APPLICATION RESTART CONTROL
Configuration Guide

Supporting

Version 3.9 of APPLICATION RESTART CONTROL for IMS™
Version 3.9 of APPLICATION RESTART CONTROL for DB2®
Version 3.9 of APPLICATION RESTART CONTROL for VSAM
Version 3.9 of BATCH CONTROL FACILITY component

June 2013
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- read overviews about support services and programs that BMC offers
- 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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In the United States and Canada, if you need technical support and do not have access to the web, call 1 800 537 1813 or send an e-mail message to [customer_support@bmc.com](mailto:customer_support@bmc.com). (In the subject line, enter **SupID:**<yourSupportContractID>, such as **SupID:**12345). Outside the United States and Canada, contact your local support center for assistance.

**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 book

This book explains how to configure the BMC Software APPLICATION RESTART CONTROL (AR/CTL) products and the BATCH CONTROL FACILITY (BCF) component of AR/CTL.

Intended for system administrators who configure AR/CTL, this information assumes familiarity with z/OS® concepts and facilities and with 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.

NOTE

Online books are formatted as PDF or HTML files. To view, print, or copy PDF books, use the free Adobe Reader from Adobe Systems. If your product installation does not install the reader, you can obtain the reader at http://www.adobe.com.

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

Related publications

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, or to view video demos (short overviews of selected product concepts, tasks, or features)

- View 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**

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.

**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>
<tbody>
<tr>
<td>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.</td>
<td>alias</td>
</tr>
<tr>
<td></td>
<td><code>databaseDirectory</code></td>
</tr>
<tr>
<td></td>
<td><code>serverHostName</code></td>
</tr>
<tr>
<td>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.</td>
<td><code>[tableName, columnName, field]</code></td>
</tr>
<tr>
<td></td>
<td><code>[-full, -incremental, -level]</code></td>
</tr>
<tr>
<td></td>
<td>(UNIX)</td>
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</tbody>
</table>
**Terms**

The following terms have a specific meaning in this guide.

<table>
<thead>
<tr>
<th>Term</th>
<th>Description</th>
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</thead>
<tbody>
<tr>
<td>IMS</td>
<td>The term IMS refers to all supported versions and releases of the IBM IMS&lt;sup&gt;®&lt;/sup&gt; product. The specific product name, version, and release numbers are noted only when this information is significant.</td>
</tr>
<tr>
<td>DB2</td>
<td>The term DB2 refers to all supported versions and releases of the IBM DB2&lt;sup&gt;®&lt;/sup&gt; product. 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, and the BATCH CONTROL FACILITY (BCF) component of AR/CTL.</td>
</tr>
<tr>
<td>Checkpoint/restart</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, not system restarts.</td>
</tr>
<tr>
<td>Term</td>
<td>Description</td>
</tr>
<tr>
<td>------------</td>
<td>--------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td><strong>Keywords</strong></td>
<td>In keyword descriptions, the characters shown in uppercase are required; you can omit the lowercase characters. When this guide discusses a keyword in text or shows it in an example, it uses the complete keyword in uppercase.</td>
</tr>
</tbody>
</table>
| **Libraries** | This guide refers to various members of sample and install libraries. As distributed by BMC Software, these libraries have the following names:  
  - `HLQ.ARCSAMP`  
  - `HLQ.ARCCUST`  

  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*. |
Installation overview

This chapter introduces you to the BMC APPLICATION RESTART CONTROL (AR/CTL) products, the product components, and the tasks for managing the products. Information about what to do if you have a question or problem is also included. This chapter presents the following topics:

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AR/CTL products

This section introduces the AR/CTL products and provides a brief overview of the major functions and features of each product.

APPLICATION RESTART CONTROL

Three AR/CTL products are available from BMC for use in the z/OS environment:

- AR/CTL for IMS
- AR/CTL for DB2
- AR/CTL for VSAM

This section discusses the major functions and features of these AR/CTL products. For more information, see the APPLICATION RESTART CONTROL User Guide.

AR/CTL checkpoint/restart services

Checkpoint/restart services provide (or enhance) an environment that allows an application program job step to be restarted from an application checkpoint after a failure. These services perform the following processing:

Restart processing

Restart processing includes program restart at the last checkpoint, automatic repositioning of data structures that use AR/CTL data services, and restoration of working storage areas. AR/CTL provides several methods for an application program to obtain restart processing; the Automatic Restart options require no program changes.

Checkpoint processing

Checkpoint processing includes saving application program working storage areas; saving information needed to reestablish program position within the data sets that use AR/CTL data services; and signaling all database management systems (DBMSs), such as DB2 and IMS, to perform commit processing. AR/CTL provides several methods for an application program to obtain checkpoint processing; the Automatic Checkpoints options require no program changes.

Automated management of checkpoint/restart data sets

AR/CTL creates, dynamically allocates, and deletes required checkpoint/restart data sets at appropriate points during application program execution.
Automated determination of checkpoint/restart requirements

AR/CTL monitors program execution status, selects the correct checkpoint for restart, and provides checkpoint information to participants in the application execution environment.

Checkpoint pacing by shift

Checkpoint pacing includes monitoring the threshold (maximum) interval allowed without a checkpoint, controlling (pacing) the minimum interval between checkpoints, and bypassing checkpoints that do not meet the defined pacing requirements.

Application reattach options

AR/CTL can invoke dynamic backout in certain abend conditions (such as deadlock and rollback) and can reattach the application program task instead of terminating the task.

AR/CTL data services

Data services focus on reestablishing the application program’s position within data structures at restart. Data services also provide availability, integrity, and performance enhancements for supported data structures. AR/CTL provides the following data services, depending on the type of application program and the AR/CTL products you have:

Sequential (QSAM) file interception

AR/CTL provides sequential file interception for data sets that an application program accesses through standard z/OS queued sequential access method (QSAM) I/O requests. AR/CTL dynamically intercepts these requests so that it can reposition the data set at restart time.

Local VSAM access

AR/CTL provides local VSAM access for VSAM data sets accessed exclusively by a batch VSAM application program. The program issues native VSAM requests. AR/CTL for VSAM dynamically intercepts these requests to provide repositioning support. AR/CTL can also provide logging and dynamic backout of uncommitted changes made by the batch program.
**Remote VSAM access (file sharing)**

AR/CTL provides remote VSAM access (also known as VSAM file sharing) to allow VSAM data sets to be shared and updated between a batch VSAM application program and one or more IBM CICS® regions. The batch program and the CICS regions can execute on a single z/OS image or on different z/OS images within a SYSPLEX environment. While a file is being shared, the CICS region owns the data sets; it manages all access to the data sets, logs changes made by those transactions, and backs out uncommitted changes in case of failure. AR/CTL dynamically intercepts the native VSAM requests issued by a batch VSAM application program, transforms the requests to online CICS commands, and ships the commands to the CICS region for service.

**IMS GSAM replacement**

AR/CTL can replace IMS generalized sequential access method (GSAM) services with enhanced AR/CTL services. GSAM replacement is for IMS and IMS-compatible application programs.

**ASAM callable interface**

AR/CTL provides the application sequential access method (ASAM) callable interface mainly for DB2 application programs to use if AR/CTL for VSAM is not available. A program can use the ASAM callable interface to obtain limited support for repositioning of VSAM entry-sequenced data sets (ESDSs), input VSAM key-sequenced data sets (KSDSs), and standard z/OS sequential files.

**QUICKSTART-to-AR/CTL bridge**

AR/CTL provides the QUICKSTART for z/OS-to-AR/CTL bridge, which allows AR/CTL to support (without program changes in most cases) application programs that use the QUICKSTART for z/OS product.

**Automatic DB2 cursor repositioning**

AR/CTL can perform repositioning automatically for the DB2 cursors used by an application program. After an abend, cursor position (the point where the application program was processing) is lost. At restart, AR/CTL can reestablish the cursor position at the last completed checkpoint. Automatic DB2 cursor repositioning requires no application program changes.

---

**NOTE**

DB2 cursor repositioning is not available when the cursor is a scrollable rowset cursor.
Program exception handling

AR/CTL can handle certain program exception errors automatically. If an error that would cause a system 0Cx-type abend occurs, AR/CTL can ignore the error and continue, ignore the bad record and reattach the application program task, or write the bad record to a file and reattach the task.

SQL return code handling

AR/CTL can intercept a defined SQL return code and transform it to a user abend code that can then be defined as eligible for application reattach processing.

AR/CTL operational services

Operational services focus on improving your control over the application program execution-time environment:

Early termination support

AR/CTL provides options you can use to terminate an application job after the next checkpoint, immediately after the next call, at a specified time of day, after a specified amount of time, after a specified number of checkpoints, before a specified number of checkpoints, and before the final checkpoint.

Suspend-and-resume interfaces with other BMC products

AR/CTL provides suspend-and-resume interfaces with other BMC products. Suspend-and-resume processing allows these products to obtain a point of consistency required for reorganization or recovery.

On-demand snap dumps

You can use AR/CTL to obtain a standard z/OS snap dump of application program storage. Snap dumps are helpful for analysis of application program problems. A snap dump does not cause program termination.

Enhanced call tracing

AR/CTL provides enhanced call tracing to help you develop, test, debug, and audit application programs. Unlike many existing trace facilities, enhanced call tracing lets you begin and end tracing while the application program is executing. It also places the trace data in a separate data set for easy access and does not significantly degrade overall system performance.
AR/CTL for IMS functions

AR/CTL for IMS provides the following IMS-oriented functions:

- GSAM replacement
- checkpoint pacing by DL/I call counts
- checkpoint threshold monitoring by DL/I call counts
- enhanced call tracing of DL/I calls
- monitoring of checkpoint usage with DL/I update calls
- automatic checkpoints based on a trigger program communication block (PCB)
- suspend-and-resume interface with other BMC products

AR/CTL for IMS is required for application programs that execute in IMS regions. If a CPU authorization password to enable AR/CTL for IMS participation is not installed, AR/CTL does not participate in any IMS region.

AR/CTL for IMS also provides the IMS-compatible mode of execution, where an application program uses IMS-format calls and structures but where IMS is not present during execution.

To use the suspend-and-resume interface, an AR/CTL for IMS license is required on the machine that executes the application program and on the machine that executes the other BMC product.

AR/CTL for DB2 functions

AR/CTL for DB2 provides the following DB2-oriented functions:

- automatic DB2 cursor repositioning
- checkpoint pacing by SQL call counts
- checkpoint threshold monitoring by SQL call counts
- automatic checkpoints based on a trigger DB2 cursor
- enhanced call tracing of SQL calls
- attach to DB2 on behalf of the application program
- suspend-and-resume interface with BMC products for DB2

If a CPU authorization password to enable AR/CTL for DB2 participation is not installed, DB2 calls are ignored and these DB2-oriented services of AR/CTL are unavailable.

To use the suspend-and-resume interface, an AR/CTL for DB2 license is required on the machine that executes the application program and on the machine that executes the other BMC product for DB2.
AR/CTL for VSAM functions

AR/CTL for VSAM provides the following VSAM-oriented functions:

- local VSAM access services (and VSAM logging and dynamic backout)
- remote VSAM access services (file sharing)
- checkpoint pacing by VSAM call counts
- checkpoint threshold monitoring by VSAM call counts
- automatic checkpoints based on a trigger VSAM file
- repositioning of VSAM data sets at restart without application program changes

If a CPU authorization password to enable AR/CTL for VSAM participation is not installed, no native VSAM requests are intercepted and these VSAM-oriented services of AR/CTL are unavailable.

BATCH CONTROL FACILITY component of AR/CTL

The BATCH CONTROL FACILITY (BCF) component of AR/CTL assists in the management of batch DL/I jobs, improves the performance of the batch logging process, and provides useful statistics for application performance tuning.

This section discusses the major functions and features of the BCF component of AR/CTL. For more information, see the APPLICATION RESTART CONTROL Reference Manual: BATCH CONTROL FACILITY.

Execution controller

The AR/CTL BCF component execution controller provides an environment where recovery from an abending batch application program is performed automatically before the job step terminates. Recovery from a system failure occurs when the job step is resubmitted. The execution controller offers many features that can improve and enhance the execution environment and performance of batch DL/I jobs:

Job surveillance during execution

The execution controller causes the application to execute as an z/OS subtask so that the BCF component of AR/CTL can monitor and record the program execution and termination status. By tracking the status of the job, the BCF component can determine whether the job step requires BCF component services during abnormal termination of the job step, during application restart after a system failure, and when the job step is using the application reattach services of AR/CTL.
Automatic batch backout

When the execution controller is active, the normal method for handling a job step or system failure is to resubmit the job after the problem is corrected. The time-consuming and error-prone manual intervention process is no longer necessary. With the BCF component of AR/CTL, it may be feasible to implement automatic job scheduling and operations in the batch application environment.

Automatic log recovery

The execution controller provides an efficient way to handle the closure of log data sets. If IMS cannot close the log data sets, the execution controller can automatically invoke the IMS Log Recovery utility and then the IMS Batch Backout utility during abnormal termination of the job step. If a job step is restarted and the previous batch log data set was not closed when the job step last terminated, the execution controller automatically invokes the IMS Log Recovery utility and closes the batch system log data set (SLDS).

Exchange of log device types

The BCF component of AR/CTL can reduce JCL changes when you decide to use discard logging and/or migrate to tape logging from DASD logging. The execution controller can deallocate the log data sets coded in the application program JCL and can dynamically allocate replacement log data sets. You have full control over this process by specifying the AR/CTL BCF component processing options and data set allocation information.

Physical Logger

The AR/CTL BCF component Physical Logger replaces the IMS routines that perform physical logging. It can provide significant performance improvements and reduce overall resource usage during the physical logging process.

Buffered device support

The AR/CTL BCF component Physical Logger removes the IMS restriction that buffered devices (3480 and 3490 tape drives) must use tape write immediate (TWI) mode when used as batch logging devices. This restriction prevents you from taking advantage of the performance improvements offered by buffered tape devices. The AR/CTL BCF component can write to these devices in buffered mode, yet still ensure data integrity. Through device monitoring and synchronization techniques, the Physical Logger provides the IMS Database Manager with write ahead log tape (WALT) support for database integrity.
Discard logging support

For some batch jobs, you may want to bypass the logging of database changes. However, DBRC requires batch logging if the database is registered and DBRC is active. Without the BCF component of AR/CTL, to bypass logging you must turn off DBRC during the batch job—opening a window for database integrity exposures. With the AR/CTL BCF component, the BCF component Physical Logger can discard the log blocks received from the IMS Logical Logger but inform IMS that the log block was written normally. It also issues the notifications to DBRC that help ensure data integrity.

IMS dynamic backout with tape logging support

The AR/CTL BCF component Physical Logger can create an in-memory dynamic log for use with the IMS dynamic backout process. The IMS dynamic backout process can handle certain classes of DL/I pseudo abends. It is particularly useful in a block-level sharing environment. When using the AR/CTL BCF component dynamic log, you can take advantage of the IMS dynamic backout capability while writing the log data sets to tape media. Without the BCF component of AR/CTL, the logs must be written to DASD for the IMS dynamic backout process to work.

SLDS duality

If the job step JCL must request dual logging, the AR/CTL BCF component Physical Logger can attempt to provide SLDS duality. It writes a specified number of blocks to each SLDS before forcing an end-of-volume condition on both log data sets. This process is consistent with the process used by the IMS Archival utility.

Execution statistics

The AR/CTL BCF component Physical Logger collects and reports statistics to help you monitor and tune the performance of batch programs. The AR/CTL BCF component Physical Logger can analyze these statistics and notify you when you can tune the job’s database buffer pools to improve logging to buffered tape devices. In some instances, this feature can also let you bypass application performance tuning unless it is really necessary.

Enhanced processing

AR/CTL BCF component enhanced processing addresses operational concerns:
Cancel intercept

Cancel intercept processing transforms a JES CANCEL command issued for an AR/CTL BCF component-controlled job into a user abend. The user abend allows the BCF component of AR/CTL to perform batch backout for the job step that completed before step termination. Without cancel intercept support, the job step is cancelled immediately, and batch backout does not occur until the job step is resubmitted.

NOTE
Cancel intercept support is provided for JES CANCEL commands only. The BCF component of AR/CTL cannot intercept z/OS CANCEL commands; you can use an z/OS CANCEL command when you want an immediate cancel without any additional processing by the BCF component.

Abend filter

Abend filter processing allows the BCF component of AR/CTL to perform batch backout for applications that have a step parameter (,STEP) coded in an abend macro. Without this function, the AR/CTL BCF component cannot perform batch backout for these applications before job step termination.

Other AR/CTL BCF component features

The BCF component of AR/CTL provides other features to address specific concerns in the DL/I batch environment:

Conditional batch backout step bypass

The batch job JCL may contain conditional batch backout steps to be executed if an IMS application fails. Because the BCF component of AR/CTL provides batch backout before step termination, usually the conditional step should not be allowed to execute. If the AR/CTL BCF component is used for the conditional backout step, the component can bypass the conditional backout step when the environment has been recovered. You do not need to make JCL changes to obtain this support, and you can return to your previous execution practices if the AR/CTL BCF component is disabled.

Dummy logging support

Dummy logging environment support lets you gather statistics for IMS batch jobs that do not execute in a valid IMS logging environment, such as jobs with log data sets specified as DUMMY. With this feature, you can create a dummy logging environment for IMS so that some, but not all, of the logging functions are performed.
by IMS. This feature enables the BCF component of AR/CTL to provide run-time execution statistics for read-only jobs. It also enables the AR/CTL BCF component to detect database updates in nonlogging environments and to notify users when updates occur.

**Batch Backout Assist**

The Batch Backout Assist feature improves the performance of read-backward processing for log data sets. It enhances any type of IMS batch backout operation, whether the log is on tape or DASD, but is most helpful when buffered tape with the IDRC recording mode is used for the batch log data set on 3480/3490 tape devices.

**SVC99 retry processing**

SVC99 retry processing enables the BCF component of AR/CTL to issue a write-to-operator with reply (WTOR) request when the requested number of devices are not available, preventing dynamic allocation of log data sets. When a WTOR is issued, the operator has the option of waiting until the requested number of devices are available. Without SVC 99 retry processing, dynamic allocation automatically fails when the requested number of devices is unavailable.

**Fast OSAM Buffer Purge**

The Fast OSAM Buffer Purge feature can improve performance for batch update jobs that use OSAM databases. Fast OSAM Buffer Purge dynamically monitors the OSAM buffer stealing process. When the buffer steal routines detect the need to steal an altered buffer, Fast OSAM Buffer Purge causes the entire OSAM buffer pool to be written back to the database with the OSAM queued write process. Fast OSAM Buffer Purge invokes standard IMS routines to cause buffer purging. The maximum benefit will be achieved for batch jobs that do not issue IMS checkpoints or for jobs where the checkpoints are not issued often enough to prevent stealing of OSAM buffers.

**BMC subsystems**

AR/CTL products use BMC standard subsystems for resource management. A major advantage of using subsystem architecture is that it reduces virtual storage requirements in user address spaces. AR/CTL products use two BMC subsystems—the BMC Primary Subsystem (BMCP) and the BMC Consolidated Subsystem (BCSS).

This manual describes installation of the subsystems. For more information about the subsystems, see the *APPLICATION RESTART CONTROL Administrator Guide*. 
BMCP

The BMCP establishes supervisory services for the BCSS and many BMC products. It allows interception of open, close, attach, and link requests in the system. (AR/CTL enhanced processing is used for interception of enqueue and dequeue requests for remote VSAM access in AR/CTL for VSAM.) BMC products share the BMCP; only one copy of the BMCP may be active on an z/OS system. All associated BMC products continue to operate normally even if the BMCP terminates; however, BMC 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 must be active on the z/OS 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.

More than one BCSS can be active on an z/OS system. One must be defined as the public BCSS; typically, it is used for production work. Each of the others is defined as a private BCSS; typically, a private BCSS is used for testing new releases of AR/CTL products. A default BCSS can be designated for all AR/CTL products on each z/OS. You use the BCSS identifier (BCSID) to identify the subsystem (and REGISET) you want to use.

Three AR/CTL components are available with the BCSS: the IMS component, the non-IMS component, and the VSAM component. The non-IMS component must be enabled to allow AR/CTL for DB2 and AR/CTL for VSAM to operate. The IMS component must be enabled to allow AR/CTL for IMS and the BCF component to operate. The VSAM component must be enabled to allow AR/CTL for VSAM to perform logging and dynamic backout of VSAM updates.

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 program execution.
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 installation 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 z/OS images).

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.

The BCSS uses a primary registration data set when providing AR/CTL products with responses to REGISET queries. You must have at least one primary registration data set; you can have as many as 11. If you have more than one and the active primary registration data set fails, the next primary registration data set is available and normal processing continues. You can recover the failing data set at a more convenient time, and recovery of the failing data set does not require restoration. If you encounter a failure in a primary registration data set and no other primary registration data set is available, the BCSS stops.

The BCSS uses a duplex registration data set to maintain an active backup copy of the active primary registration data set. Use of a duplex registration data set is optional; you can define as many as 11. Duplex registration data sets are used only for recovering primary registration data sets.

You can restore a primary registration data set by using another primary registration data set in the REGISET, a duplex registration data set in the REGISET, or a backup copy of the primary registration data set.

AR/CTL products can share the REGISET with other BMC products that use the BCSS (such as the BMC DATA ACCELERATOR product).

This manual describes installation of the REGISET. For more information about the REGISET, see the APPLICATION RESTART CONTROL Administrator Guide.
REGISET records

Most information that AR/CTL products need for controlling and managing application program processes is stored in records in the REGISET. You create, update, and delete many types of these records through the ISPF interface. AR/CTL products create and update some types of records, and you can also view, change, and delete these records through the ISPF interface. Some records are created during AR/CTL product installation or during migration to AR/CTL products.

Each record is identified by qualifiers in the record key. These qualifiers relate to the run-time environment and can include the z/OS ID, the job name, the step name, and the program name. To reduce the number of records to manage, AR/CTL products let you use wildcard characters, with specific characters, in most of the records you create.

For information about the types of REGISET records used by AR/CTL products, the qualifiers used in the record keys, and the use of wildcard characters in these qualifiers, see the APPLICATION RESTART CONTROL Reference Manual, the APPLICATION RESTART CONTROL Reference Manual: BATCH CONTROL FACILITY, or the APPLICATION RESTART CONTROL Administrator Guide.

For information about the records that are created during AR/CTL product installation, see Chapter 3, “Configuring the products.” For information about the records created during migration to AR/CTL products, see Appendix A, “Converting to AR/CTL products.”

Enhanced processing

AR/CTL enhanced processing enables cancel intercept and abend filter processing of the BCF component. AR/CTL enhanced processing provides the enqueue/dequeue interception that AR/CTL for VSAM requires to provide remote VSAM access services (file sharing). Enhanced processing is installed in an z/OS system and is reinstalled after an IPL.
Application supervisor and product execution modules

AR/CTL products execute under the control of the AR/CTL application supervisor, which manages coordination and communication among the products. Application programs also execute under the AR/CTL application supervisor.

Execution modules from the AR/CTL load library and the applicable AR/CTL product load libraries must be available during application program execution. You specify the location of these modules through an environment registration record in the RÉGISET. AR/CTL products do not require APF authorization; authorized functions are provided by BMC subsystems.

ISPF interface components

AR/CTL products provide an ISPF interface for creating, updating, viewing, deleting, and copying records that are stored the REGISET and for viewing and deleting records in product history data sets. The ISPF interface consists of a set of ISPF panels and their supporting dialogs that use common user access (CUA) guidelines. You can use ISPF LIBDEF facilities to provide access to the libraries that contain the panels (PLIB), messages (MLIB), skeletons (SLIB), and tables (TLIB) for the ISPF interface.

History data sets

AR/CTL products use history data sets to store history information (statistical reports) about application program executions. A history data set is a VSAM KSDS. You can view statistical information in the history data set through the ISPF interface.

A default AR/CTL BCF component history data set is created during AR/CTL product installation. A global dynamic allocation record for the AR/CTL history data set is created during AR/CTL product installation.

VSAM file control table data set

To provide remote VSAM access services, AR/CTL for VSAM uses a VSAM file control table data set to contain information about the files in the CICS regions that can participate in file sharing. During installation of AR/CTL for VSAM, this data set is created and initialized. AR/CTL uses one data set per z/OS image (in a single-image environment) or per SYSPLEX (in a SYSPLEX environment).
AR/CTL Install System and IVPs

The AR/CTL Install System (AESIS) is an interactive application that you use after using the Installation System. The AESIS creates customized batch jobs that continue installing and configuring the AR/CTL products. Until you submit those jobs, no action is taken to update any element on your system.

After you specify information through ISPF, the AESIS takes about 30 minutes to build the configuration JCL and run the jobs.

You can use the provided installation verification programs (IVPs) to confirm that the products installed correctly. The IVPs are not intended to demonstrate all functions and features of the AR/CTL products.

Product authorization

When processing a license agreement for a product, BMC issues CPU authorization passwords. These passwords authorize specific CPUs (also referred to as processors) to run the licensed product. Because BMC licenses its products for use on individual CPUs, the passwords are product specific and CPU specific (one license per product per CPU). You must also have a password to delete or replace an authorized CPU.

For more information, see Installation System User Guide Chapter 6 - Product Authorization.

AR/CTL security

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®) product. 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 z/OS RACROUTE interface to control access to functions and components. You can use AR/CTL external security to control read and update access to the REGISET and to control whether enhanced processing participates in application execution.

- 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. When AR/CTL internal security is implemented, you can restrict only update access; ISPF read access cannot be restricted.

For more information, see the APPLICATION RESTART CONTROL Administrator Guide.

Samples

BMC distributes sample programs, JCL, macros and definitions, and user exit routines. You can use these samples as models for your own code. Various sample jobs are available in the HLQ.ARCCUST and HLQ.ARCsamp libraries.

Questions or problems

A BMC product support representative for AR/CTL products is always on call to answer questions and solve problems. You can contact a product support representative as described on the back of the title page of this manual.

You can help the product support representative resolve your problem by having the following information available when you call:

- JCL you were using to run the job
- product messages that were issued by the job
- version, release, and maintenance level of the product
- version, release, and maintenance level of IMS (if applicable)
- version, release, and maintenance level of DB2 (if applicable)
- version, release, and maintenance level of DFP (if applicable)
- version, release, and maintenance level of CICS (if applicable)
- reports contained in the AESPRINT, ARCPRT, and/or BCPRT data sets

For product-specific information that may be needed for problem resolution, see the following publications:

- APPLICATION RESTART CONTROL User Guide
- APPLICATION RESTART CONTROL Administrator Guide
- APPLICATION RESTART CONTROL Reference Manual: BATCH CONTROL FACILITY
This chapter describes the resource requirements and considerations for the APPLICATION RESTART CONTROL (AR/CTL) products. This chapter contains the following information:

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Overview

This section describes the resource requirements and considerations for managing the AR/CTL products:

- AR/CTL for IMS
- AR/CTL for DB2
- AR/CTL for VSAM
- BATCH CONTROL FACILITY (BCF) component

The AR/CTL products share the services provided by the AR/CTL components, by the BMC Primary Subsystem (BMCP), and by the BMC Consolidated Subsystem (BCSS).

**NOTE**

For updated information about AR/CTL product support for operating systems, hardware, and database management systems, you can use the Product Availability and Compatibility (PAC) utility on the support website at [http://www.bmc.com/support](http://www.bmc.com/support).

Installation requirements

The AR/CTL products are installed by using the Installation System (formerly known as the OS/390 and z/OS Installer). This topic contains installation information that supplements or supersedes the information in the Installation System User Guide.

Installation options

The Installation System always handles installation of AR/CTL data sets in the same way, whether you choose the Merged, Non-Merged, or Run Time Enablement (RTE) option:

- For AR/CTL SMP/E target data sets, data set names always contain the product-specific low-level qualifiers (LLQs) that begin with ARC. An example LLQ is ARCLIB.
AR/CTL modules always reside in separate product-specific data sets (which are never combined with data sets for any other product).

The Installation System creates product-specific data sets to meet the following requirements:

- Ensure smaller execution libraries for better AR/CTL processing performance.
- Prevent module conflicts for common distributed module (for example, DSNHLI).
- Support the AR/CTL customization CLIST, which requires product-specific LLQs (LLQs that begin with ARC) for AR/CTL data set names.

**Password requirements**

To activate a BMC product or solution, you must have a password.

The Installation System accommodates any of the following methods for establishing license authority to access and use BMC products:

- Use the **Product Authorization** option from the Installation System Additional Options Menu. This option starts the BMC Software Product Authorization utility, which is documented in the *Installation System User Guide*.

- Review and edit the Product Authorization JCL that is unloaded with the products, and submit the JCL outside the Installation System’s operation.

- Use the Installation System’s product customization process to establish access authority.

---

**NOTE**

Some BMC products can be authorized only during the product customization process.

---

**Estimated space requirements**

During the unload process, the Installation System determines space requirements and automatically allocates various data sets according to the products that you selected for installation. The Installation System displays the total space requirements for all of your selections.
You can increase the allocation for any or all data set types. You can increase the allocation for a specific data set type, or you can apply a percentage increase to all data set allocations. You cannot decrease space allocations.

**NOTE**

The Installation System does not display space estimates for user data sets that it allocates in the $C05ALOC job. However, these data sets require approximately 40 cylinders of space.

If you are using DB2-defined objects, you must have a previously defined storage group (STOGROUP). The Installation System does not define STOGROUPs.

---

**Hardware requirements and considerations**

This section discusses hardware requirements and considerations for the AR/CTL products.

**Processor (CPU)**

AR/CTL products can operate on any processor that supports the z/OS operating system. BMC licenses products to run on specific CPUs. For more information, see the *Installation System User Guide*.

**DASD requirements**

The product libraries for the AR/CTL products require approximately 88 cylinders of DASD storage. The amount of DASD storage required for the REGISET varies according to the number of records you create and the number of job step executions that will be active simultaneously. The amount of DASD storage required for the optional history data sets depends on the number of statistics sets retained per job step and the number of job steps that use the history data set.

If you receive an electronic software distribution (ESD) image instead of a distribution tape, the image requires approximately 20 cylinders (in addition to the 88 cylinders for product libraries).
Shared DASD environment

Use the following guidelines for the placement of registration data sets in a shared DASD environment:

- Do not place a registration data set on the same volume as a catalog, an IMS RECON data set, or another registration data set (primary or duplex).
- Do not place a primary registration data set on a volume that has frequent or long-term ENQ/RESERVEs.
- Use the least-allocated, lowest-use volume you can find.

Shared REGISET

You can restart a job step on a different z/OS system than the system where the job step executed previously; however, both systems must use the same REGISET. You can use a different REGISET (and subsystem) on different z/OS systems; using a different REGISET ensures that active job steps executing in one system are not confused with active job steps executing in another system. If two or more z/OS systems are sharing a REGISET, ensure that one or more execution qualifiers distinguish job steps executing in a system from those executing in all other systems that share the REGISET.

Operating system requirements and considerations

This section discusses operating system requirements and considerations.

z/OS (DFP levels)

AR/CTL products can run on any IBM-supported version of z/OS. At execution, AR/CTL products determine which version of z/OS you are using and select the proper routines to execute for that version.
Subsystems and address spaces

When you are installing the JCL for the BMC subsystems—the BMCP and the BCSS—you must consider the dispatching priorities at your location. BMCP and BCSS address spaces should execute at a level that will allow timely initialization and operation. BMC recommends that these address spaces use the same dispatching priority as other system tasks, monitors, and subsystems. Preferably, you should use a fixed dispatching priority.

**NOTE**

AR/CTL product activities occur at the dispatching priority of the user, not at the dispatching priority of these BMC subsystem address spaces.

Storage protect key

The BMCP and the BCSS execute in a storage protect key. This storage protect key also controls the creation and storage of critical BMCP and BCSS control blocks. To protect BMCP and BCSS control blocks from storage overlays caused by other vendor products and in-house products, you can change the storage protect key. You can choose a value where it would be less likely for an overlay to occur. Storage overlays with the BMCP and the BCSS typically result in system 0C4 (S0C4) abends for the offending task.

BMC distributes started tasks for the BCSS and the BMCP with a default storage protect key of 4. This key was chosen because it is not being used by IBM. The key must be the same for both subsystems. You can modify the storage protect key of the BMCP and the BCSS by changing the name of the program specified on the PGM statements in the started tasks. For example, changing BCSMDSP4 and BPSMDSP4 to BCSMDSP0 and BPSMDSP0 changes the key from 4 to 0. You must perform an IPL for the change to take effect. If you do not perform an IPL, the previously specified storage protect key remains in effect.

Subsystem CSA/ECSA use

The BMCP and the BCSS place work areas above the 16 MB line when possible. These subsystems are compatible with DFSMS and are not sensitive to Data Facility Product (DFP) levels.

The BMCP and the BCSS use less than 64 KB in nonextended common storage and use 1.5 MB in extended common storage. Most BMCP and BCSS private storage requirements (non-CSA) are obtained from extended private storage.
Table 1 shows the storage requirements of the BMCP and the BCSS. These requirements apply to each z/OS system on which the BMC subsystems run.

<table>
<thead>
<tr>
<th>CSA storage for modules (per z/OS system)</th>
<th>Amount</th>
<th>Above 16 MB line</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMC Primary Subsystem (BMCP)</td>
<td>22 KB</td>
<td>all</td>
</tr>
<tr>
<td>BMC Consolidated Subsystem (BCSS)</td>
<td>1771 KB</td>
<td>all</td>
</tr>
</tbody>
</table>

AR/CTL storage usage in the private region

The amount of storage that AR/CTL uses in the private region varies during the execution of the job step and also varies depending on the application program environment and the services provided by AR/CTL. While AR/CTL is performing its initialization processing, it uses about 2 MB of space in the private region; AR/CTL then deletes most of the modules that were loaded during initialization. After AR/CTL initialization is complete, AR/CTL uses approximately 627 KB of below-the-line storage when the application program begins to execute. More storage is required if the job step is restarted or if it uses sequential files.

IMS, DB2, and CICS

This section discusses requirements for IMS, DB2, and Customer Information Control System (CICS). For more information about product-specific requirements and considerations, see the APPLICATION RESTART CONTROL User Guide and the APPLICATION RESTART CONTROL Reference Manual: BATCH CONTROL FACILITY.

IMS

Your site must have a licensed copy of the IMS Database Manager product in either of the following cases:

- if you want to use the BCF component of AR/CTL
- if you plan to use AR/CTL with IMS

NOTE

If you plan to use AR/CTL in IMS-compatible mode (where IMS is not present during application program execution, no IMS license is required.)
AR/CTL and the BCF component are supported for use with all IBM-supported versions and releases of IMS.

**NOTE**

As IMS requires that all application programs complete normally under the old release before executing under the new release, AR/CTL also requires that all application programs complete normally under the old AR/CTL release before migrating to the new release. After migration, you cannot restart a job that terminated abnormally under the previous release.

---

**DB2**

If you are installing AR/CTL for use with DB2, your site must have a licensed copy of DB2. The AR/CTL DB2 plan, ARCTLP$3, must be bound (and execute authority must be granted) on each DB2 subsystem where application programs use automatic checkpoints by a trigger cursor or automatic cursor repositioning. Use the same plan name, ARCTLP$3, for all DB2 subsystems.

AR/CTL is supported for use with all IBM-supported versions and releases of DB2.

**CICS**

If you are installing AR/CTL for VSAM, your site must have a licensed copy of the IBM CICS product or CICS Transaction Server product for use of remote VSAM access services in a batch VSAM application program.

AR/CTL is supported for use with all IBM-supported versions and releases of CICS and CICS Transaction Server.

**Security products**

If you have ACF2, Top Secret, or RACF, or if you are using the RACF Program Access to Data Sets (PADS) facility, consider the requirements described in this section.

**ACF2**

Authorize BMCP and BMCBCSS as started tasks under the started task control. Refer to an ACF2 system programmer guide for more information.
RACF

Authorize BMCP and BMCBCSS as started tasks in the started task names table.

If you want to use RACF to secure access for your DB2 environment, you should use the following syntax to define your Access Profile:

<table>
<thead>
<tr>
<th>Command</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><code>PERMIT subsys.MASS CLASS(DSNR)...</code></td>
<td>(for DSN attach type)</td>
</tr>
<tr>
<td><code>PERMIT subsys.BATCH CLASS(DSNR)...</code></td>
<td>(for CAF attach type)</td>
</tr>
</tbody>
</table>

Top Secret

Authorize BMCP and BMCBCSS as started tasks in the started task names table.

PADS facility

If you use the PADS facility, perform the following steps:

1. Execute the following RACF commands, where `progname` is the name of the program to add:

   ```
   RDEFINE PROGRAM (progname) UACC(READ)
   ADDMEM('linklist.lib'/volser/NOPADCHK)
   ```

   A list of programs that AR/CTL products use is located in member #AESRACF of the AR/CTL sample library. This member is in the form of a batch job that you can modify and submit to execute the commands.

2. Execute the following command:

   ```
   SETROPTS WHEN(PROGRAM) REFRESH
   ```
CICS MRO security

The use of CICS multiregion operations (MRO) requires an operating system security manager that is compatible with RACF. You can use this method to secure your MRO regions when you are using AR/CTL remote VSAM connections from any unauthorized use. For more information, see the CICS RACF Security Guide section, “Implementing MRO Security,” on issuing the RACF commands to define the DFHAPPL.applid profile in the RACF FACILITY class.

AR/CTL product requirements

The BMC products you need depend on the types of application programs you have and the AR/CTL product services you want:

- For AR/CTL BCF component services in a batch DLI program, the BCF component is required.

- A program that uses IMS or IMS-compatible structures and calls requires AR/CTL for IMS. If you want to use the AR/CTL application reattach options with a batch DLI program, the BCF component of AR/CTL is required.

- A program that uses native VSAM requires AR/CTL for VSAM for easiest implementation and unrestricted support for VSAM data sets.

- A program that needs to share a VSAM file with a CICS region requires AR/CTL for VSAM.

- A program that uses local VSAM access services (including logging and dynamic backout of VSAM updates) requires AR/CTL for VSAM.

- A program that uses DB2 but does not use IMS requires AR/CTL for DB2.

- A program that uses DB2 with IMS requires AR/CTL for IMS. AR/CTL for DB2 is optional; however, the AR/CTL functions that are specific to DB2 are available only with AR/CTL for DB2.

- A program that uses QSAM files can use AR/CTL for DB2, AR/CTL for VSAM, or AR/CTL for IMS. However, if it uses AR/CTL for IMS, it must execute program DFSRRC00.

For more information, see the APPLICATION RESTART CONTROL User Guide and the APPLICATION RESTART CONTROL Reference Manual: BATCH CONTROL FACILITY.
Other software

This section describes requirements and considerations for the use of AR/CTL products with other software products.

ISPF

The Installation System has the following ISPF requirements:

- ISPF version 4.0 or later
- You must have the DD ISPTABL library in your ISPF logon PROC. This library is needed for the ISPF table processing that the Installation System requires.
- Set the disposition of your ISPPROF or ISRPROF data set to shared (DISP=SHR) in your logon procedure.

Setting the disposition to shared allows batch TSO to update the data set. Specifically, this setting allows you to merge product tapes and run BMCINSTALL REXX EXEC. If you do not set the disposition to shared, you will receive an ISPS105 error (invalid keyword) when you submit the installation JCL to merge product tapes, and when you run BMCINSTALL REXX EXEC.

BMC database utilities

AR/CTL does not provide checkpoint/restart services or data services during execution of BMC database utility products. Most of these products use enhanced methods for I/O processing and record management; AR/CTL works with standard methods only.

Other BMC products

AR/CTL products are compatible with the BMC DATA PACKER products. If you have any concerns about compatibility between AR/CTL and a data compression product, contact BMC Customer Support.
Other BMC products
Chapter 3 Configuring the products

This chapter describes how to configure one or more APPLICATION RESTART CONTROL (AR/CTL) products at your site. This chapter presents the following topics:

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Overview

Configuration consists of these tasks:

1. Make decisions about how to manage AR/CTL products in your environment, and gather information about your decisions and your environment.

2. Execute the AESIS and enter values in the panels.

3. Generate the configuration JCL.

4. Execute the configuration jobs.

5. Install the ISPF interface.

Before you start the configuration of AR/CTL products, address the AR/CTL resource requirements and considerations that apply to your environment, as described in Chapter 2, “Product requirements and considerations.”

Make decisions and gather information

The first task for configuration AR/CTL products is deciding how to manage AR/CTL products in your environment and gathering information about your decisions and your environment.

To prepare for using the AESIS, gather the information that you will need to enter on the AESIS panels by reading this chapter and determining the names of elements needed for configuration. The text tells you to obtain an element when the element exists in the environment before you start the configuration process. The text tells you to choose an element when the element is defined during configuration. You can record your choices in the example panels and spaces provided in this chapter so that the information is readily available when you execute the AESIS.

Execute the AESIS and enter values

To execute the AESIS and enter values on the panels, perform the following steps:

1. To access the AESIS, enter the following TSO command from an ISPF panel that accepts TSO commands:

   EX 'HLQ.ARCCUST(AESINSTL)'
The variable *HLQ* is a high-level qualifier that you specified during execution of the Installation System. *HLQ* should be easily identified by all installation users in your facility.

2. At the Application Enhancement Series Install System panel (Figure 1 on page 45), press **Enter** to continue.

**Figure 1  Application Enhancement Series Install System panel**

![AESIS JCL defaults](image)

3. Enter your values into the data entry fields on the subsequent panels.

   For more information about an AESIS panel, enter the **HELP** command when the cursor is on the command line or is not in an input field. For more information about a field on the panel, enter the **HELP** command when the cursor is in that field.

   **TIP**

   Press **Enter** to move to the next panel in the AESIS. Enter the CANCEL command (assigned to **F12** or **F24**) to return to a previous panel.

**AESIS JCL defaults**

When you press **Enter** on the Application Enhancement Series Install System panel (Figure 1 on page 45), the AESIS displays the AES Install System JCL Defaults panel (Figure 2). The AESIS uses this panel to request default values for use when it tailors the JCL that configures AR/CTL products.
AESIS storage information

**Figure 2** AES Install System JCL Defaults panel

```
AESIPO20    AES Install System JCL Defaults
Command ===> ____________________________________________________________

Update the following information. Then press Enter.

Job Statement Information
  ===> //JOBCARD JOB (ACCOUNT), 'PROGRAMMER'
  ===> //*
  ===> //*
  ===> //*

Other JCL Default Options
  SYSCUT class . . . . . . . . . . * (A-Z,0-9,*)

Library Management Options
  AES data set name prefix . . . HLQ
```

**Job statement information**

The AESIS requires job statement information to place into each job that it tailors. By default, the AESIS uses the job statement information from the ISPF defaults, but you can change this information as needed.

**AES data set name prefix**

The AESIS data set name prefix (the variable HLQ) is the high-level qualifier that you specified during execution of the Installation System. HLQ should be easily identified by all installation users in your facility.

**AESIS storage information**

When you press Enter on the AES Install System JCL Defaults panel (Figure 2 on page 46), the AESIS displays the AES Install System Storage Information panel (Figure 3). The AESIS uses this panel to request storage information for allocating the AR/CTL configured data sets in your environment.
Allocation parameters

The AESIS uses allocation parameters to tailor JCL for creating new data sets. If you use Systems Managed Storage (SMS) to perform DASD allocation, you can specify any combination of storage class, management class, and data class. Or you can use the conventional method of specifying a unit, a volume, or both. If you specify a volume but do not specify a unit, the unit parameter defaults to the work data set unit.

You are not required to provide all values; however, you must provide at least one of the values listed in Table 2.

Table 2 Allocation parameter values (part 1 of 2)

<table>
<thead>
<tr>
<th>Value</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage class</td>
<td>Obtain and enter the name of the SMS storage class to use for allocating AR/CTL product libraries.</td>
</tr>
<tr>
<td>Management class</td>
<td>Obtain and enter the name of the SMS management class to use for allocating AR/CTL product libraries.</td>
</tr>
<tr>
<td>Data class</td>
<td>Obtain and enter the name of the SMS data class to use for allocating AR/CTL product libraries.</td>
</tr>
</tbody>
</table>
The AESIS uses a dynamic allocation default VOLSER for tailoring JCL to execute the REGISET population utility. This utility creates the records required during execution of AR/CTL products. Among these records are the dynamic allocation records, which are required to contain a VOLSER value.

Obtain and enter a VOLSER value that is appropriate for dynamically allocating the data sets created during execution of the installation verification programs (IVPs). After installation and configuration, the VOLSER in the dynamic allocation records can be changed to a value that is appropriate for testing the products.

**Work data set unit**

The AESIS requires a DASD unit type name to use when tailoring the JCL for allocating temporary work data sets in batch processes (such as IEBCOPY jobs). Obtain and enter a valid name to use for the DASD unit type. In most environments, SYSALLDA (or SYSDA) is valid.

**AESIS product data set names**

When you press Enter on the AES Install System Storage Information panel (Figure 3 on page 47), the AESIS displays the AES Install System Product Data Set Names panel (Figure 4). The AESIS uses this panel to display the default data set names of the product libraries.
Figure 4  AES Install System Product Data Set Names panel

<table>
<thead>
<tr>
<th>AESIP040</th>
<th>AES Install System Product Data Set Names</th>
</tr>
</thead>
<tbody>
<tr>
<td>Command</td>
<td>====&gt;</td>
</tr>
</tbody>
</table>

Confirm the following information by pressing Enter. Otherwise, Exit.

AES Product Libraries
- SAMP  . .  HLQ.ARCSAMP
- LOAD  . .  HLQ.ARCLIB
- PLIB   . .  HLQ.ARCPLIB
- MLIB   . .  HLQ.ARCMLIB
- SLIB   . .  HLQ.ARCSLIB
- TLIB   . .  HLQ.ARCTLIB
- DBRM   . .  HLQ.ARCDBRM

Update the following information if required before pressing Enter.

BMC Subsystem Libraries
- BMCP  . .  HLQ.BBLINK
- BCSS   . .  HLQ.XXLINK

The AESIS builds the data set names listed in Table 3 on page 49. The AESIS displays the names as shown in Figure 4. The variable HLQ is a high-level qualifier that was provided in the AES data set name prefix field on the AES Install System JCL Defaults panel (Figure 2 on page 46). HLQ should be easily identified by all installation users in your facility.

**NOTE**
During application execution, AR/CTL product load modules are loaded from the libraries that are specified in the environment registration record. To avoid the possibility of a back-level module being loaded from a library that is specified in the STEPLIB concatenation (especially in the IMS environment), BMC recommends that you do not install the AR/CTL product modules in any data set which is included in the STEPLIB concatenation.

<table>
<thead>
<tr>
<th>Default data set name</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLQ.ARCCUST</td>
<td>AESIS programs and samples for AR/CTL product configuration</td>
</tr>
<tr>
<td>HLQ.ARCSAMP</td>
<td>samples for AR/CTL components, for AR/CTL (if any AR/CTL product is selected for installation), and for the BCF component of AR/CTL</td>
</tr>
</tbody>
</table>
### Table 3  AR/CTL product libraries (part 2 of 2)

<table>
<thead>
<tr>
<th>Default data set name</th>
<th>Contents</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>HLQ.ARCLIB</strong></td>
<td>load modules for AR/CTL non-subsystem components, for AR/CTL (if any AR/CTL product is selected for installation), and for the BCF component of AR/CTL</td>
</tr>
<tr>
<td><strong>HLQ.ARCPLIB</strong></td>
<td>ISPF panels for AR/CTL components, for AR/CTL (if any AR/CTL product is selected for installation), and for the BCF component of AR/CTL</td>
</tr>
<tr>
<td><strong>HLQ.ARCMLIB</strong></td>
<td>ISPF messages for AR/CTL components, for AR/CTL (if any AR/CTL product is selected for installation), and for the BCF component of AR/CTL</td>
</tr>
<tr>
<td><strong>HLQ.ARCSLIB</strong></td>
<td>ISPF skeletons for AR/CTL components, for AR/CTL (if any AR/CTL product is selected for installation), and for the BCF component of AR/CTL</td>
</tr>
<tr>
<td><strong>HLQ.BBLINK</strong></td>
<td>load modules for the BMCP</td>
</tr>
<tr>
<td><strong>HLQ.XXLINK</strong></td>
<td>load modules for the BCSS</td>
</tr>
<tr>
<td><strong>HLQ.ARCDBRM</strong></td>
<td>database request modules for AR/CTL</td>
</tr>
<tr>
<td></td>
<td>This data set is present only if an AR/CTL product is selected for installation.</td>
</tr>
</tbody>
</table>
AESIS miscellaneous data set names

When you press Enter on the AES Install System Product Data Set Names panel (Figure 4 on page 49), the AESIS displays the AES Install System Miscellaneous Data Set Names panel (Figure 5 on page 51). The AESIS uses this panel to display default data set names of miscellaneous data sets.

**Figure 5**  AES Install System Miscellaneous Data Set Names panel

<table>
<thead>
<tr>
<th>Fields</th>
<th>Default data set name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>IVPLOAD</td>
<td>HLQ.ARCIVPP</td>
<td>Library that contains load modules for executing IVPs</td>
</tr>
<tr>
<td>IVPIMS</td>
<td>HLQ.ARCIVPC</td>
<td>Library that contains IMS database descriptions (DBDs) and program specification blocks (PSBs) used for the IMS IVP</td>
</tr>
<tr>
<td>From</td>
<td>none</td>
<td>Existing library that contains AR/CTL options to migrate to the new library</td>
</tr>
</tbody>
</table>
When you press Enter on the AES Install System Miscellaneous Data Set Names panel (Figure 5 on page 51), the AESIS displays the AES Install System APF Authorization panel (Figure 6). The AESIS uses this panel to request information for APF authorization.

### AESIS APF authorization

<table>
<thead>
<tr>
<th>Fields</th>
<th>Default data set name</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>To</td>
<td>HLQ.ARCLIB</td>
<td>Library to contain load modules for AR/CTL non-subsystem components, for AR/CTL (if any AR/CTL product is selected for installation), and for the BCF component of AR/CTL.</td>
</tr>
</tbody>
</table>
| Migrate extended options      | not applicable        | Installation option to control whether to migrate existing extended options (located in module ARCIEXT). By copying ARCIEXT from the old library to the new library, the configuration process maintains any existing zaps that you might have applied to the previous release. Specify one of the following values:  
  - N—(default) Do not migrate ARCIEXT.  
  - Y—Migrate ARCIEXT. |
| Migrate external security options | not applicable        | Installation option to control whether to migrate existing external security options (in module AESXSC06). By copying AESXSC06 from the old library to the new library, the configuration process retains your existing definitions for authorized users to access AR/CTL components and functions. Specify one of the following values:  
  - N—(default) Do not migrate AESXSC06.  
  - Y—Migrate AESXSC06. |
| ARVFCTAB                      | HLQ.ARVFCTAB          | VSAM file control table data set for use with AR/CTL for VSAM remote VSAM access services (file sharing). For more information, see Appendix 5, “Implementing remote VSAM access.” |
| BCFHIST                       | HLQ.BCFHIST           | Library that contains AR/CTL BCF component statistics records and post-execution log volume records. This data set is present only if the BCF component is active. |
Some AES modules must be executed from an APF-authorized library. The AES products also use the BMC Software Primary and Consolidated Subsystems which also require to be APF-authorized. The installation process can create the steps to copy AES and Subsystem modules to an existing APF-authorized library. If you specify the data set names, the copy jobs will be created for you. Note that modules such as xxxLEVEL will also have to be copied into the APF authorized library (xxx = AES or ARC or ARD or ARV or BCF). You will have to do this manually if you leave the library names blank. Type the name of an APF-authorized library.

APF-Authorized Libraries
  APF library (AES) . . . . . . HLQ.ARCAFP
  APF library (BMCP/BCSS) . . HLQ.BCSAPF

Choose the AES enhanced processing options you want. Then press Enter.

AES Enhanced Processing Options
  Enable remote VSAM access . . . . Y (Y,N)
  Enable BCF abend filter . . . . . Y (Y,N)
  Enable BCF cancel intercept . . . Y (Y,N)

The variable HLQ is a high-level qualifier that you specified during execution of the Installation System. HLQ should be easily identified by all installation users in your facility.

Some modules for AR/CTL products and components must be executed from an APF-authorized library. The AR/CTL products also use the BMCP and the BCSS, which have modules requiring APF authorization. If you provide the appropriate data set names, the AESIS creates the JCL to copy the appropriate modules to an existing or new APF load library in your environment.

**NOTE**

BMC recommends that you place only the modules that require authorization, rather than all modules, in an APF-authorized library.

If you are installing AR/CTL for VSAM or if you want to use the BCF component of AR/CTL, the AESIS can create JCL to activate the enhanced processing components for these products.
APF-authorized libraries

AR/CTL product modules that require APF-authorization, AR/CTL component modules that require APF-authorization, and the subsystem modules can reside in the same APF-authorized load library or in different libraries. If you provide the data set names of the libraries, the AESIS creates the copy jobs for you. If you do not provide the data set names, the AESIS does not create the copy jobs and you must APF-authorize the libraries manually before the subsystems are started. A list of modules that require authorization is in member #Q03APFJ of the install library.

If the data set name that you provide does not exist (or will not be created by the AESIS) on the system where you are executing the AESIS, the AESIS prompts you to verify that the data set name is correct. You can force the AESIS to use the data set name that you have provided.

The AESIS initializes environment registration records with names of the AR/CTL product load libraries. If the STEPLIB concatenation of your IMS batch jobs is APF-authorized, you need to authorize the AR/CTL product load libraries that are listed in the environment registration records; otherwise, the STEPLIB concatenation loses its APF-authorization. However, IMS can also load any modules that require APF-authorization from the DFSRESLB DD statement in the job step, so you might be able to use this statement to refer to your RESLIB and avoid APF-authorization failures.

The AESIS requests the data set names listed in Table 5.

### Table 5  AESIS data set names

<table>
<thead>
<tr>
<th>Name</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>APF library (AES)</td>
<td>If you want the AESIS to generate JCL to copy the AR/CTL component modules that require APF authorization and the product level module for each product to install, obtain and enter the data set name of an existing APF-authorized library.</td>
</tr>
<tr>
<td>APF library (BMCP/BCSS)</td>
<td>If you want the AESIS to generate JCL to copy the subsystem modules that require APF authorization, obtain and enter the data set name of an existing APF-authorized library.</td>
</tr>
</tbody>
</table>
AR/CTL enhanced processing options

AR/CTL enhanced processing is the mechanism for enabling selected services of AR/CTL for VSAM and the BCF component of AR/CTL. The AESIS can generate JCL to activate the enhanced processing options listed in Table 6.

**NOTE**
The JCL to activate enhanced processing options must be executed after every IPL.

<table>
<thead>
<tr>
<th>Option</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Enable remote VSAM access</td>
<td>If you install AR/CTL for VSAM and you want to use remote VSAM access services (file sharing), choose and enter Y; otherwise, choose and enter N.</td>
</tr>
<tr>
<td>Enable BCF abend filter</td>
<td>If you want to use AR/CTL BCF component abend filter support, choose and enter Y; otherwise, choose and enter N.</td>
</tr>
<tr>
<td>Enable BCF cancel intercept</td>
<td>If you want to use the AR/CTL BCF component cancel intercept support, choose and enter Y; otherwise, choose and enter N.</td>
</tr>
</tbody>
</table>

**AESIS IMS defaults**

If you are installing AR/CTL for IMS, when you press Enter on the AES Install System APF Authorization panel (Figure 6 on page 53) the AESIS displays the AES Install System IMS Defaults panel (Figure 7). The AESIS uses this panel to request the data set name of the IMS RESLIB library.

**Figure 7  AES Install System IMS Defaults panel**

AESIP066                  AES Install System IMS Defaults
Command ===> ________________________________________________________________

Update the following information. Then press Enter.

IMS System Defaults
IMS RESLIB data set . . . . . . . _______________________________________________

Obtain and enter the data set name of the IMS RESLIB library. The AESIS inserts this data set name into the STEPLIB DD statements and the DFSRESLB DD statements in the IVP jobs.
AESIS primary/duplex REGISET masking values

When you press Enter on the AES Install System IMS Defaults panel (Figure 7 on page 55) or (if no IMS products are selected) on the Install System APF Authorization panel (Figure 6 on page 53), the AESIS displays the AES Install System Primary/Duplex REGISET Masking Values panel (Figure 8). The AESIS uses this panel to request masking information for allocating registration data sets.

Figure 8  AES Install System Primary/Duplex REGISET Masking Values panel

The registration data sets in the REGISET are VSAM key-sequenced data sets (KSDSs). There are two types of data sets—primary and duplex. Duplex registration data sets are optional and maintain active backup copies of the primary registration data sets.

The REGISET can consist of as many as 22 data sets, 11 primary and 11 duplex. As you increase the number of data sets, however, REGISET access time increases. The minimum number of data sets is two: one primary and one duplex, or two primaries.

NOTE

BMC recommends that you use two primary and no duplex data sets.
The AESIS creates IDCAMS DEFINE JCL to allocate the registration data sets. To reduce the typing required when you provide allocation parameters, the AESIS requests masking information. It uses this masking information to prime the parameters for individual registration data sets with values; you can change these values as needed for each data set. The AESIS requests the masking information listed in Table 7.

### Table 7  Masking information

<table>
<thead>
<tr>
<th>Value</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Registration data set prefix</td>
<td>The variable <em>HLQ</em> is a high-level qualifier that was provided in the AES data set name prefix field on the AES Install System JCL Defaults panel (Figure 2 on page 46). <em>HLQ</em> should be easily identified by all installation users in your facility. The AESIS uses this high-level qualifier to prime the data set name parameter for each registration data set. The format of the primed data set name for a primary registration data set is <em>HLQ</em>.REGISET (for the first data set) and <em>HLQ</em>.REGISET$n$ (for others). The format of the primed data set name for a duplex registration data set is <em>HLQ</em>.DUPLEX (for the first data set) and <em>HLQ</em>.DUPLEX$n$ (for others). For example, if the prefix is BMCAES.TEST and you request three primary registration data sets and two duplex registration data sets, the AESIS primes the registration data set names with these values:</td>
</tr>
<tr>
<td>------------------------------</td>
<td>-----------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td></td>
<td>• BMCAES.TEST.REGISET</td>
</tr>
<tr>
<td></td>
<td>• BMCAES.TEST.REGISET0</td>
</tr>
<tr>
<td></td>
<td>• BMCAES.TEST.REGISET1</td>
</tr>
<tr>
<td></td>
<td>• BMCAES.TEST.DUPEX</td>
</tr>
<tr>
<td></td>
<td>• BMCAES.TEST.DUPEX0</td>
</tr>
<tr>
<td>Number of primary data sets</td>
<td>Choose and enter the number of primary registration data sets to create. You must choose at least one primary data set. The maximum number is 11. If you choose only one primary data set, you must choose at least one duplex data set.</td>
</tr>
<tr>
<td>Number of duplex data sets</td>
<td>Choose and enter the number of duplex registration data sets to create. If you choose only one primary data set, you must choose at least one duplex data set; otherwise, you can choose from zero to 11 duplex data sets.</td>
</tr>
</tbody>
</table>
Space parameters

The AESIS primes the space parameters listed in Table 8 for the registration data sets with masking values.

Table 8  Space parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Primary space (cylinders)</td>
<td>Choose and enter the number of cylinders of primary space to use for a masking value.</td>
</tr>
<tr>
<td>Secondary space (cylinders)</td>
<td>Choose and enter the number of cylinders of secondary space to use for a masking value.</td>
</tr>
</tbody>
</table>

Allocation parameters

The AESIS primes the allocation parameters for the registration data sets with masking values. To allocate the registration data sets, you can provide one or more SMS class names or a non-SMS disk unit name; at least one of these values is required, but you cannot provide an SMS class name and a disk unit name.

The VOLSER value is required whether you provide an SMS class name or a disk unit name. Because the BCSS issues a reserve against a volume that contains a registration data set, each registration data set must be allocated on a different volume from other registration data sets and should not share the volume with other data sets.

Table 9 lists the available allocation parameters.

Table 9  Allocation parameters

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Storage class</td>
<td>If you want to use SMS, you can obtain and enter the name of a valid SMS storage class.</td>
</tr>
<tr>
<td>Management class</td>
<td>If you want to use SMS, you can obtain and enter the name of a valid SMS management class.</td>
</tr>
<tr>
<td>Data class</td>
<td>If you want to use SMS, you can obtain and enter the name of a valid SMS data class.</td>
</tr>
<tr>
<td>Disk VOLSER</td>
<td>Obtain the disk volume serial numbers to use for the registration data sets. A separate volume is required for each registration data set you choose. Choose and enter one of these values (or a common portion of these values) to use for a mask for the VOLSER.</td>
</tr>
</tbody>
</table>
AESIS primary data set allocation

When you press Enter on the AES Install System Primary/Duplex REGISET Masking Values panel (Figure 8 on page 56), the AESIS displays the AES Install System Primary Data Set Allocation panel (Figure 9). The AESIS uses this panel to display allocation information for a primary registration data set. The AESIS presents one panel of this type for each primary registration data set that you chose on the AES Install System Primary/Duplex REGISET Masking Values panel.

Figure 9  AES Install System Primary Data Set Allocation panel

The AESIS primes the parameter values with the chosen masking values or (if you have executed the AESIS previously) the values that you used in the previous execution of the AESIS.

The variable HLQ is a high-level qualifier that was provided in the AES data set name prefix field on the AES Install System JCL Defaults panel (Figure 2 on page 46). HLQ should be easily identified by all installation users in your facility.

You can modify the data set name values for each data set. You must modify the VOLSER value for each data set after the first one presented. You can also modify other allocation values.

AESIS duplex data set allocation

When you press Enter on the AES Install System Primary Data Set Allocation panel (Figure 9 on page 59) and you have selected one or more duplex registration data sets on the AES Install System Primary/Duplex REGISET Masking Values panel (Figure 8 on page 56), the AESIS displays the AES Install System Duplex Data Set Allocation
panel (Figure 10). The AESIS uses this panel to display allocation information for a duplex registration data set. The AESIS presents one panel of this type for each duplex registration data set that you chose on the AES Install System Primary/Duplex REGISET Masking Values panel.

**Figure 10  AES Install System Duplex Data Set Allocation panel**

![AESIP090 AES Install System Duplex Data Set Allocation](image)

The AESIS primes the parameter values with the chosen masking values or (if you have executed the AESIS previously) the values that you used in the previous execution of the AESIS.

The variable **HLQ** is a high-level qualifier that was provided in the **AES data set name prefix** field on the AES Install System JCL Defaults panel (Figure 2 on page 46). **HLQ** should be easily identified by all installation users in your facility.

You can modify the data set name values for each data set. You **must** modify the VOLSER value for each data set after the first one presented. You can also modify other allocation values.

## AESIS subsystem procedure information

When you press **Enter** on the AES Install System Primary Data Set Allocation panel (Figure 9 on page 59) or, if you selected one or more duplex registration data sets, when you press **Enter** on the AES Install System Duplex Data Set Allocation panel (Figure 10 on page 60), the AESIS displays the AES Install System Subsystem Procedure Information panel (Figure 11). The AESIS uses this panel to request information for setting up the BMCP and BCSS procedures (Table 10).

For more information about the BMCP and BCSS procedures, see the **APPLICATION RESTART CONTROL Administrator Guide**.
The AESIS tailors JCL to create the procedures for the BMCP and the BCSS in the install library. You must choose procedure names and subsystem identifiers to use in the JCL. You can also choose values to use for other parameters in the procedure JCL. If you provide the name of a system procedure library, the AESIS tailors JCL to copy the new subsystem procedures from the install library to the system procedure library.

Table 10  Subsystem procedure fields (part 1 of 2)

<table>
<thead>
<tr>
<th>Field</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>BMCP subsystem procedure</td>
<td>Choose and enter the value for the procedure name to use in JCL for creating the BMCP procedure.</td>
</tr>
<tr>
<td>BMCP subsystem ID</td>
<td>Choose and enter the value for the subsystem ID of the BMCP. The value must be exactly four characters.</td>
</tr>
<tr>
<td>BCSS subsystem procedure</td>
<td>Choose and enter the value for the procedure name to use in JCL for creating the BCSS procedure.</td>
</tr>
<tr>
<td>BCSS subsystem ID</td>
<td>Choose and enter the value for the subsystem ID of the BCSS. The value must be exactly four characters.</td>
</tr>
<tr>
<td>BCSS subsystem mode</td>
<td>Choose and enter a value to indicate whether the BCSS is a public subsystem or a private subsystem.</td>
</tr>
<tr>
<td>Dataspace size (KB)</td>
<td>Choose and enter the size (1 KB to 2047 KB) of the dataspace cache to use for the BCSS. This storage is used by the consolidated subsystem to cache information passed to the applications that require subsystem services.</td>
</tr>
</tbody>
</table>
When you press Enter on the AES Install System Subsystem Procedure Information panel (Figure 11 on page 61), the AESIS displays the AES Install System CPU Authorization Selection panel (Figure 12). The AESIS uses this panel to request information for CPU authorization.

**Figure 12  AES Install System CPU Authorization Selection panel**

<table>
<thead>
<tr>
<th>Field</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Account number</td>
<td>If your system requires JCL account information on started task procedures, obtain and enter a valid account number to use for the BMCP and the BCSS.</td>
</tr>
<tr>
<td>Started task PROCLIB</td>
<td>To generate JCL to copy the new subsystem procedures to a specific started task library, you can obtain and enter the data set name of a system procedure library to use. If you do not provide a name, the AESIS uses the default name SYS1.PROCLIB to create the JCL; later, you can change this JCL to meet the requirements of your installation. You can copy the procedures to a procedure library manually. <strong>Note:</strong> SYS1.PROCLIB is not a shared JES2 procedure library. If the started task is in SYS1.PROCLIB and you use the same value for the subsystem procedure name and the subsystem ID, you must use the <strong>SUB=jesid</strong> parameter on the subsystem start command, where jesid is the JES2 subsystem ID.</td>
</tr>
</tbody>
</table>

**AESIS CPU authorization selection**

Table 10  Subsystem procedure fields (part 2 of 2)

<table>
<thead>
<tr>
<th>Field</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>AESIP120</td>
<td>AES Install System CPU Authorization Selection</td>
</tr>
<tr>
<td>Command ===&gt;</td>
<td>____________________________________________________________________</td>
</tr>
</tbody>
</table>

Update the following information. If you do not use the existing authorization, type a new security library name and product password type. Then press Enter.

Use existing password table(s) . . _ (Y,N)

Current authorization library _____________________________________________

New authorization library . . HLQ.NEWSEC

1 = Permanent 2 = Temporary

Password   Product
Type   Name
_   BMC Recovery for DB2 (includes AR/CTL for DB2)
_   APPLICATION RESTART CONTROL for DB2
_   APPLICATION RESTART CONTROL for IMS
_   APPLICATION RESTART CONTROL for VSAM
For a new installation of a product, BMC sends you the appropriate CPU authorization password (temporary or permanent). For a maintenance installation of a product, you can use the password table that you used with the previous product level. The AESIS tailors the JCL for creating new password tables and copying existing password tables for the selected products.

The AESIS requests the information listed in Table 11.

### Table 11  CPU authorization (part 1 of 2)

<table>
<thead>
<tr>
<th>Field</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Use existing password table(s)</td>
<td>If you have a previous maintenance level of an AR/CTL product to install, choose and enter Y to use the password from the previous level. If you do not have a previous maintenance level, choose and enter N.</td>
</tr>
<tr>
<td>Current CPU authorization library</td>
<td>If you choose Y to copy existing password tables, obtain and enter the name of the library that contains the existing password tables. The AESIS tailors JCL to copy the password tables from the existing library to the new library or to install new passwords into this library.</td>
</tr>
<tr>
<td>New CPU authorization library</td>
<td>If you choose N (you do not want to use any existing password tables) or if you want to copy existing password tables from the current library, enter the name of a new library to contain the password tables. The variable HLQ is a high-level qualifier that you specified during execution of the Installation System. HLQ should be easily identified by all installation users in your facility. The AESIS tailors the JCL to create the new CPU authorization library and, if you provide the name of an existing library, to copy password tables from the existing library to the new library.</td>
</tr>
<tr>
<td>Note:</td>
<td>Product authorization processing for the AR/CTL products occurs within the BCSS. The library that contains the product authorization tables must be included in the BCSS procedure. The AESPAUTH DD statement points to the CPU authorization library. The AESIS tailors the procedure to include this library. If you add or change passwords with the AR/CTL ISPF interface, make sure that you use the same library that the BCSS is using.</td>
</tr>
<tr>
<td>Password Type</td>
<td>If you have one or more new passwords to install, obtain and enter the type of each password: 1 for a permanent password or 2 for a temporary password. You can obtain this information from BMC.</td>
</tr>
</tbody>
</table>
When you press Enter on the AES Install System CPU Authorization Selection panel (Figure 12 on page 62), the AESIS displays the AES Install System CPU Authorization panel (Figure 13). The AESIS uses this panel to request information for CPU authorization of a specific product. The AESIS displays one panel of this type for each product that you selected on the AES Install System CPU Authorization Selection panel.

When you press Enter on the AES Install System CPU Authorization Selection panel (Figure 12 on page 62), the AESIS displays the AES Install System CPU Authorization panel (Figure 13). The AESIS uses this panel to request information for CPU authorization of a specific product. The AESIS displays one panel of this type for each product that you selected on the AES Install System CPU Authorization Selection panel.

**Table 11  CPU authorization (part 2 of 2)**

<table>
<thead>
<tr>
<th>Field</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>Product Name</td>
<td>The AESIS handles passwords for the following products. The three characters in parentheses after each name comprise the product code that BMC uses to identify the product.</td>
</tr>
<tr>
<td></td>
<td>• BMC Recovery for DB2 (BRY)</td>
</tr>
<tr>
<td></td>
<td>• APPLICATION RESTART CONTROL for DB2 (ARD)</td>
</tr>
<tr>
<td></td>
<td>• APPLICATION RESTART CONTROL for IMS (ARC)</td>
</tr>
<tr>
<td></td>
<td>• APPLICATION RESTART CONTROL for VSAM (ARV)</td>
</tr>
<tr>
<td></td>
<td>The three-character product code (prd) comprises part of the name of the password module:</td>
</tr>
<tr>
<td></td>
<td>• prdTBL3P is the name of a permanent password module</td>
</tr>
<tr>
<td></td>
<td>• prdTBL3T is the name of a temporary password module</td>
</tr>
<tr>
<td></td>
<td>Beginning with June 2013 maintenance levels, the AESIS recognizes BRY passwords.</td>
</tr>
</tbody>
</table>

**AESIS CPU authorization**

When you press Enter on the AES Install System CPU Authorization Selection panel (Figure 12 on page 62), the AESIS displays the AES Install System CPU Authorization panel (Figure 13). The AESIS uses this panel to request information for CPU authorization of a specific product. The AESIS displays one panel of this type for each product that you selected on the AES Install System CPU Authorization Selection panel.
The AESIS can tailor JCL for a batch job to install CPU authorization passwords into the appropriate password tables. For a permanent password, you must obtain the CPU serial number, the CPU model number, and a BMC password that enables the product to execute on that CPU. For a temporary password, you must obtain a BMC password that enables the product to execute on any CPU for a limited time.

Contact your BMC sales representative to obtain passwords.

The AESIS requests the information listed in Table 12.

<table>
<thead>
<tr>
<th>Field</th>
<th>Use</th>
</tr>
</thead>
<tbody>
<tr>
<td>CPU serial number</td>
<td>Obtain and enter the CPU serial number for the CPU that will be used to execute the selected product. If the CPU serial number has more than five digits, record only the last five digits of the number.</td>
</tr>
<tr>
<td>CPU model type</td>
<td>Obtain and enter the CPU model type for the CPU that will be used to execute the selected product.</td>
</tr>
<tr>
<td>BMC Software password</td>
<td>Obtain and enter the twelve-digit password that BMC provided when you purchased the product or when you arranged for a product trial.</td>
</tr>
</tbody>
</table>

**NOTE**

The AESIS does not install multiple new passwords for a single product. If you have multiple passwords to install, you can copy and modify statements in the tailored JCL or use the AR/CTL batch interface to install the other passwords. Member #AESSEC3 of the install library contains the tailored JCL. Member #CPUAUTH of the AR/CTL sample library contains a sample of a batch job to install passwords.

## Generate the configuration JCL

To generate AR/CTL configuration JCL, perform the following steps:

1. Allow the AESIS to generate the configuration JCL.

After you have entered the file tailoring information on the AESIS panels, the AESIS displays the AES Install System File Tailoring panel (Figure 14) to show you that the AESIS is ready to begin generating the configuration JCL. Press Enter to continue.
File tailoring for the generated JCL can take a few minutes. The AESIS displays a pop-up window to update the status of the file tailoring process.
When the file tailoring process is complete, the AESIS displays the AES Install System File Tailoring Status panel (Figure 15) to show the status of the generated JCL.

**Figure 15**  AES Install System File Tailoring Status panel

<table>
<thead>
<tr>
<th>Name</th>
<th>Status</th>
<th>Function</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Q02CK0*</td>
<td>COMPLETED</td>
<td>Subsystem check JCL</td>
</tr>
<tr>
<td>$Q03APFJ</td>
<td>COMPLETED</td>
<td>APF-authorization JCL</td>
</tr>
<tr>
<td>$Q04REGI</td>
<td>COMPLETED</td>
<td>REGISET creation JCL</td>
</tr>
<tr>
<td>BMCP</td>
<td>COMPLETED</td>
<td>BMCP PROC</td>
</tr>
<tr>
<td>BMBCSS</td>
<td>COMPLETED</td>
<td>BCSS PROC</td>
</tr>
<tr>
<td>COMMAND1</td>
<td>COMPLETED</td>
<td>Subsystem commands</td>
</tr>
<tr>
<td>$Q05CPYP</td>
<td>COMPLETED</td>
<td>Copy PROCS to system PROCLIB JCL</td>
</tr>
<tr>
<td>$Q05CPYX</td>
<td>COMPLETED</td>
<td>Migrate existing AR/CTL Extended Options JCL</td>
</tr>
<tr>
<td>$Q05CPYR</td>
<td>COMPLETED</td>
<td>Migrate existing AR/CTL External security Options JCL</td>
</tr>
<tr>
<td>$Q06BCF</td>
<td>COMPLETED</td>
<td>Create BCF history file JCL</td>
</tr>
<tr>
<td>$Q07SEC1</td>
<td>COMPLETED</td>
<td>LIBDEF table initialization JCL</td>
</tr>
<tr>
<td>$Q09INFO</td>
<td>COMPLETED</td>
<td>Information member</td>
</tr>
<tr>
<td>$Q10UPOP</td>
<td>COMPLETED</td>
<td>REGISET population JCL</td>
</tr>
<tr>
<td>$Q11IVP1</td>
<td>COMPLETED</td>
<td>AR/CTL non-IMS IVP JCL</td>
</tr>
<tr>
<td>$Q12IVP2</td>
<td>COMPLETED</td>
<td>AR/CTL IMS IVP JCL</td>
</tr>
<tr>
<td>$Q13IVP3</td>
<td>COMPLETED</td>
<td>BCF IVP JCL</td>
</tr>
</tbody>
</table>

2 Press Enter.

The AESIS has now generated the jobs that must be executed to configure the selected AR/CTL products. You can continue with the next task, or you can stop here before the generated jobs are executed. If you want to stop here, enter the END command or the EXIT command repeatedly until you exit from the AESIS.

**Execute the configuration jobs**

To configure the selected AR/CTL products, edit the generated JCL in the ARCCUST library and submit the jobs for execution.

When you press Enter on the AES Install System File Tailoring Status panel (Figure 15 on page 67), the AESIS invokes the ISPF Edit function. The member selection list (Figure 16) shows the members that you will work with to configure AR/CTL products. If you have left the AESIS, you can edit the ARCCUST library members directly with ISPF (outside of the AESIS).
Execute the configuration jobs

Figure 16  Generated JCL members in the AES INSTALL library

<table>
<thead>
<tr>
<th>Name</th>
<th>Prompt</th>
<th>Size</th>
<th>Created</th>
<th>Changed</th>
<th>ID</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Q02CK01</td>
<td></td>
<td>100</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:52</td>
<td>PAG</td>
</tr>
<tr>
<td>$Q02CK02</td>
<td></td>
<td>118</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:52</td>
<td>PAG</td>
</tr>
<tr>
<td>$Q03APFJ</td>
<td></td>
<td>152</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:52</td>
<td>PAG</td>
</tr>
<tr>
<td>$Q04REGI</td>
<td></td>
<td>56</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:53</td>
<td>PAG</td>
</tr>
<tr>
<td>$Q05CYPY</td>
<td></td>
<td>31</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:53</td>
<td>PAG</td>
</tr>
<tr>
<td>$Q05CYPY</td>
<td></td>
<td>25</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:54</td>
<td>PAG</td>
</tr>
<tr>
<td>$Q06BCFH</td>
<td></td>
<td>26</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:53</td>
<td>PAG</td>
</tr>
<tr>
<td>$Q07SEC1</td>
<td></td>
<td>48</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:54</td>
<td>PAG</td>
</tr>
<tr>
<td>$Q08INIT</td>
<td></td>
<td>14</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:55</td>
<td>PAG</td>
</tr>
<tr>
<td>$Q09INFO</td>
<td></td>
<td>5</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:54</td>
<td>PAG</td>
</tr>
<tr>
<td>$Q10UPOP</td>
<td></td>
<td>48</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:55</td>
<td>PAG</td>
</tr>
<tr>
<td>$Q11IVP1</td>
<td></td>
<td>144</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:55</td>
<td>PAG</td>
</tr>
<tr>
<td>$Q12IVP2</td>
<td></td>
<td>191</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:55</td>
<td>PAG</td>
</tr>
<tr>
<td>$Q13IVP3</td>
<td></td>
<td>163</td>
<td>2013/06/10</td>
<td>2013/06/10 14:22:55</td>
<td>PAG</td>
</tr>
</tbody>
</table>

**End**

**NOTE**

The first member in the member selection list, $README, might contain documentation changes that were identified after the manuals were published.

The $Qxxxxxx members of the ARCCUST library contain the generated JCL and comments about running the jobs. Work with the $Qxxxxxx members in the order they appear in the member list. In each member, read and follow the instructions in the comments. Unless stated otherwise in the comments, wait for a submitted job to complete successfully before you submit the next job.

**NOTE**

To execute each generated job, you must have the appropriate system authority.

The AESIS generates the $Qxxxxxx members listed in Table 13.

Table 13  $Qxxxxxx members (part 1 of 2)

<table>
<thead>
<tr>
<th>Member</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Q02CK0*</td>
<td>Check the level of the BMC subsystem modules on the distribution tape (or from the ESD image) against any subsystem modules that are installed in the system. For more information about the Installation Check program, see the APPLICATION RESTART CONTROL Administrator Guide. Always use the latest available level of the BCSS with AR/CTL products.</td>
</tr>
</tbody>
</table>
Table 13  $Qxxxxxx members (part 2 of 2)

<table>
<thead>
<tr>
<th>Member</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>$Q03APFJ</td>
<td>Copy the modules that require APF authorization to an existing APF-authorized library; also install AR/CTL enhanced processing functions if any are selected for installation. If any AR/CTL enhanced processing functions (AR/CTL for VSAM or the AR/CTL BCF component) are selected for installation, certain steps of this job (as described in the comments) must be executed after every IPL.</td>
</tr>
<tr>
<td>$Q04REGI</td>
<td>Perform IDCAMS definition of registrations data sets.</td>
</tr>
<tr>
<td>$Q05CPYP</td>
<td>Copy subsystem procedures (default names BMCP and BMCBCSS) to the system procedure library.</td>
</tr>
<tr>
<td>$Q05CPYX</td>
<td>Migrate the existing AR/CTL extended options.</td>
</tr>
<tr>
<td>$Q05CPYR</td>
<td>Migrate the existing AR/CTL external security options.</td>
</tr>
<tr>
<td>$Q06BCFH</td>
<td>Perform IDCAMS define of the default AR/CTL BCF component history data set.</td>
</tr>
<tr>
<td>$Q07SEC1</td>
<td>Install CPU authorization passwords.</td>
</tr>
<tr>
<td>$Q08INIT</td>
<td>Initialize the AR/CTL LIBDEF table to enable usage of the AR/CTL ISPF interface without modifying TSO logon procedures.</td>
</tr>
<tr>
<td>$Q09INFO</td>
<td>Read this information about tasks that must be performed before you continue executing installation jobs.</td>
</tr>
<tr>
<td>$Q10UPOP</td>
<td>Execute the REGISET Population utility.</td>
</tr>
<tr>
<td></td>
<td>This step is essential to execute for any new REGISET and whenever you install maintenance. You cannot access REGISET records with the ISPF interface if the current version of this utility has not executed successfully.</td>
</tr>
<tr>
<td>$Q11IVP1</td>
<td>Execute the non-IMS installation verification procedure (IVP) for APPLICATION RESTART CONTROL (AR/CTL).</td>
</tr>
<tr>
<td>$Q12IVP2</td>
<td>Execute the IMS IVP for AR/CTL.</td>
</tr>
<tr>
<td>$Q13IVP3</td>
<td>Execute the IVP for the BCF component of AR/CTL.</td>
</tr>
</tbody>
</table>

Complete AESIS configuration

After the AESIS has invoked ISPF Edit and you have edited and submitted the tailored configuration jobs, the AESIS displays the AES Install System Completion panel (Figure 17). This panel explains how to exit from the configuration.

Figure 17  AES Install System Completion

AESIPI60  AES Install System Completion
Command >>>

You can scroll through the previous install panels by pressing the Cancel key F12/F24, or you can exit the installation by pressing the Exit key F3/F15.
Install the ISPF interface

The ISPF interface is required for most tasks that involve working with records in the REGISET. To install the ISPF interface for users, provide access to AR/CTL product ISPF libraries with either of two methods:

- invoke ISPF LIBDEF facilities to allocate the libraries dynamically
- allocate the libraries through TSO logon procedures

Users can invoke the AR/CTL ISPF interface with a TSO command, or you can set up an existing menu to invoke the ISPF interface through a menu selection.

LIBDEF method

To invoke ISPF LIBDEF facilities to allocate the libraries dynamically, use the BMCAES member of the INSTALL library. This member contains a REXX EXEC tailored by the AESIS; the EXEC invokes ISPF LIBDEF facilities to allocate AR/CTL ISPF libraries, and then it invokes the Application Enhancement Series primary menu.

You can test the EXEC by entering the following TSO command:

```
EX 'HLQ.ARCCUST(BMCAES)'
```

The variable *HLQ* is a high-level qualifier that you specified during execution of the Installation System. *HLQ* should be easily identified by all installation users in your facility.

To provide access to the EXEC through a menu selection

1. Move or copy the BMCAES EXEC to a common library accessible to all users of the product.

2. Add the BMCAES EXEC to an ISPF menu accessible to all users. Add a line to the panel body section, providing a selection code for AR/CTL and an explanation for the selection. For example:

```
% B +BMC APPLICATION ENHANCEMENT SERIES
```

Then add statements that execute the BMCAES EXEC when you enter the selection code on the ISPF menu:
To test access to the AR/CTL ISPF interface, log off TSO and log back on. From the panel that you modified in 2, enter the AR/CTL selection code.

**Logon procedure method**

To allocate AR/CTL ISPF libraries through TSO logon procedures, you can modify user logon procedures or copy the AR/CTL ISPF elements to libraries that already are allocated in these procedures. The libraries that contain ISPF interface elements are listed in Table 14.

The variable *HLQ* is a high-level qualifier that was provided in the AES data set name prefix field on the AES Install System JCL Defaults panel (Figure 2 on page 46). *HLQ* should be easily identified by all installation users in your facility.

**Table 14  AR/CTL product libraries that contain ISPF interface elements**

<table>
<thead>
<tr>
<th>AR/CTL product library</th>
<th>Library concatenation</th>
</tr>
</thead>
<tbody>
<tr>
<td>HLQ.ARCLIB</td>
<td>ISPLLIB</td>
</tr>
<tr>
<td></td>
<td>STEPLIB (optional)</td>
</tr>
<tr>
<td>HLQ.ARCPLIB</td>
<td>ISPPLIB</td>
</tr>
<tr>
<td>HLQ.ARCMLIB</td>
<td>ISPMLIB</td>
</tr>
<tr>
<td>HLQ.ARCSLIB</td>
<td>ISPSQLIB</td>
</tr>
<tr>
<td>HLQ.ARCTLIB</td>
<td>ISPTLIB</td>
</tr>
</tbody>
</table>

You can test the ISPF interface by entering the following TSO command:

```
&ZSEL = TRANS( TRUNC(&ZCMD,'.'), B, 'CMD(BMCAES)')
```

```EX PGM(AESXPRIM)```
Perform other configuration tasks

To provide access to the AR/CTL ISPF interface through a menu selection, perform the following steps:

1. Add the AR/CTL ISPF interface primary menu program to an ISPF menu accessible to all users. Add a line to the panel body section, providing a selection code for AR/CTL and an explanation for the selection. For example:

   ```
   %   B +BMC APPLICATION ENHANCEMENT SERIES
   ```

   Then add statements that execute the AR/CTL ISPF interface primary menu program when you enter the selection code on the ISPF menu:

   ```
   &ZSEL = TRANS( TRUNC(&ZCMD, '.')
   ...
   B,'PGM(AESXPRIM) PARM(AES,AESPPRIM)+
   NEWAPPL(AESX) PASSLIB'
   ```

2. To test access to the AR/CTL ISPF interface, log off TSO and log back on. From the panel that you modified in 1, enter the AR/CTL selection code.

Perform other configuration tasks

Depending on the products and product features you selected for configuration, other tasks may be necessary to complete product configuration.

Automatic enhanced processing installation

This information applies to AR/CTL for VSAM and the AR/CTL BCF component only. Member $Q03APFJ of the ARCCUST library contains a job step to install enhanced processing for AR/CTL products; however, the installation lasts only until the next system IPL. If you selected any AR/CTL enhanced processing function for installation, you may want to set up this job step to execute automatically after an IPL. If this job step does not execute automatically, it must be executed manually after an IPL; otherwise, enhanced processing functions are not available.
Bind/grant processing

If you installed AR/CTL for DB2, you must perform bind/grant processing for the AR/CTL plan (default name ARCTLP$3) on each DB2 subsystem where application programs may execute with AR/CTL for DB2. The AR/CTL plan enables the use of the following AR/CTL processing options:

- Automatic DB2 Cursor Repositioning
- Automatic Checkpoints and Trigger Cursor Name

Member #DB2BDGT of the ARCCUST library contains JCL to perform bind/grant processing for ARCTLP$3.

The STORE step of the job in #DB2BDGT stores the plan name into module ARCIEXT. If you change the plan name from the default (ARCTLP$3), change the PARM string in the STORE step to your plan name.

If module ARCIEXT resides in an APF-authorized library when you run the bind/grant job, the job step ends with a user 1553 abend, return code '00074401'. If you receive this error, you can copy the module to a non-APF authorized library, rerun the job step, and then copy the module back to the original library.

Refresh MVS Linklist Lookaside

If you are using the MVS Linklist Lookaside (LLA) feature, you must refresh the LLA after a first time installation of BMC subsystems. To refresh LLA, issue the following command from a z/OS console:

```
F LLA,REFRESH
```

This command builds a new copy of the Linklist Lookaside directory in virtual storage. The refresh may take a few minutes to complete. Check the system log for the following message to verify that the command completed successfully:

```
CSV210I LIBRARY LOOKASIDE REFRESHED
```

In a shared DASD environment, issue this command on each CPU using the subsystem.
Migrating to production

This chapter discusses some considerations that you should review before you migrate an APPLICATION RESTART CONTROL (AR/CTL) product from a test environment to a production environment. It also discusses the tasks involved in the migration process. This chapter presents the following topics:

Migration considerations ............................................................... 75
Migration of an AR/CTL product to production .......................... 76

Migration considerations

Before you migrate an AR/CTL product to a production environment (or a product-acceptance testing environment), BMC recommends that you check the product components listed in to ensure that the product functions correctly in the new environment.

<table>
<thead>
<tr>
<th>Step</th>
<th>Component</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Product data set names</td>
<td>Ensure that all references to product data sets indicate the names of the new data sets in the production environment where the product modules reside. This task includes changing data set names in environment registration records if you copy records from a test REGISET to a production REGISET.</td>
</tr>
<tr>
<td>2</td>
<td>CPU authorization</td>
<td>Ensure that the products being migrated are authorized for use on the CPU where the production system resides. For questions about CPU authorization, contact your BMC sales representative. For more information about the authorization process, see the Installation System User Guide.</td>
</tr>
</tbody>
</table>
Migration of an AR/CTL product to production

Migrating an AR/CTL product from a test environment to a production environment usually consists of the following tasks:

1. Verify that a configured, current version of AR/CTL is installed in production along with any AR/CTL or BCSS maintenance that might have been applied to the test environment. The PTF levels of the test and production environment should be consistent. (The current version of AR/CTL uses SMP/E.)

### Table 15  Product component verification (part 2 of 2)

<table>
<thead>
<tr>
<th>Step</th>
<th>Component</th>
<th>Task</th>
</tr>
</thead>
<tbody>
<tr>
<td>3</td>
<td>Dynamic allocation skeletons</td>
<td>Ensure that the dynamic allocation skeletons are appropriate for a production environment. For more information about setting up dynamic allocation skeletons, see the following manuals:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- APPLICATION RESTART CONTROL Reference Manual</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- APPLICATION RESTART CONTROL Reference Manual: BATCH CONTROL FACILITY</td>
</tr>
<tr>
<td>4</td>
<td>Global processing option values</td>
<td>Ensure that the processing option values specified in the global processing options record for each product are appropriate for a production environment. For more information about setting option values, see the following manuals:</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- APPLICATION RESTART CONTROL Reference Manual</td>
</tr>
<tr>
<td></td>
<td></td>
<td>- APPLICATION RESTART CONTROL Reference Manual: BATCH CONTROL FACILITY</td>
</tr>
<tr>
<td>5</td>
<td>LIBDEF table</td>
<td>Ensure that all references to product data sets in the LIBDEF table indicate the names of the new data sets in the production environment where the product modules reside.</td>
</tr>
<tr>
<td>6</td>
<td>Enhanced processing</td>
<td>To use enhanced processing with AR/CTL products, ensure that enhanced processing has been installed on the CPU where the production system resides. If you plan to use enhanced processing, ensure that enhanced processing is reactivated each time an IPL is performed.</td>
</tr>
<tr>
<td>7</td>
<td>Product security</td>
<td>To use the security facility provided with the AR/CTL products, determine whether you want to use the internal security component or the external security component. If you plan to use the external security component, ensure that the security settings are consistent with the RACF settings on the production system. For more information on product security, see the APPLICATION RESTART CONTROL Administrator Guide.</td>
</tr>
<tr>
<td>8</td>
<td>Remote VSAM access implementation</td>
<td>Ensure that remote VSAM access implementation is performed in the production CICS regions as described in Appendix 5, “Implementing remote VSAM access.”</td>
</tr>
</tbody>
</table>
2 Copy REGISET records as needed.

   The REGISET Record Copy utility is available through the ISPF interface to help you transfer records quickly from a test environment to a production environment. The utility 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. For more information, see the APPLICATION RESTART CONTROL Administrator Guide.

3 Make changes as needed to accommodate the considerations discussed in “Migration considerations” on page 75.

4 Test the migrated product in the production environment.

5 Optional. Implement the AR/CTL Status Check utility to ensure that AR/CTL products, components, and functions are available for application program execution. For more information, see the APPLICATION RESTART CONTROL Administrator Guide.
Implementing remote VSAM access

This chapter is for the CICS system programmer. It describes how to set up the elements that allow APPLICATION RESTART CONTROL (AR/CTL) for VSAM to provide remote VSAM access services (also known as file sharing). These services allow a batch application program to access VSAM data sets that are allocated to a CICS region. This chapter presents the following topics:

Overview . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  80
Steps to perform in the z/OS environment . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  81
  Set up the VSAM file control table data set . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  81
  Define cross-system enqueues . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  84
Steps to perform in a CICS environment . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  84
  Set up the CICS environment for remote VSAM access . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  84
  Create AR/CTL entries in each CICS region . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  85
  Set parameter values in file entries . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  88
  Evaluate usage of CICS resources . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  88
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  Set AR/CTL processing options . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  89
  Work with the CICS connection ID table . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  90
  Work with the CICS APPLID table . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  92
  Work with the remote VSAM access file table . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . . .  96
Table 16 lists the elements that allow AR/CTL to provide remote VSAM access services in an installation.

**Table 16  Elements that provide remote VSAM access (part 1 of 2)**

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>MRO interface</td>
<td>AR/CTL requires the CICS environment to support multiregion operations (MRO); in a SYSPLEX environment (file sharing across multiple z/OS images), AR/CTL requires XCF/MRO. Through the MRO interface, AR/CTL uses CICS to provide data access and dynamic transaction backout for data sets that use remote VSAM access services. If the CICS environment does not already support MRO, you must enable MRO usage; however, you do not need to set up an MRO region.</td>
</tr>
<tr>
<td>CICS and AR/CTL program modules</td>
<td>AR/CTL requires access to certain CICS modules during execution of a batch application program. CICS requires access to certain AR/CTL program modules that perform remote VSAM access functions. Some of these programs execute during initialization or shutdown of the CICS region.</td>
</tr>
<tr>
<td>AR/CTL entries in the CICS regions</td>
<td>AR/CTL requires connection, session, program, and transaction entries to be defined in each CICS region. The same entries can be duplicated in each CICS region that will be used for remote VSAM access services. The connection entries correspond to connection IDs that you specify in the remote VSAM access connection ID table in AR/CTL.</td>
</tr>
<tr>
<td>Security definitions for AR/CTL transactions and services</td>
<td>The AR/CTL transactions and services are defined to the system security package so that the proper access authority is granted.</td>
</tr>
<tr>
<td>File control table entries</td>
<td>To provide remote VSAM access services for a VSAM data set, AR/CTL requires particular values for the parameters specified in the file control table (FCT) entry defined for that file in CICS.</td>
</tr>
<tr>
<td>CICS resources</td>
<td>Through remote VSAM access services, a batch VSAM application program uses CICS resources. You should evaluate the effect of this processing on the resource locks held by CICS and on the CICS system log.</td>
</tr>
<tr>
<td>Remote VSAM access connection ID table</td>
<td>To provide remote access to VSAM data sets owned by an online CICS region (also known as file sharing), AR/CTL connects to the CICS region during application program execution. To make the connection, AR/CTL must use one of the CICS connection entries that you define for AR/CTL in the CICS region. To identify the defined connections to AR/CTL, you set up a table of connection IDs in AR/CTL, where each connection ID is the <strong>Netname</strong> parameter defined in a connection entry in the CICS region. The table resides in module ARVRCON of the remote VSAM access library. The number of connection IDs and connection entries required depends on the number of VSAM batch application programs that may execute at the same time. AR/CTL uses one connection ID from the table for each VSAM batch application program that uses remote VSAM access services.</td>
</tr>
</tbody>
</table>
Steps to perform in the z/OS environment

This section describes how to set up the z/OS environment for remote VSAM access services (file sharing). These steps must be performed once per z/OS image (for file sharing in a stand-alone z/OS image) or once per SYSPLEX (for file sharing across multiple z/OS images in a SYSPLEX environment).

Set up the VSAM file control table data set

The VSAM file control table data set (default ddname ARVFCTAB) must be created and initialized. One ARVFCTAB data set is used per stand-alone z/OS image or per SYSPLEX.

To avoid enqueue problems, do not use the ARVFCTAB data set for any purpose other than the exclusive use of AR/CTL for VSAM.

<table>
<thead>
<tr>
<th>Element</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>Remote VSAM access APPLID table</td>
<td>To allow remote access to VSAM data sets owned by an online CICS region, define an AR/CTL table of CICS application IDs (APPLIDs) that may own shared data sets. AR/CTL uses this APPLID table to identify the CICS regions to search to determine which CICS region owns a file and to obtain the processing options you have set for the APPLID. If this table is not defined or does not contain the APPLID of the CICS region that owns a shared data set, the data set option member (FCB) for that data set must contain the APPLID. The table resides in module ARVRAPID of the remote VSAM option library.</td>
</tr>
<tr>
<td>Remote VSAM access file table data set and members</td>
<td>To enable file sharing, AR/CTL uses the VSAM file control table data set (default ddname ARVFCTAB). AR/CTL scans the file control table entries (FCTs) defined in a CICS region, builds a table (a load module), and saves this table in the VSAM file control table data set. The table contains FCT information pertinent for file sharing so that application programmers do not have to specify this information in the data set option member (FCB). When the state of a file (OPEN, CLOSE, ENABLE, DISABLE) or its access intent is altered within a CICS, a global user exit in CICS (XFCSREQC) is driven. To keep the file table accurate, AR/CTL provides the ARCB transaction, which enables this exit and builds or refreshes the table at CICS startup or on demand. AR/CTL also provides the ARCD transaction, which disables the exit and deletes the file table from storage at CICS shutdown or on demand if needed. AR/CTL accesses the VSAM file control table data set from each CICS region and batch application program execution that participates in file sharing. The data set name must be the same for all participants in file sharing across a SYSPLEX or stand-alone z/OS image.</td>
</tr>
</tbody>
</table>
Create the data set

The AR/CTL Install System (AESIS) configures the HLQ.ARCCUST(#ARVFCTB) job that you must use to create a new ARVFCTAB data set after installation.

Select the format of the data set

Typically, the ARVFCTAB data set is allocated with the partitioned data set (PDS) format. You must allow for the ongoing maintenance required for this format, such as executing a PDS compression step (to be able to reuse space). You can allocate the ARVFCTAB data set with the partitioned data set/extended (PDS/E). Using this format, the ARVFCTAB data set requires little or no maintenance.

The AESIS currently configures JCL to allocate the VSAM file control table data set (ddname ARVFCTAB) as a PDS/E only if you choose to use Systems Managed Storage (SMS) for the product data sets that you are installing. If you want to use a PDS/E for ARVFCTAB and you do not use SMS for the product data sets, you must modify the ARVFCTAB DD statement in member #ARVFCTB of the ARCCUST library. Add SMS parameters that are suitable for management of a PDS/E. The following statement is an example:

```plaintext
//ARVFCTAB DD DISP=(NEW,CATLG,CATLG),
// DSN=HLQ.ARVFCTAB,
// SPACE=(CYL,(2,5,5)),
// DSNTYPE=LIBRARY,
// STORCLAS=class,
// DCB=(LRECL=0,RECFM=U,BLSIZE=6160)
```

The variable HLQ is a high-level qualifier that you specified during execution of the Installation System. HLQ should be easily identified by all installation users in your facility.

Calculate the size of the data set (PDS)

If you must allocate the ARVFCTAB data set as a PDS, allocate enough directory blocks to allow one member per CICS region (plus extra for growth).

Calculate the suggested base size for your environment by using the following formula; this size should be sufficient if you include a step to compress the ARVFCTAB data set before each CICS startup:

```
size of PDS = ((average number of files per CICS) * (total number of CICS regions in tracks)) / 100
```

Round up to the next higher 10 tracks.
Calculate the size of the data set (PDS/E)

The default size values should be more than sufficient for most environments. To calculate the suggested size for your environment, use the following formula:

\[
\text{size of PDS/E} = \left( \frac{\text{average number of files per CICS} \times \text{total number of CICS regions in tracks}}{50} \right)
\]

Round up to the next higher 5 tracks.

The following examples show suggested sizes for various environments:

- If you have an average of 20 files per CICS region and a total of 2 CICS regions, the size of the PDS/E should be at least 5 tracks: `SPACE=(TRKS,(5,1,1)).`

- If you have an average of 200 files per CICS region and a total of 100 CICS regions, the size of the PDS/E should be at least 400 tracks: `SPACE=(TRKS,(50,8,1)).`

- If you have an average of 70 files per CICS region and a total of 20 CICS regions, the size of the PDS/E should be at least 28 tracks, rounded to 30: `SPACE=(TRKS,(15,2,1)).`

Even though the PDS/E format supports 123 extents, allocate the data set with large enough values to avoid using multiple extents.

Select the location of the data set

The ARVFCTAB data set must be allocated on a shared direct access storage device (DASD) volume so that it is accessible from all z/OS systems in the SYSPLEX.

Initialize the data set

Typically, the ARVFCTAB data set is initialized during the $Q10UPOP job (which executes program AESURPOP). To initialize this data set after configuration, you can execute the job in member #ARVFCTB (which executes program ARVRIEPR).

Provide for maintenance of the data set

If the ARVFCTAB data set is allocated as a PDS, make sure that the data set is compressed frequently enough to prevent an out-of-space condition. AR/CTL updates the ARVFCTAB data set at every startup of a CICS region and when the ARCB transaction executes. In the job that you use to start up the CICS region, you can add a step to compress the ARVFCTAB data set. Add the step before the CICS startup step.
Define cross-system enqueues

If the ARVFCTAB data set is allocated as a PDS/E, little or no ongoing maintenance is required.

Define cross-system enqueues

To avoid enqueue problems and ensure the integrity of the ARVFCTAB data set, you must register certain AR/CTL resources with your software package that handles cross-system enqueues, such as MIMS or GRS. Define a systems level ENQ for QNAMEs ARVRCON and ARVCONID.

Steps to perform in a CICS environment

This section describes how to set up AR/CTL information in a CICS environment to enable the use of remote VSAM access services.

Set up the CICS environment for remote VSAM access

AR/CTL requires use of certain CICS services, programs, and modules. CICS requires access to certain AR/CTL modules. To set up the CICS environment, perform the following steps:

1. Provide access to the VSAM file control table data set in each CICS region that can participate in file sharing. Add the following DD statement to the CICS startup JCL:

```
//ARVFCTAB DD DSN=HLQ.arvfctab
```

   where HLQ.arvfctab is the name of the VSAM file control table data set that was allocated and initialized for your environment. The ddname must be ARVFCTAB.

2. Set up the CICS environment to support MRO (or XCF/MRO) communication. See the CICS documentation for instructions about enabling MRO support.

3. AR/CTL requires access to selected CICS modules to provide remote VSAM access services, but CICS execution libraries are not usually available to batch VSAM application programs. Therefore, include the CICS library containing the DFHACEE module in the STEPLIB, JOBLIB, or LNKLST concatenation of the batch job. This module does not require APF authorization.
4 Copy module DFHIRP (from the highest CICS release available in the SYSPLEX) to the link pack area (LPA) of each z/OS system where a batch file sharing job can execute. This module is already in LPA of systems that are running CICS.

5 Make selected AR/CTL modules available to CICS by including the following AR/CTL programs in the DFHRPL DD concatenation:

<table>
<thead>
<tr>
<th>Program</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARVRCIS0</td>
<td>provides remote VSAM access services</td>
</tr>
<tr>
<td>ARVRCIS3</td>
<td>scans FCT entries; builds remote VSAM access file table</td>
</tr>
<tr>
<td>ARVRCIS5</td>
<td>removes remote VSAM access file table</td>
</tr>
<tr>
<td>ARVRFCXT</td>
<td>driven by the XFCSREQC exit in CICS to update file table after a file state changes</td>
</tr>
</tbody>
</table>

You can copy the modules to a DFHRPL library, or you can include the AR/CTL execution load module library in the DFHRPL DD concatenation.

6 In the Program List Table Program Initialization (PLTPI), add the following entry to the phase 2 section (after the DFHDELIM statement) before any other phase 2 programs:

```
DFHPLT TYPE=ENTRY,PROGRAM=ARVRCIS3
```

7 Set up security definitions for the AR/CTL transactions and sessions. The AR/CTL transactions (ARCF, ARCB, and ARCD) must be defined as having global authority in the system security package (such as RACF or ACF2). Also, set up the appropriate rules in the system security package to allow MRO (or XCF/MRO) traffic from batch VSAM jobs.

To prevent unauthorized access to a data set that is being shared with CICS, the check for authority in the installation security package occurs within the batch region. This check ensures that the batch application program has authority to access the shared data set.

---

Create AR/CTL entries in each CICS region

AR/CTL requires connection, program, session, and transaction entries in each CICS region that can own files to be shared with batch VSAM application programs. AR/CTL uses identical entries in all CICS regions in the environment. To create these entries in each CICS region, perform the following steps:
1 Define connection entries. Set up connection entries to correspond to the entries defined in the Remote VSAM Access Connection ID table in AR/CTL. The number of entries you need is approximately equal to the number of batch VSAM application programs that will use remote VSAM access services at one time. The following parameters are significant for remote VSAM access services. Use your system defaults for the other parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Connection</td>
<td>Set the value to any unique connection name in the CICS region. You will specify this value for the <code>Connection</code> parameter when you define the corresponding session entry in Step 2.</td>
</tr>
<tr>
<td>Netname</td>
<td>Set the value to any unique name in the CICS region. You will enter this value as a connection ID in the remote access connection ID table, as described in “Work with the CICS connection ID table” on page 90.</td>
</tr>
<tr>
<td>Accessmethod</td>
<td>Set the value to <code>Xm</code> for cross-memory access.</td>
</tr>
<tr>
<td>Autocnect</td>
<td>Set the value to <code>Yes</code>.</td>
</tr>
</tbody>
</table>

2 Define session entries. Set up one session entry for each connection entry you set up in the previous step. The following parameters are significant for remote VSAM access services. Use your system defaults for the other parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Sessions</td>
<td>Set the value to any unique session name in the CICS region.</td>
</tr>
<tr>
<td>Connection</td>
<td>Set the value to the value you specified for the <code>Connection</code> parameter when you defined the corresponding connection entry in 1.</td>
</tr>
<tr>
<td>Protocol</td>
<td>Set the value to <code>Lu61</code>.</td>
</tr>
<tr>
<td>RECEIVEPfx</td>
<td>Set the value to any prefix that is unique within the CICS region.</td>
</tr>
<tr>
<td>RECEIVECount</td>
<td>Set the value to <code>002</code> to define two receive sessions.</td>
</tr>
<tr>
<td>SENDPfx</td>
<td>Set the value to any prefix that is unique within the CICS region.</td>
</tr>
<tr>
<td>SENDCount</td>
<td>Set the value to <code>001</code> to define one send session.</td>
</tr>
</tbody>
</table>
3 Define program (PPT) entries. Set up program entries for the AR/CTL remote VSAM access services programs. The following parameters are significant for remote VSAM access services. Use your system defaults for the other parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>PROGram</td>
<td>Set the value to the program name. Define entries for the following programs:</td>
</tr>
<tr>
<td></td>
<td>- ARVRCIS0—provides remote VSAM access services</td>
</tr>
<tr>
<td></td>
<td>- ARVRCIS3—scans FCT entries; builds remote VSAM access file table</td>
</tr>
<tr>
<td></td>
<td>- ARVRCIS5—removes remote VSAM access file table from ECSA</td>
</tr>
<tr>
<td></td>
<td>- ARVRFCTX—driven by the XFCREQC exit in CICS to update file table after a file state changes</td>
</tr>
<tr>
<td>Language</td>
<td>Set the value to Assembler.</td>
</tr>
<tr>
<td>EXECKey</td>
<td>If you use the hardware storage protection option (the STGPRT option in the system initialization table is set to YES), set the value to CICS.</td>
</tr>
</tbody>
</table>

4 Define transaction entries. Set up transaction entries for the AR/CTL remote VSAM access services transactions. The following parameters are significant for remote VSAM access services. Use your system defaults for the other parameters.

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>TRansaction</td>
<td>Set the value to the transaction name. Define entries for the following transactions:</td>
</tr>
<tr>
<td></td>
<td>- ARCF—transaction for program ARVRCIS0</td>
</tr>
<tr>
<td></td>
<td>- ARCB—transaction for program ARVRCIS3</td>
</tr>
<tr>
<td></td>
<td>- ARCD—transaction for program ARVRCIS5</td>
</tr>
<tr>
<td>PROGram</td>
<td>Set the value to the program name.</td>
</tr>
<tr>
<td>STatus</td>
<td>Set the value to Enabled.</td>
</tr>
<tr>
<td>TASKDATAKey</td>
<td>If you use the hardware storage protection option (the STGPRT option in the system initialization table is set to YES), set the value to CICS.</td>
</tr>
</tbody>
</table>
Set parameter values in file entries

AR/CTL requires certain parameter values in the FCT entries for shared files. Ensure that the file entry for each VSAM data set that you want to access through remote VSAM access services contains the following values:

<table>
<thead>
<tr>
<th>Parameter</th>
<th>Action</th>
</tr>
</thead>
<tbody>
<tr>
<td>Disposition</td>
<td>Set the value to Share.</td>
</tr>
<tr>
<td>RECOVery</td>
<td>To use checkpoint/restart services with this data set, set the value to Backoutonly or All; if the value is set None, AR/CTL cannot provide checkpoint/restart services.</td>
</tr>
<tr>
<td>VSAM parameters</td>
<td>The local shared resources (LSR) parameter generally provides best performance. If you want to delete records in a KSDS through a path, use non-shared resources (NSR) instead of LSR. If you use LSR in this case, an LSR buffer wait will occur.</td>
</tr>
<tr>
<td>STRings</td>
<td>This value defines the number of concurrent requests that can be processed against the file. CICS also uses this value to calculate the default value in the buffer pool definition. Ensure that the value is high enough to prevent an LSR wait.</td>
</tr>
<tr>
<td>access authority</td>
<td>Set the proper authority (BROWSE, READ, ADD, DELETE, and/or UPDATE) for the actions that AR/CTL will perform on behalf of the batch VSAM application program.</td>
</tr>
</tbody>
</table>

Evaluate usage of CICS resources

Remote VSAM access services use CICS resources. Evaluate the effects on the CICS region and take steps to prevent problems. The primary concerns are resource locks and overflow of the CICS system log data sets.

Resource locks

CICS maintains locks on data updated by a batch VSAM application program through remote VSAM access services. These locks can affect the availability of this data to online transactions. If the program issues a checkpoint call, AR/CTL issues a SYNC call to CICS to release locks, making data available to online transactions. AR/CTL also issues a SYNC call at program termination.

If the batch VSAM application program does not issue checkpoint calls, CICS continues to hold the resource locks until program termination. Degraded performance and deadlock situations can result. To prevent these problems, BMC recommends that you use the checkpoint/restart services of AR/CTL; if you are not concerned with restart issues, you can use the automatic syncpoint options of AR/CTL instead of checkpoint/restart services.
Overflow of the CICS system log

Long-running transactions, such as those that may result from using remote VSAM access services, can cause a problem with the CICS system log. CICS uses two data sets to contain the system log. When one data set becomes full, CICS switches to the other data set; when that data set becomes full, CICS switches back to the first data set, and so on.

In an environment that is set up for recovery, the log must be archived before the alternate data set is reused. In an environment that is not set up for recovery, long-running transactions can cause CICS to begin writing records for the transaction to one data set, switch to the other data set and write transaction records to it, then switch back to the first data set and write transaction records. If CICS abends after this activity, an emergency restart will not be possible.

You should evaluate the size of the CICS system log to ensure that the data sets are large enough to accommodate the activity caused by batch VSAM application programs. To prevent system log overflow, BMC recommends that you use the checkpoint/restart services of AR/CTL; if you are not concerned with restart issues, you can use the automatic syncpoint options of AR/CTL instead of checkpoint/restart services.

Steps to perform in AR/CTL

This section describes the steps to perform in AR/CTL to enable the use of remote VSAM access services. Use the AR/CTL ISPF interface to perform these steps.

Set AR/CTL processing options

The AR/CTL global processing options record is created during AR/CTL installation. This record contains processing options that affect the use of remote VSAM access services. Default values for these options are set when the record was created. Verify that the default values are appropriate for your environment as follows:

- The CICS SVC Number option specifies the SVC number that AR/CTL uses when connecting to a CICS region. The default value is 216. This value must correspond to the SVC defined to z/OS for CICS; this definition is in an IEASVCxx member of the SYS1.PARMLIB library. CICS/ESA uses a Type 3 SVC, which defaults to 216. CICS Version 2.1 uses a Type 2 SVC, which also defaults to 216. If the SVC number defined to z/OS is not 216, change the value of the CICS SVC Number option to the number defined to z/OS.
Work with the CICS connection ID table

- The VSAM File Sharing Only option reduces AR/CTL initialization time for VSAM application programs that use AR/CTL remote VSAM access services (file sharing) but do not use checkpoint/restart services. This option also enables the use of the automatic syncpoint options (Autosync Trigger DDname and Autosync Trigger Count). The default value is \texttt{N} (initialize AR/CTL for file sharing and checkpoint/restart, and disable the automatic syncpoint options).

- The VSAM File Control Table DDname option identifies the ddname to use for the VSAM file control table data set in the batch application execution. The default value is \texttt{ARVFCTAB}.

For information about displaying and changing processing option values, see the \textit{APPLICATION RESTART CONTROL Reference Manual}.

Work with the CICS connection ID table

To work with the CICS connection ID table through the AR/CTL ISPF interface, perform the following steps:

1. Access the Application Enhancement Series primary menu.

2. Type 3 (APPLICATION RESTART CONTROL).

3. Press Enter. AR/CTL displays the APPLICATION RESTART CONTROL primary menu.

4. Type 10 (Remote VSAM options) in the choice entry field.

5. Press Enter. AR/CTL displays the CICS Setup for Remote VSAM Access panel (Figure 18).

\textbf{Figure 18 \quad CICS Setup for Remote VSAM Access panel}

<table>
<thead>
<tr>
<th>Command</th>
<th>CICS Setup for Remote VSAM Access</th>
</tr>
</thead>
<tbody>
<tr>
<td>ARCPCISO</td>
<td>\texttt{CICS Setup for Remote VSAM Access}</td>
</tr>
</tbody>
</table>

Select an option. Then press Enter. (no quotes for DSN Names)

\begin{itemize}
  \item 1. CICS connection IDs for remote VSAM access  
  \hspace{1cm} Library name... BMCARV.ARV.ARVCON
  \item 2. CICS APPLIDs for remote VSAM access  
  \hspace{1cm} Library name... BMCARV.ARV.FCTAB
  \item 3. Remote VSAM access file table display  
  \hspace{1cm} Override ARVFCTAB .. BMCARV.ARV.FCTAB.TEST1
  \hspace{1cm} Global ARVFCTAB
\end{itemize}
6 Type or verify the data set name of the library that contains (or will contain) the CICS connection ID table you want to work with. Allocation parameters for this library should be appropriate for load module libraries (for example, RECFM=U, LRECL=0, BLKSIZE=6144). Typically, this library is the AR/CTL execution library because these tables must be present in the ARV, STEPLIB, JOBLIB, or LNKLST concatenation or in the environment registration record of the batch jobs using remote VSAM access services.

---

**NOTE**

You can use the Override ARVFCTAB field to override the ARVFCTAB entry that is stored in the environment registration record.

---

7 Type 1 in the choice entry field.

8 Press Enter. AR/CTL displays the CICS Connection ID Table for Remote VSAM Access panel (Figure 19).

Figure 19  CICS Connection ID Table for Remote VSAM Access panel

AR/CTL uses the connection IDs defined in this table when communicating with the CICS regions that own files which use remote VSAM access services (file sharing). The table resides in module ARVRCON of the remote VSAM access library that you specified on the CICS Setup for Remote VSAM Access panel (Figure 18 on page 90). The connection IDs in this table correspond to the Netname parameter in a connection entry that you set up in the CICS region. The ARVRCON module must reside in a library that is accessible to the application program through the ARV, STEPLIB, JOBLIB, or LNKLST concatenation or through the environment registration record.

The number of connection IDs and connection entries required depends on the number of VSAM batch application programs that may execute at the same time. AR/CTL uses one connection ID from the table for each VSAM batch application program that uses remote VSAM access services.
9 Enter one of the following commands or action codes to indicate the action to take; you can use the standard ISPF LOCATE command to position the list to the member you want:

- To add a new CICS connection ID, enter the following command on the command line:

  **ADD connection id**

  The connection ID must be 1 to 8 characters and must conform to z/OS member-naming conventions. When you press **Enter**, AR/CTL adds the new connection ID to the table and redisplays the CICS Connection ID Table for Remote VSAM Access panel.

  You can omit the connection ID; if you do, AR/CTL displays the Add CICS APPLID for Remote VSAM Access panel (not shown) to request it, then redisplays the CICS Connection ID Table for Remote VSAM Access panel.

- To delete an existing connection ID, enter action code **D** in the **Act** field of the row that lists the connection ID. AR/CTL displays the Delete Remote Access Connection ID panel (not shown) to confirm the deletion.

- To save the changes made to the table and redisplay this panel, enter the following command on the command line:

  **SAVE**

- To exit this panel without saving changes or adding any new connection IDs to the table, enter the following command on the command line:

  **CAN**

  AR/CTL loses any changes that you made on the panel since the last **SAVE** command and redisplays the CICS Setup for Remote VSAM Access panel (Figure 18 on page 90).

---

**Work with the CICS APPLID table**

To work with the CICS APPLID table through the AR/CTL ISPF interface, perform the following steps:

1. Access the Application Enhancement Series primary menu.

2. Type 3 (APPLICATION RESTART CONTROL).
3 Press Enter. AR/CTL displays the APPLICATION RESTART CONTROL primary menu.

4 Type 10 (Remote VSAM options) in the choice entry field.

5 Press Enter. AR/CTL displays the CICS Setup for Remote VSAM Access panel (Figure 18 on page 90).

6 Type or verify the data set name of the library that contains (or will contain) the CICS APPLID table you want to work with. Allocation parameters for this library should be appropriate for load module libraries (for example, DSORG=PO, RECFM=U, LRECL=0, BLKSIZE=6144). Typically, this library is the AR/CTL execution library because these tables must be present in the ARV, STEPLIB, JOBLIB, or LNKLST concatenation or in the environment registration record of the batch jobs using remote VSAM access services.

7 Type 2 in the choice entry field.

8 Press Enter. AR/CTL displays the CICS APPLID Table for Remote VSAM Access panel (Figure 20 on page 93).

AR/CTL uses the table of CICS APPLIDs to identify the CICS regions that can own VSAM files accessed through remote VSAM access services. The table resides in module ARVRAPID of the remote VSAM option library you specified on the CICS Setup for Remote VSAM Access panel (Figure 18 on page 90). The ARVRAPID module must reside in a library that is accessible to the application program through the ARV, STEPLIB, JOBLIB, or LNKLST concatenation or through the environment registration record.

If the APPLID of a CICS region is omitted from this table and the application program requires remote VSAM access to a data set that this CICS region owns, the data set option member (FCB) for the data set must specify the CICS APPLID.

Figure 20  CICS APPLID Table for Remote VSAM Access panel
9 Enter one of the following commands or action codes to indicate the action to take; you can use the standard ISPF LOCATE command to position the list to the member you want:

- To display an existing set of APPLID options and (possibly) update it, enter action code S in the Act field of the row that lists the APPLID. AR/CTL displays the APPLID for Remote VSAM Access Options panel (Figure 21).

**Figure 21  APPLID for Remote VSAM Access Options panel**

- To add a new CICS APPLID, enter the following command on the command line:

  ADD applid

  The APPLID must be 1 to 8 characters and must conform to z/OS member-naming conventions. When you press Enter, AR/CTL displays the APPLID for Remote VSAM Access Options panel.

  You can omit the APPLID; if you do, AR/CTL displays the Add CICS APPLID for Remote VSAM Access panel (not shown) to request it, then displays the APPLID for Remote VSAM Access Options panel.

- To delete an existing APPLID, enter action code D in the Act field of the row that lists the APPLID. AR/CTL displays the Delete CICS APPLID for Remote VSAM Access panel (not shown) to confirm the deletion.

- To save the changes made to the table and redisplay this panel, enter the following command on the command line:

  SAVE

- To exit this panel without saving changes or adding any new APPLIDs to the table, enter the following command on the command line:

  CAN
AR/CTL loses any changes that you made on the panel since the last SAVE command and redisplays the CICS Setup for Remote VSAM Access panel (Figure 18 on page 90).

10 If you selected an existing APPLID or added a new APPLID, AR/CTL displays the APPLID for Remote VSAM Access Options panel (Figure 21 on page 94).

11 Provide values for the options that control AR/CTL processing in the CICS region:

<table>
<thead>
<tr>
<th>Option</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Maximum requests per second</strong></td>
<td>For AR/CTL to provide remote access to VSAM data sets, it must translate the application program’s VSAM requests to CICS commands and ship the resulting I/O requests to the CICS region. A high volume of remote access I/O requests can degrade performance in the CICS region.</td>
</tr>
<tr>
<td></td>
<td>You can use this option to specify the maximum number of requests that AR/CTL sends each second. When AR/CTL has shipped this maximum number of requests in a one-second interval, it waits until the beginning of the next one-second interval before it ships any more requests. AR/CTL ships the requests as soon as they are ready or, if requests are waiting, at the beginning of the interval; AR/CTL does not attempt to space the requests evenly throughout the one-second interval.</td>
</tr>
<tr>
<td></td>
<td>Set one of the following values; the default value is 0:</td>
</tr>
<tr>
<td></td>
<td>• 0—Do not limit the number of I/O requests per second sent to CICS.</td>
</tr>
<tr>
<td></td>
<td>• nnnn—The number (1 to 9999) of I/O requests per second sent to CICS.</td>
</tr>
<tr>
<td><strong>Maximum DTB KByte threshold</strong></td>
<td>If you use the File Sharing Only option, you can set a value for this option to use the number of kilobytes in the dynamic transaction backout (DTB) buffer as a trigger for an automatic syncpoint. AR/CTL issues an automatic syncpoint when the number of kilobytes of data that CICS stores for the application program in the DTB buffer reaches the value you define for this option.</td>
</tr>
<tr>
<td></td>
<td>Set one of the following values; the default value is 0:</td>
</tr>
<tr>
<td></td>
<td>• 0—Do not use the number of kilobytes in the DTB as a trigger.</td>
</tr>
<tr>
<td></td>
<td>• nnnn—The number (1 to 9999) of kilobytes of data in the DTB that triggers an automatic syncpoint.</td>
</tr>
<tr>
<td><strong>Maximum locks threshold</strong></td>
<td>If you use the VSAM File Sharing Only option (described in the APPLICATION RESTART CONTROL Reference Manual), you can set a value for this option to use the number of locks held as a trigger for an automatic syncpoint. AR/CTL issues an automatic syncpoint when the number of locks that CICS is holding for the application program reaches the value you define for this option.</td>
</tr>
<tr>
<td></td>
<td>Set one of the following values; the default value is 0:</td>
</tr>
<tr>
<td></td>
<td>• 0—Do not use the number of locks as a trigger.</td>
</tr>
<tr>
<td></td>
<td>• nnnn—The number (1 to 9999) of locks that triggers an automatic syncpoint.</td>
</tr>
</tbody>
</table>
Work with the remote VSAM access file table

To work with the remote VSAM access file table through the AR/CTL ISPF interface, perform the following steps:

1. Access the Application Enhancement Series primary menu.
2. Type 3 (APPLICATION RESTART CONTROL).
3. Press Enter. AR/CTL displays the APPLICATION RESTART CONTROL primary menu.
4. Type 10 (Remote VSAM options) in the choice entry field.
5. Press Enter. AR/CTL displays the CICS Setup for Remote VSAM Access panel (Figure 18 on page 90).
6. Type 3 in the choice entry field.
7. Press Enter. AR/CTL displays the Remote VSAM Access File Table Display panel (Figure 22).

**NOTE**

This panel is for viewing only. To change any of the file attributes, you must make the changes in the CICS region and refresh the display on this panel.
8 Type or verify the APPLID of the CICS region of the file table to display.

9 Press Enter. AR/CTL displays the information about that CICS region. AR/CTL searches for file table information in ECSA first and then in the data set specified in the Override ARVFCTAB field or the ARVFCTAB dynamic allocation record.

It is possible that the data can change after you have initially displayed the panel. To refresh the data, enter the following command on the command line:

```
REF
```

This command causes AR/CTL to read the remote VSAM access file table and to redisplay this panel with the refreshed data. AR/CTL automatically updates the table when a file is opened or closed.

**NOTE**

If the CICS region is not active, the information displayed may not be current. When the CICS region becomes active, AR/CTL can build and use a new table with current information.
10 View the fields on the panel. The **File** field contains the CICS file ID specified in the FCT, and the **Data Set Name** field contains the data set name specified in the FCT. The field labels on the right side of the panel are displayed vertically:

<table>
<thead>
<tr>
<th>Field</th>
<th>Description</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>RECF</strong></td>
<td>the record format specified in the FCT</td>
</tr>
<tr>
<td></td>
<td>The following values are valid:</td>
</tr>
<tr>
<td></td>
<td>■ V—variable</td>
</tr>
<tr>
<td></td>
<td>■ F—fixed</td>
</tr>
<tr>
<td></td>
<td>■ U—undefined</td>
</tr>
<tr>
<td><strong>TYPE</strong></td>
<td>the data set type detected at file open</td>
</tr>
<tr>
<td></td>
<td>The following values are valid:</td>
</tr>
<tr>
<td></td>
<td>■ E—entry-sequenced data set (ESDS)</td>
</tr>
<tr>
<td></td>
<td>■ K—key-sequenced data set (KSDS)</td>
</tr>
<tr>
<td></td>
<td>■ R—relative record data set (RRDS)</td>
</tr>
<tr>
<td></td>
<td>The type is available only if the file is open when the table is built.</td>
</tr>
<tr>
<td><strong>DISP</strong></td>
<td>the disposition specified in the FCT</td>
</tr>
<tr>
<td></td>
<td>The following values are valid:</td>
</tr>
<tr>
<td></td>
<td>■ S—shared</td>
</tr>
<tr>
<td></td>
<td>■ O—old</td>
</tr>
<tr>
<td><strong>READ</strong></td>
<td>the read access specified in the FCT</td>
</tr>
<tr>
<td></td>
<td>The following values are valid:</td>
</tr>
<tr>
<td></td>
<td>■ Y—read access enabled</td>
</tr>
<tr>
<td></td>
<td>■ <strong>blank</strong>—read access disabled</td>
</tr>
<tr>
<td><strong>ADD</strong></td>
<td>the add access specified in the FCT</td>
</tr>
<tr>
<td></td>
<td>The following values are valid:</td>
</tr>
<tr>
<td></td>
<td>■ Y—add access enabled</td>
</tr>
<tr>
<td></td>
<td>■ <strong>blank</strong>—add access disabled</td>
</tr>
<tr>
<td><strong>DLET</strong></td>
<td>the delete access specified in the FCT</td>
</tr>
<tr>
<td></td>
<td>The following values are valid:</td>
</tr>
<tr>
<td></td>
<td>■ Y—delete access enabled</td>
</tr>
<tr>
<td></td>
<td>■ <strong>blank</strong>—delete access disabled</td>
</tr>
<tr>
<td>Field</td>
<td>Description</td>
</tr>
<tr>
<td>-------</td>
<td>-------------</td>
</tr>
</tbody>
</table>
| UPDT  | the update access specified in the FCT  
|       | The following values are valid:  
|       |  - Y—update access enabled  
|       |  - blank—update access disabled  |
| BRWS  | the browse access specified in the FCT  
|       | The following values are valid:  
|       |  - Y—browse access enabled  
|       |  - blank—browse access disabled  |
| RECV  | the recovery status specified in the FCT  
|       | The following values are valid:  
|       |  - Y—Backoutonly or All specified  
|       |  - blank—None specified  |
| OPEN  | the open status of the file  
|       | The following values are valid:  
|       |  - Y—file open in the region  
|       |  - blank—file closed in the region  |
| ENAB  | the enable status of the file  
|       | The following values are valid:  
|       |  - Y—file is enabled  
|       |  - blank—file is not enabled  |
Work with the remote VSAM access file table
Converting to AR/CTL products

This appendix describes how to convert to APPLICATION RESTART CONTROL (AR/CTL) products if you have a previous AR/CTL product version or a BMC product that is replaced by an AR/CTL product. This appendix presents the following topics:

Overview ................................................................. 101
Converting from QUICKSTART for z/OS to AR/CTL ................. 102

Overview

The AR/CTL family of products includes the following products:

- AR/CTL for IMS
- AR/CTL for DB2
- AR/CTL for VSAM
- BATCH CONTROL FACILITY (BCF) component

These products use the BMC Primary Subsystem (BMCP) and BMC Consolidated Subsystem (BCSS).
Converting from QUICKSTART for z/OS to AR/CTL

To convert from QUICKSTART to AR/CTL, perform the following steps:

1. Install AR/CTL as described in the Installation System User Guide and configure AR/CTL as described in Chapter 3, “Configuring the products.”

2. Quiesce application activity and resolve all active job step conditions by allowing active job steps to complete normally or by completing the restart.

3. Implement AR/CTL as described in the APPLICATION RESTART CONTROL User Guide. You will use the QUICKSTART-to-AR/CTL bridge that is provided by AR/CTL to obtain checkpoint/restart services and application sequential access method (ASAM) data services.

4. Change the JCL to execute the application program as follows:
   - A. Change the EXEC statement to execute the application program directly, rather than executing another program (such as QSSTART or IKJEFT01) that connects to DB2 on behalf of the application program.
   - B. You can remove the QUICKSTART load library, the QSCTRL1 control statement, and any other QUICKSTART statements; they will be ignored.
   - C. You can add optional AR/CTL DD statements.

   For more information, see the APPLICATION RESTART CONTROL User Guide.

5. If the QUICKSTART application program can issue rollback checkpoints, take action to handle the rollback checkpoints.

   When AR/CTL detects that the program has issued rollback checkpoints, AR/CTL abnormally terminates the program with the following messages and abend code:

   ```
   BMC150225E ROLLBACK FUNCTION CURRENTLY NOT SUPPORTED BY AR/CTL
   BMC152339D Termination request for job(jobname) step(stepname).
   BMC744041 PROCESS ENDED, PROGRAM=program name RC=00150225 ABEND=U1786
   ```
If the application program normally handles rollback checkpoints by branching back to the start of the program and issuing an S-type checkpoint request, AR/CTL can provide the same results through application reattach options.

To implement reattach processing, add a reattach class record by specifying the U1786 abend code along with the 00150225 reason code. For more information, see the APPLICATION RESTART CONTROL Reference Manual.

If QUICKSTART formerly provided checkpoint pacing for the application program, you can add an AR/CTL checkpoint pacing class for the QUICKSTART application programs.
Glossary

A

AESIS
The AR/CTL Install System (AESIS) is an interactive application that you use after using the Installation System. The AESIS creates customized batch jobs that continue installing and configuring the AR/CTL products. Until you submit those jobs, no action is taken to update any element on your system.

alias
A relative value that you can define to reference your runtime data sets. Aliases facilitate product deployment to other systems. You can use an alias to enable one JCL procedure for use throughout the sysplex.

AR/CTL products
This term refers collectively to the following products or product components and their common panels and programs:

- AR/CTL for IMS
- AR/CTL for DB2
- AR/CTL for VSAM
- BCF component of AR/CTL

C

catalog indirection
An optional method that allows BMC Administrative Products for DB2 to access the DB2 catalog indirectly when making information queries. Catalog indirection uses synonyms that point either to a copy of the DB2 catalog or to user-created views of the catalog. Benefits include reducing catalog contention and providing an additional level of security for sensitive catalog data.

checkpoint/restart
Unless stated otherwise, checkpoint refers to application checkpoints rather than system checkpoints. Restart refers to application restarts rather than system restarts.

cloning
A simplified process for installing a product on multiple DB2 subsystems during a single installation session. After generating jobs for the first subsystem, the Installation System generates jobs for installing the product on subsequent DB2 subsystems. The difference is that
the subsequent jobs do not access the distribution media again. You can clone products from the
system of origin in a shared DASD environment, or from target destination systems (TDSs) after
the Installation System transports the necessary data sets to the TDSs.

customization
  The process by which you tailor products to execute from runtime data sets or SMP/E target-
zone data sets. This process follows product installation.

H
high-level qualifier (HLQ)
  A prefix that consists of the first 17 to 30 characters of a data set name. The prefix can include a
single node or multiple nodes.

I
initial runtime instance
  The first runtime instance that you create during customization. This instance serves as a model
for other instances.

installation
  The process of extracting content from the media and placing it on a system.

L
low-level qualifier (LLQ)
  A suffix (up to 8 characters) for a data set name. The default LLQs for the RTE data sets start
with BMC, followed by up to 5 characters. This syntax makes the LLQ unique while identifying
the contents of the data sets. For example, the LLQ of the messages data set is BMCMLIB.

M
merged installation
  An installation that places product libraries into consolidated SMP/E target data sets. The
SMP/E target data set LLQs use prefixes with BB, DB, IM, or XX (for example, for BBLINK,
DBLINK, IMLINK, or XXLINK).

N
non-merged installation
  An installation that places product libraries into granular SMP/E target data sets. The SMP/E
target data set LLQs are prefixed with three-character product codes followed by the type of
data set (for example, ACPLINK, ASUDBRM, DBUSAMP, or XBMPLIB).

non-shared DASD
  The condition that exists when the system of origin does not share common data sets with the
TDS.
runtime data sets
For BMC products, SMP/E target-zone data sets and user data sets that are merged into a single set of runtime data sets that are not SMP/E managed. You can use runtime data sets if you want an execution environment that is not SMP/E managed, or if you want to deploy products to other systems.

runtime enablement (RTE)
A process that creates runtime data sets that you customize and deploy to other systems. By using RTE, you build an execution environment for products that is self-contained and does not need the SMP/E target-zone data sets to run.

sample and install libraries
BMC distributes the HLQ.ARCSAMP and HLQ.ARCCUST libraries with AR/CTL. HLQ is a high-level qualifier that should be easily identified by all installation users at your site. Because whoever installs AR/CTL products at your site might change these library names, this book refers to these libraries generically as sample libraries and install libraries.

shared DASD
The condition that exists when the system of origin shares common data sets with the TDS.

system of origin
The system on which a product or solution is initially installed and on which you create the initial runtime instance.

target destination system (TDS)
The system to which a product is deployed and on which the product will be executed.

TDS instance
A copy of the initial runtime instance that you can customize for a particular system.

transport
The process of packaging the runtime data sets and the installation data sets (if DASD is not shared) on the system of origin, and using file transport protocol (FTP) to transport the package to the TDSs.
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