

FORTRA

Robot HA
13.08

Installation &
Implementation Guide

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Welcome to Robot HA

Software Configuration, Implementation, and Training Checklists

Robot HA is an IBM i high availability solution that reduces downtime and provides data replication and business continuity. It allows you to replicate your libraries, IFS directories, and system information from production to backup, which helps eliminate planned and unplanned downtime.

With Robot HA, you can use remote journaling for instant replication across any distance the moment changes are applied to your data. You can also test two different role swap scenarios to verify this replication is done correctly and ensure your systems are secure in the event of unplanned downtime. Role swaps can be tested while users are using production to minimize the disruption of working hours.

Robot HA monitors all aspects of replication — including replication tasks in error, excessive transport or apply lags, user-defined conditions, and more — and sends notification to your phone or email for any issues that need attention.

Robot HA is self-healing. It continuously audits and repairs objects and IFS directories to ensure they match the production system. This synchronization process ensures that your data is up-to-date on the backup without the need for manual monitoring.

You can replicate the following data with Robot HA:

Library data	User profiles
IFS directories	Object authorities
Authorization lists	Spoiled files
System values	Message queues
Program objects	

NOTE: These instructions are intended as a guide for quick installation and basic configuration. You can supplement this information, where needed, with the *Robot HA User Guide*.

Installation

These topics include information about installing, updating, or converting Robot HA.

Installing or Updating Robot HA

Before You Begin

Read these instructions completely before attempting an installation or update.

- This document provides specific instructions on how to install or update Robot HA using the Product Loader.
- Before loading Robot HA, we check if RBTSYSLIB needs to be updated. If it does, you'll be asked to bring down the subsystem RBTSLEEPER. This ends all Robot products running on your system. When the update completes, you can restart the subsystem.
- You must install Robot HA on every system that will be part of your high availability environment (production and backup systems).
- As of Robot HA version 12.06 and above, if you are an existing PowerHA customer and wish to use Robot HA and PowerHA together in your role swap plan, see the Using PowerHA with Robot HA - *NOSWAPIP Role Swap Checklist and the Using PowerHA with Robot HA – One to Many Role Swap Checklist for more information.
- Display size must be 27x132 to display Work With Sync Attributes Panel. HMC 5250 Console does not support 132 columns.
- Secure an understanding of the bandwidth between the production and backup systems (whether shared or dedicated for replication).
- Request replication recommendations from critical business software vendors.
- Ensure license codes are applied for all applications on your backup system. This includes third party applications and IBM LPPs.
- Review IBM installed products to ensure they are the same on both systems.
- Consider your business plan for Recovery Time and Recovery Point Objectives in a role swap.
- Review all Robot HA supported role swap options in the *Role Swap User Guide*.
- Secure familiarity with any journaled objects and journal libraries on the production system.

- Remote journaling using TCP ports 446(DRDA) and 447(DDM) and 3777(remote journaling proper). If you intend to use remote journaling and your source and target machines are separated by a firewall, be sure to open ports 446, 447, and 3777. In addition, if you are using the value *USRIDPWD for **lowest authentication method** on the CHGDDMTCPA command, refer to [Using a Secure DDM TCP/IP Connection with Robot HA](#) If you plan to use the [Robot GUIDE Automated Setup](#), skip this step.
- For optimum synchronization, ensure that the port used by PING requests is open on both systems.
- If you currently have another replication software installed and running on your system, you must ensure that application will not replicate any of the Robot HA related libraries. Some applications will pick up new libraries created on the system without having to do any setup.

The libraries to omit from the other replication software:

- RBTHALIB
- RSFTEMP
- RSFUSER
- Library names specified on INZRSFHA command for:
 - Journal Library
 - Remote journal library
 - Primary machine info: “Replicate RBTHALIB to” and “Replicate *CFG to”
 - Secondary machine info: “Replicate RBTHALIB to” and “Replicate *CFG to”
- While not required, it is recommended that the hardware between the production and backup systems are of similar size and capacity. Having insufficient resources at the backup system can lead to the following issues:
 - **Increased recovery point:** If the backup system does not have equivalent resources, it may struggle to keep up with the replication workload. Because data is continuously applied from the production system; the backup system needs enough resources in order to apply changes at the same rate as the production system or it may fall behind, resulting in apply lag.
 - **Performance degradation:** If the backup system is not capable of handling the same load as the production system, there may be a noticeable decrease in performance of applications when running on the backup system in the event of a role swap.
- Once the installation or update process completes, read the After You Are Done section for additional information.

System Requirements

- Robot HA requires the following:
- IBM i (i5/OS, OS/400) version 7.3 or higher
- Current on all IBM-supported PTFs (including journaling PTFs)
- If data is being sent from an IBM i 7.5 system to an IBM i 7.4 or 7.3 system, the following PTFs must be installed:
 - 7.4 = SI76821
 - 7.3 = SI76822
- Ideally, all systems using Robot HA together would be at the same operating system level. However, following IBM standards, Robot HA supports an operating system difference of N-2. Robot HA supports communication between operating systems within two versions of each other. Be aware that if all systems are not on the same OS level, there are OS-specific features that are not supported for replication between systems at different OS levels.

EXAMPLE: At OS 7.5 there is a new password level of 4. This is not supported on earlier OS levels.

Refer to the chart below to determine if your system configuration for Robot HA is supported:

OS	7.5	7.4	7.3
7.5	Y	Y	Y
7.4	Y	Y	Y
7.3	Y	Y	Y

Installing or Updating Robot HA

Use these instructions to install or update Robot HA on the production **and** backup system. This process downloads everything to your PC and loads the objects on the IBM i. Read the following steps carefully to proceed.

1. Download the Robot HA installer (**setupRobotHA.exe**). Double-click it to start it.
2. On the IBM i Details panel:
 - a. Select or enter the IBM i where you want to load Robot HA.
 - b. Enter a user profile and password that's a member of the user class *SECOFR and has at least the following special authorities: *ALLOBJ, *SECADM, *JOBCTL, and *IOSYSCFG. The user profile should have Limit capabilities set to *NO. This profile will be used to restore and copy objects, and for product

maintenance on the IBM i.

c. (Optional) In the Advanced Settings section:

- Enter a port number or use the arrows if you want to change the FTP port number to something other than the default of 21.
- Select **Secure File Transfer** if you want to use FTPS (FTP over SSL) during the file transfer. The default FTPS secure port is 990, but it can be changed to the required secure port for your environment.
- In the **Timeout (seconds)** field, enter the number of seconds the session should be kept active during an FTP transfer. You can choose anywhere between 25 and 1800 seconds (30 minutes).

Note: If the transfer takes longer than the amount of time specified, the session will expire.

d. Click **Next**.

3. You have two options on the Product Load Options panel:

a. Click **Immediate Load** if you'd like to load the product on the IBM i now.

Note: If you're doing an update, this ends Robot HA until the product load completes. After you are done, we'll restart the product.

b. Click **Staged Load** if you'd like to transfer the objects now and load them on the IBM i at a later time.

Note: See "[Loading Staged Objects on the IBM i](#)" below for instructions on how to load the staged objects on your selected IBM i system.

4. The Product Load Progress panel for Robot HA launches. When the processing is complete, you have two choices:

- If you have installations or updates to do on other IBM i systems, click **Restart**. Then, return to step 2.
- If this is the only installation or update of Robot HA that you're doing, click **Finish**.

Note: If the Product Load Progress panel ends with an overall Failed message, the product upload could not complete properly. To find the reason the upload failed, click **View Logs** and review your logs. You can also use **Download** at the top of the logs to save the information for future review.

Loading Staged Objects on the IBM i

If you chose to stage your objects during [step 3b of the installation or update process](#), do the following to manually load them on the IBM i you identified above.

1. On the IBM i, execute the following command to display the Work with Loads panel:
HSLOADMGR/HSWRKLOAD
2. Enter option **1**, Load, next to the Load Name for Robot HA and press **Enter**.

Entering the License Code

NOTE: You only need to enter a license code after installing Robot HA. If you updated Robot HA, skip these steps.

After you load Robot HA, you must enter a license code in order to use the product. If you haven't received a license code, contact your Regional Sales Manager.

IMPORTANT: If you plan to use the Robot GUIDE Automatic Setup, you do not need these steps. The license code entry is covered during the Robot GUIDE Automatic Setup.

1. Execute the following command on the IBM i to open the Installed Robot Products panel:
RSLVER
2. Enter option **1** by Robot HA to open the Robot HA License Setup panel.
3. Paste your new license code into the first entry field under **License Code** (it will automatically fill the other fields).

Note: You can paste the license code into the field directly or use **F11** to enter Copy and Paste Mode.

4. Press **Enter**.
5. Our license agreement displays. Read it or print it, then press **Enter**.

Note: This only happens the first time you enter a license code. If you want to review the license agreement at a later time, press **F8** from the Robot HA License Setup panel.

Once you've entered a license code for Robot HA, use the following steps to launch the product from the IBM i Main Menu.

Launching Robot HA

1. Sign on to the IBM i.
2. Execute the following command from the IBM i Main Menu:

RBO

3. Enter option **25** to view the Robot HA Main Menu.

IMPORTANT: If this is a new install, launching Robot HA for the first time will prompt you to use the [Robot GUIDE Automatic Setup](#).

After You Are Done

- If you are using the [Robot GUIDE Automated Setup](#), skip this step as it will be done for you. Verify your DDM TCP/IP network "lowest authentication method" on the **CHGDDMTCPA** command to see if you require authentication entries for Robot HA. If your "lowest authentication method" value requires a password, see [Using a Secure DDM TCP/IP Connection with Robot HA](#). Fortra recommends a minimum of *USRIDPWD, although if changing your method to use a password you should evaluate the impact of this with your other applications.
- Take note of the "lowest authentication method" you are using. Authentication entries are not replicated and will need to be manually reapplied after a role swap. To see what authentication entries exist, run the following SQL statement as supplied by IBM. This will list the entries defined on your system.
SELECT * from QSYS2.DRDA_AUTHENTICATION_ENTRY_INFO ORDER BY AUTHORIZATION_NAME, SERVER_NAME
- System values QPWD* should be set the same on both the source and the target. Note that changes on some of these system values take effect after IPL.
- QPWDLVL must be at the same level on both the source and the target.
- If you have changed the IBM default authorities on any IBM objects to *public *exclude, the user profile RSFSRV must be added to have authority to those objects.
- **For updates:** During an update, the server and synchronizing are stopped. After the update completes, you will need to go into Robot HA and start the server and synchronizing through the Control menu.
- As of Robot HA version 12.06 and above, if you are an already configured PowerHA customer run the command **CHGDTAARA DTAARA(RBTHALIB/RHAPHA (1 1)) VALUE('1') BEFORE** running INZRSFHA. If you have PowerHA installed but are not yet configured, the INZRSFHA will create the *USRPRF and *AUTL sync entries. Once you are configured and ready to use PowerHA, then delete the sync entries for *USRPRF and *AUTL if you do not want them sync'd through Robot HA. If you are using the [Robot GUIDE Automated Setup](#), skip this step.

- If this is a product update, the swap programs will not automatically be replaced in the RSFUSER library. To replace the swap programs:
 - Start the servers on the source and target systems: RBO, option 2=Control Menu, option 1=Start TCP/IP server.
 - On the *PROD system only, run the INZRSFHA command, specifying "Replace role swap programs" = *YES.
- Three libraries were restored to your system for use during the installation or update process: HSLOADMGR, HSLOADMGRW, and RBTCDRLIB. We don't remove them from your system in case you're doing multiple installations. You can delete them when you're finished.

Converting from Robot HA 12 to 13

Before You Begin

Read these instructions completely before attempting a conversion.

- This document provides specific instructions on how to convert from Robot HA 12 to 13 using the HelpSystems Product Loader.
- Before loading Robot HA, we check if RBTSYSLIB needs to be updated. If it does, you'll be asked to bring down the subsystem RBTSLEEPER. This ends all Robot products running on your system. When the update completes, you can restart the subsystem.
- Once the conversion process completes, read the After You Are Done section for additional information.
- You must convert Robot HA on every system that will be part of your high availability environment (production and backup systems).
- As of Robot HA version 12.06 and above, if you are an existing PowerHA customer and wish to use Robot HA and PowerHA together in your role swap plan, see the Using PowerHA with Robot HA - *NOSWAPIP Role Swap Checklist and the Using PowerHA with Robot HA – One to Many Role Swap Checklist for more information.
- Display size must be 27x132 to display Work With Sync Attributes Panel. HMC 5250 Console does not support 132 columns.

System Requirements

Robot HA requires the following:

IBM i (i5/OS, OS/400) version 7.2 or higher

Current on all IBM-supported PTFs (including journaling PTFs)

If data is being sent from an IBM i 7.5 system to an IBM i 7.4 or 7.3 system, the following PTFs must be installed:

- 7.4 = SI76821
- 7.3 = SI76822

Ideally, all systems using Robot HA together would be at the same operating system level. However, following IBM standards, Robot HA supports an operating system difference of N-2. Robot HA supports communication between operating systems within two versions of each other. Be aware that if all systems are not on the same OS level, there are OS-specific features that are not supported for replication between systems at different OS levels.

EXAMPLE: At OS 7.5 there is a new password level of 4. This is not supported on earlier OS levels.

Refer to the chart below to determine if your system configuration for Robot HA is supported:

OS	7.5	7.4	7.3	7.2
7.5	Y	Y	Y	N
7.4	Y	Y	Y	Y
7.3	Y	Y	Y	Y
7.2	N	Y	Y	Y

Converting Robot HA

Use these instructions to convert Robot HA on the production and backup system. This process downloads everything to your PC and loads the objects on the IBM i. Read the following steps carefully to proceed.

1. Download the Robot HA installer (**setupRobotHA.exe**). Double-click it to start it.
2. On the IBM i Details panel:

- a. Select or enter the IBM i where you want to load Robot HA.
 - b. Enter a user profile and password that's a member of the user class *SECOFR and has at least the following special authorities: *ALLOBJ, *SECADM, *JOBCTL, and *IOSYSCFG. The user profile should have Limit capabilities set to *NO. This profile will be used to restore and copy objects, and for product maintenance on the IBM i.
 - c. (Optional) In the Advanced Settings section:
 - Enter a port number or use the arrows if you want to change the FTP port number to something other than the default of 21.
 - Select **Secure File Transfer** if you want to use FTPS (FTP over SSL) during the file transfer. The default FTPS secure port is 990, but it can be changed to the required secure port for your environment.
 - In the **Timeout (seconds)** field, enter the number of seconds the session should be kept active during an FTP transfer. You can choose anywhere between 25 and 1800 seconds (30 minutes).
Note: If the transfer takes longer than the amount of time specified, the session will expire.
 - d. Click **Next**.
3. You have two options on the Product Load Options panel:
- a. Click **Immediate Load** if you'd like to load the product on the IBM i now.
Note: This ends Robot HA until the product load completes. After you are done, we will restart the product.
 - b. Click **Staged Load** if you'd like to transfer the objects now and load them on the IBM i at a later time.
Note: See the section on [Loading Staged Objects on the IBM i](#) below for instructions on how to load the staged objects on your selected IBM i system.
4. The Product Load Progress panel for Robot HA launches. When the processing is complete, you have two choices:
- If this is the last conversion of Robot HA that you're doing, click **Finish**.
 - If you have conversions to do on other IBM i systems (production or backup), click **Restart**. Then, return to step 2.
- Note:** If the Product Load Progress panel ends with an overall Failed message, the product upload could not complete properly. To find the reason the upload failed, click **View Logs** and review your logs. You can also use **Download** at the top of the logs to save the information for future review.

Loading Staged Objects on the IBM i

If you chose to stage your objects during [step 3b of the conversion process](#), do the following to manually load them on the IBM i you identified above.

1. Execute the following command to display the Work with Loads panel:
HSLOADMGR/HSWRKLOAD
2. Enter option **1**, Load, next to the Load Name for Robot HA and press **Enter**. The conversion process will begin.

After You Are Done

- To access the product's Main Menu on the IBM i, execute the command **RBO** on a command line to display the Robot Automated Operations Solution panel. Then, enter option **25** for Robot HA.
- If you are using the [Robot GUIDE Automated Setup](#), skip this step as it will be done for you. Verify your DDM TCP/IP network "lowest authentication method" on the **CHGDDMTCPA** command to see if you require authentication entries for Robot HA. If your "lowest authentication method" value requires a password, see [Using a Secure DDM TCP/IP Connection with Robot HA](#). Fortra recommends a minimum of *USRIDPWD, although if changing your method to use a password you should evaluate the impact of this with your other applications.
- Take note of the "lowest authentication method" you are using. Authentication entries are not replicated and will need to be manually reapplied after a role swap. To see what authentication entries exist, run the following SQL statement as supplied by IBM. This will list the entries defined on your system.
SELECT * from QSYS2.DRDA_AUTHENTICATION_ENTRY_INFO ORDER BY AUTHORIZATION_NAME, SERVER_NAME
- During a conversion, the server and synchronizing are stopped. After the update completes, you will need to go into Robot HA and start the server and synchronizing through the Control menu.
- Set up Robot HA on your system as described in the Robot HA Implementation Guide. You can download the user guide from our website.
- As of Robot HA version 12.06 and above, if you are an already configured PowerHA customer run the command **CHGDTAARA DTAARA(RBTHALIB/RHAPHA (1 1)) VALUE('1') BEFORE** running INZRSFHA. If you have PowerHA installed but are not yet configured, the INZRSFHA will create the *USRPRF and *AUTL sync entries. Once you are configured and ready to use PowerHA, then delete the sync entries for *USRPRF and *AUTL if you do not want them sync'd through Robot HA. If you are using the [Robot GUIDE Automated Setup](#), skip this step.

- If this is a product update, the swap programs will not automatically be replaced in the RSFUSER library. To replace the swap programs:
 - Start the servers on the source and target systems: RBO, option 2=Control Menu, option 1=Start TCP/IP server.
 - On the *PROD system only, run the INZRSFHA command, specifying "Replace role swap programs" = *YES.
- Three libraries were restored to your system for use during the conversion process: HSLOADMGR, HSLOADMGRW, and RBTCDLIB. We don't remove them from your system in case you're doing multiple conversion. You can delete them when you're finished.

Robot GUIDE Automatic Setup

The Robot GUIDE Automatic Setup provides a simple interface to enter key information to start the communication between your production system and backup system.

Overview

The Robot GUIDE runs several processes on both the backup and production systems to eliminate the need for manual setup.

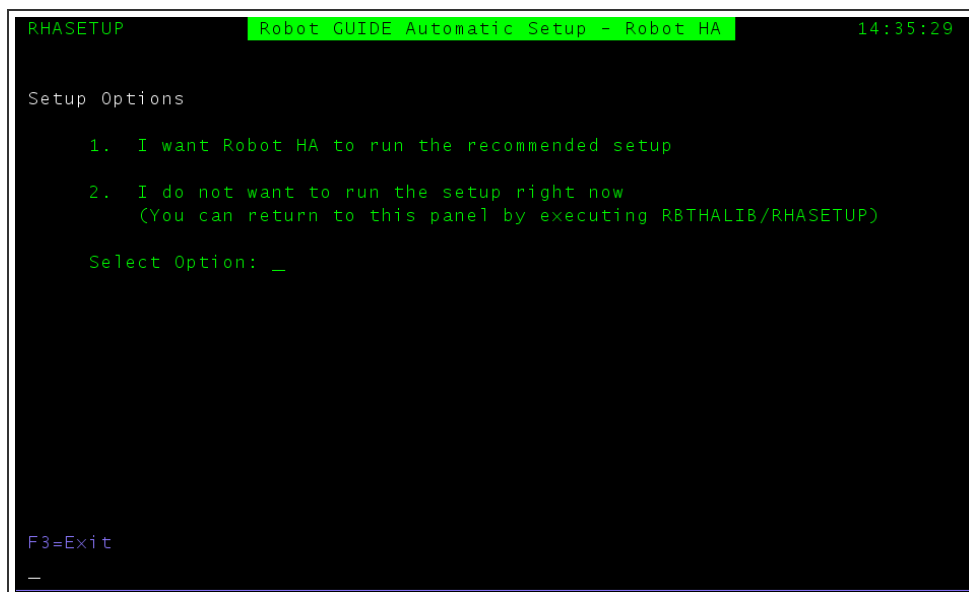
- Sets replication roles.
- Runs all steps of [INZRSFHA](#).
- Sets DDM authentication method.

Using the Robot GUIDE Automatic Setup.

After installation of Robot HA, the Robot GUIDE Automatic Setup will start upon opening Robot HA. We recommend that you run the Robot GUIDE on the backup system first, followed by the production system.

On your backup system:

1. Take option **25** Robot HA from the Robot Automated Operations Solution menu.
2. The Robot GUIDE Automated Setup should start.



```
RHASETUP Robot GUIDE Automatic Setup - Robot HA 14:35:29
Setup Options
  1. I want Robot HA to run the recommended setup
  2. I do not want to run the setup right now
    (You can return to this panel by executing RBTHALIB/RHASETUP)
Select Option: _
F3=Exit
_
```

3. Take option **1** to use the recommended setup.
4. Paste your new license code into the first entry field under **License Code**.
Note: You can paste the license code into the field directly or use **F11** to enter Copy and Paste Mode.
5. Enter ***BACKUP** for the Current Replication Role.
6. You will be brought back to the Robot HA Main Menu.

On your production system:

1. Take option **25** Robot HA from the Robot Automated Operations Solution menu.
2. The Robot GUIDE Automated Setup should start.
3. Take option **1** to use the recommended setup.
4. Paste your new license code into the first entry field under **License Code**.
Note: You can paste the license code into the field directly or use **F11** to enter Copy and Paste Mode.
5. Press **Enter**.
6. Enter ***PROD** for the Current Replication Role.
7. Press **Enter**.

```

RHASETUP Robot GUIDE Automatic Setup - Robot HA 14:45:32
NOTE: It is recommended to complete the setup on Backup system first.
Current Replication Role . . . . . : *PROD *PROD, *BACKUP
Already Configured PowerHA . . . . . :      *YES, *NO

System name and IP address to initialize Robot HA:
  Production system (Source) info:
    System name . . . . . : _____
    IP address . . . . . : _____

  Backup system (Target) info:
    System name . . . . . : _____
    IP address . . . . . : _____

F3=Exit
MW 23/2

```

8. Enter ***YES** for Already Configured PowerHA if Power HA has been configured on the system. Otherwise, enter ***NO**.
9. Enter the System Name and IP Address for both the production and backup systems.
10. Press **Enter**.
11. The INZRSFHA command will run in the background.
12. When the initialization process completes, you are prompted to update the DDM authentication method.

```

RHASETUP2      Robot GUIDE Automatic Setup - Robot HA      14:50:21

Replication Role: *PROD

Production system (Source):
  Current DDM authentication method : *USRIDPWD
Backup system (Target):
  Current DDM authentication method : *USRIDPWD

Select new DDM authentication method : *SAME      *SAME, *USRID, *USRIDPWD,
                                                *USRENCPWD, *ENCUSRPWD

F3=Exit
  
```

13. The current DDM authentication method for both production and backup will be displayed. Select the authentication method you would like to use moving forward. Changing the authentication method updates the value on the 'lowest authentication method' parameter for the CHGDDMTCPA command.

***SAME**

The value does not change

***USRID**

Do not require a password on a DDM connection request.

***USRIDPWD**

Refuse the connection if a DDM connection request does not contain a password associated with the userid

***USRENCPWD**

Require the sending of an encrypted password along with the userid by a remote client system attempting to connect.

***ENCUSRPWD**

Require the sending of an encrypted user ID and encrypted password by a remote client system attempting to connect.

14. If you select to use a different DDM method than you already have set, you are required to enter a ROBOTHA password. *USRID does not require a ROBOTHA password.

```

RHASETUP2      Robot GUIDE Automatic Setup - Robot HA      14:51:31

Replication Role: *PROD

Production system (Source):
  Current DDM authentication method : *USRIDPWD
Backup system (Target):
  Current DDM authentication method : *USRIDPWD

Select new DDM authentication method : *ENCUSRPWD  *SAME, *USRID, *USRIDPWD,
                                           *USRENCPWD, *ENCUSRPWD

NOTE: The password change for ROBOTHA will be made on both the
      production and the backup systems.

ROBOTHA Password . . . . . :

Re-enter ROBOTHA Password . . . :

F3=Exit

```

15. After entering a ROBOTHA password, a confirmation window appears.

```

RHADDMCHG      Confirmation DDM Change      14:55:23

Please confirm that you are changing the DDM
authentication method used in Robot HA.

Current DDM authentication method: *USRIDPWD
New DDM authentication method . . : *ENCUSRPWD

Press ENTER to continue

F12=Cancel

```

16. Press **ENTER** to confirm your change.
17. Your new DDM method and ROBOTHA passwords will update on both production and backup.
18. The Robot GUIDE process is complete. You can now set up sync attributes and start syncing.

Changing the Authentication Method

After initial setup (INZRSFHA or Robot GUIDE Automated Setup), if you need to change the authentication method you can use the RHACHGDDM command.

1. On your production system, enter the command **RBTHALIB/RHACHGDDM** and press F4 to prompt.
2. For the 'Server ID' parameter, enter the Server ID of the system on which to change the DDM configuration.
3. For the 'Already Configured PowerHA' parameter, enter *YES or *NO depending on your PowerHA configuration
 - Enter ***YES** if you have already configured PowerHA.
 - Enter ***NO** if you have PowerHA installed but are not yet configured or you do not have PowerHA installed.
4. Press **Enter**.
5. Enter your chosen value for the 'Select new DDM authentication method' parameter
6. Press **Enter**.

NOTE: Running the RHACHGDDM command updates the value on the 'lowest authentication method' parameter for the CHGDDMTCPA command.

Setting Replication Roles

Before you can use Robot HA, you need to set up the replication roles for your systems. Each system has a specific role that they're assigned to, no matter if they're in source or target mode.

IMPORTANT: If you used the Robot GUIDE Automatic Setup, you do not need these steps. The replication roles are set during the Robot GUIDE Automatic Setup.

On the system you want in the backup role:

1. From the Robot HA Main Menu, select option **3**, Setup Menu.
2. Select option **3**, System defaults, to display the Change RSF Defaults panel.
3. Page down to the last screen of parameters.
4. Enter *BACKUP for the **Current replication role** parameter.
5. Press Enter to change the product defaults.

On the system you want in the production role:

1. From the Robot HA Main Menu, select option **3**, Setup Menu.
2. Select option **3**, System defaults, to display the Change RSF Defaults panel.
3. Page down to the last screen of parameters.
4. Enter *PROD for the **Current replication role** parameter.
5. Press Enter to change the product defaults.

Starting the Server

Use the following steps on the production system and backup system to start your server.

1. From the Robot HA Main Menu, select option **2**, Control Menu.
2. Select option **1** to start the TCP/IP server.

Once the server has started, you should see the **Robot HA is:** message in the right-hand corner of the Control Menu change from INACTIVE to ACTIVE.

Autostart Robot HA

To have Robot HA autostart, put the following into your start up program on both production and backup systems:

***Robot HA Section */**

*******/**

STRRSFSRV

MONMSG MSGID(RSF0000 CPF0000)

STRSYNCRSF PGM(*RSFDFT) SUBMIT(*YES) SERVER(BACKUP) +

RETRY(20) DELAY(1)

MONMSG MSGID(RSF0000 CPF0000)

STRSBS SBSDB(RSFUSER/RSFHA)

MONMSG MSGID(CPF0000)

ENDPGM

Initializing Robot HA

IMPORTANT: If you used the Robot GUIDE Automatic Setup, you do not need these steps. The initialization is run during the Robot GUIDE Automatic Setup.

Once the replication roles are set, use the Initialize Robot HA Setup command on the production system to set up your high availability environment.

Overview

The Initialize Robot HA command does several things on your systems:

- Creates and defines server IDs on the production and backup systems to facilitate future role swaps.
- Creates the RSFUSER library and any configuration objects used by replication. These following objects are included:
 - Job descriptions RSFUSER/RSFHA and RSFUSER/RSFHAC
 - Job queues RSFUSER/RSFHA and RSFUSER/RSFHAC
 - Subsystem RSFUSER/RSFHA
 - Message queue RSFUSER/RSFHA
 - Source file RSFUSER/QCLSRC
- Defines standard synchronization attributes for the RBTHALIB and RSFUSER libraries, and also for system items *USRPRF, *AUTL, and *CFG.
- Sets other attributes that control the running, monitoring, and maintenance of the replication environment.
- (Optionally) Confirms there's sufficient disk space for replication on the target system.
- Installs default versions of all user-configurable programs for controlling and monitoring the HA environment. The following programs are included:
 - Source and target synchronization start programs.
 - A program for viewing active and waiting replication jobs.
 - A program to monitor the status of replication and notify you of any problems.
 - Programs to manage role swaps.
 - A program to manage cleanup, maintenance, condition checking, and other recurring tasks.

Note: These programs are stored in the RSFUSER library. They can be modified or customized as desired to meet your needs.

Initializing Robot HA

IMPORTANT: If you used the Robot GUIDE Automatic Setup, you do not need these steps. The initialization is run during the Robot GUIDE Automatic Setup.

Before you run the INZRSFHA command, make sure you know the IP addresses of your production and backup systems. If you don't know the address, you can find it by prompting **CFGTCP** on that system and selecting option **1** from the menu.

NOTE: As of Robot HA version 12.06 and above, if you are an already configured PowerHA customer, run the command **CHGDTAARA DTAARA(RBTHALIB/RHAPHA (1 1)) VALUE('1')** BEFORE running INZRSFHA. If you have PowerHA installed but are not yet configured, the INZRSFHA will create the *USRPRF and *AUTL sync entries. Once you are configured and ready to use PowerHA, then delete the sync entries for *USRPRF and *AUTL.

To initialize Robot HA on your production system:

1. On the production system, run the following command to add the Robot HA library to your library list:
ADDLIBLE RBTHALIB
2. Enter **INZRSFHA** on the production system command line and press **F4** to prompt.
3. Specify the following options for the parameters:

Note: The choices listed in this table are considered Robot HA best practices. You can come back at any time to change these parameters. For more information on the INZRSFHA command, press **F1** or see Initialize Robot HA Setup.

Parameter	Description
Check disk space	Specify whether you want to confirm that there's enough disk space on the backup system to replicate all user libraries from the production system.

Parameter	Description
Replace ...	<p>For these parameters, enter *YES if some setup has already been done for Robot HA. This copies the default version of these programs in RBTHALIB and replaces whatever was previously defined in RSFUSER/QCLSCR.</p> <p>If this is a fresh install and these programs haven't been defined (or if you've been instructed to by Technical Support), enter *AUTO to install the default version of these programs.</p>
Role swap type	<p>This parameter defaults to *NOSWAPIP. This is the most common swap type and ensures that the IP address and system name for the backup aren't changed when it's swapped to the production role. We recommend you keep the default for now and change it at a later time if desired.</p>
Journal library	<p>Specify the library you want to store your replication journals in. We recommend you keep the default JRNLIB.</p>
Remote journal library	<p>Specify the library on the target system you want to store remote journals in. We recommend you keep the default RMTJRNLIB.</p>
Sync new libraries/directories	<p>Choose whether you want newly created libraries and IFS directories to be replicated automatically. The default is *NO.</p>
Company name	<p>Enter your company name. The text you supply here is used in any messages sent from Robot HA.</p>
Page Down	

Parameter	Description
<p>Production server IDs</p>	<p>Enter the server IDs for the production system. We recommend a value of <code>PROD</code>, as it's best to name the server ID for the production role rather than to base it on a system-specific or location-specific attribute. This choice makes things much clearer in the event of a role swap, where the production environment will run on different systems in a different location.</p> <p>Note: If you have more than one production system or more than one server ID for your production system, you can enter multiple values for this parameter.</p>
<p>System name/IP address</p>	<p>Enter the name and IP address of the production system.</p>
<p>System start program/Library</p>	<p>Enter the startup program and library for the production system. The default is populated with Robot HA's best guess, but we recommend you check it. Also, we recommend that the startup program be named differently on the production and backup systems, but it is not required to be a different name.</p> <p>Note: Programs should be in a library that Robot HA can replicate. We recommend you avoid using a library like <code>QSYS</code>.</p>
<p>System test start program/Library</p>	<p>Enter the name and library for the startup program to use when performing a role swap to the production environment.</p> <p>If you don't want to create a production test startup program, specify the same startup program and library that you did for the System start program/Library field.</p>
<p>Replicate library Robot HA to</p>	<p>Enter the name of the library that Robot HA internal information should be replicated to. We recommend you keep the default <code>RSFPRD</code>.</p>
<p>Replicate *CFG to</p>	<p>Enter the name of the library that production configuration information should be replicated to. We recommend you keep the default <code>RSFCFGPRD</code>.</p>

Parameter	Description
Page Down	
Backup Server ID	<p>Enter the server IDs for the backup system. We recommend a value of <code>BACKUP</code>, as it's best to name the server ID for the backup role rather than to base it on a system-specific or location-specific attribute. This choice makes things much clearer in the event of a role swap, where the backup environment will run on different systems in a different location.</p> <p>Note: If you have more than one backup system or more than one server ID for your backup system, you can enter multiple values for this parameter.</p>
System name/ IP address	Enter the name and IP address of the backup system.
System start program/Library	<p>Enter the startup program and library for the backup system. The default is populated with Robot HA's best guess, but we recommend you check it.</p> <p>Note: Programs should be in a library that Robot HA can replicate. We recommend you avoid using a library like QSYS.</p>
Replicate library Robot HA to	Enter the name of the library that Robot HA internal information should be replicated to. We recommend you keep the default RSFBKP.
Replicate *CFG to	Enter the name of the library that backup configuration information should be replicated to. We recommend you keep the default RSFCGBKP.
Alert email address	(Optional) You can enter one or more email addresses to receive periodic emails regarding the health of the system environment.
Alert text message	(Optional) You can enter one or more phone numbers to receive a text message whenever there is a problem with the system environment. The text message points to an email in your inbox with further details.

Parameter	Description
Page Down	
All parameters	Fill out the parameters on the next two pages to specify when to check for replication problems, when to check the target machine for orphan objects in replicated libraries and directories, when to audit replicated libraries and directories, and when to purge your logs and files.

- 4. When you're finished filling out the parameters, press Enter to run the command.

Testing Your Connections

After you've made a connection and started the server on both systems, you can test your system connections to make sure everything's working properly.

To test the connection:

1. From the Robot HA Main Menu, selection option **3**, Setup Menu.
2. Select option **1**, Server definitions, to display the Work with RSF Servers panel.
3. Enter a **T** in the Opt field beside the connection you want to test. **Note:** You can only test one at a time.
4. Press Enter.

A successful completion message indicates that the connection is working.

Setting Up Synchronization

Once the replication roles are set and Robot HA has been initialized, you can synchronize your objects to ensure those defined on the production system are also defined on the backup system.

Synchronizing default objects and user profiles

Before synchronizing anything else, you should ensure that all objects and user profiles defined on the production system exist on the backup system. This helps avoid OS authority errors when synchronizing and restoring objects to the backup system. A job, *PVTAUT, will work together with the library/group sync jobs to ensure private authorities are synced. The *PVTAUT job will process through QAUDJRN entries to determine which authorities to sync. When the library or group job runs, we will apply authority changes to your backup.

To accomplish this, synchronize your replication jobs and user profiles from your production system to your backup system.

NOTE: System values QPWD* should be set the same on both the source and the target. Changes on some of these system values take effect after IPL.

To synchronize default objects and user profiles:

1. Select option **1**, Synchronization Attributes, from the Robot HA Main Menu.
2. Review the list to make sure all profiles and items that should've been added during initialization are accounted for and ready for replication.

Note: By default, Robot HA provides you with the following synchronization attributes: *AUTL (Authorization List), *CFG (Configuration), *USRPRF (User Profile), RBTHALIB (Robot HA Library), and RSFUSER (RSF User). In these steps, you'll replicate all five.

Note: *AUTL, *CFG, and *USRPRF use QAUDJRN for journaling. Ensure that the journal receivers for QAUDJRN are in the correct library. They should not be moved to a different library once synchronization has started.

3. Press **F13** to display the Change RHA User Options panel. From here, you can set user defaults.
4. Check that the following choices are specified:
 - Run in batch = ***YES**
 - Job description = **RSFHA**
 - Job description library = **RSFUSER**

5. Press Enter to return to the previous panel. This changes the default values for your user profile.
6. Type option **8** next to the *USRPRF replication job that was defined, then press Enter. Wait for the job to finish running replication.
Note: Using option 8 submits a job to a job queue, which will run replication or synchronization for the selected items.
7. Type option **8** next to the *AUTL replication job, then press Enter. Wait for the job to finish running replication.
8. Type option **8** next to the *CFG replication job, then press Enter. Wait for the job to finish running replication.
9. Type option **8** next to the *RSFUSER replication job, then press Enter. Wait for the job to finish running replication.
10. Type option **8** next to the *RBTHALIB replication job, then press Enter. Wait for the job to finish running replication.

After you've submitted your profiles for replication, you can press **F9** to view running replication jobs, then press Enter to view the Work with Job Queue panel. This shows the job currently waiting in the job queue.

When synchronizing user profiles for the first time, you may see some errors. This is often just because objects needed by one or more user profile haven't been replicated to the backup system yet. You can safely ignore these errors.

Synchronizing your Backup system to your Production system

After your user profiles, authorization lists, and configuration are all synchronized to the backup system, you need to replicate a couple items from the backup system to production. This is necessary if you want to perform a role swap later on, or if a role swap happens unexpectedly.

Note: If these items aren't replicated to production, any subsequent role swap will fail.

To synchronize items to the production system:

1. On the Backup system, select option **1**, Synchronization Attributes, from the Robot HA Main Menu to display the Work with Synchronization Attributes panel.
2. Press Enter to build the list.
3. Review the list to make sure everything that should have been added during initialization is accounted for and ready for replication.

Note: By default, the initialization process on the production system provides you with the following synchronization attributes on the backup system: *CFG and RBTHALIB.

4. Type option **8** next to the defined *CFG and RBTHALIB replication jobs, then press Enter.

Note: Using option 8 submits a job to a job queue, which will run replication or synchronization for the selected items.

After you've submitted these items, you can press **F9** to view running replication jobs, then press Enter to view the Work with Job Queue panel. This shows the jobs currently waiting in the job queue.

Defining synchronization attributes

Once your user profiles have been synchronized from the production system to the backup system, you can create synchronization attributes for groups, libraries, IFS directories, and system objects to tailor how Robot HA synchronizes them to the backup system.

To create synchronization attributes:

1. Select option **1**, Synchronization Attributes, from the Robot HA Main Menu. This panel allows you to work with synchronization attributes for libraries, groups, IFS directories, and system objects.
2. Press **F11** to toggle to the type of sync attribute you would like to add. Press **F6** to create a new Sync attribute.
3. On the resulting Add Sync Attributes panel for the chosen Sync attribute, review the panel and make additions or changes to the parameters as necessary.
4. When you're finished, press Enter.

After you press **F5** to refresh, the synchronization attribute you've created will appear in the Work with Synchronization Attributes list, ready to be synchronized and replicated. To sync, type option **8** beside each one and press Enter.

To change synchronization attributes:

1. Enter option **2**, Attributes, next to the attribute you want to change. You can change more than one at a time.
2. Press Enter. This displays the Change Sync Attributes panel for the chosen Sync attribute with the current values filled in.
3. Review the panel and make changes as necessary.
4. When you're finished, press Enter to save your changes.

Note: If you're changing more than one Sync attribute, repeat steps 3-4 as necessary until they're all saved.

Starting and Stopping Synchronization

Another way to start or stop synchronization is from the Control Menu. This stops and starts the jobs using the program that is specified in the RSF defaults (this value was filled in by the INZRSFHA command).

To start synchronization:

1. From the Robot HA Main Menu, select option **2**.
2. On the Control Menu, select option **3** to start synchronizing. This starts replication for your environment and guarantees consistency for your replication tasks.

To stop synchronization:

1. From the Robot HA Main Menu, select option **2**.
2. On the Control Menu, select option **4** to stop synchronizing.

Email Notification Setup

Robot HA provides a way for you to be notified via email of alerts and status updates. This notification requires that some email-specific fields are entered correctly within Robot HA's System Defaults.

NOTE: The email setup steps below should be run on both the production and backup systems.

To setup email notification capability in System Defaults:

1. From the Robot HA Main Menu, select option **3** and press **Enter**.
2. On the Setup Menu, select option **3** and press **Enter** for System Defaults.
3. Page Down (**PgDn**) until you find the field **Outgoing mail server**.
4. Enter the name of your mail server.
5. Enter your mail port in the **Outgoing mail port** field.

```

Change RSF Defaults (CHGRSFDFT)

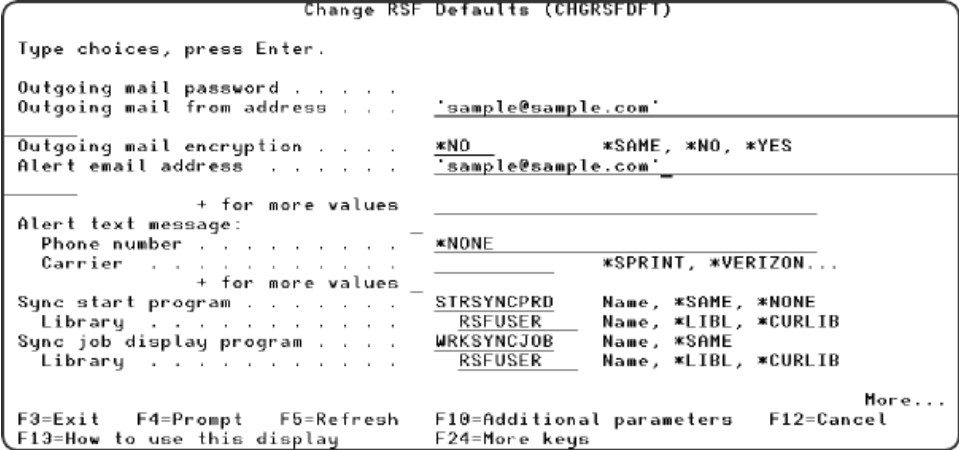
Type choices, press Enter.
PPP server IP address . . . . .
PPP server validation list . . . *NONE      Name, *NONE, *SAME
Encryption key data area . . . *NONE      Name, *NONE, *SAME
Library . . . . .                Name, *LIBL
SSL Status . . . . .             *ENABLED   *ENABLED, *DISABLED, *SAME
Require client authentication . *NO        *YES, *NO, *SAME
TCP/IP send buffer size . . . 65536     16384-8388608, *SAME
TCP/IP receive buffer size . . 65536     16384-8388608, *SAME
TCP/IP record block size . . . 1000     1-5000, *SAME
TCP/IP keep-alive interval . . 10        Number, *SAME, *DFT
Log local commands . . . . .    *NO        *YES, *NO, *SAME
Log switched connections . . . *NO        *YES, *NO, *SAME
Server ID for this machine . . *NONE      Name, *NONE, *SAME
Outgoing mail server . . . . . 'smtp.    .com'
Outgoing mail port . . . . . > *SMTP     Number, *SAME, *SMTP...
Outgoing mail user ID . . . . . *NONE

F3=Exit  F4=Prompt  F5=Refresh  F10=Additional parameters  F12=Cancel
F13=How to use this display  F24=More keys

```

6. Page Down (**PgDn**).

- 7. Enter the email address you would like messages sent from in the **Outgoing mail from address** field.
- 8. If desired, enter one or more email addresses you would like alerts and status notifications sent to in the **Alert email address** field.



- 9. Press **Enter** to save.

Training Checklists

Installation and Configuration Checklist

Task	Detail	Complete
Download and Install	Log in to your [[[Undefined variable corpvariables.hs_short]]] Community Portal account. Download and install the software for Robot HA on every system that will be part of your high availability environment (production and backup systems).	
License	Enter your license code and read the licensing agreement on all systems that have Robot HA installed.	
Set Replication Roles	Assign a role to each system. The role will either be *PROD for the main system or *BACKUP for the system you're replicating to.	
Run the INZRSFHA Command on the Production system	Use the Initialize Robot HA Setup command to configure your high availability environment.	
Test the Server Connection	Test the TCP/IP server connection the INZRSFHA command created to ensure everything's working correctly.	
Set up Synchronization	Submit your default objects, user profiles, and startup programs for replication.	
Define Synchronization Attributes	Create new synchronization attributes (groups, libraries, IFS directories, and system objects) to tailor how Robot HA synchronizes them to the backup system.	
Start Synchronization	Start synchronization of your systems from the Control Menu.	
Email Notification Setup	Setup the email notification capability within Robot HA System Defaults.	

Keeping Robot HA Up-to-Date

- Visit [My Downloads](#) on the [\[\[\[Undefined variable corpvariables.hs_short\]\]\] Community Portal](#) to acquire the latest product versions.
- Visit the [\[\[\[Undefined variable corpvariables.hs_short\]\]\] \[Monthly Release Notes\]\(#\)](#) to learn about recent updates and fixes for Robot HA.

Appendix A: Terminology

This user guide uses a lot of different terms to describe certain functions and features in Robot HA. Refer to these definitions if you have any questions.

Production system

The production system is where the original data is located.

Backup system

The backup system contains a copy of all replicated items sent to it by production. In the event the production system becomes unavailable, the backup will act as the production system and have a full copy of data to work with.

Source

A system in source mode is sending information to another system.

Target

A system in target mode is receiving information from another system.

Role

Each system set up with Robot HA is assigned to a role, like production or backup, and can only have one role at a time. The role is defined during the initial product configuration.

Mode

Systems assigned to a role can act in two different modes: source or target. The mode they're in depends on whether or not the system is sending or receiving replication information.

Replication

When using a remote journal: describes the process that sends objects between systems in real time. If not using remote journaling or for objects that are not journaled, Synchronization is used.

Synchronization

Describes the process that sends objects that are not journaled between systems every few minutes (as defined by the sync interval set for each synchronization attribute).