WHAT IS IT

This facility is used to control the availability and audit the access of SYSTEM 2000* databases in a Multi-User* environment. The user exit feature of SYSTEM 2000 is utilized to perform these tasks. During normal processing the facility is transparent to SYSTEM 2000 users. The facility is driven by a table of database access profiles. Each profile defines the access paths (CICS, TSO or Multi-User batch), the number of concurrent users and the timeframes or access windows available for a database. The current access status along with key historical events are also maintained in each profile. Every Multi-User system requires an entry for each database to be accessed. The availability of a database is interrogated at allocate and open time. The audit trail of database accesses is produced both in the Multi-User (MUDBACF) and single-user (SUDBACF) environments.

In the Multi-User system a series of CICS transactions provide menu screens to drive the facility. The facility has 2 command menus:

1) database coordinator functions (database access profile inquiry and modification), information center/help desk inquiry functions.

2) database administrator functions (database and Multi-User system commands).

Additional console commands are also provided for database and MUDBACF status inquiries.

MUDBACF is not intended as a security package. By its design as a resource access control facility it has some inherent security features. It is operationally transparent to all security facilities in-line between the users and the database. It offers but does not demand an additional layer of security for Multi-User database access.

This additional layer has 2 levels. One is the static or fixed database access profiles created from a database repository. The second is the ability to dynamically alter the database access profiles during Multi-User operation. Both levels are authorized functions restricted by MUDBACF passwords local (LPSW) to each entry or DBA passwords global (GPSW) to the access profile table.

ACCESS PROFILE PASSWORDS

LPSW requests are made through the CICS transaction S2AC or the batch interface program MUDBCNTL. MUDBCNTL is treated like any other Multi-User batch program in that manipulation of a specified database is controlled by a access profile. If a request satisfies the access profile interrogation, then the MUDBCNTL request is serviced. The GPSW is a password that can access any database entry in the access profile table.

The transaction S2SC has all S2AC functions plus the DBA additional functions. Both are restricted by CICS sign on id. The IPSW is an information-only password that can inquire into any entry in the access profile table. It has inquiry status only and cannot modify any access profile.

WHAT DOES IT DO

AUDIT FEATURES

Audit trail for database accesses is accomplished in 2 ways. First a WTO denoting the event is contained in the system messages of the job. In some cases a WTO is sent to the console if the event being recorded is of system-wide nature. The second way significant system events are recorded is via the System Management Facility (SMF). SMF record types have been assigned to MUDBACF that contain the data necessary for auditing accesses, recording statuses and problem resolution at both the database and MUDBACF level.

ERROR PROCESSING

Database errors that are integrity threatening are intercepted by MUDBACF. The appropriate access profile is modified to ERROR STATUS so that no new processing will be allowed. The next available database action is dislocation from the Multi-User environment. The problem with the database is corrected in the single-user environment. This error interception does not include rollback or any processing return codes. This error processing stops any recursive abends for a database processing in the Multi-User environment.

DISPLAY FUNCTIONS

The display functions provide information about the access profile, the users on the database, the internal status of the database, and the physical status of the files that make up the database. Combination displays provide information about applications (groups of databases) and overall MUDBACF status. These displays being inquiry-only are available to a wide range of support personnel and users.

DYNAMIC FEATURES

Changing an access profile is provided at both the local and global password level. The access profile screen provides change options at the database level. The global control screen provides change options that can be localized to a database profile and also system-wide options that affect all access profile entries.

MUDBACF DATA TRANSFER

The MUDBACF facility is driven by executing the SYSTEM 2000 ENABLE/DISABLE EXIT command in a plex (CICS transaction) program. The data passed to the Multi-User region contains the MUDBACF command, address space identification from the requesting ASID and return storage address.

WHO IS IT FOR

The database coordinator (DBC) is the designated person with overall responsibility for a database. The DBC has control of the static database profile information. The DBC also has MUDBACF functions available that allow dynamic modification of a access profile entry. The Systems and Database Support Staff has DBA and systems responsibilities. All MUDBACF capabilities are available to this staff via a global password. The information center/help desk personnel will at times need to know the current status of a specific database. The standard S2AC transaction is used but with an inquiry-only password (IPSW).

The console operator can inquire into the current status of any specified database through additional Multi-User commands in MUDBACF. These commands interact with the database access profile table. Other commands through MUDBACF will display Multi-User status from a MUDBACF or database access perspective. These additional commands eliminate the need for operators to sign on to any subsystem in order to communicate fully with any Multi-User. The following examples illustrate the command and response for the new MUDBACF commands.
ADDITIONAL MUDBACF Multi-User CONSOLE COMMANDS

<table>
<thead>
<tr>
<th>COMMAND</th>
<th>DESCRIPTION</th>
</tr>
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<tbody>
<tr>
<td>ALLOCATE DATABASE</td>
<td>This request will result in allocation of the specified data base to the Multi-User system if:</td>
</tr>
<tr>
<td></td>
<td>* the database specified is a valid entry in the access profile table,</td>
</tr>
<tr>
<td></td>
<td>* the database specified is not in a lock status,</td>
</tr>
<tr>
<td></td>
<td>* all of the database files exist, and</td>
</tr>
<tr>
<td></td>
<td>* the database is not in use by another job.</td>
</tr>
<tr>
<td>DEALLOCATE DATABASE</td>
<td>This request will result in deallocation of the specified data base from the Multi-User system if:</td>
</tr>
<tr>
<td></td>
<td>* the database specified is a valid entry in the MUDBACF table,</td>
</tr>
<tr>
<td></td>
<td>* the database specified is not in a lock status, and</td>
</tr>
<tr>
<td></td>
<td>* the active user count is zero.</td>
</tr>
</tbody>
</table>

Failure of any of these conditions will result in the database not being allocated followed by the appropriate return code. Also, any failure will produce an audit trail record. Either a successful ALLOCATION COMPLETE or an ALLOCATION FAILURE who will be issued to the program log and to the system log.

GLOBAL FUNCTIONS

LOCK DATABASE

This request will place the specified database in a LOCK status. No new user activity is allowed to start on the specified database except for logical and/or physical close. Current users are permitted to continue. The global password holder now has complete control of this database. All MUDBACF commands are available to the GPSW but only inquiry commands are available to the LPSW.

UNLOCK DATABASE

This request will return the specified database to a DBC/user access available status.

QUIESC ALL DATABASE ACTIVITY

This request will place all the databases in a QUIESCED status. No new user activity is allowed to start on any database except for logical and/or physical close. Current users are permitted to continue. The global password holder now has complete access control of all databases. Only MUDBACF inquiry processing is available to LPSW holders.

RESUME DATABASE ACTIVITY

This request will return all databases to a DBC/user access available status. Any individual databases that were in a LOCK status remain in a LOCK status.
This request will write each entry in the access profile table to the SMF log.

This request will return in access profile format each of the valid entries in the access profile. The entries are returned sequentially beginning with the first entry in the access profile table. Variations are the selection criteria of allocated, active or all access profiles.

CHANGE LOCAL PASSWORD

This request will modify the current LPSW for the duration of the current Multi-User session. The new LPSW is available only from the DBA who changed the LPSW and is not displayed except by GPSW requests. This change can be made at any time with the GPSW command.

MUDBCNTL

This program executes as a Multi-User batch job. Its function is the same as the CICS MUDBACF transactions except for the display options. It is called by a user-written program that passes request parameters to it. Request return codes are passed request parameters to it. Request return codes are returned to the calling user-program for action. The most frequent use of this interface is to allocate or deallocate a database in Multi-User. The Multi-User batch access control profile for the database must allow Multi-User batch for this request to work. MUDBCNTL must be linked with the user-written program which passes the MUDBCNTL request, the database name and the access profile password for servicing.

MUDBCNTL SCREENS

SIGNON

MENU

ACCESS STATUS

MULTI-USER DATA BASE ACCESS CONTROL FACILITY (MUDBACF)

DATA BASE STATUS

TP USERS

ACCESS PROFILE

MULTI-USER DATA BASE ACCESS CONTROL FACILITY (MUDBACF)
EXIT OPERATIONS

Several user exits are used for MUDBACF execution but the system is basically passive. Only a few instructions are executed in MUDBACF for each user during normal processing. Physical allocation and deallocation require more instructions as does error processing. MUDBACF requests execute varying numbers of instructions based on the specified command.

EXIT 00 EXIT INITIALIZATION
Exit 00 initializes the user exit table for SYSTEM 2000. Additional MUDBACF modules to support exit operations are also identified at this time.

EXIT 01 MUDBACF DRIVER
Exit 01 is normally used to control the availability of user exits. This function has been transferred to EXIT 00. Through the ENABLE/DISABLE ROUTINE command, this exit communicates with the CICS, TSO and Multi-User batch interfaces for MUDBACF.

EXIT 02 MUDBACF INITIALIZATION
Exit 02 builds the internal access profile table from the system-wide access profile file.

EXIT 03 PHYSICAL OPEN (prior to)
Exit 03 interrogates the access profile table for valid access conditions. If successful database allocation is requested.

EXIT 04 PHYSICAL CLOSE (after)
Exit 04 deallocates the database after a deallocation request or system termination.

EXIT 07 PHYSICAL OPEN (after)
Exit 07 records database status at open time and updates the active user table.

EXIT 21 RESOURCE UTILIZATION
Exit 21 compares user performance against installation performance objectives.

EXIT 24 PHYSICAL CLOSE (prior to)
Exit 24 records database status at close time.

EXIT 25 LOGICAL OPEN
Exit 25 interrogates the access profile table for valid conditions and updates the active user table.

EXIT 36 PHYSICAL CLOSE (prior to)
Exit 36 interrogates the access profile table for valid database close conditions and updates the active user table.

EXIT 41 ROLLBACK (after)
Exit 41 records Coordinated Recovery events for a database.

EXIT 42 SYSTEM TERMINATION
Exit 42 records MUDBACF data for a Multi-User job.

EXIT 43 CONSOLE COMMANDS
Exit 43 examines operator console requests to Multi-User and executes those for MUDBACF.

Acknowledgements
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