

IBM IMS Recovery Solution Pack for z/OS
2.1

Overview and Customization



Note:

Before using this information and the product it supports, read the information in [“Notices” on page 55.](#)

Fourth Edition (July 2022)

This edition applies to Version 2.1 of IBM IMS Recovery Solution Pack for z/OS (program number 5655-ISR) and to all subsequent releases and modifications until otherwise indicated in new editions.

This edition replaces SC27-8440-02.

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About this information

IBM® IMS Recovery Solution Pack for z/OS® (also referred to as IMS Recovery Solution Pack) is a product that combines a number of IBM tools into a consolidated solution that provides a complete and efficient IMS database backup and recovery environment.

IMS Recovery Solution Pack combines the following tools into a single offering:

- IMS Database Recovery Facility
- IMS Database Recovery Facility Extended Functions
- IMS High Performance Change Accumulation Utility
- IMS Recovery Expert
- IMS High Performance Image Copy
- IMS Index Builder

These topics provide an overview of the products and capabilities that are delivered with the IMS Recovery Solution Pack, as well as some common usage scenarios to help you understand the capabilities of the product. It also includes post-SMP/E installation instructions that must be performed before you can use this product.

To use the functions described in these topics, you must have already installed the IMS Recovery Solution Pack by completing the SMP/E installation process that is documented in the *Program Directory for IBM IMS Recovery Solution Pack for z/OS*, GI13-4315, which is included with the product.

These topics are designed to help database administrators, system programmers, application programmers, and system operators perform these tasks:

- Understand the capabilities of the functions that are associated with the IMS Recovery Solution Pack
- Install and operate IMS Recovery Solution Pack
- Customize your IMS Recovery Solution Pack environment
- Diagnose and recover from IMS Recovery Solution Pack problems
- Use IMS Recovery Solution Pack with other IMS products

To use these topics, you should have a working knowledge of:

- The z/OS operating system
- ISPF
- SMP/E
- IMS

Always refer to the IMS Tools Product Documentation web page for complete product documentation resources:

<https://www.ibm.com/support/pages/node/712955>

The IMS Tools Product Documentation web page includes:

- Links to [IBM Documentation](#) for the user guides ("HTML")
- PDF versions of the user guides ("PDF")
- Program Directories for IMS Tools products
- Recent updates to the user guides, referred to as "Tech docs" ("See updates to this information!")
- Technical notes from IBM Software Support, referred to as "Tech notes"
- White papers that describe product business scenarios and solutions

Chapter 1. IMS Recovery Solution Pack overview

IBM IMS Recovery Solution Pack for z/OS (also referred to as IMS Recovery Solution Pack) combines powerful IMS Tools products to provide all the capabilities that you need to backup and recover your IMS full-function, HALDB, and Fast Path databases.

Topics:

- [“What's new in IMS Recovery Solution Pack” on page 1](#)
- [“IMS Recovery Solution Pack features and benefits” on page 2](#)
- [“IMS Recovery Solution Pack components” on page 3](#)
- [“IMS Recovery Solution Pack business scenarios” on page 6](#)
- [“Hardware and software requirements” on page 6](#)
- [“Service updates and support information” on page 9](#)
- [“Product documentation and updates” on page 10](#)
- [“Accessibility features” on page 11](#)

What's new in IMS Recovery Solution Pack

This topic summarizes the technical changes for this edition.

New and changed information is indicated by a vertical bar (|) to the left of a change. Editorial changes that have no technical significance are not noted.

Revision markers follow these general conventions:

- Only technical changes are marked; style and grammatical changes are not marked.
- If part of an element, such as a paragraph, syntax diagram, list item, task step, or figure is changed, the entire element is marked with revision markers, even though only part of the element might have changed.
- If a topic is changed by more than 50%, the entire topic is marked with revision markers (so it might seem to be a new topic, even though it is not).

For a list of IMS Recovery Solution Pack new function APARs, see [IMS Recovery Solution Pack 2.1 new function APARs](#).

SC27-8440-03 - July 2022

Description	Related APARs
Documentation updates to support IBM IMS Tools Base for z/OS 1.7 and IMS Administration Foundation. IMS Administration Foundation activates the IMS administration web-browser interface of IBM Unified Management Server for z/OS to enable the management of IMS systems and resources.	N/A

SC27-8440-02 - May 2022

- Information about Advanced Image Copy Services of IMS HP Image Copy to schedule the DFSMSdss program (server) and use its API.
- Information about configuring HD Pointer Checker to use with IMS Database Recovery Facility.

SC27-8440-01 - November 2018

- Maintenance refresh.

SC27-8440-00 - October 2016

- Maintenance updates for IMS Recovery Solution Pack 2.1
- Information pertaining to the inclusion of IMS Recovery Expert as a product belonging to the IMS Recovery Solution Pack 2.1.
- Information pertaining to the inclusion of IMS Solution Packs: Data Sensor as a product belonging to the IMS Recovery Solution Pack 2.1.
- Information about using IMS Tools Setup for initial product installations, first-time users, and product evaluations.

IMS Recovery Solution Pack features and benefits

The IMS Recovery Solution Pack can simplify and streamline the database backup and recovery for IMS full-function, HALDB, and Fast Path databases. It provides a complete set of high performance tools to back up, recover, rebuild indexes for, verify, and report on full-function, HALDB, and Fast Path databases.

IMS Recovery Solution Pack provides the following benefits:

IMS Database Recovery Facility

IMS Database Recovery Facility provides a streamlined approach to database recovery by recovering multiple database data sets in a single job step.

It reduces the potential workload of having to run multiple jobs or job steps when recovering IMS databases by integrating with other products that can create new image copies, rebuild indexes, and validate the recovered databases.

IMS Database Recovery Facility Extended Functions

IMS Database Recovery Facility Extended Functions provides the capability to identify problems in your environment that affect database recoverability.

It can also create common recovery points for multiple databases and provides an interface to create recovery JCL through the use of the IMS Database Recovery Facility.

IMS High Performance Change Accumulation Utility

IMS High Performance Change Accumulation Utility reduces recovery time by pre-processing log records and creating a merged file with accumulated database updates.

The change accumulation file can be used by the recovery process and eliminates the need to process the log records at recovery time, which can save time and resources.

It also allows you to process multiple change accumulation groups in a single job step, with a single pass of the IMS log data sets.

IMS High Performance Image Copy

IMS High Performance Image Copy reduces the unavailability time of databases by providing rapid image copy features and parallel processing and minimizes manual interventions.

It also reduces operational and media costs by compressing and stacking the image copies.

IMS Index Builder

IMS Index Builder eliminates the need to create image copies and log updates to IMS index data sets by providing a quick and efficient method for rebuilding indexes.

It also provides the ability to add new indexes to existing IMS databases as needed.

IMS Recovery Expert

IMS Recovery Expert provides disaster recovery support by transforming traditional IMS disaster recovery procedures into a tape-based disaster restart methodology

Tape offload support automates copying a system backup or partial system backup from disk to tape. A system backup can be used at the local site to restore an entire IMS system. At the remote site, it can be used to restore the IMS system for disaster recovery purposes.

Generated system level backups can be used for multiple purposes saving storage and processing resources. An IMS system level backup can be used for IMS system recovery, application recovery, database recovery, and for disaster restart or recovery. With this ability, significant CPU, I/O, and storage resources that would otherwise be required to make multiple backups for different purposes are saved.

Using the Combined System Level Backup function, with a single process you can back up and recover multiple IMS subsystems, multiple Db2® subsystems, or a combination of both, to a single, consistent point in time.

IMS Recovery Expert reduces recovery time by running restore and recovery operations in parallel. Storage-based fast-replication facilities are used to restore backups quickly while invoking IMS recovery processes, to reduce overall recovery time and minimize IMS and application downtime. IMS systems are restored using volume-based fast-replication, and IMS applications and databases are restored using data set-based fast-replication facilities.

In addition, IMS Recovery Expert can restore individual IMS databases from a system backup.

Other IMS Recovery Expert features include the following:

- Provides IMS-application-level recoveries.
- Copy blades provide storage processor integration and extensibility to support heterogeneous storage platforms and fast-replication features.

IMS Recovery Expert supports IBM, EMC, and HDS storage systems and fast-replication facilities using integrated copy blades.

- Provides extensive backup validation to ensure that the system backup contains all IMS files and catalog structures required for a successful recovery.
- Includes a System Setup feature that can be used to discover an IMS system and recommend layout and configuration changes so that the IMS system can be set up appropriately to accommodate a system backup and recovery methodology.
- Provides a comprehensive metadata repository to record backup information such as backup time, backup type, log byte addresses, and volumes used for the backup.

Reports can be generated to monitor information such as backup methods and operations, storage volume usage, system backup volume usage, and archived backups.

- Provides an ISPF interface to display all the system backups that have been performed. IMS systems can be restored by selecting a system backup and specifying restore and recovery options.

IMS Solution Packs: Database Sensor

Database and Recovery Sensors collect statistics from IMS databases and DBRC RECON data sets, and store the data in a central repository that is provided by IMS Tools Knowledge Base.

The stored data can be used by Autonomics Director, Policy Services, and IMS Administration Foundation or Management Console for database analysis and tuning purposes.

IMS Recovery Solution Pack components

The IMS Recovery Solution Pack provides an effective and efficient approach to recovering your IMS data quickly and accurately. It includes several tools that have been packaged as a single solution.

The following tools are included in the IMS Recovery Solution Pack:

- “[IMS Database Recovery Facility](#)” on page 4 (embedded product with common set of target and distribution libraries)
- “[IMS Database Recovery Facility Extended Functions](#)” on page 4 (embedded product with common set of target and distribution libraries)
- “[IMS High Performance Change Accumulation Utility](#)” on page 4 (embedded product with common set of target and distribution libraries)
- “[IMS High Performance Image Copy](#)” on page 5 (consumed product with separate target and distribution libraries)
- “[IMS Index Builder](#)” on page 5 (consumed product with separate target and distribution libraries)
- “[IMS Recovery Expert](#)” on page 5 (consumed product with separate target and distribution libraries)
- “[IMS Solution Packs: Data Sensor](#)” on page 5 (consumed product with separate target and distribution libraries)

These tools are installed by following the steps in the *Program Directory for IBM IMS Recovery Solution Pack for z/OS*, GI13-4315 and in these topics. All tools must first be installed and customized before you can use the IMS Recovery Solution Pack.

IMS Database Recovery Facility

By using IMS Database Recovery Facility, you can reduce operational complexity and the impact of database recovery on system resources. It simplifies your database recovery process by eliminating the need to run separate steps or jobs for related components.

IMS Database Recovery Facility allows you to perform the following tasks:

- Simultaneously recovers multiple database data sets, HALDB partitions, and fast path areas in a single job step
- Create new image copies, rebuild indices, rebuild ILDS, and validate recovered databases

For more information, see the *IMS Recovery Solution Pack: IMS Database Recovery Facility User's Guide*.

IMS Database Recovery Facility Extended Functions

IMS Database Recovery Facility Extended Functions is useful at both the local and disaster recovery site for identifying problems that can affect database recovery. At the disaster recovery site, it ensures that all the required resources are present and helps you prepare the RECON data sets to perform recoveries.

At the local site, it can create common recovery points, check for problems that can affect database recovery, locate common recovery points for a group of databases, and generate JCL for the IMS Database Recovery Facility to perform a database recovery or create an incremental image copy.

For more information, see the *IMS Recovery Solution Pack: IMS Database Recovery Facility Extended Functions User's Guide*.

IMS High Performance Change Accumulation Utility

IMS High Performance Change Accumulation Utility improves the performance of change accumulation merge operations by running multiple change accumulation groups in parallel and streaming the output to each group simultaneously. IMS HP Change Accumulation Utility provides the following functionality:

- Merges the most recent database changes quickly, safely, and accurately while reducing the I/O, CPU time and elapsed time that is required to build change accumulation data sets.
- Enables you to extract database updates with one pass of the data, which minimizes the need for manual intervention. By using your existing DBRC GENJCL statements, you can automatically generate the JCL required to run the tool.

Using IMS HP Change Accumulation Utility to pre-process logs and database updates reduces the amount of time that is required to perform a database recovery.

For more information, see the *IMS Recovery Solution Pack: IMS High Performance Change Accumulation Utility User's Guide*.

IMS High Performance Image Copy

IMS High Performance Image Copy creates an as-is image copy of a database and recovers a physically damaged data set of an IMS database.

IMS HP Image Copy provides the same functions as the IMS standard utilities, which are the Database Image Copy utility (DFSUDMP0) and the Database Recovery utility (DFSURDB0), but with a simpler user interface. It can effectively replace the IMS standard utilities.

Additionally, it provides functions that are not provided by the IMS standard utilities, including the ability to create various types of image copies, generate a copy data set from the original image copy data set, and set site defaults for processes.

Integrates with the DFSMSdss DUMP and COPY interface to perform faster image copies with a reduced impact on the database that is being image copied.

For more information, see the *IMS High Performance Image Copy User's Guide*.

IMS Index Builder

IMS Index Builder helps streamline index creation, reorganization, maintenance and recovery. IMS Index Builder provides the following functionality:

- Enables you to build (or rebuild) IMS secondary indexes, Hierarchical Indexed Direct Access Method (HIDAM) primary indexes, and high availability large databases (HALDB) Indirect List Data Sets (ILDS)
- Supports full-function databases and partitioned HALDB
- Creates multiple indexes in one job step
- Rebuilds database indexes without having to unload and reload the primary data store
- Eliminates the need to image copy indexes because the indexes can be rebuilt instead of recovered from an image copy

For any supported hierarchical direct (HD) database and for HISAM databases, IMS Index Builder scans the existing physical database and builds IMS primary and secondary indexes. For non-partitioned databases, it creates one or more new secondary index databases. For secondary indexes and PSINDEXs, a full database reorganization and initial HALDB load are no longer necessary.

For more information, see the *IMS Index Builder User's Guide*.

IMS Recovery Expert

IMS Recovery Expert automates and manages traditional disaster recovery processes, simplifies disaster recovery procedures, reduces recovery time, and makes the recovery process less error-prone.

IMS Recovery Expert provides the ability to backup an entire IMS system (full image or data only) or a partial IMS system at the volume level through the use of system level backup profiles, whether the system is up or down.

For more information, see the *IMS Recovery Solution Pack: IMS Recovery Expert User's Guide*.

IMS Solution Packs: Data Sensor

Database sensors collect statistics from IMS databases and the Recovery Sensor collects statistics from DBRC RECON data sets. All sensors store the data in a central repository that is provided by IMS Tools Knowledge Base.

The stored data can be used by Autonomics Director, Policy Services, and IMS Administration Foundation or Management Console for database analysis and tuning purposes.

For more information, see the *IMS Solution Packs Data Sensor User's Guide*.

IMS Recovery Solution Pack business scenarios

This topic describes business scenarios that demonstrate how the IMS Recovery Solution Pack can help reduce your downtime and get your IMS systems back up and running.

Recovering from an application error

If an application error occurs, and point-in time recovery (PITR) is required, you first need to determine which application had the error and when that error occurred.

IMS Recovery Expert provides Application-level recovery allowing users to recover IMS databases or groups of related databases that represent applications from a system backup or image copies. From the ISPF interface, users create application profiles that include all the IMS databases that represent an application.

When an application needs to be recovered, IMS Recovery Expert analyzes all the available backup resources to generate the Database Recovery Facility JCL to recover all the databases in the application profile.

Making an audit copy of your databases

You can use the IMS Recovery Solution Pack to produce an audit copy of your databases.

When used in combination, these tools enable you to produce copies without accessing production databases. You can build copies from image copies, change accumulations, and log data sets.

In addition, you can generate data set names by using a prefix or suffix, date, time, high-level qualifier, and literal.

Recovering data after a system failure

The last, but critical, piece of IMS Recovery Solution Pack is the ability to recover your data in the event of a disaster. A typical disaster recovery strategy is based on cost, the amount of time that it takes to recover compromised data, and the ability of your organization to absorb any permanent loss of data.

Typical disaster recovery strategies often involve sending image copies, change accumulations, logs, and RECONS to a remote site. To minimize the amount of data that needs to be sent, as well as the resulting expense and complexity, you can use IMS Recovery Expert to send system-level-backups or use change accumulation as input to create an incremental image copy and send this image copy to a remote site.

Regardless of the amount of IMS High Performance Image Copy data that is sent, the IMS Recovery Solution Pack enables you to restore your critical IMS data efficiently and effectively.

Hardware and software requirements

IMS Recovery Solution Pack is installed by using SMP/E and standard RECEIVE, APPLY, and ACCEPT processing.

Complete information about installation requirements, prerequisites, and procedures for IMS Recovery Solution Pack for z/OS is located in the *Program Directory for IBM IMS Recovery Solution Pack for z/OS*, GI13-4315.

Hardware requirements

IMS Recovery Solution Pack can run on any z/OS hardware environment that supports the required software.

Installation software requirements

IMS Recovery Solution Pack requires z/OS 2.3 (5650-ZOS) or later.

In addition, IMS Recovery Solution Pack requires IBM IMS Tools Base for z/OS 1.6 (5655-V93) or later. IBM IMS Tools Base for z/OS must be installed into the same SMP/E CSI zone as IMS Recovery Solution Pack.

Operational software requirements

An operational requisite is defined as a product that is required and must be present or a product that is not required but should be present on the system in order for this product to operate all or some of its functions.

IMS Recovery Solution Pack operates with the following IMS versions:

- IMS 15.1 (5635-A06) or later
- IMS Database Value Unit Edition 15.1 (5655-DS5) or later

Common tool requirements

The following common tools, which are provided in IMS Tools Base, are used by IMS Recovery Solution Pack:

- IMS Tools Knowledge Base
- IMS Tools Online System Interface
- IMS Tools Generic Exits

These common tools are not distributed with IMS Recovery Solution Pack but are instead distributed with IMS Tools Base. IMS Tools Base must be installed and configured before IMS Recovery Solution Pack can be used.

IMS Tools Base 1.7 and later also provides IMS Administration Foundation, which is a browser-based graphical user interface that extends the capabilities of IBM Unified Management Server for z/OS to manage IMS systems and resources. To enable the graphical user interface of IMS Administration Foundation, the following products must be installed:

- IBM Unified Management Server for z/OS 1.1 with APAR PH47708 or later, and its prerequisite software
- IBM IMS Tools Base for z/OS 1.7 or later

Some functions and features that require IMS Tools Base include the following:

- Saving reports in IMS Tools Knowledge Base repository
- Autonomics Director capabilities
- IMS Tools Online System Interface for issuing IMS commands
- IMS Tools Generic Exits for pausing BMPs and issuing IMS commands in IMS Database Recovery Facility Extended Functions
- IMS Tools Generic Exits for logger exit capabilities in IMS Recovery Expert
- Autonomics Director for collecting sensor data in Recovery Sensor
- IMS Tools Knowledge Base for storing the sensor data in Recovery Sensor
- Policy Services for monitoring sensor data which is collected by Recovery Sensor

Conditional operational requirements

A conditional operational requisite identifies the following products that are not required for the basic function but are needed at run time for the tool to utilize specific functions.

Table 1. Conditional operational requirements

Tool	Function	Required product
Database Recovery Facility	Any functions of Database Recovery Facility	The DFSORT program, which is included in z/OS, or a functionally equivalent sort program
	Image copy option of the Recovery function	IMS High Performance Image Copy
	Incremental image copy function	
	HDPC Hash Pointer Check option of the Recovery function	IMS High Performance Pointer Checker It is also included in the following solution packs: <ul style="list-style-type: none"> • IMS Database Solution Pack • IMS Database Utility Solution
	DEDB Hash Pointer Check function of the Recovery function	IMS Fast Path Solution Pack
	FF DB/HALDB Index build option of the Recovery function	IMS Index Builder
	DEDB secondary index build option of the Database Recovery function	IMS Fast Path Solution Pack
Database Recovery Facility Extended Functions	Process through TSO terminals	The Interactive System Productivity Facility (ISPF), which is included in z/OS
	High Performance Change Accumulation	The DFSORT program, which is included in z/OS, or a functionally equivalent sort program
	Process through TSO terminals	The Interactive System Productivity Facility (ISPF), which is included in z/OS

Table 1. Conditional operational requirements (continued)

Tool	Function	Required product
High Performance Image Copy	HDPC Hash Pointer Check option of the Image Copy function	IMS High Performance Pointer Checker It is also included in the following solution packs: <ul style="list-style-type: none"> • IMS Database Solution Pack • IMS Database Utility Solution
	DEDB Hash Pointer Check option of the Image Copy function	IMS Fast Path Solution Pack
	Verification of the DBD being used for recovery in the Image Copy and Recovery functions	IMS Library Integrity Utilities It is also included in the following solution packs: <ul style="list-style-type: none"> • IMS Database Solution Pack • IMS Database Utility Solution
	Integrated Database Sensor option of the Image Copy function for full-function and HALDB databases	Either of the following packs: <ul style="list-style-type: none"> • IMS Database Solution Pack • IMS Database Utility Solution IMS Database Reorganization Expert, which is also included in the following solution packs: <ul style="list-style-type: none"> • IMS Database Solution Pack • IMS Database Utility Solution
	Integrated Database Sensor option of the Image Copy function for Fast Path databases	IMS Fast Path Solution Pack
IMS Index Builder	Index build processing	The DFSORT program, which is included in z/OS, or a functionally equivalent sort program

Conditional operational requirement of IMS Recovery Expert is listed in the *IMS Recovery Solution Pack: IMS Recovery Expert User's Guide*.

Service updates and support information

Service updates and support information for this product, including software fix packs, PTFs, frequently asked questions (FAQs), technical notes, troubleshooting information, and downloads, are available from the web.

To find service updates and support information, see the following website:

[IBM Support: IMS Recovery Solution Pack for z/OS](#)

Product documentation and updates

IMS Tools information is available at multiple places on the web. You can receive updates to IMS Tools information automatically by registering with the IBM My Notifications service.

Information on the web

Always refer to the IMS Tools Product Documentation web page for complete product documentation resources:

<https://www.ibm.com/support/pages/node/712955>

The IMS Tools Product Documentation web page includes:

- Links to [IBM Documentation](#) for the user guides ("HTML")
- PDF versions of the user guides ("PDF")
- Program Directories for IMS Tools products
- Recent updates to the user guides, referred to as "Tech docs" ("See updates to this information!")
- Technical notes from IBM Software Support, referred to as "Tech notes"
- White papers that describe product business scenarios and solutions

IBM Redbooks® publications that cover IMS Tools are available from the following web page:

<http://www.redbooks.ibm.com>

The IBM Information Management System website shows how IT organizations can maximize their investment in IMS databases while staying ahead of today's top data management challenges:

<https://www.ibm.com/software/data/ims/>

Product publications

For detailed information about tools and components of IMS Recovery Solution Pack and related products, refer to the publication libraries of the individual products.

IMS Recovery Solution Pack for z/OS 2.1 IMS Database Recovery Facility

User's Guide, SC27-8441

IMS Recovery Solution Pack for z/OS 2.1 IMS Database Recovery Facility Extended Functions

User's Guide, SC27-8442

IMS Recovery Solution Pack for z/OS 2.1 IMS High Performance Change Accumulation Utility

User's Guide, SC27-8443

IMS Recovery Solution Pack for z/OS 2.1 IMS Recovery Expert

User's Guide, SC19-4368

IMS High Performance Image Copy for z/OS 4.2

User's Guide, SC19-2756

IMS Index Builder for z/OS 3.1

User's Guide, SC18-9101

IMS Solution Packs Data Sensor

User's Guide, SC19-3283

All the information about these tools and common tools (IMS Tools Base, IMS Administration Foundation, and Management Console) can be found in [IBM Documentation](#).

Receiving documentation updates automatically

To automatically receive emails that notify you when new technote documents are released, when existing product documentation is updated, and when new product documentation is available, you

can register with the IBM My Notifications service. You can customize the service so that you receive information about only those IBM products that you specify.

To register with the My Notifications service:

1. Go to <https://www.ibm.com/support/mynotifications>
2. Enter your IBM ID and password, or create one by clicking **register now**.
3. When the My Notifications page is displayed, click **Subscribe** to select those products that you want to receive information updates about. The IMS Tools option is located under **Software > Information Management**.
4. Click **Continue** to specify the types of updates that you want to receive.
5. Click **Submit** to save your profile.

How to send your comments

Your feedback is important in helping us provide the most accurate and highest quality information. If you have any comments about this or any other IMS Tools information, you can take one of the following actions:

- Click the Feedback button at the top of the IBM Documentation topic that you are commenting on.
- Click the Contact Us tab at the bottom of any IBM Documentation topic.
- Send an email to ibmdocs@us.ibm.com. Be sure to include the book title, topic or section title, specific text, and your comment.

To help us respond quickly and accurately, please include as much information as you can about the content you are commenting on, where we can find it, and what your suggestions for improvement might be.

Accessibility features

Accessibility features help a user who has a physical disability, such as restricted mobility or limited vision, to use a software product successfully.

The major accessibility features in this product enable users to perform the following activities:

- Use assistive technologies such as screen readers and screen magnifier software. Consult the assistive technology documentation for specific information when using it to access z/OS interfaces.
- Customize display attributes such as color, contrast, and font size.
- Operate specific or equivalent features by using only the keyboard. Refer to the following publications for information about accessing ISPF interfaces:
 - *z/OS ISPF User's Guide, Volume 1*
 - *z/OS TSO/E Primer*
 - *z/OS TSO/E User's Guide*

These guides describe how to use the ISPF interface, including the use of keyboard shortcuts or function keys (PF keys), include the default settings for the PF keys, and explain how to modify their functions.

Chapter 2. Migration considerations

If you have version 1 of the IMS Recovery Solution Pack, you need to migrate it to the new environment.

IMS Recovery Solution Pack includes the functions and features that replace the following tools:

- IMS Database Recovery Facility
- IMS Database Recovery Facility Extended Functions
- IMS High Performance Change Accumulation Utility
- IMS Recovery Expert

The following tools are included in the IMS Recovery Solution Pack:

- IMS Database Recovery Facility (embedded product with common set of target and distribution libraries)
- IMS Database Recovery Facility Extended Functions (embedded product with common set of target and distribution libraries)
- IMS High Performance Change Accumulation Utility (embedded product with common set of target and distribution libraries)
- IMS High Performance Image Copy (consumed product with separate target and distribution libraries)
- IMS Index Builder (consumed product with separate target and distribution libraries)
- IMS Recovery Expert (consumed product with separate target and distribution libraries)

The individual products that are delivered and packaged with IMS Recovery Solution Pack are compatible with the prior versions of these products, except IMS Database Recovery Facility. However, some changes or enhancements might have been made to the JCL samples that are included. It is recommended that you compare all new JCL and procedures with those currently in use.

Important: The IMS Recovery Solution Pack: IMS Database Recovery Facility is not compatible with previous versions of IMS Database Recovery Facility. If you have a previous version of IMS Database Recovery Facility, you must install IMS Recovery Solution Pack: IMS Database Recovery Facility in a separate library from the previous version. The IMS Recovery Solution Pack: IMS Database Recovery Facility contains enhancements that affect setup and usage, including major changes to the contents of the MAS, RSS, and IAX address spaces. To avoid any potential conflicts, the address spaces must be renamed and modified according to the samples provided in the IMS Recovery Solution Pack. The module names are not changed.

Migration from an earlier release of IMS Tools Base

Migration of IMS Tools Base components can be achieved by using IMS Tools Setup. IMS Tools Setup is a function that helps you quickly and efficiently perform the required post-SMP/E-installation customization process for IMS Tools solution pack products.

For instructions, see the topic "Migrating from IMS Tools Base 1.6 to IMS Tools Base 1.7" or "Migrating from Tools Base 1.5 to Tools Base 1.6" in the *IMS Tools Base: Configuration Guide*. IMS Tools Setup also covers migration and customization of IMS Recovery Solution Pack products.

All the components of IMS Tools Base are compatible with earlier releases of IMS Tools Knowledge Base, IMS Tools Online System Interface, and IMS Tools Generic Exits.

If you need to customize IMS Recovery Solution Pack products manually, follow the steps in [Chapter 4, "Customizing IMS Recovery Solution Pack,"](#) on page 17 after you migrate IMS Tools Base components. Some of the customization steps that were done when you customized an earlier release of IMS Recovery Solution Pack can be bypassed. However, because IMS Recovery Solution Pack 2.1 provides new functions and features, review all the customization steps and complete the steps that are required for your environment.

Chapter 3. Initial product customization using IMS Tools Setup

IMS Tools Setup is a function that helps you quickly and efficiently perform the required post-SMP/E-installation customization process for IMS Tools solution pack products. IMS Tools Setup is provided by IBM IMS Tools Base.

What does IMS Tools Setup do?

After the selected IMS Tools solution pack products have been installed into SMP/E data sets, IMS Tools Setup provides a process to simplify the initial configuration that is required to begin using the products. IMS Tools Setup generates JCL members that you then submit as jobs, or perform as tasks, to complete the customization process.

IBM IMS Tools Base components are also configured and customized during the IMS Tools Setup process. IBM IMS Tools Base provides important supporting components and infrastructure that are required for the operation of many IMS Tools functions, such as storage repositories, autonomies, and interaction with IMS.

The goal of IMS Tools Setup is to greatly ease the time and effort it takes to have IMS Tools products up and running in your environment.

IMS Tools Setup is intended only for initial product installations, first-time users, and product evaluations. IMS Tools Setup is not intended for maintenance purposes.

IMS Tools products that can use IMS Tools Setup

The following IMS Tools products and solution packs can use IMS Tools Setup for initial configuration:

- IBM IMS Tools Base
- IBM IMS Database Solution Pack for z/OS
- IBM IMS Fast Path Solution Pack for z/OS
- IBM IMS Recovery Solution Pack for z/OS
- IBM IMS Database Utility Solution for z/OS
- IBM IMS Administration Tool for z/OS
- IBM IMS Cloning Tool for z/OS
- IBM IMS Program Restart Facility for z/OS

Starting IMS Tools Setup

The IMS Tools Setup function (HKTQSETU) can be found in IBM IMS Tools Base. You can start the function by running the following REXX EXEC:

```
EXEC 'smpehlq.SHKTCEXE(HKTQSETU)' 'HLQ(smpehlq)'
```

Note: *smpehlq* is the high-level qualifier for the IMS Tools Base SMP/E data sets.

The IMS Tools Setup ISPF panels provide an organized and logical approach to the customization tasks. The panels explain the operation and sequence of each member that is generated in the CUSTJCL data set. The correct JCL job and task operation order is very important.

Each panel contains embedded panel-context and individual field-context Help information. All information about using IMS Tools Setup is contained in the embedded Help. There is no separate user guide.

While using the IMS Tools Setup function to install IMS Tools products or to migrate your products from an earlier release to a later release, you need to specify the names of the libraries, or data sets, that are required for each IMS Tools product. Use the worksheets in the topic "[Data set names for IMS Tools Setup](#)" in the *IMS Tools Base: Configuration Guide* to make a summary of the data set names that will be used in your environment.

Completing IMS Tools Setup

After you run the HKTQSETU REXX EXEC, you can refer to the \$\$READ member in the generated *hlq.CUSTJCL* data set to view summary information about the JCL members that were generated. Additionally, all individual *hlq.CUSTJCL* members contain detailed descriptions of the functions for each job.

Each of the generated JCL members begin with the number sign (#) and are named in the logical sequence of operation. Any members ending with the at sign (@) require manual steps. You must begin with the first *#xxxx* member and submit the JCL job or perform the task. After that job or task completes, you continue on to the next member and submit that JCL job or perform that task, and so forth.

The first few members are all system-related (APF, LPA, SSN, MVSPPT), followed by security related members, TCP/IP administration, DBA related members, and others.

You must process all members in the correct order to complete the full customization task properly.

Each JCL member has its own descriptive comment section that explains what the member does and which group it might belong to.

Chapter 4. Customizing IMS Recovery Solution Pack

Before using any of the tools that are included in the IMS Recovery Solution Pack, all the tools must be installed and customized, including several common tools and services that are included in IBM IMS Tools Base for z/OS.

Customization using IMS Tools Setup is intended for initial product installations, first-time users, and product evaluations. IMS Tools Setup is not intended for maintenance purposes.

When using IMS Tools Setup is not appropriate for your situation, follow the complete manual customization instructions as outlined in this topic.

Topics:

- [“Installation and customization checklist” on page 17](#)

Installation and customization checklist

This checklist summarizes the steps that are required to install and customize the tools that are included in the IMS Recovery Solution Pack.

Status	Task
	“1-Verifying IMS Recovery Solution Pack prerequisites” on page 18
	“2-Configuring IMS Tools Generic Exits” on page 21
	“3-Configuring IMS Tools Online System Interface” on page 21
	“4-Configuring IMS Tools Knowledge Base” on page 22
	“5-Setting up Unified Management Server for IMS Administration Foundation ” on page 23
	“6-Performing MVS-related tasks” on page 24
	“7-Installing and removing IMS usermods” on page 25
	“8-Installing Extended Functions ISPF interface” on page 28
	“9-Installing IMS HP Change Accumulation Utility ISPF interface” on page 30
	“10-Installing ISPF interfaces for IMS Recovery Expert” on page 31
	“11-Performing security-related tasks” on page 31
	“12-Creating a BPE configuration member” on page 46
	“13-Updating IMS Recovery Solution Pack sample members” on page 47
	“14-Updating IMS HP Image Copy sample members” on page 48
	“15-Updating IMS Index Builder sample members” on page 49
	“16-Updating IMS HP Change Accumulation Utility sample members” on page 50
	“17-Updating IMS Recovery Expert sample members” on page 50
	“18-Verifying IMS Online System initialization” on page 50
	“19-Implementing IMS Recovery Expert” on page 51
	“20-Verifying the installation” on page 51
	“21-Verifying the installation of IMS Recovery Expert ” on page 52

Note: An installation checklist is provided in the SFRXSAMP library in member FRXCHECK. The checklist is intended to assist you in the installation, but is not intended to be a comprehensive set of instructions.

1-Verifying IMS Recovery Solution Pack prerequisites

Before you can customize the tools that are included in the IMS Recovery Solution Pack, you must install these tools by completing the instructions that are in the product program directory.

The SMP/E installation process for the IMS Recovery Solution Pack is documented in the *Program Directory for IBM IMS Recovery Solution Pack for z/OS*, GI13-4315. This process allocates and downloads the required target and distribution libraries and then installs the tools that are included in the IMS Recovery Solution Pack.

This process creates the libraries for the following tools:

- IMS Database Recovery Facility
- IMS Database Recovery Facility Extended Functions
- IMS High Performance Change Accumulation Utility
- IMS High Performance Image Copy
- IMS Index Builder
- IMS Recovery Expert
- IMS Solution Packs: Data Sensor

Use the following table as a reference for the data sets that are created during the installation process. You can make a copy of this table and update it with your actual data set names.

The list of data set names are also included in the SFRXSAMP(FRXCHECK) member. You need to refer to these data sets occasionally during the remainder of the installation and customization process.

Table 2. IMS Recovery Solution Pack data set names

Type	Name	Comments	Local DSN name
CLIST	SHKTCLIB	IMS Tools KB CLISTs	
EXEC	SFRXEXEC	IMS Recovery Solution Pack REXX/ CLISTs	
	SHPCCEXE	IMS High Performance Change Accumulation Utility REXX/CLISTs	
	SHKTCEXE	IMS Tools KB REXX/CLISTs	

Table 2. IMS Recovery Solution Pack data set names (continued)

Type	Name	Comments	Local DSN name
LMOD	SFRXLOAD	IMS Recovery Solution Pack executable load library	
	SHPCLMDO	IMS High Performance Change Accumulation Utility executable load library	
	SHPSLMDO	IMS High Performance Image Copy executable load library	
	SIULMOD	IMS Index Builder executable load library	
	SBSYLOAD	IMS Recovery Expert executable load library	
	SHKTLOAD	IMS Tools KB executable load library	
	SFOILOAD	IMS Tools Base executable load library (IMS Tools Online System Interface)	
	SGLXLOAD	IMS Tools Base executable load library (IMS Tools Generic Exit)	
MAC	SGLXMAC	IMS Tools Base macros (IMS Tools Generic Exit)	
MLIB	SFRXMENU	IMS Recovery Solution Pack ISPF messages	
	SHPCLLIB	IMS High Performance Change Accumulation Utility ISPF messages	
	SBSYMENU	IMS Recovery Expert ISPF messages	
	SHKTMENU	IMS Tools KB ISPF messages	
PLIB	SFRXPENU	IMS Recovery Solution Pack ISPF panels	
	SHPCLLIB	IMS High Performance Change Accumulation Utility ISPF panels	
	SBSYPENU	IMS Recovery Expert ISPF panels	
	SHKTPENU	IMS Tools KB ISPF panels	

Table 2. IMS Recovery Solution Pack data set names (continued)

Type	Name	Comments	Local DSN name
SAMP	SFRXSAMP	IMS Recovery Solution Pack PROC/JCL samples	
	SHPCSAMP	IMS High Performance Change Accumulation Utility PROC/JCL samples	
	SHPSSAMP	IMS High Performance Image Copy PROC/JCL samples	
	SHPSJCL0	IMS High Performance Image Copy IVPs and link-edit JCL	
	SIIUCNTL	IMS Index Builder PROC/JCL samples	
	SIIUPROC	IMS Index Builder PROC samples	
	SBSYSAMP	IMS Recovery Expert PROC/JCL/CLIST samples	
	SHKTSAMP	IMS Tools KB PROC/JCL samples	
	SGLXSAMP	IMS Tools Base PROC/JCL samples (IMS Tools Generic Exit)	
SLIB	SFRXSENU	IMS Recovery Solution Pack ISPF skeletons	
	SBSYSLIB	IMS Recovery Expert ISPF Skeletons	
TLIB	SFRXTENU	IMS Recovery Solution Pack ISPF tables	
	SHKTENU	IMS Tools KB ISPF tables	

Install and configure IMS Tools Base

Before continuing with the installation of the IMS Recovery Solution Pack, you must complete the SMP/E installation and configuration for these common components.

See the *Program Directory for IBM IMS Tools Base for z/OS*, GI10-8819 for installation instructions. This process allocates and download the target and distribution libraries and perform the SMP/E installation of the tools included in IMS Tools Base.

After completing the SMP/E installation, see the following manuals to complete the configuration of the necessary components of IMS Tools Base for executing the IMS Recovery Solution Pack:

- *IMS Tools Base: IMS Tools Common Services User's Guide and Reference*
- *IMS Tools Base: IMS Tools Knowledge Base User's Guide and Reference*
- *IMS Tools Base: Policy Services User's Guide and Reference*
- *IMS Tools Base: Autonomics Director User's Guide and Reference*
- *IMS Tools Base: Distributed Access Infrastructure User's Guide and Reference*

After you have installed and configured the common components, continue with the installation of the IMS Recovery Solution Pack.

2-Configuring IMS Tools Generic Exits

You must install and configure the IMS Tools Generic Partner Exit interface which is distributed as part of the IMS Tools Generic Exits. The IMS Tools Generic Partner Exit interface is a general-purpose interface that allows multiple exits to be defined and called. The IMS Tools Generic Partner Exit interface is required to operate the IMS Tools Online System Interface as well as the IMS Database Recovery Facility Extended Functions Recovery Point Create (RPCR) feature.

Before you begin

As part of the installation and configuration for the IMS Tools Generic Partner Exit, you might have already performed the following steps. However, if these steps have not yet been completed, you need to complete them now before continuing.

About this task

These instructions describe how to configure the IMS Tools Generic Exits.

Procedure

1. Create a unique GPR*iiii*O member for each IMS system in which IMS Tools Online System Interface is needed. *iiii* is the 4-character IMS subsystem identifier.
2. APF-authorize the executable load libraries for IMS Tools Generic Exits.
3. Update your IMS control region JCL to include in the //STEPLIB concatenation the executable load libraries for IMS Tools Generic Exits.

What to do next

You can use the SFRXSAMP(FRXGPR) and SBSYSAMP(BSYGPR) sample members to set up IMS Tools Generic Partner Exit configuration members for each IMS system. For detailed instructions on how to add a GPR*ssid*O or GP*REXIT*O member the, see the *IMS Tools Base: Configuration Guide*.

Important:

- If you use any other user-defined or vendor partner exit that does not support IMS Tools Generic Exits, you must ensure that the libraries that contain the DFSPUEO exit are concatenated ahead of the SGLXLOAD and those exits must pass control to the next exit in the STEPLIB so that IMS Tools Generic Exits get control.
- The IMS Tools Generic Exits load library, SGLXLOAD, must be in front of the IMS Tools Online System Interface load library, SFOILOAD, in the IMS control region //STEPLIB concatenation.

3-Configuring IMS Tools Online System Interface

You must install and configure the IMS Tools Online System Interface. It is a general-purpose IMS command interface that is distributed as part of IMS Tools Base.

About this task

The IMS Tools Online System Interface is an IMS command interface that is used by multiple products to issue commands to an IMS subsystem. The IMS Tools Online System Interface is required by many of the functions included in the IMS Recovery Solution Pack. The IMS Tools Online System Interface requires the use of the IMS Tools Generic Partner Exit interface.

As part of the installation and configuration for the IMS Tools Online System Interface, you might have already performed the following steps. However, if these steps have not yet been performed, you need to complete them now.

Procedure

1. Verify your installation and configuration of the IMS Tools Generic Partner Exit interface.
2. Create a unique FOIssidP member for each IMS system in which IMS Tools Online System Interface is needed. *ssid* is the 4-character IMS subsystem identifier.

Refer to SFRXSAMP(FRXFOI) for a sample.

Within this FOIssidP member, there is a 5-character maximum XCFGROUP name. This XCFGROUP name is used later in the installation process and contains a "TOI" prefix that is used to create the complete XCF group name. Record each XCFGROUP name to use later.

3. APF-authorize the executable load libraries for IMS Tools Online System Interface.
4. Update your IMS control region JCL to include in the //STEPLIB concatenation the executable load libraries for IMS Tools Online System Interface.

4-Configuring IMS Tools Knowledge Base

You must install and configure the IMS Tools Knowledge Base. It is a repository for reports and other information that is used by products in the IMS Recovery Solution Pack. It is distributed as part of IMS Tools Base.

In this topic:

- [“Defining IMS Recovery Solution Pack products to IMS Tools KB” on page 22](#)
- [“Defining RECONID records” on page 23](#)

Defining IMS Recovery Solution Pack products to IMS Tools KB

IMS Tools Knowledge Base can be used by products to store output reports for archival and viewing. Many of the products in the IMS Recovery Solution Pack currently store reports into the IMS Tools KB. Before any reports can be stored, the products must first be defined to the IMS Tools KB.

Before you begin

Before you can execute JCL to add the product IDs to IMS Tools KB, make sure that the IMS Tools KB server is active and running. Record the name of the server for use later.

Procedure

1. Modify the SFRXSAMP(FRXITKB) sample member.

This member has ADD statements for each product that is included in the IMS Recovery Solution Pack.

If any of these products are already defined, the job still runs because the REPLACE option is specified. (You must replace any old product registrations.)

2. Run the modified FRXITKB JCL to add the product IDs to IMS Tools KB.

The JCL also lists the products that have been successfully added to IMS Tools KB.

Run this JCL to confirm that the product IDs were successfully added to IMS Tools KB.

3. Run this job against each IMS Tools KB server where the products are executed.

What to do next

The SFRXSAMP(FRXITKB) sample member has a list of product IDs within the solution. A complete list of all supported products is provided in the *IMS Tools Base: IMS Tools Knowledge Base User's Guide and Reference*.

Defining RECONID records

IMS Database Recovery Facility Extended Functions requires that certain information that is related to the execution environment is stored in the IMS Tools KB. This information is stored in elements called RECONID records.

Before you begin

Before you can add RECONID records, make sure that the IMS Tools KB server is active and running. Then, determine the sets of RECON data sets that need to be defined. A unique RECONID record is required for each set of IMS RECON data sets against which IMS Database Recovery Facility Extended Functions executes.

If you have multiple IMS Tools KB servers, you must define the RECONID records to the server that is active for the associated RECON environment. Record the server names for future purposes.

Procedure

1. Access the primary IMS Tools KB ISPF interface primary menu by entering the following command in TSO Option 6:

```
EXEC 'your.hlq.SHKTCEXE(HKTZPRIM)' 'your.hlq'
```

2. Provide the following information on the primary panel:
 - Specify the IMS Tools KB server name.
 - Specify Y/N for HISTORY.
3. Choose Option 4 from the drop-down menu on the top-left side of the panel.
4. If the RECONID is not in the list of displayed RECONIDs, add a new entry by typing NEW on the command line.
5. Enter the following information to create a RECONID:
 - The 8-byte external name that is associated with the RECONID member. This value is user-defined but must be unique within this server.
 - The RECON1, RECON2, and RECON3 data set names.
 - The XCF group name that is used to communicate with IMS Tools Online System Interface in the IMS control regions.
 - The IMSPLEX name as defined to the RECON data sets, if present.
 - The RACF security class to be used for securing IMS commands that are issued through the IMS Command (IMSCMD) interface.
6. Save the RECONID.
7. Repeat this process for each RECON environment that is associated with this server.

5-Setting up Unified Management Server for IMS Administration Foundation

If you have installed IBM Unified Management Server for z/OS, you can configure and activate IMS Administration Foundation features, which provide a subset of the features that have been provided by IBM Management Console for IMS and Db2 for z/OS.

About this task

The IMS Administration Foundation features that are activated by IBM Tools Base for z/OS and IMS Recovery Solution Pack for z/OS include viewing charts based on sensor data, database exceptions, and reports. The graphical user interface is provided by IBM Unified Experience for z/OS that runs as an application for Zowe virtual desktop.

The IBM Unified Management Server for z/OS provides a web service infrastructure and a unified user interface that consolidate information from IMS subsystems and Db2 subsystems on a sysplex.

At least one Unified Management Server server instance must be set up on each sysplex and on top of a Zowe infrastructure running on the sysplex.

Procedure

1. For instructions for activating and configuring IMS Administration Foundation features for IBM Unified Management Server for z/OS, see the topic "Post-SMP/E installation for IMS Administration Foundation" in the *Unified Management Server User Guide*.
2. To use the IMS Administration Foundation features on the graphical user interface provided by IBM Unified Experience for z/OS, see the topic "Using IMS Administration Foundation" in the *Unified Management Server User Guide*.

6-Performing MVS-related tasks

These tasks involve making changes to your MVS system to allow the IMS Recovery Solution Pack to operate with the required level of authority.

Adding entries to the MVS program properties table

Several of the tools that are included in the IMS Recovery Solution Pack require entries in the MVS program properties table (PPT) in order to operate.

Procedure

1. Use the statements in the SFRXSAMP(FRXSAMP) sample member to update your SCHEDxx member of the SYS1.PARMLIB data set. The sample member contains the following entries:

```
PPT PGMNAME(FRXSDR00) /* DRF */
      CANCEL /* PROGRAM CAN BE CANCELLED */
      KEY(7) /* PROTECT KEY ASSIGNED IS 7 */
      NOSWAP /* PROGRAM IS NON-SWAPPABLE */
      NOPRIV /* PROGRAM IS NOT PRIVILEGED */
      DSI /* REQUIRES DATA SET INTEGRITY */
      PASS /* CANNOT BYPASS PASSWORD PROTECTION */
      SYST /* PROGRAM IS A SYSTEM TASK */
      AFF(NONE) /* NO CPU AFFINITY */
      NOPREF /* NO PREFERRED STORAGE FRAMES */

PPT PGMNAME(IROMAIN) /* IMSRE */
      CANCEL /* PROGRAM CAN BE CANCELLED */
      KEY(7) /* PROTECT KEY ASSIGNED IS 7 */
      NOSWAP /* PROGRAM IS NON-SWAPPABLE */
      NOPRIV /* PROGRAM IS NOT PRIVILEGED */
      DSI /* REQUIRES DATA SET INTEGRITY */
      PASS /* CANNOT BYPASS PASSWORD PROTECTION */
      SYST /* PROGRAM IS A SYSTEM TASK */
      AFF(NONE) /* NO CPU AFFINITY */
      NOPREF /* NO PREFERRED STORAGE FRAMES */

PPT PGMNAME(IIUSTART) /* IIB */
      NOSWAP /* PROGRAM IS NON-SWAPPABLE */

PPT PGMNAME(IIUBSCTL) /* IIB */
      NOSWAP /* PROGRAM IS NON-SWAPPABLE */
```

2. To activate the updated PPT, either:
 - Run the IPL (initial program load) again for the MVS system where you have identified SCHEDxx in the IAESYSy IPL member.
 - Issue the MVS SET SCH= command specifying the suffix for the SCHEDxx member that was changed.
3. Repeat these steps for each MVS system on which the products run.

APF authorizing the product load libraries

The libraries that contain the IMS Recovery Solution Pack executable modules and any other libraries that are concatenated in the STEPLIB must be APF-authorized. If any libraries in the STEPLIB are not APF-authorized, the entire STEPLIB becomes unauthorized.

About this task

The following table indicates all the libraries that are associated with the IMS Recovery Solution Pack and that need to be APF-authorized. The actual library names depend on the data set names that you created for executing these products. Refer to your recorded checklist of load library names in [“1-Verifying IMS Recovery Solution Pack prerequisites”](#) on page 18.

Table 3. Program libraries

Library	Description
SFRXLOAD	IMS Database Recovery Facility and IMS Database Recovery Facility Extended Functions
SIIULMOD	IMS Index Builder
SHPSLMD0	IMS High Performance Image Copy
SHPCLMDO	IMS High Performance Change Accumulation Utility
SGLXLOAD	IMS Tools Generic Exits
SFOILOAD	IMS Tools Online System Interface
SHKTLOAD	IMS Tools Knowledge Base

Procedure

1. Add the libraries listed in [Table 3 on page 25](#) to your MVS APF list as well as any other library that is specified in the STEPLIB of each batch utility job or IMS control region.
2. To activate the updated APF list, either IPL the MVS system or issue the MVS SET PROG command.
3. Repeat these steps for each MVS system on which you run the tools provided in the IMS Recovery Solution Pack.

7-Installing and removing IMS usermods

You must install IMS usermods for use with IMS Recovery Solution Pack. These usermods allow the IMS Recovery Solution Pack products to function properly. Without these usermods, some product features do not work.

Important: If you have IMS Program Restart Facility installed, use its interface and do not install the IMS Database Recovery Facility Extended Functions usermod. If you do not have IMS Program Restart Facility installed but you have IMS Online Reorganization Facility installed, use its interface and do not install the following BMP pauser interface usermod. If none of the other products usermods are installed, you must install the IMS usermods for the BMP Pauser Interface that is provided with IMS Recovery Solution Pack. The products mentioned here all include similar interfaces that are compatible with this usermod. However, you still need to install the CICS®/ODBA Pauser Interface.

BMP pauser interface (DFSRRRC00)

To allow the IMS Database Recovery Facility Extended Functions Recovery Point Create (RPCR) feature to function, you must install the BMP pauser interface. The RPCR feature can pause BMPs when attempting to deallocate a database.

When the RPCR feature attempts to deallocate a database, this usermod can pause a BMP at the next checkpoint and prevent any new BMPs from starting. Pausing a BMP allows the databases to be recovered by using the /DBR command and started by using the /STA command without manual intervention.

If you do not install the BMP pauser interface, RPCR cannot deallocate the database when a BMP holds the database that is being processed by RPCR, causing RPCR to fail.

If your site uses BMPs to access IMS databases, you must implement this interface for each IMS system. The BMP pauser interface is critical for the product to be able to create "Common Recovery Points." The BMPs must be restartable by IMS (XRST) and must use checkpointing (CHKPT). For full-function databases, a pseudo U3303 abend is issued and the BMP is automatically restarted after the brief pause.

For HALDB databases, the BMP is paused and no pseudo U3303 abend is issued.

Two methods of installing the BMP pauser interface are available. You need to understand both methods to determine which method to implement. "[Installation method 1: Modifying the IMS region controller module](#)" on page 26 is recommended because it does not require any BMP JCL changes.

Installation Method	Description
"Installation method 1: Modifying the IMS region controller module" on page 26	This method of installing is recommended because it does not require you to modify any BMP JCL. JCL changes are not required because the region controller is not renamed and it exists in your IMS RESLIB.
"Installation method 2: Editing the BMP JCL jobs" on page 27	To use this method, you need to edit all the BMP JCL jobs. This method requires that you make JCL changes to all the BMP jobs that access databases that are processed by the RPCR feature. Use this method if you do not want to modify the IMS region controller module.

Installation method 1: Modifying the IMS region controller module

This method of installing is recommended because it does not require you to modify any BMP JCL. JCL changes are not required because the region controller is not renamed and it exists in your IMS RESLIB.

About this task

This method is implemented as a USERMOD to IMS. This method renames the existing region controller DFSRRRC00 to DFSRRRC99, and then installs a new DFSRRRC00 front end. It also copies other DFSRRRCxx modules: one for each supported release into the IMS RESLIB. Anytime the region controller is invoked, the front end calls the IMS-dependent modules, if needed, and then transfers control to the IMS region controller. This process ensures that the BMP pauser interface is always active.

If you have any other applications that relink the IMS region controller or use a different IMS region controller module for BMPs, consider using this method to link those modules and IMS Recovery Solution Pack modules.

Procedure

To install the BMP pauser interface by using method 1 (modifying the IMS region controller), modify and run the SFRXSAMP(IROBMP1) sample member to relink the IMS region controller.

Installation method 2: Editing the BMP JCL jobs

To use this method, you need to edit all the BMP JCL jobs. This method requires that you make JCL changes to all the BMP jobs that access databases that are processed by the RPCR feature. Use this method if you do not want to modify the IMS region controller module.

About this task

- This method does not relink the DFSRRC00 module into any load library, not even IMS.RESLIB.
- If you do not modify all BMP jobs and steps, BMP pausing is not done for the BMPs for which you did not modify the JCL.

Procedure

1. Modify and run SFRXSAMP(IROBMP2) to link and create the IRORRC00 module.
2. Change all BMP JCL as follows:
 - a) Add the load library that you used as your SYSLMOD in the IROBMP2 install job as the first data set in your STEPLIB concatenation. For example:

```
//STEPLIB DD DSN=your.userlib.containing.IRORRC00
```
 - b) Modify the IMS region controller execution module on the EXEC statement of each BMP step. For example:

```
//stepname EXEC PGM=IRORRC00
```

instead of:

```
//stepname EXEC PGM=DFSRRC00
```

Removing the BMP pauser interface

If necessary, you can remove the BMP pauser interface.

Procedure

To remove the BMP pauser interface, complete one of the following steps, depending on how the BMP pauser interface was installed:

- If the BMP pauser interface was installed by using [“Installation method 1: Modifying the IMS region controller module”](#) on page 26:
 - a) Delete the existing DFSRRC00 member.
 - b) Rename DFSRRC99 to DFSRRC00.
- If the BMP pauser interface was installed by using [“Installation method 2: Editing the BMP JCL jobs”](#) on page 27:
 - a) In the modified BMP JCL, change the PGM=IRORRC00 EXEC statements to PGM=DFSRRC00.
 - b) In the modified BMP JCL, remove the data set in your STEPLIB concatenation that points to the load library that was used as the SYSLMOD in the IROBMP2 install job.

CICS/ODBA pauser interface

To allow the IMS Database Recovery Facility: Extended Functions Recovery Point Create (RPCR) feature to function, you must install the CICS/ODBA interface in the IMS control region. This interface pauses CICS and ODBA activity when RPCR is attempting to deallocate a database.

You need to determine if your site has CICS or ODBA access to IMS databases. If so, you need to complete this task for each IMS system. If you do not have CICS or ODBA access, you do not need to complete this task, however, doing so does not cause any problems or performance degradation. We

recommend that you perform this task so that if CICS/ODBA access is added in the future, RPCR will be able to function properly.

There are two methods of installing the CICS/ODBA Interface. [“Installation method 1: Using an SMP/E usermod”](#) on page 28 is the recommended method because it creates an SMP/E USERMOD to apply the necessary changes.

Method	Description
“Installation method 1: Using an SMP/E usermod” on page 28	This method creates an SMP/E usermod and is the recommended method.
“Installation method 2: Without using an SMP/E usermod” on page 28	This method is intended for testing and implements the usermod without SMP/E.

Installation method 1: Using an SMP/E usermod

This method creates an SMP/E usermod and is the recommended method.

About this task

The file that is created in the SMPOUT DD is input to SMP/E. You need to apply this USERMOD to each IMS control region that has IMS Recovery Solution Pack installed. You can repeat this first job whenever you need to reinstall the USERMOD.

Procedure

To install the CICS/ODBA pauser interface by using method 1 (an SMP/E usermod), modify and run SFRXSAMP(IROCICS1).

Installation method 2: Without using an SMP/E usermod

This method is intended for testing and implements the usermod without SMP/E.

About this task

This method links the load module into the IMS Recovery Solution Pack load library (SFRXLOAD). Use this method for testing purposes only. It requires that the IMS Recovery Solution Pack load library is in the IMS control region //STEPLIB concatenation.

Procedure

To install the CICS/ODBA pauser interface by using method 2 (without using an SMP/E usermod), modify and run SFRXSAMP(IROCICS2).

8-Installing Extended Functions ISPF interface

This ISPF interface is used to parse the Recovery Point Identification (RPID) report and present information in an easy-to-use format. From this interface, you can generate IMS Database Recovery Facility JCL to recover IMS databases or create incremental image copies.

Two methods are available for installing this ISPF interface. These methods are located in the REXX EXECs that are shipped with the IMS Recovery Solution Pack in the SFRXEXEC data set:

Method	Description
“Method 1: Using LOGON procedures” on page 29	Use this installation method when ISPF data sets are allocated through your logon procedure.
“Method 2: Using dynamic allocation” on page 29	Use this installation method when the SFRXEXEC library is not allocated as part of your logon procedure.

Method 1: Using LOGON procedures

Use this installation method when ISPF data sets are allocated through your logon procedure.

About this task

Using this install method eliminates the need to use the IROTXALC EXEC that is also located in your SFRXEXEC library.

This installation method requires that you add the ISPF libraries to your LOGON procedure.

Procedure

1. Add the ISPF libraries to your LOGON procedure. The following list shows the DD name with the data set name that you must specify. Replace *your.hlq* with the appropriate high-level qualifier (HLQ) that is associated with these data sets.

SYSEXEC

your.hlq.SFRXEXEC

ISPEXEC

your.hlq.SFRXEXEC

ISPLLIB

your.hlq.SFRXLOAD

ISPPLIB

your.hlq.SFRXPENU

ISPMLIB

your.hlq.SFRXMENU

ISPMLIB

your.hlq.SFRXSENU

ISPTLIB

your.hlq.SFRXTENU

2. Modify the IROTREXL REXX EXEC member in your SFRXEXEC library to tailor it to your environment. Follow the comments in the IROTREXL member that describe the modifications that can be made.

Accessing the ISPF interface

After installing the ISPF interface by using LOGON procedures, you can access the ISPF interface.

Procedure

1. Select **EDIT** or **VIEW** on a Recovery Point Identification (RPID) report.
2. Execute the IROTREXL edit macro from the command line to invoke the ISPF interface.

Method 2: Using dynamic allocation

Use this installation method when the SFRXEXEC library is not allocated as part of your logon procedure.

About this task

This installation method requires that you run the IROTXALC REXX EXEC to allocate the EXEC library, SFRXEXEC, to your TSO session. You must run this EXEC each time you logon to TSO and before you want to use this ISPF interface.

Procedure

1. Modify the IROTXALC and IROTREXL EXEC members. This step only needs to be performed the first time you access this ISPF interface by using this method:

- Modify the IROTXALC EXEC member to include the appropriate high-level qualifier (HLQ) for SFRXEXEC. Follow the comments in the SFRXEXEC library IROTXALC member that describe the available modifications.
 - Modify the IROTREXL REXX EXEC member in your SFRXEXEC library to tailor it to your environment. Follow the comments in the IROTREXL member that describe the available modifications.
2. Execute the IROTXALC REXX EXEC according to one of the following methods. This step only needs to be performed once for each time you logon to TSO. Running this EXEC allocates the necessary ISPF data sets to your TSO user ID.
- If you did not hardcode the high-level qualifier (HLQ) in your IROTXALC REXX EXEC, provide the HLQ parameter as follows:

```
EXEC 'your.hlq.SFRXEXEC(IROTXALC)' 'hlq(your.hlq)'
```

- If you hardcoded the HLQ in your IROTXALC REXX EXEC, eliminate the HLQ parameter as follows:

```
EXEC 'your.hlq.SFRXEXEC(IROTXALC)'
```

Accessing the ISPF interface

After installing the ISPF interface by using dynamic allocation, you can access this ISPF interface.

Procedure

1. Select **EDIT** or **VIEW** on an Recovery Point Identification (RPID) report.
2. Execute the IROTREXL edit macro from the command line to invoke the ISPF interface.

9-Installing IMS HP Change Accumulation Utility ISPF interface

The IMS High Performance Change Accumulation Utility ISPF user interface allows you to manage the IMS High Performance Change Accumulation Utility environment for one or more change accumulation groups.

Before you begin

Before you run the ISPF user interface, ensure that the following libraries exist (see [Table 2 on page 18](#) for the actual data set names at your location):

- *yourhlq*.SHPCCEXE (CLISTS)
- *yourhlq*.SHPCPLIB (Panels)
- *yourhlq*.SHPCMLIB (ISPF messages)
- *yourhlq*.SHPCLMDO (Programs)

The IMS High Performance Change Accumulation Utility ISPF user interface is designed so that you do not need to change your TSO logon procedure to include the IMS High Performance Change Accumulation Utility ISPF libraries.

Procedure

1. From ISPF main menu, select Option 6: Command.
2. From the ISPF Command Shell, enter a command string using the following syntax:

```
EX 'smphlq.SHPCCEXE(HPCC000)' 'SMPHLQ(smphlq) HPCHLQ(hpchlq) <VOL(volser)>  
<PDSE>'
```

Here are the keywords that are used to run the ISPF user interface:

smphlq

Specifies the high-level qualifier of your installation data set.

hpchlq

Specifies the high-level qualifier for work data sets required by the ISPF user interface.

volser

This optional parameter specifies the volume serial number of the DASD device on which the work data sets are allocated.

PDSE

This optional parameter specifies that the partitioned data set extended (PDSE) data sets are to be used for the IMS High Performance Change Accumulation Utility work files. The default is to define the data sets as partitioned data sets (PDS). PDS data sets require periodic compression.

3. After the IBM copyright screen is displayed, press Enter to continue to the HPCA-ID/IMS Profile panel to configure the IMS High Performance Change Accumulation Utility environment.

10-Installing ISPF interfaces for IMS Recovery Expert

Install ISPF interfaces for IMS Recovery Expert.

IMS Recovery Expert automates and manages traditional disaster recovery processes, simplifies disaster recovery procedures, reduces recovery time, and makes the recovery process less error-prone.

For more information about this configuration task, see the *IMS Recovery Solution Pack: IMS Recovery Expert User's Guide*.

11-Performing security-related tasks

The IMS Recovery Solution Pack requires specific RACF and security settings. You must ensure that all products have the necessary security authorizations in order for them to operate correctly.

Note: To perform security-related tasks for IMS Recovery Expert, refer to the *IMS Recovery Solution Pack: IMS Recovery Expert User's Guide*.

Topics:

- [“Data spaces” on page 31](#)
- [“JESSPOOL resource class” on page 32](#)
- [“Address spaces” on page 32](#)
- [“Configuring HD Pointer Checker to use with IMS Database Recovery Facility” on page 40](#)
- [“Defining RACF \(or equivalent security\) authorization for IMS commands” on page 43](#)
- [“Setting up IMS Index Builder stripe data set security” on page 45](#)
- [“ACF2 command limiting table” on page 46](#)

Data spaces

Data spaces are used by IMS Database Recovery Facility and IMS High Performance Image Copy to hold data that is being processed or to pass data between multiple address spaces. Tool-specific keywords are used to control the use of the data spaces.

Your environment can restrict the use of data spaces. If your site restricts which tools can create and use data spaces, you need to authorize the following programs to allow the tools to function properly.

The following information pertains to the tools that use data spaces and the parameters that you can use to control their use.

IMS Database Recovery Facility

IMS Database Recovery Facility uses data spaces for spilling change accumulation and log records when there is not enough memory to hold the records.

The following programs need to be authorized for creating data spaces:

FRXSDR00

IMS Database Recovery Facility main program

FRXSDR10

IMS Database Recovery Facility Index Builder or DFSPREC0 address space program

You can control the size of each data space that is created by using the SPSIZE keyword. For more information about the use of this keyword, see the *IMS Recovery Solution Pack: IMS Database Recovery Facility User's Guide*.

IMS High Performance Image Copy

IMS High Performance Image Copy uses data spaces to share control data among address spaces. The amount of space used is 128 KB plus an additional 8 KB for each DBDS being processed.

The following program needs to be authorized for creating data spaces:

FABJMAIN

IMS High Performance Image Copy main program

JESSPOOL resource class

You can use the JESSPOOL resource class to protect data sets which are written to spool.

The System Authorization Facility (SAF) is used by both JES2 and JES3 to restrict access to data stored in the spool data sets. If the JESSPOOL resource class is active when a job initiates, the Job Entry Subsystem (JES) interprets the JCL, and for any DD statements that use the spool space (for example, when SYSOUT= is specified), builds a temporary data set name that begins with *node.userid.jobname* where:

node

The network job entry (NJE) node ID of the JES2 or JES3 system.

userid

The SAF user ID that is associated with the job.

jobname

The job name associated with the job.

If you have the JESSPOOL resource class activated and protected so that the default access is NONE, you must create an SAF profile to grant the subordinate address spaces ALTER access to this class. The JESSPOOL resource class name is assigned at JCL interpretation time, occurring as the job enters the system. Therefore, the user ID that is associated with the subordinate address space is the job name, which is assigned by the system from the RACF started class.

For example, if you execute an IMS Database Recovery Facility job that starts a subordinate address space named FRXI0001, this job requires access to the JES spool data sets. To get access to the JES spool data sets, you need to grant ALTER access to a profile beginning with *node.FRXI0001*.

Address spaces

Many of the tools included in the IMS Recovery Solution Pack use the multiple address space architecture.

A common example is the user or job scheduler initiating the master address space (MAS) by submitting a set of saved JCL. The MAS then initiates one or more subordinate address spaces (SAS) to perform the requested processing. In some cases, the SAS also initiates other subordinate address spaces.

IMS Database Recovery Facility Extended Functions address space considerations

IMS Database Recovery Facility Extended Functions consists of a single job that can be submitted by a user or a job scheduler, or initiated as a started task.

The job name is determined by the user. The authority is obtained from the user ID that is associated with the job. The user ID that is associated with the job requires the following authority to the listed data sets:

- CONTROL access to the RECON data sets.
- IMS command authority if the IMS Command interface is used.
- READ access to image copy, log, change accumulation, and database data sets.

- ALTER access to the RECON copy data sets if the RECON copy feature is used.

IMS HP Image Copy address space considerations

IMS HP Image Copy consists of a single job that can be submitted by the user or a job scheduler, or initiated as a started task. The job name is determined by the user. The authority is obtained from the user ID that is associated with the job. The user ID that is associated with the job requires CONTROL access to the RECON data sets, READ access to log and database data sets, and ALTER access to image copy data sets. When Advanced Image Copy Services of IMS HP Image Copy is used, it schedules the DFSMSDss program (server) in a different address space from the address space of IMS HP Image Copy and uses its application programming interface (API).

About this task

Advanced Image Copy Services of IMS HP Image Copy schedules the DFSMSDss program (server) and uses its application programming interface (API). The DFSMSDss server runs in a different address space from the address space of IMS HP Image Copy. When a batch job starts, it starts the DFSMSDss server address space. The server remembers which job started the server. While the server is running, it accepts other connections until the originating job ends. At the end of the originating job, the job notifies the server that it has finished and this notification alerts the server that it can stop. Until the DFSMSDss address space is stopped, the address space is reused by the DFSMSDss API.

You can also start the DFSMSDss server within IMS HP Image Copy jobs. When the server is started, the server can be used by other applications that run in the same system.

Tip: The DFSMSDss server address space simplifies the running of multiple jobs. Therefore, consider starting the DFSMSDss server address space in the system whenever possible.

Procedure

To start the DFSMSDss server address space within an IMS HP Image Copy job, follow these steps:

1. Create the following started task procedure and add it to SYS1.PROCLIB.

```

//*****
//* THIS PROCEDURE WILL CREATE AN APPROPRIATE DFSMSDSS CROSS *
//* MEMORY SERVER TO BE USED WITH APPLICATIONS THAT INVOKE CROSS *
//* MEMORY REQUESTING THE DEFAULT DFSMSDSS SERVER NAME. *
//* *
//* TO USE, ENTER THE FOLLOWING AT A CONSOLE: *
//* START DFSMSDSS,PROG=ADRXMAIB *
//* *
//* WHEN THE DFSMSDSS CROSS MEMORY SERVER IS NO LONGER REQUIRED *
//* ISSUE THE FOLLOWING MODIFY COMMAND: *
//* F DFSMSDSS,STOP *
//* *
//*****
//DFSMSDSS PROC PROG=IEFBR14
//IEFPROC EXEC PGM=&PROG,REGION=0M,TIME=1440,DYNAMNBR=1635

```

2. Start the DFSMSDss server address space by using either of the following methods:

- Issue the following command:

```
S DFSMSDSS,PROG=ADRXMAIB
```

- Add the procedure as a started task in your IPL procedure.

3. When the DFSMSDss server address space is started, run the IMS HP Image Copy jobs.
4. When your IMS HP Image Copy jobs end, and if you want to stop the server address space, issue the following command:

```
F DFSMSDSS,STOP
```

IMS Index Builder address space considerations

IMS Index Builder executes in a multiple address space environment. The main job can be submitted by the user or a job scheduler, or initiated as a started task.

The job name is determined by the user. The authority is obtained from the user ID that is associated with the job. IMS Index Builder can then initiate either of the following subordinate address spaces types, depending on the processing that is being performed:

IIUSORTS

The IMS Index Builder sort subordinate address space that is initiated as a started task. The name of the started task, by default, is IIUSORTS. However, the name can be changed in the IIURPRMS customization module by using the IIURDFLT SORTP parameter.

By default, IMS Index Builder uses the IIUBSRT procedure, found in the system procedure library to create the JCL for this started task. This procedure name can be overridden in the IIURPRMS customization module using the IIURSORT parameter. However, changing this procedure affects all the created address spaces.

IIUSCANS

The IMS Index Builder scan address space which is initiated as a started task. The name of the started task, by default, is IIUSCANS. However, the name can be changed in the IIURPRMS customization module using the IIURDFLT SCAN parameter.

By default, IMS Index Builder uses the IIUBSRT procedure, found in the system procedure library to create the JCL for this started task. This procedure name can be overridden in the IIURPRMS customization module using the IIURSORT parameter. However, changing this procedure affects all the created address spaces.

IIUAPIFC

The IMS Index Builder API address space. It is initiated as a started task when IMS Database Recovery Facility initiates IMS Index Builder. The name of the started task, by default, is IIUAPIFC. However the name can be changed in the IIURPRMS customization module by using the IURDFLT APIP parameter.

IMS Index Builder uses the same procedure for creating both the IIUAPIFC and IIUSORTS address spaces.

All started tasks that are created by IMS Index Builder run with the same authority as the main job that was initiated. When IMS Index Builder initiates a started task, code that is executing in that address space creates a security control block that matches the one associated with the main job. This control block is swapped in the new address space so that it has the same level of authority as the main job. However, there is a short time in which the started task is running with default authority.

For details on this situation and potential problems, see [“RACF considerations for subordinate address spaces”](#) on page 39.

The user ID that is associated with the IMS Index Builder job needs the following authority to the listed data sets:

- CONTROL access to the RECON data sets
- READ access to database data sets
- ALTER access to index data sets

IMS HP Change Accumulation Utility address space considerations

IMS High Performance Change Accumulation Utility executes in a multiple address space environment.

The main job can be submitted by the user or by a job scheduler, or initiated as a started task. The job name is determined by the user. The authority is obtained from the user ID that is associated with the job.

IMS High Performance Change Accumulation Utility initiates the subordinate address spaces depending on the method specified for processing job tasks.

The following table describes the subordinate address spaces that can be directly initiated by IMS High Performance Change Accumulation Utility. It shows how the name is determined, how many can be started, and which JCL procedure is used to build the JCL.

Method	Subordinate address space name	Number started	JCL procedure used
“Custom job processing” on page 36	<ul style="list-style-type: none"> • The job name is determined by HPCA-ID prefix plus 4-character numeric suffix. • The prefix is determined by either: <ul style="list-style-type: none"> – The PARM specification <i>hpca-id</i> on the EXEC statement – The ID= <i>hpca-id</i> command value from HPCSYSIN 	<p>The number of address spaces is specified by the PARALLEL SORTS = command value from HPCSYSIN. The default value is 9.</p>	<p>The job that was written either to the PROCLIB or JOBLIB library that is specified in HPCAPROC DD. The job name is stored as either:</p> <ul style="list-style-type: none"> • <i>hpca-id</i> • ID= prefix plus 0001 – 0nnn
“Standard job processing” on page 36	<p>The job name is determined by either:</p> <ul style="list-style-type: none"> • The PROC = name parameter on the EXEC PARM statement • The PROCEDURE NAME= name command value from HPCSYSIN. 	<p>The number of address spaces is specified by the PARALLEL SORTS = command value from HPCSYSIN. The default value is 9.</p>	<p>An IMS High Performance Change Accumulation Utility defined member is added to the PROCLIB / JOBLIB libraries during installation. The member name must match the name value specified on either:</p> <ul style="list-style-type: none"> • PROC= • PROCEDURE NAME= <p>The member name is used to start all subordinate address spaces.</p>
“Started task control job processing” on page 37	<p>The job name is determined by either:</p> <ul style="list-style-type: none"> • The STC = name parameter on the EXEC PARM statement. • The STC NAME= name command value from HPCSYSIN. 	<p>The number of address spaces is specified by the PARALLEL SORTS = command value from HPCSYSIN. The default value is 9.</p>	<p>An IMS High Performance Change Accumulation Utility defined member is added to a user library during installation. The member name must match the name value specified on either:</p> <ul style="list-style-type: none"> • STC= • STC NAME= <p>The member name is used to start all subordinate address spaces.</p>

Method	Subordinate address space name	Number started	JCL procedure used
“Single address space job processing” on page 37	No subordinate address spaces are created. Instead, each SORT process is an internal task in the main address space.	The number of internal tasks is specified by the PARALLEL SORTS = command value from HPCSYSIN. However, IMS High Performance Change Accumulation Utility adjusts this value for managing private storage. The default value is 3.	The internal task does not require a JCL procedure; however, the member name value on PROC= or PROCEDURE NAME= must specify HPCSTASK.

For more information about the listed parameters, see the *IMS Recovery Solution Pack: IMS High Performance Change Accumulation Utility User's Guide*.

All subordinate address spaces that are initiated by IMS High Performance Change Accumulation Utility require special RACF rules to be set up to allow the job to have the appropriate level of authority. For details about setting up the proper authority and potential problems, see [“RACF considerations for subordinate address spaces” on page 39](#).

The following sections describe the four job processing methods and considerations for selecting an appropriate method for your environment:

- [“Custom job processing” on page 36](#)
- [“Standard job processing” on page 36](#)
- [“Started task control job processing” on page 37](#)
- [“Single address space job processing” on page 37](#)

Custom job processing

The custom job processing method writes each PROC or JOB to a PROCLIB or JOBLIB library.

These libraries must be available to the z/OS master scheduler or to the Job Entry Subsystem (JES). Custom procedures provide the greatest degree of flexibility and security control, but have resource and authority requirements.

The user ID that is associated with the job requires the following authority:

- UPDATE authority for access to the PROCLIB or JOBLIB data set
- CONTROL access to the RECON data sets
- READ access to log data sets
- ALTER access to change accumulation data sets

Standard job processing

For the standard job processing method, an IMS High Performance Change Accumulation Utility defined member is added to the PROCLIB and JOBLIB libraries during installation.

IMS High Performance Change Accumulation Utility does not write the procedures into a library. Instead, the definition of each step is recorded in the IMS High Performance Change Accumulation Utility control file. The control file is merged with the standard JCL using dynamic allocation when each CA sort is initiated.

Standard procedures require fewer resources and less authority for access but are more restricted than custom procedures in accommodating special situations.

The user ID that is associated with the job requires the following authorizations:

- READ authority for reading the member in the PROCLIB or JOBLIB data set
- CONTROL access to the RECON data sets

- READ access to log data sets
- ALTER access to change accumulation data sets

Started task control job processing

The started task control (STC) job processing method provides features of both the custom and standard procedure methods.

The started task control (STC) job processing method provides features of both the custom and standard procedure methods. For STC job processing, procedures are written to a user PROCLIB.

Like the standard procedure method, a single member must be inserted into a system procedure library during installation. This single member is then used to start all subordinate address spaces by using the JCL that is stored in the procedure library.

As a result, this method provides the JCL flexibility that is associated with custom procedures, but has the lesser authority requirements that are associated with standard procedures.

The user ID that is associated with the job requires the following authorizations:

- READ authority for reading the member in the PROCLIB or JOBLIB data set
- CONTROL access to the RECON data sets
- READ access to log data sets
- ALTER access to change accumulation data sets

Single address space job processing

The single address space (AS1) job processing method runs each CA group as a subtask within the control address space.

The advantages include a simplified setup, and fewer resource and security considerations. Access to a system PROCLIB is not required.

Some restrictions apply for single address space job processing, and not all environments can be supported.

The user ID that is associated with the job requires the following authorizations:

- CONTROL access to the RECON data sets
- READ access to log data sets
- ALTER access to change accumulation data sets

IMS Database Recovery Facility address space considerations

IMS Database Recovery Facility runs in a multiple address space environment. The main job can be submitted by the user or a job scheduler, or initiated as a started task.

The job name is determined by the user. The authority is obtained from the user ID that is associated with the job.

For database recovery processing, IMS Database Recovery Facility initiates a master address space that initiates one or more recovery sort subordinate address spaces. When any of the integrated auxiliary utilities are invoked during database recovery, IMS Database Recovery Facility also initiates one or more utility address spaces to perform the processing that is associated with that utility. The address spaces that can be directly initiated by IMS Database Recovery Facility are described in the following list. [Table 4 on page 38](#) provides details about the name and characteristics of each of these address spaces. All address spaces are initiated as started tasks.

IMS Database Recovery Facility master address space

This address space is the main address space, which controls the processing and functions that are being performed in the recovery job. It reads the necessary logs and change accumulation data sets and controls the initialization and termination of the subordinate address spaces.

Recovery Sort Subordinate address space

This address space processes and sorts log and change accumulation records and restores image copy data. It also provides the API that is necessary to invoke the services of IMS High Performance Image Copy and IMS High Performance Fast Path Utilities (DEDB pointer checker). Multiple recovery sort address spaces can be initiated.

Index Builder Utility address space

This address space is used to perform the processing that is associated with the IMS Index Builder. It rebuilds the non-HALDB primary and all secondary indexes for a database and initiates IMS Index Builder address spaces. Multiple Index Builder Utility address spaces can be initiated.

DFSPRECO Utility address space

This address space is used to perform the processing that is associated with the IMS HALDB DFSPRECO utility. It rebuilds the HALDB Primary Index data set and Index List data set. Multiple DFSPRECO Utility address spaces can be initiated.

Pointer Check Utility address space

This address space is used to perform the processing that is associated with the IMS High Performance Pointer Checker (full-function pointer checker). Only a single Pointer Checker Utility address space is initiated.

The following table describes the subordinate address spaces that can be directly initiated by the IMS Database Recovery Facility. It shows how the name is determined, how many address spaces can be started, and which JCL procedure is used to build the JCL.

Table 4. IMS Database Recovery Facility address space characteristics

Address space	Started task control (STC) name	Number started	JCL procedure used
IMS Database Recovery Facility master address space	Determined by the name on the job card	One master address space per recovery job	A default FRXMAS procedure is supplied.
Recovery Sort subordinate address space	DRFSORT if ASGNAME(Y) ASPREF() prefix if ASGNAME(N)	The actual number is determined by the number of DBDs that are being recovered and input image copies. The number is limited by the SORTPARM (NUM(x)) value.	The JCL procedure is specified by the DRFPROC() value. The default is FRXJCLSB.
Index Builder Utility address space	IBPREF() prefix The default prefix is BDRF	One for each index that is being rebuilt	The JCL procedure is specified by the DRFIAX() value. The default is FRXJCLIP.
DFSPRECO Utility address space	PRPREF() prefix The default prefix is PDRF	One for each PHIDAM primary index or ILDS data set rebuilt	The JCL procedure is specified by the DRFIAX() value. The default is FRXJCLIP.
Pointer Checker Utility address space	PCPREF() prefix or PCJOBNM() value The default is FABPATH0	One, regardless of the number of DBDs that are being checked.	The JCL procedure is specified by the PCPROCNM() value. If PCPREF() or PCJOBNM() is specified, FABPATHZ is used.

For more information about the listed parameters, see the *IMS Recovery Solution Pack: IMS Database Recovery Facility User's Guide*.

For more information about configuring HD Pointer Checker, see [“Configuring HD Pointer Checker to use with IMS Database Recovery Facility”](#) on page 40.

All started tasks that are created by IMS Database Recovery Facility run with the same authority as the main job that was initiated. When IMS Database Recovery Facility initiates a started task, the code that is running in that address space creates a security control block that matches the one that is associated with the main job. This control block is swapped in the new address space so that it has the same level of authority as the main job. However, for a short period of time, the started task is running with default authority.

For details about this situation and potential problems, see [“RACF considerations for subordinate address spaces”](#) on page 39.

RACF considerations for subordinate address spaces

You must assign a security identifier (for example, a user ID) to the subordinate address spaces that are directly initiated by the IMS Recovery Solution Pack products.

All subordinate address spaces are initiated as started tasks. When a started task enters the system, the system attempts to locate an entry in the RACF STARTED class that matches the started task name. If an entry with that name is found, this ID is associated with the address space and all authority comes from this ID. If no entry is found, then the started task runs with a default level of authority that is determined by the security rules that are in effect on the system. Generally, this default level does not allow the address space to function properly.

To ensure that the subordinate address spaces have the proper level of authority, you must define entries in the RACF STARTED class. Perform the steps as indicated for each product included in the IMS Recovery Solution Pack to ensure that all jobs run with the required level of authority.

IMS Database Recovery Facility: Extended Functions

Because this product runs in a single address space, no special steps must be taken for these jobs. The main address space runs with the authority of the user who submitted the job.

IMS Index Builder and IMS Database Recovery Facility

These products initiate subordinate address spaces as started tasks. The user ID that is associated with the master job is passed to all the subordinate address spaces so that they have the same level of authority.

The user ID of the subordinate address is obtained in two steps:

1. Before the product code is loaded into the subordinate address space and sets its security identity, the operating system attempts to use the user ID from the profile definitions in the STARTED class of the security system as the user ID for these started tasks.

This user ID must have READ access for all of the data sets that are allocated in the //STEPLIB DD. If any of the data sets that are allocated in the //STEPLIB DD have a default access of NONE, you must grant the subordinate address spaces authority.

To grant subordinate address space READ authority:

- a. Add an entry in the RACF STARTED class to give the subordinate address spaces access during this step by using the RDEFINE command.

After the entry is added, the class must be refreshed by using the SETROPTS command, as shown in the following example:

```
RDEFINE STARTED pfx*. * STDATA(USER(userid))
SETROPTS RACLIST(STARTED) REFRESH
```

The variable *pfx*** indicates the name that is associated with the subordinate address space started task. This class allows generic names to be defined. You must define an entry in the class for each prefix that is used by the products. For more information about the names that are associated with these address spaces and how they are derived, see [“IMS Database Recovery Facility address space considerations”](#) on page 37.



Attention: Improper security system definitions results in errors when opening the STEPLIB during subordinate address space initialization. The subordinate address space can fail with an ABENDS913.

2. After the product code is loaded into the subordinate address space, the product determines the master address space user ID.

The subordinate address space then changes its own user ID to match that of the master address space. The subordinate address space then runs with the same security authorities as the master address space.

IMS High Performance Change Accumulation Utility

These products initiate the subordinate address spaces as started tasks. Add an entry in the RACF STARTED class for each subordinate address space that can be initiated. For more information about the names that are associated with these address spaces and how they are derived, see [“IMS HP Change Accumulation Utility address space considerations”](#) on page 34.

To allow the subordinate address spaces to run with the proper level of authority, you must define an entry in the RACF STARTED class that the system can associate with each subordinate address space by using the RDEFINE command. After the entry is added, the class must be refreshed by using the SETROPTS command, as shown in the following example:

```
RDEFINE STARTED pfx*. * STDATA(USER(userid))
SETROPTS RACLIST(STARTED) REFRESH
```

The variable *pfx*. ** indicates the name that is associated with the subordinate address space started task. This class allows generic names to be defined. You must define an entry in the class for each prefix that is used by the products.

For more information about defining RACF authorization, see [“Defining RACF \(or equivalent security\) authorization for IMS commands”](#) on page 43.

Configuring HD Pointer Checker to use with IMS Database Recovery Facility

If you use HASH pointer checking of full-function databases, you configure HD Pointer Checker of IMS HP Pointer Checker. This topic describes how to configure HD Pointer Checker.

About this task

IMS Database Recovery Facility can call the HD Pointer Checker HASH Check function. To run HD Pointer Checker in IMS Database Recovery Facility jobs, you must tailor HD Pointer Checker for IMS Database Recovery Facility.

Related reading: For additional information to run the HASH Check function in IMS Database Recovery Facility, see the *IMS Recovery Solution Pack: IMS Database Recovery Facility User's Guide*.

Procedure

Complete the following steps to tailor HD Pointer Checker for IMS Database Recovery Facility:

1. APF-authorize the IMS HP Pointer Checker load module library (SHPSLMD0).

In the IMS Database Recovery Facility environment, the HD Pointer Checker program runs as an authorized program facility (APF) program.

2. Modify the FABPATH0 procedure, the FABPATHZ procedure, or both procedures.

IMS HP Pointer Checker provides two procedures; FABPATH0 and FABPATHZ. These procedures build environmental setting for the HASH pointer checking. See [“FABPATH0 and FABPATHZ procedures”](#) on page 41 for more information about the procedures and the JCL requirements for modifying the procedures.

3. Add the procedure to one of the libraries in the SYS1.PROCLIB concatenation.
4. Set up security for the HD Pointer Checker subordinate address space.

When IMS Database Recovery Facility calls the HD Pointer Checker HASH Check function, IMS HP Pointer Checker starts the procedure, which initiates HD Pointer Checker subordinate address space. To initiate the subordinate address space under a security system, you must authorize the subordinate address space. To do so, define the STARTED class profiles that correspond to the procedure names and refresh the STARTED class. You can use the following commands. If a different procedure name is used to start the HD Pointer Checker subordinate address space, replace the procedure name in the RDEFINE command.

```
RDEFINE STARTED FABPATH0.* STDATA(USER(userid))
RDEFINE STARTED FABPATHZ.* STDATA(USER(userid))
SETROPTS RACLIST(STARTED) REFRESH
```

Note: Specified user ID must be the same as the one used for the IMS Database Recovery Facility execution job.

You can also use the started procedures table ICHRIN03 to associate started procedures with user IDs instead of using the RDEFINE STARTED command.

The user ID (*userid*) that is associated with the started task job requires the access authority as follows:

- The READ access authority to the following data sets:
 - The library that contains the IMS HP Pointer Checker load modules
 - The IMS RESLIB
 - The library that contains the HALDB partition selection exit routine if you process a HALDB and the HALDB uses a HALDB partition selection exit routine
 - The library that contains the DBD load modules
- The CONTROL access authority to the RECON data sets

FABPATH0 and FABPATHZ procedures

IMS HP Pointer Checker provides two procedures (FABPATH0 and FABPATHZ) for building environmental setting for the HASH pointer checking.

When IMS Database Recovery Facility calls the HASH Check function, HD Pointer Checker starts the procedure, which initiates a subordinate address space as a started task to build environmental setting for the HASH pointer checking.

If you specify a procedure name in IMS Database Recovery Facility master address space JCL, HD Pointer Checker starts that procedure. If you do not specify a procedure name in IMS Database Recovery Facility master address space JCL, HD Pointer Checker starts the following procedure:

- If the job name that is assigned to a procedure that HD Pointer Checker starts is specified in IMS Database Recovery Facility master address space JCL, HD Pointer Checker starts the FABPATHZ procedure.
- If the job name that is assigned to a procedure that HD Pointer Checker starts is not specified in IMS Database Recovery Facility master address space JCL, HD Pointer Checker starts the FABPATH0 procedure.

The following figures show examples for the FABPATH0 procedure and the FABPATHZ procedure.

```
//FABPATH0 PROC HPPCLIB1=,HPPCLIB2=
//ATH0PROC EXEC PGM=FABPAUTH
//STEPLIB DD DISP=SHR,DSN=&HPPCLIB1
// DD DISP=SHR,DSN=HALDB partition selection exit
// DD DISP=SHR,DSN=&HPPCLIB2
//SYSUDUMP DD SYSOUT=*
```

```
//FABPATHZ PROC L1=,L2=
//ATHZPROC EXEC PGM=FABPAUTH
//STEPLIB DD DISP=SHR,DSN=&L1
//          DD DISP=SHR,DSN=HALDB partition selection exit
//          DD DISP=SHR,DSN=&L2
//SYSUDUMP DD SYSOUT=*
```

The FABPATHZ procedure differs from the FABPATH0 procedure in the following respects:

- Parameter L1= is used instead of HPPCLIB1
- Parameter L2= is used instead of HPPCLIB2

The following EXEC and DD statements are used:

EXEC statement

A required statement. Specify the EXEC statement as follows:

```
EXEC PGM=FABPAUTH
```

STEPLIB DD

A required statement. In the FABPATH0 procedure, specify two DD statements as follows:

```
//STEPLIB DD DISP=SHR,DSN=&HPPCLIB1
//          DD DISP=SHR,DSN=&HPPCLIB2
```

In the FABPATHZ procedure, specify two DD statements as follows:

```
//STEPLIB DD DISP=SHR,DSN=&L1
//          DD DISP=SHR,DSN=&L2
```

&HPPCLIB1 in FABPATH0 or &L1 in FABPATHZ is used for the IMS HP Pointer Checker load module library. &HPPCLIB2 in FABPATH0 or &L2 in FABPATHZ is used for the IMS RESLIB.

Do not remove or override these DSN parameters (&HPPCLIB1, &HPPCLIB2, &L1, and &L2). HD Pointer Checker obtains the data set names from the IMS Database Recovery Facility master address space JCL and passes the data set names to these parameters. The data sets must be cataloged.

If you process a HALDB, and the HALDB uses a partition selection exit routine, FABPATH0 or FABPATHZ refers to the partition selection exit module. It is required that you do either of the following tasks:

- Store the partition selection exit module in the IMS RESLIB.
- Add a DD statement to the STEPLIB concatenation, and specify a data set name that contains the partition selection exit module. APF-authorize the data set.

SYSUDUMP

This optional output data set defines the output from a system ABEND dump routine. It is used only when a dump is required. Though optional, it is recommended that you include this data set.

In addition, FABPATH0 and FABPATHZ refer to the IMS and RECONx DD statements. These DD statements are basically not required in the procedure JCL. HD Pointer Checker obtains the data set names from the IMS Database Recovery Facility master address space JCL. The data sets must be cataloged.

The contents of the IMS and RECON DD statements are as follows:

IMS DD

The data set that contains the DBD load modules.

RECON1, RECON2, and RECON3 DDs

RECON data sets

If IMS and RECONx DD statements are specified in the FABPATH0 or FABPATHZ JCL, the data set names in the FABPATH0 or FABPATHZ JCL are used.

Defining RACF (or equivalent security) authorization for IMS commands

You must define RACF (or equivalent security software) authorizations for the IMS Database Recovery Facility Extended Functions IMSCMD function to operate.

About this task

The IMS Database Recovery Facility Extended Functions IMSCMD function allows you to execute IMS commands through a batch job. IMS commands must be secured with RACF or other equivalent security software to control access to who can issue IMS commands.

There are three different options for securing IMS commands through this feature. The information about IMS command authorization is defined in the IMS Tools Knowledge Base RECONID record.

Procedure

In the **IMSCMD Security** field, which is located in the RECONID record, specify the type of security that you want to implement by entering one of these values:

NONE

No security authorization is performed. This value is intended for test environments only and should not be used in a secured environment. The security level of NONE allows anyone to issue any supported IMS command.

APPL

The RACF application (APPL) resource class is used for command security checking. This method uses the application resource class (APPL) to protect the IMS commands. The **RACF Class** field in the RECONID record indicates the specific application resource name, within the RACF APPL class, that is used for securing the IMS commands.

When you use the APPL resource class method, you must first define the application resource name (*applname* in the next example) to RACF. Define the application resource name to RACF by using the **RDEFINE** command, as shown in this example:

```
RDEFINE APPL applname UACC(NONE) AUDIT(NONE)
```

After you have defined the application resource name, your RACF administrator can permit users either READ or UPDATE levels of command authorization by using the **PERMIT** command, as shown in this example:

```
PERMIT applname CLASS(APPL) ID(userid) ACCESS(READ|UPDATE)
```

The *userid* specifies a particular RACF user or RACF group. ACCESS specifies either read-level access or update-level access. Read-level access allows a user to issue IMS commands that display IMS system information, and update-level access allows users to issue IMS commands that alter IMS system resources. The next table indicates which IMS commands are allowed and the corresponding level of access that is required to run them.

IMS

The IMS resource class is used for command security checking. This method uses the same IMS command security class that is used by the online IMS system. The **RACF Class** field in the RECONID record indicates the RACF security class that is used for securing IMS commands. This value must match the one that you specified to IMS using the **RCLASS=** keyword on the SECURITY macro. This method allows you to use the same security class that is used by your online IMS control region.

IMS commands required access levels for RACF APPL resource class authority

IMS commands and their corresponding required access levels for RACF APPL resource class authority are shown here.

Command	Access level required
/ACT	UPDATE
/ALL	UPDATE
/ASS	UPDATE
/BRO	UPDATE
/CHA	UPDATE
/CHE	UPDATE
/CLS	UPDATE
/COM	UPDATE
/CQC	UPDATE
/CQQ	READ
/CQS	UPDATE
/DBD	UPDATE
/DBR	UPDATE
/DEL	UPDATE
/DEQ	UPDATE
/DIA	READ
/DIS	READ
/END	UPDATE
/EXC	UPDATE
/EXI	UPDATE
/FOR	READ
/IDL	UPDATE
/LOC	UPDATE
/LOG	UPDATE
/LOO	UPDATE
/MON	UPDATE
/MSA	UPDATE
/OPN	UPDATE
/PST	UPDATE
/PUR	UPDATE
/QUI	UPDATE
/RDI	READ
/REC	UPDATE
/RMC	UPDATE
/RMD	UPDATE

Command	Access level required
/RMG	UPDATE
/RMI	UPDATE
/RML	UPDATE
/RMN	UPDATE
/RST	UPDATE
/SEC	UPDATE
/SMC	UPDATE
/SSR	UPDATE
/STA	UPDATE
/STO	UPDATE
/SWI	UPDATE
/TES	UPDATE
/TRA	UPDATE
/UNL	UPDATE
/VUN	UPDATE

Setting up IMS Index Builder stripe data set security

IMS Index Builder uses temporary data sets to pass data between the sort, scan, and master address spaces. These data sets exist only for the duration of the run.

Before you begin

When stripe data sets are used, the user ID that is associated with the master and subordinate address spaces requires ALTER access to these data sets. To ensure ALTER access, add a RACF DATASET profile with a universal access (UACC) of ALTER. If your security policies do not allow UACC(ALTER), you must add each user that runs IMS Index Builder to the profile access list of this DATASET, granting them ALTER access.

Important: By default, stripe data sets are allocated with the high-level qualifiers IIU.STRIPE. You can override this default by using the IIURDFLT CLASS setting in the IIURPRMS parameter module. However, if you override the default high-level qualifiers, you must define a DATASET profile that corresponds to the qualifiers in the installation.

Procedure

To grant ALTER access to the data sets, complete one of the following steps:

- If your security policies allow UACC(ALTER), use the following RDEFINE command to add a single RACF DATASET profile with universal access of ALTER:

```
RDEFINE 'IIU.STRIPE.*' GEN UACC(ALTER)
```

- If you are unable to define this profile with UACC(ALTER), use the following PERMIT command to give each user ID ALTER access to the profile:

```
PERMIT 'IIU.STRIPE.*' GEN ID(user-id) ACCESS(ALTER)
```

Repeat this command for each user ID that requires access.

ACF2 command limiting table

If you use CA ACF2 as a security product, you might encounter the z/OS message IKJ56500I COMMAND XXXXXXXX NOT FOUND when you attempt to run the IMS High Performance Change Accumulation Utility ISPF interface.

This message is issued because the CA ACF2 product classifies CLIST calls as commands. To prevent this error, add HPCAE000 to the CA ACF2 product command limiting table.

12-Creating a BPE configuration member

IMS Database Recovery Facility and IMS Database Recovery Facility Extended Functions are built on the Base Primitive Environment (BPE) architecture. BPE operates with internal default values, but you can also create your own configuration member if you want to alter these default values.

Before you begin

Important: The configuration member for BPE cannot be shared with other tools. You must configure a unique PROCLIB member for IMS Database Recovery Facility and IMS Database Recovery Facility Extended Functions.

About this task

IMS Recovery Solution Pack supplies a sample configuration PROCLIB member for BPE system service functions in SFRXSAMP(FRXBPECF). This sample member contains default settings that you can use for all jobs. Specify the BPE configuration PROCLIB member on the EXEC statement by using the BPECFG= parameter in the PARM= string.

Procedure

1. Determine whether you want to create a single BPE PROCLIB member or multiple BPE PROCLIB members. You can create a separate PROCLIB member for each job, or you can create a single BPE PROCLIB member to be shared among all the jobs.
 - If you create a single BPE PROCLIB member to be shared, all the specifications that are related to BPE-owned resources, such as BPE trace tables, are the same for all the address spaces.
 - If you create multiple BPE PROCLIB members, you can specify different settings for BPE resources in each address space.
2. Create the BPE PROCLIB member or members. They must be fixed length with a minimum LRECL of 9.
3. Enter values for the following keywords:

LANG=

Use this keyword to request the BPE configuration member language. Currently, only ENU (U.S. English) is supported.

TRCLEV=

Use this keyword to define trace table information. Valid parameters are:

tablename

Specify the name of the trace table. Enter an asterisk (*) to set the default for all. Valid trace table names are:

- AWE (for AWE server trace)
- CBS (for Control Block Services trace)
- CMD (for Command Services trace)
- DISP (for Dispatcher trace)
- LATC (for Latch trace)
- SSRV (for System Services trace)

- STGC (for Storage trace)

level

Specify the level of tracing. Valid entries are:

- NONE
- ERROR
- LOW
- MEDIUM
- HIGH

component

Use this parameter to specify the component name that owns the trace table. For BPE traces, the component must be BPE.

PAGES=#pages

This optional parameter specifies the number of 4 KB pages to be allocated to this trace table.

13-Updating IMS Recovery Solution Pack sample members

The following table lists the sample members are used to run each product that is distributed in the IMS Recovery Solution Pack sample library SFRXSAMP.

To customize the members, follow the instructions that are provided in each sample member.

The following abbreviations are used in the table:

DRF

IMS Database Recovery Facility

DRF/XF

IMS Database Recovery Facility Extended Functions

HPCA

IMS High Performance Change Accumulation Utility

HPIC

IMS High Performance Image Copy

ITKB

IMS Tools Base: IMS Tools Knowledge Base

IB

IMS Index Builder

TOSI

IMS Tools Online System Interface

Sample member	Products	Description	Type
FRXGPR	DRF/XF, TOSI	DRF/XF and TOSI general partner exit configuration member	Config
FRXFOI	DRF, TOSI	TOSI configuration parameters	Config
FRXBPECF	DRF, DRF/XF	BPE configuration parameters	Config
FRXCAJCL	HPCA	IMS/CA skeleton JCL for the HPCA IVP	JCL
FRXITKB	DRF, DRF/XF, HPIC, IB, ITKB	Defines the products to ITKB	JCL

Sample member	Products	Description	Type
FRXDRF	DRF	DRF master address space	JCL
FRXMAS	DRF	DRF master address space procedure	PROC
FRXJCLIP	DRF	DRF utility address space	PROC
FRXJCLSB	DRF	DRF subordinate region	PROC
FRXDRFZZ	DRF	DRF configuration parameters	Config
FRXPAT0	DRF	DRF pointer checker procedure	PROC
FRXPATZ	DRF	DRF pointer checker procedure	PROC
IROBMP1	DRF/XF	DRF/XF BMP pause method 1	JCL
IROBMP2	DRF/XF	DRF/XF BMP pause method 2	JCL
IROCICS1	DRF/XF	DRF/XF CICS/ODBA pause method 1	JCL
IROCICS2	DRF/XF	DRF/XF CICS/ODBA pause method 2	JCL
IROCFG01	DRF/XF	DRF/XF configuration	Config
IROSENSR	DRF/XF	Recovery Sensor	JCL
FRXIVPC1 FRXIVPC2 FRXIVPC3 FRXIVPC4	HPCA	HPCA IVP	JCL
FRXIVPD1	DRF	DRF IVP	JCL
FRXIVPI1	HPIC	HPIC IVP	JCL
FRXIVPR1	DRF/XF	DRF/XF IVP	JCL
FRXIVPT1	TOSI	TOSI IMS command Batch IVP	JCL
FRXIVPX1	IB	IB IVP	JCL

14-Updating IMS HP Image Copy sample members

Create or modify the sample members in the SHPSSAMP library for IMS High Performance Image Copy. The following table lists the sample members that are used to run IMS High Performance Image Copy:

Sample member	Description	Type
FABJDFLJ	Site default generation	JCL
FABJEIC	Image copy with HASH check	PROC
FABJICD1	Default member for GENJCL.IC of IMS-compatible JCL	input

Sample member	Description	Type
FABJICD2	Default member for GENJCL.IC of IMS-compatible JCL	input
FABJICS0	Skeleton JCL for GENJCL.IC of IMS-compatible JCL for compressed image copy	JCLPDS
FABJRVGR	Skeleton JCL for recovery function of IMS HP Image Copy	JCLPDS
FABPIC	Image Copy with FF HASH check	PROC

15-Updating IMS Index Builder sample members

You can update the IMS Index Builder SIIUCNTL and SIIUPROC members.

You can create or modify the required IIUBSRT procedure in the SIIUPROC library, and you can modify the optional sample JCL members in SIIUCNTL to help you perform various IMS Index Builder functions.

The following table lists the sample members that are used to run IMS Index Builder:

Sample library	Sample member	Description	Type
SIIUPROC	IIUBSRT	Required sort address space procedure	PROC
SIIUCNTL	IIUSMP01	Build all indexes by using IBSCAN	JCL
	IIUSMP02	Build a selected secondary index by using IBSCAN	JCL
	IIUSMP03	Build a selected secondary index by using DFSURWF1 input	JCL
	IIUSMP04	Build a selected secondary index by using DFSURIDX input	JCL
	IIUSMP05	Build all secondary indexes by using DFSURWF1 input	JCL
	IIUSMP06	Build primary index	JCL
	IIUSMP07	Build primary index by using an alternate primary index	JCL
	IIUSMP08	Build HALDB primary index for a specific partition	JCL
	IIUSMP09	Build HALDB ILDS for a specific partition	JCL
	IIUSMP10	Create the IIURPRMS run time default parameters to be used	JCL
	IIUSMP11	Limited APF authorization JCL	JCL

16-Updating IMS HP Change Accumulation Utility sample members

Create or modify the required IMS High Performance Change Accumulation Utility procedures and skeletons in the SHPCSAMP library. In addition, optional sample JCL members are available to help you perform various IMS High Performance Change Accumulation Utility functions.

The following table lists the sample members that are used to run IMS High Performance Change Accumulation Utility.

Sample member	Description	Type
HPCSPROC	Execution JCL Method	PROC
HPCSSTC	Started Task Method	PROC
HPCPVERS	ISPF panel used to invoke IMS High Performance Change Accumulation Utility	PANEL
HPCSBATO	Two-Step Batch Process	JCL
HPCSDIAG	Diagnostics input control file	Config
HPCSJOB	Standard procedure method sample JCL	JCL
HPCSMAIN	Extended batch process JCL	JCL
HPCSYSIN	Input control statement file	
HPCSPASS	Independent DBRC JCL	JCL
HPCCAJCL	Skeleton JCL member used by the IMS High Performance Change Accumulation Utility main address space	JCL

17-Updating IMS Recovery Expert sample members

Update IMS Recovery Expert sample members.

IMS Recovery Expert automates and manages traditional disaster recovery processes, simplifies disaster recovery procedures, reduces recovery time, and makes the recovery process less error-prone.

For more information about this configuration task, see the *IMS Recovery Solution Pack: IMS Recovery Expert User's Guide*.

18-Verifying IMS Online System initialization

Modifications are required in all the IMS subsystems that use IMS Tools Generic Exits, IMS Tools Online System Interface, and the Recovery Point Create (RPCR) feature. You must ensure that each online system is recycled with the required changes. A successful initialization is indicated by a series of messages.

The following sections contain examples of messages that you should see for each component and product.

IMS Tools Generic Exits initialization

If IMS Tools Generic Exits have been successfully installed in all the IMS control regions that use this interface, the following "GPR" messages will be issued in those IMS control regions:


```
GPR2926I IMS Tools Generic Partner Exit INITIALIZATION IN PROGRESS
GPR2926I PROCESSING PROCLIB MEMBER GPROPT0 imsi
GPR2926I PROCESSING PROCLIB MEMBER GPRimsi0 imsi
GPR2926I IMS Tools Generic Partner Exit INITIALIZATION COMPLETE
```

IMS Tools Online System Interface initialization

If the IMS Tools Online System Interface has been successfully installed in all IMS control regions that use this interface, the following messages will be issued in those control regions:

```
DFS0578I - READ SUCCESSFUL FOR DDNAME PROCLIB MEMBER = FOIimsiP
FOI100I TOOLS ONLINE INTERFACE ENABLED; XCF GROUP=TOIxcfgr imsi
```

After these messages are issued, verify that your group names were configured properly:

- Ensure that the XCF GROUP= *group name* is the same name that is specified in the various tools that you have already configured.
- Ensure that all IMS subsystems that are supposed to be in the same group all have the same XCF GROUP= *group name*.

Recovery Point Create initialization

If the Recovery Point Create feature has been successfully installed in all the IMS control regions that use this product, the following "IRO" messages will be issued in those control regions:

```
IR08100I Recovery Point Create initialization for imsi completed
```

19-Implementing IMS Recovery Expert

Install and implement IMS Recovery Expert.

IMS Recovery Expert automates and manages traditional disaster recovery processes, simplifies disaster recovery procedures, reduces recovery time, and makes the recovery process less error-prone.

For more information about this configuration task, see the *IMS Recovery Solution Pack: IMS Recovery Expert User's Guide*.

20-Verifying the installation

After completing all the installation requirements, run the installation verification (IVP) jobs for each product in IMS Recovery Solution Pack.

These jobs verify that all installation tasks have been completed successfully and the IMS Recovery Solution Pack products are ready to use. You must have your modified IMS Online Systems active for all IVPs to work successfully.

The following table contains sample members for all IVP jobs. Edit each member by following the instructions within each member then run the jobs.

IVP Member	Product
FRXIVPD1	IMS Database Recovery Facility and IMS Tools Online System Interface
FRXIVPR1	IMS Database Recovery Facility Extended Functions and IMS Tools Online System Interface
FRXIVPC1	IMS High Performance Change Accumulation Utility
FRXIVPC2	IMS High Performance Change Accumulation Utility
FRXIVPC3	IMS High Performance Change Accumulation Utility

IVP Member	Product
FRXIVPC4	IMS High Performance Change Accumulation Utility
FRXIVPI1	IMS High Performance Image Copy and IMS Tools Online System Interface
FRXIVPX1	IMS Index Builder
FRXIVPT1	IMS Tools Online System Interface

21-Verifying the installation of IMS Recovery Expert

Verify the IMS Recovery Expert installation.

IMS Recovery Expert automates and manages traditional disaster recovery processes, simplifies disaster recovery procedures, reduces recovery time, and makes the recovery process less error-prone.

For more information about this configuration task, see the *IMS Recovery Solution Pack: IMS Recovery Expert User's Guide*.

Chapter 5. Troubleshooting

Use these topics to diagnose and correct problems that you experience with IMS Recovery Solution Pack.

Topic:

- [“Gathering diagnostic information” on page 53](#)

Gathering diagnostic information

Before you report a problem with IMS Recovery Solution Pack to IBM Software Support, you need to gather the appropriate diagnostic information.

Procedure

Provide the following information for all IMS Recovery Solution Pack problems:

- A clear description of the problem and the steps that are required to re-create the problem
- All messages that were issued as a result of the problem
- Product release number and the number of the last program temporary fix (PTF) that was installed
- The version of IMS that you are using and the type and version of the operating system that you are using

Provide additional information based on the type of problem that you experienced:

For online abends, provide the following information:

- A screen capture of the panel that you were using when the abend occurred
- The job log from the TSO session that encountered the abend
- The job log from the server
- A description of the task that you were doing before the abend occurred

For errors in batch processing, provide the following information:

- The complete job log
- Print output
- Contents of the data sets that were used during the processing

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