CICS Startup and Shutdown

Objectives

CICS Startup and Shutdown

In this module, you will discover how CICS regions are started, and the actions taken to invoke initial, cold, emergency, and warm starts.

You will look at the messages produced at startup, and the processes required for the different types of CICS shutdown. You will also explore the commands used to start and shut down CICS.

After completing this module, you will be able to:

- Recognize the Different Types of CICS Starts
- Identify When CICS Is Available to Accept Work
- Recognize the Characteristics of the Different Types of CICS Shutdowns
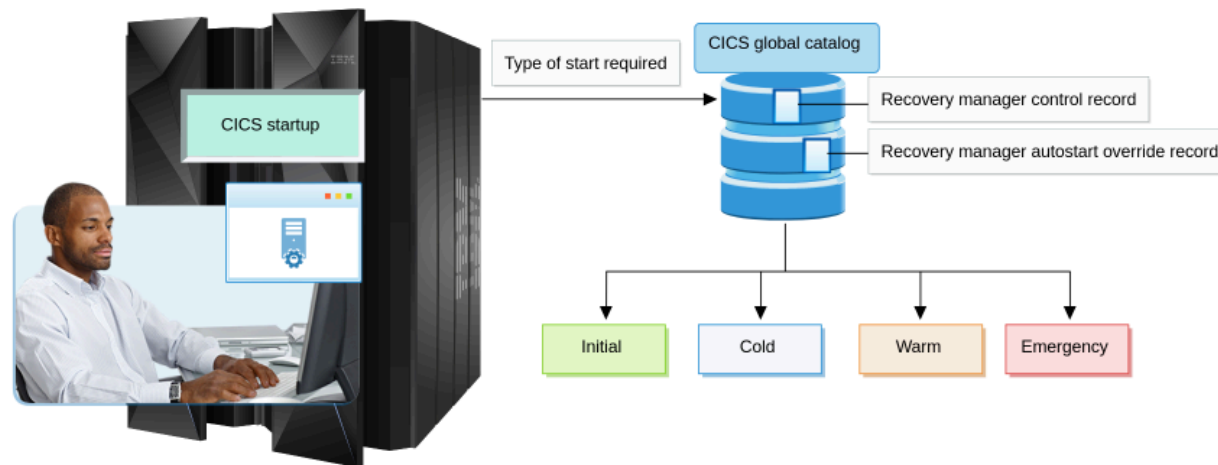- Identify the Commands to Bring CICS Up and Down

```
S CICSPRD1
$HASP100 CICSPRD1 ON STCINRDR
IEF695I START CICSPRD1 WITH JOBNAME CICSPRD1 IS ASSIGNED TO USER STCOPER
, GROUP GROUPZ
$HASP373 CICSPRD1 STARTED
DFHPA1101  CICSPRD1 DFHSIT6$ IS BEING LOADED.
DFHPA1108  CICSPRD1 DFHSIT6$ HAS BEEN LOADED. (GENERATED AT: MM/DD=
12/09 HH:MM= 20:35).
DFHPA1100  CICSPRD1 OVERRIDE PARAMETERS FROM JCL EXEC STATEMENT:
START=AUTO,SYSIN
DFHPA1102  CICSPRD1 OVERRIDE PARAMETERS FROM SYSIN:




IEE612I CN=01         DEVNUM=160  SYS=PROD      CMDSYS=PROD

IEE163I  MODE=RD
```

The method of initializing CICS is installation-dependent. CICS can be started by submitting a CICS batch job or by using the MVS START command to start CICS as a started task. For the purposes of this module, CICS is run as a started task. CICS is commonly started by using the following command:
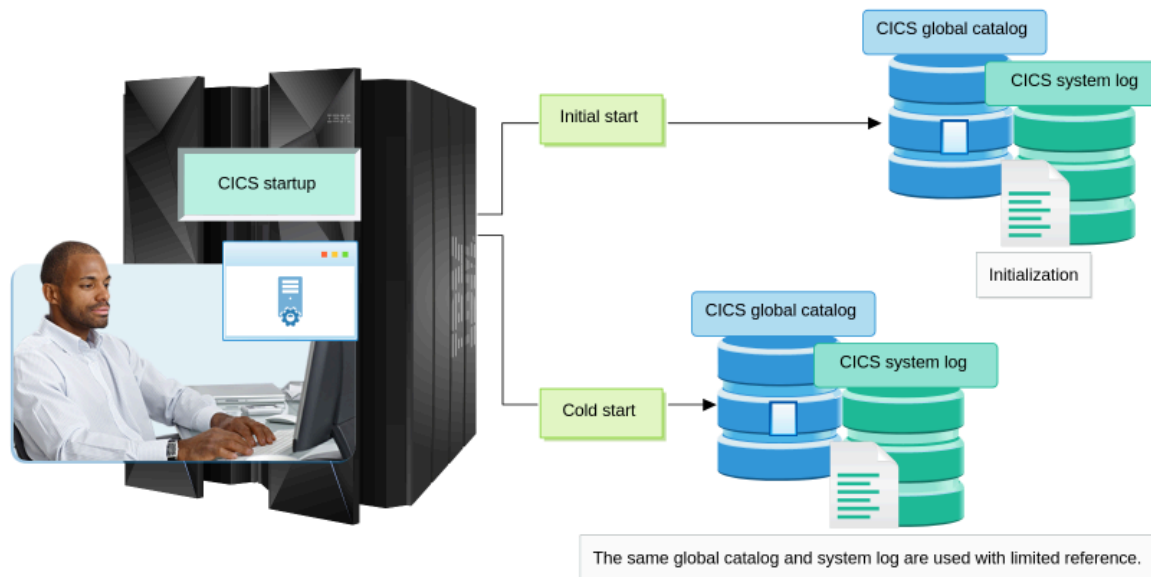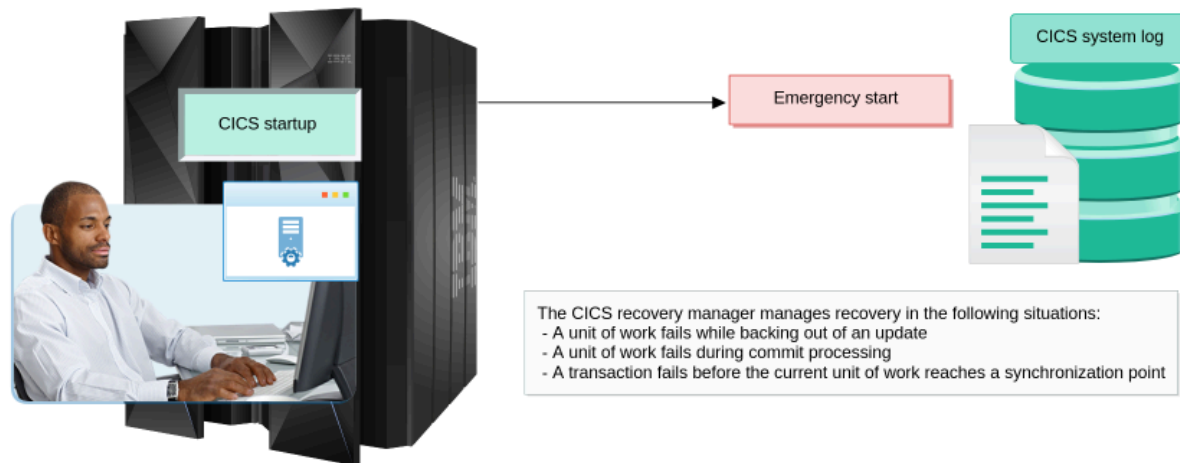
```
S cics_procedure_name
```

When using the command shown on the previous screen, CICS starts by using the START=AUTO parameter default. CICS automatically selects one of the start options, which are initial, cold, warm, and emergency.

The option that is selected will depend on how CICS was previously shut down. CICS determines the type of start by looking for two records from the global catalog. These are the recovery manager control record and the recovery manager autostart override record.
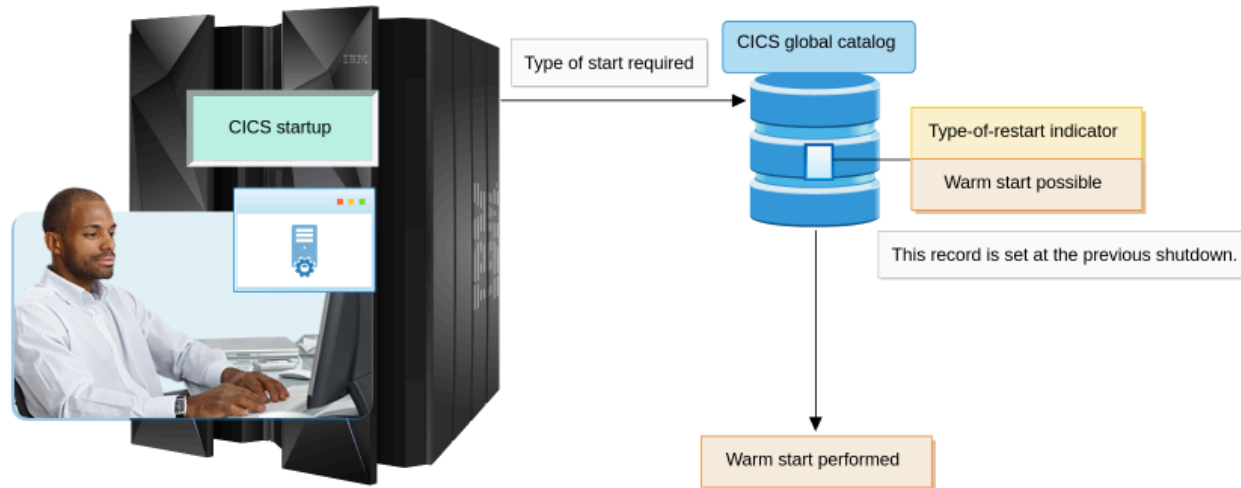
If CICS is being brought up for the first time, a start that will initialize the CICS global catalog and the system log will occur.

A cold start is usually invoked after a major error has resulted in CICS ending abnormally. During this process, CICS is initialized with little reference to any previous activity recorded in the CICS catalog. Resynchronization information for remote systems is the only existing data that is used during this type of CICS start.

CICS startup

Emergency start

CICS system log

The CICS recovery manager manages recovery in the following situations:
- A unit of work fails while backing out of an update
- A unit of work fails during commit processing
- A transaction fails before the current unit of work reaches a synchronization point

An emergency restart is required after CICS has been canceled or has abended, or MVS has failed while CICS was in operation. If CICS determines that an emergency restart is required, CICS will attempt to continue operation from a predefined point that existed before the shutdown.

CICS does this by analyzing the CICS system log to determine which tasks have not completed successfully, and backs out of the incomplete transactions.

Warm starts restore some CICS components to a state that existed at the previous controlled shutdown. A controlled shutdown is initiated by the command CEMT P SHUT.

A warm start is usually automatically invoked at the start of the day if no problems were associated with CICS batch processing or housekeeping on the previous run.

```
IEF695I START CICSTASK WITH JOBNAME CICSPA1 IS ASSIGNED TO USER CICPAJD, GROUP
USERTSO
$HASP373 CICSPA1 STARTED
IEF403I CICSPA1 - STARTED - TIME=04.27.13
DFHPA1101 CICSPA1 DFHSIT IS BEING LOADED.
DFHPA1108 CICSPA1
DFHSIT HAS BEEN LOADED. (GENERATED AT: MM/DD= 01/17 HH:MM= 01:10).
DFHPA1100 CICSPA1 OVERRIDE PARAMETERS FROM JCL EXEC STATEMENT:
DFHPA1927 CICSPA1 START=AUTO,APPLID=CICSPA1,SYSIDNT=PRDW,SYSIN
DFHPA1102 CICSPA1 OVERRIDE PARAMETERS FROM SYSIN:
DFHPA1927 CICSPA1 APPLID=CICSPA1
DFHPA1927 CICSPA1 * APPLID=is provided in the JCL PARM parameter
DFHPA1927 CICSPA1 AICONS=AUTO
DFHPA1927 CICSPA1 AUXTR=ON
DFHPA1927 CICSPA1 CICSSVC=221
DFHPA1927 CICSPA1 DFLTUSER=CICSPA1
DFHPA1927 CICSPA1 DSALIM=7M
DFHPA1927 CICSPA1 EDSALIM=256M
DFHPA1927 CICSPA1 GRPLIST=(DFHLIST,WPDLIST)
DFHPA1927 CICSPA1 GMTEXT='CICSPA1 Test Region'

IEE612I CN=01 DEVNUM=160 SYS=PROD CMDSYS=PROD

IEE163I MODE=RD
```

This shows the parameters that will override the system initialization parameters. START=AUTO indicates that CICS will perform a warm, emergency, cold, or initial start, according to the status of two control records on the global catalog. APPLID=CICSPA1 is used to define the VTAM application identifier for specified CICS region. SYSIDNT=PRDW is defining a name for the CICS region. The SYSIN keyword tells CICS to read initialization parameters from the SYSIN data set.

The screen here shows some of the messages that you will encounter during the startup process. More than 200 parameters can be referenced at CICS startup. CICS initialization parameters can be specified by using one of the following from the CICS startup procedure:

- The PARM parameter
- A SYSIN data set assigned to the startup procedure
- A system initialization table (SIT) specified through a STEPLIB statement

Mouse-over each highlighted parameter for a description.

```
DFHPA1927  CICSPA1 DSALIM=7M
DFHPA1927  CICSPA1 EDSALIM=256M
DFHPA1927  CICSPA1 GRPLIST=(DFHLIST,WPDLIST)
DFHPA1927  CICSPA1 GMTEXT='CICSPA1 Test Region'
DFHPA1927  CICSPA1 SPCTRSO=(1,2)
DFHPA1927  CICSPA1 SPCTRWB=(1,2)
DFHPA1927  CICSPA1 TCPIP=YES
DFHPA1927  CICSPA1 FCT=NO,
DFHPA1927  CICSPA1 TCT=NO,
DFHPA1927  CICSPA1 SRT=1$,
DFHPA1927  CICSPA1 PGRET=P/,
DFHPA1927  CICSPA1 PGPURGE=T/,
DFHPA1927  CICSPA1 PGCOPY=C/,
DFHPA1927  CICSPA1 PGCHAIN=X/,
DFHPA1927  CICSPA1 CONSOLE
DFHPA1927  CICSPA1 .END
DFHPA1103  CICSPA1 END OF FILE ON SYSIN.
*14 DFHPA1104 CICSPA1 SPECIFY ALTERNATIVE SIT PARAMETERS, IF ANY, AND
                        THEN TYPE '.END'.
R 14,PLTPI='YES'
IEE612I CN=01          DEVNUM=160   SYS=PROD       CMDSYS=PROD

IEE163I  MODE=RD
```

If you have to provide values for system initialization parameters during startup, you can specify the CONSOLE keyword in the PARM statement or SYSIN data set. This will prompt you for input during the startup process by issuing the DFHPA1104 message shown here.

Your reply can contain individual parameter details or a group of parameters separated by commas. When Enter is pressed, another message prompting for further input is displayed. The '.END' response can be typed when you have finished supplying parameters.

```
+DFHWB0109I CICSPA1 Web domain initialization has started.
+DFHSO0100I CICSPA1 Sockets domain initialization has started.
+DFHRX0100I CICSPA1 RX domain initialization has started.
+DFHRX0101I CICSPA1 RX domain initialization has ended.
+DFHLG0101I CICSPA1 Log manager domain initialization has started.
+DFHEJ0101 CICSPA1
        Enterprise Java domain initialization has started. Java is a
        trademark of Oracle
+DFHDH0100I CICSPA1 Document domain initialization has started.
+DFHSI1500 CICSPA1 CICS startup is in progress for CICS Transaction Server for
        z/OS, Version 5 Release 3
+DFHXS1100I CICSPA1 Security initialization has started.
+DFHXS1102I CICSPA1 Security is inactive.
+DFHSI1501I CICSPA1 Loading CICS nucleus.
+DFHDU0304I CICSPA1 Transaction Dump Data set DFHDMPB opened.
+DFHXS1101I CICSPA1 Security initialization has ended.
+DFHRM0141 CICSPA1 Recovery manager autostart override record is not present.
        Normal processing continues.
*22 DFHPA1909 CICSPA1 DATA /usr/lpp/cicsts/cicsts53 IS INVALID FOR KEYWORD
                     USSHOME=. RESPECIFY KEYWORD AND DATA.
IEE612I CN=01        DEVNUM=160  SYS=PROD        CMDSYS=PROD

IEE163I  MODE=RD
```

If CICS detects an error with one of the system initialization parameters, and the PARMERR=INTERACT parameter has been specified, the operator will receive a message prompting for a correct response. This message will be similar to the message shown here.

```
+DFHLG0748I CICSPA1 System log selective scan has started.
+DFHLG0749I CICSPA1 System log scan has completed.
+DFHER5731  CICSPA1 No active user records on the system log
+DFHER5732  CICSPA1 User recovery completed
+DFHTDO101I CICSPA1 Transient Data initialization has ended.
+DFHFC0101I CICSPA1 File Control initialization has ended.
+DFHCP0102I CICSPA1 CPI initialization has ended.
+DFHPR0105I CICSPA1 Partner resource manager initialization has ended.
+DFHAI0102I CICSPA1 AITM initialization has ended.
+DFHSI1519I CICSPA1 The interregion communication session was successfully started.
+DFHAP1203I CICSPA1 Language Environment is being initialized.
+DFHAP1211I CICSPA1 Language Environment initialization completed.
+DFHWB1007  CICSPA1 Initializing CICS Web environment.
+DFHWB1008  CICSPA1 CICS Web environment initialization is complete.
+DFHSI8430I CICSPA1 About to link to PLT programs during the third stage of initialization.
+CICSPA1 -  PLTPI PHASE 2 PROCESSING START
+DFHSI8434I CICSPA1 Control returned from PLT programs during the third stage of initialization.
+DFHSO0120  CICSPA1 8 TCBs are initialized for SSL processing.
+DFHSO0101I CICSPA1 Sockets domain initialization has ended.
+DFHSI1517  CICSPA1 Control is being given to CICS.
IEE612I CN=01         DEVNUM=160   SYS=PROD        CMDSYS=PROD

IEE163I  MODE=RD
```

When CICS is ready to accept transaction requests, it issues the following message where 'applicationID' is the name of the CICS region being initialized:

`+DFHSI1517 - 'applicationID' Control is being given to CICS.`

CICS startup

The z/OS Communications Server was not active when CICS was started.

The z/OS Communications Server is active but CICS could not open the VTAM ACB.

+DFHSI1589D 'applid' VTAM is not currently active.
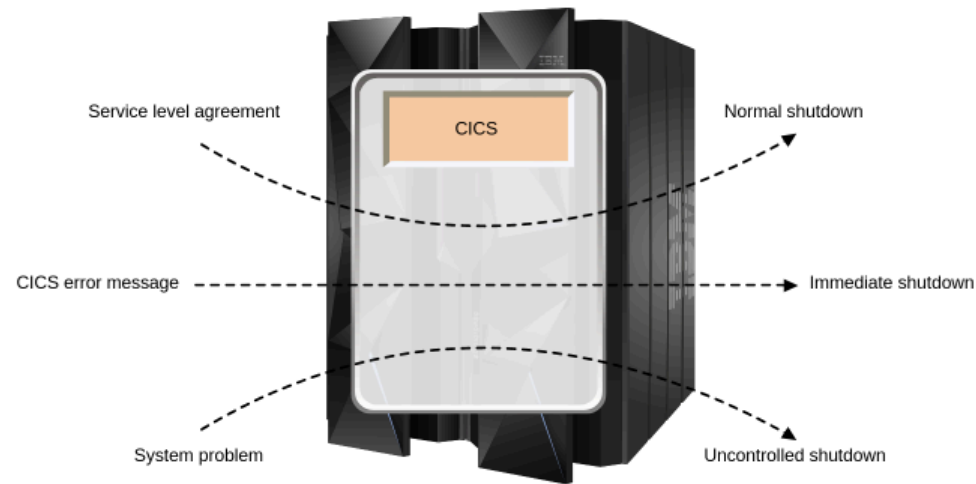+DFHSI1572 'applid' Unable to OPEN VTAM ACB - RC=xxxxxxxx, ACB CODE=yy.

System and operator response:
In this situation, the CICS COVR transaction will run automatically and attempt to connect to the z/OS Communications Server every five seconds, issuing a DFHZC0200 message every minute while the open is unsuccessful. After ten minutes it will issue the DFHZC0201 message and terminate the transaction.

There are some other situations during CICS startup in which CICS will issue an error message. Some of these require an operator response, and some will be resolved by CICS itself.

Mouse-over each situation for a description of the problem and the system and operator response.
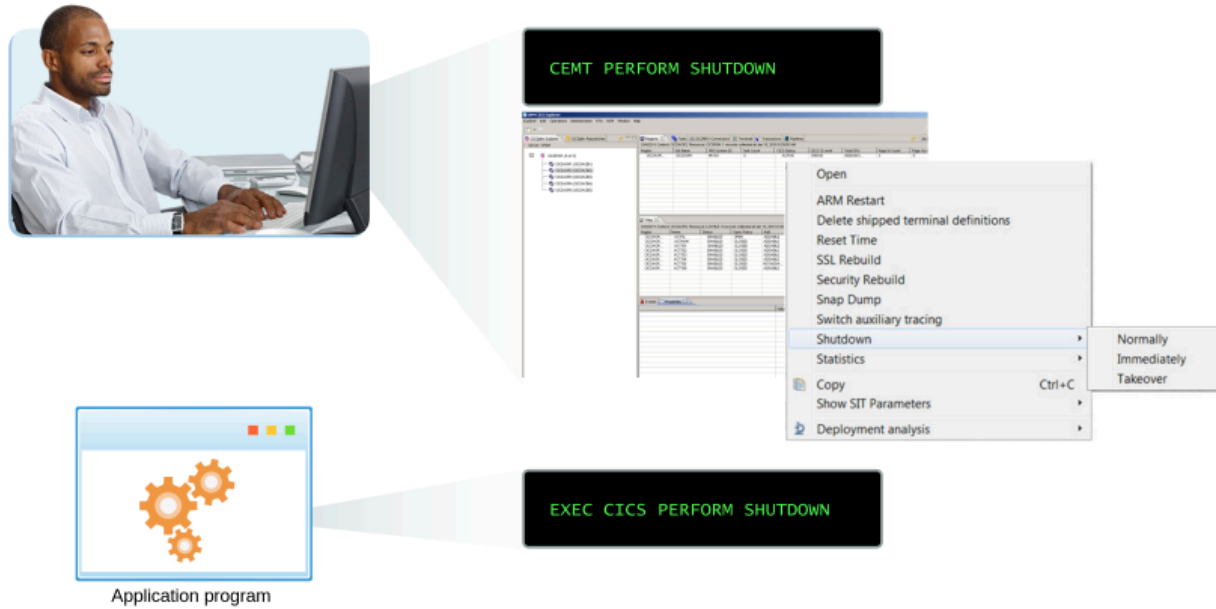
You will now look at the different processes required for the three types of CICS shutdown:

- Normal
- Immediate
- Uncontrolled

A normal shutdown is initiated by an operator or through an application program, and is invoked as a result of a scheduled shutdown, for example, as part of the scheduled hours of CICS operation. When CICS is shutdown normally, the CICS system should be left in a well-defined state.
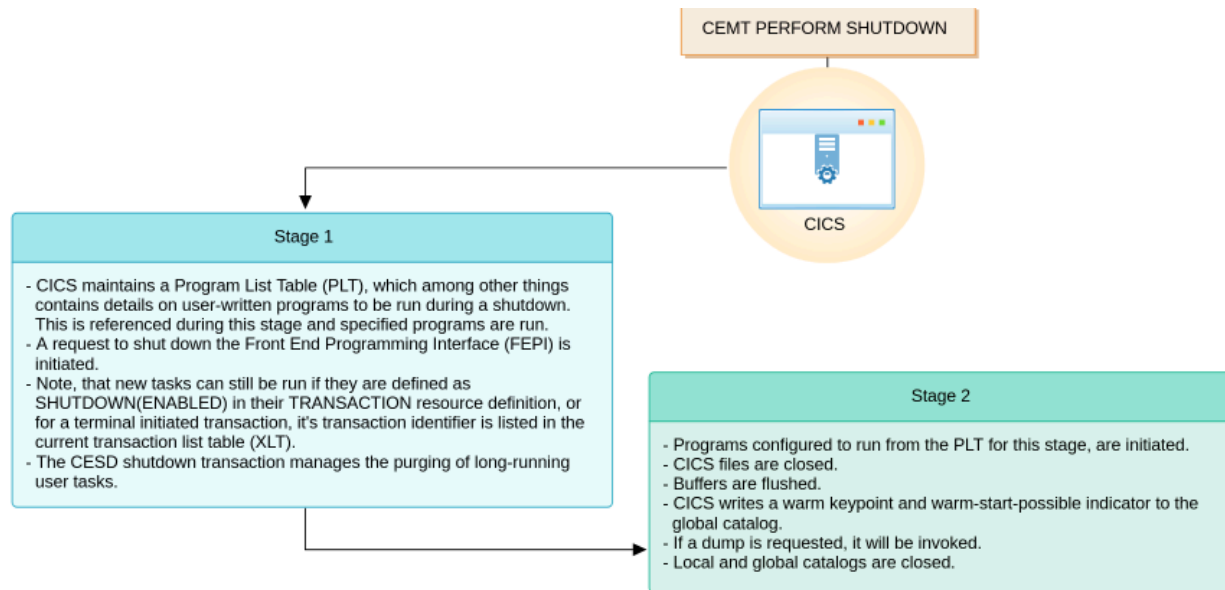
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CEMT PERFORM SHUTDOWN

Open	
ARM Restart	
Delete shipped terminal definitions	
Reset Time	
SSL Rebuild	
Security Rebuild	
Snap Dump	
Switch auxiliary tracing	
Shutdown ▸	Normally
Statistics ▸	Immediately
Copy Ctrl+C	Takeover
Show SIT Parameters ▸	
Deployment analysis ▸	

Application program

EXEC CICS PERFORM SHUTDOWN

A normal shutdown can be invoked by an operator using a CEMT PERFORM SHUTDOWN command from a 3270 terminal, or by using the appropriate menu items from CICS Explorer. An application program issuing an EXEC CICS PERFORM SHUTDOWN command can also be used to shutdown CICS.

CEMT PERFORM SHUTDOWN

CICS

Stage 1

- CICS maintains a Program List Table (PLT), which among other things contains details on user-written programs to be run during a shutdown. This is referenced during this stage and specified programs are run.
- A request to shut down the Front End Programming Interface (FEPI) is initiated.
- Note, that new tasks can still be run if they are defined as SHUTDOWN(ENABLED) in their TRANSACTION resource definition, or for a terminal initiated transaction, it's transaction identifier is listed in the current transaction list table (XLT).
- The CESD shutdown transaction manages the purging of long-running user tasks.

Stage 2

- Programs configured to run from the PLT for this stage, are initiated.
- CICS files are closed.
- Buffers are flushed.
- CICS writes a warm keypoint and warm-start-possible indicator to the global catalog.
- If a dump is requested, it will be invoked.
- Local and global catalogs are closed.

There are a number of tasks that CICS performs once a shutdown has been initiated, which are split into two stages:

1. In the first stage, tasks currently running are allowed to complete. Generally no other activity is allowed to be started but there are exceptions where programs associated with the shutdown itself will need to run. Several components are notified of the shutdown request and the CESD shutdown transaction runs. Once all terminal activity has ceased, the second stage of shutdown can begin.
2. CICS files are closed and buffers are flushed. CICS will write to the global catalog indicating that a warm start is possible next time that CICS is started.

The screen here shows some of the messages issued by CICS after a CEMT PERFORM SHUTDOWN command has been invoked. If a normal shutdown is successful, CICS issues the following message:
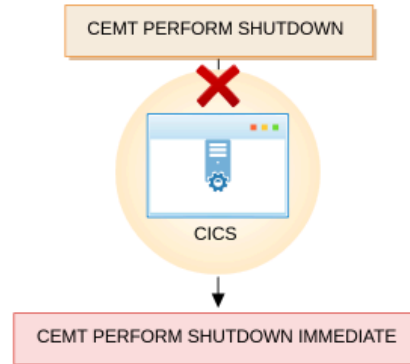
```
TERMINATION OF CICS IS COMPLETE
```

```
F CICSPA1,CEMT PERFORM SHUTDOWN IMMEDIATE
+DFHTM1703 CICSPA1 CICS is being terminated by userid CICSUSER in transaction CEMT
at netname TCP00013.
+DFHTM1782I CICSPA1 All non-system tasks have been successfully terminated.
+DFHCESD CICSPA1 SHUTDOWN ASSIST TRANSACTION CESD STARTING. SHUTDOWN IS IMMEDIATE.
+DFHSZ4015 CICSPA1 FEPI immediate termination has started.
+DFHSZ4003 CICSPA1 FEPI termination complete.
BPXP018I THREAD 1A1DEC0000000000, IN PROCESS 16842773, ENDED 050
WITHOUT BEING UNDUBBED WITH COMPLETION CODE 0033E000
, AND REASON CODE 00000000.
IST804I CLOSE IN PROGRESS FOR CICSPA1 OPENED BY CICSPA1
IST400I TERMINATION IN PROGRESS FOR APPLID CICSPA1
IST805I VTAM CLOSE COMPLETE FOR CICSPA1
ATR169I RRS HAS UNSET EXITS FOR RESOURCE MANAGER
+DFHDU0303I CICSPA1 Transaction Dump Data set DFHDMPA closed.
+DFHKE1799 CICSPA1 TERMINATION OF CICS IS COMPLETE.



IEE612I CN=01          DEVNUM=160  SYS=PROD       CMDSYS=PROD

IEE163I  MODE=RD
```

An immediate shutdown of CICS might be required if CICS does not respond to the normal shutdown request or a problem exists that requires CICS to be brought down more quickly than normal.
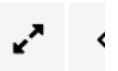
In these situations, the CEMT PERFORM SHUTDOWN IMMEDIATE command, or the equivalent CICS Explorer menu item, can be used as a last resort.
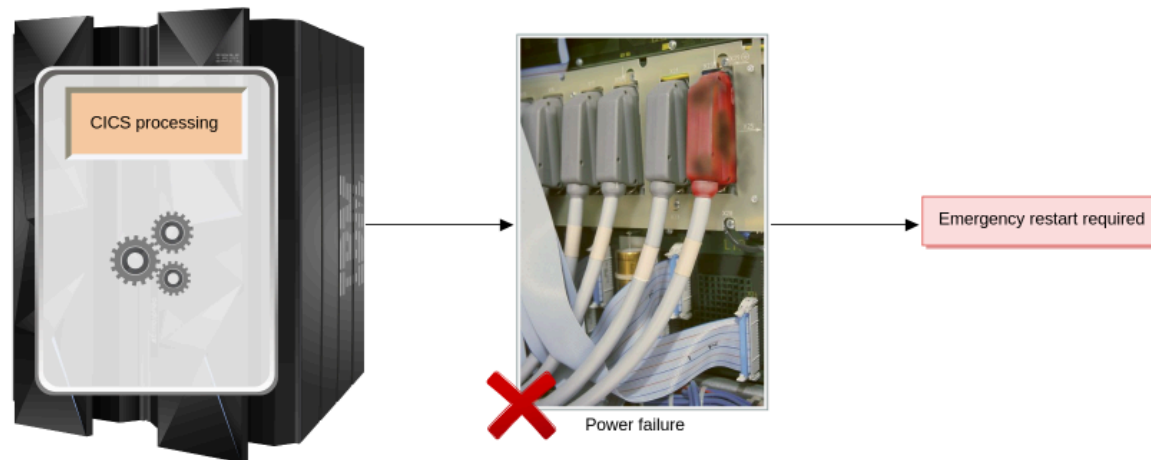
CEMT PERFORM SHUTDOWN

CICS

CEMT PERFORM SHUTDOWN IMMEDIATE

After an immediate shutdown, the next initialization of CICS must be an emergency restart. This will be invoked automatically if START=AUTO is specified for the CICS initialization.

During an immediate shutdown, the following events will differ from the normal shutdown:

- Currently active tasks will not necessarily be completed
- CICS will not record in the global catalog that a warm start is required for restarts
- CICS will leave the closing of CICS-related files to MVS and VSAM

CICS processing

Power failure

Emergency restart required

When CICS is brought down because of a major problem, such as a power or hardware failure, none of the processing described for the normal or immediate shutdowns is possible. Like the immediate shutdown, an emergency restart will be required when CICS is restarted, but errors may be encountered during the startup due to the uncontrolled nature of the shutdown.