



System i

Programming

System i High Availability Solutions Manager commands

Version 6 Release 1





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Version 6 Release 1

Note

Before using this information and the product it supports, be sure to read the information in "Notices," on page 179.

This edition applies to version 6, release 1, modification 0 of IBM System i High Availability Solutions Manager (product number 5761-HAS) and to all subsequent releases and modifications until otherwise indicated in new editions. This version does not run on all reduced instruction set computer (RISC) models nor does it run on CICS models.

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Add ASP Copy Description (ADDASPCPYD)

Where allowed to run: All environments (*ALL)
 Threadsafes: Yes

Parameters
 Examples
 Error messages

The Add Auxiliary Storage Pool Copy Description (ADDASPCPYD) command is used to describe a single physical copy of an auxiliary storage pool (ASP) and to assign a name to the description. ASP copy descriptions are used by the High Availability Solutions Manager (HASM) to manage geographic mirroring, Metro Mirror, Global Mirror and FlashCopy copies.

When geographic mirroring is configured, the disk units are assigned to the mirror copy. An ASP copy description for the mirror copy can be added either before or after the configuration. Similarly, when configuring a Metro Mirror, Global Mirror or FlashCopy target, the ASP copy description for it can be added at any time.

Restrictions:

- You must have input/output system configuration (*IOSYSCFG) special authority to use this command.
- You must have use (*USE) authority to the ASP device description for which an entry is being added.

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Parameters

Keyword	Description	Choices	Notes
ASPCPY	ASP copy	<i>Name</i>	Required, Positional 1
ASPDEV	ASP device	<i>Name</i>	Required, Positional 2
CRG	Cluster resource group	<i>Name</i> , *NONE	Optional
SITE	Cluster resource group site	<i>Name</i> , *NONE	Optional
STGHOST	Storage host	Single values: *NONE Other values (up to 2 repetitions): <i>Element list</i>	Optional
	Element 1: User name	<i>Character value</i>	
	Element 2: Password	<i>Character value</i>	
	Element 3: Internet address	Values (up to 2 repetitions): <i>Character value</i>	
RSRCNAME	Resource name	Single values: *NONE Other values (up to 64 repetitions): <i>Element list</i>	Optional
	Element 1: Resource name	Values (up to 2 repetitions): <i>Name</i>	
	Element 2: Location	Values (up to 2 repetitions): <i>Name</i> , *DEFAULT, *NONE	
LUN	Logical unit name	Single values: *NONE Other values (up to 64 repetitions): <i>Element list</i>	Optional
	Element 1: TotalStorage device	<i>Character value</i>	
	Element 2: Logical unit range	Values (up to 32 repetitions): <i>Character value</i>	

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ASP copy (ASPCPY)

Specifies the name of the ASP copy description to be added.

This is a required parameter.

name Specify the name of the ASP copy description.

Top

ASP device (ASPDEV)

Specifies the name of the ASP device description associated with the ASP copy description.

This is a required parameter.

name Specify the name of the ASP device description.

Top

Cluster resource group (CRG)

Specifies the name of the cluster resource group (CRG) that identifies the nodes among which the copy can switch.

*NONE

No cluster resource group is associated with the copy.

name Specify the name of the cluster resource group.

Top

Cluster resource group site (SITE)

Specifies the name of the cluster resource group (CRG) site that identifies the nodes among which the copy can switch.

*NONE

No cluster resource group site is associated with the copy.

name Specify the site name within the cluster resource group.

Top

Storage host (STGHOST)

Specifies the storage host (there can be more than one for redundancy purposes) for the ASP copy. Storage host information is required if the ASP copy will be used in a Metro Mirror, Global Mirror or FlashCopy session. Absence of this information when starting an ASP session causes the session to fail to start.

Single values

*NONE

There is no storage host for this ASP copy description.

Other values (up to 2 repetitions)

Element 1: User name

character-value

Specifies the user name that HASM passes to the storage host when opening a connection. The user name can be changed. It is up to the user to keep this information current. The user name can contain as many as 16 characters. The actual length used and the character values must conform to the storage host's signon rules.

Element 2: Password

character-value

Specify the password. The password can contain as many as 16 characters.

Element 3: Internet address

You can specify 2 values for this parameter element.

character-value

Specifies an internet address that the local system can use to connect to the storage host. The internet address may be an IPv4 or IPv6 address.

An IPv4 internet address is specified in the form *nnn.nnn.nnn.nnn*, where *nnn* is a decimal number ranging from 0 through 255. An IPv4 address is not valid if it has a value of all binary ones or all binary zeros for the network identifier (ID) portion or the host ID portion of the address.

An IPv6 internet address must be a unicast address and must not contain an imbedded IPv4 address (compatibility or mapped). An IPv6 internet address is specified in the form *xxxx:xx:xx:xx:xx:xx*, where *x* is a hexadecimal number ranging from 0 through X'FFFF'. "::" may be used once in the IPv6 address to indicate one or more groups of 16 bits of zeros. The "::" may be used to compress leading, imbedded, or trailing zeros in the address.

If the internet address is entered from the command line, the address must be enclosed in apostrophes.

Top

Resource name (RSRCNAME)

Specifies the resource name of the input/output adapter (IOA) that provides access to the disk units associated with the copy description and the node location from which this access can occur.

Single values

*NONE

There are no input/output resources that need to be specified for this copy description.

Other values (up to 64 repetitions)

Element 1: Resource name

You can specify 2 values for this element.

name Specify the name of an IOA resource.

Element 2: Location

You can specify 2 values for this element.

***DEFAULT**

Specifies that the node information is provided by the CRG name and CRG site name of this copy description.

***NONE**

Specifies that the copy will never be varied online. The ASP copy can only be used in FlashCopy operations and then, only as a FlashCopy target.

name Specifies the name of the node associated with the IOA resource.

Top

Logical unit name (LUN)

Specifies the logical units (LUNs) that are accessible through an individual IOA and are associated with the copy description.

Single values

***NONE**

There is no logical unit that needs to be specified.

Other values (up to 64 repetitions) The logical units are positionally related to the IOA resources specified on the resource name (RSRCNAME) parameter. That is, the LUNs of the first value are accessed through the first IOA resource, the LUNs of the second value are accessed through the second IOA resource, and so forth.

Element 1: TotalStorage device

character-value.

Specify the name of the TotalStorage device that contains the LUNs.

Element 2: Logical unit range

You can specify 32 values for this element.

character-value

Specify a LUN range in the form 'mmmm-nnnn'. 'mmmm' is the first LUN number within a range and 'nnnn' is the last LUN number in that range.

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Examples

Example 1: Adding a Copy Description for Geographic Mirroring

```
ADDASPCPYD  ASPCPY(ORDER) ASPDEV(ORDERDEV) CRG(ORDERCRG) SITE(SITE1)
```

This command adds an ASP copy description named ORDER for the independent auxiliary storage pool (ASP) associated with ASP device description ORDERDEV. The CRG name and SITE name are provided because the copy is intended for use with geographic mirroring.

Example 2: Adding a Copy Description for Global Mirror

```
ADDASPCPYD  ASPCPY(ORDER) ASPDEV(ORDERDEV) CRG(ORDERCRG) SITE(SITE1)
             STGHOST((JOEUSER JOE1PWD4U (3.3.333.33)))
             RSRCNAME((IOA001 NODEA))
             LUN((IBM.2107-AZ12341 (1000-1004)))
```

This command adds an ASP copy description named ORDER for an independent ASP. To enable the copy description to be used in a Global Mirror session, storage host information is provided. It identifies the storage host by internet address and provides the user name and password that can be used to access the storage host. The resource name is the name of the input/output adapter (IOA) that is used to access the disk units in the external storage unit. The LUN parameters identifies a storage unit and the five logical units within it. The logical units have numbers 1000 through 1004.

Example 3: Adding a Copy Description for FlashCopy

```
ADDASPCPYD  ASPCPY(ORDER) ASPDEV(ORDERDEV)
             STGHOST((JOEUSER JOE1PWD4U (3.3.333.33)))
             RSRcname((IOA001 NODEA))
             LUN((IBM.2107-AZ12341 (1000-1004)))
```

This command adds an ASP copy description named ORDER for an independent ASP. The copy will be a FlashCopy target. Therefore, CRG information is not used.

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Error messages

*ESCAPE Messages

CPF9801

Object &2 in library &3 not found.

CPF9802

Not authorized to object &2 in &3.

CPF9899

Error occurred during processing of command.

HAE002B

&1 command failed.

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Add Admin Domain MRE (ADDCADMRE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

[Parameters](#)
[Examples](#)
[Error messages](#)

The Add Cluster Admin Domain MRE (ADDCADMRE) command is used to add a monitored resource entry (MRE) to a cluster administrative domain. A monitored resource is a system object or a set of attributes not associated with a specific system object, such as the set of system environment variables. A resource represented by an MRE is monitored for changes by a cluster administrative domain. When a monitored resource is changed on one node in a cluster administrative domain, the change is propagated to the other active nodes in the domain.

When adding an MRE for a system object, the resource name is the name of the system object. One or more attributes can be specified. Only attributes that are specified will be monitored for changes.

This command will do the following:

- Create a monitored resource entry on all nodes in the cluster administrative domain.
- The resource being monitored by the cluster administrative domain will be created on all nodes in the cluster administrative domain where it does not already exist. The attributes for the created resource will be set to the values of the attributes from the monitored resource on the node from which the command was called.
- If the cluster administrative domain has been started, the values of the attributes for the monitored resource will be synchronized to the same attribute values from the monitored resource on the node where the command was called.
- If the cluster administrative domain has not been started, the attribute values for the monitored resource will not be synchronized until the cluster administrative domain is started.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. The cluster administrative domain must exist and all nodes in the domain must be active.
3. Resources cannot be added to a cluster administrative domain when it is partitioned.
4. The monitored resource must exist on the system from which this command is called.
5. The caller's user profile must exist on all nodes in the cluster administrative domain.
6. The system value QRETSVRSEC must be set to 1 to monitor any secure attribute such as the PASSWORD attribute for user profile resources.
7. This command can only be called from a cluster node in the domain node list of the cluster administrative domain.
8. A monitored resource entry for a *SBSD, *NWSD, *NWSCFG, *NWSSTG, *NWSHDEV, *ETHLIN, *TRNLIN, *OPTDEV or *TAPDEV resource type can only be added for a cluster at cluster version 6 or greater.
9. All monitored resources must exist in the system base auxiliary storage pool (ASP) except network server storage spaces (*NWSSTG) which must exist in an independent ASP.
10. IBM supplied user profiles that start with the letter Q cannot be added as a monitored resource.
11. IBM supplied class objects named QARBCLS, QMONCLS, or QLPINSTAL cannot be added as a monitored resource.

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Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
ADMDMN	Cluster administrative domain	<i>Name</i>	Required, Positional 2
RESOURCE	Monitored resource	<i>Character value</i>	Required, Positional 3
RSCTYPE	Monitored resource type	*ASPDEV, *CLS, *ENVVAR, *ETHLIN, *JOB, *NETA, *NWSCFG, *NWS, *NWSHDEV, *NWSSTG, *OPTDEV, *SBS, *SYSVAL, *TAPDEV, *TCPA, *TRNLIN, *USRPRF	Required, Positional 4
RSCLIB	Library	<i>Name</i>	Optional
ATTRIBUTE	Monitored attributes	Single values: <u>*ALL</u> Other values (up to 50 repetitions): <i>Name</i>	Optional

Top

Cluster (CLUSTER)

Specifies the cluster where the cluster administrative domain exists.

This is a required parameter.

name Specify the name of the cluster where the cluster administrative domain exists.

Top

Cluster administrative domain (ADMDMN)

Specifies the cluster administrative domain which will monitor the resource.

This is a required parameter.

name Specify the cluster administrative domain.

Top

Monitored resource (RESOURCE)

Specifies the resource to be monitored.

This is a required parameter.

name Specify the name of the monitored resource. If the name is longer than 10 characters, enter & and a blank in the first two positions and press F4 to expand the input field.

The following resource types support these resource names. The cluster version which supports the resource name is also shown. For example (5 0) means the attribute is supported at cluster version 5 modification level 0 or greater.

- *ENVVAR - The resource name is the environment variable name. (5 0)
- *NETA

Name Definition

- ALWADDCLU**
Allow add to cluster. (5 0)
- DDMACC**
DDM/DRDA request access. (5 0)
- NWSDOMAIN**
Network server domain. (5 0)
- PCSACC**
Client request access. (5 0)
- ***SYSVAL**
 - Name Definition**
 - QACGLVL**
Accounting level. (5 0)
 - QALWJOBITP**
Allow jobs to be interrupted. (6 0)
 - QALWOBJRST**
Allow object restore option. (6 0)
 - QALWUSRDMN**
Allow user domain objects in libraries. (6 0)
 - QASTLVL**
User assistance level. (5 0)
 - QATNPGM**
Attention program. (6 0)
 - QAUDCTL**
Auditing control. (6 0)
 - QAUDENDACN**
Auditing end action. (6 0)
 - QAUDFRCLVL**
Force auditing data. (6 0)
 - QAUDLVL**
Security auditing level. (6 0)
 - QAUDLVL2**
Security auditing level extension. (6 0)
 - QAUTOCFG**
Autoconfigure devices. (6 0)
 - QAUTORMT**
Autoconfigure of remote controllers. (6 0)
 - QAUTOVRT**
Autoconfigure virtual devices. (6 0)
 - QCFGMSGQ**
Configuration message queue. (6 0)
 - QCCSID**
Coded character set identifier. (5 0)
 - QCHRID**
Graphic character set and code page. (5 0)

QCHRIDCTL
Character identifier control. (5 0)

QCMNRCYLMT
Communications recovery limits. (6 0)

QCNTYID
Country or region identifier. (6 0)

QCRTAUT
Create default public authority. (6 0)

QCRTOBJAUD
Create object auditing. (6 0)

QCTLSBSD
Controlling subsystem. (6 0)

QCURSYM
Currency symbol. (5 0)

QDATFMT
Date format. (5 0)

QDATSEP
Date separator. (5 0)

QDBRCVYWT
Database recovery wait indicator. (6 0)

QDECFMT
Decimal format. (5 0)

QDEVNAMING
Device naming conventions. (5 0)

QDEVRCYACN
Device I/O error action. (6 0)

QDSCJOBIV
Time interval before disconnected jobs end. (6 0)

QDSPSGNINF
Sign-on display information control. (5 0)

QENDJOBLMT
Time limit during immediate ending of a job. (6 0)

QFRCCVNRST
Force conversion on restore. (6 0)

QHSTLOGSIZ
Maximum history log records. (6 0)

QIGCCDEFNT
Double byte code font. (6 0)

QIGCFNTSIZ
Coded font size. (6 0)

QINACTITV
Inactive job time-out. (6 0)

QINACTMSGQ
Inactive job message queue. (6 0)

QIPLTYPE
Type of IPL to perform. (6 0)

QJOBMSGQFL
Job message queue full action. (5 0)

QJOBMSGQMX
Maximum size of job message queue. (5 0)

QJOBMSGQSZ
Job message queue initial size. (5 0)

QJOBMSGQTL
Job message queue maximum initial size. (5 0)

QJOBSPLA
Spooling control block initial size. (5 0)

QKDBBUF
Type ahead and/or attention key option. (5 0)

QKBDTYPE
Keyboard language character set. (5 0)

QLANGID
Language identifier. (5 0)

QLIBLCKLVL
Library locking level. (6 0)

QLMTDEVSSN
Limit device sessions. (6 0)

QLMTSECOFR
Limit security officer device access. (5 0)

QLOCALE
Locale path name. (6 0)

QLOGOUTPUT
Job log output. (6 0)

QMAXACTLVL
Maximum activity level of system. (5 0)

QMAXJOB
Maximum number of jobs. (5 0)

QMAXSGNACN
Action to take for failed signon attempts. (5 0)

QMAXSIGN
Maximum sign-on attempts allowed. (5 0)

QMAXSPLF
Maximum spooled files. (5 0)

QMLTTHDACN
Multithreaded job action. (6 0)

QPASTHRSVR
Pass-through servers. (6 0)

QPRBFTR
Problem log filter. (6 0)

QPRBHLDTV
Problem log hold interval. (6 0)

QPRTDEV
Printer device description. (6 0)

QPRTKEYFMT
Print header and/or border information. (5 0)

QPRTTXT
Print text. (5 0)

QPWDCHGBLK
Block password change. (6 0)

QPWDEXPITV
Password expiration interval. (5 0)

QPWDEXPWRN
Password expiration warning. (6 0)

QPWDLMTAJC
Limit adjacent digits in password. (5 0)

QPWDLMTCHR
Limit characters in password. (5 0)

QPWDLMTREP
Limit repeating characters in password. (5 0)

QPWDLVL
Password level. (5 0)

QPWDMAXLEN
Maximum password length. (5 0)

QPWDMINLEN
Minimum password length. (5 0)

QPWDPOSDIF
Limit password character positions. (5 0)

QPWDRQDDGT
Require digit in password. (5 0)

QPWDRQDDIF
Duplicate password control. (5 0)

QPWDRULES
Password rules. (6 0)

QPWDVLDPGM
Password validation program. (6 0)

QPWRDWNLMT
Maximum time for PWRDWNSYS *IMMED. (6 0)

QRCLSPLSTG
Reclaim spool storage. (6 0)

QRETSVRSEC
Retain server security data. (5 0)

QRMTSIGN
Remote sign-on control. (6 0)

QRMTSRVATR
Remote service attribute. (6 0)

QSCANFS
Scan file systems. (6 0)

QSCANFCTL
Scan file systems control. (6 0)

QSCPFCONS
IPL action with console problem. (6 0)

QSECURITY
System security level. (5 0)

QSETJOBATR
Set job attributes from locale. (6 0)

QSHRMEMCTL
Shared memory control. (6 0)

QSFWERRLOG
Software error logging. (5 0)

QSPCENV
Special environment. (6 0)

QSPLFACN
Spooled file action. (5 0)

QSRTSEQ
Sort sequence. (6 0)

QSRVDMP
Service dump control. (6 0)

QSSLCSL
Secure sockets layer cipher specification list. (6 0)

QSSLCSLCTL
Secure sockets layer cipher control. (6 0)

QSSLPCL
Secure sockets layer protocol. (6 0)

QSTRUPPGM
Startup program. (6 0)

QSTSMMSG
Display status messages. (6 0)

QSYSLIBL
System part of the library list. (6 0)

QTIMSEP
Time separator. (5 0)

QTSEPOOL
Time slice end pool. (5 0)

QUPSMMSGQ
Uninterruptible power supply message queue. (6 0)

QUSEADPAUT
Use adopted authority. (6 0)

- QUSRLIBL**
User part of the library list. (6 0)
- QVFYOBJRST**
Verify object on restore. (6 0)
- *TCPA
 - Name Definition**
 - ARPTIMO**
ARP cache timeout. (5 0)
 - ECN** Enable ECN. (5 0)
 - IPDEADGATE**
IP dead gateway detection. (5 0)
 - IPDTGFWD**
IP datagram forwarding. (5 0)
 - IPPATHMTU**
Path MTU discovery. (5 0)
 - IPQOSEN**
IP QoS enablement. (5 0)
 - IPQOSTMR**
IP QoS timer resolution. (5 0)
 - IPRSBTIMO**
IP reassembly time-out. (5 0)
 - IPSRCRTG**
IP source routing. (5 0)
 - IPTTL** IP time to live (hop limit). (5 0)
 - LOGPCLERR**
Log protocol errors. (5 0)
 - NFC** Network file cache. (5 0)
 - TCPCLOTIMO**
TCP time-wait timeout. (5 0)
 - TCPCNNMSG**
TCP close connection message. (5 0)
 - TCPKEEPALV**
TCP keep alive. (5 0)
 - TCPMINRTM**
TCP minimum retransmit time. (5 0)
 - TCPRCVBUF**
TCP receive buffer size. (5 0)
 - TCPR1CNT**
TCP R1 retransmission count. (5 0)
 - TCPR2CNT**
TCP R2 retransmission count. (5 0)
 - TCPSNDBUF**
TCP send buffer size. (5 0)

TCPURGPTR
TCP urgent pointer. (5 0)

UDPCKS
UDP checksum. (5 0)

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Monitored resource type (RSCTYPE)

Specifies the type of resource to be monitored.

This is a required parameter.

name Specify the resource type.

Top

Library (RSCLIB)

Specifies the library for the monitored resource.

Note: This parameter is required if the resource is a system object of type *CLS, *JOB, or *SBSD. A library name is not allowed for any other resource type.

name Specify the name of the library for the monitored resource.

Top

Monitored attributes (ATTRIBUTE)

Specifies the attributes to be monitored. Up to 50 attributes can be specified.

Note: The system will default the attribute to the resource name for resource types of *ENVVAR, *NETA, *SYSVAL, and *TCPA. The ATTRIBUTE parameter for these resource types is not allowed.

***ALL** All the attributes for the resource will be monitored.

name Specify the attributes to be monitored. Specific attributes for each resource type follow. The cluster version which supports the attribute is shown. For example (5 0) means the attribute is supported at cluster version 5 modification level 0 or greater.

- *ASPDEV

Attribute	Definition
-----------	------------

MSGQ	Message queue. (5 0)
-------------	----------------------

RDB	Relational database. (5 0)
------------	----------------------------

RSRCNAME	Resource name. (5 0)
-----------------	----------------------

TEXT	Text description. (6 0)
-------------	-------------------------

- *CLS

Attribute	Definition
CPUTIME	Maximum CPU time. (5 0)
DFTWAIT	Default wait time. (5 0)
MAXTHD	Maximum threads. (5 0)
MAXTMPSTG	Maximum temporary storage. (5 0)
RUNPTY	Run priority. (5 0)
TEXT	Text description. (6 0)
TIMESLICE	Time slice. (5 0)
• *ETHLIN	
Attribute	Definition
ADPTADR	Local adapter address. (6 0)
ASSOCPORT	Associated port resource name. (6 0)
AUTOCRTCTL	Autocreate controller. (6 0)
AUTODLTCTL	Autodelete controller. (6 0)
CMNRCYLMT	Recovery limits. (6 0)
COSTBYTE	Cost/byte. (6 0)
COSTCNN	Cost/connection time. (6 0)
DUPLEX	Duplex. (6 0)
GENTSTFRM	Generate test frame. (6 0)
GRPADR	Group address. (6 0)
LINESPEED	Line speed. (6 0)
LINKSPEED	Link speed. (6 0)
MAXCTL	Maximum controllers. (6 0)

- MAXFRAME**
Maximum frame size. (6 0)
- MSGQ**
Message queue. (6 0)
- ONLINE**
Online at IPL. (6 0)
- PRPDLY**
Propagation delay. (6 0)
- RSRCNAME**
Resource name. (6 0)
- SECURITY**
Security for line. (6 0)
- SSAP** Source service access point. (6 0)
- TEXT** Text description. (6 0)
- USRDFN1**
User-defined 1. (6 0)
- USRDFN2**
User-defined 2. (6 0)
- USRDFN3**
User-defined 3. (6 0)
- VRYWAIT**
Vary on wait. (6 0)
- ***JOB**
 - Attribute**
 - Definition**
 - ACGCDE**
Accounting code. (5 0)
 - ALWMLTTHD**
Allow multiple threads. (5 0)
 - DDMCNV**
DDM conversation. (5 0)
 - DEVRCYACN**
Device recovery action. (5 0)
 - ENDSEV**
End severity. (5 0)
 - HOLD**
Hold on job queue. (5 0)
 - INLSPGRP**
Initial ASP group. (5 0)
 - INQMSGRPY**
Inquiry message reply. (5 0)
 - JOBMSGQFL**
Job message queue full action. (5 0)
 - JOBMSGQMX**
Job message queue maximum size. (5 0)

- JOBPTY**
Job priority (on JOBQ). (5 0)
- JOBQ** Job queue. (5 0)
- LOG** Message logging. (5 0)
- LOGCLPGM**
Log CL program commands. (5 0)
- OUTPTY**
Output priority (on OUTQ). (5 0)
- OUTQ**
Output queue. (5 0)
- PRTDEV**
Print device. (5 0)
- PRTTXT**
Print text. (5 0)
- RQSDTA**
Request data. (5 0)
- RTGDTA**
Routing data. (5 0)
- SPLFACN**
Spooled file action. (5 0)
- SWS** Job switches. (5 0)
- SYNTAX**
CL syntax check. (5 0)
- TEXT** Text description. (6 0)
- TSEPOOL**
Time slice end pool. (5 0)
- USER** User. (5 0)
- *NWSCFG - configuration type *CNNSEC
- Attribute**
Definition
- IPSECRULE**
IP security rules. (6 0)
- TEXT** Text description. (6 0)
- *NWSCFG - configuration type *RMTSYS
- Attribute**
Definition
- BOOTDEVID**
Boot device ID. (6 0)
- CHAPAUT**
CHAP authentication. (6 0)
- DELIVERY**
Delivery method. (6 0)
- DYNBOOTOPT**
Dynamic boot options. (6 0)

- INRCHAPAUT**
Initiator CHAP authentication. (6 0)
- RMTIFC**
Remote interfaces. (6 0)
- RMTSYSID**
Remote system identifier. (6 0)
- SPNWSCFG**
Service processor configuration name. (6 0)
- TEXT** Text description. (6 0)
- *NWSCFG - configuration type *SRVPRC
- Attribute**
Definition
- EID** Enclosure identifier. (6 0)
- ENBUNICAST**
Enable unicast. (6 0)
- INZSP**
Initialize service processor. (6 0)
- SPAUT**
Service processor authentication. (6 0)
- SPCERTID**
Service processor certificate identifier. (6 0)
- SPINTNETA**
Service processor Internet address. (6 0)
- SPNAME**
Service processor name. (6 0)
- TEXT** Text description. (6 0)
- *NWSD - server connection type *IXSVR
- Attribute**
Definition
- CFGFILE**
Configuration file. (6 0)
- CODEPAGE**
Code page. (6 0)
- EVTLOG**
Event log. (6 0)
- MSGQ**
Server message queue. (6 0)
- NWSSTGL**
Network server storage link. (6 0)
- PRPDMNUSR**
Propagate domain users. (6 0)
- RSRCNAME**
Resource name. (6 0)

- RSTDDEVRS**
Restricted device resource. (6 0)
- SHUTDTIMO**
Shutdown timeout. (6 0)
- SYNCTIME**
Synchronize date and time. (6 0)
- TCPDMNNAME**
TCP/IP local domain name. (6 0)
- TCPHOSTNAM**
TCP/IP local host name. (6 0)
- TCPNAMSVR**
TCP/IP name server system. (6 0)
- TCPPORTCFG**
TCP/IP port configuration. (6 0)
- TEXT** Text description. (6 0)
- VRYWAIT**
Vary on wait. (6 0)
- *NWS - server connection type *ISCSI
- Attribute**
Definition
- ACTTMR**
Activation timer. (6 0)
- CFGFILE**
Configuration file. (6 0)
- CMNMSGQ**
Communications message queue. (6 0)
- CODEPAGE**
Code page. (6 0)
- DFTSECRULE**
Default IP security rule. (6 0)
- DFTSTGPTH**
Default storage path. (6 0)
- EVTLOG**
Event log. (6 0)
- MLPTHGRP**
Multi-path group. (6 0)
- MSGQ**
Server message queue. (6 0)
- NWSCFG**
Network server configuration. (6 0)
- NWSSTGL**
Network server storage link. (6 0)
- PRPDMNUSR**
Propagate domain users. (6 0)

- RMVMEDPTH**
Removable media path. (6 0)
- RSRCNAME**
Resource name. (6 0)
- RSTDDEVRSC**
Restricted device resource. (6 0)
- SHUTDTIMO**
Shutdown timeout. (6 0)
- STGPATH**
Storage path. (6 0)
- SYNCTIME**
Synchronize date and time. (6 0)
- TCPDMNNAME**
TCP/IP local domain name. (6 0)
- TCPHOSTNAM**
TCP/IP local host name. (6 0)
- TCPNAMSVR**
TCP/IP name server system. (6 0)
- TCPPORTCFG**
TCP/IP port configuration. (6 0)
- TEXT** Text description. (6 0)
- VRTETHCTLP**
Virtual Ethernet control port. (6 0)
- VRTETHPTH**
Virtual Ethernet path. (6 0)
- VRYWAIT**
Vary on wait. (6 0)
- *NWSHDEV
 - Attribute**
 - Definition**
 - CMNCYLMT**
Recovery limits. (6 0)
 - LCLIFC**
Local interface. (6 0)
 - MSGQ**
Message queue. (6 0)
 - ONLINE**
Online at IPL. (6 0)
 - RSRCNAME**
Resource name. (6 0)
 - TEXT** Text description. (6 0)
- *NWSSTG
 - Attribute**
 - Definition**

- SIZE Size. (6 0)
- TEXT Text description. (6 0)
- *OPTDEV
 - Attribute**
 - Definition**
 - MSGQ Message queue. (6 0)
 - ONLINE Online at IPL. (6 0)
 - RSRCNAME Resource name. (6 0)
 - TEXT Text description. (6 0)
- *SBSD
 - Attribute**
 - Definition**
 - AJE Autostart job entries. (6 0)
 - CMNE Communication entries. (6 0)
 - JOBQE Job queue entries. (6 0)
 - MAXJOBS Maximum jobs. (6 0)
 - PJE Prestart job entries. (6 0)
 - RMTLOCNAME Remote location name entries. (6 0)
 - RTGE Routing entries. (6 0)
 - SGNDSPF Sign-on display file. (6 0)
 - SYSLIBLE Subsystem library. (6 0)
 - TEXT Text description. (6 0)
 - WSNE Work station name entries. (6 0)
 - WSTE Work station type entries. (6 0)
- *TAPDEV
 - Attribute**
 - Definition**
 - ASSIGN Assign device at vary on. (6 0)
 - MSGQ Message queue. (6 0)
 - ONLINE Online at IPL. (6 0)

- RSRCNAME**
Resource name. (6 0)
- TEXT** Text description. (6 0)
- UNLOAD**
Unload device at vary off. (6 0)
- ***TRNLIN**
 - Attribute**
 - Definition**
 - ACTLANMGR**
Activate LAN manager. (6 0)
 - ADPTADR**
Local adapter address. (6 0)
 - AUTOCRTCTL**
Autocreate controller. (6 0)
 - AUTODLTCTL**
Autodelete controller. (6 0)
 - CMNRCYLMT**
Recovery limits. (6 0)
 - COSTBYTE**
Cost/byte. (6 0)
 - COSTCNN**
Cost/connection time. (6 0)
 - DUPLEX**
Duplex. (6 0)
 - ELYTKNRLS**
Early token release. (6 0)
 - FCNADR**
Functional address. (6 0)
 - LINESPEED**
Line speed. (6 0)
 - LOGCFGCHG**
Log configuration changes. (6 0)
 - MAXCTL**
Maximum controllers. (6 0)
 - MAXFRAME**
Maximum frame size. (6 0)
 - MSGQ**
Message queue. (6 0)
 - ONLINE**
Online at IPL. (6 0)
 - PRPDLY**
Propagation delay. (6 0)
 - RSRCNAME**
Resource name. (6 0)

- SECURITY**
Security for line. (6 0)
- SSAP** Source service access point. (6 0)
- TEXT** Text description. (6 0)
- TRNINFBCN**
Token-ring inform of beacon. (6 0)
- TRNLOGLVL**
TRLAN manager logging level. (6 0)
- TRNMGRMODE**
TRLAN manager mode. (6 0)
- USRDFN1**
User-defined 1. (6 0)
- USRDFN2**
User-defined 2. (6 0)
- USRDFN3**
User-defined 3. (6 0)
- VRYWAIT**
Vary on wait. (6 0)
- ***USRPRF**
 - Attribute**
 - Definition**
 - ACGCDE**
Accounting code. (5 0)
 - ASTLVL**
Assistance level. (5 0)
 - ATNPGM**
Attention program. (5 0)
 - CCSID**
Code character set ID. (5 0)
 - CHRIDCTL**
Character identifier control. (5 0)
 - CNTRYID**
Country or region ID. (5 0)
 - CURLIB**
Current library. (5 0)
 - DLVRY**
Delivery. (5 0)
 - DSPSGNINF**
Display sign-on information. (5 0)
 - GID** Group ID number. (5 0)
 - GRPAUT**
Group authority. (5 0)
 - GRPAUTTYP**
Group authority type. (5 0)

GRPPRF
Group profile. (5 0)

HOMEDIR
Home directory. (6 0)

INLMNU
Initial menu. (5 0)

INLPGM
Initial program to call. (5 0)

JOB Job description. (5 0)

KBDBUF
Keyboard buffering. (5 0)

LANGID
Language ID. (5 0)

LCLPDMGT
Local password management. (5 0)

LMTCPB
Limit capabilities. (5 0)

LMTDEVSSN
Limit device sessions. (5 0)

LOCALE
Locale. (6 0)

MAXSTG
Maximum allowed storage. (5 0)

MSGQ
Message queue. (5 0)

OUTQ
Output queue. (5 0)

OWNER
Owner. (5 0)

PASSWORD
User password. (5 0)

PRTDEV
Print device. (5 0)

PTYLMT
Highest schedule priority. (5 0)

PWDEXP
Set password to expired. (5 0)

PWDEXPITV
Password expiration interval. (5 0)

SETJOBATR
Locale job attributes. (5 0)

SEV Severity code filter. (5 0)

SPCAUT
Special authority. (5 0)

SPCENV
Special environment. (5 0)

SRTSEQ
Sort sequence. (5 0)

STATUS
Status. (5 0)

SUPGRPPRF
Supplemental groups. (5 0)

TEXT Text description. (6 0)

UID User ID number. (5 0)

USRCLS
User class. (5 0)

USROPT
User options. (5 0)

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Examples

Example 1: Adding an MRE for a job description

```
ADDCADMRE CLUSTER(MYCLUSTER) ADMDMN(MYDOMAIN)
           RESOURCE(MYJOBBD) RSCTYPE(*JOBBD) RSCLIB(QGPL)
           ATTRIBUTE(*ALL)
```

This command adds a monitored resource entry for a job description named MYJOBBD in library QGPL. Any change to the job description will be monitored by the cluster administrative domain MYDOMAIN in cluster MYCLUSTER.

Example 2: Adding an MRE for a user profile

```
ADDCADMRE CLUSTER(MYCLUSTER) ADMDMN(MYDOMAIN)
           RESOURCE(MYPROFILE) RSCTYPE(*USRPRF)
           ATTRIBUTE(PASSWORD)
```

This command adds a monitored resource entry for a user profile named MYJOBBD in library QGPL. Changes to the PASSWORD attribute will be monitored by the cluster administrative domain MYDOMAIN in cluster MYCLUSTER.

Example 3: Adding an MRE for a system value

```
ADDCADMRE CLUSTER(MYCLUSTER) ADMDMN(MYDOMAIN)
           RESOURCE(QRETSVRSEC) RSCTYPE(*SYSVAL)
```

This command adds a monitored resource entry for the QRETSVRSEC system value. Changes to the system value attribute will be monitored by the cluster administrative domain MYDOMAIN in cluster MYCLUSTER.

Error messages

*ESCAPE Messages

HAE0001

Resource not added to cluster administrative domain &4.

Add Admin Domain Node Entry (ADDCADNODE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Add Cluster Admin Domain Node Entry (ADDCADNODE) command is used to add a new node to the domain node list of an existing cluster administrative domain. All monitored resource entries that have been defined for the cluster administrative domain will be added on the specified node. Any resources which do not exist will be created. If the cluster administrative domain is active, the monitored resources will be synchronized with the active domain from the node from which the command was called

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command. In addition if the the user profile is not the owner of the Cluster Resource Group object, the profile must have *ALLOBJ special authority on all nodes in the CRG's recovery domain and on the node being added to the recovery domain.
2. The node being added to the domain node list must not already be a member of this cluster administrative domain's domain node list.
3. Cluster Resource Services must be active on the node processing the request.
4. There must be at least one active node in the Cluster administrative domain list.
5. The node being added must be active in the cluster.
6. The node being added must be unique in the domain node list of the cluster administrative domain specified.
7. The cluster resource group CRG is owned by the QCLUSTER user profile. To use the cluster resource group commands with the cluster administrative domain you will need to be authorized to the cluster resource group and to the QCLUSTER user profile.

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Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
ADMMDN	Cluster administrative domain	<i>Name</i>	Required, Positional 2
NODE	Node identifier	<i>Name</i>	Required, Positional 3

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Cluster (CLUSTER)

Specifies the cluster where the cluster administrative domain exists.

This is a required parameter.

name Specify the name of the cluster where the cluster administrative domain exists.

Cluster administrative domain (ADMDMN)

Specifies the cluster administrative domain which will have the new node added to its domain node list.

This is a required parameter.

name Specify the cluster administrative domain.

Node identifier (NODE)

Specifies the node being added to the domain node list of the cluster administrative domain specified for the **Cluster administrative domain (ADMDMN)** parameter.

This is a required parameter.

name Specify the name of the node that is to be added.

Examples

```
ADDCADNODE CLUSTER(MYCLUSTER) ADMDMN(MYDOMAIN)
           NODE(NODE1)
```

This command adds node NODE1 to the domain node list of cluster administrative domain MYDOMAIN in the cluster called MYCLUSTER.

Error messages

*ESCAPE Messages

HAE0002

Node &1 not added to cluster administrative domain &2.

Add Cluster Node Entry (ADDCLUNODE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Add Cluster Node Entry (ADDCLUNODE) command is used to add a node to the membership list of an existing cluster.

If the START parameter is set to *NO, the node that is being added will have a status of New and Cluster Resource Services will not be started on that node. The Start Cluster Node (STRCLUNOD) command can be called from a program running on one of the active nodes in the cluster to start Cluster Resource Services on a node that does not have a status of Active.

If the START parameter on this command is set to *YES, Cluster Resource Services will be started on the node that is being added. If Cluster Resource Services is successfully started, the status for the added node will be set to Active. Successful completion of this command results in Cluster Resource Services jobs (QCSTCTL, QCSTCRGM, and a job for each cluster resource group object in the cluster) started as system jobs. If the Cluster Resource Services cannot be started, the status of the added node will be set to New.

During the activation of Cluster Resource Services, the allow add to cluster (ALWADDCLU) network attribute is checked to see whether the node being added should be part of the cluster and whether to validate the cluster request through the use of X.509 digital certificates. If validation is required, the requesting node and the node being added must have the following installed on the systems:

- Operating System option 34 (Digital Certificate Manager)
- Cryptographic Access Provider Product (AC2 or AC3)

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. This command cannot be issued on the node being added. You must issue the command from a node in the cluster that has a status of Active. If Cluster Resource Services has not been started on any of the nodes in the cluster, you must issue this command from the node where the cluster was originally created, and the START parameter must be set to *NO.
4. The node being added to the cluster must not already be a member of this or any other cluster. A node can be a member of only one cluster.
5. If the START parameter is set to *YES, the node must be IP reachable (TCP/IP active and the INETD server started).
6. The command will fail if any node in the cluster has a status of Partition.
7. If the START parameter is set to *YES, the potential node version of the node being added must be equal to the current cluster version or up to one level higher than the current cluster version. The potential node version and the current cluster version can be retrieved by using the Display Cluster Information (DSPCLUINF) command.

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Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
NODE	Node list	<i>Element list</i>	Required, Positional 2
	Element 1: Node identifier	<i>Name</i>	
	Element 2: IP address	Values (up to 2 repetitions): <i>Character value</i>	
START	Start indicator	<u>*YES</u> , *NO	Optional

Top

Cluster (CLUSTER)

Specifies the cluster to which the node is being added.

This is a required parameter.

name Specify the name of the cluster to which the node is being added.

Top

Node identifier (NODE)

Specifies information about the node which will be placed in the cluster membership list.

This is a required parameter.

Element 1: Node identifier

A name that uniquely identifies a node.

node-identifier

Specify a name for the system.

Element 2: IP address

The cluster interface address is an IP address that is used by Cluster Resource Services to communicate with other nodes in the cluster. A maximum of 2 interface addresses per node can be specified.

character-value

Specify an IP address to be used to communicate with other nodes in the cluster. The address is in dotted decimal format.

Top

Start indicator (START)

Specifies whether or not Cluster Resource Services is to be started on the node being added.

*YES Cluster Resource Services will be started on the node.

*NO Cluster Resource Services will not be started on any node.

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Examples

```
ADDCLUNODE CLUSTER(MYCLUSTER) NODE(NODE1 ('2.5.35.117'))
           START(*YES)
```

This command adds node NODE1 to the cluster MYCLUSTER. Node NODE1 is added to the cluster membership list and Cluster Resource Services is started on NODE1. Interface address 2.5.35.117 will be used by Cluster Resource Services to communicate with the new node.

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Error messages

*ESCAPE Messages

HAE000D

ADDCLUNODE command to add cluster node &1 in cluster &2 failed.

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Add CRG Device Entry (ADDCRGDEVE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Add Cluster Resource Group Device Entry (ADDCRGDEVE) command is used to add one or more configuration objects representing resilient hardware devices to a device cluster resource group. All devices being added must be able to be switched from one cluster node to another. When the cluster resource group is switched over or failed over to the first backup system, all devices in the device list are moved to the backup system.

If the cluster resource group contains any members of an auxiliary storage pool group, it must contain **all** members before the cluster resource group can be started. All members do not have to be specified at once. Additional members can be added later. If the auxiliary storage pool group has previously been created and clustering can determine which members are in the group, a warning message is sent if some members of the group were not added.

If an exit program is specified for the cluster resource group, the cluster resource group exit program is called with an action code of Add Device Entry on all active nodes in the recovery domain. The cluster resource group status is set to Add Device Entry Pending. If the exit program completes successfully, the cluster resource group status is reset to its value at the time the command was called. If the exit program fails and the cluster resource group cannot be restored to its original condition, the cluster resource group status is set to Indoubt.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. Cluster Resource Services must be active on the node processing the request.
4. The number of configuration objects being added plus the number of configuration objects already in the cluster resource group cannot exceed 256.
5. The configuration objects being added cannot be specified in another cluster resource group.
6. If the primary node does not currently own the specified devices, the command fails with an error message.
7. All nodes in the recovery domain must be active.
8. For the configuration objects specified:
 - a. Only these configuration object types are supported. The cluster version must be 6 or greater for devices other than auxiliary storage pool devices. A cluster resource group with sites defined can only have auxiliary storage pool devices.
 - 1) An auxiliary storage pool device.
 - 2) An asynchronous communications device.
 - 3) A binary synchronous communications device.
 - 4) A cryptographic device.
 - 5) A distributed data interface communication line.
 - 6) An Ethernet communication line.
 - 7) A facsimile communication line.
 - 8) A network server device for a guest operating system (Linux) running in a logical partition.
 - 9) A network server device that uses an iSCSI connection.

- 10) An integrated network server device.
 - 11) A local workstation controller.
 - 12) A network server host adapter device.
 - 13) An optical device.
 - 14) A point-to-point protocol communication line.
 - 15) A synchronous data link control communication line.
 - 16) A tape device.
 - 17) A token-ring line.
 - 18) A wireless local area network communication line.
 - 19) An X.25 communication line.
- b. You must create the configuration object for the devices being added on all nodes in the recovery domain of the cluster resource group.
 - c. The resource name specified in the configuration object must be the same on all nodes in the recovery domain.
 - d. Devices attached to the same IOP or high-speed link I/O bridge can be specified for only one cluster resource group.
 - e. If devices attached to different IOPs or high-speed link I/O bridges are grouped such as for an auxiliary storage pool, all devices for the affected IOPs or high-speed link I/O bridges must be specified in the same cluster resource group.
 - f. The IOP or high-speed link I/O bridge controlling the devices specified in a cluster resource group must be accessible by all nodes in the cluster resource group's recovery domain. This is verified if sufficient hardware configuration has been performed so that all nodes are aware of the new hardware. If hardware configuration is incomplete, this is verified when the Start Cluster Resource Group (STRCRG) command is called.
 - g. If a data base name is specified in the configuration object, it must be the same on all nodes in the recovery domain.
 - h. If a new auxiliary storage pool group is added to an active cluster resource group, all members of the auxiliary storage pool group must be specified.
 - i. If a server takeover IP address is specified, it must exist on all nodes in the recovery domain if the cluster resource group is active. The server takeover IP address must be unique within the cluster. It can only be associated with a primary auxiliary storage pool.

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Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
CRG	Cluster resource group	<i>Name</i>	Required, Positional 2
CFGOBJ	Configuration object list	Values (up to 256 repetitions): <i>Element list</i>	Required, Positional 3
	Element 1: Configuration object	<i>Name</i>	
	Element 2: Configuration object type	*DEV <u>D</u> , *CTLD, *LIND, *NWSD	
	Element 3: Configuration object online	*OFF <u>L</u> INE, *ONLINE, *PRIMARY	
	Element 4: Server takeover IP address	<i>Character value</i> , *NONE	

Cluster (CLUSTER)

Specifies the cluster to which the cluster resource group belongs.

This is a required parameter.

name Specify the name of the cluster which contains the cluster resource group.

Cluster resource group (CRG)

Specifies the cluster resource group which is to contain the device entries.

This is a required parameter.

name Specify the name of the cluster resource group.

Configuration object list (CFGOBJ)

Specifies detailed information about the resilient devices to be added to the cluster resource group.

This is a required parameter.

Element 1: Configuration object

The name of the configuration object which can be switched between the nodes in the recovery domain. The configuration object can be specified in only one cluster resource group.

name Specify the name of the configuration object.

Element 2: Configuration object type

Specifies the type of configuration object.

***DEV**

Configuration objects of type device description.

***CTLD**

Configuration objects of type controller description.

***LIND**

Configuration objects of type line description.

***NWSD**

Configuration objects of type network server description.

Element 3: Configuration object online

Specifies what configuration action to take when the cluster resource group is switched over or failed over to a backup node. The configuration object can be varied on and start the server takeover IP address or leave the configuration object varied off and the server takeover IP address inactive and does not start or end the server takeover IP address when device ownership is moved to another node. This attribute

does not vary the device on or off when the cluster resource group is started or ended. Switchover and failover completion may be delayed if the online attribute has a value of *YES for devices that may take a long time to vary on.

***OFFLINE**

Do not vary the configuration object on and do not start the server takeover IP address.

***ONLINE**

Vary the configuration object on and start the server takeover IP address.

***PRIMARY**

This is a secondary ASP. Vary on processing is determined by the corresponding primary ASP for this ASP group.

Element 4: Server takeover IP address

Specifies a takeover IP address for servers associated with the relational database name in the device description for an auxiliary storage pool. This element is optional and can only be specified for a primary auxiliary storage pool. If specified, the address must be presented in dotted decimal format. The specified address must exist on all nodes in the recovery domain if the cluster resource group is active. If not specified, or for configuration objects other than a primary auxiliary storage pool, the element must be set to *NONE.

***NONE**

There is no server takeover IP address associated with the relational database name in the device description.

character-value

Specify the server takeover IP address associated with the relational database name.

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Examples

```
ADDCRGDEVE CLUSTER(MYCLUSTER) CRG(MYCRG)
            CFGOBJ((IASP01 *DEVD *ONLINE *NONE))
```

This command adds an ASP device description object, IASP01, to the device list of the resilient device cluster resource group MYCRG in the cluster MYCLUSTER. If MYCRG is switched over or failed over to a backup node, the device will be varied on to the new primary.

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Error messages

***ESCAPE Messages**

HAE001F

Request to add device entries to cluster resource group &1 failed.

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Add CRG Node Entry (ADDCRGNODE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Add Cluster Resource Group Node Entry (ADDCRGNODE) command is used to add a new node to the recovery domain of an existing cluster resource group. This command results in the preferred recovery domain and the current recovery domain being updated.

For primary-backup model cluster resource groups, the node can be added as another backup node, as a replicate node, or as the new primary node in the cluster resource group's recovery domain. A node can only be added as a primary node if the cluster resource group has a status of Inactive. When a new node is added as the primary, the old primary node becomes the last backup. If the cluster resource group has a status of Active, a node can be added as either a backup or a replicate. If the cluster resource group has a status of Active, it has more than one backup node, and some backup nodes are not active, the recovery domain may be reordered so that all active backup nodes are ordered before inactive backup nodes.

For peer model cluster resource groups, the node can be added as a peer node or a replicate node. If the cluster resource group has a status of Active (10) and a peer node is added, the node will be added as an active access point.

A node can be added to a resilient device cluster resource group even if it has no device entries. Device entries must be added using the Add Cluster Resource Group Device Entry (ADDCRGDEVE) command before the cluster resource group can be started. If the node being added to a device cluster resource group is to become the new primary node, ownership of the devices specified are switched from the current primary to the new primary if none of the devices are varied on for the current primary. If any devices are varied on, an error message is returned. Devices are not varied on after the ownership is switched.

If a node is being added to a resilient device cluster resource group for cross site mirroring, the node will be added to the recovery domain and then the QcstChangeClusterResourceGroup API will be used to add the site name and any data port IP addresses to the node. If there is a failure due to the QcstChangeClusterResourceGroup call, then the node will be removed from the recovery domain.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command. In addition if the the user profile is not the owner of the Cluster Resource Group object, the profile must have *ALLOBJ special authority on all nodes in the CRG's recovery domain and on the node being added to the recovery domain.
2. This command cannot be called from a cluster resource group exit program.
3. The node being added to the recovery domain must not already be a member of this cluster resource group's recovery domain.
4. For primary-backup model cluster resource groups, to add a node as the primary the cluster resource group must be Inactive.
5. Cluster Resource Services must be active on the node processing the request.
6. There must be at least one active node in the recovery domain.
7. The node being added must be active in the cluster.
8. The cluster resource group exit program must exist on each node in the recovery domain, including the node being added.

9. The node being added must be unique in the recovery domain of the cluster resource group specified.
10. If a node is being added to a resilient device cluster resource group:
 - a. A node can be added to a cluster resource group even if it has no device entries. Device entries must be added using the Add Cluster Resource Group Device Entry (ADDCRGDEVE) command before the cluster resource group can be started.
 - b. The node must be in the same device domain as the other nodes in the recovery domain.
 - c. The configuration objects for the device resources in the cluster resource group must exist on the node being added and the resource names in the configuration objects must be the same as the resource names used by the configuration objects on the existing nodes in the recovery domain. The node being added must be able to access the hardware resources represented by the configuration objects in the cluster resource group.
 - d. If a data base name is specified in the configuration objects in the cluster resource group, it must be the same on the node being added.
 - e. All members of an auxiliary storage pool group must be configured in the cluster resource group before ownership of the auxiliary storage pool can be changed.
 - f. If a server takeover IP address is specified in the cluster resource group and the cluster resource group is active, the server takeover IP address must exist.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
CRG	Cluster resource group	<i>Name</i>	Required, Positional 2
RCYDMN	Recovery domain node list	<i>Element list</i>	Required, Positional 3
	Element 1: Node identifier	<i>Name</i>	
	Element 2: Node role	*CRGTYPE , *PRIMARY, *BACKUP, *REPLICATE, *PEER	
	Element 3: Backup sequence number	1-127, *LAST	
	Element 4: Site name	<i>Name</i> , *NONE	
Element 5: Data port IP address	Single values: *NONE Other values (up to 4 repetitions): <i>Character value</i>		

Top

Cluster (CLUSTER)

Specifies the cluster where the cluster resource group exists.

This is a required parameter.

name Specify the name of the cluster where the cluster resource group exists.

Top

Cluster resource group (CRG)

Specifies the cluster resource group that will have the new node added to its recovery domain.

This is a required parameter.

name Specify the cluster resource group.

Top

Recovery domain node list (RCYDMN)

Specifies the node and role for the node being added to the recovery domain of the cluster resource group specified for the **Cluster resource group (CRG)** parameter.

This is a required parameter.

Element 1: Node identifier

Specifies the node being added.

name Specify the name of the cluster node.

Element 2: Node role

Specifies the role the node being added is to have in the recovery domain of the cluster resource group specified. For primary-backup model cluster resource groups a node can have one of three roles: primary, backup, or replicate. For peer model cluster resource groups a node can have one of two roles: peer or replicate. Any number of nodes can be designated as a peer or replicate. The following summarizes the valid values for the node being added:

*CRGTYPE

The node role will be set based on the type of the cluster resource group. If the type of cluster resource group is *PEER the default for the node role will be *PEER. For any other type of cluster resource group the default will be *BACKUP.

*PRIMARY

The new node will be added as the primary node. The cluster resource group must have a status of Inactive.

*BACKUP

The new node will be added as a backup node.

*REPLICATE

The new node will be added as a replicate. Replicates are not ordered and cannot become an access point unless changed to a proper role for the given cluster resource group type.

*PEER The new node will be added as a peer. Peer nodes are not ordered and can become an active access point for the cluster resources.

Element 3: Backup sequence number

Specifies the backup order for a node with role of *BACKUP. If there is already a node with the same backup order, the new node is inserted in the position requested. At the completion of the request, the nodes with backup roles will be sequentially renumbered from the first backup to the last. The first backup will always be 1.

*LAST

The new node will be added as the last backup in the recovery domain.

1-127 Specify the backup sequence number to be used.

Element 4: Site name

Specifies the site name of the recovery domain node. This is valid only for a device cluster resource group for cross site mirroring. A site contains a subset of recovery domain nodes in the same physical location. All nodes at a site have access to the same copy of auxiliary storage pool.

*NONE

The recovery domain node does not have a site name.

name Specify the site name for a recovery domain node.

Element 5: Data port IP address

Specifies the data port IP address for the recovery domain node. This is valid only for a device cluster resource group, specifically for geographic mirroring. The data port IP address is used to send updates from a source node that owns the production copy of auxiliary storage pool to a target node that owns the mirror copy of auxiliary storage pool.

Single values

*NONE

The recovery domain node does not have a data port IP address.

Other values (up to 4 repetitions)

character-value

Specify the data port IP address for the recovery domain node.

Top

Examples

Example 1: Adding a Backup Node to a CRG Recovery Domain

```
ADDCRGNODE CLUSTER(MYCLUSTER) CRG(MYCRG) RCYDMN(NODE1 *BACKUP 3)
```

This command adds node NODE1 to the recovery domain of cluster resource group MYCRG in the cluster called MYCLUSTER. The node is added as the third backup node. Any existing backup nodes will be renumbered sequentially.

Example 2: Adding a Node with Multiple Dataport IP Addresses

```
ADDCRGNODE CLUSTER(MYCLUSTER) CRG(MYCRG)
RCYDMN(NODE1 *BACKUP *LAST MYSITE ('1.1.1.1' '2.2.2.2'))
```

This command adds node NODE1 to the recovery domain of cluster resource group MYCRG in the cluster called MYCLUSTER. The node is added as the last backup node in the site MYSITE with 2 data port IP addresses.

Top

Error messages

*ESCAPE Messages

HAE0019

Node &1 not added to cluster resource group &2.

[Top](#)

Add Device Domain Entry (ADDDEVDMNE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

[Parameters](#)
[Examples](#)
[Error messages](#)

The Add Device Domain Entry (ADDDEVDMNE) command is used to add a cluster node to the membership list of a device domain. There is no command to create a device domain. The device domain will be created when the first cluster node is added to it. Once the node is a member of a device domain, it can be added to the recovery domain of device cluster resource groups.

This command can be called from a program running on any node in the cluster which has a status of Active.

This command requires that Operating System option 41, HA Switchable Resources, is installed and a valid license key exists on all cluster nodes that will be in the device domain.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. The node to be added and at least one current member of the device domain must be Active. On certain conditions, all current members of the device domain must be Active.
4. A node can only be a member of one device domain.
5. This command will fail if any member of the device domain to which the node being added has a status of Partition.
6. The command will fail if it is the first node being added to the device domain and any node in the cluster has a status of Partition.

[Top](#)

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
DEVDMN	Device domain	<i>Name</i>	Required, Positional 2
NODE	Node identifier	<i>Name</i>	Required, Positional 3

[Top](#)

Cluster (CLUSTER)

Specifies the cluster that contains the node.

This is a required parameter.

name Specify the name of the cluster which contains the node.

Device domain (DEVDMN)

Specifies the device domain to which the node is being added. If the device domain does not currently exist, it will be created.

This is a required parameter.

name Specify the name of the device domain to which the node is being added.

Node identifier (NODE)

Specifies the cluster node to be added to the device domain.

This is a required parameter.

name Specify the name of the cluster node.

Examples

```
ADDDEVDMNE CLUSTER(MYCLUSTER) DEVDMN(MYDOMAIN)
            NODE(NODE01)
```

Consider a cluster with a cluster membership list of NODE01, NODE02, and NODE03 and no existing device domains. This command creates the device domain MYDOMAIN and adds node NODE01 to the device domain membership list. Nodes NODE02 and NODE03 do not belong to any device domain.

Error messages

*ESCAPE Messages

HAE0015

Node &1 not added to device domain &2 in cluster &3.

Change ASP Copy Description (CHGASPCPYD)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Change Auxiliary Storage Pool Copy Description (CHGASPCPYD) command changes an existing auxiliary storage pool (ASP) copy description.

Restrictions:

- You must have input/output system configuration (*IOSYSCFG) special authority to use this command.
- You must have use (*USE) authority to the ASP device description of the ASP copy description that is being changed.

Top

Parameters

Keyword	Description	Choices	Notes
ASPCPY	ASP copy	<i>Name</i>	Required, Key, Positional 1
ASPDEV	ASP device	<i>Name</i> , *SAME	Optional
CRG	Cluster resource group	<i>Name</i> , *SAME, *NONE	Optional
SITE	Cluster resource group site	<i>Name</i> , *SAME, *NONE	Optional
STGHOST	Storage host	Single values: *SAME Other values (up to 2 repetitions): <i>Element list</i>	Optional
	Element 1: User name	<i>Name</i>	
	Element 2: Password	<i>Character value</i> , *SAME	
	Element 3: Internet address	Values (up to 2 repetitions): <i>Character value</i> , *SAME	
RSRCNAME	Resource name	Single values: *SAME Other values (up to 64 repetitions): <i>Element list</i>	Optional
	Element 1: Resource name	Values (up to 2 repetitions): <i>Name</i>	
	Element 2: Location	Values (up to 2 repetitions): <i>Name</i> , *SAME, *DEFAULT, *NONE	
LUN	Logical unit name	Single values: *SAME Other values (up to 64 repetitions): <i>Element list</i>	Optional
	Element 1: TotalStorage device	<i>Character value</i>	
	Element 2: Logical unit range	Values (up to 32 repetitions): <i>Character value</i> , *SAME	

Top

ASP copy (ASPCPY)

Specifies the name of the ASP copy description to be changed.

This is a required parameter.

name Specify the name of the ASP copy description.

Top

ASP device (ASPDEV)

Specifies the name of the ASP device description associated with the ASP copy description.

*SAME

The name of the ASP device description does not change..

name Specify the name of the ASP device description.

Top

Cluster resource group (CRG)

Specifies the name of the cluster resource group (CRG) that identifies the nodes among which the copy can switch.

*SAME

The name of the cluster resource group does not change.

*NONE

There is no cluster resource group for this copy description.

name Specify the name of the cluster resource group.

Top

Cluster resource group site (SITE)

Specifies the name of the cluster resource group (CRG) site that identifies the nodes among which the copy can switch.

*SAME

The name of the cluster resource group site does not change.

*NONE

No cluster resource group site is associated with the copy.

name Specify the site name within the cluster resource group.

Top

Storage host (STGHOST)

Specifies the storage host (there can be more than one for redundancy purposes) for the ASP copy.

Single values

*SAME

The storage host information is not changed.

Other values (up to 2 repetitions)

Element 1: User name

name Specifies the name of the user that HASM passes to the connection agent when opening a connection. The user name can be changed. It is up to the user to keep this information current.

Element 2: Password

***SAME**

The user signon password does not change.

character-value

Specify the password.

Element 3: Internet address

You can specify 2 values for this element.

***SAME**

The internet address does not change.

character-value

Specifies an internet address that the local system can use to connect to the storage host. The internet address may be an IPv4 or IPv6 address.

An IPv4 internet address is specified in the form *nnn.nnn.nnn.nnn*, where *nnn* is a decimal number ranging from 0 through 255. An IPv4 address is not valid if it has a value of all binary ones or all binary zeros for the network identifier (ID) portion or the host ID portion of the address.

An IPv6 internet address must be a unicast address and must not contain an imbedded IPv4 address (compatibility or mapped). An IPv6 internet address is specified in the form *x::x::x::x::x::x*, where *x* is a hexadecimal number ranging from 0 through X'FFFF'. "::" may be used once in the IPv6 address to indicate one or more groups of 16 bits of zeros. The "::" may be used to compress leading, imbedded, or trailing zeros in the address.

If the internet address is entered from the command line, the address must be enclosed in apostrophes.

Top

Resource name (RSRCNAME)

Specifies the resource name of the input/output adapter (IOA) resource that provides access to the disk units associated with the copy description and the node from which this access can occur.

Single values

***SAME**

The resource name does not change.

Other values (up to 64 repetitions)

Element 1: Resource name

name Specify the name of an IOA resource.

Element 2: Location

You can specify 2 values for this element.

***SAME**

The resource name information is not changed.

***DEFAULT**

Specifies that the node information is provided by the CRG name and CRG site name of this copy description.

***NONE**

Specifies that the copy will never be varied online. The ASP copy can only be used in FlashCopy operations and then, only as a FlashCopy target.

name Specifies the name of the node associated with the IOA resource.

Top

Logical unit name (LUN)

Specifies the logical units (LUNs) that are accessible through an individual IOA and are associated with the copy description.

Single values

***SAME**

The logical unit information does not change.

Other values (up to 64 repetitions) The logical units are positionally related to the IOA resources specified on the resource name (RSRCNAME) parameter. That is, the LUNs of the first value are accessed through the first IOA resource, the LUNs of the second value are accessed through the second IOA resource, and so forth.

Element 1: TotalStorage device

character-value

Specify the name of the TotalStorage device that contains the LUNs.

Element 2: Logical unit range

You can specify 32 values for this element.

***SAME**

The logical unit ranges does not change.

character-value

Specify a LUN range in the form 'mmmm-nnnn'. 'mmmm' is the first LUN number within a range and 'nnnn' is the last LUN number in that range.

Top

Examples

Example 1: Changing the Resource Name

```
CHGASPCPYD  ASPCOPY(ORDER)  RSRCNAME((IOA002 NODEA))
```

This command changes the name of the input/output adapter (IOA) and node that is used to access the ASP copy's disk units.

Example 2: Changing the Storage Host Internet Address

```
CHGASPCPYD  ASPCOPY(ORDER)  STGHOST(*SAME *SAME (4.4.444.44))
```


This command changes the internet address that is used to a storage host.

[Top](#)

Error messages

***ESCAPE Messages**

CPF9801

Object &2 in library &3 not found.

CPF9802

Not authorized to object &2 in &3.

CPF9899

Error occurred during processing of command.

HAE002B

&1 command failed.

[Top](#)

Change ASP Session (CHGASPSSN)

Where allowed to run: All environments (*ALL)
 Threadsafte: Yes

Parameters
 Examples
 Error messages

The Change Auxiliary Storage Pool Session (CHGASPSSN) command is used to change an existing geographic mirroring, Metro Mirror, Global Mirror or FlashCopy session.

To suspend or resume geographic mirroring, Metro Mirror or Global Mirror, it is necessary to have already configured the mirror copy disks and a cluster resource group (CRG) with a recovery domain that has two sites. Suspend does not occur for Metro Mirror or Global Mirror if i5/OS is not active but the storage area network is.

To change session attributes (use the *CHGATTR option) when using geographic mirrorint, the production copy of the ASP must be offline.

Restrictions:

- You must have job control (*JOBCTL) special authority to use this command and you must have use (*USE) authority to the ASP device descriptions of the session that is being changed.

Top

Parameters

Keyword	Description	Choices	Notes
SSN	Session	<i>Name</i>	Required, Key, Positional 1
OPTION	Option	*CHGATTR, *SUSPEND, *RESUME, *DETACH, *REATTACH, *INCR, *REVERSE	Required, Key, Positional 2
ASPCPY	ASP copy	Values (up to 223 repetitions): <i>Element list</i>	Optional, Positional 3
	Element 1: Preferred source	<i>Name</i> , <u>*SAME</u>	
	Element 2: Preferred target	<i>Name</i> , <u>*SAME</u>	
	Element 3: Consistency source	<i>Name</i> , <u>*SAME</u> , *NONE	
	Element 4: Consistency target	<i>Name</i> , <u>*SAME</u> , *NONE	
SSPTIMO	Suspend timeout	1-7200, <u>*SAME</u>	Optional
MODE	Mirroring mode	<u>*SAME</u> , *SYNC, *ASYN	Optional
PRIORITY	Synchronization priority	<u>*SAME</u> , *LOW, *MEDIUM, *HIGH	Optional
TRACKSPACE	Tracking space	0-100, <u>*SAME</u>	Optional
FLASHTYPE	FlashCopy type	<u>*SAME</u> , *COPY	Optional
PERSISTENT	Persistent relationship	<u>*SAME</u> , *YES, *NO	Optional
ASPDEV	ASP device	Single values: <u>*ALL</u> Other values (up to 223 repetitions): <i>Name</i>	Optional
TRACK	Track	<u>*YES</u> , *NO	Optional

Top

Session (SSN)

Specifies the name of the ASP session to be changed.

This is a required parameter.

name Specify the name of an ASP session. This is the name that was specified when the ASP session was started.

Top

Option (OPTION)

Specifies the function of the change request.

This is a required parameter.

*CHGATTR

Specifies that one or more of the parameters for the following keywords is to be changed: SSPTIMO, MODE, PRIORITY, TRACKSPACE, FLASHTYPE, PERSISTENT and ASPDEV.

*SUSPEND

Specifies that the ASP session is to be suspended.

*RESUME

Specifies that the ASP session is to be resumed.

*DETACH

Specifies that the session's geographic mirroring mirror copy or its Metro Mirror, Global Mirror or FlashCopy target is to be detached.

*REATTACH

Specifies that the session's geographic mirroring mirror copy or its Metro Mirror, Global Mirror or FlashCopy target is to be reattached.

*INCR

Specifies that a new incremental FlashCopy operation is to be done. This option is only valid for a FlashCopy session.

*REVERSE

Specifies that the session's FlashCopy is to be reversed. This option is only valid for a FlashCopy session.

Top

ASP copy (ASPCPY)

Specifies the ASP copy description names that are changed.

You can specify 223 values for this parameter.

Element 1: Preferred source

*SAME

The name of the copy description does not change.

name Specify the name of a preferred source ASP copy description.

Element 2: Preferred target

***SAME**

The name of the copy description does not change.

name Specify the name of the preferred target ASP copy description that corresponds to the preferred source.

Element 3: Consistency source

***SAME**

The name of the copy description does not change.

***NONE**

There is no consistency copy description that corresponds to the preferred source.

name Specify the name of the consistency copy description that corresponds to the preferred source.

Element 4: Consistency target

***SAME**

The name of the copy description does not change.

***NONE**

There is no consistency copy description that corresponds to the preferred target.

name Specify the name of the consistency copy description that corresponds to the preferred target.

Top

Suspend timeout (SSPTIMO)

Specifies the number of seconds to wait for a response when doing cross-site mirroring, Metro Mirror or Global Mirror before suspending due to lack of a response.

***SAME**

The suspend timeout is not changed.

1-7200 Specify the number of seconds to wait before suspending.

Top

Mirroring mode (MODE)

Specifies whether the mode for cross-site mirroring is synchronous or asynchronous.

***SAME**

The mode is not changed.

***SYNC**

Use synchronous cross-site mirroring.

***ASYNC**

Use asynchronous cross-site mirroring.

Top

Synchronization priority (PRIORITY)

Specifies the geographic mirroring synchronization priority.

***SAME**

The priority is not changed.

***MEDIUM**

Use medium priority.

***LOW** Use low priority.

***HIGH**

Use high priority.

Top

Tracking space (TRACKSPACE)

Specifies the percent of the maximum assignable tracking space to use. The maximum assignable tracking space is 2 percent of the total space within an independent ASP. For example, a 100 gigabyte independent ASP has a maximum tracking space of 1 gigabyte. A tracking space parameter value of 5 would specify that 5 percent of 1 gigabyte (50 megabytes) should be reserved for tracking changes.

***SAME**

The value is not changed.

0-100 Specify the percent of the maximum assignable tracking space to reserve for tracking changes.

Top

FlashCopy type (FLASHTYPE)

Specifies the FlashCopy session type.

Use of this keyword is only valid for a FlashCopy session. A FlashCopy *NOCOPY session can be changed to FlashCopy *COPY but a FlashCopy *COPY session cannot be changed to FlashCopy *NOCOPY.

***SAME**

The FlashCopy type does not change.

***COPY**

The FlashCopy type changes to *COPY.

Top

Persistent relationship (PERSISTENT)

Specifies whether the relationship is to last beyond the brief interval that it takes to establish a FlashCopy copy. A persistent relationship is necessary in order to do an incremental FlashCopy or a reverse FlashCopy.

***SAME**

The persistent relationship is not changed.

***YES** Specifies that the relationship is persistent. Change recording is done. For *SUSPEND, this parameter applies to the source or production copy. For detach of a geographic mirroring mirror copy, this parameter applies to both the production copy and the mirror copy.

***NO** Specifies that the relationship is not persistent. Change recording is not done.

Top

ASP device (ASPDEV)

Specifies the ASP entries within the session that are affected. *DETACH, *REATTACH and *REVERSE work on an entire ASP group and only allow a primary or UDFS ASP to be specified.

Single values

***ALL** All ASP devices are to change.

Other values (up to 223 repetitions)

name Specify the names of the ASP devices that are to change.

Top

Track (TRACK)

Specifies whether changes are to be tracked.

This parameter is only valid for the *SUSPEND and *DETACH options of a geographic mirroring session.

***YES** Specifies that changes are to be tracked.

***NO** Specifies that changes are not to be tracked.

Top

Examples

Example 1: Suspending an ASP Session

```
CHGASPSSN  SSN(ORDERSSN)  OPTION(*SUSPEND)
           ASPDEV(ORDER)  TRACK(*YES)
```

This command suspends sending of changes from the session source ASP device named ORDER. Changes to the production copy will be tracked so that a subsequent RESUME request does not require that the entire contents of the ASP be sent.

Example 2: Changing an attribute of an ASP Session

```
CHGASPSSN  SSN(ORDERSSN)  OPTION(*CHGATTR)
           SSPTIMO(90)    TRACKSPACE(80)
```

This command changes the suspend timeout to 90 seconds. It also changes the percent of the total tracking space that can be used to 80 percent.

Top

Error messages

*ESCAPE Messages

CPF9801

Object &2 in library &3 not found.

CPF9802

Not authorized to object &2 in &3.

CPF9899

Error occurred during processing of command.

HAE002B

&1 command failed.

[Top](#)

Change Cluster Admin Domain (CHGCAD)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Change Cluster Administrative Domain (CHGCAD) command changes an existing cluster administrative domain. The cluster administrative domain provides synchronization of monitored resources across the active nodes in the domain. Synchronization of multiple changes to a monitored resource occurs when a cluster node joins an administrative domain and when the peer cluster resource group (CRG) which represents the cluster administrative domain is started. The synchronization option can be used to indicate how the cluster administrative domain handles changes when an inactive node joins the cluster.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. All nodes in the administrative domain must be in the cluster with a status of Active.
3. This command must run from an active cluster node in the domain node list of the cluster administrative domain.
4. This command can only be used with a cluster at cluster version 6 or later.
5. The cluster resource group CRG is owned by the QCLUSTER user profile. To use the cluster resource group commands with the cluster administrative domain you will need to be authorized to the cluster resource group and to the QCLUSTER user profile.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Key, Positional 1
ADMDMN	Cluster administrative domain	<i>Name</i>	Required, Key, Positional 2
SYNOPT	Synchronization option	*SAME , *LASTCHG, *ACTDMN	Optional

Top

Cluster (CLUSTER)

Specifies the cluster containing the cluster administrative domain to be changed.

This is a required parameter.

name Specify the name of the cluster.

Top

Cluster administrative domain (ADMDMN)

Specifies the cluster administrative domain to be changed.

This is a required parameter.

name Specify the name of the cluster administrative domain.

Top

Synchronization option (SYNCOPT)

Specifies the synchronization behavior when a node joins a cluster administrative domain.

- If all changes to monitored resources should be applied to the cluster administrative domain, *LASTCHG should be specified. When a node joins the cluster, the most recent change made to each monitored resource will be applied to all active nodes in the domain. If the most recent change was made on the node that is joining, it will be propagated to the active domain.
- If only changes to monitored resources are allowed from active nodes, the *ACTDMN option should be specified. Changes made to monitored resources on inactive nodes will be discarded when the node joins the domain.
- The *ACTDMN option does not apply to network server storage spaces (*NWSSTG). Synchronization of *NWSSTG resources is always based on the last change made.

*SAME

The synchronization option is not changed.

*LASTCHG

The last change that was made before the node joined the cluster administrative domain is processed by all nodes in the active domain. The last change could have been made in the active domain or on the joining node while it was inactive.

*ACTDMN

Only changes made on active nodes in an active cluster administrative domain are processed. Changes made on a node while it was inactive are not passed to the active domain. When a node joins the cluster administrative domain, it will be synchronized with the values from the active domain.

Top

Examples

```
CHGCAD CLUSTER(MYCLUSTER) ADMDMN(MYDOMAIN)
        SYNCOPT(*ACTDMN)
```

This command changes the synchronization behavior of a cluster administrative domain called MYDOMAIN in a cluster called MYCLUSTER. When a node joins MYDOMAIN, any changes made to monitored resources while it was inactive will be discarded and the node will be synchronized with values from the active domain.

Top

Error messages

*ESCAPE Messages

HAE0003

Cluster administrative domain &1 not changed.

[Top](#)

Change Cluster (CHGCLU)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Change Cluster (CHGCLU) command is used to change cluster configuration parameters. Values for current settings may be retrieved using the Display Cluster Information (DSPCLUINF) command or Work Cluster (WRKCLU) command..

Prior to cluster version 6, a failover message queue could be defined for a cluster resource group. If the failover message queue was defined, a message was enqueued during the failover of the cluster resource group, allowing the user to cancel or continue the failover. If a cluster node ended or failed and there were multiple cluster resource groups with that node as a primary recovery domain node, the user would have needed to respond to a message for each cluster resource group.

In cluster version 6 and above, the user has the option of receiving and responding to one message for all cluster resource groups which are failing over to the same node when the primary node for the cluster resource groups ends or fails. A cluster message queue, failover wait time, and failover default action may be specified. If a failure occurs on a node, that node is the primary recovery domain node for any active cluster resource groups, and the cluster message queue is defined, then one message will be enqueued on the cluster message queue. This gives the user the option of continuing all cluster resource group failovers to the new primary, or cancelling all cluster resource group failovers. No message will be enqueued if the primary node is removed from the cluster because that node can not remain the primary node of the cluster resource group. If a cluster resource group is failing over individually, one message will be sent which will control the failover of that cluster resource group. The message will be placed on the message queue on the new primary node before the cluster resource groups call their exit programs. If the failovers are cancelled, the primary node of the cluster resource groups will not be changed, and the cluster resource groups will become Inactive. The exit programs will be called with an action code of Failover Cancelled.

If the user wants to specify failover actions for a specific cluster resource group, the failover message queue fields on the CRTCRG (Create CRG) or CHGCRG (Change CRG) commands should be used instead of the cluster message queue fields. If the failover fields are set at a cluster level, they will override any cluster resource group failover parameters. If the cluster message queue is set to *NONE, then the failover of each individual cluster resource group will be controlled via the cluster resource group failover parameters.

The command provides a base level of tuning support where the cluster will adjust to a predefined set of values identified for maximum, minimum, and normal timeout and messaging interval values. If an advanced level of tuning is desired, usually anticipated with the help of IBM support personnel, then individual parameters may be tuned over a predefined range of values using the Change Cluster Resource Services (QcstChgClusterResourceServices) API.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. This command must be called on a cluster node with a status of Active.
4. The configuration tuning level must be the same in both partitions for a merge to be allowed.
5. If the cluster message queue is specified, it must exist on all started nodes in the cluster.

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
CLUMSGQ	Cluster message queue	Single values: *SAME , *NONE Other values: <i>Qualified object name</i>	Optional
	Qualifier 1: Cluster message queue	<i>Name</i>	
	Qualifier 2: Library	<i>Name</i>	
FLVWAITTIM	Failover wait time	<i>Integer</i> , *SAME , *NOWAIT, *NOMAX	Optional
FLVDFTACN	Failover default action	*SAME , *PROCEED, *CANCEL	Optional
CFGTUNLVL	Configuration tuning level	*SAME , *NORMAL, *MIN, *MAX	Optional

Top

Cluster (CLUSTER)

Specifies the cluster for which the configuration parameters will be changed.

This is a required parameter.

name Specify the name of the cluster.

Top

Cluster message queue (CLUMSGQ)

Specifies the message queue to receive messages dealing with failover. If this field is set, the specified message queue must exist on all nodes in the recovery domain after the exit program completes. The message queue cannot be in an independent auxiliary storage pool.

Single values

*SAME

The current cluster message queue is not changed.

*NONE

No cluster message queue is defined. No messages will be sent when a failover occurs. This is the behavior for V5R4M0 and prior releases.

Qualifier 1: Cluster message queue

name Specify the name of the cluster message queue.

Qualifier 2: Library

name Specify the name of the library that contains the cluster message queue. The library name cannot be *CURLIB, QTEMP, or *LIBL.

Top

Failover wait time (FLVWAITTIM)

Specifies the number of minutes to wait for a reply to the failover message that was enqueued on the cluster message queue. This parameter is ignored when the CLUMSGQ parameter is *NONE.

*SAME

The current failover wait time is not changed.

*NOWAIT

Failover proceeds without user intervention.

*NOMAX

Wait forever until a response is given to the failover inquiry message.

integer

Specify the number of minutes to wait for a response to the failover inquiry message. If no response is received in the specified number of minutes, the failover default action field will be looked at to decide how to proceed.

Top

Failover default action (FLVDFTACN)

Specifies the default action to be taken if a response to the failover message is not received in the failover wait time limit. This parameter is ignored when the CLUMSGQ parameter is *NONE.

*SAME

The current failover default action is not changed.

*PROCEED

Proceed with failover.

*CANCEL

Do not attempt failover.

Top

Configuration tuning level (CFGTUNLVL)

Specifies the desired cluster communications configuration tuning sensitivity level. Provides a simple way to set cluster performance and configuration parameters.

*SAME

The current value for cluster tuning level is used.

*NORMAL

Default values are used for cluster communications performance and configuration parameters. This setting may be used to return all parameters to the original default values.

*MIN Adjustments are made to cluster communications to increase the heartbeating interval and increase the various message timeout values. With fewer heartbeats and longer timeout values, the cluster will be slower to respond (minimum sensitivity) to communications failures.

*MAX Adjustments are made to cluster communications to decrease the heartbeating interval and decrease the various message timeout values. With more frequent heartbeats and shorter timeout values, the cluster will be quicker to respond (maximum sensitivity) to communications failures.

Top

Examples

Example 1: Changing the Cluster Message Queue

```
CHGCLU CLUSTER(MYCLUSTER) CLUMSGQ(MYLIB/MYQUEUE) FLVWAITTIM(5)
      FLVDFTACN(*PROCEED) CFGTUNLVL(*SAME)
```

This command changes the cluster message queue called MYQUEUE in library MYLIB for cluster MYCLUSTER. If a failover message is enqueued on the cluster message queue, the failover will proceed after waiting 5 minutes for a message reply. The configuration tuning level is not changed.

Example 2: Changing the Configuration Tuning Level

```
CHGCLU CLUSTER(MYCLUSTER) CLUMSGQ(*SAME) FLVWAITTIM(*SAME)
      FLVDFTACN(*SAME) CFGTUNLVL(*MIN)
```

This command changes the configuration tuning level of the cluster MYCLUSTER. The tuning level is set to the minimum sensitivity level. The cluster message queue and failover parameters are not changed.

Top

Error messages

*ESCAPE Messages

HAE0012

Cluster &1 not changed.

Top

Change Cluster Node Entry (CHGCLUNODE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Change Cluster Node Entry (CHGCLUNODE) command is used to change cluster membership information for a cluster node entry. The information that can be changed is the cluster interface addresses defined for the node and status of the node. The node entry which is being changed may or may not have Cluster Resource Services started.

You can add, remove, or replace an interface address for the cluster node. The cluster interface address is an IP address that is used by Cluster Resource Services to communicate with other nodes in the cluster. The address is in dotted decimal format.

You can also change the the status of a node to Failed. Using this command to change the status of a node to Failed provides a way to tell Cluster Resource Services that a node has really failed. There are certain failure conditions that Cluster Resource Services cannot detect as a node failure. Rather, the problem appears to be a communication problem and the cluster looks like it has become partitioned. By telling Cluster Resource Services that a node has failed, it makes recovery from the partition state simpler for primary-backup model cluster resource groups since a backup node from the remaining active cluster nodes can then be assigned as the primary node.

For primary-backup model cluster resource groups:

- When you change the status of a node to Failed, the role of nodes in the recovery domain for each cluster resource group in the partition may be reordered by assigning the specified node as the last backup. If an exit program is specified for the cluster resource group, it will be called with an action code of Change Node Status. If multiple nodes have failed and their status needs to be changed, the order in which the nodes are changed will affect the final order of the recovery domain's backup nodes in the cluster resource group.
- If the node status is changed to failed and the node was the primary node for a cluster resource group, the first active backup will be reassigned as the new primary node. When this occurs for a device cluster resource group, ownership of the hardware will be moved to the new primary node.

If a problem is detected and the command does not complete successfully, the command can be run again once the problem is corrected. Any cluster resource group that had already had the status of a node changed from Partition to Failed and the recovery domain order changed will not be affected by running this command again.

Warning: Changing the node status to failed when, in fact, the node is still active and a true partition has occurred should not be done. Doing so for primary-backup model cluster resource groups, allows a node in each partition to become the primary node for a cluster resource group. When two nodes think they are the primary node, data such as files or data bases could become corrupted if two different nodes are each making independent changes to copies of their files. In addition, the two partitions cannot be merged back together when a node in each partition has been assigned the primary role.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. This command must be called from a program running on a cluster node with a status of Active.

4. If the cluster is in a partitioned state, this operation can only be performed within the partition running the command.
5. Only one cluster interface address can be changed at a time. If the cluster is in partitioned state, the change cluster interface address is only allowed for a node within the same partition.
6. To change the cluster node status, only a node that has a status of Partition or Failed can be changed and it can only be changed to Failed status.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
NODE	Node identifier	<i>Name</i>	Required, Positional 2
OPTION	Option	*ADDIFC, *RMVIFC, *CHGIFC, *CHGSTS	Required, Positional 3
OLDINTNETA	Old IP address	<i>Character value</i>	Optional, Positional 4
NEWINTNETA	New IP address	<i>Character value</i>	Optional, Positional 5

Top

Cluster (CLUSTER)

Specifies the cluster that contains the node being changed.

This is a required parameter.

name Specify the name of the cluster.

Top

Node identifier (NODE)

Specifies the node being changed.

This is a required parameter.

name Specify the name of the node being changed.

Top

Option (OPTION)

Indicates what is being changed.

This is a required parameter.

***ADDIFC**

Add an internet address for the specified node.

***RMVIFC**

Remove an internet address for the specified node.

***CHGIFC**

Replace an internet address for the specified node with a different existing internet address.

***CHGSTS**

Change cluster node status from Partition or Failed to Failed.

Top

Old IP address (OLDINTNETA)

Specifies the cluster interface address which is being replaced or removed. The address is in dotted decimal format.

This is a required parameter.

character-value

Specify the cluster interface address to be changed.

Top

New IP address (NEWINTNETA)

Specifies the cluster interface address which is being added to the node information or replacing an old cluster interface address. The address is in dotted decimal format.

This is a required parameter.

character-value

Specify the cluster interface address which is to be used to communicate with the node.

Top

Examples

```
CHGCLUNODE CLUSTER(MYCLUSTER) NODE(NODE01) OPTION(*CHGSTS)
```

This command changes the status of node NODE01 in cluster MYCLUSTER to Failed.

Top

Error messages

*ESCAPE Messages

HAE0011

Cluster node &1 in cluster &2 not changed.

Top

Change Cluster Version (CHGCLUVER)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Change Cluster Version (CHGCLUVER) command is used to adjust the current version of the cluster. The current cluster version is the version at which the nodes in the cluster are actively communicating with each other. In addition, this value determines what nodes can join into the cluster and the cluster's ability to use new functions supported by the nodes potential node version. It is initially set when the cluster is created. This command adjusts the cluster version to be one level greater than the existing value. To view the current cluster version, use the Display Cluster Information (DSPCLUINF) command.

This command can only be used to adjust to a higher version. The only way to change the cluster to a lower version is to delete and recreate the cluster at the lower version.

This command will not cause the cluster resource group exit program to be called.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. This command must be invoked from a cluster node with a status of Active.
4. This command cannot be used if the cluster is in a partitioned state.
5. The cluster version cannot be set higher than the lowest potential node version in the cluster. To view the potential node versions, use the Display Cluster Information (DSPCLUINF) command.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1

Top

Cluster (CLUSTER)

Specifies the cluster being adjusted.

This is a required parameter.

name Specify the name of the cluster that is to be changed.

Top

Examples

```
CHGCLUVER CLUSTER(MYCLUSTER)
```

This command adjust the current version of cluster MYCLUSTER. If the current cluster version level was 2, it is set to 3 as a result of this command.

[Top](#)

Error messages

*ESCAPE Messages

HAE0013

Cluster version of cluster &1 not changed.

[Top](#)

Change Cluster Resource Group (CHGCRG)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Change Cluster Resource Group (CHGCRG) command changes some of the attributes of a cluster resource group. The cluster resource group object is changed on all active nodes in the recovery domain. Recovery domain nodes that are not active at the time of the change will have the change made when they become active again.

For primary-backup model cluster resource groups, changing the node role to primary or changing the takeover IP address can only be done when the cluster resource group status is Inactive or Indoubt. If the cluster resource group is active, the Change Cluster Resource Group Primary (CHGCRGPRI) command can be used to assign the primary role to the first backup node.

For peer model cluster resource groups:

- The recovery domain role can be changed from peer to replicate or replicate to peer by specifying one or more recovery domain nodes. The full recovery domain does not need to be specified.
- If the cluster resource group is Active (10) and:
 - The role is changed from peer to replicate, the node becomes an inactive access point.
 - The role is changed from replicate to peer, the node becomes an active access point.
- There must be at least one node designated as peer if the cluster resource group is Active (10).

The following fields may be changed without causing the cluster resource group exit program to be called:

- text description
- exit program data
- user profile
- takeover IP address
- job name
- allow application restart
- number of restarts
- the cluster resource group exit program
- failover message queue
- failover wait time
- failover default action
- cluster resource group exit program format name
- application identifier

This command will do the following for all cluster resource group types:

- Call the cluster resource group exit program with an action code of Change on all active nodes in the recovery domain when either the preferred or current role is changed, if an exit program is specified for the cluster resource group. The cluster resource group status is set to Change Pending. If the exit program completes successfully, the cluster resource group status is reset to its value at the time the command was called. If the exit program fails and the cluster resource group cannot be restored to its original condition, the cluster resource group status is set to Indoubt.

- Change the cluster resource group without calling the exit program if neither node role, site name nor data port IP addresses are changed.
- Change the name to be used for batch jobs submitted by cluster resource group. If the cluster resource group status is Active, batch jobs already submitted will not be changed. Any jobs submitted after the change will use the new name. This is true for other attributes associated with a submitted exit program such as the user profile, the restart count and so on. Changes to the cluster resource group will not affect an exit program that was previously submitted and is either on a job queue or is running.
- For primary-backup model cluster resource groups, if the current node role in the recovery domain is changed and the cluster resource group is active and it has more than one backup node and some backup nodes are not active, the recovery domain may be reordered so that all active backup nodes are ordered before inactive backup nodes.

This command will do the following for application cluster resource groups:

- If the Cluster Resource Services configures the takeover IP address, it will remove the current address and add the new address when the takeover IP address is changed. If either the add or remove address function fails, the command will fail.
- If the cluster resource group is active and the role of a node is being changed from replicate to backup, verify the takeover IP address exists and is not active on the node being changed. If the takeover IP address does not exist or is active on the node being changed, the command will fail.

This command will do the following for device cluster resource groups:

- If the role of the current primary node is being changed, ownership of the devices specified in the cluster resource group is switched from the current primary to the new primary if the current primary has none of the devices varied on. If any devices are varied on, an error message is returned. In addition, the new primary node must be active. All members of an auxiliary storage pool group must be configured in the cluster resource group before ownership can be changed. Devices are not varied on after the ownership is switched.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. Cluster Resource Services must be active on the node processing the request.
4. Primary-backup model cluster resource groups must have a status of Inactive or Indoubt to designate a new primary node.
5. If defined, the exit program must exist on all nodes in the recovery domain when the cluster resource group exit program is changed.
6. There must be at least one active node in the recovery domain.
7. If defined, the failover message queue must exist on all nodes in the recovery domain when the cluster resource group is changed.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
CRG	Cluster resource group	<i>Name</i>	Required, Positional 2

Keyword	Description	Choices	Notes
CRGTYPE	Cluster resource group type	*DATA, *APP, *DEV, *PEER	Required, Positional 3
EXITPGM	CRG exit program	Single values: *SAME, *NONE Other values: <i>Qualified object name</i>	Optional
	Qualifier 1: CRG exit program	<i>Name</i>	
	Qualifier 2: Library	<i>Name</i> , *CURLIB	
EXITPGMFMT	Exit program format name	*SAME, EXTP0100, EXTP0200	Optional
EXITPGMDTA	Exit program data	<i>Character value</i> , *SAME, *NONE	Optional
USRPRF	User profile	<i>Simple name</i> , *SAME, *NONE	Optional
TEXT	Text description	<i>Character value</i> , *SAME	Optional
RCYDMNACN	Recovery domain action	*SAME, *CHGPREFER, *CHGCUR	Optional
RCYDMN	Recovery domain node list	Values (up to 128 repetitions): <i>Element list</i>	Optional
	Element 1: Node identifier	<i>Name</i> , *SAME	
	Element 2: Node role	*SAME, *BACKUP, *PRIMARY, *REPLICATE, *PEER	
	Element 3: Backup sequence number	1-127, *SAME, *LAST	
	Element 4: Site name	<i>Name</i> , *SAME, *NONE	
	Element 5: Data port IP address action	*SAME, *ADD, *REMOVE	
	Element 6: Data port IP address	Single values: *SAME, *NONE Other values (up to 4 repetitions): <i>Character value</i>	
TKVINTNETA	Takeover IP address	<i>Character value</i> , *SAME	Optional
JOB	Job	<i>Name</i> , *JOBID, *SAME	Optional
ALWRESTART	Allow application restarts	*SAME, *NO, *YES	Optional
NBRRESTART	Number of application restarts	0-3, *SAME	Optional
FLVMSGQ	Failover message queue	Single values: *SAME, *NONE Other values: <i>Qualified object name</i>	Optional
	Qualifier 1: Failover message queue	<i>Name</i>	
	Qualifier 2: Library	<i>Name</i>	
FLVWAITTIM	Failover wait time	<i>Integer</i> , *SAME, *NOWAIT, *NOMAX	Optional
FLVDFTACN	Failover default action	*SAME, *PROCEED, *CANCEL	Optional
APPID	Application identifier	<i>Character value</i> , *SAME, *NONE	Optional

Top

Cluster (CLUSTER)

Specifies the cluster containing the cluster resource group which will be changed.

This is a required parameter.

name Specify the name of the cluster.

Top

Cluster resource group (CRG)

Specifies the cluster resource group to be changed.

This is a required parameter.

name Specify the name of the cluster resource group.

Top

Cluster resource group type (CRGTYPE)

Specifies the type of the cluster resource group that is to be changed.

This is a required parameter.

***DATA**

The cluster resource group is a data cluster resource group.

***APP** The cluster resource group is an application cluster resource group

***DEV** The cluster resource group is a device cluster resource group.

***PEER** The cluster resource group is a peer cluster resource group.

Top

CRG exit program (EXITPGM)

Specifies the exit program that is used to handle action codes that are passed to it due to operations on the cluster resource group. The exit program cannot be in an independent auxiliary storage pool. The action codes are described in the Cluster Resource Group Exit Program section of the API reference manual. If the exit program is changed for an active application cluster resource group, the job currently running which was submitted to handle the Start action code continues running the prior exit program.

Single values

***SAME**

The current exit program is not changed.

***NONE**

The cluster resource group does not have an exit program.

Qualifier 1: CRG exit program

name Specify the name of the exit program.

Qualifier 2: Library

***CURLIB**

The exit program exists in the current library for the job. If no library is specified as the current library for the job, the QGPL library is used.

name Specify the name of the library where the exit program exists. QTEMP is not a valid library name.

Top

Exit program format name (EXITPGMFMT)

Specifies the format which should be used for the information passed to the user when a cluster resource group exit program is called.

*SAME

The exit program format name is not changed.

EXTP0100

Exit program information defined in EXTP0100 format will be passed to user.

EXTP0200

Exit program information defined in EXTP0200 format will be passed to user. Additional information such as site name and data port IP address on each node are passed to the exit program. This format is not allowed for a peer cluster resource group.

Top

Exit program data (EXITPGMDTA)

Specifies up to 256 bytes of data that is passed to the cluster resource group exit program when it is called. This parameter may contain any scalar data except pointers. For example, it can be used to provide state information. This data will be stored with the specified cluster resource group and copied to all nodes in the recovery domain. Pointers in this area will not resolve correctly on all nodes and should not be placed in the data. The data specified will replace the existing exit program data stored with the cluster resource group, if the command completes successfully.

*SAME

The exit program data is not changed.

*NONE

There is no exit program data.

character-value

Specify up to 256 bytes of data to be passed to the cluster resource group exit program.

Top

User profile (USRPRF)

Specifies the user profile under which the exit program should be run. The user profile must exist on all nodes in the recovery domain.

The following user profiles are not valid:

1. QDBSHR
2. QDOC
3. QDTFOWN
4. QRJE
5. QLPAUTO
6. QLPOINSTALL
7. QSECOFR
8. QSPL
9. QSYS
10. QTSTRQS

***SAME**

The current user profile is not changed.

***NONE**

There is no exit program so no user profile is needed.

simple-name

Specify the name of the user profile to use for running the exit program.

Top

Text description (TEXT)

Specifies the text used to briefly describe the cluster resource group object.

***SAME**

The current text description is not changed.

character-value

Specify the new text to describe the cluster resource group object.

Top

Recovery domain action (RCYDMNACN)

Specifies the type of action to take for the recovery domain.

***SAME**

The recovery domain is not being changed.

***CHGPREFER**

The preferred roles for nodes in the recovery domain are to be changed. The RCYDMN parameter contains the new node roles.

***CHGCUR**

The current roles for nodes in the recovery domain are to be changed. The RCYDMN parameter contains the new node roles. For a device cluster resource group, the site name and data port IP address also can be changed.

Top

Recovery domain node list (RCYDMN)

Specifies the changes for the recovery domain. For primary-backup model cluster resource groups, this specifies the roles for nodes that compose the recovery domain. The full recovery domain must be specified. For peer model cluster resource groups, this specifies the roles for the nodes being changed. Only those nodes being changed must be specified.

Element 1: Node identifier

Specifies the node whose role is being changed in the recovery domain of the cluster resource group specified. The node specified must currently be defined in the recovery domain of the cluster resource group specified.

***SAME**

The recovery domain will not be changed. This value must be used if RCYDMNACN(*SAME) is specified.

name Specify the name of the node.

Element 2: Node role

Specifies the role of the node in the recovery domain of the cluster resource group. A role must be defined for each node in the recovery domain. For primary-backup model cluster resource groups a node can have one of three roles: primary, backup, or replicate. Only one node can be designated as the primary. For peer model cluster resource groups a node can have one of two roles: peer or replicate. Any number of nodes can be designated as a peer or replicate.

*SAME

The node role is not changed.

*BACKUP

The node role will be set as a backup node. The node can take over as the access point for the cluster resources.

*PRIMARY

The node role will be set as the primary node. This node can become an active access point for the cluster resources. The cluster resource group must have a status of Inactive.

*REPLICATE

The new node role will be set as a replicate. Replicate nodes are not ordered and cannot become an access point unless its role is changed to the proper value for the cluster resource group type.

***PEER** The new node will be set as a peer node. Peer nodes are not ordered. This node can become an active access point for the cluster resources.

Element 3: Backup sequence number

Specifies the backup order for a node with role of *BACKUP. If there is already a node with the same backup order and it is also not changed at the same time, the command will fail. At the completion of the request the nodes with backup roles will be sequentially renumbered from the first backup to the last. The first backup will always be 1.

*SAME

The backup sequence number is not changed.

*LAST

The node will be added as the last backup in the recovery domain.

integer

Specify the backup sequence number.

Element 4: Site name

Specify the site name of the recovery domain node. This is valid only for a device cluster resource group. Can only change from a site name to *NONE or from *NONE to a site name. Cannot change from one site name to another site name. A site name can be changed only if all configuration objects in the cluster resource group are for auxiliary storage pool devices.

*SAME

The site name is not changed.

*NONE

The recovery domain node does not have a site name.

name Specify the site name for a recovery domain node.

Element 5: Data port IP address action

Specifies the type of action to take for the data port IP address.

***SAME**

The data port IP address is not changed.

***ADD** Add one or more data port IP address to the recovery domain node.

***REMOVE**

Remove one or more data port IP address from the recovery domain node.

Element 6: Data port IP address

Specify the data port IP address for the recovery domain node. This is valid only for a device cluster resource group, specifically for geographic mirroring. The data port IP address is used to send updates from a source node that owns the production copy of auxiliary storage pool to a target node that owns the mirror copy of auxiliary storage pool.

Single values

***SAME**

The recovery domain node data port IP address is not changed.

***NONE**

The recovery domain node does not have a data port IP address.

Other values (up to 4 repetitions)

character-value

Specify the data port IP address for the recovery domain node. When adding a data port IP address, it must already exist on the specified node. User is responsible for starting/ending data port IP address. This field must be represented in dotted decimal format.

Top

Takeover IP address (TKVINTNETA)

Specifies the internet interface address that is to be associated with an application. This is the takeover IP address that will be switched between systems. The field must be represented in dotted decimal format. If the value is not *SAME and the Cluster Resource Services configured the takeover IP address, this command will remove the current IP address and add this IP address to the node. If either the add or remove address function fails, the command will fail. The cluster resource group must be Inactive to change this field. This field is only valid for an application cluster resource group.

***SAME**

The takeover IP address is not changed.

character-value

Specify the takeover IP address for the application cluster resource group.

Top

Job (JOB)

Specifies the name given the batch job that is submitted by the cluster resource group. This job will call the cluster resource group exit program with the action code generated by the command being used.

***SAME**

The job name is not changed.

***JOB**

The job name in the job description for the specified user profile will be used.

name Specify the name to be given to the batch job submitted for running the exit program.

Top

Allow application restarts (ALWRESTART)

Specifies whether or not to restart an application if the cluster resource group exit program fails.

*SAME

Allow application restart is not changed.

***NO** Do not attempt to restart the application. The cluster resource group exit program is called with an action code of Failover.

***YES** Attempt to restart the application on the same node. The cluster resource group exit program will be called with an action code of Restart. If the application cannot be restarted in the specified maximum number of attempts, the cluster resource group exit program will be called with an action code of Failover.

Top

Number of application restarts (NBRRESTART)

Specifies the number of times a cluster resource group exit program can be called on a same node before failure occurs. Maximum number of restarts is 3. If the cluster resource group is currently active, any change does not take affect until failover occurs or the cluster resource group exit program job ends.

*SAME

The number of restart attempts is not changed.

0-3 Specify the number of times that restart will be attempted before doing a failover.

Top

Failover message queue (FLVMSGQ)

Specifies the message queue to receive messages (CPABB01) dealing with failover. If this field is set, the specified message queue must exist on all nodes in the recovery domain after the exit program completes. The message queue cannot be in an independent auxiliary storage pool.

Single values

*SAME

The current failover message queue is not changed.

***NONE**

No messages will be sent when a failover occurs for this cluster resource group.

Qualifier 1: Failover message queue

name Specify the name of the failover message queue.

Qualifier 2: Library

name Specify the name of the library that contains the message queue to receive the failover message. The library name cannot be *CURLIB, QTEMP, or *LIBL.

Top

Failover wait time (FLVWAITTIM)

Specifies the number of minutes to wait for a reply to the failover message that was enqueued on the failover message queue. This parameter is ignored when the FLVMSGQ parameter is *NONE.

*SAME

The current failover wait time is not changed.

*NOWAIT

Failover proceeds without user intervention.

*NOMAX

Wait forever until a response is given to the failover inquiry message.

integer

Specify the number of minutes to wait for a response to the failover inquiry message. If no response is received in the specified number of minutes, the failover default action field will be looked at to decide how to proceed.

Top

Failover default action (FLVDFTACN)

Specifies the default action to be taken if a response to the failover message is not received in the failover wait time limit. This parameter is ignored when the FLVMSGQ parameter is *NONE.

*SAME

The current failover default action is not changed.

*PROCEED

Proceed with failover.

*CANCEL

Do not attempt failover.

Top

Application identifier (APPID)

Specifies the application identifier. This defines the purpose of the cluster resource group.

*SAME

The current application identifier is not changed.

*NONE

The application identifier is removed.

name Specify the name of the application that supplied the peer cluster resource group. The name can be up to 20 characters. The recommended format is 'vendor-id.name' where vendor-id is an identifier for the vendor creating the cluster resource group and name is the application name. For example, QIBM.ExamplePeer, indicates it is supplied by IBM for the ExamplePeer application. It is not recommended to use QIBM unless the cluster resource group is supplied by IBM.

Top

Examples

Example 1: Changing the Exit Program Data


```
CHGCRG CLUSTER(MYCLUSTER) CRG(MYCRG) CRGTYPE(*DATA)
        EXITPGMDTA('replace this data')
        TEXT('CRG FOR PAYROLL APPLICATION DATA')
```

This command changes a data cluster resource group called MYCRG in the cluster called MYCLUSTER. The exit program data is replaced with the character string specified. The text description for the cluster resource group object is also changed to the value specified. All other fields are unchanged.

Example 2: Changing the Recovery Domain

```
CHGCRG CLUSTER(MYCLUSTER) CRG(MYCRG) CRGTYPE(*DEV)
        EXITPGMFM(*SAME) TEXT('CRG FOR CROSS SITE MIRRORING')
        RCDYMN(*SAME *SAME *LAST MYSITE *ADD ('1.1.1.1'))
```

This command changes a device cluster resource group called MYCRG in the cluster called MYCLUSTER. The text description for the cluster resource group object is changed to the value specified. The recovery domain is added to the site MYSITE, with 1 data port IP address.

Top

Error messages

***ESCAPE Messages**

HAE001D

Cluster resource group &1 not changed.

Top

Change CRG Device Entry (CHGCRGDEVE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Change Cluster Resource Group Device Entry (CHGCRGDEVE) command changes information about one or more configuration objects in a device cluster resource group. You can change the configuration action to be taken when the cluster resource group is switched over to a backup system. The entry being changed is found by searching the current entries for a matching configuration object name and configuration object type.

If an exit program is specified for the cluster resource group, the cluster resource group exit program is called with an action code of Change Device Entry on all active nodes in the recovery domain. The cluster resource group status is set to Change Device Entry Pending. If the exit program completes successfully, the cluster resource group status is reset to its value at the time the command was called. If the exit program fails and the cluster resource group cannot be restored to its original condition, the cluster resource group status is set to Indoubt.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. Cluster Resource Services must be active on the node processing the request.
4. The number of configuration object entries in the configuration object array cannot exceed 256.
5. At least one node in the recovery domain must be active.
6. If a server takeover IP address is specified, it must exist on all nodes in the recovery domain if the cluster resource group is active. The server takeover IP address must be unique. It can only be associated with a primary auxiliary storage pool.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
CRG	Cluster resource group	<i>Name</i>	Required, Positional 2
CFGOBJ	Configuration object list	Values (up to 256 repetitions): <i>Element list</i>	Required, Positional 3
	Element 1: Configuration object	<i>Name</i>	
	Element 2: Configuration object type	*DEVD, *CTLD, *LIND, *NWSD	
	Element 3: Configuration object online	*SAME, *OFFLINE, *ONLINE, *PRIMARY	
	Element 4: Server takeover IP address	<i>Character value</i> , *SAME, *NONE	

Top

Cluster (CLUSTER)

Specifies the cluster to which the cluster resource group belongs.

This is a required parameter.

name Specify the name of the cluster which contains the cluster resource group.

Top

Cluster resource group (CRG)

Specifies the cluster resource group which is to be changed.

This is a required parameter.

name Specify the name of the device cluster resource group.

Top

Configuration object list (CFGOBJ)

Specifies detailed information about the resilient devices to be changed.

This is a required parameter.

Element 1: Configuration object

Specifies the configuration which is in the cluster resource group.

*SAME

The current configuration object is not changed.

name Specify the name of the configuration object.

Element 2: Configuration object type

This specifies the type of configuration object specified with configuration object name.

*DEV

Configuration object of type device description.

*CTLD

Configuration object of type controller description.

*LIND

Configuration object of type line description.

*NWSD

Configuration object of type network server description.

Element 3: Configuration object online

Specifies what configuration action to take when the cluster resource group is switched over or failed over to a backup node. The configuration object can be varied on and the server takeover IP address will be started or left varied off and the server takeover IP address is left inactive when a device ownership is moved to another node. This attribute does **not** vary the device on or off or start the server takeover IP

address when the cluster resource group is started or ended. Switchover and failover completion may be delayed if the online attribute has a value of *YES for devices that may take a long time to vary on.

***SAME**

The current configuration object online value is not changed.

***OFFLINE**

Do not vary the configuration object on and do not start the server takeover IP address.

***ONLINE**

Vary the configuration object on and start the server takeover IP address.

***PRIMARY**

This is a secondary ASP. Vary on processing and starting of the server takeover IP address is determined by the corresponding primary ASP for this ASP group.

Element 4: Server takeover IP address

Specifies a takeover IP address for servers associated with the relational database name in the device description for an auxiliary storage pool. This element is optional and can only be specified for a primary auxiliary storage pool. If specified, the address must be presented in dotted decimal format. The specified address must exist on all nodes in the recovery domain if the cluster resource group is active. If not specified, or for configuration objects other than a primary auxiliary storage pool, the element must be set to *NONE.

***SAME**

The current server takeover IP address is not changed.

***NONE**

There is no server takeover IP address associated with the relational database name in the device description for an auxiliary storage pool.

character-value

Specify the server takeover IP address for the relational database name.

Top

Examples

```
CHGCRGDEVE CLUSTER(MYCLUSTER) CRG(MYCRG)
            CFGOBJ((IASP01 *DEVD *ONLINE *NONE))
```

This command changes the device list information for the configuration object IASP01 in the resilient device cluster resource group MYCRG in the cluster MYCLUSTER. The configuration action is now set to vary the configuration object online in the event of a failover or switchover.

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Error messages

***ESCAPE Messages**

HAE0020

Request to change device entries in cluster resource group &1 failed.

Top

Change CRG Primary (CHGCRGPRI)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Change Cluster Resource Group Primary (CHGCRGPRI) command performs an administrative switchover of the cluster resource group by changing the current roles of nodes in the recovery domain. The primary point of access for the cluster resource group is changed as follows:

1. The current primary node is assigned the role of last active backup.
2. The current first backup is assigned the role of primary.

This command is not valid for peer model cluster resource groups.

If a backup node does not exist in the recovery domain, the switchover will fail. If the first backup is not the desired primary, first use the Change Cluster Resource Group (CHGCRG) command to arrange the backup nodes in recovery domain to the desired order.

This command will cause the cluster resource group exit program to be called with an action code of Switchover on all active nodes in the recovery domain.

When switching over cluster resource groups of different types, the order of switchover is important. Device cluster resource group objects should be done first followed by data cluster resource group objects and finally application cluster resource group objects. If you are changing the primary point of access for a data or a device cluster resource group, you should also ensure that the applications using this data are quiesced.

This command will do the following for all cluster resource group types:

1. Set the cluster resource group status Switchover Pending.
2. Call the cluster resource group exit program on all active nodes in the recovery domain with an action code of Switchover, if an exit program is specified for the cluster resource group.
3. Set the cluster resource group status to Active if the exit program completes successfully.
4. Set the cluster resource group status to Indoubt if the exit program is unsuccessful and the original state of the cluster resource group cannot be recovered.

This command will do the following for resilient application cluster resource groups:

1. Cancel the cluster resource group exit program job with a Cancel Job Immediate on the current primary. (**Note:** The application and exit program code should provide cancel handlers to clean up resources the job uses if it is cancelled).
2. End the takeover IP interface on the current primary.
3. Start the takeover IP interface on the new primary.
4. Start the cluster resource group exit program on the new primary.
5. Set the cluster resource group status to Active if the TCP/IP address and the cluster resource group exit program job are started.
6. Set the cluster resource group status to Indoubt if either the TCP/IP address or the cluster resource group exit program job are not started.

This command will do the following for resilient device cluster resource groups:

1. The configuration objects must exist on all active nodes in the recovery domain and the resource names in the configuration objects must be the same on all active nodes.

2. The current primary node must own the IOPs or high-speed link I/O bridges for the devices configured in the cluster resource group.
3. The new primary node must be able to access the IOPs or high-speed link I/O bridges for the devices configured in the cluster resource group.
4. For the configuration objects specified in the cluster resource group, vary the configuration objects off if they are varied on and end the server takeover IP addresses if they are active on the current primary node. The devices are varied off and moved to the new primary before the exit program is called on the current primary. If any of the devices in the cluster resource group are a primary auxiliary storage pool, all members of the auxiliary storage pool group will be varied off. Before varying the devices off, cluster resource services will attempt to end all jobs which are using auxiliary storage pools configured in the cluster resource group. There are some system server jobs which will not be cancelled. If those server jobs are performing long running operations against data on an auxiliary storage pool, the devices may not vary off and the switchover will fail.
5. For the configuration objects specified in the cluster resource group, vary the configuration objects on and start the server takeover IP address on the new primary node if the entry in the cluster resource group indicates the configuration objects is to be varied on. If any of the devices in the cluster resource group are a primary auxiliary storage pool, all members of the auxiliary storage pool group will be varied on if the primary specifies the vary on value. The exit program is called on the new primary after the devices are moved to the new primary and varied on.
6. A separate batch job is submitted to vary each configuration object on or off. The job is submitted to the job queue defined in the job description associated with the command's requesting user profile. The batch subsystem should be defined to allow these batch jobs to run concurrently in order to make switchover as fast as possible.
7. Cluster Resource Services varies the configuration objects in parallel based on the object type. All configuration objects of the type must either complete the vary (successfully or not) or be in vary pending before configuration objects of the next type are varied. The vary off sequence is *NWS configuration objects first, followed by *DEVD, *CTLD, *LIND. The vary on sequence is the reverse order, *LIND, *CTLD, *DEVD, and lastly *NWS configuration objects.
8. Set the cluster resource group status to Active if the devices can be successfully switched to the new primary.
9. If the device entry in the cluster resource group indicates the device should be varied on and the vary on or the start of the server takeover IP address fails for some reason, the switchover will not complete successfully. The exit program will be called with an action code of Undo and the devices will be moved back to the original primary node.
10. If the devices can not be switched to the new primary, then the switchover fails. The exit program will be called with an action code of Undo (15) and the devices will be moved back to the original primary node and/or the role of auxiliary storage pool will be swapped back as before (for cross site mirroring where the new primary node is at a different site than the current primary node).
11. If the device entry in the cluster resource group indicates the device should be varied on and the vary on or the start of the server takeover IP address fails for some reason, the switchover will not complete successfully. The devices remain on the new primary, and the exit program will be called with an action code dependent data of Configuration Object Online Failure (16). Configuration objects that had successfully varied on will remain varied on.
12. Set the cluster resource group status to Indoubt if the devices cannot be successfully switched to the new primary node and cannot be returned to the same state on the old primary node.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. Cluster Resource Services must be started on the node processing the request.
4. The status of the cluster resource group being switched must be Active.

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
CRG	Cluster resource group	<i>Name</i>	Required, Positional 2
EXITPGMDTA	Exit program data	<i>Character value, *SAME</i>	Optional

Top

Cluster (CLUSTER)

Specifies the cluster containing the cluster resource group.

This is a required parameter.

name Specify the name of the cluster.

Top

Cluster resource group (CRG)

Specifies the cluster resource group.

This is a required parameter.

name Specify the name of the cluster resource group that is to be switched over.

Top

Exit program data (EXITPGMDTA)

Specifies up to 256 bytes of data that is passed to the cluster resource group exit program when it is called. This parameter may contain any scalar data except pointers. For example, it can be used to provide state information. This data will be stored with the specified cluster resource group and copied to all nodes in the recovery domain. Pointers in this area will not resolve correctly on all nodes and should not be placed in the data. The data specified will replace the existing exit program data stored with the cluster resource group. If blanks are specified, then the exit program data stored with the cluster resource group will be cleared. This parameter must be set to *SAME if no exit program is specified for the cluster resource group.

*SAME

The exit program data stored with the cluster resource group specified will be passed to the exit program.

character-value

Specify the exit program data that will be passed to the cluster resource group exit program.

Top

Examples

```
CHGCRGPRI CLUSTER(MYCLUSTER) CRG(MYCRG)
          EXITPGMDTA('important information')
```

This command changes the primary point of access for the cluster resource group MYCRG in cluster MYCLUSTER. The role of the current primary node is changed to become the last backup and the role of the current first backup node is changed to become the primary. The resilient resources associated with the cluster resource group are now accessed through the new primary node.

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Error messages

*ESCAPE Messages

HAE001E

Primary node of cluster resource group &1 not changed.

[Top](#)

Create Cluster Admin Domain (CRTCAD)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Create Cluster Administrative Domain (CRTCAD) command creates a peer cluster resource group object which represents the cluster administrative domain. The cluster administrative domain provides synchronization of monitored resources across the active nodes in the domain. The cluster nodes which are defined within the cluster administrative domain will participate in the synchronization process. The cluster administrative domain name is the name of the cluster resource group which is being created. The nodes defined in the domain node list are the nodes in the recovery domain of the cluster resource group. Successful completion of this command results in a new job started as a system job. This job has the same name as the name of the cluster administrative domain being created.

To add nodes to the cluster administrative domain, use the Add Cluster Admin Domain Node Entry (ADDCADNODE) command. To remove nodes from the cluster administrative domain, use the Remove Cluster Admin Domain Node Entry (RMVCADNODE) command. To start the cluster administrative domain, use the Start Cluster Admin Domain (STRCAD) command. To end the cluster administrative domain use the End Cluster Admin Domain (ENDCAD) command.

This command will do the following:

- Create the cluster administrative domain on all nodes in the defined administrative domain. The cluster administrative domain may be accessed by a cluster resource group command running on any node in the cluster.
- Provide users a single system image of the cluster administrative domain. That is, any changes made to any monitored resources defined in the cluster administrative domain will be made on all nodes in the administrative domain.
- The cluster resource group (CRG) is owned by the QCLUSTER user profile. The user who is running the command is granted *all authority to the cluster resource group object. To use the cluster resource group commands with the cluster administrative domain you will need to be authorized to the cluster resource group and to the QCLUSTER user profile.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. The cluster administrative domain name cannot begin with QCST.
3. Cluster Resource Services must be active on the node processing the request.
4. All nodes in the administrative domain must be in the cluster with a status of Active.
5. Each node can be specified only once in the administrative domain.
6. A node can only be specified in one cluster administrative domain within a cluster.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1

Keyword	Description	Choices	Notes
ADMDMN	Cluster administrative domain	<i>Name</i>	Required, Positional 2
DMNNODL	Admin domain node list	Values (up to 128 repetitions): <i>Name</i>	Required, Positional 3
SYNCOPT	Synchronization option	* <u>LASTCHG</u> , *ACTDMN	Optional

Top

Cluster (CLUSTER)

Specifies the cluster containing the cluster administrative domain to be created.

This is a required parameter.

name Specify the name of the cluster.

Top

Cluster administrative domain (ADMDMN)

Specifies the cluster administrative domain to be created.

This is a required parameter.

name Specify the name of the cluster administrative domain.

Top

Admin domain node list (DMNNODL)

Specifies the list of nodes that compose the administrative domain. Nodes in the administrative domain must be unique cluster nodes. Each node must be active in the cluster.

You can specify up to 128 nodes for the administrative domain.

This is a required parameter.

name Specify the name of an active cluster node.

Top

Synchronization option (SYNCOPT)

Specifies the synchronization behavior when a node joins a cluster administrative domain.

- If all changes to monitored resources should be applied to the cluster administrative domain, *LASTCHG should be specified. When a node joins the cluster, the most recent change made to each monitored resource will be applied to all active nodes in the domain. If the most recent change was made on the node that is joining, it will be propagated to the active domain.
- If only changes to monitored resources are allowed from active nodes, the *ACTDMN option should be specified. Changes made to monitored resources on inactive nodes will be discarded when the node joins the domain.

- The *ACTDMN option does not apply to network server storage spaces (*NWSSTG). Synchronization of *NWSSTG resources is always based on the last change made.

***LASTCHG**

The last change that was made before the node joined the cluster administrative domain is processed by all nodes in the active domain. The last change could have been made in the active domain or on the joining node while it was inactive.

***ACTDMN**

Only changes made on active nodes in an active cluster administrative domain are processed. Changes made on a node while it was inactive are not passed to the active domain. When a node joins the cluster administrative domain, it will be synchronized with the values from the active domain.

Top

Examples

Creating a Cluster Administrative Domain With a Three-Node Administrative Domain

```
CRTCAD CLUSTER(MYCLUSTER) ADMDMN(MYDOMAIN)
        DMNNODL(NODE01 NODE02 NODE03)
        SYNCOPT(*LASTCHG)
```

This command creates a cluster administrative domain called MYDOMAIN in the cluster called MYCLUSTER. The administrative domain consists of three nodes, NODE01, NODE02 and NODE03. The last change to monitored resources will be applied when a node joins the cluster administrative domain.

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Error messages

***ESCAPE Messages**

HAE0024

Cluster administrative domain &1 not created.

Top

Create Cluster (CRTCLU)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Create Cluster (CRTCLU) command is used to create a new cluster of one or more nodes. Each node specified on the Node parameter will be placed in the cluster membership list.

If the Start indicator (START) parameter value is *NO, each node that is being added will have a status of New and Cluster Resource Services will not be started on any node. In order to start Cluster Resource Services, the Start Cluster Node (STRCLUNOD) command must be invoked on a node that ran the CRTCLU command. The STRCLUNOD command may be used to start nodes in the cluster membership list.

If the START parameter value is *YES, the cluster can contain only one node. Cluster Resource Services will be started on the node being defined. If the START parameter value is *YES and more than one cluster node is specified, the START parameter will be ignored. Cluster Resource Services will not be started on any node being defined. If Cluster Resource Services is not successfully started, the status of the node remains New.

After Cluster Resource Services has been started on the original node, additional nodes can only be started by calling the Start Cluster Node (STRCLUNOD) command on the original node. If Cluster Resource Services is active on more than one node, additional nodes may be started by invoking the Start Cluster Node (STRCLUNOD) command on any node that has a status of Active.

Once the cluster has been created, the Add Cluster Node Entry (ADDCLUNODE) command can be used to add additional nodes to the cluster membership list. The ADDCLUNODE command can be invoked on any node in the cluster that has a status of Active or from the node on which the cluster was originally created.

Prior to cluster version 6, a failover message queue could be defined for a cluster resource group. If the failover message queue was defined, a message was enqueued during the failover of the cluster resource group, allowing the user to cancel or continue the failover. If a cluster node ended or failed and there were multiple cluster resource groups with that node as a primary recovery domain node, the user would have needed to respond to a message for each cluster resource group.

In cluster version 6 and above, the user has the option of receiving and responding to one message for all cluster resource groups which are failing over to the same node when the primary node for the cluster resource groups ends or fails. A cluster message queue, failover wait time, and failover default action may be specified on this command or it can also be specified on the CHGCLU (Change Cluster) command. If a failure occurs on a node, that node is the primary recovery domain node for any active cluster resource groups, and the cluster message queue is defined, then one message will be enqueued on the cluster message queue. This gives the user the option of continuing all cluster resource group failovers to the new primary, or cancelling all cluster resource group failovers. No message will be enqueued if the primary node is removed from the cluster because that node can not remain the primary node of the cluster resource group. If a cluster resource group is failing over individually, one message will be sent which will control the failover of that cluster resource group. The message will be placed on the message queue on the new primary node before the cluster resource groups call their exit programs. If the failovers are cancelled, the primary node of the cluster resource groups will not be changed, and the cluster resource groups will become Inactive. The exit programs will be called with an action code of Failover Cancelled.

If the user wants to specify failover actions for a specific cluster resource group, the failover message queue fields on the CRTCRG (Create CRG) or CHGCRG (Change CRG) commands should be used instead of the cluster message queue fields. If the failover fields are set at a cluster level, they will override any cluster resource group failover parameters. If the cluster message queue is set to *NONE, then the failover of each individual cluster resource group will be controlled via the cluster resource group failover parameters.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. A node can be a member of only one cluster.
4. You must include the system on which the command is issued in the cluster membership list.
5. If a cluster message queue is specified, it must exist on each node in the cluster. This will be verified on the requesting node as part of the CRTCLU (Create Cluster) command, and will be verified on each additional cluster node when that node is started.

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Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
NODE	Node list	Values (up to 128 repetitions): <i>Element list</i>	Required, Positional 2
	Element 1: Node identifier	<i>Name</i>	
	Element 2: IP address	Values (up to 2 repetitions): <i>Character value</i>	
START	Start indicator	*YES , *NO	Optional
VERSION	Target cluster version	*CUR , *PRV	Optional
CLUMSGQ	Cluster message queue	Single values: *NONE Other values: <i>Qualified object name</i>	Optional
	Qualifier 1: Cluster message queue	<i>Name</i>	
	Qualifier 2: Library	<i>Name</i>	
FLVWAITTIM	Failover wait time	<i>Integer</i> , *NOWAIT , *NOMAX	Optional
FLVDFTACN	Failover default action	*PROCEED , *CANCEL	Optional

Top

Cluster (CLUSTER)

Specifies the cluster which will be created.

This is a required parameter.

name Specify the name of the cluster to be created.

Top

Node identifier (NODE)

Specifies information about the cluster and the list of nodes which will be placed in the cluster membership list. A maximum of 128 nodes can be in a cluster.

This is a required parameter.

Element 1: Node identifier

name Specify the name for the system that uniquely identifies a node.

Element 2: IP address

The cluster interface address is an IP address that is used by Cluster Resource Services to communicate with other nodes in the cluster. A maximum of 2 interface addresses per node can be specified.

character-value

Specify the IP address to be used to communicate with other nodes in the cluster. The address is in dotted decimal format.

Top

Start indicator (START)

Specifies whether or not Cluster Resource Services is to be started on the node being defined. If more than one cluster node is specified, the START parameter will be ignored. Cluster Resource Services will not be started on any node being defined.

***YES** Cluster Resource Services will be started on the node.

***NO** Cluster Resource Services will not be started on any node.

Top

Target cluster version (VERSION)

Specifies the version the cluster will use in conversation with other nodes in the cluster. This also determines the potential node version of the nodes allowed to join the cluster. The following possible values are based on the node originating the request.

***CUR** The cluster will communicate at the requesting node's potential node version. In addition, nodes with a potential node version less than the requesting node will not be allowed to join the cluster.

***PRV** The cluster will communicate at the requesting node's potential node version minus 1. This allows nodes at a previous potential node version to join the cluster. However, no new cluster function can be used until all nodes have the latest cluster version.

Top

Cluster message queue (CLUMSGQ)

Specifies the message queue to receive messages relating to cluster or node level events. For cluster version 6, messages relating to failover will be sent to this queue. For node level failovers, one message will be sent which will control the failover of all cluster resource groups with the same new primary node. If a cluster resource group is failing over individually, one message will be sent which will control the failover of that cluster resource group. The message will be sent on the new primary node. If this field is set, the individual cluster resource group failover message queue fields will not be used. If this

field is set, the specified message queue must exist on all nodes in the cluster. This will be verified on the requesting node as part of the CRTCLU command and will be verified on each additional cluster node when that node is started. The message queue cannot be in an independent auxiliary storage pool.

Single values

*NONE

No cluster message queue has been defined.

Qualifier 1: Cluster message queue

name Specify the name of the cluster message queue.

Qualifier 2: Library

name Specify the name of the library that contains the message queue to receive cluster messages. The library name cannot be *CURLIB, QTEMP, *LIBL, *USRLIBL, *ALL, or *ALLUSR.

Top

Failover wait time (FLVWAITTIM)

Specifies the number of minutes to wait for a reply to the failover message that was enqueued on the cluster message queue.

*NOWAIT

Failover proceeds without user intervention. Acts the same as V5R4M0 and prior.

*NOMAX

Wait forever until a response is given to the failover inquiry message.

integer

Specify the number of minutes to wait for a response to the failover inquiry message. If no response is received in the specified number of minutes, the failover default action field will be looked at to decide how to proceed.

Top

Failover default action (FLVDFTACN)

Specifies the default action to be taken if a response to the failover message on the cluster message queue is not received in the failover wait time limit.

*PROCEED

Proceed with failover.

*CANCEL

Do not attempt failover.

Top

Examples

```
CRTCLU CLUSTER(MYCLUSTER)
      NODE((NODE01 ('9.5.13.187')) (NODE02 ('9.5.13.193')))
      START(*NO) VERSION(*CUR) CLUMSGQ(MYLIB/MYQUEUE)
      FLVWAITTIM(5) FLVDFTACN(*PROCEED)
```

This command creates cluster MYCLUSTER. The cluster membership list is NODE01 and NODE02. Interface address 9.5.13.187 will be used to communicate with node NODE01. Interface address 9.5.13.193 will be used to communicate with node NODE02. Cluster communications will use the cluster version equal to the requesting nodes potential version level. Cluster Resource Services is not started on the nodes. A cluster message queue called MYQUEUE in library MYLIB is defined. If a failover message is enqueued on the cluster message queue, the failover will proceed after waiting 5 minutes for a message reply.

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Error messages

*ESCAPE Messages

HAE0005

Cluster &1 not created.

[Top](#)

Create Cluster Resource Group (CRTCRG)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Create Cluster Resource Group (CRTCRG) command creates a cluster resource group object. The cluster resource group serves as the control object for a collection of resilient resources. It identifies a recovery domain, which is a set of nodes in the cluster that will play a role in the recovery. Additional characteristics for the cluster resource group, such as the exit program that will be called to perform resource specific processing. The cluster resource group exit program will be called with an action code of Initialize after each group has been created on each node in the recovery domain, if an exit program is specified for the cluster resource group. Successful completion of this command results in a new job started as a system job. This job has the same name as the name of the cluster resource group being created.

To change attributes of the cluster resource group use the Change Cluster Resource Group (CHGCRG) command.

This command will do the following:

- Create the cluster resource group object on all nodes in the recovery domain. The cluster resource group may be accessed by a cluster resource group command running on any node in the cluster.
- Provide users a single system image of the cluster resource group object. That is, any changes made to the cluster resource group will be made on all nodes in the recovery domain.
- Call the cluster resource group exit program with an action code of Initialize after the cluster resource group has been created on each node in the recovery domain, if an exit program is specified for the cluster resource group. The cluster resource group status will be set to Initialize Pending. If the exit program fails, the cluster resource group object is deleted from all nodes in the recovery domain.
- If the exit program is successful, the cluster resource group status is set to Inactive. To change the cluster resource group status to Active, use the Start Cluster Resource Group (STRCRG) command.
- After the exit program is called, this command verifies the queue (CRGMSGUSRQ parameter), used by the Distribute Information (QcstDistributeInformation) API, exists if one was specified. The distributed information user queue must be created with pointer capable messages disabled. This means that pointers are not allowed within the message content.
- After the exit program is called, this command verifies the failover message queue and library on all recovery domain nodes if one was specified.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. The cluster resource group name cannot begin with QCST.
4. Cluster Resource Services must be active on the node processing the request.
5. All nodes in the recovery domain must be in the cluster with a status of Active.
6. The cluster resource group exit program must exist on all nodes in the recovery domain if an exit program is specified. It must have the same name and be in the same library on each node.
7. Each node can be specified only once in the recovery domain.
8. The cluster resource group name cannot be used by an existing cluster resource group on any node in the cluster.

9. For application cluster resource groups, the following restrictions apply to the specified takeover IP address:
 - a. If Cluster Resource Services configures the takeover IP address, all nodes in the recovery domain must be in the same subnet (network address) and the subnet defined on all nodes in the recovery domain.
 - b. The takeover IP address must be unique. If Cluster Resource Services is responsible for configuring the takeover IP address, it will be added to each node in the recovery domain.
 - c. The takeover IP address must not be active on any node in the recovery domain.
10. For device cluster resource groups:
 - a. Only these configuration object types are supported. The cluster version must be 6 or greater for devices other than auxiliary storage pool devices. A cluster resource group with sites defined can only have auxiliary storage pool devices.
 - 1) An auxiliary storage pool device.
 - 2) An asynchronous communications device.
 - 3) A binary synchronous communications device.
 - 4) A cryptographic device.
 - 5) A distributed data interface communication line.
 - 6) An Ethernet communication line.
 - 7) A facsimile communication line.
 - 8) A network server device for a guest operating system (Linux) running in a logical partition.
 - 9) A network server device that uses an iSCSI connection.
 - 10) An integrated network server device.
 - 11) A local workstation controller.
 - 12) A network server host adapter device.
 - 13) An optical device.
 - 14) A point-to-point protocol communication line.
 - 15) A synchronous data link control communication line.
 - 16) A tape device.
 - 17) A token-ring line.
 - 18) A wireless local area network communication line.
 - 19) An X.25 communication line.
 - b. All nodes in the recovery domain must belong to the same device domain.
 - c. The configuration objects, such as device descriptions, for the devices specified for the cluster resource group must exist on all nodes in the recovery domain and the resource name specified in a configuration object must be the same on all nodes in the recovery domain.
 - d. If a site name is specified, then for geographic mirroring a data port IP address must be specified. All other types of cross site mirroring do not use data port addresses. If a data port IP address is specified, then a site name must be specified.
 - e. If a data base is specified in a configuration object, it must be the same on all nodes in the recovery domain.
 - f. The server takeover IP address must be unique. It can only be associated with a primary auxiliary storage pool.
 - g. The same configuration object cannot be specified for more than one cluster resource group.
 - h. Devices attached to the same input/output processor (IOP) or high-speed link input/output (I/O) bridge can be specified for only one cluster resource group.
 - i. If devices attached to different IOPs or high-speed link I/O bridges are grouped such as for an auxiliary storage pool, all devices for the affected IOPs or high-speed link I/O bridges must be specified in the same cluster resource group.

- j. The IOP or high-speed link I/O bridge controlling the devices specified in a cluster resource group must be accessible by all nodes in the cluster resource group's recovery domain. This is verified if sufficient hardware configuration has been performed so that all nodes are aware of the new hardware. If hardware configuration is incomplete, this is verified when the Start Cluster Resource Group (STRCRG) command is called.
- k. If configuration objects are specified and the primary node does not currently own the devices, this command fails with an error message.
- l. A cluster resource group may be created with no device entries. Device entries must be added using the Add Cluster Resource Group Device Entry (ADDCRGDEVE) command before the cluster resource group can be started.
- m. If the cluster resource group contains any members of an auxiliary storage pool group, it must contain **all** members before the cluster resource group can be started. All members do not have to be specified when the cluster resource group is created. Additional members can be added with the Add Cluster Resource Group Device Entry (ADDCRGDEVE) Command. If the auxiliary storage pool group exists and clustering can determine the members of the group, a warning message is sent if any members were not specified.
- n. If the configuration objects specified are for remote independent auxiliary storage pool mirroring, each node in the recovery domain may have a site name and, for geographic mirroring only, up to 4 data port IP addresses. There can be at most 2 different site names amongst the nodes. If one or more data port IP address is specified, a site name must be specified.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
CRG	Cluster resource group	<i>Name</i>	Required, Positional 2
CRGTYPE	Cluster resource group type	*DATA, *APP, *DEV, *PEER	Required, Positional 3
EXITPGM	CRG exit program	Single values: *NONE Other values: <i>Qualified object name</i>	Required, Positional 4
	Qualifier 1: CRG exit program	<i>Name</i>	
	Qualifier 2: Library	<i>Name</i>	
USRPRF	User profile	<i>Simple name</i> , *NONE	Required, Positional 5
RCYDMN	Recovery domain node list	Values (up to 128 repetitions): <i>Element list</i>	Required, Positional 6
	Element 1: Node identifier	<i>Name</i>	
	Element 2: Node role	* CRGTYPE , *PRIMARY, *BACKUP, *REPLICATE, *PEER	
	Element 3: Backup sequence number	1-127, * LAST	
	Element 4: Site name	<i>Name</i> , * NONE	
	Element 5: Data port IP address	Single values: * NONE Other values (up to 4 repetitions): <i>Character value</i>	
TKVINTNETA	Takeover IP address	<i>Character value</i>	Optional, Positional 7
EXITPGMFMT	Exit program format name	EXTP0100 , EXTP0200	Optional
EXITPGMDTA	Exit program data	<i>Character value</i> , * NONE	Optional

Keyword	Description	Choices	Notes
CRGMSGUSRQ	Distribute info user queue	Single values: *NONE Other values: <i>Qualified object name</i>	Optional
	Qualifier 1: Distribute info user queue	<i>Name</i>	
	Qualifier 2: Library	<i>Name</i>	
CFGINTNETA	Configure takeover IP address	Single values: *CRS Other values: <i>Element list</i>	Optional
	Element 1: Responsibilities	*USR	
	Element 2: Allow active IP address	*NO , *YES	
JOB	Job	<i>Name</i> , *JOB	Optional
ALWRESTART	Allow application restarts	*NO , *YES	Optional
NBRRESTART	Number of application restarts	0-3, *NONE	Optional
CFGOBJ	Configuration object list	Values (up to 256 repetitions): <i>Element list</i>	Optional
	Element 1: Configuration object	<i>Name</i> , *NONE	
	Element 2: Configuration object type	*DEVD , *CTLD , *LIND , *NWS	
	Element 3: Configuration object online	*OFFLINE , *ONLINE , *PRIMARY	
	Element 4: Server takeover IP address	<i>Character value</i> , *NONE	
TEXT	Text description	<i>Character value</i> , *BLANK	Optional
FLVMSGQ	Failover message queue	Single values: *NONE Other values: <i>Qualified object name</i>	Optional
	Qualifier 1: Failover message queue	<i>Name</i>	
	Qualifier 2: Library	<i>Name</i>	
FLVWAITTIM	Failover wait time	<i>Integer</i> , *NOWAIT , *NOMAX	Optional
FLVDFTACN	Failover default action	*PROCEED , *CANCEL	Optional
APPID	Application identifier	<i>Character value</i> , *NONE	Optional

Top

Cluster (CLUSTER)

Specifies the cluster containing the cluster resource group which will be created.

This is a required parameter.

name Specify the name of the cluster.

Top

Cluster resource group (CRG)

Specifies the cluster resource group to be created.

This is a required parameter.

name Specify the name of the cluster resource group.

Cluster resource group type (CRGTYPE)

Specifies the type of the cluster resource group to be created.

This is a required parameter.

*DATA

The cluster resource group is a data cluster resource group.

*APP The cluster resource group is an application cluster resource group.

*DEV The cluster resource group is a device cluster resource group.

*PEER The cluster resource group is a peer cluster resource group.

Top

CRG exit program (EXITPGM)

Specifies the exit program that is used to handle action codes that are passed to it due to operations on the cluster resource group. The exit program cannot be in an independent auxiliary storage pool. The action codes are described in the Cluster Resource Group Exit Program section in the API manual.

This is a required parameter.

Single values

*NONE

The cluster resource group does not have an exit program. This is valid only for a device cluster resource group.

Qualifier 1: CRG exit program

name Specify the name of the exit program.

Qualifier 2: Library

name Specify the name of the library where the exit program exists. QTEMP is not a valid library name.

Top

User profile (USRPRF)

Specifies the user profile under which the exit program should be run. The user profile must exist on all nodes in the recovery domain.

The value for this parameter must be *NONE if no exit program is specified.

The following user profiles are not valid:

- QDBSHR
- QDOC
- QDTFOWN
- QRJE

- QLPAUTO
- QLPINSTALL
- QSECOFR
- QSPL
- QSYS
- QTSTRQS

This is a required parameter.

***NONE**

There is no exit program so no user profile is needed.

simple-name

Specify the name of the user profile to use for running the exit program.

Top

Recovery domain node list (RCYDMN)

Specifies the list of nodes that compose the recovery domain. A role must be defined for each node in the recovery domain. Nodes in the recovery domain must be unique.

You can specify up to 128 nodes for the recovery domain.

This is a required parameter.

Element 1: Node identifier

Specify an active cluster node that will participate in the recovery of resilient resources represented by this cluster resource group.

name Specify the name for the system that uniquely identifies a node.

Element 2: Node role

Specify the role of the node in the recovery domain of the cluster resource group. For primary-backup model cluster resource groups a node can have one of three roles: primary, backup, or replicate. Only one node can be designated as the primary. For peer model cluster resource groups a node can have one of two roles: peer or replicate. Any number of nodes can be designated as a peer or replicate.

***CRGTYPE**

The node role will be set based on the type of the cluster resource group. If the type of cluster resource group is *PEER the default for the node role will be *PEER. For any other type of cluster resource group the default will be *BACKUP.

***PRIMARY**

The node will be set as the primary node. One node in the recovery domain must have the role of *PRIMARY. This node can become an active access point for the cluster resources.

***BACKUP**

The node will be set as a backup node. The node can take over as the access point for the cluster resources.

***REPLICATE**

The new node will be added as a replicate. Replicate nodes are not ordered and cannot become an access point unless its role is changed to the proper value for the cluster resource group type.

***PEER** The new node will be added as a peer. Peer nodes are not ordered. This node can become an active access point for the cluster resources.

Element 3: Backup sequence number

Specifies the backup order for a node with a role of ***BACKUP**. At the completion of the request the nodes with backup roles will be sequentially renumbered from the first backup to the last. The first backup will always be 1.

***LAST**

The node will be added as the last backup in the recovery domain. If ***LAST** is specified for more than one node, then the first node specified with ***LAST** will be the last backup node, second node specified will be the second to the last backup node, etc..

integer

Specify the backup sequence number.

Element 4: Site name

Specifies the site name of the recovery domain node. This is valid in a version 4 cluster and only in a device cluster resource group for cross site mirroring. A site contains a subset of recovery domain nodes in the same physical location. All nodes at a site have access to the same copy of the auxiliary storage pool. Only nodes with a site name need to have access to the devices.

***NONE**

The recovery domain node does not have a site name.

name Specify the site name for a recovery domain node.

Element 5: Data port IP address

Specify the data port IP address for the recovery domain node. This is valid only in a cluster of version 4 or higher, for a device cluster resource group, specifically for geographic mirroring. The data port IP address is used to send updates from a source node that owns the production copy of auxiliary storage pool to a target node that owns the mirror copy of the auxiliary storage pool. The user is responsible for configuring and starting/ending the data port IP address. The data port IP address must already exist on the specified node. This must be represented in dotted decimal format.

Single values

***NONE**

The recovery domain node does not have a data port IP address.

Other values (up to 4 repetitions)

character-value

Specify the data port IP address for the recovery domain node.

Top

Takeover IP address (TKVINTNETA)

Specifies the internet interface address that is to be associated with an application. This is the takeover IP address that will be switched between systems. The field must be represented in dotted decimal format.

Note: This parameter must be specified if ***APP** is specified for the **Cluster resource group type (CRGTYPE)** parameter.

character-value

Specify the takeover IP address for the application cluster resource group.

Top

Exit program format name (EXITPGMFMT)

Specifies the format which should be used for the information passed to the user when a CRG exit program is called.

EXTP0100

Exit program information defined in EXTP0100 format will be passed to user.

EXTP0200

Exit program information defined in EXTP0200 format will be passed to user. Additional information such as site name and data port IP address on each node are passed to the exit program. This format is not allowed for a peer cluster resource group.

Top

Exit program data (EXITPGMDTA)

Specifies up to 256 bytes of data that is passed to the cluster resource group exit program when it is called. This parameter may contain any scalar data except pointers. For example, it can be used to provide state information. This data will be stored with the specified cluster resource group and copied to all nodes in the recovery domain. Pointers in this area will not resolve correctly on all nodes and should not be placed in the data.

*NONE

There is no exit program data.

character

Specify up to 256 bytes of data to be passed to the cluster resource group exit program.

Top

Distribute info user queue (CRGMSGUSRQ)

Specifies the user queue to receive distributed information from the Distribute Information (QcstDistributeInformation) API. If the user would like to distribute cluster-wide information through this cluster resource group using the Distribute Information (QcstDistributeInformation) API, then this parameter must be set to a value other than *NONE. If this field is set, the specified user queue must exist on all nodes in the recovery domain after the exit program completes. The only way to change the value of this field once the cluster resource group has been created is to delete and recreate the cluster resource group.

Single values

*NONE

The QcstDistributeInformation (QcstDistributeInformation) API will not be used to distribute information through this cluster resource group.

Qualifier 1: Distribute info user queue

name Specify the name of the user queue to receive the distributed information.

Qualifier 2: Library

name Specify the name of the library that contains the user queue to receive the distributed information. The library name cannot be QTEMP.

Top

Configure takeover IP address (CFGINTNETA)

Specifies who is responsible for configuring (adding and removing) the takeover IP address. This does not affect the starting and ending of the takeover IP address, Cluster Resource Services will perform this function.

Single values

***CRS** Cluster Resource Services is responsible for configuring the takeover IP address. The takeover IP address must not exist on any of the nodes in the recovery domain prior to creating cluster resource group. The takeover IP address will be removed when the cluster resource group is deleted.

Element 1: Responsibilities

***USR** User is responsible for configuring the takeover IP address. The takeover IP address must be added on all nodes in the recovery domain except replicates prior to starting the cluster resource group. For details on configuring a takeover IP address for an application cluster resource group that has recovery domain nodes in different subnets, go to Configuring under the Clustering topic in the i5/OS Information Center. You can access the Information Center from the i5/OS Information Center CD-ROM or see the i5/OS Information Center at <http://www.ibm.com/systems/i/infocenter/>.

Element 2: Allow active IP address

Specifies whether or not a takeover IP address can be active when starting an application cluster resource group.

***NO** Do not allow the takeover IP address to already be active when starting the cluster resource group.

***YES** Allow the takeover IP address to already be active when starting the cluster resource group.

Top

Job (JOB)

Specifies the name given the batch job that is submitted by the cluster resource group. This job will call the cluster resource group exit program with the action code generated by the command being used. If this field is blank, the job name will be the value in the job description found in the specified user profile to run the exit program.

***JOB**

The job name in the job description for the specified user profile will be used.

name Specify the name to be given to the batch job submitted for running the exit program.

Top

Allow application restarts (ALWRESTART)

Specifies whether or not to restart an application if the cluster resource group exit program fails.

- *NO** Do not attempt to restart the application. The cluster resource group exit program is called with an action code of Failover.
- *YES** Attempt to restart the application on the same node. The cluster resource group exit program will be called with an action code of Restart. If the application cannot be restarted in the specified maximum number of attempts, the cluster resource group exit program will be called with an action code of Failover.

Top

Number of application restarts (NBRRESTART)

Specifies the number of times a cluster resource group exit program can be called on a same node before failure occurs. Maximum number of restarts is 3. If the cluster resource group is currently active, any change does not take affect until failover occurs or the cluster resource group exit program job ends.

***NONE**

There should be no restart attempts before a failover is started.

- 0-3** Specify the number of times that restart will be attempted before doing a failover.

Top

Configuration object list (CFGOBJ)

Specifies detailed information about the resilient devices to be added to the cluster resource group.

You can specify up to 256 devices for this parameter.

Element 1: Configuration object

The name of the configuration object which can be switched between the nodes in the recovery domain. A configuration object can be specified in only one cluster resource group.

***NONE**

There are no configuration objects defined for this cluster resource group.

name Specify the name of the configuration object.

Element 2: Configuration object type

Specifies the type of configuration object specified with configuration object name.

***DEV**

Configuration objects of type device description.

***CTLD**

Configuration objects of type controller description.

***LIND**

Configuration objects of type line description.

***NWSD**

Configuration objects of type network server description.

Element 3: Configuration object online

Specifies what configuration action to take when the cluster resource group is switched over or failed over to a backup node. The configuration object can be varied on and the server takeover IP address can

be started or leave the configuration object varied off and the server takeover IP address inactive when a device ownership is moved to another node. This attribute does **not** vary the device on or off when the cluster resource group is started or ended. Switchover and failover completion may be delayed if the online attribute has a value of *YES for devices that may take a long time to vary on.

***OFFLINE**

Do not vary the configuration object on and do not start the server takeover IP address.

***ONLINE**

Vary the configuration object on and start the server takeover IP address.

***PRIMARY**

This is a secondary ASP. Vary on processing is determined by the corresponding primary ASP for this ASP group.

Element 4: Server takeover IP address

Specifies a takeover IP address for servers associated with the relational database name in the device description for an auxiliary storage pool. This element is optional and can only be specified for a primary auxiliary storage pool. If specified, the address must be presented in dotted decimal format. The specified address must exist on all nodes in the recovery domain if the cluster resource group is active. If not specified, or for a secondary or UDFS auxiliary storage pool, the element must be set to *NONE.

***NONE**

There is no server takeover IP address associated with the relational database name in the device description for an auxiliary storage pool.

character-value

Specify the takeover IP address for servers associated with the relational database name.

Top

Text description (TEXT)

Specifies the text used to briefly describe the cluster resource group object.

***BLANK**

There is no text describing this cluster resource group.

character-value

Specify up to 50 characters of text to describe the cluster resource group object.

Top

Failover message queue (FLVMSGQ)

Specifies the message queue to receive messages (CPABB01) dealing with failover. If the user would like to receive notice before a failover occurs, then this parameter must be set to a value other than *NONE. If this field is set, the specified message queue must exist on all nodes in the recovery domain after the exit program completes. The message queue cannot be in an independent auxiliary storage pool.

Single values

***NONE**

No messages will be sent when a failover occurs for this cluster resource group.

Qualifier 1: Failover message queue

name Specify the name of the failover message queue.

Qualifier 2: Library

name Specify the name of the library that contains the message queue to receive the failover message. The library name cannot be *CURLIB, QTEMP, or *LIBL.

Top

Failover wait time (FLVWAITTIM)

Specifies the number of minutes to wait for a reply to the failover message that was enqueued on the failover message queue.

*NOWAIT

Failover proceeds without user intervention.

*NOMAX

Wait forever until a response is given to the failover inquiry message.

integer

Specify the number of minutes to wait for a response to the failover inquiry message. If no response is received in the specified number of minutes, the failover default action field will be looked at to decide how to proceed.

Top

Failover default action (FLVDFTACN)

Specifies the default action to be taken if a response to the failover message is not received in the failover wait time limit.

*PROCEED

Proceed with failover.

*CANCEL

Do not attempt failover.

Top

Application identifier (APPID)

Specifies the application identifier. This identifies the purpose of the cluster resource group.

*NONE

No application identifier.

name Specify the name of the application that supplied the peer cluster resource group. The name can be up to 20 characters. The recommended format is 'vendor-id.name' where vendor-id is an identifier for the vendor creating the cluster resource group and name is the application name. For example, QIBM.ExamplePeer, indicates it is supplied by IBM for the ExamplePeer application. It is not recommended to use QIBM unless the cluster resource group is supplied by IBM.

Top

Examples

Example 1: Creating a CRG with a Two-Node Recovery Domain


```

CRTCRG CLUSTER(MYCLUSTER) CRG(MYCRG) CRGTYPE(*DEV)
EXITPGM(TEST/EXITPGM) USRPRF(USER1)
RCYDMN((NODE01 *PRIMARY) (NODE02 *BACKUP *LAST))
CFGOBJL(*NONE) TEXT('IASP for Application 17')

```

This command creates a device cluster resource group called MYCRG in the cluster called MYCLUSTER. The recovery domain consists of two nodes. NODE01 is the primary and NODE02 is the only backup. The list of configuration objects is not specified on this command; the Add CRG Device Entry (ADDCRGDEVE) command can be used to add this information.

Example 2: Creating a CRG with a Single-Node Recovery Domain

```

CRTCRG CLUSTER(MYCLUSTER) CRG(MYCRG) CRGTYPE(*DEV)
EXITPGM(TEST/EXITPGM) USRPRF(USER1)
RCYDMN((NODE01 *PRIMARY *LAST MYSITE ('1.1.1.1'
                                     '2.2.2.2')))
EXITPGMFMT(EXTP0200)
TEXT('IASP for Application 17')

```

This command creates a device cluster resource group called MYCRG in the cluster called MYCLUSTER. The recovery domain consists of one node, NODE01. The recovery domain sets NODE01 as the primary node in site MYSITE, with 2 data port IP addresses, 1.1.1.1 and 2.2.2.2.

Example 3: Creating a Peer CRG with a Two-Node Recovery Domain

```

CRTCRG CLUSTER(MYCLUSTER) CRG(MYPEER) CRGTYPE(*PEER)
EXITPGM(TEST/EXITPGM) USRPRF(USER1)
RCYDMN((NODE01 *PEER) (NODE02 *PEER))
APPID(CompanyName.ExPeer)
TEXT('Peer for ExamplePeer Application')

```

This command creates a peer cluster resource group called MYPEER in the cluster called MYCLUSTER. The recovery domain consists of two nodes, NODE01 and NODE02. This cluster resource group is for an IBM shipped application called ExamplePeer.

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Error messages

*ESCAPE Messages

HAE0017

Cluster resource group &1 not created.

Top

Delete Cluster Admin Domain (DLTCAD)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Delete Cluster Admin Domain (DLTCAD) command deletes the cluster resource group associated with a cluster administrative domain from all cluster nodes in the administrative domain. Cluster Resource Services must be active to use this command. The cluster resource group object is marked for deletion and is deleted on each active cluster node. The cluster resource group object will be deleted on other nodes in the cluster when they become active.

The Delete Cluster Resource Group (DLTCRG) command can be used to delete the cluster resource group object associated with a cluster administrative domain on a system that does not have Cluster Resource Services active.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. Cluster Resource Services must be active on the node processing the request.
3. The status of the cluster resource group being deleted must not be active.
4. The cluster resource group CRG is owned by the QCLUSTER user profile. To use the cluster resource group commands with the cluster administrative domain you will need to be authorized to the cluster resource group and to the QCLUSTER user profile.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
ADMDMN	Cluster administrative domain	<i>Name</i>	Required, Positional 2

Top

Cluster (CLUSTER)

Specifies the cluster containing the cluster administrative domain.

This is a required parameter.

name Specify the name of the cluster.

Top

Cluster administrative domain (ADMDMN)

Specifies the cluster administrative domain that is to be deleted.

This is a required parameter.

name Specify the name of the cluster administrative domain that is to be deleted.

Top

Examples

```
DLTCAD CLUSTER(MYCLUSTER) ADMDMN(MYDOMAIN)
```

This command deletes the cluster administrative domain named MYDOMAIN from the cluster MYCLUSTER.

Top

Error messages

*ESCAPE Messages

HAE0004

Cluster administrative domain &1 not deleted.

Top

Delete Cluster (DLTCLU)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Delete Cluster (DLTCLU) command deletes a cluster on all nodes currently in the cluster's membership list. All cluster resource group objects and device domains associated with the cluster are also deleted. Cluster Resource Services is ended on each node in the cluster membership list, and the cluster is deleted.

If this command is initiated from a cluster node with a status of Active, all active cluster nodes will be removed from the cluster, and the cluster resource group objects associated with the cluster will be deleted. Cluster resource group objects on nodes with a status of Inactive or Failed will not be deleted. If this command is initiated from a cluster node with a status of Failed or Inactive, only that node is removed from the cluster and cluster resource group objects on that node are deleted.

Cluster resource group exit programs will be called with an action code of Delete (or Delete Command if Cluster Resource Services is not active on the node where the command is invoked).

This command may be called when the cluster is in a partitioned state. In this case, the delete operation will only be performed within the partition running the command.

A node which was a member of a device domain has internal information related to auxiliary storage pools such as disk unit numbers or virtual memory addresses. After a cluster is deleted, this internal information persists until the node is IPLed. If the cluster is deleted, the node must be IPLed before the node can become a member of another device domain.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. This command must be called from a node defined in the cluster membership list.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1

Top

Cluster (CLUSTER)

Specifies the cluster which is being deleted.

This is a required parameter.

name Specify the name of the cluster that is to be deleted.

Examples

```
DLTCLU CLUSTER(MYCLUSTER)
```

This command deletes the cluster MYCLUSTER. All nodes that were in the membership list of MYCLUSTER are no longer members of any cluster.

Error messages

*ESCAPE Messages

HAE0014

Cluster &1 not deleted.

Delete CRG Cluster (DLTCRGCLU)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

[Parameters](#)
[Examples](#)
[Error messages](#)

The Delete Cluster Resource Group from Cluster (DLTCRGCLU) command deletes a cluster resource group from all cluster nodes in the recovery domain. Cluster Resource Services must be active to use this command. The cluster resource group object is marked for deletion and is deleted on each active cluster node. The cluster resource group object will be deleted on other nodes in the cluster when they become active.

Deleting a device cluster resource group will not change the ownership of devices. The devices remain on whatever node owns them at the time of the delete.

If Cluster Resource Services configured the takeover IP address for an application cluster resource group and the IP interface is not active, the takeover IP address will be removed. If Cluster Resource Services finds that the takeover IP address is active, the command will fail.

If an exit program is specified for the cluster resource group, the cluster resource group exit program is called on each active node in the recovery domain with an action code of Verification Phase and action code dependent data of Delete. The cluster resource group status is set to Delete Pending. The cluster resource group exit program is called with an action code of Delete if the verification phase is successful. The cluster resource group will not be deleted if the verification phase fails. This command will **not** call the cluster resource group exit program with an action code of Undo when the verification phase fails.

The Delete Cluster Resource Group (DLTCRG) command can be used to delete a cluster resource group object on a system that does not have Cluster Resource Services active.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. Cluster Resource Services must be active on the node processing the request.
3. The status of the cluster resource group being deleted must not be active.

[Top](#)

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
CRG	Cluster resource group	<i>Name</i>	Required, Positional 2

[Top](#)

Cluster (CLUSTER)

Specifies the cluster containing the cluster resource group.

This is a required parameter.

name Specify the name of the cluster.

Top

Cluster resource group (CRG)

Specifies the cluster resource group that is to be deleted.

This is a required parameter.

name Specify the name of the cluster resource group that is to be deleted.

Top

Examples

```
DLTCRGCLU CLUSTER(MYCLUSTER) CRG(MYCRG)
```

This command deletes the cluster resource group named MYCRG from the cluster named MYCLUSTER.

Top

Error messages

*ESCAPE Messages

HAE0018

Cluster resource group &1 not deleted.

Top

Display ASP Copy Description (DSPASPCPYD)

Where allowed to run: All environments (*ALL)
Threadsafe: No

Parameters
Examples
Error messages

The Display Auxiliary Storage Pool Copy Description (DSPASPCPYD) command displays an auxiliary storage pool (ASP) copy description.

Restrictions:

- You must have use (*USE) authority to the ASP device description that is having an ASP copy description displayed.

Top

Parameters

Keyword	Description	Choices	Notes
ASPCPY	ASP copy	<i>Name</i>	Required, Positional 1
OUTPUT	Output	*, *_PRINT _	Optional

Top

ASP copy (ASPCPY)

Specifies the name of the ASP copy description to be displayed.

This is a required parameter.

name Specify the name of the ASP copy description.

Top

Output (OUTPUT)

Specifies whether the output from the command is shown at the requesting workstation or printed with the job's spooled output.

* Output requested by an interactive job is shown on the display. Output requested by a batch job is printed with the job's spooled output.

*PRINT

The output is printed with the job's spooled output.

Top

Examples

Example 1: Displaying an ASP Copy Description

```
DSPASPCPYD  ASPCPY (ORDER)
```

This command shows the ASP copy description named ORDER on the requesting workstation.

Example 2: Printing an ASP Copy Description

```
DSPASPCPYD  ASPCPY (ORDER)  OUTPUT (*PRINT)
```

This command writes the ASP copy description named ORDER to the job's spooled output.

[Top](#)

Error messages

*ESCAPE Messages

CPF9801

Object &2 in library &3 not found.

CPF9802

Not authorized to object &2 in &3.

CPF9899

Error occurred during processing of command.

HAE002B

&1 command failed.

[Top](#)

Display ASP Session (DSPASPSSN)

Where allowed to run: All environments (*ALL)
Threadsafe: No

Parameters
Examples
Error messages

The Display Auxiliary Storage Pool Session (DSPASPSSN) command displays an auxiliary storage pool (ASP) session.

Restrictions:

- You must have use (*USE) authority to the ASP device descriptions of the session for which an entry is being displayed.

Top

Parameters

Keyword	Description	Choices	Notes
SSN	Session	<i>Name</i>	Required, Positional 1
OUTPUT	Output	*, *_PRINT _	Optional

Top

Session (SSN)

Specifies the name of the ASP session to be displayed.

This is a required parameter.

name Specify the name of an ASP session.

Top

Output (OUTPUT)

Specifies whether the output from the command is shown at the requesting workstation or printed with the job's spooled output.

* Output requested by an interactive job is shown on the display. Output requested by a batch job is printed with the job's spooled output.

*PRINT

The output is printed with the job's spooled output.

Top

Examples

Example 1: Displaying an ASP Session

```
DSPASPSSN  SSN(ORDERSSN)
```

This command displays the ASP session named ORDERSSN.

Example 2: Printing an ASP Session

```
DSPASPSSN  SSN(ORDERSSN)  OUTPUT(*PRINT)
```

This command prints the ASP session named ORDERSSN to the job's spooled output.

[Top](#)

Error messages

*ESCAPE Messages

CPF9801

Object &2 in library &3 not found.

CPF9802

Not authorized to object &2 in &3.

CPF9899

Error occurred during processing of command.

HAE002B

&1 command failed.

[Top](#)

Display Cluster Information (DSPCLUINF)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Display Cluster Information (DSPCLUINF) command is used to display or print information about a cluster. It must be invoked from a node in the cluster. The information displayed or printed may not be current if the command is called on a node that has a status of Inactive or Failed. In this case, the information displayed or printed will reflect the state of the cluster when the node was last active. You can use this command to either display or print basic information describing the cluster membership list or complete configuration information about the cluster. This command may be called from a cluster resource group exit program.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i> , * _	Optional, Positional 1
OUTPUT	Output	*, *PRINT _	Optional

Top

Cluster (CLUSTER)

Specifies the cluster for which information is displayed or printed.

*
_ Indicates that information will be displayed or printed for the cluster currently defined on this system.

name Specify the name of the cluster.

Top

Output (OUTPUT)

Specifies whether the output from the command is shown at the requesting workstation or printed with the job's spooled output. More information on this parameter is in commonly used parameters.

*
_ Output requested by an interactive job is shown on the display. If the command is run as part of a batch job, the output is printed with the job's spooled output.

***PRINT**

The output is printed with the job's spooled output.

Top

Examples

```
DSPCLUINF CLUSTER(MYCLUSTER) OUTPUT(*PRINT)
```

This command will print the complete set information about the cluster MYCLUSTER.

[Top](#)

Error messages

*ESCAPE Messages

CPF1999

Errors occurred on command.

[Top](#)

Display CRG Information (DSPCRGINF)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Display Cluster Resource Group Information (DSPCRGINF) command is used to display or print information about cluster resource groups. It must be invoked from a node in the cluster. The information displayed or printed may not be current if the command is called on a node that has a status of Inactive or Failed. In this case, the information displayed or printed will reflect the state of the cluster when the node was last active. You can use this command to display or print a list of cluster resource groups or complete information about a cluster resource group.

If CRG(*LIST) is specified, the request for information is not distributed to other nodes in the cluster. The information about the cluster resource groups shows the values obtained from the node running this command. Several conditions (for example, Cluster Resource Services not active on the node running the command) may produce inconsistent information about a cluster resource group in the cluster.

When you request information for a specific cluster resource group, basic information for the cluster resource group is always shown. In addition, you can request additional details that include the recovery domain and the list of resilient devices. If Cluster Resource Services has been started, this command will return information about the cluster resource group even if it does not exist on the node from which the command is called provided at least one recovery domain node is active.

If Cluster Resource Services has not been started:

1. The information returned may not be current
2. Information will only be returned for a cluster resource group that exist on the node running the command

This command may be called from a cluster resource group exit program. However if the cluster resource group exit program was called as a result of the Create Cluster Resource Group (CRTCRG) command and you are requesting information for that cluster resource group, the command will fail.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
CRG	Cluster resource group	<i>Character value, *LIST</i>	Optional, Positional 2
OUTPUT	Output	<i>*, *PRINT</i>	Optional

Top

Cluster (CLUSTER)

Specifies the cluster which contains the cluster resource groups for which information will be displayed or printed.

This is a required parameter.

name Specify the name of the cluster.

Top

Cluster resource group (CRG)

Specifies the cluster resource group for which information is to be displayed or printed.

***LIST** Indicates that the list of cluster resource groups currently defined in the specified cluster are to be displayed or printed. Descriptive information about each cluster resource group will also be printed. The information will be returned for all cluster resource groups in the cluster, even if they do not exist on the node running the command. The Work Objects (WRKOBJ) CL command can be used to provide a list of cluster resource group objects that only exist on this node. Information on all the cluster resource groups will be printed regardless of the authority of the user calling the command.

name Specify the name of the cluster resource group.

Top

Output (OUTPUT)

Specifies whether the output from the command is shown at the requesting workstation or printed with the job's spooled output. More information on this parameter is in commonly used parameters.

***** Output requested by an interactive job is shown on the display. If the command is run as part of a batch job, the output is printed with the job's spooled output.

***PRINT**
The output is printed with the job's spooled output.

Top

Examples

```
DSPCRGINF CLUSTER(MYCLUSTER) CRG(*LIST) OUTPUT(*PRINT)
```

This command will print the basic configuration information about all cluster resource groups defined in cluster MYCLUSTER.

Top

Error messages

*ESCAPE Messages

CPF1999

Errors occurred on command.

End ASP Session (ENDASPSSN)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The End Auxiliary Storage Pool Session (ENDASPSSN) command ends an existing auxiliary storage pool (ASP) session. If the session is a geographic mirroring session, it deletes the mirror copy's disk units and copy description.

Restrictions:

- You must have job control (*JOBCTL) special authority to use this command and you must have use (*USE) authority to the ASP device descriptions of the session that is being ended.

Top

Parameters

Keyword	Description	Choices	Notes
SSN	Session	<i>Name</i>	Required, Positional 1
DLTASP	Delete ASP	*NO, *YES	Optional

Top

Session (SSN)

Specifies the name of the ASP session to be ended.

This is a required parameter.

name Specify the name of an ASP session.

Top

Delete ASP (DLTASP)

Specifies whether the target ASP of the session is to be deleted as part of ending the session.

***NO** The target copy of the ASP is not to be deleted as part of ending the session. *NO is the required parameter value for a *METROMIR, *GLOBALMIR and *FLASHCOPY session.

***YES** Specifies that the target copy of the session is to be deleted on ending the session. *YES is the required parameter value for a *GEOMIR session.

Top

Examples

ENDASPSSN SSN(ORDERCPY)

This command ends the ASP session named ORDERCPY. The target ASP of the session is not deleted.

[Top](#)

Error messages

*ESCAPE Messages

CPF9801

Object &2 in library &3 not found.

CPF9802

Not authorized to object &2 in &3.

CPF9899

Error occurred during processing of command.

HAE002B

&1 command failed.

[Top](#)

End Cluster Admin Domain (ENDCAD)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

[Parameters](#)
[Examples](#)
[Error messages](#)

The End Cluster Admin Domain (ENDCAD) command disables synchronization of the specified cluster administrative domain. The cluster administrative domain status is set to Inactive. Changes to monitored resources associated with the cluster administrative domain are no longer synchronized. Once the cluster administrative domain is ended, any changes made to monitored resources are set to a pending status and will be synchronized on all active nodes in the domain when the domain is started again.

Restrictions:

1. The cluster resource group CRG is owned by the QCLUSTER user profile. To use the cluster resource group commands with the cluster administrative domain you will need to be authorized to the cluster resource group and to the QCLUSTER user profile.

[Top](#)

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
ADMDMN	Cluster administrative domain	<i>Name</i>	Required, Positional 2

[Top](#)

Cluster (CLUSTER)

Specifies the cluster containing the cluster administrative domain.

This is a required parameter.

name Specify the name of the cluster.

[Top](#)

Cluster administrative domain (ADMDMN)

Specifies the cluster administrative domain to be ended.

This is a required parameter.

name Specify the name of the cluster administrative domain to end.

[Top](#)

Examples

```
ENDCAD CLUSTER(MYCLUSTER) ADMDMN(MYDOMAIN)
```

This command ends synchronization for the cluster administrative domain named MYDOMAIN in the cluster named MYCLUSTER.

[Top](#)

Error messages

*ESCAPE Messages

HAE0006

Cluster administrative domain &1 not ended.

[Top](#)

End Cluster Node (ENDCLUNOD)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The End Cluster Node (ENDCLUNOD) command is used to end Cluster Resource Services on one or all the nodes in the membership list of an existing cluster. The status of each node that is ended is set to Inactive. In order to restart Cluster Resource Services on nodes that have been ended, the Start Cluster Node (STRCLUNOD) command is used.

When a node in the cluster is ended, it is not removed from the cluster membership list.

This command can be called on the node which is to be ended, or it can be called on any node in the cluster which has a status of Active. If this command is called when the cluster is partitioned, only nodes in the partition running the command will process the request.

The cluster resource group exit program on the node being ended will be called with an action code of End Node. The exit program on all other nodes in the recovery domain will be called with an action code of Failover. If all the nodes in the cluster are being ended, cluster resource group exit programs will not be called with an indication to failover.

The recovery domain of cluster resource groups on the node that had ended will indicate a node status of Active even though the node is inactive. For all the other nodes in the recovery domain, the status of the node will be Inactive. If the node being ended is the primary node for an active device cluster resource group, ownership of the hardware associated with the cluster resource group will be moved to a backup node. If the cluster resource group is not active, there are no backup nodes, or all backup nodes are either inactive or in a different cluster partition, the ownership of the hardware is left with the node being ended.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. The node being ended must be active.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
NODE	Node identifier	<i>Name</i> , *ALL	Required, Positional 2
OPTION	Option	<u>*IMMED</u> , *CNTRLD	Optional

Top

Cluster (CLUSTER)

Specifies the cluster that contains the node or nodes to be ended.

This is a required parameter.

name Specify the name of the cluster.

Top

Node identifier (NODE)

Specifies the node identifier(s) to be ended.

This is a required parameter.

***ALL** End all active nodes in the cluster.

name Specify the name of the node to be ended.

Top

Option (OPTION)

Specifies the method to end the node.

***IMMED**

Immediate. The request to end Cluster Resource Services on the node will be processed immediately.

***CNTRLD**

Controlled. Pending cluster resource group actions will complete before the request to end Cluster Resource Services is processed.

Top

Examples

```
ENDCLUNOD CLUSTER(MYCLUSTER) NODE(NODE01) OPTION(*IMMED)
```

This command ends Cluster Resource Services on node NODE01 for cluster MYCLUSTER. The request is processed immediately without waiting for any pending cluster resource group actions to complete.

Top

Error messages

***ESCAPE Messages**

HAE0010

Cluster node &1 in cluster &2 not ended.

Top

End Cluster Resource Group (ENDCRG)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

[Parameters](#)
[Examples](#)
[Error messages](#)

The End Cluster Resource Group (ENDCRG) command disables resilience of the specified cluster resource group. The cluster resource group status is set to Inactive if the residency is ended on all nodes in the recovery domain. The resources associated with the cluster resource group are no longer resilient. That is, there is no failover or switchover action provided for these resources while the cluster resource group is ended.

Ending a device cluster resource group will not change the ownership of devices. The devices remain on whatever nodes owns them at the time the command is run. Also, the devices are not varied off when the cluster resource group is ended.

Ending a peer cluster resource group will end the access point for the cluster resources on all nodes defined as a peer node.

If an exit program is specified for the cluster resource group, it is called with an action code of End on each active node in the recovery domain. When the exit program is called, the cluster resource group status is set to End Pending. Successful completion of the exit program sets the cluster resource group status to Inactive. In addition, for an application cluster resource group:

1. The current exit program job on the primary node will be cancelled with the *IMMED option.
2. The takeover IP interface for the cluster resource group will be ended for the application cluster resource group.

If the exit program fails and the original state of the cluster resource group cannot be recovered, the cluster resource group status is set to Indoubt.

[Top](#)

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
CRG	Cluster resource group	<i>Name</i>	Required, Positional 2
EXITPGMDTA	Exit program data	<i>Character value, *SAME</i>	Optional

[Top](#)

Cluster (CLUSTER)

Specifies the cluster containing the cluster resource group.

This is a required parameter.

name Specify the name of the cluster.

Cluster resource group (CRG)

Specifies the cluster resource group to be ended.

This is a required parameter.

name Specify the name of the cluster resource group to end.

Top

Exit program data (EXITPGMDTA)

Specifies up to 256 bytes of data that is passed to the cluster resource group exit program when it is called. This parameter may contain any scalar data except pointers. For example, it can be used to provide state information. This data will be stored with the specified cluster resource group and copied to all nodes in the recovery domain. Pointers in this area will not resolve correctly on all nodes and should not be placed in the data. The data specified will replace the existing exit program data stored with the cluster resource group. If blanks are specified, then the exit program data stored with the cluster resource group will be cleared. This parameter must be set to *SAME if no exit program is specified for the cluster resource group.

*SAME

The exit program data stored with the cluster resource group specified will be passed to the exit program.

character-value

Specify the data that is to be passed to the exit program.

Top

Examples

```
ENDCRG CLUSTER(MYCLUSTER) CRG(MYCRG)
        EXITPGMDTA('important information')
```

This command ends resiliency of the cluster resource group called MYCRG in the cluster called MYCLUSTER. When the cluster resource group exit program is called, it will be passed the exit program data 'important information' on all active nodes in the recovery domain.

Top

Error messages

*ESCAPE Messages

HAE001C

Cluster resource group &1 not ended.

Top

Remove ASP Copy Description (RMVASPCPYD)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Remove Auxiliary Storage Pool Copy Description (RMVASPCPYD) command is used to remove an existing auxiliary storage pool (ASP) copy description. It does not remove the disk configuration.

Restrictions:

- You must have input/output system configuration (*IOSYSCFG) special authority to use this command.
- You must have use (*USE) authority to the ASP device description for which an entry is being deleted.

Top

Parameters

Keyword	Description	Choices	Notes
ASPCPY	ASP copy	<i>Name</i>	Required, Positional 1

Top

ASP copy (ASPCPY)

Specifies the name of the ASP copy description to be removed.

This is a required parameter.

name Specify the name of the ASP copy description.

Top

Examples

```
RMVASPCPYD  ASPCY (ORDER)
```

This command removes the ASP copy description named ORDER.

Top

Error messages

*ESCAPE Messages

CPF9801

Object &2 in library &3 not found.

CPF9802

Not authorized to object &2 in &3.

CPF9899

Error occurred during processing of command.

HAE002B

&1 command failed.

[Top](#)

Remove Admin Domain MRE (RMVCAADMRE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Remove Cluster Admin Domain Monitored Resource Entry (RMVCAADMRE) command removes a Monitored Resource Entry (MRE) from the cluster administrative domain.

This command does the following:

- Removes the monitored resource entry from all nodes in the cluster administrative domain.
- Once the monitored resource entry is removed, changes to resource will not be synchronized within the cluster administrative domain.
- Any system objects that were created or any system environment variables that were added when the monitored resource was added will not be deleted.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. The cluster administrative domain must exist and all nodes in the domain must be active.
3. Resources cannot be removed from a cluster administrative domain when it is partitioned.
4. The caller's user profile must exist on all nodes in the cluster administrative domain.
5. This command can only be called from a cluster node in the domain node list of the cluster administrative domain.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
ADMDMN	Cluster administrative domain	<i>Name</i>	Required, Positional 2
RESOURCE	Monitored resource	<i>Character value</i>	Required, Positional 3
RSCTYPE	Monitored resource type	*ASPDEV, *CLS, *ENVVAR, *ETHLIN, *JOB, *NETA, *NWSCFG, *NWS, *NWSHDEV, *NWSSTG, *OPTDEV, *SBSD, *SYSVAL, *TAPDEV, *TCPA, *TRNLIN, *USRPRF	Required, Positional 4
RSCLIB	Library	<i>Name</i>	Optional

Top

Cluster (CLUSTER)

Specifies the cluster where the cluster administrative domain exists.

This is a required parameter.

name Specify the name of the cluster where the cluster administrative domain exists.

Top

Cluster administrative domain (ADMDMN)

Specifies the cluster administrative domain which is monitoring the resource.

This is a required parameter.

name Specify the cluster administrative domain.

Top

Monitored resource (RESOURCE)

Specifies the name of the monitored resource entry to be removed.

This is a required parameter.

name Specify the name of the monitored resource. If the name is longer than 10 characters, enter & and a blank in the first two positions and press F4 to expand the input field.

Top

Monitored resource type (RSCTYPE)

Specifies the type of monitored resource.

This is a required parameter.

name Specify the resource type.

Top

Library (RSCLIB)

Specifies the library for the monitored resource.

Note: This parameter is required if the resource is a system object of type *CLS, *JOB, or *SBSD. A library name is not allowed for resource types *ENVVAR, *NETA, *SYSVAL, or *TCPA. The parameter is allowed but not required for the other system object resources that can exist only in QSYS or QUSRSYS.

name Specify the name of the library for the monitored resource.

Top

Examples

```
RMVCLADMRE CLUSTER(MYCLUSTER) ADMDMN(MYDOMAIN)
            RESOURCE(MYPROFILE) RSCTYPE(*USRPRF)
```

This command removes a monitored resource entry for the user profile MYPROFILE. Changes to MYPROFILE will no longer be monitored by the cluster administrative domain MYDOMAIN in cluster MYCLUSTER. The user profile MYPROFILE is not deleted when the command is called.

[Top](#)

Error messages

*ESCAPE Messages

HAE0007

Resource not removed from cluster administrative domain &4.

[Top](#)

Remove Admin Domain Node Entry (RMVCADNODE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Remove Cluster Admin Domain Node Entry (RMVCADNODE) command is used to remove a node from the domain node list of a cluster administrative domain. The node being removed does not need to be active in the cluster. When the node is removed from the domain node list, the cluster administrative domain object is deleted from that system and all monitored resource entries (MREs) are removed. System objects represented by MREs are not deleted on the node being removed from the domain.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. Cluster Resource Services must be started on the node processing the request.
3. At least one node in the domain node list must be active.
4. The last node in the domain node list cannot be removed if the cluster administrative domain status is Active.
5. At least one node must remain active in the domain node list of the cluster administrative domain after the successful completion of the remove operation.
6. The cluster resource group CRG is owned by the QCLUSTER user profile. To use the cluster resource group commands with the cluster administrative domain you will need to be authorized to the cluster resource group and to the QCLUSTER user profile.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
ADMDMN	Cluster administrative domain	<i>Name</i>	Required, Positional 2
NODE	Node identifier	<i>Name</i>	Required, Positional 3

Top

Cluster (CLUSTER)

Specifies the cluster to which the cluster administrative domain belongs.

This is a required parameter.

name Specify the name of the cluster which contains the cluster administrative domain.

Top

Cluster administrative domain (ADMDMN)

Specifies the cluster administrative domain from which the node will be removed.

This is a required parameter.

name Specify the name of the cluster administrative domain.

Top

Node identifier (NODE)

Specifies the node that is to be removed from the domain node list of the cluster administrative domain.

This is a required parameter.

name Specify the name of the node that is to be removed.

Top

Examples

```
RMVCADNODE CLUSTER(MYCLUSTER) ADMDMN(MYDOMAIN)
           NODE(RCHCST03)
```

This command removes node RCHCST03 from the domain node list of cluster administrative domain MYDOMAIN in cluster MYCLUSTER.

Top

Error messages

*ESCAPE Messages

HAE0008

Node &1 not removed from cluster administrative domain &2.

Top

Remove Cluster Node Entry (RMVCLUNODE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Remove Cluster Node Entry (RMVCLUNODE) command is used to remove a node from a cluster. The node specified will be removed from the cluster membership list and will no longer be considered a member of the cluster. The node will also be removed from the membership of the device domain to which it belongs. The cluster resource group objects on the node being removed are deleted only if the node has a status of Active or if this command is called on the node that is being removed.

A node can be removed regardless of its status. If this command is called on a node with a status of Active, any node in the cluster can be removed. If this command is called on a node with a status of Inactive or Failed, only the node running the command can be removed. To remove a node that is not active, this command should be called on the node being removed and on a node in the cluster that is active.

If the cluster is partitioned and any node in the partition is removed, then that node must be removed in all other partitions in order for an automerge to complete successfully.

If the node being removed is active, the cluster resource group exit program will be passed an action code of Remove Node. The exit program on all other nodes in the recovery domain of the cluster resource group will be passed an action code of Failover. If the node being removed is the primary node for a device cluster resource group, ownership of the hardware associated with the cluster resource group will be moved to a backup node. If there are no backup nodes or all the backup nodes are either inactive or in a different cluster partition, ownership of the hardware is left with the node being removed.

If the node being removed is inactive, the cluster resource group exit program will be passed an action code of Remove Node on all nodes in the recovery domain. Ownership of hardware associated with a device cluster resource group will not be changed but will remain with the node being removed. If the node being removed is inactive, the cluster resource group exit program will be called with an action code of Delete Command on the node being removed if the command is run on the node being removed.

If the node being removed is a member of a device domain and it later will be added back to a cluster, the node most likely will need to be IPLed before it can be added to any device domain. One example of this situation would be if a device description for an auxiliary storage pool has been varied on since the last IPL.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. If all of the nodes in the cluster have a status of New, this command can only be called on the node where the cluster was originally created.
4. There must be more than one node in the membership list.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
NODE	Node identifier	<i>Name</i>	Required, Positional 2

Top

Cluster (CLUSTER)

Specifies the cluster that contains the node to be removed.

This is a required parameter.

name Specify the name of the cluster.

Top

Node identifier (NODE)

Specifies the node identifier to be removed.

This is a required parameter.

name Specify the name of the node to be removed.

Top

Examples

```
RMVCLUNODE CLUSTER(MYCLUSTER) NODE(RHCST01)
```

This command removes the node RHCST01 from the cluster membership for cluster MYCLUSTER. Cluster Resource Services is ended on node RHCST01.

Top

Error messages

*ESCAPE Messages

HAE000E

Cluster node &1 in cluster &2 not removed.

Top

Remove CRG Device Entry (RMVCRGDEVE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Remove Cluster Resource Group Device Entry (RMVCRGDEVE) command removes one or more configuration objects from a device cluster resource group. All configuration object entries can be removed but at least one configuration object entry must exist before the Start Cluster Resource Group (STRCRG) command can be called.

Ownership of the hardware associated with the configuration object being removed is not affected. The hardware is still owned by whatever node owned it before this command was called.

If an exit program is specified for the cluster resource group, the cluster resource group exit program is called with an action code of Remove Device Entry on all active nodes in the recovery domain. The cluster resource group status is set to Remove Device Entry Pending. If the exit program completes successfully, the cluster resource group status is reset to its value at the time the command was called. If the exit program fails and the cluster resource group cannot be restored to its original condition, the cluster resource group status is set to Indoubt.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. Cluster Resource Services must be active on the node processing the request.
4. At least one node in the recovery domain must be active.
5. If the cluster resource group is Active, the last device entry cannot be removed. The cluster resource group must be ended first.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
CRG	Cluster resource group	<i>Name</i>	Required, Positional 2
CFGOBJ	Configuration object list	Values (up to 256 repetitions): <i>Element list</i>	Required, Positional 3
	Element 1: Configuration object	<i>Name</i>	
	Element 2: Configuration object type	<u>*DEV</u> D, *CTLD, *LIND, *NWSD	

Top

Cluster (CLUSTER)

Specifies the cluster to which the cluster resource group belongs.

This is a required parameter.

name Specify the name of the cluster which contains the cluster resource group.

Top

Cluster resource group (CRG)

Specifies the cluster resource group from which device list entries are being removed.

This is a required parameter.

name Specify the name of the cluster resource group which contains the device list entries.

Top

Configuration object list (CFGOBJ)

Specifies the resilient devices that are to be removed from the cluster resource group.

You can specify up to 256 values for this parameter.

This is a required parameter.

Element 1: Configuration object

Specifies the configuration object which will be removed from the device list of the cluster resource group.

name Specify the name of the configuration object.

Element 2: Configuration object type

Specifies the object type of the configuration object specified for element 1.

*DEVD

Configuration object of type device description.

*CTLD

Configuration object of type controller description.

*LIND

Configuration object of type line description.

*NWSD

Configuration object of type network server description.

Top

Examples

```
RMVCRGDEVE CLUSTER(MYCLUSTER) CRG(MYCRG)
            CFGOBJ((IASP01 *DEV))
```

This command removes configuration object IASP01 from an existing cluster resource group MYCRG in cluster MYCLUSTER.

[Top](#)

Error messages

*ESCAPE Messages

HAE0021

Request to remove device entries from cluster resource group &1 failed.

[Top](#)

Remove CRG Node Entry (RMVCRGNODE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Remove Cluster Resource Group Node Entry (RMVCRGNODE) command is used to remove a node from the recovery domain of a cluster resource group. The node being removed does not need to be active in the cluster to be removed from the recovery domain. When the node is removed from the recovery domain, the cluster resource group object is deleted from that system.

For primary-backup model, if the cluster resource group has no backup nodes in either the current recovery domain or the preferred recovery domain, the primary node cannot be removed.

This command results in the preferred recovery domain and the current recovery domain being updated.

This command will do the following for all cluster resource group types:

1. Set the cluster resource group status to Remove Node Pending.
2. Call the exit program on all active nodes in the recovery domain with an action code of Remove Node, if an exit program is specified for the cluster resource group.
3. Reset the cluster resource group status to the value at the time the command was called, if the exit program completes successfully on all nodes.
4. Set the cluster resource group status to Indoubt if the exit program fails on any node and the original state of the cluster resource group cannot be recovered.

This command will do the following for application cluster resource group:

1. If Cluster Resource Services configured the takeover IP address, it will be removed.

This command will do the following for device cluster resource groups:

1. If the node being removed is the current primary node, ownership of the devices specified in the cluster resource group are switched from the current primary to the new primary if none of the configuration objects on the current primary are varied on. If any configuration objects are varied on, an error message is returned. In addition, the new primary node must be active. Devices are not varied on after the ownership is switched. The node which is to become the new primary must be active in the cluster.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. Cluster Resource Services must be started on the node processing the request.
4. At least one node in the recovery domain must be active.
5. For primary-backup model cluster resource groups:
 - The cluster resource group status must **not** be Active in order to remove the node that is currently the primary.
 - If the cluster resource group has no backup nodes, the primary node cannot be removed.
6. For peer model cluster resource groups, the last node designated as a peer node cannot be removed if the cluster resource group status is Active.

- At least node must remain active in the recovery domain of the cluster resource group after the successful completion of the remove operation.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
CRG	Cluster resource group	<i>Name</i>	Required, Positional 2
NODE	Node identifier	<i>Name</i>	Required, Positional 3

Top

Cluster (CLUSTER)

Specifies the cluster to which the cluster resource group belongs.

This is a required parameter.

name Specify the name of the cluster which contains the cluster resource group.

Top

Cluster resource group (CRG)

Specifies the cluster resource group from which the node will be removed.

This is a required parameter.

name Specify the name of the cluster resource group.

Top

Node identifier (NODE)

Specifies the node that is to be removed from the recovery domain of the cluster resource group.

This is a required parameter.

name Specify the name of the node that is to be removed.

Top

Examples

```
RMVCRGNODE CLUSTER(MYCLUSTER) CRG(MYCRG) NODE(RHCST03)
```

This command removes node RHCST03 from the recovery domain of cluster resource group MYCRG in cluster MYCLUSTER.

[Top](#)

Error messages

*ESCAPE Messages

HAE001A

Node &1 not removed from cluster resource group &2.

[Top](#)

Remove Device Domain Entry (RMVDEVDMNE)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Remove Device Domain Entry (RMVDEVDMNE) command is used to remove a cluster node from a device domain. The removed node will no longer be able to be in the recovery domain for a device cluster resource group.

A node which has been removed from a device domain will most likely need to be IPLed before it can be added to any device domain. One example of this situation would be if a device description for an auxiliary storage pool has been varied on since the last IPL.

This command can be called on any node in the cluster which has a status of Active.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. The node to be removed cannot be in the recovery domain of any device cluster resource group.
4. The node to be removed and at least one other member of the device domain must be active. On certain conditions, all current members of the device domain must be active.
5. This command will fail if any member of the device domain from which the node being removed has a status of Partition.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
DEVDMN	Device domain	<i>Name</i>	Required, Positional 2
NODE	Node identifier	<i>Name</i>	Required, Positional 3

Top

Cluster (CLUSTER)

Specifies the cluster that contains the node.

This is a required parameter.

name Specify the name of the cluster which contains the node.

Top

Device domain (DEVDMN)

Specifies the device domain from which the node is to be removed.

This is a required parameter.

name Specify the name of the device domain from which the node is to be removed.

Top

Node identifier (NODE)

Specifies the cluster node which will be removed from the device domain.

This is a required parameter.

name Specify the name of the node.

Top

Examples

```
RMVDEVDMNE CLUSTER(MYCLUSTER) DEVDMN(MYDOMAIN) NODE(NODE01)
```

This command removes the node NODE01 from the device domain MYDOMAIN in cluster MYCLUSTER. If the cluster membership list is NODE01, NODE02, and NODE03 and all three nodes were in the same device domain, then nodes NODE02 and NODE03 still belong to device domain MYDOMAIN.

Top

Error messages

*ESCAPE Messages

HAE0016

Node &1 not removed from device domain &2 in cluster &3.

Top

Start ASP Session (STRASPSSN)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Start Auxiliary Storage Pool Session (STRASPSSN) command assigns a name to geographic mirroring, Metro Mirror, Global Mirror and FlashCopy sessions and starts High Availability Solutions Manager (HASM) sessions for them. A geographic mirroring session exists in i5/OS from the time the geographic mirroring mirror copy ASP is created. Metro Mirror, Global Mirror or FlashCopy sessions exists in TotalStorage from the time they are configured in the TotalStorage devices. The HASM sessions allow HASM to manage and monitor their activity. The HASM sessions are named so that users and HASM can identify to one another which session a management or monitoring activity pertains.

A session continues to exist until it is ended even if the session operation has completed. This is done because a session consists of an operation and the status of the operation. Keeping the session beyond the completion of the actual operation allows the session completion information to be retrieved.

Any ASP can be a FlashCopy source ASP. The following cannot be a FlashCopy target ASP:

- A geographic mirroring mirror copy, whether or not it is a detached mirror copy.
- A Metro Mirror target.
- A Global Mirror target.
- A target of some other FlashCopy cannot itself be a FlashCopy target.
- A geographic mirroring production copy.

Restrictions:

- You must have job control (*JOBCTL) special authority to use this command and you must have use (*USE) authority to the ASP device descriptions of the session that is being started.

Top

Parameters

Keyword	Description	Choices	Notes
SSN	Session	<i>Name</i>	Required, Positional 1
TYPE	Session type	*GEOMIR, *METROMIR, *GLOBALMIR, *FLASHCOPY	Required, Positional 2
ASPCPY	ASP copy	Values (up to 223 repetitions): <i>Element list</i>	Required, Positional 3
	Element 1: Preferred source	<i>Name</i>	
	Element 2: Preferred target	<i>Name</i>	
	Element 3: Consistency source	<i>Name</i> , *NONE	
	Element 4: Consistency target	<i>Name</i> , *NONE	
SSPTIMO	Suspend timeout	1-7200, <u>120</u>	Optional
MODE	Mirroring mode	* <u>SYNC</u> , *ASYNC	Optional
PRIORITY	Synchronization priority	* <u>MEDIUM</u> , *LOW, *HIGH	Optional
TRACKSPACE	Tracking space	0-100, <u>5</u>	Optional

Keyword	Description	Choices	Notes
FLASHTYPE	FlashCopy type	*COPY, *NOCOPY	Optional
PERSISTENT	Persistent relationship	*YES, *NO	Optional

Top

Session (SSN)

Specifies the name of the session to be started.

This is a required parameter.

name Specify the name for the ASP session.

Top

Session type (TYPE)

Specifies the type of session being started.

This is a required parameter.

*GEOMIR

The session is a geographic mirroring session.

*METROMIR

The session is a Metro Mirror session.

*GLOBALMIR

The session is a Global Mirror session.

*FLASHCOPY

The session is a FlashCopy session.

Top

ASP copy (ASPCPY)

Specifies the names of the ASP copy descriptions for the ASP session. An ASP copy description is required for each copy of each ASP device, whether primary, secondary or UDFS ASP, that participates as a source or target in the session. ASP copy descriptions must be grouped by device in the parameter.

This is a required parameter. The first two values are required for all sessions. For a FlashCopy session, the values for each device must have the source copy specified first and the target second. For other sessions, a copy's Cluster Resource Group (CRG) overrides the order of specification and is used to identify the current source and target. The third and fourth values are needed by Global Mirror sessions to identify copies that are used to provide a consistent target.

You can specify 223 values for this parameter.

Element 1: Preferred source

name Specify the name of a preferred source ASP copy description.

Element 2: Preferred target

name Specify the name of the preferred target ASP copy description that corresponds to the preferred source copy description.

Element 3: Consistency source

*NONE

There is no consistency copy description that corresponds to the preferred source.

name Specify the name of the consistency copy description that corresponds to the preferred source.

Element 4: Consistency target

*NONE

There is no consistency copy description that corresponds to the preferred target.

name Specify the name of the consistency copy description that corresponds to the preferred target.

Top

Suspend timeout (SSPTIMO)

Specifies the length of time to wait for a response when doing cross-site mirroring, Metro Mirror or Global Mirror before suspending the ASP session due to lack of a response.

120 A timeout value of 120 seconds (two minutes) is used.

1-7200 Specify the number of seconds to wait before suspending.

Top

Mirroring mode (MODE)

Specifies whether the mode for cross-site mirroring is synchronous or asynchronous.

Use of this keyword is only valid for a geographic mirroring session.

*SYNC

Use synchronous cross-site mirroring.

*ASYNC

Use asynchronous cross-site mirroring.

Top

Synchronization priority (PRIORITY)

Specifies the geographic mirroring synchronization priority.

Use of this keyword is only valid for a geographic mirroring session.

*MEDIUM

Use medium priority.

*LOW Use low priority.

*HIGH

Use high priority.

Top

Tracking space (TRACKSPACE)

Specifies the percent of the maximum assignable tracking space to use. The maximum assignable tracking space is 2 percent of the total space within an IASP. For example, a 100 gigabyte IASP has a maximum tracking space of 1 gigabyte. A tracking space parameter value of 5 would specify that 5 percent of 1 gigabyte (50 megabytes) should be reserved for tracking changes.

Use of this keyword is only valid for a geographic mirroring session.

5 As much as five percent of the maximum assignable tracking space will be used.

0-100 Specify the percent of the maximum assignable tracking space to reserve for tracking changes. A value of 0 disables tracking.

Top

FlashCopy type (FLASHTYPE)

Specifies the FlashCopy session type.

Use of this keyword is only valid for a FlashCopy session.

*COPY

The session is a "copy" FlashCopy session.

*NOCOPY

The session is a "no copy" FlashCopy session.

Top

Persistent relationship (PERSISTENT)

Specifies whether the relationship is to last beyond the brief interval that it takes to establish a FlashCopy copy. A persistent relationship is necessary in order to do an incremental FlashCopy or a reverse FlashCopy. These two operations are options on the Change Auxiliary Storage Pool Session (CHGASPCSSN) command.

Use of this keyword is only valid for a FlashCopy session.

*YES The relationship between source and target is persistent.

*NO The relationship between source and target is not persistent.

Top

Examples

Example 1: Starting a Geographic Mirroring Session

```
STRASPCSSN  SSN(ORDER)  TYPE(*GEOMIR)
             ASPCPY(ORDER ORDERBKP)
             SSPTIMO(60) PRIORITY(*HIGH) TRACKSPACE(50)
```

This command starts a geographic mirroring session within the High Availability Solutions Manager. It sets the suspend timeout value to 60 seconds, specifies that the re-synchronization priority should be the highest possible and specifies that up to 50 percent of the available tracking space can be used for recording changes.

Example 2: Starting a Metro Mirror Session

```
STRASPSSN  SSN(ORDER)  TYPE(*METROMIR)
           ASPCPY(ORDER ORDERBKP)
```

This command starts a Metro Mirror session within the High Availability Solutions Manager. The source ASP copy description is named ORDER and the target ASP copy description is named ORDERBKP.

[Top](#)

Error messages

*ESCAPE Messages

CPF9801

Object &2 in library &3 not found.

CPF9802

Not authorized to object &2 in &3.

CPF9899

Error occurred during processing of command.

HAE002B

&1 command failed.

[Top](#)

Start Cluster Admin Domain (STRCAD)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Start Cluster Admin Domain (STRCAD) command enables monitored resource synchronization for the specified cluster administrative domain. The cluster administrative domain will have a status of Active upon successful completion of the command.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. Cluster Resource Services must be active on the node running the command.
3. At least one node in the domain node list must have a membership status of Active.
4. The cluster administrative domain status must be either Inactive or Indoubt.
5. The cluster resource group CRG is owned by the QCLUSTER user profile. To use the cluster resource group commands with the cluster administrative domain you will need to be authorized to the cluster resource group and to the QCLUSTER user profile.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
ADMDMN	Cluster administrative domain	<i>Name</i>	Required, Positional 2

Top

Cluster (CLUSTER)

Specifies the cluster containing the cluster administrative domain.

This is a required parameter.

name Specify the name of the cluster.

Top

Cluster administrative domain (ADMDMN)

Specifies the cluster administrative domain to be started.

This is a required parameter.

name Specify the name of the cluster administrative domain.

Examples

```
STRCAD CLUSTER(MYCLUSTER) ADMDMN(MYDOMAIN)
```

This command enables synchronization for the cluster administrative domain MYDOMAIN in the cluster MYCLUSTER. The cluster administrative domain will have a status of Active upon successful completion of this command.

Error messages

*ESCAPE Messages

HAE0009

Cluster administrative domain &1 not started.

Start Cluster Node (STRCLUNOD)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Start Cluster Node (STRCLUNOD) command is used to start Cluster Resource Services on a node in the cluster. If Cluster Resource Services is successfully started on the node specified, the status of the node will be set to Active.

As part of starting the node, Cluster Resource Services checks the allow add to cluster (ALWADDCLU) network attribute to see whether the node being started should be part of the cluster and whether to validate the cluster request through the use of X.509 digital certificates. If validation is required, the requesting node and the node being added must have the following installed on the systems:

1. Operating System option 34 (Digital Certificate Manager)
2. Cryptographic Access Provider Product (AC2 or AC3)

If the cluster is partitioned, this command may be used to start nodes in the partition running this command.

The potential node version of the node being started must be equal to the current cluster version or up to one level higher than the current cluster version. The potential node version and the current cluster version can be retrieved by using the Display Cluster Information (DSPCLUINF) command.

If the node being started is in a device domain, then Operating System option 41, HA Switchable Resources, must be installed and a valid license key must exist on that node.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. The node being started must exist in the cluster membership list.
4. If all nodes have a status of New, this command must be invoked on the node on which the cluster was originally created.
5. The node to be started must be IP reachable (TCP/IP is active and the INETD server is started).
6. The first time a node is started, this command must be invoked on a node that is active.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
NODE	Node identifier	<i>Name</i>	Required, Positional 2

Top

Cluster (CLUSTER)

Specifies the cluster that contains the node to be started.

This is a required parameter.

name Specify the name of the cluster.

Top

Node identifier (NODE)

Specifies the node identifier to be started.

This is a required parameter.

name Specify the node to be started.

Top

Examples

```
STRCLUNOD CLUSTER(MYCLUSTER) NODE(NODE01)
```

This command starts Cluster Resource Services on node NODE01 for cluster MYCLUSTER.

Top

Error messages

*ESCAPE Messages

HAE000F

Cluster node &1 in cluster &2 not started.

Top

Start Cluster Resource Group (STRCRG)

Where allowed to run: All environments (*ALL)
Threadsafe: Yes

Parameters
Examples
Error messages

The Start Cluster Resource Group (STRCRG) command enables resilience for the specified cluster resource group on the specified recovery domain nodes. This command can be used to change the cluster resource group from a status of Indoubt or Inactive to Active.

This command will do the following for all cluster resource group types:

1. Set the cluster resource group status to Start Pending.
2. For primary-backup model cluster resource groups if the current recovery domain has more than one backup node and some backup nodes are not active, the recovery domain may be reordered so that all active backup nodes are ordered before inactive backup nodes. If the inactive backup nodes are already ordered after active backup nodes or if there are no inactive backup nodes, this command will not change the recovery domain.
3. Call the exit program on all active nodes in the recovery domain with an action code of Start, if an exit program is specified for the cluster resource group.
4. Set the cluster resource group status to Active if the exit program is successful on all active nodes in the recovery domain.
5. If the exit program is unsuccessful on any active node in the recovery domain when processing the Undo action code, the status of the cluster resource group will be set to Indoubt on all nodes.

This command will do the following for application cluster resource groups:

1. Verify the takeover IP address has been configured on all nodes in the recovery domain except replicates.
2. Start the TCP/IP interface on the primary node.
3. If the exit program is unsuccessful on any active node in the recovery domain, the exit program job on the primary node will be cancelled and the Takeover IP address will be ended on the primary node.

For an application cluster resource group, the exit program on the primary node is not expected to complete. The status of the cluster resource group will be set to Active when the exit program job has been started on the primary and the exit program has completed successfully on all other nodes in the recovery domain.

This command will do the following for device cluster resource groups:

1. The cluster resource group must have at least one configuration object entry.
2. The configuration objects specified for the cluster resource group must exist on all active nodes in the recovery domain and the resource name specified in a configuration object must be the same on all active nodes in the recovery domain.
3. If a data base name has been specified for a configuration object, it must be the same on all active nodes in the recovery domain.
4. If a server takeover IP address is specified, it must exist on all nodes in the recovery domain.
5. The primary node must be the current owner of all input/output processors or high-speed link I/O bridges for the devices in the cluster resource group.
6. The IOP or high-speed link I/O bridge controlling the devices specified in the cluster resource group must be accessible by all active nodes in the cluster resource group's recovery domain.

7. Starting the cluster resource group will not vary on the configuration objects or start the server takeover IP address.
8. All members of an auxiliary storage pool group must be configured in the cluster resource group.
9. A value of *PRIMARY for the device's configuration object online' attribute can be specified only for a secondary auxiliary storage pool.

This command will do the following for peer cluster resource groups:

1. All nodes that are designated with a peer role will be an active access point upon successful completion of this command.

Restrictions:

1. You must have input/output system configuration (*IOSYSCFG) special authority to run this command.
2. This command cannot be called from a cluster resource group exit program.
3. Cluster Resource Services must be active on the node running the command.
4. For primary-backup module cluster resource groups, the status of the node currently assigned the role of primary must have a membership status of Active.
5. For peer model cluster resource groups:
 - At least one node must be designated as a peer node or the cluster resource group cannot be started.
 - At least one peer node must have a membership status of Active.
6. The cluster resource group status must be either Inactive or Indoubt.
7. For a device cluster resource group:
 - a. The cluster resource group must have at least one configuration object entry.
 - b. The configuration objects specified for the cluster resource group must exist on all active nodes in the recovery domain and the resource name specified in a configuration object must be the same on all active nodes in the recovery domain.
 - c. The primary node must be the current owner of all input/output processors or high-speed link I/O bridges for the devices in the cluster resource group.
 - d. Hardware configuration must be complete so that the physical hardware has been associated with the configuration object. In particular for auxiliary storage pools, the disk units must have been assigned.
 - e. The input/output processor or high-speed link I/O bridge controlling the devices specified in the cluster resource group must be accessible by all active nodes in the cluster resource group's recovery domain.

Top

Parameters

Keyword	Description	Choices	Notes
CLUSTER	Cluster	<i>Name</i>	Required, Positional 1
CRG	Cluster resource group	<i>Name</i>	Required, Positional 2
EXITPGMDTA	Exit program data	<i>Character value, *SAME</i>	Optional

Top

Cluster (CLUSTER)

Specifies the cluster containing the cluster resource group.

This is a required parameter.

name Specify the name of the cluster.

Top

Cluster resource group (CRG)

Specifies the cluster resource group to be started.

This is a required parameter.

name Specify the name of the cluster resource group.

Top

Exit program data (EXITPGMDTA)

Specifies up to 256 bytes of data that is passed to the cluster resource group exit program when it is called. This parameter may contain any scalar data except pointers. For example, it can be used to provide state information. This data will be stored with the specified cluster resource group and copied to all nodes in the recovery domain. Pointers in this area will not resolve correctly on all nodes and should not be placed in the data. The data specified will replace the existing exit program data stored with the cluster resource group. If blanks are specified, then the exit program data stored with the cluster resource group will be cleared. This parameter must be set to *SAME if no exit program is specified for the cluster resource group.

*SAME

The exit program data stored with the cluster resource group specified will be passed to the exit program.

character-value

Specify the data to be passed to the exit program.

Top

Examples

```
STRCRG CLUSTER(MYCLUSTER) CRG(MYCRG)
        EXITPGMDTA('important information')
```

This command enables resiliency of the cluster resource group MYCRG in the cluster MYCLUSTER. The exit program, when called, is passed 'important information' in the exit program data field. The cluster resource group will be ACTIVE as a result of this command.

Top

Error messages

*ESCAPE Messages

HAE001B

Cluster resource group &1 not started.

[Top](#)

Work with ASP Copy Description (WRKASPCPYD)

Where allowed to run: All environments (*ALL)
Threadsafe: No

Parameters
Examples
Error messages

The Work with Auxiliary Storage Pool Copy Descriptions (WRKASPCPYD) command displays a panel of existing auxiliary storage pool (ASP) copy descriptions and identifies any copy sessions they may have.

Restrictions:

- You must have use (*USE) authority to the ASP device descriptions that are displayed.

Top

Parameters

Keyword	Description	Choices	Notes
ASPCPY	ASP copy	Name, <u>*ALL</u>	Optional, Positional 1

Top

ASP copy (ASPCPY)

Specifies the name of the ASP copy description that you wish to work with.

*ALL All ASP copy descriptions are displayed.

name Specify the name of the ASP copy description you wish to work with.

Top

Examples

Example 1: Work with All ASP Copy Descriptions

```
WRKASPCPYD
```

This command displays all ASP copy descriptions.

Example 2: Work with a Specific ASP Copy Description

```
WRKASPCPYD  ASPCY (ORDER)
```

This command displays the ASP copy description named ORDER.

Top

Error messages

*ESCAPE Messages

CPF9801

Object &2 in library &3 not found.

CPF9802

Not authorized to object &2 in &3.

CPF9899

Error occurred during processing of command.

HAE002B

&1 command failed.

Top

Work with Cluster (WRKCLU)

Where allowed to run: Interactive environments (*INTERACT
*IPGM *IREXX *EXEC)
Threadsafe: Yes

Parameters
Examples
Error messages

The Work with Cluster (WRKCLU) command is used to display and to work with cluster nodes and objects. When you run this command, the Work with Cluster display is shown.

Options are available from Work with Cluster to display cluster information, display current cluster performance and configuration information, work with the nodes in the cluster, work with the device domains in the cluster, work with the cluster resource groups in the cluster, work with the administrative domains in the cluster and gather debug information.

Top

Parameters

Keyword	Description	Choices	Notes
OPTION	Option	*SELECT, *CLUINF, *CFG, *NODE, *DEVDMN, *ADMDMN, *CRG, *SERVICE	Optional, Positional 1

Top

Option (OPTION)

Specifies the cluster information you want to work with.

*SELECT

Display the Work with Cluster menu.

*CLUINF

Display cluster information.

***CFG** Display the performance and configuration parameters for the cluster.

*NODE

Display the Work with Cluster Nodes panel which is a list of nodes in the cluster.

*DEVDMN

Display the Work with Device Domains panel which is a list of device domains in the cluster.

***CRG** Display the Work with Cluster Resource Groups panel which is a list of cluster resource groups in the cluster.

*ADMDMN

Display the Work with Administrative Domains panel which is a list of administrative domains in the cluster.

*SERVICE

Gathers related trace and debug information for all cluster resource service jobs in the cluster. This information is written to a file with a member for each cluster resource service job.

Use this option only when directed by your service provider. It will display a prompt panel for the Dump Cluster Trace (DMPCLU TRC) command.

Examples

Example 1: Displaying a list of nodes in the cluster.

```
WRKCLU OPTION(*NODE)
```

This command displays a list of all nodes in the cluster and detailed information about each node.

Example 2: Getting a list of cluster resource groups that are currently known to the cluster.

```
WRKCLU OPTION(*CRG)
```

This command will provide a list of cluster resource groups. It contains options to get more information about the specifics of a cluster resource group.

Error messages

*ESCAPE Messages

CPF1999

Errors occurred on command.

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