Transaction Processing

Transaction Coordination Priority

The ATM instances involved in a transaction can be running with `TMSYNCMGR=RRMS` or `TMSYNCMGR=NONE`.

When the transaction is under the control of a client-side transaction coordinator such as the CICS Syncpoint Manager TMP parameter (`LCLSYNC=YES`), each ATM daemon is aware of this and does not involve RRMS, even if its own ADARUN parameters indicate that its RRMS interface is to be activated (`TMSYNCMGR=RRMS`).

The transaction executing under the CICS/RMI can change Adabas and DB2 databases, for example, and these changes are coordinated by the CICS Sycnpoint Manager. For such a transaction, the ATM daemon behaves as if it were running with `TMSYNCMGR=NONE`.

In order for the transactions of a job or IMS/TM system to be coordinated by RRMS, you must set the job parameter `HSTSYNC=YES`, and ATM must run with ADARUN parameter `TMSYNCMGR=RRMS`.

Heuristic Completion of Prepared Transactions

When is Heuristic Completion Required?

In certain situations, it may be necessary for a resource manager to make a heuristic decision about completing a transaction that it has already prepared.

For example, suppose a resource manager is asked by its local transaction manager to prepare its part of a global transaction initiated by a remote user, and then the network fails. The resource manager would normally lock any resources held by the transaction and wait to receive an instruction from the transaction manager to commit or roll back.

The transaction resources could remain locked for a long time. While the locks remain, the resource manager is unable to perform certain functions, such as a database save.

Note:
A prepared transaction is not subject to the normal timeout rules.

Adabas Termination of a Global Transaction

An Adabas nucleus will terminate its part of a global transaction which it has successfully prepared, if all of the following are true:

- an internal ET syncpoint occurs; and the TT time limit currently in effect for the user has expired.

  An internal ET syncpoint occurs when:

  - an ADAEND command is issued;
  - an online save or delta save syncpoint occurs; or
  - a SYNCC command is issued.

  An Adabas nucleus will also terminate its part of a global transaction if a HALT command is received, or if Work part 4 overflows.

In most of the above cases, the Adabas nucleus decides to commit the local transaction. However, if HALT is issued or Work part 4 overflows, the nucleus backs out the local transaction. In all cases, Adabas writes information about the terminated transaction to its DDPRINT dataset for audit purposes.

Caution:
It is strongly recommended not to use the HALT command for an Adabas nucleus running with the parameter setting DTP=RM.

Transaction Timeout (TT) Setting

The risk of heuristic transaction terminations would increase if an operator command were allowed to reduce the TT value (in preparation for an ADAEND command or an online save, for example). For this reason, an Adabas nucleus running with DTP=RM normally ignores a command to reduce its TT value if it has any prepared transactions that have not yet completed. However, if the nucleus has a pending ET syncpoint (at the end of an online save, for example), the new TT value will take effect.

Online Save

If a prepared transaction remains at the end of an online save operation, and has not been completed within a period of 60 seconds plus the value of the TTSYN parameter, measured from the beginning of the transaction, the Adabas nucleus will heuristically back out the transaction, to allow the pending ET syncpoint to complete.

ADAEND Command

When an Adabas nucleus running with DTP=RM receives an ADAEND command, it prevents new transactions from being prepared or started and asks its local ATM daemon to quiesce any global transactions in which it is involved. If this process is successful, any prepared transactions are completed (committed or backed out) and the ADAEND command is then processed. If prepared transactions remain incomplete, they are heuristically terminated when their TT time limits expire, and then the ADAEND command is processed.

Internal Synchronized Checkpoint

An internal synchronized checkpoint takes place at the end of an online save operation. This requires all users of the nucleus to be at ET status simultaneously. No user can begin a new transaction until the checkpoint has completed. The TTSYN parameter of ADASAV can be used to make a temporary reduction in the nucleus's TT value; this causes incomplete transactions to be backed out after the specified time. This logic applies only to unprepared transactions. If ATM is in use, there is a possibility for prepared transactions to remain open after the period specified by TTSYN. If this is the case, an additional period of approximately 60 seconds is allowed for prepared transactions to complete. Once this extra period has elapsed, the nucleus will heuristically back out any transactions remaining in prepared status. An ADAN89 message will be written to the console and DDPRINT for each such heuristic termination.

Caution:
Heuristic termination can result in the loss of transaction integrity. When part of a global transaction is terminated, the global transaction as a whole may have mixed completion, which means that parts of it are committed while other parts are backed out. Mixed completion indicates a loss of global transaction integrity. However, since unilateral local transaction completion applies only to prepared transactions, the likelihood of mixed completion is small.