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Kyndryl Resiliency Orchestration

Resiliency File Replicator Installation Guide

Version 8.4.12.0

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8.4.12.0	June 2024	Removed the reference t CBC cipher from two cipher strings and renamed partial as string as example		

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Preface

The Kyndryl Resiliency File Replicator Software Installation Guide provides concepts and procedures to install, upgrade, and uninstall the File Replicator product. Although this guide is intended for administrators responsible for installing, configuring, and maintaining the File Replicator product, advanced users will also benefit from the information it contains.

Document Overview

This manual consists of the following sections:

- Installing File Replicator
- Configuring File Replicator for Security
- Starting and Stopping File Replication Service
- Upgrading File Replicator
- Uninstalling File Replicator

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1   Installation Overview

1.1   File Replicator Software

The File Replicator Software is compatible with the following servers:

- Windows Server
- Solaris Server
- Linux Server
- HPUX Server
- AIX Server

1.1.1   Prerequisites

Based on the features, download the GPL dependent binaries from GPL dependent binaries (https://sourceforge.net/projects/gnu-utils/files/binaries/) before starting File Replicator and perform the steps mentioned in Configuring Resiliency File Replicator for Security.

1.1.2   Enabling TLSv1.2 for the Resiliency File Replicator

TLS protocol is used for communication between Kyndryl Resiliency File Replicator Service (also known as PFR or SFR service) and the File Replicator Agent (also known as PFR agent). By default, File Replicator Service and File Replicator Agent communication is secure with TLS using the TLSv1.2 protocol

1.1.3   Configurations on the Resiliency File Replicator Service

 Setting the communication protocol on RFR
The following properties in `$EAMSROOT/installconfig/PFRConfiguration.cfg` are used to set the communication protocol on the File Replicator Service.

Note You need to configure the File Replicator Service and Agents to use the same communication type.

The communication protocol used is TLSv1.2 by default and is configurable.

1.2   Enabling TLSv1.2 for the Resiliency File Replicator

TLS protocol is used for communication between Kyndryl Resiliency File Replicator Service (also known as PFR or SFR service) and the File Replicator Agent (also known as PFR agent).

By default, File Replicator Service and File Replicator Agent communication is secure with TLS using TLSv1.2 protocol.

1.2.1   Configurations on the Resiliency File Replicator Service

The following properties in $EAMSROOT/installconfig/PFRConfiguration.cfg are used to set the communication protocol on the File Replicator Service.

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Note: You need to configure the File Replicator Service and Agents to use the same communication type.

The communication protocol used is TLSv1.2 by default and is configurable.

> **This property** is applicable if the communication mode is TLS, configured using the parameter 'SOCKET_COMMUNICATIONTYPE'
>
> panaces.acp**.communicationTLSProtocolVersion = TLSv1.2**

This property is applicable if the communication mode is TLS, configured using the parameter 'SOCKET_COMMUNICATIONTYPE'

panaces.acp.communicationTLSProtocolVersion = TLSv1.2

This property is to be updated if a specific cipher needs to be used.

update the parameter panaces.acp.communication as below example with secure cipher
panaces.acp.communicationTLSCipher=TLS_DHE_RSA_WITH_AES_256_GCM_SHA384,TLS_DHE_RSA_WITH_AES_128_GCM_SHA256,TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384,TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256

a. SOCKET_COMMUNICATIONTYPE = SECUREWITHTLS

b. In case of any cipher issues such as any incompatibilities, use default cipher (which will load all ciphers) by updating the property as -
panaces.acp.communicationTLSCipher=default

   Resiliency File Replicator Agent

The PFR agent interacts with the PFR service to enable monitoring and initiate file replication.

c. The agent supports TLSv1.0 and TLSv1.2 to support older versions of PFR Service. In future releases, the support for TLSv1.0 will be removed.

1.2.2   Keystore generation steps for customizing passwords for PFR service.

Note: Before RO 8.4.8.0, this config parameter had a **plain** keystore password.

1. Custom password facility applies to the `pfr.keystore` keystore file and is used to start PFR Service with Secure SSL port(46443).

2. The keystore password for the 'pfr.keystore' keystore file is stored in encrypted format in the 'PFRConfiguration.cfg' file.
The parameter name is `SSL_KEYSTORE_PASSWORD`.

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3. Keystore password can be encrypted using the Encryption Tool ($SFRROOT/bin/Encryptor.sh) provided with the PFR module.
Sample usage of this tool:
Command given:
` ./Encryptor.sh <your custom password>`
Example `./Encryptor.sh <YourPassword>`
[1] Connect with the Support/Delivery team to get the default passwords.

Output generated:
string to encrypt: **<**`YourPassword`>
  1. encrypted string: <Password[1]>
     [1]Connect with the Support/Delivery team to get the default passwords.
  2. `decryptedString:` **<**`YourPassword`>
  3.
Encryption and Decryption are working fine...
#

4. A new Keystore file can be generated with the below "keytool" utility.
Command#1: `openssl genrsa -out serverCA.key 2048`

Command#2: `openssl req -x509 -new -nodes -key serverCA.key -sha256 -days 1095 -out serverCA.pem -subj "/C=US/ST=New York/L=New York City/O=Security and Resiliency Services/OU=Security and Resiliency Services/CN=Kyndryl Inc/emailAddress=abcEmp@kyndryl.com"`

Command#3: `openssl pkcs12 -password pass:" <your custom password>" -export -name server-cert -in serverCA.pem -inkey serverCA.key -out serverkeystore.p12`

Command#4: `$SFRROOT/jre/bin/keytool -importkeystore -deststorepass "<your custom password>" -destkeystore pfr.keystore -srcstorepass "<your custom password>" -srckeystore serverkeystore.p12 -srcstoretype pkcs12 -alias server-cert`

5. Existing keyStore can be viewed using the below "keytool" command.
`$SFRROOT/jre/bin/keytool -v -list -keystore $SFRROOT/installconfig/pfr.keystore`

Note: After the above command, the tool will prompt you for the password. Verify that you input the correct plain password (not encrypted) to see keystore file contents.

Third Party Installation

Refer to [GPL License information] for more information on GPL licenses.

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In RHEL 7.9, unzip utility is not installed on the linux server by default. You have to install it manually. To install the unzip or zip utility, run the following command -

yum install zip unzip -y

1.2.3   Generating pfr.keystore certificate by using a script

The generated certificate is applicable for the RO 8.4.10.0 and onward versions.

a. Prerequisites
   1. Make sure that the following four files are present in the SFRROOT/bin folder:

   - "Generate_pfr_cert.sh",
   - Linux_AIX_Helper.sh,
   - Win_Helper.bat
   - "params.txt"

   2. Make sure the data entered in the params.txt file is available in the SFRROOT/bin.

b. Steps to execute the script

   1. Go to SFRROOT/bin and execute the following steps:

      ```
      ./Generate_pfr_cert.sh
      ```

      On running this script, the user will be asked for two confirmations. Next user is prompted to enter the password for generating the keystore file.

   2. On completion of script execution, new pfr.keystore will be created under SFRROOT/bin.

   3. For Linux/AIX copy the pfr.keystore, Linux_AIX_Helper.sh from SFRROOT/bin

      to /tmp directory of your Linux/AIX SFR endpoints.

      For Win copy the pfr.keystore,Win_Helper.bat

      from SFRROOT/bin

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to `C:\` `(C drive)` of your Win SFR endpoint.

4. Login to Linux/AIX endpoints, go to `/tmp dir` and execute

   `./Linux_AIX_Helper.sh`
   as root (or equivalent to the root user)
   to install the SFR certificate.

5. Login to Win endpoints, open cmd prompt as administrator go to C:\ drive, and execute `Win_Helper.bat` to install SFR certificate.
   The script will take back up of `PFRConfiguration.cfg, pfr.keystore` and

   Place it in the `SFRROOT/bin/installconfig` folder.

6. Services will be restarted by the script after replacing the certificate.

c. Rollback steps:

1   Delete `pfr.keystore` and `PFRConfiguration.cfg` from `SFRROOT/installconfig`.

2   Backup of `pfr.keystore` and `PFRConfiguration.cfg` will be available in `SFRROOT/installconfig`,

   rename these files as original files.

   Example: `PFRConfiguration.cfg_2024-03-12-04:45` rename as

   `PFRConfiguration.cfg` and

   `pfr.keystore_2024-03-12-04:45` rename as `pfr.keystore`.

3   Then restart the service.

2 Using the rsync

1. Tar and Rsync Version Details

The following table displays the tar and resync versions of various OS platforms that File Replicator supports.

Platform	Tar Version	Rsync Version
Windows 64-Bit	tar1.16	rsync3.0.7
Linux 64-Bit RHEL 7.x	tar1.23-RHEL7-64bit	rsync3.0.9-RHEL7-64bit
Linux 64-Bit RHEL 8.x	tar1.23-RHEL7-64bit	rsync3.0.9-RHEL7-64bit
AIX	tar1.14	rsync3.0.5
HPUX 64-BIT Itanium	tar1.26	rsync3.0.9
HPUX 64-BIT Parisac	tar1.26	rsync3.0.9
Solaris_Sparc	tar1.18	rsync3.0.5
Solaris_Intel	tar1.26	rsync3.0.5

2. Secure Replication with Rsync

The File Replicator uses Rsync for replication of large files, only if it is installed (because installation is optional) which are greater than 1 GB by default, from the local host to the remote host. You can use the ssh-keygen and ssh-copy-id to login to a remote Linux server without entering a password. The ssh-keygen creates the public and private keys, and then ssh-copy-id copies the local host public key to the remote host authorized_keys file. The ssh-copy-id assigns the required permission, such as ~/.ssh, ~/.ssh/authorized_keys to the home of the remote host.

From the 8.3.9.1 version of RO rsync is disabled by default and users can choose to enable it.

Refer to the RO file replicator user guide for steps to enable rsync.

You need to perform the following steps to create public and private keys on your local host:

1.   Log in to your local system.

2.   Run the following command:

     ssh-keygen -t rsa -m PEM

3.   Enter the location of the file to save the key. For example, /home/user_name/.ssh/id_rsa.

4.   Type a passphrase, and then press **Enter** to create the passphrase.

> **Note**
> If you do not want to create a passphrase, press Enter.

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5.   Type the same passphrase, and then press Enter. Your identification and the
      public key are saved in the specified file, and the key fingerprint is
      displayed.

You need to perform the following steps to use ssh-copy-id to copy the public key
to the remote host:

1.   Log in to your local system.

2.   Run the following command:

      ssh-copy-id –i ~/.ssh/id_rsa.pub remote-host

3.   Enter the remote host password.

ii. Software Versions

The following installation packages and documents are available for download:

- The File Replicator software for Windows, Solaris, Linux, HPUX, and AIX is
  available in the **Installers** folder.

- The File Replicator Installation Documentation.

1. *Licensed Version*

You can download the licensed versions of the Kyndryl Resiliency Orchestration software
that is available on th [Passport Advantage](#) (PA) Portal. ([https://www-
01.ibm.com/software/passportadvantage/](https://www-01.ibm.com/software/passportadvantage/))

2. *Software Fixes and Updates*

You can also download the Kyndryl Resiliency Orchestration software fixes and updates that
are available on the [Fix Central](#) Portal (https://www-945.ibm.com/support/fixcentral/).

3. *File Replication Support*

The following table provides information on various platforms that File Replicator supports.

Application Version	Platform	OS Version/Patch
File Replicator 8.1	**Intel, AMD, SUN/Sparc, PA-RISC, Itanium**	**Windows 2012** **Windows 2016** **Windows 2019** **RHEL 7** **RHEL 8** **Solaris Intel(v10)** **Solaris Sparc (v9, 10 Patch > 147148-26)** **AIX** **HP-UX v11i (PA-RISC/Itanium)**

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You can install the File Replicator Software using either of the following methods:

Graphical Mode: Graphical mode installation is an interactive, GUI-based method for installing File Replicator Software. For more information, refer to *Installing File Replicator Using GUI Mode Installation*.

Silent Mode: Silent mode installation is a non-interactive method of installing File Replicator Software. This method requires the use of a **.properties** file for selecting installation options. For more information, refer to *Installing File Replicator Using Silent Mode Installation*.

iii.   Upgrade

The File Replicator software is a separate installer. You can upgrade the existing File Replicator version from 7.2 to 8.1. Only the GUI mode is supported for upgrade. The older versions before version 4.2 of File Replicator are not supported for upgrade. File Replicator should be enabled on port 46000 for nonsecure communication and 46443 for secure communication.

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2.   Installing File Replicator Using GUI Mode Installation

This software is packaged as an image file called sfr.bin on the Resiliency Orchestration Distribution FTP in the Server folder. It contains all the binaries and packages to run File Replicator Software. This software installation involves installing File Replicator binaries, and tools used by File Replicator on **Windows**, **Solaris**, **Linux**, **HPUX**, or **AIX** servers.

a.   Prerequisites for Installing File Replicator

For the installer to install the File Replicator Platform package successfully on the selected Server, you need the following hardware/software:

- Server with a minimum of 2 GB RAM.

- Kyndryl Resiliency File Replicator should be enabled on port 46000 for non-secure communication and 46443 for secure communication.

- The user should have Administrator or root equivalent privileges to install File Replicator.

- Verify that the temporary directory (/tmp) has approximately 700 MB of free space.

b.   Installation of File Replicator

This section outlines the procedure to install File Replicator.

To install File Replicator, perform the following steps:

1.   Log in to the system and download the server binaries from the given ftp path.

2.   Navigate to the directory that contains the installation file. The selection of the folder and action to be performed to run the installer is based on the server platform used to install. Refer to the following table for details:

Servers	Folder Name	Action to be Performed Next
Windows	Installers\Windows64 for 64-bit Windows Operating Systems.	**Double-click the SFR.exe file.**
Solaris	Installers/SolarisIntel for intel architecture or Installers/SolarisSparc for sparc architecture.	**At the command prompt, enter ./SFR.bin.**
Linux	Installers/Linux64 for 64-bit Linux Operating Systems.	**At the command prompt, enter ./SFR.bin.**
HPUX	Installers/ HPUX.	**At the command prompt, enter ./SFR.bin.**

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AIX	Installers/AIX	At the command prompt, enter ./SFR.bin.

Note

The following are the limitations of installing File Replicator on Windows:

- Services can only be registered and started by users having local administrator permissions on the physical target machine, and not remotely.

- If Services need to be registered and started from remote machines, such as a Terminal Server, the user must be an Administrator having necessary permissions to the registry and Windows\System32 directories.

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3. After extracting the files from SFR.bin, File Replicator installation starts with the following screen.

Note

On Linux Server, if the RHEL version is not 7.x or 8.0, a warning message will be displayed on the screen. However, the user can continue with the installation.

4. After displaying the File Replicator installer screen, the **Introduction** window is displayed.

Figure 1. File Replicator Installation - Introduction
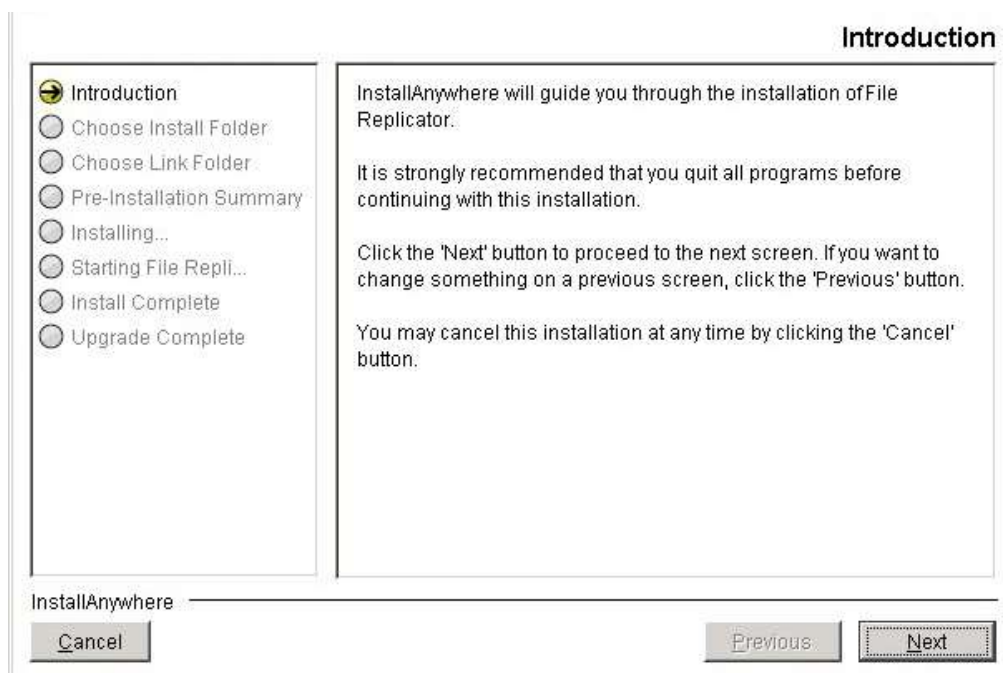
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5. Go through the installation procedure and click **Next**. The **Choose Install Folder** window is displayed.

Figure 2. File Replicator Installation - Choose Install Folder
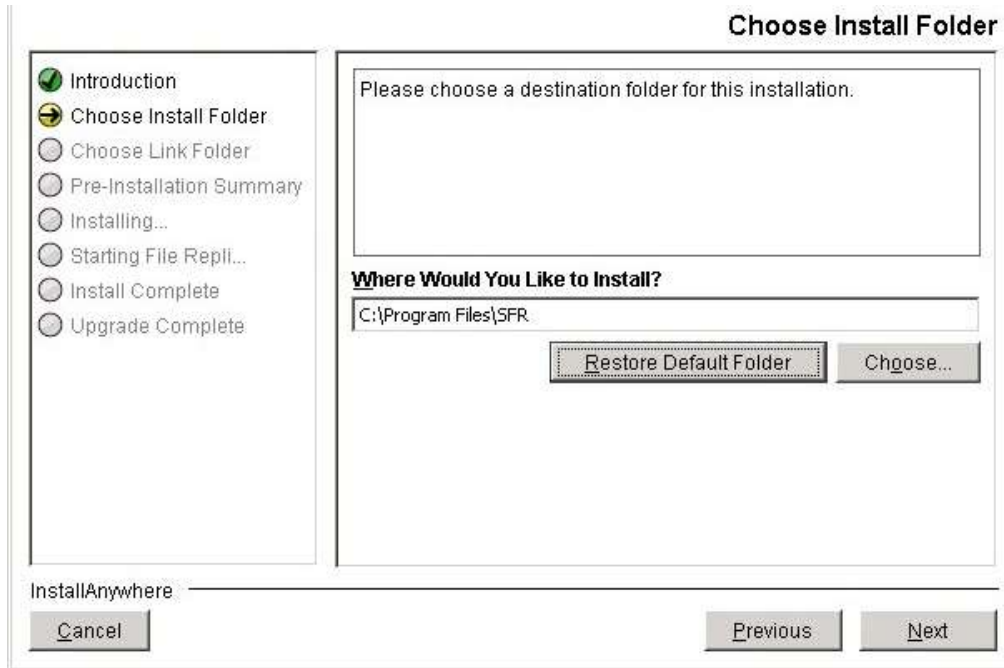
6. Select a path to install the software by clicking **Choose.** Alternatively, you can click Restore Default Folder to restore the default path. The default path is **C:\Program Files\SFR** for **the Windows** server and **/opt/SFR** for **Solaris**, **Linux**, **HUPX,** and **AIX** server (**Unix**). You must use the default path displayed.

7. Click Next. The **NAT IP Address** window is displayed. Enter the NAT IP address in the NAT IP Address field.

Figure 3. File Replicator Installation - Provide NAT IP Address

> **Note**
> NAT IP address should be the private IP of the server where you are installing the
> File Replicator.

8.   Click **Next**. The **Choose Shortcut Folder** window is displayed.

Figure 4. File Replicator Installation - Choose Shortcut Folder

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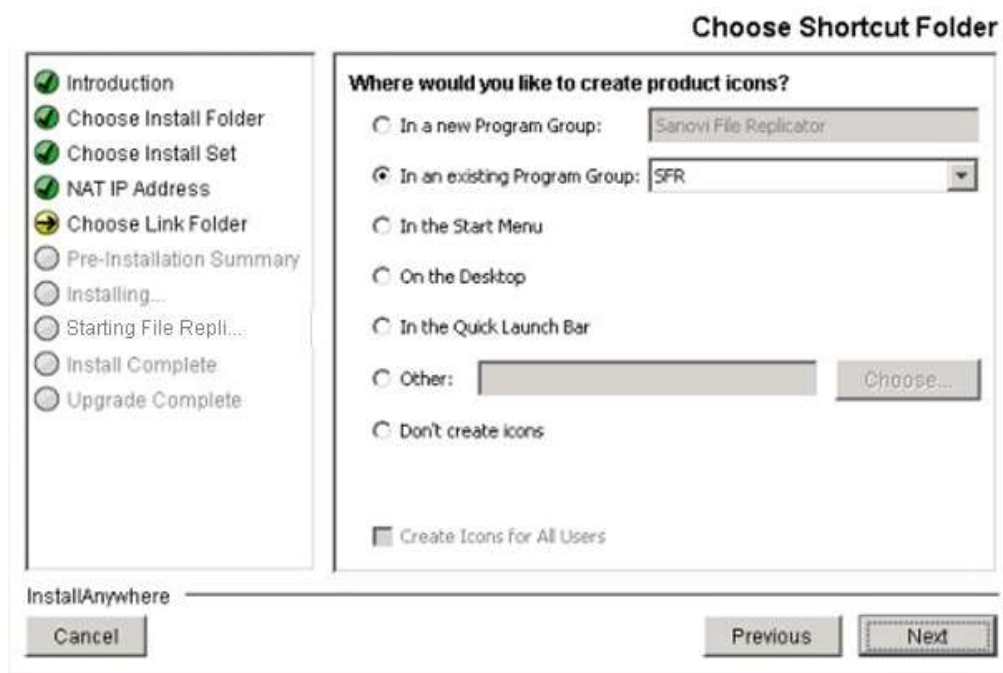
9.   Select an option to create a product icon in the required location. For
     example, select the **Other** option button to create a product icon in a
     specific path, or select the **Don't create icons** option button if creating
     shortcut folders is not required. Select **Create Icons for All Users** to
     create shortcut folders for all users if required.

10. Click Next. The **Pre-Installation Summary** window is displayed.

     Figure 5. File Replicator Installation – Pre-Installation Summary

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11. Go through the pre-installation summary to verify the inputs provided. If you want to change the inputs, click **Previous** and modify.

12. Click Install. The Installing Resiliency File Replicator window is displayed.

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Figure 6. File Replicator Installation - Installing File Replicator
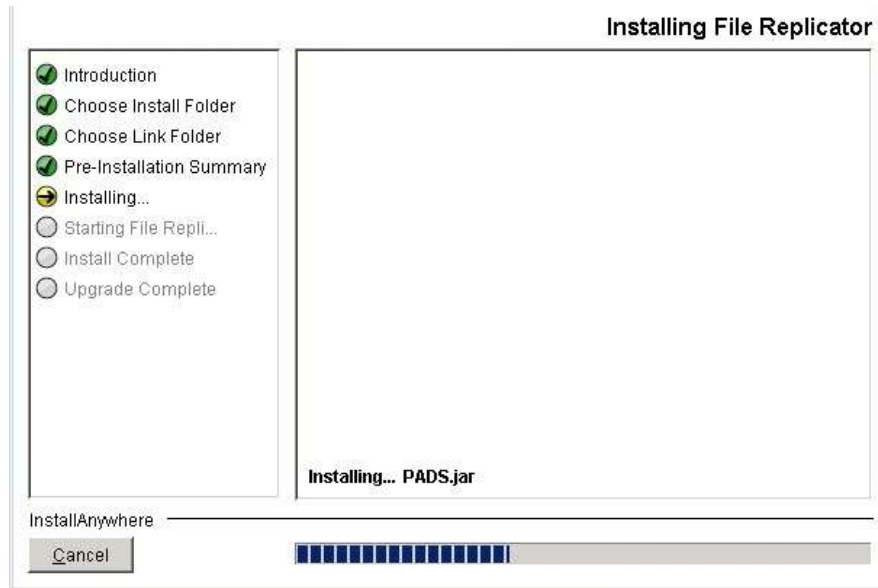
13. Once the installation is complete, the **Install Complete** window is
     displayed indicating successful installation, as shown in the following figure:

Figure 7. File Replicator Installation - Install Complete

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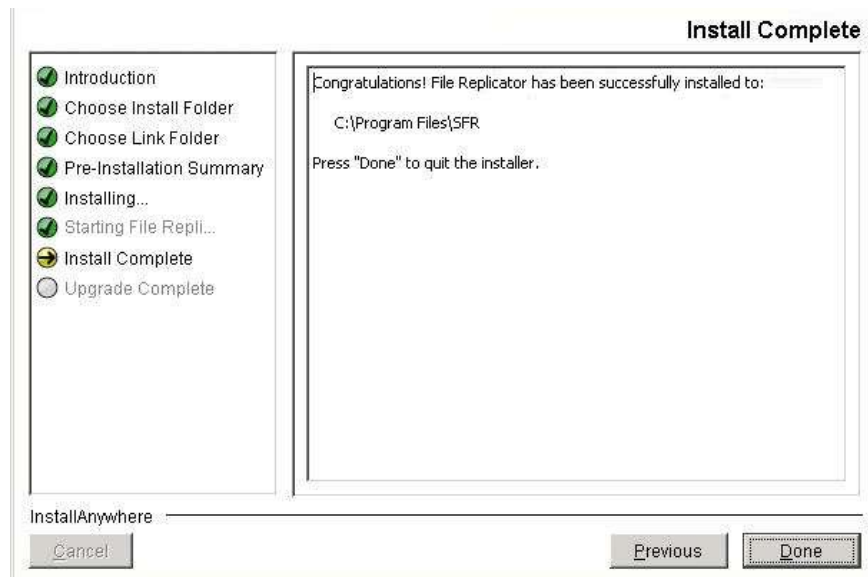
14.   Click Done to complete the installation process.

Refer to **Third Party Installation** and perform the File Replicator Third Party
Installation depending on the Operating System.

> **Note**
> Once the installation is complete, verify the individual File Replicator service
> installation manually, by clicking the Services icon on the Administrative tools
> group in Control Panel on the Windows server.

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3.   Installing File Replicator Using Silent Mode Installation

In the Silent mode installation method, the installation program reads the settings for your configuration from the .properties file that you create before installation. The installation program does not display any configuration options during the installation process. Silent mode installation is supported on Windows, Linux, Solaris, HPUX, and AIX platforms.

The following sections describe the method to install File Replicator, using the silent mode. It is assumed that you have acquired the installation program from the FTP server.

> **Note**
> Make sure that the hardware and software configuration required for File Replicator installation is in place. For details, refer to the *Prerequisites for Installing File Replicator*.

a.   Editing Properties File

When you install File Replicator in Silent mode, the installation program uses the **SFRInstaller**.properties file to determine, which installation options should be implemented. Before running the installation program in Silent mode, you must edit the **SFRInstaller.properties** file in which you specify the installation options that you want to invoke while performing the File Replicator installation. Perform the following steps to edit the properties files.

To edit the SFRInstaller.properties file:

1.   Download the file from the ftp path.

2.   Open the properties file. The following is the command to open the properties file:

- For Linux/Solaris/AIX/HPUX, run the following command:

    vi SFRInstaller.properties

- For Windows, perform the following procedure:

    1. Open the **SFRInstaller.properties** file in Notepad.

    2. Modify the corresponding properties file for the keywords shown in the following table, to reflect your configuration.

    3. The **SFRInstaller.properties** file contains the following keywords:

Keyword	Description
INSTALLER_UI	Displays the mode of installation as "silent".
USER_INSTALL_DIR	Enter the full pathname for the directory in which you want to install the File Replicator software.
PFR _START_YES	Enter 1 if you want to start File Replicator automatically after the installation. Enter 0 if you want to start File Replicator manually.

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> **Note**
> PFR service will not start after the installation due to dependency on the third-party libraries

b.   File Replicator Silent Mode Installation

The following section provides steps to install the software in silent mode.

> **Note**
> In silent mode, uninstallation does not check whether services are running or not. The user needs to verify that services are stopped before uninstallation in silent mode.

i.   Starting Silent Mode Installation on Windows Server

Perform the following steps to install File Replicator in the Windows system.

1. Log in to the Windows system.

2. Open an MS-DOS command prompt window.

3. Go to the directory that contains the installation file and enter the following command to launch the installation procedure:

   install.exe –f <complete path of the SFRInstaller.properties file with the properties file name>

   For example install.exe -f c:\\Progra~1\\SFRInstaller.properties

> **Note**
> After completing the installation of File Replicator, no status is displayed. The user does not get information on whether the installation is successful or not.

Refer to *Configuring Resiliency File* Replicator for Security

c.   Enabling TLSv1.2 for the Resiliency File Replicator

TLS protocol is used for communication between Kyndryl Resiliency File Replicator Service (also known as PFR or SFR service) and the File Replicator Agent (also known as PFR agent).

By default, File Replicator Service and File Replicator Agent communication is secure with TLS using TLSv1.2 protocol.

Configurations on the Resiliency File Replicator Service

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    i. **The following properties in** $EAMSROOT/installconfig/PFRConfiguration.cfg are used to set the communication protocol on the File Replicator Service.

    ii. Note - You need to configure the File Replicator Service and Agents to use the same communication type.

The communication protocol used is TLSv1.2 by default and is configurable.

This property is applicable if the communication mode is TLS, configured using the parameter 'SOCKET_COMMUNICATIONTYPE'

panaces.acp.communicationTLSProtocolVersion = TLSv1.2

This property is to be updated if a specific cipher needs to be used.

update the parameter panaces.acp.communication as below example with secure cipher panaces.acp.communicationTLSCipher=TLS_DHE_RSA_WITH_AES_256_~~GCM~~_SHA384,TLS_ DHE_RSA_WITH_AES_128_GCM_SHA256,TLS_ECDHE_RSA_WITH_AES_256_GCM_SHA384, TLS_ECDHE_RSA_WITH_AES_128_GCM_SHA256

SOCKET_COMMUNICATIONTYPE = SECUREWITHTLS

In case of any cipher issues such as any incompatibilities, use default cipher (which will load all ciphers) by updating the property as - panaces.acp.communicationTLSCipher=default

    Resiliency File Replicator Agent

The PFR agent interacts with the PFR service to enable monitoring and initiate file replication.

The agent supports TLSv1.0 and TLSv1.2 to support older versions of PFR Service. In future releases, the support for TLSv1.0 will be removed.

Third Party Installation and perform the RFR Third Party Installation based on the Operating System.

    iii.   Starting Silent Mode Installation on Unices Servers

1. Log in to the Linux/Solaris/HPUX/AIX system.
2. Navigate to the directory that contains the installation file. Edit and save the property file to /tmp.
3. Launch the installation by entering the following command:

    ./install.bin –f <complete path of the SFRInstaller.properties file with the properties file name>

    For Example ./SFR.bin –f /tmp/ SFRInstaller.properties

    Refer to *Configuring Resiliency File* Replicator for Security

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d.   Enabling TLSv1.2 for the Resiliency File Replicator

TLS protocol is used for communication between Kyndryl Resiliency File Replicator Service (also known as PFR or SFR service) and the File Replicator Agent (also known as PFR agent).

By default, File Replicator Service and File Replicator Agent communication is secure with TLS using TLSv1.2 protocol.

i.   Configurations on the Resiliency File Replicator Service

The following properties in `$EAMSROOT/installconfig/PFRConfiguration.cfg` are used to set the communication protocol on the File Replicator Service.

> **Note -** You need to configure the File Replicator Service and Agents to use the same communication type.

The communication protocol used is TLSv1.2 by default and is configurable.

This property is applicable if the communication mode is TLS, configured using the parameter 'SOCKET$_{COMMUNICATIONTYPE}$'

      a. panaces.acp.communicationTLSProtocolVersion = TLSv1.2

This property is to be updated if a specific cipher needs to be used.

      b. update the parameter panaces.acp.communication as below example with secure cipher
panaces.acp.communicationTLSCipher=TLS_DHE_RSA_WITH_AES_256 _GCM—SHA384,TLS_DHE_RSA_WITH_AES_128_GCM_SHA256,TLS_ECD HE_RSA_WITH_AES_256_GCM_SHA384,TLS_ECDHE_RSA_WITH_AES_ 128_GCM_SHA256

      c. SOCKET_COMMUNICATIONTYPE = SECUREWITHTLS

In case of any cipher issues such as any incompatibilities, use default cipher (which will load all ciphers) by updating the property as - panaces.acp.communicationTLSCipher=default

ii.   Resiliency File Replicator Agent

The PFR agent interacts with the PFR service to enable monitoring and initiate file replication.

The agent supports TLSv1.0 and TLSv1.2 to support older versions of PFR Service. In future releases, the support for TLSv1.0 will be removed.

Third Party Installation and perform the File Replicator Third-Party installation based on the Operating System.

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4.   Configuring Resiliency File Replicator for Security

a.   Enabling TLSv1.2 for the Resiliency File Replicator

TLS protocol is used for communication between Kyndryl Resiliency File Replicator Service (also known as PFR or SFR service) and the File Replicator Agent (also known as PFR agent).

By default, File Replicator Service and File Replicator Agent communication is secure with TLS using TLSv1.2 protocol.

i.   Configurations on the Resiliency File Replicator Service

The following properties in `$EAMSROOT/installconfig/PFRConfiguration.cfg` are used to set the communication protocol on the File Replicator Service.

> **Note -** You need to configure the File Replicator Service and Agents to use the same communication type.

The communication protocol used is TLSv1.2 by default and is configurable.

This property is applicable if the communication mode is TLS, configured using the parameter '`SOCKET_COMMUNICATIONTYPE`'

    d.   panaces.acp.communicationTLSProtocolVersion = TLSv1.2

This property is to be updated if a specific cipher needs to be used.

    e.   update the parameter panaces.acp.communication as below example with secure cipher
panaces.acp.communicationTLSCipher=TLS_DHE_RSA_WITH_AES_256 _GCM_SHA384,TLS_DHE_RSA_WITH_AES_128_GCM_SHA256,TLS_ECD HE_RSA_WITH_AES_256_GCM_SHA384,TLS_ECDHE_RSA_WITH_AES_ 128_GCM_SHA256

    f.   SOCKET_COMMUNICATIONTYPE = SECUREWITHTLS

In case of any cipher issues such as any incompatibilities, use default cipher (which will load all ciphers) by updating the property as - panaces.acp.communicationTLSCipher=default

ii.   Resiliency File Replicator Agent

The PFR agent interacts with the PFR service to enable monitoring and initiate file replication.

The agent supports TLSv1.0 and TLSv1.2 to support older versions of PFR Service. In future releases, the support for TLSv1.0 will be removed.

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5.   Third Party Installation

During Resiliency File Replicator installation, the user can configure the $SFRROOT path. This is the home directory for Resiliency File Replicator.

a.   Third Party Binary Installation For Windows-32/64-Bit

Perform the following steps after installing the Kyndryl Resiliency File Replicator (RFR). Before deploying the dependent binaries, ensure the RFR services are stopped.

> **Note**
> Download the binaries from the link GPL Dependent binaries mentioned in Prerequisites section.
> Refer to GPL License information for more information on GPL licenses.

1.   Go to the $SFRROOT/bin folder by executing the following command.

cd $SFRROOT/bin

2.   Download the following files to the same location

tar1.16-Windows-32bit.zip

3.   Extract tar1.16-Windows-32bit.zip

Optional steps a,b In case the user chooses to configure the rsync replication

a.   Download the following files to the same location

i.   rsync3.0.7-Windows-32bit.zip

b.   Extract rsync3.0.7-Windows-32bit.zip

b.   Third Party Binary Installation for Linux 64-Bit

Perform the following steps after installing the Kyndryl Resiliency File Replicator (RFR). Before deploying the dependent binaries, ensure the RFR services are stopped.

> **Note**
> Download the binaries from the link GPL Dependent binaries mentioned in Prerequisites section.
> Refer to GPL License information for more information on GPL licenses.

i.   RHEL 7.X/8.0

1.   Go to the $SFRROOT folder by executing the following command.

cd $SFRROOT

2.   Download and then Unzip the files by executing the following commands:

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tar -xvzf tar1.23-RHEL7-64bit.tar.gz

The next step is Optional In case the user chooses to configure the rsync replication

tar -xvzf rsync3.0.9-RHEL7-64bit.tar.gz

Note - Refer to the note on the unzip utility at Unzip Note.

c.   Third Party Binary Installation For AIX

Perform the following steps after installing the Kyndryl Resiliency File Replicator (RFR). Before deploying the dependent binaries, ensure the RFR services are stopped.

> **Note**
> Download the binaries from the link GPL Dependent binaries mentioned in Prerequisites section.
> Refer to *GPL License information* for more information on GPL licenses.

i. Option 1

For Kyndryl Resiliency File Replicator to function properly, tar 1.14 is the prerequisite requirement.

Configuration of Rsync replication is optional.

Once the pre-requisites are downloaded and installed, create the soft link as described below

Assume Tar location: /usr/bin/tar and Rsync location: /usr/bin/rsync

Use the following commands (replace $SFRROOT with SFR root path)

ln -s /usr/bin/tar $SFRROOT/bin/tar

The next step is Optional In case the user chooses to configure the rsync replication

ln -s /usr/bin/rsync $SFRROOT/bin/rsync

ii. Option 2

> **Note**
> Download the binaries from the link GPL Dependent binaries mentioned in Prerequisites section.
> Refer to *GPL License information* for more information on GPL licenses.
> Refer to the note on the unzip utility at Unzip Note.

1.   Go to the $SFRROOT folder by executing the following command:

    § cd $SFRROOT

2.   Download and then unzip the files by executing the following commands

    § gunzip tar1.14-AIX.tar.gz

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§ tar -xvf tar1.14-AIX.tar.gz

if rsync replication is chosen ONLY then execute the next steps

1.Download and then unzip the files by executing the following commands.

§ gunzip rsync3.0.5-AIX.tar.gz

§ tar -xvf rsync3.0.5-AIX.tar.gz

2. Verify that execution of $SFRROOT/bin/rsync does not show any library file error if any error is specific to the library please create the following soft link:

§ ln –s $SFRROOT/bin/libiconv.a /usr/lib/libiconv.a

d.   Third-Party Binary Installation For HPUX-64-BIT Itanium

Perform the following steps after installing the Kyndryl Resiliency File Replicator (RFR). Before deploying the dependent binaries, ensure the RFR services are stopped.

> **Note**
> Download the binaries from the link GPL Dependent binaries mentioned in Prerequisites section.
> Refer to *GPL License information* for more information on GPL licenses.
> Refer to the note on the unzip utility at Unzip Note.

1.   Go to a $SFRROOT folder by executing the following command.

cd $SFRROOT

2.   Download and then Unzip/Untar the following files by executing the following command

gunzip tar1.26-HPUX11.31-IA.tar.gz

tar -xvf tar1.26-HPUX11.31-IA.tar

The next step is Optional In case the user chooses to configure the rsync replication

gunzip rsync3.0.9-HPUX11.31-IA.tar.gz

tar -xvf rsync3.0.9-HPUX11.31-IA.tar

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Create the following soft links.

**ln -s $SFRROOT/tool/usr/local/lib/libpopt.so
/usr/lib/hpux32/libpopt.so**

e.   Third Party Binary Installation for Solaris_Sparc

Perform the following steps after installing the Kyndryl Resiliency File Replicator (RFR).
Before deploying the dependent binaries, ensure the RFR services are stopped.

> **Note**
> Download the binaries from the link GPL Dependent binaries mentioned in
> Prerequisites section.
> Refer to *GPL License information* for more information on GPL licenses.
> Refer to the note on the unzip utility at Unzip Note.

1.   Go to a $SFRROOT folder by executing the following command.

   cd $SFRROOT

2.   Download and then Unzip/Untar the following files

   tar -xvzf rsync3.0.5-SOLARIS10-SPARC.tar.gz

3.   Execute the following command to add the library packages

> **Note**
> If the package is already installed as part of tar, the other packages only selected

   **pkgadd -d $SFRROOT/bin/tar-1.18-sol10-sparc-local -R $SFRROOT/tool
   <<EOF**

   1

   EOF

   **pkgadd -d $SFRROOT/bin/libiconv-1.11-sol10-sparc-local -R
   $SFRROOT/tool <<EOF**

   1

   EOF

   **pkgadd -d $SFRROOT/bin/libintl-3.4.0-sol10-sparc-local -R
   $SFRROOT/tool <<EOF**

   1

   EOF

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```
pkgadd -d $SFRROOT/bin/libgcc-3.4.6-sol10-sparc-local -R
$SFRROOT/tool <<EOF

1

EOF
```

The next two steps are Optional In case the user chooses to configure the rsync
replication

1. Execute the following command to add the library packages

> **Note**
> If the package is already installed as part of tar, the other packages only selected

```
pkgadd -d $SFRROOT/bin/rsync-3.0.5-sol10-sparc-local -R $SFRROOT/tool
<<EOF

1

EOF

pkgadd -d $SFRROOT/bin/libiconv-1.11-sol10-sparc-local -R
$SFRROOT/tool <<EOF

1

EOF

pkgadd -d $SFRROOT/bin/libintl-3.4.0-sol10-sparc-local -R
$SFRROOT/tool <<EOF

1

EOF

pkgadd -d $SFRROOT/bin/libgcc-3.4.6-sol10-sparc-local -R
$SFRROOT/tool <<EOF

1

EOF

pkgadd -d $SFRROOT/bin/popt-1.14-sol10-sparc-local -R $SFRROOT/tool
<<EOF

1

EOF
```

2. Download and then Unzip/Untar the following files

```
tar -xvzf tar1.18-SOLARIS10-SPARC.tar.gz
```

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3. Create the following soft links.

> **ln –s $SFRROOT /tool/usr/local/lib/libiconv.so.2**

> **ln –s $SFRROOT /tool/usr/local/lib/libgcc_s.so.1**

f.   Third Party Binary Installation For Solaris_Intel

Perform the following steps after installing the Kyndryl Resiliency File Replicator (RFR). Before deploying the dependent binaries, ensure the RFR services are stopped.

> **Note**
> Download the binaries from the link GPL Dependent binaries mentioned in Prerequisites section.
> Refer to GPL License information for more information on GPL licenses.
> Refer to the note on the unzip utility at Unzip Note.

1.   Go to a $SFRROOT folder by executing the following command.

> **cd $SFRROOT**

2.   Download and then Unzip/Untar the following files

> **tar -xvzf tar1.26-SOLARIS10-x86.tar.gz**

3.   Execute the following command to add the library packages

> **Note**
> If the package is already installed as part of tar, the other packages only selected

> **pkgadd -d $SFRROOT/bin/tar-1.26-sol10-x86-local -R $SFRROOT/tool <<EOF**
>
> **1**
>
> **EOF**
>
> **pkgadd -d $SFRROOT/bin/libiconv-1.14-sol10-x86-local -R $SFRROOT/tool <<EOF**
>
> **1**
>
> **EOF**
>
> **pkgadd -d $SFRROOT/bin/libintl-3.4.0-sol10-x86-local -R $SFRROOT/tool <<EOF**
>
> **1**

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EOF

pkgadd -d $SFRROOT/bin/libgcc-3.4.6-sol10-x86-local -R $SFRROOT/tool <<EOF

1

EOF

The next two steps are Optional In case the user chooses to configure the rsync replication

1. Download and then Unzip/Untar the following files

   tar -xvzf rsync3.0.5-SOLARIS10-x86.tar.gz

2. Execute the following command to add the library packages

   > **Note**
   > If the package is already installed as part of tar, the other packages only selected

   pkgadd -d $SFRROOT/bin/rsync-3.0.5-sol10-x86-local -R $SFRROOT/tool <<EOF

   1

   EOF

   pkgadd -d $SFRROOT/bin/libiconv-1.14-sol10-x86-local -R $SFRROOT/tool <<EOF

   1

   EOF

   pkgadd -d $SFRROOT/bin/libintl-3.4.0-sol10-x86-local -R $SFRROOT/tool <<EOF

   1

   EOF

   pkgadd -d $SFRROOT/bin/libgcc-3.4.6-sol10-x86-local -R $SFRROOT/tool <<EOF

   1

   EOF

   pkgadd -d $SFRROOT/bin/popt-1.16-sol10-x86-local -R $SFRROOT/tool <<EOF

   1

   EOF

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3. Create the following soft links.

ln –s $SFRROOT / tool/usr/local/lib/libintl.so.8 /lib/libintl.so.8

ln –s $SFRROOT / tool/usr/local/lib/libiconv.so.2 /lib/libiconv.so.2

ln –s $SFRROOT / tool/usr/local/lib/libgcc_s.so.1 /lib/libgcc_s.so.1

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6.   Stopping and Starting File Replicator

This chapter explains the procedures that you must follow to start and stop File Replicator on Windows, Solaris, AIX, HPUX, and Linux servers.

The script S999PanPFRSvc starts the service automatically when the server is booted. However, you can start or stop the service manually without rebooting the server.

a.   Starting and Stopping of File Replicator Service on Windows

1. Open Control Panel > Administrative Tools > Services.

2. Right-click the file File Replicator and select Start to start the service.

3. Right-click the file File Replicator and select Stop to stop the service.

4. Right-click the file File Replicator and select Restart to restart the service.

b.   Starting and Stopping of File Replicator Service on Solaris

*   Start and Stop scripts of the Solaris agent reside at the following location:

    /etc/rc3.d

These scripts start the service automatically when the server is booted.

*   To start the File Replicator Service manually, go to:

    $SFRROOT/bin

*   To start the File Replicator Service manually, you can directly give the following command:

    # ./PFR.sh start

*   Check whether the agents have been started or not with the following command:

    # ps –ef | grep -i LAX

*   To stop the File Replicator Service manually, you can directly give the following command:

    # ./PFR.sh stop

c.   Starting and Stopping of File Replicator Service on Linux

*   Start and Stop scripts of the File Replicator Service reside at the following location:

    /etc/rc3.d

*   These scripts start the service automatically when the server is booted.

*   To start the File Replicator Service manually, go to:

    $SFRROOT/bin

*   To start the File Replicator Service, you can directly give the following command:

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 # ./ PFR.sh start

- Check whether the File Replicator Service has been started or not with the following command:

 # ps –ef | grep -i LAX

- To stop the File Replicator Service manually, you can directly give the following command:

 # ./PFR.sh stop

d.   Starting and Stopping of File Replicator Service on HPUX

- Enter the following folder to start the File Replicator Service:

$SFRROOT/bin

- You can directly run the following command to start the File Replicator Service:

 # ./ PFR.sh start

- Check whether the File Replicator Service has been started or not with the following command:

 # ps –ef | grep -i LAX

- To stop the File Replicator Service, you can directly give the following command:

 # ./ PFR.sh stop

e.   Starting and Stopping of File Replicator Service on AIX

- Start and Stop scripts of the AIX agent reside at the following location:

/etc/rc.d/rc2.d

- These scripts start the service automatically when the server is booted.
- Enter the following folder to start the File Replicator Service manually:

$SFRROOT/bin

- You can directly run the following command to start the File Replicator Service manually:

 # ./PFR.sh start

- Check whether the File Replicator Service is started or not with the following command:

 # ps –ef | grep –i LAX

- Run the following command directly to stop the File Replicator Service manually:
 # ./PFR.sh stop

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7.   Upgrading File Replicator

Kyndryl Resiliency File Replicator can be upgraded using GUI mode as detailed in the section
Upgrading File Replicator in GUI mode or through Low Touch Upgrade from Kyndryl
Resiliency Orchestration. For low-touch upgrade steps, refer to the Kyndryl Resiliency
Orchestration Administrator's guide.

a.   Prerequisites for upgrading

- Stop all the File Replicator Services.
- Ensure that the temporary directory (/tmp) has approximately 700 MB of free space.
- Before proceeding upgrade take the backup of SFRROOT directory.

b.   Upgrading File Replicator in GUI mode

Perform the following steps for upgrading the server.

1. Login to the system and Download the server binaries from the given ftp path.

2. Navigate to the directory that contains the installation file. The selection of the folder and action to be performed to run the installer is based on the server platform used to install. Refer to the following table for these details:

Servers	Folder Name	Action to be performed next
Windows	Installers\Windows64 for 64-bit Windows Operating Systems.	Double-click the SFR.exe file.
Solaris	Installers/SolarisIntel for intel architecture or Installers/SolarisSparc for sparc architecture.	At the command prompt, enter ./SFR.bin.
Linux	Installers/Linux64 for 64-bit Linux Operating Systems.	At the command prompt, enter ./SFR.bin.
HPUX	Installers/ HPUX.	At the command prompt, enter ./SFR.bin.
AIX	Installers/AIX.	At the command prompt, enter ./SFR.bin.

3. After extracting the files from SFR.bin, the File Replicator upgrade starts with the following screen.

> **Note**
> On Linux Server, if the RHEL version is not 7.x/8.0, then a warning message will be displayed on the screen. However, the user can continue with the installation.

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4. After displaying the **Resiliency File Replicator Installer** screen, the **Introduction** window is displayed.
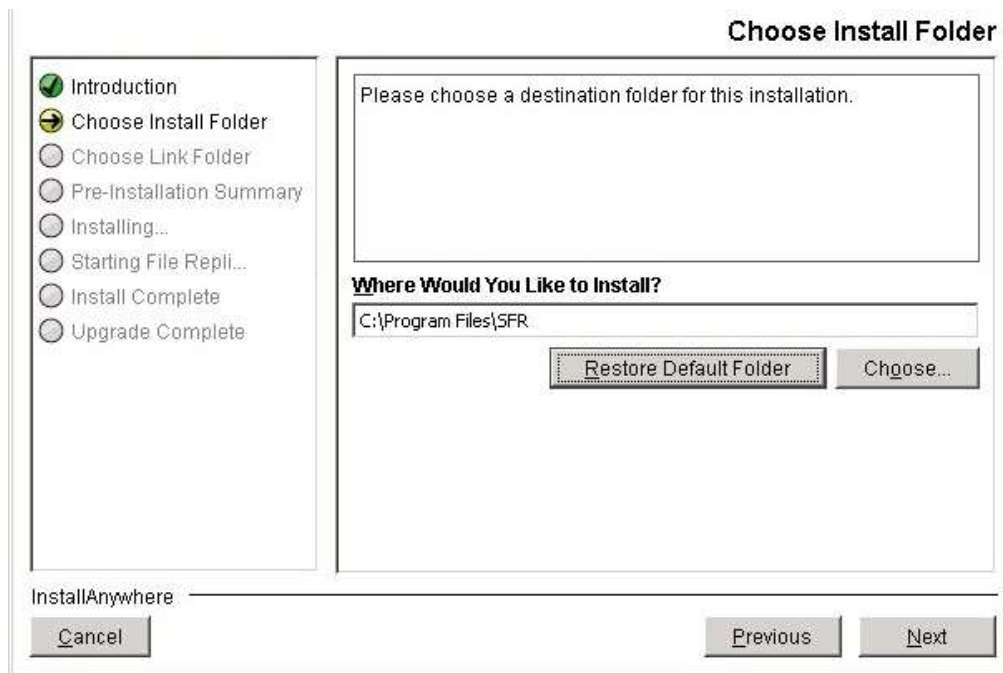
Figure 8. Upgrading File Replicator - Introduction
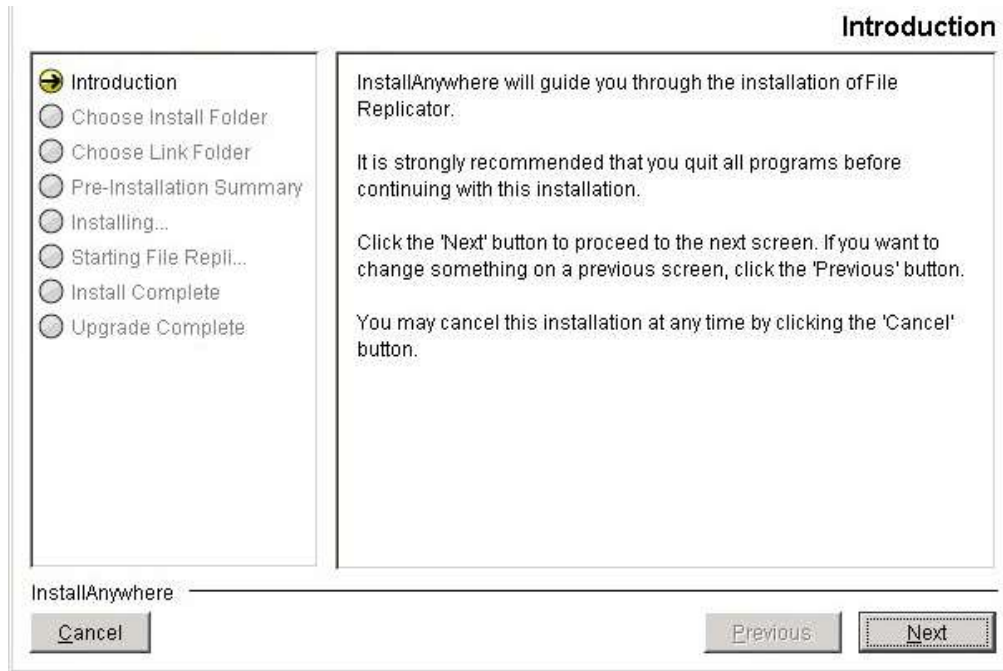
5. Go through the installation procedure and click **Next**. The **Choose Install Folder** window is displayed.

Figure 9. Upgrading File Replicator - Choose Install Folder

6.   Select the path of the existing File Replicator Installation to upgrade by
      clicking Choose. Alternatively, you can click Restore Default Folder to
      restore the default path. The default path is **C:\Program Files\SFR** for
      Windows servers and **/opt/SFR** for **Unix** servers. It is recommended that
      you use the default path.

7.   Click **Next**. An **Upgrade Installation** dialog box is displayed.

Figure 10. Upgrading File Replicator - Upgrade Installation

![kyndryl logo]

8.   Click **OK** to continue with the upgrade.

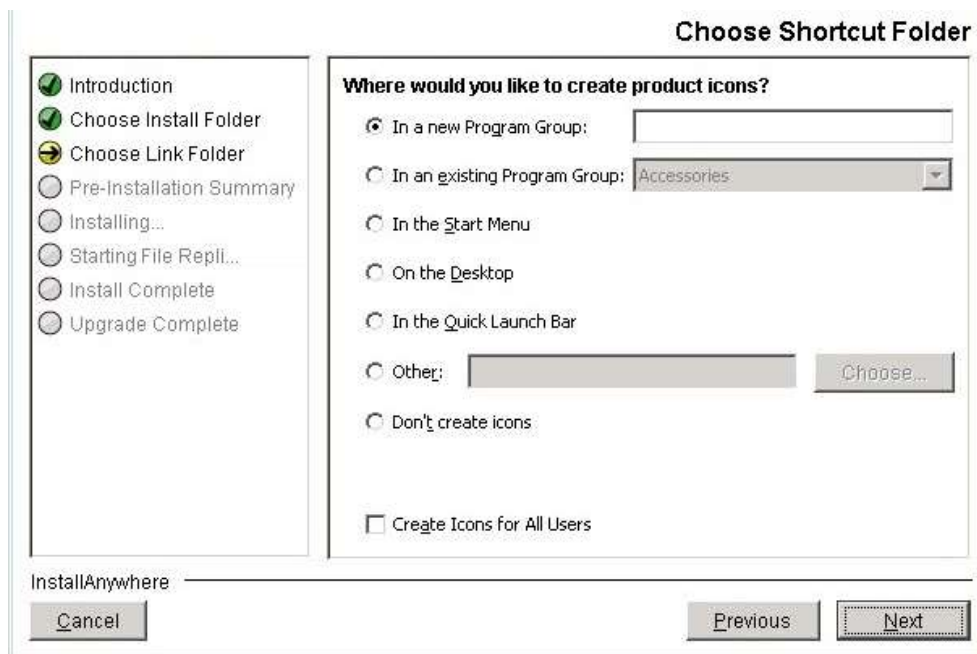| |
|---|
| **Note**
A **File Replicator running** dialog box may be displayed with a warning as shown in the following figure. Click **Stop** to continue with the upgrade. |

Figure 11. Upgrading File Replicator - File Replicator running

9.   The Choose Shortcut Folder/Choose Link Folder window is displayed.

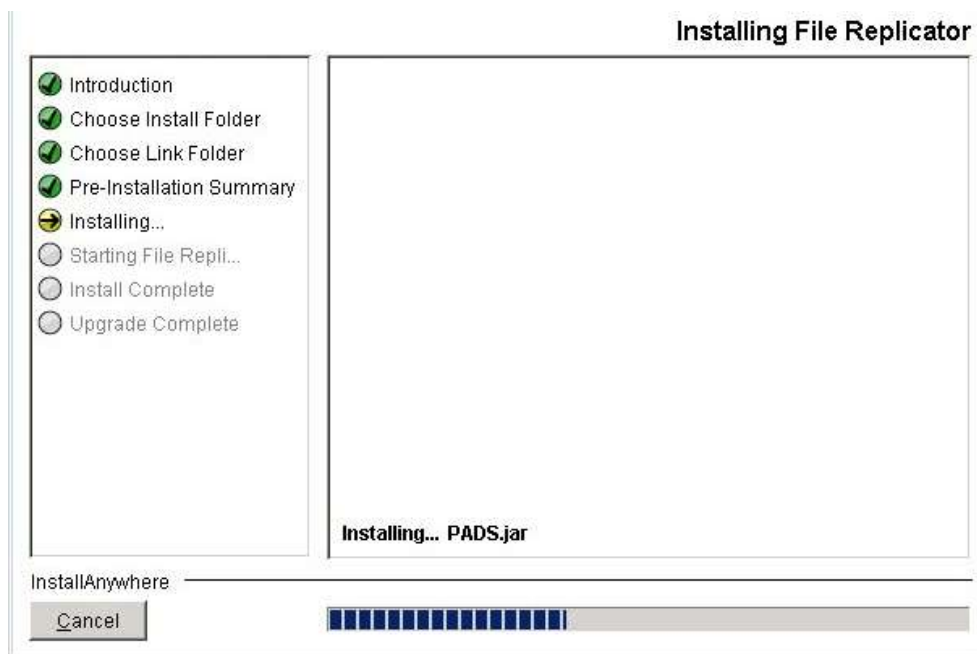Figure 12. Upgrading File Replicator - Choose Shortcut Folder

10. Select an option to create a product icon in the required location. For example, select the **Other** option button to create a product icon in a specific path, or select the **Don't create icons**/Don't create links option button to avoid creating shortcut folders.

11. Click Next. The **Preinstallation Summary** window is displayed.

Figure 13. Upgrading File Replicator - Preinstallation Summary

12. Go through the preinstallation summary to verify the inputs provided. If you want to change the inputs, click **Previous** and modify.

13. Click Install. The **Installing Resiliency File Replicator** window is displayed.

Figure 14. Upgrading File Replicator - Installing File Replicator

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14.   Once the installation is complete, the **Starting Resiliency File Replicator**
      window is displayed.

Figure 15. Upgrading File Replicator - Starting File Replicator
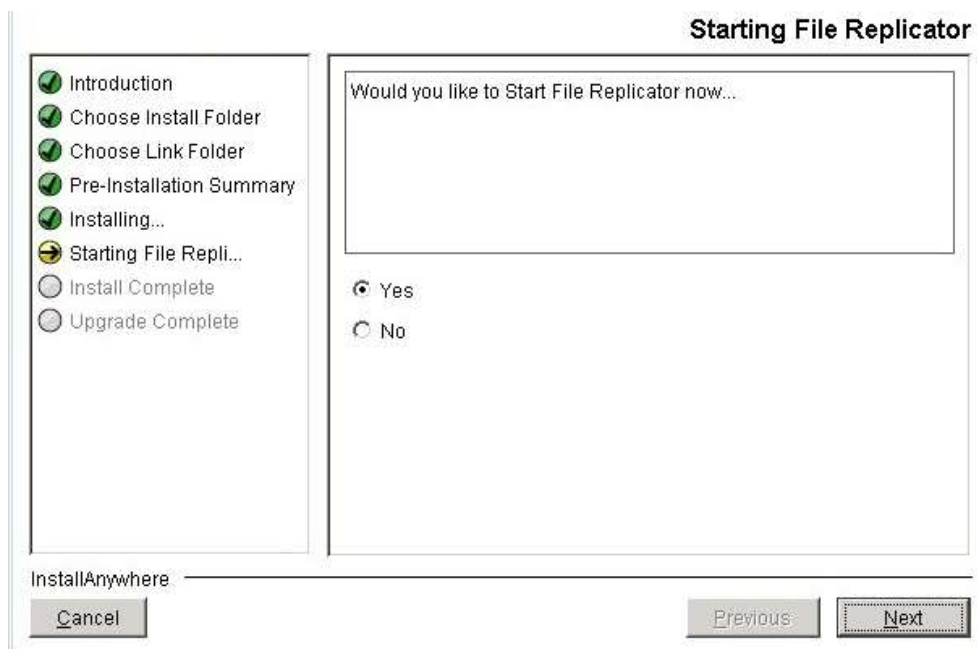
15.   On the **Starting Resiliency File Replicator** window, perform either of the
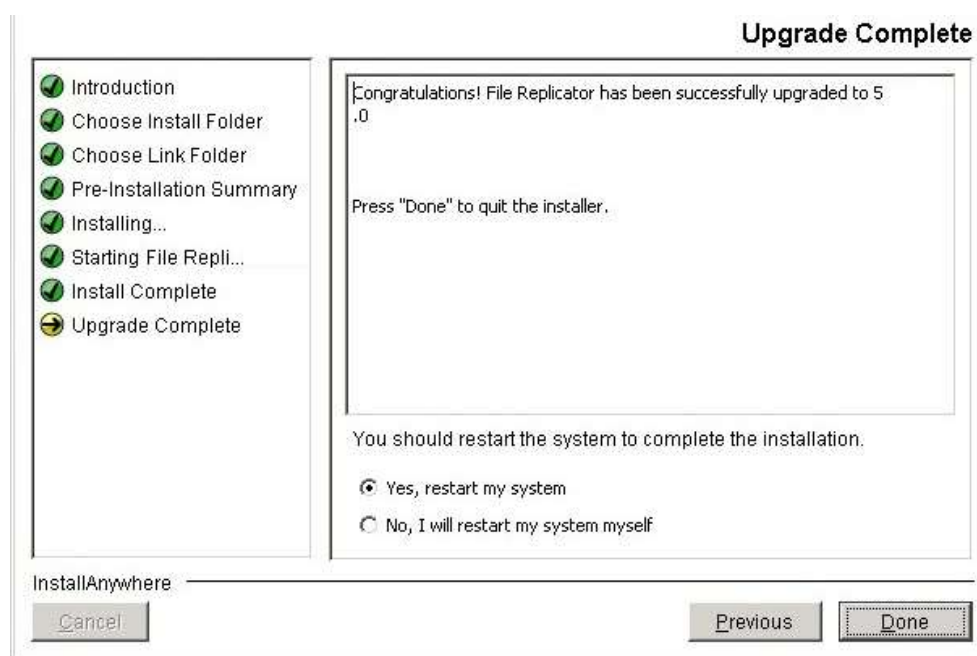   following:

16. Click Yes to start the File Replicator services automatically.

17. Click No to start the File Replicator services manually.

> **Note**
> The best practice is not to change the default value displayed on the Starting
> Resiliency File Replicator window.

18. Restart the File Replicator machine, if the agents do not start after File Replicator installation is complete.

19. Click **Next.** The **Upgrade Complete** window is displayed, indicating a successful upgrade.

Figure 16. Upgrading File Replicator - Upgrade Complete

20. Click **Done** to complete the upgrade process.

c.   Upgrading Resiliency File Replicator using Command Line

Perform the following steps for the Kyndryl Resiliency File Replicator (RFR) upgrade:

1. Stop the RFR service.

2. Take a backup of the **panacesFileReplicator** folder.

3. Uninstall the existing RFR.

4. Install the newer version of RFR using downloaded binaries.

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5. Install the tar from the Patch directory.

In case the user chooses rsync replication Install rsync.

6. Apply the TLS patch by performing the following steps:

   a. Copy the PFR.jar from the **PFRAgent** folder to
      /opt/panaces/DRMAgents/lib folder.

   b. Copy the PFR.jar from the **SFRService** folder to
      /opt/panaces/SFR/lib folder.

   c. Edit the PFRConfiguration.cfg file from the TLS Patch directory
      and modify the following entries:

   - ```
     SOCKET_COMMUNICATIONTYPE = SECUREWITHTLS
     ```

   - ```
     RSYNC_COMMUNICATIONTYPE = DAEMON
     ```

   d. Copy the PFRConfiguration.cfg file from the TLS Patch directory to
      /opt/panaces/SFR/installconfig folder.

7. Apply the SSL patch by copying the pfr.keystore file from the SSL Patch
   directory to **/opt/panaces/SFR/installconfig** folder.

8. Apply log4j Patch by copying the log4j.jar from LOG4J Patch
   directory to **/opt/panaces/SFR/lib** folder.

9. Apply Java Patch by performing the following steps:

   a. Take a backup of the jre folder from **/opt/panaces/SFR**
      folder.

   b. Copy the jre folder from the JAVA Patch directory to
      /opt/panaces/SFR folder.

10. Copy the files and folders within the bak, filesets, and sfrdb using
    backup of panacesFileReplicator to the new location of
    panacesFileReplicator.

11. Edit the .rt file from bak and filesets and append the following
    lines to the files.

    - ```
      FILESET_TOTAL_REPLICATED_TIME=3
      ```

    - ```
      FILESET_TOTAL_PENDING_FILES_SIZE_BEFORE_REPLICATION=0
      ```

12. Start the RFR service.

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8.   Uninstalling File Replicator

This chapter provides detailed information on uninstalling File Replicator on your system.

> **Note**
> If you have used the Silent mode of installation, you can perform only the Silent mode of uninstallation. After the Silent mode of installation, the Graphical mode of uninstallation cannot be performed.

If you have used the Graphical mode of installation for File Replicator, you can employ either the Graphical or Silent mode of uninstallation. Use the following commands to perform silent mode un-installation:

Uninstall_Sanovi_File_Replicator -i silent

Uninstall_Sanovi_File_Replicator -i silent

a.   Uninstallation of File Replicator

To uninstall File Replicator from GUI, perform the following steps:

1.   Enter in the folder $SFRROOT/Uninstall.

2.   Click Uninstall_Sanovi_File_Replicator

3.   To uninstall File Replicator from the command prompt, perform the following steps:
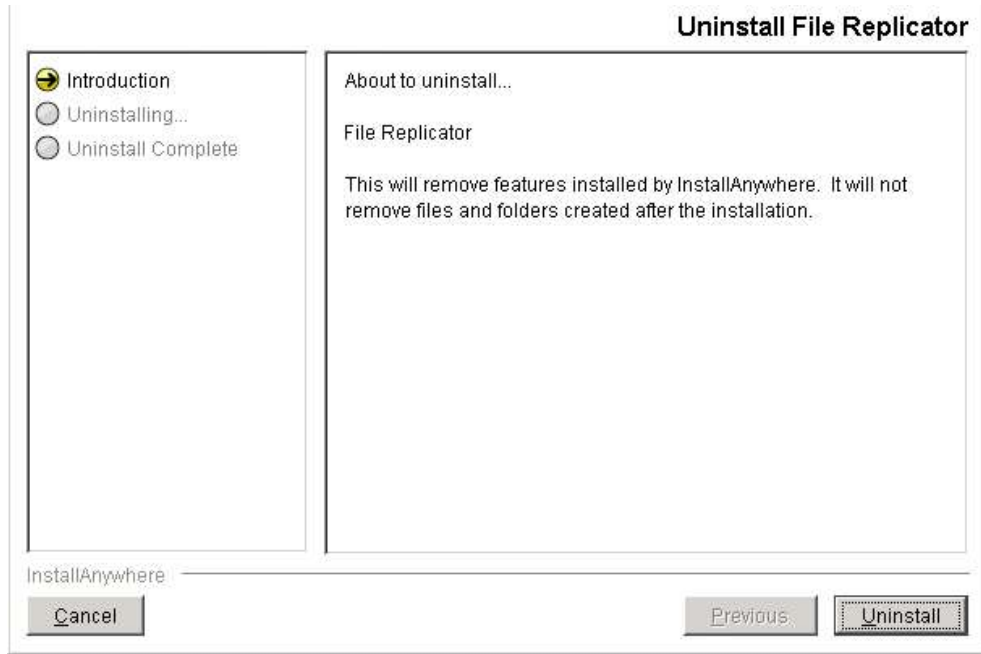
   # cd $SFRROOT/Uninstall

   # ./Uninstall_Sanovi_File_Replicator

   This process will uninstall all binaries that have been installed while installing File Replicator. This process will not uninstall Tomcat binaries.

Figure 17. Uninstallation of File Replicator

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9.   License Information

a.   GPL License Information

If you wish to access the source code for any of these packages, it is recommended that you visit the official download site of the package maintainer directly. A link to each download site appears in the table below. These links are provided "as-is" and will take you to sites that are not owned or controlled by Kyndryl. Kyndryl is not accountable for the contents of these sites and is not acting as a distributor of the code on such sites. Kyndryl in no way warrants that the code or other information on these sites is accurate, will function in a particular manner, or is non-infringing of a third party's intellectual property rights. Please contact the maintainers of the code for information on the licenses and documentation that accompany the source code distributed from their site.

Open source licenses such as GNU Public License (GPL) require that Kyndryl makes the source available on request by the client. For packages with such licenses, the client must either go to the official site of the source or download the information from this link: *https://sourceforge.net/projects/gnu-utils/files/binaries/*.

In addition to GPL, each of these packages includes its own licensing information. It is essential to understand the terms and conditions of the licensing information of the individual tools.