

Db2 12 for z/OS

Requirements for the Common Criteria
Last updated: 2024-03-12



Notes

Before using this information and the product it supports, be sure to read the general information under "Notices" at the end of this information.

Subsequent editions of this PDF will not be delivered in IBM Publications Center. Always download the latest edition from [IBM Documentation](#).

2024-03-12 edition

This edition applies to Db2[®] 12 for z/OS[®] (product number 5650-DB2), Db2 12 for z/OS Value Unit Edition (product number 5770-AF3), and to any subsequent releases until otherwise indicated in new editions. Make sure you are using the correct edition for the level of the product.

Specific changes are indicated by a vertical bar to the left of a change. A vertical bar to the left of a figure caption indicates that the figure has changed. Editorial changes that have no technical significance are not noted.

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About this information

This information describes the Common Criteria-evaluated version of Db2 12 for z/OS.

It provides detailed information about installing and configuring Db2 12 to comply with the Common Criteria. For detailed information about installing and configuring z/OS 2.2, a prerequisite of the evaluated configuration of Db2 12, see [z/OS 2.2 Planning for Multilevel Security and the Common Criteria](#).

Throughout this information, "Db2" means "Db2 12 for z/OS". References to other Db2 products use complete names or specific abbreviations.

Who should read this information

This information is intended for those people who are responsible for installing Db2 or managing Db2 security. It is primarily intended for those who plan to install Db2 to be Common Criteria compliant and maintain a Common Criteria-evaluated configuration of Db2.

Db2 Utilities Suite for z/OS

Important: Db2 Utilities Suite for z/OS is available as an optional product. You must separately order and purchase a license to such utilities, and discussion of those utility functions in this publication is not intended to otherwise imply that you have a license to them.

Db2 12 utilities can use the DFSORT program regardless of whether you purchased a license for DFSORT on your system. For more information about DFSORT, see <https://www.ibm.com/support/pages/dfsor>.

Db2 utilities can use IBM® Db2 Sort for z/OS as an alternative to DFSORT for utility SORT and MERGE functions. Use of Db2 Sort for z/OS requires the purchase of a Db2 Sort for z/OS license. For more information about Db2 Sort for z/OS, see [Db2 Sort for z/OS documentation](#).

Related concepts

[Db2 utilities packaging \(Db2 Utilities\)](#)

Terminology and citations

When referring to a Db2 product other than Db2 for z/OS, this information uses the product's full name to avoid ambiguity.

The following terms are used as indicated:

Db2

Represents either the Db2 licensed program or a particular Db2 subsystem.

IBM rebranded DB2® to Db2, and Db2 for z/OS is the new name of the offering that was previously known as "DB2 for z/OS". For more information, see [Revised naming for IBM Db2 family products on IBM z/OS platform](#). As a result, you might sometimes still see references to the original names, such as "DB2 for z/OS" and "DB2", in different IBM web pages and documents. If the PID, Entitlement Entity, version, modification, and release information match, assume that they refer to the same product.

IBM OMEGAMON® for Db2 Performance Expert on z/OS

Refers to any of the following products:

- IBM OMEGAMON for Db2 Performance Expert on z/OS
- IBM Db2 Performance Monitor on z/OS
- IBM Db2 Performance Expert for Multiplatforms and Workgroups
- IBM Db2 Buffer Pool Analyzer for z/OS

C, C++, and C language

Represent the C or C++ programming language.

CICS®

Represents CICS Transaction Server for z/OS.

IMS

Represents the IMS Database Manager or IMS Transaction Manager.

MVS™

Represents the MVS element of the z/OS operating system, which is equivalent to the Base Control Program (BCP) component of the z/OS operating system.

RACF®

Represents the functions that are provided by the RACF component of the z/OS Security Server.

Accessibility features for Db2 for z/OS

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

Accessibility features

The following list includes the major accessibility features in z/OS products, including Db2 for z/OS. These features support:

- Keyboard-only operation.
- Interfaces that are commonly used by screen readers and screen magnifiers.
- Customization of display attributes such as color, contrast, and font size

Tip: IBM Documentation (which includes information for Db2 for z/OS) and its related publications are accessibility-enabled for the IBM Home Page Reader. You can operate all features using the keyboard instead of the mouse.

Keyboard navigation

For information about navigating the Db2 for z/OS ISPF panels using TSO/E or ISPF, refer to the *z/OS TSO/E Primer*, the *z/OS TSO/E User's Guide*, and the *z/OS ISPF User's Guide*. These guides describe how to navigate each interface, including the use of keyboard shortcuts or function keys (PF keys). Each guide includes the default settings for the PF keys and explains how to modify their functions.

Related accessibility information

IBM and accessibility

See the *IBM Accessibility Center* at <http://www.ibm.com/able> for more information about the commitment that IBM has to accessibility.

How to send your comments about Db2 for z/OS documentation

Your feedback helps IBM to provide quality documentation.

Send any comments about Db2 for z/OS and related product documentation by email to db2zinfo@us.ibm.com.

To help us respond to your comment, include the following information in your email:

- The product name and version
- The address (URL) of the page, for comments about online documentation
- The book name and publication date, for comments about PDF manuals
- The topic or section title

- The specific text that you are commenting about and your comment

Related concepts

[About Db2 12 for z/OS product documentation \(Db2 for z/OS in IBM Documentation\)](#)

Related reference

[PDF format manuals for Db2 12 for z/OS \(Db2 for z/OS in IBM Documentation\)](#)

Chapter 1. Introduction to the Common Criteria

A *Common Criteria-evaluated subsystem* is a subsystem that has been evaluated according to the Common Criteria, an internationally recognized ISO standard (ISO 15408) that evaluates the security of IT products. You can configure a Db2 subsystem that complies with the Common Criteria. The subsystem configuration that meets the Common Criteria requirements is referred to as the *evaluated configuration*.

An environment with the following products contains the technology to meet the requirements of the Common Criteria assurance level EAL4 augmented by ALC_FLR.3 with controlled access:

- The Common Criteria Evaluated Base for z/OS 2.2 Package
- The Common Criteria Evaluated Base for IBM Resource Access Control Facility (RACF) for z/OS 2.2
- The Common Criteria Evaluated Base for Db2 Db2 12 for z/OS Package

See [“Evaluated configuration software” on page 11](#) for more information about the package contents.

Db2 allows two modes of operation: Discretionary access control and mandatory access control. Only discretionary access control is evaluated for Db2 12 for z/OS. Labeled security includes mandatory access control, which is not evaluated. Labeled security is documented herein only to provide appropriate information about Db2 and RACF functions. See [z/OS planning for multilevel security and the Common Criteria \(GA32-0891\)](#) for more information about the environment in which z/OS 2.2 is configured to meet the requirements of the Common Criteria Operating System Protection Profile (OSPP).

The formal evaluation of Db2 was conducted by an independent licensed laboratory (atsec security information) and certified by a certificate authorizing scheme (Organismo di Certificazione della Sicurezza Informatica). Conformance claims can be found in the IBM Db2 12 for z/OS Security Target that is posted on the certifier's website (<http://www.ocsi.isticom.it/>) at the time of certification. The evaluation of Db2 12 for z/OS did not include all Db2 security functions or all methods of achieving the required level of security. You can use security functions that have not been evaluated, or you can use methods of achieving the required level of security that have not been evaluated. However, if you decide to use functions or methods that have not been formally evaluated, you no longer run the evaluated configuration, and you assume responsibility for the security characteristics of the subsystem.

This information supersedes other information in the Db2 12 for z/OS library in cases where there is conflicting information. Therefore, use this information if you want to set up a Db2 12 for z/OS subsystem to meet the requirements of the Common Criteria.

Chapter 2. Security environment for the evaluated configuration of Db2

The evaluated configuration is assured to provide effective security measures in a cooperative non-hostile environment only if the configuration is installed, managed, and used correctly.

You must manage the operational environment according to this information.

Assumptions for security objectives

The security objectives of a Db2 subsystem is based on a specific set of assumptions.

The security objectives of a Db2 12 subsystem is based on the following assumptions:

- The IT environment provides the Db2 subsystem with appropriate physical security. The physical security is commensurate with the value of the IT assets that Db2 protects.
- Authorized users possess the necessary authorization to access at least some of the information managed by Db2.
- Db2 security functionality is managed by one or more competent individuals. The system administrative personnel are not careless, willfully negligent, or hostile, and will follow and abide by the instructions provided by the guidance documentation.
- Users are sufficiently trained and trusted to accomplish individual or group of tasks within a secure IT environment by exercising complete control over their user data.
- There are no general-purpose computing capabilities, such as compilers or user applications, available on the Db2 subsystem, other than those services necessary for Db2 operation, administration, and support.
- All remote IT systems that are trusted by the target security functions (TSF) to provide TSF data or services to the Db2 subsystem or to enforce security policy decisions are assumed to correctly implement the functionality used by the TSF. Such implementation must be consistent with the assumptions defined for this functionality and properly managed and operated under security policy constraints compatible with those of the Db2 subsystem.
- Any information provided by a trusted entity in the IT environment and used to support the provision of time and date, any information used in audit capture, user authentication and authorization information that is used by the Db2 subsystem is correct and up to date.
- All connections to and from remote trusted IT systems and between separate parts of the TSF are physically or logically protected within the Db2 subsystem environment to ensure the integrity and confidentiality of the data transmitted and to ensure the authenticity of the communication end points.

Organizational security policies

An *organizational security policy* is a set of rules or procedures that is imposed by an organization on its operations to protect its sensitive data.

The organizational security policies that are required by the evaluated configuration are as follows:

- Authorized users of Db2 shall be held accountable for their actions within the Db2 subsystem.
- Administrative authorities to Db2 management functionality shall be granted to trusted personnel only. The grant shall be as restricted as possible and supports only the administrative duties that a user has. This role shall be separate and distinct from other authorized users.
- Administrative authorities shall be granted only to users who are trusted to perform the tasks correctly.

Operational environment security objectives

Security objectives reflect the stated intent to oppose identified threats and comply with any organizational security policies. The evaluated configuration is assumed to be complete and self-contained and, as such, is not dependent on any other products to perform properly. However, certain security objectives with respect to the general operational environment must be met.

The operational environment security objectives for the Db2 subsystem are as follows:

- Individuals responsible for the Db2 subsystem are competent, trustworthy, and capable of managing the subsystem and the security of the information it contains.
- Individuals responsible for the Db2 subsystem must establish and implement procedures to ensure that information is protected in an appropriate manner. In particular, they must complete the following tasks:
 - All network and peripheral cabling must be approved for the transmittal of the most sensitive data. Such physical links are assumed to be adequately protected against threats to the confidentiality and integrity of the data transmitted using appropriate physical and logical protection techniques.
 - Discretionary access control protections on security-relevant files (such as audit trails and authorization databases) must be set up correctly.
- Users must be authorized if they need to access parts of the data managed by the Db2 subsystem and trained to exercise control over their own data.
- There are no general-purpose computing capabilities, such as compilers or user applications, available on the Db2 subsystem, other than those services necessary for Db2 operation, administration, and support.
- Individuals responsible for the Db2 subsystem must ensure that the parts of the subsystem critical to the enforcement of the security policy are protected from physical attacks that might compromise IT security objectives. The protection must be commensurate with the value of the IT assets protected by the Db2 subsystem.
- Any information provided by a trusted entity in the environment and used for authorizing and authenticating access to the Db2 subsystem is correct and up to date.
- If the Db2 subsystem relies on remote trusted IT systems to support the enforcement of the security policy, those systems must provide the required functions to sufficiently protect the environment from any attack that might compromise IT security objectives.
- The remote trusted IT systems must implement the protocols and mechanisms required by the target security functions (TSF) to support the enforcement of the security policy. These remote trusted IT systems are managed according to known, accepted, and trusted policies as well as the rules applicable to the Db2 subsystem.

Physical security

For a Db2 Common Criteria system to be considered secure, the hardware and firmware components that provide the physical environment for the evaluated configuration are required to be physically protected from unauthorized access and physical modification.

In addition, Db2 must be running in an environment in which IBM z/OS V2R2 is configured to meet the requirements of the Common Criteria Operating System Protection Profile (OSPP), BSI-CC-PP-0067, Version 2.0 (dated 2010-06-10) as defined in [z/OS planning for multilevel security and the Common Criteria \(GA32-0891\)](#).

Personnel requirements for the Common Criteria

One or more qualified individuals must be assigned to manage the evaluated configuration and the security of the information that it contains. These authorized users must act in a cooperating manner and follow the instructions in this information and other guidance information.

Assign all individual users a unique user ID and specific security label, and grant users access to objects based on existing procedures.

Labeled Security only: Every individual must be associated with a security label.

Procedural requirements for the Common Criteria (Labeled Security only)

The ability of the evaluated configuration to enforce the intent of the organizational security policy, especially with regard to the mandatory access controls, is dependent on the establishment of procedures.

Create the following procedures to protect the data:

- Permit users authorization to specific security labels
- Establish the security label of all important information
- Mark a security label on all generated output
- Establish the security label of all peripheral devices (such as printers, disk drives, tape drives)

Connections to Db2

Only IBM zSystems to IBM zSystems connections are allowed in the evaluated configuration. Any other systems that the evaluated configuration communicates with must be under the same management control and operate under the same security constraints as the evaluated configuration.

Certificate-based connections to the evaluated configuration are not allowed. Do not create a distributed identity filter to map a Db2 authorization ID associated with a certificate to a RACF user ID. In other words, do not define a mapping association between a RACF user ID and an authorization ID that is both authorized to access Db2 and associated with a certificate.

All connections to other systems must reside within the controlled access facilities unless they are protected by the Secure Socket Layer (SSL) or IPsec protocol. Db2 supports the SSL protocol by using the z/OS Communications Server IP Application Transparent Transport Layer Security (AT-TLS). Internal communication paths to access points such as terminals or job entry stations, and communication links that use Distributed Relational Database Architecture™ (DRDA) to access Db2, are assumed to be adequately protected by measures in the evaluated configuration environment.

When you set up connections for labeled security, the content of the security label of the user varies depending on the connection that is used with Db2:

- For local connections, the security label of the user is the label that the user used during sign-on.
- For TCP/IP connections, the security label of the user is defined by the security zone.
- For trusted connections, the security label can be associated with the user based on the trusted context definition.

Related concepts

[Encrypting your data with Secure Socket Layer \(SSL\) support \(Managing Security\)](#)

[Security labels \(Managing Security\)](#)

Related reference

[RACF RACMAP command \(create, delete, list, or query a distributed identity filter\) \(Security Server RACF Command Language Reference\)](#)

Threats to Db2

Threats to the evaluated configuration are violations of the organizational security policies that are defined in this information.

The IT assets that are to be protected comprise the data that is stored, processed, or transmitted by the evaluated configuration. The term *data* is used here to refer to all data that is held within the evaluated configuration, including data that is in transit between different systems as part of a Parallel Sysplex[®] environment.

The threat agents can be categorized as one of the following types of users:

- Unauthorized users of the evaluated configuration, such as individuals who have not been permitted the right to access the system
- Authorized users of the evaluated configuration, such as individuals who have been permitted the right to access the system

The threat agents are assumed to originate from a well-managed user community in a working environment, and the evaluated configuration therefore protects against threats of inadvertent or casual attempts to breach the system security. The evaluated configuration is not intended to be applicable to circumstances in which protection is required against determined attempts by hostile attackers with a high level of expertise to breach system security.

Chapter 3. Hardware configuration

For the evaluated configuration to remain Common Criteria-compliant, it must operate on a secure hardware configuration.

Supported IBM zSystems hardware

Db2 12 for z/OS operates on IBM System z114 or z196 and subsequent 64-bit z/Architecture[®] processors, running z/OS 2.1 or later.

The acceptable hardware platforms are as follows:

- IBM System z114 Enterprise Class (z114 EC) or later
- IBM System z196 Business Class (z196 EC) or later

Supported peripherals

You must place the peripheral devices and their connections within the controlled access facilities unless they are protected by the Secure Socket Layer (SSL) or IPSec protocol. Db2 supports the SSL protocol by using the z/OS Communications Server IP Application Transparent Transport Layer Security (AT-TLS).

Prior to installation, you must develop procedures for establishing physical security for all peripheral devices (such as printers, disk drives, and tape drives) that are attached to the evaluated configuration.

You can use the following peripherals with the evaluated configuration:

- Terminals
- Printers
 - **Controlled Access only:** any printer that is supported by the evaluated configuration.
 - **Labeled Security only:** any printer that is used to print output with different security labels must support the Guaranteed Print Labeling function. Guaranteed print labeling works with a subset of Advanced Function Presentation (AFP) printers and ensures the integrity of the identification label by preventing the user from changing the label. Review the printer hardware documentation or contact the printer vendor to determine if a printer supports this function.
- Storage devices and backup devices such as disk and tape drives
- Ethernet and token-ring network adapters

You can connect to peripherals within the evaluated configuration environment if the evaluated configuration executes within a logical partition (LPAR). Virtual devices are allowed in an LPAR environment because the logical partitioning software is part of the hardware, and therefore part of the evaluated configuration environment.

Related concepts

[Encrypting your data with Secure Socket Layer \(SSL\) support \(Managing Security\)](#)

Chapter 4. Installation requirements for the Common Criteria-evaluated configuration of Db2

You must satisfy all the requirements for installing the Common Criteria-evaluated configuration of Db2.

Installation of the evaluated configuration of Db2 consists of the following steps:

1. Read this document in its entirety.
2. Verify the integrity of the package that you received: the cardboard box must be wrapped with glass tape with all seams covered and there must be no sign of rewrapping or attempt to open the box. Tapes that are included in the box must be shrink-wrapped as well.
3. Verify that the labels of the ServerPacs that were shipped correspond to the packages that are enumerated in the [“Evaluated configuration software”](#) on page 11 section of this document. Additional PTFs might be listed in the memo that is enclosed in the package.
4. Install the ServerPac according to the Installing Your Order document that accompanies the ServerPac, taking into account the exceptions that are described in the following topics.
5. Install the unintegrated service that is shipped with the ServerPac that applies to your subsystem.
6. Install the service that is delivered on the media that accompanies the ServerPac.
7. Install the remaining unintegrated service that is shipped with the ServerPac and that did not apply in step 3.
8. Configure your new subsystem with the options that are described in the following topics.

Before you install the evaluated configuration of Db2, become familiar with the normal Db2 installation process. For overview information about a standard installation of Db2, see [Installing or migrating to Db2 12 \(Db2 Installation and Migration\)](#).

The evaluated configuration of Db2 must be installed with a ServerPac installation using the "Full System Replace" installation option. Failure to do so results in a non-evaluated configuration.

Follow the instructions in the ServerPac: Installing Your Order document with the following exceptions:

- During Db2 installation CLIST processing, on Distributed data facility panel 2: DSNTIP5, ensure that the TCP/IP ALREADY VERIFIED field is set to the default value of NO. A value of NO results in a DSNZPARM value TCPALVER=NO in job DSNTIJUZ and is required for the evaluation configuration.
- Job DSNTIJEX: Db2 sample authorization exits

Use of the Db2 RACF authorization exit routine (DSNXRXAC) is required and built by Db2 installation job DSNTIJEX. However, the use of other sample authorization exits that are built in DSNTIJEX are restricted by the evaluated configuration and must be removed. To remove these other sample authorization exits, modify the job as follows:

- Delete step JEX0001. JEX0001 assembles the Db2 sign-on exit, DSN3SSGN/DSN3@SGN, the use of which is restricted.
 - Delete step JEX0002. JEX0002 assembles the Db2 identify exit, DSN3SATH/DSN3@ATH. the use of which is restricted.
 - Modify step JEX0003 to refer to DSNXRXAC(MEM=DSNXRXAC) instead of DSNXSXAC. DSNXRXAC is the required RACF external security module that is used as the Db2 access control authorization exit.
 - Delete step JEX0004. JEX0004 assembles the user exit for the DSNACICS stored procedure, DSNASCIX/DSNACICX, the use of which is restricted.
- Installing Your Order, section 5.2: IPLing z/OS and Starting Your New Db2 System.

Job DSNTIJTC requires installation SYSOPR. See [Installation or migration without requiring SYSADM \(Db2 for z/OS What's New?\)](#), [Required authorization for installation or migration \(Db2 Installation and Migration\)](#), and [DSNTIPG: Installation preferences panel \(Db2 Installation and Migration\)](#) for information about using installation SYSOPR to install and migrate DB2.

- Installing Your Order, section 5.3: Logging on to TSO/E

Define the Db2 SYSADM authorization ID to RACF or UADS with ALTER authority for all system resources, such as catalogs. Enter the authorization ID that has Db2 SYSADM authority for the SYSADM parameter.

To enable primary authorization IDs to issue Db2 commands from the z/OS console or TSO SDSF, use the following statements to define RACF classes that authorize Db2 commands:

```
SETR CLASSACT(DSNADM)
RDEFINE DSNADM DSN1.SYSOPR UACC(NONE)
PERMIT DSN1.SYSOPR CLASS(DSNADM) ID(userid) ACCESS(READ)
SETR RACLIST(DSNADM) REFRESH
```

- Job DSNTIJSG: Define and bind Db2 objects and user-maintained databases

Do not use the Db2 GRANT SQL statements that are provided in this job. The evaluated configuration requires that you use the RACF external security module, DSNXRXAC, that is defined in installation job DSNTIJEX, instead of Db2 GRANT or REVOKE SQL statements. Modify DSNTIJSG and delete or comment out job step DSNTIJG entirely.

Do not use Java™ Archives (JAR) objects that would be bound by this job. Modify step DSNTIRU to comment out or delete all BIND commands for PACKAGE(DSNJAR).

In the Labeled Security mode, restrictions apply to some Db2 functions because the required Db2 objects that are created in DSNTIJSG do not have Labeled Security-required security labels defined and the CREATE SQL statements fail. Modify job steps DSNTIRL, DSNTIJR, DSNTIJQ, and DSNTIJP to comment out or delete all the objects and any dependant indexes.

- Job DSNTIJRT: Install and configure Db2-supplied routines

Use the following process to remove GRANT statements and to avoid creating objects that are not supported in the evaluated configuration:

1. In job step DSNTRIN, change the MODE setting to INSTALL-PREVIEW to generate another job that contains generated DDL and BIND statements for installing Db2-supplied routines. Verify that the JCLOUT DD allocates a partitioned data set and member to receive this job.
2. Run job DSNTIJRT that should end with a return code of 0 or 4.
3. Edit the job that was written to the data set and member allocated by the JCLOUT DD. Follow the directions in the job prolog to customize it for your Db2. In addition, make the following additional modifications:
 - a. Job step GRNTSTEP: Delete this job step entirely to remove all GRANT statements.
 - b. Job step INSTSTEP: Locate and remove all but the following SQL and BIND statements:

```
- BIND PACKAGE(DSNAHVPM) MEMBER(DSNAHVPM) ...
- BIND PACKAGE(DSNACCOR) MEMBER(DSNACCOR) ...
- BIND PACKAGE(DSNACCOX) MEMBER(DSNACCOX) ...
- BIND PACKAGE(DSNTWR) MEMBER(DSNTWR) ...
- BIND PACKAGE(DSNWSPM) MEMBER(DSNWSPM) ...
- BIND PACKAGE(DSNUTILS) MEMBER(DSNUTILS) ...
- BIND PACKAGE(DSNUTILU) MEMBER(DSNUTILU) ...
- BIND PACKAGE(DSNUTILV) MEMBER(DSNUTILV) ...
- CREATE PROCEDURE SYSPROC.DSNAHVPM ...
- CREATE PROCEDURE SYSPROC.DSNACCOR ...
- CREATE PROCEDURE SYSPROC.DSNACCOX ...
- CREATE GLOBAL TEMPORARY TABLE SYSIBM.SYSPSMOUT ...
- CREATE PROCEDURE SYSPROC.DSNTPSMP ...
- CREATE PROCEDURE SYSPROC.WLM_REFRESH ...
- CREATE PROCEDURE SYSPROC.DSNWSPM ...
- CREATE PROCEDURE SYSPROC.DSNWZP ...
- CREATE GLOBAL TEMPORARY TABLE SYSIBM.SYSPRINT ...
- CREATE PROCEDURE SYSPROC.DSNUTILS ...
- CREATE PROCEDURE SYSPROC.DSNUTILU ...
- CREATE PROCEDURE SYSPROC.DSNUTILV ...
```

- c. Run the job to create and bind the Db2-supplied routines.

- Job DSNTIJIC: Back up the Db2 directory and catalog

If Db2 is started under ACCESS(MAINT), the user on the job statement must be the same user that you specified for either the SYSTEM ADMIN 1 option or the SYSTEM ADMIN 2 option on installation panel DSNTIPP1.

- **Labeled Security only:** Installing Your Order, section 6: Verifying Installation

It is not recommended that you execute the Db2 installation verification (IVP) jobs in Labeled Security mode because the IVP jobs always fail in Labeled Security mode systems. This is because in Labeled Security mode systems, the Db2 objects that are created by the IVP jobs do not have Labeled Security-required security labels defined on them, so the CREATE SQL statements fail. This does not mean that installation of the evaluated configuration failed.

Related concepts

[Db2 installation options and restrictions](#)

The evaluated configuration has strict requirements about which options and elements must be used, which options can be used, and which options cannot be used. Restrictions also apply to how some options and elements can be used.

[Introduction to the RACF access control module \(RACF Access Control Module Guide\)](#)

[Required authorization for installation or migration \(Db2 Installation and Migration\)](#)

Evaluated configuration software

The evaluated configuration has strict requirements about which software must be installed, which options can be installed, which external software can be installed, and which options cannot be installed.

The evaluated configuration requires installation of the following packages in the following order:

1. The Common Criteria Evaluated Base for z/OS V2R2 Package as described in [z/OS planning for multilevel security and the Common Criteria \(GA32-0891\)](#).
2. The Common Criteria Evaluated Base for Db2 12 for z/OS Package, which includes the following software elements:
 - Either the standard Db2 12 for z/OS (program number 5650-Db2) or the Db2 12 for z/OS (Value Unit Edition) (program number 5770-AF3). This includes the RACF Access Control Module (DSNXXRAC member of *prefix.SDSNSAMP*).
 - Db2 Utilities Suite for z/OS Version 12 (program number 5770-AF4).
 - Additional critical PTFs.

Any fixes that are delivered with the two packages must be installed as described in the memos that are delivered with the packages.

z/OS installation

To have an evaluated configuration of Db2, you must use the Common Criteria Evaluated Base for z/OS V2R2 Package.

For detailed information about installing and configuring the Common Criteria-evaluated configuration of z/OS, see [z/OS planning for multilevel security and the Common Criteria \(GA32-0891\)](#).

Db2 installation options and restrictions

The evaluated configuration has strict requirements about which options and elements must be used, which options can be used, and which options cannot be used. Restrictions also apply to how some options and elements can be used.

The following options and elements must be installed in the evaluated configuration:

- Audit traces
- Installation SYSADM and installation SYSOPR authorization IDs for the initial setup and configuration of Db2

You must disable the installation SYSADM and installation SYSOPR authorization IDs after installation. For instructions for disabling the installation SYSADM and SYSOPR authorization IDs after installation, see [“Disabling the installation SYSADM and installation SYSOPR authorization IDs” on page 16](#).

- RACF authorization exit routine (DSNXXAC)

DSNXXAC is shipped in *prefix.SDSNSAMP*. Do not customize DSNXXAC. Use installation job DSNTIJEX to install DSNXXAC, as explained in [Managing security with the RACF access control module](#). Run only step 3 (JEX0003) in DSNTIJEX and set the error option &ERROROPT to 2.

- Subsystem security that is provided by the z/OS Common Criteria environment
- TCP/IP security that is provided by the z/OS Common Criteria environment, if you use distributed data

You can use the following options and elements without changing the security characteristics of the evaluated configuration:

- Call attachment facility
- TSO attachment facility
- RRSF attachment facility
- IBM utilities

You cannot use the following objects, options, and elements in the evaluated configuration because either they violate the security policies on which the evaluation was based, or they were not evaluated (due to complexity, scheduling, or other reasons). The following objects, options, and elements must not be configured for use, or must be deactivated:

- Administrative task scheduler

You can disable the administrative task scheduler by issuing one of the following commands from the z/OS console, where *admtproc* is the procedure name of the administrative task scheduler task that is to be stopped:

MODIFY *admtproc*, APPL=SHUTDOWN

The MODIFY command waits until all executed tasks finish and then brings down the scheduler, and no new tasks are started.

STOP *admtproc*

The STOP command stops the administrative task scheduler and interrupts every task that is currently being executed by the scheduler, so that these tasks get an error status.

You can also set DSN6SPRM.ADMTPROC in job DSNTIJUZ to blank so that the administrative task scheduler does not attempt to start. When you run the installation CLIST, you can set DSN6SPRM.ADMTPROC in the ADMIN SCHEDULER field on panel DSNTIPX.

- Administrative stored procedures

Do not use administrative stored procedures.

- CICS connections

You can disable Db2 processing of CICS transactions in any of the following ways:

- Define the DSNR class profile subsystem.SASS with ACCESS(NONE).
- BIND the application (plan or package) with the DISABLE option for connection type CICS.
- Deactivate from within CICS:

CICS transaction code security works with RACF to control the transactions and programs that can access Db2. Within Db2, you can use the ENABLE and DISABLE options of the bind operation to limit access to specific CICS subsystems.

- Data propagation products

Do not install.

- Accelerator Servers

Do not install.

- Db2 Web Services

Do not install the Db2 Web Services as described in [Enabling Db2 web services \(Db2 Installation and Migration\)](#). Db2 Web Services depend on JDBC.

- Db2 REST API connections.
- Encryption and decryption built-in functions

Do not use the encryption or decryption built-in functions.

- GRANT/REVOKE functions

The GRANT/REVOKE functions will not be used for authorization if RACF profiles are defined for all Db2 objects for which authorization is checked. Defining these RACF profiles ensures that the RACF access control module returns only authorized and not authorized responses, which prevents Db2 grants from being considered in the authorization decision.

The RACF access control module has error option &ERROROPT set to 2, which shuts down Db2 when the RACF module abends or returns an unexpected return code. This setting ensures that authorization is not switched to Db2 if the RACF module malfunctions.

- IMS connections (FMID HIYCC10)

You can disable Db2 processing of IMS transactions in any of the following ways:

- Define the DSNR class profile subsystem.MASS with ACCESS(NONE).
- BIND the application (plan or package) with the DISABLE option for connection type IMS, IMSBMP, IMSMPP and DLIBATCH.
- Deactivate from within IMS:

IMS terminal security lets you limit the entry of a transaction code to a particular logical terminal (LTERM) or group of LTERMs in the system. To protect a particular program, you can authorize a transaction code that is to be entered only from any terminal on a list of LTERMs. Alternatively, you can associate each LTERM with a list of the transaction codes that a user can enter from that LTERM. IMS then passes the validated LTERM name to Db2 as the initial primary authorization ID.

- JDBC/SQLJ (FMID JDBCC12)

- **Db2 Db2 JDBC/SQLJ:** Do not execute Java installation job "db2jdbcbind", which would bind the driver to Db2.

- Java Archives (JAR)

Before executing installation job is DSNTIJSG, delete all BIND commends for PACKAGE(DSNJAR).

- Kerberos

Do not enable the use of Kerberos as described in [Making the program operational](#).

- ODBC/CLI (FMID JDBCC17)

Do not execute installation job DSNTIJCL, which would bind the ODBC driver to Db2.

- PassTickets

Do not enable the use of PassTickets as described in [Enabling the use of PassTickets](#).

- Secondary authorization IDs

Do not install DSN3@ATH using the sample connection exit routine that is provided (DSN3SATH). The default connection exit routine from SDSNLOAD is DSN3@ATH and is active if you do not assemble and install DSN3SATH. The default connection exit routine excludes secondary authorization IDs. To use the default, delete step JEX0002, which assembles DSN3@ATH, from installation job DSNTIJEX.

- Sign-on authorization IDs

Do not install DSN3@SGN using the sample sign-on exit routine that is provided (DSN3SSGN). The default sign-on exit routine from prefix.SDSNLOAD is DSN3@SGN and is active if you do not assemble and install DSN3SSGN. The default sign-on exit routine excludes code-altering authorization IDs at

sign-on. To use the default, delete step JEX0001, which assembles DSN3@SGN, from installation job DSNTIJEX.

- SNA connections

To disable SNA connections, remove all rows from the SYSIBM.LUNAMES table.

- Unified debugger

Remove the SDSNLOAD(DSNASPDB) and its 15 related aliases:

- DSNACRSS
- DSNADTSS
- DANAEMNG
- DSNAGTLV
- DSNAGTRP
- DSNAINCL
- DSNALSMG
- DSNALTSS
- DSNAPMNG
- DSNAPTCM
- DSNAQRSS
- DSNARCCCL
- DSNASDCM
- DSNASDRQ
- DSNATRCL

Also, remove the SDSNLOAD(DSNAPSMD) Db2 load module.

- User exit routines

Do not use table-defined edit routines or table-defined field procedures in the evaluated configuration.

Exception: You must install the RACF authorization exit routine (DSNXRXAC).

- Db2 MQ user-defined functions

Do not install the IBM MQ user-defined functions as described in [Additional steps for enabling IBM MQ user-defined functions \(Db2 Installation and Migration\)](#).

- z/OSMF installation

Do not use z/OSMF for Db2 installation.

- z/OS ODBC interface to SQL

Do not perform the bind packages and plans steps as documented in [Configuring Db2 ODBC and running sample applications \(Db2 Programming for ODBC\)](#).

Restrictions: The following restrictions apply to database objects and user security:

- Authorization caching for packages and routines is normally enabled in Db2 12, however it is automatically excluded from the
- Protection panel: DSNTIPP

When you install Db2, you cannot accept the default values for the following security-related fields on panel DSNTIPP:

- ROUTINE AUTH CACHE, subsystem parameter CACHERAC

The default value of ROUTINE AUTH CACHE is non-zero, but must be set to zero because routine authorization caching is excluded from the evaluated configuration.

- AUTH EXIT CHECK, subsystem parameter AUTHEXIT_CHECK

The default value of AUTHEXIT_CHECK is PRIMARY, but must be set to DB2 because the object owner is used for authorization checks, where applicable, in the evaluated configuration.

- Performance and optimization panel: DSNTIP8

When you install Db2, you cannot accept the default YES value for the CACHE DYNAMIC SQL field. You must set the field value to NO.

- Distributed data facility panel 1: DSNTIPR

When you install Db2, you cannot accept the default value for the following security-related field on panel DSNTIPR:

- EXTENDED SECURITY, subsystem parameter EXTSEC

The default value of EXTENDED SECURITY is YES, but must be set to NO to prevent RACF users from changing their passwords and because descriptive security error codes are excluded from the evaluated configuration.

- **Labeled Security only:** You must set the COMCRIT parameter to YES in a Common Criteria Labeled Security environment. The effect of changing the value of the COMCRIT parameter to YES is that every table that is created must have multilevel security. The parameter is set by changing the value of COMCRIT from the default of NO to YES in job DSNTIJUZ during installation. Setting the COMCRIT parameter to YES causes the optional installation IVP jobs to produce error messages that do not affect the success of the installation. See [COMCRIT](#) in macro DSN6SPRM (Db2 Installation and Migration).

Labeled Security only: The following functions do not operate in Labeled Security mode because they use tables that do not have a security label column:

- EXPLAIN
- REORG TABLESPACE using the SHRLEVEL CHANGE
- Resource Limit Facility (RLF)

When Db2 is started in a Labeled Security Common Criteria environment, Db2 issues SQLCODE -4738 under the following circumstances:

- Whenever a CREATE TABLE statement does not include a column with the AS SECURITY LABEL clause. Every normal base table must include a security label column in a Labeled Security Common Criteria environment.
- Whenever a CREATE or ALTER TABLE statement attempts to define a materialized query table. You cannot define materialized query tables in a Labeled Security Common Criteria environment.
- Whenever the LIKE or AS (fullselect) clauses are specified as part of a CREATE TABLE or DECLARE GLOBAL TEMPORARY TABLE statement. These clauses are not supported in a Labeled Security Common Criteria environment.

Controlled Access only: You must set the COMCRIT parameter to NO in a Common Criteria Controlled Access environment. If the value of COMCRIT is NO, tables cannot be created with a column defined with the AS SECURITY LABEL clause.

- You can create user-maintained databases only when Db2 objects are protected by RACF.
- System data sets must be RACF-controlled. These include underlying data sets for user data and indexes, archive logs, active logs, bootstrap data sets (BSDSs), online library, work file data sets, sort file data sets, catalog and directory data sets, and data sets that are used to collect statistics or EXPLAIN history.
- **Labeled Security only:** To run certain LOAD, UNLOAD, and REORG TABLESPACE utility jobs, you need a valid security label and additional authorizations.

Related concepts

[Installation requirements for the Common Criteria-evaluated configuration of Db2](#)

You must satisfy all the requirements for installing the Common Criteria-evaluated configuration of Db2.

[Installing or migrating to Db2 12 \(Db2 Installation and Migration\)](#)

[Basic information about Db2 utilities \(Db2 Utilities\)](#)

Disabling the installation SYSADM and installation SYSOPR authorization IDs

After installing Db2, you can disable the installation SYSADM and installation SYSOPR authorization IDs.

About this task

The DSNTIPP1: Protection panel 2 (Db2 Installation and Migration) defines the values of the installation SYSADM and installation SYSOPR authorization IDs in the following fields:

- SYSTEM ADMIN 1
- SYSTEM ADMIN 2
- SYSTEM OPERATOR 1
- SYSTEM OPERATOR 2

The values of the installation SYSADM and installation SYSOPR authorization IDs require a valid RACF authorization ID for proper installation.

The values that are defined in the fields on DSNTIPP1: Protection panel 2 (Db2 Installation and Migration) result in the following fields in the Db2 Parameter Module:

- &SYSADM
- &SYSADM2
- &SYSOPR1
- &SYSOPR2

The Db2 Parameter Module is defined during installation on the DSNTIPO3: Default startup modules panel (Db2 Installation and Migration). The default file name is DSNZPARM.

However, to have a Common Criteria compliant Db2 subsystem, all authorization IDs must use the external authorization software product Resource Access Control Facility (RACF). In Db2, if the authorization ID that is being verified is the installation SYSADM or installation SYSOPR authorization ID, RACF is not invoked and all Db2 privileges of SYSADM or SYSOPR are permitted.

Therefore, to meet the requirements for Common Criteria compliance, the installation SYSADM and installation SYSOPR authorization IDs must be disabled after Db2 installation is completed.



CAUTION: Installation SYSADM and installation SYSOPR privileges can be required for critical events and are required to run the SYSTEM RESTORE Db2 utility. Have well-defined procedures in place to enable the installation SYSADM and installation SYSOPR authorization ID privileges.

Example

Assume you define the following RACF ID to be Db2 installation SYSADM with the privileges that are usually associated with a RACF ID SYSADM1:

```
ADDUSER SYSADM1 SECLABEL(SYSHIGH) PASSWORD(password)
ALTUSER SYSADM1 PASSWORD(password) NOEXPIRED
PERMIT SYSHIGH CLASS(SECLABEL) ACCESS(ALTER) ID(SYSADM1)
PERMIT DB2A.SYSADM ID(SYSADM1) ACC(UPDATE) CL(DSNADM)
PERMIT DB2A.BATCH ID(SYSADM1) ACC(UPDATE) CL(DSNR)
```

where *password* is your subsystem password

1. To disable the RACF ID that is defined as the Db2 installation SYSADM authorization ID, issue the following command:

```
ALTUSER SYSADM1 REVOKE
```

The REVOKE option specifies that RACF is to prevent the user from accessing the system. The user's profile and data set profiles are not deleted from the RACF database.

2. Also force this user from THE SYSTEM, for example the user may already be logged on TSO.

What to do next

To re-enable the RACF ID that is defined as the Db2 installation SYSADM authorization ID, issue the following command:

```
ALTUSER SYSADM1 RESUME
```

The RESUME option specifies that the user can access the system again and is typically used to restore a user's access to the system that has been prevented by a prior REVOKE command.

Related reference

[RACF commands \(Security Server RACF Command Language Reference\)](#)

Verifying the evaluated configuration

You can run the System Modification Program Extended (SMP/E) program to verify and ensure the integrity of the evaluated configuration of Db2.

Procedure

1. At the completion of the installation, run the SMP/E program to generate a report that identifies the function modification identifiers (FMIDs) and the program temporary fixes (PTFs). The FMIDs and PTFs in this original report constitutes the evaluated configuration software or the common criteria evaluated base (CCEB) of Db2.
2. Whenever necessary, run the SMP/E program again to generate a new report of the installed FMIDs and PTFs.
3. Compare the new report against the original one to verify and ensure that no change is made to the evaluated configuration.

Chapter 5. System configuration

You use both mandatory and optional parameters and controls to configure your evaluated configuration.

You must configure the mandatory requirements as stated to maintain the minimum level of security that the evaluated configuration requires. You can choose which options to implement based on a security policy that matches your own security requirements.

Identification and authentication

Users are identified and authenticated by a user ID and password combination before being authorized to perform any other security-relevant action.

Users can choose their own passwords, their default group, and their user IDs.

Labeled Security only: Users can choose their security levels when they log in.

A user can interact with the evaluated configuration in one of the following ways:

- As a TSO user
- As a UNIX user
- As a user connecting to the DRDA interface of Db2
- As an operator at a console
- Through the association with a trusted context that is established by an external entity
- By submitting a job that is to be initiated and scheduled by the Job Entry Subsystem (JES2)

In the case of jobs that are submitted by a user who is already authenticated, no additional authentication is required for jobs that run with the ID of the user who submitted them. The internal reader accepts (and relies) in this case on the authentication that was performed when the user logged on to TSO.

Exception: Started tasks with the TRUSTED or PRIVILEGED attribute operate under a protected user ID and are started either at system startup or through an operator command. These tasks do not execute on behalf of a human user, and their protected user IDs cause all authentication checks to pass. They must be started only from trusted data sets.

RACF password configuration

To remain Common Criteria-compliant, you must enforce certain rules for RACF passwords.

Users must select their own passwords, and only they can know their passwords. If a password needs to be reset, the security administrator must reset the password. This new password must be in an expired state, which forces the user to enter a new password on the first logon.

Exception: When a new user ID for a pseudo-user is created and the pseudo-user is not a protected user ID, the initial password can be marked as unexpired.

Determine the rules for forming valid passwords. To make the rules system-wide, use the SETROPTS command. To make the rules specific to a single user, use the PASSWORD command. For more information about the rules for RACF passwords, see [z/OS planning for multilevel security and the Common Criteria \(GA32-0891\)](#).

Related concepts

[Introduction to the RACF access control module \(RACF Access Control Module Guide\)](#)

Related reference

[z/OS planning for multilevel security and the Common Criteria \(GA32-0891\)](#)

RACF configuration

You must configure RACF with certain options.

To conform with the evaluated configuration, configure RACF with the following options (using the RACF SETROPTS command):

- CATDSNS(FAILURES)
- CLASSACT(TEMPDSN)
- ERASE(ALL)
- GENERIC(*)
- GRPLIST
- JES(BATCHALLRACF)
- NOCOMPATMODE
- PASSWORD
- PROTECTALL(FAILURES)
- **Labeled Security only:** MLACTIVE(FAILURES)
- **Labeled Security only:** MLFSOBJ(ACTIVE)
- **Labeled Security only:** MLIPCOBJ(ACTIVE)
- **Labeled Security only:** MLS(FAILURES)
- **Labeled Security only:** MLSTABLE
- **Labeled Security only:** SECLABELAUDIT
- **Labeled Security only:** SECLABELCONTROL

All other RACF options are optional.

Related concepts

[Introduction to the RACF access control module \(RACF Access Control Module Guide\)](#)

Related reference

[RACF commands \(Security Server RACF Command Language Reference\)](#)

[RACF security administration \(Security Server RACF Security Administrator's Guide\)](#)

RACF resource classes

You can use RACF resource classes to protect system objects.

The evaluated configuration covers the protection that is provided by the Db2-related RACF resource classes that are shown in the following table.

Table 1. Db2-related RACF resource classes

Class	Function
DSNADM	Controls Db2 administrative authority.
DSNR	Controls access to Db2 subsystems.
GDSNBP or MDSNBP	Controls access to Db2 buffer pools.
GDSNCL or MDSNCL	Controls access to Db2 collections.
GDSNDB or MDSNDB	Controls access to Db2 databases.
GDSNGV or MDSNGV	Controls access to Db2 global variables.

Table 1. Db2-related RACF resource classes (continued)

Class	Function
GDSNJR or MDSNJR	Controls access to Db2 Java archive files. Restriction: You cannot access Java archive files in the evaluated configuration.
GDSNPK or MDSNPK	Controls access to Db2 packages.
GDSNPN or MDSNPN	Controls access to Db2 plans.
GDSNSC or MDSNSC	Controls access to Db2 schemas.
GDSNSG or MDSNSG	Controls access to Db2 storage groups.
GDSNSM or MDSNSM	Controls Db2 privileges.
GDSNSP or MDSNSP	Controls access to Db2 stored procedures.
GDSNSQ or MDSNSQ	Controls access to Db2 sequences.
GDSNTB or MDSNTB	Controls access to Db2 tables, indexes, and views.
GDSNTS or MDSNTS	Controls access to Db2 table spaces.
GDSNUF or MDSNUF	Controls access to Db2 user-defined functions. ¹
GDSNUT or MDSNUT	Controls access to Db2 user-defined types. ¹

Note: You can use user-defined types and user-defined functions, but they are not part of the evaluated configuration. RACF resource classes GDSNUF, MDSNUF, GDSNUT, and MDSNUT do not protect or otherwise influence the other classes that are defined for Db2 objects.

The evaluated configuration also covers the protection that is provided by the generic RACF resource classes that are shown in the following table.

Table 2. Generic RACF resource classes

Class	Function
CONSOLE	Controls access to MCS or SMCS consoles. Also controls conditional access to other resources for commands that originate from an operator console.
DASDVOL	Controls access to DASD volumes for maintenance operations.
DEVICES	Controls access to unit record devices, teleprocessing or communication devices, and graphic devices.
DIRAUTH ¹	Ensures that security label authorization checking is done when a user receives a message that is sent through the TPUT macro or the TSO SEND or LISTBC commands. Profiles are not allowed in this class.
FACILITY	Used by various components of the evaluated configuration to manage specific privileges that can be assigned to users so that they do not need the SPECIAL attribute.
GLOBAL	Defines the entries in the global access checking table.

Table 2. Generic RACF resource classes (continued)

Class	Function
GTERMINL	Resource group class for TERMINAL class.
JESINPUT	Port of entry class to control which JES2 input devices a user can use to submit batch work to the system.
JESJOBS	Controls the submission and cancellation of jobs by job name.
JESSPOOL	Controls access to job data sets on the JES spool (that is, SYSIN and SYSOUT data sets).
NODES	Controls the following factors on z/OS systems: <ul style="list-style-type: none"> • Whether jobs are allowed to enter the system from other JES2 nodes. • Whether jobs that enter the system from other nodes must pass user identification and password verification checks.
OPERCMDS	Controls who can issue operator commands.
PROGRAM	Controls access to programs (load modules).
PSFMPL	Used by Print Services Facility (PSF) to perform security functions for printing, such as separator page labeling, data page labeling, and enforcement of the user printable area.
SDSF	Controls the use of authorized commands in the System Display and Search Facility (SDSF).
Labeled Security only: SECDATA	Controls security classification of users and data (security levels and security categories).
Labeled Security only: SECLABEL	Controls security labels.
SERVAUTH	Controls a client's authorization to use a server or to use resources that are managed by the server.
SERVER	Controls the validity of servers for the application environment.
SMESSAGE	Controls to which users a user can send messages (TSO only).
STARTED	Assigns an identity to a started task during the processing of a z/OS START command. Use STARTED as an alternative to the started procedures table (ICHRIN03).
TAPEVOL	Controls access to tape volumes.
TERMINAL	Controls access to terminals (TSO/E).
TSOPROC	TSO logon procedures.
UNIXPRIV	Used to grant z/OS UNIX privileges.
VTAMAPPL	Controls who can open ACBs from non-APF-authorized programs. This prevents programs from counterfeiting login screens.

Table 2. Generic RACF resource classes (continued)

Class	Function
WRITER	Controls the user of JES2 printers and outbound NJE processing.

The security enforcement of all RACF classes was not subject to evaluation. However, you can choose to use additional classes.

Related concepts

[Introduction to the RACF access control module \(RACF Access Control Module Guide\)](#)

Limiting concurrent sessions for a user

You can define and use a Db2 RACF custom field to provide a limit for a user's concurrent sessions. Db2 uses the value of this field to define the maximum number of concurrent threads for the primary authorization ID of the current ACEE when the COMCRIT subsystem parameter is set to YES.

About this task

A RACF administrator or user who is authorized to define custom fields and add or update data in a custom field can complete this task.

Procedure

To define the maximum number of concurrent sessions for a user ID:

1. Issue the RDEFINE command to define the new custom field USER.CSDATA.DSNMUCTL with the following attributes:

```
RDEFINE CFIELD USER.CSDATA.DSNMUCTL UACC(NONE)
CFDEF(TYPE(NUM)
MAXLENGTH(4)
MINVALUE(0)
MAXVALUE(2000)
HELP('DB2 MAX USER CONCURRENT THREAD LIMIT, 4 DIGITS')
LISTHEAD('DB2 MAX USER THREAD LIMIT='))
```

The maximum value for this field is 2000 because Db2 allows a maximum of 2000 concurrent threads.

2. Issue the RLIST command to list the new custom field and review the results of the RDEFINE processing:

```
RLIST CFIELD USER.CSDATA.DSNMUCTL CFDEF NORACF
```

3. Add custom field data to the CSDATA segment of a user or group profile by issuing the following command, where *USERABC* is the user ID or group ID and *nnnn* is the maximum number of concurrent threads.:

```
ALTUSER USERABC CSDATA(DSNMUCTL(nnnn))
```

4. Issue the LISTUSER or LISTGRP command to review the contents of the CSDATA segment for the changed user or group profile:

```
LISTUSER USERABC CSDATA NORACF
```

Results

If the USER.CSDATA.DSNMUCTL custom field is not associated with a primary authorization ID in RACF, there is no limit on the number of concurrent sessions for that user ID.

Only new sessions that start while the COMCRIT subsystem parameter is set to YES are counted toward the number of concurrent sessions for a user ID.

Access control

z/OS provides the Resource Access Control Facility (RACF) as the component that performs access control between subjects that act on behalf of a user and resources that are protected by the discretionary and mandatory access control policies.

The protection philosophy of RACF is based on “profiles” that represent protected resources, users, and groups. RACF uses user and resource profiles that it stores in the RACF database to determine if a user has access to a non-UNIX resource (For UNIX resources, the access permissions are carried with the resource itself). For applicable privileges, RACF looks for a match on schema name before checking RACF profiles.

Profiles are organized in profile classes, where each class represents a type of resource (such as data sets or terminals) or other entity (such as users or groups). A profile stores attributes of the subject or object that it represents. For profiles that represent a protected resource, you can assign an access list. This access list specifies the type of access that subjects can have to the resource that is represented by the profile.

Access to Db2 objects is also controlled by RACF. Db2 acts as a resource manager for those objects and calls RACF when a user attempts to access one of those objects. A set of Db2-specific classes are defined in RACF, and profiles in those classes are used to protect the Db2 resources.

Labeled Security only: Db2 uses RACF for row-level security to check the right of the user to access a field in a row, based on the labels for mandatory access control. RACF checks if the current security label of the user allows the type of access, based on the security label of the row and the rules of mandatory access control.

RACF-controlled access is available only at the table and view level (not at the row level) as the lowest granularity of discretionary access.

Related concepts

[Authorization checking for implicitly created databases \(RACF Access Control Module Guide\)](#)

[Matching schema names \(RACF Access Control Module Guide\)](#)

Related reference

[Schema privileges \(RACF Access Control Module Guide\)](#)

Data sets

You must use RACF to protect all data sets in the evaluated configuration.

By default, RACF expects a data set name (and the data set profile name) to consist of at least two qualifiers. RACF also expects the high-level qualifier of the data set profile name to be either a RACF-defined user ID or a RACF-defined group name. If you choose to define data set profiles under the standard RACF naming conventions, you can create a group for each high-level qualifier that is not a user ID. You can also permit users to protect any data set that has that high-level qualifier by giving them CREATE authority in that group.

An installation can use the RACF naming convention table to set up and enforce a data set naming convention other than the convention that is used by RACF. The table can do the following tasks:

- Supply a qualifier that is to be used as the high-level qualifier for authorization checking
- Convert data set names to RACF naming convention form for RACF use
- Convert names in RACF form to the installation-specific format for external display
- Enforce a naming convention by not allowing the definition of data sets that do not conform to the rules of an installation
- Reduce RACF overhead by determining whether a data set is a user data set or group data set

You can create a naming convention table (module ICHNCV00), which RACF uses to check and modify (internally to RACF) the data set name in all commands and macros that process data set names. An installation can use the table to selectively rearrange data set names to fit the RACF convention without actually changing those names.

If you need to protect data sets that have names consisting of a single qualifier, you can RACF-protect those data sets by issuing the SETROPTS command with the PREFIX operand.

User data sets

A user data set is a data set whose high-level qualifier is a RACF user ID.

The following rules apply to user data sets:

- In general, all RACF-defined users can protect their own data sets.
- A user can RACF-protect a data set for another user under any of the following conditions:
 - The user who is protecting the data set has the SPECIAL attribute. The user can create a discrete or generic profile.
 - The user who is protecting the data set has the group-SPECIAL attribute, and the high-level-qualifier of the data set name is a user within the group-SPECIAL user's scope of authority. The user can create a discrete or generic profile.
 - The user who is protecting a data set has the OPERATIONS attribute (or the group-OPERATIONS attribute if the data set is within the user's scope of authority) and is simultaneously creating the data set. In this case, the user can create a discrete profile by using one of the following methods:
 - Use ADSP.
 - Specify the PROTECT operand on the TSO ALLOCATE command that creates the data set.
 - Specify the PROTECT=YES OR SECMODEL=*profile-name* operands on the JCL DD statement that creates the data set.

Group data sets

A group data set is a data set whose high-level qualifier is a RACF group name.

A RACF-defined user can RACF-protect a group data set under any of the following conditions:

- The user has JOIN, CONNECT, or CREATE authority in the group.
- The user has the SPECIAL attribute (or the group-SPECIAL attribute for that group), and the request is made using the ADDSD command.
- The user has the OPERATIONS attribute and is not connected to the group.

New data sets

By using data set profiles, you can control whether users can create new data sets.

For cataloged data sets, creating, deleting, or renaming the data set involves access not only to the data set profile that protects the data set, but also to the catalog in which the data set is cataloged. In general, users need the following access:

- To add entries to the catalog, users need authority to create the data set as specified below and UPDATE authority to the catalog.
- To delete entries from the catalog, users need ALTER authority to the protecting profile or to the catalog.

A user can create a new user data set in any of the following situations:

- The data set is protected by an existing generic profile, and the user does not have ADSP. RACF allows the user to create a new data set if at least one of the following statements is true:
 - The user has ALTER authority to the data set either through a generic profile or global access checking.
 - The data set is the user's own data set.
- The data set name is not associated with an existing generic profile, the user does not have ADSP, and the data set is protected by the global access check table.

- The user has ADSP, and the data set is the user's own data set. RACF allows the user to create a new data set and creates a discrete profile for the data set.
- The user has the OPERATIONS attribute. If the user has the group-OPERATIONS attribute (that is, the user is connected to a group with the OPERATIONS attribute), the high-level qualifier of the new data set must be the ID of a user who is within the scope of that group.

A user can create a new group data set in any of the following situations:

- The data set name is protected by an existing generic profile, and the user does not have ADSP. RACF allows the user to create a new data set if at least one of the following statements is true:
 - The user has ALTER authority to the data set either through the generic profile or global access checking.
 - The user has CREATE authority in the group.
- The data set name is not associated with an existing generic profile, and the user does not have ADSP.
- The user has ADSP, and the data set belongs to a group of which the user is a member. RACF allows the user to create a new group data set only if the user has CREATE authority in the group. If RACF allows the user to create a new group data set, RACF creates a discrete profile for the data set.
- The user has the OPERATIONS attribute, unless both of the following statements are true:
 - The user is connected to the group with less than CREATE authority.
 - The user has less than ALTER access to the data set if it is protected by a generic profile.

If the user has the group-OPERATIONS attribute (that is, the user is connected to a superior group with the OPERATIONS attribute), the group for which the new data set is being created must be within the scope of that superior group.

Data set profile ownership

Each data set profile that is defined to RACF requires a RACF-defined user or group as the owner of the profile.

If the owner is a user, the owner has full control over the profile, including the access list.

If the owner of the data set profile is a group, users with group-SPECIAL in that group have full control over the profile.

Ownership of data set profiles is assigned when the profiles are defined to RACF but can be changed later. Ownership of a data set profile does not mean that the owner can automatically access that data set. To access a data set, the owner must still be authorized by the discretionary access control policy rules.

Labeled Security only: The owner must also be authorized by the mandatory access control policy rules to access a data set.

For more information about discretionary access control, see [“Discretionary access control” on page 30](#). For more information about mandatory access control, see [“Mandatory access control \(Labeled Security only\)” on page 28](#).

Disk and tape volumes

By defining profiles in the DASDVOL class, you can define non-SMS-managed disk volumes to RACF and authorize users to perform maintenance operations (such as dump, restore, scratch, and rename) without giving them access to the data set profiles that protect the data sets on the volume.

If a user does not have the necessary DASDVOL authority to a non-SMS-managed volume, the user must have the necessary authority in the DATASET class for each of the data sets on the volume.

Tape volumes are protected by profiles in the TAPEVOL class.

Devices

A user who is authorized to define profiles in the DEVICES class can use this class to control which users can allocate unit record devices, teleprocessing or communications devices, and graphics devices.

For example, the DEVICES class can be used to ensure that only authorized users can allocate devices by name. The DEVICES class cannot be used to protect other kinds of devices, such as tape or disk devices.

TCP/IP communication

TCP/IP is a component of the IBM Communications Server subsystem of the evaluated configuration. TCP/IP runs as a started task and provides the TCP function in the evaluated configuration.

TCP/IP loads an INET Physical File System into the UNIX System Services kernel to handle socket requests. TCP/IP connects to the VTAM® component of z/OS Communications Server subsystem of the evaluated configuration for physical communications device management services. Up to eight instances of the TCP/IP started task can be run concurrently on one instance of the evaluated configuration to isolate networks or stacks by security label. Socket applications can be directed to a particular stack or can transparently span multiple stacks. Several TCP/IP resources can be protected by resources in the SERVAUTH class:

- Access to a particular TCP/IP stack is controlled when an application opens a socket by read access to a profile in the following form:

```
EZB.STACKACCESS.system-name.stack-name
```

The *system-name* is the name of the evaluated configuration image, and the *stack-name* is the job name of the particular stack.

- Access to a particular IP address is controlled when an application explicitly binds a socket to a local address and when an application sends data to or receives data from a peer address. IP addresses are configured into named security zones within the stack through use of NETACCESS profile statements. Access to a particular security zone is controlled by read access to a profile in the following form:

```
EZB.NETACCESS.system-name.stack-name.zone-name
```

The *system-name* is the name of the evaluated configuration image, the *stack-name* is the job name of the particular stack, and the *zone-name* is the name of the security zone that contains the IP address.

- Access to a particular port is controlled when an application explicitly binds a socket to a local port. Applications that bind to low ports (below 1024) must be a UNIX superuser or APF-authorized. Port usage can also be controlled by configuring the Port statement in the TCP/IP profile. Control can be controlled by using user ID, job name, or read access to a profile in the following form:

```
EZB.PORTACCESS.system-name.stack-name.SAF-name
```

The *system-name* is the name of the evaluated configuration image, the *stack-name* is the job name of the particular stack, and the *SAF-name* is the name that is configured on the port statement.

(Labeled Security only): TCP/IP performs additional access control when the RACF option MLACTIVE is set. All profiles in the SERVAUTH class require security labels to be defined. Sockets are always considered to be read/write objects; therefore all checks on SERVAUTH profiles require equivalent security labels.

- The security label on the STACKACCESS profile must be identical to the security label of the stack job. Only applications that run under an equivalent security label can access a given stack. A stack that runs under the SYSMULTI label can be accessed by applications with any security label, but communications are allowed only between applications with equivalent security labels.
- The security label on the NETACCESS profile for each local interface address must be identical to the security label of the stack job. This requirement ensures that all implicit address assignments are equivalent to the application security label.
- The security label on the NETACCESS profile for each local VIPA must be equivalent to the stack security label of the stack job and can be SYSMULTI only when the stack job is also SYSMULTI. When SourceVIPA

processing is enabled, a VIPA with a security label that is equivalent to the application is chosen as the implicit source address.

- Communications are permitted only when the source IP address and the destination IP address are in NETACCESS security zones with equivalent security labels. Additionally, when both security zones have SYSMULTI labels, the security label of the sending application is recorded in the IP header in a proprietary format. These proprietary packets are restricted to IUTSAMEHOST links between stacks on the same evaluated system or XCF links between stacks on the same Sysplex.

Mandatory access control (Labeled Security only)

Mandatory access control evaluates dominance and controls user access to information according to the access rules.

Mandatory access control prevents users from accessing information that they do not have clearance to access. It also prevents users from declassifying information by disallowing a user to write to an object unless the security label of the user and the security label of the object are equivalent. Mandatory access is controlled by the Db2 interface with RACF in a Common Criteria-configured system.

To immediately reflect changes in the security policy, long-running applications that have not been committed or rolled back need to be canceled.

Related concepts

[Protecting Db2 objects \(RACF Access Control Module Guide\)](#)

Related reference

[Implementing multilevel security with Db2 \(Managing Security\)](#)

RACF configuration for mandatory access control

In an approved Common Criteria configuration, access control is performed by RACF, not Db2.

To avoid a mix of access control by RACF and access control by Db2, disable Db2 authorization control by defining a profile with the name ** with UACC(NONE) in each of the Db2-related classes. Using these generic profiles ensures that RACF returns either a YES or NO decision when an access request is made. Security is completely controlled by RACF in a Common Criteria-certified configuration.

In RACF, you need to set the value of &ERROPT to 2, which prevents Db2 from using the default Db2 access control if one of the following situations occurs:

- An error occurs during initialization of RACF.
- RACF abends continually.
- Db2 receives an unexpected return code from RACF.

Related concepts

[Introduction to the RACF access control module \(RACF Access Control Module Guide\)](#)

Mandatory access control in z/OS

You can choose to protect objects by using label-based mandatory access control, which is supported by z/OS in the evaluated configuration.

You can define the values for the security levels and the categories. You can then define resources in the SECLABEL resource class as a combination of one security level and zero or more security categories. Such a resource is called a *security label*.

The system defines a set of predefined security labels:

SYSHIGH

Consists of the highest security level and all categories that are defined for the system.

SYSLOW

Consists of the lowest security level that is defined for the system and no categories.

SYSNONE

Is used for resources that need to be read and written by users with different security labels. Reserve this label for resources that can be accessed only in a controlled way using trusted programs to avoid a breach of the information flow policy.

SYSMULTI

Is used for resources that support a range of security labels. Reserve this label for resources that are controlled by trusted programs.

Assign the SYSMULTI security label only to administrators that need to create objects with a SYSMULTI security label.

z/OS prohibits the modification of a security label of a resource unless the system is in a state that allows the activity to be performed in a secure way. This prohibits unauthorized flow of information that might result when users use a resource while the security label of the resource is changed.

The following types of resources have been evaluated with regard to mandatory access control:

- Data sets
- Volumes (DASD and tape)
- TCP/IP connections
- Operator commands

You can choose to apply mandatory access control to other objects also. However, the effectiveness of their protection has not been evaluated.

You can restrict the security labels that can be used with terminals, IP addresses, and devices such as printers. Such restrictions allow the installation to restrict user logons to certain terminals or IP addresses, or to restrict printer output with critical security labels to certain printers.

You can choose to grant the write-down privilege to authorized users on a system that has implemented mandatory access control by using the IRR.WRITEDOWN.BYUSER profile in the FACILITY class.

Mandatory access control in Db2

You can take advantage of mandatory access control in Db2 to protect table data, based on the security labels of the rows.

You must define a column for the security label in the table that you want to protect with mandatory access control by using the AS SECURITY LABEL operand in the CREATE TABLE SQL statement (**Labeled Security only**).

When a user accesses a row or a field in the row with an SQL statement, Db2 calls RACF to verify that the user is allowed to perform the type of access that is required for the SQL statement. The access is allowed only if the user has the requested access right to all of the rows containing fields that are accessed as part of the SQL statement. For all fields that the SQL statement accesses, Db2 checks the security label of the row containing the field and denies access when the user's security label does not dominate the security label of the any one of the rows containing the fields.

When the system is configured with the RACF MLS option not active, access to Db2 objects, privileges, or administrative authorities is allowed if the user or group that is requesting access is in the access list of the RACF profile that is protecting the object, privilege, or authority with at least READ access.

If the system is configured with the RACF MLS option active, the level of access that is required is UPDATE rather than READ. Use of UPDATE access, regardless of the configuration, rather than READ access in one configuration and UPDATE access in another configuration has no effect on access protection and eases administration.

The security label of a row is initialized with the security label when you create the row using an INSERT SQL statement. Avoid use of the national characters (such as @ # \$) in security labels and authorization IDs. If you have the write-down privilege, you can specify a different label than your current one when you create a row. Your security label must dominate the security label that you specify, and you must be authorized to use the security label that you specify.

A user with the write-down privilege can change the security label of an existing row in a table by using an UPDATE SQL statement.

Because the security labels of rows of a Db2 table are stored in a dedicated column of the table, the security labels are exported when the database is exported. The system that imports the labelled data must have defined security labels that are compatible with those of the exporting system to allow the consistent interpretation of the labels.

Related reference

[z/OS multilevel security and the Common Criteria \(Planning for Multilevel Security and the Common Criteria\)](#)

Discretionary access control

Discretionary access control is controlled by RACF.

Db2 internal access controls, which are the GRANT and REVOKE statements, are not used in the evaluated configuration.

If you use mandatory access control, discretionary access control occurs after mandatory access control is complete (**Labeled Security only**).

Related concepts

[Protecting Db2 objects \(RACF Access Control Module Guide\)](#)

Related reference

[Implementing multilevel security with Db2 \(Managing Security\)](#)

Discretionary access control in z/OS

Discretionary access control to RACF resources is controlled by the user, group, and resource profiles that are stored and managed by RACF.

RACF controls the types of access to all non-UNIX resources with access lists. The access types are ordered hierarchically, an access type that is listed higher in the access hierarchy implies that it has all of the access types lower in this hierarchy except for NONE access. The semantics of the access types might differ depending on the resource class. The full semantics of each access type are defined by the resource manager.

You can control access to resources by using discrete resource profiles for a specific resource or generic resource profiles for a set of resources of the same type. Discrete profiles protect one single resource (such as one data set), whereas generic profiles can be used to define a whole set of resources and protect them using a single profile that is based on patterns in the resource name. Whenever a discrete profile exists for a resource, it has precedence over a generic profile that also would apply for the resource. If more than one generic profile applies, z/OS always chooses the most specific profile that is applicable based on a matching algorithm.

Related reference

[RACF commands \(Security Server RACF Command Language Reference\)](#)

[RACF security administration \(Security Server RACF Security Administrator's Guide\)](#)

Discretionary access control in Db2

Discretionary access control is defined for Db2 objects.

Each Db2 command, utility, and SQL statement is associated with a set of privileges, authorities, or both. Authority control is performed with the support of the RACF access control module. Db2 authority checking ensures that Db2 objects map to RACF objects such that the following statements are all true:

- Db2 object types map to RACF class names.
- Db2 privileges map to RACF resource names for Db2 objects.
- Db2 authorities map to the RACF administrative authority class (DSNADM) and to the RACF resource.

- Db2 security rules map to RACF profiles.

Rows are not objects that are subject to discretionary access control on their own. Discretionary access control is at the granularity of a table or a column.

When the system is configured with the RACF MLS option not active, access to Db2 objects, privileges, or administrative authorities is allowed if the user or group that is requesting access is in the access list of the RACF profile that is protecting the object, privilege, or authority with at least READ access.

If the system is configured with the RACF MLS option active, the level of access that is required is UPDATE rather than READ. Use of UPDATE access, regardless of the configuration, rather than READ access in one configuration and UPDATE access in another configuration has no effect on access protection and eases administration.

Related reference

[z/OS multilevel security and the Common Criteria \(Planning for Multilevel Security and the Common Criteria\)](#)

z/OS users and groups

z/OS users and groups are defined in RACF.

User roles and attributes are capabilities, restrictions, or environments that can be assigned to a user, either all of the time or when the user is connected to a specific group or groups. User attributes are stored and managed within the RACF database.

When a role or attribute applies only to a specific group or groups, it is specified at the group level and is called a group-related user attribute.

For example, user attributes that are specified in an ADDUSER or ALTUSER command are stored in the user's profile and are in effect regardless of the group to which the user is connected.

Creation of user profiles

To create user profiles and user attributes, create RACF user profiles. Users can be people or programs.

To create a user profile, create a user profile for the new user in RACF. Each user profile consists of a base segment and optional segments for the use of specific subsystems. In the evaluated configuration, the user attributes that the evaluated configuration requires are contained in the base segment and the OMVS segment for z/OS UNIX System Services. Other segments of the user profile might exist, but the effects of any values in those segments do not influence the security of the evaluated configuration.

To create or modify a user profile, a user must be authorized in one of the following ways:

- Has SPECIAL role as a general system administrator.
- Has UPDATE authority to the fields in a non-base segment of the profile that the user wants to modify through field-level access checking.
- Create user profile only: Is connected to a user that has the group-SPECIAL role, has the CLAUTH attribute for the USER class, and is the owner of or has JOIN authority in the new user's default group.

The following roles of the ADDUSER command cannot be assigned in this case:

- OPERATIONS
 - SPECIAL
 - AUDITOR
- Modify user profile only: Has the CLAUTH attribute for the user class. Only the CLAUTH and NOCLAUTH attributes can be changed.

Creation of group profiles

To make the management of users, user attributes, and roles easier, you can define groups of RACF users in group profiles.

To create a new group of users, define a group profile in RACF. A group profile (like a user profile) consists of a base segment and, optionally, other segments. As with user profiles, all group attributes that the evaluated configuration requires are contained in the base segment and in the OMVS segment of the group profile. Each group that is defined in RACF must be owned by a RACF-defined user or by its superior group. You can assign ownership of a group with the ADDGROUP command when you create a new group profile. You can change ownership of a group with the ALTGROUP command when you change an existing group profile.

The owner of a group or a user who has the group-SPECIAL role and is connected to a group can perform the following actions:

- Define new users to RACF (if the user also has the CLAUTH attribute for the USER class)
- Connect and remove users from the group
- Delegate and change group authorities and set the default UACC for all new resources that belong to members of the group
- Modify, list, and delete the group profile
- Define, delete, and list the names of the subgroups under the group
- Specify the group terminal option

Users can be connected to a number of groups and have the group-related authorities of all the groups that they are connected to. The OMVS segment of a group profile contains the group's z/OS UNIX group identifier.

z/OS user roles

You can choose to grant the AUDITOR privilege only to users who do not have the SPECIAL privilege.

Recommendation: Keep user privileges such as the SPECIAL or OPERATIONS user attributes under control, and assign these attributes based on operational needs.

Db2 user roles

Db2 user roles, which are also known as Db2 administrative authorities, are defined by dedicated profiles in the DSNADM class.

When a user is assigned access to a profile that is associated with a role, the user is also assigned that role. This assignment can be done by any user that is allowed to assign permission to those profiles according to the rules that are implemented in RACF.

Db2 supports the following roles:

- ACCESSCTRL
- DATAACCESS
- DBADM
- DBCTRL
- DBMAINT
- Installation SYSADM
- Installation SYSOPR
- PACKADM
- SECADM
- SQLADM
- SYSADM

- SYSCTRL
- SYSDBADM
- SYSOPR

SYSADM, SYSCTRL, and SYSOPR are roles with privileges on the Db2 subsystem level. DBADM, DBCTRL, and DBMAINT are roles with privileges on the database level within a defined Db2 subsystem. PACKADM is a role that is defined on the level of a collection.

Installation SYSADM and installation SYSOPR are roles that are used for the initial setup and configuration of Db2. In the evaluated configuration, installation SYSOPR is to be used, and it must be disabled after the initial configuration.

Security-related audits

The evaluated configuration provides a general facility to collect data that is required for security-related auditing information. This facility, the System Management Facility (SMF), collects and records system- and job-related information that you can use.

RACF generates both audit records that are related to access control checking for Db2 objects and audit records that are related to access control checking of other objects that are protected by RACF. You can define what is audited with the AUDIT parameter of the ADDSD, ALTDSD, RDEFINE, and RALTER commands or with the GLOBALAUDIT parameter of the ALTDSD and RALTER commands.

Db2 generates audit records for security-relevant audit data by using the Db2 trace facility. You can use the START TRACE command to start the generation of audit trace records and the STOP TRACE command to stop the generation of Db2-related audit records. The trace must be directed to SMF so that the protection functions of SMF apply.

Audit data protection

You must take steps to protect SMF data sets and dump data sets.

SMF writes audit records into dedicated SMF data sets that you define during system configuration. The evaluated configuration requires that you define at least two SMF data sets. You must protect the SMF data sets and dump data sets against unauthorized access by using RACF access control lists. The evaluated configuration requires that the system halts if no buffer space is available for the SMF audit records.

Db2 audit trace records are also stored by SMF and protected by RACF access control lists.

Malfunction such as a power loss can affect the consistency of the audit records.

Object reuse

You must prepare objects for reuse.

z/OS supports explicit object reuse for the following objects:

- Memory objects
- z/OS data sets
- z/OS tape volumes

In the evaluated configuration, z/OS ensures that objects are prepared for reuse before they are allocated to another subject. Memory objects are filled with zeros before they are allocated for the first time to a subject. DASD data from z/OS data sets is erased when the data is released when the erase-on-scratch option is active. Tape volumes are erased when they are returned to the scratch pool by appropriately configuring the SECCLS PARMLIB option for the PARMLIB member EDGRMMxx. z/OS UNIX file system objects and z/OS UNIX IPC objects are cleared before they are made accessible to a new user.

The evaluated parts of Db2 execute in their own address spaces. Object reuse of memory objects within those address spaces is provided by z/OS functions.

Db2 manages its own objects. When a Db2 object is deleted, Db2 ensures that the space that has been occupied by that object cannot be accessed by Db2 unless the space is allocated to another Db2 object and completely filled with the initial values for the new object. This ensures that values that are stored in space that is allocated to Db2 objects that have been deleted cannot be accessed by Db2 until the space is allocated to another Db2 object and has been prepared for reuse as part of the allocation.

Db2 stores its objects in z/OS data sets. Object reuse for data sets is provided by z/OS. RACF access control functions for data sets prohibit direct access by untrusted users to the data sets that are used by Db2.

Chapter 6. Common Criteria resources

For general information about Common Criteria, refer to the following Web site: <http://www.commoncriteriaportal.org/>

Information resources for Db2 for z/OS and related products

You can find the online product documentation for Db2 12 for z/OS and related products in IBM Documentation.

For all online product documentation for Db2 12 for z/OS, see [IBM Documentation \(https://www.ibm.com/docs/en/db2-for-zos/12\)](https://www.ibm.com/docs/en/db2-for-zos/12).

For other PDF manuals, see [PDF format manuals for Db2 12 for z/OS \(https://www.ibm.com/docs/en/db2-for-zos/12?topic=zos-pdf-format-manuals-db2-12\)](https://www.ibm.com/docs/en/db2-for-zos/12?topic=zos-pdf-format-manuals-db2-12).

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Programming interface information

This information describes the Common Criteria-evaluated version of Db2 12 for z/OS servers. This information also documents Product-sensitive Programming Interface and Associated Guidance Information provided by Db2 12 for z/OS.

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Glossary

The glossary is available in IBM Documentation

For definitions of Db2 for z/OS terms, see [Db2 glossary \(Db2 Glossary\)](#).

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