SYBASE®

Programmer's Guide

Monitor Client Library

12.5

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Contents

About This Book

Sybase® Adaptive Server™ Enterprise Monitor™ Client Library Programmer's Guide describes how to write Sybase Adaptive Server Enterprise Monitor Client Library (Monitor Client Library) applications that access Sybase Adaptive Server Enterprise performance data.

Audience

This guide is for programmers who use Adaptive Server Enterprise Monitor Server or Adaptive Server Enterprise Monitor Historical Server.

How to use this book

When writing a Monitor Client Library application, use this book as a source of general information on how to construct Monitor Client Library programs.

- Chapter 1, "Getting started with Monitor Client Library" explains how to structure a basic Monitor Client Library program and includes a simple, complete Monitor Client Library application.
- Chapter 2, "Data Items and Statistical Types" describes data items, statistical types, and valid data item combinations of data items used in Monitor Client Library applications to gather performance data.
- Chapter 3, "Monitor Client Library Functions" describes each function including syntax, parameter values, examples, permissions, and related functions.
- Chapter 4, "Building a Monitor Client Library Application" describes how to compile and link a Monitor Client Library program.
- Chapter 5, "Monitor Client Library Configuration Instructions" explains how to configure Monitor Client Library on UNIX or Windows NT.
- Appendix A, "Examples of Views" provides examples of valid views.
- Appendix B, "Datatypes and Structures" summarizes datatypes used by Monitor Client Library and describes the datatypes that have no equivalent in C or Open-Client Client Library.
- Appendix C, "Backward Compatibility" lists obsolete functions and their replacement functions.

- Appendix D, "Troubleshooting Information and Error Messages" explains how to respond to problems that you might have with Monitor Client Library and lists error messages that may be reported.

Related documents

The following documents comprise the Sybase Adaptive Server Enterprise documentation:

- The release bulletin for your platform – contains last-minute information that was too late to be included in the books.

  A more recent version of the release bulletin may be available on the World Wide Web. To check for critical product or document information that was added after the release of the product CD, use the Sybase Technical Library.

- The *Installation Guide* for your platform – describes installation, upgrade, and configuration procedures for all Adaptive Server and related Sybase products.
- *Configuring Adaptive Server Enterprise* for your platform – provides instructions for performing specific configuration tasks for Adaptive Server.
- *What's New in Adaptive Server Enterprise?* – describes the new features in Adaptive Server version 12.5, the system changes added to support those features, and the changes that may affect your existing applications.
- *Transact-SQL User's Guide* – documents Transact-SQL, Sybase's enhanced version of the relational database language. This manual serves as a textbook for beginning users of the database management system. This manual also contains descriptions of the pubs2 and pubs3 sample databases.
- *System Administration Guide* – provides in-depth information about administering servers and databases. This manual includes instructions and guidelines for managing physical resources, security, user and system databases, and specifying character conversion, international language, and sort order settings.
- *Reference Manual* – contains detailed information about all Transact-SQL commands, functions, procedures, and datatypes. This manual also contains a list of the Transact-SQL reserved words and definitions of system tables.

- *Performance and Tuning Guide* – explains how to tune Adaptive Server for maximum performance. This manual includes information about database design issues that affect performance, query optimization, how to tune Adaptive Server for very large databases, disk and cache issues, and the effects of locking and cursors on performance.
- The *Utility Guide* – documents the Adaptive Server utility programs, such as isql and bcp, which are executed at the operating system level.
- The *Quick Reference Guide* – provides a comprehensive listing of the names and syntax for commands, functions, system procedures, extended system procedures, datatypes, and utilities in a pocket-sized book. Available only in print version.
- The *System Tables Diagram* – illustrates system tables and their entity relationships in a poster format. Available only in print version.
- *Error Messages and Troubleshooting Guide* – explains how to resolve frequently occurring error messages and describes solutions to system problems frequently encountered by users.
- *Component Integration Services User's Guide* – explains how to use the Adaptive Server Component Integration Services feature to connect remote Sybase and non-Sybase databases.
- *Java in Adaptive Server Enterprise* – describes how to install and use Java classes as datatypes, functions, and stored procedures in the Adaptive Server database.
- *Using Sybase Failover in a High Availability System* – provides instructions for using Sybase's Failover to configure an Adaptive Server as a companion server in a high availability system.
- *Using Adaptive Server Distributed Transaction Management Features* – explains how to configure, use, and troubleshoot Adaptive Server DTM features in distributed transaction processing environments.
- *EJB Server User's Guide* – explains how to use EJB Server to deploy and execute Enterprise JavaBeans in Adaptive Server.
- *XA Interface Integration Guide for CICS, Encina, and TUXEDO* – provides instructions for using Sybase's DTM XA interface with X/Open XA transaction managers.
- *Glossary* – defines technical terms used in the Adaptive Server documentation.

- *Sybase jConnect for JDBC Programmer's Reference* – describes the jConnect for JDBC product and explains how to use it to access data stored in relational database management systems.
- *Full-Text Search Specialty Data Store User's Guide* – describes how to use the Full-Text Search feature with Verity to search Adaptive Server Enterprise data.
- *Historical Server User's Guide* –describes how to use Historical Server to obtain performance information for SQL Server and Adaptive Server.
- *Monitor Server User's Guide* – describes how to use Monitor Server to obtain performance statistics from SQL Server and Adaptive Server.
- *Monitor Client Library Programmer's Guide* – describes how to write Monitor Client Library applications that access Adaptive Server performance data.

Other sources of information

Use the following books for more information about Adaptive Server Enterprise configuration and tuning:

- *Managing and Monitoring Sybase Adaptive Server Enterprise* describes how to manage Adaptive Server Enterprise and monitor its activities using Sybase Central™.
- *Adaptive Server Enterprise Performance and Tuning Guide* describes how to analyze Adaptive Server Enterprise performance and tune it to improve performance.
- *Adaptive Server Enterprise Reference Manual* describes SQL commands, functions, and stored procedures used with Sybase Adaptive Server Enterprise.
- *Adaptive Server Enterprise System Administration Guide* contains information about administering Adaptive Server Enterprise.

Use the Sybase Technical Library CD and the Technical Library Product Manuals Web site to learn more about your product:

- Technical Library CD contains product manuals and is included with your software. The DynaText browser (downloadable from Product Manuals at http://www.sybase.com/detail/1,3693,1010661,00.html) allows you to access technical information about your product in an easy-to-use format.

  Refer to the *Technical Library Installation Guide* in your documentation package for instructions on installing and starting the Technical Library.

- Technical Library Product Manuals Web site is an HTML version of the Technical Library CD that you can access using a standard Web browser. In addition to product manuals, you will find links to the Technical Documents Web site (formerly known as Tech Info Library), the Solved Cases page, and Sybase/Powersoft newsgroups.

  To access the Technical Library Product Manuals Web site, go to Product Manuals at http://www.sybase.com/support/manuals/.

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4. Select the Certification Report filter, specify a time frame, and click Go.
5. Click a Certification Report title to display the report.

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2. Select EBFs/Updates. Enter user name and password information, if prompted (for existing Web accounts) or create a new account (a free service).
3. Specify a time frame and click Go.
4. Select a product.
5. Click an EBF/Update title to display the report.

❖ **To create a personalized view of the Sybase Web site (including support pages)**

Set up a MySybase profile. MySybase is a free service that allows you to create a personalized view of Sybase Web pages.

1. Point your Web browser to Technical Documents at http://www.sybase.com/support/techdocs/
2. Click MySybase and create a MySybase profile.

Text conventions

Italics indicates emphasis or indicates that a definition accompanies the highlighted term.

Variable names, document titles, file names, directory names, and Adaptive Server Enterprise table names are in italic typeface:

-U*myname*
Adaptive Server Enterprise Monitor Server User's Guide
SQLMon.mrg file
$SYBASE directory
systables

Command syntax

Command syntax statements use the following notational conventions:

Table 1: Command syntax conventions

Example	Description
monserver	Command keywords appear in lowercase.
option	Variables (words that stand for values that you supply in the command) appear in italic.
[*option*]	Brackets mean that including the enclosed items in the command is *optional*. Do not include the brackets in your command.
option...	Ellipses indicate that you may repeat the preceding item as many times as you like in the command. Do not include ellipses in your command.

If you need help

Each Sybase installation that has purchased a support contract has one or more designated people who are authorized to contact Sybase Technical Support. If you cannot resolve a problem using the manuals or online help, please have the designated person contact Sybase Technical Support or the Sybase subsidiary in your area.

CHAPTER 1 Getting started with Monitor Client Library

This chapter describes the following topics:

Overview

Monitor Client Library is part of Adaptive Server Enterprise Monitor™. It is an application programming interface (API) that enables you to write client applications that connect to Adaptive Server, Adaptive Server Enterprise Monitor Server (Monitor Server), and Adaptive Server Enterprise Historical Server (Historical Server) to gather performance data. This chapter describes Adaptive Server Enterprise Monitor, explains the components of a Monitor Client Library application, and lists a sample Monitor Client Library application.

What is Adaptive Server Enterprise Monitor

Adaptive Server Enterprise Monitor provides a way to monitor Adaptive Server performance in real time or in a historical data-gathering mode. System administrators can use this information to identify potential resource bottlenecks, to research current problems, and to tune for better performance. Adaptive Server Enterprise Monitor provides feedback for tuning at several levels:

- Adaptive Server configuration

- Table and index design
- SQL statements in applications and stored procedures

Adaptive Server Enterprise Monitor components

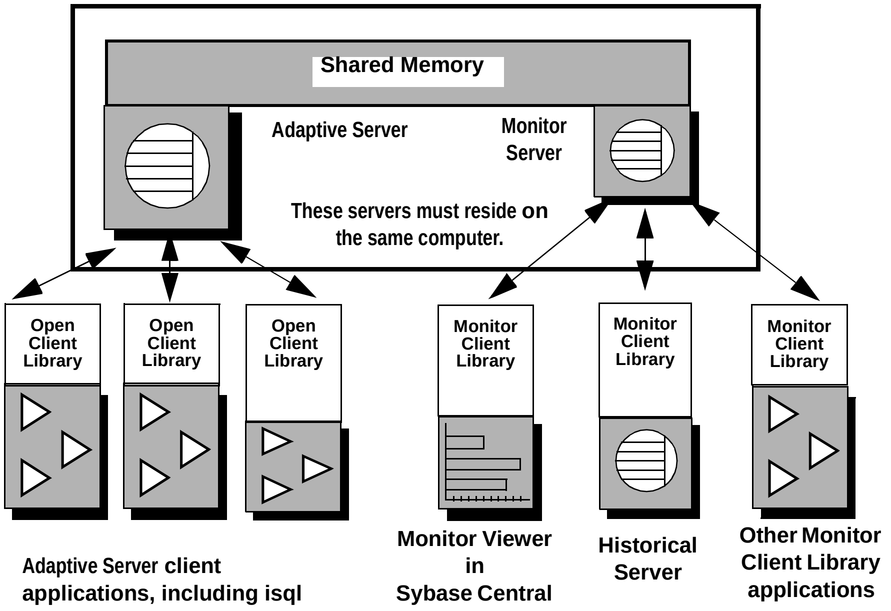
Adaptive Server Enterprise Monitor consists of four components that gather or display Adaptive Server performance data:

- Monitor Server – a server that collects Adaptive Server performance data in real time and makes the data available to the other Adaptive Server Enterprise Monitor components. Monitor Server is a Sybase Open Server™ application.
- Historical Server – a server that obtains Adaptive Server performance data from Monitor Server and saves the data in files for deferred analysis. Historical Server is a Sybase Open Server application.
- Monitors in the Adaptive Server plug-in for Sybase Central (Monitor Viewer) – the monitors provide a graphical user interface to Monitor Server. They obtain Adaptive Server performance data from Monitor Server and display the data in real time in tables and graphs.
- Monitor Client Library – an application programming interface to Monitor Server available to users for developing monitoring applications. Monitor Viewer and Historical Server are Monitor Client Library applications.

Adaptive Server Enterprise Monitor architecture

Figure 1-1shows the relationships between Adaptive Server and the various components of Adaptive Server Enterprise Monitor.

Figure 1-1: Adaptive Server Enterprise Monitor architecture



Adaptive Server saves performance data in a shared *memory area* that Monitor Server reads. Because of this shared memory technique, Monitor Server must be installed and running on the same machine as the Adaptive Server installation being monitored. A one-to-one relationship exists between Adaptive Server and Monitor Server. For more information about Monitor Server, see the *Sybase Adaptive Server Enterprise Monitor Server User's Guide*.

Monitor Client Library applications obtain Adaptive Server performance statistics from Monitor Server. These applications are clients of Monitor Server. For performance reasons, Sybase recommends running Monitor Client Library applications on machines other than the ones where Adaptive Server/Monitor Server pairs are running.

Monitor Viewer in Sybase Central includes a set of monitors showing different aspects of Adaptive Server resource usage at various levels of detail. Each open monitor is a separate application, with a unique client connection to Monitor Server. In Sybase Central, each Adaptive Server installation has its own Monitors folder containing the set of monitor objects.

Historical Server collects performance information from Monitor Server and saves the information in files for deferred analysis. Historical Server interfaces let users specify the data to collect and the time period desired. They also include a historical data playback feature. The interfaces are:

- A command interface in isql. For more information, see the *Sybase Adaptive Server Enterprise Monitor Historical Server User's Guide*.
- A programming interface using Monitor Client Library. For more information, see Chapter 3, "Monitor Client Library Functions" and the *Sybase Adaptive Server Enterprise Monitor Historical Server User's Guide*.

Writing a Basic Monitor Client Library program

A basic Monitor Client Library application:

1. Defines error handling.
2. Connects to a server using the following steps:
   - Allocates a connection.
   - Sets properties on a connection.
   - Connects to a server.
3. Creates one or more views that define the performance data to be monitored.
4. Optionally, targets specific performance data values with filters.
5. Optionally, sets alarms on performance data values.
6. Requests performance data values.
7. Processes the results.
8. Closes the connection to the server.
9. Deallocates the connection or reuse it by reconnecting.

Note You must have the System Administrator role on Adaptive Server or execute permission on the stored procedure mon_rpc_connect to perform monitoring.

Application logic flow

Most Monitor Client Library applications exhibit a logic flow similar to the following:

```
allocate a connection
set properties on the connection
connect
loop to create views on the connection
loop to create filters (optional)
loop to create alarms (optional)
loop to refresh connection
    for each view
        get the row count
        for each row
            for each column
                get the data
                display the data
loop to drop alarms (optional)
loop to drop filters (optional)
loop to drop views (optional)
close monitor connection
deallocate or reuse connection
```

where:

- An application can have any number of connections.
- A connection can have one or more views.
- A view must have one or more data items.
- A view can have one filter per data item.
- A view can have any number of alarms and can have multiple alarms per data item in the view.

The following sections describe the steps for a basic Monitor Client Library program.The steps are cross referenced to the sample program that follows them.

Step 1: define error handling

An application uses one or more callback routines to handle Monitor Client Library and Server error and informational messages.

See the code sample on page 34.

Step 2: connect to a server

The Monitor Client Library functions require establishing an Adaptive Server Enterprise Monitor connection. The Adaptive Server Enterprise Monitor connection uses one or more Open Client connections depending upon the connection type.

The two types of Monitor connections are *Live* mode and *Historical* mode:

- Live mode connects to Monitor Server and Adaptive Server. It provides access to performance data.
- Historical mode connects to Historical Server and either records performance data for later access or plays back recorded data.

Connecting to a server is a three-step process. An application:

- Allocates a connection structure
- Sets properties for the connection, if necessary
- Logs in to a server

Allocating a connection structure

An application calls smc_connect_alloc to allocate a connection structure.

See the code sample on page 16.

Setting connection structure properties

An application calls smc_connect_props to set, retrieve, or clear connection structure properties.

Connection properties define various aspects of a connection’s behavior. For example:

- SMC_PROP_USERNAME defines the *username* that a connection will use when logging into a server.
- SMC_PROP_PASSWORD specifies the *password* for the *username*.
- SMC_PROP_SERVERNAME defines the server for this connection.
- SMC_PROP_IFILE defines the *interfaces* file name for this connection. If you do not specify this property on a UNIX system, the default *interfaces* file in the *SYBASE* environment variable directory is used. On Windows NT, the default *interfaces* file is *sql.ini*.

- SMC_PROP_SERVERMODE defines the type of connection: live or historical.

Required connection properties

At a minimum, an application must set the connection properties that specify the connection's *username* (SMC_PROP_USERNAME) and allow the server to authenticate the user's identity by requiring a valid password. If the server requires a password, then the application must set the SMC_PROP_PASSWORD property to the value of the user's server password.

See the code sample on page 17.

Connecting to a server

An application calls smc_connect_ex to connect to a server. When establishing a connection, smc_connect_ex sets up communication with the network, logs in to the server, and communicates any connection-specific property information to the server. A connection to Adaptive Server writes dbcc traceon messages to the Adaptive Server error log. You can ignore these messages.

For example, if the server supports network-based user authentication and the client application requests it, then Client Library and the server query the network's security system to see if the user (whose name is specified by SMC_PROP_USERNAME) is logged in to the network.

See the code sample on page 22.

Step 3: create a view

Views are defined groups of data items. The data items specified determine how the data is summarized. Since you can specify multiple views, the application has full flexibility in the gathering of data. For example, a view consisting of two data items (device name, value for sample and device I/O, rate for sample) returns the device I/O rate for each database device.

For details on valid combinations of data items and information about how data items are summarized, see Chapter 2, "Data Items and Statistical Types"

For examples of views, see Appendix A, "Examples of Views".

Data items

A data item is a particular piece of data that can be obtained from the Monitor Client Library, for example, page I/O, login name, device reads, and so on. For each data item in a view, you must specify a statistical type.

Statistical types

The *statistic type* defines the duration of the data item (sample or session) and whether the server performs calculations on the data item.

The six statistic types are:

- SMC_STAT_VALUE_SAMPLE – this statistic type returns a count of activity or some type of information that applies to the most recent sample interval. No calculations are performed.
  - Activity counts – for data items that represent activity counts, SMC_STAT_VALUE_SAMPLE returns the number of occurrences of an activity during the most recent sample interval. For example, SMC_STAT_VALUE_SAMPLE for SMC_NAME_PAGE_IO is the number of page I/Os that occurred during the most recent sample interval.
  - Other information – this is the only statistic type valid for data items that represent character strings. For example, SMC_STAT_VALUE_SAMPLE for SMC_NAME_OBJECT_NAME returns the name of a database object. This statistic type is also the only one valid for data items that represent values such as IDs and values for configured parameters, on which calculations are never performed.
- SMC_STAT_VALUE_SESSION – this statistic type returns a cumulative count of activity since the start of gathering the data (since the connection was opened). No calculations are performed. For example, SMC_STAT_VALUE_SESSION for SMC_NAME_PAGE_IO is the number of page I/Os that occurred since the session started.
- SMC_STAT_RATE_SAMPLE – this statistic type calculates a rate per second. It returns the average number of occurrences per second of an activity during the most recent sample interval. For example, SMC_STAT_RATE_SAMPLE for SMC_NAME_PAGE_IO is the average number of page I/Os that occurred each second during the most recent sample interval.

The calculation is *count for the most recent sample interval* divided by *number of seconds in the sample interval*.

- SMC_STAT_RATE_SESSION – this statistic type calculates a rate per second. It returns the average number of occurrences per second of an activity during the current session. For example, SMC_STAT_RATE_SESSION for SMC_NAME_PAGE_IO is the average number of page I/Os that occurred per second since the session started.

  The calculation is *count for the session* divided by *number of seconds in the session*.

- SMC_STAT_AVG_SAMPLE – this statistic type calculates an average value per occurrence of an activity over the most recent sample interval. Only a few data items can use this statistic type. The meaning of the returned value depends on the data item name. For example, SMC_STAT_AVG_SAMPLE for SMC_NAME_STP_ELAPSED_TIME is the average execution time per execution of a stored procedure during the most recent sample interval.
- SMC_STAT_AVG_SESSION – this statistic type calculates an average value per occurrence of an activity over the session. Only a few data items can use this statistic type. The meaning of the returned value depends on the data item name. For example, SMC_STAT_AVG_SESSION for SMC_NAME_STP_ELAPSED_TIME is the average execution time per execution of a stored procedure during the recording session.

Note Not all statistical types are valid for all data items. See Chapter 2, “Data Items and Statistical Types” for more information about data items and the rules for using them.

Creating views for a connection

smc_create_view creates a view on a particular Monitor connection. A connection must have at least one view.

For details on valid combinations of data items and information about how data items are summarized, see Chapter 2, “Data Items and Statistical Types”.

You can think of a view as a table. The data items in a view are represented by the columns in that table. The number of rows returned for a particular view depend upon the particular data items in the view. For example, a view with server-wide data returns a single row, whereas a view with per-device data returns one row for each device.

For example:

A view consisting of two data items:

```
SMC_NAME_LOCK_TYPE, SMC_STAT_VALUE_SAMPLE
SMC_NAME_LOCK_COUNT, SMC_STAT_RATE_SAMPLE
```

returns the rate of requested locks for each lock type during the sample interval.

A view consisting of one data item:

```
SMC_NAME_LOCK_COUNT, SMC_STAT_RATE_SAMPLE
```

returns the rate of requested locks summarized for all lock types during the sample interval.

For complete details on valid combinations of data items and understanding of how data items are summarized, refer to Chapter 2, "Data Items and Statistical Types"

See the code sample on page 22.

Step 4: create filters

smc_create_filter creates a filter on a data item. Filters limit the number of rows of performance data returned by a view. A filter can be applied to any data item specified in a view. A view can contain one filter per data item. If you include more than one filter in a view, Monitor Client Library uses ANDs to include those filters.

The types of filters available are:

- Equal to
  - returns only values equal to one of the specified values (logical OR of each Equal comparison)
- Not Equal to
  - returns only values equal to none of the specified value (logical AND of each Not-Equal comparison)
- Greater than or equal to

    - returns values greater than or equal to the specified value
- Less than or equal to
    - returns values less than or equal to the specified value
- Range: bottom is less than or equal to value which is less than or equal to top
    - returns values between the top and bottom values, inclusive
- Top N
    - returns the N highest values

A view may contain more than one filter, but any particular data item may only have one filter bound to it. When a view contains more than one filter, the filters are combined with an AND.

You can add or drop filters at any time. The change in filtering takes effect as of the next refresh.

See the code sample on page 24.

Step 5: set alarms

smc_create_alarm_ex sets an alarm on any numeric data item (except for IDs) in a view. When specifying an alarm for a particular data item in a live connection, an application supplies a callback function that is invoked when the alarm is triggered.

The Historical Server cannot call a callback function, but it can write to a log file or execute a procedure each time an alarm is triggered.

An example of the type of actions an application can execute upon the triggering of an alarm is to log a message, which is one of the features provided by Historical Server.

You can add or drop an alarm at any time. The change in alarm specification takes effect as of the next refresh.

Note Monitor Client Library applies alarms after it applies filters.

See the code sample on page 25.

Step 6: request performance data and process results

After all of the connections, views, alarms, and filters are created, an application requests values for performance data. Retrieving performance data is a three-step process:

- Refresh the data.
- Check the row count.
- Look at each data item in the view.

When a Monitor Client Library application needs to retrieve data, it initiates a refresh. The refresh causes Monitor Client Library to obtain fresh data. After each refresh, the application retrieves the data in each view on an item-by-item basis (that is, for each column of a table).

After calling smc_refresh_ex on a given connection, the application retrieves the data. The user retrieves data on an item-by-item basis.

Depending on the number of events being collected, frequent refreshes might be necessary. A view that contains many keys needs more frequent refreshes than views with one or a few keys. The following symptoms might indicate an application that is not refreshing frequently enough:

- Very large numbers of lost events reported in the Monitor Server error log. The *Sybase Adaptive Server Enterprise Monitor Server User's Guide* discusses configuration changes that can also help to reduce event loss.
- The application appears to hang in a call to smc_refresh_ex. A large number of keys in a view can cause a condition in which Monitor Server can not keep up with the number of events being collected and does not return control. Because of this, Monitor Server begins to consume large amounts of CPU time.

smc_get_row_count determines how many rows of results are available for a view. A view returns results in what is essentially a table with potentially many "rows" of result data, but in some cases, possibly zero rows.

smc_get_dataitem_value retrieves performance data values for a single column of a single row of a view.

Filters and alarms are applied during the refresh of the data.

Polling for new performance data is client-driven and is limited only by the speed of the data-providing system and the data-gathering system.

See the code sample on page 26.

Step 7: close and deallocate connections

Before exiting, a Monitor Client Library application must:

- Close all open connections.
- Deallocate each connection.

Closing and deallocating connections

An application calls smc_close to close a connection and smc_connect_drop to deallocate a connection structure. It is an error to deallocate a connection that has not been closed. A call to smc_close results in the following implicit Monitor Client Library calls:

- One or more calls to smc_drop_alarm to remove alarms, if necessary.
- One or more calls to smc_drop_filter to remove filters, if necessary.
- One or more calls to smc_drop_view to remove views.

See the code sample on page 33.

Reopening connections

After an application closes a connection, but before it deallocates the connection structure, it can call smc_connect_ex to reopen the connection.

Playing back recorded data

To retrieve recorded data from Historical Server, the steps are similar to the above, except:

- The application must connect to Historical Server. Set smc_prop_servermode to SMC_SERVER_M_HISTORICAL before making the connection.
- The application must call smc_create_playback_session after connecting, but before creating views.
- The application must call smc_initiate_playback after creating all views.
- Alarms are not allowed on playback of recorded historical data.
- Views and filters cannot be dropped.
- After the last refresh, the application must call smc_terminate_playback.

A sample Monitor Client Library program

This section contains a listing for a sample Monitor Client Library program that connects to a server, sends a query, processes the results, then exits.

Example program

The following example program, *monitor.c*, demonstrates the steps outlined in the previous section. Commentary for each step follows the example.

```
/*monitor.c
 ** Example program showing logic flow of Monitor Client Library
 ** application. This example assumes the use of an ANSI C
 ** compliant compiler. This program creates two connections
 ** to the Monitor Server. Data is extracted from one connection
 ** at the beginning and end of the monitoring session.
 ** Data is extracted from the other connection every
 ** SAMPLE_INTERVAL seconds NUM_OF_SAMPLES times.
 */
#include <stdio.h>
 #include <stdlib.h>
 #include <ctype.h>
/* The mcpublic.h header file contains function prototypes, etc.
 ** for monitor client library functions. It also includes a
 ** header file called mctypes.h, which defines the datatypes
 ** used for monitor client library applications.
 */
#include "mcpublic.h"
#define NUM_OF_SAMPLES 10
 #define SAMPLE_INTERVAL 5
 #define NUM_SERVER_DATA_ITEMS 3
 #define NUM_DB_INFO_ITEMS 14
 #define NUM_NW_INFO_ITEMS 6
 #define OPTIONAL_CALLS -1

/*Error signals*/
 #define VIEW_NONEXISTENT -1
 #define CONNECT_NONEXISTENT -1

SMC_RETURN_CODE main (SMC_INT argc, SMC_CHARP argv[])
 {
  SMC_VALUE_UNION serverNameUnion;
   SMC_VALUE_UNION userNameUnion;
   SMC_VALUE_UNION passwordUnion;
   SMC_VALUE_UNION interfacesFileUnion;
   SMC_VALUE_UNION workUnion;
   SMC_VALUE_UNION returnedDataUnion;
   SMC_CONNECT_ID connect1_id;
   SMC_CONNECT_ID connect2_id;
   SMC_VIEW_ID server_view_id;
   SMC_VIEW_ID db_info_view_id;
   SMC_VIEW_ID nw_info_view_id;

  SMC_RETURN_CODE ret;
   SMC_DATAITEM_TYPE dataitem_type;  /*Holds data item type
                                     returned by get_dataitem_type
                                function call*/
/*Needed if alarms and filters are used */
 #ifdef OPTIONAL_CALLS
   SMC_ALARM_ID   alarm_id;
   SMC_FILTER_ID  filter_id;
   SMC_CHARP      filter_strings[2]; /*datatype is pointer to
                                     string. This is an array
                                     of pointers.*/
 #endif
   SMC_SIZET  row,num_of_rows,item;  /*This is an integer data
                                     type*/
   SMC_SIZET  outputLength;          /*Length of output returned
                                     by smc_connect_props
                                function call*/
/*
 ** Definition of SMC_DATAITEM_STRUCT datatype
 */
   SMC_DATAITEM_STRUCT  server_info_view[NUM_SERVER_DATA_ITEMS];
   SMC_DATAITEM_STRUCT  db_info_view[NUM_DB_INFO_ITEMS];
   SMC_DATAITEM_STRUCT  nw_bytes_view[NUM_NW_INFO_ITEMS];

   SMC_VALUE_UNION   server_data[NUM_SERVER_DATA_ITEMS];
   SMC_VALUE_UNION   db_data[NUM_DB_INFO_ITEMS];
   SMC_VALUE_UNION   nw_data[NUM_NW_INFO_ITEMS];

/*Callback function prototypes. Actual functions are defined
 ** below.
 */
  SMC_VOID errorCallback(SMC_CONNECT_ID,SMC_COMMAND_ID,SMC_VOIDP);
  SMC_VOID alarmCallback(SMC_CONNECT_ID,SMC_COMMAND_ID,SMC_VOIDP);

  SMC_BOOL explicitInterfacesFile = FALSE;

  int index,iterations;
```

```
/*
 ** These are labels used when printing out data returned by the
 ** database info view.
 */
   SMC_CHARP db_info_labels[NUM_DB_INFO_ITEMS] = {
     "Database ID:  ",
     "Object ID:  ",
     "Database name:  ",
     "Object name:  ",
     "Page hit percent:  ",
     "Page I/O:  ",
     "Page logical reads this sample:  ",
     "Page logical reads this session:  ",
     "Page logical read rate this sample:  ",
     "Page logical read rate this session:  ",
     "Page physical reads this sample:  ",
     "Page physical reads this session:  ",
     "Page physical read rate this sample:  ",
     "Page physical read rate this session:  "
   };


/*
 ** These are labels used when printing out data returned by
 ** network info view.
 */
   SMC_CHARP nw_info_labels[NUM_NW_INFO_ITEMS] = {
     "Network bytes received this sample:  ",
     "Network bytes received this session:  ",
     "Network bytes sent this sample:  ",
     "Network bytes sent this session:  ",
     "Network byte I/O rate this sample:  ",
     "Network byte I/O rate this session:  "
   };
   if (argc <5){
     printf("Usage <%s> -U <user_name> [-P <password>]\
           -S <monserver name> [-I <interfaces_file>]\n",argv[0]);
     exit(1);
   }
/*

** Connect to a server.
*/
```

For commentary, see “Step 2: connect to a server” on page 6

```
/*
```

```
** Allocate first connection
*/
   ret=smc_connect_alloc(errorCallback,
                         &connect1_id   /*Pointer to connect_id!*/
                         );
   if (ret != SMC_RET_SUCCESS) {
     printf("Attempt to allocate first connection failed \
             with error %d.\n",ret);
     exit(1);
   }
/*
 ** Allocate second connection
 */
   ret=smc_connect_alloc(errorCallback,
                         &connect2_id   /*Pointer to connect_id!*/
                         );
   if (ret != SMC_RET_SUCCESS) {
     printf("Attempt to allocate second connection failed \
             with error %d.\n",ret);
     exit(1);
   }
/*

** Set mandatory and some optional connection properties.

** Mandatory connection properties are user name, server name,
 ** and password if user password is not NULL. If interfaces
 ** file name is not set, default is "interfaces" in directory
 ** pointed to by $SYBASE environment variable.
```

For commentary, see “Required connection properties” on page 7.

```
*/

  for (index=1;index<argc;index++) {
/*User name*/
    if (strncmp(argv[index],"-U",2) == 0) {
       userNameUnion.stringValue = argv[index+1];
       ret=smc_connect_props(connect1_id,
                             SMC_PROP_ACT_SET, /*Property action*/
                             SMC_PROP_USERNAME,/*Property*/
                             &userNameUnion, /*Note that union,
                                             not member of union,
                                             is used for
                                             property value*/
                             SMC_NULLTERM,   /*Indicates null-
                                             terminated string
                                             for buffer length*/
                             NULL            /*Use NULL when
                                             setting a property*/
                             );
    }                            /*End if argument is user name*/
   if (ret != SMC_RET_SUCCESS) {
     printf("Could not set user name.\n");
     exit(SMC_RET_FAILURE);
   }
 /*Password. Default password is a null string*/
    if (strncmp(argv[index],"-P",2) == 0) {
       passwordUnion.stringValue = argv[index+1];
       ret=smc_connect_props(connect1_id,
                             SMC_PROP_ACT_SET, /*Property action*/
                             SMC_PROP_PASSWORD,/*Property*/
                             &passwordUnion,  /*Note that union,
                                              not member of union,
                                              is used for
                                              property value*/
                             SMC_NULLTERM,    /*Indicates null-
                                              terminated string
                                              for buffer length*/
                             NULL             /*Use NULL when
                                              setting a property*/
                             );
    }                             /*End if argument is password*/
   if (ret != SMC_RET_SUCCESS) {
     printf("Could not set password.\n");
     exit(SMC_RET_FAILURE);
   }
/*Server name*/
     if (strncmp(argv[index],"-S",2) == 0) {
       serverNameUnion.stringValue = argv[index+1];
       ret=smc_connect_props(connect1_id,
                            SMC_PROP_ACT_SET,  /*Property action*/
                            SMC_PROP_SERVERNAME,/*Property*/
                            &serverNameUnion, /*Note that union,
                                              not member of union,
                                              is used for
                                              property value*/
                             SMC_NULLTERM,    /*Indicates null-
                                              terminated string
                                              for buffer length*/
                             NULL             /*Use NULL when
                                              setting a property*/
                             );
     }                        /*End if argument is server name*/
   if (ret != SMC_RET_SUCCESS) {
     printf("Could not set server name.\n");
     exit(SMC_RET_FAILURE);
   }
 /*Interfaces file. If unspecified, $SYBASE/interfaces is used*/
     if (strncmp(argv[index],"-I",2) == 0) {
       interfacesFileUnion.stringValue = argv[index+1];
       ret=smc_connect_props(connect1_id,
                            SMC_PROP_ACT_SET,  /*Property action*/
                            SMC_PROP_IFILE,    /*Property*/
                            &interfacesFileUnion, /*Note that
                                                 pointer to union,
                                                 not member of
                                                 union,is used for
                                                 property value*/
                             SMC_NULLTERM,     /*Indicates null-
                                               terminated string
                                               for buffer length*/
                             NULL              /*Use NULL when
                                              setting a property*/
                             );
       explicitInterfacesFile = TRUE;
     }            /*End if argument is interfaces file pathname*/
   if (ret != SMC_RET_SUCCESS) {
     printf("Could not set interfaces file name.\n");
     printf("Using default interfaces file.\n");
   }
   }             /*End for loop getting connection properties
              from command-line arguments*/
/*
 ** Optional smc_get_connect_props call that sets a pointer to be
 ** passed to error callback. In this case, the pointer is to a
 ** string that tells which connection encountered the error.
 */
   workUnion.voidpValue = "first connection"; /*Call to set user
                                              data handle looks
                                              for value to set in
                                              void pointer member
                                              of union.*/
   ret=smc_connect_props(connect1_id,SMC_PROP_ACT_SET,\
                SMC_PROP_USERDATA,&workUnion,SMC_NULLTERM,NULL);
   if (ret != SMC_RET_SUCCESS){
   printf("smc_connect_props call failed to \
           set userDataHandle.\n");
  }
/*
```

```
 ** Demonstration of "get" mode for smc_get_connect_props
 */
 /*Check if user name has been set*/
  ret=smc_connect_props(connect1_id,
                        SMC_PROP_ACT_GET,/*Property action is "get"*/
                        SMC_PROP_USERNAME,
                        &workUnion,
                        SMC_UNUSED,     /*Length parameter ignored
                                          on "get" operations*/
                        &outputLength   /*Note this is a pointer!*/
                            );
  if (ret != SMC_RET_SUCCESS) {
    printf ("Could not get user name. Execution continuing.\n");
  }
  else {
    if (outputLength == 0) {
      printf("User name not set.  Quitting execution.\n");
      exit(SMC_RET_FAILURE);
    }
   else {
/*
 ** Application is responsible for freeing
 ** memory allocated to string member of SMC_VALUE_UNION by
 ** library.
 */
    free(workUnion.stringValue);
   }
   }
 /*Check if server name has been set*/
  ret=smc_connect_props(connect1_id,
                        SMC_PROP_ACT_GET,/*Property action is "get"*/
                        SMC_PROP_SERVERNAME,
                        &workUnion,
                        SMC_UNUSED,      /*Length parameter ignored
                                         on "get" operations*/
                        &outputLength    /*Note this is a pointer!*/
                            );
   if (ret != SMC_RET_SUCCESS) {
    printf ("Could not get server name. Execution continuing.\n");
   }
   else {
     if (outputLength == 0) {
       printf("Server name not set. Quitting execution.\n");
      exit(SMC_RET_FAILURE);
     }
     else {
       free(workUnion.stringValue);
     }
   }
/*
 ** Allocate properties for second connection. No need to
 ** repeat error checking.
 */
  ret=smc_connect_props(connect2_id,SMC_PROP_ACT_SET, \
             SMC_PROP_USERNAME,&userNameUnion,SMC_NULLTERM, NULL);
   if (ret != SMC_RET_SUCCESS) {
     printf("Could not set user name for second connection.\n");
     exit(SMC_RET_FAILURE);
   }
   ret=smc_connect_props(connect2_id,SMC_PROP_ACT_SET, \
             SMC_PROP_PASSWORD,&passwordUnion,SMC_NULLTERM,NULL);
   if (ret != SMC_RET_SUCCESS) {
     printf("Could not set password for second connection.\n");
     exit(SMC_RET_FAILURE);
   }
   ret=smc_connect_props(connect2_id,SMC_PROP_ACT_SET, \
          SMC_PROP_SERVERNAME,&serverNameUnion,SMC_NULLTERM,NULL);
   if (ret != SMC_RET_SUCCESS) {
     printf("Could not set server name for second connection.\n");
     exit(SMC_RET_FAILURE);
   }
   if (explicitInterfacesFile) {
     ret=smc_connect_props(connect2_id,SMC_PROP_ACT_SET, \
           SMC_PROP_IFILE,&interfacesFileUnion,SMC_NULLTERM,NULL);
    if (ret != SMC_RET_SUCCESS) {
     printf("Could not set server name for second connection.\n");
     exit(SMC_RET_FAILURE);
     }
   }
/*
 ** Optional smc_connect_props call to set user-defined pointer to
 ** be passed to error callback. This pointer points to a
 ** string that tells where the error callback was triggered.
 */
 workUnion.voidpValue = "second connection"; /*Call to set user
                                             data handle looks for
                                             value to set in void
                                             pointer member
                                             of union.*/
 ret=smc_connect_props(connect2_id,SMC_PROP_ACT_SET, \
                  SMC_PROP_USERDATA,&workUnion,SMC_NULLTERM,NULL);
 if (ret != SMC_RET_SUCCESS){
```

```
 printf("smc_connect_props call failed to set userDataHandle.\n");
   }
/*
** Connect to monitor server
```

For commentary, see "Connecting to a server" on page 7

```
*/
 /*
 ** First connection
 */
   ret=smc_connect_ex(connect1_id);
   if (ret != SMC_RET_SUCCESS) {
    printf("First connection failed to connect to \
          monitor server.\n");
    exit(SMC_RET_FAILURE);
   }
/*
 ** Second connection
 */
   ret=smc_connect_ex(connect2_id);
   if (ret != SMC_RET_SUCCESS) {
     printf("Second connection failed to connect to \
          monitor server.\n");
     exit(SMC_RET_FAILURE);
   }
/*
 ** Create views on connections.
 */
```

For commentary, see "Step 3: create a view" on page 7

```
** Define views.
/*
** Each data item must be paired with a
 ** statistic type . View definitions are used in create_view
 ** calls after connecting to monitor server.
 */
 /*This is a server-wide view that returns one row of data*/
 server_info_view[0].dataItemName =SMC_NAME_SQL_SERVER_NAME;
  server_info_view[0].dataItemStatType = SMC_STAT_VALUE_SAMPLE;
  server_info_view[1].dataItemName = SMC_NAME_SQL_SERVER_VERSION;
  server_info_view[1].dataItemStatType = SMC_STAT_VALUE_SAMPLE;
  server_info_view[2].dataItemName = SMC_NAME_TIMESTAMP;
  server_info_view[2].dataItemStatType = SMC_STAT_VALUE_SAMPLE;
/*
```

```
 ** This is a view with key and result data items that returns
 ** multiple rows of data.
 */
db_info_view[0].dataItemName = SMC_NAME_DB_ID; /*Key data items*/
 db_info_view[0].dataItemStatType = SMC_STAT_VALUE_SAMPLE;
 db_info_view[1].dataItemName = SMC_NAME_OBJ_ID;
 db_info_view[1].dataItemStatType = SMC_STAT_VALUE_SAMPLE;
 db_info_view[2].dataItemName = SMC_NAME_DB_NAME;    /*Result data
                                                     items*/
 db_info_view[2].dataItemStatType = SMC_STAT_VALUE_SAMPLE;
 db_info_view[3].dataItemName = SMC_NAME_OBJ_NAME;
 db_info_view[3].dataItemStatType = SMC_STAT_VALUE_SAMPLE;
 db_info_view[4].dataItemName = SMC_NAME_PAGE_HIT_PCT;
 db_info_view[4].dataItemStatType = SMC_STAT_VALUE_SAMPLE;
 db_info_view[5].dataItemName =SMC_NAME_PAGE_IO;
 db_info_view[5].dataItemStatType = SMC_STAT_VALUE_SAMPLE;
 db_info_view[6].dataItemName = SMC_NAME_PAGE_LOGICAL_READ;
 db_info_view[6].dataItemStatType = SMC_STAT_VALUE_SAMPLE;
 db_info_view[7].dataItemName = SMC_NAME_PAGE_LOGICAL_READ;
 db_info_view[7].dataItemStatType = SMC_STAT_VALUE_SESSION;
 db_info_view[8].dataItemName = SMC_NAME_PAGE_LOGICAL_READ;
 db_info_view[8].dataItemStatType = SMC_STAT_RATE_SAMPLE;
 db_info_view[9].dataItemName = SMC_NAME_PAGE_LOGICAL_READ;
 db_info_view[9].dataItemStatType = SMC_STAT_RATE_SESSION;
 db_info_view[10].dataItemName = SMC_NAME_PAGE_PHYSICAL_READ;
 db_info_view[10].dataItemStatType = SMC_STAT_VALUE_SAMPLE;
 db_info_view[11].dataItemName = SMC_NAME_PAGE_PHYSICAL_READ;
 db_info_view[11].dataItemStatType = SMC_STAT_VALUE_SESSION;
 db_info_view[12].dataItemName = SMC_NAME_PAGE_PHYSICAL_READ;
 db_info_view[12].dataItemStatType = SMC_STAT_RATE_SAMPLE;
 db_info_view[13].dataItemName = SMC_NAME_PAGE_PHYSICAL_READ;
 db_info_view[13].dataItemStatType = SMC_STAT_RATE_SESSION;
/*
 ** Another server-wide view
 */
   nw_bytes_view[0].dataItemName = SMC_NAME_NET_BYTES_RCVD;
   nw_bytes_view[0].dataItemStatType = SMC_STAT_VALUE_SAMPLE;
   nw_bytes_view[1].dataItemName = SMC_NAME_NET_BYTES_RCVD;
   nw_bytes_view[1].dataItemStatType = SMC_STAT_VALUE_SESSION;
   nw_bytes_view[2].dataItemName = SMC_NAME_NET_BYTES_SENT;
   nw_bytes_view[2].dataItemStatType = SMC_STAT_VALUE_SAMPLE;
   nw_bytes_view[3].dataItemName = SMC_NAME_NET_BYTES_SENT;
   nw_bytes_view[3].dataItemStatType = SMC_STAT_VALUE_SESSION;
   nw_bytes_view[4].dataItemName = SMC_NAME_NET_BYTE_IO;
   nw_bytes_view[4].dataItemStatType = SMC_STAT_RATE_SAMPLE;
   nw_bytes_view[5].dataItemName = SMC_NAME_NET_BYTE_IO;
   nw_bytes_view[5].dataItemStatType = SMC_STAT_RATE_SESSION;

ret=smc_create_view (connect1_id,      /*Connect ID assigned when
                                        connect allocated*/
                      server_info_view, /*This is a pointer to
                                     array of SMC_DATAITEM_STRUCTS
                                     which defines the view*/
                      NUM_SERVER_DATA_ITEMS, /*No. of items in
                                             the view*/
                      "server info view",    /*Ignored on a live
                                             connection*/
                      &server_view_id        /*Value is assigned
                                             by this call*/
                      );
 if (ret != SMC_RET_SUCCESS) {               /*Cleanup from failed
                                             create_view call*/
   ret=smc_connect_drop(connect1_id);        /*Create view failed
                                             so no further use for
                                             this connection*/
   connect1_id = CONNECT_NONEXISTENT;
 }
 /*
 ** The second connection will have two views
 */
   ret=smc_create_view(connect2_id,db_info_view,NUM_DB_INFO_ITEMS,
                       "db info view",&db_info_view_id);
   if (ret != SMC_RET_SUCCESS) {
     db_info_view_id = VIEW_NONEXISTENT;
   }
   ret=smc_create_view(connect2_id,nw_bytes_view,NUM_NW_INFO_ITEMS,
                       "nw bytes view",&nw_info_view_id);
   if (ret != SMC_RET_SUCCESS) {
     nw_info_view_id = VIEW_NONEXISTENT;
   }
/*

** Create a filter.

*/
```

For commentary, see “Step 4: create filters” on page 10

```
/*
 ** Filters and alarms may be applied to data items within a view.
 ** This is optional.
 ** In this case, we only want to see I/O activity for a
 ** particular database and tempdb. If any physical reads occur,
 ** an alarm is triggered that posts a message to the screen.
 */
#ifdef OPTIONAL_CALLS
   filter_strings[0] = "my_db";     /*Change to db of interest*/
   filter_strings[1] = "tempdb";
   workUnion.voidpValue = filter_strings;
   ret=smc_create_filter(connect2_id,       /*Connection id*/
                         db_info_view_id,   /*View id*/
                         &db_info_view[2],  /*Pointer to a data
                                            item within the view
                                            to be filtered*/
                         SMC_FILT_T_EQ,     /*Type of filter*/
                         &workUnion,        /*Filter value*/
                         2,                 /*Number of elements
                                            in array of filter
                                            values*/
                         SMC_DI_TYPE_CHARP, /*datatype of filter
                                            values*/
                         &filter_id         /*Value is assigned by
                                            this function call*/
                         );
   if (ret != SMC_RET_SUCCESS) {
     printf("Filters were not applied. Continuing execution.\n");
   }
/*

** Set alarms.

*/
```

For commentary, see “Step 5: set alarms” on page 11

```
workUnion.longValue = 1;                   /*Value above which
                                             alarm is triggered*/
   ret=smc_create_alarm_ex(connect2_id,       /*Connection id*/
                           db_info_view_id,   /*View id*/
                           &db_info_view[11], /*Pointer to a data
                                              item within the view
                                              to which the alarm
                                              is applied*/
                           &workUnion,        /*Where value that
                                              triggers the alarm
                                              is located*/
                           SMC_DI_TYPE_LONG,  /*datatype of item
                                              to which alarm is
                                              applied*/
                           SMC_ALARM_A_NOTIFY,/*Trigger alarm
                                              callback function.
                                              This is the only
                                              action possible when
                                              the server mode is
                                              LIVE.*/
                           NULL,    /*For server mode HISTORICAL,
                                    this is where log file to be
                                    written to or program to be
                                    run is specified. For server
                                    mode LIVE, this field is
                                    ignored.*/

/*The following is a string that is passed to the alarm callback function.*/
                         "Physical read occurred in database.",
                          alarmCallback,     /*Alarm callback
                                             function*/
                          &alarm_id          /*Variable into which
                                             alarm id is placed.*/
                          );
   if (ret != SMC_RET_SUCCESS) {
     printf("Alarm was not applied. Execution continuing.\n");
   }
 #endif
/*

** Request data and process results.

*/
```

For commentary, see "Step 6: request performance data and process results" on page 12

```
/*
 ** Get data from first connection. As server name and version
 ** do not change during the connection, we only get it once.
 ** Post the time when the refresh was done.
 */
   if (connect1_id != CONNECT_NONEXISTENT) { /*If the connect is
                                              not successful,the
                                              error callback is
                                              triggered. For a
                                              friendlier display,
                                              we check first.*/
     ret=smc_refresh_ex(connect1_id,         /*ID of connect*/
                        0                    /*STEP not used in
                                             live connection*/
                        );
     if (ret != SMC_RET_SUCCESS) {
       printf("refresh call failed on first connect ID.\n");
    }
    else {                  /*Check row count even though only one
                            row is expected in this case. If no
                            rows are returned, get_dataitem_value
                            calls will return errors.*/
     ret=smc_get_row_count(connect1_id,
                          server_view_id,
                          #_of_rows);
     if (ret != SMC_RET_SUCCESS){
      printf("Get row count call failed.\n");
     }
     else {
      if (num_of_rows > 0){
/*
 ** A get_dataitem_value call is made for each item in the view.
 ** The retrieved data is stored in an array of SMC_VALUE_UNIONs.
 */
          for (index=0;index <NUM_SERVER_DATA_ITEMS;index++){
            ret=smc_get_dataitem_value(connect1_id,
                               server_view_id,
                               &server_info_view[index],/*Look at
                                                         each data
                                                         item in
                                                         the view*/
                               0,              /*Only one row of
                                               data is returned for
                                               this particular view,
                                               so the value for row
                                               is hard-coded in this
                                               case.*/
                                &server_data[index]   /*Retrieved
                                                       data stored
                                                       here*/
                                );
           }                             /*End for loop*/
/*
 ** Display the returned data.
 */
         printf("Adaptive Server Enterprise name is: \
                 %s.\n",server_data[0].stringValue);
          printf("Adaptive Server Enterprise version is: \
                 %s.\n",server_data[1].stringValue);
          printf("Date and time is: \
               %s.\n",server_data[2].stringValue);
/*
 ** The application is responsible for freeing memory allocated
 ** by the Monitor Client Library for string members of
** SMC_VALUE_UNIONs. This also illustrates the use of the
** smc_get_dataitem_type function call.
*/
 for (index=0;index <NUM_SERVER_DATA_ITEMS;index++){
   ret=smc_get_dataitem_type(&server_info_view[index], \
                              &dataitem_type);
   if (ret != SMC_RET_SUCCESS) {
     printf("Get dataitem type failed for item %d \
              in server_info_view.\n");
   }
   else {
     if (dataitem_type == SMC_DI_TYPE_CHARP) {
       free(server_data[index].stringValue);
     }
   }
 }                /*End for loop*/
        }         /*End if number of rows > 0*/
      }           /*End case get_row_count was successful*/
    }             /*End case smc_refresh_ex call was successful*/
  }               /*End case connect still valid*/
/*
** Get the data from the views in the second connection to see
** how the data changes over time. To do this, we sample
** NUM_OF_SAMPLES times, pausing SAMPLE_INTERVAL times between
** each sample. The process of retrieving data is within a loop.
*/
 for (iterations=0;iterations<NUM_OF_SAMPLES;iterations++){
    sleep(SAMPLE_INTERVAL);
    ret=smc_refresh_ex(connect2_id,     /*Note second connection
                                         specified for refresh*/
                       0                /*Step not used in live
                                         connection*/
                       );
    if (ret == SMC_RET_SUCCESS) {
      if (db_info_view_id != VIEW_NONEXISTENT){ /*Attempting
                                                 get_row_count for
                                                 nonexistent view
                                                 will cause errors
                                                 so check if view
                                                 was actually
                                                 created*/
        ret=smc_get_row_count(connect2_id,
                              db_info_view_id,
                              #_of_rows   /*Multiple rows will
                                             be returned. For
                                             each row of data
```

```
                                     returned, use
                                     get_dataitem_value
                                     loop. Function call
                                     puts number of rows
                                     returned into
                                     variable.*/
                    );
for(row=0;row<num_of_rows;row++){
  for (index=0;index <NUM_DB_INFO_ITEMS;index++){
    ret=smc_get_dataitem_value(connect2_id,
                   db_info_view_id, /*View specified for
                                    get_dataitem_value.*/
                   &db_info_view[index],
                   row,              /*Multiple rows in
                                     this case */
                   &db_data[index]
                   );
    if (ret != SMC_RET_SUCCESS) {
      printf("Get dataitem value failed for data item \
              %s.\n",db_info_labels[index]);
    }
    else {
      printf("%s",db_info_labels[index]);
      ret=smc_get_dataitem_type(&db_info_view[index],\
                              &dataitem_type);
      if (ret != SMC_RET_SUCCESS){
        printf("Get data item type failed for data item \
                %s.\n",db_info_view[index]);
      }
      else {
        switch (dataitem_type) {
        case SMC_DI_TYPE_CHARP:
          printf("%s.\n",db_data[index].stringValue);
          free(db_data[index].stringValue);
          /*Application is responsible for freeing
          memory allocated for strings by library*/
          break;
        case SMC_DI_TYPE_LONG:
          printf("%d.\n",db_data[index].longValue);
          break;
        case SMC_DI_TYPE_DOUBLE: /*Rates are generally
                               floating point variables*/
          printf("%f.\n",db_data[index].doubleValue);
          break;
        default:
          printf("Unknown datatype encountered.\n");
```

```
                   break;
                 }    /*End switch*/
               }      /*End case get_dataitem_type successful*/
             }        /*End case get_dataitem_value successful*/
           }          /*End for loop to get each data item value*/
         }            /*End for loop to get each row of data*/
       }           /*End case view exists*/
/*
 ** Retrieve data from second view in refresh.
 ** Processing is much the same.
 */
       if (nw_info_view_id != VIEW_NONEXISTENT){ /*Attempting
                                                 get_row_count for
                                                 nonexistent view
                                                 causes errors, so
                                                 check to see if
                                                 view was actually
                                                 created*/
         ret=smc_get_row_count(connect2_id,
                               nw_info_view_id,
                               #_of_rows    /*This is a server-
                                               wide view so only
                                               one row should be
                                               returned*/
                             );
         if (num_of_rows > 0 ){
           for (index=0;index <NUM_NW_INFO_ITEMS;index++){
             ret=smc_get_dataitem_value(connect2_id,
                               nw_info_view_id, /*Note view
                                                specified for
                                              get_dataitem_value*/
                               &nw_bytes_view[index],
                               0,         /*One row in this case*/
                               &nw_data[index]
                               );
             if (ret != SMC_RET_SUCCESS) {
               printf("Get dataitem value failed for data item \
                       %s.\n",nw_info_labels[index]);
             }
             else {
               printf("%s",nw_info_labels[index]);
               ret=smc_get_dataitem_type(&nw_bytes_view[index],\
                                         &dataitem_type);
               if (ret != SMC_RET_SUCCESS){
                 printf("Get data item type failed for data item \
                         %s.\n",nw_bytes_view[index]);
```

```
                }
                else {
                  switch (dataitem_type) {
                  case SMC_DI_TYPE_CHARP:
                    printf("%s.\n",nw_data[index].stringValue);
                    free(nw_data[index].stringValue);
                    /*Application is responsible for freeing
                    memory allocated for strings by library*/
                    break;
                  case SMC_DI_TYPE_LONG:
                    printf("%d.\n",nw_data[index].longValue);
                    break;
                  case SMC_DI_TYPE_DOUBLE:    /*Rates are generally
                                              floating point
                                              variables*/
                    printf("%f.\n",nw_data[index].doubleValue);
                    break;
                  default:
                    printf("Unknown datatype encountered.\n");
                    break;
                  }    /*End switch*/
                }      /*End case get_dataitem_type successful*/
              }        /*End case get_dataitem_value successful*/
            }          /*End for loop to get each data item value*/
          }            /*End if any rows of data returned*/
          else {
            printf("No data returned for network info view.\n");
          }
        }             /*End case view exists*/
      }               /*End case refresh successful*/
      else {
        printf("Refresh of second connect failed. \
                Return code is %d.\n",ret);
      }
    }                 /*End for loop for number of iterations*/
/*
 ** This shows how to drop filters and alarms. It is not necessary
 ** to do this prior to closing a connection, as it is done
 ** automatically when the connection is closed. Filters may be
 ** dropped, for example, to see the filtered results of a query
 ** followed by the unfiltered results.
 */
 #ifdef OPTIONAL_CALLS
   ret=smc_drop_filter(connect2_id,db_info_view_id,filter_id);
   if (ret != SMC_RET_SUCCESS) {
     printf("Attempt to drop filter failed.\n");
   }
   ret=smc_drop_alarm(connect2_id,db_info_view_id,alarm_id);
   if (ret != SMC_RET_SUCCESS) {
     printf("Attempt to drop alarm failed.\n");
   }
 #endif
/*
 ** Get another time stamp before disconnecting. To do this,
 ** do a refresh on the first connection again and only display
 ** the time stamp data returned.
 */
   if (connect1_id != CONNECT_NONEXISTENT) {
     ret=smc_refresh_ex(connect1_id,0 );
     if (ret != SMC_RET_SUCCESS) {
       printf("refresh call failed on first connect ID.\n");
     }
     else {                          /*Check row count even though
                                     only one row is expected. If
                                     no rows are returned,
                                     get_dataitem_value calls
                                     will return errors.*/
       ret=smc_get_row_count(connect1_id,
                      server_view_id,
                      #_of_rows);
       if (ret != SMC_RET_SUCCESS){
         printf("Get row count call on first connection \
                 failed.\n");
       }
       else {
         if (num_of_rows > 0){
             ret=smc_get_dataitem_value(connect1_id,
                      server_view_id,
                      &server_info_view[2],  /*In this case
                                             we are only
                                             interested in
                                             the third data
                                             item*/
                      0,            /*Only one row of data
                                    is returned for this
                                    particular view, so the
                                    value for row is hard-
                                    coded in this case.*/
                      &server_data[2]
                      );
             printf("Date and time on conclusion of monitoring:\
                     %s\n",server_data[2].stringValue);
```

```
            free(server_data[2].stringValue);
            /*Application must free string memory returned
            by library*/
          }                /*End if row of data returned*/
      }                    /*End case get_row_count successful*/
    }                      /*End case refresh successful*/
  }                        /*End case connection exists*/

/*

** Close and deallocate the connection.

*/
```

For commentary, see "Step 7: close and deallocate connections" on page 13

```
/*
 ** Cleanup. This consists of closing all connections, then
 ** de-allocating them. Alternatively, connections can be re-used.
 */
   ret=smc_close(connect1_id,
                 SMC_CLOSE_REQUEST          /*Close only if no
                                            outstanding commands
                                            (only close request type
                                            currently supported)*/
                 );
   if (ret != SMC_RET_SUCCESS) {
     printf("Attempt to close first connection failed. \
             Return code is %d.\n",ret);
   }
   ret=smc_close(connect2_id,SMC_CLOSE_REQUEST);
   if (ret != SMC_RET_SUCCESS) {
     printf("Attempt to close second connection failed. \
             Return code is %d.\n",ret);
   }
/*
 ** Connections can be re-used at this point, for example, to
 ** connect to different servers. However, we de-allocate them.
 */
   ret=smc_connect_drop(connect1_id);
   if (ret != SMC_RET_SUCCESS){
     printf("Attempt to drop first connection failed. \
             Return code is %d.\n",ret);
   }
   ret=smc_connect_drop(connect2_id);
   if (ret != SMC_RET_SUCCESS){
     printf("Attempt to drop second connection failed. \
             Return code is %d.\n",ret);
   }
   return(SMC_RET_SUCCESS);
 }                                         /*End main*/
/*
** Callback functions
```

For commentary, see "Step 1: define error handling" on page 5.

```
*/
 SMC_VOID errorCallback(
   SMC_CONNECT_ID connectID,
   SMC_COMMAND_ID commandID,        /*Value internal to Monitor
                                    Client Library*/
   SMC_VOIDP userDataHandle         /*User-defined pointer. Set by
                                    smc_connect_propscall*/
   )
 {
   SMC_SIZET          ret;
   SMC_VALUE_UNION    errorInfo;    /*Used for getting information
                                    from smc_get_command_info
                                    function call*/
   SMC_SIZET          returned_msg_length;
   printf ("Inside new error callback.\n");
/*
 ** Use smc_get_command_info function call to get information
 ** from error and alarm callbacks.
 */
   ret=smc_get_command_info(connectID,
                         commandID,
                         SMC_INFO_ERR_MAPSEVERITY, /*Information
                                                   requested about
                                                   command*/
                         &errorInfo,         /*Where information
                                             returned about
                                             command is placed*/
                         NULL                /*Value is numeric
                                             so length of returned
                                       data not needed*/
                        );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call requesting error map \
             severity failed. Error returned is:  %d\n",ret);
     }
   else{
     printf("Monitor Client Library error severity level is: \
             %d\n",errorInfo.sizetValue);
   }
```

```
ret=smc_get_command_info(connectID,
                        commandID,
                        SMC_INFO_ERR_MSG,
                        &errorInfo,
                        &returned_msg_length      /*Find string
                                                  length */
                                                                        );
if (ret != SMC_RET_SUCCESS){
  printf("get_command_info call requesting error message \
          failed. Error returned is:  %d\n",ret);
}
else{
  printf("Error message text is:  %s\n",errorInfo.stringValue);
  free(errorInfo.stringValue);
  /*Application is responsible for freeing string buffer
  memory allocated by library*/
}
ret=smc_get_command_info(connectID,
                         commandID,
                         SMC_INFO_ERR_NUM,
                         &errorInfo,
                         NULL
                         );
if (ret != SMC_RET_SUCCESS){
  printf("get_command_info call requesting error number \
          failed. Error returned is:  %d\n",ret);
}
else{
  printf("Error number is: %d\n",errorInfo.sizetValue);
}
ret=smc_get_command_info(connectID,
                         commandID,
                         SMC_INFO_ERR_SEVERITY,
                         &errorInfo,
                         NULL
                         );
if (ret != SMC_RET_SUCCESS){
  printf("get_command_info call requesting error severity \
          failed.  Error returned is:  %d\n",ret);
}
else{
  printf("Error severity level is: %d\n",errorInfo.sizetValue);
}
ret=smc_get_command_info(connectID,
                         commandID,
                         SMC_INFO_ERR_SOURCE,
                            &errorInfo,
                            NULL
                            );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call requesting error source \
             failed.  Error returned is:  %d\n",ret);
   }
   else{
     printf(" Error source is:  %d\n",errorInfo.sizetValue);
   }
   ret=smc_get_command_info(connectID,
                            commandID,
                            SMC_INFO_ERR_STATE,
                            &errorInfo,
                            NULL
                            );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call requesting state failed. \
             Error returned is: %d\n",ret);
   }
   else{
     printf(" Error state is:  %d\n",errorInfo.sizetValue);
   }
/*
 ** Demonstrate use of userDataHandle. This value was set as a
 ** connection property for the connection in the main program and
 ** is passed to this function.
 */
   if (userDataHandle != NULL){
     printf("Connection on which error occurred is \
             %s.\n",userDataHandle);
   }
 }                                          /*End errorCallback */
 /*Alarm callback*/
 SMC_VOID alarmCallback(
   SMC_CONNECT_ID connectID,
   SMC_COMMAND_ID commandID,           /*Value internal to Monitor
                                       Client Library*/
   SMC_VOIDP userDataHandle
   )
 {
 #define MSG_BUFFER_LENGTH 80
   SMC_SIZET          ret;
   SMC_VALUE_UNION    alarmInfo;      /*Union into which requested
                                      data is placed*/
   SMC_SIZET          returned_msg_length;
   printf ("Alarm callback triggered.\n");
/*
 ** Use smc_get_command_info function call to get information
 ** from error and alarm callbacks.
 */
   ret=smc_get_command_info(connectID,
                            commandID,
                            SMC_INFO_ALARM_ALARMID,
                            &alarmInfo,
                            NULL
                            );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call failed.  \
             Error returned is:  %d",ret);
   }
   else{
     printf("Alarm ID is:  %d\n",alarmInfo.sizetValue);
   }
/*
 ** This demonstrates the use of the SMC_INFO_ALARM_VALUE_DATATYPE
 ** information that might be useful in a generic alarm callback
 ** function.
 */
   ret=smc_get_command_info(connectID,
                            commandID,
                            SMC_INFO_ALARM_VALUE_DATATYPE,
                            &alarmInfo,
                            NULL
                            );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call failed. \
             Error returned is:  %d",ret);
   }
   else{
     switch(alarmInfo.intValue){
     case SMC_DI_TYPE_INT:
       ret=smc_get_command_info(connectID,
                                commandID,
                                SMC_INFO_ALARM_CURRENT_VALUE,
                                &alarmInfo,
                                NULL
                                );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call failed.  \
             Error returned is:  %d",ret);
   }
   else {
     printf("Current value of alarmed data item is:\
             %d.\n",alarmInfo.intValue);
   }
   break;
     case SMC_DI_TYPE_LONG:
       ret=smc_get_command_info(connectID,
                                commandID,
                                SMC_INFO_ALARM_CURRENT_VALUE,
                                &alarmInfo,
                                NULL
                                );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call failed.  \
             Error returned is:  %d",ret);
   }
   else {
     printf("Current value of alarmed data item is: \
             %d.\n",alarmInfo.longValue);
   }
   break;
     case SMC_DI_TYPE_DOUBLE:
       ret=smc_get_command_info(connectID,
                                commandID,
                                SMC_INFO_ALARM_CURRENT_VALUE,
                                &alarmInfo,
                                NULL
                                );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call failed.  Error returned is:  %d",ret);
   }
   else {
     printf("Current value of alarmed data item is: \
             %f.\n",alarmInfo.doubleValue);
   }
   break;
     default:
     printf("Invalid value returned for datatype of \
             current alarm value.\n");
     break;
     }                                              /*End switch*/
   }
   ret=smc_get_command_info(connectID,
                            commandID,
                            SMC_INFO_ALARM_ROW,
                            &alarmInfo,
                            NULL
                            );
  if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call failed.  \
             Error returned is:  %d",ret);
   }
   else{
     printf("Row of data which triggered alarm is: \
             %d\n",alarmInfo.sizetValue);
   }
   ret=smc_get_command_info(connectID,
                            commandID,
                            SMC_INFO_ALARM_VALUE_DATATYPE,
                            &alarmInfo,
                            NULL
                            );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call failed.  \
             Error returned is:  %d",ret);
   }
   else{
     switch(alarmInfo.intValue){
     case SMC_DI_TYPE_INT:
       ret=smc_get_command_info(connectID,
                                commandID,
                                SMC_INFO_ALARM_THRESHOLD_VALUE,
                                &alarmInfo,
                                NULL
                                );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call failed. \
             Error returned is:  %d",ret);
   }
   else {
     printf("Value of data item exceeded alarm-triggering \
             value of: %d.\n",alarmInfo.intValue);
   }
   break;
     case SMC_DI_TYPE_LONG:
       ret=smc_get_command_info(connectID,
                                commandID,
                                SMC_INFO_ALARM_THRESHOLD_VALUE,
                                &alarmInfo,
                                NULL
                                );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call failed. \
             Error returned is:  %d",ret);
   }
   else {
     printf("Value of data item exceeded alarm-triggering \
             value of: %d.\n",alarmInfo.longValue);
   }
   break;
     case SMC_DI_TYPE_DOUBLE:
       ret=smc_get_command_info(connectID,
                                commandID,
                                SMC_INFO_ALARM_THRESHOLD_VALUE,
                                &alarmInfo,
                                NULL
                                );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call failed.  \
             Error returned is:  %d",ret);
   }
   else {
     printf("Value of data item exceeded alarm-triggering\
             value of: %f.\n",alarmInfo.doubleValue);
   }
   break;
     default:
     printf("Invalid value returned for datatype of \
             THRESHOLD alarm value.\n");
     break;
     }                                           /*End switch*/
   }
   ret=smc_get_command_info(connectID,
                            commandID,
                            SMC_INFO_ALARM_TIMESTAMP,
                            &alarmInfo,
                            &returned_msg_length
                            );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call failed.  \
             Error returned is:  %d",ret);
    }
   else{
     printf("Time when alarm was triggered is: \
             %s\n",alarmInfo.stringValue);
     free(alarmInfo.stringValue); /*Application is responsible
                                  for freeing string buffer memory
                                  allocated by library.*/
   }

   ret=smc_get_command_info(connectID,
                            commandID,
                            SMC_INFO_ALARM_VIEWID,
                            &alarmInfo,
                            NULL
                            );
   if (ret != SMC_RET_SUCCESS){
     printf("get_command_info call failed.  \
             Error returned is:  %d",ret);
   }
   else{
     printf("ID of view which triggered alarm is: \
             %d.\n",alarmInfo.sizetValue);
   }
 }                              /*End newAlarmCallback*/
```

CHAPTER 2 Data Items and Statistical Types

This chapter contains the following topics:

Overview

A data item is a particular piece of performance data that can be obtained by using Monitor Client Library. A statistical type specifies the calculations to be performed and the duration for which to report the data collected by the data item.

This chapter describes the types of data items and statistical types. It also describes each data item and its characteristics.

Monitor Client Library terminology is defined in "Overview" on page 1.

Result and key data items

Data items are classified as keys or results:

- A *key data item* refines the amount of detail in a view and usually results in additional rows returned when a view is refreshed. With the inclusion of each successive key, envision adding the word "per" to a view definition. For example, start with the Page I/O result data item. Refine the granularity by adding the Database key data item, Page I/Os "per" Database. Further refine the granularity by adding the Object key data item, Page I/Os "per" Database "per" Object.

- A *result data item* returns performance data at the level of detail determined by the key data items in a view. If no key data items are specified, only one row of data is returned.

Note A data item's designation as a result or key is a characteristic of the data item and is independent of the statistical type associated with the data item in a view.

Data items and views

A view usually contains a mix of key and result data items. This mixture of keys and results provides flexibility in determining the amount of detail of the data to be returned. The exception is server-wide data, such as transaction or network activity data. For server-wide data, no key data items are specified and only one row of data is returned.

Table 2-1 shows examples of data returned by views.

Table 2-1: Examples of data returned by views

View defined with	Returns

SMC_NAME_PAGE_IO	`page I/Os for the whole server`
	`Row results:`
	`    Page I/O`
	`    ---------`
	`    145`

SMC_NAME_SPID, SMC_NAME_LOGIN_NAME, SMC_NAME_PAGE_IO
 	
(where SPID is a key data item)
	`page I/O per process`
	`Row results:`
	`SPID          Login Name         Page I/O`
	`---------------------------`
	`3             sa                 45`
	`5             joe                100`

View defined with	Returns

SMC_NAME_SPID, SMC_NAME_DB_ID, SMC_NAME_OBJ_ID, SMC_NAME_DB_NAME, SMC_NAME_OBJ_NAME, and SMC_NAME_PAGE_IO (where SMC_NAME_SPID, SMC_NAME_DB_ID, and SMC_NAME_OBJID are key data items)	`page I/O per database table per process`
	`Row results:`
	`SPID     DBID    ObjID    DBName   ObjName   PageIO`
	`------------------------------------------------`
	`1       5     208003772  pubs2    titles      10`
	`1       5     336004228  pubs2    blurbs      5`
	`5       5     22003430   pubs2    sales       100`

Rows with no data versus no rows in views

When there is no activity to report, some data items cause an empty row (that is, a row with zero values for result data items) to appear in a view, and other data items cause the row to be omitted. The rules controlling whether empty rows appear in a view are:

- Server level data items always return a row, even when there is no activity to report.
- Views that contain the key data item SMC_NAME_SPID or SMC_NAME_APPLICATION_NAME only report on processes that are active as of the end of the sample period.
- Views that contain the key data items SMC_NAME_OBJ_ID or SMC_NAME_ACT_STP_ID omit the row when there is no activity to report during the sample period.
- Views that contain keys other than those listed in the previous bullets return rows when there is no activity.

Server-level status

Some data items are available only at the server level. Views with server-level data items contain only result data items and provide performance data summarized over Adaptive Server.

Combining data items

Data items cannot be combined indiscriminately. The absence or presence of a key data item in a view determines which other data items are allowed in the view.

If a view contains a key data item, all result data items in the view must be valid for the key data item. Also, for each result data item in a view, all required keys for that result data item must be in the view.

If a view does not contain a key data item, it can include any data item that does not require a key.

Result and key combinations

In some cases, if you use an optional key data item, you must also use one or more others. In the data item descriptions in this chapter, data items that have this requirement are grouped with the other required data items in brackets and separated by a plus sign (+).

Not all result data items require a key data item. If a view contains only result data items, by default the summary is at the server level. The result data items that have only optional keys can be used with server-level data items when no key data item is included in the view.

To combine various result data items within a view, match common key data items.

Connection summaries

Some views consume Monitor Server connection summaries. For information about Monitor Server connection summaries, refer to the *Adaptive Server Enterprise Monitor Server User's Guide*.

Current statement and application name data items

If you want to get data for a current statement data item (SMC_NAME_CUR_STMT_x) or SMC_NAME APPLICATION NAME, the monitor client application must connect to the monitor server and create the view before you start the application you are monitoring.

Data item definitions

This section lists data items in alphabetical order with the following information:

- Description
- Server level status
- Result or key designation
- For result data items, required keys and optional keys
- For key data items, result data items that require the key data item and result data items that can use the key data item, but do not require it
- Version compatibility: either SQL Server 11.0 or Adaptive Server 11.5 and later
- Valid statistical types

The valid statistical types are as follows:

- SMC_STAT_VALUE_SAMPLE
- SMC_STAT_VALUE_SESSION
- SMC_STAT_RATE_SAMPLE
- SMC_STAT_RATE_SESSION
- SMC_STAT_AVG_SAMPLE
- SMC_STAT_AVG_SESSION

The possible datatypes for a data item are:

- LONG – long
- ENUMS – integer
- DOUBLE – double
- CHARP – character
- DATIM – date/time

For more information about enumerated types, see Appendix B, “Datatypes and Structures”.

Note Not all statistical types are available for each data item.

You cannot use SMC_NAME_SPID and SMC_NAME_APPLICATION_NAME in the same view.

Deciphering the names of data items

The syntax of a data item's name is an abbreviation of a description of the information it reports. All data items start with SMC_NAME. The remaining components of the name are either English words, abbreviations, or both. The abbreviations and their meanings are:

- ACT – active
- APP – application
- CNT – count (number of)
- CUR – current
- DATIM – date and time
- DB – database
- DEV – device
- ID – identification number
- IMMED – immediate
- IO – input/output (page reads and writes)
- KPID – a persistent process ID
- MAX – maximum
- MEM – memory
- NET – network
- NUM – number
- OBJ – database object
- PCT – percent
- PKT – packet
- PROC – process
- RCVD – received
- REF – referenced

- SPID – server process ID
- STMT – statement
- STP – stored procedure
- XACT – transaction

The data items described in *Historical Server User’s Guide* are equivalent to these data items, but use a natural language naming convention.

SMC_NAME_ACT_STP_DB_ID

Description	Reports the database identification number of the active stored procedure.
Version compatibility	11.0 and later
Data item type	Key
Server level	No

Result data items that require this key

SMC_NAME_ACT_ STP_DB_NAME
SMC_NAME_ACT_ STP_NAME
SMC_NAME_ACT_ STP_OWNER_NAME
SMC_NAME_STP_CPU_TIME
SMC_NAME_STP_ELAPSED_TIME
SMC_NAME_STP_EXECUTION_CLASS
SMC_NAME_STP_LINE_TEXT
SMC_NAME_STP_NUM_TIMES_EXECUTED

Result data items for which this key is optional

SMC_NAME_LOCKS_GRANTED_IMMED
SMC_NAME_LOCKS_GRANTED_WAITED
SMC_NAME_LOCKS_NOT_GRANTED
SMC_NAME_PAGE_INDEX_LOGICAL_READ
SMC_NAME_PAGE_INDEX_PHYSICAL_READ
SMC_NAME_PAGE_HIT_PCT
SMC_NAME_PAGE_IO
SMC_NAME_PAGE_LOGICAL_READ
SMC_NAME_PAGE_PHYSICAL_READ
SMC_NAME_PAGE_WRITE

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_ACT_STP_DB_NAME

Description	Reports the database name of the active stored procedure.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_ACT_STP_DB_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_ACT_STP_ID

Description	Reports the identification number of the active stored procedure.
Version compatibility	11.0 and later
Data item type	Key
Server level	No
Required keys	SMC_NAME_ACT_STP_DB_ID

Result data items that require this key

SMC_NAME_ACT_ STP_NAME
SMC_NAME_ACT_ STP_OWNER_NAME
SMC_NAME_STP_CPU_TIME
SMC_NAME_STP_ELAPSED_TIME
SMC_NAME_STP_EXECUTION_CLASS
SMC_NAME_STP_LINE_TEXT
SMC_NAME_STP_NUM_TIMES_EXECUTED

Result data items for which this key is optional

SMC_NAME_LOCKS_GRANTED_IMMED
SMC_NAME_LOCKS_GRANTED_WAITED
SMC_NAME_LOCKS_NOT_GRANTED
SMC_NAME_PAGE_INDEX_LOGICAL_READ
SMC_NAME_PAGE_INDEX_PHYSICAL_READ
SMC_NAME_PAGE_HIT_PCT
SMC_NAME_PAGE_IO
SMC_NAME_PAGE_LOGICAL_READ
SMC_NAME_PAGE_PHYSICAL_READ
SMC_NAME_PAGE_WRITE

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_ACT_STP_NAME

Description	Reports the name of the active stored procedure.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_ACT_STP_DB_ID, SMC_NAME_ACT_STP_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_ACT_STP_OWNER_NAME

Description	Reports the name of the owner of the active stored procedure.
Version compatibility	11.0 and later
Data item type	Result
Server level	No

Required keys

SMC_NAME_ACT_STP_DB_ID, SMC_NAME_ACT_STP_ID

Optional keys

None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_APPLICATION_NAME

Description

Reports the name of each application for which other statistics are being accumulated. Views that contain SMC_NAME_APPLICATION_NAME only report on processes that are active as of the end of the sample period.

SMC_NAME_APPLICATION_NAME is mutually exclusive with SMC_NAME_SPID in a view.

Version compatibility

11.0 and later

Data item type

Key

Server level

No

Result data items that require this key

SMC_NAME_APP_EXECUTION_CLASS

Result data items for which this key is optional

SMC_NAME_CPU_PCT
SMC_NAME_CPU_TIME
SMC_NAME_LOCKS_GRANTED_IMMED
SMC_NAME_LOCKS_GRANTED_WAITED
SMC_NAME_LOCKS_NOT_GRANTED
SMC_NAME_NUM_PROCESSES
SMC_NAME_PAGE_INDEX_LOGICAL_READ
SMC_NAME_PAGE_INDEX_PHYSICAL_READ
SMC_NAME_PAGE_LOGICAL_READ
SMC_NAME_PAGE_PHYSICAL_READ
SMC_NAME_PAGE_WRITE

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_APP_EXECUTION_CLASS

Description

Reports the configured execution class, if any, for a given application name. The name is returned in one of the following formats:

- If the application is bound to the execution class only with scope NULL, the name of the execution class is returned.
- If the application is bound to the execution class with a scope of NULL and a scope of one or more logins, an asterisk (*) is appended to the name of the execution class.
- If the application is bound to the execution class only with a scope of one or more logins, an asterisk is returned.

Version compatibility

11.0 and later

Data item type

Result

Server level

No

Required keys

SMC_NAME_APPLICATION_NAME

Optional keys

None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_BLOCKING_SPID

Description

Reports the identification number of the process that holds a lock that the process indicated by the SMC_NAME_SPID data item is waiting for. If a process is not blocked, the Blocking SPID is zero.

Version Compatibility

11.0 and later

Data item type

Result

Server level

No

Required keys

SMC_NAME_SPID, SMC_NAME_DB_ID, SMC_NAME_OBJ_ID, SMC_NAME_LOCK_STATUS

Optional keys

SMC_NAME_LOCK_TYPE, SMC_NAME_PAGE_NUM

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_CONNECT_TIME

Description	Reports the time elapsed (in seconds) since the process was started. If the process was active before you began monitoring it, connect time is the time you have monitored this process.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG				

SMC_NAME_CPU_BUSY_PCT

Description	Reports the percentage of the time when Adaptive Server is in a Busy state.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_ENGINE_NUM

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_CPU_PCT

Description	Reports the percentage of time that a process or the set of processes running a given application was in the Running state of the time that all processes were in the Running state.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID or SMC_NAME_APPLICATION_NAME

Note SMC_NAME_SPID and SMC_NAME_APPLICATION_NAME are mutually exclusive.

Optional keys SMC_NAME_ENGINE_NUM

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_CPU_TIME

Description	At server level (with no keys), reports the total CPU “busy” time on the server. When used with keys, reports on how much of that busy time was used by each process, application, or engine.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_ENGINE_NUM, SMC_NAME_SPID or SMC_NAME_APPLICATION_NAME

Note SMC_NAME_SPID and SMC_NAME_APPLICATION_NAME are mutually exclusive.

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_CPU_YIELD

Description	Reports the number of times that Adaptive Server yielded to the operating system.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required key	None
Optional keys	SMC_NAME_ENGINE_NUM

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_CUR_APP_NAME

Description	Reports the name of the application that is executing on a particular process.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_CUR_ENGINE

Description	Reports the number of the Adaptive Server engine on which a process was currently running.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_CUR_EXECUTION_CLASS

Description	Reports the name of the execution class under which a process is currently running.
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_CUR_PROC_STATE

Description

Reports the current state of a process. The possible states are:

- None
- Alarm Sleep
- Background

- Bad Status
- Infected
- Lock Sleep
- Received Sleep
- Remote I/O
- Runnable
- Running
- Send Sleep
- Sleeping
- Stopped
- Sync Sleep
- Terminating
- Yielding

Version compatibility 11.0 and later

Data item type Result

Server level No

Required keys SMC_NAME_SPID

Optional keys None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
ENUMS					

Enum SMC_PROC_STATE

SMC_NAME_CUR_STMT_ACT_STP_DB_ID

Description Reports the database ID of the stored procedure (including triggers, a special kind of stored procedure) that contains the currently executing SQL statement for a particular process. If the currently executing SQL statement is not contained in a stored procedure, this ID is zero.

Version compatibility 11.5 and later

Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_CUR_STMT_ACT_STP_DB_NAME

Description	Reports the database name of the stored procedure (including triggers, a special kind of stored procedure) that contains the currently executing SQL statement for a particular process. If the currently executing SQL statement is not contained in a stored procedure, this name is "**NoDatabase**".
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_CUR_STMT_ACT_STP_ID

Description	Reports the ID of the stored procedure (including triggers, a special kind of stored procedure) that contains the currently executing SQL statement for a particular process. If the currently executing SQL statement is not contained in a stored procedure, this ID is zero.
Version compatibility	11.5 and later
Data item type	Result
Server level	No

Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_CUR_STMT_ACT_STP_NAME

Description	Reports the name of the stored procedure (including triggers, a special kind of stored procedure) that contains the currently executing SQL statement for a particular process. If the currently executing SQL statement is not contained in a stored procedure, this name is “**NoObject**”.
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_CUR_STMT_ACT_STP_OWNER_NAME

Description	Reports the owner name of the stored procedure (including triggers, a special kind of stored procedure) that contains the currently executing SQL statement for a particular process. If the currently executing SQL statement is not contained in a stored procedure, this name is “**NoOwner**”.
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_CUR_STMT_ACT_STP_TEXT

Description	Reports the text of a particular stored procedure (including triggers, a special kind of stored procedure) being executed for a particular process. If both CUR_STMT_ACT_STP_DB_ID is equal to 0 and CUR_STMT_ACT_STP_ID is equal to 0 then a stored procedure is not currently executing and this text is a null-terminated empty string (""). If the text is not available (because this stored procedure was compiled and its text was discarded, or because the text is stored in an encrypted format), then this text is a null-terminated empty string ("").
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_CUR_STMT_BATCH_ID

Description	Reports the ID of a particular query batch being executed for a particular process.
Version compatibility	11.5 and later
Data item type	Result
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_CUR_STMT_BATCH_TEXT

Description

Reports the text of a particular query batch being executed for a particular process. This text can only be an initial substring of the complete text in a query batch. The maximum amount of text stored in this field is determined by the Adaptive Server configuration option max SQL text monitored and can be monitored using SMC_NAME_CUR_STMT_BATCH_TEXXT ENABLED.

Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_CUR_STMT_BATCH_TEXT_ENABLED

Description

Reports whether Adaptive Server is saving the SQL text of the currently executing query batches, and if so, how much.

Value of 0 = saving SQL text disabled.

Value of 1 or more = maximum number of bytes of batch text per server process that can be saved.

Version compatibility	11.5 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_CUR_STMT_CONTEXT_ID

Description	Reports the ID that uniquely identifies a stored procedure invocation within a particular query batch being executed for a particular process.
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_CUR_STMT_CPU_TIME

Description	Reports the amount of time (in seconds) that the currently executing SQL statement has spent in the running state.
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes:

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_CUR_STMT_ELAPSED_TIME

Description	Reports the amount of time (in seconds) that the currently executing SQL statement has been running.
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_CUR_STMT_LINE_NUM

Description	Reports the number of the line (within a query batch or stored procedure) that contains the beginning of the currently executing SQL statement for a particular process. The currently executing SQL statement is in the query batch if CUR_STMT_ACT_STP_DB_ID is equal to 0 and CUR_STMT_ACT_STP_ID is equal to 0. Otherwise, the currently executing SQL statement is in the stored procedure uniquely identified by these two IDs.
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_CUR_STMT_LOCKS_GRANTED_IMMED

Description	Reports the number of lock requests by the currently executing SQL statement that were granted immediately or were not needed (because sufficient locking was already held by the requestor).
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_CUR_STMT_LOCKS_GRANTED_WAITED

Description	Reports the number of lock requests by the currently executing SQL statement that were granted after waiting.
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_CUR_STMT_LOCKS_NOT_GRANTED

Description	Reports the number of lock requests by the currently executing SQL statement that were denied.
Version compatibility	11.5 and later

Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_CUR_STMT_NUM

Description

Reports the number of the statement (appearing in a query batch or stored procedure) that is the currently executing SQL statement for a particular process. The currently executing SQL statement is in the query batch if both CUR_STMT_ACT_STP_DB_ID is equal to 0 and CUR_STMT_ACT_STP_ID is equal to 0. Otherwise, the currently executing SQL statement is in the stored procedure uniquely identified by these two IDs.

A value of zero indicates partial data for the currently executing SQL statement (that is, this SQL statement began executing before monitoring began. Performance metrics are available but numbers reflect only the time period since the start of monitoring).

Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_CUR_STMT_PAGE_IO

Description

Reports the number of combined logical page reads and page writes accumulated by the currently executing SQL statement.

Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_CUR_STMT_PAGE_LOGICAL_READ

Description	Reports the number of data page reads (satisfied from cache or from device reads) accumulated by the currently executing SQL statement.
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_CUR_STMT_PAGE_PHYSICAL_READ

Description	Reports the number of data page reads that could not be satisfied from the data cache, accumulated by the currently executing SQL statement.
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_CUR_STMT_PAGE_WRITE

Description	Reports the number of data pages written to a database device, accumulated by the currently executing SQL statement.
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_CUR_STMT_QUERY_PLAN_TEXT

Description	Reports the text of the query plan for a particular query being executed for a particular connection. If the text is not available (because Adaptive Server has removed this plan from its catalog of query plans), then this text is a null-terminated empty string ("").
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_CUR_STMT_START_TIME

Description	Reports the date and time, in the time zone of Adaptive Server, when the currently executing SQL statement began running. If this SQL statement began running before monitoring began, then this is the date and time that activity was first encountered for this statement.
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DATM					

SMC_NAME_CUR_STMT_TEXT_BYTE_OFFSET

Description	Reports the byte offset to the beginning of a statement within the query batch or stored procedure being executed for a particular process. If both CUR_STMT_ACT_STP_DB_ID is equal to 0 and CUR_STMT_ACT_STP_ID is equal to 0, then the statement is the currently executing SQL statement in the query batch. Otherwise, the statement is the currently executing SQL statement is in the stored procedure uniquely identified by these two IDs (above).
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_DATA_CACHE_CONTENTION

Description	Reports the fraction of the requests for a data cache's spinlock that were forced to wait (*spinlock_waits* divided by *spinlock_requests*).
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_DATA_CACHE_EFFICIENCY

Description	Reports the number of cache hits per second per megabyte of a particular data cache.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_DATA_CACHE_HIT

Description	Reports the number of times a page read was satisfied from a particular data cache.
Version compatibility	11.0 and later
Data item type	Result

Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_DATA_CACHE_HIT_PCT

Description

Reports the fraction of the page reads satisfied, which is computed from the following formula:

cache_hits / (*cache_hits* + *cache_misses*) * 100

Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

Note When SMC_NAME_DATA_CACHE_MISS overstates the number of physical page reads, SMC_NAME_DATA_CACHE_HIT_PCT understates the percentage of cache hits.

SMC_NAME_DATA_CACHE_ID

Description

Reports the ID of a data cache. Tables or indexes or both can be bound to a specific data cache, or all objects in a database can be bound to the same data cache. No object can be bound to more than one data cache.

Version compatibility

11.0 and later

Data item type	Key
Server level	No

Result data items that require this key

SMC_NAME_DATA_CACHE_CONTENTION
SMC_NAME_DATA CACHE_EFFICIENCY
SMC_NAME_DATA_CACHE_HIT
SMC_NAME_DATA_CACHE_HIT_PCT
SMC_NAME_DATA_CACHE_LARGE_IO_DENIED
SMC_NAME_DATA_CACHE_LARGE_IO_PERFORMED
SMC_NAME_DATA_CACHE_LARGE_IO_REQUESTED
SMC_NAME_DATA_CACHE_MISS
SMC_NAME_DATA_CACHE_NAME
SMC_NAME_DATA_CACHE_PREFETCH_EFFICIENCY
SMC_NAME_DATA_CACHE_REF_AND_REUSE
SMC_NAME_DATA_CACHE_REUSE
SMC_NAME_DATA_CACHE_SIZE

Result data items for which this key is optional: SMC_NAME_DATA_CACHE_REUSE_DIRTY

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_DATA_CACHE_LARGE_IO_DENIED

Description	Reports the number of times the Adaptive Server buffer manager did not satisfy requests (of the optimizer) to load data into a buffer in this data cache by fetching more than one contiguous page from disk at a time.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_DATA_CACHE_LARGE_IO_PERFORMED

Description	Reports the number of times the Adaptive Server buffer manager satisfied requests (of the optimizer) to load data into a buffer in this data cache by fetching more than one contiguous page from disk at a time.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_DATA_CACHE_LARGE_IO_REQUESTED

Description	Reports the number of times the optimizer made requests (of the Adaptive Server buffer manager) to load data into a buffer in this data cache by fetching more than one contiguous page from disk at a time.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_DATA_CACHE_MISS

Description	Reports the number of times that a page read was satisfied from disk rather than from a particular data cache.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

Note SMC_NAME_DATA_CACHE_MISS includes failed attempts to locate pages in the data caches during page allocation. Therefore, the number of physical page reads reported may be overstated. If this occurs, the percentage of data cache misses reported by SMC_NAME_DATA_CACHE_HIT_PCT is understated.

SMC_NAME_DATA_CACHE_NAME

Description	Reports the name of a data cache. Tables or indexes or both can be bound to a specific data cache, or all objects in a database can be bound to the same data cache. No object can be bound to more than one cache.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_DATA_CACHE_PREFETCH_EFFICIENCY

Description	Reports the ratio of pages in buffers that were both referenced and reused, relative to all pages in buffers in a given cache that were reused. If the ratio is large, then prefetching is effective; otherwise, prefetching is not providing much benefit. This may suggest that a buffer pool should be eliminated (or it may imply that a clustered index on some table is fragmented, and that the index should be dropped and recreated). **Note** SMC_NAME_DATA_CACHE_PREFETCH_EFFICIENCY ignores buffers in the default buffer pool in each cache.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_DATA_CACHE_REUSE

Description	Reports the number of pages in buffers that were reused. A large value indicates a high rate of turnover of buffers in the cache, and suggests that a pool may be too small. A zero value suggests that a buffer pool other than the default buffer pool may be too large.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_DATA_CACHE_REUSE_DIRTY

Description	Reports the number of times that a buffer that was reused had changes that needed to be written. A non-zero value indicates that the wash size is too small.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_DATA_CACHE_REF_AND_REUSE

Description	Reports the number of pages in buffers that were both referenced and reused. This count is employed when determining the efficiency of prefetching buffers (see SMC_NAME_DATA_CACHE_PREFETCH_EFFICIENCY).
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_DATA_CACHE_SIZE

Description	Reports the size of a data cache in megabytes.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DATA_CACHE_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE					

SMC_NAME_DB_ID

Description	Reports the identification number of the database.
Version compatibility	11.0 and later
Data item type	Key
Server level	No

Result data items that require this key

SMC_NAME_BLOCKING_SPID
SMC_NAME_DB_NAME
SMC_NAME_DEMAND_LOCK
SMC_NAME_LOCKS_BEING_BLOCKED_CNT
SMC_NAME_OBJ_NAME
SMC_NAME_OBJ_TYPE
SMC_NAME_OWNER_NAME
SMC_NAME_TIME_WAITED_ON_LOCK

Result data items for which this key is optional

SMC_NAME_LOCKS_GRANTED_IMMED
SMC_NAME_LOCKS_GRANTED_WAITED
SMC_NAME_LOCKS_NOT_GRANTED
SMC_NAME_PAGE_INDEX_LOGICAL_READ
SMC_NAME_PAGE_INDEX_PHYSICAL_READ
SMC_NAME_PAGE_HIT_PCT

SMC_NAME_PAGE_IO
SMC_NAME_PAGE_LOGICAL_READ
SMC_NAME_PAGE_PHYSICAL_READ
SMC_NAME_PAGE_WRITE

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_DB_NAME

Description	Reports the name of the database.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	DB_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_DEADLOCK_CNT

Description	Reports the number of deadlocks.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG				

SMC_NAME_DEMAND_LOCK

Description	Reports the character string (Y or N) that indicates whether or not a lock has been upgraded to demand lock status.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID, SMC_NAME_DB_ID, SMC_NAME_OBJ_ID, SMC_NAME_LOCK_STATUS
Optional keys	SMC_NAME_LOCK_TYPE, SMC_NAME_PAGE_NUM

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_DEV_HIT

Description	Reports the number of times access to a device was granted.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_DEV_NAME

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_DEV_HIT_PCT

Description	Reports the fraction of device requests that were granted, which is computed by dividing SMC_NAME_DEV_HIT into the result of SMC_NAME_DEV_MISS multiplied by 100.
Version compatibility	11.0 and later

Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_DEV_NAME
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_DEV_IO

Description	Reports the total of device reads and device writes.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_DEV_NAME
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_DEV_MISS

Description	Reports the number of times that access to a device had to wait.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_DEV_NAME

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_DEV_NAME

Description	Reports the name of each database device.
Version compatibility	11.0 and later
Data item type	Key
Server level	No
Result data items that require this key	None

Result data items for which this key is optional

SMC_NAME_DEV_HIT
SMC_NAME_DEV_HIT_PCT
SMC_NAME_DEV_IO
SMC_NAME_DEV_MISS
SMC_NAME_DEV_READ
SMC_NAME_DEV_WRITE

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_DEV_READ

Description	Reports the number of reads made from a database device.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_DEV_NAME

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_DEV_WRITE

Description	Reports the number of writes made to a database device.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_DEV_NAME

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_ELAPSED_TIME

Description	Reports the time increment, in seconds, either from one data refresh to the next (sample) or from the creation of the view to the present session.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG				

SMC_NAME_ENGINE_NUM

Description	Reports the number of an Adaptive Server engine.
Version compatibility	11.0 and later
Data item type	Key
Server level	No
Result data items that require this key	None

Result data items for which this key is optional

SMC_NAME_CPU_BUSY_PCT
SMC_NAME_CPU_PCT
SMC_NAME_CPU_TIME
SMC_NAME_CPU_YIELD
SMC_NAME_PAGE_INDEX_LOGICAL_READ
SMC_NAME_PAGE_INDEX_PHYSICAL_READ
SMC_NAME_PAGE_HIT_PCT
SMC_NAME_PAGE_IO
SMC_NAME_PAGE_LOGICAL_READ
SMC_NAME_PAGE_PHYSICAL_READ
SMC_NAME_PAGE_WRITE

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_HOST_NAME

Description	Reports the name of the host computer that established a particular connection to Adaptive Server.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None

Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_KPID

Description	Reports the Adaptive Server process identification number that remains unique over long periods of time.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_LOCK_CNT

Description	Reports the number of locks. This is an accumulated value.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_SPID, SMC_NAME_LOCK_TYPE, SMC_NAME_LOCK_RESULT, SMC_NAME_LOCK_RESULT_SUMMARY
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_LOCK_HIT_PCT

Description	Reports the percentage of successful requests for locks.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_LOCK_RESULT

Description

Reports the result of a logical lock request. Lock result values are:

- Granted immediately.
- Not needed; requestor already held a sufficient lock.
- Waited; requestor waited.
- Did not wait; lock was not available immediately and the requestor did not want the lock request to be queued.
- Deadlock; requestor selected as deadlock victim.
- Interrupted; the lock request was interrupted by attention condition.

Version compatibility	11.0 and later
Data item type	Key
Server level	No
Result data items that require this key	None
Result data items for which this key is optional	SMC_NAME_LOCK_CNT

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
ENUMS					

Enum SMC_LOCK_RESULT

SMC_NAME_LOCK_RESULT_SUMMARY

Description Reports the lock results summarized at a granted or not granted level.

- The lock result summary granted includes the granted, not needed, and waited lock results.
- The lock result summary not granted includes the did not wait, deadlock, and interrupted lock results.

Version compatibility 11.0 and later

Data item type Key

Server level No

Result data items that require this key None

Result data items for which this key is optional SMC_NAME_LOCK_CNT

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
ENUMS					

Enum SMC_LOCK_RESULT_SUMMARY

SMC_NAME_LOCK_STATUS

Description Reports the current status of a lock. The lock status values are:

- Held and blocking
- Held and not blocking
- Requested and blocked
- Requested and not blocked

Version compatibility	11.0 and later
Data item type	Key
Server level	No

Result data items that require this key

SMC_NAME_BLOCKING_SPID
SMC_NAME_DEMAND_LOCK
SMC_NAME_LOCK_STATUS_CNT
SMC_NAME_LOCKS_BEING_BLOCKED_CNT
SMC_NAME_TIME_WAITED_ON_LOCK

Result data items for which this key is optional: None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
ENUMS					

Enum: SMC_LOCK_STATUS

SMC_NAME_LOCK_STATUS_CNT

Description	Reports the number of locks in each lock status. This is a snapshot value.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	LOCK_STATUS
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_LOCK_TYPE

Description	Reports the type of lock used by Adaptive Server. Adaptive Server protects tables or data pages being used by active transactions by locking them. Adaptive Server uses the following lock types: • Exclusive table • Shared table • Exclusive intent • Shared intent • Exclusive page • Shared page • Update Page
Version compatibility	11.0 and later
Data item type	Key
Server level	No
Result data items that require this key	None

Result data items for which this key is optional

SMC_NAME_BLOCKING_SPID
SMC_NAME_DEMAND_LOCK
SMC_NAME_LOCK_CNT
SMC_NAME_LOCKS_BEING_BLOCKED_CNT
SMC_NAME_TIME_WAITED_ON_LOCK

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
ENUMS					

Enum — SMC_LOCK_TYPE

SMC_NAME_LOCKS_BEING_BLOCKED_CNT

Description	Reports the number of locks being blocked by the process that holds this “hold_and_blocking” lock.
Version compatibility	11.0 and later

Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID, SMC_NAME_DB_ID, SMC_NAME_OBJ_ID, SMC_NAME_LOCK_STATUS
Optional keys	SMC_NAME_LOCK_TYPE, SMC_NAME_PAGE_NUM

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_LOCKS_GRANTED_IMMED

Description	Reports the number of locks that were granted immediately, without having to wait for another lock to be released.
Version compatibility	11.5 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_SPID, SMC_NAME_APPLICATION_NAME, [SMC_NAME_DB_ID + SMC_NAME_OBJ_ID], [SMC_NAME_CUR_STMT_ACT_STP_DB_ID + SMC_NAME_CUR_STMT_ACT_STP_ID], [SMC_NAME_ACT_STP_DB_ID + SMC_NAME_ACT_STP_ID]

Note SMC_NAME_SPID and SMC_NAME_APPLICATION_NAME are mutually exclusive. If you use the SMC_NAME_CUR_STMT_ACT_STP_DB_ID + SMC_NAME_CUR_STMT_ACT_STP_ID key combination, you cannot use any other keys.

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_LOCKS_GRANTED_WAITED

Description	Reports the number of locks that were granted after waiting for another lock to be released.
Version compatibility	11.5 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_SPID, SMC_NAME_APPLICATION_NAME, [SMC_NAME_DB_ID + SMC_NAME_OBJ_ID], [SMC_NAME_CUR_STMT_ACT_STP_DB_ID + SMC_NAME_CUR_STMT_ACT_STP_ID], [SMC_NAME_ACT_STP_DB_ID + SMC_NAME_ACT_STP_ID]

Note SMC_NAME_SPID and SMC_NAME_APPLICATION_NAME are mutually exclusive. If you use the SMC_NAME_CUR_STMT_ACT_STP_DB_ID + SMC_NAME_CUR_STMT_ACT_STP_ID key combination, you cannot use any other keys.

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_LOCKS_NOT_GRANTED

Description	Reports the number of locks that were requested but not granted.
Version compatibility	11.5 and later
Data item type	Result
Server level	Yes
Required keys	None

Optional keys

SMC_NAME_SPID, SMC_NAME_APPLICATION_NAME,
[SMC_NAME_DB_ID + SMC_NAME_OBJ_ID],
[SMC_NAME_CUR_STMT_ACT_STP_DB_ID +
SMC_NAME_CUR_STMT_ACT_STP_ID],
[SMC_NAME_ACT_STP_DB_ID + SMC_NAME_ACT_STP_ID]

Note SMC_NAME_SPID and SMC_NAME_APPLICATION_NAME are mutually exclusive. If you use the SMC_NAME_CUR_STMT_ACT_STP_DB_ID + SMC_NAME_CUR_STMT_ACT_STP_ID key combination, you cannot use any other keys.

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_LOG_CONTENTION_PCT

Description

Reports the percentage of times, of the total times when a user log cache was flushed into the transaction log, that it had to wait for the log semaphore.

A high percentage may indicate that the user log cache size should be increased.

Version compatibility

11.0 and later

Data item type

Result

Server level

Yes

Required keys

None

Optional keys

None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_LOGIN_NAME

Description

Reports the login name associated with Adaptive Server processes.

Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	**VALUE_ SESSION**	**RATE_ SAMPLE**	**RATE_ SESSION**	**AVG_ SAMPLE**	**AVG_ SESSION**
CHARP					

SMC_NAME_MEM_CODE_SIZE

Description	Reports the amount of memory in bytes allocated for Adaptive Server.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	**VALUE_ SESSION**	**RATE_ SAMPLE**	**RATE_ SESSION**	**AVG_ SAMPLE**	**AVG_ SESSION**
LONG					

SMC_NAME_MEM_KERNEL_STRUCT_SIZE

Description	Reports the amount of memory in bytes allocated for the kernel structures.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_MEM_PAGE_CACHE_SIZE

Description	Reports the amount of memory in bytes allocated for the page cache.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_MEM_PROC_BUFFER

Description	Reports the amount of memory in bytes allocated for procedure buffers.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_MEM_PROC_HEADER

Description	Reports the amount of memory in bytes allocated for procedure headers.

Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_MEM_SERVER_STRUCT_SIZE

Description	Reports the amount of memory in bytes allocated for the Adaptive Server structures.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_MOST_ACT_DEV_IO

Description	Reports the number of combined reads and writes against the device with the most activity during a given time interval.
Version compatibility	11.0 and later
Server level	Yes
Data item type	Result
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_MOST_ACT_DEV_NAME

Description	Reports the name of the device with the largest number of combined reads and writes during a given time interval.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP	CHARP				

SMC_NAME_NET_BYTE_IO

Description	Reports the number of combined network bytes sent and received.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_NET_BYTES_RCVD

Description	Reports the number of network bytes received.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_NET_BYTES_SENT

Description	Reports the number of network bytes sent.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_NET_DEFAULT_PKT_SIZE

Description	Reports the default size of a network packet.
Type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_NET_MAX_PKT_SIZE

Description	Reports the maximum size configured for a network packet.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_NET_PKT_SIZE_RCVD

Description	Reports the average size of network packets received.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_NET_PKT_SIZE_SENT

Description	Reports the average size of network packets sent.

Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_NET_PKTS_RCVD

Description	Reports the number of network packets received.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_NET_PKTS_SENT

Description	Reports the number of network packets sent.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_NUM_ENGINES

Description	Reports the number of engines running on Adaptive Server.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_NUM_PROCESSES

Description	Reports the number of processes currently running on Adaptive Server, or, if used with the key SMC_NAME_APPLICATION_NAME, the number of processes currently running a given application.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_APPLICATION_NAME

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_OBJ_ID

Description	Reports the identification number of a database object where the object returned is either a table or a stored procedure.
Version compatibility	11.0 and later
Data item type	Key
Server level	No
Required keys	SMC_NAME_DB_ID

Result data items that require this key

SMC_NAME_BLOCKING_SPID
SMC_NAME_DEMAND_LOCK
SMC_NAME_LOCKS_BEING_BLOCKED_CNT
SMC_NAME_OBJ_NAME
SMC_NAME_OBJ_TYPE
SMC_NAME_OWNER_NAME
SMC_NAME_TIME_WAITED_ON_LOCK

Result data items for which this key is optional

SMC_NAME_LOCKS_GRANTED_IMMED
SMC_NAME_LOCKS_GRANTED_WAITED
SMC_NAME_LOCKS_NOT_GRANTED
SMC_NAME_PAGE_INDEX_LOGICAL_READ
SMC_NAME_PAGE_INDEX_PHYSICAL_READ
SMC_NAME_PAGE_HIT_PCT
SMC_NAME_PAGE_IO
SMC_NAME_PAGE_LOGICAL_READ
SMC_NAME_PAGE_PHYSICAL_READ
SMC_NAME_PAGE_WRITE

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

If you create a view using the SMC_NAME_OBJ_ID data item, you might see negative numbers as object IDs. Negative object IDs are an accurate reporting of IDs as assigned by Adaptive Server.

Monitor Server reports on *all* activity, including activity on temporary tables that Adaptive Server creates to perform a complex query. The object IDs that Adaptive Server assigns to temporary tables can be positive or negative. The object ID that was assigned by Adaptive Server is reported.

SMC_NAME_OBJ_NAME

Description	Reports the name of a database object. In views that show SMC_NAME_OBJ_NAME, the string **TempObject** is reported for temporary tables.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_DB_ID, SMC_NAME_OBJ_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_OBJ_TYPE

Description	Reports the type of database object, table, or stored procedure.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_DB_ID, SMC_NAME_OBJ_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
ENUMS					

Enum SMC_OBJ_TYPE

SMC_NAME_OWNER_NAME

Description	Reports the owner name of the database object.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_DB_ID, SMC_NAME_OBJ_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_PAGE_HIT_PCT

Description	Reports the percentage of times that a data page read could be satisfied from cache without requiring a physical page read.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_SPID, [SMC_NAME_DB_ID + SMC_NAME_OBJ_ID], [SMC_NAME_ACT_STP_DB_ID + SMC_NAME_ACT_STP_ID], SMC_NAME_ENGINE_NUM

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_PAGE_INDEX_LOGICAL_READ

Description	Reports the number of index page reads satisfied from cache or from device reads.
Version compatibility	11.0 and later

Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_SPID, SMC_NAME_APPLICATION_NAME, SMC_NAME_DB_ID, SMC_NAME_OBJ_ID, SMC_NAME_ENGINE_NUM, [SMC_NAME_ACT_STP_DB_ID + SMC_NAME_ACT_STP_ID]

Note SMC_NAME_SPID and SMC_NAME_APPLICATION_NAME are mutually exclusive.

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_PAGE_INDEX_PHYSICAL_READ

Description	Reports the number of index page reads that could not be satisfied from the data cache.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	None
Optional keys	SMC_NAME_SPID, SMC_NAME_APPLICATION_NAME, SMC_NAME_DB_ID, SMC_NAME_OBJ_ID, SMC_NAME_ENGINE_NUM, [SMC_NAME_ACT_STP_DB_ID + SMC_NAME_ACT_STP_ID]

Note SMC_NAME_SPID and SMC_NAME_APPLICATION_NAME are mutually exclusive.

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_PAGE_IO

Description	Reports the number of combined logical page reads and page writes.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_SPID, SMC_NAME_APPLICATION_NAME, [SMC_NAME_DB_ID + SMC_NAME_OBJ_ID], [SMC_NAME_ACT_STP_DB_ID + SMC_NAME_ACT_STP_ID], SMC_NAME_ENGINE_NUM

Note SMC_NAME_SPID and SMC_NAME_APPLICATION_NAME are mutually exclusive.

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_PAGE_LOGICAL_READ

Description	Reports the number of data page reads, whether satisfied from cache or from a database device.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_SPID, SMC_NAME_APPLICATION_NAME, SMC_NAME_DB_ID, SMC_NAME_OBJ_ID, SMC_NAME_ENGINE_NUM, [SMC_NAME_ACT_STP_DB_ID + SMC_NAME_ACT_STP_ID]

Note SMC_NAME_SPID and SMC_NAME_APPLICATION_NAME are mutually exclusive.

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_PAGE_NUM

Description	Reports the number of the data page for a given lock or lock request.
Version compatibility	11.0 and later
Data item type	Key
Server level	No
Result data items that require this key	None

Result data items for which this key is optional

SMC_NAME_BLOCKING_SPID
SMC_NAME_DEMAND_LOCK
SMC_NAME_LOCKS_BEING_BLOCKED_CNT
SMC_NAME_TIME_WAITED_ON_LOCK

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_PAGE_PHYSICAL_READ

Description	Reports the number of data page reads that could not be satisfied from the data cache.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None

Optional keys

SMC_NAME_SPID, SMC_NAME_APPLICATION_NAME, SMC_NAME_DB_ID, SMC_NAME_OBJ_ID, SMC_NAME_ENGINE_NUM, [SMC_NAME_ACT_STP_DB_ID + SMC_NAME_ACT_STP_ID]

Note SMC_NAME_SPID and SMC_NAME_APPLICATION_NAME are mutually exclusive.

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_PAGE_WRITE

Description	Reports the number of data pages written to a database device.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	SMC_NAME_SPID, SMC_NAME_APPLICATION_NAME, SMC_NAME_DB_ID, SMC_NAME_OBJ_ID, SMC_NAME_ENGINE_NUM, [SMC_NAME_ACT_STP_DB_ID + SMC_NAME_ACT_STP_ID]

Note SMC_NAME_SPID and SMC_NAME_APPLICATION_NAME are mutually exclusive.

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_PROC_STATE

Description

Reports the state of a process. The possible states are:

- None
- Alarm Sleep
- Background
- Bad Status
- Infected
- Lock Sleep
- Received Sleep
- Remote IO
- Runnable
- Running
- Send Sleep
- Sleeping
- Stopped
- Sync Sleep
- Terminating
- Yielding

Version compatibility	11.0 and later
Data item type	Key
Server level	No
Result data items that require this key	SMC_NAME_PROC_STATE_CNT
Result data items for which this key is optional	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
ENUMS					

Enum SMC_PROC_STATE

SMC_NAME_PROC_STATE_CNT

Description	Reports the number of processes in a particular state.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_PROC_STATE
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_SPID

Description	Reports the process identification number. Views that contain SMC_NAME_SPID only report on processes that are active as of the end of the sample period. SMC_NAME_SPID is mutually exclusive with SMC_NAME_APPLICATION_NAME in a view.
Version compatibility	11.0 and later
Data item type	Key
Server level	No

Result data items that require this key

SMC_NAME_BLOCKING_SPID
SMC_NAME_CONNECT_TIME
SMC_NAME_CPU_PCT
SMC_NAME_CPU_TIME
SMC_NAME_CUR_APP_NAME
SMC_NAME_CUR_ENGINE
SMC_NAME_CUR_EXECUTION_CLASS
SMC_NAME_CUR_PROC_STATE
SMC_NAME_CUR_STMT_ACT_STP_DB_NAME
SMC_NAME_CUR_STMT_ACT_STP_NAME
SMC_NAME_CUR_STMT_ACT_STP_OWNER_NAME
SMC_NAME_CUR_STMT_ACT_STP_TEXT
SMC_NAME_CUR_STMT_BATCH_TEXT

SMC_NAME_CUR_STMT_CPU_TIME
SMC_NAME_CUR_STMT_ELAPSED_TIME
SMC_NAME_CUR_STMT_LINE_NUM
SMC_NAME_CUR_STMT_LOCKS_GRANTED_IMMED
SMC_NAME_CUR_STMT_LOCKS_GRANTED_WAITED
SMC_NAME_CUR_STMT_LOCKS_NOT_GRANTED
SMC_NAME_CUR_STMT_PAGE_IO_CNT
SMC_NAME_CUR_STMT_PAGE_CACHE_READ_CNT
SMC_NAME_CUR_STMT_PAGE_PHYSICAL_READ_CNT
SMC_NAME_CUR_STMT_PAGE_WRITE_CNT
SMC_NAME_CUR_STMT_QUERY_PLAN_TEXT
SMC_NAME_CUR_STMT_START_TIME
SMC_NAME_CUR_STMT_TEXT_BYTE_OFFSET
SMC_NAME_DEMAND_LOCK
SMC_NAME_HOST_NAME
SMC_NAME_KPID
SMC_NAME_LOCKS_BEING_BLOCKED_CNT
SMC_NAME_LOGIN_NAME
SMC_NAME_TIME_WAITED_ON_LOCK

Result data items for which this key is optional

SMC_NAME_LOCK_CNT
SMC_NAME_LOCKS_GRANTED_IMMED
SMC_NAME_LOCKS_GRANTED_WAITED
SMC_NAME_LOCKS_NOT_GRANTED
SMC_NAME_PAGE_INDEX_LOGICAL_READ
SMC_NAME_PAGE_INDEX_PHYSICAL_READ
SMC_NAME_PAGE_LOGICAL_READ
SMC_NAME_PAGE_PHYSICAL_READ
SMC_NAME_PAGE_WRITE
SMC_NAME_STP_CPU_TIME
SMC_NAME_STP_NUM_TIMES_EXECUTED

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_SQL_SERVER_NAME

Description	Reports the name of the Adaptive Server that is being monitored as specified in the -s parameter to the start-up command of the Monitor Server to which the application is connected.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_SQL_SERVER_VERSION

Description	Reports the version of the Adaptive Server that is being monitored. For more information, refer to the global *@@version* variable in the *Transact-SQL User's Guide*.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_STP_CPU_TIME

Description	Reports the CPU time, in seconds, spent executing a stored procedure.
Version compatibility	11.0 and later

Data item type	Result
Server level	No
Required keys	SMC_NAME_ACT_STP_DB_ID, SMC_NAME_ACT_STP_ID
Optional keys	SMC_NAME_SPID, SMC_NAME_STP_STMT_NUM, SMC_NAME_STP_LINE_NUM

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE			DOUBLE	DOUBLE

SMC_NAME_STP_ELAPSED_TIME

Description	Reports the time, in seconds, spent executing a stored procedure.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_ACT_STP_DB_ID, SMC_NAME_ACT_STP_ID
Optional keys	SMC_NAME_STP_STMT_NUM, SMC_NAME_STP_LINE_NUM

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE			DOUBLE	DOUBLE

SMC_NAME_STP_EXECUTION_CLASS

Description	Reports the configured execution class, if any, for a given stored procedure.
Version compatibility	11.5 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_ACT_STP_DB_ID, SMC_NAME_ACT_STP_ID
Optional keys	SMC_NAME_STP_STMT_NUM, SMC_NAME_STP_LINE_NUM

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_STP_HIT_PCT

Description	Reports the percentage of times that a stored procedure execution found the procedure's query plan in procedure cache and available for use.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_STP_LINE_NUM

Description	Reports the stored procedure line number.
Version compatibility	11.0 and later
Data item type	Key
Server level	No
Result data items that require this key	None

Result data items for which this key is optional

SMC_NAME_STP_CPU_TIME
SMC_NAME_STP_ELAPSED_TIME
SMC_NAME_STP_NUM_TIMES_EXECUTED

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_STP_LINE_TEXT

Description	Reports the entire text of the stored procedure.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_ACT_STP_DB_ID, SMC_NAME_ACT_STP_ID
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_STP_LOGICAL_READ

Description	Reports the number of requests to execute a stored procedure, whether satisfied from procedure cache or with a read from *sysprocedures*.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_STP_NUM_TIMES_EXECUTED

Description	Reports the number of times a stored procedure, or a line in a stored procedure, was executed.
Version compatibility	11.0 and later
Data item type	Result
Server level	No

Required keys	SMC_NAME_ACT_STP_DB_ID, SMC_NAME_ACT_STP_ID
Optional keys	SMC_NAME_SPID, SMC_NAME_STP_STMT_NUM, SMC_NAME_STP_LINE_NUM

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_STP_PHYSICAL_READ

Description	Reports the number of requests to execute a stored procedure for which a read from *sysprocedures* was necessary.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_STP_STMT_NUM

Description	Reports the number within a stored procedure. A single stored procedure line may contain one or more statements.
Version compatibility	11.0 and later
Data item type	Key
Server level	No
Result data items that require this key	None

Result data items for which this key is optional

SMC_NAME_STP_CPU_TIME
SMC_NAME_STP_ELAPSED_TIME
SMC_NAME_STP_NUM_TIMES_EXECUTED

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_THREAD_EXCEEDED_MAX

Description	Reports the number of times a query plan was runtime-adjusted because of attempting to exceed the configured limit of threads in the server-wide worker thread pool in Adaptive Server.
Version compatibility	11.5 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_THREAD_EXCEEDED_MAX_PCT

Description	Reports the percentage of time a query plan was adjusted at runtime because it tried to exceed the configured limit of threads in the server-wide worker thread pool in Adaptive Server.
Version compatibility	11.5 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DOUBLE	DOUBLE				

SMC_NAME_THREAD_MAX_USED

Description	Reports the maximum number of threads from the server-wide worker thread pool that were concurrently in use on the server.
Version compatibility	11.5 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_TIME_WAITED_ON_LOCK

Description	Reports the amount of time (in seconds) waited for a lock request to be granted.
Version compatibility	11.0 and later
Data item type	Result
Server level	No
Required keys	SMC_NAME_SPID, SMC_NAME_DB_ID, SMC_NAME_OBJ_ID, SMC_NAME_LOCK_STATUS
Optional keys	SMC_NAME_LOCK_TYPE, SMC_NAME_PAGE_NUM

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG					

SMC_NAME_TIMESTAMP

Description	Reports the date and time on Adaptive Server in its time zone. For more information, refer to the getdate() function in the *Transact-SQL User's Guide*.
Version compatibility	11.0 and later
Data item type	Result

Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
CHARP					

SMC_NAME_TIMESTAMP_DATIM

Description	Reports the date and time on Adaptive Server in its time zone, returned in a CS_DATETIME struct. For more information, refer to the getdate() function in the *Transact-SQL User's Guide*.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
DATIM					

SMC_NAME_XACT

Description	Reports the number of committed Transact-SQL statement blocks (transactions).
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_XACT_DELETE

Description	Reports the number of rows deleted from database tables.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_XACT_DELETE_DEFERRED

Description	Reports the number of rows deleted from a database table that were done in deferred mode.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_XACT_DELETE_DIRECT

Description	Reports the number of rows deleted from a database table that were done in direct mode.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_XACT_INSERT

Description	Reports the number of insertions into a database table.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_XACT_INSERT_CLUSTERED

Description	Reports the number of insertions to database tables that have a clustered index.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes

Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_XACT_INSERT_HEAP

Description	Reports the number of insertions to database tables that do not have a clustered index.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_XACT_SELECT

Description	Reports the number of SELECT or OPEN CURSOR statements.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_XACT_UPDATE

Description	Reports the updates to database tables.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_XACT_UPDATE_DEFERRED

Description	Reports the updates to a database table that are performed in deferred mode rather than in direct mode.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_XACT_UPDATE_DIRECT

Description	Reports the sum of expensive, in-place, and not-in-place updates (everything except updates deferred). Also called updates in place.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes

Required keys	None
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_XACT_UPDATE_EXPENSIVE

Description	Reports the updates to a database table that are done in expensive mode. In expensive mode, a row is deleted from its original location, and inserted at a new location.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_XACT_UPDATE_IN_PLACE

Description	Reports the updates that do not require a delete and insert.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None
Statistic types and datatypes	

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

SMC_NAME_XACT_UPDATE_NOT_IN_PLACE

Description	Reports the updates that require a delete and insert.
Version compatibility	11.0 and later
Data item type	Result
Server level	Yes
Required keys	None
Optional keys	None

Statistic types and datatypes

VALUE_ SAMPLE	VALUE_ SESSION	RATE_ SAMPLE	RATE_ SESSION	AVG_ SAMPLE	AVG_ SESSION
LONG	LONG	DOUBLE	DOUBLE		

CHAPTER 3

Monitor Client Library Functions

In addition to giving you detailed information about Monitor Client Library functions, this chapter contains the following topics:

You use Monitor Client Library functions to write applications that collect Adaptive Server performance data. This chapter describes, in alphabetical order, each Monitor Client Library function. Table 3-1 lists the functions and a brief description of each.

Table 3-1: Monitor Client Library functions

Function	Description
smc_close	Closes a connection
smc_connect_alloc	Creates a connection structure
smc_connect_drop	Deallocates a connection structure
smc_connect_ex	Establishes a connection
smc_connect_props	Sets, retrieves, or clears properties on a connection
smc_create_alarm_ex	Adds an alarm to a data item
smc_create_filter	Adds a filter to a data item
smc_create_playback_session	Initializes a playback session on a Historical Server connection
smc_create_recording_session	Initializes a recording session on a Historical Server connection
smc_create_view	Defines a view
smc_drop_alarm	Removes an alarm from a data item in a view
smc_drop_filter	Removes a filter from a data item in a view
smc_drop_view	Drop a views
smc_get_command_info	Retrieves detailed information about an alarm or error
smc_get_dataitem_type	Retrieves the type of a data item

Function	Description
smc_get_dataitem_value	Retrieves the data for a particular data item and row
smc_get_row_count	Retrieves the number of rows of data in a view
smc_get_version_string	Retrieves the Monitor Client Library version number
smc_initiate_playback	Concludes the definition of views for a playback session
smc_initiate_recording	Concludes the definition of views for a recording session
smc_refresh_ex	Retrieves data for all views in a given connection
smc_terminate_playback	Ends a playback session on a Historical Server connection
smc_terminate_recording	Cancels a recording session on a Historical Server connection

Most functions work with Monitor Server and Historical Server. In this chapter, unless otherwise noted, the term connection means a connection to Monitor Server or Historical Server. See Appendix C, “Backward Compatibility” for information about obsolete functions.

Threads

Two threads cannot use Monitor Client Library functions at the same time. Use a global lock (semaphore) on Monitor Client Library calls to avoid any thread overwrites or unpredictable actions.

Monitor Client Library functions are not protected from reentrant invocation. Use the following special programming considerations when using these functions in a multithreaded environment. Be sure that:

- A call to create a client connection (smc_connect) is serialized with all other Monitor Client Library function calls across all threads.
- A call to disconnect a client connection (smc_disconnect) is serialized with all other Monitor Client Library function calls across all threads.

- Any single client connection lives in one, and only one, thread. All Monitor Client Library function calls to access this client connection occur in this thread.
- A call to refresh a client connection is serialized with all other Monitor Client Library function calls on this connection in this thread.

Error handling

A Monitor Client Library application installs an error handler when it creates a connection (smc_connect_alloc, described on 131). This error handler is called whenever an error occurs for that connection.

Most Monitor Client Library functions return one of the following values:

Table 3-2: Return values

Return value	Description
SMC_RET_SUCCESS	The function completed successfully.
SMC_RET_FAILURE	The function failed. More detailed information is available from the error handler.
SMC_RET_INVALID_CONNECT	The function did not execute because it was requested against an erroneous connection. The error handler is not invoked because error handlers are available only for valid connections.

Other return values are listed with the functions that return them.

Note The error callback function is not triggered under certain error conditions regarding data item specification in smc_create_view and smc_create_alarm. To capture these error conditions, check the return code for these functions.

Error handler

Description

An error handler is a user-defined function.

Syntax

```
SMC_VOID ErrorCallback (
 SMC_CONNECT_ID clientId,
 SMC_COMMAND_ID commandId,
 SMC_VOIDP userDataHandle)
```

Parameters

clientId
identifies a Monitor connection.

commandId
identifies an instance of a command.

userDataHandle
user-supplied pointer.

Usage

- An error handler can be changed at any time via either smc_change_error_handler or smc_connect_props functions. (See Callback function on page 128 for more information)

Note C++ member functions cannot be used as callback functions.

Callback function

Description

Callback functions are user-defined functions that notify an application when an event has occurred. These functions are registered with Monitor Client Library API calls for:

- Alarms
- Error information

When either of the above events occur, a callback function is executed.

Syntax

```
SMC_VOID CallbackFunction
 (SMC_CONNECT_ID clientId,
             SMC_COMMAND_ID commandId,
             SMC_VOIDP userDataHandle)
```

Parameters

clientId
identifies the connection.

commandId
identifies the instance of a command.

userDataHandle
user data pointer for a given connection. An application can set this pointer by using smc_connect_props.

Usage

Accessing callback data When an event triggers a callback function, you can request information about the event. Data is accessed by calling smc_get_command_info from within the callback function. This function takes a connection ID, a command ID, and an enumerator constant that identifies which piece of data the user is interested in. The data available depends on the type of callback. Table 3-3 describes the data available for alarm callbacks. Table 3-4 describes the data available for error callbacks.

Table 3-3: Data available for alarm callbacks

Information type	Description
SMC_INFO_ALARM_ACTION_DATA	String supplied for *alarmActionData* upon creation of the alarm.
SMC_INFO_ALARM_ALARMID	Identifies the alarm.
SMC_INFO_ALARM_CURRENT_VALUE	Current value that met or exceeded the alarm threshold.
SMC_INFO_ALARM_DATAITEM	Data item on which the alarm was set. Points to a SMC_DATAITEM_STRUCT.
SMC_INFO_ALARM_ROW	Row containing the data item value that triggered the alarm.
SMC_INFO_ALARM_THRESHOLD_VALUE	Threshold value defined for this alarm.
SMC_INFO_ALARM_TIMESTAMP	Time (in the Adaptive Server time zone) marking the end of the sample interval in whose data the alarm condition was met.
SMC_INFO_ALARM_VIEWID	Identifies a view created on the connection.

Table 3-4: Data available for error callbacks

Information type	Description
SMC_INFO_ERR_MAPSEVERITY	Monitor Client Library severity level.
SMC_INFO_ERR_MSG	Text of the error message. (See Appendix D, “Troubleshooting Information and Error Messages”.)
SMC_INFO_ERR_NUM	Number of the error.
SMC_INFO_ERR_SEVERITY	Severity of the error message.

Information type	Description
SMC_INFO_ERR_SOURCE	Source of the error message. One of the following: • SMC_SRC_UNKNOWN – not known • SMC_SRC_HS – Historical Server • SMC_SRC_SMC – Monitor Client Library • SMC_SRC_CT – Client Library • SMC_SRC_SS – Adaptive Server • SMC_SRC_SMS – Monitor Server
SMC_INFO_ERR_STATE	State of the error. Useful for technical support in diagnosing internal errors.

smc_close

Description

Closes a connection that was created with smc_connect_ex. This function terminates the connection but does not deallocate it. Use smc_connect_drop to deallocate a connection structure.

Syntax

```
SMC_RETURN_CODE smc_close
 (SMC_CONNECT_ID        clientId,
          SMC_CLOSE_TYPE        closeType)
```

Parameters

clientId
identifies the connection.

closeType
type of close: SMC_CLOSE_REQUEST

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

This example assumes that you have created a connection and have a *clientId*.

```
if (smc_close(clientId,SMC_CLOSE_REQUEST)
        != SMC_RET_SUCCESS)
 {
        printf("smc_close failed\n");
        /* do some cleanup */
```

```
    }
```

Usage

- All views (as well as alarms and filters associated with the data items in the view) on the specified connection are also dropped.
- smc_close only disconnects a connection. Call smc_connect_drop to deallocate a connection structure.
- If smc_close returns a failure, the user is advised to call smc_connect_drop.

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	Yes

Errors

Error	Indicates
SMC_RET_INTERNAL_ERROR	Internal error
SMC_RET_INVALID_API_FUNCTION	Invalid use of obsolete and replacement functions in the same connection
SMC_RET_INVALID_API_FUNC_ SEQUENCE	Invalid calling sequence of Monitor Client Library functions

See also

smc_connect_drop, smc_connect_ex

smc_connect_alloc

Description

Creates a connection structure with error callback, but does not establish a connection.

Syntax

```
SMC_RETURN_CODE smc_connect_alloc
 (SMC_GEN_CALLBACK     ErrCallback,
          SMC_CONNECT_IDP      clientIdHandle)
```

Parameters

ErrCallback

Pointer to error callback function.

clientIdHandle

Pointer to a variable, which should be declared as type SMC_CONNECT_ID. If the call to smc_connect succeeds, this variable contains the ID for the Monitor connection.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.

Examples

The following example assumes you have defined an error callback function, *myErrorHandler*.

```
SMC_CONNECT_ID  clientId;
 if (smc_connect_alloc(myErrorHandler,&clientId)
      != SMC_RET_SUCCESS)
 {
      printf("smc_connect_alloc failed\n");
      exit(1);
 }
```

Usage

- The error handler parameter cannot be null.
- Use smc_connect_props to set properties on a connection.
- Use smc_connect_ex to establish the connection identified by *clientIdHandle*.
- Use smc_connect_drop to deallocate a connection structure created with smc_connect_alloc.

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	Yes

Errors

Error	Indicates
SMC_RET_INSUFFICIENT_MEMORY	Insufficient memory
SMC_RET_INTERNAL_ERROR	Internal error

See also

smc_connect_drop, smc_connect_ex, smc_connect_props

smc_connect_drop

Description

Deallocates a connection structure that was created with smc_connect_alloc.

Syntax

SMC_RETURN_CODE smc_connect_drop
 (SMC_CONNECT_ID *clientId*)

Parameters

clientId
identifies the connection.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

This example assumes that:

- You have created a connection using smc_connect_alloc and have a *clientId*.
- You have successfully executed smc_close on the connection.

```
if (smc_connect_drop(clientId) != SMC_RET_SUCCESS) {
   printf("smc_connect_drop failed\n");
   /* do some cleanup */
 }
```

Usage

- smc_close must be called before smc_connect_drop, if a connection was successfully made.

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	Yes

Errors

Error	Indicates
SMC_RET_CONNECT_NOT_CLOSED	Connection has not been closed
SMC_RET_INVALID_API_FUNCTION	Invalid use of obsolete and replacement functions on the same connection
SMC_RET_INVALID_API_FUNC_SEQUENCE	Invalid calling sequence of Monitor Client Library functions

See also

smc_close, smc_connect_alloc

smc_connect_ex

Description

Establishes a connection for the connection structure created with smc_connect_alloc. Properties on the connection, such as Server Name and Server Mode, must have been set with smc_connect_props.

Syntax

```
SMC_RETURN_CODE smc_connect_ex
 (SMC_CONNECT_ID        clientId)
```

Parameters

clientId
identifies the connection.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

This example assumes you have created a connection using smc_connect_alloc and have a *clientId*.

```
if (smc_connect_ex(clientId) != SMC_RET_SUCCESS)
 {
       printf("smc_connect_ex failed\n");
       exit(1);
 }
```

Usage

- smc_connect_alloc and smc_connect_props must be called before smc_connect_ex.
- Each Monitor Client Library connection uses two network connections. If you are running a Monitor Client Library application on a PC and reach the limit on network connections, reconfigure your networking software to raise the limit.

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	Yes

Errors

Error	Indicates
SMC_RET_INSUFFICIENT_MEMORY	Insufficient memory
SMC_RET_INTERNAL_ERROR	Internal error

Error	Indicates
SMC_RET_INVALID_API_FUNCTION	Invalid use of obsolete and replacement functions on the same connection
SMC_RET_INVALID_API_FUNC_SEQUENCE	Invalid calling sequence of Monitor Client Library functions
SMC_RET_INVALID_PROPERTY	Property has not been set
SMC_RET_UNABLE_TO_CONNECT_TO_SMS	Cannot connect to Monitor Server
SMC_RET_UNABLE_TO_CONNECT_TO_SS	Cannot connect to Adaptive Server

See also

smc_close, smc_connect_alloc

smc_connect_props

Description

Sets, retrieves, or clears properties on a connection.

Syntax

```
SMC_RETURN_CODE smc_connect_props
 (SMC_CONNECT_ID      clientId,
        SMC_PROP_ACTION      propertyAction,
        SMC_PROP_TYPE        property,
        SMC_VALUE_UNIONP     propertyValue,
        SMC_SIZET            bufferLength,
        SMC_SIZETP           outputLengthHandle)
```

Parameters

clientId
identifies the connection.

propertyAction
Property action type. Valid types are:

- SMC_PROP_ACT_CLEAR – reset the value of the specified property to its default.
- SMC_PROP_ACT_GET – retrieve the value of the specified property.
- SMC_PROP_ACT_SET – set the value of the specified property.

property
the symbolic name of the property whose value is being set, retrieved, or cleared. See Table 3-5 on page 138 for a list of this argument's legal values.

propertyValue
if *propertyAction* is:

- SMC_PROP_ACT_CLEAR – *propertyValue* is ignored.
- SMC_PROP_ACT_GET – pointer to the union in which smc_connect_props will place the requested information.
- SMC_PROP_ACT_SET – pointer to the union that contains the value to which property is to be set.

bufferLength
the length of data in bytes of *(*propertyValue*->*stringValue*). Used only if *propertyValue* is a pointer to a string. If *propertyAction* is:

- SMC_PROP_ACT_CLEAR – *bufferLength* is ignored, and must be passed SMC_UNUSED.
- SMC_PROP_ACT_GET – *bufferLength* is ignored, and must be passed SMC_UNUSED.
- SMC_PROP_ACT_SET – *bufferLength* must contain the number of bytes of *(*propertyValue*-> *stringValue*) or SMC_NULLTERM to indicate the string's length by a terminating null byte.

outputLengthHandle
a pointer to an integer variable. Used only if *propertyValue* is a pointer to a string. If *propertyAction* is:

- SMC_PROP_ACT_CLEAR – *outputLengthHandle* is ignored, and must be passed null.
- SMC_PROP_ACT_GET – the length in bytes of the requested information. Contains the number of bytes that were actually written to *propertyValue*->*stringValue* (not including the null-terminating byte). Pass null if this information is not desired.
- SMC_PROP_ACT_SET – *outputLengthHandle* is ignored, and must be passed null.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

This example assumes that you have previously allocated a connection using smc_connect_alloc and have a *clientId*.

```
SMC_VALUE_UNION  value.sizetValue = 512;
 if (smc_connect_props(clientId,
     SMC_PROP_ACT_SET,
     SMC_PROP_PACKETSIZE,
     &value,
     0,
     NULL) != SMC_RET_SUCCESS)
 {
       printf("smc_connect_props failed\n");
       /* do some cleanup */
 }
```

Usage

- A property resets to its default value when cleared.
- smc_connect_props must be called after smc_connect_alloc.
- The following properties must be set on a connection before calling smc_connect_ex:
    - SMC_PROP_PASSWORD
    - SMC_PROP_SERVERNAME
    - SMC_PROP_USERNAME
- The *serverMode* determines which other Monitor Client Library functions are applicable for the connection. For example, smc_create_recording_session is not applicable for a live connection.
- The *serverMode* (specified upon creation of a connection) determines the behavior of the common functions. For example, smc_create_view can be used to create a live view or a historical view.
- For live connections and historical connections for defining recording sessions, the property SMC_PROP_USERNAME must be set to either “sa”, the name of an Adaptive Server account having sa_role, or the name of an Adaptive Server account with execute permission on the stored procedure master.dbo.mon_rpc_connect.
- To retrieve only the length of a string, pass null for *propertyValue* and a valid pointer for *outputLengthHandle*.
- For the definition of a SMC_VALUE_UNION structure, see “Union: SMC_VALUE_UNION” on page 240.

- For data of type SMC_CHARP, *stringValue* points to the value. The Monitor Client Library allocates the memory for this string and the calling application must deallocate it using free().
- The following properties are only valid before a connection is made:
    - SMC_PROP_APPNAME
    - SMC_PROP_IFILE
    - SMC_PROP_PASSWORD
    - SMC_PROP_SERVERMODE
    - SMC_PROP_SERVERNAME
    - SMC_PROP_USERNAME.

  If these properties are changed on a connection after it has been established, they take effect during the next call to smc_connect_ex.
- Table 3-5 summarizes the Monitor Client Library properties, whether they can be set, retrieved, or cleared, and the datatype of each property value:

Table 3-5: Monitor Client Library connection properties

Property	Set/ Get/ Clear	*propertyValue is	Default
SMC_PROP_APPNAME	All	SMC_CHARP	An empty string
SMC_PROP_ERROR_ CALLBACK	Set/ Get	A function pointer (use *voidpValue* member of SMC_VALUE_UNI ON)	
SMC_PROP_IFILE	All	SMC_CHARP	Empty string, signifying the *interfaces* file in directory where the *SYBASE* environment variable points (on Windows, *sql.ini* in the *ini* subdirectory)

Property	Set/ Get/ Clear	*propertyValue is	Default
SMC_PROP_LOGIN_TIMEOUT	All	SMC_SIZET	0 (Use the server default)
SMC_PROP_PACKETSIZE	All	SMC_SIZET	0 (Use the server default)
SMC_PROP_PASSWORD	Set/ Clear	SMC_CHARP	An empty string
SMC_PROP_SERVERMODE	All	SMC_INT	SMC_SERVER_M_LIVE
SMC_PROP_SERVERNAME	All	SMC_CHARP	An empty string
SMC_PROP_TIMEOUT	All	SMC_SIZET	0 (Use the server default)
SMC_PROP_USERDATA	All	SMC_VOIDP	NULL
SMC_PROP_USERNAME	All	SMC_CHARP	An empty string

Properties

Property	Description
SMC_PROP_APPNAME	The name of the application using Monitor Client Library. This property can be modified at any time, but takes effect only when smc_connect_ex is called.
SMC_PROP_ERROR_ CALLBACK	The error callback function. This property can be modified at any time during the connection.
SMC_PROP_IFILE	The *interfaces* file. This property can be modified at any time, but takes effect only when smc_connect_ex is called.
SMC_PROP_LOGIN_TIMEOUT	The timeout value (in seconds) used during login time. This property can be modified at any time, but takes effect when only smc_connect_ex is called.
SMC_PROP_PACKETSIZE	The packet size to use for communicating to the servers. This property can be modified at any time during the connection.
SMC_PROP_PASSWORD	The password. This property can be modified at any time, but takes effect only when smc_connect_ex is called.

Property	Description
SMC_PROP_SERVERMODE	The server mode. This property can be set only before a connection is established. It can be modified at any time, but takes effect when only smc_connect_ex is called. The value is an enum: SMC_SERVER_MODE. See “Enum: SMC_SERVER_MODE” on page 239.
SMC_PROP_SERVERNAME	The server name. This property can be modified at any time, but takes effect only when smc_connect_ex is called.
SMC_PROP_TIMEOUT	The timeout value to use for requests sent to the servers. This property can be modified at any time during the connection.
SMC_PROP_USERDATA	A user-supplied pointer. This pointer is passed back to callback functions. It can be changed at any time on an available connection.
SMC_PROP_USERNAME	The *username* to use for this connection. This property can be modified at any time, but takes effect only when smc_connect_ex is called.

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	Yes

Errors

Error	Indicates
SMC_RET_INVALID_API_FUNCTION	Invalid use of obsolete and replacement functions in program.
SMC_RET_INVALID_PARAMETER	Invalid parameter value.

See also smc_connect_alloc, smc_connect_ex

smc_create_alarm_ex

Description Creates an alarm on one data item within a view on a connection.

Syntax

```
SMC_RETURN_CODE smc_create_alarm_ex
 (SMC_CONNECT_ID        clientId,
             SMC_VIEW_ID            viewId,
             SMC_DATAITEM_STRUCTP    dataItemHandle,
             SMC_VALUE_UNIONP        alarmValueDataHandle,
             SMC_DATAITEM_TYPE       alarmDatatype,
             SMC_ALARM_ACTION_TYPE   alarmActionType,
             SMC_CHARP               alarmActionData,
             SMC_VOIDP               userDataHandle,
             SMC_GEN_CALLBACK        alarmCallback,
             SMC_ALARM_IDP           alarmIdHandle)
```

Parameters

clientId
identifies the connection.

viewId
identifies a view created on the connection.

dataItemHandle
pointer to data item and statistic type.

alarmValueDataHandle
pointer to threshold at or above which the alarm is triggered.

alarmDatatype
the datatype of the alarm value must be one of the following and must match the expected datatype for the given data item:

- SMC_DI_TYPE_DOUBLE
- SMC_DI_TYPE_INT
- SMC_DI_TYPE_LONG

alarmActionType

- SMC_ALARM_A_NOTIFY
 (SMC_SERVER_ M_LIVE mode only) – invokes the alarm callback.
- SMC_ALARM_A_EXEC_PROC (SMC_SERVER_ M_HISTORICAL mode only) – invokes the specified external program.
- SMC_ALARM_A_LOG_TO_FILE (SMC_SERVER_ M_HISTORICAL mode only) – writes a message to the log file.

alarmActionData
pointer to null-terminated string whose contents depend on *alarmActionType*. If *alarmActionType* equals:

- SMC_ALARM_A_NOTIFY – *alarmActionData* is ignored.
- SMC_ALARM_A_EXEC_PROC – null-terminated string that contains the filename and optional parameter list of the program to invoke.

- SMC_ALARM_A_LOG_TO_FILE – null-terminated string that contains the log file name.

These file names are on the system where Historical Server is running (which need not be where the application is running). The Historical Server must have access to the files.

userDataHandle
user-supplied pointer.

alarmCallback
identifies the notification function employed by *alarmActionType*, SMC_ALARM_A_NOTIFY.

alarmIdHandle
pointer to a variable, which should be declared as type SMC_ALARM_ID. If the call to smc_create_alarm succeeds, this variable contains the ID for the alarm.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

This example assumes that:

- You have created a connection using smc_connect_ex and have a *clientId*.
- You have created a view on the connection and have a *viewId*.
- The view contains the *dataItem* SMC_NAME_PAGE_LOGICAL_READ, SMC_STAT_VALUE_SAMPLE.
- You have defined an alarm handler function, *myAlarmHandler*.

```
SMC_DATAITEM_STRUCT  dataItem =
                    { SMC_NAME_PAGE_LOGICAL_READ,
                      SMC_STAT_VALUE_SAMPLE };
 SMC_DATAITEM_STRUCTP dataItemHandle = &dataItem;
 SMC_VALUE_UNION alarmValue;
 SMC_VALUE_UNIONP alarmValueHandle = &alarmValue;
 SMC_ALARM_ID  alarmId;
 SMC_ALARM_IDP alarmIdHandle = &alarmId;
 alarmValue.longValue = 10L;

 if (smc_create_alarm_ex(clientId,
         viewId,
         dataItemHandle,
         alarmValueHandle,
         SMC_DI_TYPE_LONG,
         SMC_ALARM_A_NOTIFY,
         NULL, /* ignored */
         NULL,/* no user data */
         myAlarmHandler,
         alarmIdHandle) != SMC_RET_SUCCESS)
 {
   printf("smc_create_alarm_ex failed\n");
   /* do some cleanup */
 }
```

Usage

- Alarms can be created on result data items, but not on key data items.
- *alarmId*s are unique only within a given view.
- Alarms are triggered for each row of a view where the data item value meets or exceeds the threshold.
- Alarms are applied after filters, in the context of a refresh call.
- Alarms are triggered at each refresh based upon a data item's value (state) rather than the change of a data item's value (transition).
- Multiple alarms can be created on the same data item.
- When used in a Historical Server connection during the definition of a recording session, smc_create_alarm_ex defines an alarm that will be created during the execution of a recording session.
- Alarms cannot be defined in a Historical Server connection during a playback session.
- When creating a log-to-file alarm, if you specify a UNIX directory for the location of the log file, be sure that the directory is valid and mounted on the machine where Historical Server is running. Also be sure that you have write permissions to the directory. If the directory you specify is invalid, unmounted, or not writable, Historical Server does not create a log file, nor does it issue a message advising you that the location is invalid.

The syntax of the alarm callback is:

```
SMC_VOID AlarmCallback
 (SMC_CONNECT_ID      clientId,
    SMC_COMMAND_ID      commandId,
    SMC_VOIDP           userDataHandle)
```

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	Yes (for recording)

Errors

Error	Indicates
SMC_RET_INSUFFICIENT_MEMORY	Insufficient memory
SMC_RET_INVALID_ALARM_VALUE	Invalid alarm value
SMC_RET_INVALID_API_FUNCTION	Invalid use of obsolete and replacement functions within the same program
SMC_RET_INVALID_DATAITEM_FOR_ ALARM	Data item statistic type or alarm value mismatched
SMC_RET_INVALID_DATATYPE	Invalid datatype
SMC_RET_INVALID_DINAME	Data item does not exist
SMC_RET_INVALID_DISTAT	Data item statistic type does not exist
SMC_RET_INVALID_PARAMETER	Invalid parameter value
SMC_RET_INVALID_VIEWID	View does not exist
SMC_RET_INTERNAL_ERROR	Internal error

Callback parameters

Parameter	Description
clientId	Identifies the connection.
commandId	Identifies the instance of a command.
userDataHandle	Pointer that was set by the call to smc_create_alarm for this alarm.

The alarm callback function uses smc_get_command_info to obtain information about the circumstances that triggered the alarm.

See also

smc_connect_ex, smc_drop_alarm, smc_get_command_info

smc_create_filter

Description

Creates a filter on a data item in a view. Each data item in a view can have only one filter.

This function can be used with both Monitor Server and Historical Server. When used with Historical Server (that is, when the connection mode is SMC_SERVER_M_HISTORICAL), it creates a filter for the recording session that is being defined.

Syntax

```
SMC_RETURN_CODE smc_create_filter
 (SMC_CONNECT_ID        clientId,
SMC_VIEW_ID           viewId,
  SMC_DATAITEM_STRUCTP   dataItemHandle,
  SMC_FILTER_TYPE       filterType,
  SMC_VALUE_UNIONP      filterValueListHandle,
  SMC_SIZET             filterValueListLength,
  SMC_DATAITEM_TYPE     filterDatatype,
  SMC_FILTER_IDP        filterIdHandle)
```

Parameters

clientId
identifies the connection.

viewId
identifies a view created on the connection.

dataItemHandle
data item and statistic type. The data item must be numeric if the filter type is any of the following:

- SMC_FILT_T_GE
- SMC_FILT_T_LE
- SMC_FILT_T_GE_AND_LE
- SMC_FILT_TOP_N

filterType
type of filter to apply. Valid filter types are:

- SMC_FILT_T_EQ – equal to.
- SMC_FILT_T_NEQ – not equal to.
- SMC_FILT_T_GE – greater than or equal to.
- SMC_FILT_T_LE – less than or equal to.
- SMC_FILT_T_GE_AND_LE – a lower bound followed by an upper bound.
- SMC_FILT_T_TOP_N – top N.

filterValueListHandle
pointer to an array of filter values. The number of filter values depends on the filter type:

- SMC_FILT_T_EQ – one or more.
- SMC_FILT_T_NEQ – one or more.
- SMC_FILT_T_GE – one.
- SMC_FILT_T_LE – one.
- SMC_FILT_T_GE_AND_LE – two; low bound must be first element in list and high bound second.
- SMC_FILT_T_TOP_N – one.

filterValueListLength
number of filter values listed in *filterValueListHandle*.

filterDataType
datatype of the values for the filter; one of the following:

- SMC_DI_TYPE_CHARP
- SMC_DI_TYPE_DATIM
- SMC_DI_TYPE_DOUBLE
- SMC_DI_TYPE_ENUMS
- SMC_DI_TYPE_INT
- SMC_DI_TYPE_LONG

Must match the datatype for the data item. The filter values must also be of this type, except:

- If the filter type is SMC_FILT_T_TOP_N, the filter value in the *filterValueListHandle* must be type SMC_INT.
- If the datatype is SMC_DI_TYPE_ENUMS, the filter value in the *filterValueListHandle* must be passed using the *intValue* member.

filterIdHandle
pointer to a variable, which should be declared as type SMC_FILTER_ID. If the call to smc_create_filter succeeds, this variable contains the ID for the filter.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

The following example assumes that:

- You have created a connection and have a *clientId*.
- You have created a view on that connection and have a *viewId*.
- The view contains the *dataItem* defined in the example.

```
SMC_DATAITEM_STRUCT  dataItem =
                      { SMC_NAME_PAGE_LOGICAL_READ,
                         SMC_STAT_VALUE_SAMPLE };
 SMC_DATAITEM_STRUCTP dataItemHandle = &dataItem;
 SMC_VALUE_UNION filterValue;
 SMC_VALUE_UNIONP filterValueHandle = &filterValue;
 SMC_FILTER_ID filterId;
 SMC_FILTER_IDP filterIdHandle = &filterId;
 filterValue.longValue = 10L;

if (smc_create_filter(clientId,
         viewId,
   dataItemHandle,
         SMC_FILT_T_GE,
         filterValueHandle,
         1,   /* just one filterValue */
         SMC_DI_TYPE_LONG,
         filterIdHandle) != SMC_RET_SUCCESS)
 {
   printf("smc_create_filter failed\n");
   /* do some cleanup */
 }
```

Usage

- The application can employ wildcard (%) characters on all filters that apply to string datatypes.
- Filters are applied before alarms, in the context of a refresh call.
- Only one filter can be created on a data item.
- A filter defined for a recording session is not created until execution of the recording session.
- Not allowed during playback.
- For database objects, you can define SMC_FILT_T_EQ filters on the name of the object, that is, on a data item of SMC_NAME_OBJ_NAME or SMC_NAME_ACT_STP_NAME. The string value must include the fully qualified object name, for example, *database.owner.object*. However, you can use wildcards for each component of the name.

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	Yes (for recording only)

Errors

Error	Indicates
SMC_RET_INSUFFICIENT_MEMORY	Insufficient memory
SMC_RET_INVALID_COMPOSITE_FILTER	Invalid composite filter
SMC_RET_MISSING_DATAITEM	Missing data item
SMC_RET_INVALID_DATATYPE	Invalid datatype
SMC_RET_INVALID_DINAME	Invalid data item
SMC_RET_INVALID_DISTAT	Invalid data item statistic type
SMC_RET_INVALID_FILTER_VALUE	Invalid value for filter
SMC_RET_INVALID_FILTER_RANGE	Invalid range values
SMC_RET_INVALID_VALUE_COUNT	Invalid value for *filterValueListLength*
SMC_RET_INVALID_VIEWID	View does not exist

See also smc_drop_filter

smc_create_playback_session

Description Initializes a playback session on Historical Server.

Syntax

```
SMC_RETURN_CODE smc_create_playback_session
 (SMC_CONNECT_ID          clientId,
      SMC_SESSION_IDP         sessionIdArray,
      SMC_SIZET               numInputSessions,
      SMC_CHARP               startTime,
      SMC_CHARP               endTime,
      SMC_HS_PLAYBACK_OPT     playbackType,
      SMC_SIZET               summarizationInterval,
      SMC_HS_ESTIM_OPT        estimationOption,
      SMC_HS_MISSDATA_OPT     missingDataOption,
  SMC_HS_TARGET_OPT       playbackTarget,
  SMC_CHARP               directoryName
      SMC_HS_SESS_PROT_LEVEL  protectionLevel,
SMC_HS_SESS_SCRIPT_OPT  scriptOption,
      SMC_HS_SESS_DELETE_OPT  deleteOption,
      SMC_SESSION_IDP         sessionIdHandle)
```

Parameters

clientId
identifies the connection.

sessionIdArray
array of session numbers identifying the existing recording session(s) on Historical Server that furnishes data for this playback session. If more than one input session is specified, then they all must have been defined to record data from the same Adaptive Server, and they must be ordered chronologically.

If *playbackTarget* is SMC_HS_TARGET_FILE, then there must not be any gaps between the times covered by multiple input sessions. The input sessions must contain data for all times between the *startTime* and *endTime* parameters.

numInputSessions
the number of input sessions, that is, the length of the *sessionIdArray*. Must be at least one.

startTime
null-terminated string containing the time to start playback, using the format:

```
yyyy/mm/dd hh:mm[:ss] [time zone]
```

The default is to start at the beginning of the first input session.

endTime
null-terminated string containing the time at which to stop playback, using the format:

```
yy/mm/dd hh:mm[:ss] [time zone]
```

The default is to stop at the end of the last input session.

playbackType
specifies the level of detail of the playback. Valid values are:

- SMC_HS_PBTYPE_RAW – plays back data as it was collected, using whatever (possibly varying) intervals are contained in the input session. This option can include snapshot data such as current SQL statement data and status on locks or processes. Valid only with *playbackTarget* SMC_HS_TARGET CLIENT.
- SMC_HS_PBTYPE_ACTUAL – plays back data at whatever (possibly varying) intervals are contained in the input session(s). This option cannot include snapshot data.

- SMC_HS_PBTYPE_INTERVAL – plays back data summarized into sample intervals of the length specified in *summarizationInterval*.
- SMC_HS_PBTYPE_ENTIRE – plays back data for each input recording session summarized as a single sample. The sample interval is the time between the requested playback *startTime* and *endTime*.

If *playbackTarget* is SMC_HS_TARGET_FILE, then *playbackType* must be SMC_HS_PBTYPE_INTERVAL or SMC_HS_PBTYPE_ENTIRE.

summarizationInterval

if *playbackType* is SMC_HS_PBTYPE_INTERVAL, then this specifies the length in seconds of the playback intervals over which the input data is to be summarized.

For other values of *playbackType*, applications must specify SMC_UNUSED for this parameter.

estimationOption

specifies whether playback may estimate the values of data items that cannot be calculated exactly. Valid values are:

- SMC_HS_ESTIM_ALLOW
- SMC_HS_ESTIM_DISALLOW

If SMC_HS_ESTIM_DISALLOW is specified, then a subsequent call for this playback session to smc_create_view will return an error if it includes data items requiring estimation.

This option is ignored if *playbackType* is SMC_HS_PBTYPE_RAW.

missingDataOption

specifies whether the Monitor Client Library will return playback samples for periods of time when no data is available in the input session(s). Valid values are:

- SMC_HS_MISSDATA_SHOW – Monitor Client Library will return a sample for periods of time lacking data.
- SMC_HS_MISSDATA_SKIP – Monitor Client Library will not return a sample for periods of time lacking data; instead, the Library will return data for the next available time interval for which data is available.

If *playbackTarget* is SMC_HS_TARGET_FILE, this parameter is ignored.

playbackTarget

specifies whether the playback session returns data to the application or whether playback creates a new session on Historical Server. Valid values are:

- SMC_HS_TARGET_CLIENT – the playback session returns data to the application, by means of calls to smc_refresh_ex.
- SMC_HS_TARGET_FILE – playback creates a new session on Historical Server.

directoryName

if *playbackTarget* is SMC_HS_TARGET_FILE, this parameter specifies the directory in which the Historical Server creates the data file(s) and error file for the new sessions to be created.

protectionLevel

if *playbackTarget* is SMC_HS_TARGET_FILE, this parameter specifies the protection level of the new session to be created. Valid values are:

- SMC_HS_SESS_PROT_PUBLIC
- SMC_HS_SESS_PROT_PRIVATE

This parameter is ignored if *playbackTarget* is SMC_HS_TARGET_CLIENT.

scriptOption

if *playbackTarget* is SMC_HS_TARGET_FILE, this parameter specifies whether Historical Server must create a script that creates tables for loading results (from the new session) into Adaptive Server. The choices are:

- SMC_HS_SESS_SCRIPT_NONE – no script.
- SMC_HS_SESS_SCRIPT_SYBASE – Sybase script.

This parameter is ignored if *playbackTarget* is SMC_HS_TARGET_CLIENT.

deleteOption

if *playbackTarget* is SMC_HS_TARGET_FILE, this parameter specifies whether Historical Server must delete the input session(s) after successfully creating a new session. The choices are:

- SMC_HS_DELETE_FILES
- SMC_HS_RETAIN_FILES

This parameter is ignored if *playbackTarget* is SMC_HS_TARGET_CLIENT.

sessionIdHandle

if *playbackTarget* is SMC_HS_TARGET_FILE, this parameter must be a pointer to a variable of type SMC_SESSION_ID, into which the Monitor Client Library writes the identifier for the new session.

This parameter is ignored if *playbackTarget* is SMC_HS_TARGET_CLIENT.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

This example assumes that you have created a connection to Historical Server and have a *clientId*.

```
SMC_SESSION_ID  inputSessions[2];

if (smc_create_playback_session(clientId,
         inputSessions,
         2,/* number of input sessions */
"",/* default start time */
"",/* default end time */
         SMC_HS_PBTYPE_INTERVAL,/* summarize at */
         60,/* uniform minute intervals */
         SMC_HS_ESTIM_ALLOW,/* allow estimation */
         SMC_HS_MISSDATA_SHOW, /* produce a sample*/
              /* every minute even if no data is */
              /* available for that interval */
         SMC_HS_TARGET_CLIENT, /* do playback */
         "",/* directory name */
         SMC_HS_SESS_PROT_PUBLIC,/* so next 5 */
         SMC_HS_SESS_SCRIPT_SYBASE,/* are */
         SMC_HS_DELETE_FILES,/* unused */
         NULL)/* No output session ID */
    != SMC_RET_SUCCESS)
 {
   printf("smc_create_playback_session failed\n");
      /* do some cleanup */
 }
```

Usage

- In a Historical Server connection, recording sessions and playback sessions are mutually exclusive. An application that connects to a Historical Server and defines a recording session, must complete the definition of the recording session using the function smc_initiate_recording before creating a playback session.
- If the *playbackType* is SMC_HS_PBTYPE_RAW, the application can specify only one input session. Otherwise, the application can specify any number of input sessions (but at least one), provided that all sessions were recorded against the same Adaptive Server installation and Monitor Server.
- If the *playbackType* is SMC_HS_PBTYPE_RAW, different rules apply to the definition of playback views. Refer to the *Adaptive Server Enterprise Monitor Historical Server User's Guide* for more information about views.
- You cannot combine *playbackTarget* SMC_HS_TARGET_FILE with *playbackType* SMC_HS_PBTYPE_RAW or SMC_HS_PBTYPE_ACTUAL.
- Input sessions can include recording sessions that are still in the process of recording, unless *playbackTarget* is SMC_HS_TARGET_FILE.
- If *playbackTarget* is SMC_HS_TARGET_FILE, then the input session must contain performance data for the entire time from *startTime* to *endTime*, with no gaps between input sessions.
- Refer to the *Monitor Historical Server User's Guide* for more information about the hs_create_playback_session command.

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	No
SMC_SERVER_M_HISTORICAL	Yes

Errors

Error	Indicates
SMC_RET_INTERNAL_ERROR	Internal error
SMC_INVALID_SVR_MODE	Invalid server mode

See also smc_initiate_playback

smc_create_recording_session

Description

Initiates the definition of a recording session on Historical Server.

This function is applicable only if the connection mode is SMC_SERVER_M_HISTORICAL.

Syntax

```
SMC_RETURN_CODE smc_create_recording_session
 (SMC_CONNECT_ID         clientId,
         SMC_CHARP              SMSName,
         SMC_INT               sampleInterval,
         SMC_CHARP              directoryName,
         SMC_CHARP              startTime,
         SMC_CHARP              endTime,
         SMC_HS_SESS_PROT_LEVEL   protectionLevel,
         SMC_HS_SESS_ERR_OPT      errOption,
SMC_HS_SESS_SCRIPT_OPT   scriptOption,SMC_SESSION_IDP
sessionIdHandle)
```

Parameters

clientId
identifies the connection.

SMSName
null-terminated string containing the name of the Monitor Server.

sampleInterval
the number of seconds to wait between consecutive samplings of data.

directoryName
null-terminated string containing the full path name to the directory containing the data and error files created by Historical Server during execution of this recording session.

The directory must be writable on the system on which Historical Server is running. This might not be the same system that is running the client application that invoked the function call.

startTime
null-terminated string containing the time to start recording, using the format:

```
yyyy/mm/dd hh:mm[:ss] [time zone]
```

The default is to start immediately.

endTime
null-terminated string containing the time at which to stop the recording, using the format:

```
yy/mm/dd hh:mm[:ss] [time zone]
```

The default is to stop 24 hours after *startTime*.

protectionLevel
protection level of the data recorded. Valid values are:

- SMC_HS_SESS_PROT_PUBLIC
- SMC_HS_SESS_PROT_PRIVATE

errOption
indicate what Historical Server must do when encountering a non-fatal error. The choices are:

- SMC_HS_SESS_ERR_CONT – continue the session.
- SMC_HS_SESS_ERR_HALT – stop the session.

scriptOption
indicate whether Historical Server must create a script that creates tables for loading results (from this recording session) into Adaptive Server. The choices are:

- SMC_HS_SESS_SCRIPT_NONE – no script.
- SMC_HS_SESS_SCRIPT_SYBASE – Sybase script.

sessionIdHandle
pointer to a variable, which should be declared as type SMC_SESSION_ID. If the call to smc_create_recording_session succeeds, this variable contains the ID for the recording session.

Return value

Return value	**Indicates**
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

This example assumes that you have created a connection to Historical Server and have a *clientId*.

```
SMC_SESSION_ID  sessionId;
 SMC_SESSION_IDP sessionIdHandle = &sessionId;
if (smc_create_recording_session(clientId,
         "myMonitorServer",
         60,   /* sample interval (seconds) */
         "/usr/hist_serv_home_dir",
         "95/07/22 15:00",  /* start time */
         "95/07/23 15:30",  /* end time */
         SMC_HS_SESS_PROT_PUBLIC,
         SMC_HS_SESS_ERR_CONT,
         SMC_HS_SESS_SCRIPT_SYBASE,
         sessionIdHandle) != SMC_RET_SUCCESS)
 {
 printf("smc_create_recording_session failed\n");
       /* do some cleanup */
 }
```

Usage

- In a Historical Server connection, recording sessions and playback sessions are mutually exclusive. An application that connects to Historical Server and creates a playback session must end the playback session using the function smc_terminate_playback before creating a recording session.
- Refer to the *Adaptive Server Enterprise Monitor Historical Server User's Guide* for more information on the hs_create_recording_session command.

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	No
SMC_SERVER_M_HISTORICAL	Yes

Errors

Error	Indicates
SMC_RET_INTERNAL_ERROR	Internal error
SMC_RET_INVALID_SVR_MODE	Invalid server mode

See also smc_initiate_recording

smc_create_view

Description

Creates a view that can contain one or more data items.

For information about data items, refer to Chapter 2, "Data Items and Statistical Types".

You can use the smc_create_view function with both Monitor Server and Historical Server. When used with Historical Server (SMC_SERVER_M_HISTORICAL), it creates a view for the recording or playback session that is being defined.

Syntax

```
SMC_RETURN_CODE smc_create_view
 (SMC_CONNECT_ID        clientId,
SMC_DATAITEM_STRUCTP  dataItemListHandle,
SMC_SIZET             dataItemListLength,
SMC_CHARP             viewName,
SMC_VIEW_IDP          viewIdHandle)
```

Parameters

clientId
identifies the connection.

dataItemListHandle
pointer to array of SMC_DATAITEM_STRUCTs.

dataItemListLength
number of data items in the array pointed to by the *dataItemListHandle*.

viewName
null-terminated string containing a descriptive name for this view. This name can include a – z, A – Z, 0 – 9, and underscore (_) characters, or can be NULL.

Used only for a Historical Server connection. For a live connection, the view name is ignored.

viewIdHandle
pointer to a variable, which should be declared as type SMC_VIEW_ID. If the call to smc_create_view succeeds, this variable contains the ID for the view.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

This example assumes that you have created a connection and have a *clientId*.

```
SMC_DATAITEM_STRUCT  dataItem =
                      { SMC_NAME_PAGE_LOGICAL_READ,
                         SMC_STAT_VALUE_SAMPLE };
 SMC_DATAITEM_STRUCTP dataItemHandle = &dataItem;
 SMC_VIEW_ID viewId;
 SMC_VIEW_IDP viewHandle = &viewId;


if (smc_create_view(clientId,
         dataItemHandle,
         1,   /* just one dataItem */
         NULL,   /* this is a Monitor Server view */
         viewIdHandle) != SMC_RET_SUCCESS)
```

```
{
     printf("smc_create_view failed\n");
     /* do some cleanup */
}
```

Usage

- Refer to Chapter 2, "Data Items and Statistical Types" for rules for using views with live views.
- When called against a Historical Monitor connection, smc_create_view must be preceded by a call to smc_create_recording_session or smc_create_playback_session.
- When used in Historical Server during the definition of a recording session, it defines a view to be recorded by Historical Server during the recording session.
- When used in Historical Server during a playback session, it selects a view for playback from those previously recorded in recording session(s). If the playback session uses more than one input session, then the selected view must exist in all input sessions and use the same name, data items, and filters.
- Depending on whether the playback session was created for "raw" or summarizing playback, the playback view may or may not include certain data items from the original view. Refer to the *Adaptive Server Enterprise Monitor Historical Server User's Guide* for more information on the hs_create_playback_view command.

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	Yes

Errors

Error	Indicates
SMC_RET_INVALID_API_FUNC_SEQUENCE	Invalid calling sequence of Monitor Client Library functions
SMC_RET_INVALID_DINAME	Invalid data item
SMC_RET_INVALID_DI_STATTYPE	Invalid data item statistic type
SMC_RET_INSUFFICIENT_MEMORY	Insufficient memory

See also

smc_create_recording_session, smc_create_playback_session, smc_initiate_recording, smc_initiate_playback, smc_drop_view

smc_drop_alarm

Description

Removes an alarm on a data item in a view.

Syntax

```
SMC_RETURN_CODE smc_drop_alarm
 (SMC_CONNECT_ID   clientId,
        SMC_VIEW_ID      viewId,
        SMC_ALARM_ID     alarmId)
```

Parameters

clientId
identifies the connection.

viewId
identifies a view created on the connection.

alarmId
identifies the alarm.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_BUSY	Function not executed, connection is busy.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

The following example assumes that:

- You have created a connection and have a *clientId*.
- You have created a view on that connection and have a *viewId*.
- You have created an alarm on that view and have an *alarmId*.

```
if (smc_drop_alarm(clientId,
                   viewId,
                   alarmId) != SMC_RET_SUCCESS)
 {
   printf("smc_drop_alarm_failed\n");
   exit(1);
 }
```

Usage

You cannot drop an alarm created while defining a Historical session (that is, when the connection mode is SMC_SERVER_M_HISTORICAL).

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	No

Errors

Error	Indicates
SMC_RET_INVALID_VIEWID	Function failed.
SMC_RET_INVALID_ALARMID	Alarm does not exist.

See also

smc_create_alarm_ex, smc_drop_view

smc_drop_filter

Description

Removes a filter on a data item.

Syntax

```
SMC_RETURN_CODE smc_drop_filter
 (SMC_CONNECT_ID      clientId,
  SMC_VIEW_ID         viewId,
  SMC_FILTER_ID       filterId)
```

Parameters

clientId
identifies the connection.

viewId
identifies a view created on the connection.

filterId
identifies the filter to be dropped.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

The following example assumes that:

- You have created a connection and have a *clientId*.
- You have created a view on that connection and have a *viewId*.
- You have created a filter on that view and have a *filterId*.

```
if (smc_drop_filter(clientId,
                    viewId,
                    filterId) != SMC_RET_SUCCESS)
 {
   printf("smc_drop_filter_failed\n");
   /* do some cleanup */
}
```

Usage

- Dropping a filter takes effect at the next call to smc_refresh following the call to smc_drop_filter.
- You cannot drop a filter created while defining a Historical Server session (that is, when the connection mode is SMC_SERVER_M_HISTORICAL).

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	No

Errors

Error	Indicates
SMC_RET_INVALID_VIEWID	View does not exist.
SMC_RET_INVALID_FILTERID	Filter does not exist.

See also

smc_create_filter, smc_drop_view

smc_drop_view

Description

Removes a view from a connection.

Syntax

```
SMC_RETURN_CODE smc_drop_view
 (SMC_CONNECT_ID  clientId,
           SMC_VIEW_ID     viewId)
```

Parameters

clientId
identifies the connection.

viewId
identifies a view created on the connection.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

The following example assumes that:

- You have created a connection and have a *clientId*.

- You have created a view on that connection and have a *viewId*.

```
if (smc_drop_view(clientId,
                  viewId) != SMC_RET_SUCCESS)
 {
   printf("smc_drop_view_failed\n");
   /* do some cleanup */
 }
```

Usage

- All alarms and filters associated with the data items in the view are dropped.
- You cannot drop a view created on a Historical Server session (that is, when the connection mode is SMC_SERVER_M_HISTORICAL).

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	No

Error

Error	Indicates
SMC_RET_INVALID_VIEWID	View does not exist.

See also

smc_create_view, smc_drop_alarm, smc_drop_filter

smc_get_command_info

Description

Retrieves detailed information about an alarm or error notification.

Syntax

```
SMC_RETURN_CODE smc_get_command_info
 (SMC_CONNECT_ID          clientId,
      SMC_COMMAND_ID          commandId,
      SMC_INFO_TYPE          infoType,
      SMC_VALUE_UNIONP          infoValue,
      SMC_SIZETP          outputLengthHandle)
```

Parameters

clientId
identifies the connection.

commandId
identifies an invocation of a callback function.

infoType
describes the type of requested information. See "Data available for alarm callbacks" on page 129.

infoValue
pointer to an SMC_VALUE_UNION structure receiving the value of *infoType*.

outputLengthHandle
a pointer to an integer variable. Upon a successful call to smc_get_command_info, the Monitor Client Library writes into this variable. The actual length, in bytes, of the data to be copied into **infoValue* (not including the null-terminator byte). If the *infoValue* datatype is not SMC_CHARP, this parameter is ignored. Pass null if the information is not desired.

Return value

Return value	**Indicates**
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_API_FUNCTION	Invalid use of obsolete and replacement functions within the same program.
SMC_RET_INVALID_COMMAND	Instance of command does not exist.
SMC_RET_INVALID_CONNECT	Connection does not exist.
SMC_RET_INVALID_INFOTYPE	Invalid context for requested information type.
SMC_RET_INVALID_PARAMETER	Invalid parameter value.

Examples

This example assumes that:

- An error callback function is executing.
- You have created a connection and have a *clientId*.
- The example code is being used in the context of a Monitor Client Library API callback function, which supplies the *commandId*.

```
SMC_VALUE_UNION myValue;
 SMC_VALUE_UNIONP myValuePtr = &myValue;
 if (smc_get_command_info(clientId,
                 commandId,
                 SMC_INFO_ERR_NUM,
                 myValuePtr,
                 NULL) != SMC_RET_SUCCESS)
 {
   printf("smc_get_command_info failed\n");
```

```
            /* do some cleanup */
        }
```

Usage

- For the definition of an SMC_VALUE_UNION structure, see "Union: SMC_VALUE_UNION" on page 240.
- For data of type SMC_CHARP, *stringValue* points to the value. The Monitor Client Library allocates the memory for this string and the calling application must deallocate it using free().
- To retrieve just the length in bytes of a string, pass null for *infoValue* and a valid pointer for *outputLengthHandle*.
- Table 3-6 lists the command *infoType* and associated datatype:

Table 3-6: Monitor Client Library command information types

Information type	**infoValue datatype**	**Available**
SMC_INFO_ALARM_ACTION_DATA	SMC_CHARP	In an alarm callback function
SMC_INFO_ALARM_ALARMID	SMC_SIZET	In an alarm callback function
SMC_INFO_ALARM_CURRENT_VALUE	Depends on the data item and statistic type combination. (See Chapter 2, "Data Items and Statistical Types".)	In an alarm callback function
SMC_INFO_ALARM_DATAITEM	SMC_VOIDP	In an alarm callback function
SMC_INFO_ALARM_ROW	SMC_SIZET	In an alarm callback function
SMC_INFO_ALARM_THRESHOLD_VALUE	Depends on data item/ statistic type combination. (See Chapter 2, "Data Items and Statistical Types".)	In an alarm callback function
SMC_INFO_ALARM_TIMESTAMP	SMC_CHARP	In an alarm callback function
SMC_INFO_ALARM_VALUE_DATATYPE	SMC_INT	In an alarm callback function

Information type	infoValue datatype	Available
SMC_INFO_ALARM_VIEWID	SMC_SIZET	In an alarm callback function
SMC_INFO_ERR_MAPSEVERITY	SMC_SIZET	In an error callback function
SMC_INFO_ERR_MSG	SMC_CHARP	In an error callback function
SMC_INFO_ERR_NUM	SMC_SIZET	In an error callback function
SMC_INFO_ERR_SEVERITY	SMC_SIZET	In an error callback function
SMC_INFO_ERR_SOURCE	SMC_SIZET	In an error callback function
SMC_INFO_ERR_STATE	SMC_SIZET	In an error callback function

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	Yes

Errors This function does not employ error callback functions.

See also

smc_create_alarm_ex

smc_get_dataitem_type

Description

Returns the datatype for the specified data item.

Syntax

```
SMC_RETURN_CODE smc_get_dataitem_type
 (SMC_DATAITEM_STRUCTP     dataItemHandle,
             SMC_DATAITEM_TYPEP       ptrType)
```

Parameters

dataItemHandle

pointer to data item and statistical type.

ptrType
pointer to data value type.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.

Examples

```
SMC_DATAITEM_STRUCT  dataItem =
                      { SMC_NAME_PAGE_LOGICAL_READ,
                         SMC_STAT_VALUE_SAMPLE };
 SMC_DATAITEM_STRUCTP dataItemHandle = &dataItem;
 SMC_DATAITEM_TYPE dataItemType;
 SMC_DATAITEM_TYPEP dataItemTypeHandle = &dataItemType;


if (smc_get_dataitem_type(dataItemHandle,
         dataItemTypeHandle) != SMC_RET_SUCCESS)
 {
      printf("smc_get_dataitem_type failed\n");
      /* do some cleanup */
 }
```

Usage

- The data item types are as follows:

Data item type	Description
SMC_DI_TYPE_CHARP	Pointer to a character string.
SMC_DI_TYPE_DATIM	Sybase date and time.
SMC_DI_TYPE_DOUBLE	Double-precision floating-point number.
SMC_DI_TYPE_ENUMS	An enumerated datatype, specific to the data item. Enumerated types are defined in the *mctype.sh* include file and in Appendix B, “Datatypes and Structures”.
SMC_DI_TYPE_INT	Integer.
SMC_DI_TYPE_LONG	Long integer.

- If you supply a data item and statistical type that Monitor Client Library does not support, the output parameter type is set to SMC_DI_TYPE_NONE.

See also

smc_create_view

smc_get_dataitem_value

Description

Returns data after a refresh. This data is returned one data item of one row at a time.

Syntax

```
SMC_RETURN_CODE smc_get_dataitem_value
 (SMC_CONNECT_ID         clientId,
       SMC_VIEW_ID            viewId,
       SMC_DATAITEM_STRUCTP    dataItemHandle,
       SMC_SIZET             row,
       SMC_VALUE_UNIONP        returnVal)
```

Parameters

clientId
identifies the connection.

viewId
identifies a view created on the connection.

dataItemHandle
pointer to data item and statistic type.

row
row number of requested data.

returnVal
return value that contains the value of one data item.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	No connection exists with the specified ID.

Examples

The following example assumes that:

- You have created a connection and have a *clientId*.
- You have created a view on that connection and have a *viewId*.
- The view contains the *dataItem* defined in the example.
- You have successfully executed a refresh call.
- The row count is greater than zero.

```
SMC_DATAITEM_STRUCT  dataItem =
                      { SMC_NAME_PAGE_LOGICAL_READ,
                         SMC_STAT_VALUE_SAMPLE };
 SMC_DATAITEM_STRUCTP dataItemHandle = &dataItem;
SMC_VALUE_UNION returnValue;
```

```
 SMC_VALUE_UNIONP returnValueHandle = &returnValue;
if (smc_get_dataitem_value(clientId,
        viewId,
        dataItemHandle,
        0,/* row number */
        returnValueHandle) != SMC_RET_SUCCESS)
 {
   printf("smc_get_dataitem_value failed\n");
   /* do some cleanup */
 }
```

Usage

- The first row of data is indexed by row number zero, the second by one, and so on.
- For data of type SMC_DI_TYPE_CHARP, the Monitor Client Library allocates the memory. The calling application must deallocate the memory using free().
- See Appendix B, "Datatypes and Structures" for a listing of members in SMC_VALUE_UNION.
- See the *mctype.sh* include file or Appendix B, "Datatypes and Structures" for the values for enumerated types.

Errors

Error	Indicates
SMC_RET_INVALID_VIEWID	View does not exist.
SMC_RET_INVALID_DINAME	Invalid data item.
SMC_RET_INVALID_DISTAT	Invalid data item statistic type.
SMC_RET_INVALID_PARAMETER	Invalid parameter.

See also

smc_refresh_ex, smc_get_dataitem_type

smc_get_row_count

Description

Returns the number of rows returned by a given view after a refresh.

Syntax

```
SMC_RETURN_CODE smc_get_row_count
 (SMC_CONNECT_ID    clientId,
        SMC_VIEW_ID       viewId,
        SMC_SIZETP        rowCountHandle)
```

Parameters

clientId

identifies the connection.

viewId
identifies a view created on the connection.

rowCountHandle
pointer to a variable into which Monitor Client Library writes the number of rows in a view.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

The following example assumes that:

- You have created a connection and have a *clientId*.
- You have created a view on that connection and have a *viewId*.
- You have successfully executed a refresh call.

```
SMC_SIZET rowCount;
 SMC_SIZETP rowCountHandle = &rowCount;
if (smc_get_row_count(clientId,
         nviewId,
         rowCountHandle) != SMC_RET_SUCCESS)
 {
   printf("smc_get_row_count failed\n");
   /* do some cleanup */
 }
```

Usage

The first row of data is indexed by row number 0, the second by 1, and so on.

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	Yes (during playback)

Error

Error	Indicates
SMC_RET_INVALID_VIEWID	View does not exist.

See also

smc_refresh_ex, smc_get_dataitem_value

smc_get_version_string

Description

Returns the Monitor Client Library version number.

Syntax

SMC_RETURN_CODE smc_get_version_string
(SMC_CHARPP *versionBuffer*)

Parameters

versionBuffer
return value that contains the version string.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.

Examples

```
SMC_CHARP versionBufferHandle;
if (smc_get_version_string(&versionBufferHandle)
                              != SMC_RET_SUCCESS)
 {
      printf("smc_get_version_string failed\n");
      /* do some cleanup */
 }
 printf("%s\n",versionBufferHandle);
free(versionBufferHandle);
```

Usage

- The Monitor Client Library allocates the memory for this string. The calling application must deallocate this memory using free().
- This function does not require a connection.

smc_initiate_playback

Description

Concludes the definition of views for a playback session on Historical Server, and prepares to start playback.

Syntax

SMC_RETURN_CODE smc_initiate_playback
(SMC_CONNECT_ID *clientId*)

Parameters

clientId
identifies the connection.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.

Return value	Indicates
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

This example assumes that:

- You have created a connection to Historical Server and have a *clientId*.
- You have successfully executed smc_create_playback_session.
- You have created at least one view on the connection.

```
if (smc_initiate_playback(clientId) !=
   SMC_RET_SUCCESS)
 {
   printf("smc_initiate_playback failed\n");
   /* do some cleanup */
 }
```

Usage

- The data for a playback session is defined by calls to smc_create_view, made after a call to smc_create_playback_session and before the call to smc_initiate_playback.
- If this playback session was defined to create a new session from playback (that is, if smc_create_playback_session was called with *playbackTarget* SMC_HS_TARGET_FILE), then smc_initiate_playback creates the new session. The application must then call smc_terminate_playback to conclude the playback session.
- If the playback session was defined to play back data to the application (that is, if smc_create_playback_session was called with *playbackTarget* SMC_HS_TARGET_CLIENT), then the application calls smc_refresh_ex to retrieve each playback sample, and smc_terminate_playback to conclude the playback session.
- After a successful call to smc_terminate_playback, the Historical Server connection can be used to define another playback session, or to create a recording session.

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	No
SMC_SERVER_M_HISTORICAL	Yes

Errors

Error	Indicates
SMC_RET_INVALID_SVR_MODE	Invalid server mode.
SMC_RET_INTERNAL_ERROR	Internal error.

See also

smc_create_view, smc_create_playback_session, smc_refresh_ex, smc_terminate_playback

smc_initiate_recording

Description

Completes the definition of a recording session against Historical Server, that is, an SMC_SERVER_M_HISTORICAL connection only.

Syntax

SMC_RETURN_CODE smc_initiate_recording
 (SMC_CONNECT_ID *clientId*)

Parameters

clientId
identifies the connection.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

The following example assumes that:

- You have created a connection to Historical Server and have a *clientId*.
- You have successfully executed smc_create_recording_session.
- You have created at least one view on the connection.

```
if (smc_initiate_recording(clientId) !=
   SMC_RET_SUCCESS)
 {
   printf("smc_initiate_recording failed\n");
   /* do some cleanup */
 }
```

Usage

- The data for the recording session is defined by calls to smc_create_view and smc_create_filter that are made after a call to smc_create_recording_session and before the call to smc_initiate_recording.
- After a successful call to smc_initiate_recording, the Historical Server connection can be used to define another recording session, or to create a playback session.

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	No
SMC_SERVER_M_HISTORICAL	Yes

Errors

Error	Indicates
SMC_RET_INVALID_SVR_MODE	Invalid server mode.
SMC_RET_INTERNAL_ERROR	Internal error.

See also

smc_create_alarm_ex, smc_create_filter, smc_create_view, smc_create_recording_session, smc_terminate_recording_session

smc_refresh_ex

Description

Obtains a sampling of data for all views on a connection.

Syntax

```
SMC_RETURN_CODE smc_refresh_ex
 (SMC_CONNECT_ID  clientId,
  SMC_SIZET       step)
```

Parameters

clientId

identifies the connection.

step

during playback in a Historical Server connection, allows skipping ahead a specified number of samples. Ordinarily, on playback, *step* is +1 to retrieve the next sample (negative *step* values are not allowed).

Does not apply for live connections; use SMC_UNUSED.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

This example assumes that:

- You have created a connection and have a *clientId*.
- You have created at least one view on that connection.

```
if (smc_refresh_ex(clientId,SMC_UNUSED)
                      != SMC_RET_SUCCESS)
                   {
                      printf("smc_refresh_ex failed\n");
                      /* do some cleanup */
                   }
```

Usage

- In a playback session, smc_refresh_ex must be preceded by a call to smc_initiate_playback.
- If you try to refresh a view at the same time someone creates a database, the refresh may fail.
- A refresh for a view may fail if one or more databases on Adaptive Server are in single-user mode.

Valid server modes

Mode	**Availability**
SMC_SERVER_M_LIVE	Yes
SMC_SERVER_M_HISTORICAL	Yes (for playback)

Errors

Error	**Indicates**
SMC_RET_INVALID_API_FUNCTION	Invalid use of obsolete and replacement functions in program.
SMC_RET_INVALID_SVR_MODE	Invalid server mode.

See also

smc_connect_ex

smc_terminate_playback

Description

Concludes a playback session on Historical Server.

Syntax

```
SMC_RETURN_CODE smc_terminate_playback
 (SMC_CONNECT_ID   clientId)
```

Parameters

clientId
identifies the connection.

Return value

Return value	**Indicates**
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Connection does not exist.

Examples

This example assumes that:

- You have created a connection to Historical Server and have a *clientId*.
- You have successfully executed smc_create_playback_session.
- You have created at least one view on the connection.
- You have successfully executed smc_initiate_playback.

```
if (smc_terminate_playback(clientId)
   != SMC_RET_SUCCESS)
 {
   printf("smc_terminate_playback failed\n");
   /* do some cleanup */
 }
```

Usage

- After a successful call to smc_terminate_playback, the Historical Server connection can be used to create another playback session, or to define a recording session.

Valid server modes

Mode	**Availability**
SMC_SERVER_M_LIVE	No
SMC_SERVER_M_HISTORICAL	Yes

Errors

Error	**Indicates**
SMC_RET_INVALID_SVR_MODE	Invalid server mode.
SMC_RET_INTERNAL_ERROR	Internal error.

See also

smc_create_playback_session, smc_initiate_playback

smc_terminate_recording

Description

Cancels a recording session on a Historical Server connection.

Syntax

SMC_RETURN_CODE smc_terminate_playback(
 SMC_CONNECT_ID *clientId*,
 SMC_SESSION_ID *sessionId*
SMC_HS_SESS_DELETE_OPT*deleteOption*,
)

Parameters

clientId
identifies the Monitor connection.

sessionId
identifies the recording session to cancel.

deleteOption
specifies whether Historical Server should delete the data files, if any, associated with the session. The choices are SMC_HS_DELETE_FILES and SMC_HS_RETAIN_FILES.

This parameter is ignored if the session has not been initiated or if it has not started recording.

Return value

Return value	Indicates
SMC_RET_SUCCESS	Function succeeded.
SMC_RET_FAILURE	Function failed.
SMC_RET_INVALID_CONNECT	Monitor connection does not exist.

Examples

This example assumes that:

- You have created a connection to Historical Server and have a *clientId*.
- You have successfully executed smc_create_recording_session and have a *sessionId*.

```
if (smc_terminate_recording(
        clientId,
        sessionId,
    SMC_HS_DELETE_FILES)
    != SMC_RET_SUCCESS)
  {
    printf("smc_terminate_recording failed\n");
    /* do some cleanup */
  }
```

Usage

- If the recording session had already been initiated, then smc_terminate_recording cancels the session. If the session had been scheduled, but had not actually started recording, then smc_terminate_recording causes the session to be unscheduled. If the session had actually started recording, then smc_terminate_recording causes the session to end prematurely, that is, before the scheduled end time.
- If the recording session had not been initiated, then smc_terminate_recording cancels definition of the recording session. After a successful call to smc_terminate_recording, the HISTORICAL connection may be used to create another recording session, or to define a playback session.

Valid server modes

Mode	Availability
SMC_SERVER_M_LIVE	No
SMC_SERVER_M_HISTORICAL	Yes

Errors

Error	Indicates
SMC_RET_INVALID_SVR_MODE	Invalid server mode.
SMC_RET_INTERNAL_ERROR	Internal error.

See also smc_create_recording_session, smc_initiate_recording

CHAPTER 4

Building a Monitor Client Library Application

This chapter contains information about building a Monitor Client Library application on the following platforms:

This chapter describes the steps required to build a Monitor Client Library application, including:

- Compiling
- Linking
- Running

Two sample programs are provided with the Monitor Client Library:

- *testmon*, which obtains data from a Monitor Server
- *testhist*, which creates a Historical Server recording session and places data into a file

You can use the build procedures supplied with these sample applications as a model for other applications. The sample programs are discussed separately for UNIX and Windows platforms.

Note The following instructions assume that the Monitor Client Library is installed in the Sybase root directory, and that the *SYBASE* environment variable is set to this root directory.

Building on UNIX platforms

This section explains how to compile, link, run, and build the sample applications for UNIX platforms.

Compiling the application

Each source file that uses the Monitor Client Library must include the following line:

```
       #include "mcpublic.h"
```

The header files for Monitor Client Library are installed, by default, in the *monclt/include* directory of the directory indicated by the *SYBASE* environment variable.

Open Client header files, which are needed for compilation, are also installed in this directory. Include this directory in the compilation command line. For example, you could enter:

```
   cc -I$SYBASE/monclt/include myprog.c
```

If the header files have been installed in directories other than the default, substitute those directories in the compilation command line.

Linking the application

The Monitor Client Library is installed in the *monclt/lib* directory of the directory indicated by the *SYBASE* environment variable. In addition, Open Client libraries, which are required for linking with the Monitor Client Library, are installed in the *monclt/lib* directory. To find the names of the libraries with which you must link your application, see the *make* files supplied with the examples.

Running the application

To run a Monitor Client Library application, set the *SYBASE* environment variable to the Open Client installation directory that contains the *locales*, *charsets*, and *lib* directories. These directories are loaded during Monitor Client Library installation.

Note Adaptive Server and Monitor Server must be configured and running on your network before you run a Monitor Client Library application.

Building the sample applications

The sample programs and the procedures to build them are installed, by default, in the *$SYBASE/sample/monclt* directory. The two versions of the build procedure are:

- *Makefile*, which uses the native ANSI compiler and linker
- *Makefile_gcc*, which uses the GNU C compiler and linker

To build and run the sample programs, use the following steps:

1. If the entries for the Adaptive Server, Monitor Server, and Historical Server that you intend to use with the examples do not appear in your *interfaces* file, add the entries. You can use monclt/bin/sybinit to edit the *interfaces* file.
2. Copy the sample files from the *monclt/sample* directory to another directory to keep the original sample for future reference and enable you to edit your own copy.
3. If you are not already there, change your directory to the directory that contains your copies of the sample files.
4. Edit the *example.h* file to supply the names of:
   - Adaptive Server
   - Monitor Server
   - Historical Server
   - Login name on Adaptive Server
   - Password
   - *interfaces* file location

If you are using the default *interfaces* file located in the directory indicated by the *SYBASE* environment variable, you can accept the default null string ("") for the *interfaces* file name. If you are not using the default *interfaces* file, specify the full path name of the *interfaces* file.

5 Set the *MONCLTLIBDIR* environment variable to the root installation directory for Monitor Client Library, which is by default, the *monclt* directory of the Sybase root installation directory:

```
setenv MONCLTLIBDIR $SYBASE/monclt
```

6 You can edit the *make* files and change the value of the *SYBASE* variable to point to a different Sybase root directory. By default, it points to *$MONCLTLIBDIR*.

7 Use the make utility to build the test programs.

If you use the native UNIX make utility, enter:

```
make all
```

If you use the GNU compiler, enter:

```
make -f Makefile_gcc
```

8 Run the sample programs.

To run the program that retrieves and displays live data from Monitor Server, enter:

```
./testmon
```

To run the program that creates a recording session using Historical Server, enter:

```
./testhist
```

Building on Windows platforms

This section describes how to compile, link, run, and build the sample applications on a Windows platform.

Compiling the application

To compile a Monitor Client Library application on a Windows platform, do the following:

1. Include the following line in each source file that uses Monitor Client Library:

   ```
   #include "mcpublic.h"
   ```

2. Include the path of the directory that contains the Monitor Client Library and Open Client header files in the list of directories (sometimes called the Include path) in which the C compiler preprocessor looks for header files. The header files for Monitor Client Library and Open Client are installed, by default, in the *C:\SYBASE\INCLUDE* directory.

3. Set the compiler preprocessor option to define the *_WIN* and *WIN32* preprocessor macros.

4. Set the code generation option to use the *__cdecl* calling convention.

Note To use a calling convention other than the default, you must declare it in each callback function that uses it.

Linking the application

The Monitor Client Library is contained in the *smcapi32.lib* file, which is installed in the *C:\SYBASE\LIB* directory.

You can specify the full path name of the library or the *smcapi32.lib* file name in the list of libraries for the linker to use for your application. However, if you include only the file name, you must include the *C:\SYBASE\LIB* directory in the list of directories in which the linker looks for libraries.

Running the application

Refer to the release bulletin for Adaptive Server Enterprise Monitor for a list of software required to run a Monitor Client Library application.

Define the *SYBASE* environment variable to indicate the directory where the Sybase client software has been installed. The *ini* directory within this directory must contain the *sql.ini* file. Use the SQLEDIT utility to set up this file to include the names of any Adaptive Server installations, Monitor Servers, and (optionally) Historical Servers that your application uses.

Note Adaptive Server and Monitor Server must be configured and running on your network before you run a Monitor Client Library application.

Building the sample applications

The sample programs and the build procedures to build them are installed in the *C:\SYBASE\SAMPLE\MONCLT\TESTMON* and *C:\SYBASE\SAMPLE\MONCLT\TESTHIST* directories.

For each of the sample programs, there is a project (*.mak*) file. For applications to be built using Microsoft Visual C/C++ version 4.0 and to be run under Windows NT or Windows 95 as a console application, the two project files are *TESTMO32.MAK* and *TESTHI32.MAK*.

To build and run the sample programs, use the following steps:

1. Modify the *PATH* environment variable to include the *C:\SYBASE\DLL* directory in which the Sybase DLLs were installed.
2. If you have not already done so, set the *SYBASE* environment variable to the Sybase *\SYBASE* root installation directory.
3. If you do not have the appropriate server names in the *sql.ini* file, add the entries for the Adaptive Server installation, Monitor Server, and Historical Server that you intend to use to the *C:\SYBASE\INI\SQL.INI* file.
4. Edit the *\SYBASE\SAMPLE\MONCLT\TESTMON\ EXAMPLE.H* and *\SYBASE\SAMPLE\MONCLT\TESTHIST\ EXAMPLE.H* files to supply the names of the Adaptive Server, Monitor Server, Historical Server (for *TESTHIST* only), login name on Adaptive Server, and password.
5. Open the project (*.mak*) file for the sample application you want to build.
   - To use the program that tests a live connection to Monitor Server, enter:

     ```
     \SYBASE\SAMPLE\MONCLT\TESTMON\TESTMO32.MAK
     ```

   - To use the program that tests Historical Server, enter:

```
\SYBASE\SAMPLE\MONCLT\TESTHIST\TESTHI32.MAK
```

6. If the Monitor Client Library is installed in a directory other than *\SYBASE*:

   - Modify the compiler preprocessor option to include the *INCLUDE* subdirectory of the installation directory, instead of the default *\SYBASE\INCLUDE* directory, in the list of directories in which the C compiler preprocessor looks for header files.
   - Edit the list of libraries for the linker to use for the application so that it specifies the full path name of the library, instead of the *\SYBASE\LIB\SMCAPI32.LIB* default directory path name.

7. Build the project.
8. Run the application.

   To run applications under Windows NT or Windows 95, enter the name of the executable program from a Command Prompt window. For example:

   ```
   C:\SYBASE\SAMPLE\MONCLT\TESTMON\WinDebug\TESTMO32
   ```

CHAPTER 5

Monitor Client Library Configuration Instructions

This chapter describes the installation and configuration process for Monitor Client Library.

Loading Monitor Client Library

To move the Monitor Client Library files from the distribution media onto your machine, use Studio Installer. This utility allows you to load all of the products you have ordered onto one machine in one Studio Installer session or to distribute your software among different licensed machines by running separate Studio Installer sessions.

Using Studio Installer

If you have not already done so, follow the instructions in the installation guide to load Monitor Client Library onto your machine.

After loading the software, return to this chapter to complete the installation and configuration of Monitor Client Library.

Results of the load

The Studio Installer utility places the Monitor Client Library software in the load directory you specified to Studio Installer during the installation process. The default load directory is the *$SYBASE* directory.

The load directory contains all software and other files for Monitor Client Library, including the *locales* and *charsets* subdirectories at the correct version level for Monitor Client Library.

Confirming your login account and permissions

To perform the tasks described in this chapter, you must be logged in using the “sybase” account or some other account that has read, write, and search (execute) permissions on the load directory. The load directory is the directory name you supplied to Studio Installer when you loaded the Monitor Client Library software onto your machine. The default load directory is the *$SYBASE* directory.

Modifying the *interfaces* file

Before a Monitor Client Library application can run, it must have access to an *interfaces* file that contains entries for Adaptive Server Enterprise Monitor. The *interfaces* file can exist on a local or remote machine, so long as the Monitor Client Library application has access to the file system containing the *interfaces* file.

If an *interfaces* file does not exist on a machine where a Monitor Client Library application will run and an *interfaces* file is not accessible remotely, you must create one.

The *interfaces* file accessed by a Monitor Client Library application must contain entries for the following servers:

- The Adaptive Server installations being monitored
- The Monitor Server(s) that Monitor Viewer is using
- Optionally, the Monitor Historical Server if one is being used

The entries that you add to the *interfaces* file accessed by the Monitor Client Library application must match the entries that already exist in the *interfaces* file for the servers, on the server machine. Those entries define the server names, their host machine names, and their port numbers. You must use the same values on the client machine. See the person who installed Monitor Server and Monitor Historical Server to obtain the entries for the servers.

The general format for additions to a client *interfaces* file is:

```
sql_server_name
   query entry
   master entry
 monitor_server_name
   query entry
   master entry
 historical_server_name
   query entry
   master entry
```

Use the sybinit utility or a text editor to add entries to the *interfaces* file.

Note Before invoking sybinit, make sure that your *SYBASE* environment variable points to the directory containing the *interfaces* file that you want to change or, if the file does not yet exist on your machine, the directory where you want it to reside.

If you use a text editor to update the *interfaces* file, entries must comply with the following rules:

- The entry cannot contain blank lines.
- The *server_name* line must start in the first column of the *interfaces* file.
- The entries for query and master must have one tab preceding them. You must indent the query and master lines using the Tab key; do not use the space bar to indent these two lines.

If you use sybinit to edit the *interfaces* file, the utility enforces these rules.

For information about editing *interfaces* files, specifics about the *interfaces* file format, and details about parameters within an *interfaces* file entry, see *Configuring Adaptive Server Enterprise* for your platform.

Setting up the user environment

On start-up, a Monitor Client Library application must:

- The correct version of the *locales* and *charsets* directories
- An *interfaces* file

The *SYBASE* environment variable defines the location of the *locales* and *charsets* directories. The *SYBASE* variable also defines the default location of the *interfaces* file; however, the Monitor Client Library application might need to override that default location.

Setting the *SYBASE* environment variable

When a user starts a Monitor Client Library application, the directory pointed to by the *SYBASE* environment variable must contain the correct version of the *locales* and *charsets* directories. Therefore, users must set their *SYBASE* environment variable to point to the *monclt* subdirectory of the load directory (the directory where the Studio Installer placed Monitor Client Library software).

Overriding the default location of the *interfaces* file

The default location of the *interfaces* file is the directory pointed to by the *SYBASE* environment variable. Since the *SYBASE* environment variable must point to the load directory, then one of the following statements also must be true when users run a Monitor Client Library application:

- The *interfaces* file must be located in the load directory, or
- The Monitor Client Library application code must override the default location of the *interfaces* file.

  To override the default location, the Monitor Client Library application must call the smc_connect function, specifying an explicit value in the *interfaceFile* parameter. In most cases, it would be appropriate to obtain the value of the *interfaceFile* parameter from the user at start-up time, as a command-line argument, from an X resource file, or from an interactive dialog box.

For more information about the smc_connect function, see the *Adaptive Server Enterprise Monitor Client Library Programmer's Guide*.

Using Monitor Client Library

After completing the installation and setting up the user environment, you can build and run the sample programs provided. For more details on the sample programs, see the *Adaptive Server Enterprise Monitor Client Library Programmer's Guide*.

If you have not already done so, read the *Adaptive Server Enterprise Monitor Client Library Release Bulletin* for your platform.

Notes

- Adaptive Server and Monitor Server must be configured and running on your network before you run a Monitor Client Library application.
- For maximum responsiveness, Sybase recommends that Monitor Client applications run on different machines from the one on which Adaptive Server and Monitor Server are running.

APPENDIX A

Examples of Views

This appendix contains examples of views. These views also appear in the sample views file installed with Historical Server.

You may find that some of these views collect exactly the information that you are interested in, while others can serve as templates for building the views that you need.

Some of the sample views differ from one another only in the time interval over which the data is accumulated (either the duration of the most recent sample interval or the entire session). Other views may contain similar data items, but in a different order. The order in which data items appear in a view is significant because the data is sorted according to the key field. The first key field appears in a view's definition and acts as the primary sort key, the second key field is the secondary sort key, and so on.

```
#include mcpublic.h

SMC_VOID
ErrorCallback(
SMC_SIZET    id,
SMC_SIZET    error_number,
SMC_SIZET    severity,
SMC_SIZET    map_severity,
SMC_SIZET    source,
SMC_CCHARP   error_msg,
SMC_SIZET    state);

SMC_VOID
RefreshCallback(
SMC_SIZET   id,
SMC_VOIDP   user_msg,
SMC_CHARP   msg);
SMC_CHARP
SMC_DATAITEM_NAME   value);

SMC_CHARP
LookupDataItemStat(
SMC_DATAITEM_STATTYPE   value);
```

```
SMC_CHARP
LookupLockResult(
SMC_LOCK_RESULT   value);

SMC_CHARP
LookupLockResultSummary(
SMC_LOCK_RESULT_SUMMARY   value);

SMC_CHARP
LookupLockStatus(
SMC_LOCK_STATUS   value);
SMC_CHARP
LookupLockType(
SMC_LOCK_TYPE   value);

SMC_CHARP
LookupObjectType(
SMC_OBJ_TYPE   value);

SMC_CHARP
LookupProcessState(
SMC_PROCESS_STATE   value);
SMC_INT
main(
SMC_INT     argc,
SMC_CHARP   argv[])
{
```

Cache performance summary

This view shows the overall effectiveness of Adaptive Server caches during the most recent sample interval. It shows the percentage of data page reads that were satisfied from Adaptive Server data caches and the percentage of requests for procedure execution that were satisfied from Adaptive Server procedure cache.

```
SMC_SIZET cache_perf_sum_count = 2;
SMC_DATAITEM_STRUCT cache_perf_sum_view[] = {
{ SMC_NAME_PAGE_HIT_PCT,           SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_STP_HIT_PCT,            SMC_STAT_VALUE_SAMPLE }
};
```

Current statement summary

This view displays information about the statement that is currently being executed by Adaptive Server whether it is part of a stored procedure or batch text. Use a view such as this if you are trying to determine what an application is doing at a particular point in its execution.

```
SMC_SIZET cur_stmt_act_count = 11;
SMC_DATAITEM_STRUCT cur_stmt_act_view[] = {
{ SMC_NAME_SPID,                      SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CUR_STMT_ACT_STP_DB_ID,   SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CUR_STMT_ACT_STP_DB_NAME, SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CUR_STMT_ACT_STP_ID,      SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CUR_STMT_ACT_STP_NAME,    SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CUR_STMT_ACT_STP_TEXT,    SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CUR_STMT_BATCH_ID,        SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CUR_STMT_CONTEXT_ID,      SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CUR_STMT_NUM,             SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CUR_STMT_QUERY_PLAN_TEXT, SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CUR_STMT_START_TIME,      SMC_STAT_VALUE_SAMPLE },
};
```

Database object lock status

This view shows the status of locks on database objects that are held or being requested by Adaptive Server processes as of the end of the most recent sample interval. Each lock is identified by:

- The name and ID of the object being locked
- The name and ID of the database that contains that object
- The page number to which the lock applies (if it is a page lock)

Each Adaptive Server process associated with the lock is also identified by its login name, Process ID and Kernel Process ID. The type of lock is shown, together with the current status of the lock and an indication of whether or not this is a demand lock.

If the lock is being requested by the process, the amount of time that this process has waited to acquire the lock and the Process ID of the process that already holds the lock are shown. If the process already holds the lock, the count of other processes waiting to acquire that lock is shown.

```
SMC_SIZET object_lock_status_count = 14;
SMC_DATAITEM_STRUCT object_lock_status_view[] = {
{ SMC_NAME_DB_ID,                     SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DB_NAME,                   SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_OBJ_ID,                    SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_OBJ_NAME,                  SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_NUM,                  SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_LOGIN_NAME,                SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_SPID,                      SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_KPID,                      SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_LOCK_TYPE,                 SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_LOCK_STATUS,               SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DEMAND_LOCK,               SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_TIME_WAITED_ON_LOCK,       SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_BLOCKING_SPID,             SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_LOCKS_BEING_BLOCKED_CNT,   SMC_STAT_VALUE_SAMPLE }
};
```

Database object page I/O

This view shows the objects in Adaptive Server databases and the page I/Os associated with them. It shows the Adaptive Server database name and ID, and the object names and IDs within each database. For each object, this view shows the associated logical reads, physical reads, and page writes for both the most recent sample interval and for the session.

```
SMC_SIZET object_page_io_count = 10;
SMC_DATAITEM_STRUCT object_page_io_view[] = {
{ SMC_NAME_DB_ID,                 SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DB_NAME,               SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_OBJ_ID,                SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_OBJ_NAME,              SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_LOGICAL_READ,     SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_PHYSICAL_READ,    SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_WRITE,            SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_LOGICAL_READ,     SMC_STAT_VALUE_SESSION },
{ SMC_NAME_PAGE_PHYSICAL_READ,    SMC_STAT_VALUE_SESSION },
{ SMC_NAME_PAGE_WRITE,            SMC_STAT_VALUE_SESSION }
};
```

Data cache activity for individual caches

This view shows information about the performance of individual data caches.

For each named cache, including the default data cache, configured in Adaptive Server, this view collects the cache's name and the percentage of page reads for objects bound to the cache that were satisfied from the cache since the start of the recording session.

This view also shows the:

- Efficiency of the cache's use of space
- Percentage of times when an attempt to acquire the cache's spinlock was forced to wait, since the start of the session
- Number of cache hits and misses for the session

```
SMC_SIZET data_cache_activity_count = 7;
SMC_DATAITEM_STRUCT data_cache_activity__view[] = {
{ SMC_NAME_DATA_CACHE_NAME,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DATA_CACHE_ID,            SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DATA_CACHE_HIT_PCT,       SMC_STAT_VALUE_SESSION },
{ SMC_NAME_DATA_CACHE_EFFICIENCY,    SMC_STAT_VALUE_SESSION },
{ SMC_NAME_DATA_CACHE_CONTENTION,    SMC_STAT_RATE_SESSION },
{ SMC_NAME_DATA_CACHE_HIT,           SMC_STAT_VALUE_SESSION },
{ SMC_NAME_DATA_CACHE_MISS,          SMC_STAT_RATE_SESSION }


};
```

Data cache statistics for session

This view shows the effectiveness of the data caches of Adaptive Server since the start of the session. It shows the:

- Percentage of requests for page reads that were satisfied from cache for the session
- Number of logical reads, physical reads, and page writes for the session
- Rate of logical reads, physical reads, and page writes for the session

```
SMC_SIZET session_page_cache_stats_count = 7;
SMC_DATAITEM_STRUCT session_page_cache_stats_view[] = {
{ SMC_NAME_PAGE_HIT_PCT,         SMC_STAT_VALUE_SESSION },
{ SMC_NAME_PAGE_LOGICAL_READ,    SMC_STAT_VALUE_SESSION },
{ SMC_NAME_PAGE_LOGICAL_READ,    SMC_STAT_RATE_SESSION },
{ SMC_NAME_PAGE_PHYSICAL_READ,   SMC_STAT_VALUE_SESSION },
{ SMC_NAME_PAGE_PHYSICAL_READ,   SMC_STAT_RATE_SESSION },
{ SMC_NAME_PAGE_WRITE,           SMC_STAT_VALUE_SESSION },
{ SMC_NAME_PAGE_WRITE,           SMC_STAT_RATE_SESSION }
};
```

Data cache statistics for sample interval

This view shows the effectiveness of the data caches of Adaptive Server for the most recent sample interval. It shows the:

- Percentage of requests for page reads that were satisfied from cache for the most recent sample interval
- Number of logical reads, physical reads, and page writes for the most recent sample interval
- Rate of logical reads, physical reads, and page writes for the most recent sample interval

```
SMC_SIZET sample_page_cache_stats_count = 7;
SMC_DATAITEM_STRUCT sample_page_cache_stats_view[] = {
{ SMC_NAME_PAGE_HIT_PCT,         SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_LOGICAL_READ,    SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_LOGICAL_READ,    SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_PAGE_PHYSICAL_READ,   SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_PHYSICAL_READ,   SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_PAGE_WRITE,           SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_WRITE,           SMC_STAT_RATE_SAMPLE }
};
```

Device I/O for session

This view shows the I/O activity that occurred on Adaptive Server database devices since the start of the session. It identifies each device by name. Device I/O levels are presented in two ways: as counts of total device I/Os, reads and writes since the start of the session, and also as overall rates of total I/Os, reads and writes per second since the session began.

```
SMC_SIZET session_device_io_count = 7;
SMC_DATAITEM_STRUCT session_device_io_view[] = {
{ SMC_NAME_DEV_NAME,      SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DEV_READ,      SMC_STAT_VALUE_SESSION },
{ SMC_NAME_DEV_WRITE,     SMC_STAT_VALUE_SESSION },
{ SMC_NAME_DEV_IO,        SMC_STAT_VALUE_SESSION },
{ SMC_NAME_DEV_READ,      SMC_STAT_RATE_SESSION },
{ SMC_NAME_DEV_WRITE,     SMC_STAT_RATE_SESSION },
{ SMC_NAME_DEV_IO,        SMC_STAT_RATE_SESSION }
};
```

Device I/O for sample interval

This view shows the I/O activity that occurred on Adaptive Server database devices during the most recent sample interval. It identifies each device by name. Device I/O levels are presented in two ways: as counts of total device I/Os, reads and writes during the most recent sample interval, and also as rates of total I/Os, reads and writes per second during the sample interval.

```
SMC_SIZET sample_device_io_count = 7;
SMC_DATAITEM_STRUCT sample_device_io_view[] = {
{ SMC_NAME_DEV_NAME,      SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DEV_IO,        SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DEV_READ,      SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DEV_WRITE,     SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DEV_IO,        SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_DEV_READ,      SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_DEV_WRITE,     SMC_STAT_RATE_SAMPLE }
};
```

Device I/O performance summary

This view shows reads and writes to database devices by Adaptive Server, since the start of the session. It shows the:

- Overall rate of reads and writes to database devices since the start of the session
- Most active database device for that time period

- Rate of reads and writes to the most active device

```
SMC_SIZET device_perf_sum_count = 3;
SMC_DATAITEM_STRUCT device_perf_sum_view[] = {
{ SMC_NAME_DEV_IO,               SMC_STAT_RATE_SESSION },
{ SMC_NAME_MOST_ACT_DEV_NAME,    SMC_STAT_VALUE_SESSION },
{ SMC_NAME_MOST_ACT_DEV_IO,      SMC_STAT_RATE_SESSION }
};
```

Engine activity

This view shows the level of activity for each active Adaptive Server engine during the most recent sample interval. This view shows, for each engine, the:

- Percentage of the sample interval when that engine used the CPU
- Number of lock requests
- Number of logical page reads, physical page reads, and page writes that were generated by the engine during the sample interval

```
SMC_SIZET engine_activity_count = 6;
SMC_DATAITEM_STRUCT engine_activity_view[] = {
{ SMC_NAME_ENGINE_NUM,            SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CPU_BUSY_PCT,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_LOCK_CNT,              SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_LOGICAL_READ,     SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_PHYSICAL_READ,    SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_WRITE,            SMC_STAT_VALUE_SAMPLE }
};
```

Lock performance summary

This view shows the total number of locks of each type requested and granted during the most recent sample interval.

```
SMC_SIZET lock_perf_sum_count = 3;
SMC_DATAITEM_STRUCT lock_perf_sum_view[] = {
{ SMC_NAME_LOCK_TYPE,             SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_LOCK_RESULT_SUMMARY,   SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_LOCK_CNT,              SMC_STAT_VALUE_SAMPLE }
};
```

Network activity for session

This view shows the network activity over all Adaptive Server network connections since the start of the session. It shows the:

- Default packet size
- Maximum packet size
- Average packet sizes sent and received since the start of the session
- Number of packets sent
- Number of packets received
- The rate at which packets were sent and received
- Number of bytes sent
- Number of bytes received
- Rate at which bytes were sent and received

```
SMC_SIZET session_network_activity_count = 12;
SMC_DATAITEM_STRUCT session_network_activity_view[] = {
{ SMC_NAME_NET_DEFAULT_PKT_SIZE,   SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_NET_MAX_PKT_SIZE,       SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_NET_PKT_SIZE_SENT,      SMC_STAT_VALUE_SESSION },
{ SMC_NAME_NET_PKT_SIZE_RCVD,      SMC_STAT_VALUE_SESSION },
{ SMC_NAME_NET_PKTS_SENT,          SMC_STAT_VALUE_SESSION },
{ SMC_NAME_NET_PKTS_RCVD,          SMC_STAT_VALUE_SESSION },
{ SMC_NAME_NET_PKTS_SENT,          SMC_STAT_RATE_SESSION },
{ SMC_NAME_NET_PKTS_RCVD,          SMC_STAT_RATE_SESSION },
{ SMC_NAME_NET_BYTES_SENT,         SMC_STAT_VALUE_SESSION },
{ SMC_NAME_NET_BYTES_RCVD,         SMC_STAT_VALUE_SESSION },
{ SMC_NAME_NET_BYTES_SENT,         SMC_STAT_RATE_SESSION },
{ SMC_NAME_NET_BYTES_RCVD,         SMC_STAT_RATE_SESSION }
};
```

Network activity for sample interval

This view shows the network activity over all Adaptive Server network connections during the most recent sample interval. It shows the:

- Default packet size
- Maximum packet size
- Average packet sizes sent and received for the sample interval
- Number of packets sent
- Number of packets received
- Rate at which packets were sent and received
- Number of bytes sent
- Number of bytes received
- Rate at which bytes were sent and received

```
SMC_SIZET sample_network_activity_count = 12;
SMC_DATAITEM_STRUCT sample_network_activity_view[] = {
{ SMC_NAME_NET_DEFAULT_PKT_SIZE,   SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_NET_MAX_PKT_SIZE,       SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_NET_PKT_SIZE_SENT,      SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_NET_PKT_SIZE_RCVD,      SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_NET_PKTS_SENT,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_NET_PKTS_RCVD,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_NET_PKTS_SENT,          SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_NET_PKTS_RCVD,           SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_NET_BYTES_SENT,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_NET_BYTES_RCVD,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_NET_BYTES_SENT,          SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_NET_BYTES_RCVD,,         SMC_STAT_RATE_SAMPLE }
};
```

Network performance summary

This view shows the rate of Adaptive Server activity over all its network connections during the most recent sample interval. It shows the number of bytes per second that were received by and sent by Adaptive Server during the interval.

```
SMC_SIZET network_perf_sum_count = 2;
SMC_DATAITEM_STRUCT network_perf_sum_view[] = {
{ SMC_NAME_NET_BYTES_RCVD,      SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_NET_BYTES_SENT,,     SMC_STAT_RATE_SAMPLE }
};
```

Procedure cache statistics for session

This view shows the effectiveness of the procedure cache of Adaptive Server since the start of the session. It shows the:

- Percentage of requests for stored procedure executions that were satisfied by the procedure cache
- Number of logical reads and physical reads of stored procedures since the start of the session
- Overall rate of logical and physical reads of stored procedures since the start of the session

```
SMC_SIZET session_procedure_cache_stats_count = 5;
SMC_DATAITEM_STRUCT session_procedure_cache_stats_view[] = {
{ SMC_NAME_STP_HIT_PCT,         SMC_STAT_VALUE_SESSION },
{ SMC_NAME_STP_LOGICAL_READ,,   SMC_STAT_VALUE_SESSION },
{ SMC_NAME_STP_LOGICAL_READ,    SMC_STAT_RATE_SESSION },
{ SMC_NAME_STP_PHYSICAL_READ,   SMC_STAT_VALUE_SESSION },
{ SMC_NAME_STP_PHYSICAL_READ,   SMC_STAT_RATE_SESSION }
};
```

Procedure cache statistics for sample interval

This view shows the effectiveness of the procedure cache of Adaptive Server for the most recent sample interval. It shows the:

- Percentage of requests for stored procedure executions that were satisfied by the procedure cache for the most recent sample interval
- Number of logical reads and physical reads of stored procedures during the most recent sample interval

- Rate of logical and physical reads of stored procedures for the most recent sample interval

```
SMC_SIZET sample_procedure_cache_stats_count = 5;
SMC_DATAITEM_STRUCT sample_procedure_cache_stats_view[] = {
{ SMC_NAME_STP_HIT_PCT,        SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_STP_LOGICAL_READ,   SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_STP_LOGICAL_READ,   SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_STP_PHYSICAL_READ,  SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_STP_PHYSICAL_READ,  SMC_STAT_RATE_SAMPLE }
};
```

Procedure page I/O

This view shows page I/Os that occurred while running stored procedures during the most recent sample interval. For each stored procedure that generated page I/Os during the sample interval, it shows the stored procedure name and ID, together with the name and ID of the database that contains the procedure. If page I/Os were produced when no stored procedure was active, those I/Os are associated with procedure ID and database ID values of zero.

This view also shows, on a per stored procedure level:

- Total page I/Os
- Percentage of page I/O requests that could be satisfied by Adaptive Server data caches
- Number of logical reads, physical reads, and page writes generated while executing the stored procedures during the most recent sample interval.

```
SMC_SIZET procedure_page_cache_io_count = 9;
SMC_DATAITEM_STRUCT procedure_page_cache_io_view[] = {
{ SMC_NAME_ACT_STP_DB_NAME,     SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_ACT_STP_DB_ID,       SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_ACT_STP_NAME,        SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_ACT_STP_ID,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_IO,             SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_HIT_PCT,        SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_LOGICAL_READ,   SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_PHYSICAL_READ,  SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_WRITE,          SMC_STAT_VALUE_SAMPLE }
};
```

Process activity

This view shows the CPU use, page I/Os, and current process state for all processes in Adaptive Server.

For each process in the most recent sample interval it shows the:

- Login name
- Process ID
- Kernel Process ID
- Current process state.

The view also presents each process's connect time, total page I/Os and CPU usage time, accumulated since the start of the session.

```
SMC_SIZET process_activity_count = 7;
SMC_DATAITEM_STRUCT process_activity_view[] = {
{ SMC_NAME_LOGIN_NAME,        SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_SPID,              SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_KPID,              SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CONNECT_TIME,      SMC_STAT_VALUE_SESSION },
{ SMC_NAME_PAGE_IO,           SMC_STAT_VALUE_SESSION },
{ SMC_NAME_CPU_TIME,          SMC_STAT_VALUE_SESSION },
{ SMC_NAME_CUR_PROC_STATE,    SMC_STAT_VALUE_SAMPLE }
};
```

Process database object page I/O

This view shows the page I/Os by database object for each Adaptive Server process. For each process that had page I/Os during the most recent sample interval it shows the:

- Login name
- Process ID
- Kernel Process ID

For each such process and for each database object it accessed, the view shows the:

- Object name
- Object ID

- Database name and ID
- Page I/Os

The view also shows the total page I/Os, the percentage of page I/O requests that could be satisfied by Adaptive Server cache, and the number of logical reads, physical reads, and page writes for the most recent sample interval.

```
SMC_SIZET process_object_page_io_count = 13;
SMC_DATAITEM_STRUCT process_object_page_io_view[] = {
{ SMC_NAME_LOGIN_NAME,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_SPID,                SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_KPID,                SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DB_NAME,             SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DB_ID,               SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_OBJ_NAME,            SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_OBJ_ID,              SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_OBJ_TYPE,            SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_IO,             SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_HIT_PCT,        SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_LOGICAL_READ,   SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_PHYSICAL_READ,  SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_WRITE,          SMC_STAT_VALUE_SAMPLE }
};
```

Process detail for locks

This view shows the status of locks held or being requested by Adaptive Server processes as of the end of the most recent sample interval. Each lock is identified by:

- Login name
- Process ID
- Kernel Process ID of the Adaptive Server process associated with the lock
- Name and ID of the object being locked
- Name and ID of the database that contains that object
- Page number to which the lock applies (if it is a page lock)
- Current status of each lock
- Indication of whether or not this is a demand lock

If the lock is being requested by the process, the amount of time that this process has waited to acquire the lock and the Process ID of the process that holds the lock are shown. If the process holds the lock, the count of other processes waiting to acquire that lock is shown.

```
SMC_SIZET process_detail_locks_count = 13;
SMC_DATAITEM_STRUCT process_detail_locks_view[] = {
{ SMC_NAME_LOGIN_NAME,              SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_SPID,                    SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_KPID,                    SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DB_NAME,                 SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DB_ID,                   SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_OBJ_NAME,                SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_OBJ_ID,                  SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_NUM,                SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_LOCK_STATUS,             SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_DEMAND_LOCK,             SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_TIME_WAITED_ON_LOCK,     SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_BLOCKING_SPID,           SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_LOCKS_BEING_BLOCKED_CNT, SMC_STAT_VALUE_SAMPLE }
};
```

Process detail page I/O

This view shows the page I/Os for each Adaptive Server process in detail. It shows the following as of the end of the most recent sample interval:

- Login name
- Process ID
- Kernel Process ID
- Process state and current engine are shown for each Adaptive Server process

The view shows the percentage of page I/O requests that could be satisfied by Adaptive Server data caches, both for the sample interval and since the start of the session. It also shows the number of logical reads, physical reads, and page writes since the start of the session.

```
SMC_SIZET process_detail_io_count = 12;
SMC_DATAITEM_STRUCT process_detail_io_view[] = {
{ SMC_NAME_LOGIN_NAME,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_SPID,                SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_KPID,                SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CUR_PROC_STATE,      SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CUR_ENGINE,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_CONNECT_TIME,        SMC_STAT_VALUE_SESSION },
{ SMC_NAME_CPU_TIME,            SMC_STAT_VALUE_SESSION },
{ SMC_NAME_PAGE_HIT_PCT,        SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_HIT_PCT,        SMC_STAT_VALUE_SESSION },
{ SMC_NAME_PAGE_LOGICAL_READ,   SMC_STAT_VALUE_SESSION },
{ SMC_NAME_PAGE_PHYSICAL_READ,  SMC_STAT_VALUE_SESSION },
{ SMC_NAME_PAGE_WRITE,          SMC_STAT_VALUE_SESSION }
};
```

Process locks

This view shows the count of lock requests for every process in Adaptive Server that generated lock requests during the most recent sample interval.

```
SMC_SIZET process_lock_count = 4;
SMC_DATAITEM_STRUCT process_lock_view[] = {
{ SMC_NAME_LOGIN_NAME,    SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_SPID,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_KPID,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_LOCK_CNT,      SMC_STAT_VALUE_SAMPLE }
};
```

Process page I/O

This view summarizes the page I/Os for each Adaptive Server process for the most recent sample. For each process in Adaptive Server that generated page I/Os during the interval, it shows the login name, Process ID, and Kernel Process ID.

This view also shows, for each process:

- Total page I/Os
- Percentage of page I/O requests that could be satisfied by Adaptive Server data caches
- Number of logical reads, physical reads, and writes for the most recent sample interval

```
SMC_SIZET process_page_io_count = 8;
SMC_DATAITEM_STRUCT process_page_io_view[] = {
{ SMC_NAME_LOGIN_NAME,           SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_SPID,                 SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_KPID,                 SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_IO,              SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_HIT_PCT,         SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_LOGICAL_READ,    SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_PHYSICAL_READ,   SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_WRITE,           SMC_STAT_VALUE_SAMPLE }
};
```

Process state summary

This view shows the number of processes that were in each process state at the end of the most recent sample interval.

```
SMC_SIZET process_perf_sum_count = 2;
SMC_DATAITEM_STRUCT process_perf_sum_view[] = {
{ SMC_NAME_PROC_STATE,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PROC_STATE_CNT,      SMC_STAT_VALUE_SAMPLE }
};
```

Process stored procedure page I/O

This view shows the page I/Os associated with stored procedure executions by Adaptive Server processes. It shows the login name, Process ID, and Kernel Process ID for each process that generated page I/Os during the sample interval.

For each process and stored procedure that generated page I/Os, it shows the name and ID of the database that contains the stored procedure, and the name and ID of the procedure.

For the most recent sample interval, the view shows the:

- Total page I/Os
- Percentage of page I/O requests that could be satisfied from data caches
- Number of logical reads, physical reads, and page writes

```
                    SMC_SIZET process_procedure_page_io_count = 12;
SMC_DATAITEM_STRUCT process_procedure_page_io_view[] = {
{ SMC_NAME_LOGIN_NAME,            SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_SPID,                  SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_KPID,                  SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_ACT_STP_DB_NAME,       SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_ACT_STP_DB_ID,         SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_ACT_STP_NAME,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_ACT_STP_ID,            SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_IO,                SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_HIT_PCT,           SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_LOGICAL_READ,      SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_PHYSICAL_READ,     SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_PAGE_WRITE,             SMC_STAT_VALUE_SAMPLE }
};
```

Server performance summary

This view shows overall Adaptive Server performance. It shows the:

- Number of lock requests per second
- Percentage of the sample interval when Adaptive Server was busy
- Number of transactions processed per second
- Number of times Adaptive Server detected a deadlock during the most recent sample interval

```
SMC_SIZET server_perf_sum_count = 4;
SMC_DATAITEM_STRUCT server_perf_sum_view[] = {
{ SMC_NAME_LOCK_CNT,           SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_CPU_BUSY_PCT,       SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_XACT,               SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_DEADLOCK_CNT,       SMC_STAT_VALUE_SAMPLE }
};
```

Stored procedure activity

This view shows stored procedure activity for procedure statements. Each statement of any stored procedure that was executed during the most recent sample interval is identified by:

- Name and ID of the database that contains the procedure
- Name and ID of the procedure
- Relative number of the statement within the stored procedure
- Line of the procedure's text on which the statement begins

The view shows the:

- Number of times each statement was executed, both during the most recent sample interval and since the start of the session
- Average elapsed time needed to execute the statement, both for the sample interval and for the session so far

```
SMC_SIZET procedure_activity_count = 10;
SMC_DATAITEM_STRUCT procedure_activity_view[] = {
{ SMC_NAME_ACT_STP_DB_ID,SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_ACT_STP_DB_NAME,         SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_ACT_STP_ID,              SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_ACT_STP_NAME,            SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_STP_LINE_NUM,            SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_STP_STMT_NUM,            SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_STP_NUM_TIMES_EXECUTED,  SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_STP_NUM_TIMES_EXECUTED,  SMC_STAT_VALUE_SESSION },
{ SMC_NAME_STP_ELAPSED_TIME,        SMC_STAT_AVG_SAMPLE },
{ SMC_NAME_STP_ELAPSED_TIME,        SMC_STAT_AVG_SESSION }
};
```

Transaction activity

This view shows the transaction activity that occurred in the Adaptive Server, both for the sample interval and the session.

```
SMC_SIZET transaction_activity_count = 20;
SMC_DATAITEM_STRUCT transaction_activity_view[] = {
{ SMC_NAME_XACT,                SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_XACT_DELETE,         SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_XACT_INSERT,         SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_XACT_UPDATE,          SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_XACT_UPDATE_DIRECT,   SMC_STAT_VALUE_SAMPLE },
{ SMC_NAME_XACT,                 SMC_STAT_VALUE_SESSION },
{ SMC_NAME_XACT_DELETE,          SMC_STAT_VALUE_SESSION },
{ SMC_NAME_XACT_INSERT,          SMC_STAT_VALUE_SESSION },
{ SMC_NAME_XACT_UPDATE,          SMC_STAT_VALUE_SESSION },
{ SMC_NAME_XACT_UPDATE_DIRECT,   SMC_STAT_VALUE_SESSION },
{ SMC_NAME_XACT,                 SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_XACT_DELETE,          SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_XACT_INSERT,          SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_XACT_UPDATE,          SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_XACT_UPDATE_DIRECT,   SMC_STAT_RATE_SAMPLE },
{ SMC_NAME_XACT,                 SMC_STAT_RATE_SESSION },
{ SMC_NAME_XACT_DELETE,          SMC_STAT_RATE_SESSION },
{ SMC_NAME_XACT_INSERT,          SMC_STAT_RATE_SESSION },
{ SMC_NAME_XACT_UPDATE,,         SMC_STAT_RATE_SESSION },
{ SMC_NAME_XACT_UPDATE_DIRECT,   SMC_STAT_RATE_SESSION }
};SMC_SIZET num_views = 27;
  SMC_SIZET* view_count = (SMC_SIZET*) malloc (sizeof(SMC_SIZET)
       * num_views );
  SMC_DATAITEM_STRUCT** view_list = (SMC_DATAITEM_STRUCT**)
       malloc (sizeof(SMC_DATAITEM_STRUCT*) * num_views );
  SMC_SIZET** view_id_handle_list = (SMC_SIZET**) malloc
       (sizeof(SMC_SIZET*) * num_views );
  SMC_SIZET* view_id_list = (SMC_SIZET*) malloc
       (sizeof(SMC_SIZET) * num_views );

  SMC_SIZET  client_id;
  SMC_SIZETP client_id_handle = &client_id;

  SMC_SERVER_MODE server_mode = SMC_SERVER_M_LIVE;
  SMC_CHAR server_name[ 40 ];
  SMC_CHAR user_name[ 40 ];
  SMC_CHAR password[ 40 ];
  SMC_CHAR interfaces_file[ 40 ];

  SMC_RETURN_CODE ret;
  SMC_SIZET refresh_num, view_num, col_num, row_num;

  SMC_SIZET num_refreshes = 10;

  SMC_SIZET  row_count;
  SMC_SIZETP row_count_handle = &row_count;

  SMC_DATAITEM_STRUCTP dataitem_list;
  SMC_DATAITEM_NAME dataitem_name;
  SMC_CHARP dataitem_name_str;
  SMC_DATAITEM_STATTYPE dataitem_stat;
  SMC_CHARP dataitem_stat_str;
  SMC_DATAITEM_TYPE dataitem_type;

  SMC_VALUE_UNION data_union;
  SMC_VALUE_UNIONP data_union_handle = &data_union;
  SMC_CHARP data_str;
  SMC_INT ival;
printf("**************************************************\n");
printf("** Test Driver for SQL Monitor Client Library **\n");
printf("**************************************************\n");
if (argc != 5)
{
    printf(Usage: testcli <SQLMonitorServer> <user> <password>
       <"interfaces_file>\n");
    exit(1);
  }

  strcpy(server_name, argv[1]);
  strcpy(user_name, argv[2]);
  strcpy(password, argv[3]);
  strcpy(interfaces_file, argv[4]);

  for(view_num=0; view_num<num_views; view_num++)
  {
    view_id_handle_list[ view_num ] = &(view_id_list[ view_num ]);
  }

  view_count [  0 ] = cache_perf_sum_count;
  view_list  [  0 ] = cache_perf_sum_view;
  view_count [  1 ] = object_lock_status_count;
  view_list  [  1 ] = object_lock_status_view;
  view_count [  2 ] = object_page_io_count;
  view_list  [  2 ] = object_page_io_view;
  view_count [  3 ] = session_page_cache_stats_count;
  view_list  [  3 ] = session_page_cache_stats_view;
  view_count [  4 ] = sample_page_cache_stats_count;
  view_list  [  4 ] = sample_page_cache_stats_view;
  view_count [  5 ] = session_device_io_count;
  view_list  [  5 ] = session_device_io_view;
  view_count [  6 ] = sample_device_io_count;
  view_list  [  6 ] = sample_device_io_view;
  view_count [  7 ] = device_perf_sum_count;
  view_list  [  7 ] = device_perf_sum_view;
  view_count [  8 ] = engine_activity_count;
  view_list  [  8 ] = engine_activity_view;
  view_count [  9 ] = lock_perf_sum_count;
  view_list  [  9 ] = lock_perf_sum_view;
  view_count [ 10 ] = session_network_activity_count;
  view_list  [ 10 ] = session_network_activity_view;
  view_count [ 11 ] = sample_network_activity_count;
  view_list  [ 11 ] = sample_network_activity_view;
  view_count [ 12 ] = network_perf_sum_count;
  view_list  [ 12 ] = network_perf_sum_view;
  view_count [ 13 ] = session_procedure_cache_stats_count;
  view_list  [ 13 ] = session_procedure_cache_stats_view;
  view_count [ 14 ] = sample_procedure_cache_stats_count;
  view_list  [ 14 ] = sample_procedure_cache_stats_view;
  view_count [ 15 ] = procedure_page_cache_io_count;
  view_list  [ 15 ] = procedure_page_cache_io_view;
  view_count [ 16 ] = process_activity_count;
  view_list  [ 16 ] = process_activity_view;
  view_count [ 17 ] = process_object_page_io_count;
  view_list  [ 17 ] = process_object_page_io_view;
  view_count [ 18 ] = process_detail_locks_count;
  view_list  [ 18 ] = process_detail_locks_view;
  view_count [ 19 ] = process_detail_io_count;
  view_list  [ 19 ] = process_detail_io_view;
  view_count [ 20 ] = process_lock_count;
  view_list  [ 20 ] = process_lock_view;
  view_count [ 21 ] = process_page_io_count;
  view_list  [ 21 ] = process_page_io_view;
  view_count [ 22 ] = process_perf_sum_count;
  view_list  [ 22 ] = process_perf_sum_view;
  view_count [ 23 ] = process_procedure_page_io_count;
  view_list  [ 23 ] = process_procedure_page_io_view;
  view_count [ 24 ] = server_perf_sum_count;
  view_list  [ 24 ] = server_perf_sum_view;
  view_count [ 25 ] = procedure_activity_count;
  view_list  [ 25 ] = procedure_activity_view;
  view_count [ 26 ] = transaction_activity_count;
  view_list  [ 26 ] = transaction_activity_view;

  printf("**********   testing smc_connect()   **********\n");
  ret = smc_connect(server_mode,
                    server_name,
                    user_name,
                    password,
                    interfaces_file,
                    ErrorCallback,
                    0,
                    0,
                    client_id_handle);
  if ( ret != SMC_RET_SUCCESS )
  {
    printf("error returned by smc_connect()\n");
    return (int) ret;
  }
  else
  {
    printf("smc_connect() succeeded\n");
  }
printf("**********   testing smc_create_view()   **********\n");
for(view_num=0; view_num<num_views; view_num++)
{
ret = smc_create_view(client_id,
                    view_list[ view_num ],
                    view_count[ view_num ],
                    (SMC_CHARP) 0,
                    view_id_handle_list[ view_num ]);
    if ( ret != SMC_RET_SUCCESS )
    {
      printf("error returned by smc_create_view( %d )\n",
          view_num);
      return (int) ret;
    }
    else
    {
      printf("smc_create_view( %d ) succeeded\n", view_num);
    }
  }
printf("**********   testing smc_refresh()   **********\n");
for(refresh_num=0; refresh_num<num_refreshes; refresh_num++)
{
    ret = smc_refresh(client_id,
                      (SMC_VOIDP) 0,
                      RefreshCallback,
                      0);
    if ( ret != SMC_RET_SUCCESS )
    {
      printf("error returned by smc_refresh() number %d\n",
          refresh_num);
      return (int) ret;
    }
    else
    {
      printf("smc_refresh() number %d succeeded\n", refresh_num);
    }

    for(view_num=0; view_num<num_views;  view_num++)
    {
      printf("******   testing smc_get_row_count()   ******\n");
      ret = smc_get_row_count(client_id,
                              view_id_list[ view_num ],
                              row_count_handle);
      if ( ret != SMC_RET_SUCCESS )
      {
        printf("error returned by smc_get_row_count()\n");
        return (int) ret;
      }
      else
      {
        printf("smc_get_row_count( view_id = %d ) = %d\n",
          view_id_list[view_num], row_count);
      }

      dataitem_list = view_list[view_num];

      /* print dataitem name headers */
      for(col_num = 0; col_num<view_count[ view_num ]; col_num++)
      {
        dataitem_name = (dataitem_list[col_num]).dataItemName;
        dataitem_name_str = LookupDataItemName( dataitem_name );
        printf("Col %d %s\t", col_num, dataitem_name_str);
      }
      printf("\n");

      /* print dataitem stattype headers */
      for(col_num = 0; col_num<view_count[ view_num ]; col_num++)
      {
        dataitem_stat = (dataitem_list[col_num]).dataItemStatType;
        dataitem_stat_str = LookupDataItemStat( dataitem_stat );
        printf("Col %d %s\t", col_num, dataitem_stat_str);
      }
      printf("\n");

      for(row_num = 0; row_num<row_count; row_num++)
      {
        for(col_num = 0; col_num<view_count[ view_num ];
          col_num++)
        {
          dataitem_name = (dataitem_list[col_num]).dataItemName;
          dataitem_stat = (dataitem_list[col_num]).dataItemStatType;
```

```
dataitem_name_str = LookupDataItemName( dataitem_name );
ret = smc_get_dataitem_value(client_id,
                             view_id_list[ view_num ],
                             &(dataitem_list[col_num]),
                             row_num,
                             data_union_handle);
if ( ret != SMC_RET_SUCCESS )
{
  printf("error returned by smc_get_dataitem_value()\n");
  return (int) ret;
}

smc_get_dataitem_type(&(dataitem_list[col_num]),
                        &dataitem_type);

switch(dataitem_type)
{
  case SMC_DI_TYPE_CHARP:
    printf("Col %d:
       \"%s\"\t",col_num,data_union.stringValue);
    free( data_union.stringValue );
    break;
  case SMC_DI_TYPE_DOUBLE:
    printf("Col %d:
       %f\t",col_num,data_union.doubleValue);
    break;
  case SMC_DI_TYPE_ENUMS:
    ival = data_union.intValue;
    switch (dataitem_name)
    {
      case SMC_NAME_LOCK_RESULT_SUMMARY:
        data_str = LookupLockResultSummary(
          ((SMC_LOCK_RESULT_SUMMARY) ival) );
        printf("Col %d: \"%s\"\t",col_num, data_str );
        break;
      case SMC_NAME_LOCK_RESULT:
        data_str = LookupLockResult(
          ((SMC_LOCK_RESULT) ival) );
        printf("Col %d: \"%s\"\t",col_num, data_str );
        break;
      case SMC_NAME_LOCK_STATUS:
        data_str = LookupLockStatus(
          ((SMC_LOCK_STATUS) ival) );
        printf("Col %d: \"%s\"\t",col_num, data_str );
        break;
      case SMC_NAME_LOCK_TYPE:
```

```
                data_str = LookupLockType( ((SMC_LOCK_TYPE)
                  ival) );
                printf("Col %d: \"%s\"\t",col_num, data_str );
                break;
              case SMC_NAME_OBJ_TYPE:
                data_str = LookupObjectType( ((SMC_OBJ_TYPE)
                  ival) );
                printf("Col %d: \"%s\"\t",col_num, data_str );
                break;
              case SMC_NAME_CUR_PROC_STATE:
              case SMC_NAME_PROC_STATE:
                data_str = LookupProcessState(
                  ((SMC_PROCESS_STATE) ival) );
                printf("Col %d: \"%s\"\t",col_num, data_str );
                break;
              default:
                printf("Col %d: \"ERR with %s\"\t",col_num,
                  dataitem_name_str );
            }
            break;
          case SMC_DI_TYPE_LONG:
            printf("Col %d: %d\t",col_num,
               data_union.longValue);
            break;
          case SMC_DI_TYPE_DATIM:
          case SMC_DI_TYPE_NONE:
          default:
            printf("Col %d: \"ERR with %s\"\t",col_num,
               dataitem_name_str );
        }
      }
      printf("\n");
    }
  }
}

printf("**********   testing smc_disconnect()   **********\n");
ret = smc_disconnect(client_id);
if ( ret != SMC_RET_SUCCESS )
{
  printf("error returned by smc_disconnect()\n");
  return (int) ret;
}
{
  printf("smc_disconnect() succeeded\n");
}
```

```
  free(view_count);
  free(view_list);

  return 0;
}


SMC_VOID
ErrorCallback(
  SMC_SIZET    id,
  SMC_SIZET    error_number,
  SMC_SIZET    severity,
  SMC_SIZET    map_severity,
  SMC_SIZET    source,
  SMC_CCHARP   error_msg,
  SMC_SIZET    state
  )
{
  printf("****************************************\n");
  printf("Inside ErrorCallback()\n");

  printf("id = %d\n", id);
  printf("error_number = %d\n", error_number);
  printf("err severity = %d\n", severity);
  printf("map severity = %d\n", map_severity);
  printf("source = %d\n", source);
  printf("error msg = %s\n", error_msg);
  printf("state = %d\n", state);
  printf("****************************************\n");
  return;
}


SMC_VOID
RefreshCallback(
  SMC_SIZET   id,
  SMC_VOIDP   user_msg,
  SMC_CHARP   msg
  )
{
  printf("****************************************\n");
  printf("Inside RefreshCallback()\n");

  printf("id = %d\n", id);
  printf("user_msg = %s\n", (SMC_CHARP) user_msg);
  printf("msg = %s\n", msg);

  return;
}


SMC_CHARP
LookupDataItemName(
  SMC_DATAITEM_NAME   value
  )
{
  typedef struct {
    SMC_CHARP           str_name;
    SMC_DATAITEM_NAME   enum_name;
  } DATAITEM_NAME_MAPPER;
  DATAITEM_NAME_MAPPER   dataitem_name_map[] = {
  { "Process ID",          SMC_NAME_SPID },
  { "Kernel Process ID",   SMC_NAME_KPID },
  { "Cache Name",          SMC_NAME_DATA_CACHE_NAME },
  { "Database ID",         SMC_NAME_DB_ID },
  { "Object ID",           SMC_NAME_OBJ_ID },
  { "Procedure Database ID",SMC_NAME_ACT_STP_DB_ID },
  { "Procedure ID",         SMC_NAME_ACT_STP_ID },
  { "Procedure Line Number",SMC_NAME_STP_LINE_NUM },
  { "Lock Type",           SMC_NAME_LOCK_TYPE },
  { "Lock Result",         SMC_NAME_LOCK_RESULT },
  { "Lock Results Summarized",SMC_NAME_LOCK_RESULT_SUMMARY },
  { "Lock Status",         SMC_NAME_LOCK_STATUS },
  { "Engine Number",       SMC_NAME_ENGINE_NUM },
  { "Page Number",         SMC_NAME_PAGE_NUM },
  { "Device Name",         SMC_NAME_DEV_NAME },
  { "Process State",       SMC_NAME_PROC_STATE },
  { "Login Name",          SMC_NAME_LOGIN_NAME },
  { "Database Name",       SMC_NAME_DB_NAME },
  { "Owner Name",          SMC_NAME_OWNER_NAME },
  { "Object Name",         SMC_NAME_OBJ_NAME },
  { "Object Type",         SMC_NAME_OBJ_TYPE },
  { "Procedure Database Name",SMC_NAME_ACT_STP_DB_NAME },
  { "Procedure Owner Name",SMC_NAME_ACT_STP_OWNER_NAME },
  { "Procedure Name",      SMC_NAME_ACT_STP_NAME },
  { "Blocking Process ID", SMC_NAME_BLOCKING_SPID },
  { "Cache Efficiency",    SMC_NAME_DATA_CACHE_EFFICIENCY },
  { "Cache Hit Pct",       SMC_NAME_DATA_CACHE_HIT_PCT },
  { "Cache Hits",          SMC_NAME_DATA_CACHE_HIT },
  { "Cache Misses",        SMC_NAME_DATA_CACHE_MISS },
  { "Cache Spinlock Contention",SMC_NAME_DATA_CACHE_CONTENTION },
  { "Connect Time",        SMC_NAME_CONNECT_TIME },
  { "CPU Busy Percent",    SMC_NAME_CPU_BUSY_PCT },
  { "CPU Percent",         SMC_NAME_CPU_PCT },
  { "CPU Time",            SMC_NAME_CPU_TIME },
  { "Current Engine",      SMC_NAME_CUR_ENGINE },
  { "Current Process State",SMC_NAME_CUR_PROC_STATE },
  { "Deadlock Count",      SMC_NAME_DEADLOCK_CNT },
  { "Demand Lock",         SMC_NAME_DEMAND_LOCK },
  { "Device Hits",         SMC_NAME_DEV_HIT },
  { "Device Hit Percent",  SMC_NAME_DEV_HIT_PCT },
  { "Device I/O",          SMC_NAME_DEV_IO },
  { "Device Misses",       SMC_NAME_DEV_MISS },
  { "Device Reads",        SMC_NAME_DEV_READ },
  { "Device Writes",       SMC_NAME_DEV_WRITE },
  { "Lock Count",          SMC_NAME_LOCK_CNT },
  { "Lock Hit Percent",    SMC_NAME_LOCK_HIT_PCT },
  { "Lock Status Count",   SMC_NAME_LOCK_STATUS_CNT },
  { "Locks Being Blocked Count",SMC_NAME_LOCKS_BEING_BLOCKED_CNT },
  { "Code Memory Size",    SMC_NAME_MEM_CODE_SIZE },
  { "Kernel Structures Memory Size",SMC_NAME_MEM_KERNEL_STRUCT_SIZE },
  { "Page Cache Size",     SMC_NAME_MEM_PAGE_CACHE_SIZE },
  { "Procedure Buffer Size",SMC_NAME_MEM_PROC_BUFFER },
  { "Procedure Header Size",SMC_NAME_MEM_PROC_HEADER },
  { "Server Structures Size",SMC_NAME_MEM_SERVER_STRUCT_SIZE },
  { "Most Active Device I/O", SMC_NAME_MOST_ACT_DEV_IO },
  { "Most Active Device Name",SMC_NAME_MOST_ACT_DEV_NAME },
  { "Net I/O Bytes",       SMC_NAME_NET_BYTE_IO },
  { "Net Bytes Received",  SMC_NAME_NET_BYTES_RCVD },
  { "Net Bytes Sent",      SMC_NAME_NET_BYTES_SENT },
  { "Net Default Packet Size",SMC_NAME_NET_DEFAULT_PKT_SIZE },
  { "Net Max Packet Size", SMC_NAME_NET_MAX_PKT_SIZE },
  { "Net Packet Size Received",SMC_NAME_NET_PKT_SIZE_RCVD },
  { "Net Packet Size Sent",SMC_NAME_NET_PKT_SIZE_SENT },
  { "Net Packets Received",SMC_NAME_NET_PKTS_RCVD },
  { "Net Packets Sent",    SMC_NAME_NET_PKTS_SENT },
  { "Page Hit Percent",    SMC_NAME_PAGE_HIT_PCT },
  { "Logical Page Reads",  SMC_NAME_PAGE_LOGICAL_READ },
  { "Page I/O",            SMC_NAME_PAGE_IO },
  { "Physical Page Reads", SMC_NAME_PAGE_PHYSICAL_READ },
  { "Page Writes",         SMC_NAME_PAGE_WRITE },
  { "Process State Count", SMC_NAME_PROC_STATE_CNT },
  { "Timestamp",           SMC_NAME_TIMESTAMP },
  { "Elapsed Time",        SMC_NAME_ELAPSED_TIME },
  { "SQL Server Name",     SMC_NAME_SQL_SERVER_NAME },
  { "SQL Server Version",  SMC_NAME_SQL_SERVER_VERSION },
  { "Procedure Elapsed Time",SMC_NAME_STP_ELAPSED_TIME },
  { "Procedure Hit Percent",SMC_NAME_STP_HIT_PCT },
  { "Procedure Line Text", SMC_NAME_STP_LINE_TEXT },
  { "Procedure Execution Count",SMC_NAME_STP_NUM_TIMES_EXECUTED },
  { "Procedure Logical Reads",SMC_NAME_STP_LOGICAL_READ },
  { "Procedure Physical Reads",SMC_NAME_STP_PHYSICAL_READ },
  { "Time Waited on Lock", SMC_NAME_TIME_WAITED_ON_LOCK },
  { "Transactions",        SMC_NAME_XACT },
  { "Rows Deleted",        SMC_NAME_XACT_DELETE },
  { "Rows Inserted Clustered",SMC_NAME_XACT_CINSERT },
  { "Rows Inserted",       SMC_NAME_XACT_INSERT },
  { "Rows Inserted Nonclustered",SMC_NAME_XACT_NCINSERT },
  { "Rows Updated",        SMC_NAME_XACT_UPDATE },
  { "Rows Updated Directly",SMC_NAME_XACT_UPDATE_DIRECT },
  { (SMC_CHARP)0,SMC_NAME_NONE }
  };

  SMC_INT    idx = 0;
  SMC_BOOL   match = FALSE;
  while( match == FALSE)
  {
    if ( value == dataitem_name_map[ idx ].enum_name )
      return dataitem_name_map[ idx ].str_name;

    if (dataitem_name_map[ idx ].enum_name == SMC_NAME_NONE )
      return dataitem_name_map[ idx ].str_name;

    idx++;
  }
}


SMC_CHARP
LookupDataItemStat(
  SMC_DATAITEM_STATTYPE   value
  )
{
  typedef struct {
    SMC_CHARP               str_stat;
    SMC_DATAITEM_STATTYPE   enum_stat;
  } DATAITEM_STAT_MAPPER;

  DATAITEM_STAT_MAPPER   dataitem_stat_map[] = {
  { "Value for Sample",       SMC_STAT_VALUE_SAMPLE },
  { "Value for Session",      SMC_STAT_VALUE_SESSION },
  { "Rate for Sample",        SMC_STAT_RATE_SAMPLE },
  { "Rate for Session",       SMC_STAT_RATE_SESSION },
  { "Avg for Sample",         SMC_STAT_AVG_SAMPLE },
  { "Avg for Session",        SMC_STAT_AVG_SESSION },
  { (SMC_CHARP)0,0 }
  };

  SMC_INT    idx = 0;
  SMC_BOOL   match = FALSE;

  while( match == FALSE)
  {
    if ( value == dataitem_stat_map[ idx ].enum_stat )
      return dataitem_stat_map[ idx ].str_stat;

    if (dataitem_stat_map[ idx ].enum_stat == 0 )
      return dataitem_stat_map[ idx ].str_stat;

    idx++;
  }
}


SMC_CHARP
LookupLockResult(
  SMC_LOCK_RESULT   value
  )
{
  typedef struct {
    SMC_CHARP         str_lock_res;
    SMC_LOCK_RESULT   enum_lock_res;
  } LOCK_RESULT_MAPPER;

  LOCK_RESULT_MAPPER lock_result_map[] = {
  { "granted",                SMC_LOCK_R_GRANTED },
  { "notneeded",              SMC_LOCK_R_NOTNEEDED },
  { "waited",                 SMC_LOCK_R_WAITED },
  { "didntwait",              SMC_LOCK_R_DIDNTWAIT },
  { "deadlock",               SMC_LOCK_R_DEADLOCK },
  { "interrupted",            SMC_LOCK_R_INTERRUPTED},
  { (SMC_CHARP)0,0 }
  };

  SMC_INT    idx = 0;
  SMC_BOOL   match = FALSE;

  while( match == FALSE)
  {
    if ( value == lock_result_map[ idx ].enum_lock_res )
      return lock_result_map[ idx ].str_lock_res;

    if (lock_result_map[ idx ].enum_lock_res == 0 )
      return lock_result_map[ idx ].str_lock_res;

    idx++;
  }
}
SMC_CHARP
LookupLockResultSummary(
  SMC_LOCK_RESULT_SUMMARY   value
  )
{
  typedef struct {
    SMC_CHARP                 str_lock_ressum;
    SMC_LOCK_RESULT_SUMMARY   enum_lock_ressum;
  } LOCK_RESULT_SUMMARY_MAPPER;

  LOCK_RESULT_SUMMARY_MAPPER lock_result_summary_map[] = {
  { "granted",                SMC_LOCK_RS_GRANTED },
  { "notgranted",             SMC_LOCK_RS_NOTGRANTED },
  { (SMC_CHARP)0,0 }
  };

  SMC_INT    idx = 0;
  SMC_BOOL   match = FALSE;

  while( match == FALSE)
  {
    if ( value == lock_result_summary_map[ idx ].enum_lock_ressum )
      return lock_result_summary_map[ idx ].str_lock_ressum;

    if (lock_result_summary_map[ idx ].enum_lock_ressum == 0 )
      return lock_result_summary_map[ idx ].str_lock_ressum;

    idx++;
  }
}

SMC_CHARP
LookupLockStatus(
  SMC_LOCK_STATUS   value
  )
{
  typedef struct {
    SMC_CHARP         str_lock_status;
    SMC_LOCK_STATUS   enum_lock_status;
  } LOCK_STATUS_MAPPER;

  LOCK_STATUS_MAPPER lock_status_map[] = {
  { "held_blocking",       SMC_LOCK_S_HELD_BLOCKING },
  { "held_notblocking",    SMC_LOCK_S_HELD_NOTBLOCKING },
  { "requested_blocked",   SMC_LOCK_S_REQUESTED_BLOCKED },
  { "requested_notblocked",SMC_LOCK_S_REQUESTED_NOTBLOCKED },
  { (SMC_CHARP)0,0 }
  };

  SMC_INT    idx = 0;
  SMC_BOOL   match = FALSE;

  while( match == FALSE)
  {
    if ( value == lock_status_map[ idx ].enum_lock_status )
      return lock_status_map[ idx ].str_lock_status;

    if (lock_status_map[ idx ].enum_lock_status == 0 )
      return lock_status_map[ idx ].str_lock_status;

    idx++;
  }
}


SMC_CHARP
LookupLockType(
  SMC_LOCK_TYPE   value
  )
{
  typedef struct {
    SMC_CHARP       str_lock_type;
    SMC_LOCK_TYPE   enum_lock_type;
  } LOCK_TYPE_MAPPER;

  LOCK_TYPE_MAPPER lock_type_map[] = {
  { "ex_tab",                 SMC_LOCK_T_EX_TAB },
  { "sh_tab",                 SMC_LOCK_T_SH_TAB },
  { "ex_int",              SMC_LOCK_T_EX_INT },
  { "sh_int",              SMC_LOCK_T_SH_INT },
  { "ex_page",             SMC_LOCK_T_EX_PAGE },
  { "sh_page",             SMC_LOCK_T_SH_PAGE },
  { "upd_page",            SMC_LOCK_T_UP_PAGE },
  { (SMC_CHARP)0,0 }
  };

  SMC_INT    idx = 0;
  SMC_BOOL   match = FALSE;

  while( match == FALSE)
  {
    if ( value == lock_type_map[ idx ].enum_lock_type )
      return lock_type_map[ idx ].str_lock_type;

    if (lock_type_map[ idx ].enum_lock_type == 0 )
      return lock_type_map[ idx ].str_lock_type;

    idx++;
  }
```

APPENDIX B Datatypes and Structures

Summary of datatypes

Table B-1 lists Monitor Client Library type constants with descriptions and their corresponding C or Open Client datatypes.

Table B-1: Summary of datatypes

Monitor Client Library datatype	Description	Corresponding C or Open Client datatype
SMC_ALARM_ACTION_TYPE	Specifies the type of action to take when an alarm is triggered	None
SMC_ALARM_ID	Alarm identifier	size_t
SMC_ALARM_IDP	Pointer to alarm identifier	size_t*
SMC_BOOL	Boolean	int
SMC_CHAR	Character	char
SMC_CHARP	Character pointer	char*
SMC_CHARPP	Pointer to character pointer	char**
SMC_CCHARP	Constant character pointer	CS_CONST char*
SMC_CLOSE_TYPE	Specifies an option when closing a Adaptive Server Enterprise Monitor connection	None
SMC_COMMAND_ID	Command identifier	size_t
SMC_COMMAND_IDP	Pointer to command identifier	size_t*
SMC_CONNECT_ID	Connection identifier	size_t
SMC_CONNECT_IDP	Pointer to connection identifier	size_t*
SMC_DATETIME	Date and time	CS_DATETIME
SMC_DATAITEM_NAME	Identifies a particular piece of performance data that Monitor Client Library is to obtain	None
SMC_DATAITEM_NAMEP	Pointer to SMC_DATAITEM_NAME	None
SMC_DATAITEM_STATTYPE	Identifies what normalization, if any, Monitor Client Library should perform on data	None
SMC_DATAITEM_STRUCT	Identifies data that Monitor Client Library is to obtain	None
SMC_DATAITEM_STRUCTP	Pointer to SMC_DATAITEM_STRUCT	None

Monitor Client Library datatype	Description	Corresponding C or Open Client datatype
SMC_DATAITEM_TYPE	Identifies datatype of data that Monitor Client Library obtains	None
SMC_DATAITEM_TYPEP	Pointer to SMC_DATAITEM_TYPE	None
SMC_DOUBLE	Double precision floating point	double
SMC_DOUBLEP	Pointer to double precision	double*
SMC_ERR_SEVERITY	Indicates the degree of severity of an error	None
SMC_FILTER_ID	Filter identifier	size_t
SMC_FILTER_IDP	Pointer to filter identifier	size_t*
SMC_FILTER_TYPE	Specifies the type of filter to create with smc_create_filter	None
SMC_HS_ESTIM_OPT	Specifies whether, in playback of historical performance data, to authorize estimation of data that cannot be calculated reliably from the available recorded data	None
SMC_HS_MISSDATA_OPT	Specifies whether, in playback of historical performance data, a sample should be returned for a period of time for which no data is available	None
SMC_HS_PLAYBACK_OPT	Specifies whether playback of historical performance data should be normalized or summarized or both	None
SMC_HS_SESS_DELETE_OPT	Specifies whether to delete data files associated with a Historical Server session	None
SMC_HS_SESS_ERR_OPT	Specifies whether a recording session should continue after an error	None
SMC_HS_SESS_PROT_LEVEL	Specifies whether the data in a recording session should be accessible to other users	None
SMC_HS_SESS_SCRIPT_OPT	Specifies whether to create a script to create tables corresponding to the views in a recording session	None
SMC_HS_TARGET_OPT	Specifies whether playback of historical performance data should be sent to the client application, or used to create a new session	None
SMC_INFO_TYPE	Specifies the type of information to request in a call to smc_get_command_info	None
SMC_INT	Integer	int
SMC_INTP	Pointer to integer	int*
SMC_LOCK_RESULT	Identifies the possible outcomes of a lock request	None
SMC_LOCK_RESULT_SUMMARY	Identifies the two major categories of outcomes of a lock request	None

Monitor Client Library datatype	Description	Corresponding C or Open Client datatype
SMC_LOCK_STATUS	Identifies the possible statuses of a lock or lock request	None
SMC_LOCK_TYPE	Identifies the granularity and exclusivity of a lock	None
SMC_LONG	Long	long
SMC_LONGP	Pointer to long	long*
SMC_OBJ_TYPE	Identifies the type of an object in an Adaptive Server database	None
SMC_PROC_STATE	Identifies the possible statuses of an Adaptive Server process	None
SMC_PROP_ACTION	Specifies the action to take in a call to smc_connect_props	None
SMC_PROP_TYPE	Specifies the property that is the object of a call to smc_connect_props	None
SMC_RETURN_CODE	Indicates whether a Monitor Client Library operation succeeded, and, if not, what error occurred	None
SMC_SERVER_MODE	Specifies whether a Adaptive Server Enterprise Monitor connection is to obtain live performance data or whether to manipulate historical data	None
SMC_SESSION_ID	Session identifier	size_t
SMC_SESSION_IDP	Pointer to session identifier	size_t*
SMC_SIZET	unsigned integer	size_t
SMC_SIZETP	Pointer to unsigned integer	size_t*
SMC_SOURCE	Indicates the software layer that detected an error	None
SMC_VALUE_UNION	Structure containing data	None
SMC_VALUE_UNIONP	Pointer to SMC_VALUE_UNION	None
SMC_VIEW_ID	View identifier	size_t
SMC_VIEW_IDP	Pointer to view identifier	size_t*
SMC_VOID	Void	void
SMC_VOIDP	Pointer to void	void*

The rest of this appendix describes individual datatypes that have no equivalent in C or Open-Client Client Library.

Enum: SMC_ALARM_ACTION_TYPE

An enum to identify the type of action taken when an alarm is triggered:

Table B-2: Alarm action type

SMC_ALARM_A_EXEC_PROC
SMC_ALARM_A_LOG_TO_FILE
SMC_ALARM_A_NOTIFY

Enum: SMC_CLOSE_TYPE

An enum used to identify the extent of a close command:

Table B-3: Close type

SMC_CLOSE_REQUEST

Enum: SMC_DATAITEM_NAME

An enum used in conjunction with smc_create_view to specify performance data. See Chapter 2, “Data Items and Statistical Types” for a list of the available data items.

Enum: SMC_DATAITEM_STATTYPE

An enum used in conjunction with smc_create_view to identify statistical type and accumulation interval of performance data.

Table B-4: Data item statistical type

SMC_STAT_VALUE_SAMPLE
SMC_STAT_VALUE_SESSION
SMC_STAT_RATE_SAMPLE
SMC_STAT_RATE_SESSION
SMC_STAT_AVG_SAMPLE
SMC_STAT_AVG_SESSION

Structure: SMC_DATAITEM_STRUCT

A structure used in conjunction with smc_create_view to identify performance data.

typedef struct SMC_DATAITEM_STRUCT{	
SMC_DATAITEM_NAME	*dataItemName*
SMC_DATAITEM_STATTYPE	*dataItemStatType*
} SMC_DATAITEM_STRUCT;	

Enum: SMC_DATAITEM_TYPE

An enum used in conjunction with smc_get_dataitem_type to identify physical type of performance data results:

Table B-5: Data item type

SMC_DI_TYPE_NONE
SMC_DI_TYPE_CHARP
SMC_DI_TYPE_DATIM
SMC_DI_TYPE_DOUBLE
SMC_DI_TYPE_ENUMS
SMC_DI_TYPE_INT
SMC_DI_TYPE_LONG

Enum: SMC_ERR_SEVERITY

An enum used in conjunction with smc_get_command_info to identify the severity of an error, warning, or informational notification.

Table B-6: Error severity

SMC_ERR_SEV_INFO
SMC_ERR_SEV_WARN
SMC_ERR_SEV_FATAL

Enum: SMC_FILTER_TYPE

An enum to identify the types of filters:

Table B-7: Filter type

SMC_FILT_T_EQ
SMC_FILT_T_NEQ
SMC_FILT_T_GE
SMC_FILT_T_LE
SMC_FILT_T_GE_AND_LE
SMC_FILT_T_TOP_N

Enum: SMC_HS_ESTIM_OPT

An enum to specify whether to allow certain data to be estimated during a playback session.

Table B-8: Historical Server error action

SMC_HS_ESTIM_ALLOW
SMC_HS_ESTIM_DISALLOW

Enum: SMC_HS_MISSDATA_OPT

An enum to specify what action Historical Server should take if a given sample during a playback session has no performance data to play back:

Table B-9: Historical Server missing data option

SMC_HS_MISSDATA_SHOW
SMC_HS_MISSDATA_SKIP

Enum: SMC_HS_PLAYBACK_OPT

An enum to specify whether data for a playback session should be normalized, summarized, or both.

Table B-10: Historical Server protection level

SMC_HS_PBTYPE_ENTIRE
SMC_HS_PBTYPE_ACTUAL
SMC_HS_PBTYPE_INTERVAL
SMC_HS_PBTYPE_RAW

Enum: SMC_HS_SESS_DELETE_OPT

An enum to specify whether to delete data files associated with a Historical Server connection.

Table B-11: Historical Server file deletion option

SMC_HS_SESS_DELETE_FILES
SMC_HS_SESS_RETAIN_FILES

Enum: SMC_HS_SESS_ERR_OPT

An enum to specify what action Historical Server should take if a recording session encounters non-fatal errors:

Table B-12: Historical Server error option

SMC_HS_SESS_ERR_CONT
SMC_HS_SESS_ERR_HALT

Enum: SMC_HS_SESS_PROT_LEVEL

An enum to specify the protection level for access to performance data recorded by Historical Server:

Table B-13: Historical Server protection level

SMC_HS_SESS_PROT_PRIVATE
SMC_HS_SESS_PROT_PUBLIC

Enum: SMC_HS_SESS_SCRIPT_OPT

An enum to specify the type of script (if any) that Historical Server should create to help the user to manipulate the performance data of a recording session:

Table B-14: Historical Server script option

SMC_HS_SESS_SCRIPT_SYBASE
SMC_HS_SESS_SCRIPT_NONE

Enum: SMC_HS_TARGET_OPT

An enum to specify whether the playback session will return data to the application or whether playback will create a new session on Historical Server:

Table B-15: Historical Server script option

SMC_HS_TARGET_CLIENT
SMC_HS_TARGET_FILE

Enum: SMC_HS_TARGET_OPT

An enum to specify the destination of data in a playback session:

Table B-16: Historical Server playback target option

SMC_HS_TARGET_CLIENT
SMC_HS_TARGET_FILE

Enum: SMC_INFO_TYPE

An enum to identify the various pieces of data that are available for querying from a callback function, using smc_get_command_info:

Table B-17: Information type

SMC_INFO_ALARM_ACTION_DATA
SMC_INFO_ALARM_ALARMID

SMC_INFO_ALARM_CURRENT_VALUE
SMC_INFO_ALARM_DATAITEM
SMC_INFO_ALARM_ROW
SMC_INFO_ALARM_THRESHOLD_VALUE
SMC_INFO_ALARM_TIMESTAMP
SMC_INFO_ALARM_VALUE_DATATYPE
SMC_INFO_ALARM_VIEWID
SMC_INFO_ERR_MAPSEVERITY
SMC_INFO_ERR_MSG
SMC_INFO_ERR_NUM
SMC_INFO_ERR_SEVERITY
SMC_INFO_ERR_SOURCE
SMC_INFO_ERR_STATE

Enum: SMC_LOCK_RESULT

An enum to identify results of a lock request:

Table B-18: Lock result type

SMC_LOCK_R_GRANTED
SMC_LOCK_R_NOTNEEDED
SMC_LOCK_R_WAITED
SMC_LOCK_R_DIDNTWAIT
SMC_LOCK_R_DEADLOCK
SMC_LOCK_R_INTERRUPTED

Enum: SMC_LOCK_RESULT_SUMMARY

An enum to identify whether the lock request was granted or not granted:

Table B-19: Lock result summary type

SMC_LOCK_RS_GRANTED
SMC_LOCK_RS_NOTGRANTED

Enum: SMC_LOCK_STATUS

An enum to identify the status of a lock:

Table B-20: Lock status type

SMC_LOCK_S_HELD_BLOCKING
SMC_LOCK_S_HELD_NOTBLOCKING
SMC_LOCK_S_REQUESTED_BLOCKED
SMC_LOCK_S_REQUESTED_NOTBLOCKED

Enum: SMC_LOCK_TYPE

An enum to identify lock types:

Table B-21: Lock type

SMC_LOCK_T_EX_TAB
SMC_LOCK_T_SH_TAB
SMC_LOCK_T_EX_INT
SMC_LOCK_T_SH_INT
SMC_LOCK_T_EX_PAGE
SMC_LOCK_T_SH_PAGE
SMC_LOCK_T_UP_PAGE

Enum: SMC_OBJ_TYPE

An enum to identify object types:

Table B-22: Object type

SMC_OBJ_T_STP
SMC_OBJ_T_TBL

Enum: SMC_PROC_STATE

An enum to identify process states:

Table B-23: Process state

SMC_PROC_STATE_ALARM_SLEEP
SMC_PROC_STATE_BACKGROUND
SMC_PROC_STATE_BAD_STATUS
SMC_PROC_STATE_INFECTED
SMC_PROC_STATE_LOCK_SLEEP
SMC_PROC_STATE_RECV_SLEEP
SMC_PROC_STATE_RUNNABLE
SMC_PROC_STATE_RUNNING
SMC_PROC_STATE_SEND_SLEEP
SMC_PROC_STATE_SLEEPING
SMC_PROC_STATE_STOPPED
SMC_PROC_STATE_TERMINATING
SMC_PROC_STATE_YIELDING
SMC_PROC_STATE_REMOTE_IO
SMC_PROC_STATE_SYNC_SLEEP

Enum: SMC_PROP_ACTION

An enum used to identify the desired action of an smc_connect_props function call:

Table B-24: Connection property action

SMC_PROP_ACT_SET
SMC_PROP_ACT_GET
SMC_PROP_ACT_CLEAR

Enum: SMC_PROP_TYPE

An enum used to identify the property to operate on in a call to smc_connect_props:

Table B-25: Connection property

SMC_PROP_APPNAME
SMC_PROP_ERROR_CALLBACK

SMC_PROP_IFILE
SMC_PROP_LOGIN_TIMEOUT
SMC_PROP_PACKETSIZE
SMC_PROP_PASSWORD
SMC_PROP_SERVERMODE
SMC_PROP_SERVERNAME
SMC_PROP_TIMEOUT
SMC_PROP_USERDATA
SMC_PROP_USERNAME

Enum: SMC_RETURN_CODE

An enum to identify the types of return codes:

Table B-26: Return codes

SMC_RET_SUCCESS
SMC_RET_FAILURE
SMC_RET_INSUFFICIENT_MEMORY
SMC_RET_CONNECTION_ERROR
SMC_RET_UNABLE_TO_CONNECT_TO_SMS
SMC_RET_UNABLE_TO_CONNECT_TO_SS
SMC_RET_MISSING_RESULT_TABLE
SMC_RET_INVALID_USER_PASSWD
SMC_RET_INVALID_PARAMETER
SMC_RET_INVALID_CACHE
SMC_RET_INVALID_DCID
SMC_RET_INVALID_COMMAND
SMC_RET_INVALID_VIEWID
SMC_RET_INVALID_DINAME
SMC_RET_INVALID_DISTAT
SMC_RET_INVALID_DI_STRUCT
SMC_RET_DI_STAT_MISMATCH
SMC_RET_INVALID_DI_COMBO
SMC_RET_INVALID_DATATYPE
SMC_RET_INVALID_VALUE_COUNT
SMC_RET_INVALID_FILTER_VALUE

SMC_RET_INVALID_FILTER_RANGE
SMC_RET_DATAITEM_CONTAINS_FILTER
SMC_RET_INVALID_COMPOSITE_FILTER
SMC_RET_INVALID_SVR_MODE
SMC_RET_MISSING_DATAITEM
SMC_RET_INVALID_FILTERID
SMC_RET_INVALID_ALARMID
SMC_RET_INVALID_ALARM_VALUE
SMC_RET_INVALID_DINAME_FOR_ALARM
SMC_RET_INVALID_API_FUNC_SEQUENCE
SMC_RET_INVALID_API_FUNCTION
SMC_RET_INVALID_PROPERTY
SMC_RET_INVALID_INFOTYPE
SMC_RET_CONNECT_NOT_CLOSED
SMC_RET_ARITHMETIC_OVERFLOW
SMC_RET_LOGIN_LACKS_SA_ROLE
SMC_RET_INTERNAL_ERROR

Enum: SMC_SERVER_MODE

An enum to identify the types of Adaptive Server Enterprise Monitor connections:

Table B-27: Server mode type

SMC_SERVER_M_LIVE
SMC_SERVER_M_HISTORICAL

Enum: SMC_SOURCE

An enum used in conjunction with ErrorCallback to identify the source of an error, warning or informational notification.

Table B-28: Error source

SMC_SRC_UNKNOWN
SMC_SRC_HS

SMC_SRC_SMC
SMC_SRC_CT
SMC_SRC_SS
SMC_SRC_SMS

Union: SMC_VALUE_UNION

A union used in conjunction with smc_connect_props, smc_get_command_info, and smc_get_dataitem_value to set and retrieve results.

typedef union SMC_VALUE_UNION {	
SMC_INT	*intValue*
SMC_LONG	*longValue*
SMC_DOUBLE	*doubleValue*
SMC_SIZET	*sizetValue*
SMC_CHARP	*stringValue*
SMC_VOIDP	*voidpValue*
SMC_DATETIME	*datetimeValue*
} SMC_VALUE_UNION;	

APPENDIX C

Backward Compatibility

Monitor Client Library version 11.5 and later replaces several API functions. The new API and callback functions provide improved features and extensibility. Replaced API and callback functions have been preserved within the library for backwards compatibility.

Obsolete and replacement functions

Table C-1 maps obsolete Monitor Client Library functions to their replacement functions:

Table C-1: Obsolete functions and replacement functions

Obsolete	Replacement
smc_change_error_handler	smc_connect_props
smc_connect	smc_connect_alloc smc_connect_props smc_connect_ex
smc_create_alarm	smc_create_alarm_ex
smc_disconnect	smc_close smc_connect_drop
smc_refresh	smc_refresh_ex

The most significant syntactic difference between the obsolete and replacement functions is the callback function parameter. In earlier versions, SMC_CALLBACK, SMC_ALARM_CALLBACK, and SMC_ERR_CALLBACK were used to specify a callback function. These callback function types are have been replaced by SMC_GEN_CALLBACK.

Note The new refresh function, smc_refresh_ex, does not use any callback function, unlike the obsolete smc_refresh.

In addition to changing the callback function types, smc_connect and smc_disconnect have been replaced by a set of functions that allow for greater flexibility and control.

New functions

Table C-2 lists the new functions.

Table C-2: New functions

smc_create_playback_session
smc_get_command_info
smc_initiate_playback
smc_terminate_playback
smc_terminate_recording

Note New functions cannot be used with obsolete functions.

Rules for functions and callbacks compatibility

Use the following rules to decide which functions and callbacks can be used together:

- If you are using any new or replacement functions, do not use obsolete functions.
- If you are using obsolete functions, use the obsolete error callback function types.
- If you are using replacement or new functions, use the version 11.1 error callback function types.
- You can use unchanged functions with all other types of functions.

APPENDIX D

Troubleshooting Information and Error Messages

This appendix contains two sections.

- “Troubleshooting” lists problems that you may encounter using Monitor Client Library, but that do not have specific error messages.
- “Error Messages” describes error messages that you may receive.

Troubleshooting

Confusing messages from Adaptive Server

If you create a view that requires information from a database that needs to be recovered, you get error messages from Adaptive Server rather than a concise error message from Monitor Client Library.

View refreshes fail

- If you try to refresh a view at the same time as someone creates a database, the refresh may fail.
- A refresh for a view may fail if one or more databases on Adaptive Server are in single user mode.

Negative numbers as object IDs

If you create a view using the SMC_NAME_OBJ_ID data item, you might see negative numbers as object IDs. Negative object IDs are an accurate reporting of IDs as assigned by Adaptive Server.

Monitor Server reports on *all* activity, including activity on temporary tables that Adaptive Server creates to perform a complex query. The object IDs that Adaptive Server assigns to temporary tables can be positive or negative. The object ID that was assigned by Adaptive Server is reported.

In views that show SMC_NAME_OBJ_NAME, the string `**TempObject**` is reported for temporary tables.

Error messages

Monitor Client Library is an Open Server application that uses the Open Client Library to communicate with Adaptive Server and Monitor Server. Any of these components can detect and report errors conditions. Monitor Client Library also detects and reports error conditions, which it logs or reports or both to clients.

The following building, linking, and compiling error messages may be reported. They are listed here in alphabetical order.

Communication failure: check if server is running.

While running testmon.exe, one of the following conditions caused the error to be reported:

- Server names are incorrect in *example.h*.
- *sql.ini* file is missing.
- *sql.ini* file has incorrect network connection information.
- Adaptive Server is not running.
- Historical Server is not running.
- User name is incorrectly set in *example.h*.
- Password for the user name is incorrectly set in *example.h*.

Configuration failure: possibly missing *interfaces* file or bad login parameters.

While running testmon.exe, one of the following conditions caused the error to be reported:

- Server names are incorrect in *example.h*.
- *sql.ini* file is missing.
- *sql.ini* file has incorrect network connection information.
- Adaptive Server is not running.
- Historical Server is not running.
- User name is incorrectly set in *example.h*.

- Password for the user name is incorrectly set in *example.h*.

Don't know how to build *example.h*

While building testmon.exe, one of the following conditions caused the compile error to be reported:

- Project needs to rebuild all dependencies.
- Project's *include* file path needs the location of the file names.
- Default location would be *C:\SYBASE\INCLUDE* and *C:\SYBASE\MONCLT\SAMPLE*.

error L2029: 'SMC_CONNECT' : unresolved external

While building testmon.exe, the following condition caused the link error to be reported:

- *smcapi32.lib* needs to be included as one of the libraries in which to link. It is located by default in *C:\SYBASE\MONCLT\LIB*.

error L2029: 'SMC_CREATE_VIEW' : unresolved external

While building testmon.exe, the following condition caused the link error to be reported:

- You need to include *smcapi32.lib* as one of the libraries in which to link. It is located by default in *C:\SYBASE\MONCLT\LIB*.

fatal error C1083: Cannot open include file: 'cstypes.h': No such file or directory

While building testmon.exe, one of the following conditions caused the compile error to be reported:

- Project needs to rebuild all dependencies.
- Project's *include* file path needs the location of the file names.

- Default location would be *C:\SYBASE\INCLUDE* and *C:\SYBASE\MONCLT\SAMPLE*.

fatal error C1083: Cannot open include file: ‘mcpublic.h’: No such file or directory

While building testmon.exe, the following condition caused the compile error to be reported:

- Project’s *include* path for the preprocessor needs to be edited to the correct setting. It is currently set to *C:\SYBASE\MONCLT\INCLUDE; C:\SYBASE\INCLUDE*.

LINK: fatal error L4051: smcapi32.lib : cannot find library

While building testmon.exe, the following condition caused the link error to be reported:

- The project’s Library File’s path needs to include the location of *smcapi32.lib*, which is assumed to be in *C:\SYBASE\MONCLT\LIB*.

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