AIX Version 7.1

Cluster Data Aggregation Tool User's Guide and Reference

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Note
Before using this information and the product it supports, read the information in "Notices" on page 23.

This edition applies to AIX Version 7.1 and to all subsequent releases and modifications until otherwise indicated in new editions.

Contents

About this document

This document provides users and system administrators with complete information about Cluster Data Aggregation Tool (CDAT). AIX® Cluster Data Aggregation Tool provides a single instance to launch RAS debug and monitoring actions, and to collect problem determination data for multiple nodes.

Highlighting

The following highlighting conventions are used in this document:

Bold	Identifies commands, subroutines, keywords, files, structures, directories, and other items whose names are predefined by the system. Also identifies graphical objects such as buttons, labels, and icons that the user selects.
Italics	Identifies parameters whose actual names or values are to be supplied by the user.
`Monospace`	Identifies examples of specific data values, examples of text similar to what you might see displayed, examples of portions of program code similar to what you might write as a programmer, messages from the system, or information you should actually type.

Case-sensitivity in

Everything in the AIX operating system is case-sensitive, which means that it distinguishes between uppercase and lowercase letters. For example, you can use the **ls** command to list files. If you type `LS`, the system responds that the command `is not found`. Likewise, **FILEA**, **FiLea**, and **filea** are three distinct file names, even if they reside in the same directory. To avoid causing undesirable actions to be performed, always ensure that you use the correct case.

ISO 9000

ISO 9000 registered quality systems were used in the development and manufacturing of this product.

CDAT user's guide and reference

CDAT (Cluster Data Aggregation Tool) provides a single instance to launch RAS debug and monitoring actions, and to collect problem determination data for multiple nodes. To use the information effectively, you must be familiar with commands, system calls, subroutines, file formats, and special files. This topic is also available on the documentation CD that is shipped with the AIX operating system.

The Cluster Data Aggregation Tool environment is made of a central master node and remote nodes. The Cluster Data Aggregation Tool is installed on and executed from the central master node. The central master node hosts the data collection repository, which is a new file system that contains all the collection data from multiple remote nodes. The remote nodes are the locations where the Cluster Data Aggregation Tool data are collected that are the AIX LPAR, VIOS, and HMC. The Cluster Data Aggregation Tool is managed by the **cdat** command that is divided into several subcommands. The subcommands are **access**, **archive**, **check**, **collect**, **delete**, **discover-nodes**, **init**, **list-nodes**, **list-types**, and **show**.

Cluster Data Aggregation Tool

AIX Cluster Data Aggregation Tool provides a single instance to launch RAS debug and monitoring actions, and to collect problem determination data for multiple nodes. The Cluster Data Aggregation Tool environment is made of a central master node and remote nodes.

Overview

AIX Cluster Data Aggregation Tool provides a single instance to launch RAS debug and monitoring actions, and to collect problem determination data for multiple nodes.

The Cluster Data Aggregation Tool is installed on and executed from the central master node. The central master node hosts the data collection repository, which is a new file system that contains all the collection data from multiple remote nodes. The remote nodes are where Cluster Data Aggregation Tool data are collected, which are AIX LPAR, VIOS, and HMC.

Cluster Data Aggregation Tool has following features.

- Captures problem determination data across multiple nodes.
- Supports sending data gathering tool on remote nodes.
- Provides extensible plug-in feature that supports new data collection types for user.
- Integrates with RBAC to enable non-root user to collect Cluster Data Aggregation Tool data.
- Relies on SSH for secure connectivity between nodes.
- Is controlled via CLI and SMIT panel.

The Cluster Data Aggregation Tool command is named **cdat**. It is divided into several subcommands. The subcommands are **init**, **show**, **check**, **delete**, **discover-nodes**, **list-nodes**, **access**, **collect**, **list-types**, and **archive**. The **init** subcommand creates the data infrastructure and defines the user used to run all other subcommands.

The Cluster Data Aggregation Tool provides a smit interface. It can be launched from the Problem Determination menu or using the fast path **cdat** (smit cdat).

To capture problem determination data across multiple nodes, the collect framework provides the following features:

- It coordinates invocation of Cluster Data Aggregation Tool data gathering. For second failure data capture (SFDC) it replaces the need for customers to manually start data gathering across multiple nodes, and synchronizes the start and stop of data collection instance across multiple nodes.
- Retrieving RAS and monitoring data from multiple nodes, it provides an easy way to collect them from multiple remote nodes and place onto a single central node. The RAS tools need to be pushed out to multiple nodes.
- The Cluster Data Aggregation Tool framework data can be gathered from the AIX LPAR, VIOS, and HMC
- The central node supports AIX only. The remote nodes supports HMC (Linux) and AIX. The central node as a host supports AIX Version 6.1 and above releases.

The data collection repository should be large enough to contain all the data collections under a single place. The default size is 10 GB.

The Cluster Data Aggregation Tool data type collection supports data collections for some tools, like **perfpmr**, **snap**, **trace**. Cluster Data Aggregation Tool framework provides a capability for plug-in additional data collection types as needed.

The Cluster Data Aggregation Tool framework is initialized by the root user. A non-root user is created during the tool initialization, and is used for subsequent tool subcommands. Additionally, the framework allows to create a non-admin user on the remote nodes that will be used during data collection. The user is assigned AIX roles with necessary authorizations, which will ensure RAS commands (**snap**, **dump**, **trace**, **iptrace**, **perfpmr**) can be executed by this user.

The core of the Cluster Data Aggregation Tool framework is a standalone command line base. The root user or the specified non-admin user is able to initialize The Cluster Data Aggregation Tool and capture data by running commands.

The Cluster Data Aggregation Tool configuration is simple. The Cluster Data Aggregation Tool Framework supports configuration changes, such as a user may want to add or remove nodes or change the configuration information for a node.

CDAT command

The Cluster Data Aggregation Tool command is named **cdat**.

Purpose

The Cluster Data Aggregation Tool is divided into several subcommand.

Description

The **cdat** command is divided into several subcommand. The subcommand are **init**, **show**, **check**, **delete**, **discover-nodes**, **list-nodes**, **access**, **collect**, **list-types**, and **archive**. Only the **init** subcommand needs to be executed by the privileged user (root). The **init** subcommand creates the data infrastructure and defines the user used to run all other subcommand.

Note: To prevent concurrent accesses to the **nodes.txt** file or to the **collect.xml** file, running multiple instances of the **cdat** command on the same repository is forbidden and the repository is protected by a lock file.

Syntax

```
cdat -h <subcommand> [<options....>]
```

Flags

Flag	Description
-h	Displays command usage.
subcommand	Specifies the subcommand name, among: • init • show • check • delete • discover-nodes • list-nodes • access • collect • list-types • archive

Output

If used with **-h** or with an unknown subcommand, the command prints the help, otherwise the output is the subcommand output.

Return Code

If used with **-h** or with an unknown subcommand, the return code is **1**. Otherwise the return code is the return code of the subcommand.

cdat init subcommand

Purpose

Initializes the Cluster Data Aggregation repository.

Description

The **init** subcommand initializes the Cluster Data Aggregation repository. This subcommand must be run by the privileged user **root**.

You can specify the name of the directory for the repository (**/cdat** by default). You can request to create a specific file system. In that case, you can specify the name of the volume group and the size. You can specify the logical volume. It also allows you to define which user will run the **cdat** command to collect data. The default user is **cdat**.

Syntax

```
cdat init -h
cdat init [-c [-g VGName] [-s FSSize]] [-d Directory] [-l LVName] [-u User]
```

Flags

Flag	Description
-h	Displays command usage.
-d `Directory`	Specifies the directory to use as the repository.
-u `User`	Specifies the user to run the **cdat** subcommand.
-c	Creates a logical volume mounted on the cdat directory path.
-g `VGName`	Selects the volume group to use to create the logical volume.

Flag	Description
-l LVName	Specifies the name of the new logical volume to use.
-s FSSize	Specifies the size of the logical volume.

Output

If the subcommand is used with **-h** or with an invalid parameter, the subcommand prints the help. The command displays the name of the cdat user and then requests a password. The command displays the name of the directory that is used to store the collect data.

Example

```
# cdat init
Creating user "cdat"
Changing password for "cdat"
cdat's new password: *********
Re-enter cdat's new password: ********
creating directory "/cdat"
```

Return code

If the subcommand is used with **-h** or with an invalid parameter, the return code is 1. If the command fails to create the user or to set the user's password, the return code is 2. If the command fails to create the directory, the return code is 3. If the command fails to create the logical volume, the return code is 4. Otherwise, the return code is 0.

cdat show subcommand

Displays content of the Cluster Data Aggregation repository.

Purpose

Displays the content of the Cluster Data Aggregation repository.

Description

The **show** subcommand displays the content of the Cluster Data Aggregation repository. A first level of verbosity only displays global collection information. A second level also displays the node information.

You can specify to display by node or by collect Id (by default). You can specify a collect Id, a PMR number, or a node to filter the output. You can use verbose mode to display more information.

Syntax

```
cdat show -h
cdat show [-v]
cdat show [-v] Id
cdat show [-v] -p PMR
cdat show [-v] -n [Host]
```

Flags

Flag	Description
-h	Displays command usage.
-v	Enables verbose mode. Displays node information.
-n	Displays the list ordered by node.
`Id`	Specifies the name of the collection.
-p	Specifies the PMR number of the collection.
`PMR`	

Output

If the subcommand is used with **-h** or with an invalid parameter, the subcommand prints the help. Otherwise, the command displays information you requested.

The **cdat show** command without specifying a parameter displays the list of collections:

```
# cdat show
Repository: /cdat
Local user: cdat

1: 20090127-12:23:45+0200

    Collect perfpmr data to identify the cause of performance trouble
    PMR: 12345,678,901
    Location: /cdat/00000001/

2: 20090212-18:30:25+0200

    Gather system configuration information with snap for analysis
    PMR: 12345,589,235
    Location: /cdat/00000002/
```

With the **-v** parameter, the output is more verbose and displays the nodes involved for each collection:

```
# cdat show -v
Repository: /cdat
Local user: cdat

1: 20090127-12:23:45+0200

    Collect perfpmr data to identify the cause of performance trouble
    PMR: 12345,678,901
    Location: /cdat/00000001/

    node1:
        type : VIOS
        user : padmin
        machine id: 000069EAD300
        lpar id : 1
        timezone : CEST

    node2:
        type : LPAR
        user : root
        machine id: 000069EAD300
        lpar id : 2
        timezone: CEST

    node3:
        type : LPAR
        user : root
        machine id: 000069EAD300
        lpar id : 4
        timezone : CDT
```

```
2: 20090212-18:30:25+0200

    Gather system configuration information with snap for analysis.
    PMR: 12345,589,235
    Location: /cdat/00000002/
[...]
```

The information for only one collection can be displayed by providing the collect Id:

```
# cdat show 1
Repository: /cdat
Local user: cdat

1: 20090127-12:23:45+0200

    Collect perfpmr data to identify the cause of performance trouble.
    PMR: 12345,678,901
    Location: /cdat/00000001/
```

The **-v** option is also available to display nodes information.

The list can also be displayed by node instead of by collection:

```
# cdat show -n
Repository: /cdat
Local user: cdat

node1:

1: 20090127-12:23:45+0200

    Collect perfpmr data to identify the cause of performance trouble.
    PMR: 12345,678,901
    Location: /cdat/00000001/

2: 20090212-18:30:25+0200

    Gather system configuration information with snap for analysis.
    PMR: 12345,589,235
    Location: /cdat/00000002/

node2:

1: 20090127-12:23:45+0200

    Collect perfpmr data to identify the cause of performance trouble
    PMR: 12345,678,901
    Location: /cdat/00000001/

2: 20090127-12:52:07+0200

    Collect IP trace analysis.
    PMR: 12345,678,901
    Location: /cdat/00000002/
[...]
```

The information for one given node is available using the **-n** option:

```
# cdat show -n node1
Repository: /cdat
Local user: cdat

node1:

1: 20090127-12:23:45+0200

    Collect perfpmr data to identify the cause of performance trouble.
```

```
    PMR: 12345,678,901
    Location: /cdat/00000001/

2: 20090212-18:30:25+0200

    Gather system configuration information with snap for analysis.
    PMR: 12345,589,235
    Location: /cdat/00000002/
```

The **-v** option is also available to display nodes information for each collection.

The list of collects for a given PMR is available using the **-p** option:

```
# cdat show -p 12345,678,901
Repository: /cdat
Local user: cdat

5: 20090127-12:23:45+0200

    Collect perfpmr data to identify the cause of performance trouble.
    PMR: 12345,678,901
    Location: /cdat/00000005/

8: 20090212-18:30:25+0200

    Gather system configuration information with snap for analysis.
    PMR: 12345,678,901
    Location: /cdat/00000008/
```

The **-v** option is also available to display nodes information for each collection.

Return code

If the subcommand is used with **-h** or with an invalid parameter, the return code is 1. If the command fails, the return code is 2. Otherwise the return code is 0.

cdat check subcommand

To check consistency of the Cluster Data Aggregation repository, the **check** subcommand is used.

Purpose

The **check** subcommand checks consistency of the Cluster Data Aggregation repository.

Description

The **check** subcommand checks consistency between the **cdat.xml** file that contains the description of the repository and the real content of the Cluster Data Aggregation repository.

If you specify the **-d** option, it can correct possible inconsistencies (this operation is interactive).

Syntax

```
cdat check -h
cdat check [-d]
```

Flags

Flag	Description
-h	Displays command usage.
-d	Specifies the files that must be corrected if required.

Output

If used with **-h** or with an invalid parameter, the subcommand prints the help. During the processing, the command displays the list of discovered inconsistencies. It asks for confirmation before repairing.

Return Code

If used with **-h** or with an invalid parameter, the return code is 1. If the command detects some inconsistencies, the return code is 2. Otherwise the return code is 0.

cdat delete subcommand
Purpose

Removes the specified collections from the Cluster Data Aggregation repository.

Description

The **delete** subcommand removes entries from the **cdat.xml** file and from the Cluster Data Aggregation repository for the specified collections.

Each collection is identified by an Id. Either you can specify a collect Id to suppress the specified collection or you can specify a PMR number to suppress all the collections relative to the specified PMR number.

Syntax

```
cdat delete -h
cdat delete -p PMR
cdat delete Id
```

Flags

Flag	Description
-h	Displays command usage.
`Id`	Specifies the Id of the collection to delete.
-p	Specifies the PMR number of the collections to be deleted.
`PMR`	

Output

If the subcommand is used with **-h** or with an invalid parameter, the subcommand prints the help. Otherwise, the command displays the list of collections it is deleting.

Return code

If the subcommand is used with **-h** or with an invalid parameter, the return code is 1. If the command fails to delete the collection, the return code is 2. Otherwise, the return code is 0.

cdat discover-nodes subcommand
Purpose

Retrieves the LPAR name of all nodes connected to one or more given HMCs or IVMs.

Description

The **discover-nodes** subcommand retrieves the name of the LPAR connected to the specified list of HMCs. You can specify a Virtual I/O Server (VIOS) instead of an HMC in case an Integrated Virtualization Management (IVM) replaces an HMC. You can also specify an LPAR node to retrieve the workload partition (WPAR) running on this LPAR. You can specify the file where the list of found nodes is stored. By default, the list is stored in the nodes.txt file under the directory specified with the **cdat init subcommand** (/cdat by default). You can execute the **cdat discover-nodes subcommand** several times, and you can append or overwrite the file. Multiple instances of the same node are not recorded in the file.

The result of the **discover-nodes** subcommand can be used as input to the **access** and **run** subcommands. The **discover-nodes** subcommand retrieves LPAR names, which means that if the LPAR name is not the same as the host name, you must edit the file to set the real host name.

Syntax

```
cdat  discover-nodes -h
cdat  discover-nodes [-a|-w] [-f File] -n Type:[User@]Node ...
```

Flags

Flag	Description
-h	Displays command usage.
-w	Specifies that the file must be overwritten.
-a	Specifies that new nodes must be appended to the file.
-f `File`	Specifies the file where the nodes must be stored.
-n `Type:[User@]Node`	Specifies a list of nodes, where **Type** is one of the following values: • HMC • VIOS • LPAR Defines the HMC, VIOS, or LPAR to connect to and possibly the user used to connect to.

Output

If the subcommand is used with **-h** or with an invalid parameter, the subcommand prints the help. Otherwise, the command requests the password for the **hscroot** user (privileged user on an HMC), the **padmin** user (privileged user on an IVM), the **root** user (privileged user on an LPAR), or the specified user. The subcommand then displays the name of the file where the nodes list is written.

Example

```
$ cdat discover-nodes -a -n HMC:uranus -n LPAR:mylpar
hscroot@uranus's Password: ******
root@mylpar's Password: *******
Updating /cdat/nodes.txt
```

Return code

If the subcommand is used with **-h** or with an invalid parameter, the return code is 1. If the command cannot connect to the HMC or IVM, the return code is 2. If the command cannot write data to the file, the return code is 3. Otherwise, the return code is 0.

cdat list-nodes subcommand

Purpose

Displays the list of known nodes.

Description

The **list-nodes** subcommand displays the list of known nodes (the content of the file **nodes.txt**). You can specify one or more node files.

Syntax

```
cdat list-nodes -h
cdat list-nodes [-f File ...]
```

Flags

Flag	Description
-h	Displays command usage.
-f `File`	Specifies the file that contains the list of nodes. Multiple files can be specified using multiple **-f** options.

Output

If the subcommand is used with **-h** or with an invalid parameter, the subcommand prints the help. Otherwise, the command lists the known remote nodes.

Example

```
$ cdat list-nodes
HMC uranus
VIOS miranda
LPAR ariel
LPAR umbriel
LPAR titania
LPAR oberon
```

Return code

If the subcommand is used with **-h** or with an invalid parameter, the return code is 1. If the command is not able to list the nodes, the return code is 2. Otherwise, the return code is 0.

cdat access subcommand

The access authorization to remote nodes is managed by the **access** subcommand.

Purpose

The **access** subcommand manages access authorization to remote nodes.

Description

The **access** subcommand sets up access authorization to the specified remote nodes. It creates the specified users on the remote nodes if they do not already exist and it attributes to these users all the RBAC authorizations required to perform collection of RAS data. It uses the appropriate privileged user to create the user on each node. Accordingly, **hscroot** user is used on HMC, **root** on LPAR and **padmin** on VIOS. The subcommand installs the SSH public key of the **cdat** user on the remote nodes. If the SSH daemon is not available on a remote node, it uses the exec protocol (port 512) if it is available or the telnet protocol to execute commands on the remote node. You can directly specify the list of nodes in the command line or you can specify the file containing the list of nodes. You can specify a default remote user that is used if you do not specify a user for a given node. If you specify the **-d** option, the **cdat** access subcommand removes access authorization to the specified remote nodes previously set up; it also removes the remote users on the remote nodes if they were previously created by the **cdat access** subcommand.

Syntax

```
cdat access -h
cdat access [-dF] [-u User] -n Type:[User@]Node ...
cdat access [-dF] [-u User] -f File ...
```

Flags

Flag	Description
-h	Displays command usage.
-d	Deletes authentication credentials from remote nodes.
-F	Forces operation even if it was already done.
-u `User`	Specifies the user to create on the remote nodes.
-n `Type:[User@]Node`	Specifies the list of nodes to authenticate with, where **Type** is one of: • HMC • LPAR • VIOS **Node** is the name or the IP address of the node to connect to. **User** is the user to create on this particular node (overrides -u).
-f `File`	Specifies the file containing the list of node to authenticate with. Multiple files can be specified using multiple **-f** options.

Output

If used with **-h** or with an invalid parameter, the subcommand prints the help. Otherwise, the command asks for the **cdat** user's password and displays the connection status.

Example

```
$ cdat access -u cdat
"cdat" user password: *********
accessing cdat@uranus
accessing cdat@miranda
accessing cdat@ariel
accessing cdat@umbriel
accessing cdat@titania
accessing cdat@oberon
```

Return code

If used with **-h** or with an invalid parameter, the return code is 1. If the command fails to connect to a remote node, the return code is 2. If the command fails to access nodes list file, the return code is 3. Otherwise the return code is 0.

cdat collect subcommand
Purpose

Starts analysis tools on remote nodes and collects results at the end.

Description

The **collect** subcommand starts analysis tools on remote nodes and collects results at the end.

Similarly to the **access** subcommand, the list of nodes can be provided either on the command line or from a file.

Several collect types can be done in one collection. This subcommand updates the **cdat.xml** file, creates the **collect.xml** file, and gets remote files from nodes to place them into the local Cluster Data Aggregation repository.

Collections might be associated with a product modification request (PMR) number. It is easier to list collection types that are related to the same PMR (using the **show** subcommand) or to remove all collection types related to a specified PMR (using the **delete** subcommand).

Syntax

```
cdat collect [-gqv] [-i Id] [-p PMR] [-m Comment] [-u User] -t Type[,Options] ... -n Type:[User@]Node ...
cdat collect [-gqv] [-i Id] [-p PMR] [-m Comment] [-u User] -t Type[,Options] ... -f File ...
```

Flags

Flag	Description
-h	Displays command usage.
-i `Id`	Specifies the name of the collect.
-p `PMR`	Specifies the PMR number of this collect.
-m `Comment`	Specifies a comment for this collect.
-q	Enables quiet (noninteractive) mode. No questions are asked of the user. The flag is useful for scheduling collects from a cron job.
-v	Enables the verbose mode, and displays additional status information during the collection.
-g	Causes the growth of the file system automatically if needed.
-u `User`	Specifies the user to connect to the remote nodes.
-t `Type[,Options]`	Specifies the type of collect operation to run. Optionally, you can specify options related to the type of collect you want.
-n `Type:[User@]Node`	Specifies the nodes to connect to and, optionally, the user to use.
-f `File`	Specifies the file containing the list of nodes to connect to. Multiple files can be specified using multiple **-f** options.

Output

If the sub command is used with **-h** or with an invalid parameter, the subcommand prints the help.

Return code

If the sub command is used with **-h** or with an invalid parameter, the return code is 1. If the collect operation fails, the return code is 2. Otherwise, the return code is 0.

Related information:

"Custom collect scripts" on page 18
You can find the information on a set of six phases for the collect operation: check, init, execute, terminate, grab, and clean that the Cluster Data Aggregation Tool framework defines.

cdat list-types subcommand
Purpose

Displays the list of installed collect types and their descriptions.

Description

The **list-types** subcommand displays the list of installed collect types along with their descriptions. It searches for collect types in the **/usr/lib/cdat/types/** and the **/var/adm/ras/cdat/** directories, and in directories specified by the **CDAT_TYPE** environment variable (separated by a colon). All directories that contain a **manifest.xml** file are considered as a valid collect type.

Syntax

```
cdat list-types -h
cdat list-types [-v]
```

Flags

Flag	Description
-h	Displays command usage.
-v	Enables verbose output and displays the usage of collect types.

Output

If the subcommand is used with **-h** or with an invalid parameter, the subcommand prints the help. Otherwise, the command lists the installed collect types.

Example

```
$ cdat list-types -v
List of available collect types:

trace (/usr/lib/cdat/types/trace):     \\Records selected system events from nodes of type AIX LPAR or VIOS.
Usage: trace [-d duration] -- [trace_options]
-d duration                            \\duration of collect in seconds (default is 30)
trace_options AIX trace(5) command options

perfpmr (/usr/lib/cdat/types/perfpmr):  \\Retrieves the result of the perfpmr command from nodes of type AIX LPAR.
Usage: perfpmr [-d duration]
-d duration                             \\duration of collect in seconds (default is 600)

snap (/usr/lib/cdat/types/snap):        \\Gathers system configuration information from nodes of type AIX LPAR or VIOS.
Usage: snap [snap_options]
snap_options AIX snap(5) command options (default is -a)
```

Return code

If the subcommand is used with **-h** or with an invalid parameter, the return code is 1. If the command is not able to list the collect types, the return code is 2. Otherwise, the return code is 0.

cdat archive subcommand

To create a compressed archive **tar.Z** of collects stored in the repository, the **archive** subcommand can be used .

Purpose

The **archive** subcommand can be used to create a compressed archive **tar.Z** of collects stored in the repository.

Description

The **archive** subcommand can be used to create a compressed archive **tar.Z** of collects stored in the repository. It is possible to archive all collects associated with a given PMR number or a collect specified by its name.

Syntax

```
cdat archive -h
cdat archive [-f File] -p PMR
cdat archive -f File Id
```

Flags

Flag	Description
-h	Displays command usage.
Id	Specifies the identifier of the collect to be archived.
-p	Specifies the PMR number of the collects to be archived.
PMR	
-f	Specifies the name of the archive to be created. In case where **-p** is specified, the default filename is PMR.tar.Z, PMR is the PMR number.
FILE	

Output

If used with **-h** or with an invalid parameter, the subcommand prints the help. Otherwise the command creates an archive containing all the collects corresponding to the specified PMR number or collect name. The archive contains all the directories of the collects as well as a text file (**README**) describing the collects. This text file is the output of the **cdat show -v** command on the specified PMR number or collect name.

Example

```
% cdat archive -p 12345,123,123 -f archive.tar.Z
% uncompress -c archive.tar.Z | tar tf -
README
mycollect/
mycollect/logs.txt
mycollect/trace/
mycollect/trace/fleuret_ios/
mycollect/trace/fleuret_ios/logs.txt
mycollect/trace/fleuret_ios/trcfile
mycollect/trace/fleuret_ios/trcfmt
mycollect/trace/mnffdc1/
mycollect/trace/mnffdc1/logs.txt
mycollect/trace/mnffdc1/trcfile
mycollect/trace/mnffdc1/trcfmt
mycollect/trace/sohmc/
mycollect/trace/sohmc/logs.txt
mycollect/trace/sohmc/errors.txt
mycollect/trace/mnffdc2/
mycollect/trace/mnffdc2/logs.txt
mycollect/trace/mnffdc2/trcfile
mycollect/trace/mnffdc2/trcfmt
```

Return code

If used with **-h** or with an invalid parameter, the return code is 1. If the command is not able to create the archive, the return code is 2. Otherwise the return code is 0.

Periodic collections

It is possible to schedule periodic data collections using the **crontab(1)** command.

For example, to run the **snap** collect type every day at midnight:

```
% crontab -e cdat
0 0 * * * /usr/bin/cdat collect -q -t snap -f /cdat/nodes.txt
```

With this configuration, **cdat** creates a new directory under **/cdat** (and a new collect Id) every day at midnight that will contain the snap data for each node present in **/cdat/nodes.txt**. It is possible (but not mandatory) to overwrite previous snap collections by specifying a collect Id to the collect subcommand by using the -i option:

```
% crontab -e cdat
0 0 * * * /usr/bin/cdat collect -q -t snap -i my_daily_snap -f /cdat/nodes.txt
```

In this case, the same directory is used for all collections. Only the last valid snap data is kept for each node present in **/cdat/nodes.txt**. Older snap data is overwritten. Removing a previously scheduled collections can be done by running the **crontab -e cdat** command and by removing the appropriate entry from the file. Scheduled collections can be managed transparently from the SMIT menus, which avoids the, manual manipulation of the **crontab**.

Log files

Log files can be used to diagnose problems encountered during a collection.

There are two types of log files, one per-collect log file that contains synchronization information between nodes and one per-node log file that contains information about collection phases and remote commands. A log file is named logs.txt and is located in the collect directory, for example, **/cdat/00000001/**, or the node directory for example, **/cdat/00000001/trace/node1**, respectively, for a per-collect log file or for a per-node log file. Each line in a log file is prefixed with a time stamp of the central node.

Here is an example of a *per-collect log file* for the trace collect on the node1 node:

```
% cat /cdat/00000001/logs.txt
2010-07-29 09:17:42: Creating "/cdat/00000001/collect.xml"
2010-07-29 09:17:42: Retrieving node information for node1
2010-07-29 09:17:44: Starting collect type "trace"
2010-07-29 09:17:44: Creating directory "/cdat/00000001/trace"
2010-07-29 09:17:44: Creating directory "/cdat/00000001/trace/node1"
2010-07-29 09:17:44: Starting "check" phase on node1 (LPAR): pid 5570774
2010-07-29 09:17:44: Waiting for children to terminate
2010-07-29 09:17:44: pid 5570774 (node1) terminated with exit status 0
2010-07-29 09:17:44: Starting "init" phase on node1 (LPAR): pid 5570776
2010-07-29 09:17:44: Waiting for children to terminate
2010-07-29 09:17:44: pid 5570776 (node1) terminated with exit status 0
2010-07-29 09:17:44: Starting "execute" phase on node1 (LPAR): pid 5570778
2010-07-29 09:17:44: Waiting for children to terminate
2010-07-29 09:17:46: pid 5570778 (node1) terminated with exit status 0
2010-07-29 09:17:46: Starting "terminate" phase on node1 (LPAR): pid 5570780
2010-07-29 09:17:46: Waiting for children to terminate
2010-07-29 09:17:47: pid 5570780 (node1) terminated with exit status 0
2010-07-29 09:17:47: Starting "grab" phase on node1 (LPAR): pid 5570782
2010-07-29 09:17:47: Waiting for children to terminate
2010-07-29 09:17:49: pid 5570782 (node1) terminated with exit status 0
2010-07-29 09:17:49: Starting "clean" phase on node1 (LPAR): pid 5570784
2010-07-29 09:17:49: Waiting for children to terminate
2010-07-29 09:17:50: pid 5570784 (node1) terminated with exit status 0
```

Here is an example of a *per-node log file* for the trace collect for the node1 node:

```
% cat /cdat/00000001/trace/node1/logs.txt
*** "check" phase ***
Running "/usr/lib/cdat/types/trace/trace -d1"
*** "init" phase ***
Running "/usr/lib/cdat/types/trace/trace -d1"
*** "execute" phase ***
Running "/usr/lib/cdat/types/trace/trace -d1"
Running remote command "LANG=C /usr/sbin/trace -a -o /tmp/cdat.trc " on "node1" as user "cdat"
Return code 0
*** "terminate" phase ***
Running "/usr/lib/cdat/types/trace/trace -d1"
Running remote command "LANG=C /usr/bin/trcstop" on "node1" as user "cdat"
```

```
Return code 0
*** "grab" phase ***
Running "/usr/lib/cdat/types/trace/trace -d1"
Retrieving /tmp/cdat.trc from LPAR node1 using SCP
Retrieving /etc/trcfmt from LPAR node1 using SCP
*** "clean" phase ***
Running "/usr/lib/cdat/types/trace/trace -d1"
Running remote command "rm -f /tmp/cdat.trc" on "node1" as user "cdat"
Return code 0
```

Collect types

The Cluster data Aggregation framework provides you with a set of collect types.

The set of default collect type are : **snap**, **perfpmr**, and **trace**.

Default collect types

The default collect types are as follows:

- **snap:** Collects snap data from an AIX LPAR or VIOS.
- **perfpmr**: Collects **perfpmr** data from an AIX LPAR.
- **trace**: Tracks trace data from an AIX LPAR or VIOS.

snap collect type

The snap collect type runs the **snap** command with the specified options on an AIX LPAR or VIOS and retrieves the content of the `/tmp/ibmsupt` directory in the central repository. The snap collect type supports all the options supported by the AIX **snap** command.

Example

An example of a snap (default is `snap -a`) collect for two nodes (one for AIX LPAR and another for VIOS) follows:

```
% cdat collect -t snap -n LPAR:root@lpar1 -n
VIOS:padmin@vios1
```

perfpmr collect type

The **perfpmr** collect type installs the **perfpmr** command on an AIX LPAR (for example, `perf61.tar.Z`) and runs it with the`perfpmr.sh 600` command.

The **perfpmr** collect type retrieves the file produced by `perfpmr.sh -o perfdata -z` on the central repository under the `perfpmr.pax.gz` directory. The perfpmr collect type supports the option **-d <duration>** that specifies the duration of the analysis in seconds (default is 600 seconds). If no version of the perfpmr tool matches the Operating System level of a remote node (for example, `perf61.tar.Z` for AIX 6.1) under the `/usr/lib/cdat/types/perfpmr/` directory, the perfpmr collect type fails for that node and you must download the appropriate version of perfpmr for the node and copy it under the`/usr/lib/cdat/types/perfpmr/` directory.

Examples

An example for the collect type follows:

```
Phase "check" of collect type "perfpmr" failed for node lpar1:
### BEGIN REASON
/usr/lib/cdat/types/perfpmr/perf61.tar.Z not found.
Please install a version of PERFPMR suitable for AIX 6.1.3.0 under
/usr/lib/cdat/types/perfpmr/perf61.tar.Z.
You may find it at the following URL:
ftp://ftp.software.ibm.com/aix/tools/perftools/perfpmr/
### END REASON
```

An example for a perfpmr collect (duration equals 60 seconds) for the two AIX LPAR nodes follows:

```
% cdat collect -t perfpmr,"-d 60" -n LPAR:lpar1 -n LPAR:root@lpar2
```

Note: You might retrieve the perfpmr package (for instance `perf61.tar.Z`) at `ftp://ftp.software.ibm.com/aix/tools/perftools/perfpmr` and select the appropriate version (for `perf61` download `perf61.tar.Z`forAIX).

trace collect type

The trace collect type runs the command **trace -a** on an AIX LPAR or VIOS.

The trace collect type holds for the specified number of seconds and then runs the **trcstop** command. It retrieves the trace file on the central repository under the `trcfile` file. The trace collect type supports the option **-d <duration>**, which specifies the duration of the trace in seconds (default is 30 seconds). Options can be passed to the AIX trace(5) command that are separated from script options by the `--` symbol.

Example

The following command can be run:

```
% cdat collect -t trace,"-d 60 –- -j 492" -n LPAR:lpar1 \
     -n LPAR:root@lpar2
```

This command runs the **trace** command with option `-j 492` during 60 seconds on nodes `lpar1` and `lpar2`

Extending the framework

This section describes how to extend the framework.

You can define a new type of collect in any of the following ways:

1. Creating a directory with the name of the new collect type in the `/var/adm/ras/cdat/` directory.
2. Creating a manifest XML file within the directory that describes the function of the newly added collect type.
3. Writing a script within the directory to perform the collect operation.

Format of the manifest.xml file

A manifest.xml file describes what a collect type is and what options it supports.

An example of a manifest.xml file for the **trace** collect type follows:

```
<?xml version="1.0"?>
<manifest>
    <description>
        Retrieve trace data from remote nodes.
    </description>
    <script-arg id="d" mandatory="0" default="30"
        <description>Duration in seconds</description>
    </script-arg>
    <pass-through-arg default="-a">
        <description>AIX trace(5) command options</description>
    </pass-through-arg>
</manifest>
```

The XML Schema Definition for the manifest.xml file follows:

```
<?xml version="1.0"?>
<xs:schema xmlns:xs="http://www.w3.org/2001/XMLSchema">
  <xs:element name="manifest">
    <xs:complexType>
      <xs:sequence>
```

```
        <xs:element name="description"/>
        <xs:element name="script-arg">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="description"/>
            </xs:sequence>
            <xs:attribute name="id" type="xs:string" use="required"/>
            <xs:attribute name="mandatory" type="xs:integer" use="required"/>
            <xs:attribute name="default" type="xs:string" use="required"/>
          </xs:complexType>
        </xs:element>
        <xs:element name="pass-through-arg">
          <xs:complexType>
            <xs:sequence>
              <xs:element name="description"/>
            </xs:sequence>
            <xs:attribute name="default" type="xs:string" use="required"/>
          </xs:complexType>
        </xs:element>
      </xs:sequence>
    </xs:complexType>
  </xs:element>
</xs:schema>
```

Custom collect scripts

You can find the information on a set of six phases for the collect operation: check, init, execute, terminate, grab, and clean that the Cluster Data Aggregation Tool framework defines.

A collect type might provide a script or an executable to implement those phases. Not all phases are required, and if a given phase is not implemented, this phase is ignored. There is a synchronization point after each phase; that is, that is the framework waits for the previous phase to finish on all nodes before starting the next phase.

- The purpose of the **check** phase is to verify that the collect operation can be performed on the remote node. The process include steps such as checking the OS level of the remote node and checking the disk space.
- The purpose of the **init** phase is to set up the environment that is required for the execution of the collect. The process include the installation of file sets or scripts on the remote node. It is best to use the push_file service to copy files to the remote node.
- The purpose of the **execute** phase is to start the collect process on the remote nodes.
- The purpose of the **terminate** phase is to stop the collect process on the remote nodes such that the result of the collect is available.
- The purpose of the **grab** phase is to retrieve the collected data from the remote node and to copy it into the destination directory. Use the get_file service to retrieve files or directories from a remote node because this service manages the authentication with the remote node automatically and is capable of extending the size of the repository when required.
- The purpose of the **clean** phase is to perform cleanup on the local or remote node. The process include the removal of temporary files or the removal of file sets installed during the init phase from the remote node. Notice that the clean phase is always performed, even if the collect fails or is interrupted.

A custom collect script must be provided to implement phases such as `check`, `init`, `execute`, `terminate`, `grab`, and `clean`. It is not mandatory to implement all the phases. For example, you are not required to provide an `init` or `terminate` implementation, if no special action is being performed during those phases. The script is written in any programming language (scripts or compiled binaries). You call the `push_file`, `get_file`, `mlog`, and `remote_cmd` services provided by the Cluster Data Aggregation Tool framework from the custom scripts to transfer files, log messages, or run commands on a remote node.

Each implemented phase of the custom script must follow the rules that are described for the return codes:

Return value	Description
0	Indicates that the collect phase succeeded.
1	Indicates that the current remote node should be ignored in subsequent phases.
More than 128	Indicates that an error occurred during the execution of the phase. The framework calls the **clean** phase when such an error occurs.

A collect script is invoked with the following environment variables (set by the framework):

Variable name	Description
CDAT_DEST_DIR	Specifies the directory on the master node where the data collected on the remote node is stored.
CDAT_HOST	Specifies the host name of the remote node.
CDAT_PHASE	Specifies the phase to be executed.
CDAT_PMR	If set, specifies the PMR number associated with the current collect.
CDAT_SRVC_DIR	Specifies the path on the master node to the **get_file**, **push_file**, **remote_cmd**, and **mlog** services.
CDAT_TYPE	Specifies the node type (that is, LPAR, HMC, VIOS, or PSCALE).
CDAT_TYPE_DIR	Specifies the directory that contains the script for the current collect type.
CDAT_USER	Specifies the user name to log into the remote node.

Example

An example of a new collect type definition that retrieves the content of the `/var/adm/ras/errlog` file from remote nodes (of type AIX LPAR) follows:

1. Create a new directory under the `/var/adm/ras/cdat/` directory:
   ```
   % mkdir -p /var/adm/ras/cdat/myerrlog
   ```
2. Create the `manifest.xml` file:
   ```
   % vi /var/adm/ras/cdat/myerrlog/manifest.xml
    <?xml version="1.0"?>
    <manifest>
    <description>Retrieve the content of the /var/adm/ras/errlog file.</description>
    </manifest>
   ```

   Note: You can also create localized manifest.xml files by adding a local suffix (for example, the manifest.fr_FR.xml file for French).
3. Create the script that fetches the `errlog` file. In the following example, only the grab phase is implemented because there is no command to generate the file (no execute phase).
   ```
   % vi /var/adm/ras/cdat/myerrlog/myerrlog
   #!/bin/sh
   if [ $CDAT_PHASE = "grab" ]; then
       $CDAT_SRVC_DIR/get_file /var/adm/ras/errlog
       if [ $? -ne 0 ] ; then
           $CDAT_SRVC_DIR/mlog 0 "Could not retrieve errlog from $CDAT_HOST"
           exit 128
       fi
   fi
   exit 0
   ```
4. Verify whether the new collect type is added and detected, by running the following command:
   ```
   % cdat list-types
   ```

   The preceding command lists all the available collect types.

   The following command retrieves the content of the `/var/adm/ras/errlog` file:

   ```
   ... myerrlog (/var/adm/ras/cdat/myerrlog)
   ```
5. Run the new collect type:
   ```
   % cdat collect -t myerrlog -n LPAR:root@mylpar1 -n LPAR:root@mylpar2
   ```

Related concepts:
"cdat collect subcommand" on page 11

Framework helpers

The framework provides a set of services to collect scripts that you use to log messages, to execute commands on remote nodes, or to transfer files between remote nodes and the central master node.

To be portable, collect scripts use these services to accomplish those actions instead of creating your own. These services allow the collect scripts to ignore the underlying transport protocol, which is used to connect to remote nodes such as Secure Shell (SSH), Remote Execution Protocol (REXEC), Telnet, and File Transfer Protocol (FTP).

remote_cmd service

Use the **remote_cmd** service to execute commands on the remote nodes.

Information about how to connect to the remote node is retrieved from the **CDAT_USER, CDAT_HOST**, and **CDAT_TYPE** environment variables. The **remote_cmd** service might use SSH, REXEC, or Telnet to execute the command on the remote node. If logging to the remote node requires a password (for example, no preauthentication phase was performed for this node), the **remote_cmd** service will fail.

Syntax

```
remote_cmd <command>
```

push_file service

Use the **push_file** service to copy files or directories from the central master node to a remote node.

Information about how to connect to the remote node is retrieved from the **CDAT_USER, CDAT_HOST**, and **CDAT_TYPE** environment variables. The **push_file** service might use Secure Copy Protocol (SCP) or File Transfer Protocol (FTP) to copy the files to the remote node. If copying a file to the remote node requires a password (for example, no preauthentication phase was performed for this node), the **push_file** service will fail.

Syntax

```
push_file <local file>....<remote directory>
```

get_file service

Use the **get_file** service to copy files or directories from the remote node to the central master node. Information about how to connect to the remote node is retrieved from the **CDAT_USER, CDAT_HOST**, and **CDAT_TYPE** environment variables.

The **CDAT_DEST_DIR** environment variable specifies the location where files must be copied. The **get_file** service might use Secure Copy Protocol (SCP) or FTP to copy the files from the remote node. If copying a file from the remote node requires a password (for example, no preauthentication phase was performed for this node), the **get_file** service will fail.

Syntax

```
get_file <remote file>....<local file>
```

A directory can be specified instead of **local file** to retrieve several files or directories with a single call.

```
get_file <remote file>....<local directory>
```

Before retrieving the file, the **get_file** service determines whether there is enough free space in the destination file system to store that file. If this is not the case, the **get_file** service extends the size of the file system automatically if the **cdat collect** command was called with option **-g**.

mlog service

Use the **mlog** service to log diagnostic messages. These diagnostic messages are stored in the per-node log files.

Syntax

```
mlog <level> <message to log>
```

A severity level can be specified with **<level>** (an integer). If the level is -1, the message is also printed on the **stderr** output (and in the **collect log** file), when the current collect phase ends.

CDAT quick start

Before using the Cluster Data Aggregation Tool, you must initialize it on the master node, the central node that gathers problem determination data.

To initialize Cluster Data Aggregation Tool, complete the following steps:

1. Log in to the Cluster Data Aggregation Tool central master node as root and run the **smit cdat** command.
2. Select **Create the Repository**.
3. Select **Discover Nodes** to create a file that lists all of the remote nodes where you need to collect problem determination data. The default name for this file is **/cdat/nodes.txt**.
4. Select **Manage Remote Nodes**.
5. Select **Initialize Access to Remote Nodes**.
6. Specify the file name that lists all the remote nodes in the **Node filename** field.
7. Press **Enter** to perform the initialization.
8. Answer all questions when prompted and specify a password for the **cdat** user that is created on each remote node. You must provide the **root** password of each remote node.

After the Cluster Data Aggregation Tool master node has been initialized, you are able to collect problem determination data on the remote nodes by using default collect types such as **perfpmr**, **snap**, or **trace**

To collect data on remote nodes, complete the following steps:

1. Log in to the Cluster Data Aggregation Tool master node as root or as cdat user and run the **smit cdat** command.
2. Select **Collect Data from Remote Nodes**.
3. If there is a file that lists all of the remote nodes where you need to collect problem determination data, use it to specify the remote nodes. The default value for the **Node filename** field is **/cdat/nodes.txt**. If you do not have a file that lists the remote nodes, manually enter the remote nodes in the **Remote nodes** field.
4. Select the collect type you want to perform in the **Collect type** field.
5. Specify options in the **Parameters** field.
6. Press **Enter** to perform the collect operation.

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