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- find the most current information about BMC products
- search a database for issues similar to yours and possible solutions
- order or download product documentation
- download products and maintenance
- report an issue or ask a question
- subscribe to receive proactive e-mail alerts when new product notices are released
- find worldwide BMC support center locations and contact information, including e-mail addresses, fax numbers, and telephone numbers

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Before contacting BMC

Have the following information available so that Customer Support can begin working on your issue immediately:

- product information
  - product name
  - product version (release number)
  - license number and password (trial or permanent)

- operating system and environment information
  - machine type
  - operating system type, version, and service pack or other maintenance level such as PUT or PTF
  - system hardware configuration
  - serial numbers
  - related software (database, application, and communication) including type, version, and service pack or maintenance level

- sequence of events leading to the issue

- commands and options that you used

- messages received (and the time and date that you received them)
  - product error messages
  - messages from the operating system, such as file system full
  - messages from related software
License key and password information

If you have questions about your license key or password, use one of the following methods to get assistance:

- Send an e-mail message to customer_support@bmc.com.
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About this guide

This guide describes administrative information about the BMC Software APPLICATION RESTART CONTROL (AR/CTL) products and the BATCH CONTROL FACILITY (BCF) component of those products. This guide also describes how to manage the BMC Software subsystems and the control data sets used by these products.

The information is for the system programmer or database administrator who is assigned to administer the products. This guide assumes that you are familiar with IBM® concepts and facilities and job control language (JCL).

Like most BMC documentation, this book is available in printed and online formats. To request printed books or to view online books and notices (such as release notes and technical bulletins), see the support website at http://www.bmc.com/support.

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The software also offers online Help. To access Help, press F1 within any product or click the Help button in graphical user interfaces (GUIs).

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From the BMC Support Central website (http://www.bmc.com/support), you can use either of the following methods to access related publications that support your product or solution:

- Link to the BMC Documentation Center (https://webapps.bmc.com/infocenter/index.jsp) to browse documentation sets

- View BMC Quick Course Demos (short overviews of selected product concepts, tasks, or features), which are included in the BMC Documentation Center

- Read individual product documents (books and notices) within the “A – Z Supported Product List”
You can order hardcopy documentation from your BMC sales representative or from the support site. You can also subscribe to proactive alerts to receive e-mail messages when notices are issued.

## Conventions

The guide uses the following conventions to present information:

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>DB2</td>
<td>The term DB2 refers to all supported versions and releases of IBM DB2®. The specific product name, version, and release numbers are noted only when this information is significant.</td>
</tr>
<tr>
<td>IMS</td>
<td>The term IMS refers to all supported versions and releases of IBM IMS™. The specific product name, version, and release numbers are noted only when this information is significant.</td>
</tr>
<tr>
<td>AR/CTL Products</td>
<td>The collective term AR/CTL products refers to AR/CTL for IMS, AR/CTL for DB2, AR/CTL for VSAM, the BCF component of the AR/CTL products, and the common AR/CTL panels and programs that support these products.</td>
</tr>
<tr>
<td>Checkpoint/Rstart</td>
<td>Unless stated otherwise, the term checkpoint in this guide refers to application checkpoints rather than system checkpoints. The term restart refers to application restarts rather than system restarts.</td>
</tr>
<tr>
<td>Libraries</td>
<td>This guide refers to various members of sample and install libraries. As distributed by BMC Software, these libraries have the following names:</td>
</tr>
<tr>
<td></td>
<td>• HLQ.ARCsamp</td>
</tr>
<tr>
<td></td>
<td>• HLQ.ARCcust</td>
</tr>
<tr>
<td>Notes and Warnings</td>
<td>The variable HLQ is a high-level qualifier that should be easily identified by all installation users in your facility. Because the person who installed AR/CTL products at your site could have chosen any name, the guide refers to these libraries generically as sample libraries and install libraries.</td>
</tr>
</tbody>
</table>

This book uses notes and warnings as follows:
Special Conventions

This book uses the following special conventions:

- All syntax, operating system terms, and literal examples are presented in this typeface.

- Variable text in path names, system messages, or syntax is displayed in italic text:
  
  `testsys/instance/fileName`

- The symbol `=>` connects items in a menu sequence. For example, `Actions => Create Test` instructs you to choose the `Create Test` command from the `Actions` menu.

Typographical Conventions

This guide uses the following typographic conventions:

<table>
<thead>
<tr>
<th>Description</th>
<th>Style</th>
<th>Example</th>
</tr>
</thead>
<tbody>
<tr>
<td>Entries you type</td>
<td>ALL CAPS, BOLDFACE</td>
<td>Type ADD at the cursor.</td>
</tr>
<tr>
<td>Specific key names</td>
<td>Initial Caps, Boldface</td>
<td>Press Enter.</td>
</tr>
<tr>
<td>Commands, keywords, parameters, nonspecific key names</td>
<td>SMALL CAPS</td>
<td>Use the <code>TYPE</code> keyword to select control block type.</td>
</tr>
<tr>
<td>Field names</td>
<td>Literal caps, boldface</td>
<td>The Next Page field contains the number of the page to display next.</td>
</tr>
<tr>
<td>JCL examples</td>
<td>COURIER TYPEFACE</td>
<td>//STEPLIB DD</td>
</tr>
</tbody>
</table>
Syntax statements

The following example shows a sample syntax statement:

```
COMMAND KEYWORD1 [KEYWORD2 | KEYWORD3] KEYWORD4={YES | NO} fileName...
```

The following table explains conventions for syntax statements and provides examples:

<table>
<thead>
<tr>
<th>Item</th>
<th>Example</th>
</tr>
</thead>
</table>
| Items in italic type represent variables that you must replace with a name or value. If a variable is represented by two or more words, initial capitals distinguish the second and subsequent words. | alias  
databaseDirectory  
serverHostName |
| Brackets indicate a group of optional items. Do not type the brackets when you enter the option. A comma means that you can choose one or more of the listed options. You must use a comma to separate the options if you choose more than one option. | [tableName, columnName, field]  
[ -full, -incremental, -level] (UNIX) |
| Braces indicate that at least one of the enclosed items is required. Do not type the braces when you enter the item. | {DBDName | tableName}  
UNLOAD device={disk | tape.  
fileName | deviceName}  
{-a | -c} (UNIX) |
| A vertical bar means that you can choose only one of the listed items. In the example, you would choose either commit or cancel. | {commit | cancel}  
{-commit | -cancel} (UNIX) |
| An ellipsis indicates that you can repeat the previous item or items as many times as necessary. | columnName ... |
Introduction

This chapter provides general information you will need when you perform administrator tasks for the APPLICATION RESTART CONTROL (AR/CTL) products and components. AR/CTL products include APPLICATION RESTART CONTROL for IMS, APPLICATION RESTART CONTROL for DB2, APPLICATION RESTART CONTROL for VSAM, and the BATCH CONTROL FACILITY (BCF) component. This chapter contains the following information:

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Overview

Almost all tasks that you perform with AR/CTL products involve three components.

- Records in the REGISET, the collection of repository data sets that AR/CTL products use to manage information
- Interactive System Productivity Facility (ISPF) interface
Two BMC Software subsystems:

— BMC Software Primary Subsystem (BMCP)
— BMC Consolidated Subsystem (BCSS)

When you set up AR/CTL products, you create records in the REGISET. These records contain information about how you want the product to work in your environment and during the execution of an application program. For greatest flexibility and ease of maintenance, you can use wildcard characters in the qualifiers of the record. Wildcard characters allow a single record to apply to multiple application program executions.

As each AR/CTL product participates in application program execution, the product creates, maintains, and deletes records in the REGISET and, if you use one, the history data set. The qualifiers of the records created by the product are specific to a particular execution of an application program.

To create, display, change, and delete records in the REGISET, you most often will use the ISPF interface. The panels and dialogs of the ISPF interface conform to Common User Access (CUA) standards and are easy to navigate and use.

Working with REGISET records

This section describes the AR/CTL records in the REGISET and how to use wildcard characters in the record IDs of REGISET records. For more information about the REGISET, see Chapter 3, “Working with the REGISET.”
Types of records

All AR/CTL products can use the following types of AR/CTL records:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR/CTL global options</td>
<td>Contains the values that control the use of AR/CTL products, and is created during AR/CTL product configuration. You can use the ISPF interface to update the record. The AR/CTL global options record must be in the REGISET for AR/CTL products to work.</td>
</tr>
<tr>
<td>non-IMS environment registration</td>
<td>Contains the values that provide access to AR/CTL product load modules for application programs that do not use IMS. The global non-IMS environment registration record is created during AR/CTL product configuration. You can use the ISPF interface to update the global record and to create and update other records of this type. The global non-IMS environment registration record must be in the REGISET for AR/CTL products to work in a non-IMS program.</td>
</tr>
<tr>
<td>non-IMS program registration</td>
<td>Contains the values that control AR/CTL product participation in the execution of an application program that does not use IMS. You can use this type of record to avoid changes to application program JCL. You can use the ISPF interface to create and update records of this type.</td>
</tr>
<tr>
<td>non-IMS program exclusion</td>
<td>Prevents AR/CTL products from participating in the execution of an application program that does not use IMS. You can use the ISPF interface to create and update records of this type.</td>
</tr>
<tr>
<td>IMS environment registration</td>
<td>Contains the values that provide access to AR/CTL product load modules for application programs that use IMS. The global IMS environment registration record is created during AR/CTL product configuration. You can use this type of record to avoid changes to application program JCL. You can use the ISPF interface to update the global record and to create and update other records of this type. The IMS environment registration record must be in the REGISET for AR/CTL products to work in an IMS program.</td>
</tr>
<tr>
<td>IMS program registration</td>
<td>Contains the values that control AR/CTL product participation in the execution of an application program that uses IMS. You can use this type of record to avoid changes to application program JCL. You can use the ISPF interface to create and update records of this type.</td>
</tr>
<tr>
<td>IMS program exclusion</td>
<td>Prevents AR/CTL products from participating in the execution of an application program that uses IMS. You can use the ISPF interface to create and update records of this type.</td>
</tr>
</tbody>
</table>
Record IDs

The record key of each record in the REGISET contains fields that determine whether an AR/CTL product will select the record to include in a limited list of records and during execution of the application program. These fields together are called the record ID. When you create the record, you fill in the fields with values that will match information from the application program execution. This information includes *qualifiers*, such as the MVS system ID, the job name from the JCL, and the program name.

A record type might not use all possible qualifiers in its record ID. An execution might not have a value for a qualifier. For example, an execution that does not use a JCL procedure will have a blank procedure name qualifier.

**Standard qualifiers**

Most AR/CTL product record IDs contain some or all of the following standard qualifiers:

**PROGNAME**

The program name (1 to 8 bytes) of the application program.

**PROCSTEP**

The procedure step name (1 to 8 bytes) from the JCL procedure. If the execution does not use a JCL procedure, this qualifier is blank.

**JOBSTEP**

The job step name (1 to 8 bytes) from the EXEC statement in the JCL to execute the job step. If the job step executes a JCL procedure and the job step name is blank, the procedure name is used as the job step name.

**JOBNAME**

The job name (1 to 8 bytes) from the JOB statement in the JCL to execute the application job.

**ASBNAME**

The name (1 to 8 bytes) of the application specification block (ASB) used by the application program.

*NOTE*

For IMS programs, this name is the application program name that is used in the second parameter of the EXEC PGM=DFSRRC00 statement. For IMS programs that use DB2, this parameter will be DSNMTV01 or the second parameter of the EXEC PGM=DFSRRC00 statement.
An ASB is an AR/CTL control block, also known as a program option member. It communicates information between an application program and AR/CTL. The ASB is associated with data set option members (file characteristics blocks, or FCBs) that identify information about the data sets that use AR/CTL data services.

In the ISPF interface, **ASBNAME** is shown as the qualifier if IMS elements are not selected for display.

**PSBNAME**
The name (1 to 8 bytes) of the program specification block (PSB) used by the application program.

A PSB is an IMS control block that is external to the application and is used to exchange information between the application and IMS or AR/CTL. A PSB consists of one or more Program Communication Blocks (PCBs), and is built during the PSBGEN process. It is specified as the third parameter on the EXEC PGM=DFSRRC00 statement.

In the ISPF interface, **PSBNAME** is shown as the qualifier if IMS elements are selected for display.

**ARCID**
The AR/CTL ID (1 to 4 bytes) if the application program does not use IMS. For non-IMS application programs, you can set the value of the ARCID with one of these methods:

- use the Default System Identifier (ARCID) processing option
- code a parameter on the EXEC statement in the job step JCL
- set an option in the non-IMS program registration record

**NOTE**
BMC Software recommends that you do not use the DB2 system ID as the ARCID.

In the ISPF interface, **ARCID** is shown as the qualifier if IMS elements are not selected for display.

**IMSID**
The IMSID (1 to 4 bytes) if the application program uses IMS or IMS-compatible calls and structures:

- For application programs that use the IMS region controller, the ARCID is the IMSID set during the SYSGEN of the IMS system or the IMSID set on the EXEC statement in the job step JCL.
For IMS-compatible application programs (that do not use the IMS region controller), the ARCID is set with a parameter on the EXEC statement in the job step JCL or with the Default System Identifier (ARCID) option.

In the ISPF interface, **IMSID** is shown as the qualifier if IMS elements are selected for display.

To allow a job step that abends on one IMS system to be restartable on a different IMS system, set the IMSID to wildcard characters in the program registration record. Although the IMSID is not in the record ID of the restart control record, the IMSID is in the record ID of the program registration record that identifies the application program for AR/CTL participation.

**MVSID**

The System Management Facilities (SMF) system ID (1 to 4 bytes) of the MVS system where the application program executes.

**DB2ID**

The DB2 system ID (1 to 4 bytes) of the DB2 system used by the application program.

**PLANNAME**

The name (1 to 24 bytes) of the DB2 plan used to execute the application program.

## Record ID qualifiers

Table 1 lists the qualifiers included in record IDs of AR/CTL records.

<table>
<thead>
<tr>
<th>Record type</th>
<th>Qualifiers in record ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>AR/CTL global options</td>
<td>none (only one record per REGISET is allowed)</td>
</tr>
<tr>
<td>non-IMS environment registration</td>
<td>ARCID, MVSID</td>
</tr>
<tr>
<td>non-IMS program registration</td>
<td>PROGNAME, PROCSTEP, JOBSTEP, JOBNAME, MVSID, DB2ID, PLANNNAME</td>
</tr>
<tr>
<td>non-IMS program exclusion</td>
<td>PROGNAME, PROCSTEP, JOBSTEP, JOBNAME, ASBNAME, ARCID, MVSID</td>
</tr>
<tr>
<td>IMS environment registration</td>
<td>IMSID, MVSID</td>
</tr>
<tr>
<td>IMS program registration</td>
<td>PROGNAME, PROCSTEP, JOBSTEP, JOBNAME, PSBNAME, IMSID, MVSID</td>
</tr>
<tr>
<td>IMS program exclusion</td>
<td>PROGNAME, PROCSTEP, JOBSTEP, JOBNAME, PSBNAME, IMSID, MVSID</td>
</tr>
</tbody>
</table>
Wildcard characters in record qualifiers

To reduce the number of records you need to set up and maintain, AR/CTL supports wildcard characters in most qualifiers of the REGISET record IDs. Wildcard characters are a powerful tool that might yield unintended results; therefore, BMC Software recommends that you use them with caution.

**WARNING**

Indiscriminate use of wildcard characters in the PROGNAME qualifier of non-IMS program registration records can cause AR/CTL to initialize in program executions where AR/CTL processing is invalid or unnecessary. Even if you use specific characters in other qualifiers, such as the JOBNAME, be careful when using wildcards in the PROGNAME. For example, if you have entered all specific characters for the job name but all wildcard characters for the program name, AR/CTL will initialize in all steps of that job, including IDCAMS and IEB-type steps. Possible unwanted results include:

- MVS system outages
- Abnormal termination of multiple programs
- Unwanted overhead

AR/CTL uses the following symbols for wildcard characters:

* asterisk - trailing multiple character match

% percent sign - leading or imbedded single character match

You can use wildcard characters alone or in combination with valid specific characters, according to the following rules:

- You can enter a percent sign in any position of the qualifier except the last position. Do not follow a percent sign immediately with an asterisk. AR/CTL accepts any character in the position occupied by a percent sign when determining which records to select. One or more percent signs at the end of a specific string (but not in the last position of the qualifier) causes a match for the qualifier that contains only the specific string plus those that start with the specific string, followed by as many characters or blanks as the number of percent signs.

- You can enter an asterisk in the trailing position after a specific string or in the first position of a qualifier; no specific characters or percent signs can follow an asterisk. AR/CTL automatically propagates a trailing asterisk to the last position of the qualifier. The asterisk is a match for any character. One or more asterisks at the end of a specific string makes AR/CTL accept any length of qualifier if the specific string matches.
If you enter a string containing only wildcards, any value in the qualifier is a match.

If you enter strings containing only wildcards for all qualifiers on a Limit List of Records panel, AR/CTL displays all records of the selected type in the REGISET.

Table 2 shows examples of wildcard usage for the 1- to 4-byte MVSID qualifier. The same principles apply to longer qualifiers.

<table>
<thead>
<tr>
<th>Example</th>
<th>Discussion</th>
</tr>
</thead>
<tbody>
<tr>
<td>%ABC</td>
<td>matches all 4-byte MVSIDs that contain ABC in positions 2 through 4</td>
</tr>
<tr>
<td>A%B</td>
<td>matches all 3-byte MVSIDs that start with A, contain any character except blank in position two, and end with B</td>
</tr>
<tr>
<td>AB%</td>
<td>matches MVSID AB and all 3-byte MVSIDs that start with AB</td>
</tr>
<tr>
<td>ABC%</td>
<td>not valid because percent sign cannot be in last position; specify ABC* instead</td>
</tr>
<tr>
<td>A*</td>
<td>matches all MVSIDs of any length that start with A; AR/CTL displays the qualifier as A*** after padding the end with asterisks.</td>
</tr>
<tr>
<td>ABC*</td>
<td>matches all MVSIDs that start with ABC</td>
</tr>
<tr>
<td>*AB</td>
<td>not valid because asterisk cannot precede specific characters or percent sign</td>
</tr>
<tr>
<td>A*B</td>
<td>not valid because asterisk cannot precede specific characters or percent sign</td>
</tr>
<tr>
<td>A*%</td>
<td>not valid because asterisk cannot follow a percent sign immediately</td>
</tr>
<tr>
<td>AB%%%</td>
<td>not valid because an asterisk cannot follow a percent sign immediately</td>
</tr>
<tr>
<td>****</td>
<td>matches all MVSIDs</td>
</tr>
<tr>
<td>A%B*</td>
<td>matches all 3- or 4-byte MVSIDs that start with A and have B in position 3</td>
</tr>
<tr>
<td>%A%B*</td>
<td>matches all 3- or 4-byte MVSIDs that have A in position 3</td>
</tr>
<tr>
<td>ABCD</td>
<td>matches the MVSID ABCD only</td>
</tr>
</tbody>
</table>

Order of REGISET records

For display purposes, the REGISET records are sorted from most qualified to least qualified. The term qualified refers to the order of the qualifiers of an object and the position of wildcard characters in the qualifier. The following standard qualifiers are listed from most qualified to least qualified:

1. PROGNAME
2. PROCSTEP
3. JOBSTEP
4. JOBNAME
A percent sign wildcard character coded in a qualifier is sorted after a specific character coded in the same position, and an asterisk wildcard character is sorted after specific characters and the percent sign. The wildcard characters are considered the highest values in the sort order, and specific characters have EBCDIC values (for example, $B$ has a lower value than 2). A record with a specific character in a position is more qualified than a record with a wildcard character in that position. The global record is listed last because all qualifiers contain all wildcards.

**Examples of wildcard usage**

This section contains examples of the use of wildcards. Examples 1 and 2 show a set of qualifiers entered on a Limit List of Records panel with the list of records displayed on a List Records panel. Examples 3 and 4 show a set of qualifiers from an application program execution and the records that would apply to the execution.

For the examples, assume that the REGISET contains the records shown in Figure 1.

**Figure 1  List of REGISET records for wildcard examples**
Example 1

The qualifiers shown in Figure 2 are entered on a Limit List of Records panel. On a List Records panel, AR/CTL displays the records shown in Figure 3.

Figure 2  Example 1: Qualifiers on Limit List of Records panel

![Figure 2: Example 1: Qualifiers on Limit List of Records panel]

Figure 3  Example 1: Records listed on List Records panel

![Figure 3: Example 1: Records listed on List Records panel]

Example 2

The qualifiers shown in Figure 4 are entered on a Limit List of Records panel. On a List Records panel, the ISPF interface displays the records shown in Figure 5.

![Figure 4: Example 2: Qualifiers on Limit List of Records panel]

![Figure 5: Example 2: Records listed on List Records panel]
**Example 3**

The application program execution has the qualifiers shown in Figure 6. AR/CTL uses the records shown in Figure 7 when it merges applicable records, and the option values in the record at the top of the list override the option values from records that follow it. AR/CTL uses the record shown in Figure 8 when it selects a single record at execution.
Example 4

The application program execution has the qualifiers shown in Figure 9. AR/CTL uses the records shown in Figure 10 when it merges applicable records, and the option values in the record at the top of the list override the option values from records that follow it. AR/CTL uses the record shown in Figure 11 when it selects a single record at execution.

Figure 9 Example 4: Application program qualifiers

<table>
<thead>
<tr>
<th>PROGNAME</th>
<th>PROCSTEP</th>
<th>JOBSTEP</th>
<th>JOBNAME</th>
<th>PSBNAME</th>
<th>IMSID</th>
<th>MVSID</th>
</tr>
</thead>
<tbody>
<tr>
<td>********</td>
<td>********</td>
<td>********</td>
<td>PAYROLL*</td>
<td>********</td>
<td>ARCP</td>
<td>****</td>
</tr>
<tr>
<td>********</td>
<td>********</td>
<td>********</td>
<td>********</td>
<td>********</td>
<td>ARCP</td>
<td>****</td>
</tr>
<tr>
<td>********</td>
<td>********</td>
<td>********</td>
<td>********</td>
<td>********</td>
<td>ARCP</td>
<td>****</td>
</tr>
<tr>
<td>********</td>
<td>********</td>
<td>********</td>
<td>********</td>
<td>********</td>
<td>ARCP</td>
<td>****</td>
</tr>
<tr>
<td>********</td>
<td>********</td>
<td>********</td>
<td>********</td>
<td>********</td>
<td>ARC*</td>
<td>****</td>
</tr>
<tr>
<td>********</td>
<td>********</td>
<td>********</td>
<td>********</td>
<td>********</td>
<td>****</td>
<td>MVSP</td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>PROGNAME</th>
<th>PROCSTEP</th>
<th>JOBSTEP</th>
<th>JOBNAME</th>
<th>PSBNAME</th>
<th>IMSID</th>
<th>MVSID</th>
</tr>
</thead>
<tbody>
<tr>
<td>********</td>
<td>********</td>
<td>********</td>
<td>PAYROLL*</td>
<td>********</td>
<td>ARCP</td>
<td>****</td>
</tr>
<tr>
<td>********</td>
<td>********</td>
<td>********</td>
<td>********</td>
<td>********</td>
<td>ARCP</td>
<td>****</td>
</tr>
</tbody>
</table>

AR/CTL uses these records when it merges applicable records, and the option values in the record at the top of the list override the option values from records that follow it:
Getting started with the AR/CTL ISPF interface

AR/CTL products provide a CUA-compliant ISPF interface that you can use to perform most tasks related to the use of the product. This section provides overview information about the ISPF interface.

Setting up your ISPF session

To use the ISPF interface, your ISPF session must have access to the AR/CTL product libraries containing panel dialogs and messages. The libraries were created by the Runtime Enablement (RTE) process during the installation of the AR/CTL products. You can include these libraries in your logon procedure, or you can use the ISPF LIBDEF facilities to access them. The data set names are documented in the Installation System User Guide. For more information about setting up the LIBDEF facilities to access product libraries, see “Working with AR/CTL LIBDEF table” on page 116.

Most functions of the ISPF interface access the REGISET. The BCSS must be active to access the REGISET. The ISPF interface also makes sure that the REGISET contains required records created by the REGISET Population utility (AESURPOP). If the required records are not present, the ISPF interface issues a message and prevents access to the REGISET. For more information about AESURPOP, see “AR/CTL REGISET population utility” on page 66.
The first time you invoke the ISPF interface (from each TSO user ID that you use), you must set values for environment-specific ISPF display options and for the temporary file unit name. (The display options hide or display elements that specifically relate to IMS, DB2, or VSAM.) You can also customize the appearance of the panels with the Application Enhancement Series Profile Options panel. For information about these topics, see “Setting the unit type for temporary files” on page 121 and “Setting environment-specific options for AR/CTL ISPF” on page 124.

Using general panel elements

The ISPF interface uses these general conventions:

Navigation

You can navigate forward in a progression of panels (for example, from the primary menu to the Limit List of Records panel to the List Records panel) by pressing Enter or entering a command. To navigate backward in a progression of panels, enter the END command (usually assigned to the F3 key) or the CAN command (where valid).

To navigate forward in a series of panels (for example, from page to page of the Processing Options panels), enter the DOWN command (usually assigned to the F8 key). To navigate backward in a series of panels, enter the UP command (usually assigned to the F7 key).

Commands

In addition to the standard ISPF commands, you can enter the following commands on many panels; the specific commands available on the panel are listed in the top right area of the panel:

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>CAN</td>
<td>Exit this panel without saving changes or creating a new record. AR/CTL loses any changes that you made on the panel since the last SAVE command and redisplay the panel where you selected the record or entered the ADD command.</td>
</tr>
<tr>
<td>SAVE</td>
<td>Create the new record or save the changes made to the existing record, and remain on the currently displayed panel.</td>
</tr>
<tr>
<td>END</td>
<td>Create the new record or save the changes made to the existing record, and return to the panel where you selected the record or entered the ADD command.</td>
</tr>
</tbody>
</table>
Using the Application Enhancement Series primary menu

Use the Application Enhancement Series primary menu (Figure 12 on page 32) to access AR/CTL records, the BATCH CONTROL FACILITY primary menu, the APPLICATION RESTART CONTROL primary menu, and the AR/CTL common utilities.

To use the Application Enhancement Series primary menu, perform the following steps:

1. Access the Application Enhancement Series primary menu.

2. In the choice entry field, type the number corresponding to one of the following options, and press Enter:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Access AR/CTL records, including AR/CTL global options, environment registration, program registration, and program exclusion. For more information, see Chapter 4, “Working with AR/CTL records.”</td>
</tr>
<tr>
<td>2</td>
<td>Access the BATCH CONTROL FACILITY primary menu. For more information, see the APPLICATION RESTART CONTROL Reference Manual: BATCH CONTROL FACILITY.</td>
</tr>
<tr>
<td>3</td>
<td>Access the APPLICATION RESTART CONTROL primary menu. For more information, see the APPLICATION RESTART CONTROL Reference Manual.</td>
</tr>
<tr>
<td>11</td>
<td>View information about the operating environment and set up environment defaults for AR/CTL product ISPF interfaces. For more information, see Chapter 5, “Working with AR/CTL environment options.”</td>
</tr>
<tr>
<td>12</td>
<td>View information about AR/CTL product messages. For more information, see the APPLICATION RESTART CONTROL messages in the BMC Documentation Center.</td>
</tr>
<tr>
<td>13</td>
<td>Set up the security environment for the AR/CTL products. For more information, see Chapter 6, “Using AR/CTL security.”</td>
</tr>
<tr>
<td>14</td>
<td>Process CPU ID authorization passwords for the AR/CTL products. For more information, see the Installation System User Guide.</td>
</tr>
<tr>
<td>15</td>
<td>Use the REGISET Record Copy utility to copy records for AR/CTL products. For more information, see Chapter 7, “Copying REGISET records.”</td>
</tr>
<tr>
<td>16</td>
<td>Exit from the Application Enhancement Series primary menu.</td>
</tr>
<tr>
<td>99</td>
<td>View information about new features and changes to the AR/CTL family of products.</td>
</tr>
</tbody>
</table>
Using the Limit List of Records panel

The REGISET can contain numerous records of some types (such as processing option records and dynamic allocation records). To allow you to limit the list of these records to a manageable number, the AR/CTL ISPF interface displays the Limit List of Records panel (Figure 13). Use this panel to enter the specific qualifiers to use for listing records.

Figure 13  Limit List of Records panel

Select an option. Then press Enter.

   Application Enhancement Series (AES)
     1. AES records
     2. BATCH CONTROL FACILITY (BCF)
     3. APPLICATION RESTART CONTROL (AR/CTL)

AES Common Options
   11. Display, print, jobcard, allocation, and profile options
   12. Messages
   13. Security
   14. Product authorization
   15. REGISET record copy utility
   16. Exit

99. New features and changes for the AES family of products

Using the Limit List of Records panel

To limit the list of records, type positional masking characters and wildcard characters (*). Then press Enter.

Record ID
   PROGNAME . . . . . .  ********
   PROCSTEP . . . . . .  ********
   JOBSTEP  . . . . . .  ********
   JOBNAME  . . . . . .  ********
   asbname  . . . . . .  ********
   arcld   . . . . . . .  ****
   MVSID   . . . . . . .  ****
Using the List Records panel

You can enter specific and generic qualifiers in any combination to tailor the list. When you press Enter, the AR/CTL ISPF interface displays the List Records panel (Figure 14 on page 33), listing the records of the selected type that match the selection criteria and omitting those that do not match. If no records match the criteria, the list is empty, and you can add new records from the List Records panel.

--- NOTE ---

A wildcard character in a particular position of a qualifier matches any specific character and any wildcard character in that position of existing records. You will see all records that have wildcard characters in the positions you enter as specific characters on the Limit List of Records panel, in addition to the records that have specific matching characters in those positions.

Using the List Records panel

When you press Enter on the Limit List of Records panel, the AR/CTL ISPF interface displays the List Records panel (Figure 14). This panel lists all records of the selected type that match the qualifiers you specified. The panel lists the records in most specific to least specific order.

Figure 14  List Records panel

To create a new record in the REGISET, enter the ADD command. The AR/CTL ISPF interface displays the Add Record panel (Figure 15 on page 34) to request the qualifiers for the record ID.

You can enter the following action codes in the Act field:

D
Delete the record from the REGISET. The AR/CTL ISPF interface displays the Delete Record panel (Figure 16 on page 35) to request confirmation of the deletion.
S
Display the contents of this record (and possibly make changes). The panel that
the AR/CTL ISPF interface displays depends on the record type.

L
Display information about the last update of the record. The AR/CTL ISPF
interface displays the Last Update Data panel (Figure 17 on page 36).

Using the Add Record panel

When you enter the ADD command on the List Records panel, the AR/CTL ISPF
interface displays the Add Record panel (Figure 15). Use this panel to create a new
record in the REGISET.

Figure 15  Add Record panel

You can enter specific and generic qualifiers in any combination in the record ID. For
information about using wildcard characters in the qualifiers, see “Wildcard
characters in record qualifiers” on page 23.

Depending on the type of record, the option fields shown in Figure 15 might not be
included on the panel or might be continued on multiple panels. Values you set in the
option fields are stored in the new record.

To prevent the accidental registration of all executions in your environment (and the
problems this action can cause), the Add Record panel prevents the addition of a
program registration record that contains all asterisks in the record ID.
Using the Delete Record panel

When you select a record in the REGISET for deletion, the AR/CTL ISPF interface displays the Delete Record panel (Figure 16) so that you can confirm the delete request. To help you identify the record completely, the panel displays the last update (or creation) information for the record.

**NOTE**
Most valid ISPF commands are available on this panel; however, because you should give careful consideration to the delete request, the END command is not available. The panel does not provide a default value; you must choose an option before continuing.

**Figure 16  Delete Record panel**

In the **Confirm delete** field, type one of the following options, and press **Enter**:

- 1—Delete this record.
- 2—Cancel the delete request.

**WARNING**
Be careful when using this option. Depending on the record and the record ID, deleting the record can affect multiple application programs in the environment. Be sure that the record is not needed before deleting it.

Using the Last Update Data panel

When you select a record in the REGISET to obtain information about the last update of the record, the AR/CTL ISPF interface displays the Last Update Data panel (Figure 17).
Using the Last Update Data panel

This panel displays the date, time, and user associated with the last update or creation of the record. For REGISET records, the panel also displays the AR/CTL product version, release, and maintenance level that was used to update or create the record.
Working with BMC Software subsystems

This chapter describes the BMC Software subsystems used by the APPLICATION RESTART CONTROL (AR/CTL) products. This chapter contains the following information:

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BMC Software subsystems

AR/CTL products use two BMC Software standard subsystems for resource management: the BMC Primary Subsystem (BMCP) and the BMC Consolidated Subsystem (BCSS).

**WARNING**

AR/CTL products can share BMC Software subsystems with other BMC Software products. Some commands discussed in this chapter might affect those BMC Software products. For more information, see the documentation for those products.

The BMCP and the BCSS are maintained independently of the AR/CTL products; their maintenance levels do not correspond to the maintenance levels of the AR/CTL products. When you install a new or updated BMC Software product that uses the BMCP and the BCSS, use the Installation Check program to determine the level of the existing subsystems against the level of the subsystems from the distribution tape. For AR/CTL products, always use the highest level of subsystem code available.

**BMCP**

The BMCP establishes supervisory services for the BCSS and many BMC Software products. It allows interception of open, close, attach, and link requests in the system.

BMC Software products share the BMCP. You can have only one copy of the BMCP on an MVS system.

All associated BMC Software products continue to operate normally even if the BMCP terminates. However, BMC Software recommends that you leave the BMCP running at all times.

**BCSS**

The BCSS manages I/O to the registration data sets (collectively called the REGISET), manages APF-authorized functions, and performs processing for intercepted open, close, attach, and link requests.
The BCSS performs most of the I/O to the REGISET during initialization and termination of the step execution. A small amount of I/O is performed during application program execution, mainly during checkpoint request processing. Most I/O during checkpoint processing is performed against the checkpoint data set.

The BCSS must be active on the MVS system where you want to execute application programs that use AR/CTL products and where you want to access records in the REGISET through the ISPF interface. You can use the AR/CTL Status Check utility (program AESUVBCS) to ensure that required AR/CTL products, components, and functions are available for application execution.

### Multiple BCSSs

More than one BCSS can be active on an MVS image. Non-AR/CTL products, such as DATA ACCELERATOR, can share a BCSS (and REGISET) with AR/CTL products or use a separate BCSS (and REGISET). The BMCP ensures that each BCSS receives control at the proper time for the products using that BCSS.

Whether you use the same BCSS or different ones depends mainly on how you want to manage REGISET access. To isolate the I/O effects of the products, use multiple BCSS subsystems. If the REGISET activity is not an issue, multiple products can use the same BCSS.

You must use the `MODE` parameter in the startup procedure to designate one (and only one) BCSS on an MVS image as the public BCSS. All others must be designated as private subsystems. The BMCP allows the public BCSS first access to an intercepted request.

A default BCSS can be designated for all AR/CTL products on each MVS; this default is for use in migration from an earlier version of AR/CTL products. The BCSS identifier (BCSID) identifies the subsystem (and REGISET) in commands and interfaces that work with the BCSS.

You can include the AES$ssid DD statement in the execution JCL to ensure that an application program execution uses a specific BCSS. For more information, see the `APPLICATION RESTART CONTROL Reference Manual` or the `APPLICATION RESTART CONTROL Reference Manual: BATCH CONTROL FACILITY`.

---

**Chapter 2 Working with BMC Software subsystems**

39
AR/CTL components of the BCSS

The following AR/CTL components are available with the BCSS:

- IMS component—This component must be enabled to allow AR/CTL for IMS and the BATCH CONTROL FACILITY (BCF) component to operate. The IMS component must be enabled for AR/CTL to execute in IMS-compatible mode.

- non-IMS component—This component must be enabled to allow AR/CTL for DB2 and AR/CTL for VSAM to operate.

- VSAM component—This component must be enabled to allow AR/CTL for VSAM to provide logging and dynamic backout of VSAM updates when an application program uses local VSAM access services.

Subsystem procedure names

The AR/CTL Installation System tailors two subsystem procedures, one to start the BMCP (default procedure name BMCP) and one to start the BCSS (default procedure member name BMCBCSS). Each procedure contains the required parameter and statements for the subsystem. If either default name conflicts with the name of another procedure member, you can use a different member name during configuration.

Subsystem identifiers

You must use a four-character name to identify the BMCP and the BCSS to MVS. The AR/CTL Installation System uses the default names BMCP and BCSS. If either name conflicts with a non-BMC Software subsystem installed on your system, you can use the SUBSYSID parameter in the BMCP or BCSS startup procedure to change the subsystem names. If you change a subsystem name after the subsystem starts, you must perform an IPL.

Types of procedure libraries

For ease of use, execute the started tasks for the BMCP and the BCSS from a JES2 procedure library that is shared by all MVS images in your environment. You can use the following subsystem command to start the subsystem, where ssid is the subsystem ID:

S ssid
CPU authorization passwords

SYS1.PROCLIB is not a shared procedure library. When the procedure name is the same as the subsystem ID (as they are if you use the AR/CTL Installation System defaults for the BMCP) and the procedure is in a non-shared library (such as SYS1.PROCLIB), MVS runs the subsystem under the master scheduler. After the first attempt to start the procedure, any subsequent attempts to start it will result in an error (procedure not found) unless you specify the `SUB=jesid` parameter on the subsystem start command, where `jesid` is the JES2 subsystem ID. For example, use the following command to start the BMCP if your JES2 subsystem ID is SYSA:

```
S BMCP,SUB=SYSA
```
You can insert non-BCSS commands, including MVS console commands, in the BCSS commands data set. After the BCSS has initialized and is prepared for execution, non-BCSS commands execute sequentially. Prefix each MVS command that appears in the BCSS commands data set with `MVS`. For example, to start JES initiators 1 through 20 after BCSS initialization completes, add the `MVS $SI1-20` command to the BCSS commands data set. The JES command executes immediately after BCSS initialization.

**Registration data set DD statements**

The BCSS procedure contains DD statements that identify the registration data sets for the BCSS to use. The AR/CTL Installation System automatically tailors these DD statements in the BCSS procedure to use the registration data set information you provide during configuration.

A BCSS must use at least two registration data sets. The following combinations are valid:

- two (or more) primary data sets and no duplex data sets
- one primary data set and one (or more) duplex data sets
- one (or more) primary data sets and one (or more) duplex data sets

For more information about the registration data sets, see Chapter 3, “Working with the REGISET.”

REGISET DD statements identify primary registration data sets. The first primary data set uses ddname REGISET; a second primary data set uses ddname REGISET0, a third uses REGISET1, and so on through ddname REGISET9.

DUPLEX DD statements identify duplex registration data sets. The first duplex data set uses ddname DUPLEX; a second duplex data set uses ddname DUPLEX0, a third uses DUPLEX1, and so on through ddname DUPLEX9.

Two or more BCSSs can share a REGISET. For some AR/CTL product functions and features, involved BCSSs *must* share a REGISET. For more information about these functions and features, see the *APPLICATION RESTART CONTROL User Guide* and the *APPLICATION RESTART CONTROL Reference Manual: BATCH CONTROL FACILITY*. 
Startup sequence of subsystems

Start the BMC Software subsystems in the following sequence:

1. BMCP
2. BCSS (PUBLIC)
3. BCSS (PRIVATE if necessary)

Executing the Installation Check program

The Installation Check program looks for other BMC Software products in your system that share common subsystems with the AR/CTL products. It also determines whether you have previously installed the AR/CTL products. If either situation occurs, the program checks whether the subsystems are compatible.

Execute the Installation Check program during normal operating conditions on each CPU that uses the products you are installing. This program requires READ access to all LNKLST libraries. You must run the Installation Check program on each CPU operating in a shared DASD environment.

**NOTE**

Always use the latest available level of the BCSS with AR/CTL products.

Edit and submit the job

The AR/CTL Installation System tailors jobs to execute the Installation Check program. These jobs are located in members $Q02CK01 and $Q02CH02 in the ARCCUST library.

If the product load modules are not installed in the MVS LNKLST, remove the comment character from the PDS parameter and include the associated DD statements.

If the product load modules are installed in the MVS LNKLST, you can leave the PDS parameter commented out as shown in member #CHKREG of the AR/CTL sample library.
If you do not know whether other BMC Software products have previously installed the BPS and BCS load modules in the MVS LNKLST, run the Installation Check program twice, once with the PDS parameter and once without the PDS parameter.

Check the output

When the Installation Check program terminates, it produces the following outputs:

- report listing the BMC Software subsystems installed and the AR/CTL load modules found on your system
- customized installation instructions that describe the procedures you should follow based on the review of your current environment

**NOTE**

If you are performing a maintenance installation, the report describes the condition code and lists the steps necessary to install maintenance.

- a SYSLIB to a LNKLST cross reference

**BMCP command tasks**

This section describes BMCP commands. You can execute commands three ways:

- place these commands in a COMMNDxx member of SYS1.PARMLIB so they are issued automatically during an IPL
- place them in a BCSS commands data set so they are issued at BCSS startup
- Issue them as needed from the operator console.

**NOTE**

Commands issued from the operator console remain active until the next IPL, at which time the values in the BCSS commands data set are reinstated.
Starting the BMCP

You must start the BMCP before starting any applications. For normal operations, place the MVS START BMCP command in a COMMNDxx member of SYS1.PARMLIB. This command causes the BMCP to start automatically during an IPL. To start the BMCP manually after you have terminated it, issue the START command from the operator console.

To start the BMCP, perform the following steps:

1. Required. Issue the following MVS START command to start the BMCP (where bmcp is the procedure library member that contains the BMCP procedure):

   START bmcp

   If the BMCP is started from a non-shared procedure library (such as SYS1.PROCLIB), and the procedure library name is the same as the subsystem ID, specify the SUB=jesid parameter, where jesid is the JES2 subsystem ID. For example, use the following command to start the BMCP if your JES2 subsystem ID is JES2:

   START bmcp,SUB=JES2

2. Required. Check the system log to ensure that the command completed successfully. The BMCP responds with messages indicating its availability.

3. Optional. Issue the MVS DISPLAY ACTIVE LIST (D A, L) command. MVS responds with the following information (in this example, the ASID is 0013):

<table>
<thead>
<tr>
<th>JOBS</th>
<th>M/S</th>
<th>TS</th>
<th>USERS</th>
<th>SYSAS</th>
<th>INITS</th>
<th>ACTIVE/MAX VTAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>00004</td>
<td>00025</td>
<td>00150</td>
<td>00009</td>
<td>00013</td>
<td>00150/00250</td>
<td></td>
</tr>
<tr>
<td>BMCBCSS</td>
<td>BCSS0014</td>
<td>SSAS</td>
<td>NSW</td>
<td>S</td>
<td>BMCP</td>
<td>BMCP 0013</td>
</tr>
<tr>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>----</td>
<td>-------------</td>
</tr>
</tbody>
</table>

   An active BMCP appears in this list, but the STEPNAME for this BMCP is modified to reflect its address space ID (ASID) in hexadecimal notation.

Terminating the BMCP

You should leave BMCP running at all times, except when installing maintenance modules. You must also terminate BMCP as part of an orderly shutdown of MVS before an IPL (discussed in “Performing an orderly shutdown before IPL” on page 54).
To manually terminate the BMCP address space, perform the following steps:

1. Required. Issue the following command (where `bmcpid` is the subsystem identifier):
   
   ```bash
   bmcpid SHUTDOWN
   ```

2. Required. Check the system log to ensure that the command completed successfully. The BMCP responds with messages indicating that termination was initiated and completed.

## Displaying the status of the BMCP

You can display status information about the BMCP to indicate whether the BMCP is active. To display the status of the BMCP, perform the following steps:

1. Required. Issue the following command (where `bmcpid` is the subsystem identifier):
   
   ```bash
   bmcpid STATUS
   ```

2. Required. Check the system log to ensure that the command completed successfully. The BMCP responds with messages indicating the status of the address space.

## BCSS operator console command tasks

This section describes BCSS operator commands. You can execute commands three ways:

- place these commands in a COMMNDxx member of SYS1.PARMLIB so they are issued automatically during an IPL
- place them in a BCSS commands data set so they are issued at BCSS startup
- Issue them as needed from the operator console.

**NOTE**

Commands issued from the operator console remain active until the next IPL, at which time the values in the BCSS commands data set are reinstated.
Starting the BCSS

You must start the BCSS before starting any applications. For normal operations, place the MVS START command in a COMMNDxx member of SYS1.PARMLIB so that the BCSS starts automatically during an IPL. To start the BCSS manually after you have terminated it, issue the START command from the operator console.

To start the BCSS, perform the following tasks:

1 Required. Issue one of the following commands (where bmcbcss is the procedure library member that contains the BCSS procedure):

   START bmcbcss,OPTION=REFRESH

   START bmcbcss,OPTION=NREFRESH

Use the REFRESH option to start the BCSS with new copies of resident BCSS modules; REFRESH is the default for BCSS startup. Use the NREFRESH option to start the BCSS with existing copies of resident BCSS modules.

If the member name of the procedure in the procedure library is the same as the subsystem name, you might also need to specify the SUB parameter if you stop and restart the subsystem.

2 Required. Check the system log to ensure that the command completed successfully. The BCSS responds with messages indicating that it is available.

3 Optional. Issue the MVS DISPLAY ACTIVE LIST (D A, L) command. MVS responds with the following information (in this example, the ASID is 0014):

<table>
<thead>
<tr>
<th>JOBS</th>
<th>M/S</th>
<th>TS</th>
<th>USERS</th>
<th>SYSAS</th>
<th>INITS</th>
<th>ACTIVE/MAX</th>
<th>VTAM</th>
</tr>
</thead>
<tbody>
<tr>
<td>00004</td>
<td>0025</td>
<td>00150</td>
<td>00009</td>
<td>00013</td>
<td>00150/00250</td>
<td></td>
<td></td>
</tr>
<tr>
<td>LLA</td>
<td>LLA</td>
<td>LLA</td>
<td>NSW</td>
<td>RMF</td>
<td>A</td>
<td>IEFPROC</td>
<td>NSW S</td>
</tr>
<tr>
<td>NET</td>
<td>NET</td>
<td>NETNCP</td>
<td>OWT</td>
<td>TSO</td>
<td>TSO</td>
<td>STEPI</td>
<td>NSW S</td>
</tr>
<tr>
<td>BMCBCSS</td>
<td>BCSS</td>
<td>0014</td>
<td>SSAS</td>
<td>NSW</td>
<td>BMCP</td>
<td>BMCP0013</td>
<td>BPSMDSPO</td>
</tr>
</tbody>
</table>

An active BCSS appears in this list, but the STEPNAME for this BCSS is modified to reflect its ASID in hexadecimal notation.
Terminating the BCSS

You should leave the BCSS running at all times, except when terminating it to install maintenance modules. You must also terminate BCSS as part of an orderly shutdown of MVS before an IPL (discussed in “Performing an orderly shutdown before IPL” on page 54).

**WARNING**

Before you issue the command to terminate the BCSS, issue the appropriate commands to disable active AR/CTL components. For more information, see “Disabling AR/CTL components” on page 52.

To terminate the BCSS address space, perform the following steps:

1. Required. Issue the following command (where bcssid is the subsystem identifier):

   ```
   bcssid SHUTDOWN
   ```

2. Required. Check the system log to ensure that the command completed successfully. The BCSS responds with messages indicating that termination was initiated and completed.

Displaying the status of BCSS

You can display status information about the BCSS to indicate whether the BCSS is active. To display the status of the BCSS, perform the following steps:

1. Required. Issue the following command (where bcssid is the subsystem identifier):

   ```
   bcssid STATUS
   ```

2. Required. Check the system log to ensure that the command completed successfully. The BCSS responds with messages indicating the status of the address space.

Reinitializing AR/CTL components

You must reinitialize AR/CTL components after an IPL, after a registration data set fails, or after an AR/CTL component abend. When you issue the reinitialization command, an individual AR/CTL component initializes only if a product that uses that component is licensed.
To reinitialize AR/CTL components, perform the following steps:

1. Required. Issue the following command (where $bcssid$ is the subsystem identifier):

   \[bcssid\text{ REINIT AES}\]

2. Required. Check the system log to ensure that the command completed successfully. The BCSS responds with messages indicating that it has initialized the AR/CTL components; status messages also are displayed.

**AR/CTL component command tasks**

This section describes AR/CTL component commands. You can issue AR/CTL component commands through the BCSS by placing them in a BCSS commands data set so that they are issued at BCSS startup. You can also issue these commands as needed from the operator console.

**NOTE**

Commands issued from the operator console remain active until the next IPL, at which time the values in the BCSS commands data set are reinstated.

**Displaying the status of AR/CTL components**

You can display status information about AR/CTL components by performing the following steps:

1. Required. Issue the following command (where $bcssid$ is the subsystem identifier):

   \[bcssid\text{ AES component STATUS}\]

   In this command, component is one of the following values:

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONIMS or NIMS</td>
<td>Display status information for the initialized AR/CTL non-IMS component.</td>
</tr>
<tr>
<td>IMS</td>
<td>Display status information for the initialized AR/CTL IMS component.</td>
</tr>
<tr>
<td>VSAM</td>
<td>Display status information for the initialized AR/CTL VSAM component.</td>
</tr>
</tbody>
</table>
Enabling AR/CTL components

You can omit the component parameter to display only general status information about AR/CTL components, such as version and release information.

2. Optional. Check the system log to ensure that the command completed successfully. The BCSS responds with messages indicating the status of the selected components.

Enabling AR/CTL components

You can enable AR/CTL component functions in the BCSS to enable AR/CTL products to participate in application program execution and to provide other product services.

To enable AR/CTL component functions, perform the following steps:

1. Required. Issue the following command (bcssid is the subsystem identifier):

   `bcssid AES component ENABLE function`

   Include one of these component parameter values with the command:

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONIMS or NIMS</td>
<td>Enable functions of the AR/CTL non-IMS component.</td>
</tr>
<tr>
<td>IMS</td>
<td>Enable functions of the AR/CTL IMS component.</td>
</tr>
<tr>
<td>VSAM</td>
<td>Enable functions of the AR/CTL VSAM component.</td>
</tr>
</tbody>
</table>

   Include function parameter values with the command as follows:

   - If the component is IMS, you can include one of these function parameter values with the command. If you omit the value, the default value is ALL.

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>Enable all of the following functions.</td>
</tr>
<tr>
<td>OPEN</td>
<td>Enable MVS OPEN interception. This function is required for interception of QSAM and VSAM requests for sequential file interception, local VSAM access, and remote VSAM access services of AR/CTL. With OPEN interception enabled, the BMCP examines all QSAM and VSAM open requests in the system. AR/CTL determines whether to act on the open request.</td>
</tr>
</tbody>
</table>
If the component is NONIMS (or NIMS), you can include one of these function parameter values with the command; if you omit the value, the default value is ALL.

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATTACH</td>
<td>Enable MVS ATTACH interception. This function is required for AR/CTL product participation in application program execution.</td>
</tr>
<tr>
<td>LINK</td>
<td>Enable MVS LINK interception. This function is required for AR/CTL product participation in an application program execution if the program is executed through an MVS LINK process. The IMS component intercepts a LINK to DFSRRC00 only. The non-IMS component intercepts a LINK to ARCCCTRL only. You should enable LINK interception only if required.</td>
</tr>
<tr>
<td>OPEN</td>
<td>Enable MVS OPEN interception. This function is required for interception of QSAM and VSAM requests for sequential file interception, local VSAM access, and remote VSAM access services of AR/CTL. With OPEN interception enabled, the BMCP examines all QSAM and VSAM open requests in the system. AR/CTL determines whether to act on the open request.</td>
</tr>
<tr>
<td>ATTACH</td>
<td>Enable MVS ATTACH interception. This function is required for AR/CTL product participation in application program execution.</td>
</tr>
<tr>
<td>LINK</td>
<td>Enable MVS LINK interception. This function is required for AR/CTL product participation in an application program execution if the program is executed through an MVS LINK process. The IMS component intercepts a LINK to DFSRRC00 only. The non-IMS component intercepts a LINK to ARCCCTRL only. You should enable LINK interception only if required.</td>
</tr>
<tr>
<td>AUTOREG</td>
<td>For the specified DB2 subsystem (db2ssid), enable automatic registration for non-IMS application programs. If you omit the optional db2ssid, the command applies to any DB2 subsystem. For more information, see “Working with automatic registration records” on page 91.</td>
</tr>
</tbody>
</table>

- If the component is NONIMS (or NIMS), you can include one of these function parameter values with the command; if you omit the value, the default value is ALL.
Disabling AR/CTL components

You can disable the AR/CTL component functions in the BCSS. When a component function is disabled, the BCSS will not intercept any requests for the disabled function.

### Disabling AR/CTL components

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AUTOREGUPD db2ssid</td>
<td>For the specified DB2 subsystem (db2ssid), enable automatic registration for non-IMS application programs and enable the updating of DB2 subsystem IDs and plan names. If you omit the optional db2ssid, the command applies to any DB2 subsystem. For more information, see “Working with automatic registration records” on page 91.</td>
</tr>
<tr>
<td>AUTOREGREPL db2ssid</td>
<td>For the specified DB2 subsystem (db2ssid), enable automatic registration for non-IMS application programs and replace the contents of existing program registration records with the contents of the automatic registration record. If you omit the optional db2ssid, the command applies to any DB2 subsystem. For more information, see “Working with automatic registration records” on page 91.</td>
</tr>
</tbody>
</table>

For example, if you want to phase in the use of full AR/CTL services, you can specify CAF for the DB2 Attachment Facility Only option in the automatic registration record. The AR/CTL application supervisor creates program registration records that specify the use of the AR/CTL for DB2 batch attachment facility only. Later, when you want these programs to use full AR/CTL services, you can specify N for the DB2 Attachment Facility Only option in the automatic registration record, and the AR/CTL application supervisor changes the value of this option in the existing program registration records.

- If the component is VSAM, you can include one of these function parameter values with the command; if you omit the value, the default value is ALL.

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>Enable the following function. (This function is equivalent to the LOGGING function.)</td>
</tr>
<tr>
<td>LOGGING</td>
<td>Enable the VSAM logging function. (You can abbreviate the function to L.)</td>
</tr>
</tbody>
</table>

2 Optional. Check the system log to ensure that the command completed successfully. The BCSS responds with messages indicating which components have been enabled.
To disable AR/CTL component functions, perform the following steps:

1. Required. Issue the following command (where \textit{bcssid} is the subsystem identifier):

   \texttt{bcssid AES component DISABLE function}

   You can omit the \textit{component} parameter to disable functions for all AR/CTL components, or you can include one of these \textit{component} parameter values with the command:

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>NONIMS or NIMS</td>
<td>Disable functions of the AR/CTL non-IMS component.</td>
</tr>
<tr>
<td>IMS</td>
<td>Disable functions of the AR/CTL IMS component.</td>
</tr>
<tr>
<td>VSAM</td>
<td>Display status information for the initialized AR/CTL VSAM component.</td>
</tr>
</tbody>
</table>

   If the component is \textit{IMS}, you can include one of these \textit{function} parameter values with the command; if you omit the value, the default value is \textit{ALL}.

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>Disable all of the following functions.</td>
</tr>
<tr>
<td>OPEN</td>
<td>Disable MVS OPEN interception. This command disables sequential file interception, local VSAM access, and remote VSAM access services of AR/CTL.</td>
</tr>
<tr>
<td>ATTACH</td>
<td>Disable MVS ATTACH interception. The command disables AR/CTL product participation in application program execution.</td>
</tr>
<tr>
<td>LINK</td>
<td>Disable MVS LINK interception for the AR/CTL component.</td>
</tr>
</tbody>
</table>

   If the component is \textit{NONIMS} (or \textit{NIMS}), you can include one of these \textit{function} parameter values with the command; if you omit the value, the default value is \textit{ALL}.

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>Disable all of the following functions.</td>
</tr>
<tr>
<td>OPEN</td>
<td>Disable MVS OPEN interception. This command disables sequential file interception, local VSAM access, and remote VSAM access services of AR/CTL.</td>
</tr>
<tr>
<td>ATTACH</td>
<td>Disable MVS ATTACH interception. The command disables AR/CTL product participation in application program execution.</td>
</tr>
<tr>
<td>LINK</td>
<td>Disable MVS LINK interception for the AR/CTL component.</td>
</tr>
</tbody>
</table>
Performing an orderly shutdown before IPL

To perform an orderly shutdown of BMC Software subsystems before an IPL, stop the BCSS and stop the BMCP on each MVS image running AR/CTL products. Other steps might apply if the subsystems are shared with other BMC Software products; for more information, see the documentation for those products.

To perform an orderly shutdown for AR/CTL products, perform the following steps:

1. Required. Issue the following command to terminate BCSS processing:
   
   `bcssid SHUTDOWN`

2. Required. Issue the following command to terminate BMCP processing:
   
   `AUTOREG db2ssid`
   
   For the specified DB2 subsystem (`db2ssid`), disable all automatic registration processing for non-IMS application programs. If you omit the optional `db2ssid`, the command applies to any DB2 subsystem. For more information, see “Working with automatic registration records” on page 91.

   `AUTOREGUPD db2ssid`
   
   For the specified DB2 subsystem (`db2ssid`), disable all automatic registration processing for non-IMS application programs. If you omit the optional `db2ssid`, the command applies to any DB2 subsystem. For more information, see “Working with automatic registration records” on page 91.

   `AUTOREGREPL db2ssid`
   
   For the specified DB2 subsystem (`db2ssid`), disable all automatic registration processing for non-IMS application programs. If you omit the optional `db2ssid`, the command applies to any DB2 subsystem. For more information, see “Working with automatic registration records” on page 91.

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ALL</td>
<td>Disable the following function. (This function is equivalent to the LOGGING function.)</td>
</tr>
<tr>
<td>LOGGING</td>
<td>Disable the VSAM logging function. (You can abbreviate the function to L.)</td>
</tr>
</tbody>
</table>

2. Optional. Check the system log to ensure that the command completed successfully. The BCSS responds with messages indicating which components have been disabled.
Using the AR/CTL Status Check utility

The AR/CTL Status Check utility (program AESUVBCS) can test for the availability of AR/CTL components, AR/CTL products, and functions of the AR/CTL components. The utility can be executed as a stand-alone program at any time, or it can be called from the application address space.

Executing AESUVBCS as a stand-alone program

The sample JCL in Figure 18 shows how to execute program AESUVBCS as a stand-alone program.

Figure 18 AESUVBCS execution JCL

```jcl
//AESUVBCS JOB (ACCT),'PROGRAMMER NAME     ',CLASS=A,REGION=04096K,
// MSGLEVEL=(1,1),MSGCLASS=X,NOTIFY=USERID
//AESUVBCS EXEC PGM=AESUVBCS,
// PARM='ssid,COMPONENTS=(components),PRODUCTS=(products),SERVICES=(services),RETURNCODE=returncode',
// REGION=04096K
//STEPLIB DD DSNAME=BMCAES.V20.LOAD,DISP=SHR <== CONTAINS AESUVBCS
//SYSUDUMP DD SYSOUT=*<
```

Parameters control execution of the utility. Separate a keyword parameter from its value with an equal sign (=). Some parameters allow multiple parameter values. If you code more than one value, enclose the values within parentheses and separate them with commas. Use a comma to separate a parameter/value combination from other parameter/value combinations. Code a non-blank character in column 72 for continuation to the next line. The following EXEC statement PARM string shows an example of the syntax:

```jcl
//*---1234567---<
// PARM='BCS1,COMPONENTS=(IMS,NIMS),PRODUCTS=(ARC,ARD),SERVICES=(ATTACH,OPEN),ABEND=3000,REASONCODE=1'
```

The following parameters are valid:

- **ssid**
  
The subsystem ID parameter is positional and is required. It specifies the subsystem ID of the BCSS that you want to check.
EXECUTING AESUVBCS AS A STAND-ALONE PROGRAM

COMPONENTS

The COMPONENTS parameter indicates the AR/CTL components that you want to check. The following parameter values are valid; you can code multiple values:

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMS</td>
<td>Check the AR/CTL IMS component.</td>
</tr>
<tr>
<td>NIMS</td>
<td>Check the AR/CTL non-IMS component.</td>
</tr>
<tr>
<td>VSAM</td>
<td>Check the AR/CTL VSAM component.</td>
</tr>
</tbody>
</table>

PRODUCTS

The PRODUCTS parameter indicates the AR/CTL products that you want to check. The following parameter values are valid; you can code multiple values:

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARC</td>
<td>Check for a valid product license for AR/CTL for IMS.</td>
</tr>
<tr>
<td>ARD</td>
<td>Check for a valid product license for AR/CTL for DB2.</td>
</tr>
<tr>
<td>ARV</td>
<td>Check for a valid product license for AR/CTL for VSAM.</td>
</tr>
<tr>
<td>BCF</td>
<td>Check for a valid product license for BCF.</td>
</tr>
</tbody>
</table>

NOTE

An AR/CTL password will enable the AR/CTL products and the BCF component of those products.

If you have a BCF password, you can use that password to run BCF without AR/CTL.

You can also disable AR/CTL with the APPLICATION RESTART CONTROL Active flag in the AR/CTL general processing options record. See the APPLICATION RESTART CONTROL Reference Manual for more information.

SERVICES

The SERVICES parameter indicates the AR/CTL component functions that you want to check. The following parameter values are valid; you can code multiple values:

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ATTACH</td>
<td>Check for MVS ATTACH interception.</td>
</tr>
<tr>
<td>OPEN</td>
<td>Check for MVS OPEN interception.</td>
</tr>
<tr>
<td>LINK</td>
<td>Check for MVS LINK interception.</td>
</tr>
<tr>
<td>LOGGING</td>
<td>Check for AR/CTL for VSAM logging.</td>
</tr>
</tbody>
</table>
ABEND
The ABEND parameter indicates the user abend completion code that you want the utility to set if any check fails. The value must be specified in decimal digits greater than zero and less than 4096. Do not use the ABEND parameter if you use the RETURNCODE parameter.

REASONCODE
The REASONCODE parameter indicates the user abend reason code that you want the utility to set if any check fails. The value must be one to eight valid hexadecimal digits. The REASONCODE parameter is valid only if you use the ABEND parameter.

RETURNCODE
The RETURNCODE parameter indicates the return code that you want the utility to set if any check fails. The value must be specified in decimal digits greater than zero and less than 4096. Do not use the RETURNCODE parameter if you use the ABEND parameter.

Calling AESUVBCS from an application program

The assembler language statements in Figure 19 show how to call AESUVBCS from an application program address space.

Figure 19   AESUVBCS called from an application program

<table>
<thead>
<tr>
<th>LOAD</th>
<th>EP=AESUVBCS*</th>
<th>LOAD AESUVBCS</th>
</tr>
</thead>
<tbody>
<tr>
<td>LR</td>
<td>R15,R0</td>
<td>LOAD A(AESUVBCS)</td>
</tr>
<tr>
<td>LA</td>
<td>R1,@PARM</td>
<td>LOAD A(PARM LIST)</td>
</tr>
<tr>
<td>BASR</td>
<td>R14,R15</td>
<td>CALL AESUVBCS</td>
</tr>
<tr>
<td>LR</td>
<td>R2,R15</td>
<td>COPY RETURN CODE</td>
</tr>
<tr>
<td>*</td>
<td>DELETE EP=AESUVBCS*</td>
<td>DELETE AESUVBCS</td>
</tr>
<tr>
<td>*</td>
<td>LTR R2,R2</td>
<td>SERVICES AVAILABLE?</td>
</tr>
<tr>
<td>BNZ</td>
<td>SERVICES_NOT_AVAILABLE</td>
<td>NO -- ERROR</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>DC</td>
<td>0D'0'</td>
<td></td>
</tr>
<tr>
<td>@PARM</td>
<td>DC A(PARM_LEN)</td>
<td></td>
</tr>
<tr>
<td>DC</td>
<td>H'0'</td>
<td></td>
</tr>
<tr>
<td>PARM_LEN</td>
<td>DC AL2(L'PARM)</td>
<td></td>
</tr>
<tr>
<td>PARM</td>
<td>DC C'ssid,COMPONENT=component,...'</td>
<td></td>
</tr>
</tbody>
</table>
The halfword length of the parameter must immediately precede the parameter in virtual storage. When program AESUVBCS receives control, general purpose register 1 must contain the address of the halfword length of the parameter, immediately followed by the parameter.
Chapter 3

Working with the REGISET

This chapter provides essential information about the collection of registration data sets—the REGISET—that APPLICATION RESTART CONTROL (AR/CTL) products use as a repository for control information. This chapter contains the following information:

REGISET structure and use .................................................. 59
- Registration data sets ................................................. 60
- Primary registration data sets ...................................... 60
- Duplex registration data sets ....................................... 61
- REGISET cache .......................................................... 62
- REGISET records ....................................................... 62
Registration data set recovery ........................................... 63
- Recovering a primary registration data set ..................... 63
- Recovering a duplex registration data set ...................... 65
REGISET backups .......................................................... 66
AR/CTL REGISET population utility ................................. 66
- Records for AR/CTL .................................................. 67
- Records for AR/CTL .................................................. 67
- Records for the BCF component of AR/CTL ................. 69

REGISET structure and use

This section explains the physical structure of the REGISET and how it is associated with a BMC Consolidated Subsystem (BCSS).
Registration data sets

A registration data set is a VSAM KSDS that contains the information necessary for central control over various phases of application program processing with AR/CTL products. During configuration of AR/CTL products or other products that use the BCSS, you define a set of registration data sets called the REGISET. The BCSS manages the REGISET. Each BCSS uses only one REGISET, but a REGISET can be shared by more than one BCSS (if the BCSSs are running on different MVS images). The registration data sets that a BCSS uses are identified in the BCSS procedure (default name BMCBCSS) with DD statements.

You can define two types of registration data sets—primary and duplex—and you can define multiple data sets of each type. Each registration data set contains the same records as the other copies contain, and the BCSS keeps the records and their contents in sync. The REGISET usually is allocated as two primary registration data sets, but it can consist of a maximum of 11 primary and 11 duplex registration data sets. Whether a registration data set is treated as a primary or a duplex is determined by the ddnames in the BCSS procedure.

Depending on your recovery needs, you can define one of the following scenarios for your site:

- a single primary registration data set and multiple duplex registration data sets
- multiple primary registration data sets and no duplex registration data sets
- multiple primary registration data sets and multiple duplex registration data sets

BMC Software recommends use of two primary registration data sets and no duplex registration data sets.

Each registration data set must reside on a separate volume and cannot be defined as a multivolume data set.

**WARNING**

For a volume that contains a registration data set (especially a duplex registration data set), be careful when performing any process (such as a defrag operation) that might cause the volume to be unavailable for an extended time. Such a process can cause severe delays in REGISET processing.

Primary registration data sets

BCSS uses the primary registration data sets when providing AR/CTL components with responses to REGISET queries. You must have at least one primary registration data set; you can have as many as 11.
When you define more than one primary registration data set, you are using the Multiple Primary feature. If the active primary registration data set fails, a message is issued, indicating that the failing data set has been dropped from processing. Because an additional primary registration data set is available, normal processing continues, allowing you to recover the failing data set at a more convenient time. In addition, recovery of the failing data set is simplified because restoration is not necessary; you can define a valid primary registration data set.

When the BCSS updates a primary registration data set, it issues a hardware reserve against the volume. A primary registration data set should not reside on the same volume with another data set that might be reserved, such as an IMS RECON or a DB2 catalog. The shared reserve does not lock out access from the same MVS image but does lock out access from other different MVS images in a shared DASD configuration. Reserves are of short duration and occur only during update activity. The reserve is held until updates to all primary registration data sets and all duplex registration data sets are complete. Primary registration data sets are defined with SHAREOPTIONS(4,3).

For best results, place each primary registration data set on a volume that contains no other data sets. If this arrangement is not possible, you can place a primary registration data set on the same volume with another primary registration data set of a different REGISET, as long a both are defined to their BCSSs with the same ddname (REGISET, REGISET0, REGISET1, and so on).

**WARNING**

Do not place a primary registration data set on the same volume with any other registration data set (primary or duplex) unless it is another primary registration data set with the same ddname. Do not place a primary registration data set on a volume where an AR/CTL checkpoint data set might be allocated.

### Duplex registration data sets

The duplex registration data sets maintain active backup copies of the primary registration data sets. Using this type of registration data set is optional, but you can define as many as 11 duplex registration data sets.

The duplex registration data sets are used only for recovering primary registration data sets. When BCSS updates a primary registration data set, it also updates the duplex registration data sets. It makes these updates one at a time while holding a RESERVE on the primary registration data sets. This ensures that, if a failure occurs in the only available primary registration data set, the duplex registration data sets are, at most, one update behind. Subsystems can continue to function if one primary registration data set is available. Duplex registration data sets are defined with SHAREOPTIONS(4,3).
If you encounter a failure in a primary registration data set and there are no additional primary registration data sets, the BCSS stops. You can restore a primary registration data set by using an additional copy of the primary registration data set, one of the duplex registration data sets, or a backup copy of the primary registration data set.

Although the BCSS does not issue a reserve against the volume that contains a duplex registration data set, do not place a duplex registration data set on the same volume with any primary registration data set. For best results, place each duplex registration data set on a volume that contains no other data sets. If this arrangement is not possible, you can place a duplex registration data set on the same volume with another duplex registration data set of a different REGISET, as long as both are defined to their BCSSs with the same ddname (DUPLEX, DUPLEX0, DUPLEX1, and so on).

**REGISET cache**

The REGISET Cache feature substantially reduces the amount of I/O activity to the REGISET. This feature uses IBM Data Space technology and is available only in an MVS/ESA environment.

The cache size is variable and is controlled by the `DSPSIZE` parameter in the BCSS procedure (default name BMCBCSS). You can specify 1 MB to 2047 MB for `DSPSIZE`. The default value in the AR/CTL Installation System is 512 MB.

**REGISET records**

During AR/CTL configuration, the AR/CTL REGISET Population utility is executed to initialize the REGISET with required records for AR/CTL products. These records must be present in the REGISET for access to records through the ISPF interface and for correct processing during application program execution.

Records are created in the REGISET by people working through the ISPF interface, by the Population utility or a migration utility, and by AR/CTL products during application program execution.

Records are deleted from the REGISET by people working through the ISPF interface and by AR/CTL products during application program execution.
Registration data set recovery

This section provides instructions for recovering a primary or a duplex registration data set.

If the BCSS detects a REGISET failure, it issues a BMC Software message indicating that a registration data set (primary or duplex) has failed (dropped) and requires recovery. System programmers should recover the registration data set immediately. If you are using multiple primary registration data sets, immediate recovery is not necessary as long as additional primary registration data sets are available for recovery purposes.

Recovering a primary registration data set

Recovering a primary registration data set is a simple task when an additional primary registration data set is available. If no additional primary is available but a duplex registration data set is available, you can still recover a primary registration data set in a few simple steps.

When possible, use a duplex registration data set rather than a backup copy to recover a lost primary registration data set. If no primary or duplex data sets are available, you can use a backup copy for recovery, but you must perform steps to ensure correct backout and restart of the application programs that use AR/CTL products.

Recovery with another primary registration data set

To recover a primary registration data set when an additional primary registration data set is available, perform the following steps:

1 Required. Issue the following command to stop the BCSS (where bcsid is the subsystem identifier):

   bcsid SHUTDOWN

2 Required. Recover the failed primary registration data set. You can delete the failed data set (if it has not already been deleted) and redefine it, or you can define a new data set and change the startup procedure for the BCSS to refer to the new data set instead of the failed data set.

3 Required. Issue the following command to restart the BCSS (where bmcbcss is the procedure library member that contains the BCSS procedure):

   START bmcbcss
Recovering a primary registration data set

Recovery with a duplex registration data set

To recover the primary registration data set when no additional primary registration data set is available but a duplex registration data set is available, perform the following steps:

1. Required. Issue the following command to stop the BCSS (where bcsid is the subsystem identifier):
   
   ```
   bcsid SHUTDOWN
   ```

2. Required. Delete the failed primary registration data set.

3. Required. Redefine the primary registration data set (the redefined primary becomes the duplex in the next step). You can use the job in $Q04REGI of the AR/CTL install library as a model for definition.

4. In the BCSS procedure, switch ddname REGISET with ddname DUPLEX. This action causes the valid duplex data set to become the primary and the newly defined data set to become the duplex.

5. Required. Issue the following command to restart the BCSS (where bmcbcss is the procedure library member that contains the BCSS procedure):
   
   ```
   START bmcbcss
   ```

Recovering from a backup copy

Because much of the information in registration data sets changes frequently, recover a registration data set from an additional primary or duplex registration data set if at all possible. You can use a backup copy for recovery if each of the following conditions is true, such as in a disaster recovery situation:

- The primary registration data set fails.
- Another primary registration data set is not available.
- No duplex registration data set is available to recover the failed primary registration data set.
Recovering a duplex registration data set

Recovery from a backup is helpful only for restoring the records that people (and populate or migrate utilities) have created in the REGISET; these record types include registration records, processing option records, and dynamic allocation records. Records that AR/CTL products have created in the REGISET, such as restart control records and execution control records, reflect current execution conditions. Any records of these types in a backup of the REGISET are unlikely to be useful. After recovery from a backup copy, you must perform steps to ensure correct handling of application program executions that were active at the time of the REGISET failure.

To recover the primary registration data set from a backup copy, perform the following steps:

1 Required. Issue the following command to stop the BCSS (where bcsid is the subsystem identifier):

   `bcsid SHUTDOWN`

2 Required. Delete the failed primary registration data set.

3 Required. Redefine the primary registration data set. You can use the job in $Q04REGI of the AR/CTL install library as a model for definition.

4 Required. Use IDCAMS to `REPRO` the contents of a backup into the redefined primary registration data set.

5 Required. Issue the following command to restart the BCSS (where bmcbcss is the procedure library member that contains the BCSS procedure):

   `START bmcbcss`

---

Recovering a duplex registration data set

The BCSS corrects most duplex registration data set failures automatically. When the BCSS cannot fix a failed duplex registration data set, it issues a message stating that you will need to recover a particular duplex registration data set.

To recover a duplex registration data set, complete the following steps:

1 Required. Issue the following command to stop the BCSS (where bcsid is the subsystem identifier):

   `bcsid SHUTDOWN`

2 Required. Delete the failed duplex registration data set.
3 Required. Redefine the duplex registration data set. You can use the job in $Q04REGI of the AR/CTL install library as a model for definition.

**NOTE**

You do not need to use the IDCAMS `REPRO` command to copy the contents of a primary registration data set into a duplex registration data set. When the BCSS initializes, it makes the necessary changes to ensure the duplex registration data set is an exact copy of the primary registration data set.

4 Required. Issue the following command to restart the BCSS (where `bmcbcss` is the procedure library member that contains the BCSS procedure):

```
START bmcbcss
```

**REGISET backups**

For disaster recovery and other purposes, and if you plan to share the REGISET across CPUs, you should create a daily or weekly job to examine and back up all registration data sets.

Member #CHKREG in the AR/CTL sample library contains sample JCL to examine and back up the REGISET. The IDCAMS Examine function detects index errors before the errors must be recovered.

To make backup copies of your registration data sets, complete the following steps:

1 Required. Use the JCL in member #CHKREG of the AR/CTL sample library.

**NOTE**

BMC Software recommends that you create backup copies of the registration data sets with this JCL only. This JCL uses subsystem services to make the backup copies and guarantees the output as being the most recent copies of the registration data sets.

2 Required. Modify the JCL as needed, and submit the job.

**AR/CTL REGISET population utility**

The AR/CTL REGISET Population utility (program name AESURPOP) creates required records in the REGISET for AR/CTL products and the BATCH CONTROL FACILITY (BCF) component.
AESURPOP must be executed whenever you create a new REGISET and whenever you install maintenance to the AR/CTL products. The ISPF interface checks for the existence of required records created by AESURPOP.

### Records for AR/CTL

The utility constructs the following default records in the REGISET for AR/CTL products:

- AR/CTL global processing options record
- AR/CTL global non-IMS environment registration record
- AR/CTL global IMS environment registration record
- AR/CTL global dynamic allocation skeleton record for ddname ARCCHKP; the utility uses the following values for the allocation options:
  - unit is SYSALLDA
  - space type is CYLINDERS
  - primary space quantity is 1
  - volume serial is from an input parameter
  - data set name is &USER.&JOB.&DATE.&TIME.ARCCHKP
- AR/CTL global dynamic allocation skeleton record for ddname ARCDLTRC; the utility uses the following values for the allocation options:
  - unit is SYSALLDA
  - space type is CYLINDERS
  - primary space quantity is 1
  - block size is 32760
  - logical record size is 32756
  - volume serial is from an input parameter
  - data set name is &USER.&JOB.&DATE.&TIME.ARCDLTRC
AR/CTL global dynamic allocation skeleton record for ddname ARVDBLOG; the utility uses the following values for the allocation options:

- unit is SYSALLDA
- space type is CYLINDERS
- primary space quantity is 1
- secondary space quantity is 1
- block size is 32700
- volume serial is from an input parameter
- data set name is &USER.&JOB.&DATE.&TIME.ARVDBLOG

AR/CTL global dynamic allocation skeleton record for ddname ARCHIST; the utility uses the following values for the allocation options:

- unit is SYSALLDA
- space type is CYLINDERS
- primary space quantity is 1
- secondary space quantity is 1
- block size is 12288
- record size is 197
- volume serial is from an input parameter
- data set name is SYS1.ARCHIST

AR/CTL default checkpoint pacing class record

AR/CTL default checkpoint pacing shift record; the utility sets the shift to 1

AR/CTL default reattach class record; the utility primes the record with the following abend code and return code combinations eligible for reattach:

- S04E with 00E7000F
- S04E with 00E70010
- S04E with 00D44033
- U777 with 00000000

AR/CTL default program exception class record

AR/CTL default SQL return code class record
Records for the BCF component of AR/CTL

The utility constructs the following default records in the REGISET for the BCF component of the AR/CTL products:

- BCF global processing options record
- BCF global dynamic allocation skeleton record for ddname IEFRDER; the utility uses the default value SYSALLDA for the unit type
Working with AR/CTL records

This chapter describes how to create and change the APPLICATION RESTART CONTROL (AR/CTL) records in the REGISET. These AR/CTL records provide information to the AR/CTL application supervisor about the participation of AR/CTL and the BATCH CONTROL FACILITY (BCF) component during application program execution. This chapter contains the following information:

- Overview
- Working with AR/CTL records
  - Using the Active BMC Consolidated Subsystems panel
- Working with AR/CTL global options
  - AES application supervisor active
  - Initialization error option
  - Force BCF execution
  - Force AR/CTL execution
  - Program abend option
  - Program return code option
  - Normal termination SYSOUT class
- Setting AR/CTL processing options in the AESSYSIN data set
  - Control statement syntax
  - Keyword summary
- Working with non-IMS environment registration records
- Working with non-IMS program registration records
- Working with non-IMS program exclusion records
- Working with automatic registration records
  - Overview
  - Enabling and disabling automatic non-IMS program registration
  - Enabling and disabling SMF auditing
  - Accessing automatic registration records
  - Specifying automatic registration record criteria
- Working with IMS environment registration records
- Working with IMS program registration records
- Working with IMS program exclusion records
Overview

AR/CTL and the BCF component execute under the AR/CTL application supervisor. The AR/CTL application supervisor uses AR/CTL records in the REGISET to identify application program executions that require AR/CTL services, BCF component services, or both. AR/CTL records can also contain options to customize execution. You can use the AR/CTL ISPF interface to create and update AR/CTL records:

- The AR/CTL global options record contains values for the AR/CTL processing options, which define how you want the AR/CTL application supervisor to handle situations such as an initialization failure of an AR/CTL product and the issuing of abend codes. AR/CTL global option values apply to all job steps that are executed using the AR/CTL products. For a particular job step execution, you can also set AR/CTL processing options by using keywords in the AESSYSIN data set. The AR/CTL global options record is created during AR/CTL configuration. You can use the ISPF interface to display and change the record.

- A non-IMS environment registration record contains the data set names of the AR/CTL load module libraries. This type of record is used when an application program does not use IMS or IMS-type structures. The global non-IMS environment registration record is created during AR/CTL configuration. You can use the ISPF interface to add, delete, display, and change records of this type.

- A non-IMS program registration record causes the participation of AR/CTL during execution of an application program that does not use IMS or IMS-type structures. (The program can be registered for the AR/CTL for DB2 batch attachment facility only.) The record can contain information about DB2 entities, if applicable. You can use the ISPF interface to add, delete, display, and change records of this type.

- A non-IMS program exclusion record prevents the participation of AR/CTL during execution of an application program that does not use IMS or IMS-type structures. You can use the ISPF interface to add, delete, display, and change records of this type.

- An automatic registration record causes the AR/CTL application supervisor to create a non-IMS program registration record automatically when an eligible application program is executed. Then the program uses AR/CTL services as defined in this non-IMS program registration record and applicable AR/CTL records. (The program can be registered for the AR/CTL for DB2 batch attachment facility only.) You can use the ISPF interface to add, delete, display, and change records of this type.
Working with AR/CTL records

To access AR/CTL records through the AR/CTL ISPF interface, perform the following steps; for more information about any of these steps, see Chapter 1, “Introduction.”

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).
2. Type 1 (AES records) in the choice entry field.
3. Press Enter. The AR/CTL ISPF interface displays the Application Enhancement Series Records panel (Figure 20).

An IMS environment registration record contains the data set names of the AR/CTL and the BCF component load module libraries. This type of record is used when an application program uses IMS or IMS-type structures. The global IMS environment registration record is created during AR/CTL configuration. You can use the ISPF interface to add, delete, display, and change records of this type.

An IMS program registration record causes the participation of AR/CTL and the BCF component during execution of an application program that uses IMS or IMS-type structures. The record might contain information about AR/CTL options to use in the IMS environment. You can use the ISPF interface to add, delete, display, and change records of this type.

An IMS program exclusion record prevents the participation of AR/CTL and the BCF component during execution of an application program that uses IMS or IMS-type structures. You can use the ISPF interface to add, delete, display, and change records of this type.
Type or verify the BMC Consolidated Subsystem (BCSS) identifier (BCSID). If you don’t know which BCSS to use, or if you want to know which ones are active, type ? or blanks for a list of active subsystems; the AR/CTL ISPF interface displays the Active BMC Consolidated Subsystems panel (Figure 21 on page 75).

**NOTE**
If you receive message AESM31A SSCT NOT FOUND, the BCSS is not active.

The **Current BCSS subsystem type** field displays the type and version of the BCSS. The version of the BCSS usually does not correspond to the level of AR/CTL. For more information about the BCSS, see the *APPLICATION RESTART CONTROL Configuration Guide*.

Type one of the following options in the choice entry field:

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
<th>More information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Work with AR/CTL global options records.</td>
<td>“Working with AR/CTL records” on page 73.</td>
</tr>
<tr>
<td>2</td>
<td>Work with non-IMS environment registration records.</td>
<td>“Working with non-IMS environment registration records” on page 84.</td>
</tr>
<tr>
<td>3</td>
<td>Work with non-IMS program registration records.</td>
<td>“Working with non-IMS program registration records” on page 86.</td>
</tr>
<tr>
<td>4</td>
<td>Work with non-IMS program exclusion records.</td>
<td>“Working with non-IMS program exclusion records” on page 89.</td>
</tr>
</tbody>
</table>
Using the Active BMC Consolidated Subsystems panel

If you enter ? or blanks in the BCSS identifier (BCSID) field on the Application Enhancement Series Records panel, AR/CTL displays the Active BMC Consolidated Subsystems panel (Figure 21). Use this panel to select the BCSS (and REGISET) you want to work with.

NOTE
If no BCSS is active, AR/CTL displays a message instead of the Active BMC Consolidated Subsystems panel.

For the MVS system where your TSO session is running, the panel lists all BCSSs that have been started since the last IPL and that are still active. The types PRIVATE and PUBLIC are defined when the subsystem is installed.

The BCSS must be started (active) before you can connect to it. For more information about starting the BCSS, see Chapter 2, “Working with BMC Software subsystems.”

Figure 21  Active BMC Consolidated Subsystems panel

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
<th>More information</th>
</tr>
</thead>
<tbody>
<tr>
<td>5</td>
<td>Work with automatic registration records.</td>
<td>“Working with automatic registration records” on page 91.</td>
</tr>
<tr>
<td>6</td>
<td>Work with IMS environment registration records.</td>
<td>“Working with IMS environment registration records” on page 104.</td>
</tr>
<tr>
<td>7</td>
<td>Work with IMS program registration records.</td>
<td>“Working with IMS program registration records” on page 105.</td>
</tr>
</tbody>
</table>
Working with AR/CTL global options

To display and change AR/CTL processing option values in the AR/CTL global options record, perform the following steps; for more information about any of these steps, see Chapter 1, “Introduction.”

1 Access the Application Enhancement Series primary menu (Figure 12 on page 32).

2 Type 1 (AES records) in the choice entry field.

3 Press Enter. The AR/CTL ISPF interface displays the Application Enhancement Series Records panel (Figure 20 on page 74).

4 Type or verify the BCSID.

5 Type 1 (AES global options) in the choice entry field.

6 Press Enter. The AR/CTL ISPF interface displays the AES Global Processing Options panel (Figure 22).

7 On the AES Global Processing Options panel, type or verify values for the AR/CTL global options. The following sections provide details about these options.

**Figure 22 AES GLOBAL Processing Options panel**

<table>
<thead>
<tr>
<th>AESOPY01</th>
<th>AES Global Options Record</th>
</tr>
</thead>
<tbody>
<tr>
<td>Type or verify values. Then press Enter. For information about an option, type ? in the field.</td>
<td>Commands: CANcel SAVE</td>
</tr>
<tr>
<td>AES application supervisor active Y (Y,N)</td>
<td></td>
</tr>
<tr>
<td>Initialization error option . . . . . IMS (IMS,ABEND)</td>
<td></td>
</tr>
<tr>
<td>Force BCF execution . . . . . . . . N (N,Y)</td>
<td></td>
</tr>
<tr>
<td>Force AR/CTL execution . . . . . . N (N,Y,BMP,DLI)</td>
<td></td>
</tr>
<tr>
<td>Program abend option . . . . . . . PASS (PASS,BMC)</td>
<td></td>
</tr>
<tr>
<td>Program return code option . . . . . PASS (PASS,BMC)</td>
<td></td>
</tr>
<tr>
<td>Normal termination SYSOUT class . . * (A-Z,1-9,*)</td>
<td></td>
</tr>
</tbody>
</table>

**AES application supervisor active**

Use this option to activate or deactivate the AR/CTL application supervisor.

**ISPF panel field**

AES application supervisor active
AESSYSIN keyword
AESACTive

Values
Set one of the following values:

- Y—Initialize and activate the AR/CTL application supervisor. This is the default value.
- N—Bypass initialization of the AR/CTL application supervisor. AR/CTL products will not be used. IMS or native routines will be used instead.

Initialization error option

Use this option to specify the action to take if the AR/CTL application supervisor cannot initialize in an IMS environment.

ISPF panel field
  Initialization error option

AESSYSIN keyword
  INITERR

Values
Set one of the following values:

- IMS—Pass control to native IMS routines if the application program executes in an IMS environment. This is the default value.
- ABEND—Allow the application program to abend. Set this value if the application program is executing in a non-IMS environment or if the application program accesses a combination of IMS and non-IMS data.

Force BCF execution

Use this option to specify the action to take if the BCF component of the AR/CTL products cannot initialize.

NOTE
This option is ignored for a batch message processing (BMP) region.
Force AR/CTL execution

ISPF panel field
Force BCF execution

AESSYSIN keyword
FORCEBcf

Values
Set one of the following values:

- **N**—Allow the AR/CTL application supervisor to continue initializing if the BCF component is not installed or fails to initialize properly. This is the default value.
- **Y**—Stop the AR/CTL application supervisor if the BCF component is not installed or fails to initialize properly.

**Force AR/CTL execution**

Use this option to specify the action to take if AR/CTL for IMS cannot initialize in an IMS environment. A value of **Y** is forced if AR/CTL for IMS is working in IMS-compatible mode.

**NOTE**
This option is available only with AR/CTL for IMS.
Values
Set one of the following values:

- **N**—Allow the AR/CTL application supervisor to continue initializing if AR/CTL for IMS is not installed or fails to initialize properly. This is the default value.
- **Y**—Stop the AR/CTL application supervisor from initializing if AR/CTL for IMS is not installed or fails to initialize properly.
- **BMP**—Stop the AR/CTL application supervisor from initializing if AR/CTL for IMS is not installed or fails to initialize properly in a BMP environment. (Continue initializing if AR/CTL for IMS is not installed or fails to initialize properly in an IMS DL/I environment.)
- **DLI**—Stop the AR/CTL application supervisor from initializing if AR/CTL for IMS is not installed or fails to initialize properly in a DL/I environment. (Continue initializing if AR/CTL for IMS is not installed or fails to initialize properly in an IMS BMP environment.)

**NOTE**
If the application program updates a full-function IMS database and you specify **DLI** while the BCF component is not active, you must manually back out the changes before you can restart the application.

Program abend option

Use this option to control the abend code that the AR/CTL application supervisor issues if the application program abends.

The Program Abend option allows an automated operations program to determine whether an AR/CTL product has participated in the job step execution. When an application program terminates abnormally, the value you set for this option determines whether the job step ends with an application program abend code or whether the application program abend code is replaced with an abend code supplied by the AR/CTL application supervisor.

**ISPF panel field**
Program abend option

**AESSYSIN keyword**
ABEND
Program return code option

Values
Set one of following values:

- **PASS**—Terminate with the abend code from the application program. If you set this option to **PASS**, the AR/CTL application supervisor passes the abend code from the application program at job step termination. It also reports the application program abend code in message BMC74404I in the job log data set. This is the default value.

- **BMC**—Terminate with abend code U1568 instead of the abend code from the application program. The AR/CTL application supervisor reports the abend code from the application program in message BMC74404I in the job log data set.

Program return code option

Use this option to control the program return code set by the AR/CTL application supervisor during job step termination.

This option is similar to the Program Abend option. If subsequent job steps, automated operations, or restart products must be able to determine whether an AR/CTL product participated in the job step execution, set this option to **BMC**. Set this option to **PASS** to pass the return code from the application program at job step termination.

ISPF panel field
Program return code option

AESSYSIN keyword
RC

Values
Set one of following values:

- **PASS**—Pass the return code from the application program. This is the default value.

- **BMC**—Issue the AR/CTL return code at job step termination. Return code 98 is issued if the return code from the application program is not 0 but the job step terminates normally. If the return code from the application is 0, AR/CTL passes it as usual.
Normal termination SYSOUT class

Use this option to set the SYSOUT class and the output class to dynamically allocate AESPRINT print data sets for printing AR/CTL application supervisor information. If the job step terminates normally and one of these data sets is dynamically allocated, the data set is dynamically unallocated and directed to the SYSOUT class specified as the value of the SYSOUT Class option. If the job step terminates abnormally, the data set is directed to the default SYSOUT class (SYSOUT=*). AESPRINT data sets can be dynamically allocated if the AESPRINT DD statement is not present in the JCL.

ISPF panel field
SYSOUT class

AESSYSIN keyword
SYSOUT

Values
Set one of following values:

- * — Use the same output class as the job message class. This is the default value.
- class — Use this output device class (A to Z, 1 to 9) at normal termination.

Setting AR/CTL processing options in the AESSYSIN data set

To set AR/CTL processing options at the execution (AESSYSIN) level, you can code keywords in the AESSYSIN data set. This option level is less flexible than the other levels. BMC Software recommends that you set execution-level options only when no other option level meets your needs, such as when testing a specific feature or setting a one-time override value.

This section explains AESSYSIN syntax and summarizes the uses of the keywords.

Control statement syntax

The AR/CTL common routines employ a free-form control statement syntax. The elements you can combine are keywords, their values, and separators. Figure 23 shows an example of a control statement in the AESSYSIN data set.
The following rules apply to control statement syntax:

**Keywords and values**
Keywords can begin in any column and can be coded in any order. An equal sign (=) follows the keyword, and the value follows the equal sign, with no intervening blanks. Table 3 on page 82 lists the AESSYSIN keywords and their valid values.

**Separators**
Use one or more blanks and/or a comma to separate the keywords. (Do not use a blank or a comma between a keyword and its value.

**Continuation**
To continue a statement to the next line, no continuation character is necessary. You must keep a keyword and its value on the same line. You can use columns 1 to 72 only.

**Syntax errors**
If the AR/CTL common routines detect a syntax error while processing the AESSYSIN data set, they complete processing of the control statements, write error messages to the AESPRINT data set, and issue an abend for the job step. You can provide the AESPRINT DD statement in the job step JCL. If you omit the AESPRINT DD statement, it is allocated dynamically.

### Keyword summary

Table 3 provides a summary of basic information about the AR/CTL processing options. Each option is discussed in detail on the indicated pages.

#### Table 3  AR/CTL processing options summary (part 1 of 2)

<table>
<thead>
<tr>
<th>ISPF panel field</th>
<th>AESSYSIN keyword</th>
<th>Valid values</th>
<th>Initial default value</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>AES application supervisor active</td>
<td>AESACTive</td>
<td>Y, N</td>
<td>Y</td>
<td>76</td>
</tr>
<tr>
<td>Initialization error option</td>
<td>INITERR</td>
<td>IMS, Abend</td>
<td>IMS</td>
<td>77</td>
</tr>
</tbody>
</table>
You can use keywords in the AESSYSIN data set to specify DB2 connection information.

### DB2PLAN keyword

You can use the DB2PLAN option to specify the DB2 plan name to use for DB2 programs. This specification overrides all other DB2 plan information that is specified with other methods (non-IMS program registration record, DDITV02, AESSSMLB, SSM member, and so on).

#### ISPF panel field

- **none**

#### AESSYSIN keyword

- **DB2PLAN**

<table>
<thead>
<tr>
<th>ISPF panel field</th>
<th>AESSYSIN keyword</th>
<th>Valid values</th>
<th>Initial default value</th>
<th>Page</th>
</tr>
</thead>
<tbody>
<tr>
<td>Force BCF execution</td>
<td>FORCEBcf</td>
<td>N, Y</td>
<td>N</td>
<td>77</td>
</tr>
<tr>
<td>Force AR/CTL execution</td>
<td>FORCEArc</td>
<td>N, Y, BMP, DLI</td>
<td>N</td>
<td>78</td>
</tr>
<tr>
<td>Program abend option</td>
<td>ABEND</td>
<td>PASS, BMC</td>
<td>PASS</td>
<td>79</td>
</tr>
<tr>
<td>Program return code option</td>
<td>RC</td>
<td>PASS, BMC</td>
<td>PASS</td>
<td>80</td>
</tr>
<tr>
<td>SYSOUT class</td>
<td>SYSOUT</td>
<td>* class (A–Z, 1–9)</td>
<td>*</td>
<td>81</td>
</tr>
</tbody>
</table>
Values
Set the value to the DB2 plan name. There is no default value.

DB2SSNM keyword

You can use the DB2SSNM option to specify the DB2 subsystem ID to use for DB2 programs. This specification overrides all other DB2 subsystem ID information that is specified with other methods (non-IMS program registration record, DDITV02, AESSSMLB, SSM member, and so on).

ISPF panel field
none

AESSYSIN keyword
DB2SSNM

Values
Set the value to the DB2 subsystem ID. There is no default value.

Working with non-IMS environment registration records

To provide access to the AR/CTL product execution modules in a non-IMS environment, create one or more non-IMS environment registration records in the REGISET. A non-IMS environment is any environment where IMS is not active and where the application programs that execute in the environment do not use IMS-type calls and structures.

To work with non-IMS environment registration records, perform the following steps; for more information about any of these steps, see Chapter 1, “Introduction.”

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).
2. Type 1 (AES records) in the choice entry field.
3. Press Enter. The AR/CTL ISPF interface displays the Application Enhancement Series Records panel (Figure 20 on page 74).
4. Type or verify the BCSID.
5. Type 2 (Non-IMS Environment registration) in the choice entry field.
6 Press Enter. The AR/CTL ISPF interface displays the Limit List of Records panel (Figure 13 on page 32).

7 Type or verify the qualifiers for limiting the list of records. You can use specific and wildcard characters as explained in “Wildcard characters in record qualifiers” on page 23.

8 Press Enter. The AR/CTL ISPF interface displays the List Records panel (Figure 14 on page 33), showing a list of records that match your selection criteria.

9 Select one or more records to display (and possibly update) or to delete. Or enter the ADD command to create a new record.

10 Press Enter:

- If you entered the ADD command, the AR/CTL ISPF interface displays the non-IMS environment registration Add Record panel (Figure 24).

- If you selected a record to display, the AR/CTL ISPF interface displays the non-IMS environment registration Display Record panel (not shown). This panel is similar to the Add Record panel, except that you do not enter the record ID to use.

- If you selected a record to delete, the AR/CTL ISPF interface displays the Delete Record panel (Figure 16 on page 35) to confirm the deletion.

11 On the Add Record or Display Record panel, type or verify the data set name of the AES execution load module library and the AR/CTL execution load module library. The AES execution load module library and the AR/CTL execution load module library should reside in the same data set.

**Figure 24 Add Record (Non-IMS environment registration) panel**

```
AESPNIVV                           Add Record
Command ===> __________________________________________________________________
BCSID   : AESQ      Record type : Non-IMS environment registration
Type positional masking characters and wildcard characters (*) in key fields.
Type values in option fields. Then press Enter.
Record ID
ARCID . . . . . . . . TEST
MVSID . . . . . . . . TEST
AES load library DSN . . . . ___________________________________________
ARC/CTL load library DSN . . ___________________________________________
```
Working with non-IMS program registration records

To set up an AR/CTL product to participate in the execution of a non-IMS application program, create one or more non-IMS program registration records in the REGISET. In a non-IMS program, IMS is not active and the program does not use IMS-type calls and structures.

**NOTE**

You might be able to use an automatic registration record to create non-IMS program registration records automatically as eligible application programs are executed. For more information, see “Working with automatic registration records” on page 91.

To work with non-IMS program registration records, perform the following steps; for more information about any of these steps, see Chapter 1, “Introduction.”

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).
2. Type **1** (AES records) in the choice entry field.
3. Press Enter. The AR/CTL ISPF interface displays the Application Enhancement Series Records panel (Figure 20 on page 74).
4. Type or verify the BCSID.
5. Type **3** (Non-IMS Program manual registration) in the choice entry field.
6. Press Enter. The AR/CTL ISPF interface displays the Limit List of Records panel (Figure 13 on page 32).
7. Type or verify the qualifiers for limiting the list of records. You can use specific and wildcard characters as explained in “Wildcard characters in record qualifiers” on page 23.
8. Press Enter. The AR/CTL ISPF interface displays the List Records panel (Figure 14 on page 33), showing a list of records that match your selection criteria.
9. Select one or more records to display (and possibly update) or to delete. Or enter the **ADD** command to create a new record.
10. Press Enter:

   - If you entered the **ADD** command, the AR/CTL ISPF interface displays the non-IMS program registration Add Record panel (Figure 25).
- If you selected a record to display, the AR/CTL ISPF interface displays the non-IMS program registration Display Record panel (not shown). This panel is similar to the Add Record panel, except that you do not enter the record ID to use.

- The block at the bottom of the Display Record panel displays the message AESM032A, followed by the user ID, date, and time of the last update to the record.

- If you selected a record to delete, the AR/CTL ISPF interface displays the Delete Record panel (Figure 16 on page 35) to confirm the deletion.

**Figure 25  Add Record (Non-IMS program registration) panel**

On the Add Record panel or the Display Record panel, type or verify the record qualifiers to use. You cannot enter all wildcard characters in the PROGNAME, PROCSTEP, JOBSTEP, and JOBNAME qualifiers; at least one of these qualifier must contain one non-wildcard, non-blank character.

Certain program names (for example, IKJEFT01 and ARCCRTL) are not valid for the PROGNAME qualifier of a non-IMS program registration record. The ISPF interface prevents you from entering an invalid program name.

**WARNING**

Indiscriminate use of wildcard characters in the PROGNAME qualifier can cause AR/CTL to initialize in program executions where AR/CTL processing is invalid or unnecessary; possible results include abnormal termination of multiple programs, unwanted overhead, and other undesirable effects.
12 Type or verify the values to use for these options:

**ASB name**
Optional. Specify the name (1 to 8 characters) of the application specification block (ASB) used by the application program. An ASB is an AR/CTL control block, also known as a program option member, that communicates information between an application program and AR/CTL. The ASB is associated with data set option members (FCBs) that identify information about the data sets that use AR/CTL data services. The panel primes the field with the name of the default ASB, AUTO$ASB. If you enter blanks in this field, AR/CTL uses the program name for the ASB name.

**AR/CTL Identifier (ARCID)**
Optional. Specify the ARCID (1 to 4 bytes) to associate with this program. The ARCID is a qualifier of the record ID of many other AR/CTL records in the REGISET. BMC Software recommends that you do not use the DB2 system ID or any other subsystem ID as the ARCID.

**DB2 subsystem name**
Required for DB2 programs; do not specify for non-DB2 programs. Specify the DB2 subsystem name. This value tells AR/CTL that the program uses DB2. AR/CTL uses the name you specify to locate DB2 connection information.

**DB2 plan name**
Required for DB2 programs if the plan name is the different from the program name; otherwise, not applicable. Specify the DB2 plan name.

---

**NOTE**
If a non-IMS program registration record and a subsystem member (SSM) both apply to an application execution, AR/CTL uses the plan name in the program registration record.

**DB2 attachment facility ONLY**
Optional. Use this option to enable all AR/CTL services for the application program or to use only the AR/CTL for DB2 batch attachment facility for the program. Specify one of the following values. The default value is N.

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Initialize the program execution environment for the use of all applicable AR/CTL services.</td>
</tr>
<tr>
<td>CAF</td>
<td>Initialize the program execution environment for the AR/CTL for DB2 batch attachment facility only. AR/CTL provides a call attachment facility (CAF) connection to the DB2 subsystem for the registered program.</td>
</tr>
<tr>
<td>RRS</td>
<td>Initialize the program execution environment for the AR/CTL for DB2 batch attachment facility only. AR/CTL provides a Resource Recovery Services (RRS) connection to the DB2 subsystem for the registered program. AR/CTL provides no RRS support other than the connection to DB2.</td>
</tr>
</tbody>
</table>
Error return code
Optional. In this field, specify the return code (0–4095) that you want the AR/CTL application supervisor to issue for the application program job step if the AR/CTL for DB2 batch attachment facility encounters any error with the connection to DB2. The AR/CTL application supervisor returns control to the application program after issuing this return code. If you specify a value other than 0 in this field, you cannot specify a value in the Abend code field. The default value is 0.

This option has meaning only if you specify CAF or RRS for the DB2 Attachment Facility Only option.

Abend code
Optional. In this field, specify a value (0–4095) if you want the AR/CTL application supervisor to issue an abend for the application program job step if the AR/CTL for DB2 batch attachment facility encounters any error with the connection to DB2. The AR/CTL application supervisor sets the abend code to the specified value and does not return control to the application program. If you specify a value other than 0 in this field, you cannot specify a value in the Error return code field. The default value is 0.

This option has meaning only if you specify CAF or RRS for the DB2 Attachment Facility Only option.

Reason code
Optional. In this field, specify the reason code (8 hexadecimal digits) that you want the AR/CTL application supervisor to issue when it issues an abend as specified in the Abend code field. If the value in the Abend code field is 0, this field is ignored. The default value is 00000000.

Working with non-IMS program exclusion records

To prevent AR/CTL product participation in the execution of non-IMS application programs, create one or more non-IMS program exclusion records in the REGSET. In a non-IMS program, IMS is not active and the program does not use IMS-type calls and structures.

To work with non-IMS program exclusion records, perform the following steps; for more information about any of these steps, see Chapter 1, “Introduction.”

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).

2. Type 1 (AES records) in the choice entry field.
3 Press Enter. The AR/CTL ISPF interface displays the Application Enhancement Series Records panel (Figure 20 on page 74).

4 Type or verify the BCSID.

5 Type 4 (Non-IMS program exclusion) in the choice entry field.

6 Press Enter. The AR/CTL ISPF interface displays the Limit List of Records panel (Figure 13 on page 32).

7 Type or verify the qualifiers for limiting the list of records. You can use specific and wildcard characters as explained in “Wildcard characters in record qualifiers” on page 23.

8 Press Enter. The AR/CTL ISPF interface displays the List Records panel (Figure 14 on page 33), showing a list of records that match your selection criteria.

9 Select one or more records to display (and possibly update) or to delete. Or enter the ADD command to create a new record.

10 Press Enter:
   - If you entered the ADD command, the AR/CTL ISPF interface displays the non-IMS program exclusion Add Record panel (Figure 26).
   - If you selected a record to display, the AR/CTL ISPF interface displays the non-IMS program exclusion Display Record panel (not shown). This panel is similar to the Add Record panel, except that you do not enter the record ID to use.
   - If you selected a record to delete, the AR/CTL ISPF interface displays the Delete Record panel (Figure 16 on page 35) to confirm the deletion.

Figure 26  Add Record (Non-IMS Program Exclusion) panel
On the Add Record or Display Record panel, type or verify the qualifiers to use in the record ID.

Working with automatic registration records

The following sections describe how to use automatic registration records.

Overview

For an AR/CTL product to participate in the execution of a non-IMS application program, an applicable non-IMS program registration record must be present in the REGISET. You can create a non-IMS program registration record manually (as explained in “Working with non-IMS program registration records” on page 86), or the AR/CTL application supervisor might be able to create these records automatically from the criteria that you specify in an automatic registration record.

For DB2 application job steps, automatic registration records identify the ddname that, if present in the job step, causes the AR/CTL application supervisor to register the job step for AR/CTL product services. The AR/CTL application supervisor can also extract DB2 connection parameters from the data set that is associated with this ddname. The connection parameters can be indicated in the nodes of the data set name or can be contained in the first record in the data set.

For non-DB2, non-IMS programs, automatic registration records identify the ddname that, if present in the job step, causes the AR/CTL application supervisor to register the job step for AR/CTL product services.

NOTE

Automatic registration records apply to non-IMS job steps only.

Criteria sets

An automatic registration record contains four sets of criteria. Each set contains the ddname that identifies the job step as eligible for AR/CTL product participation. Each set also contains the option values that the AR/CTL application supervisor should use in the newly created non-IMS program registration record and, if applicable, describes the method for obtaining the required parameters for connecting to a DB2 subsystem. The following sets of criteria are available in each automatic registration record:
QUICKSTART DSNAME criteria
This set of criteria applies to job steps that use the nodes of a data set name to identify the job step as eligible for AR/CTL product participation and, if applicable, DB2 subsystem connections. You specify the ddname of the data set and, if applicable, identify the nodes that contain the required connection information.

Programs that are set up to use the BMC Software QUICKSTART for MVS product and use the DB2 DSN format convention for connecting to DB2 usually use the following defaults:

- The ddname of the data set is DSNPARMS.
- The second node of the data set name is the DB2 subsystem ID.
- The third node of the data set name is the plan name.

alternate DSNAME criteria
This set of criteria also applies to job steps that use the nodes of a data set name to identify the job step as eligible for AR/CTL product participation. The options are identical to the options in the QUICKSTART criteria set, but the option values that you specify can be different.

primary record criteria
This set of criteria applies to job steps that use the first record in a data set to identify the job step as eligible for AR/CTL product participation. You specify the ddname of the data set and, if applicable, the offsets of locations within the record that contain the required DB2 connection information.

For example, programs might be set up to use the following conventions: the ddname of the connection information data set is DSNPARM, the DB2 subsystem ID starts in column 1, and the plan name starts in column 9.

alternate record criteria
This set of criteria also applies to job steps that use the first record in a data set to identify the job step as eligible for AR/CTL product participation. The options are identical to the options in the primary record criteria set, but the option values that you specify can be different.

Usage order
You assign a usage order to each set of criteria to tell the AR/CTL application supervisor which set to use first, second, third, fourth, or not at all. You can assign the same usage order value to multiple sets; when the AR/CTL application supervisor encounters the same usage order on multiple sets, it uses the sets in the following order:
1. QUICKSTART DSNAME criteria

2. alternate DSNAME criteria

3. primary record criteria

4. alternate record criteria

**Creation of non-IMS program registration records**

If use of automatic program registration records is enabled and the AR/CTL application supervisor detects the execution of a non-IMS application program that has no applicable non-IMS program registration record, the supervisor checks for an applicable automatic registration record. If an applicable record is present, the supervisor attempts to apply a set of criteria according to the assigned usage order. If a set of criteria applies to this execution, the supervisor uses the information in the automatic registration record to create a new non-IMS program registration record in the REGISET, and this job step would execute with the AR/CTL for DB2 batch attachment facility or with full AR/CTL services (depending on the criteria that were specified in the record). If no set of criteria applies, the supervisor does not create a non-IMS program registration record, and job step processing continues without AR/CTL product participation.

**Enabling and disabling automatic non-IMS program registration**

You use AR/CTL component BCSS commands to enable and disable automatic registration functionality. For example, to enable and disable processing of automatic registration records and updating of DB2 subsystem IDs and plan names, you would execute the following BCSS commands. (In these commands, `bcssid` is the BCSS ID, and `db2ssid` is an optional DB2 subsystem ID.) For complete information, see “AR/CTL component command tasks” on page 49.

```
bcssid AES NIMS ENABLE AUTOREGUPD db2ssid
bcssid AES NIMS DISABLE AUTOREGUPD db2ssid
```

For the AR/CTL application supervisor to perform automatic registration processing, non-IMS ATTACH SVC screening must be enabled. You should enable automatic registration before you enable ATTACH SVC screening, and you should disable ATTACH SVC screening before you disable automatic registration processing.
If automatic registration is disabled, the AR/CTL application supervisor makes no attempt to match executing application programs with automatic registration records; however, any existing program registration records continue to be used until non-IMS ATTACH SVC screening is disabled.

For each BCSS, the AR/CTL application supervisor maintains a single table of DB2 subsystem IDs. The highest level of automatic registration that is enabled for any DB2 subsystem in the table is performed for all DB2 subsystems in the table. The highest level of automatic registration is AUTOREGREPL. The next level is AUTOREGUPD. The lowest level is AUTOREG. To use a lower level after enabling a higher level on a BCSS, you must disable automatic registration for all DB2 subsystems on the BCSS and then enable them for the lower level.

Enabling and disabling SMF auditing

You use AR/CTL component BCSS commands to enable and disable System Management Facilities (SMF) auditing within AR/CTL. For example, to enable and disable logging of updates to BCS REGISET AR/CTL records, you would execute the following BCSS commands. For complete information, see “AR/CTL component command tasks” on page 49.

```plaintext
bcssid AES ENABLE AUDIT RECORD TYPE=ttt SUBTYPE=sssss SSID=iiii
bcssid AES DISABLE AUDIT
```

The command variables are defined as follows:

- **bcssid**: the BCSS ID
- **ttt**: the SMF record type
  - The SMF record type must be three digits. The valid range is 128 through 255.
- **sssss**: the SMF record subtype
  - Optional. The SMF record subtype can be from one to five digits. The valid range is zero through 32767. You can specify any subtype that is valid for the level of the operating system that you are using. If you do not specify a subtype, the default value of zero is used.
- **iiii**: a system identifier to be included in the SMF record
  - Optional. You cannot specify a system identifier without also specifying the SMF record subtype. If you do not specify a system identifier, the ID of the BCSS on which the record resides will be used.
The **ENABLE** command only applies to the subsystem for which it is issued. When you enable SMF auditing within AR/CTL, updates to BCS REGISET AR/CTL records are logged. When a TSO user updates a BCS record, BCS records the update in the REGISET and SMF records the update in a MAN file.

An IBM-supplied extract routine extracts the data from the MAN file and stores it in a variable block spanned (VBS) data set. The AR/CTL sample library contains sample JCL and COBOL programs to select and format the AR/CTL-generated SMF records.

All parameters that follow the **TYPE** parameter in the **ENABLE** command are optional. The values for the optional parameters can be found in SYS1.PARMLIB. See the IBM publication *MVS Initialization and Tuning Reference* for more information about the optional parameters.

You can use the **DISABLE** command to deactivate SMF auditing. The auditing is also deactivated when you issue the **bcssid SHUTDOWN** command to shut down the subsystem.

To determine whether SMF auditing is enabled for a BCSS, issue the following BCSS command:

```plaintext
bcssid AES STATUS
```

The following message is displayed:

```plaintext
BMC151074I STATUS, AES AUDITING IS ENABLED|DISABLED
```

**Record selection**

The sample AR/CTL SMF record selector COBOL program is in member AESUSMFS. The sample JCL to compile, bind, and execute the sample AR/CTL SMF selector COBOL program is in member ###USMFS.

COBOL program AESUSMFS selects the AR/CTL record types and stores them in an AR/CTL data set.

Following is a sample from the extract job, where `mmm` is the SMF record ID (129 through 255), `nnn` is the subtype, and `xxxx` is the BCSS ID:

```plaintext
//userid JOB (4$22),'USER NAME',CLASS=A,NOTIFY=userid, 
// MSGCLASS=X,MSGLEVEL=(1,1)
//*================================================================
//* POPULATE THE EXTRACTION DATA SET FOR SMF RECORDS
//*----------------------------------------------------------------+
//STSELSMF EXEC PGM=AESUSMFS,REGION=4M,PARM='mmm,nnn,xxxx'
//STEPLIB DD DISP=SHR,DSN=BMCPROD.COMPILO.LOAD
// DD DISP=SHR,DSNAME=CEE.SCEERUN
//SMFIN DD DISP=SHR,DSN=hlq.SUPPORT.SEQUFILE.SMFLOG.ARCHIVE
```
Enabling and disabling SMF auditing

Record formatting

The sample AR/CTL SMF record formatter COBOL program is in member AESUSMFF. The sample JCL to compile, bind, and execute the sample AR/CTL SMF record formatter COBOL program is in member ###USMFF.

COBOL program AESUSMFF formats the AR/CTL records and calls service routines AESUFSRN and AESUFSEN to obtain the names of the BCS REGISTAR/CTL update record names and AR/CTL update element names, respectively, and then writes those records to a report.

Following is a sample from the format job:

```
//AESOUT DD DISP=OLD, DSN=hlq.SUPPORT.SEQUFILE.SMFLOG.EXTRACT
//AESLINT DD SYSOUT=*  
//SYSOUT DD SYSOUT=*  
//CBLOUTDD DD SYSOUT=*  
//CEEDUMP DD SYSOUT=*  
//CEEOUT DD SYSOUT=*  
//CEERPTS DD SYSOUT=*  
//SYSUDUMP DD DUMMY
```

```
//userid JOB (4$22),'USER NAME',CLASS=A,NOSY=userid,  
// MSGCLASS=X,MSGLEVEL=(1,1)  
//=================================================================  
//* FORMAT THE EXTRACTED SMF RECORDS  
//*---------------------------------------------------------------+  
//STEPFMT EXEC PGM=AESUSMFF,REGION=4M  
// STEPLIB DD DISP=SHR, DSN=BMCPROD.COMPI.LOAD  
// DD DISP=SHR, DSN=BMCPROD.AES351.LOAD  
// DD DISP=SHR, DSN=CEE.SCEERUN  
//AESIN DD DISP=SHR, DSN=hlq.SUPPORT.SEQUFILE.SMFLOG.EXTRACT  
//AESLIST DD SYSOUT=*  
//SYSOUT DD SYSOUT=*  
//CBLOUTDD DD SYSOUT=*  
//CEEDUMP DD SYSOUT=*  
//CEEOUT DD SYSOUT=*  
//CEERPTS DD SYSOUT=*  
//SYSUDUMP DD DUMMY
```

**NOTE**

The AES load library must be included in the STEPLIB or the LINKLIST.
Accessing automatic registration records

To work with automatic registration records, perform the following steps; for more information about any of these steps, see Chapter 1, “Introduction.”

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).

2. Type 1 (AES records) in the choice entry field.

3. Press Enter. The AR/CTL ISPF interface displays the Application Enhancement Series Records panel (Figure 20 on page 74).

4. Type or verify the BCSID.

5. Type 5 (Non-IMS Program automatic registration) in the choice entry field.

6. Press Enter. The AR/CTL ISPF interface displays the Limit List of Records panel (Figure 13 on page 32).

7. Type or verify the qualifiers for limiting the list of records. You can use specific and wildcard characters as explained in “Wildcard characters in record qualifiers” on page 23.

8. Press Enter. The AR/CTL ISPF interface displays the List Records panel (Figure 14 on page 33), showing a list of records that match your selection criteria.

9. Select one or more records to display (and possibly update) or to delete. Or enter the ADD command to create a new record.

10. Press Enter:

   - If you entered the ADD command, the AR/CTL ISPF interface displays the automatic registration record Add Record panel (Figure 15 on page 34). Type or verify the record qualifiers to use. Press Enter. The AR/CTL ISPF interface displays the QUICKSTART DSNAME Criteria (1 of 8) panel (Figure 27 on page 99).

   You cannot enter all wildcard characters in the PROGNAME, PROCSTEP, JOBSTEP, JOBNAME and MVSID qualifiers; at least one of these qualifiers must contain one non-wildcard, non-blank character if you do not supply a ddname in the DDNAME field.

   Certain program names (for example, IKJEFT01 and ARCCTRL) are not valid for the PROGNAME qualifier of an automatic registration record. The ISPF interface prevents you from entering an invalid program name.
Specifying automatic registration record criteria

When you add a new automatic registration record or select an existing record, the AR/CTL ISPF interface displays a series of panels that you use to enter option values for each set of criteria. The panels are paired as follows:

- The QUICKSTART DSNAME Criteria (1 of 8) panel (Figure 27 on page 99) and the QUICKSTART DSNAME Criteria (2 of 8) panel (Figure 28 on page 100) work together to request the required information for application programs that are set up to use nodes in a data set name to identify the job step as eligible for AR/CTL product participation and, if applicable, to provide DB2 connection parameters (such as with the DB2 DSN format of QUICKSTART).

- The Alternate DSNAME Criteria (3 of 8) panel (not shown) and the Alternate DSNAME Criteria (4 of 8) panel (not shown) also work together to request the required information for application programs that are set up to use nodes in a data set name to identify the job step as eligible for AR/CTL product participation and, if applicable, to provide DB2 connection parameters. This set of criteria allows you to specify information for job steps that use a ddname that is different from the ddname in the set of QUICKSTART DSNAME criteria; it is simply an alternate set of criteria.

- The Primary Record Criteria (5 of 8) panel (Figure 29 on page 102) and the Primary Record Criteria (6 of 8) panel (not shown) work together to request the required information for application programs that are set up to use the first record in a data set to identify the job step as eligible for AR/CTL product participation and, if applicable, to provide DB2 connection parameters.

---

**WARNING**
Indiscriminate use of wildcard characters in the PROGNAME qualifier can cause AR/CTL to initialize in program executions where AR/CTL processing is invalid or unnecessary; possible results include abnormal termination of multiple programs, unwanted overhead, and other undesirable effects.

- If you selected a record to display, the AR/CTL ISPF interface displays the QUICKSTART DSNAME Criteria (1 of 8) panel (Figure 27 on page 99).
- If you selected a record to delete, the AR/CTL ISPF interface displays the Delete Record panel (Figure 16 on page 35) to confirm the deletion.
The Alternate Record Criteria (7 of 8) panel (not shown) and the Alternate Record Criteria (8 of 8) panel (not shown) also work together to request the required information for application programs that are set up to use the first record in a data set to identify the job step as eligible for AR/CTL product participation and, if applicable, to provide DB2 connection parameters. This set of criteria allows you to specify information for job steps that use a ddname that is different from the ddname in the set of primary record criteria; it is simply an alternate set of criteria.

On the QUICKSTART DSNAME Criteria (1 of 8) panel (Figure 27), type or verify the values to use for the following options in the QUICKSTART DSNAME criteria set.

**Figure 27 QUICKSTART DSNAME Criteria (1 of 8) panel**

<table>
<thead>
<tr>
<th>Usage order</th>
<th>DDNAME</th>
<th>DB2 connection parms relative node</th>
<th>Exclude DDNAME</th>
</tr>
</thead>
<tbody>
<tr>
<td>0</td>
<td>DSNPARMS (DDNAME)</td>
<td>(relative to one)</td>
<td>(No auto registration if present)</td>
</tr>
</tbody>
</table>

**Usage order**
Optional. Specify the order in which you want the AR/CTL application supervisor to apply this set of criteria (the option values from this panel and the next). You must set the usage order for at least one set of criteria to a value other than 0 before you can save this automatic registration record. The default value is 0.

**DDNAME**
Required if you have specified all wildcard characters for the PROGNAME, PROCSTEP, JOBSTEP, and JOBNAME fields on the Add Record panel; otherwise optional. Specify the DD name of the data set name that identifies the job step as eligible for AR/CTL product participation and, if applicable, that indicates the DB2 connection parameters to use. The default value is DSNPARMS.

**DB2 connection parms relative node: SSN**
Optional. Specify the data set name node (relative to 1) that contains the DB2 subsystem name. The default value is 0.
Specifying automatic registration record criteria

DB2 connection parms relative node: Plan
Optional. Specify the data set name node (relative to 1) that contains the plan name. The default value is 0.

DB2 attachment facility ONLY
Optional. Use this option to enable all AR/CTL services for the application program or to use only the AR/CTL for DB2 batch attachment facility for the program. Specify one of the following values. The default value is N.

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Initialize the program execution environment for the use of all applicable AR/CTL services.</td>
</tr>
<tr>
<td>CAF</td>
<td>Initialize the program execution environment for the AR/CTL for DB2 batch attachment facility only. AR/CTL provides a call attachment facility (CAF) connection to the DB2 subsystem for the registered program.</td>
</tr>
<tr>
<td>RRS</td>
<td>Initialize the program execution environment for the AR/CTL for DB2 batch attachment facility only. AR/CTL provides a Resource Recovery Services (RRS) connection to the DB2 subsystem for the registered program. AR/CTL provides no RRS support other than the connection to DB2.</td>
</tr>
</tbody>
</table>

Exclude DDNAME
Optional. Specify the DD name that, if present in the application program job step, causes the AR/CTL application supervisor to bypass the automatic creation of the non-IMS program registration record. No default value is provided.

2 Enter the Down command (typically assigned to F8). The AR/CTL ISPF interface displays the QUICKSTART DSNNAME Criteria (2 of 8) panel (Figure 28).

Figure 28 QUICKSTART DSNNAME Criteria (2 of 8) panel

AESPNI2    AUTO NIMS PGM REGISTRATION: Quickstart Criteria  More: - +
Command ===> Commands: CANcel
BCSID  :  R231  Record type : Automatic Non-IMS Program Registration
QuickStart DSNNAME Criteria  (2 of 8)
PROGNAME  PROCSTEP  JOBSTEP  JOBNAME  MVSID
Rec ID  :  PAG***** PAG***** PAG***** PAG***** PAG1
Type values in option fields below. Then press Enter.
Error return code . . . . . . . . 0  (0 - 4095: exclusive w/ Abnd)
Abend code . . . . . . . . . . . 0  (0 - 4095: exclusive w/RetCd)
Reason code . . . . . . . . . . . 00000000  (eight hex digits)
To allow creation of wildcard registration records, enter a Y in the character position(s) where you will allow masking.(NOTE: program cannot be wild-carded)
PROCSTEP . . . . . . . NNNNNNNN  (Y=match any character)
JOBSTEP . . . . . . . NNNNNNNN  (N=use explicit char)
JOBNAME . . . . . . . NNNNNNNN
MVSID . . . . . . . . . NNNN  (YYYY means match all ids)
Type or verify the values to use for the following options in the QUICKSTART DSNAME criteria set:

**Error return code**
Optional. In this field, specify the return code (0–4095) that you want the AR/CTL application supervisor to issue for the application program job step if the AR/CTL for DB2 batch attachment facility encounters any error with the connection to DB2. The AR/CTL application supervisor returns control to the application program after issuing this return code. If you specify a value other than 0 in this field, you cannot specify a value in the Abend code field. The default value is 0.

This option has meaning only if you specify CAF or RRS for the DB2 Attachment Facility Only option.

**Abend code**
Optional. In this field, specify a value (0–4095) if you want the AR/CTL application supervisor to issue an abend for the application program job step if the AR/CTL for DB2 batch attachment facility encounters any error with the connection to DB2. The AR/CTL application supervisor sets the abend code to the specified value and does not return control to the application program. If you specify a value other than 0 in this field, you cannot specify a value in the Error return code field. The default value is 0.

This option has meaning only if you specify CAF or RRS for the DB2 Attachment Facility Only option.

**Reason code**
Optional. In this field, specify the reason code (8 hexadecimal digits) that you want the AR/CTL application supervisor to issue when it issues an abend as specified in the Abend code field. If the value in the Abend code field is 0, this field is ignored. The default value is 00000000.

**PROCSTEP, JOBSTEP, JOBNAME, MVSID**
Optional. By default, the AR/CTL application supervisor creates fully qualified non-IMS program registration records, which apply to a single application program job step. Instead, you can have it create generic program registration records, which potentially apply to multiple application program job steps.

A generic record contains one or more wildcard characters along with the literal characters in the record qualifiers. Replace the default N with Y to indicate that you want the record to be created with a wildcard character in that position in the record qualifier. You cannot specify Y in every position of the PROCSTEP, JOBSTEP, and JOBNAME fields unless you have also specified a ddname in the DDNAME field and a N in every position of the MVSID field.
For more information about the use of wildcard characters, see “Wildcard characters in record qualifiers” on page 23.

3 Enter the Down command. The AR/CTL ISPF interface displays the Alternate DSNAME Criteria (3 of 8) panel (not shown). This panel is identical to the QUICKSTART DSNAME Criteria (1 of 8) panel (Figure 27 on page 99), except that the option values apply to the alternate DSNAME criteria set. Type or verify the values to use for the options.

4 Enter the Down command. The AR/CTL ISPF interface displays the Alternate DSNAME Criteria (4 of 8) panel (not shown). This panel is identical to the QUICKSTART DSNAME Criteria (2 of 8) panel (Figure 28 on page 100), except that the option values apply to the alternate DSNAME criteria set. Type or verify the values to use for the options.

5 Enter the Down command. The AR/CTL ISPF interface displays the Primary Record Criteria (5 of 8) panel (Figure 29).

Figure 29  Primary record criteria—page 5 panel

```
Command ===> __________________________________________________________________
BCSID : AES1   Record type : Non-IMS Program automatic registration criteria
          Primary Record Criteria               (5 of 8)
PROGNAME  PROCSTEP  JOBSTEP  JOBNAME  MVSID
Rec ID  : ********                         ********   ****
Usage order . . . . . . . . . . . 0         (1-4 : 0 = do not use; reset)
DDNAME  . . . . . . . . . . . . . ________  (DDNAME)
DB2 connection parms relative offset        (relative to one)
   SSN . . . . . . . . . . . . . 0         (DB2 subsys name relative offset)
   Plan . . . . . . . . . . . . . 0         (Plan name relative offset)
   Length Plan . . . . . . . 0 (Max allowable DB2 Plan length)
       (range: 8:24 and zero)
DB2 Attachment Facility ONLY. . . N         (N, CAF, RRS)
Exclude DDNAME . . . . . . . . ________  (No auto registration if present)
```

Type or verify the values to use for the following registration options in the primary record criteria set:
Usage order
Optional. Specify the order in which you want the AR/CTL application supervisor to apply this set of criteria (the option values from this panel and the next). The default value is 0.

DDNAME
Required if you have specified all wildcard characters for the PROGNAME, PROCSTEP, JOBSTEP, and JOBNAME fields on the Add Record panel; otherwise optional. Specify the DD name of the data set name that identifies the job step as eligible for AR/CTL product participation and, if applicable, that contains a first record identifying the DB2 connection parameters to use. No default value is provided.

DB2 connection parms relative offset: SSN
Optional. Specify the record offset (relative to 1) that contains the DB2 subsystem name. The default value is 0.

DB2 connection parms relative offset: Plan
Optional. Specify the record offset (relative to 1) that contains the plan name. The default value is 0.

DB2 connection parms relative offset: Length Plan
Optional. Specify the maximum plan name length allowed (up to 24 bytes). The default value is 8.

DB2 attachment facility ONLY
This option is identical to the option on the QUICKSTART DSNAME Criteria (1 of 8) panel (Figure 27 on page 99).

Exclude DDNAME
This option is identical to the option on the QUICKSTART DSNAME Criteria (1 of 8) panel (Figure 27 on page 99).

6 Enter the Down command. The AR/CTL ISPF interface displays the Primary Record Criteria (6 of 8) panel (not shown). This panel is identical to the QUICKSTART DSNAME Criteria (2 of 8) panel (Figure 28 on page 100), except that the option values apply to the primary record criteria set.

7 Enter the Down command. The AR/CTL ISPF interface displays the Alternate DSNAME Criteria (7 of 8) panel (not shown). This panel is identical to the Primary Record Criteria (5 of 8) panel (Figure 29 on page 102), except that the option values apply to the alternate record criteria set.

8 Enter the Down command. The AR/CTL ISPF interface displays the Alternate Record Criteria (8 of 8) panel (not shown). This panel is identical to the QUICKSTART DSNAME Criteria (2 of 8) panel (Figure 28 on page 100), except that the option values apply to the alternate record criteria set.
Working with IMS environment registration records

To provide access to AR/CTL product execution modules in an IMS environment, create one or more IMS environment registration records in the REGISET. An IMS environment is any environment where IMS is active or where IMS-compatible application programs execute using IMS-type calls and structures but IMS is not active.

To work with IMS environment registration records, perform the following steps; for more information about any of these steps, see Chapter 1, “Introduction.”

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).

2. Type 1 (AES records) in the choice entry field.

3. Press Enter. The AR/CTL ISPF interface displays the Application Enhancement Series Records panel (Figure 20 on page 74).

4. Type or verify the BCSID.

5. Type 6 (IMS Environment registration) in the choice entry field.

6. Press Enter. The AR/CTL ISPF interface displays the Limit List of Records panel (Figure 13 on page 32).

7. Type or verify the qualifiers for limiting the list of records. You can use specific and wildcard characters as explained in “Wildcard characters in record qualifiers” on page 23.

8. Press Enter. The AR/CTL ISPF interface displays the List Records panel (Figure 14 on page 33), showing a list of records that match your selection criteria.

9. Select one or more records to display (and possibly update) or to delete. Or enter the ADD command to create a new record.

10. Press Enter:
- If you entered the ADD command, the AR/CTL ISPF interface displays the IMS environment registration Add Record panel (Figure 30).
If you selected a record to display, the AR/CTL ISPF interface displays the IMS environment registration Display Record panel (not shown). This panel is similar to the Add Record panel, except that you do not enter the record ID to use.

If you selected a record to delete, the AR/CTL ISPF interface displays the Delete Record panel (Figure 16 on page 35) to confirm the deletion.

**Figure 30 Add Record (IMS environment registration) panel**

![Add Record panel](image)

On the Add Record or Display Record panel, type or verify the data set names of the AES execution load module library, the AR/CTL execution load module library, and the BCF execution load module library. The AES execution load module library, AR/CTL execution load module library, and BCF execution load module library should all reside in the same data set.

**Working with IMS program registration records**

To set up AR/CTL products to participate in the execution of IMS or IMS-compatible application programs, create one or more program registration records in the REGISET. In an IMS program, IMS is active and the program uses IMS calls and structures or AR/CTL common calls. In an IMS-compatible program, the program uses IMS-type calls and structures or AR/CTL common calls but IMS is not active; an IMS-compatible program is registered as an IMS program.

To work with IMS program registration records, perform the following steps; for more information about any of these steps, see Chapter 1, “Introduction.”
1 Access the Application Enhancement Series primary menu (Figure 12 on page 32).

2 Type 1 (AES records) in the choice entry field.

3 Press Enter. The AR/CTL ISPF interface displays the Application Enhancement Series Records panel (Figure 20 on page 74).

4 Type or verify the BCSID.

5 Type 7 (IMS Program registration) in the choice entry field.

6 Press Enter. The AR/CTL ISPF interface displays the Limit List of Records panel (Figure 13 on page 32).

7 Type or verify the qualifiers for limiting the list of records. You can use specific and wildcard characters as explained in “Wildcard characters in record qualifiers” on page 23.

8 Press Enter. The AR/CTL ISPF interface displays the List Records panel (Figure 14 on page 33), showing a list of records that match your selection criteria.

9 Select one or more records to display (and possibly update) or to delete. Or enter the ADD command to create a new record.

10 Press Enter:

   - If you entered the ADD command, the AR/CTL ISPF interface displays the IMS program registration Add Record panel (Figure 31).

   - If you selected a record to display, the AR/CTL ISPF interface displays the IMS program registration Display Record panel (not shown). This panel is similar to the Add Record panel, except that you do not enter the record ID to use.

   - If you selected a record to delete, the AR/CTL ISPF interface displays the Delete Record panel (Figure 16 on page 35) to confirm the deletion.
11 On the Add Record or Display Record panel, type or verify the qualifiers to use in the record ID. You cannot enter all wildcard characters in the PROGNAME, PROCSTEP, JOBSTEP, JOBNAME, and IMSID qualifiers; at least one of these qualifiers must contain one non-wildcard, non-blank character.

Certain program names (for example, DFSRRC00, DFSURGU0, and DFSURGL0) are not valid for the PROGNAME qualifier of an IMS program registration record. The ISPF interface prevents you from entering an invalid program name.

NOTE

If you use the PROGNAME qualifier, code the program name that is used in the second parameter of the EXEC PGM=DFSRRC00 statement. For an IMS program that uses DB2, this parameter will be DSNMTV01; another qualifier, such as the PSB name, is required.

12 Type or verify the value to use for the following options:
IMS replacement mode?
Required. AR/CTL can replace IMS checkpoint/restart and generalized sequential access method (GSAM) services. For an application program that uses IMS-type calls and structures only to obtain IMS checkpoint/restart services, GSAM services, or both, you can use this option to force the use of AR/CTL instead of IMS. IMS will not be invoked. Set one of the following values; there is no default value, but you must specify N if the application program uses any IMS services other than a checkpoint/restart and GSAM:

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>N</td>
<td>Use IMS services. This value is required if the application program uses any IMS services other than checkpoint/restart and GSAM. This value is required for a BMP.</td>
</tr>
<tr>
<td>Y</td>
<td>Use AR/CTL IMS-compatible mode. If the application program uses any IMS services except checkpoint/restart and GSAM, AR/CTL issues an abend for the job step at the first unsupported call because IMS is not active to service the call. For more information, see the APPLICATION RESTART CONTROL User Guide.</td>
</tr>
</tbody>
</table>

IMS replacement mode default SSM
Required if you want to connect to DB2 in IMS replacement mode. AR/CTL allows you to specify the DB2 connection information to use for the job.

Specify the DB2 connection information. If you use BMP JCL and do not supply the SSM parameter and PROCLIB in the JCL, AR/CTL will append the SSM to the IMSID to create the member name in the PROCLIB.

IMS replacement mode default PROCLIB DSN
Required if you want to connect to DB2 in IMS replacement mode and you did not specify the PROCLIB in the BMP JCL. AR/CTL allows you to specify a default PROCLIB data set name. AR/CTL will dynamically allocate the PROCLIB data set.

Specify the default data set name for the PROCLIB.

**NOTE**
AR/CTL will only use the IMS replacement mode default SSM and IMS replacement mode default PROCLIB DSN if you did not specify an SSM and PROCLIB in the job parameter JCL. The JCL statements should be similar to the following:
Working with IMS program exclusion records

To prevent AR/CTL product participation in the execution of IMS or IMS-compatible application programs, create one or more IMS program exclusion records in the REGISET. In an IMS program, IMS is active and the program uses IMS calls and structures or AR/CTL common calls. In an IMS-compatible program, the program uses IMS-type calls and structures or AR/CTL common calls but IMS is not active; an IMS-compatible program is registered as an IMS program.

To work with IMS program exclusion records, perform the following steps; for more information about any of these steps, see Chapter 1, “Introduction.”

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).

2. Type 1 (AES records) in the choice entry field.

3. Press Enter. The AR/CTL ISPF interface displays the Application Enhancement Series Records panel (Figure 20 on page 74).

4. Type or verify the BCSID.

5. Type 8 (IMS Program exclusion) in the choice entry field.

6. Press Enter. The AR/CTL ISPF interface displays the Limit List of Records panel (Figure 13 on page 32).

7. Type or verify the qualifiers for limiting the list of records. You can use specific and wildcard characters as explained in “Wildcard characters in record qualifiers” on page 23.

8. Press Enter. The AR/CTL ISPF interface displays the List Records panel (Figure 14 on page 33), showing a list of records that match your selection criteria.

9. Select one or more records to display (and possibly update) or to delete. Or enter the ADD command to create a new record.

10. Press Enter:

   - If you entered the ADD command, the AR/CTL ISPF interface displays the IMS program exclusion Add Record panel (Figure 32).
   - If you selected a record to display, the AR/CTL ISPF interface displays the IMS program exclusion Display Record panel (not shown). This panel is similar to the Add Record panel, except that you do not enter the record ID to use.
   - If you selected a record to delete, the AR/CTL ISPF interface displays the Delete Record panel (Figure 16 on page 35) to confirm the deletion.
Figure 32  Add Record (IMS program exclusion) panel

On the Add Record or Display Record panel, type or verify the qualifiers to use in the record ID.

11 On the Add Record or Display Record panel, type or verify the qualifiers to use in the record ID.
Chapter 5  Working with AR/CTL environment options

This chapter describes how to display and change information that defines the APPLICATION RESTART CONTROL (AR/CTL) operating environment. This chapter contains the following information:

Overview ................................................................. 111
Environment information ............................................ 111
Accessing the AR/CTL Operating Environment panel ............. 112
Displaying information about the operating environment .......... 113
Working with AR/CTL LIBDEF table .................................. 116
Working with AR/CTL LIBDEF variables .......................... 117
Setting print options ................................................. 119
Setting JOB statement options .................................... 120
Setting the unit type for temporary files ............................ 121
Setting panel attribute options ...................................... 122
Setting environment-specific options for AR/CTL ISPF .......... 124

Overview

The AR/CTL ISPF interface allows you to display and update information about the environment in which AR/CTL products operate and about the values used for your ISPF session.

Environment information

You can use the AR/CTL ISPF interface to display and update information about the environment in which AR/CTL products operate and about the values used for your ISPF session:
Accessing the AR/CTL Operating Environment panel

To work with AR/CTL operating environment information, perform these steps:

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).

2. Type 11 (Display, Print, Jobcard, Allocation, and Profile Options) in the choice entry field.

3. Press Enter. AR/CTL displays the Select Environment Option panel (Figure 33).
Displaying information about the operating environment

The Display AES Operating Environment panel (Figure 34 on page 114) supplies information about the system, your ISPF session, and the maintenance level of AR/CTL products. This information can be helpful when diagnosing problems in the AR/CTL environment.

To work with the Display AES Operating Environment panel, perform these steps:

4 Type one of the following options in the choice entry field, and press Enter:

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
<th>More information</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Display information about the current operating environment.</td>
<td>“Displaying information about the operating environment” on page 113</td>
</tr>
<tr>
<td>2</td>
<td>Display and update the AR/CTL LIBDEF table.</td>
<td>“Working with AR/CTL LIBDEF table” on page 116</td>
</tr>
<tr>
<td>3</td>
<td>Display and update AR/CTL LIBDEF variables.</td>
<td>“Working with AR/CTL LIBDEF variables” on page 117</td>
</tr>
<tr>
<td>4</td>
<td>Set AR/CTL ISPF print options.</td>
<td>“Setting print options” on page 119</td>
</tr>
<tr>
<td>5</td>
<td>Display and update job card options.</td>
<td>“Setting JOB statement options” on page 120</td>
</tr>
<tr>
<td>6</td>
<td>Display and set the temporary file allocation unit.</td>
<td>“Setting the unit type for temporary files” on page 121</td>
</tr>
<tr>
<td>7</td>
<td>Set profile options for panel attributes.</td>
<td>“Setting panel attribute options” on page 122</td>
</tr>
<tr>
<td>8</td>
<td>Set options to hide or display selected panels and data in the AR/CTL ISPF interface.</td>
<td>“Setting environment-specific options for AR/CTL ISPF” on page 124</td>
</tr>
</tbody>
</table>
1 Access the Application Enhancement Series primary menu (Figure 12 on page 32).

2 Type 11 (Display, Print, Jobcard, Allocation, and Profile Options) in the choice entry field.

3 Press Enter. AR/CTL displays the Select Environment Option panel (Figure 33 on page 113).

4 Type 1 in the choice entry field, and press Enter. AR/CTL displays the first page of the Display AES Operating Environment panel.

**Figure 34 Display AES Operating Environment panel (page 1)**

```
AESPIENV Command ===> _________________________________________________________________
Type data set name of IMS RESLIB. Then press Enter.

IMS RESLIB DSN . . IMSVS.R51.RESLIB____________________________

IBM Products
MVS . . . . . : SP5.2.2
SMF system ID . : SYSP
DFP level . . . : 3.3.2
SMS subsystem ID: SMS
SMS level . . . : 01.03.00
IMSID . . . . . : BMC1
IMS release . . . : 5.1.0
ISPF level . . . : ISPF 4.2
TSO level . . . : 2.04.0

Hardware
Processor . . . : 9021
CPU ID . . . . : 13902
Terminal type . : 3278
No. of lines . : 0043
```

5 If you are interested in the IMS environment, type the data set name of the IMS RESLIB, and press Enter.

6 View the following information about the operating environment (the fields cannot be changed):

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MVS</td>
<td>Release number of the MVS you are using.</td>
</tr>
<tr>
<td>SMF system ID</td>
<td>System management facilities (SMF) identifier assigned to the MVS system you are using.</td>
</tr>
<tr>
<td>DFP level</td>
<td>Release number of the DFP you are using.</td>
</tr>
<tr>
<td>SMS subsystem ID</td>
<td>Subsystem identifier of the Storage Management Subsystem (SMS) you are using.</td>
</tr>
<tr>
<td>SMS level</td>
<td>Release number of the SMS you are using. This field is displayed only if SMS is installed.</td>
</tr>
</tbody>
</table>
Displaying information about the operating environment

7 Press Enter. AR/CTL displays the second page of the Display AES Operating Environment panel (Figure 35).

**Figure 35  Display AES Operating Environment panel (page 2)**

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IMSID</td>
<td>IMSID of the IMS system, if you provided the data set name of the IMS RESLIB.</td>
</tr>
<tr>
<td>IMS release</td>
<td>Release number of the IMS system.</td>
</tr>
<tr>
<td>ISPF level</td>
<td>Release number of the ISPF you are using.</td>
</tr>
<tr>
<td>TSO level</td>
<td>Release number of the TSO you are using.</td>
</tr>
<tr>
<td>Processor</td>
<td>Type of CPU you are running on. If it is an ES/9000 model processor, this value will be 9021, 9121, or 9221, depending on the machine type.</td>
</tr>
<tr>
<td>CPU ID</td>
<td>CPU identifier. AR/CTL products use this identifier during product authorization processing using a CPU authorization password.</td>
</tr>
<tr>
<td>Terminal type</td>
<td>Type of terminal you are using.</td>
</tr>
<tr>
<td>No. of lines</td>
<td>The number of lines displayed for the model configuration of your terminal.</td>
</tr>
</tbody>
</table>

8 View the following information about the AR/CTL products in your environment (the fields cannot be changed):

**AES**
The last date that maintenance was applied to AR/CTL. If you call BMC Software for assistance, use this information to tell the product support representative your maintenance level.

**BCF**
The last date that maintenance was applied to the BCF component of the AR/CTL products, if this product is installed on your system. If you call BMC Software for assistance, use this information to tell the product support representative your maintenance level.
Working with AR/CTL LIBDEF table

AR/CTL FOR DB2
The last date that maintenance was applied to AR/CTL for DB2, if this product is installed on your system. If you call BMC Software for assistance, use this information to tell the product support representative your maintenance level.

AR/CTL FOR IMS
The last date that maintenance was applied to AR/CTL for IMS, if this product is installed on your system. If you call BMC Software for assistance, use this information to tell the product support representative your maintenance level.

AR/CTL FOR VSAM
The last date that maintenance was applied to AR/CTL for VSAM, if this product is installed on your system. If you call BMC Software for assistance, use this information to tell the product support representative your maintenance level.

Working with AR/CTL LIBDEF table

The Display AES LIBDEF Table panel (Figure 36 on page 117) allows you to display and update the AR/CTL LIBDEF table. The ISPF interface uses the AR/CTL LIBDEF table when it dynamically invokes load modules. The table is necessary because the ISPF LIBDEF facility does not affect MVS LOAD, LINK, ATTACH, and BLDL services.

The table sets certain ISPF variables each time a user accesses the ISPF interface. Updates to the table affect all users who access the interface, but changes will not affect users until they exit and reenter the ISPF interface. Values for the AR/CTL LIBDEF variables are also updated if corresponding entries in the table are updated.

WARNING
The table definitions must be consistent with the LIBDEF commands that were issued when you accessed the ISPF interface. If they are inconsistent, results will be unpredictable.

To work with the Display AES LIBDEF Table panel, perform the following steps:

1 Access the Application Enhancement Series primary menu (Figure 12 on page 32).

2 Type 11 (Display, Print, Jobcard, Allocation, and Profile Options) in the choice entry field.

3 Press Enter. AR/CTL displays the Select Environment Option panel (Figure 35 on page 115).

4 Type 2 in the choice entry field, and press Enter. AR/CTL displays the Display AES LIBDEF Table panel (Figure 36 on page 117).
5 Type or verify the data set name of the product library. The **Library** field identifies the library by a three-character product code, a one-character library type (X for execution or M for messages), and the characters **LIB**. If you do not want to use **LIBDEF** for an AR/CTL product, change the data set name to **DUMMY** or **NONE**.

6 You can use the following commands:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>SET</strong></td>
<td>Update the table with the new values you typed in the <strong>Data Set Name</strong> field. (The original table values will no longer be available.) The table will not be updated until all entries are free of errors. Any error messages are displayed to the right of the data set name in error.</td>
</tr>
<tr>
<td><strong>RESET</strong></td>
<td>Restore the values in the <strong>Data Set Name</strong> field to the values present when the last <strong>SET</strong> command was issued. <strong>RESET</strong> does not update the table and does not nullify any <strong>SET</strong> commands that were previously issued.</td>
</tr>
<tr>
<td><strong>LOCATE</strong></td>
<td>Reposition the scrollable display to the entry most closely matching the operand you typed with the <strong>LOCATE</strong> command.</td>
</tr>
<tr>
<td><strong>END</strong></td>
<td>Return to the Select Environment Option panel.</td>
</tr>
</tbody>
</table>

**Figure 36 Display AES LIBDEF Table panel**

7 To reset an individual definition to the value it had at the last **SET** command, type action code **R** in the **Action** field to the left of an individual definition, and press Enter.

**Working with AR/CTL LIBDEF variables**

When you access the AR/CTL ISPF interface, the AR/CTL LIBDEF variables are set to the values defined in the AR/CTL LIBDEF table. You can use the Display LIBDEF Variables panel (**Figure 37 on page 119**) to display and temporarily update AR/CTL LIBDEF variables for your session. This panel is primarily for testing and for
emergencies when you need to update the variables without changing the AR/CTL LIBDEF table. Any changes you make are temporary and will affect only your own ISPF session. When you exit from and reenter the ISPF interface, the variables will be reset to the values defined in the AR/CTL LIBDEF table.

To work with the Display AES LIBDEF Variables panel, perform the following steps:

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).
2. Type 11 (Display, Print, Jobcard, Allocation, and Profile Options) in the choice entry field.
3. Press Enter. AR/CTL displays the Select Environment Option panel (Figure 33 on page 113).
4. Type 3 in the choice entry field, and press Enter. AR/CTL displays the Display AES LIBDEF Variables panel.
5. Type or verify the data set name of the product library. The Library field identifies the library by a three-character product code, a one-character library type (X for execution or M for messages), and the characters LIB. If you do not want to use LIBDEF for an AR/CTL product, change the data set name to DUMMY or NONE.
6. You can use the following commands:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>SET</td>
<td>Update the table with the new values you typed in the Data Set Name field. (The original table values will no longer be available.) The table will not be updated until all entries are free of errors. Error messages are displayed to the right of the data set name in error.</td>
</tr>
<tr>
<td>RESET</td>
<td>Restore the values in the Data Set Name field to the values present when the last SET command was issued. RESET does not update the table and does not nullify any SET commands that were previously issued.</td>
</tr>
<tr>
<td>LOCATE</td>
<td>Reposition the scrollable display to the entry most closely matching the operand you typed with the LOCATE command.</td>
</tr>
<tr>
<td>END</td>
<td>Return to the Select Environment Option panel.</td>
</tr>
</tbody>
</table>
7 To reset an individual definition to the value it had at the time of the last SET command, type action code R in the Action field to the left of an individual definition, and press Enter.

**Setting print options**

Use the Set Online Print Options panel (Figure 38 on page 120) to set the default options to be used when AR/CTL prints the items (such as reports) that you select from an ISPF panel.

To work with the Set Online Print Options panel, perform the following steps:

1 Access the Application Enhancement Series primary menu (Figure 12 on page 32).

2 Type 11 (Display, Print, Jobcard, Allocation, and Profile Options) in the choice entry field.

3 Press Enter. AR/CTL displays the Select Environment Option panel (Figure 33 on page 113).

4 Type 4 in the choice entry field, and press Enter. AR/CTL displays the Set Online Print Options panel (Figure 38).
Type or verify the SYSOUT class of the printer, the number of copies you want to print, and the destination JES node for your print job. Then enter the END command.

## Setting JOB statement options

Use the Set Default JOB Statement Image panel (Figure 39 on page 121) to supply an image of the default JOB statement(s) you want to use, according to the standards of your site.

To work with the Set Default JOB Statement Image panel, perform the following steps:

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).
2. Type 11 (Display, Print, Jobcard, Allocation, and Profile Options) in the choice entry field.
3. Press Enter. AR/CTL displays the Select Environment Option panel (Figure 33 on page 113).
4. Type 5 in the choice entry field, and press Enter. AR/CTL displays the Set Default JOB Statement Image panel (Figure 39).
Figure 39  Set Default JOB Statement Image panel

AESPJP20                Set Default JOB Statement Image
Command ===> _________________________________________________________________
Type or verify information. Then press Enter.  Commands: CANcel

Display JOB statement on SUBMIT . . .  1. Display
  2. Do not display

Submit using TSO SUBMIT . . . . . . .  1. Write to INTRDR
  2. Use TSO SUBMIT

JOB Statement Image
JCL 1 //PAGLIST  JOB (1610),PAULA GREEN',NOTIFY=PAG.
JCL 2 //MSGCLASS=H,CLASS=Q,USER=PAG
JCL 3 //*__________________________________________________________________
JCL 4 //*__________________________________________________________________
JCL 5 _____________________________________________________________________
JCL 6 _____________________________________________________________________

5  Type or verify the values in the following fields:

Display job statement on SUBMIT
Specify whether you want to view (and change) the job statement before submitting the job:
  ■ 1—Display the job statement before submitting the job.
  ■ 2—Submit the job without displaying the job statement.

Submit using TSO SUBMIT
Specify the method for submitting the job:
  ■ 1—Write the job to the internal reader (INTRDR) for execution.
  ■ 2—Use TSO SUBMIT to submit the job.

Job Statement Image
Provide the JOB statement and parameters according to the standards of your site.

6  Enter the END command to save the defaults and redisplay the Select Environment Option panel. Enter the CANCEL command to end without saving your changes.

Setting the unit type for temporary files

Use the Set Unit Type for Temporary Files panel (Figure 40) to specify the type of DASD unit to be allocated for displaying temporary files under ISPF Browse, such as when you select reports for display.
To work with the Set Unit Type for Temporary Files panel, perform the following steps:

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).

2. Type 11 (Display, Print, Jobcard, Allocation, and Profile Options) in the choice entry field.

3. Press Enter. AR/CTL displays the Select Environment Option panel (Figure 33 on page 113).

4. Type 2 in the choice entry field, and press Enter. AR/CTL displays the Set Unit Type for Temporary Files panel (Figure 40).

   **Figure 40** Set Unit Type for Temporary Files panel

   AESPTUNT  Set Unit Type for Temporary Files

   Command ===> _________________________________________________________________

   Type information. Then press Enter.

   Unit type for AES temporary files . . . SYSDA___

5. Type or verify the unit type. Enter the END command to save your changes and return to the Select Environment Option panel.

### Setting panel attribute options

You can use the Set AES Profile Options panel (Figure 41) to tailor the appearance of the panels in the AR/CTL ISPF interface. You can also use this panel to hide or show panels and data related to the application program environment.

To work with the Set AES Profile Options panel, perform the following steps:

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).

2. Type 11 (Display, Print, Jobcard, Allocation, and Profile Options) in the choice entry field.
3 Press Enter. AR/CTL displays the Select Environment Option panel (Figure 33 on page 113).

4 Type 7 in the choice entry field.

5 Press Enter. AR/CTL displays the Set AES Profile Options panel (Figure 41).

Figure 41  Set AES Profile Options panel

6 Type or verify values in the following fields:

Extended highlighting
Set the attributes to be used for extended highlighting. AR/CTL typically uses extended highlighting for panel fields where you can enter information.

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Blink</td>
</tr>
<tr>
<td>2</td>
<td>Reverse video</td>
</tr>
<tr>
<td>3</td>
<td>Underscore</td>
</tr>
<tr>
<td>4</td>
<td>None (no highlighting)</td>
</tr>
</tbody>
</table>

Pad character
Set the character to be used for padding the remaining positions in a field that is not completely filled with a value:

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Underscore</td>
</tr>
<tr>
<td>2</td>
<td>User defined</td>
</tr>
</tbody>
</table>

7 Enter the END command to save your changes and return to the Select Environment Option panel.
Setting environment-specific options for AR/CTL ISPF

You can use the Set Environment-Specific Options for AR/CTL ISPF panel (Figure 42) to hide or show panels, fields, and data related to the application program environment: DB2, IMS, and VSAM.

**NOTE**

Even if you set an option on this panel to hide a particular environment, the AR/CTL ISPF interface might still show some fields and data related to that environment. Some fields and data are more related to a feature than to an environment and are displayed with other fields and data for that feature.

To work with the Set Environment-Specific Options for AR/CTL ISPF panel, perform these steps:

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).
2. Type 11 (Display, Print, Jobcard, Allocation, and Profile Options) in the choice entry field.
3. Press Enter. AR/CTL displays the Select Environment Option panel (Figure 33 on page 113).
4. Type 8 in the choice entry field.
5. Press Enter. AR/CTL displays the Set Environment-Specific Options for AR/CTL ISPF panel (Figure 42).

**Figure 42**  Set Environment-Specific Options for AR/CTL ISPF panel

AESPDSF0       Set Environment-Specific Options for AR/CTL ISPF
Command ===> _________________________________________________________________

Type a value to display or hide environment-specific options when you work with the AR/CTL ISPF interface. Then press Enter.
If you set a value of N for an environment, some panels may be bypassed and some fields may be hidden or altered.

<table>
<thead>
<tr>
<th>Option</th>
<th>Value</th>
</tr>
</thead>
<tbody>
<tr>
<td>Display DB2 options</td>
<td>Y</td>
</tr>
<tr>
<td>Display IMS options</td>
<td>Y</td>
</tr>
<tr>
<td>Display VSAM options</td>
<td>Y</td>
</tr>
</tbody>
</table>

6. Type or verify values in the following fields:
Display DB2 options
Specify whether to display panels and information related to a DB2 environment:

- **Y**—Display DB2 panels and information.
- **N**—Hide DB2 panels and information.

Display IMS options
Specify whether to display panels and information related to an IMS environment:

- **Y**—Display IMS panels and information.
- **N**—Hide IMS panels and information.

Display VSAM options
Specify whether to display panels and information related to a VSAM environment:

- **Y**—Display VSAM panels and information.
- **N**—Hide VSAM panels and information.

Trace all RACROUTE
Specify whether to issue diagnostic WTO messages for all RACROUTE calls:

<table>
<thead>
<tr>
<th>Values</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>N</strong></td>
<td>Issue WTO messages only for RACROUTE calls that are unsuccessful.</td>
</tr>
<tr>
<td><strong>Y</strong></td>
<td>Issue WTO messages for all RACROUTE calls, whether they are successful or unsuccessful. You should use this value only at the request of BMC Software Product Support.</td>
</tr>
</tbody>
</table>

Enter the `END` command to save your changes and return to the Select Environment Option panel.
Using AR/CTL security

This chapter describes how to implement security for the APPLICATION RESTART CONTROL (AR/CTL) products and the BATCH CONTROL FACILITY (BCF) component. This chapter contains the following information:

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Using AR/CTL external security ........................................ 128
  Setting up AR/CTL external security ............................... 129
  Individual security entities ......................................... 132
  Modifying individual security entities ............................ 136
Using AR/CTL internal security ....................................... 137
  Setting up AR/CTL internal security ............................... 137
  Composite security entities ...................................... 138
  Modifying internal security components ........................ 139
Displaying an AR/CTL security definition ......................... 139
  Internal security definition ...................................... 140
  External security definition .................................... 141
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  Implementing the exit ........................................... 141
  Activating the exit ............................................ 142
  Using registers at entry ........................................ 142
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Overview

AR/CTL components, especially REGISET records, often require security in addition to that provided by the system security manager. The system security manager is typically a product compatible with the IBM Resource Access Control Facility (RACF®).

AR/CTL products provide the following facilities for implementing security:

- external security
AR/CTL external security requires an operating system security manager compatible with RACF. AR/CTL external security uses the MVS RACROUTE interface to control read and update access to product functions and components.

- **Internal security**

  AR/CTL internal security uses two components—the security file and the security module—to secure the AR/CTL ISPF interface and the REGISET against unauthorized updates. With AR/CTL internal security, you can restrict ISPF update access only; ISPF read access cannot be restricted.

Use of AR/CTL security is optional. You can use AR/CTL external security or AR/CTL internal security; if both are used, external security is used. AR/CTL products determine which facility you are using by performing the following sequence of tests:

1. AR/CTL products determine whether AR/CTL security is active. If AR/CTL security is not active, AR/CTL products allow access to the product component; however, the system security manager can deny access at the data set level.

2. If AR/CTL security is active, AR/CTL products check for the presence of external security components. If external security components are present, AR/CTL products use external security.

3. If external security components are not present, AR/CTL products check for the presence of internal security components. If internal security components are present, AR/CTL products use internal security.

4. If internal security components are not present, AR/CTL products assume that any user with access to the online panels and the REGISET can update AR/CTL components. Use of AR/CTL products and functions during application execution is also unrestricted at this level.

### Using AR/CTL external security

If you set up AR/CTL external security, AR/CTL products permit only authorized users to access AR/CTL product components and functions. When a user tries to access an AR/CTL product component or function, AR/CTL external security issues a RACROUTE call to determine the access authority of the user ID associated with the ISPF session or application program. AR/CTL external security retains the results of the RACROUTE calls for use as long as the current AR/CTL ISPF interface session is active or the application is executing.

AR/CTL RACROUTE requests specify a default resource class name of AES0. For easy maintenance, AR/CTL products use only one resource class name.
For performance reasons, define the resource class name (default AES0) as a system-level RACLIST class.

AR/CTL RACROUTE requests also specify an entity name associated with a specific function of an AR/CTL product. The RACROUTE entity names are associated with specific access levels, and they limit access to specific records of the REGIST, specific functions of the AR/CTL ISPF interface, or participation of AR/CTL products in the application execution. The permitted access levels are read and update, depending on the type of operation being performed. AR/CTL RACROUTE entity names and descriptions defined within AR/CTL products are shown in Table 4 on page 132.

If the return code from the RACROUTE call indicates that the user is not authorized for the function, AR/CTL products perform no additional security processing and deny the request for access.

**Setting up AR/CTL external security**

AR/CTL products use the AESXSC06 CSECT to control AR/CTL external security processing. The AESXSC06 CSECT contains a switch to activate AR/CTL external security and fields to define the resource class name. You must modify, assemble, and link-edit this CSECT into the AR/CTL execution library.

AR/CTL external security works with RACF-compatible system security managers. You must define AR/CTL product resources to the system security manager. Because the implementation and usage of system security managers is often unique to the site, the following procedure provides general guidelines and examples. It is based on RACF as the system security manager. The system security administrator at your site is probably the person who will define the AR/CTL product resources to the system security manager.

To activate AR/CTL external security, perform the following steps; all steps are required:

1. Modify the AESXSC06 CSECT (Figure 43). The source is located in member AESXSC06 of the AR/CTL sample library.

**Figure 43  AESXSC06 CSECT**

```
AESXSC06 CSECT ,
   DC  C'N'            RACF USAGE SWITCH
   DC  CL3' '          RESERVED
   DC  F'4'            LEN OF GENERAL RESOURCE CLASS NAME
   DC  CL8'AES0'       GENERAL RESOURCE CLASS NAME
```
Edit the AESXSC06 source as follows:

- Change the RACF usage switch to **Y** to activate AR/CTL external security.
- Set the resource class name. The default name is AES0; you can modify it. You can use a class name of up to eight characters. If the class name is other than four characters, modify the length as well as the name.

2. Assemble and link-edit the AESXSC06 CSECT. Member #AESSECR of the AR/CTL sample library contains sample JCL for the assemble and link-edit job. The link-edited, modified AESXSC06 CSECT must be in the library that contains the AR/CTL execution modules.

**NOTE**
Make sure to run *all* steps in member #AESSECR to ensure that external security works in the ISPF environment.

3. Define the necessary resource class to RACF, as shown in the following example:

```plaintext
ES0  ICHERCDE CLASS=AES0,ID=200,
    MAXLNTH=8,FIRST=ALPHANUM,
    OTHER=ANY,OPER=NO,POSIT=19,
    RACLIST=ALLOWED
```

**RACLIST** is allowed but not used by AR/CTL external security.

4. Add the resource class name to the RACF Router table, as shown in the following example:

```plaintext
ICHFRFTB CLASS=AES0,ACTION=RACF
```

5. Activate the resource class with the RACF **SETROPTS** command. The default resource class name referenced in the **RACROUTE** macro is **AES0**. The following example shows the default class name used with the RACF **SETROPTS** command:

```plaintext
SETROPTS CLASSACT(AES0)
```
Using extended security entity definitions

AR/CTL extended security entity definitions build on basic AR/CTL external security functions. They allow you to control security individually for an operating system image and for a particular BMC Software Consolidated Subsystem (BCSS) that is executing on that image.

Implementation of extended security entity definitions

To implement the extended security entity definitions, perform the following steps:

1. Expand the resource class definition to allow entity name lengths of a maximum of 64 bytes.

2. Add the following extended security entity name to the resource class with UACC(UPDATE):

   `smfid.bcsid.AESRXT`

   In this entity name, `smfid` is the identifier of the operating system image and `bcsid` is the identifier of the BCSS on which you want the entities to be in effect. The AESRXT entity does not directly control AR/CTL functions, but it indicates that you want to use extended security entity definitions for access checking.

3. Define the individual entity names that you want to use as follows:

   `smfid.bcsid.entity`
In this entity name, \textit{smfid} is the identifier of the operating system image and \textit{bcssid} is the identifier of the BCSS on which you want the entities to be in effect; \textit{entity} is the entity to be defined. Valid entities are listed in Table 4 on page 132.

**Extended security entity definition example**

In the following example, you want to control access to the AR/CTL pacing class records on two operating system images called SYSA and SYSB. The images share a RACF database. Separate BCSSs, called AESA and AESB, are running on each image. On SYSA, you want all users to be able to display AR/CTL pacing class records, but you do not want them to add, modify, or delete records without additional individual permissions. On SYSB, you want all users to have full access to AR/CTL pacing class records.

You would add the following extended security entities, one for each system:

SYSA.AESA.AESRXT --- UACC(UPDATE)
SYSB.AESB.AESRXT --- UACC(UPDATE)

You would add the following individual entities, one for each system:

SYSA.AESA.ARCPAC --- UACC(READ)
SYSB.AESB.AESPAC --- UACC(UPDATE)

**Individual security entities**

Table 4 lists the individual security entities that AR/CTL products use in the \texttt{RACROUTE} calls that the products issue when you set up AR/CTL external security. If you use AR/CTL internal security, you can define these entities in the AR/CTL internal security file, in addition to the composite security entities described in Table 5 on page 139.

### Table 4  AR/CTL individual security entities (part 1 of 4)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AESALL</td>
<td>Controls access to all AR/CTL ISPF interface functions and records (except for the REGISET Copy utility). A level of UPDATE is required to display AR/CTL panels and records and to create (add), delete, or modify records with the panels. A level of READ is required to display AR/CTL panels and records; records cannot be created, deleted, or modified. A level of NONE prevents access to all AR/CTL functions and records.</td>
</tr>
<tr>
<td>AESCPU</td>
<td>Controls access to the BMC Software product authorization panels (option 14 on the Application Enhancement Series primary menu). A level of UPDATE is required to display these panels and update items with these panels.</td>
</tr>
</tbody>
</table>
### Table 4  AR/CTL individual security entities (part 2 of 4)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AESGBL</td>
<td>Controls access to the AR/CTL global options record (option 1 on the Application Enhancement Series Records panel, which is accessed with option 1 on the AES primary menu). A level of READ is required to display this record. A level of UPDATE is required to update this record.</td>
</tr>
<tr>
<td>AESIMP</td>
<td>Controls access to AR/CTL IMS program registration records (option 7 on the Application Enhancement Series Records panel, which is accessed with option 1 on the AES primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>AESIMV</td>
<td>Controls access to AR/CTL IMS environment registration records (option 6 on the Application Enhancement Series Records panel, which is accessed with option 1 on the AES primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>AESIMX</td>
<td>Controls access to AR/CTL IMS program exclusion records (option 8 on the Application Enhancement Series Records panel, which is accessed with option 1 on the AES primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>AESLBF</td>
<td>Controls access to the AR/CTL LIBDEF facility panels (option 11 on the Application Enhancement Series primary menu, and then option 2 or 3). A level of READ is required to view these panels. A level of UPDATE is required to update the LIBDEF table and LIBDEF variables.</td>
</tr>
<tr>
<td>AESNIA</td>
<td>Controls access to AR/CTL non-IMS automatic registration records (option 5 on the Application Enhancement Series Records panel, which is accessed with option 1 on the AES primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>AESNIP</td>
<td>Controls access to AR/CTL non-IMS program registration records (option 3 on the Application Enhancement Series Records panel, which is accessed with option 1 on the AES primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>AESNIV</td>
<td>Controls access to AR/CTL non-IMS environment registration records (option 2 on the Application Enhancement Series Records panel, which is accessed with option 1 on the AES primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>AESNIX</td>
<td>Controls access to AR/CTL non-IMS program exclusion records (option 4 on the Application Enhancement Series Records panel, which is accessed with option 1 on the AES primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>AESSEC</td>
<td>Controls access to the Set Security Control panel (option 13 on the Application Enhancement Series primary menu). A level of UPDATE is required to access this panel and change information on it. This panel is used to control AR/CTL internal security.</td>
</tr>
<tr>
<td>AESRXT</td>
<td>Controls whether extended security entity definitions are allowed. A level of UPDATE is required to allow extended security entity definitions.</td>
</tr>
<tr>
<td>ARCaaaa</td>
<td>Allows AR/CTL to participate in the execution of applications. The entity name contains the four-character ARCID (aaaa). A level of READ is required to allow AR/CTL participation.</td>
</tr>
</tbody>
</table>

**Note:** This entity is not valid for internal or extended security.
Table 4   AR/CTL individual security entities  (part 3 of 4)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCALL</td>
<td>Controls access to all AR/CTL ISPF interface functions and records (except for the REGISET Copy utility). A level of UPDATE is required to display AR/CTL panels and records and to create (add), delete, or modify records with the panels. A level of READ is required to display AR/CTL panels and records; records cannot be created, deleted, or modified. A level of NONE prevents access to all AR/CTL functions and records.</td>
</tr>
<tr>
<td>ARCALO</td>
<td>Controls access to AR/CTL dynamic allocation records (option 9 on the AR/CTL primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>ARCCSR</td>
<td>Controls access to AR/CTL cursor repositioning records (option 6 on the AR/CTL primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>ARCCSL</td>
<td>Controls access to AR/CTL cursor repositioning records options. A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>ARCDSO</td>
<td>Controls access to AR/CTL data set option (also known as file characteristics block or FCB) members (option 9 on the AR/CTL primary menu). A level of READ is required to display these members. A level of UPDATE is required to add, update, or delete these members.</td>
</tr>
<tr>
<td>ARCGBL</td>
<td>Controls access to the AR/CTL global options record (option 5 on the AR/CTL primary menu). A level of READ is required to display this record. A level of UPDATE is required to update this record.</td>
</tr>
<tr>
<td>ARCJSC</td>
<td>Controls access to AR/CTL restart control records in the REGISET (option 1 on the AR/CTL primary menu). A level of READ is required to display these records. A level of UPDATE is required to delete these records.</td>
</tr>
<tr>
<td>ARCOPT</td>
<td>Controls access to AR/CTL options records in the REGISET (option 5 on the AR/CTL primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>ARCPAC</td>
<td>Controls access to AR/CTL pacing class records in the REGISET (option 3 on the AR/CTL primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>ARCPGM</td>
<td>Controls access to AR/CTL program option (also known as application specification block or ASB) members (option 10 on the AR/CTL primary menu). A level of READ is required to display these members. A level of UPDATE is required to add, update, or delete these members.</td>
</tr>
<tr>
<td>ARCPE0</td>
<td>Controls access to AR/CTL program exception class records in the REGISET (option 13 on the AR/CTL primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>ARCRPT</td>
<td>Controls access to AR/CTL reports in the history data set (option 4 on the AR/CTL primary menu). A level of READ is required to display these records. A level of UPDATE is required to delete these records.</td>
</tr>
<tr>
<td>ARCREA</td>
<td>Controls access to AR/CTL reattach class records (option 8 on the AR/CTL primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>ARCSHF</td>
<td>Controls access to AR/CTL current shift records in the REGISET (option 2 on the AR/CTL primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
</tbody>
</table>
Table 4  AR/CTL individual security entities  (part 4 of 4)

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCSQL</td>
<td>Controls access to AR/CTL SQL return code class records in the REGISET (option 12 on the AR/CTL primary menu). A level of READ is required to display these records. A level of UPDATE is required to add, update, or delete these records.</td>
</tr>
<tr>
<td>ARCTRACE</td>
<td>Controls access to AR/CTL enhanced call tracing. A level of READ is required to activate the call trace.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> This entity is not valid for extended security and only applies for batch processing.</td>
</tr>
<tr>
<td>ARVCON</td>
<td>Controls access to AR/CTL IBM CICS® remote connection list members (option 11 on the AR/CTL primary menu). A level of READ is required to display these members. A level of UPDATE is required to add or update these members.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> This entity is not valid for internal security.</td>
</tr>
<tr>
<td>ARVFT0</td>
<td>Controls access to AR/CTL remote VSAM access file table display (option 10 on the AR/CTL primary menu). A level of READ is required to display this table.</td>
</tr>
<tr>
<td></td>
<td><strong>Note:</strong> This entity is not valid for internal security.</td>
</tr>
<tr>
<td>BCFALL</td>
<td>Controls access to all BCF component ISPF interface functions and records (except for the REGISET Copy utility). A level of UPDATE is required to display BCF component panels and records and to create (add), delete, or modify records with the panels. A level of READ is required to display BCF component panels and records; records cannot be created, deleted, or modified. A level of NONE prevents access to all BCF component functions and records.</td>
</tr>
<tr>
<td>BCFALO</td>
<td>Controls access to BCF component dynamic allocation records (option 7 on the BCF primary menu). A level of READ is required to display these records. A level of UPDATE is required to delete or update these records.</td>
</tr>
<tr>
<td>BCFGBL</td>
<td>Controls access to the BCF component global options record (option 4 on the BCF primary menu). A level of READ is required to display this record. A level of UPDATE is required to update this record.</td>
</tr>
<tr>
<td>BCFJSC</td>
<td>Controls access to BCF component execution control records in the REGISET (option 3 on the BCF primary menu). A level of READ is required to display these records. A level of UPDATE is required to delete these records.</td>
</tr>
<tr>
<td>BCFOPT</td>
<td>Controls access to BCF component system and job step options records in the REGISET (options 5 and 6 on the BCF primary menu). A level of READ is required to display these records. A level of UPDATE is required to delete or update these records.</td>
</tr>
<tr>
<td>BCFRPT</td>
<td>Controls access to BCF component statistics records and log volume records in the history data set (option 1 on the BCF primary menu). A level of READ is required to display these records. A level of UPDATE is required to delete these records.</td>
</tr>
<tr>
<td>RCPAES</td>
<td>Controls access to AR/CTL records copied through the REGISET Copy utility. A level of UPDATE is required to copy these records.</td>
</tr>
<tr>
<td>RCPALL</td>
<td>Controls access to all AR/CTL and BCF component records copied through the REGISET Copy utility. A level of UPDATE is required to copy these records.</td>
</tr>
<tr>
<td>RCPARC</td>
<td>Controls access to AR/CTL records copied through the REGISET Copy utility. A level of UPDATE is required to copy these records.</td>
</tr>
<tr>
<td>RCPBCF</td>
<td>Controls access to BCF component records copied through the REGISET Copy utility. A level of UPDATE is required to copy these records.</td>
</tr>
</tbody>
</table>
Modifying individual security entities

Table 4 on page 132 lists the default definitions of individual security entities. For flexibility in the interface with external security facilities, you can change the default definitions of the individual security entities. To change the default definitions, perform the following steps; all steps are required:

1 Modify the AESXSC07 CSECT (Figure 44). The source is located in member AESXSC07 of the AR/CTL sample library. Specify an 18-byte entry for each entity name you want to change, using the format shown in Figure 44. The following values are valid for the access intent:

<table>
<thead>
<tr>
<th>Value</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>R</td>
<td>Use read access.</td>
</tr>
<tr>
<td>U</td>
<td>Use update access.</td>
</tr>
<tr>
<td>' '</td>
<td>Use the default access intent.</td>
</tr>
</tbody>
</table>

Terminate the table with an entry of hexadecimal FFs.

2 Assemble and link-edit the AESXSC07 CSECT into the library that contains the AR/CTL execution modules. Member #AESSEC2 of the AR/CTL sample library contains sample JCL for the assemble and link-edit job.
Using AR/CTL internal security

If AR/CTL external security is not set up, AR/CTL invokes internal security processing (if you set it up). AR/CTL internal security consists of two components:

- The internal security file is a sequential data set containing records to define the TSO user IDs of authorized users and their corresponding levels of authorization.
- The internal security module (module name AESXSCOM) is a load module in the AR/CTL execution library. It contains the data set name of the internal security file.

**NOTE**

If the internal security file does not contain any records, AR/CTL internal security is not invoked. Any user who can access the AR/CTL ISPF interface can update all AR/CTL components.

After you set up internal security for the first time, to add or change defined authorizations you simply add or change records in the internal security file. No reassembly or relink is needed.

Setting up AR/CTL internal security

To set up AR/CTL internal security for the first time, perform the following steps; all steps are required:

1. Allocate the internal security file. Define a record length of at least 80 bytes and a fixed-blocked (FB) record format. Use your RACF-compatible system security manager to secure access to the internal security file.

2. Add authorization records to the internal security file. The internal security file can contain only authorization records and comments. Figure 45 on page 138 is an example of these authorization records.

Authorization records begin with a valid TSO user ID or generic user ID in column 1, followed by one or more individual and composite security entities. Comments contain an asterisk (*) in column 1.

Security entities are enclosed in parentheses and separated by commas. For more information about valid security entities, see “Individual security entities” on page 132 and “Composite security entities” on page 138.
A generic user ID begins with an alphanumeric or national (@, #, $) character, can contain additional alphanumeric and national characters, and ends with an asterisk. Use a generic user ID to authorize any user ID that begins with those characters. For example, if you specify GG*, user IDs GG1, GGU2, GGHL1, and so on are authorized.

**Figure 45  Internal security file**

```
* THIS IS A SAMPLE SECURITY FILE
*USER ID      AUTHORIZATION
ENT*          (AESALL,AESSEC)
R*            (AESALL)
BA*           (AESSEC,BCFALL)
NOP           (ARCALL)
NTK           (BCFJSC,ARCJSC)
*           
* THIS USER ID IS COMMENTED OUT
*hgf          (AESSEC)
```

3 Modify the JCL in member #AESXSC1 of the AR/CTL sample library. This JCL executes program AESXSC01, which creates the internal security module in the AR/CTL execution library. Make the following changes:

- Modify the STEPLIB DD statement to define the AR/CTL execution library to contain the internal security module.
- Modify the CNTLDSN DD statement to identify the data set name of the internal security file. Program AESXSC01 checks for valid organization of the security file.

4 Submit the modified JCL for execution. When the job completes, check the job output for the following message:

SECURITY MODULE HAS BEEN INITIALIZED

## Composite security entities

Table 5 lists the composite security entities that AR/CTL products use to secure the AR/CTL ISPF interface and the REGISET against unauthorized updates. These entities include several individual security entities. You can set up AR/CTL internal security with the individual entities listed in Table 4 on page 132 or with the composite entities listed in Table 5.

**NOTE**

None of the composite entities authorize the user ID to update the name of the internal security file. You must use individual security entity AESSEC for this authorization.
Modifying internal security components

To update the entries in the internal security file, use ISPF Edit.

To change the data set name of the internal security file or to place the internal security module in a different load library, use either of these methods:

- Reassemble and relink-edit the security module with the JCL in member #AESXSC1 of the AR/CTL sample library. You can modify the STEPLIB DD statement to define the AR/CTL execution library to contain the internal security module and modify the CNTLDSN DD statement to define the data set name of the internal security file. When you execute the job, check the output for the message SECURITY MODULE HAS BEEN INITIALIZED.

- Use the Set Security Control panel as described in “Internal security definition” on page 140. An internal security module must exist and your user ID must be authorized to update it (with the AESSEC entity in the internal security file).

Table 5  AR/CTL composite security entities

<table>
<thead>
<tr>
<th>Name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>AESALL</td>
<td>Authorizes the user ID to use AR/CTL ISPF interface functions (except for the REGISET Copy utility).</td>
</tr>
<tr>
<td>ARCALL</td>
<td>Authorizes the user ID to use all AR/CTL ISPF interface functions and to update all AR/CTL components (except for copies with the REGISET Copy utility).</td>
</tr>
<tr>
<td>BCFALL</td>
<td>Authorizes the user ID to use all BCF component ISPF interface functions and to update all BCF components (except for copies with the REGISET Copy utility).</td>
</tr>
</tbody>
</table>

Displaying an AR/CTL security definition

You can display AR/CTL internal and external security information through the AR/CTL ISPF interface, and you can use the ISPF interface to change AR/CTL internal security components. Select option 13 on the Application Enhancement Series primary menu to access the Set Security Control panel (Figure 46).
The Set Security Control panel contains fields related to internal security. You can use these fields to change the name of the security file data set and to change the data set name of the product load library that contains the security module.

**NOTE**
The information in these fields is ignored if the external security **RACF Switch On** field is set to **Y**.

**Security File Data Set**
Type or verify the name of the current security data set. This data set contains the user IDs and authorization levels that are defined for AR/CTL internal security. You can change the displayed file name to another file name.

**Loadlib for Security module**
Type or verify the data set name of the product load library that contains the security module built by program AESXSC01.
External security definition

The Set Security Control panel contains fields that indicate the status of external security. The values displayed in these fields cannot be changed with the ISPF interface; to change the values, see “Setting up AR/CTL external security” on page 129.

NOTE
If the external security RACF Switch On field is set to Y, AR/CTL products ignore any information in the internal security definition fields.

RACF Switch On
Verify whether external security is active (Y) or inactive (N).

RACF Class Len
Verify the length of the general resource class name.

RACF Class Name
Verify the general resource class name to be used by the AR/CTL product when requesting authorization from the external security package. The default resource class name is AES0.

Using the User Security exit

You can use the User Security exit to restrict update access to AR/CTL restart control records in the REGISET. For example, you can restrict programmers to updating restart control records for their own programs only.

NOTE
This security exit is for use with AR/CTL only.

Implementing the exit

To implement the User Security exit, perform the following steps:
1 Code the user exit routine with the conventions described in the following sections. Member ARCU0000 of the sample library contains a sample User Security exit routine that you can copy and modify.

2 Assemble and link-edit the user exit routine. You can use any valid module name. This module must be located in the AR/CTL execution library, and this library must be in the concatenation of load libraries available to the TSO user.

### Activating the exit

The User Security exit is activated automatically when a user tries to update a restart control record by entering one of the following codes on the List Record panel (not shown):

<table>
<thead>
<tr>
<th>Code</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>M</td>
<td>Modify the status of this restart control record.</td>
</tr>
<tr>
<td>C</td>
<td>Display and change information about the restart data set named in the restart control record.</td>
</tr>
<tr>
<td>O</td>
<td>Set manual restart information.</td>
</tr>
<tr>
<td>J</td>
<td>Submit the job step named in the restart control record for restart with the submit restart exit.</td>
</tr>
</tbody>
</table>

AR/CTL invokes the User Security exit routine; the routine performs its processing. When processing is completed, the routine returns a message that AR/CTL displays in the long message field on the List Records panel. Check the message to verify that the exit produced the intended results.

### Using registers at entry

The user exit routine must save and restore registers. The parameter list that AR/CTL passes to the routine contains the address of storage that the routine can use as a register save area if needed. When AR/CTL calls the routine, it sets the registers as follows:

- **R0**: unpredictable contents
- **R1**: address of the parameter list

The format of this parameter list is defined in the sample routine in member ARCU0000 of the sample library.
R2-R12
  unpredictable contents

R13
  address of save area

R14
  return address

R15
  authorization status of the user:
  ■ 0—The user is authorized
  ■ 4—The user is not authorized

Setting registers for return

When the user exit routine returns control to AR/CTL, the routine must set all registers to the contents as they were at entry.
Copy the REGISET records

This chapter describes how to use the APPLICATION RESTART CONTROL (AR/CTL) ISPF interface to copy records from a set of registration data sets (collectively called a REGISET). This chapter contains the following information:

Overview .......................................................... 145
Limitations ......................................................... 145
Restrictions ......................................................... 146
Using the REGISET Record Copy utility ....................... 146
Accessing the utility .............................................. 146
Selecting the BCSSs and the record type ....................... 147
Selecting records to copy ....................................... 148
Changing the record ID ......................................... 149
Replacing a record ............................................. 150

Overview

The REGISET Record Copy utility works with all types of AR/CTL product records and BATCH CONTROL FACILITY (BCF) component records. It can copy a record from a REGISET to the same REGISET with a change to the record ID. It can copy a record to different REGISET with or without a change to the record ID.

Limitations

The REGISET Record Copy utility is intended for use as a migration tool. It can help you transfer records quickly from a test environment to a production environment. With the REGISET Record Copy utility, you can view and change the record ID only; you cannot view or change the contents of a record. To view or change the record contents, you must go back to the Application Enhancement Series primary menu, selected the product (AR/CTL or the BCF component), and then select the record type you want to work with.
Although the REGISET Record Copy utility copies all types of records and most records of each type, it cannot copy most global-level records (which are records created by the AESURPOP utility). The utility can copy global AR/CTL checkpoint pacing class records, reattach class records, and program exception class records. Other global-level records must be built in the REGISET by the AESURPOP utility.

**Restrictions**

Some restrictions apply to the use of the REGISET Record Copy utility:

- Both REGISETs must be active—each must be accessed from an active BMC Consolidated Subsystem (BCSS).
- Both REGISETs must have been initialized by the AESURPOP utility.
- You must provide the BCSS IDs (for the source and target REGISETs) before the utility can perform the copy. Note that the active BCSS ID list is not refreshed until you exit the utility panels.

**Using the REGISET Record Copy utility**

This section describes how to use the REGISET Record Copy utility.

**Accessing the utility**

To access the REGISET Record Copy utility, perform the following steps:

1. Access the Application Enhancement Series primary menu (Figure 12 on page 32).
2. Type 15 (REGISET record copy utility) in the choice entry field.
3. Press Enter. AR/CTL displays the List REGISET Record Types panel (Figure 47).
Selecting the BCSSs and the record type

To set the fields on the List REGISET Record Types panel (Figure 47 on page 147), perform the following steps:

1. In the **Source BCSS** field, type or verify the ID of the BCSS associated with the source REGISET from which to copy records. You can enter a question mark (?) to choose the ID from a list of active BCSSs.

2. In the **Target BCSS** field, type or verify the ID of the BCSS associated with the target REGISET to which to copy records. You can enter a question mark (?) to choose the ID from a list of active BCSSs. The target BCSS can be the same as the source BCSS.

3. To select one or more record types to copy, type **S** in the selection field to the left of the record type. The list of record types is scrollable; use the **DOWN** and **UP** commands to see the rest of the list.

4. Press Enter.
   - For most record types, the Limit List of Records panel is displayed (Figure 13 on page 32).
To select records to copy, perform the following steps:

1. In the Allow record replacement field, type one of the following values:
   - N—Prevent the utility from replacing an existing record with a copy.
   - Y—Allow the utility to replace an existing record with a copy.

   **NOTE**
   The value in the Allow record replacement field is always reset to N when you exit from the List Records panel.
2. In the **Suppress replace warning** field, type one of the following values:

- **N**—Show the Replace Warning panel (Figure 50 on page 150) before replacing an existing record with a copy.
- **Y**—Replace an existing record without confirmation.

**NOTE**
The value in the **Suppress replace warning** field is always reset to **N** when you exit from the List Records panel.

3. To select one or more records to copy, type **S** (for a simple copy function) or **R** (for a copy with a record ID change) in the field to the left of the record.

4. Press **Enter**.

- If you selected the record to copy with **S** and if the source BCSS and target BCSS are different, the List Records panel is redisplayed, and the *Action* field shows the action performed on the selected record.
- If you selected the record to copy with **R**, or if the source BCSS and target BCSS are the same, the Change Record ID panel (Figure 49) is displayed. The fields displayed on this panel depend on the record type.

**Figure 49  Change Record ID panel**

<table>
<thead>
<tr>
<th>Command ====&gt;</th>
<th>Change Record ID</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Record type</strong>: AES NON-IMS PROGRAM REGISTRATION</td>
<td></td>
</tr>
<tr>
<td><strong>Source BCSSID</strong>: ARD1</td>
<td></td>
</tr>
<tr>
<td><strong>Target BCSSID</strong>: ARD1</td>
<td></td>
</tr>
<tr>
<td>Enter new record ID information. Then press Enter.</td>
<td></td>
</tr>
</tbody>
</table>

<table>
<thead>
<tr>
<th>New record ID:</th>
<th><strong>Old record ID:</strong></th>
</tr>
</thead>
<tbody>
<tr>
<td>PROGNAME . APIDEMX*</td>
<td>PROGNAME . : APIDEMX*</td>
</tr>
<tr>
<td>PROCSTEP . ********</td>
<td>PROCSTEP . : ********</td>
</tr>
<tr>
<td>JOBSTEP . ********</td>
<td>JOBSTEP . : ********</td>
</tr>
<tr>
<td>JOBNAME . RXF*****</td>
<td>JOBNAME . : RXF*****</td>
</tr>
<tr>
<td>MVSID . ****</td>
<td>MVSID . : ****</td>
</tr>
<tr>
<td>DB2ID . ____</td>
<td>DB2ID . :</td>
</tr>
<tr>
<td>PLANNAME .</td>
<td>PLANNAME . :</td>
</tr>
</tbody>
</table>

**Changing the record ID**

To use the Change Record ID panel, perform the following steps:
1 Type or verify the qualifiers to use in the new record ID. You must change at least one qualifier.

2 To create the new record, press Enter. To exit without creating the new record, enter the END or CANCEL command.

---

**NOTE**

The List Records panel does not list the new record until you exit from and redisplay the panel.

---

### Replacing a record

If the target REGISET already contains a record with the same record ID as the record you are copying and if the Suppress replace warning field is set to N, the Replace Warning panel (Figure 50) is displayed. Enter Y to replace the existing record or N to return to the List Records panel without replacing the existing record.

**Figure 50  Replace Warning panel**

<table>
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<tr>
<td>Replace Warning</td>
</tr>
<tr>
<td>KEY  DUP</td>
</tr>
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</table>

Record type : AES NON-IMS PROGRAM REGISTRATION
Source BCSID : ARD1
Target BCSID : ARD1

Record ID:

<table>
<thead>
<tr>
<th>PROGNAME</th>
<th>PROCSPEC</th>
<th>JOBSTEP</th>
<th>DB2</th>
<th>MVS</th>
</tr>
</thead>
<tbody>
<tr>
<td>APIDEMX*</td>
<td>********</td>
<td></td>
<td></td>
<td></td>
</tr>
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The record you are copying to the target BCSID will replace an existing record. Type Y to replace. Type N to bypass copy.

Then press Enter.

Replace existing record . . . . N
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