

Figure 4.3 Operating Procedure when Changing the Configuration

4.2 Operation Commands

This section describes the commands used for Mainframe Agent operation. For details on the symbols used to explain the command syntax, see Table A.1. For details on the command syntax elements, see Table A.2.

4.2.1 Starting Mainframe Agent

To start Mainframe Agent, use the `START` command.

Mainframe Agent resides on the system, and runs according to the definition of the `YKPRM`***xx*** initialization parameter. You can start one or more Mainframe Agents.

Start IBM Communications Server before starting Mainframe Agent because Mainframe Agent uses the TCP/IP protocol to communicate with HiCommand. If IBM Communications Server has not been started before Mainframe Agent starts, the `YKY315I` message is displayed and the startup fails.

4.2.1.1 Format

```
START
Δ1startup-cataloged-procedure-name[.identification-name]
[,MEMBER=member-name]
[,SYSOUT=output-class]
```

4.2.1.2 Operands

startup-cataloged-procedure-name

Specify the name of the Mainframe Agent startup cataloged procedure.

identification-name

Specifies the identification name. This operand is used to identify each job when the same startup cataloged procedure name is used to start multiple jobs.

`MEMBER=`***member-name***

Specifies the member name of the initialization parameter.

When this operand is omitted, the standard member name specified in the startup cataloged procedure is assumed.

`SYSOUT=`***output-class***

Specifies the output class of the output list. When this operand is omitted, the output class depends on the system settings.

4.2.1.3 Example

The example below shows how to start Mainframe Agent, specifying the following:

- Name of the cataloged procedure: YKAGENTD
- Identifier: YK
- Member name of the initialization parameter: YKPRM10
- Output class: X

```
START YKAGENTD.YK,MEMBER=YKPRM10,SYSOUT=X
```

4.2.2 Stopping Mainframe Agent

To stop Mainframe Agent normally, use the STOP command.

If a request from HiCommand was already accepted before the STOP command was executed, the stop processing will be suspended until the processing for that request is completed.

4.2.2.1 Format

```
STOP
Δ1[startup-cataloged-procedure-name.]identification-name
```

4.2.2.2 Operand

startup-cataloged-procedure-name

Specify the name of the startup cataloged procedure for the Mainframe Agent for which a planned stop is to be performed.

identification-name

Specify the identification name specified in the START command. If the identification name has been omitted in the START command, specify the name of the startup cataloged procedure.

4.2.2.3 Example

To perform a planned stop of the Mainframe Agent with the identification name YK, enter the following command:

```
STOP YK
```

4.2.2.4 Return Codes

The following table lists and describes return codes when Mainframe Agent ends.

Table 4.1 Return Codes When Mainframe Agent Ends

Return code (in decimal)	Description

Return code (in decimal)	Description
0	Planned stop (by using the STOP command)
4	Immediate shutdown (When the child task has terminated or abnormally terminated with a return code other than 0)
8	▪ Initialization parameter analysis error ▪ YKLIST DD open error
12	▪ GETMAIN failure for the tables used by job step tasks ▪ Other initialization errors (other than the initialization parameter analysis error) ▪ Mainframe Agent has not started via IKJEFT01

4.2.3 Performing a Forced Stop of Mainframe Agent

To perform a forced stop, use the CANCEL command. All requests are cancelled, and Mainframe Agent is stopped.

4.2.3.1 Format

```
CANCEL
Δ1[startup-cataloged-procedure-name.]identification-name
```

4.2.3.2 Operand

startup-cataloged-procedure-name

Specify the name of the startup cataloged procedure for the Mainframe Agent to be forcibly stopped.

identification-name

Specify the identification name specified in the START command. If the identification name has been omitted in the START command, specify the name of the startup cataloged procedure.

4.2.3.3 Example

To forcibly stop the Mainframe Agent with the identification name YK, enter the following command:

```
CANCEL YK
```

4.2.4 Displaying the Log Output Level

To display the current Mainframe Agent log output level, use the MODIFY command with DISPLAY LOGLEVEL specified.

4.2.4.1 Format

```
MODIFY
Δ1[startup-cataloged-procedure-name.]identification-name
,DISPLAY LOGLEVEL
```

4.2.4.2 Operands

startup-cataloged-procedure-name

Specify the name of the startup cataloged procedure for the Mainframe Agent whose log output level is to be displayed.

identification-name

Specify the identification name specified in the `START` command. If the identification name has been omitted from the `START` command, specify the name of the startup cataloged procedure.

`DISPLAY LOGLEVEL`

Displays the current log output level.

4.2.4.3 Example

To display the current log output level of the Mainframe Agent with the identification name `YK`, enter the following command:

```
MODIFY YK,DISPLAY LOGLEVEL
YKY114I LOGLEVEL=2
```

4.2.5 Changing the Log Output Level

To change the Mainframe Agent log output level, use the `MODIFY` command with `SETINIT LOGLEVEL` specified.

4.2.5.1 Format

```
MODIFY
Δ1[startup-cataloged-procedure-name.]identification-name
,SETINIT LOGLEVEL(output-level)
```

4.2.5.2 Operands

startup-cataloged-procedure-name

Specify the name of the startup cataloged procedure for the Mainframe Agent whose log output level is to be changed.

identification-name

Specify the identification name specified in the START command. If the identification name has been omitted from the START command, specify the name of the startup cataloged procedure.

SETINIT LOGLEVEL(*output-level*) ~ <*1-digit-number*> ((0 to 2))

Specify the new output level.

For details about the output level, see section 3.3.2.3.

The following table shows the LOGLEVEL specification and the messages that are output.

LOGLEVEL	Output messages
0	No output
1	YKY300I, YKY301I, YKY304I, and YKY307I
2	YKY300I, YKY301I, YKY304I, YKY307I, and YKY680I

4.2.5.3 Example

To change the log output level of the Mainframe Agent with the identification name YK to 2, enter the following command:

```
MODIFY YK,SETINIT LOGLEVEL(2)
YKY111I LOGLEVEL WAS CHANGED
YKY114I LOGLEVEL=2
```

Chapter 5 Messages

This chapter describes the messages that are issued by Mainframe Agent.

- Message Format (section 5.1)
- Message Output Destination (section 5.2)
- List of Messages (section 5.3)

5.1 Message Format

This section describes the format of the messages that are issued by Mainframe Agent and the notations used in this manual.

5.1.1 Message Output Format

This section presents the format of the messages issued by Mainframe Agent. Each message consists of a message ID followed by the message text. The format is as follows:

- *YYYnnnZ message-text*

  The message ID indicates the following:

  YYY

  Indicates the program that has issued the message:

  YKT: YKALCSVC

  YKY: Mainframe Agent

  nnn

  Indicates the serial number of the message.

  Z

  Indicates the severity of the message:

  E: Error

  I: Notification of information

5.1.2 Notations Used to Describe Messages

This section describes the notations used to describe messages in this manual. Messages are listed in the order of message IDs. The following shows the format of a message explanation:

message-ID message-output-destination	*message-text*	*description-of-the-message*

5.2 Message Output Destination

The following destinations appear in messages issued by Mainframe Agent:

- CON

  Console

- SYS

  SYSLOG

- XML

  HiCommand's log and window

5.3 List of Messages

This section describes the messages that are issued by Mainframe Agent and how to handle them.

Message ID	Message Text	Explanation and Actions
YKT001E CON	Can't find SVCTABLE	The "SVCTABLE" search in the NUCLKUP macro failed. The program abnormally terminates with user completion code 996. Contact HDS Technical Support for assistance.
YKT002E CON	Can't find IGCERROR	The "IGCERROR" search in the NUCLKUP macro failed. The program abnormally terminates with user completion code 996. Contact HDS Technical Support for assistance.
YKT003E CON	No SVC #'s available	No SVC number available. The program abnormally terminates with user completion code 996.
YKT004E CON	Couldn't add SVC entry	SVC number addition failed in the SVCUPDTE macro. The program abnormally terminates with user completion code 996. Contact HDS Technical Support for assistance.
YKT005E CON	Couldn't create name/token	Name/Token registration failed. The program abnormally terminates with user completion code 996. Contact HDS Technical Support for assistance.
YKT006W CON RC=16	Couldn't delete name/token	Name/Token deletion failed. Contact HDS Technical Support for assistance.
YKT007W CON RC=16	Couldn't delete SVC entry	SVC number deletion failed in the SVCUPDTE macro. Contact HDS Technical Support for assistance.
YKT008E CON RC=20	System task started from TSO.	The `YKALCSVC` command was executed in the TSO/E environment. Execute the `YKALCSVC` command using the `START` command or a batch job.
YKT012E CON RC=16	Name/token error	An error occurred in the Name/Token service. Contact HDS Technical Support for assistance.
YKT021E CON RC=20	Invalid parameter	A value specified in the PARM parameter is invalid. Check the specification of the `PARM` parameter.
YKT022E CON RC=4	SVC routine is already inserted	The user SVC routine is already registered.
YKT023E CON RC=16	Couldn't delete SVC routine	The user SVC routine deletion failed. Contact HDS Technical Support for assistance.
YKT024E CON	Couldn't copy load module	Copying of the load module failed. The program abnormally terminates with user completion code 996. Contact HDS Technical Support for assistance.
YKT025E CON RC=4	SVC routine is already deleted	The user SVC routine is not registered or is deleted.
YKT026E CON	SVC # is already used	The specified SVC number is already used. The program abnormally terminates with user completion

Message ID	Message Text	Explanation and Actions
		code 996. Specify an unassigned SVC number in the PARM parameter of the YKALCSVC command, or re-execute without the PARM parameter.
YKT032E CON RC=20	The task is not APF-authorized.	The dataset name of the Business Continuity Manager load library was not registered in SYS1.PARMLIB. Alternately, the execution of the command failed because authorized/unauthorized datasets co-existed while concatenating DD statements in the load library, and they were handled as unauthorized datasets.
YKT098I CON RC=0	SVC routine is deleted	The user SVC routine deletion succeeded.
YKT099I CON RC=0	SVC routine is inserted	The user SVC routine registration succeeded.
YKT299I CON SC=0	*command* command return code=*nnnn*.	The command identified by *command* terminated with the return code *nnnn*.
YKY001I CON	AGENT STARTED (*vv-rr*[-*zz*])	Mainframe Agent has started. *vv* Version number *rr* Revision number *zz* Exception
YKY002I CON	INVALID INITIALIZATION PARAMETER: *parameter-name*	The specified parameter has not been defined in the initialization parameters, or the initialization parameter shown as *parameter-name* is invalid. Mainframe Agent has been terminated. Correct the initialization parameters and then restart Mainframe Agent.
YKY003I CON	INVALID CONTINUATION LINE FOUND. PARAMETER SCAN TERMINATED	The initialization parameters contain the specification for a continuation line, but no parameter is continued. Mainframe Agent will be terminated. Correct the initialization parameters and then restart Mainframe Agent.
YKY005I CON	AGENT INITIALIZATION FAILED P=*termination-code*	Mainframe Agent cannot start for the reason indicated in the message that was displayed before this message. Contact the center administrator. The center administrator must take appropriate action for the message that was displayed before this message and then restart Mainframe Agent. *termination-code* (decimal number) ▪ 04: An attempt was made to start without using IKJEFT01. ▪ 08: Initialization parameter analysis processing failed. ▪ 48: A process module loading error occurred. ▪ 60: Subtask initialization processing failed.
YKY008I CON	INSUFFICIENT SPACE AVAILABLE FOR INITIALIZATION	Initialization parameters analysis failed due to a shortage of work space. Mainframe Agent will be

Message ID	Message Text	Explanation and Actions
		terminated. Check, and, if necessary, revise the specification of the user region in the job step in the Mainframe Agent startup cataloged procedure, correct the memory requirements, and then restart Mainframe Agent.
YKY016I CON	TASK(*task-ID*) ABENDED,CODE=*completion-code*	A task terminated abnormally during Mainframe Agent start up. Mainframe Agent will be terminated. *task-ID* Name of the task *completion-code* System completion code
YKY018I CON	MODULE(*load-module-name*) NOT FOUND	The load module shown as *load-module-name* was not found. Mainframe Agent will be terminated. Make sure that the indicated load module was installed correctly.
YKY019I CON	*dd-name* DD STATEMENT NOT FOUND	The `DD` statement shown as *dd-name* is missing. Mainframe Agent will be terminated. Specify the `DD` statement in the cataloged procedure used for starting Mainframe Agent and then restart Mainframe Agent.
YKY051I CON	AGENT ENDED	Mainframe Agent was terminated.
YKY052I CON	AGENT IN SCHEDULED SHUTDOWN	Mainframe Agent termination processing has begun.
YKY053I CON	AGENT ABENDED	Mainframe Agent terminated abnormally. If the cause is unknown, collect the ABEND dump in the `SYSABEND` dump format and then contact customer support for investigation.
YKY100I CON	MODIFY COMMAND ACCEPTED	The `MODIFY` command was accepted.
YKY101I CON	STOP COMMAND ACCEPTED	The `STOP` command was accepted.
YKY102I CON	INVALID *error-type*: *text*	After an entry of the `MODIFY` command, an error was detected in the command or operand shown as *text*. Check, and, if necessary, revise the command. *error-type* `COMMAND`: Indicates that an error was detected in the command. `OPERAND`: Indicates that an error was detected in the operand.
YKY103I CON	COMMAND SYNTAX ERROR	The entered command has a syntax error. Check, and, if necessary, revise the command.
YKY104I CON	OPERAND IS INCORRECT	The specified operand is invalid. Correct the error and then re-enter the operand.
YKY111I CON	*parameter-name* WAS CHANGED	The value of the initialization parameter has been changed. The parameter name is given in *parameter-name*.
YKY114I CON	*parameter-name=parameter-value*	This message displays the current value of the initialization parameter.

Message ID	Message Text	Explanation and Actions
		parameter-name Initialization parameter name *parameter-value* Initialization parameter value
YKY130I CON	SESSION NO.=*session-number*	This message displays the TCP/IP session number. This message is followed by the TCP/IP session information. *session-number* Session identification number
YKY131I CON	*host-type* PORT=*port-number* HOST=*IP-address*	This message displays the port number and IP address of the local or remote host. This message is followed by the TCP/IP session information. *host-type* ▪ LOCAL: Indicates that the TCP/IP session information for the local host is displayed. ▪ REMOTE: Indicates that the TCP/IP session information for the remote host is displayed. *port-number* ▪ When LOCAL is displayed: Port number of the local host ▪ When REMOTE is displayed: Port number of the remote host *IP-address* ▪ When LOCAL is displayed: IP address of the local host ▪ When REMOTE is displayed: IP address of the remote host
YKY132I CON	CONNECTING START TIME=*YYYY/MM/DD hh:mm:ss*	This message displays the time the corresponding TCP/IP session was established. This message is followed by the TCP/IP session information. *YYYY/MM/DD hh:mm:ss* Time (local time)
YKY133I CON	LAST *data-direction-type* TIME=*YYYY/MM/DD hh:mm:ss*	This message displays the last transmission or reception time in the corresponding TCP/IP session. *data-direction-type* ▪ SEND: Indicates the last transmission time. ▪ RECV: Indicates the last reception time. *YYYY/MM/DD hh:mm:ss* Time (local time)
YKY300I SYS	*hh:mm:ss task-ID*,TCP CONNECTION ACCEPTED	The TCP connection request was accepted. Information about the communication with the remote host is displayed in the YKY307I message. *hh:mm:ss* Message output time (local time) *task-ID* Number used to identify the processing task that output the message
YKY301I SYS	*hh:mm:ss task-ID*,TCP CONNECTION ENDED	The TCP connection was released successfully.

Message ID	Message Text	Explanation and Actions
	NORMALLY	*hh:mm:ss* Message output time (local time) *task-ID* Number used to identify the processing task that output the message
YKY304I SYS	*hh:mm:ss task-ID*,REQUEST DENIED,REASON=(*reason-for-denial*)	The request was received, but was denied. *hh:mm:ss* Message output time (local time) *task-ID* Number used to identify the processing task that output the message *reason-for-denial* ▪ `INVALID FORMAT`: The format is invalid. ▪ `VERSION MISMATCH`: The version does not match.
YKY305I CON	*task-ID*,TCP CONNECTION LOST DURING EVENT PROCESSING,TCP-STATUS=(*reason-for-disconnection*)	The TCP connection was lost during TCP/IP processing for the reason shown as *reason-for-disconnection*. Determine the cause of disconnection from the remote host. *task-ID* Number used to identify the processing task that output the message *reason-for-disconnection* ▪ `FIN ACCEPT`: A disconnection request (`TCP-FIN`) from the remote host was received. ▪ `RST ACCEPT`: A disconnection request (`TCP-RST`) from the remote host was received.
YKY307I SYS	*hh:mm:ss task-ID*,TCP CONNECTION INFORMATION,REMOTE-HOST=*IP-address*,REMOTE-PORT=*remote-port-number*,LOCAL-PORT=*local-port-number*	The TCP connection request was accepted. Take appropriate action according to the message that was displayed before this message. *hh:mm:ss* Message output time (local time) *task-ID* Number used to identify the processing task that output the message *IP-address* IP address of the remote host *remote-port-number* Port number of the remote host *local-port-number* Port number of the local host
YKY315I CON	*task-ID*,COMMUNICATION ERROR,@API[,*request-name*[,RC=*response-code*]][,EC=*event-code*][,SRC=*local-IP-address*:*local-port-number*][,DST=*connection-target-IP-address*:*connection-target-port-number*]	A communication error was detected. The message displays the request name, the target IP address:target port number (decimal number), and the local IP address:local port number (decimal number). The currently executing process is cancelled. If necessary, check the YKY330I message that was

Message ID	Message Text	Explanation and Actions
		displayed immediately before this message to determine the cause of the error. *task-ID* Number used to identify the processing task that output the message *request-name* ▪ @OPNSAP: Preprocessing ▪ @OPEN: Processing for establishing a connection ▪ @SEND: Send processing ▪ @RECV: Receive processing ▪ @CLOSE: Processing for releasing the connection ▪ @QUERY: Remote address search processing ▪ @ABORT: Forcibly releasing the connection ▪ @QUIT: Postprocessing *response-code* Code generated during the request shown as *request-name* *event-code* Event that occurred during the TCP/IP session *local-IP-address* IP address of the local host *local-port-number* Port number of the local host *connection-target-IP-address* IP address of the connection target host *connection-target-port-number* Port number of the connection target host
YKY321I CON	*task-ID*,COMMUNICATION TIMED OUT	There is no response within the specified response wait time. The connection will be released. Check the cause of the response timeout. *task-ID* Number used to identify the processing task that output the message
YKY330I CON	SOCKET API FAILURE (*maintenance-information*,*request-type*,*return-code*,*error-number*)	The request shown as *request-type* resulted in an error on the socket interface for IBM TCP/IP for MVS. *return-code* and *error-number* indicate the error information. Check the cause of the error and take appropriate action. If TCP/IP has stopped due to the error, stop Mainframe Agent. Once the error is corrected, start the TCP/IP program, and then start Mainframe Agent. *maintenance-information* Detailed information used for error analysis *request-type* One of the following request types is displayed: ▪ "ACCEPT " ▪ "BIND "

Message ID	Message Text	Explanation and Actions
		▪ "CLOSE " ▪ "INITAPI " ▪ "IOCTL " ▪ "LISTEN " ▪ "RECV " ▪ "SETSOCKOPT " ▪ "SOCKET " For details about the return code (RETCODE) for the request type and the error number (ERRNO), see the IBM manual *Communications Server IP API Guide*.
YKY362I CON	RECEIVED DATA SIZE INVALID,DST=*connection-target-IP-address*:*connection-target-port-number*	Mainframe Agent received an invalid size of data from *connection-target-IP-address*:*connection-target-port-number*. The corresponding receive processing will be stopped. The size of data that can be received is 4,096 bytes. Check, and, if necessary, revise the received data size, and then re-execute the operation.
YKY600I CON	INSUFFICIENT SPACE AVAILABLE. *maintenance-information*	The area allocation by Mainframe Agent failed. Mainframe Agent will be terminated. Increase the region size and then restart Mainframe Agent. *maintenance-information* Detailed information used for error analysis
YKY604I CON	IRXJCL MODULE ERROR,CODE=*return-code*	The IRXJCL routine returned an error with the return code shown as *return-code*. Mainframe Agent will terminate the processing. Check the return code. If the return code is 20, the SYSEXEC DD statement may be invalid in the cataloged procedure used for starting Mainframe Agent. Check, and, if necessary, revise JCL, and then re-execute. *return-code* ▪ 20: Processing failed. The EXEC processing was not performed. ▪ 20021: The parameter list passed to IRXJCL was invalid.
YKY605I CON	IRXINIT MODULE ERROR,CODE=*return-code*,R0=*abnormal-termination-code-and-reason-code-for-abnormal-termination*,PARM7=*reason-code*	The IRXINIT routine returned an error with the return code shown as *return-code*. Mainframe Agent will terminate the processing. Check the return code. *return-code* ▪ 20: Processing failed due to an error. Check the reason code that was returned to PARM7 by IRXINIT. ▪ 100: Processing failed because the system terminated abnormally while IRXINIT was checking the environment. The system may output multiple messages reporting abnormal termination. R0 includes the abnormal termination code and the reason code for abnormal termination. *abnormal-termination-code-and-reason-code-for-*

Message ID	Message Text	Explanation and Actions
		abnormal-termination IRXINIT returns the abnormal termination code set in the two trailing bytes of R0. IRXINIT returns the reason code for abnormal termination set in the two leading bytes of R0. If the reason code for abnormal termination is larger than two bytes, IRXINIT returns only the two trailing bytes of the reason code for abnormal termination. For details about the abnormal termination code and reason code, see the *MVS System Codes*. *reason-code* For details about the reason code, see the *TSO/E REXX Reference*.
YKY606I CON	IRXTERM MODULE ERROR,CODE=*return-code*,R0=*abnormal-termination-code-and-reason-code-for-abnormal-termination*	The IRXTERM routine returned an error with the indicated return code. Mainframe Agent terminates the processing. Check the return code. *return-code* For details about the return code, see the *TSO/E REXX Reference*. *abnormal-termination-code-and-reason-code-for-abnormal-termination* R0 includes the abnormal termination code and the reason code for abnormal termination. IRXTERM returns the abnormal termination code set in the two trailing bytes of R0. IRXTERM returns the reason code for abnormal termination set in the two leading bytes of R0. If the reason code for abnormal termination is larger than two bytes, IRXTERM returns only the two trailing bytes of the reason code for abnormal termination. For details about the abnormal termination code and reason code, see the *MVS System Codes*.
YKY680I SYS	*hh:mm:ss task-ID*,*command*,RC=*return-code*[,*text*]	An error was detected during the execution of a command that was issued by the agent. If the number of characters in the message output by the command exceeds 126, it will be displayed on multiple lines. The maximum number of message lines for a single command is 10. *hh:mm:ss* Message output time (local time) *task-ID* Identification number of the processing task to which the message was output *command* Name of the command that the agent executed *return-code* Return code from the command that the agent executed *text* Message (maintenance information) that was output by the command that the agent executed

Message ID	Message Text	Explanation and Actions
YKY699I CON	AGENT FUNCTION ABEND CODE=*Sxxx Uxxxx* DATE=*yy-mm-dd* TIME=*hh:mm:nn* ABENDED-MODULE=*module-name* C-DATE=*module-created-date* BASE=*bbbbbbbb* DISP=*dddd* [CALLING-MODULE=*module-name* C-DATE=*y'y'.m'm'.d'd'* BASE=*bbbbbbbb* DISP=*dddd*] PSW=*pppppppp pppppppp* ILC=*ll* INTC=*xx* REGISTERS AT TIME OF FAILURE GR 00-03 *contents-of-register-0 contents-of-register-1 contents-of-register-2 contents-of-register-3* GR 04-07 *contents-of-register-4 contents-of-register-5 contents-of-register-6 contents-of-register-7* GR 08-11 *contents-of-reiuster-8 contents-of-register-9 contents-of-reiuster-10 contents-of-register-11* GR 12-15 *contents-of-register-12 contents-of-register-13 contents-of-register-14 contents-of-register-15*	The main task or subtask terminated abnormally during Mainframe Agent processing. If the task cannot be recovered, Mainframe Agent will be terminated. Contact the center administrator. *Sxxx* System completion code when the task terminated abnormally (hexadecimal) *Uxxxx* User completion code when the task terminated abnormally (decimal number) *yy-mm-dd* Date the task terminated abnormally *hh:mm:dd* Time the task terminated abnormally *module-name* Section name of the Mainframe Agent module or the load module name. If the module cannot be identified, `UNKNOWN` is displayed. When `UNKNOWN` is displayed, the values indicated by *y'y'.m'm'.d'd'* and *bbbbbbbb* are not correct. *module-creation-date* *y'y'.m'm'.d'd'*: Creation date of the module indicated by *module-name* *y'y'/m'm'/d'd'*: Creation date of the module indicated by *module-name* *bbbbbbbb* Contents of the base register *dddd* ▪ `ABENDED-MODULE`: Location where `ABENDED-MODULE` was called, relative to the top of the module ▪ `CALLING-MODULE`: Location where `CALLING-MODULE` was called, relative to the top of the module *pppppppp pppppppp* `PSW` during the abnormal termination *ll* Length of command during the abnormal termination *xx* Interrupt code during the abnormal termination
YKY703E XML	XML translation error: The sent entity is not XML.	This is an XML error. The sent entity is not XML. Check, and, if necessary, revise the request coding.
YKY704E XML	End of request was detected in the comment.	The end of the XML request was detected in the comment. Check, and, if necessary, revise the comment.
YKY705E XML	End of request was detected in an element.	The end of the XML request was detected in an

Message ID	Message Text	Explanation and Actions
		element. Check, and, if necessary, revise the last element in the XML request.
YKY706E XML	The number of elements exceeded the allowed limit.	The number of element hierarchies exceeded the permitted maximum value (16). Check, and, if necessary, revise the request.
YKY707E XML	The request version is a mismatch.	The API version of the XML request is not supported. Make sure that the version is supported by Mainframe Agent.
YKY713E XML	An invalid element '*element-name*' was specified in the XML request.	An invalid *element-name* was specified in the XML request. Check, and, if necessary, revise the specified request.
YKY714E XML	An invalid parameter '*parameter-name*' was specified in the XML request element '*element-name*'.	An invalid *parameter-name* was specified in the XML request element *element-name*. Check, and, if necessary, revise the specified request.
YKY715E XML	An invalid value was specified for the parameter '*parameter-name*' in the XML request element '*element-name*'.	An invalid value was specified for *parameter-name* in the XML request element *element-name*. Check, and, if necessary, revise the specified request.
YKY716E XML	An invalid child element '*child-element-name*' was specified in the XML request element '*parent-element-name*'.	An invalid child element *child-element-name* was specified for the parent element name *parent-element-name* in the XML request. If the parent element name cannot be acquired, *parent-element-name* is set to null. Check, and, if necessary, revise the specified request.
YKY717E XML	A required element is missing from the request. '*element*'	A required element is missing in the request. Check, and, if necessary, revise the element specification in the request.
YKY718E XML	A required parameter is missing from the element '*element-name*' of the request. '*parameter-name*'	A required parameter is missing in the element. Check, and, if necessary, revise the corresponding element specification in the request.
YKY719E XML	There is a conflict with element '*element-name*'.	The end tag for the element shown as *element-name* does not have a paired start tag, or the correspondence between the end and start tags is invalid. Check, and, if necessary, revise the corresponding element specification in the request.

Chapter 6 Troubleshooting

This chapter describes the troubleshooting of Mainframe Agent.

- Information Output to Logs (section 6.1)
- Troubleshooting (section 6.2)

6.1 Information Output to Logs

Mainframe Agent connects via TCP/IP and exchanges storage information with Device Manager.

If a communication line error or Mainframe Agent failure occurs while Mainframe Agent is running, error information is output to the Device Manager log. However, since the error is detected after Device Manager issues a request, the output of error information might be delayed for some time after the actual error occurrence.

Also, if an error occurs when Mainframe Agent attempts to acquire storage information, that storage information and the error information will not be displayed in the Device Manager window. If this happens, check the contents of the collected log.

Table 6.1 shows the information that Mainframe Agent outputs to logs.

Table 6.1 Information Output to Logs

Trigger of the Log Output	Output Information	Output Location
Reception of a request to establish a TCP connection	Information output in the `YKY300I` or `YKY307I` message: ▪ Message output time, when the connection request was received ▪ Remote host's IP address ▪ Remote host's port number ▪ Local host's port number	`SYSLOG`
Normal release of a TCP connection	Information output in the `YKY301I` message: ▪ Message output time, when the connection was released	
Denial of a connection request	Information output in the `YKY304I` message: ▪ Message output time, when the request was denied ▪ Reason for denial	
Error detected during information acquisition	Information output in the `YKY680I` message: ▪ Time of message output when the command is executed ▪ Command name ▪ Command return code	
Forced release of a TCP connection	Information output in the `YKY305I` message: ▪ Reason for release	Console
Error detected during communication processing	Information output in the `YKY315I` message: ▪ Name of request during TCP/IP communication ▪ Response code and event code ▪ Local IP address: Local port number ▪ Remote IP address: Remote port number	
No response after the response wait time was exceeded	The `YKY321I` message is output.	
Error detected in IBM Communications Server socket interface request	Information output in the `YKY330I` message: ▪ Request type ▪ Return code and error number for request identification See the *Communications Server: IP API Guide*.	

Trigger of the Log Output	Output Information	Output Location
Size of data received by Mainframe Agent invalid	Information output in the YKY362I message: ▪ Remote IP address and remote port number	
Abnormal termination of task during Mainframe Agent processing	Information output in the YKY699I message: ▪ System completion code when the task terminated abnormally ▪ User completion code when the task terminated abnormally# ▪ Date and time the task terminated abnormally ▪ Information on system status when the abnormal termination occurred (register contents, module information, PSW, instruction length, interrupt code)	
	A memory dump is output to the location specified by the SYSABEND DD statement in the Mainframe Agent startup cataloged procedure JCL (normally, SYSOUT=* is specified).	SYSABEND dataset
The data requested by the corresponding HiCommand is invalid	The YKY703E to YKY719E messages are output.	HiCommand Windows or HiCommand error log files

#: If an error is detected during program execution, execution terminates with a user completion code, as follows:

0007: Subtask ATTACH failure

Other than 0007: Error in internal processing of Mainframe Agent

6.2 Troubleshooting

This section describes how to troubleshoot during Mainframe Agent operation.

6.2.1 When Mainframe Agent Cannot Be Started

Table 6.2 describes the events and actions to be taken when Mainframe Agent cannot be started. Locate (in the Event column, going down in the order listed) the first description that matches the event, and then take the action (in the Action column) to solve the problem.

Table 6.2 Events and Actions to Be Taken When Mainframe Agent Cannot Be Started

No.	Event		Action
1	Mainframe Agent terminates with a system completion code (878).		Check and if necessary revise the region size of Mainframe Agent, and then restart Mainframe Agent.
2	The IEC130I message is displayed.		Make sure that the DD statement indicated in the message is specified correctly and then restart Mainframe Agent.
3	IKJEFT01 terminates with return code 12 immediately after start.		Make sure that the STEPLIB DD statement is specified correctly and then restart Mainframe Agent.
4	The following message is displayed: YKY019I YKPARM DD STATEMENT NOT FOUND		Make sure that the YKPARM DD statement is defined correctly and then restart Mainframe Agent.
5	Mainframe Agent terminates abnormally with a system completion code (013).	The IEC141I message is displayed.	Make sure that the DD statement is defined correctly and then restart Mainframe Agent.
		The IEC141I message is not displayed.	Take appropriate action according to the displayed message.
6	Mainframe Agent terminates abnormally with a system completion code (001).	The IEC020I message is displayed.	Make sure that the DD statement is defined correctly and then restart Mainframe Agent.
		The IEC020I message is not displayed.	Take appropriate action according to the displayed message.
7	The following message is displayed: YKY604I IRXJCL MODULE ERROR, CODE=20	The SYSEXEC DD statement is missing.	Specify the correct SYSEXEC DD statement and then restart Mainframe Agent.
		The SYSEXEC DD statement is displayed.	Check with the system administrator to determine if the settings for the REXX execution environment and the REXX alternate libraries environment are correct.
8	After being started, Mainframe Agent terminates immediately with a return code (00).		Make sure that YKAGENTD is specified in the PARM operand in the EXEC statement, and then restart Mainframe Agent.
9	An error is displayed during initialization parameter analysis.		Take appropriate action according to the displayed error message.
10	The TCP/IP setting error is displayed.		Take appropriate action according to the displayed message.
11	A message other than the above is displayed.		Take appropriate action according to the displayed message.

No.	Event	Action
12	Mainframe Agent terminates with a return code other than (00).	Take appropriate action according to the return code.

6.2.2 When Information Obtained from Mainframe Agent Is Not Updated

Table 6.3 describes the events and actions to be taken when the information from Mainframe Agent is not updated when information is acquired by HiCommand. Locate (in the Event column, going down in the order listed) the first description that matches the event, and then take the action (in the Action column) to solve the problem.

Table 6.3 Events and Actions to Be Taken When Information from Mainframe Agent Is Not Updated

No.	Event	Action
1	The following message is displayed: YKY330I SOCKET API FAILURE (OPEN,BIND,-0000001,0000048)	The specified port number is in use. Either terminate the program that is using the port number or change the port number in the initialization parameter, and then restart Mainframe Agent.
2	The following message is displayed: YKY330I SOCKET API FAILURE (INIT,INITAPI,-0000001,0000156)	Protected by RACF. Check, and, if necessary, revise the RACF settings and then restart Mainframe Agent.
3	The following message is displayed: YKY330I SOCKET API FAILURE (OPEN,BIND,-0000001,0000013)	Protected by RACF. Check, and, if necessary, revise the RACF settings and then restart Mainframe Agent.
4	Mainframe Agent has terminated abnormally with a system completion code (F*nn*). (F*nn*: SVC number)	Make sure that the user SVC has been registered and then restart Mainframe Agent.
5	An error message is displayed on the console or in SYSLOG.	Take appropriate action according to the displayed message.

Appendix A Command Format

A.1 Symbols Used in Command Explanations

Table A.1 shows the symbols used in command explanations.

Table A.1 Symbols Used in Command Explanations

Font for symbol	Convention
| (stroke)	Separator between multiple items, meaning "or". Example: "A | B | C" means "A, B, or C".
[ ]	Square brackets enclose an item whose specification is optional. When multiple items are in the square brackets, either none or one of them must be selected. Example: [A] means that either nothing or A must be specified.
Italics	Italics are used to indicate a placeholder for some actual text provided by the user or system.
<< >>	Double angle brackets enclose the default value that is assumed by the system when the corresponding item is omitted.
(( ))	Double parentheses enclose a permitted value range.
Δ	There is one space.
Δ*n*	At least *n* spaces are required.
~	The item immediately preceding this symbol must observe the syntax rules in the angle brackets that follow this symbol.
< >	Angle brackets enclose the syntax rules that must be observed when each item is specified.

A.2 Syntax Elements for Parameters

Table A.2 lists the syntax elements for commands.

Table A.2 Command Syntax Elements

Syntax element	Permitted character
<numeric>	0|1|2|3|4|5|6|7|8|9
<uppercase alphabetic>	A|B|C|D|E|F|G|H|I|J|K|L|M|N|O|P|Q|R|S|T|U|V|W|X|Y|Z|$|#|@
<alphabetic>	A|B|C|D|E|F|G|H|I|J|K|L|M|N|O|P|Q|R|S|T|U|V|W|X|Y|Z|a|b|c|d|e|f|g|h|i|j|k|l|m|n|o|p|q|r|s|t|u|v|w|x|y|z|$|#|@
<alphanumeric>	Alphabetical characters, numeric characters, or a set of alphabetic and numeric characters
<hexadecimal>	0|1|2|3|4|5|6|7|8|9|A|B|C|D|E|F

Glossary

AddHost command	A Device Manager command used for registering mainframe hosts into Device Manager.
AddHostRefresh command	A Device Manager command used for refreshing mainframe storage information displayed on Device Manager Web Client.
AddURLLink command	A Device Manager command used for registering Mainframe Agent into Device Manager.
CANCEL command	A command to forcibly stop the Mainframe Agent.
DeleteHost command	A Device Manager command used for deleting mainframe hosts registered in Device Manager.
DeleteURLLink command	A Device Manager command used for deleting Mainframe Agent registration information registered in Device Manager.
Device Manager	The base program for storage management. Device Manager can integrate storage operations and management functions.
DEVN	A device number used by a mainframe host to manage storage volumes.
GetURLLink command	A Device Manager command used for acquiring Mainframe Agent registration information registered in Device Manager.
HiCommand	A group of programs that support the creation, operation, and monitoring of storage systems.
Hitachi Business Continuity Manager	A program used for building a highly reliable backup system in which multiple data centers are linked together. This program enables operations to continue, by using the copy functionality of the disk subsystems, even if a disaster occurs and also enables you to minimize the restoration time or data loss from a disaster.
host identification name	A name specified to identify a mainframe when the volume information for multiple mainframe hosts is obtained. This name is specified by using the initialization parameter `HOSTNAME` of the Mainframe Agent.
initialization parameter	A parameter used for setting up the environment of the Mainframe Agent at the startup of the agent. The following settings are available by using this parameter: port number, reception wait time, host identification name, device number, and log output level.
JES startup procedure	A cataloged procedure to start JES (Job Entry Subsystem).
log level	A level that controls the output of the following types of

	messages: messages, which are output to the system log (SYSLOG) while the Mainframe Agent is running, that show the progress of the communication execution, and error messages that are output when storage information is collected. This log level is specified by using the initialization parameter `LOGLEVEL` of the Mainframe Agent.
ModifyHost command	A Device Manager command used for changing mainframe host information registered in Device Manager.
RACF	An IBM security management product.
REXX	A type of structured programming language developed by IBM. Mainly employed by IBM's mainframe OS, REXX is used as the macro language for calling application and OS functions.
REXX alternate library	An alternate library used when neither of the following libraries exists: IBM Library for REXX on zSeries Release 4 (FMID HWJ9140), or IBM Library for REXX on zSeries Alternate Library (FMID HWJ9143).
SETINIT command	A command used to set the initialization parameter for the Mainframe Agent. By specifying this parameter in the `MODIFY` command, you can dynamically change the log output level.
START command	A command used to start the Mainframe Agent.
startup cataloged procedure	A cataloged procedure used for startup of the Mainframe Agent.
STOP command	A command used to perform a planned stop of the Mainframe Agent.
VOLSER	A volume serial number used by a mainframe host to manage storage volumes.
YKAGALLO job	A job that assigns datasets required before installation of Mainframe Agent.
YKAGENTD	An executable program of the Mainframe Agent. This is also the name of the standard startup cataloged procedure of the Mainframe Agent.
YKAGINST job	A job that installs Mainframe Agent.
YKALCSVC command	A command used for registering the user SVC required for running Mainframe Agent. This command is started by the OS START command.
YKPRM00	A member to which an initialization parameter necessary to run the Mainframe Agent is registered.

Acronyms and Abbreviations

BCM	Hitachi Business Continuity Manager
BLKSIZE	BLocK SIZE
Device Manager	HiCommand Device Manager
DKC	DisK Controller
DSORG	DataSet ORGanization
FMID	Function Modification IDentifier
JCL	job control language
LRECL	Logical RECord Length
MCS	Modification Control Statements
OS	Operating System
PC	Personal Computer
RACF	Resource Access Control Facility
RECFM	RECord ForMat
REXX	REstructured eXtended eXecutor
TagmaStore NSC	TagmaStore Network Storage Controller
TagmaStore USP	TagmaStore Universal Storage Platform
Universal Storage Platform V	Hitachi Universal Storage Platform V
VM	Virtual Machine
XML	eXtensible Markup Language

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