

INSTALLING AND RUNNING THE CI EXERCISER SOFTWARE (AV-T637B-TE)

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1.0 ABSTRACT

The CI Exerciser is an online tool used to detect errors within a CI cluster and isolate a problem to a specific node. The software package consists of a user mode diagnostic that runs under the diagnostic supervisor, a controller class driver, and a responder class driver.

When running the exerciser in a cluster, at least one node must be a controller; any or all of the nodes can be responders. The controller sends commands to the responder, the responder takes the specified action and returns responses to the controller. In this manner, the controller can systematically check out the cluster and isolate any problems to a specific node.

All error printouts are made at the controlling node(s); there is no user interface to the responder.

2.0 PREPARING TO RUN THE CI EXERCISER

2.1 Process Quotas And Privileges

When running the CI Exerciser, the user must have specific privileges and quotas. The required values can be given to an account by running the authorize program. The privileges and quotas must at least meet the minimum shown in appendix B.

2.2 System Resources

The SYSGEN utility can be used to modify the parameters specified below. Since most are non-dynamic, the system must be REBOOTED before the new parameters values take effect.

IT IS STRONGLY RECOMMENDED THAT THE SYSTEM MANAGER BE NOTIFIED BEFORE MODIFYING THE SYSGEN PARAMETERS AND REBOOTING THE SYSTEM.

2.3 Modifying The System Parameters

The CI Exerciser (and associated drivers) require a certain amount of system resources. Specifically, the values for nonpaged pool, IRP count, SRP count, LRP count, scsconnct and scsbuffcnt should be increased before loading and running the exerciser. Appendix A shows how to calculate the required values. The CIEPARAMS command file will modify these values for you. DO NOT RUN THIS COMMAND FILE WITHOUT FIRST NOTIFYING THE SYSTEM MANAGER. There is a second command file that can be run to put these sysgen values back to the values prior to running the CIEPARAMS command file, it is called CIEPARRST. If CIEPARAMS is run more than once, CIEPARRST will only return the values to the last set. Remember that once the sysgen parameters are changed, rebooting will not restore them to their original values. If CIEPARAMS is run twice without running CIEPARRST, the values must be changed manually. Refer to appendix A to calculate the amount by which CIEPARAMS will change the sysgen parameters and for instructions to execute the

command files. CIEPARAMS and CIEPARST command files are put into the sysmaint area by the installation procedure explained below.

The cluster configuration is important in modifying these parameters. Controller/Responder nodes require greater increases to the parameters than Responder nodes, and larger clusters require greater increases to the parameters than small clusters.

Refer to appendix A for a table that shows the additions that should be made to the system parameters as a function of node type and cluster configuration.

2.4 SCS System ID

Each node in the CI cluster must have a unique, NON-ZERO SCS system identification. This parameter is strictly a software entity used by the CI software to distinguish between nodes in the cluster, and should not be confused with the system configuration register. The SCS System ID is modified by the sysgen parameter SCSSYSTEMID. If more than one node in a cluster has the same SCS system ID, the diagnostic will NOT run correctly.

2.5 Polling Interval

The interval at which the CI port driver polls should be kept at 15 seconds or less. This restriction helps avoid excessively long timeout intervals which can occur if an error is detected by the exerciser. The polling interval is controlled by the sysgen parameter PAPOLLINTERVAL.

3.0 INSTALLING THE CI EXERCISER SOFTWARE

The CI Exerciser software resides on floppy disk (AS-T637A-TE) for a CI780 or on TU58 (BE-T645A-DE) for a CI750. Installing the software simply involves executing a command procedure on the media which copies the appropriate files into the SYS\$MAINTENANCE area. To install the CI exerciser software on a VAX do the following:

- Log into the field service or system manager account
- Remove the console media from the console device
- Insert the CI Exerciser media into the console device
- Mount the CI Exerciser media by typing "MOUNT CS1 CIE"

Note:

If the attempt to mount the CIE media fails due to no device, then the console must be connected using sysgen. Type the following and then continue the installation:

```
$ MCR SYSGEN
SYSGEN> CONNECT CONSOLE
```

SYSGEN> EXIT

- Perform the installation by typing "@CS1:[CIE]CIEINSTAL"
- Dismount the CI Exerciser media by typing "DISMOUNT CS1"
- Remove the CI Exerciser media from the console device
- Replace the console media in the console device

The latest version of the Diagnostic Supervisor should also be put into the sysmaint area and used to run EVXCI. Diagnostic supervisor media is included in the installation kit.

4.0 LOADING THE CI EXERCISER SOFTWARE

Before running the CI exerciser, a second command procedure must be executed to load the appropriate class driver(s) into nonpaged pool. This procedure, CIELOAD.COM, prompts the user as to whether the node is to be a controller or just a responder, and loads the driver(s) appropriately. Running the controller in a node will cause moderate degradation of system performance, while running just the responder will have less of a degrading effect.

The drivers must be loaded each time the system is rebooted. To load the drivers, perform the following steps:

- Log into the field service or system manager account
- Establish CMKRNL privilege by typing "SET PROC/PRIV=CMKR" (Not necessary if the system manager account is being used)
- Load the software by typing "@SYSSMAINTENANCE:CIELOAD"

5.0 RUNNING THE CI EXERCISER

Once the CI class drivers have been loaded on the system, the responder is ready to participate in cluster test activity. The following additional commands must be issued to run the controller software. Note that an ATTACH and SELECT command must be issued for each port that is to be tested.

For a CI780...

```
$ RUN ESSAA
DS> LOAD EVXCI
DS> ATT CI780 SBI PAA0 tr br port_number
DS> ATT CI_NODE PAA0 node_name VAX780 port_number
DS> attach additional ports...
DS> SELECT PAA0
DS> select additional ports...
DS> ST
```

For a CI750...

```
$ RUN ECSAA
DS> LOAD EVXCI
DS> ATT CI750 HUB PAA0 slot br port_number
DS> ATT CI_NODE PAA0 node_name VAX750 port_number
DS> attach additional ports...
DS> SELECT PAA0
DS> select additional ports...
DS> ST
```

Note:

If running the generate activity test, test 20, control C may take up to 30 seconds to respond. When the DS prompt is returned, the desired action may be taken.

Note:

Only one controller should run either the generate activity test (test 20) or the monitor performance counters test (test 21) in a cluster at one time.

A help facility is also available with the CI Exerciser. Type "HELP EVXCI" to find the topics for which help information is available, and "HELP EVXCI topic" for information about a particular topic.

APPENDIX A
SYSGEN PARAMETERS

Below are two table, the first for nodes that are to be controllers and responders and the other for nodes that are to be only responders. A controller node must be a responder. The values are calculated by first determining the maximum number of controllers and responders that will be running in the system. Then plug in the values and determine the amount to increase the parameter.

C = maximum number of controllers in the cluster.

R = maximum number of responders in the cluster.

+ add

* multiply

Parameter	Value to add to existing parameter
NPAGEDYN	$29k + (2.5k * C)$ bytes
SRPCOUNT	$66 + (2 * R) + (5 * C)$
IRPCOUNT	$(8 * R) + (8 * C)$
LRPCOUNT	$(7 * R) + (2 * C)$
SCSCONNCNT	$(2 * R) + C$
SCSBUFFCNT	$2 + (2 * C)$

Table 1 - Controller / Responder Node

C = maximum number of controllers in the cluster.

R = maximum number of responders in the cluster.

+ add

* multiply

Parameter	Value to add to existing parameter
NPAGEDYN	5k + (2.5k * C) bytes
SRPCOUNT	66 + R + (5 * C)
IRPCOUNT	(4 * R) + (8 * C)
LRPCOUNT	(2 * R) + (2 * C)
SCSCONNCNT	R + C
SCSBUFFCNT	2 * C

Table 2 - Responder Only Node

C = maximum number of controllers in the cluster.

R = maximum number of responders in the cluster.

+ add

* multiply

Example -

Suppose one controller node is being run in a three node cluster, with all three nodes being selected for test. Then, the following increases should be made to the sysgen parameters:

C = 1

R = 2

In the controller/responder node:

- NPAGEDYN $29k + (2.5 * 1) = 31.5k$ bytes
- SRPCOUNT $66 + (2 * 2) + (5 * 1) = 75$
- IRPCOUNT $(8 * 2) + (8 * 1) = 24$
- LRPCOUNT $(7 * 2) + (2 * 1) = 16$
- SCSCONNCNT $(2 * 2) + 1 = 5$
- SCSBUFFCNT $2 + (2 * 1) = 4$

The following increases should be made to the sysgen parameters in the two responder nodes:

- NPAGEDYN $5k + (2.5 * 1) = 7.5k$ bytes
- SRPCOUNT $(1 * 2) + (5 * 1) = 7$
- IRPCOUNT $(4 * 2) + (8 * 1) = 16$
- LRPCOUNT $(2 * 2) + (2 * 1) = 6$
- SCSCONNCNT $2 + 1 = 3$
- SCSBUFFCNT $(2 * 1) = 2$

APPENDIX B

PROCESS QUOTAS AND PRIVILEGES

The following is a table of minimum and typical process quotas and privileges needed to run the CI exerciser. These values can be modified by running the Authorize program. Authorize has a help facility to aid in making any necessary changes.

PRIO:	4	BYTLM:	65000	HIOLM:	1000
PRCLM:	2	PBYTLM:	0	DIOLM:	1000
ASTLM:	10	WSDEFAULT:	150	FILLM:	20
ENQLM:	20	WSQUOTA:	1024	SHRFILLM:	0
TQELM:	100	WSEXTENT:	1024	CPU:	no limit

Privileges

CMKRNL,DIAGNOSE,LOG_IO,PSWAPM,PHY_IO