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IBM i monitoring Using Nagios and similar tools

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Reference document

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| Date | 13 December 2023 |
| Reference documentation | V3.24 |
| CTL4I library version | V03, Build 2023/12/13 |

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1 *Product description*

1.1 *Principles*

The aim of the “Control for i” product is to monitor an IBM i partition using a product such as one of its derivatives (Centreon, Shinken, ...), or certain non-free products compatible with Control for i such as PRTG, SolarWinds or Pandora FMS for example.

In the rest of this document, the term Nagios will be used as a generic name, and represents all monitoring tools compatible with Control for i.

As standard, Nagios can be used to check the basic elements: PING, CPU power used, disk space used, etc. It cannot be used to monitor whether a subsystem has started and contains all the expected jobs, or if backups were made the previous night.

The plugin supplied with Control For i enables the connection between Nagios and the IBM i partition. The only input parameter is an IBM i command which will be run on the partition. The message returned from this command will be the text displayed by Nagios or sent by e-mail if it concerns an error.

The product is supplied with numerous check commands which cover the majority of needs relating to IBM i operations.

The commands can also be used interactively in a 5250 session to test a check or in a CLP program written by the user.

All the commands are written to be executed very quickly in order to avoid timeouts during checks performed by Nagios.

1.2 *Accessing the product*

The Control For i product is mainly used via a tool such as Nagios, Centreon or any other monitoring product based on the same principle. But some operations may need to be accessed via a 5250 session (screen emulation), particularly for part of the configuration.

All the product constituents are contained in the CTL4I library. This library needs to be online (EDTLIBL) beforehand.

The CTMENU menu displays the main commands that will be used. To access it, the user can type the GO CTMENU command or create a user profile and assign it the CTMENU menu as a start menu. The CTMENU command also displays this menu.

The names of all the commands performing checks start with CTCHK or CTM3. They can be used interactively in a 5250 session to test a future Nagios check for example, then they will be used as a parameter in a Nagios service definition.

Each command can also be used in a CLP program to assemble several checks for example, or to perform checks on IBM i jobs without using Nagios.

1.3 *Control For i operation*

The following conditions must be met for the product to operate correctly.

1.3.1 *CONTROL4I subsystem*

The CONTROL4I subsystem must be permanently active. It must contain the 2 CTAGENT and CTAUTO jobs. It also contains 3 pre-started jobs which handle the commands which are incompatible with the threads. It is advisable to schedule this subsystem to start automatically by adding the CTL4I/CTSTRSBS command to the system start-up program (QSTRUPPGM system value).

The CTAGENT job uses threads to call commands sent by Nagios, and pre-started jobs for the commands that are not compatible with threads.

- The number of threads is limited to about 200,000 per job.
- The number of pre-started jobs is limited to about 50 000.

In most installations, these maximum are reached after several weeks. However, in some cases with a lot of Nagios checks, these limits may be reached in 2 or 3 days.

When the number of threads reaches 150,000 or the number of pre-started jobs reaches 30 000, an automatic stop/start of the CTAGENT job will be performed at the time specified by the RESTART parameter. This restart may generate false alerts for a few tens of seconds.

See the RESTART parameter (CTPARAM command) if a large number of services need to be set up.

If the number of threads exceeds 190,000 or the number of pre-started jobs exceeds 49 000 before the time specified in the RESTART parameter is reached, the job will still stop and restart, regardless of the time.

1.3.2 *Communication between Nagios and the IBM i partition*

Nagios must be able to contact the IBM i partition using its name or IP address.

Nagios will use default port 7357 or the one that was defined when the product was installed.

The port must not be blocked by a Firewall.

If the Nagios server does not have direct access to the IBM i partition to be monitored, for example because the two are in different networks or subnets, it is possible to use the "Proxy partition" function. This feature allows to use an intermediate IBM i partition to access a second IBM i partition. A chapter is dedicated to the explanation of this technique.

2 *Installing the product and/or changing version*

This section is about installing the product on the IBM i system and Nagios (object restore) or changing Control For i version.

Content of the downloaded zip file

The file downloaded from the web site www.m81.eu is a compressed file (.zip) that contains:

- The SAVF with the product to be installed on the IBM i partition
- A CRC file that must only be used with the remote upgrade from a PC. See chapter "12.3 Remote upgrade from a Windows or Linux PC"

For a version change, only the "2.1 Changing the version of Control For i " section is applicable.

When installing the product for the first time, start at the "2.2 Installation prerequisites" section.

2.1 *Changing the version of Control For i*

This section describes the operations to perform to **change** the Control For i product **version**.

To find out which version of the product is installed, use the CTDSPINF command, then press F1 on the resulting message (if it is not already displayed in full). The message indicates the version installed, as well as the product generation date (in yyyy/mm/dd format).

2.1.1 *Note about the plugin's version*

To see if any changes have been made, check the "Evolutions Tracking" document.
The last major modification to the plugin was made with the 2022/07/20 release.

Updating the plugin on the Nagios server, PRTG, etc. is not necessary every time. It should only be done if a major change has been made to the plugin, or if you need to use a new feature.

2.1.2 *Transfer the SAVF file to the IBM i via FTP for example*

The supplied SAVF containing the product must be transferred to the IBM i partition.
Place this SAVF in the QGPL library for example.
Do not restore its content at this stage. Follow the operating procedure below.

Use FTP for example to perform the transfer:

On the IBM i partition:

```
CRTSAVF QGPL/CONTROL4I
```

On the PC, using a DOS command line:

```
FTP Partition_Address  
Enter the profile and password  
bin  
put c:\xxxx\control4i.savf qgpl/control4i  
  
quit
```

2.1.3 *Stop the agent and automatic jobs*

Stop automatic jobs beforehand and check that no-one is using it (display commands)

To stop the product:

```
ADDLIBLE CTL4I
```

```
CTENDSBS
```

To check that no-one is using it:

```
WRKOBJLCK OBJ(CTL4I) OBJTYPE(*LIB)
```

If jobs appear in the list given by this command, it means that they are at least using the product library (CTL4I). These jobs must be stopped or must no longer use the library.

For interactive jobs, type the EDTLIBL command and remove the CTL4I library from the list.

2.1.4 *Restore the product*

The QALWOBJRST system value must contain *ALL to restore all objects correctly. If not, change this system value to *ALL, and then restore the original value after the FLRSTPRD command is completed.

The sequence of commands below is used to restore the product according to the following considerations:

- Creation of user profile CTL4IOWN (object owner)
- Creation of user profile CTL4I, which will be used to automatically start the agent
- If the product is already installed, restore the product with the existing settings, including the license key.
- In the CTRSTPRD command, choose the main and possibly secondary language. The possible values are FR for French and EN for English

```
RSTOBJ OBJ(*ALL) SAVLIB(QTEMP) DEV(*SAVF)  
SAVF(*LIBL/CONTROL4I)
```

```
QTEMP/CTRSTPRD MAINLNG(xx)
```

At the end of the operation, the following message is displayed (at the bottom of the screen)

```
CONTROL4I restore to version V03, build xxxxxx completed correctly
```

xxxxxx being the product creation date (in yymmdd format)

2.1.5 *Note on control commands of other M81 products*

If another M81 product is installed on the partition (Flash for i or Recover for i), the control commands of these products have been automatically copied to the CTL4IUSR library.

The commands concerned are those whose name starts with :

- FLCHK* for the product Flash for i
- BKCHK* for the product Recover for i

This operation allows the controls of these products to be integrated into the monitoring tool.

2.1.6 Upgrade the plugin

The following releases contain a new version of the plugin.

Starting in February 2022.

This version allows to compare the time of the partition with the time of the monitoring server with the CTCHKTIM command.

The upgrade of the plugin on the monitoring server is not mandatory as long as the CTCHKTIM command is not used. The old version can continue to be used.

Starting in July 2022.

This version allows to use the "Proxy partition" function

The upgrade of the plugin on the monitoring server is not mandatory as long as this function is not used. The old version can continue to be used.

Starting in November 2023

several bugs have been fixed on the Windows plugin (for PRTG and every monitoring tools running on Windows).

If it is planned to use one of the new function, upgrade the plugin by following the operations described in chapter "2.9 Install the plugin on the Nagios (or compatible) server", "2.10 Use Control for i with Zabbix" or "2.11 Use Control for i with PRTG"

2.1.7 Start the agent and automatic jobs

Start the CONTROL4I subsystem which contains the agent and the jobs needed for the product to run. To do this, use the command:

```
CTSTRSBS
```

Check that the subsystem is active and contains the CTAGENT and CTAUTO jobs.

| | | | | | |
|-----------|-------|-----|-----|-------------|------|
| CONTROL4I | QSYS | SBS | 0.0 | | DEQW |
| CTAGENT | CTL4I | ASJ | 0.0 | CMD-CTAGENT | TIMW |
| CTAUTO | CTL4I | ASJ | 0.2 | DLY-60 | DLYW |

This confirms that installation was correctly performed and the license key is valid.

This is the end of the operations to perform to change the product version.

Consult the list of new commands available or changes since the last version to configure new services in Nagios.

2.2 Installation prerequisites

2.2.1 IBM i partition

- V7R3M0 or higher
- For V7R1 and V7R2 systems, the Control for i product will no longer evolve. Release V3.22 dated 6 September 2023 is the last release that will be supported for V7R1 and V7R2 systems.

2.2.2 Nagios-type monitoring tool

The Control For i product is designed to be used by Nagios or by any other product using the same plugins as Nagios.

The following products are compatible for example:

- Nagios
- Centreon
- icinga
- Shinken
- EON
- POM
- Zabbix
- Solarwinds
- ...

2.2.3 Network

Communication between Nagios and the IBM partition is carried out using the 7357 port by default but it can be configured to use another port.

2.3 Install the CTL4I library

The operations below must be carried out when installing the product for the first time.

2.3.1 Transfer the SAVF file to IBM i via FTP for example

The supplied SAVF containing the product must be transferred to the IBM i partition. Place this SAVF in the QGPL library for example. Do not restore its content at this stage. Follow the operating procedure below.

Use FTP for example to perform the transfer:

On the IBM i partition:

```
CRTSAVF QGPL/CONTROL4I
```

On the PC, using a DOS command line:

```
FTP Partition_Address  
Enter the profile and password  
bin  
put c:\xxxx\control4i.savf qtpl/control4i
```

quit

2.3.2 Restore the product

The QALWOBJRST system value must contain *ALL to restore all objects correctly. If not, change this system value to *ALL, and then restore the original value after the FLRSTPRD command is completed.

The sequence of commands below is used to restore the product according to the following considerations:

- Creation of user profile CTL4IOWN (object owner)
- Creation of user profile CTL4I, which will be used to automatically start the agent
- If the product is already installed, restore the product with the existing settings, including the license key.
- In the CTRSTPRD command, choose the main and possibly secondary language. The possible values are FR for French and EN for English

```
RSTOBJ OBJ (*ALL) SAVLIB (QTEMP) DEV (*SAVF)  
      SAVF (*LIBL/CONTROL4I)
```

```
QTEMP/CTRSTPRD MAINLNG (xx)
```

At the end of the operation, the following message is displayed (at the bottom of the screen)

```
CONTROL4I restore to version V03, build xxxxxx completed correctly
```

xxxxxx being the product creation date (in yymmdd format)

2.3.3 Note on control commands of other M81 products

If another M81 product is installed on the partition (Flash for i or Recover for i), the control commands of these products have been automatically copied to the CTL4IUSR library.

The commands concerned are those whose name starts with :

- FLCHK* for the product Flash for i
- BKCHK* for the product Recover for i

This operation allows the controls of these products to be integrated into the monitoring tool.

2.3.4 Enter the product key

If the product is already installed and already has its own license key. This step is not necessary.

Type the following command to find out the information required to generate the license key:

```
CTDSPINF
```

The following message appears at the bottom of the screen.

Press F1 on the message to see all the information. Make a note of this information and send it to your contact at M81.

```
Additional Message Information  
Message ID . . . . . : GEN0005
```

```
Date sent . . . . . : 22/11/17      Time sent . . . . . : 16:04:41

Message . . . . . : System name = M81FLASH, Partition = 004, Serial N° =
                    4412345, Model = E4A, CONTROL4I product key = 501639503586167, Version =
                    V03, Generation date = 17/10/24
```

Obtain a valid license key from M81 then enter this key with the following command.

```
CTADDKEY KEY(123456789012345)
```

2.3.5 Define which port to use

By default, the product will use port 7357 for communication between Nagios and IBM i. Check that port 7357 is not in the list of ports currently being used on the partition.

```
NETSTAT
Option 3
F14 to see the numbers of ports being used
```

If port 7357 is not being used, it is advisable to use this port by default.
If port 7357 is being used, configure the product to use another port.

- On the IBM i partition, by indicating the port to use in the PORT parameter (accessed via the CTPARAM command)
- In Nagios, by following the procedure described in the “2.9.3 Change the port to use (possibly)” section.
- Caution: if Nagios is used to monitor several IBM i partitions, the same port needs to be used on all IBM i partitions.

2.3.6 Start the agent and automatic jobs

Start the CONTROL4I subsystem which contains the agent and the jobs needed for the product to run. To do this, use the command:

```
CTSTRSBS
```

Check that the subsystem is active and contains the CTAGENT and CTAUTO jobs.

| | | | | | |
|-----------|-------|-----|-----|-------------|------|
| CONTROL4I | QSYS | SBS | 0.0 | | DEQW |
| CTAGENT | CTL4I | ASJ | 0.0 | CMD-CTAGENT | TIMW |
| CTAUTO | CTL4I | ASJ | 0.2 | DLY-60 | DLYW |

This confirms that installation was correctly performed and the license key is valid.

2.3.7 System start-up program

Change the initial system program (the name of which is specified in the QSTRUPPGM system value) to add the following command sequence. This systematically starts the subsystem containing the automatic jobs.

```
ADDLIBLE CTL4I
MONMSG MSGID(CPF0000)
CTSTRSBS
MONMSG MSGID(CTL0000 CPF0000)
```

The TCP/IP must be fully started before starting the Control For i agent. It is therefore advisable to add a few seconds' time delay during the first IPL before running the CTSTRSBS command.

2.4 Activate JSON functions on IBM i

If it is planned to use Control for i to check M3 based on GRID information, JSON data will be converted before to be integrated in Data base files using SQL function. This function must be initialized.
Run commands described in section " 7.2 Activate JSON functions" to initialize this function.

2.5 Choosing the plugin

This directory contains 8 files:

3 plugins for "standard" use of the product, i.e. when the Nagios server has direct access to each partition to be monitored.

The **check_Control4i_zabbix** plugin must be used if the monitoring tool is Zabbix

The **check_Control4i_prtg.exe** plugin must be used if the monitoring tool is PRTG or SolarWinds (Windows system)

The **check_Control4i** plugin must be used in all other cases (Linux system)

3 plugins for use with the "proxy partition" feature, i.e. when the Nagios server does not have direct access to a partition and must use another one as an intermediate.

The **check_Control4i_zabbix_remote** plugin should be used if the monitoring tool is Zabbix

The **check_Control4i_prtg_remote.exe** plugin must be used if the monitoring tool is PRTG or SolarWinds (Windows system)

The **check_Control4i_remote** plugin must be used in all other cases (Linux system)

The **check_Control4i_config** file contains some configuration information. It must be transferred to the monitoring product (Nagios, Centr on, Zabbix, PRTG, ...) in all cases.

The file **Lookup_Control_For_i_PRTG.ovl** will be used only in PRTG to initialize the limits of some graphs.

2.6 Plugin parameters

The standard plugin should be used when Nagios has direct access to the partitions that are monitored. This is the most common case.

The plugin accepts a number of parameters allowing you to choose certain options.

The syntax is as follow:

```
check -H host -c "IBMi_command" [-p port] [-t timeout] [-u]
                                [-v version] [-h]
```

Meaning of the parameters:

- -h: display help
- -H: IP address of the IBM i host on which the command is to be executed
- -c: The command to run. It must be surrounded by double quotes.

- -p: If the default port 7357 (defined in the configuration file) can not be used, it is possible to modify the command to indicate which port will be used.
- -t: Specify the duration (in number of seconds) that the plugin waits for an answer from the host before indicating an error. The default value is 10 seconds.
- -u: By default, when the plugin is in error because of a network problem, or of non-response of the agent, the service enters the "Critical" state. Add the -u parameter for the state to be "Unknown". (This parameter is not available for PRTG)
- -v: Specify the version of the communication mode to be used between the plugin and the partition
 - o V01 (default value) can be used for the vast majority of commands.
 - o V02 (available from February 2022) transmits the time of the monitoring server in addition to the command. This parameter must be specified for the CTCHKTIM command.

For the Windows plugin for PRTG

- -r: Indicate whether the returned message is plain text or in JSON format. By default, the result is returned in JSON format. Possible value -r msg

2.7 The Proxy Partition Plugin Settings

The proxy partition plugin should be used when Nagios does not have direct access to the partitions that are monitored.

The plugin accepts a number of parameters allowing you to choose certain options.

The syntax is as follow:

```
Check_XXX_remote -H host -i Remote_IP -c "IBMi_command"  
                [-p port] [-t timeout] [-u] [-h]
```

Meaning of the parameters:

- -h: display help
- -H: IP address of the IBM i host on which the command is to be executed
- -i: IP address of the remote IBM i host on which the command should be executed
- -c: The command to run. It must be surrounded by double quotes.
- -p: If the default port 7357 (defined in the configuration file) can not be used, it is possible to modify the command to indicate which port will be used.
- -t: Specify the duration (in number of seconds) that the plugin waits for an answer from the host before indicating an error. The default value is 10 seconds.
- -u: By default, when the plugin is in error because of a network problem, or of non-response of the agent, the service enters the "Critical" state. Add the -u parameter for the state to be "Unknown". (This parameter is not available for PRTG)

For the Windows plugin for PRTG

- -r: Indicate whether the returned message is plain text or in JSON format. By default, the result is returned in JSON format. Possible value -r msg

2.8 Detailed explanation of plugin operation

It is not necessary to understand the detailed operation of the plugin in order to install and use the product.

This chapter is intended for those wishing to develop specific applications around this plugin.

If you are using Control for i in a conventional way, skip to the next chapter.

There are 3 plug-ins supplied with Control for i.

Check_Control4i

To be used on Linux systems with Nagios and all Nagios-compatible products.

It returns information in the form of text and a return code for use by Nagios.

Check_Control4i_Zabbix

To be used on Linux systems with Zabbix, or products which do not interpret the program's return code, and which need additional information contained in the message text to know the status (OK, Warning or Critical).

Check Control4i PRTG

To be used on a Windows system with all products using this operating system.

Returns information in 2 different formats. Standard JSON format, or text format identical to the Linux plugin by adding the `-r msg` parameter.

2.8.1 Returning information in text format.

This text is always in the following form:

Message | **Channel-name-1=xxxxUnit-1 Channel-name-2=xxxxUnit-2**

The first part contains the message sent by the command executed on the IBM i partition (via the agent). The pipe sign (|) ends this message, indicating that the rest contains numerical data, which will be used by monitoring tools to generate graphs.

All numerical data have the following elements:

- Channel-name: Name representing the numerical value that follows.
- The = sign
- Numeric value
- The unit

These 4 pieces of information are pasted together, without spaces.

If there are several numerical values, they are separated by a space.

For some commands, no numerical value is returned. In this case, the return text contains only the message, and no | sign.

Examples

Example of the return for the CTCHKDSK command, which returns 4 numerical values.

- Used
- Total
- Rate
- Evol

```
check_Control4i -H 10.43.43.70 -c "ctchkdsk"  
CTL1141 - Ok : 60% used on a total of 286 GB for the ASP 1.|Used=173GB  
Total=286GB Rate=60% Evol=0%
```

Another example is the "CTCHKSBS QBATCH" command, which returns no numerical values.

```
check_Control4i -H 10.43.43.70 -c "ctchksbs qbatch"  
CTL1015 - The QBATCH subsystem is in the *RUN state
```

The return code

All plugins end with a return code. This code is interpreted by Nagios and compatible products to determine the status of the response. The value of the return code has the following meaning:

- 0 = ok

- 1 = Warning
- 2 = Critical

The Check_Control4i_Zabbix plugin is designed for products that do not interpret the program's return code (such as Zabbix, for example). It integrates this return code at the beginning of the message.

- The message returned by the plugin has been modified to add the return code as the first character.
- The first character therefore contains the value 0, 1 or 2, depending on the status of the alert (same meanings as above).

Example:

From a Linux server on which plugins are installed, the following command is used:

```
# ./check_Control4i -H 192.168.1.4 -c "ctchksbs control4i"  
CTL1015 - CONTROL4I subsystem is in *RUN state
```

With the Zabbix-specific plugin:

```
# ./check_Control4i_zabbix -H 192.168.1.4 -c "ctchksbs control4i"  
0CTL1015 - CONTROL4I subsystem is in *RUN state
```

The return code **0** is added at the beginning of the message.

To take this simulated return code into account, Zabbix can define a trigger in which the first character of the message is tested.

2.8.2 Returning information in JSON format.

The Windows plugin can also return information in JSON format. This is the default format. JSON format is not available with Linux plugins.

The JSON returned is in the following form:

```
{ "prtg":  
  {  
    "result":  
    [  
      {"channel": " ChannelName-1", "value":xxx, "CustomUnit": "unit-1"},  
      {"channel": " Channel-Name-2", "value":yyy, "CustomUnit": "unit-2"},  
      {"channel": " Status", "value":Z},  
    ],  
    "text": "message"  
  }  
}
```

The first part always contains "prtg":

Then the keyword "result": followed by the list of returned numerical values.

Each numerical value contains the following text:

- Channel = Name representing the numerical value that follows
- Value = Numerical value returned
- CustomUnit = corresponding unit

The return code

In addition, for each command there is always a channel whose name is "Status", which contains the plugin's return code and whose possible values are:

- 0 = ok
- 1 = Warning
- 2 = Critical

Examples

Example of the return code for the CTCHKDSK command, which returns 4 numerical values.

- Used
- Total
- Rate
- Evol

These 4 values correspond to the 4 channels in the JSON, plus the Status added systematically for all commands

```
check_Control4i_prtg.exe -H 10.43.43.70 -c "ctchkdsk"

{"prtg":{"result":[{"channel":"Used","value":173,"CustomUnit":"GB"}, {"channel":"Total","value":286,"CustomUnit":"GB"}, {"channel":"Rate","value":60,"CustomUnit":"%"}, {"channel":"Evol","value":0,"CustomUnit":"%"}, {"channel":"Status","value":0}], "text": "CTL1141 - Ok : 60% used on a total of 286 GB for the ASP 1."}}
```

Another example is the "CTCHKSBS QBATCH" command, which returns no numerical values.

```
check_Control4i_prtg.exe -H 10.43.43.70 -c "ctchksbs qbatch"

{"prtg":{"result":[{"channel":"Status","value":0}], "text": "CTL1015 - The QBATCH subsystem is in the *RUN state"}}
```

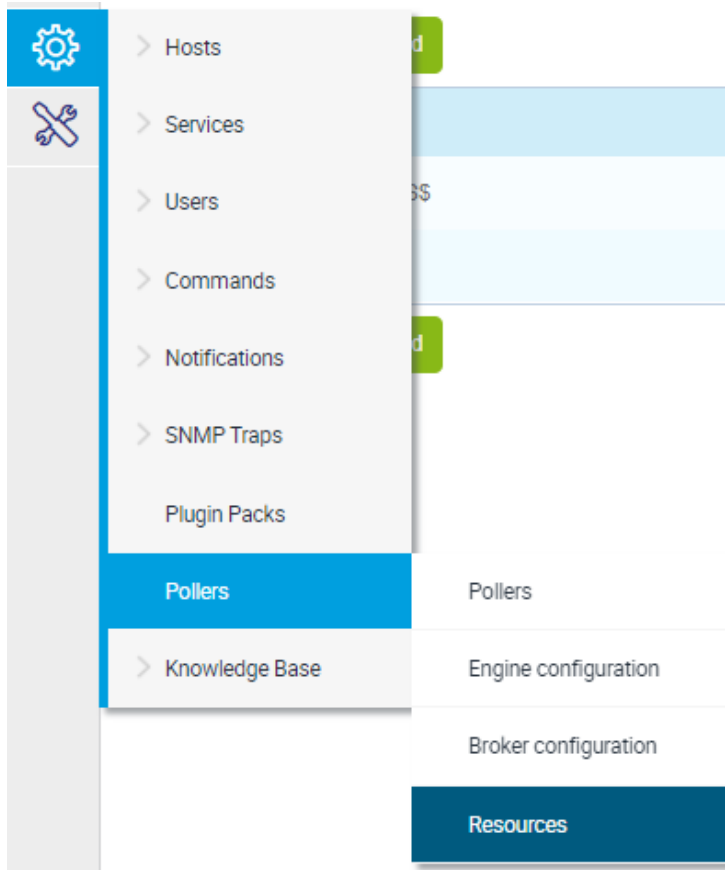
2.9 Install the plugin on the Nagios (or compatible) server

The operating procedure below is based on the use of Centreon but it can be easily adapted to other products based on the same principle.

The operations below need to be carried out when installing Control For i for the first time on an already operational Centreon solution.

2.9.1 Search for the name of the directory containing the plugins

In Centreon, access "[Configuration](#) ▶ [Pollers](#) ▶ [resources](#)"



| <input type="checkbox"/> Name | Values |
|--|---------------------------|
| <input type="checkbox"/> \$CENTREONPLUGINS\$ | /usr/lib/centreon/plugins |
| <input type="checkbox"/> \$USER1\$ | /usr/lib64/nagios/plugins |

More actions ▼ Add

The \$USER1\$ variable contains the name of the directory containing the plugins.
In our example: /usr/lib64/nagios/plugins

2.9.2 Transfer the plugin to Nagios

The installation of the Control For i product created the /Ctl4i directory which contains the plugin and configuration file to install on the Nagios server.

Transfer both plugins and the configuration file from the "/Ctl4i" directory of the IBM i partition to the directory containing the plugins in Nagios. In our example: "/usr/lib64/nagios/plugins".

It is highly likely that it is not possible to FTP to the Centreon server. We therefore suggest initializing the connection from the Centreon server.

Open a session with Putty (for example) on the Centreon server. Then type the following instructions:

```
# cd /usr/lib64/nagios/plugins/

# ftp <IBMi-Partition-IP-Address>
Connected to 192.168.1.4.
220-QTCP at M81DEV.
220 Connection will close if idle more than 5 minutes.
504 Security mechanism not recognized. LIST=TLS,TLS-C,TLS-P,SSL
504 Security mechanism not recognized. LIST=TLS,TLS-C,TLS-P,SSL
KERBEROS_V4 rejected as an authentication type

Name (192.168.1.4:root): <IBMi-Profile>
331 Enter password.

Password: <Password>
230 PRU logged on.
Remote system type is .

ftp> bin
200 Representation type is binary IMAGE.

ftp> get /Ctl4i/check_Control4i check_Control4i
local: check_Control4i remote: /Control4i/check_Control4i
227 Entering Passive Mode (192,168,1,4,171,239).
150-NAMEFMT set to 1.
150 Retrieving file /Control4i/check_Control4i
226 File transfer completed successfully.
69622 bytes received in 0.023 seconds (2.9e+03 Kbytes/s)

ftp> get /Ctl4i/check_Control4i_remote check_Control4i_remote
local: check_Control4i_remote remote: /Control4i/check_Control4i_remote
227 Entering Passive Mode (192,168,1,4,171,239).
150-NAMEFMT set to 1.
150 Retrieving file /Control4i/check_Control4i_remote
226 File transfer completed successfully.
69622 bytes received in 0.023 seconds (2.9e+03 Kbytes/s)

ftp> get /Ctl4i/check_Control4i_config check_Control4i_config
local: check_Control4i remote: /Control4i/check_Control4i
227 Entering Passive Mode (192,168,1,4,171,239).
150-NAMEFMT set to 1.
150 Retrieving file /Control4i/check_Control4i
226 File transfer completed successfully.
69622 bytes received in 0.023 seconds (2.9e+03 Kbytes/s)

ftp> quit
221 QUIT subcommand received.

# chmod 775 check_Control4i*
```

2.9.3 Change the port to use (possibly)

If port 7357 is already being used, the port to be used for communication between the Nagios plugin and the agent on the IBM i partition may be changed.

The default port is defined in the `check_Control4i_Config` file located in the same directory as the plugin that has just been transferred.

Edit the content of this file and change the port number.

A specific port can also be used by defining a command (in Nagios) which calls the `check_Control4i` plugin by passing it the parameter `-p` followed by the port number to use.

2.9.4 Check that the plugin is working properly

In the IBM i partition, check that the CONTROL4I subsystem is active. If not, start it with the CTSTRSBS command.

In the open Putty session shown above, type the following commands:

```
# cd /usr/lib/nagios/plugins/  
  
# ./check_Control4i -H 192.168.1.4 -c "ctchksbs control4i"  
CTL1015 - The CONTROL4I subsystem is in *RUN state
```

If the returned message is:

```
CTL1015 - The CONTROL4I subsystem is in *RUN state
```

The plugin operation is validated.

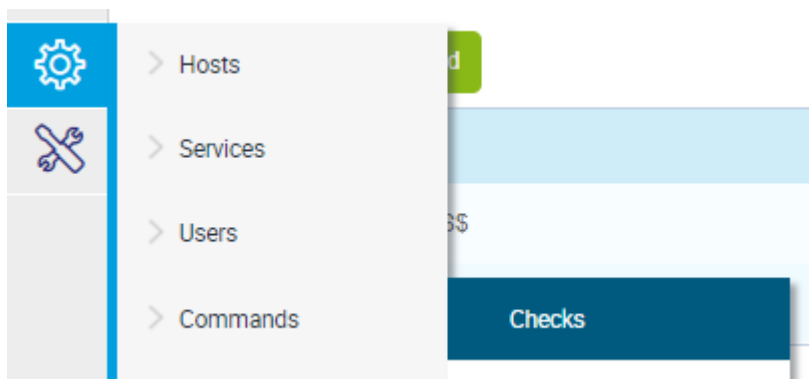
During the first use, you may receive no answer from the IBM I partition. Run the same command 3 times before to look for another cause. The reason is that when the agent starts (job CTAGENT) the 3 first demands are rejected, for a technical reason.

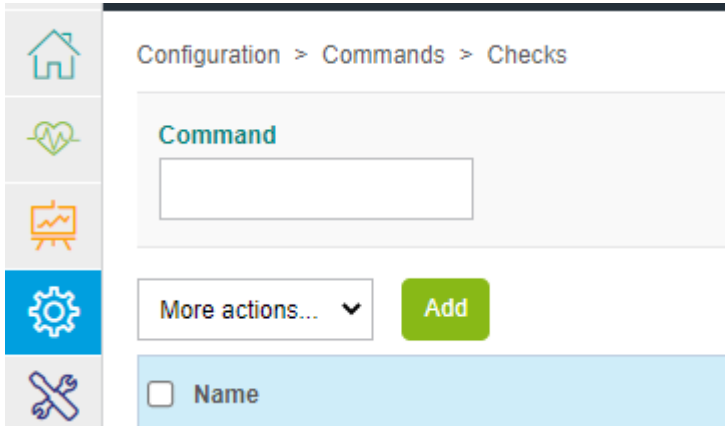
The plugin for the proxy partition requires more settings. See the chapter dedicated to it beforehand.

2.9.5 Configure the command in Nagios

Change the Centreon configuration to add the definition of this new plugin.

In Centreon, access [Configuration](#) [Commands](#) [Checks](#)





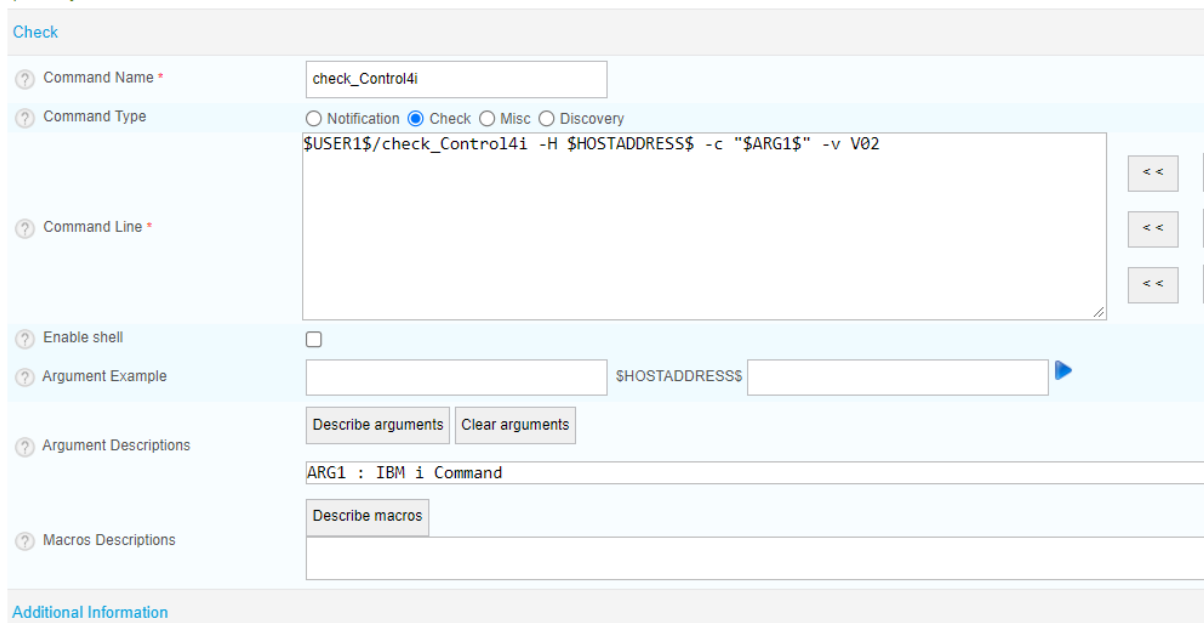
Select "Add" to add a new command

Add the command using the following parameters:

Name: check_Control4i

Command: \$USER1\$/check_Control4i -H \$HOSTADDRESS\$ -c "\$ARG1\$" -v V02

For Argument 1, enter the text "IBM i command"



Note regarding the port to use

If default port 7357 (defined in the configuration file) cannot be used, the command can be changed to indicate which port to use.

Command: \$USER1\$/check_Control4i -H \$HOSTADDRESS\$ **-p <port>** -c "\$ARG1\$" -v V02

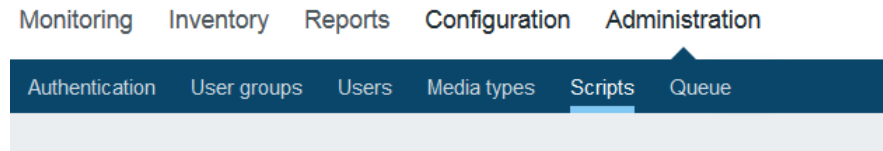
2.10 Use Control for i with Zabbix

2.10.1 Define the new script

The specific plugin for Zabbix must be deposited in the appropriate directory on the Zabbix server.
/usr/lib/zabbix/externalscripts/

Configure this new script:

In Zabbix menu, select "Administration", then "Scripts"



Enter the plugin name as follow:

/usr/lib/zabbix/externalscripts/check_Control4i_zabbix

* Name

Type IPMI Script

Execute on Zabbix agent Zabbix server (proxy) Zabbix server

Commands

Description

User group

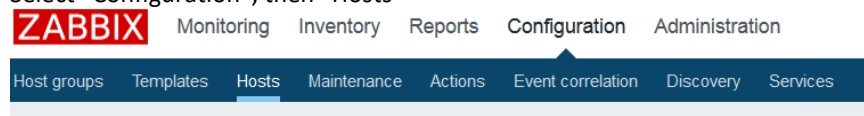
Host group

Permissions Read Write

2.10.2 Configure a new item

For each new check to be performed, a new item associated with a host must be added.

Select "Configuration", then "Hosts"



Select the host for which the new check is to be performed (an IBM i partition).
Then click on "item", then "add".

All hosts / IBM i Remote Enabled ZBX SNMP JMX IPMI Applications 1 Items 8 Triggers 3 Graphs Discovery rules Web scena

Item Preprocessing

* Name

Type

* Key

* Host interface

Type of information

* Update interval

Custom intervals

| Type | Interval | Period | Action |
|----------|------------|--------|---|
| Flexible | Scheduling | 50s | 1-7,00:00-24:00 <input type="button" value="Remove"/> |

[Add](#)

2.10.3 Taking into account the result of the plugin

Zabbix works very similarly to Nagios regarding the use of plugins, but the processing of feedback provided by the plugin is different.

The main difference is the way the status (Ok, Warning, Critical) is interpreted.

For Nagios, the plugin must provide a "return code" and a "message text". The "return code" sent by the plugin must have the following values:

- 0 = ok
- 1 = Warning
- 2 = Critical

Zabbix does not use the "return code" that could be provided by the plugin.

The specific plugin of Control for i for Zabbix has been modified to integrate this "return code" in the "message".

- The message returned by the plugin has been modified to add the return code as the first character.
- The first character contains the value 0, 1 or 2 depending on the state of the alert.

Example:

On a Linux server where both plugins are installed, the following command is used:

```
# ./check_Control4i -H 192.168.1.4 -c "ctchksbs control4i"
CTL1015 - The CONTROL4I subsystem is in the *RUN state
```

With the specific plugin for Zabbix :

```
# ./check_Control4i_zabbix -H 192.168.1.4 -c "ctchksbs control4i"
0CTL1015 - The CONTROL4I subsystem is in the *RUN state
```

The return code 0 is added at the beginning of the message.

To consider this simulated return code, it is possible to configure a trigger in Zabbix, and check the first character of the message.

2.11 Use Control for i with PRTG

This document describes the specific points to consider when using Control for I with PRTG.

2.11.1 Plugin installation

The product Control for i is delivered with several plugins by default.
If the software PRTG is used, choose the plugin “check_Control4i_prtg.exe”,
“check_Control4i_prtg_remote.exe”, and the configuration file “check_Control4i_config”.

Transfer those 3 files to the PRTG server, in directory

C:\Program Files (x86)\PRTG Network Monitor\Custom Sensors\EXEXML

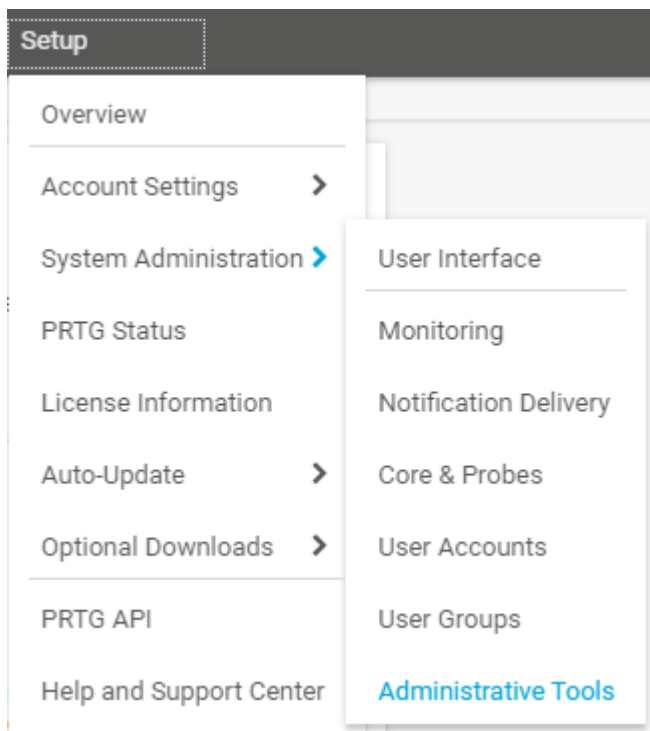
If PRTG is configured in cluster mode, the 3 files must be placed in the directory of each server of the cluster.

Transfer the file “Lookup_Control_For_i_PRTG.ovl” in directory

C:\Program Files (x86)\PRTG Network Monitor\lookups

This new file must be activated

Select “Setup”, “System Administration”, “Administrative Tools”



Look for “Load Lookup and File Lists”, then click on “Go!”

Load Lookups and File Lists

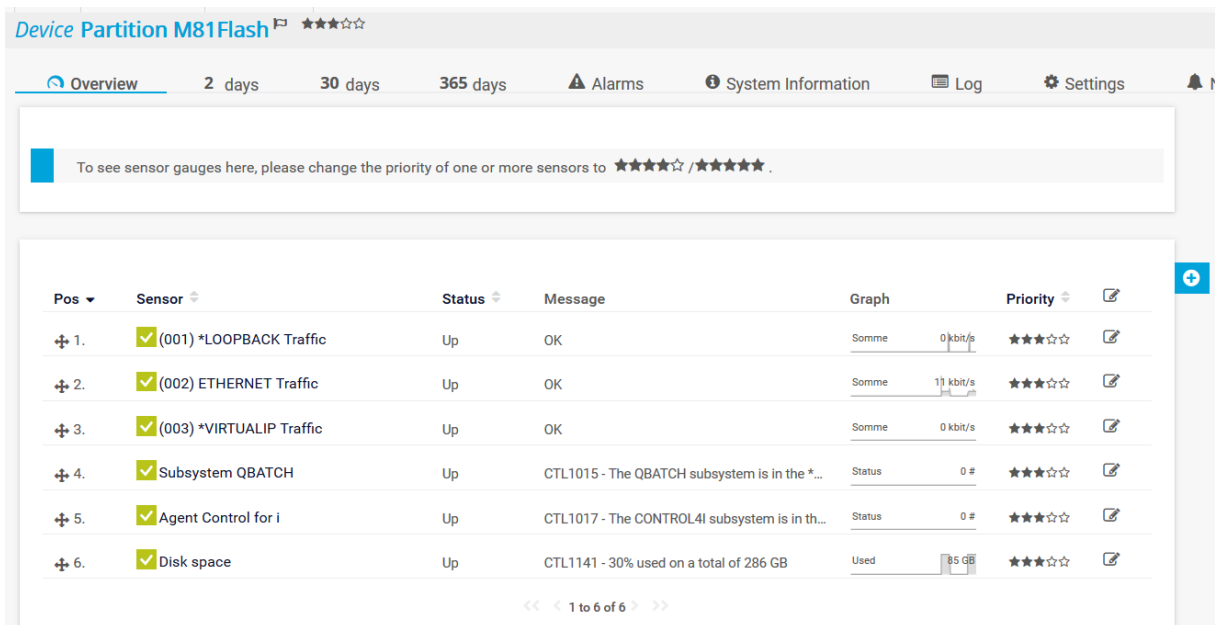
Reloads the lookup files from the `lookups\custom` folder of the PRTG program directory, and other file lists that are displayed in the web interface, for example, SNMP libraries, device icons, and report templates.

[Go!](#)

It shows “Working” for a few seconds, then comes back to the original text.

2.11.2 Define a new sensor

Select the device (IBM i partition) where the control must be configured.

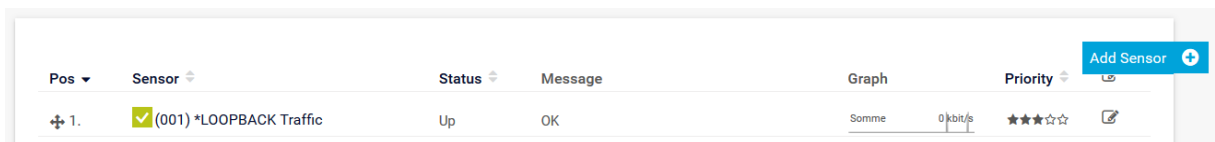


The screenshot shows the PRTG interface for a device named "Device Partition M81Flash". At the top, there are navigation tabs: Overview (selected), 2 days, 30 days, 365 days, Alarms, System Information, Log, and Settings. A message box states: "To see sensor gauges here, please change the priority of one or more sensors to ★★★★★/★★★★★." Below this is a table of sensors:

| Pos | Sensor | Status | Message | Graph | Priority |
|-----|--------------------------|--------|---|-----------------|----------|
| 1. | (001) *LOOPBACK Traffic | Up | OK | Somme 0 kbit/s | ★★★★☆ |
| 2. | (002) ETHERNET Traffic | Up | OK | Somme 11 kbit/s | ★★★★☆ |
| 3. | (003) *VIRTUALIP Traffic | Up | OK | Somme 0 kbit/s | ★★★★☆ |
| 4. | Subsystem QBATCH | Up | CTL1015 - The QBATCH subsystem is in the *... | Status 0 # | ★★★★☆ |
| 5. | Agent Control for i | Up | CTL1017 - The CONTROL4I subsystem is in th... | Status 0 # | ★★★★☆ |
| 6. | Disk space | Up | CTL1141 - 30% used on a total of 286 GB | Used 85 GB | ★★★★☆ |

At the bottom of the table, there is a pagination control: << < 1 to 6 of 6 > >>

Click the + sign, then “Add Sensor”



This screenshot shows the same sensor list as above, but with an "Add Sensor" button (containing a plus sign) in the top right corner. The first sensor, "(001) *LOOPBACK Traffic", is still visible at the bottom of the list.

Select « Custom Sensors »

Control for i Reference document

- Enter all the parameters that the script needs
- -H %host
 - Gives the IP address of the IBM I partition where the control must be done
- -c "IBMi_Command"
 - Keyword -c must be followed by the "Control for i" command to use
 - This command must be entered between double quotes (sign ")

Sensor Settings

Important: The EXE file has to run on the computer where the parent probe is installed, not on the parent device. The work different working directories.

| | |
|------------------|--|
| EXE/Script | <input type="text" value="check_Control4I_prtg.exe"/> |
| Parameters | <input type="text" value="-H %host -c *CTCHKMSGW SBS(*ALL) LEVEL(*CRITICAL)"/> |
| Environment | <input checked="" type="radio"/> Default Environment <input type="radio"/> Set placeholders as environment values |
| Security Context | <input checked="" type="radio"/> Use security context of probe service <input type="radio"/> Use Windows credentials of parent device |
| Mutex Name | <input type="text"/> |
| Timeout (Sec.) | <input type="text" value="60"/> |

The other parameters of this sensor can be changed, they have no relationship with "Control for I"

Then click Create.



The new sensor is now created, and is shown in the list.
After less than 1 minute, it should be executed, and display its first result.

| | | | | | |
|------|--|----|-------------------------------------|---------|--------|
| + 7. | <input checked="" type="checkbox"/> Jobs in MSGW | Up | CTL1074 - No job in the MSGW state. | Nb_MSGW | 0 jobs |
|------|--|----|-------------------------------------|---------|--------|

2.11.3 Determine the alerts conditions

With PRTG, the alerts conditions must be specified in the definition of the sensor.
We will look at 2 different cases.

2.11.3.1 Case 1 : Commands with performance data

For example, CTCHKDSK command returns the disk space used and total disk space, or command CTCHKMSGW returns the number of jobs in MSGW status.

In order to know if a command is returning performance data, run this command in a 5250 session, then look at the resulting message. It contains the sign | followed by numeric values.

For those commands, it is possible to use directly the data they send to define the limits for PRTG to generate an alert.

Example:

The following sensor returns the number of jobs in MSGW status in the partition.

✓ Jobs in MSGW Up CTL1074 - No job in the MSGW state. Nb_MSGW 0 jobs

The overview shows 2 graphs generated

- Nb_MSGW gives the number of jobs in MSGW status
- Status gives the severity level of the command. See case #2 for explanation

✓ Sensor Jobs in MSGW ★★★★☆
CTL1074 - No job in the MSGW state.

Overview Live Data 2 days 30 days 365 days Historic Data Log Settings

Nb_MSGW Status

0 #

0 jobs 0 1 jobs

| Channel | ID | Last Value | Minimum | Maximum |
|----------|----|------------|---------|---------|
| Downtime | -4 | | | |
| Nb_MSGW | 2 | 0 jobs | 0 jobs | 0 jobs |
| Status | 3 | 0 # | 0 # | 0 # |

In our example, we will click on the Channel “Nb_MSGW” in the bottom list.

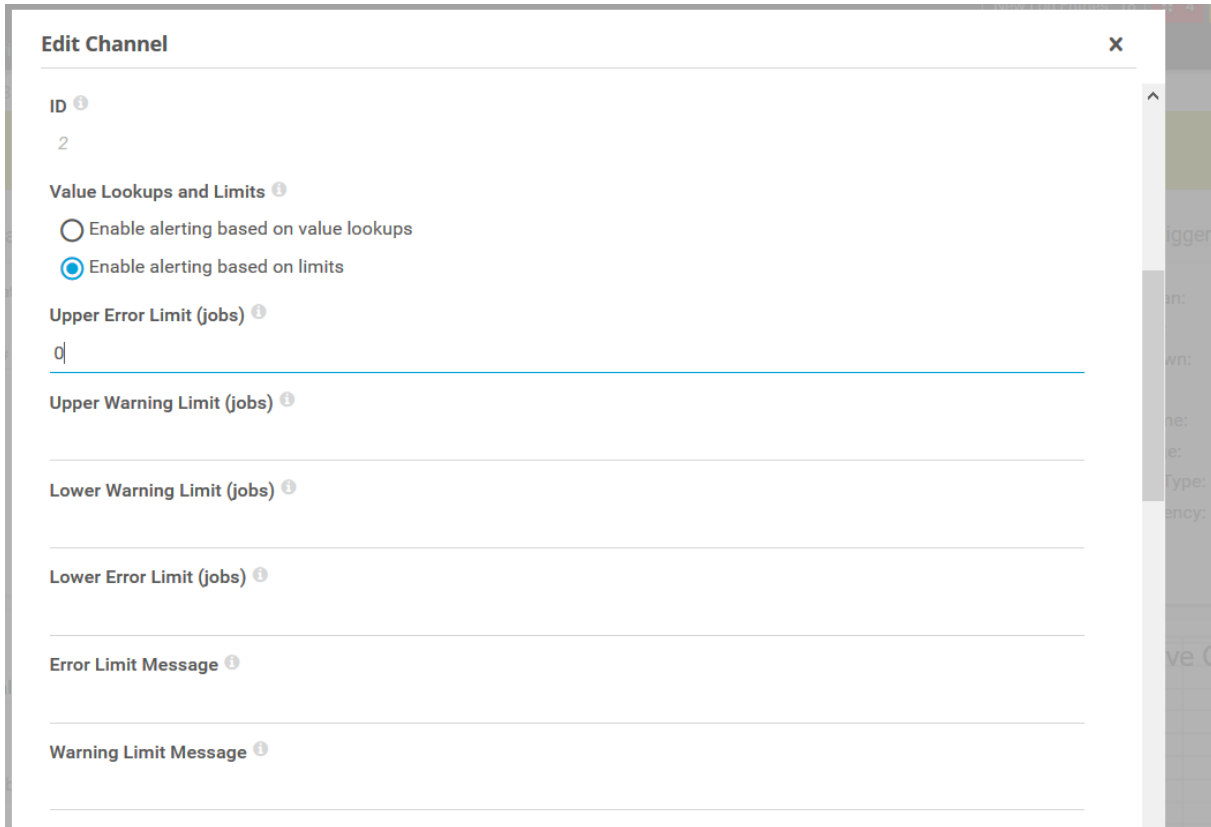
Channel ▾

Downtime

Nb_MSGW

In the next window, select “Enable alerting based on limits”, then enter the limit to start generating an alert by PRTG.

In our example, an alert will be generated starting with 1 job in MSGW status.



2.11.3.2 Case 2 : Commands with no graph data

Several commands from Control for I only send a text message saying that the control is correct or not, but don't send performance data. That's the message severity that is the value saying if the control is correct or not.

Severity is showed by PRTG with the channel "Status", which is giving the severity of the message. This channel will be there for every Control for I command (even if they already return performance data). The possible values are:

- 0 = Status OK
- 1 = Status Warning
- 2 = Status Critical

For example, if the command CTCHKDSK LMT_W(80) LMT_C(90) is used:

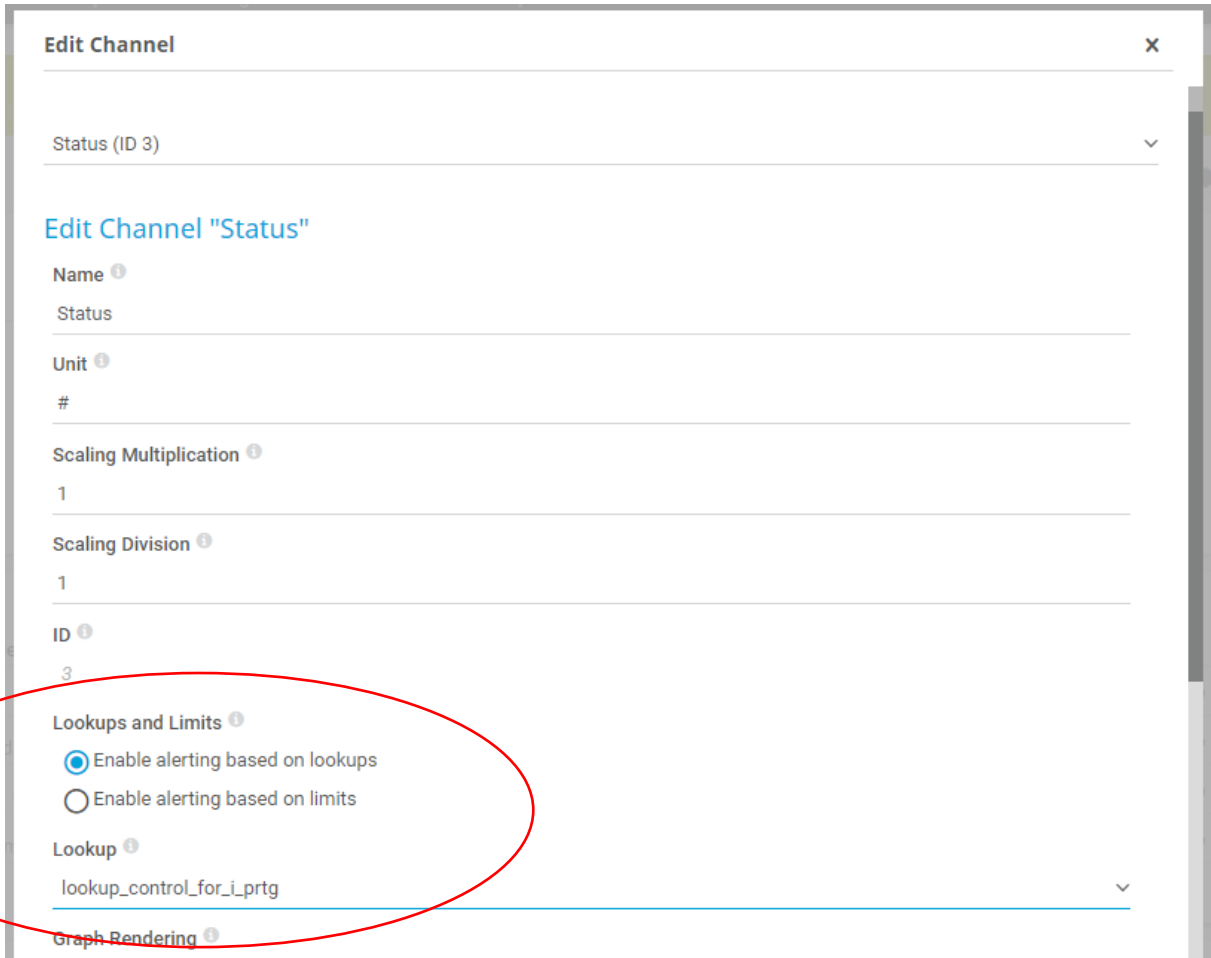
- If disk space used is less than 80%, the value of Status will be 0
- If disk space used is equal or greater than 80%, and less than 90%, the value of Status will be 1
- If disk space used is greater or equal than 90%, the value of Status will be 2

Other example,

- If the command CTCHKSBS SBSB(QBATCH) LEVEL(*CRITICAL) is used:
 - o If subsystem QBATCH is active, the value of Status will be 0
 - o If subsystem QBATCH is not active, the value of Status will be 2
- If the command CTCHKSBS SBSB(QBATCH) LEVEL(*WARNING) is used:
 - o If subsystem QBATCH is active, the value of Status will be 0
 - o If subsystem QBATCH is not active, the value of Status will be 1

To define an alert level based on the Status Channel, display the overview of the sensor, then click on the channel name "Status"

In the next window, select “Enable alerting based on lookups”, then in the field “Lookup”, select the file “lookup_Control_for_i_PRTG “



Edit Channel [Close]

Status (ID 3) [Dropdown]

Edit Channel "Status"

Name ⓘ
Status

Unit ⓘ
#

Scaling Multiplication ⓘ
1

Scaling Division ⓘ
1

ID ⓘ
3

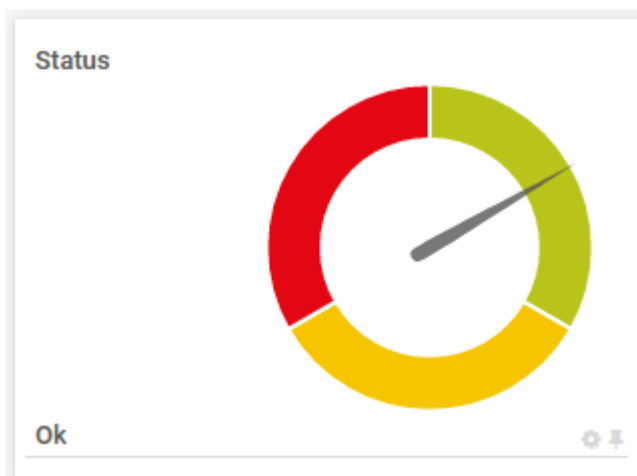
Lookups and Limits ⓘ

- Enable alerting based on lookups
- Enable alerting based on limits

Lookup ⓘ
lookup_control_for_i_prtg [Dropdown]

Graph Rendering ⓘ

If there has been no error, the graph displays as:



3 IBM i check commands

The Control For i product provides the basic elements for connecting a Nagios server or equivalent with an IBM i partition. It is supplied with a certain number of IBM i commands for performing most of the checks required to monitor a partition.

This section describes the commands provided to check that the IBM i partition is operating correctly.

Commands are presented in alphabetical order.

The messages resulting from these commands contain some additional information. They end in |Err=&2 Val=&3 Total=&4. This part provides "performance" information.

The format is specially designed for use in monitoring products such as Nagios.

3.1 CTCHKBCH, Check that a Batch job has run

The CTCHKBCH command checks if a job has been executed in a time slot passed as a parameter. It can be used, for example, to check that an overnight process or a backup job started and ended within the time slot passed as a parameter.

The command parameters are as follows:

```

                                Check if a Batch has run (CTCHKBCH)

Specify your choices then press Enter.

Job . . . . . JOB
  User . . . . . *ANY
Check type . . . . . TYPE *BOTH
Maximum end code . . . . . ENDCODE *ANY
Minimum number of jobs . . . . . MIN 1
Maximum number of jobs . . . . . MAX 1
Start date and time:          START
  Start date . . . . . *CURRENT
  Start time . . . . . *BEGIN
End date and time:           END
  End date . . . . . *CURRENT
  End time . . . . . *END
Severity level . . . . . LEVEL *CRITICAL

```

Description of parameters:

- JOB = (Required) Name of job to search for. It's possible to enter a full name, or a generic name.
Also indicate the profile name under which the job should have run.
*ANY = The profile will not be checked
- TYPE = Type of search to perform for the job
*JOBSTR = Checks that the job started in the indicated time slot
*JOBEND = Checks that the job ended in the indicated time slot
*BOTH = Both of the above checks are carried out

| | |
|---------|---|
| ENDCODE | = Maximum value permitted for the job end code. The end code indicates whether the job ended correctly (value 0) or not. Consult the CPF1164 message help for more details on this end code. *ANY = The end code is not checked. |
| MIN | = Minimum number of jobs with the same name which should be found in the time slot |
| MAX | = Maximum number of jobs with the same name which should be found in the time slot |
| START | = Check time slot start date and time *CURRENT = The current day's date is used *PRV = The previous day's date is used *BEGIN = The time slot starts at 00:00 |
| END | = Check time slot end date and time *CURRENT = The current day's date is used *PRV = The previous day's date is used *END = the time slot ends at the current time or 23:59 |
| LEVEL | = Severity levels of the alert generated in the monitoring product *CRITICAL = CRITICAL-type alert generated *WARNING = WARNING-type alert generated |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1096 | 0 | Job &5 started &1 time(s) and ended &2 times |
| CTL5092 | 20 | &1 job(s) started when the minimum required is &3 JobsStr=&1Jobs JobsEnd=&2Jobs JobDur=&6Min |
| CTL5093 | 20 | &1 job(s) started when the maximum required is &4 JobsStr=&1Jobs JobsEnd=&2Jobs JobDur=&6Min |
| CTL5094 | 20 | &2 job(s) ended when the minimum required is &3 JobsStr=&1Jobs JobsEnd=&2Jobs JobDur=&6Min |
| CTL5095 | 20 | &2 job(s) ended when the maximum required is &4 JobsStr=&1Jobs JobsEnd=&2Jobs JobDur=&6Min |
| CTL5097 | 20 | End job code &1, greater than the &2 limit required JobsStr=&3Jobs JobsEnd=&4Jobs JobDur=&5Min |
| CTL1001 | 40 | The &1 product license key is not valid. Contact M81 |
| CTL1091 | 40 | ENDCODE parameter not allowed if TYPE(*JOBSTR) |
| CTL1092 | 40 | &1 job(s) started when the minimum required is &3 JobsStr=&1Jobs JobsEnd=&2Jobs JobDur=&6Min |
| CTL1093 | 40 | &1 job(s) started when the maximum required is &4 JobsStr=&1Jobs JobsEnd=&2Jobs JobDur=&6Min |
| CTL1094 | 40 | &2 job(s) ended when the minimum required is &3 JobsStr=&1Jobs JobsEnd=&2Jobs JobDur=&6Min |
| CTL1095 | 40 | &2 job(s) ended when the maximum required is &4 JobsStr=&1Jobs JobsEnd=&2Jobs JobDur=&6Min |
| CTL1097 | 40 | End job code &1, greater than the &2 limit required JobsStr=&3Jobs JobsEnd=&4Jobs JobDur=&5Min |

Using the command:

Specify the job name to search for in the JOB parameter.

If a generic name is specified, every job which name begins with those letters will be considered.

Specify the time slot in which the job should be searched for.

If the TYPE parameter contains *JOBSTR, the command will check (in the system log) that there is a trace of the requested job start.

If the TYPE parameter contains *JOBEND, the command will check (in the system log) that there is a trace of the requested job end.

If the TYPE parameter contains *BOTH, both checks above are performed.

If the MIN and MAX values are identical (equal to 1 for example), the command will search for a specific number of jobs executed in the time slot (one only if the value is equal to 1). The presence of a different number of jobs would constitute an error.

If the MIN and MAX values are different, any number of jobs between these 2 values (inclusive) will be considered as correct.

The date and time indicated in the START parameter must be before the date and time indicated in the END parameter.

The message resulting from the command contains performance data (located at the end of the message after the | character) which can be used to generate graphs in monitoring tools. This information is filled in with the following considerations:

- JobStr contains the number of jobs corresponding to the request that have been started. It is only filled in if the request concerns TYPE(*JOBSTR) or TYPE(*BOTH).
- JobEnd contains the number of jobs corresponding to the request which have been stopped. It is only filled in if the request concerns TYPE(*JOBEND) or TYPE(*BOTH)
- JobDur contains the total time the job was active, in minutes. This value is only filled in if only one job has been found, and it has been completed. In all other cases, this value is 0.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.2 CTCHKBRM, Check that the BRMS save is correct

The CTCHKBRM command checks that the saves performed by BRMS were correct.

The command parameters are as follows:

```

                                Check the BRMS saves (CTCHKBRM)

Specify your choices then press Enter.

Number of Control groups . . NBSAV          0
Start date and time:          START
  Start date . . . . .                *CURRENT
  Start time . . . . .                *BEGIN
End date and time:           END
  End date . . . . .                  *CURRENT
  End time . . . . .                  *END
Save job . . . . .                JOB      *ANY
  User . . . . .                      *ANY
Severity level . . . . . LEVEL      *CRITICAL

```

Description of parameters:

| | |
|-------|--|
| NBSAV | = Number of BRMS control groups saved |
| START | = Check time slot start date and time *CURRENT = The current day's date is used *PRV = The previous day's date is used *BEGIN = The time slot starts at 00:00 |
| END | = Check time slot end date and time *CURRENT = The current day's date is used *PRV = The previous day's date is used *END = the time slot ends at the current time or 23:59 |
| JOB | = Job name and name of the user who performed the backup *ANY = The job name or user name is not checked |
| LEVEL | = Severity levels of the alert generated in the monitoring product *CRITICAL = CRITICAL-type alert generated *WARNING = WARNING-type alert generated |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1161 | 0 | &1 BRMS saves OK. Volumes used: &3, &4, &5 SAVOK=&1 SAVERR=&2 |
| CTL2162 | 20 | Error during BRMS saves. &1 save OK, &2 save in error. Volumes used: &3, &4, &5 SAVOK=&1 SAVERR=&2 |
| CTL1001 | 40 | The &1 product license key is not valid. Contact M81 |
| CTL3162 | 40 | Error during BRMS save. &1 save Ok, &2 save in error. Volumes used: &3, &4, &5 SAVOK=&1 SAVERR=&2 |
| CTL3175 | 40 | Unexpected error |

Using the command:

The CTCHKBRM command will analyze the BRMS log looking for end messages generated when running a control group.

The number specified relating to NBSAV parameters indicates the number of end messages that should be found, so the number of control groups run.

An alert is generated if the number of end messages does not correspond.

An alert is generated if at least one of the messages is an abnormal backup end.

The message gives the number of saves that were OK, and the number of saves that were in error.

The date and time indicated in the START parameter must be before the date and time indicated in the END parameter.

The returned message also gives the name of the last 3 volumes used during the last backup.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.3 CTCHKBRMDP, Check that a DUPTAP with BRMS is correct

The CTCHKBRMDP command checks that one or some DUPTAP have been performed successfully by BRMS.

The command parameters are as follows:

```

                                Check DUPTAP BRMS (CTCHKBRMDP)

Specify your choices then press Enter.

Min DUPTAP number . . . . . NBDUPMIN          1
Max DUPTAP number . . . . . NBDUPMAX          1
Starting date and time:          START
  Starting date . . . . .                    *CURRENT
  Starting time . . . . .                    *BEGIN
Ending date and time:          END
  Ending date . . . . .                      *CURRENT
  Ending time . . . . .                      *END
DUPTAP Job . . . . . JOB                    *ANY
User . . . . .                               *ANY
Severity level . . . . . LEVEL                *CRITICAL

```

Description of parameters:

- NBDUPMIN = Minimum number of DUPTAP performed by BRMS
- NBDUPMAX = Maximum number of DUPTAP performed by BRMS
- START = Check time slot start date and time
 - *CURRENT = The current day's date is used
 - *PRV = The previous day's date is used
 - *BEGIN = The time slot starts at 00:00
- END = Check time slot end date and time
 - *CURRENT = The current day's date is used
 - *PRV = The previous day's date is used
 - *END = the time slot ends at the current time or 23:59
- JOB = Job name and name of the user who performed the DUPTAP
 - *ANY = The job name or user name is not checked
- LEVEL = Severity levels of the alert generated in the monitoring product
 - *CRITICAL = CRITICAL-type alert generated
 - *WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1581 | 0 | Ok : &1 DUPTAP performed during the given period. Within the limits min &2 and max &3 NbDUPTAP=&1 |
| CTL2581 | 20 | Warning : &1 DUPTAP performed during the given period. Within the limits min &2 and max &3 NbDUPTAP=&1 |

CTL3581 40 Critical : &1 DUPTAP performed during the given period. Within the limits min
&2 and max &3|NbDUPTAP=&1

Using the command:

The CTCHKBRMDP command will analyze the BRMS log looking for end messages generated when duplicating a tape, or DUPTAP.

The number specified relating to NBDUPMIN and BNDUPMAX parameters indicates the minimum and maximum number of end messages that should be found, so the number of DUPTAP performed.

An alert is generated if the number of end messages does not correspond.

An alert is generated if at least one of the messages is an abnormal DUPTAP end.

The date and time indicated in the START parameter must be before the date and time indicated in the END parameter.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.4 CTCHKBRMEX, Check the number of expired media in BRMS

The CTCHKBRMEX command checks that the number of expired media is enough to perform the next backup.

The command parameters are as follows:

```

                                Check expired vol. for BRMS (CTCHKBRMEX)

Specify your choices then press Enter.

Minimum nb volumes critical . . . EXPMEDCRIT
Minimum nb volumes warning . . . EXPMEDWARN
Media class . . . . . MEDCLS
Location . . . . . LOC                *ANY
System name . . . . . SYSNAME         *ANY
```

Description of parameters:

- EXPMEDWARN = Minimum number of media before a warning alert is generated
- EXPMEDCRIT = Minimum number of media before a critical alert is generated
- MEDCLS = Media class in which expired media should be searched for
- LOC = Location where the media must be
- SYSNAME = System name where the media must be

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1171 | 0 | Ok, &1 volume(s) available, inside the limits defined. Media class : &2, location : &3, system : &4 VOLAVAIL=&1Volumes |
| CTL2172 | 20 | Warning, &1 volume(s) available, less than the warning limit. Media class : &2, location : &3, system : &4 VOLAVAIL=&1 |
| CTL3173 | 40 | Critical, &1 volume(s) available, lower than the critical limit. Media class : &2, location : &3, system : &4 VOLAVAIL=&1 |
| CTL3174 | 40 | Media class &1 not found |
| CTL3175 | 40 | Unexpected error |
| CTL3176 | 40 | Location &1 not found. |
| CTL3177 | 40 | The name of the location exceeds 8 characters. |
| CTL3178 | 40 | The network ID exceeds 8 characters. |

Using the command:

The CTCHKBRMEX command checks if there are enough expired volumes to be able to backup with BRMS. Indicate the minimum number of volumes required as well as the media class and/or a system name to check.

Note:

This command is not compatible with the Threads (technology used as standard by the Control For i agent). It must be executed in a separate job. This is done automatically when adding this command to the COMMAND parameter.

3.5 CTCHKBRMFC, Check FlashCopy status for BRMS

Backups with BRMS can be performed on clone partitions generated with the FlashCopy function of the disk arrays (e.g. using the "Flash for i" product). While the backup is performed on the Clone partition, the FlashCopy indicator in BRMS must be set to *ENDPRC.

The CTCHKBRMFC command is used to check the status of FlashCopy in BRMS.

The command parameters are as follows:

```

Check state FlashCopy BRMS (CTCHKBRMFC)

Type choices, press Enter.

FlashCopy State . . . . . FCSTATE          *STRPRC
Severity level . . . . . LEVEL             *CRITICAL
  
```

Description of parameters:

- FCSTATE = Enter the expected status for the FlashCopy function in BRMS
 - *STRPRC = The expected state is *STRPRC
 - *ENDPRC = The expected state is *ENDPRC
- LEVEL = Severity levels of the alert generated in the monitoring product
 - *CRITICAL = CRITICAL-type alert generated
 - *WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1541 | 0 | Ok, FlashCopy BRMS state is &1. |
| CTL2541 | 20 | Warning, FlashCopy BRMS state isn't &1. |
| CTL3541 | 40 | Critical, FlashCopy BRMS state isn't &1. |

Using the command:

The CTCHKBRMFC command is used to check the status of the FlashCopy for BRMS.

This function is only available if the BRMS Network option is installed (5770BR1 BRMS - Network Feature).

This status can be viewed with the command

WRKPCYBRM TYPE(*SYS)

Then option 4. "Change network group"

```

Change Network Group                                M81DEV  APPN
Network group . . . . : *MEDINV                    Position to . . . . :
FlashCopy state . . . : *ENDPRC
Communication method : *IP                        *AVAIL, *IP, *SNA, *NONE
Notify period . . . . : 3600                       30-99999 seconds

```

The value of this status must be:

- *STRPRC when a backup with BRMS is in progress on a Clone partition.
- *ENDPRC if no backup with BRMS is in progress on a Clone partition

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.6 CTCHKBRMST, Check pending DUPMEDBRM

The CTCHKBRMST command counts the number of volumes that must be duplicated by BRMS and generates an alert if it's more than the indicated limits.

The command parameters are as follows:

```

Check DUPMEDBRM for BRMS (CTCHKBRMST)

Type choices, press Enter.

Max Nb pending DUPMEDBRM (C) . . DUPMEDCRIT
Max Nb pending DUPMEDBRM (W) . . DUPMEDWARN

```


Description of parameters:

DUPMEDCRIT = Enter the maximum number of pending DUPMEDBRM to generate a critical alert.
DUPMEDWARN = Enter the maximum number of pending DUPMEDBRM to generate a warning alert.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1541 | 0 | Ok, &1 volume(s) to duplicate, inside the limits def defined. VOLDUP=&1Vol |
| CTL2541 | 20 | Warning, &1 volume(s) to duplicate, higher than the warning limit. VOLDUP=&1Vol |
| CTL3541 | 40 | Critical, &1 volume(s) to duplicate, higher than the critical limit. VOLDUP=&1Vol |

Using the command:

The CTCHKBRMST command counts the number of volumes that BRMS has to duplicate.

This function is only available if the BRMS is installed.

The volumes with a pending duplication are displayed with the value 1 in column “Dup Sts” when using the command WRKMEDBRM.

3.7 CTCHKCFGST, Check configuration status

The CTCHKCFGST command checks that a configuration item (line, controller or device) is in the expected state.

The command parameters are as follows:

```

Check configuration status (CTCHKCFGST)

Type choices, press Enter.

Configuration description . . . CFGD                *ALL
                        + for more values
Type . . . . . TYPE                *LIN
Status . . . . . STATUS            *ACTIVE
Detailed status . . . . . DETAILSTS
                        + for more values
Severity level . . . . . LEVEL      *CRITICAL

```

Description of parameters:

CFGD = Enter the name of the element(s) to be checked. It is possible to indicate a list of up to 100 items.
*ALL = All the elements of the type indicated in parameter TYPE will be checked
TYPE = Enter the type of element(s) to be checked.
STATUS = Enter the status that the indicated elements must have.
*ACTIVE

- *VARYON
- *VARYOFF
- *AVAILABLE
- *FAILED
- *DETAILSTS = Indicate the detailed status(es) expected in the DETAILSTS parameter.

DETAILSTS = If the value *DETAILSTS has been entered in the STATUS parameter, indicate here the list of detailed states expected for the elements. The aim is to use a more precise list of states than is possible with the STATUS parameter. A maximum of 25 possible states can be indicated. The elements must be in one of these states.

- *ACTIVE
- *ACTIVE_ALLOCATE
- *ACTIVE_CNN_PENDING
- *ACTIVE_DETACHED
- *ACTIVE_READER
- *ACTIVE_SOURCE
- *ACTIVE_TARGET
- *ACTIVE_WRITER
- *ALLOCATED
- *AS_36_DISABLED
- *AS_36_ENABLED
- *AVAILABLE
- *CONNECT_PENDING
- *DAMAGED
- *DEALLOCATED
- *DEGRADED
- *DIAGNOSTIC_MODE
- *FAILED
- *FAILED_ALLOCATE
- *FAILED_DETACHED
- *FAILED_READER
- *FAILED_SOURCE
- *FAILED_TARGET
- *FAILED_WRITER
- *HELD
- *HELD_ALLOCATE
- *HELD_DETACHED
- *HELD_SOURCE
- *HELD_TARGET
- *LOCKED
- *OPERATIONAL
- *POWERED_OFF
- *RCYCNL
- *RCYCNL_ALLOCATE
- *RCYCNL_DETACHED
- *RCYCNL_SOURCE
- *RCYCNL_TARGET
- *RCYPND
- *RCYPND_ALLOCATE
- *RCYPND_DETACHED
- *RCYPND_SOURCE
- *RCYPND_TARGET
- *REBUILD
- *SHUTDOWN
- *SIGNON_DISPLAY
- *STAND_ALONE
- *SYSTEM_REQUEST
- *UNAVAILABLE
- *UNKNOWN

*UNPROTECTED
*VARIED_OFF
*VARIED_ON
*VARIED_ON_ALLOCATE
*VARY_OFF_PENDING
*VARY_ON_PENDING
*VARY_ON_PENDING_ALLOCATE
*VARY_ON_PENDING_DETACHED
*VARYON_CNNPENDING

LEVEL = Severity levels of the alert generated in the monitoring product
*CRITICAL = CRITICAL-type alert generated
*WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1591 | 0 | Ok : no configuration description of type &1 doesn't have the status &2. NbErr=0 |
| CTL2591 | 20 | Warning : &1 configuration descriptions of type &2 doesn't have the status &3. First 5 are &4, &5, &6, &7, &8. NbErr=&1Err |
| CTL3591 | 40 | Critical : &1 configuration descriptions of type &2 doesn't have the status &3. First 5 are &4, &5, &6, &7, &8. NbErr=&1Err |
| CTL3593 | 40 | No configuration element &2 type &1 found. NbErr=&1Err |

Using the command:

The CTCHKCFGSTS command is used to check that a configuration item (line, controller or device) is in the expected state. For example, that an Ethernet line is active.

The system can differentiate between more than 100 different states. For this command, the STATUS parameter can be used to reduce the number of states to 5, as shown below. The DETAILSTS parameter is used to indicate the precise state(s) expected.

***ACTIVE :**

CONNECT PENDING, SIGNON DISPLAY, ACTIVE/CNN PENDING, ACTIVE, ACTIVE/DETACHED, ACTIVE/SOURCE, ACTIVE READER, ACTIVE/TARGET, ACTIVE/ALLOCATE, ACTIVE WRITER, SYSTEM REQUEST

***FAILED :**

UNAVAILABLE, HELD, HELD/DETACHED, HELD/SOURCE, HELD/TARGET, HELD/ALLOCATE, RCYPND, RCYPND/DETACHED, RCYPND/SOURCE, RCYPND/TARGET, RCYPND/ALLOCATE, RCYCNL, RCYCNL/DETACHED, RCYCNL/SOURCE, RCYCNL/TARGET, RCYCNL/ALLOCATE, FAILED, FAILED/DETACHED, FAILED/SOURCE, FAILED READER, FAILED/TARGET, FAILED/ALLOCATE, FAILED WRITER, DIAGNOSTIC MODE, *DAMAGED, *LOCKED, *UNKNOWN, DEGRADED, INVALID STATUS, DEALLOCATED, UNPROTECTED, ALLOCATED, STAND-ALONE, REBUILD

***VARYOFF :**

VARIED OFF, AS/36 DISABLED, VARY ON PENDING, VARY ON PENDING/DETACHED, VARY ON PENDING/ALLOCATE, POWERED OFF, SHUTDOWN

***VARYON :**

VARY OFF PENDING, VARIED ON, VARIED ON/ALLOCATE, VARYON/CNNPENDING, AS/36 ENABLED

***AVAILABLE :**

OPERATIONAL, AVAILABLE

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.8 CTCHKCERT, Check Validity date for a certificate

This command checks that the validity of certificates contained in a certificate store will not be out of date in a few days.

The command parameters are as follows:

```

Check certif. validity date (CTCHKCERT)

Type choices, press Enter.

Certificate store name . . . . . STORENAME

Password . . . . . STOREPWD

Max warning duration (days) . . MAXDUR_W      0
Max critical duration (days) . . MAXDUR_C      0

```

Description of parameters:

- STORENAME = Enter the name of the file containing the certificate store
The following special values are supported
*SYSTEM
*OBJECTSIGNING
*SIGNATUREVERIFICATION
- STOREPWD = Enter the password for this certificate store
- MAXDUR_W = Enter a number of days. If the certificates contained in the store expire before this number of days, a Warning alert will be generated.
- MAXDUR_C = Enter a number of days. If the certificates contained in the store expire before this number of days, a Critical alert will be generated.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1571 | 0 | Ok, no errors with the certificate store &1 Crit=0 Warn=0 |
| CTL3575 | 0 | &1, Limit date in &2 days for &3 |
| CTL2571 | 20 | Warning, &1 warning errors with the certificate store &2. First 2 are &3, &4 Crit=0 Warn=&1 |

| | | |
|---------|----|---|
| CTL3571 | 40 | Critical, &1 critical errors, &2 warning errors with the certificate store &3. First 2 are &4, &5 Crit=&1 Warn=&2 |
| CTL3572 | 40 | Error, invalid password of the certificate store &1. |
| CTL3573 | 40 | Error, certificate store &1 not found. |
| CTL3574 | 40 | Unknown error, unable to access the certificate store &1 |
| CTL3576 | 40 | Invalid certificate store. Please indicate a directory |

Using the command:

The CTCHKCERT command allows to search for all certificates in a Certificate Store and check their validity date. The validity period of these certificates is compared to the number of days provided, and an alert will be generated if necessary.

For each certificate, an intermediate message CTL3575 is added to the job log indicating the number of days remaining. This message will not be visible or usable in Nagios, but it will be visible if the command is used in an interactive session.

3.9 CTCHKCPU, Check CPU usage

The CTCHKCPU command checks power usage by the system, all the jobs in a list of subsystems or by one or several jobs.

The command parameters are as follows:

```

                                Check CPU usage (CTCHKCPU)

Specify your choices then press Enter.

Scope of check . . . . . SCOPE          *SYSTEM
Interval . . . . . DELAY                2
Warning threshold . . . . . MAXCPU_W    80
Critical threshold . . . . . MAXCPU_C   90
Subsystem(s) . . . . . SBS
                                + for more values
Jobs . . . . . JOB
                                + for more values

```

Description of parameters:

- SCOPE = Specifies which level the check will be performed at:
 - *SYSTEM = The CPU power considered is that of the whole partition (all the jobs).
 - *SBS = The CPU power considered is that of the jobs contained in the subsystem(s) indicated in the SBS parameter
 - *JOB = The CPU power considered is that of the jobs indicated in the JOB parameter
- DELAY = Specifies the time collection lasts, in number of seconds
- MAXCPU_W = Specifies the percentage of CPU usage above which a Warning-type alert will be generated
- MAXCPU_C = Specifies the percentage of CPU usage above which a Critical-type alert will be generated
- SBS = Specifies the list of subsystems for which power consumption will be considered. This parameter is only authorized if SCOPE(*SBS) has been specified. A maximum of 10 names can be specified.
- JOB = Specifies the list of jobs for which power consumption will be considered. This parameter is only authorized if SCOPE(*JOB) has been specified. A maximum of 50 names can be specified.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1151 | 0 | System CPU usage: &1% CPU=&1% |
| CTL1154 | 0 | Jobs CPU usage: &1% CPU=&1% |
| CTL1157 | 0 | SubSystem(s) CPU usage: &1% CPU=&1% |
| CTL5152 | 20 | System CPU usage: &1% over the Warning threshold of &2%. CPU=&1% |
| CTL5155 | 20 | Jobs CPU usage: &1% over the Warning threshold of &2%. CPU=&1% |
| CTL5158 | 20 | SubSystem(s) CPU usage: &1% over the Warning threshold of &2%. CPU=&1% |
| CTL1152 | 40 | System CPU usage: &1% Over the Critical threshold of &2% |
| CTL1155 | 40 | Jobs CPU usage: &1% over the Critical threshold of &2%. CPU=&1% |
| CTL1158 | 40 | SubSystem(s) CPU usage: &1% over the Critical threshold &2%. CPU=&1% |

Using the command:

The CTCHKCPU command is used to obtain the CPU usage rate.

The TIME parameter is used to choose how long the sampling is carried out (in seconds). The default value is 2 seconds. If this value is changed, check that the total processing time remains shorter than the time out (usually 10 seconds) set by the monitoring product (Nagios).

If the SCOPE(*SYSTEM) parameter is specified, the returned value will be the CPU usage percentage for all the jobs. This means the same information as that displayed by the WRKACTJOB command at the top of the screen.

If the SCOPE(*SBS) parameter is specified, the list of subsystems to include must also be entered. The returned value will be the percentage of CPU usage by all the jobs in the indicated subsystems.

If the SCOPE(*JOB) parameter is specified, the list of jobs to include must also be entered. The returned value will be the percentage of CPU usage by all the jobs with the indicated name(s).

3.10 CTCHKDSK, Check disk space usage

The CTCHKDSK command is used to monitor system ASP disk space usage.

The command parameters are as follows:

```

Check ASP usage (CTCHKDSK)

Specify your choices then press Enter.

ASP number . . . . . ASP                *SYSBAS
Warning limit . . . . . LMT_W           80
Critical limit . . . . . LMT_C           90
Max evolution rate warning . . . EVOL_W  *NOCTL
Max evolution rate critical . . . EVOL_C  *NOCTL
Duration for evolution ctl (h)   EVOL_TIME 24
Return type . . . . . RETTYPE           *DFT

```

Description of parameters:

- ASP = Enter the number of the ASP for which you want to know the % used.
 *SYSBAS = System ASP % used (ASP 1)
 *ALL = The % used will be the average rate of all disks combined.
 2-32 = User ASP % used will be calculated
 33-255 = iASP % used will be calculated
- LMT_W = Specifies the warning alert level. If this value is exceeded, a Warning-type alert will be generated.
- LMT_C = Specifies the critical alert level. If this value is exceeded, a Critical-type alert will be generated.
- EVOL_W = Enter a percentage change in the disk % used. If the disk % used evolves more than this value, a Warning alert will be generated.
 *NOCTL = The evolution of the disk % used is not checked.
- EVOL_C = Enter a percentage change in the disk % used. If the disk % used evolves more than this value, a Critical alert will be generated.
 *NOCTL = The evolution of the disk % used is not checked.
- EVOL_TIME = Specify the number of hours to be used to monitor the evolution of the disk % used.
- RETTYPE = Specify the format of the message to be generated in return for the command. In both cases, the message text will be the same, but the performance data will be different.
 *DFT = The performance data contains information in the following form:
 Used=&3GB Total=&2GB Rate=&1% Evol=&4%
 *PERFDATA = Performance data contains information in the form that comes standard in the Nagios product, which is:
 label=value[UOM];[warn];[crit];[min];[max]

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1141 | 0 | Ok : &1% used on a total of &2 GB for the ASP &5. Used=&3GB Total=&2GB Rate=&1% Evol=&4% |
| CTL1148 | 0 | Ok : &7% used on a total of &9 GB for ASP &1. ASP&1=&2B;&3;&4;&5;&6 Rate=&7% Evol=&8% |
| CTL5142 | 20 | Warning : &1% used (over the warning limit of 4%) on a total of &2 GB for the ASP &6. Used=&3GB Total=&2GB Rate=&1% Evol=&5% |
| CTL5144 | 20 | Warning : evolution rate of &4%, over the warning limit of 5% for the ASP &6. Used=&3GB Total=&2GB Rate=&1% Evol=&4% |
| CTL5145 | 20 | Warning : &7% used (over the limit of &9%) on a total of &10 GB for ASP &1. ASP&1=&2B;&3;&4;&5;&6 Rate=&7% Evol=&8% |
| CTL5146 | 20 | Warning : evolution rate of &8%, over the limit of &9% for ASP &1. ASP&1=&2B;&3;&4;&5;&6 Rate=&7% Evol=&8% |
| CTL1142 | 40 | Critical : &1% used (over the critical limit of &4%) on a total of &2 GB for the ASP &6. Used=&3GB Total=&2GB Rate=1% Evol=&5% |
| CTL1143 | 40 | Critical : evolution rate of &4%, over the critical limit of &5% for the ASP &6. Used=&3GB Total=&2GB Rate=&1% Evol=&4% |
| CTL5143 | 40 | Error, unable to track ASP usage. |
| CTL1145 | 40 | Critical : ASP &1 doesn't exist. ASP&1=&2B;&3;&4;&5;&6 Rate=&7% Evol=&8% |
| CTL1146 | 40 | Critical : &7% used (over the limit of &9%) on a total of &10 GB for ASP &1. ASP&1=&2B;&3;&4;&5;&6 Rate=&7% Evol=&8% |
| CTL1147 | 40 | Critical : evolution rate of &8%, over the limit of &9% for ASP &1. ASP&1=&2B;&3;&4;&5;&6 Rate=&7% Evol=&8% |

Using the command:

The CTCHKDSK command is used to obtain disk space usage for the system ASP (*SYSBAS or value 1), or for any other ASP or iASP known on the system.

For the iASP, the number must be used. It is not possible to use the iASP name.

For *SYSBAS, the returned value corresponds to that displayed at the top of the WRKSYSSTS command screen.

For *ALL, the returned value is the average % used of every disks of any ASP and iASP.

The evolution of the disk %used is calculated using the number of hours provided in the EVOL_TIME parameter. For example, if the following command is used:

```
CTCHKDSK ASP (*SYSBAS)
        EVOL_W (5)
        EVOL_C (8)
        EVOL_TIME (24)
```

A Warning alert will be generated if the disk % used has increased by 5% over a period of 24 hours.

A Critical Alert will be generated if the disk % used has increased by 8% over a period of 24 hours.

For information, the disk % used is automatically retrieved every hour by CTAUTO job. It is this value that allows the evolution of this data to be calculated.

This data is automatically cleared to keep only a maximum of 10 days.

3.11 CTCHKDTAA, Check the content of a Data Area

The CTCHKDTAA command is used to check if the content of a Data Area corresponds to the value passed as a parameter.

If the value is not the same, an alert is generated.

The command parameters are as follows:

```

                                Check the content of a DTAARA (CTCHKDTAA)

Specify your choices then press Enter.

Name of DTAARA to check . . . . DTAARA
  Library . . . . . *LIBL
Check start position . . . . . STRPOS      1
Value length to check . . . . . LEN       1
Expected value . . . . . VALUE

Severity level . . . . . LEVEL            *CRITICAL
```

Description of parameters:

- DTAARA = (Required) Name of the Data Area with content to be checked and name of the library it is in.
- STRPOS = Start position of characters to check
- LEN = Length of characters to check
- VALUE = Value to compare with the Data Area content
- LEVEL = Severity levels of the alert generated in the monitoring product
- *CRITICAL = CRITICAL-type alert generated

*WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|-------------------|-----------------|--|
| CTL1104 | 0 | Correct content for DTAARA &1/&2. Current content is &3 |
| CTL5101 | 20 | DTAARA &1/&2 not found |
| CTL5102 | 20 | Error while reading DTAARA &1/&2 content. |
| CTL5103 | 20 | DTAARA &1/&2 content is different from expected. Current content is &3 |
| CTL1001 | 40 | The &1 product license key is not valid. Contact M81 |
| CTL1101 | 40 | DTAARA &1/&2 not found |
| CTL1102 | 40 | Error while reading DTAARA &1/&2 content |
| CTL1103 | 40 | DTAARA &1/&2 content is different from expected. Current content is &3 |

Using the command:

This command can, for example, be used to check that a long operation (overnight process for example) finished correctly. The following operating procedure can be used:

- Create a text-type Data Area 8 characters long. QGPL/PROCESS01 for example.
- Change the overnight process as follows:
 - o At the start of the process, change the Data Area to add the characters "IN PROGRESS". This value will mean that the process is not finished.
 - o At the end of the process, if everything has gone well, change the content of the Data Area to specify the 'OK' value.
 - o If an error has occurred, specify the 'PROBLEM' value.
- In Nagios, create an overnight process checking service. This service will be run at a time at which the overnight process would normally have ended. The command to execute will be:
 - o CTCHKDTAA DTAARA(QGPL/PROCESS01) STRPOS(1) LEN(8) VALUE('OK')

When running this check in Nagios:

- If the process ended correctly, the service will change to OK
- If the process is still in progress, the service will change to CRITICAL and an alert will be generated. The text associated with this alert will contain the value found in the Data Area, i.e. 'IN PROGRESS'. The person receiving this alert will know that the process in question has been delayed.
- If the process terminated in error, the service will change to CRITICAL and an alert will be generated. The text associated with this alert will contain the value found in the Data Area, i.e. 'PROBLEM'. The person receiving this alert will know that the process terminated incorrectly.

This is just an example of how this command can be used.

The Data Area to check must exist and must be character type.

Its size must be at least equal to the sum of the 2 STRPOS and LEN values.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.12 CTCHKDTAQ, Check Number of messages in DTAQ

The CTCHKDTAQ command is used to check the number of messages in a Data Queue, and generate an alert if this number is greater than a limit.

The command parameters are as follows:

```

Check Nb Messages in DTAQ (CTCHKDTAQ)

Type choices, press Enter.

Data queue . . . . . DTAQ
Library . . . . . *LIBL
ASP Device . . . . . ASPDEV *SYSBAS
Minimum Critical Nb of message NBMIN_C
Minimum Warning Nb of messages NBMIN_W
Maxi Warning Nb of messages . . NBMAX_W
Maxi Critical Nb of messages . . NBMAX_C
  
```

Description of parameters:

- DTAQ = (Required) Name of the Data Queue to be checked and name of the library it is in.
- ASPDEV = Name of the iASP In which the object is.
*SYSBAS = The object is in the system ASP.
- NBMIN_C = Minimum number of messages in the DTAQ. If there are less messages, a Critical alert will be generated.
- NBMIN_W = Minimum number of messages in the DTAQ. If there are less messages, a Warning alert will be generated.
- NBMAX_W = Maximum number of messages in the DTAQ. If there are more messages, a Warning alert will be generated.
- NBMAX_C = Maximum number of messages in the DTAQ. If there are more messages, a Critical alert will be generated.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1383 | 0 | &1 messages. Inside the limits defined for DTAQ &2/&3 NB_MSG=&1 |
| CTL2381 | 20 | Warning, &1 messages, more than Maximum &6 for DTAQ &2/&3 NB_MSG=&1 |
| CTL2382 | 20 | Warning, &1 messages, less than minimum &5 for DTAQ &2/&3 NB_MSG=&1 |
| CTL1001 | 40 | The &1 product license key is not valid. Contact M81 |
| CTL3380 | 40 | Data queue &2/&1 not found |
| CTL3381 | 40 | Critical, &1 messages, more than Maximum &7 for DTAQ &2/&3 NB_MSG=&1 |
| CTL3382 | 40 | Critical, &1 messages, less than minimum &4 for DTAQ &2/&3 NB_MSG=&1 |
| CTL3384 | 40 | Unexpected error. See job log for more information |
| CTL3644 | 40 | ASP Device &1 not correct |

Using the command:

This command extract the number of messages in a DTAQ.

The DTAQ must exist.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.13 CTCHKIFSNF, Check Number of files in an IFS directory

The CTCHKIFSNF command is used to check the number of files in an IFS directory, and generate an alert if this number is less or greater than limits.

The command parameters are as follows:

```

                                Check Nb of IFS Files (CTCHKIFSNF)

Type choices, press Enter.

Directory . . . . . DIR

Include Subtrees . . . . . SUBTREE          *NO
File name (*generic*) . . . . . FILE        *ALL

Case sensitive . . . . . CASESEN           *YES
Maximum lifetime . . . . . MAXLIFE         *NOCTL
Time unit . . . . . UNIT                   *DAY
Minimum number of files . . . . . MIN       *NOCTL
Maximum number of files . . . . . MAX      *NOCTL
Severity level . . . . . LEVEL             *CRITICAL

```

Description of parameters:

- DIR = (Required) Directory name.
- SUBTREE = Indicate whether the analysis is to be performed only on the directory specified in parameter DIR, or whether sub-directories are to be part of the analysis.
 - *NO = Only the files in the directory specified in parameter DIR will be scanned.
 - *INCLUDE = All the files contained in the directory will be scanned, as well as the files contained in its subdirectories. *INCLUDE is not allowed if the controlled directory is the root (/)
- FILE = Name of the files to look for. It's possible to look for an individual file, or to use a generic name like *xxx*. In this case, every file which name contains xxx is counted.
 - *ALL = All files in the directory are counted.
- CASESEN = Indicate if the case of the file name must be respected for the check
 - *YES = Search will be done using exact case (upper/lower case)
 - *NO = Case is not taken into account for this check.
- MAXLIFE = Indicate the maximum lifetime that files should have.
 - The unit used must be entered in the UNIT parameter.
 - If files older than the time specified here are found, then an alert will be generated.
 - *NOCTL = The lifetime of the files will not be checked.
- UNIT = Indicate which unit is to be used for the file lifetime check.
 - *DAY = The value specified in parameter MAXLIFE represents a number of days.
 - *HOUR = The value in parameter MAXLIFE represents a number of hours.
 - *MIN = The value in parameter MAXLIFE represents a number of minutes.
- MIN = Minimum number of files in the directory. If there are less files, an alert will be generated.

MAX = Maximum number of files in the directory. If there are more files, an alert will be generated.

LEVEL = Severity levels of the alert generated in the monitoring product
*CRITICAL = CRITICAL-type alert generated
*WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1471 | 0 | Ok : &1 files starting with ' &2 ' found in the directory &3, none exceeds their lifetime. NbFiles=&1files MaxLife=&4 |
| CTL1472 | 0 | Ok : &1 files ending with ' &2 ' found in the directory &3, none exceeds their lifetime. NbFiles=&1files MaxLife=&4 |
| CTL1473 | 0 | Ok : &1 files containing ' &2 ' found in the directory &3, none exceeds their lifetime. NbFiles=&1files MaxLife=&4 |
| CTL1474 | 0 | Ok : &1 files named ' &2 ' found in the directory &3, none exceeds their lifetime. NbFiles=&1files MaxLife=&4 |
| CTL1475 | 0 | Ok : &1 files found in the directory &2, none exceeds their lifetime. NbFiles=&1files MaxLife=&4 |
| CTL2471 | 20 | Warning : &1 files starting with ' &2 ' found in the directory &3. NbFiles=&1files MaxLife=&4 |
| CTL2472 | 20 | Warning : &1 files ending with ' &2 ' found in the directory &3. NbFiles=&1files MaxLife=&4 |
| CTL2473 | 20 | Warning : &1 files containing ' &2 ' found in the directory &3. NbFiles=&1files MaxLife=&4 |
| CTL2474 | 20 | Warning : &1 files named ' &2 ' found in the directory &3. NbFiles=&1files MaxLife=&4 |
| CTL2475 | 20 | Warning : &1 files found in the directory &2. NbFiles=&1files MaxLife=&4 |
| CTL2476 | 20 | Warning : &1 files have exceeded their lifetime in the directory &2. NbFiles=&3files MaxLife=&4 |
| CTL3471 | 40 | Critical : &1 files starting with ' &2 ' found in the directory &3. NbFiles=&1files MaxLife=&4 |
| CTL3472 | 40 | Error : Enter a correct directory path |
| CTL3473 | 40 | Critical : &1 files ending with ' &2 ' found in the directory &3. NbFiles=&1files MaxLife=&4 |
| CTL3474 | 40 | Critical: &1 files containing ' &2 ' found in the directory &3. NbFiles=&1files MaxLife=&4 |
| CTL3475 | 40 | Critical : &1 files named ' &2 ' found in the directory &3. NbFiles=&1files MaxLife=&4 |
| CTL3476 | 40 | Critical : &1 files found in the directory &2. NbFiles=&1files MaxLife=&4 |
| CTL3477 | 40 | Critical : &1 files have exceeded their lifetime in the directory &2. NbFiles=&3files MaxLife=&4 |
| CTL3478 | 40 | The directory contains too many subdirectories. |
| CTL3479 | 40 | Error, can't read a directory. |
| CTL3480 | 40 | Parameter SUBTREE can't be *INCLUDE if the directory is '/. |

Using the command:

This command lists the files contained in the directory, and compares this list to the name in parameter FILE.

If the FILE parameter has a file name (without character *), the command looks for this exact file name in the directory.

If the FILE parameter has a generic name like xxx*, the command counts the number of files which name begins with xxx.

If the FILE parameter has a generic name like *xxx*, the command counts the number of files which name contains xxx.

If the number of files found is inside the limits given in parameters MIN and MAX, a message with OK type is sent.

Otherwise, a Critical or Warning message is sent, according to the severity level asked in parameter LEVEL.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.14 CTCHKIFSTX, Look for a text in an IFS file

The CTCHKIFSTX command allows to search for a text in an IFS file, and to generate an alert if this text is not found.

The command parameters are as follows:

```

                                Check text in IFS file (CTCHKIFSTX)

Indiquez vos choix, puis appuyez sur ENTREE.

Directory . . . . . DIR
File name . . . . . FILE
Text to search . . . . . LOOKUP

When an alert is generated . . . ALERT          *FOUND
Case sensitive for file name . . CASEFILE       *NO
Case sensitive for text . . . . CASELOOKUP     *NO
Severity level . . . . . LEVEL                 *CRITICAL

```

Description of parameters:

Description of the parameters:

DIR = (Required) Name of the directory.
 FILE = (Required) Name of the file or files to be analyzed. It is possible to analyze the contents of a single file, or to specify a generic name in the form xxx*. In this case, all files beginning with xxx are analyzed.

LOOKUP = (Required) Text to search for in the file.

ALERT = Indicate in which case an alert should be generated
 *FOUND = An alert will be generated if the text is found in the file
 *NOTFOUND = An alert will be generated if the text is not found in the file

CASEFILE = Indicate if the file name is case sensitive for the check.
 *YES = The file name must match exactly (upper/lower case)
 *NO = The case of the file name is not taken into account for this control.

CASELOOKUP = Indicate if the case of the text to be searched must be respected for the control.
 *YES = The text contained in the file must correspond exactly to the text indicated (upper/lower case)
 *NO = The text case is not taken into account for this control.

LEVEL = Severity levels of the alert generated in the monitoring product
 *CRITICAL = CRITICAL type alert generated
 *WARNING = WARNING type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1713 | 0 | Ok, file &1 (directory &2) does not contain the text &3. NbError=&4files |
| CTL1714 | 0 | Ok, no file matching pattern &1 contain the text &2 in directory &3. NbError=&4files |
| CTL1716 | 0 | Ok, file &1 (directory &2) contain the text &3. NbError=&4files |
| CTL1717 | 0 | Ok, all files matching pattern &1 contain the text &2 in directory &3. NbError=&4files |
| CTL2710 | 20 | Warning, file &1 (directory &2) contain the text &3. NbError=&4files |
| CTL2711 | 20 | Warning, &1 files matching pattern &2 contain the text &3 in directory &4. NbError=&1files |
| CTL2712 | 20 | Warning, file &1 (directory &2) does not contain the text &3. NbError=&4files |
| CTL2713 | 20 | Warning, &1 files matching pattern &2 do not contain the text &3 in directory &4. NbError=&1files |
| CTL3710 | 40 | Critical, file &1 (directory &2) contain the text &3. NbError=&4files |
| CTL3711 | 40 | Critical, &1 files matching pattern &2 contain the text &3 in directory &4. NbError=&1files |
| CTL3712 | 40 | Critical, file &1 (directory &2) does not contain the text &3. NbError=&4files |
| CTL3713 | 40 | Critical, &1 files matching pattern &2 do not contain the text &3 in directory &4. NbError=&1files |
| CTL3714 | 40 | File name &1 not correct. |
| CTL3715 | 40 | Directory &1 not found. |
| CTL3716 | 40 | File &1 (directory &2) not found. |

Using the command:

The command scans the contents of the file and searches for the text passed to the LOOKUP parameter. If the parameter ALERT(*FOUND) is specified, an alert will be generated if the text is found in at least one file. If parameter ALERT(*NOTFOUND) is specified, an alert will be generated if the text is not found in any file.

If parameter FILE contains a file name (without the * character), the command searches for the text in the specified file.

If the FILE parameter contains a generic name in the form xxx*, the command searches for the text in all files whose name begins with xxx

If an alert is generated, a message of type Critical or Warning is sent, depending on the level requested in the parameter LEVEL.

Be careful, if the file(s) to be analyzed are too long, the command may last longer than the timeout specified in the monitoring product.

This command does not display any screen. The result of this command is the sending of a return message indicating the necessary information.

3.15 CTCHKJOB, Check the status of a job

The CTCHKJOB command is used to check whether a job is active or inactive.

The command parameters are as follows:

```

                                Check a job (CTCHKJOB)

Specify your choices then press Enter.

Name of the job to check . . . . . JOBNAME
Job user profile . . . . . JOBUSER
Status of the job to check . . . STATUS          *RUN
Forbidden status for the job . . STSALERT        *NONE
                                + for more values
Maximum number of threads . . . THREADS         *NOCTL
Severity level . . . . . LEVEL                  *CRITICAL

```

Description of parameters:

- JOBNAME = Name of the job to check
- JOBUSER = User profile name the job must run under
 - *ANY = The user profile will not be checked
- STATUS = Status the job must be in
 - *RUN = The job must be active. If not, an alert will be generated.
 - *STOP = No job with the specified name is active in the system. If a job with the name specified in the JOBNAME parameter is active, an alert will be generated.
- STSALERT = List of statuses the job must not be in.
 - The possible values are all the statuses that can be displayed by the WRKACTJOB command. For example: MSGW, LCKW, etc.
- THREADS = Maximum number of threads allowed for this job
 - *NOCTL = This value will not be checked.
- LEVEL = Severity levels of the alert generated in the monitoring product
 - *CRITICAL = CRITICAL-type alert generated
 - *WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1053 | 0 | &3 &1 job(s), &2 profile running. NbJobs=&4 NbThreads=&5 |
| CTL5051 | 20 | &4 &1 job(s), &2 profile found in forbidden state NbJobs=&4 NbThreads=&5 |
| CTL5052 | 20 | No &1 job, &2 profile running. NbJobs=&4 NbThreads=&5 |
| CTL5054 | 20 | &3 &1 job(s), &2 profile running. NbJobs=&4 NbThreads=&5 |
| CTL1001 | 40 | The &1 product license key is not valid. Contact M81 |
| CTL1051 | 40 | &4 &1 job(s), &2 profile found in forbidden state NbJobs=&4 NbThreads=&5 |
| CTL1052 | 40 | No &1 job, &2 profile running NbJobs=&4 NbThreads=&5 |
| CTL1054 | 40 | &3 &1 job(s), &2 profile running. NbJobs=&4 NbThreads=&5 |
| CTL1056 | 40 | Number of threads &5 greater than the limit &6 for job &1. NbJobs=&4 NbThreads=&5 |

Using the command:

This command searches the active jobs to see if one of them has the name passed in the JOBNAME parameter. If the user profile name is specified in the JOBUSER parameter, the job searched for must be running under this profile name.

If the STATUS parameter contains *RUN, the command expects the requested job to be active. If no job is found under this name, an alert is generated.

If the STATUS parameter contains *STOP, the command expects the requested job to be inactive. If a job with this is found, an alert will be generated.

The STSALERT parameter is a list of “forbidden” statuses for this job. If the job is active and in one of the specified statuses, an alert is generated.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.16 CTCHKJOBDO, Check jobs duration

The CTCHKJOBDO command is used to check that the job is not running for a too long time. An alert will be generated if the jobs of a subsystem have been active for a too long time.

The command parameters are as follows:

```

Check jobs duration (CTCHKJOBDO)

Type choices, press Enter.

Jobs to select . . . . . JOB          *ALL
                    + for more values
Jobs user profile . . . . . USER      *ANY
Current user . . . . . CURUSER        *ANY
Jobs subsystem . . . . . SBS          *ANY
Job status . . . . . JOBSTS           *ANY
Warning limit duration . . . . . DURATION_W  1
Critical limit duration . . . . . DURATION_C  1
Return tyme (10 names/3 jobs) . RETTYPE    *NAMES

```

Description of parameters:

- JOB** = Name of the job(s) for which the execution time will be checked
*ALL = All jobs will be checked. This value is only possible if a subsystem name is entered in parameter SBS.
- USER** = Name of the user profile for which the jobs are to be checked.
*ANY = All jobs will be checked, regardless of user profile
- USER** = Name of the current user (the one really used by the job) for which the jobs are to be checked.
*ANY = All jobs will be checked, regardless of current user
- SBS** = Name of the subsystem in which the job to be checked is running.

| | |
|------------|---|
| | *ANY = All jobs will be checked, regardless of the subsystem in which they are running. This value is not allowed if *ALL is specified in parameter JOB. |
| JOBSTS | = Status to be checked for the job. *ANY = The status of the job will not be taken into account. Only the total duration of the job will be taken into account to generate an alert. Other state = If a particular state is indicated, an alert will be generated if the job has remained in this state for the duration indicated in the DURATION_x parameters. The states are those displayed by the WRKACTJOB command. |
| DURATION_W | = Duration in minutes. A Warning alert will be generated for all jobs that have been active for longer than this value. |
| DURATION_C | = Duration in minutes. A Critical alert will be generated for all jobs that have been active for longer than this value. |
| RETTYPE | = Used to indicate which type of message will be used for the response. *NAMES = In the case of an alert, the list of the first 10 job names will be indicated (only the job name) *JOBS = In the case of an alert, the list of the 3 first jobs will be indicated (full job name in number/user/job format and the name of the subsystem it is in). |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1551 | 0 | Ok, no jobs have been running for too long time. NbEr=0jobs |
| CTL2551 | 20 | Warning, &1 jobs in warning state. First 10 are &2, &3, &4, &5, &6, &7, &8, &9, &10, &11. NbEr=&1jobs |
| CTL2552 | 20 | Warning, &1 jobs in warning state. First 3 are Job=&2 Sbs=&3, Job=&4 Sbs=&5, Job=&6 Sbs=&7 NbEr=&1jobs |
| CTL3551 | 40 | Critical, &1 jobs too long, &2 jobs warn. First 10 critical jobs are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12. NbEr=&13jobs |
| CTL3552 | 40 | Critical, &1 jobs too long, &2 jobs warn. First 3 critical jobs are Job=&3 Sbs=&4, Job=&5 Sbs=&6, Job=&7 Sbs=&8 NbEr=&9jobs |
| CTL3553 | 40 | Subsystem can't be *ANY if jobs to select is *ALL. |
| CTL3554 | 40 | Job &1 not correct. |

Using the command:

This command is used to check that a job does not last too long.

It lists the jobs corresponding to the entered parameters, i.e. the job name, the user profile, the current user and the sub-system in which it is running, and checks how long the job has been active.

If the duration is greater than the number of minutes entered in the parameter, then an alert is generated.

If the JOBSTS parameter contains *ANY, the duration taken into account is the total time of execution of the job.

If the JOBSTS parameter contains a specific status, the time taken into account is the time since the job is in the specified status.

Note: the command only takes into account the status of the job at the time the command is executed. If the job changes status between 2 times when the command is used, this change is not detected. The job will be considered to have remained in the same status for the duration of the interval.

The duration for sending an alert of type Warning must be less than or equal to the duration for a Critical alert.

The user profile (USER parameter) is the one that started the job. The current user (CURUSER parameter) is the profile in use at the time of the check. These 2 profiles can be different. The WRKACTJOB command can be

used to view these 2 profiles. The first screen displayed shows the current user. If you press F11 twice in succession, the initial user profile is displayed.

The RETTYPE parameter is only used when an alert is generated. It determines the format of the message returned for the alert.

If the parameter value is *NAMES, message CTL1072 will be returned.

If the parameter value is *JOBS, message CTL1073 will be returned.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.17 CTCHKJOBQ, Check the number of jobs in a JOBQ

The CTCHKJOBQ command is used to check that the number of jobs in a JOBQ does not exceed a certain number, passed as a parameter.

The command parameters are as follows:

```

                                Check number of JOBS in JOBQ (CTCHKJOBQ)

Specify your choices then press Enter.

Job queue . . . . . JOBQ
  Library . . . . . *LIBL
Spool status to select . . . . . STS *ALL

Spool status to omit . . . . . OMITSTS *NONE

Max Warning Nb of jobs . . . . . MAXJOB_W 0
Max Critical Nb of jobs . . . . . MAXJOB 0
Max warning job duration (min) . . . . . MAXDUR_W *NOCTL
Max crit. job duration (min) . . . . . MAXDUR_C *NOCTL
Expected JOBQ status . . . . . STATUS *RLS
Severity level . . . . . LEVEL *CRITICAL

```

Description of parameters:

- JOBQ = Name of the JOBQ to check, and the name of the library it is in
*ALL = Every JOBQ in the system will be included in this check.
- STS = Enter the list of jobs states to be taken into account. Only the jobs whose state is in this list will be counted.
*ALL = All jobs are counted, regardless of their state.
The list of possible states is as follow:
SCD, HLD, RLS
- OMITSTS = If *ALL has been entered in the STS parameter, it is possible to specify a list of states that will not be taken into account.
*NONE = No state is excluded from counting.
The list of possible states is as follow:
SCD, HLD, RLS
- MAXJOB_w = Maximum number of jobs allowed in this JOBQ. Above this number, a Warning alert will be generated.

| | |
|----------|---|
| MAXJOB | = Maximum number of jobs allowed in this JOBQ. Above this number, a Critical alert will be generated. |
| MAXDUR_W | = Maximum time that jobs can spend in JOBQ. If jobs have been present in JOBQ for longer than this number of minutes, a Warning alert will be generated. |
| MAXDUR_C | = Maximum time that jobs can spend in JOBQ. If jobs have been in JOBQ for longer than this number of minutes, a Critical alert will be generated. |
| STATUS | = Status the JOBQ should be in. This status can be checked interactively with the WRKJOBQ command. *RLS = The JOBQ must be released *HLD = The JOBQ must be held *ANY = The JOBQ status is not checked |
| LEVEL | = Severity levels of the alert generated in the monitoring product *CRITICAL = CRITICAL-type alert generated *WARNING = WARNING-type alert generated |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1124 | 0 | Correct state, duration and number of jobs for the JOBQ &2/&1. Nb_Jobs=&3jobs |
| CTL1126 | 0 | Correct state, duration and number of jobs for all JOBQ Nb_Jobs=&1jobs Nb_JobqEr=0jobq |
| CTL5121 | 20 | JOBQ &2/&1 does not exist |
| CTL5122 | 20 | JOBQ &2/&1 status &3 different from the expected one Nb_Jobs=&4jobs |
| CTL5123 | 20 | The JOBQ &2/&1 contains &3 jobs, greater than the warning limit &4 Nb_Jobs=&3jobs |
| CTL5124 | 20 | All JOBQ contains &1 jobs, greater than the warning limit &2. Nb_Jobs=&1jobs Nb_JobqEr=0jobq |
| CTL5125 | 20 | Unexpected error &1 occurred during processing |
| CTL5126 | 20 | Warning, &1 JOBQ with a different status from the expected on. First 5 are &2, &3, &4, &5, &6. Nb_Jobs=&7 Nb_JobqEr=&1 |
| CTL5127 | 20 | &1 JOBQ with warning job duration (greater than &2min). 5 first are &3, &4, &5, &6, &7. Nb_Jobs=&8jobs Nb_JobqEr=&9jobq |
| CTL5128 | 20 | Warning, JOBQ &2/&1 has jobs waiting for more than the limit &3min. Nb_Jobs=&4jobs |
| CTL1120 | 40 | &1 JOBQ with critical job duration (greater than &2min). 5 first are &3, &4, &5, &6, &7. Nb_Jobs=&8jobs Nb_JobqEr=&9jobq |
| CTL1121 | 40 | JOBQ &2/&1 does not exist |
| CTL1122 | 40 | &2/&1 JOBQ in &3 state, different from the expected one Nb_Jobs=&4jobs |
| CTL1123 | 40 | The &2/&1 JOBQ contains &3 jobs, greater than the critical limit &4. Nb_Jobs=&3jobs |
| CTL1125 | 40 | Unexpected error &1 occurred during processing |
| CTL1127 | 40 | All JOBQ contains &1 jobs, greater than the critical limit &2. Nb_Jobs=&1jobs Nb_JobqEr=0jobq |
| CTL1128 | 40 | Critical, &1 JOBQ with a different status from the expected one. 5 first are &2, &3, &4, &5, &6. Nb_Jobs=&7 Nb_JobqEr=&1 |
| CTL1129 | 40 | &1 JOBQ with crit. job duration (> &2min), &3 JOBQ with warn. job duration (> &4min). 5 first are &5, &6, &7, &8, &9. &10 |
| CTL1130 | 40 | Critical, JOBQ &2/&1 has jobs waiting for more than the limit &3min. Nb_Jobs=&4jobs |
| CTL3561 | 40 | Parameter STS must be *ALL or the parameter OMITSTS must be *NONE. |

Using the command:

Use the command by specifying the name of a JOBQ to check and the maximum number of jobs allowed in this JOBQ. If the number of pending jobs exceeds the value specified in the MAXJOB_W or MAXJOB parameter, an alert will be generated.

If the value *ALL is entered in the JOBQ parameter, the number of jobs will be counted in every JOBQ of the system.

If one or more states are specified in parameter STS, only the jobs that are in these states are counted. If the STS parameter contains *ALL, then all jobs are counted except those in one of the states indicated in the OMITSTS parameter.

During the same operation, the JOBQ status can be checked (held or released).

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.18 CTCHKJOBS, Check the jobs in a specific status

The CTCHKJOBS command is used to generate an alert if at least one job is in the status indicated in the parameter JOBSTS.

The command parameters are as follows:

```

Check JOB in specific status (CTCHKJOBS)

Specify your choices then press Enter.

Job status . . . . . JOBSTS          *ANY
Subsystems to select . . . . . SBS      *ALL
      + for more values
Subsystems to omit . . . . . OMITSBS    *NONE
      + for more values
Jobs to select . . . . . JOB           *ALL
      + for more values
Jobs to omit . . . . . OMITJOB         *NONE
      + for more values
Users to omit . . . . . OMITUSR        *NONE
      + for more values
Current users to omit . . . . . OMITCURUSR *NONE
      + for more values
Severity level . . . . . LEVEL         *CRITICAL
Return type (10 names/3 jobs) . RETTYPE *NAMES

```

Description of parameters:

JOBSTS = Indicates the status of the jobs being searched for.

*ANY = Job status is not checked. Using this value is the same as counting all the jobs which correspond to the other parameters of the command.
The other authorised values are the possible states visible with the WRKACTJOB command.

| | |
|------------|--|
| SBS | = Specifies the list of subsystems in which jobs in the requested status are searched for. A list of 100 subsystem names can be indicated. *ALL = All the active jobs are searched. Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name. |
| OMITSBS | = If *ALL was indicated in the SBS parameter, a list of 100 subsystems to exclude can be indicated here. Any jobs in the requested status in these subsystems will not be included. *NONE = No subsystem is omitted. Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name. |
| JOB | = Used to indicate a list of 50 names of jobs which will be checked. Only the jobs included in this list will be checked. *ALL = Every jobs in the subsystem(s) indicated will be checked. Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name. |
| OMITJOB | = Used to indicate a list of 50 names of jobs which will not be included in the check. *NONE = No job will be omitted. Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name. |
| OMITUSR | = Allows you to specify a list of 50 user names that will not be included in the control. *NONE = No user will be omitted. Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name. |
| OMITCURUSR | = Allows you to specify a list of 50 current user names that will not be included in the control. The current user is the one under which the job is run. *NONE = No current user will be omitted. Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name. |
| LEVEL | = Severity levels of the alert generated in the monitoring product *CRITICAL = CRITICAL-type alert generated *WARNING = WARNING-type alert generated |
| RETTYPE | = Used to indicate which type of message will be used for the response. *NAMES = In the case of an alert, the list of the first 10 job names will be indicated (only the job name) *JOBS = In the case of an alert, the list of the 3 first jobs will be indicated (full job name in number/user/job format and the name of the subsystem it is in). |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1074 | 0 | No job in &1 status. Nb_&1=0 jobs |
| CTL5072 | 20 | &2 job(s) in &1 status. The first 10 are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12. Nb_&1=&2 jobs |
| CTL5073 | 20 | &2 job(s) in &1 status. The first 3 are Job=&3/&4/&5 Sbs=&6, Job=&7/&8/&9 Sbs=&10, Job=&11/&12/&13 Sbs=&14 |
| CTL1071 | 40 | *ALL required in SBS parameter to omit subsystems (OMITSBS) |

| | | |
|---------|----|--|
| CTL1072 | 40 | &2 job(s) in &1 status. The first 10 are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12. Nb_&1=&2 jobs |
| CTL1073 | 40 | &2 job(s) in &1 status. The first 3 are Job=&3/&4/&5 Sbs=&6, Job=&7/&8/&9 Sbs=&10, Job=&11/&12/&13 Sbs=&14 |

Using the command:

The command searches all the jobs in the status entered in parameter JOBSTS in the list of subsystems specified in the SBS parameter. If *ALL is indicated, the search is carried out in the whole system.

Certain subsystems can be excluded from the search by using the OMIT SBS parameter.

It is possible to select a list of jobs to check by entering their name in JOB parameter. This allows you to check the correct execution of several batch jobs whose name begins with the same characters, or a job whose name end changes according to the day.

Certain jobs can be excluded from the search by indicating the name of these jobs in the OMITJOB parameter.

It is also possible to omit user profiles or current users from the search. To find out more about the difference between these 2 types of users, use the WRKACTJOB command. The first screen displays the name of the current user. Press F11 twice to see the original user profile.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

The RETTYPE parameter is only used when an alert is generated. It determines the format of the message returned for the alert.

If the parameter value is *NAMES, message CTL1072 will be returned.

If the parameter value is *JOBS, message CTL1073 will be returned.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.19 CTCHKJRN, Check attached JRNRCV size

The CTCHKJRN command checks the size and number of entries in the journal receiver currently attached to one or more journals.

The parameters of the command are as follows:

```

Check attached JRNRCV (CTCHKJRN)

Type choices, press Enter.

Journal . . . . . JRN
Library . . . . .
          + for more values

Max size warning (MB) . . . . . MAXSIZE_W *NOCTL
  
```

| | | |
|------------------------------------|------------|--------|
| Max size critical (MB) | MAXSIZE_C | *NOCTL |
| Max nb of entries warning | MAXENTRY_W | *NOCTL |
| Max nb of entries critical | MAXENTRY_C | *NOCTL |

Description of parameters:

- JRN = Name of the journal(s) to be monitored.
A maximum of 10 journal's names can be specified.
- MAXSIZE_W = Specify the maximum size of the journal receiver currently attached to the journal.
Beyond this number, a Warning alert will be generated. The size must be indicated in MB.
*NOCTL = This value will not be checked.
- MAXSIZE_C = Specify the maximum size of the journal receiver currently attached to the journal.
Beyond this number, a Critical alert will be generated. The size must be specified in MB.
*NOCTL = This value will not be checked.
- MAXENTRY_W= Specify the maximum number of entries that the journal receiver currently attached to the journal should contain. Beyond this number, a Warning alert will be generated.
*NOCTL = This value will not be checked.
- MAXENTRY_C= Specify the maximum number of entries that the journal receiver currently attached to the journal should contain. Beyond this number, a Critical alert will be generated.
*NOCTL = This value will not be checked.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1671 | 0 | Ok, no journal in error. NBOK=&3Jrn NBWARN=&2Jrn NBCRIT=&1Jrn |
| CTL2670 | 20 | Warning, &2 journals in warning error. NBOK=&3Jrn NBWARN=&2Jrn NBCRIT=&1Jrn |
| CTL3670 | 40 | Error, library &1 not found. |
| CTL3671 | 40 | Error, journal &2 not found in library &1. |
| CTL3672 | 40 | Error, cannot get information about active receiver for journal &1/&2. |
| CTL3673 | 40 | Critical, &1 journals in critical error, &2 in warn |

Extended messages

In the event that an alert is generated, the resulting message will contain additional information that will appear:

- When used in a 5250 session, in the second level of the message.
- When displayed in the monitoring tool, in the extended data of the service if it is compatible.

The additional information contains a list of all journals for which an error has been found.

CTL1670 0 Journal &1/&2, status &3, active receiver &4/&5, size &6 MB, number of entries &7.

Using the command:

Use the command by specifying the name of a journal to check. It is possible to specify a list of up to 10 journals.

For each journal, the command will check the size and number of entries of the last journal receiver. The receiver that is currently attached.

If the value *NOCTL is specified for all checks, then this is equivalent to checking only the existence of the journal.

This command does not display any screen. The result of this command is that a message is sent back with the necessary information.

3.20 CTCHKLCKW, Check the jobs in LCKW status

The CTCHKLCKW status is used to generate an alert if at least one job is in LCKW (Lock Wait) status in the system.

The command parameters are as follows:

```

                                Check JOB in LCKW status (CTCHKLCKW)

Specify your choices then press Enter.

Subsystems to select . . . . . SBS                *ALL
                                + for more values
Subsystems to omit . . . . . OMIT SBS            *NONE
                                + for more values
Jobs to select . . . . . JOB                    *ALL
                                + for more values
Jobs to omit . . . . . OMIT JOB                 *NONE
                                + for more values
Severity level . . . . . LEVEL                 *CRITICAL
Return type (10 names/3 jobs RETTYPE          *NAMES

```

Description of parameters:

- SBS = Indicates the list of subsystems in which jobs in LCKW status are searched for. A list of 100 subsystem names can be indicated.
*ALL = All the active jobs are searched.
Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name.
- OMIT SBS = If *ALL was indicated in the SBS parameter, a list of 100 subsystems to exclude can be indicated here. Any jobs in LCKW in these subsystems will not be taken into account.
*NONE = No subsystem is omitted.
Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name.
- JOB = Used to indicate a list of 50 names of jobs which will be checked. Only the jobs included in this list will be checked.

| | |
|---------|--|
| | *ALL = Every jobs in the subsystem(s) indicated will be checked. Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name. |
| OMITJOB | = Used to indicate a list of 50 names of jobs which will not be included in the check. *NONE = No job will be omitted. Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name. |
| LEVEL | = Severity levels of the alert generated in the monitoring product *CRITICAL = CRITICAL-type alert generated *WARNING = WARNING-type alert generated |
| RETTYPE | = Used to indicate which type of message will be used for the response. *NAMES = In the case of an alert, the list of the first 10 job names will be indicated (only the job name) *JOBS = In the case of an alert, the list of the 3 first jobs will be indicated (full job name in number/user/job format and the name of the subsystem it is in). |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1074 | 0 | No job in &1 status. Nb_&1=0 jobs |
| CTL5072 | 20 | &2 job(s) in &1 status. The first 10 are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12. Nb_&1=&2 jobs |
| CTL5073 | 20 | &2 job(s) in &1 status. The first 3 are Job=&3/&4/&5 Sbs=&6, Job=&7/&8/&9 Sbs=&10, Job=&11/&12/&13 Sbs=&14 |
| CTL1071 | 40 | *ALL required in SBS parameter to omit subsystems (OMITSBS) |
| CTL1072 | 40 | &2 job(s) in &1 status. The first 10 are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12. Nb_&1=&2 jobs |
| CTL1073 | 40 | &2 job(s) in &1 status. The first 3 are Job=&3/&4/&5 Sbs=&6, Job=&7/&8/&9 Sbs=&10, Job=&11/&12/&13 Sbs=&14 |

Using the command:

The command searches all the jobs in LCKW (Lock Wait) status in the list of subsystems indicated in the SBS parameter. If *ALL is indicated, the search is carried out in the whole system.

Certain subsystems can be excluded from the search by using the OMITSBS parameter.

It is possible to select a list of jobs to check by entering their name in JOB parameter. This allows you to check the correct execution of several batch jobs whose name begins with the same characters, or a job whose name end changes according to the day.

Certain jobs can be excluded from the search by indicating the name of these jobs in the OMITJOB parameter.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

The RETTYPE parameter is only used when an alert is generated. It determines the format of the message returned for the alert.

If the parameter value is *NAMES, message CTL1072 will be returned.

If the parameter value is *JOBS, message CTL1073 will be returned.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.21 CTCHKLCLIP, Check a local IP address

The CTCHKLCLIP command is used to check whether a local IP address (internal to the partition) is active or inactive.

The command parameters are as follows:

```

Check local IP address state (CTCHKLCLIP)

Specify your choices then press Enter.

IP address . . . . . IP

Expected state . . . . . STATUS          *ACTIVE
Severity level . . . . . LEVEL           *CRITICAL
    
```

Description of parameters:

- IP = Indicate the IP address to be checked.
- STATUS = Indicate the state in which the IP address should be.
*ACTIVE = The IP address must be active.
*INACTIVE = The IP address must be inactive.
- LEVEL = Severity levels of the alert generated in the monitoring product
*CRITICAL = CRITICAL-type alert generated
*WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1740 | 0 | Ok, local address IP &1 in expected &2 state. |
| CTL2740 | 20 | Warning, local IP address IP &1 in &2 state instead of &3 state expected. |
| CTL3740 | 40 | Critical, local IP address &1 in &2 state instead of &3 state expected. |
| CTL3741 | 40 | IP address &1 not found. |

Using the command:

This command allows to check if an IP address is active or inactive. The address specified in the IP parameter must be a valid IP address defined in the CFGTCP option 1 command.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.22 CTCHKLOG: Check the number of error messages

The CTCHKLOG command is used to count the number of error messages in a specific time and to generate an alert if this number exceeds the quantities passed as parameters.

The command parameters are as follows:

```

                                Check errors (CTCHKLOG)

Type choices, press Enter.

Search period (in h.) . . . . . PERIOD           24
Max error nb. (W) . . . . . MAXERR_W           0
Max error nb. (C) . . . . . MAXERR_C           0

```

Description of parameters:

- PERIOD = Indicates a number of hours. The command will include the number of error messages occurring since this time.
- MAXERR_W = Indicates the maximum number of error messages in the period. If the number of errors found is higher than this parameter, a Warning alert will be generated.
- MAXERR_C = Indicates the maximum number of error messages in the period. If the number of errors found is higher than this parameter, a Critical alert will be generated.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1412 | 0 | There are &1 error message(s) (under the requested limit) Err=&1, Val=&2, Total=&3 |
| CTL2411 | 20 | Number of errors &2 higher than the warning limit &1 Err=&2, Val=&3, Total=&4 |
| CTL3411 | 40 | Number of errors &2 higher than the critical limit &1 Err=&2, Val=&3, Total=&4 |

Extended messages

In the event that an alert is generated, the resulting message will contain additional information that will appear:

- When used in a 5250 session, in the second level of the message.
- When displayed in the monitoring tool, in the extended data of the service if it is compatible.

The additional information contains a list of most recent errors.

Using the command:

This command does not display a screen. The result of this command is a message sent in return indicating the necessary information.

The messages resulting from this command contain some additional information. They end in |Err=&2, Val=&3, Total=&4. For information, this part gives the following values:

- Err = Number of error messages found in the period
- Val = Number of validated error messages found in the period
- Total = Total number of messages found in the period

This format is specially designed for use in monitoring products such as Nagios.

3.23 CTCHKMQST: MQ Series: Check a manager status

The CTCHKMQST command is used to check the status of an MQ Series manager.

The command parameters are as follows:

```

Check MQ Series manager state (CTCHKMQST)

Specify your choices then press Enter.

MQ Series Manager name . . . . . MANAGER
Expected state . . . . . STATUS          *RUNNING, *STOPPED
Severity level . . . . . LEVEL           *CRITICAL
  
```

Description of parameters:

- MANAGER = Indicates the name of the manager to check.
- STATUS = Indicates awaited status for this manager.
*RUNNING = The manager must be running
*STOPPED = The manager must be stopped
- LEVEL = Severity levels of the alert generated in the monitoring product
*CRITICAL = CRITICAL-type alert generated
*WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1730 | 0 | Ok, manager &1 in expected &2 state. |
| CTL2730 | 20 | Warning, manager &1 in &2 state instead of &3 state expected. |
| CTL3724 | 40 | Error returned by MQ : &1 |
| CTL3725 | 40 | Error, unable to get the number of messages for queue &1. |
| CTL3726 | 40 | Error, unable to allocate the object CTMQCMD. |
| CTL3727 | 40 | Error while using the command STRMQMMQSC (manager &1). |
| CTL3728 | 40 | Error, unable to deallocate the object CTMQCMD. |
| CTL3729 | 40 | Error, unable to get data from spool file in file CTMQRES. |
| CTL3730 | 40 | Critical, manager &1 in &2 state instead of &3 state expected. |

Using the command:

Use this command if MQ Series is installed and used to check the status of a Manager.

This command does not display a screen. The result of this command is a message sent in return indicating the necessary information.

3.24 CTCHKMQMSG: MQ Series: Check number of messages

The CTCHKMQMSG command is used to check the number of messages waiting in one or more Queues.

The command parameters are as follows:

```

Check nb of MQ msg on queue (CTCHKMQMSG)
Specify your choices then press Enter.
Manager name . . . . . MANAGER
Queues to control . . . . . QUEUES          *ALL
                                     + si autres valeurs
Queues to omit . . . . . OMTS             *NONE
                                     + si autres valeurs
Warning alert max msg nb . . . . . MAXMSG_W      *NOCTL
Critical alert max msg nb . . . . . MAXMSG_C      *NOCTL

```

Description of parameters:

- MANAGER = Indicates the name of the manager to check.
- QUEUES = Indicate the name of the queue(s) to be controlled. A maximum of 50 names can be entered.
*ALL = The check will be performed on all the queues managed by this manager.
*SYSTEM = The system type queues will be checked.
- OMITS = Indicate the name of the queue(s) not to be checked. A maximum of 50 names can be entered.
*NONE = no queue will be excluded from the list indicated in the QUEUES parameter.
*SYSTEM = The system type queues will be excluded from the check.
- MAXMSG_W = Maximum number of messages the queue should contain. If there are more messages, a Warning alert will be generated.
- MAXMSG_C = Maximum number of messages the queue should contain. If there are more messages, a Critical alert will be generated.

This command generates the following messages in return:

Message ID Severity Message text

| | | |
|---------|----|--|
| CTL1722 | 0 | Ok, queue &1 has &2 messages, lower than the limit &3. NbErrWarn=&4err NbErrCrit=&5err |
| CTL1723 | 0 | Ok, all queues have less messages than the limit &1. NbErrWarn=&2err NbErrCrit=&3err |
| CTL2720 | 20 | Warning, queue &1 has &2 messages, greater than the warning limit &3. NbErrWarn=&4err NbErrCrit=&5err |
| CTL2721 | 20 | Warning, &1 queues have more messages than the warning limit &2. NbErrWarn=&1err NbErrCrit=&3err |
| CTL3720 | 40 | Critical, queue &1 has &2 messages, greater than the critical limit &3. NbErrWarn=&4err NbErrCrit=&5err |
| CTL3721 | 40 | Critical, &1 queues exceed the warning limit &2. &3 exceed the critical limit &4. NbErrWarn=&1err NbErrCrit=&3err |
| CTL3724 | 40 | Error returned by MQ : &1 |
| CTL3725 | 40 | Error, unable to get the number of messages for queue &1. |
| CTL3726 | 40 | Error, unable to allocate the object CTMQCMD. |
| CTL3727 | 40 | Error while using the command STRMQMMQSC (manager &1). |
| CTL3728 | 40 | Error, unable to deallocate the object CTMQCMD. |
| CTL3729 | 40 | Error, unable to get data from spool file in file CTMQRES. |

Using the command:

Use this command if MQ Series is installed and used to verify that no message is locked in a queue.

The purpose of this command is to generate an alert if the number of messages in an MQ Series queue is too high.

The *SYSTEM parameter value indicates all queues whose names begin with "SYSTEM".

This command does not display a screen. The result of this command is a message sent in return indicating the necessary information.

3.25 CTCHKMSGW, Check the jobs in MSGW status

The CTCHKMSGW status is used to generate an alert if at least one job is in MSGW (Message Wait) status in the system.

The command parameters are as follows:

```

Check JOB in MSGW status (CTCHKMSGW)

Specify your choices then press Enter.

Subsystems to select . . . . . SBS                *ALL
                    + for more values
Subsystems to omit . . . . . OMITSBS            *NONE
                    + for more values
Jobs to select . . . . . JOB                    *ALL
                    + for more values
Jobs to omit . . . . . OMITJOB                 *NONE
                    + for more values
Errors only, or every job . . . IGNRCVMSG      *ERRONLY

```

| | | |
|----------------------------------|---------|-----------|
| Severity level | LEVEL | *CRITICAL |
| Return type (10 names/3 jobs . . | RETTYPE | *NAMES |

Description of parameters:

- SBS** = Specifies the list of subsystems in which jobs in MSKW status are searched for. A list of 100 subsystem names can be indicated.
 *ALL = All the active jobs are searched.
 Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name.
- OMITSBS** = If *ALL was indicated in the SBS parameter, a list of 100 subsystems to exclude can be indicated here. Any jobs in MSGW status in these subsystems will not be included.
 *NONE = No subsystem is omitted.
 Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name.
- JOB** = Used to indicate a list of 50 names of jobs which will be checked. Only the jobs included in this list will be checked.
 *ALL = Every jobs in the subsystem(s) indicated will be checked.
 Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name.
- OMITJOB** = Used to indicate a list of 50 names of jobs which will not be included in the check.
 *NONE = No job will be omitted.
 Generic = It is possible to enter generic names by adding the character * at the beginning or the end of the name.
- IGNRCVMSG** = Indicate whether all jobs in MSGW state should be considered, or only those which are in error and awaiting a response to a message sent in QSYSOPR.
 *ERRONLY = Only jobs which are in error and waiting for a response to a message sent in QSYSOPR are considered.
 *ALLMSGW = All jobs in MSGW state are considered, even those for which MSGW is their usual state.
- LEVEL** = Severity levels of the alert generated in the monitoring product
 *CRITICAL = CRITICAL-type alert generated
 *WARNING = WARNING-type alert generated
- RETTYPE** = Used to indicate which type of message will be used for the response.
 *NAMES = In the case of an alert, the list of the first 10 job names will be indicated (only the job name)
 *JOBS = In the case of an alert, the list of the 3 first jobs will be indicated (full job name in number/user/job format and the name of the subsystem it is in).

Extended messages

In the event that an alert is generated, the resulting message will contain additional information that will appear:

- When used in a 5250 session, in the second level of the message.
- When displayed in the monitoring tool, in the extended data of the service if it is compatible.

The additional information contains a list of the last messages found (maximum of about 20 messages).

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|-------------------------------------|
| CTL1074 | 0 | No job in &1 status. Nb_&1=0 jobs |

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| | | |
|---------|----|--|
| CTL5072 | 20 | &2 job(s) in &1 status. The first 10 are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12. Nb_&1=&2 jobs |
| CTL5073 | 20 | &2 job(s) in &1 status. The first 3 are Job=&3/&4/&5 Sbs=&6, Job=&7/&8/&9 Sbs=&10, Job=&11/&12/&13 Sbs=&14 |
| CTL1071 | 40 | *ALL required in SBS parameter to omit subsystems (OMITSBS) |
| CTL1072 | 40 | &2 job(s) in &1 status. The first 10 are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12. Nb_&1=&2 jobs |
| CTL1073 | 40 | &2 job(s) in &1 status. The first 3 are Job=&3/&4/&5 Sbs=&6, Job=&7/&8/&9 Sbs=&10, Job=&11/&12/&13 Sbs=&14 |

Using the command:

The command searches all the jobs in MSGW (Message Wait) status in the list of subsystems specified in the SBS parameter. If *ALL is indicated, the search is carried out in the whole system.

Certain subsystems can be excluded from the search by using the OMITSBS parameter.

It is possible to select a list of jobs to check by entering their name in JOB parameter. This allows you to check the correct execution of several batch jobs whose name begins with the same characters, or a job whose name end changes according to the day.

Certain jobs can be excluded from the search by indicating the name of these jobs in the OMITJOB parameter.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

The RETTYPE parameter is only used when an alert is generated. It determines the format of the message returned for the alert.

If the parameter value is *NAMES, message CTL1072 will be returned.

If the parameter value is *JOBS, message CTL1073 will be returned.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.26 CTCHKOBJ, Check the presence and size of an object

The CTCHKOBJ command is used to check that an object is present, and that its size does not exceed a limit passed in parameter.

The command parameters are as follows:

```

                                Check object size (CTCHKOBJ)

Type choices, press Enter.

Object . . . . . OBJ
  Library . . . . . *LIBL
Object type . . . . . OBJTYPE
  
```


| | | |
|-----------------------------------|-----------|-----------|
| ASP Device | ASPDEV | *SYSBAS |
| Maximum size (MB)- Warning . . . | MAXSIZE_W | |
| Maximum size (MB)- Critical . . . | MAXSIZE_C | |
| Severity level | LEVEL | *CRITICAL |

Description of parameters:

- OBJ = (Required) Name of the object to be checked, and name of the library in which it is located.
- OBJTYPE = (Required) Type of the object. The list of possible types is the same as for the DSPOBJD command
- ASPDEV = Name of the iASP In which the object is.
*SYSBAS = The object is in the system ASP.
- MAXSIZE_W = Maximum size of the object. If the object exceeds this size, a Warning alert will be generated.
- MAXSIZE_C = Maximum size of the object. If the object exceeds this size, a Critical alert will be generated.
- LEVEL = Severity levels of the alert generated in the monitoring product
*CRITICAL = CRITICAL-type alert generated
*WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1641 | 0 | Size of object &2/&1 type &3 is &4 MB. Less than limit values. Size=&4MB |
| CTL2641 | 20 | Warning: Size &4 MB for object &2/&1 type &3 is greater than the warning limit &5 MB. Size=&4Mo |
| CTL2642 | 20 | Warning: Object &2/&1 type &3 doesn't exist. |
| CTL2643 | 20 | Warning: Error when retrieving information for object &2/&1 type &3. |
| CTL3641 | 40 | Critical: Size &4 MB for object &2/&1 type &3 is greater than the critical limit &5 MB. Size=&4Mo |
| CTL3642 | 40 | Critical: Object &2/&1 type &3 doesn't exist. |
| CTL3643 | 40 | Critical: Error when retrieving information for object &2/&1 type &3. |
| CTL3644 | 40 | ASP Device &1 not correct |

Using the command:

This command checks the presence of the object passed in parameter, and compares its size to the values passed to the MAXSIZE_W and MAXSIZE_C parameters.

If the object is not found, an alert is generated. The type of alert depends on the LEVEL parameter.

This command does not display any screen. The result of this command is a return message with the necessary information.

3.27 CTCHKOUTQ, Check number of spools in an OUTQ

The CTCHKOUTQ command counts the number of spool files in an output queue (OUTQ), and sends an alert if this number is outside the limits given in the parameters.

The command parameters are as follows:

```

Check Nb spools in OUTQ (CTCHKOUTQ)

Type choices, press Enter.

Output queue . . . . . OUTQ
  Library . . . . . *LIBL
States to select . . . . . STS          *ALL
      + for more values
States to omit . . . . . OMITSTS      *NONE
      + for more values
Minimum Critical Nb of spools . NBMIN_C
Minimum Warning Nb of spools . . NBMIN_W
Maxi Warning Nb of spools . . . NBMAX_W
Maxi Critical Nb of spools . . . NBMAX_C
Expected OUTQ status . . . . . OUTQSTS  > *RLS
Severity level . . . . . LEVEL          *CRITICAL

```

Description of parameters:

- OUTQ = Output queue name to check, and it's library name.
- STS = Enter the list of spool states to be taken into account. Only the spools whose state is in this list will be counted.
*ALL = All spools are counted, regardless of their state.
The list of possible states is as follow:
*RDY, *OPN, *DFR, *SND, *CLO, *HLD, *SAV, *WTR, *PND, *PRT, *MSGW
- OMITSTS = If *ALL has been entered in the STS parameter, it is possible to specify a list of states that will not be taken into account.
*NONE = No state is excluded from counting.
The list of possible states is as follow:
*RDY, *OPN, *DFR, *SND, *CLO, *HLD, *SAV, *WTR, *PND, *PRT, *MSGW
- NBMIN_C = Minimum number of spool files that must be in the OUTQ. If less files are found, a critical alert is sent.
- NBMIN_W = Minimum number of spool files that must be in the OUTQ. If less files are found, a warning alert is sent.
- NBMAX_W = Maximum number of spool files that must be in the OUTQ. If more files are found, a warning alert is sent.
- NBMAX_C = Maximum number of spool files that must be in the OUTQ. If more files are found, a critical alert is sent.
- OUTQSTS = Enter the expected status for the OUTQ
*ANY = The status of the OUTQ is not checked
*RLS = The OUTQ must be in status RLS (released)
*HLD = The OUTQ must be in status HLD (Held)
- LEVEL = Severity levels of the alert generated in the monitoring product
*CRITICAL = CRITICAL-type alert generated
*WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1373 | 0 | Ok, correct status and spools number. &1 spools. Inside the limits defined for OUTQ &2/&3 NB_SPOOL=&1 |
| CTL2371 | 20 | Warning, &1 spools, more than Maximum &6 for OUTQ &2/&3 NB_SPOOL=&1 |
| CTL2372 | 20 | Warning, &1 spools, less than minimum &5 for OUTQ &2/&3 NB_SPOOL=&1 |
| CTL2373 | 20 | Warning : wrong status for the OUTQ &3/&2. OUTQ status : &4 NB_SPOOL=&1Spools |
| CTL3370 | 40 | Output Queue &2/&1 not found |
| CTL3371 | 40 | Critical, &1 spools, more than Maximum &7 for OUTQ &2/&3 NB_SPOOL=&1 |
| CTL3372 | 40 | Critical, &1 spools, less than minimum &4 for OUTQ &2/&3 NB_SPOOL=&1 |
| CTL3374 | 40 | Parameter STS must be *ALL or the parameter OMITSTS must be *NONE. |
| CTL3374 | 40 | Unexpected error. See job log for more information |
| CTL3375 | 40 | Critical : wrong status for the OUTQ &3/&2. OUTQ status : &4 NB_SPOOL=&1Spools |

Using the command:

This command counts the number of spool files in the OUTQ.

If one or more states are specified in parameter STS, only the spools that are in these states are counted.

If the STS parameter contains *ALL, then all spools are counted except those in one of the states indicated in the OMITSTS parameter.

The OUTQ must exist.

The command also checks the status of the OUTQ itself (visible with the command WRKOUTQ)

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.28 CTCHKPING, Perform a PING from the IBM i partition

The CTCHKPING command is used to check that a corresponding server is available (via the PING command) from the IBM i partition.

The command parameters are as follows:

```

Check remote IP connection (CTCHKPING)

Specify your choices then press Enter.

Name or IP address . . . . . RMTSYS

Packet length (in bytes) . . . . PKTLEN          256
Alert threshold percentage . . . . WARNING        80
  
```

Description of parameters:

RMTSYS = Specifies the IP address or name the PING command must be run for.
 PKTLEN = specifies the length of the packet to use
 WARNING = Specifies the success percentage below which the response must generate an alert.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1035 | 0 | Connection to system &1 successful. Success=&2% RtMin=&3ms RtAvg=&4ms RtMax=&5ms |
| CTL5034 | 20 | Response rate &2% from system &1 below the threshold. Success=&2% RtMin=&3ms RtAvg=&4ms RtMax=&5ms |
| CTL1031 | 40 | System &1 unknown. Success=0% RtMin=9999ms RtAvg=9999ms RtMax=9999ms |
| CTL1032 | 40 | Unexpected error during PING &1 command. Success=0% RtMin=9999ms RtAvg=9999ms RtMax=9999ms |
| CTL1033 | 40 | No response from system &1. Success=0% RtMin=9999ms RtAvg=9999ms RtMax=9999ms |

Using the command:

Nagios allows a PING to be performed to different equipment to check that this element is there and operational.

But some equipment is on a VLAN which is accessible from an IBM i partition but not from Nagios. The CTCHKPING command allows the PING to be moved and performed from the partition itself. This checks that the partition can access the remote equipment.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

The meaning of the values returned in the messages is as follows:

- Success = Success rate of the Ping on a total of 5 attempts
- RtMin = Minimum response time (Round Trip) in milliseconds
- RtAvg = Average response time (Round Trip) in milliseconds
- RtMax = Maximum response time (Round Trip) in milliseconds

3.29 CTCHKPRB, Check for system problems

The CTCHKPRB command is used to generate an alert when a system problem is detected. System problems are visible with the WRKPRB command.

The command parameters are as follows:

```

Check System Problems (CTCHKPRB)

Specify your choices then press Enter.

Problem origin . . . . . ORIGIN          *SYSTEM
Status type . . . . . STATUS            *UNCLOSED
+ for more values
  
```

Description of parameters:

| | |
|--------|--|
| ORIGIN | = Indicates the scope of messages to take into account. *SYSTEM = Only problems detected by the system will generate an alert *ALL = All entries displayed by the WRKPRB command will generate an alert, including PTF requests for example. |
| STATUS | = Enter the type of problem to be considered. It is possible to enter several values. *UNCLOSED = All problems that are not in the CLOSE state will be taken into account and will generate an alert (default value) *ALL = All detected problems will generate an alert, regardless of their status. The other values each correspond to a particular state that will be taken into account. *OPENED *READY *PREPARED *SENT *ANSWERED *VERIFIED *CLOSED |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1063 | 0 | No system problem detected. |
| CTL1061 | 40 | Error when executing the DSPPRB command. Consult the log |
| CTL1062 | 40 | &1 system problem(s) detected. Latest problem from &4/&3/&2 to &5:&6:&7, symptom: &8 |

Extended messages

In the event that an alert is generated, the resulting message will contain additional information that will appear:

- When used in a 5250 session, in the second level of the message.
- When displayed in the monitoring tool, in the extended data of the service if it is compatible.

The additional information contains a list of every problem found.

Using the command:

The command searches the problems detected by the system and generates an alert if at least one problem is in a status other than Closed.

The resulting message indicates the number of problems found and some information concerning the most recent ones.

When an alert is generated by the CTCHKPRB command, the operator needs to connect to the partition, use the WRKPRB command to obtain more details about the problem encountered and take action to correct this problem.

When the problem is taken into account, it must be modified (option 8) to change to CLOSED status.

To prevent the CTCHKPRB command from generating more alerts, all the problems must be in CLOSED status.

It is possible to specify a list of exceptions using the CTCHKPRB parameter in the CTPARAM command. Specify the list of SRC codes for which no alert should be generated.

If a problem is detected by the command, the generated alert will always be of CRITICAL type.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.30 CTCHKSAV, Check that the save is correct

The CTCHKSAV command is used to check that the backups were made correctly.

The command parameters are as follows:

```

                                Check the save (CTCHKSAV)

Specify your choices then press Enter.

Number of SAVSECDTA . . . . . NBSAVSEC          0
Number of SAVCFG . . . . . NBSAVCFG            0
Number of SAVLIB . . . . . NBSAVLIB           0
Number of SAVDLO . . . . . NBSAVDLO          0
Number of SAV . . . . . NBSAV                 0
Start date and time:          START
  Start date . . . . . *CURRENT
  Start time . . . . . *BEGIN
End date and time:          END
  End date . . . . . *CURRENT
  End time . . . . . *END
Save job . . . . . JOB *ANY
  User . . . . . *ANY
Severity level . . . . . LEVEL *CRITICAL
  
```

Description of parameters:

- NBSAVSEC = Number of SAVSECDTA commands executed
- NBSAVCFG = Number of SAVCFG commands executed
- NBSAVLIB = Number of SAVLIB commands executed
- NBSAVDLO = Number of SAVDLO commands executed
- NBSAV = Number of SAV commands executed
- START = Check time slot start date and time
 - *CURRENT = The current day's date is used
 - *PRV = The previous day's date is used
 - *BEGIN = The time slot starts at 00:00
- END = Check time slot end date and time
 - *CURRENT = The current day's date is used
 - *PRV = The previous day's date is used
 - *END = the time slot ends at the current time or 23:59
- JOB = Job name and name of the user who performed the backup
 - *ANY = The job name or user name is not checked
- LEVEL = Severity levels of the alert generated in the monitoring product
 - *CRITICAL = CRITICAL-type alert generated
 - *WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1081 | 0 | All the saves are OK SECDTA=&1, CFG=&2, SAVLIB=&3, SAVDLO=&4, SAV=&5 |
| CTL5082 | 20 | Error during backups SECDTA=&1, CFG=&2, SAVLIB=&3, SAVDLO=&4, SAV=&5 |
| CTL1082 | 40 | Error during backups SECDTA=&1, CFG=&2, SAVLIB=&3, SAVDLO=&4, SAV=&5 |

Using the command:

The CTCHKSAV command will analyze the content of the system log (DSPLOG system log) looking for end messages generated by the save commands.

The number indicated relating to NBSAVxxx parameters indicates the number of end messages that need to be found.

For example, if the NBSAVSEC parameter contains the value 2, this means that, in the indicated time slot, the SAVSECDTA command is used twice. The CTCHKSAV command will search for 2 end messages.

An alert is generated if the number of end messages does not correspond.

An alert is generated if at least one of the messages is an abnormal backup end.

Specific feature of the SAVLIB command:

The message generated by this command is only taken into account if several libraries have been saved. It is therefore imperative that it is used with:

- Several library names (at least 2)
- A generic name
- One of the specific values: *ALLUSR, *IBM or *NONSYS

The date and time indicated in the START parameter must be before the date and time indicated in the END parameter.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.31 CTCHKSBS, Check the status of a subsystem

The CTCHKSBS command is used to check that a subsystem is active, or indeed stopped. It is also used to check a list of jobs that need to be active in this subsystem.

The command parameters are as follows:

```

Check subsystem status (CTCHKSBS)

Specify your choices then press Enter.

Name of subsystem to check   SBSD
Library . . . . . *ANY
Status of subsystem to check STATUS *RUN
Min number of active jobs . . . NBJOB *NOCTL
  
```

| | | |
|-------------------------------|-------------------|-----------|
| Mandatory jobs list | LSTJOB | *NONE |
| | + for more values | |
| Severity level | LEVEL | *CRITICAL |

Description of parameters:

- SBSD = Name of the subsystem to check, and the library it is in
*ANY = The library name will not be taken into account
- STATUS = Specifies the expected subsystem status
*RUN = The subsystem must be active
*STOP = The subsystem must be stopped
- NBJOB = Specifies the minimum number of jobs that must be active in the subsystem. This parameter is only authorized for an active subsystem, so if the expected status is *RUN
*NOCTL = The number of active jobs in the subsystem will not be checked
- LSTJOB = Indicate the list of jobs that must be present and active in the subsystem. This list may contain up to 50 names. This parameter is only authorized for an active subsystem, so if the expected status is *RUN
*NONE = The presence of no job will be checked.
- LEVEL = Severity levels of the alert generated in the monitoring product
*CRITICAL = CRITICAL-type alert generated
*WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1015 | 0 | Subsystem &1 is in &2 status |
| CTL1017 | 0 | Subsystem &1 is in &2 status and all the requested jobs are present |
| CTL5012 | 20 | Subsystem &1/&2 is inactive, while it should be active |
| CTL5013 | 20 | Subsystem &1/&2 is active, while it should be inactive |
| CTL5014 | 20 | &2 job(s) present in subsystem &1 instead of expected &3 job(s) |
| CTL5016 | 20 | Subsystem &1, &2 job(s) missing. The first 10 are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12. |
| CTL1011 | 40 | Parameters NBJOB and LSTJOB are authorized only if status is *RUN |
| CTL1012 | 40 | Subsystem &1/&2 is inactive, while it should be active |
| CTL1013 | 40 | Subsystem &1/&2 is active, while it should be inactive |
| CTL1014 | 40 | &2 job(s) present in subsystem &1 instead of expected &3 job(s) |
| CTL1016 | 40 | Subsystem &1, &2 job(s) missing. The first 10 are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12. |

Using the command:

The CTCHKSBS command will check that the subsystem indicated is in the expected status.

If the expected status is *RUN, an alert will be generated if the subsystem is not active when the check is performed. This is used, for example, to check that the subsystems required for operation are permanently active and to be quickly warned in the event of a problem.

If the expected status is *STOP, an alert will be generated if the subsystem is active when the check is performed. This is used, for example, to check that QINTER is stopped at night, or that a QNIGHT subsystem has not been started by accident during the day.

The NBJOB parameter specifies the minimum number of jobs that must be active in the subsystem.

The LSTJOB parameter is used to check a list of jobs that need to be active in the subsystem. Only the job name is used to perform the check.

If several jobs with the same name are active, the command will check that this job name is present.

If at least one of the jobs requested in the list is not active, an alert will be generated. The text of the alert message will contain the name of the missing job. If several jobs are missing, the list of the 10 first names is indicated in the message.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.32 CTCHKSYSST, Check System status

The CTCHKSYSST command allows to check some indicators provided by the WRKSYSSTS command, such as the total number of jobs in the system, the temporary memory used, or the percentage of addresses used.

The command parameters are as follows:

```

Check system status (CTCHKSYSST)

Specify your choices then press Enter.

Jobs in system . . . . . NBJOBS          *NOCTL
Active jobs . . . . . NBACTJOBS        *NOCTL
Temp. memory used (MB) . . . . . TMPMEMUSE  *NOCTL
Temp. memory used (%) . . . . . PCTTMPMUSE  *NOCTL
Temp. memory max (MB) . . . . . TMPMEMMAX  *NOCTL
Temp. memory max (%) . . . . . PCTTMPMAX   *NOCTL
Percentage perm. addresses . . . . . PCTPERMADR *NOCTL
Percentage temp. addresses . . . . . PCTTEMPADR *NOCTL
Job tables entries used (%) . . . . . PCTJTBLUSE *NOCTL
Severity level . . . . . LEVEL          *CRITICAL
  
```

Description of parameters:

NBJOBS = Enter the total number of jobs known in the system from which an alert is to be generated.
*NOCTL = This value will not be checked.

NBACTJOBS = Enter the number of active jobs known in the system from which an alert is to be generated.
*NOCTL = This value will not be checked.

| | |
|------------|--|
| TMPMEMUSE | = Enter the size of memory currently used (in MB) by temporary objects from which an alert should be generated. *NOCTL = This value will not be checked. |
| PCTTMPMUSE | = Enter the percentage of memory currently used by temporary objects (equivalent to TMPMEMUSE) from which an alert should be generated. *NOCTL = This value will not be checked. |
| TMPMEMMAX | = Enter the maximum memory size (in MB) used by temporary objects since the last IPL from which an alert should be generated. *NOCTL = This value will not be checked. |
| PCTTMPMMAX | = Enter the percentage of maximum memory used by temporary objects since the last IPL (equivalent to TMPMEMMAX) from which an alert should be generated. *NOCTL = This value will not be checked. |
| PCTPERMADR | = Enter the percentage of the maximum number of addresses possible for permanent objects that have been used since the last IPL from which an alert should be generated. *NOCTL = This value will not be checked. |
| PCTTEMPADR | = Enter the percentage of the maximum possible number of addresses for temporary objects that have been used from which an alert should be generated. *NOCTL = This value will not be checked. |
| PCTJTBLUSE | = Enter the percentage of the actual number of jobs compared to the maximum possible number of jobs in the system from which an alert should be generated. *NOCTL = This value will not be checked. |
| LEVEL | = Severity levels of the alert generated in the monitoring product *CRITICAL = CRITICAL-type alert generated *WARNING = WARNING-type alert generated |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1601 | 0 | Ok : all parameters are below their limits. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL2601 | 20 | Warning : &1 jobs in system, greater than the limit &6. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL2602 | 20 | Warning : &2MB of temp. memory used, greater than the limit &6. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL2603 | 20 | Warning : &3MB of temp. memory max, greater than the limit &6. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL2604 | 20 | Warning : &4% of perm. addresses, greater than the limit &6%. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL2605 | 20 | Warning : &5% of temp. addresses, greater than the limit &6%. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |

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| | | |
|---------|----|---|
| CTL2606 | 20 | Warning : &1 active jobs, greater than the limit &2 NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL2607 | 20 | Warning : &1% of job tables entries are used, greater than the limit &2%. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL2608 | 20 | Warning : &1% of temp. memory used, greater than the limit &2%. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL2609 | 20 | Warning : &1% of temp. memory max, greater than the limit &2%. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL3601 | 40 | Critical : &1 jobs in system, greater than the limit &6. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL3602 | 40 | Critical : &2MB of temp. memory used, geater than the limit &6. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL3603 | 40 | Critical : &3MB of temp. memory max, greater than the limit &6. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL3604 | 40 | Critical : &4% of perm. addresses, greater than the limit &6%. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL3605 | 40 | Critical : &5% of temp. addresses, greater than the limit &6%. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL3606 | 40 | Critical : &1 active jobs, greater than the limit &2 NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL3607 | 40 | Critical : &1% of job tables entries are used, greater than the limit &2%. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL3608 | 40 | Critical : &1% of temp. memory used, greater than the limit &2%. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |
| CTL3609 | 40 | Critical : &1% of temp. memory max, greater than the limit &2%. NbJobs=&1jobs NbActJobs=&2jobs MemUse=&3Mo MemMax=&4Mo PctPermAdr=&5% PctTempAdr=&6% PctJobTblEntUsed=&7% %MemUse=&8% %MemMax=&9% |

Using the command:

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The values controlled by the command CTCHKSYSST are those displayed by the system command WRKSYSSTS, an example of which is shown below (for V7R3):

| Work with System Status | | PROD | |
|----------------------------|----------|--------------------------|---------------|
| | | 20/07/20 | 15:50:32 CEST |
| % CPU used : | 3.1 | Auxiliary storage: | |
| Elapsed time : | 01:10:35 | System ASP : | 286.3 G |
| Jobs in system : | 1585 | % system ASP used . . : | 57.1320 |
| % perm addresses : | .033 | Total : | 286.3 G |
| % temp addresses : | .138 | Current temporary used : | 11057 M |
| | | Peak temporary used . : | 11361 M |

The correspondence of the parameters is as follows:

| | |
|----------------------------|------------|
| Jobs in system : | NBJOBS |
| Current temporary used : | TMPMEMUSE |
| Peak temporary used . . : | TMPMEMMAX |
| % perm addresses : | PCTPERMADR |
| % temp addresses : | PCTTEMPADR |

The PCTTMPMUSE parameter is the percentage of TMPMEMUSE relative to the total disk space of ASP1. The PCTTMPMMAX parameter is the percentage of TMPMEMMAX in relation to total disk space of ASP1.

The parameter NBACTJOBS is issued from the WRKACTJOB command, value of "Active jobs":

| Work with Active Jobs | | PROD | |
|-----------------------|-----|---------------|--------------|
| | | 30/11/22 | 19:59:58 CET |
| CPU %: | 0,0 | Elapsed time: | 00:00:00 |
| | | Active jobs: | 308 |

The PCTJTBLUSE parameter allows to check that the number of jobs is close to the maximum number of jobs possible in the system. It is based on data from the DSPJOBTL command, which provides the total number of jobs known to the system (value 675 below). This value is compared with the maximum number of jobs possible (value 163520 below).

| Permanent job structures: | | Temporary job structures: | |
|---------------------------|--------|---------------------------|---------|
| Initial : | 200 | Initial : | 200 |
| Additional : | 30 | Additional : | 30 |
| Available : | 3647 | Available : | 15 |
| Total : | 4324 | Storage used . . . : | 46,64 M |
| Maximum : | 163520 | | |

| -----Entries----- | | | | | |
|-------------------|---------|-------|-----------|--------|-------|
| Table | Size | Total | Available | In-use | Other |
| 1 | 4461312 | 4324 | 3647 | 675 | 1 |

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.33 CTCHKTIM, Check the partition time

The CTCHKTIM command is used to compare the time of the partition with that of the monitoring server (Nagios, PRTG, etc.).

The command parameters are as follows:

```

                                Check time (CTCHKTIM)

Specify your choices then press Enter.

Reference time . . . . . REFTIME          *MONITORTIME
Time difference with Ref. (mn)  TIMEDIF     *NONE
Margin of error Warning (s)    . . DELAY_W  10
Margin of error Critical (s)   . . DELAY_C  10

```

Description of parameters:

- REFTIME = Reference date and time, against which the partition time will be compared.
*MONITORTIME = This parameter can only be used from a monitoring server. It will be automatically replaced by the date and time of the monitoring server.
Date and time: It is possible (to test the command) to specify a date and time in the format "YYYY-MM-DD.HH:MM:SS". The punctuation between the values must be respected.
- TIMEDIF = Specify a possible time difference between the time of the monitoring server and the partition.
*NONE = The monitoring server and the partition must be at the same time.
Number of minutes = Specify the number of minutes of time difference between the monitoring server and the partition.
- DELAY_W = Specify the maximum number of seconds of difference between the 2 servers before generating a warning alert.
Number of seconds = If the time difference between the 2 servers exceeds this value, a warning alert will be generated.
- DELAY_C = Specify the maximum number of seconds of difference between the 2 servers before generating a critical alert.
Number of seconds = If the time difference between the 2 servers exceeds this value, a critical alert will be generated.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1654 | 0 | OK: Correct time on the partition. DIFF=&1s |
| CTL2653 | 20 | Warning: Offset of &1 s found. DIFF=&1s |
| CTL3651 | 40 | The date &1 in parameter REFTIME is in a bad format. |
| CTL3652 | 40 | The time &1 in parameter REFTIME is in a bad format. |
| CTL3653 | 40 | Critical: Offset of &1 s found. DIFF=&1s |

Using the command:

CAUTION :

The use of this command requires the use of the -v V02 parameter when calling the plugin on the monitoring server. This may require additional settings depending on the tool used. This parameter is available with the plugin delivered from February 2022. If the configuration on the monitoring server was done before this date, an upgrade may be necessary.

The CTCHKTIM command will compare the time of the monitoring server with that of the partition and generate an alert if a discrepancy is found.

When this command is used from a monitoring server, the REFTIME(*MONITORTIME) parameter must be used. This value will be automatically replaced by the date and time of the monitoring server before being used by the agent.

It is possible to test the command in an IBM i session, or to use it in another context by specifying a date and time in the following format "YYYY-MM-DD.HH:MM:SS" in the REFTIME parameter. Punctuation is important.

Example:

```
CTCHKTIM REFTIME('2022-02-10.11:23:41')
```

The TIMEDIF parameter is used to indicate a time difference between the partition and the monitoring server. For example, if the monitoring server is on French time, and must monitor a partition on English time. In this case, indicate -60 in the TIMEDIF parameter to take into account that the partition time is 1 hour earlier than the monitoring server.

The DELAY_W and DELAY_C parameters are used to indicate the number of seconds after which an alert will be generated.

It is advisable to indicate at least a few seconds for these parameters to take into account the transfer time of the request to the partition and the execution time of the command.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.34 CTCHKUPTIM, Check how long the partition has been active

The CTCHKUPTIM command calculates how long the partition has been active, and generates an alert:

- If it has been IPLed for a short time
- If it has not been IPLed for too long

The command parameters are as follows:

```

                                Check uptime (CTCHKUPTIM)

Specify your choices then press Enter.

Mini crit time since IPL (Min)   MINI_C
Mini warn time since IPL (Min)   MINI_W
Max warn time since IPL (days)  MAXI_W
Max crit time since IPL (days)  MAXI_C

```

Description of parameters:

- MINI_C = Minimum critical time (in minutes). If an IPL has been performed for less than the number of minutes indicated here, a critical alert will be generated.
*NOCTL = This value will not be checked
- MINI_W = Minimum duration (in minutes) warning. If an IPL has been performed for less than the number of minutes indicated here, a warning alert will be generated.

The number of minutes indicated here must be greater than that of the MINI_C parameter.

*NOCTL = This value will not be checked

MAXI_W = Maximum duration (in days) warning. If no IPL has been performed for the number of days indicated here, a warning alert will be generated.

The number of days indicated here must be greater than the MAXI_C parameter.

*NOCTL = This value will not be checked

MAXI_C = Maximum critical duration (in days). If no IPL has been performed for the number of days specified here, a critical alert will be generated.

*NOCTL = This value will not be checked

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1661 | 40 | Error, unable to retrieve information about the controlling subsystem &1 (library &2). |
| CTL1662 | 0 | Ok, system up since &1 days (&2 minutes), within given limits. UpSince=&1Days |
| CTL2661 | 20 | Warning, system up since &1 minutes, lower than the mini warning limit of &2 minutes. UpSince=&3Days |
| CTL2662 | 20 | Warning, system up since &1 days, greater than the maxi warning limit of &2 days. UpSince=&1Days |
| CTL3661 | 40 | Critical, system up since &1 minutes, lower than the mini critical limit of &2 minutes. UpSince=&3Days |
| CTL3662 | 40 | Critical, system up since &1 days, greater than the maxi critical limit of &2 days. UpSince=&1Days |

Using the command:

There are 2 different objectives for this command.

The MINI_C and MINI_W parameters are used to check that there has been no unscheduled IPL during the day. These parameters contain values expressed in minutes, with a maximum of 1440, i.e. one day.

The MAXI_C and MAXI_W parameters are used to check when the last IPL was performed, and to warn if too much time has passed since that date.

These parameters contain values expressed in days, with a maximum of 366, i.e. one year.

This command does not display any screen. The result of this command is that a message is sent back with the necessary information.

3.35 CTCHKUSR, Check the status of profiles

The CTCHKUSR command is used to count the number of *DISABLED users from a given list and to generate an alert if this number exceeds the quantities passed as parameters.

It also allows you to check the validity of passwords, and to generate an alert if the password expires in a few days.

The command parameters are as follows:

```

                                Check a profile status (CTCHKUSR)

Specify your choices then press Enter.

Profile name . . . . . USRPRF
                                + for more values
Max number of *DISABLED profil  MAXDISPRF          0
Password validity period . . . . PWDDL          *NOCTL
Severity level . . . . . LEVEL          *CRITICAL

```

Description of parameters:

- USRPRF = Specifies one or more user names to check. If one of the requested users is not found, an alert will be generated.
- MAXDISPRF = Specifies the maximum number of users that can be in *DISABLED status. If this parameter is exceeded, an alert will be generated.
*NOCTL = This value will not be checked
- PWDDL = Specify the number of days the password is valid. If the user's password expires before the specified number, an alert will be generated. The *ENABLED profiles are considered.
*NOCTL = This value will not be checked
- LEVEL = Severity levels of the alert generated in the monitoring product
*CRITICAL = CRITICAL-type alert generated
*WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1134 | 0 | &1 *DISABLED profiles, lower than the limit &2. The first 10 are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 Disabled=&1prf Pwd=&2prf Total=&3prf |
| CTL1136 | 0 | No *ENABLED profile has the password expiring in less than &1 days. Disabled=&1prf Pwd=&2prf Total=&3prf |
| CTL1137 | 0 | &1 *DISABLED profiles (lower than the limit &2), no *ENABLED profile has the password expiring in less than &3 days. Disabled=&1prf Pwd=&2prf Total=&3prf |
| CTL2131 | 20 | Warning, &1 *DISABLED profiles, greater than the limit &2. The first 10 are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 Disabled=&1prf Pwd=&2prf Total=&3prf |
| CTL2132 | 20 | Warning, &1 *ENABLED profiles have the password expiring in less than &2 days. The first 10 are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 Disabled=&1prf Pwd=&2prf Total=&3prf |
| CTL1131 | 40 | User &1 was not found |
| CTL1132 | 40 | User &1 is not authorized to access this information. |
| CTL1133 | 40 | Unexpected error when searching for user &1 |
| CTL3131 | 40 | Critical, &1 *DISABLED profiles, greater than the limit &2. The first 10 are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 Disabled=&1prf Pwd=&2prf Total=&3prf |
| CTL3132 | 40 | Critical, &1 *ENABLED profiles have the password expiring in less than &2 days. The first 10 are &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 Disabled=&1prf Pwd=&2prf Total=&3prf |

Using the command:

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

3.36 CTCHKWEBSV, Check the status of web services

The CTCHKWEBSV command allows you to check the status of a server's web services.

The command parameters are as follows:

```

                                Check web services (CTCHKWEBSV)

Specify your choices then press Enter.

Server name . . . . . SERVER

Web services to check . . . . . SERVICE          *ALL

                                + for more values

Expected state . . . . . STATUS                *RUN
Severity level . . . . . LEVEL                 *CRITICAL
```

Description of parameters:

- SERVER = Specify the name of the web server to monitor.
- SERVICE = Indicate the name of the web service(s) to monitor. It is possible to specify a list of 20 services.
*ALL = All services of the specified server will be monitored.
- STATUS = Indicate the state in which the services should be.
*RUN = Services must be active.
*STOP = Services should be stopped.
- LEVEL = Severity levels of the alert generated in the monitoring product
*CRITICAL = CRITICAL-type alert generated
*WARNING = WARNING-type alert generated

This command generates the following messages in return:

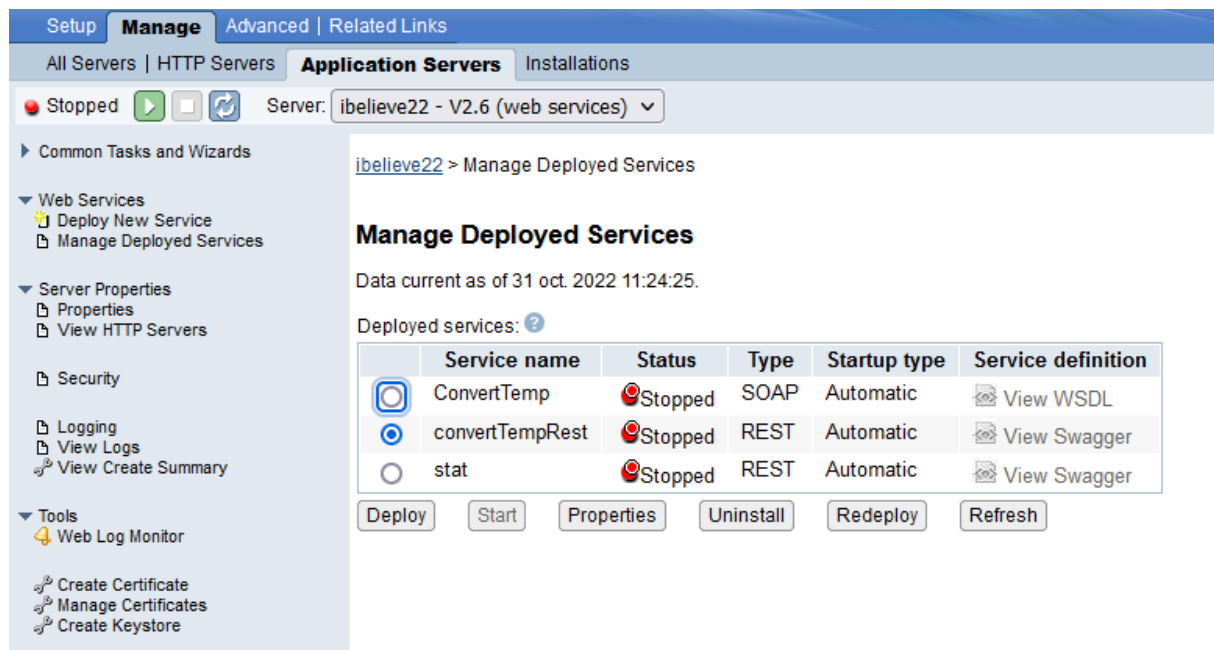
| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1680 | 40 | Error, unable to retrieve data for the server &1. |
| CTL1681 | 40 | Error, unable to process data for the server &1. |

| | | |
|---------|----|--|
| CTL1683 | 0 | Ok, all services are in &1 state for server &2. NbActive=&3services NbInactive=&4services |
| CTL1684 | 40 | Service &1 not found on server &2. |
| CTL1685 | 0 | Ok, service &1 is in &2 state for server &3. NbActive=&3services NbInactive=&4services |
| CTL2680 | 20 | Warning, &1 services are in &2 state instead of &3 state for the server &4. NbActive=&5services NbInactive=&6services |
| CTL2681 | 20 | Warning, service &1 is in &2 state instead of &3 state for server &4. NbActive=&5services NbInactive=&6services |
| CTL3680 | 40 | Critical, &1 services are in &2 state instead of &3 state for the server &4. NbActive=&5services NbInactive=&6services |
| CTL3681 | 40 | Critical, service &1 is in &2 state instead of &3 state for server &4. NbActive=&5services NbInactive=&6services |

Using the command:

For the SERVER parameter, indicate the name of the web server. In the example below, the server name is "ibelive22".

For the SERVICE parameter, the name of the services to be controlled must be case sensitive (upper/lower case)



The screenshot shows the IBM i Management Center interface. The top navigation bar includes 'Setup', 'Manage', 'Advanced', and 'Related Links'. Below this, there are tabs for 'All Servers', 'HTTP Servers', 'Application Servers', and 'Installations'. The 'Application Servers' tab is active, and the server 'ibelive22 - V2.6 (web services)' is selected. The left sidebar contains various management options like 'Web Services', 'Server Properties', 'Security', 'Logging', and 'Tools'. The main content area displays 'Manage Deployed Services' for the selected server, with a table of services and their status.

| | Service name | Status | Type | Startup type | Service definition |
|--|-----------------|---------|------|--------------|--------------------|
| | ConvertTemp | Stopped | SOAP | Automatic | View WSDL |
| | convertTempRest | Stopped | REST | Automatic | View Swagger |
| | stat | Stopped | REST | Automatic | View Swagger |

Below the table, there are buttons for 'Deploy', 'Start', 'Properties', 'Uninstall', 'Redeploy', and 'Refresh'.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

4 High availability check commands

This section lists the commands used to monitor high availability products.

- Quick EDD-HA
- Mimix

4.1 CTCHKEDH, Check the status of Quick EDH replication

The CTCHKEDH command is used to check that the replication performed by the Quick EDD-HA product (by Traders) is correct and not excessively delayed.

The command parameters are as follows:

```

                                Check EDH replication status (CTCHKEDH)

Specify your choices then press Enter.

Environment . . . . . ENV
Expected status . . . . . STATUS          *RUN
Severity level . . . . . LEVEL           *CRITICAL
Accepted Delay      (Warning) DELAY_W     300
Accepted delay      (Critical) DELAY_C     600
Max unsync objects  (Warning) DESYNC_W    0
Max unsync objects  (Critical) DESYNC_C    0

```

Description of parameters:

- ENV = Name of the Quick EDD-HA environment to check
- STATUS = Status the environment must be in
 - *RUN = The environment must be active
 - *STOP = The environment must be stopped
 - *ANY = The environment status is not checked
- LEVEL = Severity level of the alert generated if the environment is not in the expected status
 - *CRITICAL = CRITICAL-type alert generated
 - *WARNING = WARNING-type alert generated
- DELAY_W = Replication delay time above which a WARNING alert must be generated
- DELAY_C = Replication delay time above which a CRITICAL alert must be generated
- DESYNC_W = Number of objects with a synchronization error above which a WARNING alert must be generated
- DESYNC_C = Number of objects with a synchronization error above which a CRITICAL alert must be generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1114 | 0 | Environment &1 is inactive |
| CTL1117 | 0 | Environment &1 is OK delay=&2s, UnSync=&3obj |
| CTL5111 | 20 | Environment &1 does not exist |
| CTL5112 | 20 | Environment &1 is active when it should be stopped |

| | | |
|---------|----|--|
| CTL5113 | 20 | Environment &1 is inactive when it should be started |
| CTL5115 | 20 | &2 s delay for environment &1. delay=&2s, UnSync=&3obj |
| CTL5116 | 20 | &3 unsynchronized objects for environment &1. delay=&2s, UnSync=&3obj |
| CTL1001 | 40 | The &1 product license key is not valid. Contact M81 |
| CTL1111 | 40 | Environment &1 does not exist |
| CTL1112 | 40 | Environment &1 is active when it should be stopped |
| CTL1113 | 40 | Environment &1 is inactive when it should be started |
| CTL1115 | 40 | &2 s delay for environment &1. delay=&2s, UnSync=&3obj |
| CTL1116 | 40 | &3 unsynchronized objects for environment &1. delay=&2s, UnSync=&3obj |

Using the command:

This command checks initially that a replication environment is active or conversely, that an environment used only for tests for example is stopped.

For an active environment, the delay time indicated by the product will be compared with the values passed in the DELAY_W and DELAY_C parameters to generate an alert if it is exceeded.

The environment to check must exist in the Quick EDD-HA product.

If the parameter STATUS contains *STOP, the command checks that the environment is stopped. The other parameters are not checked.

If parameter STATUS contains *RUN, the command checks that the environment is started. If it is, the other parameters are checked. Otherwise, the other parameters are not checked.

If parameter STATUS contains *ANY, the state of the environment is not checked. The other parameters are checked.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

4.2 CTCHKMMXAG, Check the status of a MIMIX Application Group

The CTCHKMMXAG command is used to check that a MIMIX Application Group is active and that no constituents have errors.

The command parameters are as follows:

```

Mimix, Application Group status (CTCHKMMXAG)

Specify your choices then press Enter.

Application Group name . . . . . AGDFN
```

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Reference document

| | | |
|-----------------------------------|-----------|-----------|
| Managers status | APPNODSTS | *ACTIVE |
| Data replication status | REPSTS | *ACTIVE |
| Procedures status | PROCSTS | *OK |
| MIMIX Library name | MMXLIB | MIMIX |
| Severity level | LEVEL | *CRITICAL |

Description of parameters:

- AGDFN = Application group (AG) name as defined in MIMIX.
- APPNODSTS = Specifies the status the Application Group must be in.
 *ACTIVE = The managers of all the Data Groups in this AG must be active. All other statuses will generate an alert.
 *INACTIVE = None of the managers in the Data Groups in this AG must be active.
 *NOCTL = This parameter will not be checked.
- REPSTS = Specifies the status the data replication must be in for all the Data Groups in this AG.
 *ACTIVE = All data replications must be active. All other statuses will generate an alert.
 *INACTIVE = None of the Data Groups in this AG must have active data replication.
 *NOCTL = This parameter will not be checked.
- PROCSTS = Specifies the status procedures must be in for all the Data Groups in this AG.
 *OK = All the procedures must be in Active or Comp status. All other statuses will generate an alert.
 *NOCTL = This parameter will not be checked.
- MMXLIB = Name of the library containing the MIMIX instance to check.
- LEVEL = Severity levels of the alert generated in the monitoring product
 *CRITICAL = CRITICAL-type alert generated
 *WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1243 | 0 | All checks are OK for Application Group &1 |
| CTL2243 | 20 | AG Managers in &1 status when &2 status is expected (APPNODSTS parameter). |
| CTL2244 | 20 | Data replication in &1 status when &2 status is expected (REPSTS status). |
| CTL2245 | 20 | Procedures in &1 status when *COMP or *ACTIVE status is expected (PROCSTS parameter). |
| CTL3118 | 40 | Library &1 does not exist |
| CTL3240 | 40 | RTVAGSTS command not found in library &1 |
| CTL3241 | 40 | Unexpected error received by RTVAGSTS command |
| CTL3243 | 40 | AG Managers in &1 status when &2 status is expected. (APPNODSTS parameter) |
| CTL3244 | 40 | Data replication in &1 status when &2 status is expected (REPSTS status). |
| CTL3245 | 40 | Procedures in &1 status when *COMP or *ACTIVE status is expected (PROCSTS parameter). |

Using the command:

This command can only be used if the MIMIX product is installed on the partition, in the library indicated in the MMXLIB parameter.

The names of the parameters used in this command correspond to the parameters of the RTVAGSTS command supplied with MIMIX. The user may refer to the RTVAGSTS command help for further information.

Use the MIMIX WRKAG command to find out the name of the Application Groups available.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

4.3 CTCHKMMXAU, Check the status of MIMIX audits

The command CTCHKMMXAU is used to check that the MIMIX audits are corrects, or send an alert if there are errors.

The command parameters are as follows:

```

Mimix, Check Audits (CTCHKMMXAU)

Type choices, press Enter.

Data group definition:          DGDFN
  Name . . . . .
  System 1 . . . . .
  System 2 . . . . .
                                + for more values
MIMIX Library name . . . . . MMXLIB          MIMIX
Criticality level . . . . . LEVEL           *CRITICAL
  
```

Description of parameters:

- DGDFN = Data group (DG) name as defined in MIMIX. This name has 3 parts (Name, system 1 and system 2).
- MMXLIB = Name of the library containing the MIMIX instance to check.
- LEVEL = Severity levels of the alert generated in the monitoring product
 - *CRITICAL = CRITICAL-type alert generated
 - *WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--------------------------|
| CTL1192 | 0 | No error in Mimix audits |

| | | |
|---------|----|---|
| CTL2392 | 20 | &1 Errors in Mimix audit(s). &2 &3 &4 &5 &6 &7 &8 &9 &10 &11 &12 &13 &14 &15 &16 &17 &18 &19 &20 &21 NbERR=&1 |
| CTL3392 | 40 | &1 Errors in Mimix audit(s). &2 &3 &4 &5 &6 &7 &8 &9 &10 &11 &12 &13 &14 &15 &16 &17 &18 &19 &20 &21 NbERR=&1 |

Using the command:

This command can only be used if the MIMIX product is installed on the partition, in the library indicated in the MMXLIB parameter.

Use the MIMIX WRKDG command to find out the name of the Data Groups available.

The MIMIX audits are usually scheduled to run at regular intervals. The list of audits is as follows:

- #DGFE
- #DLOATR
- #FILATR
- #FILATRMBR
- #FILDTA
- #IFSATR
- #MBRRDCDCNT
- #OBJATR

The command CTCHKMMXAU checks the audit status.

The list above gives the possible statuses for the audits, and if we consider them as error or not.

It is possible to change these default values with command CTPARAM, then select parameter MIMIXAUDIT.

| | |
|------------|--------|
| *AUTORCVD | *OK |
| *CMPACT | *OK |
| *DIFFNORCY | *ERROR |
| *DISABLED | *OK |
| *ENDED | *ERROR |
| *FAILED | *ERROR |
| *IGNATR | *OK |
| *IGNOBJ | *ERROR |
| *NEW | *OK |
| *NODIFF | *OK |
| *NOTRCVD | *ERROR |
| *NOTRUN | *ERROR |
| *QUEUED | *OK |
| *USRRCVD | *OK |

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

4.4 CTCHKMMXDG, Check the status of a MIMIX Data Group

The CTCHKMMXDG command is used to check that a MIMIX Data Group is active.

The command parameters are as follows:

```

Mimix, Data Group status (CTCHKMMXDG)

Specify your choices then press Enter.

Data group definition:          DGDFN
Name . . . . .
System 1 . . . . .
System 2 . . . . .
General state of Data Group . . DGSTATE          *ENABLED
Status, communication link . . . TFRSTS          *ACTIVE
Status, Data Area Process . . . DTAPOLLPRC       *ACTIVE
Status, DB send process . . . . DBSNDPRC         *RJ
Status, Remote Journal link . . . RJLNK          *ACTIVE
Status, DB reader process . . . . DBRDRPRC       *ACTIVE
Mini Nb of DB Apply process . . . DBAPYPRC       1
Status, OBJ send process . . . . OBJSNDPRC       *ACTIVE
Nb OBJ retrieve process . . . . . OBJRTVPRC       1
Nb OBJ Apply process . . . . . OBJJAPYPRC        1
Mini nb Cont. send process . . . CNRSNDPRC        1
Status, Application Process . . . APYPRC         *ACTIVE
MIMIX Library name . . . . . MMXLIB             MIMIX
Severity level . . . . . LEVEL                 *CRITICAL

```

Description of parameters:

- DGDFN = Data group (DG) name as defined in MIMIX. This name has 3 parts (Name, system 1 and system 2).
- DGSTATE = Specifies the general state the Data Group must be in.
*ENABLED = The Data Group is enabled and can be used.
*DISABLED = Le Data Group is disabled. It cannot start.
*NOCTL = This parameter will not be checked.
- TFRSTS = Specifies the state the communication links must be in.
*ACTIVE = The communication links must be active. All other statuses will generate an alert.
*INACTIVE = The communication links must be inactive.
*NOCTL = This parameter will not be checked.
- DTAPOLLPRC = Specifies the state the Data Area poller must be in.
*ACTIVE = The Data Area poller must be active. All other statuses will generate an alert.
*INACTIVE = The Data Area poller must be inactive.
*NOCTL = This parameter will not be checked.
- DBSNDPRC = Specifies the state the database send process must be in.
*ACTIVE = The process must be active. All other statuses will generate an alert.
*INACTIVE = The process must be inactive.
*RJ = The database is sent by Remote Journaling.
*NOCTL = This parameter will not be checked.
- RJLNK = Specifies the state the remote journaling process must be in.
*ACTIVE = The process must be active. All other statuses will generate an alert.
*INACTIVE = The process must be inactive.

| | |
|-----------------|---|
| DBRDRPRC | *NOCTL = This parameter will not be checked. = Specifies the state the database read process must be in. *ACTIVE = The process must be active. All other statuses will generate an alert. *INACTIVE = The process must be inactive. |
| DBAPYPRC | *NOCTL = This parameter will not be checked. = Specifies the minimum number of database application jobs. Number = Minimum number of expected jobs. |
| OBJSNDPRC | *NOCTL = This parameter will not be checked. = Specifies the state the object send process must be in. *ACTIVE = The process must be active. All other statuses will generate an alert. *INACTIVE = The process must be inactive. |
| OBJRTVPRC | *NOCTL = This parameter will not be checked. = Specifies the minimum number of object read jobs. Number = Minimum number of expected jobs. |
| OBJAPYPRC | *NOCTL = This parameter will not be checked. = Specifies the minimum number of object application jobs. Number = Minimum number of expected jobs. |
| CNRSNDPRC | *NOCTL = This parameter will not be checked. = Specifies the minimum number of container send jobs. Number = Minimum number of expected jobs. |
| APYPRC | *NOCTL = This parameter will not be checked. = Specifies the state the apply process must be in. *ACTIVE = The Apply process must be active. All other statuses will generate an alert. *INACTIVE = The Apply process must be inactive. |
| MMXLIB LEVEL | *NOCTL = This parameter will not be checked. = Name of the library containing the MIMIX instance to check. = Severity levels of the alert generated in the monitoring product *CRITICAL = CRITICAL-type alert generated *WARNING = WARNING-type alert generated |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1253 | 0 | All checks are OK for DG &2 - &3 - &4. |
| CTL2253 | 20 | The communication link is in &1 state when &2 state is expected (TFRSTS parameter). |
| CTL2254 | 20 | DTAARA poller is in &1 state when &2 state is expected (DTAPOLLPRC parameter). |
| CTL2255 | 20 | The DB send process is in &1 state when &2 state is expected (DBSNDPRC parameter). |
| CTL2256 | 20 | The Remote Journal link is in &1 state when &2 state is expected (RJLNK parameter). |
| CTL2257 | 20 | The DB read process is in &1 state when &2 state is expected (DBRDRPRC parameter). |
| CTL2258 | 20 | There is &1 DB apply process when a minimum of &2 are required (DBAPYPRC parameters). |
| CTL2259 | 20 | The object send process is in &1 state when it should be in &2 state (OBJSNDPRC parameter). |
| CTL2260 | 20 | There is &1 Object retrieve process when a minimum of &2 are required (OBJRTVPRC parameters). |
| CTL2261 | 20 | There is &1 Object apply process when a minimum of &2 are required (OBJAPYPRC parameters). |
| CTL2262 | 20 | There is &1 Container send process when a minimum of &2 are required (CNRSNDPRC parameters). |
| CTL2263 | 20 | The Data Group is in &1 state when it should be in &2 state (DGSTATE parameter). |

| | | |
|---------|----|---|
| CTL2264 | 20 | The application process status is &1, while it should be &2 (parameter APYPRC). |
| CTL3118 | 40 | Library &1 does not exist |
| CTL3250 | 40 | RTVDGSTS command not found in library &1 |
| CTL3251 | 40 | Unexpected error received by command RTVDGSTS |
| CTL3252 | 40 | Unexpected error received by command RTVAPYSTS |
| CTL3253 | 40 | The communication link is in &1 state when &2 state is expected (TFRSTS parameter) |
| CTL3254 | 40 | The DTAARA poller is in &1 state when &2 state is expected (DTAPOLLPRC) |
| CTL3255 | 40 | The DB send process is in &1 state when &2 state is expected (DBSNDPRC parameter) |
| CTL3256 | 40 | The Remote Journal link is in &1 state when &2 state is expected (RJLNK parameter). |
| CTL3257 | 40 | The DB read process is in &1 state when &2 state is expected (DBRDRPRC parameter). |
| CTL3258 | 40 | There is &1 DB apply process when a minimum of &2 are required (DBAPYPRC parameters). |
| CTL3259 | 40 | The object send process is in &1 state when it should be in &2 state (OBSNDPRC parameter). |
| CTL3260 | 40 | There is &1 Object retrieve process when a minimum of &2 are required (OBJRTVPRC parameters). |
| CTL3261 | 40 | There is &1 Object apply process when a minimum of &2 are required (OBJAPYPRC parameters). |
| CTL3262 | 40 | There is &1 Container send process when a minimum of &2 are required (CNRSNDPRC parameters). |
| CTL3263 | 40 | The Data Group is in &1 state when it should be in &2 state (DGSTATE parameter). |
| CTL3264 | 40 | The application process status is &1, while it should be &2 (parameter APYPRC). |

Using the command:

This command can only be used if the MIMIX product is installed on the partition, in the library indicated in the MMXLIB parameter.

The names of the parameters used in this command correspond to the parameters of RTVDGSTS or RTVAPYSTS commands supplied with MIMIX. The user may refer to the RTVDGSTS or RTVAPYSTS command's help for further information.

Use the MIMIX WRKDG command to find out the name of the Data Groups available.

For the parameters APYPRC, DBSNDPRC and RJLNK, the Mimix configuration includes a *THRESHOLD notion which allows to indicate if the corresponding operation undergoes a delay. The limit for this delay is set in MIMIX.

By indicating *ACTIVE for these parameters in the CTCHKMMXDG command, an alert will be generated if the Mimix Threshold is exceeded.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

4.5 CTCHKMMXDS, Check MIMIX Data Group replication errors

The CTCHKMMXDS command is used to check that there are no replication errors for a MIMIX Data Group.

The command parameters are as follows:

```

Mimix, Data Group Status (CTCHKMMXDS)

Specify your choices then press Enter.

Data group definition:                DGDFN
  Name . . . . .
  System 1 . . . . .
  System 2 . . . . .
Max. No. Objects in Error . . . . . OTEHLDERR
Max. No. Inactive Obj . . . . . OTENOTACT
Max. No. Non Journalized Obj Src . . . . . OTENOTJRNS
Max. No. Non Journalized Obj Tgt . . . . . OTENOTJRNT
Max. No. Files in Error . . . . . FEHLDERR2
Max. No. Inactive Files . . . . . FENOTACT2
Max. No. IFS Error . . . . . ITEHLDERR
Max. No. Inactive IFS Files . . . . . ITENOTACT
Max. No. Not Jrnl Src IFS Files . . . . . ITENOTJRNS
Max. No. Not Jrnl Tgt IFS Files . . . . . ITENOTJRNT
Max. No. Objects in Error . . . . . OBJERR
MIMIX Library name . . . . . MMXLIB          MIMIX
Severity level . . . . . LEVEL              *CRITICAL

```

Description of parameters:

- DGDFN = Data group (DG) name as defined in MIMIX. This name has 3 parts (Name, system 1 and system 2).
- OTEHLDERR = Specifies the maximum number of objects on hold due to an error.
*NOCTL = This parameter will not be checked.
- OTENOTACT = Specifies the maximum number of objects for which replication is not active, whatever the reason.
*NOCTL = This parameter will not be checked.
- OTENOTJRNS = Specifies the maximum number of objects which are not journaled, or journaled in another journal than the one configured, in the SOURCE system.
*NOCTL = This parameter will not be checked.
- OTENOTJRNT = Specifies the maximum number of objects which are not journaled, or journaled in another journal to the one configured, in the TARGET system.
*NOCTL = This parameter will not be checked.
- FEHLDERR2 = Specifies the maximum number of DB files on hold due to an error.
*NOCTL = This parameter will not be checked.
- FENOTACT2 = Specifies the maximum number of DB files for which replication is not active, whatever the reason.
*NOCTL = This parameter will not be checked.
- ITEHLDERR = Specifies the maximum number of IFS files on hold due to an error.
*NOCTL = This parameter will not be checked.
- ITENOTACT = Specifies the maximum number of IFS files for which replication is not active, whatever the reason.
*NOCTL = This parameter will not be checked.

| | |
|------------|---|
| ITENOTJRNS | = Specifies the maximum number of IFS files which are not journaled, or journaled in another journal to the one configured, in the SOURCE system. *NOCTL = This parameter will not be checked. |
| ITENOTJRNT | = Specifies the maximum number of IFS files which are not journaled, or journaled in another journal than the one configured, in the TARGET system. *NOCTL = This parameter will not be checked. |
| MMXLIB | = Name of the library containing the MIMIX instance to check. |
| LEVEL | = Severity levels of the alert generated in the monitoring product *CRITICAL = CRITICAL-type alert generated *WARNING = WARNING-type alert generated |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1253 | 0 | All checks are OK for DG &2 - &3 - &4. |
| CTL2281 | 20 | Caution: &1 objects in error, above the &2 threshold |
| CTL2282 | 20 | Caution: &1 inactive objects, above the &2 threshold |
| CTL2283 | 20 | Caution: &1 objects incorrectly journaled in the source, above the &2 threshold |
| CTL2284 | 20 | Caution: &1 objects incorrectly journaled in the target, above the &2 threshold |
| CTL2285 | 20 | Caution: &1 files in error, above the &2 threshold |
| CTL2286 | 20 | Caution: &1 inactive files, above the &2 threshold |
| CTL2287 | 20 | Caution: &1 errors in the IFS, above the &2 threshold |
| CTL2288 | 20 | Caution: &1 inactive files in the IFS, above the &2 threshold |
| CTL2289 | 20 | Caution: &1 files incorrectly journaled in the source IFS, above the &2 threshold |
| CTL2290 | 20 | Caution: &1 files incorrectly journaled in the target IFS, above the &2 threshold |
| CTL2291 | 20 | Caution: &1 objects in error, above the &2 threshold |
| CTL3118 | 40 | Library &1 does not exist |
| CTL3250 | 40 | RTVDGSTS command not found in library &1 |
| CTL3251 | 40 | Unexpected error received by RTVDGSTS command |
| CTL3281 | 40 | Critical: &1 objects in error, above the &2 threshold |
| CTL3282 | 40 | Critical: &1 inactive objects, above the &2 threshold |
| CTL3283 | 40 | Critical: &1 objects incorrectly journaled in the source, above the &2 threshold |
| CTL3284 | 40 | Critical: &1 objects incorrectly journaled in the target, above the &2 threshold |
| CTL3285 | 40 | Critical: &1 files in error, above the &2 threshold |
| CTL3286 | 40 | Critical: &1 inactive files, above the &2 threshold |
| CTL3287 | 40 | Critical: &1 errors in the IFS, above the &2 threshold |
| CTL3288 | 40 | Critical: &1 inactive files in the IFS, above the &2 threshold |
| CTL3289 | 40 | Critical: &1 files incorrectly journaled in the source IFS, above the &2 threshold |
| CTL3290 | 40 | Critical: &1 files incorrectly journaled in the target IFS, above the &2 threshold |
| CTL3291 | 40 | Critical: &1 objects in error, above the &2 threshold |

Using the command:

This command can only be used if the MIMIX product is installed on the partition, in the library indicated in the MMXLIB parameter.

The names of the parameters used in this command correspond to the parameters of the RTVDGSTS command supplied with MIMIX. The user may refer to the RTVDGSTS command help for further information.

Use the MIMIX WRKDG command to find out the name of the Data Groups available.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

4.1 Information about iTera's monitoring

4.1.1 Origin of iTera status information

Control for i contains 2 commands that allow monitoring iTera (CTCHKITAST and CTCHKITADL). These 2 commands are based on the information provided by the iTera product in the "1.1 System Monitor" menu. The 2 screens provided by this option are given below.

The iTera monitoring commands provided by Control for i refer to the information displayed on these 2 screens.

```

EDUC08      BACKUP 1      Assure iTERA HA 6.2      E22020RI
HAM8ADMIN      System Monitor      26.05.21
QPADEV0001      13:19:07

                                Primary      Backup
System Name . . . . . EDUC07      EDUC08
% Total Disk Storage Used . . . . 34.530%      34.908%
% Total Used By Receivers . . . . 2.225%      2.203%
Last Update Time . . . . . 13.07.30      13.07.25
Role Swap Readiness . . . . . Error      Error

Local/Remote Journals Active . . . Yes / Yes      Yes
Apply Jobs Active . . . . . Yes      Yes
Network/Subsystem Active . . . . .      Yes / Yes

Journal Entries Not Applied . . .      0      1817696
Current Max Apply Latency . . . .      30:16
Current Max Network Exposure . . . .      :00
24-Hour Max Network Exposure . . . .      :00
Object Requesting Sync . . . . .      1

F3=Exit F6=Objects Requesting Sync F7=E2SBS F8=ASP F9=Apply Stats
F11=E2MSGLOG F14=Role Swap Readiness F16=Process Monitor F24=More keys

```

```

EDUC08      BACKUP 1      Assure iTERA HA 6.2      E22020RI
HAM8ADMIN      System Monitor      26.05.21
QPADEV0001      13:19:21

                                Primary      Backup
System Name . . . . . EDUC07      EDUC08
Audit Status . . . . . ERR      ERR
Assure Audit Status . . . . .      Err
OBJMON 1 Pending . . . . .      0
OBJMON 2 Pending . . . . .      1
OBJMON 3 Pending . . . . .      0

```

```

Heal Records . . . . . 0
IFS Pending . . . . . 0
Spooled File Pending . . . . . 0
Commands Pending . . . . . 0
Other Pending . . . . . 0
Journal Receivers . . . . . 107      107

O/S Version . . . . . V7R4M0      V7R4M0
iTERA HA Version . . . . . 6.2.13.00 6.2.13.00
F3=Exit F6=Objects Requesting Sync F7=E2SBS F8=ASP F9=Apply Stats
F11=E2MSGLOG F14=Role Swap Readiness F16=Process Monitor F24=More keys

```

4.1.2 Identification of Node code

iTera allows you to manage replication on multiple systems. In order to identify exactly which system is being checked, the control commands will use the name defined as "Node Code" in the iTera setup. These names should be used in the NODCODSRC and NODCODTGT parameters in both commands.

To find the "Node Code", use the following options from the iTera main menu:

- 30. Environment and Setup Menu
- 21. Setup and Manage Environments

```

EDUC07          Assure iTera HA 6.2          E25501RE
HAM8ADMIN       Node Maintenance            2.06.21
QPADEV0001      14:36:48
Base Library . . . . . ITERA          Transfer Port . . . . . 51577
User (Takeover) IP . . . 192.168.215.197
Type options, press Enter.
2=Change Node  4=Delete Node  7=Set as Replicate Node  8=Promote Current Role
9=Promote Preferred Role  12=Update RDB Entry          ...
Position to
Short
Opt Node Id  Node      Replication  Current  Preferred  iTera  Node
Code        IP          Role        Role      State      Code
EDUC07      ITERAN01  10.10.25.1  Primary  Primary    Inactive  N01
EDUC08      ITERAN02  10.10.25.2  Backup 1  Backup 1   Active   N02

```

4.1.3 iTera audit control

iTera uses the same audits as Mimix. To control the iTera audits, you must use the CTCHKMMXAU command, indicating the name of the iTera library.

4.1.4 Data validity period

The information used to perform these checks is collected automatically by iTera. The default collection frequency is 15 minutes. In the commands below, the DURVALDTA parameter is used to check that the data on which the checks are based have actually been updated.

4.2 CTCHKITAST, Check iTera's global status

The CTCHKITAST command allows you to check the status of the replication performed by the iTera product as well as the possibility to switch to the backup system.

The parameters of the command are as follows :

| iTera, global state (CTCHKITAST) | | |
|----------------------------------|-----------|-----------|
| Type choices, press Enter. | | |
| Role Swap Readiness Ctl | RLESWPREA | *OK |
| Local/Remote Jrn Active Ctl . . | LCLRMTJRN | *OK |
| Apply Jobs Active Ctl | APLJOBACT | *OK |
| Network/Subsystem Active Ctl . . | NTWSBSACT | *OK |
| Remote Active Ctl | RMTACT | *OK |
| Disk Storage Used By Receivers: | DSKSTGRCV | |
| Warning limit (%) | | 1 |
| Critical limit (%) | | 1 |
| Source Node Code | NODCODSRC | |
| Target Node Code | NODCODTGT | |
| iTera library name | ITELIB | ITERA |
| Data validity period (min) . . . | DURVALDTA | 30 |
| Severity level | LEVEL | *CRITICAL |

Parameter description:

| | |
|-----------|--|
| RLESWPREA | = Refers to the "Role Swap Readiness" line. Controls iTera's ability to allow a switch on the replica. *OK = Check that a Role Swap is possible *NOTOK = Check that a swap role is not possible *NOCTL = This parameter will not be checked. |
| LCLRMTJRN | = Refers to the "Local/Remote Journals Active" line. *OK = Check that the logs are active *NOTOK = Check that the logs are not active *NOCTL = This parameter will not be checked. |
| APLJOBACT | = Refers to the "Apply Jobs Active" line. *OK = Vérifier que les travaux d'application sont actifs *NOTOK = Vérifier que les travaux d'application ne sont pas actifs *NOCTL = Ce paramètre ne sera pas contrôlé. |
| NTWSBSACT | = Refers to the "Network/Subsystem Active" line. *OK = Check that the network part and subsystems are active *NOTOK = Check that the network part and subsystems are not active *NOCTL = This parameter will not be checked. |
| RMTACT | = Refers to the "Remote Active" line. *OK = Check that the remote server is active *NOTOK = Check that the remote server is not active *NOCTL = This parameter will not be checked. |
| DSKSTGRCV | = Refers to the line "% Total Used By Receivers Warning limit (%) = Indicate the % of occupation of the receivers from which a Warning alert will be generated. Critical limit (%) = Indicate the % of occupation of the receivers from which a Critical alert will be generated. This value must be greater than or equal to the Warning limit. |
| NODCODSRC | = Node code of the source location for which to perform the check. See paragraph "4.1.2 Identification of Node code" for more information. |

| | |
|-----------|---|
| NODCODTGT | = Node code of the backup location for which to perform the check. |
| ITELIB | = Enter the library where the iTera product is located. |
| DURVALDTA | = Maximum duration of data validity expressed in minutes. See paragraph "4.1.4 Data validity period". |
| LEVEL | = Levels of gravity of the alert generated in the monitoring product. *CRITICAL = CRITICAL alert generated. *WARNING = WARNING alert generated. |

This command returns the following messages:

| ID message | Gravity | Text message |
|------------|---------|---|
| CTL1611 | 0 | Ok, correct global state of iTERA. |
| CTL2612 | 20 | Warning, wrong state for Local/Remote Jrn Active. State &1 on node code &2. |
| CTL2613 | 20 | Warning, wrong state for Network/Subsystem Active. State &1 on node code &2. |
| CTL2614 | 20 | Warning, wrong state for Remote Active. State &1 on node code &2. |
| CTL2615 | 20 | Warning, wrong state for Apply Jobs Active. State &1 on node code &2. |
| CTL2616 | 20 | Warning, wrong state for Role Swap Readiness. State &1 on node code &2. |
| CTL2632 | 20 | Warning, &2 warning errors for global state of iTERA regarding source node code &3 and target node code &4. |
| CTL2634 | 20 | Warning, disk storage used by receivers is &1%, greater than the warning limit &2% on node code &3. |
| CTL1001 | 40 | The &1 product license key is not valid. Contact M81 |
| CTL3118 | 40 | Library &1 not found |
| CTL3611 | 40 | Data of node code &1 are too old. Greater than the limit of &2 minutes. |
| CTL3612 | 40 | Critical, wrong state for Local/Remote Jrn Active. State &1 on node code &2. |
| CTL3613 | 40 | Critical, wrong value for Network/Subsystem Active. State &1 on node code &2. |
| CTL3614 | 40 | Critical, wrong state for Remote Active. State &1 on node code &2. |
| CTL3615 | 40 | Critical, wrong value for Apply Jobs Active. State &1 on node code &2. |
| CTL3616 | 40 | Critical, wrong value for Role Swap Readiness. State &1 on node code &2. |
| CTL3617 | 40 | Source node code and target node code are mandatory. |
| CTL3618 | 40 | Can't found data for node code &1. |
| CTL3619 | 40 | Node code &1 isn't a source node code. |
| CTL3920 | 40 | Node code &1 isn't a target node code. |
| CTL3632 | 40 | Critical, &1 crit. errors and &2 warn. for global state of iTERA regarding source node code &3 and target node code &4. |
| CTL3634 | 40 | Critical, disk storage used by receivers is &1%, greater than the critical limit &2% on node code &3. |
| CTL3635 | 40 | The warning limit can't be greater than the critical limit for the disk storage used by receivers. |

Use of the command:

This command can only be used if the iTera product is installed on the partition, in the library specified in the ITELIB parameter.

This command allows to check the status of the replication performed by iTera.

4.3 CTCHKITADL, Check iTera replication times

The CTCHKITADL command is used to control the delays in which the replications performed by the iTera product.

The parameters of the command are as follows:

```

iTERA, delays control (CTCHKITADL)

Type choices, press Enter.

Cur. Max Apply Latency Ctl (s)    MAXAPLLAT    1
Cur. Max Net. Exposure Ctl (s)   MAXNTWEXP    1
Nb Max Object Requesting Sync .   OBJREQSYN    0
Nb Max OBJMON 1 Pending . . . . . OBJMON1      0
Nb Max OBJMON 2 Pending . . . . . OBJMON2      0
Nb Max OBJMON 3 Pending . . . . . OBJMON3      0
Nb Max Heal Records . . . . .     HEALRCD     0
Nb Max IFS Pending . . . . .       IFSPEND     0
Nb Max Spooled File Pending . .   SPLPEND     0
Nb Max Commands Pending . . . . . CMDPEND     0
Nb Max Other Pending . . . . .     OTHPEND     0
Source Node Code . . . . .         NODCODSRC
Target Node Code . . . . .         NODCODTGT
iTERA library name . . . . .       ITELIB      ITERA
Data validity period (min) . . .   DURVALDTA   30
Severity level . . . . .           LEVEL       *CRITICAL

```

Parameter description:

| | |
|-----------|---|
| MAXAPLLAT | = Refers to the "Current Max Apply Latency" line. *NOCTL = This parameter will not be checked. |
| MAXNTWEXP | = Refers to the "Current Max Network Exposure" line. *NOCTL = This parameter will not be checked. |
| OBJREQSYN | = Refers to the line "Object Requesting Sync". Presence or not of one or more objects that need to be synchronized. *NOCTL = This parameter will not be checked. |
| OBJMON1 | = Refers to the line "OBJMON 1 Pending". *NOCTL = This parameter will not be checked. |
| OBJMON2 | = Refers to the line "OBJMON 2 Pending". *NOCTL = This parameter will not be checked. |
| OBJMON3 | = Refers to the line "OBJMON 3 Pending". *NOCTL = This parameter will not be checked. |
| HEALRCD | = Refers to the "Heal Records" line. *NOCTL = This parameter will not be checked. |
| IFSPEND | = Refers to the "IFS Pending" line. Number of files waiting to be synchronized in IFS tolerated. *NOCTL = This parameter will not be checked. |
| SPLPEND | = Refers to the "Spooled File Pending" line. Number of spooled files waiting to be synchronized tolerated. *NOCTL = This parameter will not be checked. |
| CMDPEND | = Refers to the "Commands Pending" line. Number of pending orders tolerated for synchronization. *NOCTL = This parameter will not be checked. |
| OTHPEND | = Refers to the "Other Pending" line. *NOCTL = This parameter will not be checked. |
| NODCODSRC | = Node code of the source location for which to perform the check. See paragraph "4.1.2 Identification of Node code" for more information. |
| NODCODTGT | = Node code of the backup location for which to perform the check. |
| ITELIB | = Enter the library where the iTerA product is located. |
| DURVALDTA | = Maximum duration of data validity expressed in minutes. See paragraph "4.1.4 Data validity period". |
| LEVEL | = Levels of gravity of the alert generated in the monitoring product. *CRITICAL = CRITICAL alert generated. *WARNING = WARNING alert generated. |

This command return the following messages:

| ID message | Gravity | Text message |
|------------|---------|---|
| CTL1621 | 0 | Ok, correct delays control of iTERA. |
| CTL2621 | 20 | Warning, Cur. Max Apply Latency is &2, greater than the limit &3 on node code. |
| CTL2622 | 20 | Warning, Object Requesting Sync is &2, greater than the limit &3 on node code. |
| CTL2623 | 20 | Warning, Cur. Max Net. Exposure is &2, greater than the limit &3 on node code. |
| CTL2624 | 20 | Warning, OBJMON 1 Pending is &2, greater than the limit &3 on node code &1. |
| CTL2625 | 20 | Warning, OBJMON 2 Pending is &2, greater than the limit &3 on node code &1. |
| CTL2626 | 20 | Warning, OBJMON 3 Pending is &2, greater than the limit &3 on node code &1. |
| CTL2627 | 20 | Warning, IFS Pending is &2, greater than the limit &3 on node code &1. |
| CTL2628 | 20 | Warning, Spooled File Pending is &2, greater than the limit &3 on node code &1. |
| CTL2629 | 20 | Warning, Commands Pending is &2, greater than the limit &3 on node code &1. |
| CTL2630 | 20 | Warning, Other Pending is &2, greater than the limit &3 on node code &1. |
| CTL2631 | 20 | Warning, Heal Records is &2, greater than the limit &3 on node code &1. |
| CTL2633 | 20 | Warning, &1 errors for delays control of iTERA. Source node code &2, target node code &3. |
| CTL1001 | 40 | The &1 product license key is not valid. Contact M81 |
| CTL3118 | 40 | Library &1 not found |
| CTL3611 | 40 | Data of node code &1 are too old. Greater than the limit of &2 minutes. |
| CTL3617 | 40 | Source node code and target node code are mandatory. |
| CTL3618 | 40 | Can't found data for node code &1. |
| CTL3619 | 40 | Node code &1 isn't a source node code. |
| CTL3620 | 40 | Node code &1 isn't a target node code. |
| CTL3621 | 40 | Critical, Cur. Max Apply Latency is &2, greater than the limit &3 on node code &1. |
| CTL3622 | 40 | Critical, Object Requesting Sync is &2, greater than the limit &3 on node code &1. |
| CTL3623 | 40 | Critical, Cur. Max Net. Exposure is &2, greater than the limit &3 on node code &1. |
| CTL3624 | 40 | Critical, OBJMON 1 Pending is &2, greater than the limit &3 on node code &1. |
| CTL3625 | 40 | Critical, OBJMON 2 Pending is &2, greater than the limit &3 on node code &1. |
| CTL3626 | 40 | Critical, OBJMON 3 Pending is &2, greater than the limit &3 on node code &1. |
| CTL3627 | 40 | Critical, IFS Pending is &2, greater than the limit &3 on node code &1. |
| CTL3628 | 40 | Critical, Spooled File Pending is &2, greater than the limit &3 on node code &1. |
| CTL3629 | 40 | Critical, Commands Pending is &2, greater than the limit &3 on node code &1. |
| CTL3630 | 40 | Critical, Other Pending is &2, greater than the limit &3 on node code &1. |
| CTL3631 | 40 | Critical, Heal Records is &2, greater than the limit &3 on node code &1. |
| CTL3633 | 40 | Critical, &1 errors for delays control for iTERA. Source node code &2, target node code &3. |

Use of the command:

This command can only be used if the iTera product is installed on the partition, in the library specified in the ITELIB parameter.

This command allows to check the status of the replication performed by iTera.

5 Messages check commands

The Control For i product allows to control messages in message queues (MSGQ), in system log (QHST or DSPLOG command), in BRMS logs, or in defined active job log.

This section describes the commands provided to check that those messages.

5.1 Principle of working for this control

The goal is to analyze the messages received in an MSGQ, in system log (QHST or DSPLOG command), in BRMS logs or the messages found in the Job Log of an active job, and generate an alert for some messages previously defined.

The messages that will generate an alert must be defined using command CTWRKMSG. Find more details on how to configure those messages in chapter “ 5.2 CTWRKMSG ”.

The job CTAUTO (automatically started with subsystem CONTROL4I) will analyze every new message in the MSGQ, the system log, BRMS logs or Job Logs defined with CTWRKMSG. The analyze is done every minute. Every message considered as critical or warning will be added to an internal table of the product.

The command CTDSPALR can be used to have the list of these critical and warning messages detected by CTAGENT. The user can then see the detail of these messages. He also can acknowledge the messages.

The command CTCHKMSGQ can be used in Nagios. It checks if there are critical or warning messages in the internal table, and generate an alert in Nagios, giving the number of messages found, and the list of the fist 10 messages ID found. The messages acknowledged by the user using CTDSPALR command are not considered as alerts any more, and are not considered by CTCHKMSGQ.

For the definition of messages, first create a scenario definition. A scenario will be associated to a MSGQ, QHST, BRMS or a Job log.

For each scenario definition, the list of messages to consider as critical or warning will be entered. Several options are available such as:

- Message ID, or every inquiry message, or every message
- A text contained in the message (the search can be done in message level 1 and/or level 2 text)
- The job name or user profile name that sent the message
- The message severity
- A time period during which the message has been sent may be defined

When using the command CTCHKMSGQ, enter as a parameter the scenario name to check. This allows for example to create several different services in Nagios for one MSGQ.

The origin of the messages is different depending on the type of scenario defined:

- *BRMS
 - o The messages are those provided by the DSPLOGBRM command
 - o This option is not available in V7R1. It is only available starting with IBM I version V7R2 with the following PTF:
 - V7R2 : SI68845
 - V7R3 : SI68846
- *MSGQ
 - o The messages are those contained in the message queue whose name is indicated in the group definition.
- *JOBLOG
 - o The messages are those contained in the Joblog of the job whose name is indicated in the group definition.
 - o The messages are only analyzed as long as the job is active. When the job is finished, it is no longer taken into account

- o If there are several active jobs with the same name, they will all be analyzed.
- o As the message check is done at regular intervals (every 60 seconds by default), it is possible that the last messages generated in the job's joblog are not taken into account.
- *QHST
 - o The messages in the system history are analyzed (DSPLOG command)

5.2 CTWRKMSG, Define alerts for *MSGQ, *QHST, *BRMS and *JOBLOG

This command is used to enter the list of scenario (message group definition), and messages that will generate an alert.

Look at section “5.1 Principle of working for this control” for more information on how this control works.

The first step is to define a “scenario” for each message queue (MSGQ) to analyze. One scenario refers to one MSGQ and only one. But there may be several different scenarios referring the same MSGQ (for example to associate in Nagios some messages to an email distribution list, and other messages to another email distribution list).

Each scenario will contain a list of messages that will generate alerts.

The scenario name will be used in command CTCHKMSGQ.

The following display is shown.

```

CTMS1S01          Work with scenarios definitions for CTCHKMSGQ          M81DEV
                                                    24/12/18 15:22:29

Position to . . . . .

Type options, press Enter.
  2=Change  3=Copy  4=Delete  5=Display  10=Test with CTCHKMSGQ
  12=Work with messages

Opt Name      Activ Type of definition      Description
BRMS_ERR      *YES *BRMS                      Errors in BRMS
QSYSOPR       *YES QSYS/QSYSOPR              Check QSYSOPR messages for system
QSYSOPR2      *YES QSYS/QSYSOPR              Check specific messages in QSYSOPR
SAVE          *YES QGPL/SAVE                  Check Backups

                                                    Bottom

F3=Exit  F5=Refresh  F6=Create  F12=Cancel
  
```

The list of groups is displayed.

The columns have the following meanings:

- Nom = Group definition name.
- Activ = Indicates whether the controls defined in this group are active or not.
The group can be enabled/disabled via option 2 (Edit) or by using the CTCHGMSGST command.

| | |
|--------------------|--|
| Type of definition | <p>*YES = Controls defined in this group are currently being considered. *NO = Checks defined in this group are not considered at the moment. = Indicates either the name of the MSGQ or the type of element being monitored. *BRMS = messages are searched in BRMS log *JOBLOG = messages are searched in an active job log *QHST = Messages are searched for in the system log.</p> |
| Description | = Description for this messages group definition |

Possible inputs:

Position to
Specifies from which definition name to display.

Options:

Options 2 and 5 allow to change or display a group definition.

Option 3 allow to create a new scenario by copying an existing group. In this case, the messages defined in the source scenario are copied in the destination group.

If a new group is created by copying another scenario (with option 3), the control of messages in this new scenario will not start at the beginning of the MSGQ, but starting at the first message coming into the MSGQ. If the control must start t the beginning of the MSGQ, use F6 to create the scenario.

If the scenario type (*MSGQ, *BRMS, *QHST or *JOBLOG) is changed when copying, additional checks are made on the list of defined messages. Messages that are not compatible with the definition type will not be copied.

Option 4 will delete the scenario definition. The messages defined in the scenario will also be deleted.

Option 10 will display the prompt of the command CTCHKMSGQ. This allows to check immediately the scenario definition.

Attention, If the definition has been changed right before, there may have no new alert corresponding to the new message definitions entered.

Option 12 will display the list of messages defined in the scenario.

Function keys

Press F6 to create a new scenario

5.2.1 Option 2 or 5 = Display or change a scenario detail

```

CTMS1S02          Display definition scenario for CTCHKMSGQ          M81DEV
                                                           24/12/18 15:30:24

Type options, press Enter.

Definition scenario . . . . . QSYSOPR          Name
Type of definition . . . . . *MSGQ          *BRMS, *JOBLOG, *MSGQ, *QHST
Description . . . . . Check QSYSOPR messages for system team
  
```

Control for i
Reference document

```

Definition Active . . . . *YES          *YES, *NO
Recovery of controls . . . *LASTCHK    *AVAIL, *LASTCHK, *NOW

Message queue . . . . . QSYSOPR        Name
  Library . . . . . QSYS                Name

F3=Exit   F5=Refresh   F12=Cancel
  
```

The fields have the following meanings:

- Definition scenario = Enter the name of the scenario. This name will be used in command CTCHKMSGQ
- Type of definition = Enter the type of element to be controlled
 - *BRMS = messages are searched in BRMS log
 - *MSGQ = Messages will be analyzed in a MSGQ
 - *JOBLOG = Messages will be analyzed in a Job Log
 - *QHST = Messages will be analyzed in system log (DSPLOG command)
- Description = Enter a free text describing the scenario
- Definition Active = Is this scenario active. This value can also be changed using CTCHGMSGST command.
 - *YES = The scenario is active. The messages of the MSGQ or JOBLOG are currently analyzed by job CTAGENT, and may generate alerts.
 - *NO = The scenario is not active. The job CTAGENT will not use this definition
- Recovery of control = Indicate from which messages the controls should resume. This parameter is only considered for already existing scenarios, which were inactive.
 - * AVAIL = the analysis starts from the beginning (the oldest messages available)
 - * LASTCHK = the analysis starts where it left off (for scenarios that were inactive)
 - * NOW = The analysis starts from the messages generated now. History is not considered
- Message queue = Name of the MSGQ to analyze.

5.2.2 Option 12 = Display list of messages

The following display is the result of option 12 in front of the scenario name. It displays the list of messages to be checked for this scenario.

```

CTMS2S01A          Work with definitions for CTCHKMSGQ          PROD
                                                           13/07/23 10:10:18
Scenario . . . . . QSYSOPR
Position to . . . . .

Type options, press Enter.
  2=Change  3=Copy  4=Delete  5=Display  12=Work with automatic actions
                Nb Auto
Opt Order Type      Msg ID   Act  Description
      1 Warning     CPI2417   0   msgq wrapped
  
```

Control for i
Reference document

| | | | | |
|----|----------|---------|---|--|
| 2 | Omit | CPC0905 | 0 | Subsystem CONTROL4I prestart job entry |
| 3 | Omit | BRM1481 | 0 | |
| 5 | Critical | CPF0927 | 0 | |
| 8 | Critical | CPF9877 | 3 | |
| 19 | Omit | *REPLY | 0 | |
| 20 | Warning | *ANY | 0 | All unknown messages with Sev 40+ |

Bottom

F3=Exit F5=Refresh F6=Create F8=Resequense F10=Msg ID view F11=Details
F12=Cancel

An order number is associated to every message. This order number is important. Every message found in a MSGQ or Job Log will be compared to this definition list in the order of this number. As soon as one condition is true, it's used to generate a critical alert, a warning alert, or to omit the message. Only the first true condition is considered.

By default, messages in this list are sorted by order number.
F10 allows to sort by message ID.

F11 allows to display detailed information about each message in the list.

| | | | | | | |
|----------------------------|-------------------------------------|----------|-----------|--------------------------------|-------------------|-----------------------|
| CTMS2S01A | Work with definitions for CTCHKMSGQ | | | | PROD | |
| | | | | | 13/07/23 10:11:29 | |
| Scenario | QSYSOPR | | | | | |
| Position to | | | | | | |
| Type options, press Enter. | | | | | | |
| 2=Change | 3=Copy | 4=Delete | 5=Display | 12=Work with automatic actions | | |
| Severity | | | | | | |
| Opt | Order | Type | Msg ID | Job | User | Mini Text to look for |
| | 1 | Warning | CPI2417 | *ANY | *ANY | 0 |
| | 2 | Omit | CPC0905 | *ANY | CTL4I | 0 |
| | 3 | Omit | BRM1481 | *ANY | *ANY | 0 |
| | 5 | Critical | CPF0927 | *ANY | *ANY | 0 QBATCH |
| | 8 | Critical | CPF9877 | *ANY | *ANY | 0 |
| | 19 | Omit | *REPLY | *ANY | *ANY | 0 |
| | 20 | Warning | *ANY | *ANY | *ANY | 40 |

Bottom

F3=Exit F5=Refresh F6=Create F8=Resequense F10=Msg ID view F11=General
F12=Cancel

The columns have the following meanings:

- Order Order number to use for this message definition. This number determines the order in which the checks will be made.
- Type Type of alert generated by this entry. The possible types are:
 Critical = This definition will generate a Critical alert
 Warning = This definition will generate a Warning alert
 Omit = This definition will not generate any alert
- Msg ID Message Identification

| | |
|----------------------------|--|
| Nb Auto Act Description | Number of automatic actions defined for this message. Description for this message |
| Job User | Job name. Only message sent by a job with that name will be considered. User profile name. Only messages send by a job using that profile will be considered. |
| Message severity | Only messages with a severity level that is equal or higher than this limit will be considered. |

Possible inputs:

Position to
Specifies from which order number to display.

Options:

Options 2 and 5 allow to change or display a message definition.

Option 3 allows to add a new message by copying an existing one. If there are automatic actions defined, they are also copied.

Option 4 allows to delete a message definition

Option 12 allows to work with the list of automatic actions that will be used when the message is found.

Function keys

Press F6 to add a new message definition

Press F8 to change the order numbers. A screen asks for the new interval to use between the order numbers.

5.2.3 Option 2 or 5 = Display or change a message definition

```

CTMS2S02                Display definition for CTCHKMSGQ                M81V7R2
                                                                    26/12/18 09:52:46

Type options, press Enter.

Definition Scenario . . . . . QSYSOPR          QSYSOPR

Control order number . . .      251

Description . . . . . File full

Type of alert/ Omit . . .      C Critical          Critical, Warning, Omit

Message ID . . . . . CPA5305          Msg ID, *NONE, *ANY, *INQ,
                                                                    *REPLY, generic?*

Text to look for in msg .

Msg level text to look for *MSG          *BOTH, *MSG, *SECLVL

Job name . . . . . *ANY          Name, *ANY, generic?*
  
```

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| | | |
|---------------------------|------------------|------------------------|
| User profile name | *ANY | Name, *ANY, generic?* |
| Message severity | Mini : 0 | Maxi : 99 00 - 99 |
| Valid time period | Begin : 00.00.00 | End : 24.00.00 |

F3=Exit F4=List F5=Refresh F12=Cancel

The fields have the following meanings:

- Definition scenario = Enter the name of the scenario name in which the definition will be.
- Control order number = Enter the order number to use for this message definition. This number determines the order in which the checks will be made.
- Description = Enter a free text describing the message definition
- Type of alert/ Omit = Enter the type of alert that will be generated for this message
 - C = A critical alert will be generated
 - W = A warning alert will be generated
 - O = No alert will be generated for this message
- Message ID = Enter the message ID that will be compared to generate an alert (or will be omitted)

It's possible to use generic names containing the sign ? to replace any character, or sign * at the end to compare only the prefix of the message.

 - *ANY = Every message will be accepted for this definition, without to control the message ID
 - *INQ = Every Inquiry message will be accepted for this definition, without to control the message ID
 - *REPLY = Every answer message will be accepted.
 - *NONE = Every message that has no message ID, other than reply type messages.
- Text to look for in msg = Enter a text that must be in the message text. If this text is found in the message, an alert will be generated.

Upper/Lower cases are not considered

If no text is entered, this parameter is not used.
- Msg level text to look for = Specify in which part of the message the text must be compared
 - *MSG = The process will look for the text in the message level 1
 - *SECLVL = The process will look for the text in the message level 2
 - *BOTH = The process will look for the text in the message level 1 and level 2
- Job name = Enter the job name. Only message sent by a job with that name will be considered.

It's possible to use generic names containing the sign ? to replace any character, or sign * at the end to compare only the prefix of the message.

 - *ANY = The job name will not be checked
- User profile name = Enter the user profile name. Only messages send by a job using that profile will be considered.

It's possible to use generic names containing the sign ? to replace any character, or sign * at the end to compare only the prefix of the message.

 - *ANY = The profile name will not be checked
- Message severity = Enter the severity level to use. Only messages with a severity level that is between the limits entered here will be considered.

If the severity level must not be controlled, enter mini: 00 and maxi: 99
- Valid time period = Enter the time period to use. Only messages generated inside this time period will be used.

5.2.4 Option 12 = Work with automatic action for a message

For each message definition, it is possible to define one or more actions that will be performed automatically.

These automatic actions are only possible for Critical or Warning type definitions. It is not possible to define an automatic action for a definition of type Omission.

It is possible to define several automatic actions, which will be performed in the order of the indicated order numbers.

The actions can be one of the 4 following types :

- *ANS = Answer sent to the message
- *CMD = Call a command
- *PGM = Call a program with 4 parameters
- *PGM2 = Call a program with 5 parameters
- *CRIT = Generate an alert type Critical
- *WARN = Generate an alert type Warning

When a message occurs and the defined condition is true, the action(s) defined for that occurrence are performed. Several actions can be performed on one occurrence.

When an action is performed, no critical or warning alert is generated, unless a *CRIT or *WARN action is added in the actions list. A simple message is added (visible with the CTDSPALR command) indicating that an automatic action has been performed.

When there is no more automatic action to perform (number of occurrences higher than those defined), an alert is generated.

```

CTMS3S01                Work with automatic actions                M81V7R2
                                                                26/03/20 09:47:28

Scenario definition . . . . . QSYSOPR
Message order number . . . . . 251
Msg ID . . . . . CPA5305
Position to . . . . .

Type options, press Enter.
  2=Change  3=Copy  4=Delete  5=Display
--Occurrence-
Opt Order  Start   End Type  Description
    10      1      5 *ANS  Add 1000 records to the file, 5 times
    20      3      5 *CMD  Send a message to operator
    30      6      6 *ANS  Reply C

                                                                Bottom

F3=Exit  F5=Refresh  F6=Create  F12=Cancel
  
```

The columns have the following meanings:

- Order = Order number in which the actions will be carried out
- Occurrence Start and End = Indicates when this action is to be performed. See explanations below.
- Type = Type of action to be performed :

*ANS = Send a reply to the message. This type of action should only be used for messages awaiting a reply.
 *CMD = Call a command
 *PGM = Call a user program. 4 Parameters to identify the message are passed as parameters to the program (see description below).
 *PGM2 = Call a user program. 5 Parameters to identify the message are passed as parameters to the program (see description below).
 *CRIT = An alert of type Critical is generated
 *WARN = An alert of type Warning is generated
 Description = Text indicating what is performed by this action.

5.2.5 Create, display or change an action

F6 allows to create a new action definition.

```

CTMS3S02                Create, automatic action                V7R3
                                                                26/03/20 10:38:01

Type options, press Enter.

Scenario definition . . . . . QSYSOPR
Message order number . . . . . 251
Msg ID . . . . . CPA5305

Action order number . . . . . 0
Description . . . . .
Starting occurrence . . . . . 1          1 - 999999
Ending occurrence . . . . . 1          1 - 999999, *NOMAX

Type of automatic action . . . . . *ANS, *PGM, *PGM2, *CMD, *WARN, *CRIT

                                                                Bottom

F3=Exit   F5=Refresh   F12=Cancel
  
```

The fields have the following meanings:

- Definition scenario = The scenario name is recalled.
- Message order number = The order number to use for this message definition is recalled.
- Message ID = The message ID is recalled.

- Action order number = Enter the order number in which the action will be carried out
- Description = Enter a free text describing the action
- Starting occurrence = Enter when this action will be realized for the first time. The value indicates the sequence number of the occurrence of the message in the job that generated it.
- Ending occurrence = Enter when this action will be realized for the last time. The value indicates the sequence number of the occurrence of the message in the job that generated it.
 *NOMAX = This action will be realized without any limit.

Type of automatic action = Enter the type of action to performed when the message occurs.

- *ANS = Send a reply to the message. This type of action should only be used for messages awaiting a reply.
- *CMD = Call a command
- *PGM = Call a user program. 4 Parameters to identify the message are passed as parameters to the program (see description below).
- *PGM2 = Call a user program. 5 Parameters to identify the message are passed as parameters to the program (see description below).
- *CRIT = An alert of type Critical is generated
- *WARN = An alert of type Warning is generated

Depending on the type of action requested, a specific screen appears to enter the necessary information.

Type of action *ANS

```
Type of automatic action . *ANS *ANS, *PGM, *PGM2, *CMD, *WARN, *CRIT
Text of the answer . . .
```

Text of the answer = Enter the reply that will be sent to the message.

Type of action *CMD

```
Type of automatic action . *CMD *ANS, *PGM, *PGM2, *CMD, *WARN, *CRIT
Command . . . . .
```

Command = Enter the command that will be executed. Press F4 to prompt the command.

Type of action *PGM

```
Type of automatic action . *PGM *ANS, *PGM, *PGM2, *CMD, *WARN, *CRIT
Name of the program . . Name
Library of the program Name
4 parameters are sent to the program : the message id (char 7), the job name
(char 10), the user name (char 10) and the job number (char 6). All these
parameters concern the message that triggered the automatic action.
```

Name of the program = Enter the name (and library) of the program that will be called.

The program will be called passing 4 parameters.

These parameters are mandatory, even if they are not used by the program. If the called program does not wait for these parameters, then an error will occur.

The parameters passed are:

- The ID of the message that caused this action (7 characters)
- The name, user and number of the job that sent this message (10 characters for each parameter).

Type of action *PGM2

```
Type of automatic action . *PGM2 *ANS, *PGM, *PGM2, *CMD, *WARN, *CRIT
Name of the program . . Name
```

```

Library of the program          Name
5 parameters are sent to the program : the message id (char 7), the job name
(char 10), the user name (char 10), the job number (char 6) and the message
data (char 1000). All these parameters concern the message that triggered
the automatic action.

```

Name of the program = Enter the name (and library) of the program that will be called.

The program will be called passing 5 parameters.

These parameters are mandatory, even if they are not used by the program. If the called program does not wait for these parameters, then an error will occur.

The parameters passed are:

- The ID of the message that caused this action (7 characters)
- The name, user and number of the job that sent this message (10 characters for each parameter).
- The message's data coming from the message

Type of action *CRIT

```
Type of automatic action . *CRIT *ANS, *PGM, *PGM2, *CMD, *WARN, *CRIT
```

There is no parameter for this type of action.

When an action is defined (*ANS, *CMD, *PGM or *PGM2), there is an information message generated for command CTDSPALR, but no alert.

Use this action if there is another action define (call a program for example) and you want to have a critical alert generated also.

Type of action *WARN

```
Type of automatic action . *WARN *ANS, *PGM, *PGM2, *CMD, *WARN, *CRIT
```

There is no parameter for this type of action.

When an action is defined (*ANS, *CMD, *PGM or *PGM2), there is an information message generated for command CTDSPALR, but no alert.

Use this action if there is another action define (call a program for example) and you want to have a warning alert generated also.

Start and end occurrence

The number of occurrences indicates the number of times the message occurs for the same job.

For example, consider the following definition:

```

Scenario definition . . . . . QSYSOPR
Message order number . . . . . 251
Msg ID . . . . . CPA5305

      --Occurrence--
Opt Order Start End Type Description
      10      1   5 *ANS Add 1000 records to the file, 5 times
      20      3   5 *CMD Send a message to operator
      30      6   6 *ANS Reply C

```

```
Action order number . . . 10
Type of automatic action . *ANS *ANS, *PGM, *PGM2, *CMD
Text of the answer . . . 1000
```

```
Action order number . . . 20
Type of automatic action . *CMD *ANS, *PGM, *PGM2, *CMD
Command . . . . . SNDMSG MSG('The size of a file is increasing quick
ly') TOUSR(OPERATOR)
```

```
Action order number . . . 30
Type of automatic action . *ANS *ANS, *PGM, *PGM2, *CMD
Text of the answer . . . C
```

In this case, if a job sends the message CPA5305 to QSYSOPR

- The first time,
 - o The reply 1000 is sent to increase the size of the file
- The second time,
 - o The reply 1000 is sent to increase the size of the file
- The third time,
 - o The reply 1000 is sent to increase the size of the file
 - o The command SNDMSG is called to send a message to operator
- The fourth time,
 - o The reply 1000 is sent to increase the size of the file
 - o The command SNDMSG is called to send a message to operator
- The fifth time,
 - o The reply 1000 is sent to increase the size of the file
 - o The command SNDMSG is called to send a message to operator
- The sixth time,
 - o The reply C is sent to stop the program

5.2.6 Example of program for *PGM2 action type

The source file CTL4I/CTEXAMPLE contains a sample program that can be used for the action type *PGM2. In this example, the goal is to automatically reactivate a user profile that would have been deactivated for the "network neighborhood" or NetServer function, which is detected by the arrival of message CPIB682 in QSYSOPR.

```

/*****
/*                               Example program for Control4i                               */
/*                               -----                               */
/* Program      : Example_03                                           */
/* Description  : Example of a program that can be used in MSGQ       */
/*               control. Use CTWRKMSG command, enter in a group list to */
/*               see the messages. Use option 12 to work with actions for */
/*               a message. Press F6 to create a new action, and select  */
/*               *PGM2 for the type of action.                         */
/*               */
/*               */
/* Parameters   : &MSGID      (In ) Message ID                          */
/*               &JOB        (In ) Job name that generated the message */
/*               &USER       (In ) User that generated the message     */
/*               &JOBNBR     (In ) Job number that generated the msg    */
/*               &MSGDTA     (In ) Message data associated to MSGID    */
/*               */
/* This program gives an example for customer to re-enable user       */
/*****/

```

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```

/* profiles that have been disabled from NertServer. */
/* When a user profile is disabled for NetServer, the message */
/* CPIB682 is sent to QSYSOPR. */
/* Use command CTWRKMSG to use or create a definition for */
/* QSYSOPR. */
/* Add an entry for message CPIB682 with alert type Warning or */
/* Critical. Then use option 12 to add an actions. */
/* Add an automatic action type *PGM2. Start occurrence = 1 */
/* End occurrence = 999 (or less if you want) */
/* Program name = EXAMPLE_03. */
/* */
/* */
/* Copyright M81, 2020 */
/*****

                PGM                PARM(&MSGID &JOB &USER &JOBNBR &MSGDTA)

/* *****/
/*          Variables for this example          */
/* *****/
/* Variables for *PGM2 type exit program */
DCL          VAR(&MSGID)          TYPE(*CHAR) LEN(7)
DCL          VAR(&JOB)            TYPE(*CHAR) LEN(10)
DCL          VAR(&USER)           TYPE(*CHAR) LEN(10)
DCL          VAR(&JOBNBR)        TYPE(*CHAR) LEN(6)
DCL          VAR(&MSGDTA)        TYPE(*CHAR) LEN(1000)

/* Variables for this specific example */
DCL          VAR(&USRPRF)        TYPE(*CHAR) LEN(10)
DCL          VAR(&RQSVAR)        TYPE(*CHAR) LEN(14)
DCL          VAR(&RQSLEN)        TYPE(*INT)

/* *****/
/*          Program start          */
/* *****/

                CHGVAR          VAR(&RQSLEN) VALUE(14)
                CHGVAR          VAR(&USRPRF) VALUE(%SST(&MSGDTA 1 10))

/* *****/
/*          call the QZLSCHSI API to re-enable a */
/*          disabled NetServer user profile. */
/* *****/

/* Note that the first part of the value below is four */
/* (4) spaces. This sometimes appears compressed to */
/* when viewed on the web. */
                CHGVAR          VAR(&RQSVAR) VALUE('    ' *CAT &USRPRF)
                CHGVAR          VAR(%BINARY(&RQSVAR 1 4)) VALUE(&RQSLEN)
                CALL             QSYS/QZLSCHSI PARM(&RQSVAR &RQSLEN ZLSS0200 X'00000000')

/* *****/
/*          Add message to log that user has been changed */
/* *****/

```



```

          CTADDLOG      TYPE(INF) MSGDTA('User profile ' *CAT &USRPRF +
                                *TCAT ' re-enabled for NetServer')

/* ***** */
/*          Program end                                     */
/* ***** */

ENDPGM:      ENDPGM

```

5.3 CTCHGMSGST, Enable/Disable the messages control

The CTCHGMSGST command is used to activate or deactivate the controls for a message definition.

The command parameters are as follows:

```

          Change messages control status (CTCHGMSGST)

Type choices, press Enter.

Definition name . . . . . NAME
Desired operation . . . . . OPERATION      *START
Recovery of controls . . . . . RECOVERY    *NOW

```

Description of parameters:

- NAME Scenario definition name to change
- OPERATION Enter the desired operation
 - *START = Enable the controls for this scenario.
 - *STOP = Disable the controls for this scenario
- RECOVERY = Indicate from which messages the controls should resume. This parameter is only considered for already existing scenarios, which were inactive.
 - *AVAIL = the analysis starts from the beginning (the oldest messages available)
 - *LASTCHK = the analysis starts where it left off (for scenarios that were inactive)
 - *NOW = The analysis starts from the messages generated now. History is not considered

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL2501 | 40 | Definition &1 doesn't exist. |
| CTL2502 | 40 | Definition &1 already has the good state. |
| CTL2503 | 0 | The definition &1 is now active. |
| CTL2504 | 0 | The definition &1 is now inactive. |

Using the command:

It may be interesting to only perform controls on messages at certain times of the day, and not to do them at other times.

The CTCHGMSGST command allows you to enable or disable these controls for a definition scenario.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

5.4 CTCHKMSGQ, Check messages in *MSGQ, *QHST, *BRMS or JOBLOG

The CTCHKMSGQ command is used to check if there are messages to take care about in a Message queue (MSGQ), system log (QHST or DSPLOG), in BRMS or in the job log of an active job.

This command doesn't work like most of other commands from the product Control for i. It's necessary to define some parameters before, as described hereunder.

The CTCHKMSGQ command is used to check if there are critical or warning messages found in MSGQ or Job Logs, for a defined scenario, and generate an alert in Nagios.

The command parameters are as follows:

```

                                Check Alerts in MSGQ (CTCHKMSGQ)

Type choices, press Enter.

Definition name . . . . . GROUP          *ALL
Search period (in h.) . . . . . PERIOD    *NOMAX
  
```

Description of parameters:

- GROUP = Scenario definition name defining the critical and warning messages
*ALL = Every message from every scenario will be considered as an alert
- PERIOD = Enter a number of hours. The command will count the number of messages that occurred since this number of hours.
*NOMAX = Every critical or warning message (not acknowledged) will be count without time limit.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1421 | 0 | No error message found for scenario &1. Crit=&3; Warn=&4; Total=&2 |
| CTL2422 | 20 | &4 Warning error(s) and &3 Critical error(s) found for scenario &1. Last error on &5 at &6. &7 Crit=&3msg Warn=&4msg Total=&2msg |
| CTL3423 | 40 | &3 Critical error(s) and &4 Warning error(s) found for scenario &1. Last error on &5 at &6. &7 Crit=&3msg Warn=&4msg Total=&2msg |
| CTL3424 | 40 | Scenario &1 not active, or no scenario found. |

Extended messages

In the event that an alert is generated, the resulting message will contain additional information that will appear:

- When used in a 5250 session, in the second level of the message.
- When displayed in the monitoring tool, in the extended data of the service if it is compatible.

The additional information contains a list of the last messages found (maximum of about 20 messages).

Using the command:

This command doesn't directly analyze the MSGQ or Job Log when it runs. That's CTAGENT job that does it, and adds records in an internal table with critical and warning messages found. This command generates an alert if such messages are found in the internal table.

The alert message gives the list of the 10 first message ID that generated this alert (variable &7).

The command CTDSPALR displays Critical and Warning messages found by job CTAGENT. It must be used to acknowledge the messages.

The command CTVLDALR can also be used to validate the alerts.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

5.5 CTDSPALR, Display alerts for MSGQ, QHST, BRMS or JOBLOG

The command CTDSPALR displays the critical and warning messages found in MSGQ, QHST, BRMS or JOBLOG. The way of working for these messages is explained in "5.1 Principle of working for this control " section

The messages displayed have been detected by job CTAGENT, and added with type Critical or Warning. The Critical or Warning messages are considered as errors by the command CTCHKMSGQ, that will generate an alert in Nagios.

In order CTCHKMSGQ to stop generating an alert, the messages must be validated using command CTDSPALR, then option 6, or F23.

The command parameters are as follows:

```

                                Display alerts (CTDSPALR)

Type choices, press Enter.

Definition scenario name . . . . . GROUP          *ALL
```

Description of parameters:

GROUP = Enter the name of definition scenario to display

```
CTDSPALR1                                Display alerts in MSGQ                                M81V7R2
                                                                                               24/12/18 12:05:51
Definition name . . . . . *ALL
position to . . . . . 0/00/00 à 0:00:00
```

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```

Lookup for a text . . . . . (May be long)

Type options, press Enter.
 3=Create definition  5=Display  6=Validate  9=Display job

Opt Date      Time      Type Sev MsgID  Scenario      Message text
24/12/18    9:14:12  WARN 40 CPI2417 QSYSOPR      Job message queue for 439661/FL_USER/FL_AUTO has been wrapped.
24/12/18    9:14:12  WARN 40 CPI2417 QSYSOPR2     Job message queue for 439661/FL_USER/FL_AUTO has been wrapped.
23/12/18    22:13:40  CRIT 99 CPA7025 QSYSOPR2     Receiver QLZALO2016 in QUSRSYS never fully saved. (I C)
23/12/18    22:13:40  CRIT 99 CPA7025 QSYSOPR2     Receiver QSZRAI2016 in QUSRSYS never fully saved. (I C)
23/12/18    22:13:40  CRIT 99 CPA7025 QSYSOPR2     Receiver QASOSC2017 in QUSRSYS never fully saved. (I C)
23/12/18    22:13:39  CRIT 99 CPA7025 QSYSOPR2     Receiver QZCAJR2016 in QUSRSYS never fully saved. (I C)
23/12/18    22:13:39  CRIT 99 CPA7025 QSYSOPR2     Receiver QZMF2016 in QUSRSYS never fully saved. (I C)
23/12/18    22:13:39  CRIT 99 CPA7025 QSYSOPR2     Receiver QMAJRN2016 in QUSRSYS never fully saved. (I C)
23/12/18    22:13:38  CRIT 99 CPA7025 QSYSOPR2     Receiver QAOSDI2017 in QUSRSYS never fully saved. (I C)
23/12/18    22:13:38  CRIT 99 CPA7025 QSYSOPR2     Receiver QSXJRN2042 in QUSRSYS never fully saved. (I C)
23/12/18    22:13:38  CRIT 99 CPA7025 QSYSOPR2     Receiver QSNADS2016 in QUSRSYS never fully saved. (I C)
23/12/18    22:13:38  CRIT 99 CPA7025 QSYSOPR2     Receiver QDSNX2016 in QUSRSYS never fully saved. (I C)
23/12/18    17:08:38  WARN 40 CPI2417 QSYSOPR      Job message queue for 449661/CTL4I/CTAUTO has been wrapped.
23/12/18    17:08:38  WARN 40 CPI2417 QSYSOPR2     Job message queue for 449661/CTL4I/CTAUTO has been wrapped.

F3=Exit  F5=Refresh  F10=Errors only  F12=Cancel  F23=Validate all  More...
  
```

The Critical messages are displayed with word CRIT in red.
The Warning messages are displayed with word WARN in yellow.

The messages that have been validated by the user are displayed with word VAL in green.

The columns have the following meanings:

- Date and Time = Date and time at which the message was generated.
- Type = Message type. The possible types are as follows:
 - CRIT = Messages defined as critical in Scenario definition.
 - WARN = Messages defined as warning in Scenario definition.
 - VAL = Error message which has been validated by the operator (see option 6 further on)
- Sev = Severity of the message. This is used to rank the severity of the message. The higher this number, the more severe the message is.
- Msg ID = Message ID.
- Scenario = Name of definition Scenario in which the message was defined as an alert.
- Message text = Message text

Possible inputs:

Position to

Specifies from which date and time messages need to be displayed.

As messages are sorted into decreasing order, entering a date only and leaving the time as 0 will display the first message from the previous date. For example, entering 170814 in the date field and nothing in the time field will display the last message available for Aug 16, 2014. The user needs to page up to see the first messages from the selected date.

Find a string

Used to search for a character string in the message text or ID.

NB: the whole log is searched. If the character string searched for is not present in any message, the search may take a long time before the following screen is displayed.

Options:

Option 3 = Create definition

Use this option to create a new message definition with scenario name and message ID as default values. In next display, every value may be changed by the user. The order number is initialized with the first available number. The user must change it to place the new definition at the desired place.

Look at section "5.2.3 Option 2 or 5 = Display or change a message definition " for more details.

Option 5 = Display

Displays the detail of a message. See further information below.

Option 6 = Validate

Used to validate an error message.

This option can only be used on critical or warning messages to indicate that an error has been taken into account and must no longer be processed. This enables the operator to concentrate on the remaining errors, without being concerned about the ones he/she has already validated.

This validation only has an effect for the operator. It has no effect on the product itself.

This option may be used for several messages at the same time.

A confirmation screen is displayed. Press Enter to confirm that the messages need to be validated.

The command CTDLALR allows to validate the alerts without to use an interactive session.

Option 9 = Display job

Use DSPJOB command to display the job that generated a message.

Function keys

F3 = Exit the screen

F5 = Update the values

F10 = Display error messages only

F12 = Exit the screen

F23 = Validate every message between 2 date/time

5.5.1 Option 5 = Display

The detail of the selected message is displayed.

```

CTDSPALR5                                     Display message detail                                     M81V7R2
                                                                                                     24/12/18 12:32:39
System name . . . . . M81V7R2           Message date . . . 23/12/18           Message time . . . . 22:13:40
Definition name . . . QSYSOPR2         Message type . . . Critical           Severity . . . . . 99
Message ID . . . . . CPA7025           Message origin . . . 450213/QPGMR/QCLNSYSLOG

Message . . . . . : Receiver QLZALO2016 in QUSRSYS never fully saved. (I C)

```

Cause : An attempt was made to delete a receiver that was never fully saved after the receiver was detached with a CHGJRN command.

If this message was issued during automatic system cleanup (through Operational Assistant options or the STRCLNUP command), then the journal receiver QLZALO2016 in library QUSRSYS was deleted.

Recovery . . . : If the receiver is to be deleted anyway, enter I to continue processing, otherwise, enter C to cancel processing.

If this message was issued during automatic system cleanup (through Operational Assistant options or the STRCLNUP command), you can avoid the message by including the journal receivers in your normal backup procedures.

Possible choices for replying to message :

- I -- Processing is continued.
- C -- Processing is terminated.

Press ENTER to continue

Bottom

F3=Exit F12=Cancel

5.6 CTVLDALR, Validate the alerts

The CTVLDALR command allows alerts to be validated without the need to use an interactive session. It has the same effect as using the CTDSPALR command, then option 6.

This command can be used in a CLP program, or in a user-defined automation.

The command parameters are as follows:

```

                                Validate alerts (CTVLDALR)

Type choices, press Enter.

Scenario name . . . . . GROUP
Message ID . . . . . MSGID          *ALL
Beginning date and time:      START
  Beginning date . . . . .          *BEGIN
  Beginning time . . . . .          *BEGIN
Ending date and time:        END
  Ending date . . . . .             *END
  Ending time . . . . .             *END
  
```

Description of parameters:

- GROUP** = Name of the scenario for which the critical or warning messages must be validated.
*ALL = All scenarios are taken into account.
- MSGID** = Indicate the ID of the messages that have to be validated. Only corresponding messages will be validated.
It is possible to indicate generic names containing either the ? sign to replace a character or the * sign at the end to end with any sequence of characters.
*ALL = All messages in the selected scenario and in the indicated time range will be validated.
- START** = Indicate the date and time that constitute the beginning of the time slot. All the alerts that have been generated from this date and time until the date and time contained in the END parameter will be validated.
*BEGIN = All alerts will be validated from the beginning.

END = Indicate the date and time that constitute the end of the time range. All alerts that have been generated from the date and time contained in the START parameter to the date and time entered here will be enabled.
*END = All alerts will be validated until the last one.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--------------------------------|
| CTL0081 | 0 | &1 alerts have been validated. |

Using the command:

This command allows you to validate alerts without having to connect to an interactive session. It has the same effect as using the CTDSPALR command, then option 6.

6 Libraries check commands

The Control For i product allows to control libraries size, and follow their evolution.

This section describes the commands provided for those checks.

6.1 Principle of working for this control

The goal is to analyze the size and number of objects contained in a number of libraries at regular intervals (once a day for example), then generate an alert in Nagios when a library reaches a size limit, or if it's growing too fast.

The libraries that have to be analyzed must be defined using command CTWRKLIB. Find more details on how to configure those libraries in chapter " 5.2 CTWRKMSG ". For each library, enter the size limit to generate an alert, and the maximum evolution rate.

The job CTAGENT (automatically started with subsystem CONTROL4I) will submit the job CTRTVLIB in subsystem CONTROL4I on a regular basis. It will analyze every library defined in CTWRKLIB command. Use command CTPARAM and select ACTIONS to look at the definition of this planned job. Select action RTVLIB. This job may be submitted from any other scheduler.

The command CTDSPLIB can be used to have the list of the libraries that have been defined and analyzed, with their size, number of objects and evolution rate.
The user will can see the details and history.

The commands CTCHKLIBSZ and CTCHKLIBEV can be used in Nagios. They generate an alert if the size of one or some libraries have reached the defined limit, or if it evolved too quickly.

6.2 CTWRKLIB, define libraries to analyze

This command is used to enter the list of libraries to analyze, and the limits to use.

The following display is shown.

```

CTWRKLIB                                Work with library                                M81DEV
                                           17/09/19 10:24:45

Position to . . . . .

Type options, press Enter.
  2=Change  3=Copy  4=Delete  5=Display

--- Size limit (MB) --  ----- Rate -----  Nb of days
Opt Name      Warning  Critical  Warning  Critical  Evolution
CTL4I         108      120      1        1         5
PMEDHJRN     *NOCTL   *NOCTL   *NOCTL   *NOCTL    1
QGPL          5         6        1        1         1
  
```


| |
|--|
| Bottom |
| F3=Exit F5=Refresh F6=Create F12=Cancel |

The list of libraries to analyze is displayed.
The value *NOCTL displayed in the list means that this value is not checked.

Press F6 to define a new library.

Options 2 and 5 allow to change or display a definition.

Option 3 allow to add a new library by copying an existing library.

Option 4 will delete the definition.

Options 2 (Change) and 5 (Display) show the following screen:

| | | |
|---|-----------------------------|-----------------------------|
| CTWRKLIB2 | Change a library definition | M81DEV |
| | | 17/09/19 10:33:19 |
| Type options, press Enter. | | |
| Enter the value 1- if no control for parameter. | | |
| Name | CTL4I | Name |
| Lib size, warning limit . . | 108 MB | 0-999999999, *NOCTL |
| Lib size, critical limit . . | 120 MB | 0-999999999, *NOCTL |
| Lib size, data found | 57 MB | |
| Nb of objects, warn limit . | 99999999 | objects 0-999999999, *NOCTL |
| Nb of objects, crit limit . | 99999999 | objects 0-999999999, *NOCTL |
| Nb of objects, data found . | 414 | objects |
| Evolution rate, warn limit . | 1 % | 0-999, *NOCTL |
| Evolution rate, crit limit . | 1 % | 0-999, *NOCTL |
| Nb days for evol calculation | 5 | days |
| F3=Exit F5=Refresh F12=Cancel | | |

Enter the value *NOCTL to indicate that information should not be controlled.

The fields have the following meanings:

- Name = Name of library to analyze

- Lib size, warning limit = Enter the minimum size from which a Warning alert should be generated.
The size is indicated in MB.
- Lib size, critical limit = Enter the minimum size from which a Critical alert should be generated.
This value must be greater than or equal to the value specified in the parameter "Lib size, Warning limit"
The size is indicated in MB.
- Lib size, data found = Current size of the library if the definition was made before the collect job has run for the last time.

| | |
|------------------------------|--|
| Nb of objects, warn limit | = Enter the minimum number of objects contained in the library from which a Warning alert must be generated. |
| Nb of objects, crit limit | = Indicate the minimum number of objects contained in the library from which a Critical alert must be generated. This value must be greater than or equal to the value specified in the parameter " Nb of objects, warn limit " |
| Nb of objects, data found | = Current number of objects in the library if the definition was made before the collect job has run for the last time. |
| Evolution rate, warn limit | = Enter the minimum rate of change of the library size from which a Warning alert should be generated. |
| Evolution rate, crit limit | = Enter the minimum rate of change of the library size from which a Warning alert should be generated. This value must be greater than or equal to the value specified in the parameter " Evolution rate, warn limit " |
| Nb days for evol calculation | = Enter the number of days to be used for calculating the rate of change in the library size. |

The rate of change in a library size will be calculated by comparing the current size of the library, to that found a few days before (the number of days entered here).

If there is no data found for the exact number of days, the previous data will be used.

6.3 CTCHKLIBSZ, Check libraries size

The CTCHKLIBSZ command is used to check if there are libraries exceeding the size limit defined in CTWRKLIB command.

An alert will be generated if at least one of the libraries exceeds the limit.

This command does not check the library size in real time, but uses the data collected by the CTRTVLIB automatic job.

The command parameters are as follows:

```

Check library size (CTCHKLIBSZ)

Type choices, press Enter.

Name of the library . . . . . LIB
Max delay for last collect (h)   DELAY           24

```

Description of parameters:

| | |
|-------|--|
| LIB | = Library name to check *ALL = Every library defined with CTWRKLIB command will be checked |
| DELAY | = Enter the maximum duration (in number of hours) from which a collection of the libraries size must have been made. If this time is exceeded, a critical alert will be generated. |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1511 | 0 | Ok : all the libraries are in a correct state NbCrit=0,NbWarn=0 |
| CTL1512 | 0 | Ok : library &1 has a correct state NbObj=&2,SzLib=&3 |
| CTL2511 | 20 | Warning : &1 libraries have a warning state. The 5 first are : &2, &3, &4, &5, &6 NbCrit=0;NbWarn=&1 |
| CTL2512 | 20 | Warning : the library &1 has a warning state NbObj=&2;SzLib=&3 |
| CTL3511 | 40 | Critical : no data recovered since &1 hours. |
| CTL3512 | 40 | Critical : &1 libraries have a critical state and &2 have a warning state. The 5 first are &3, &4, &5, &6, &7 NbCrit=&1,NbWar=&2 |
| CTL3513 | 40 | Critical : the library &1 has a critical state NbObj=&2,SzLib=&3 |
| CTL3514 | 40 | The library definition &1 doesn't exist. |

Using the command:

This command doesn't directly analyze the libraries size when it runs. That's CTRTVLIB job that does it, and adds records in an internal table with statistics found for libraries.

The CTRTVLIB job is submitted automatically via the internal actions of the Control for i product. It is possible to access the setting of this action with the CTPARAM command, select ACTIONS then RTVLIB. The job must be submitted because it can take a long time, and in fact disrupt other operations performed by CTAGENT job. It can also be suspended in automatic actions and submitted from another scheduler.

This command generates an alert if at least one library exceeds the limits set in its definition.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

6.4 CTCHKLIBEV, Check libraries size evolution

The CTCHKLIBEV command is used to check if there are libraries size defined in CTWRKLIB command has evolved too quickly.

An alert will be generated if at least one of the libraries exceeds the limit.

This command does not check the library size in real time, but uses the data collected by the CTRTVLIB automatic job.

The command parameters are as follows:

```

Check evolution of a lib (CTCHKLIBEV)

Type choices, press Enter.

Name of the library . . . . . LIB

```

Description of parameters:

- LIB = Library name to check
- *ALL = Every library defined with CTWRKLIB command will be checked

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1521 | 0 | Ok : all the libraries have a correct evolution rate NbCrit=0,NbWarn=0 |
| CTL1522 | 0 | Ok : library &1 has a correct evolution rate EvoRate=&2 |
| CTL2521 | 20 | Warning : &1 libraries have a warning evolution rate. The 5 first are : &2, &3, &4, &5, &6 NbCrit=0,NbWarn=&1 |
| CTL2522 | 20 | Warning : the library &1 has a warning evolution rate EvoRate=&2 |
| CTL3514 | 40 | The library definition &1 doesn't exist. |
| CTL3521 | 40 | Critical : &1 libraries have a critical evolution rate, &2 warning. The first 5 are : &3, &4, &5, &6, &7 NbCrit=&1,NbWarn=&2 |
| CTL3522 | 40 | Critical : the library &1 has a critical evolution EvoRate=&2 |

Using the command:

This command doesn't directly analyze the libraries size when it runs. That's CTRTVLIB job that does it, and adds records in an internal table with statistics found for libraries.

The CTRTVLIB job is submitted automatically via the internal actions of the Control for i product. It is possible to access the setting of this action with the CTPARAM command, select ACTIONS then RTVLIB. The job must be submitted because it can take a long time, and in fact disrupt other operations performed by CTAGENT job. It can also be suspended in automatic actions and submitted from another scheduler.

This command generates an alert if at least one library size has evolved faster than the limits set in its definition.

The method for calculating the rate of change is described in the chapter "6.2 CTWRKLIB, define libraries to analyze".

This command does not display a screen. The result of this command is a return message indicating the necessary information.

6.5 CTDSPLIB, Display libraries statistics

The command CTDSPLIB displays the list of libraries for which statistics have been collected.

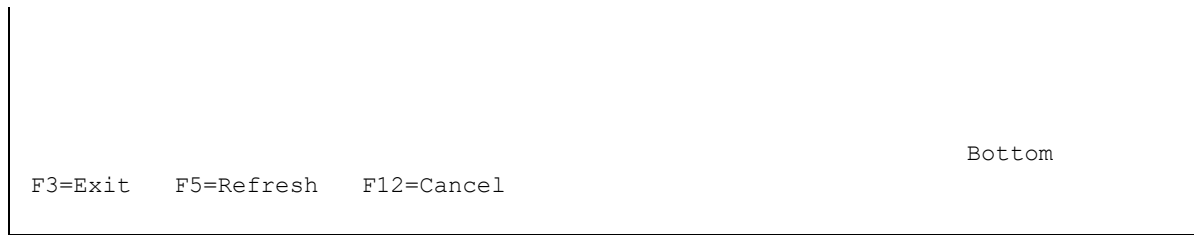
```

CTDSPLIB                Display libraries controls                M81DEV
                                                                17/09/19 11:24:06

Position to . . . . .

Type options, press Enter.
  5=Display  8=History

----- Size (MB) -----
Opt Library   Date      Time      Library  Biggest obj  Nb objects  Evol rate
CTL4I        16/09/19 19:00:02      69         31         363         11
PMEDHJRN    16/09/19 19:00:02  53.175     106         539          0
QGPL        16/09/19 19:00:04   8.154      4.750       301          0
TEST        24/08/19 19:50:03      50         15         500          0
  
```



For libraries whose size has exceeded the defined critical limit, the size appears in red.
For libraries whose size has exceeded the defined warning limit, the size appears in yellow.

The columns have the following meanings:

| | |
|-------------------|--|
| Library | = library name |
| Date and Time | = Date and time at which last statistics have been collected |
| Size, Library | = Library size, in MB |
| Size, Biggest obj | = Size of the biggest object in the library, in MB |
| Nb objects | = Number of objects in the library |
| Evol rate | = Evolution rate calculated between 2 collections |

The method for calculating the rate of change is described in the chapter "6.2 CTWRKLIB, define libraries to analyze".

Possible inputs:

Position to
Specifies the first library to be displayed.

Options:

Option 5 = Display
Displays the detail of a library statistics. See further information below.

Option 8 = History
Displays the list of statistics collected for this library

Function keys

F3 = Exit the screen

F5 = Update the values

F12 = Exit the screen

6.5.1 Option 5 = Display

The detail of a library statistics is displayed.

```

CTDSPLIB3                Display a library state                M81DEV
                                                                    17/09/19 14:06:00

    Press ENTER to continue

Library name . . . . . CTL4I
Control . . . . . 16/09/19 at 19:00:02

                                Real value    Warning limit    Critical limit
Library size (MB) . . . . .      69          108             120
Biggest object size (MB) . . . . .    31
Calculated evol size (%) . . . . .    11             1                 1
Calculated over 5 days

Number of objects . . . . .    363          99.999.999       99.999.999

F3=Exit   F5=Refresh   F12=Cancel
  
```

For elements that have exceeded the defined critical limit, the value appears in red.
For elements that have exceeded the defined warning limit, the value appears in yellow.

The columns have the following meanings:

- Real value = Value found when extracting the statistics
- Warning limit = Limit set for a Warning alert in the library definition (CTWRKLIB command)
- Critical limit = Limit set for a Critical alert in the library definition (CTWRKLIB command)
- Library size = Library size, in MB
- Biggest object size = Size of the biggest object in the library, in MB
- Calculated evol rate = Evolution rate calculated between 2 collections separated by the number of days indicated on the following line
- Number of objects = Number of objects in the library

The method for calculating the rate of change is described in the chapter "6.2 CTWRKLIB, define libraries to analyze".

6.5.1 Option 8 = History

The history of statistics for a library is displayed.

```

CTDSPLIB2                Display controls for a library                M81DEV
                                                                    17/09/19 14:17:40

Name of the library . . . . . PMEDHJRN
Position to . . . . . 0/00/00
  
```

Control for i
Reference document

Type options, press Enter.

| Date | Time | Library | Biggest obj | Nb objects | Evol rate |
|----------|----------|---------|-------------|------------|-----------|
| 16/09/19 | 19:00:02 | 53.175 | 106 | 539 | 0 |
| 15/09/19 | 19:00:06 | 52.989 | 106 | 537 | 0 |
| 14/09/19 | 19:00:00 | 52.776 | 106 | 535 | 0 |
| 13/09/19 | 19:00:00 | 52.572 | 106 | 533 | 0 |
| 12/09/19 | 19:00:09 | 52.376 | 106 | 531 | 0 |
| 11/09/19 | 19:00:05 | 52.173 | 106 | 529 | 0 |
| 10/09/19 | 19:00:06 | 51.988 | 106 | 527 | 0 |
| 9/09/19 | 17:00:06 | 51.778 | 106 | 525 | 0 |
| 8/09/19 | 19:00:00 | 51.588 | 106 | 523 | 0 |
| 7/09/19 | 19:00:04 | 51.376 | 106 | 521 | 0 |
| 6/09/19 | 19:00:07 | 51.177 | 106 | 519 | 0 |
| 5/09/19 | 19:00:01 | 50.986 | 106 | 517 | 0 |

More...

F3=Exit F5=Refresh F12=Cancel

For elements that have exceeded the defined critical limit, the value appears in red.
For elements that have exceeded the defined warning limit, the value appears in yellow.

The columns have the following meanings:

- Date and Time = Date and time at which last statistics have been collected
- Size, Library = Library size, in MB
- Size, Biggest object = Size of the biggest object in the library, in MB
- Number of objects = Number of objects in the library
- Evol rate = Evolution rate calculated between 2 collections separated by the number of days indicated on the definition

The method for calculating the rate of change is described in the chapter "6.2 CTWRKLIB, define libraries to analyze".

7 M3 software check commands

This section lists the commands used to monitor M3 software.

7.1 Method

M3 software (formerly MOVEX) supplies information about the status of all its components. This information is obtained from 2 different ways:

- GRID or ServerView furnish many information that give the status of all components.
 - o A definition of those http servers must be created thru CTPARAM, parameter M3SERVER
 - o Enter this definition name in the parameter SERVER of the commands from Control for i using the GRID or ServerView.
- M3 internal tables are another source of information for controls.
 - o The Control for I commands using the M3 tables have a parameter where the M3 library must be entered

The controls provided by Control for i use these two sources of information.

The controls available are different depending on the version of M3.

Versions V5 and V7

These versions did not use the GRID

ServerView related controls can be used, as well as commands based on internal tables.

Version V10

Data returned by the GRID is in XML format

ServerView related controls can be used, as well as commands based on internal tables.

Version V13

Data returned by GRID including JSON format

ServerView related controls can be used, as well as commands based on internal tables.

The CTAUTO job will automatically extract the information by querying the server every minute and putting the result in internal tables. The collected data can then be used by the check commands described below.

The url to be used for commands using GRID or ServerView must respect the following points:

For GRID accesses, the url must contain the full path as for a browser access, removing the .html extension.

For example:

If viewing hosts with a browser is done with the following address

<http://10.43.43.39:30005/grid/hosts.html>

For recent versions of GRID allowing JSON outputs, the address must be entered as:

<http://10.43.43.39:30005/grid/hosts>

For older versions of GRID allowing only XML output, the address must be entered as:

<http://10.43.43.39:30005/grid/hosts.xml>

See the CTPARAM command documentation for information on how to define the list of servers, and how to specify profiles and passwords if required.

7.2 Activate JSON functions

Data extracted from the GRID use JSON format starting with V13.
To insert data into tables, JSON data must be converted by using an SQL function that must be initialized.

Use the following commands.

```
CHGJOB CCSID(37)
```

Start shell

```
QSH
```

Run command to activate the function

```
/QIBM/ProdData/OS/SQLLIB/bin/db2nosql -setup enable
```

The result is the following.

```
CPD4090: Printer device PRT01 not found. Output queue changed to QPRINT in
library QGPL.
JSON Command Shell Setup and Launcher.
Type db2nosql -help to see options

IBM DB2 NoSQL JSON API 1.1.0.0 build 1.4.8
Licensed Materials - Property of IBM
(c) Copyright IBM Corp. 2013,2015 All Rights Reserved.

Executing SQL...
CDJSN1209I Database artifacts created successfully.
$
```

This operation must be done only once on each partition.

7.3 *CTM3CHGCOL, Activate M3 data collection*

This command is used to enable or disable the collection of data from an M3 server.

The command parameters are as follows:

```
Activate M3 data collection (CTM3CHGCOL)

Type choices, press Enter.

M3 server name *HOSTS . . . . . SERVER
Action . . . . . ACTION
Type of server . . . . . SRVTYPE *ALL
```

Description of parameters:

- SERVER = (Required) Server name defined by the user in CTPARAM witch state must be changed.
- ACTION = (Required) action to be performed for the specified server.
 *ENABLE = Automatic data collection will be enabled for the specified server.
 *DISABLE = Automatic data collection will be disabled for the specified server.
- SRVTYPE = Specify the type of server for which the status should be changed.
 *ALL = All server types for the server specified in the SERVER parameter will be changed.
 *APPSTS = Only this server type will be changed.
 *JOBS = Only this server type will be changed
 *HOSTS = Only this server type will be modified
 *SERVICES = Only this server type will be modified
 *NODES = Only this server type will be modified

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL3700 | 40 | No definition found for M3 server &1, &2 |
| CTL3701 | 0 | M3 server &1, &2 already in state &3 |
| CTL3702 | 0 | New state &3 for M3 server &1, &2. |

Using the command:

Data from all M3 servers defined using the CTPARAM command is collected automatically at regular intervals by the CTAUTO job. But if the GRID server or ServerView are stopped, no data can be collected, and error messages are generated.

The CTM3CHGCOL command can be inserted into the system operation to enable or disable the collection of this data.

7.4 CTM3APPSTS, Check M3 applications status

This command is used to check if the M3 applications are active.

The command parameters are as follows:

```

Check M3 apps status (CTM3APPSTS)

Type choices, press Enter.

M3 server name *APPSTS . . . . . SERVER
Apps to control . . . . . APPS          *ALL
                + for more values
Apps to omit . . . . . OMITTS         *NONE
                + for more values
Status to control . . . . . STATUS     *OK
Severity level . . . . . LEVEL        *CRITICAL
  
```

Description of parameters:

- SERVER = (Required) Server name defined as *APPST by the user in CTPARAM.
- APPS = (Required) list of applications to check. A list of 10 names maximum is possible.

- OMITS *ALL = Every application is checked
 = If parameter APPS contains *ALL, it is possible to give a list of applications to omit
- *NONE = No application is omitted.
- STATUS = Enter the status expected for the applications
- *OK = The applications must have the status OK
- *NOTOK = The applications must have status NOTOK
- *NOTRUNNING = The applications must have status "not Running"
- LEVEL = Severity levels of the alert generated in the monitoring product
- *CRITICAL = CRITICAL-type alert generated
- *WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1481 | 0 | Ok: the status is good on all applications NbAPP=0 |
| CTL2481 | 20 | Warning: &1 applications haven't the good status. The first 10 are : &2 , &3 , &4 , &5 , &6 , &7 , &8 , &9 , &10 , &11 NbAPP=&1 |
| CTL3310 | 40 | Server name &1 doesn't exist or is not active |
| CTL3314 | 40 | Error during data extraction from &1, type &2. |
| CTL3315 | 40 | Application &1 from server M3 &2 type &3 doesn't exist |
| CTL3481 | 40 | Critical: &1 applications haven't the good status. The first 10 are : &2 , &3 , &4 , &5 , &6 , &7 , &8 , &9 , &10 , &11 NbAPP=&1 |

Using the command:

Specify in the SERVER parameter the server name of type *APPSTS entered in CTPARAM and which you require information about.

Specify the list of applications to be checked, or *ALL to check every application.

If *ALL is entered in parameter APPS, use the parameter OMITS to enter the list of applications that must not be checked.

If an error occurs when retrieving info about jobs from the server passed as a parameter, an error message indicating this will be sent to the program.

7.5 CTM3APPERR, Check errors in M3 applications

This command sends an alert if there are errors in an M3 application.

The command parameters are as follows:

```

                                Check errors of M3 apps (CTM3APPERR)

Type choices, press Enter.

M3 server name *APPSTS . . . . . SERVER
Apps to control . . . . . APPS           *ALL
                                + for more values
Apps to omit . . . . . OMITS           *NONE
                                + for more values
Max number Warning by app . . . WARNING 0
Max number Critical by app . . . CRITICAL 0

```

Description of parameters:

| | |
|----------|--|
| SERVER | = (Required) Server name defined as *APPST by the user in CTPARAM. |
| APPS | = (Required) list of applications to check. A list of 10 names maximum is possible. *ALL = Every application is checked |
| OMITS | = If parameter APPS contains *ALL, it is possible to give a list of applications to omit *NONE = No application is omitted. |
| WARNING | = Specifies the maximum number of errors above which a Warning-type alert will be generated |
| CRITICAL | = Specifies the maximum number of errors above which a Critical-type alert will be generated |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1491 | 0 | Ok : applications have fewer errors than given values NbAPP=0 |
| CTL2491 | 20 | Warning : &1 applications have more than &2 errors. The first 10 are : &3 , &4 , &5 , &6 , &7 , &8 , &9 , &10 , &11 , &12 NbAPP=&1 |
| CTL3310 | 40 | Server name &1 doesn't exist or is not active |
| CTL3314 | 40 | Error during data extraction from &1, type &2. |
| CTL3315 | 40 | Application &1 from server M3 &2 type &3 doesn't exist |
| CTL3491 | 40 | Critical: &1 applications have more than &2 errors. The first 10 are : &2 , &3 , &4 , &5 , &6 , &7 , &8 , &9 , &10 , &11 NbAPP=&1 |

Using the command:

There are 2 type of incidents in M3 : Errors and Warnings.
The command CTM3APPERR checks if there are Errors types only.

Specify in the SERVER parameter the server name of type *APPSTS entered in CTPARAM and which you require information about.

Specify the list of applications to be checked, or *ALL to check every application.

If *ALL is entered in parameter APPS, use the parameter OMITS to enter the list of applications that must not be checked.

If the M3 applications in the list have errors (this information can be seen in the GRID), then an alert will be sent.

If an error occurs when retrieving info about applications from the server passed as a parameter, an error message indicating this will be sent to the program.

7.6 *CTM3APPWRN, Check Warnings in M3 applications*

This command sends an alert if there are Warnings in an M3 application.

The command parameters are as follows:

| |
|--|
| Check warnings of M3 apps (CTM3APPWRN) |
|--|

```
Type choices, press Enter.

M3 server name *APPSTS . . . . . SERVER
Apps to control . . . . . APPS          *ALL
          + for more values
Apps to omit . . . . . OMTS           *NONE
          + for more values
Max number Warning by app . . . WARNING    0
Max number Critical by app . . . CRITICAL  0
```

Description of parameters:

- SERVER = (Required) Server name defined as *APPST by the user in CTPARAM.
- APPS = (Required) list of applications to check. A list of 10 names maximum is possible.
*ALL = Every application is checked
- OMITS = If parameter APPS contains *ALL, it is possible to give a list of applications to omit
*NONE = No application is omitted.
- WARNING = Specifies the maximum number of warnings above which a Warning-type alert will be generated
- CRITICAL = Specifies the maximum number of warnings above which a Critical-type alert will be generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1492 | 0 | Ok : applications have fewer warnings than given values NbAPP=0 |
| CTL2492 | 20 | Warning : &1 applications have more than &2 warnings. The first 10 are : &3 , &4 , &5 , &6 , &7 , &8 , &9 , &10 , &11 , &12 NbAPP=&1 |
| CTL3310 | 40 | Server name &1 doesn't exist or is not active |
| CTL3314 | 40 | Error during data extraction from &1, type &2. |
| CTL3315 | 40 | Application &1 from server M3 &2 type &3 doesn't exist |
| CTL3492 | 40 | Critical: &1 applications have more than &2 warnings. The first 10 are : &2 , &3 , &4 , &5 , &6 , &7 , &8 , &9 , &10 , &11 NbAPP=&1 |

Using the command:

There are 2 type of incidents in M3 : Errors and Warnings.

The command CTM3APPWRN checks if there are Warnings types only.

Specify in the SERVER parameter the server name of type *APPSTS entered in CTPARAM and which you require information about.

Specify the list of applications to be checked, or *ALL to check every application.

If *ALL is entered in parameter APPS, use the parameter OMTS to enter the list of applications that must not be checked.

If the M3 applications in the list have warnings (this information can be seen in the GRID), then an alert will be sent.

If an error occurs when retrieving info about applications from the server passed as a parameter, an error message indicating this will be sent to the program.

7.7 CTM3CHKBCH, Check that a M3 Batch job has run

The CTM3CHKBCH command makes 2 different checks:

- Checks if a M3 job has been running and successfully ended (status 30) in a time slot passed as a parameter. It can be used, for example, to check that an overnight process started and ended within the time slot passed as a parameter.
- Count the number of M3 batch jobs that have run and successfully ended (status 30) in a time slot passed as a parameter.

The command parameters are as follows:

```

Check ended M3 jobs (CTM3CHKBCH)

Type choices, press Enter.

Job name . . . . . JOBNAME          *ALL
Beginning date and time:          START
  Beginning date . . . . .          *CURRENT
  Beginning time . . . . .          *BEGIN
Ending date and time:            END
  Ending date . . . . .             *CURRENT
  Ending time . . . . .             *END
Minimum number of jobs . . . . . MIN
Maximum number of jobs . . . . . MAX
Severity level . . . . . LEVEL      *CRITICAL
M3 Library . . . . . LIBM3
  
```

Description of parameters:

| | |
|---------|--|
| JOBNAME | = (Required) Name of M3 job with status 30 to search for *ALL = The number of job with status 30 will ne counted |
| START | = Check time slot start date and time *CURRENT = The current day's date is used *PRV = The previous day's date is used *BEGIN = The time slot starts at 00:00 |
| END | = Check time slot end date and time *CURRENT = The current day's date is used *PRV = The previous day's date is used *END = the time slot ends at the current time or 23:59 |
| MIN | = Minimum number of jobs which should be found in the time slot |
| MAX | = Maximum number of jobs which should be found in the time slot |
| LEVEL | = Severity levels of the alert generated in the monitoring product *CRITICAL = CRITICAL-type alert generated *WARNING = WARNING-type alert generated |
| LIBM3 | = Name of the library containing the M3 tables. |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1461 | 0 | Ok : &1 jobs correctly ended from &2 to &3 |
| CTL1462 | 0 | Ok : &1 jobs &2 correctly ended from &3 to &4 |
| CTL2461 | 20 | Warning : &1 jobs correctly ended from &2 to &3 |
| CTL2462 | 20 | Warning : &1 jobs &2 correctly ended from &3 to &4 |
| CTL3441 | 40 | Objet &1 not found in library &2 |

| | | |
|---------|----|---|
| CTL3442 | 40 | Library &1 not found |
| CTL3443 | 40 | Error : Enter correct M3 library name |
| CTL3444 | 40 | Unknown error |
| CTL3461 | 40 | Critical : &1 jobs correctly ended from &2 to &3 |
| CTL3462 | 40 | Critical : &1 jobs &2 correctly ended from &3 to &4 |

Using the command:

To check if a specific message has run successfully:

- Specify the job name to search for in the JOBNAME parameter.
- Specify the number of expected jobs in parameters MIN and MAX. Usually, specify value 1 in both parameters to check 1 job only.

To check the total number of jobs successfully finished (status 30) in a time slot:

- Specify *ALL in JOBNAME parameter
- Specify the expected total number of jobs in parameter MIN and MAX

If the MIN and MAX values are identical (equal to 1 for example), the command will search for a specific number of jobs executed in the time slot (one only if the value is equal to 1). The presence of a different number of jobs would constitute an error.

If the MIN and MAX values are different, any number of jobs between these 2 values (inclusive) will be considered as correct.

The date and time indicated in the START parameter must be before the date and time indicated in the END parameter.

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

7.8 CTM3G_NBAJ, Check the number of Asynchronous jobs

This command is used to check the number of asynchronous jobs running on an M3 host.

The command parameters are as follows:

```

M3, number of Autojobs (CTM3G_NBAJ)

Specify your choices then press Enter.

Server name . . . . . SERVER
Minimum number of jobs . . . . . MIN_NO
Maximum number of jobs . . . . . MAX_NO
Severity level . . . . . LEVEL          *CRITICAL
```

Description of parameters:

- SERVER = (Required) Server name defined by the user when entering the parameters.
- NB_MIN = (Required) Minimum number of jobs that must run on the host
- NB_MAX = (Required) Maximum number of jobs that must run on the host

LEVEL = Severity levels of the alert generated in the monitoring product
 *CRITICAL = CRITICAL-type alert generated
 *WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1311 | 0 | Number of asynchronous jobs: &1 |
| CTL2312 | 20 | &1 asynchronous job(s), lower than the &2 required |
| CTL2313 | 20 | &1 asynchronous job(s), higher than the &2 required |
| CTL3310 | 40 | Server name &1 does not exist |
| CTL3311 | 40 | Error when retrieving asynchronous jobs for &1 |
| CTL3312 | 40 | &1 asynchronous job(s), lower than the &2 required |
| CTL3313 | 40 | &1 asynchronous job(s), higher than the &2 required |

Using the command:

Specify in the SERVER parameter the server name entered in the parameters and which you require information about.

Specify the minimum and maximum numbers of jobs that must be present on the server.

If the SERVER parameter contains a value which does not exist in the config, the program will send an error message.

If an error occurs when retrieving info about jobs from the server passed as a parameter, an error message indicating this will be sent to the program.

If the MIN and MAX values are identical (equal to 1 for example), the command will search for a specific number of jobs. The presence of a different number of jobs would constitute an error.

If the MIN and MAX values are different, any number of jobs between these 2 values (inclusive) will be considered as correct.

7.9 CTM3G_JOB, Checks on jobs

This command is used to check the CPU percentage used by certain jobs passed as parameters.

The command parameters are as follows:

```

M3, Check jobs (CTM3G_JOB)

Type choices, press Enter.

M3 server name *JOBS . . . . . SERVER
Jobs to control . . . . . JOBS          *ALL
                + for more values
Jobs to omit . . . . . OMITTS         *NONE
                + for more values
Job type . . . . . JOBTYP           *ALL
CPU Warning Limit . . . . . MAXCPU_W   80
CPU Critical Limit . . . . . MAXCPU_C  90
Activity Max Warning . . . . . MAXACT_W *NOCTL
Activity Max Critical . . . . . MAXACT_C *NOCTL
  
```


Description of parameters:

| | |
|----------|---|
| SERVER | = (Required) Server name defined by the user when entering the parameters. |
| JOBS | = (Required) List of jobs to check. A list of 10 job names can be indicated. *ALL = All the jobs are taken into account |
| OMITS | = If *ALL was indicated in the JOBS parameter, a list of jobs to exclude can be indicated here. *NONE = No job will be omitted |
| JOBTYPE | = Type of job to check *ALL = All types of job *AUTOJOB = Asynchronous jobs *INTERACT = Interactive jobs *BATCH = Batch jobs *MIJOBS = Specific jobs |
| MAXCPU_W | = Specifies the percentage of CPU usage above which a Warning-type alert will be generated |
| MAXCPU_C | = Specifies the percentage of CPU usage above which a Critical-type alert will be generated |
| MAXACT_W | = Specifies the level of activity above which a Warning-type alert will be generated |
| MAXACT_C | = Specifies the level of activity above which a Critical-type alert will be generated |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1321 | 0 | No job uses more than &1% of CPU |
| CTL1322 | 0 | No job has an activity level of over &1 |
| CTL1323 | 0 | No job uses more than &1% of CPU or has an activity level of over &2 |
| CTL2321 | 20 | Warning: &1 jobs use more than &2% of CPU. The first 10 are: &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 |
| CTL2322 | 20 | Warning: &1 jobs have an activity level of over &2. The first 10 are: &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 |
| CTL3310 | 40 | Server name &1 does not exist |
| CTL3321 | 40 | Critical: &1 jobs use more than &2% of CPU. The first 10 are: &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 |
| CTL3322 | 40 | Critical: &1 jobs have an activity level of over &2. The first 10 are: &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 |

Using the command:

Specify in the SERVER parameter the server name entered in the parameters and which you require information about.

Specify in the JOBS parameter the list of jobs you want to check (or *ALL if you want to check them all).

If *ALL was indicated in the JOBS parameter, specify in the OMITS parameter the list of jobs you do not want to check, or *NONE if you do not want to omit any.

Specify in the JOBTYPE parameter the type of job you want to check.

If an error occurs when retrieving info about jobs from the server passed as a parameter, an error message indicating this will be sent to the program.

If the MAXCPU_C and MAXCPU_W, or MAXACT_W and MAXACT_C values are identical (equal to 1 for example), the command will only return critical errors.

7.10 CTM3G_NOD, Check node status

This command is used to check the status of a node as well as its memory used.

The command parameters are as follows:

```

M3, Ctl nodes CPU and Mem (CTM3G_NOD)

Type choices, press Enter.

M3 server name *NODES . . . . . SERVER
Nodes to control . . . . . NODS          *ALL
                        + for more values
Nodes to omit . . . . . OMITTS         *NONE
                        + for more values
CPU Warning Limit . . . . . MAXCPU_W    80
CPU Critical Limit . . . . . MAXCPU_C    90
Memory Warning Limit . . . . . MAXMEM_W  80
Memory Critical Limit . . . . . MAXMEM_C  90
Node status . . . . . STATUS           *ONLINE
  
```

Description of parameters:

- SERVER = (Required) Server name defined by the user when entering the parameters.
- NODS = List of nodes to check.
*ALL = All the nodes are checked
- OMITTS = List of nodes to omit if *ALL was indicated in the NODLIST parameter.
*NONE = No node is omitted
- MAXCPU_W = Specifies the percentage of CPU usage above which a Warning-type alert will be generated
*NOCTL = No check carried out on the warning threshold
- MAXCPU_C = Specifies the percentage of CPU usage above which a Critical-type alert will be generated
*NOCTL = No check carried out on the critical threshold
- MAXMEM_W = Specifies the percentage of memory usage above which a Warning-type alert will be generated
*NOCTL = No check carried out on the warning threshold
- MAXMEM_C = Indicate the percentage of memory usage above which a Critical-type alert will be generated
*NOCTL = No check carried out on the critical threshold
- STATUS = Specifies the status in which the nodes should be
*ONLINE = The nodes must be online
*OFFLINE = The nodes must be offline
*NOCTL = This parameter is not checked

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1361 | 0 | No node is using more than &1% of CPU |
| CTL1362 | 0 | No node is using more than &1% of memory |
| CTL1363 | 0 | No node is using more than &1% of CPU or more than &2% of memory |
| CTL1365 | 0 | All the nodes are in &1 status |

| | | |
|---------|----|---|
| CTL2361 | 20 | Warning: &1 nodes are using more than &2% of CPU. The first 10 are: &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 |
| CTL2362 | 20 | Warning: &1 nodes are using more than &2% of memory. The first 10 are: &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 |
| CTL3310 | 40 | Server name &1 does not exist |
| CTL3361 | 40 | Critical: &1 nodes are using more than &2% of CPU. The first 10 are: &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 |
| CTL3362 | 40 | Critical: &1 nodes are using more than &2% of memory. The first 10 are: &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 |
| CTL3363 | 40 | Critical: &1 nodes are offline. The first 10 are: &2, &3, &4, &5, &6, &7, &8, &9, &10, &11 |
| CTL3364 | 40 | Critical: &1 nodes are online. The first 10 are: &2, &3, &4, &5, &6, &7, &8, &9, &10, &11 |

Using the command:

Specify in the SERVER parameter the server name entered in the parameters and which you require information about.

Specify in the NODS parameter the list of nodes you want to check (or *ALL if you want to check them all).

If *ALL was indicated in the NODS parameter, specify in the OMITTS parameter the list of nodes you do not want to check, or *NONE if you do not want to omit any.

Specify in MAXCPU and MAXMEM parameters the Critical and Warning thresholds that must not be exceeded. Specify *NOCTL if a check should not be carried out.

If an error occurs when retrieving info about jobs from the server passed as a parameter, an error message indicating this will be sent to the program.

If the MAXCPU_C and MAXCPU_W values are identical (equal to 1 for example), the command will only return critical errors.

In the case of several nodes have the same name, the command will return OK if at least one node has the right status.

7.11 CTM3G_SVC, Check M3 service status

This command is used to check that the ports and threads of the M3 services are actives.

The command parameters are as follows:

```

M3, Check service status (CTM3G_SVC)

Type choices, press Enter.

M3 server name *SERVICES . . . . . SERVER
Services to control . . . . . SERVICES          *ALL
                + for more values
Services to omit . . . . . OMITTS             *NONE
                + for more values
Port . . . . . PORT                          *ACTIVE
Thread . . . . . THREAD                       *ACTIVE

```

| | |
|--------------------------------|-----------|
| Severity level LEVEL | *CRITICAL |
|--------------------------------|-----------|

Description of parameters:

SERVER = (Required) Server name defined by the user when entering the parameters.
 SERVICES = Services to check
 *ALL = All the services
 OIMITS = Services to omit if *ALL was specified in the SERVICES parameter
 *NONE = Omit no services
 PORT = Status the port must be in
 *ACTIVE = The port must be active
 *DOWN = The port must be inactive
 *NOCTL = No check carried out on the port
 THREAD = Status the thread must be in
 *ACTIVE = The thread must be active
 *DOWN = The thread must be inactive
 *NOCTL = No check carried out on the port
 LEVEL = Severity levels of the alert generated in the monitoring product
 *CRITICAL = CRITICAL-type alert generated
 *WARNING = WARNING-type alert generated

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1341 | 0 | All the requested service ports are active |
| CTL1342 | 0 | All the requested service ports are inactive |
| CTL1343 | 0 | All the requested service threads are active |
| CTL1344 | 0 | All the requested service threads are inactive |
| CTL1345 | 0 | All the services are in the requested status |
| CTL2341 | 20 | Warning: &1 services have an inactive port. The first 10 are: &2, &3, &4, &5, &6, &7, &8, &9, &10, &11 |
| CTL2342 | 20 | Warning: &1 services have an active port. The first 10 are: &2, &3, &4, &5, &6, &7, &8, &9, &10, &11 |
| CTL2343 | 20 | Warning: &1 services have an inactive thread. The first 10 are: &2, &3, &4, &5, &6, &7, &8, &9, &10, &11 |
| CTL2344 | 20 | Warning: &1 services have an active thread. The first 10 are: &2, &3, &4, &5, &6, &7, &8, &9, &10, &11 |
| CTL3310 | 40 | Server name &1 does not exist |
| CTL3341 | 40 | Critical: &1 services have an inactive port. The first 10 are: &2, &3, &4, &5, &6, &7, &8, &9, &10, &11 |
| CTL3342 | 40 | Critical: &1 services have an active port. The first 10 are: &2, &3, &4, &5, &6, &7, &8, &9, &10, &11 |
| CTL3343 | 40 | Critical: &1 services have an inactive thread. The first 10 are: &2, &3, &4, &5, &6, &7, &8, &9, &10, &11 |
| CTL3344 | 40 | Critical: &1 services have an active thread. The first 10 are: &2, &3, &4, &5, &6, &7, &8, &9, &10, &11 |

Using the command:

Specify in the SERVER parameter the server name entered in the parameters and which you require information about.

Specify in the SERVICES parameter the services to check, or *ALL to check all the services.

Specify in the OMITTS parameter the services not to check, or *NONE to omit none.

Specify in PORT and THREAD parameters the status these must be in, or *NOCTL to not carry out a check.

Specify in the LEVEL parameter the alert level that must be returned by the check.

If the SERVER parameter contains a value which does not exist in the config, the program will send an error message.

7.12 CTM3HSTSTS, Check host status

This command is used to check the status of a host as well as its memory used.

The command parameters are as follows:

```

M3, Hosts status (CTM3HSTSTS)

Specify your choices then press Enter.

Server name . . . . . SERVER
Host name . . . . . HOSTS          *ALL
          + for more values
Omit Hosts . . . . . OMITTS       *NONE
          + for more values
Memory Warning Limit . . . . . MAXMEM_W      80
Memory Critical Limit . . . . . MAXMEM_C      90
Status . . . . . STATUS           *ONLINE

```

Description of parameters:

SERVER = (Required) Server name defined by the user when entering the parameters.

HOSTS = Hosts to check
*ALL = All the hosts are checked

OMITTS = Host to omit if *ALL was indicated in the HOSTS parameter
*NONE = No host is omitted

MAXMEM_W = Specifies the percentage of memory usage above which a Warning-type alert will be generated
*NOCTL = No Warning alert will be sent

MAXMEM_C = Specifies the percentage of memory usage above which a Critical-type alert will be generated
*NOCTL = No Critical alert will be sent

STATUS = Status in which the hosts must be
*ONLINE = The hosts must be online
*OFFLINE = The hosts must be offline
*NOCTL = The host status is not checked

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1331 | 0 | All the hosts are online |
| CTL1332 | 0 | All the hosts are online and using less than &1% of memory |
| CTL1333 | 0 | All the hosts are offline |

| | | |
|---------|----|---|
| CTL1334 | 0 | All the hosts are offline and using less than &1% of memory |
| CTL1335 | 0 | No host is using more than &1% of memory |
| CTL2333 | 20 | Warning: &1 hosts are using more than &2% of memory. The first 10 are: &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 |
| CTL3310 | 40 | Server name &1 does not exist |
| CTL3331 | 40 | Critical: &1 hosts are offline. The first 10 are: &2, &3, &4, &5, &6, &6, &7, &8, &9, &10, &11 |
| CTL3332 | 40 | Critical: &1 hosts are online. The first 10 are: &2, &3, &4, &5, &6, &6, &7, &8, &9, &10, &11 |
| CTL3333 | 40 | Critical: &1 hosts are using more than &2% of memory. The first 10 are: &3, &4, &5, &6, &7, &8, &9, &10, &11, &12 |

Using the command:

Specify in the SERVER parameter the server name entered in the parameters and which you require information about.

Specify in the HOSTS parameter the list of hosts to check, or *ALL for all the hosts.

Specify in the OMITTS parameter the list of hosts not to check, or *NONE for all the hosts.

Specify in MAXMEM parameters the Critical and Warning thresholds to avoid exceeding. Specify *NOCTL if a check should not be carried out.

Specify in the STATUS parameter the status in which the host should be, or *NOCTL if no check should be carried out.

If the SERVER parameter contains a value which does not exist in the config, the program will send an error message.

The command first checks that the host is online. If so, or if you have asked not to check this parameter, the percentage of memory used will be checked, provided *NOCTL has not been specified.

7.13 CTM3JOBQ, Control jobs in M3 JOBQ

This command is used to check the number of jobs in a M3 JOBQ.

The command parameters are as follows:

```

Control jobs in M3 JOBQ (CTM3JOBQ)

Type choices, press Enter.

Job Queue . . . . . JOBQ
Warning limit . . . . . LIMWARN
Critical limit . . . . . LIMCRIT
M3 Library . . . . . LIBM3

```

Description of parameters:

- JOBQ = (Required) Name of M3 JOBQ to check
*ALL = Every JOBQ will be checked
- LIMWARN = Maximum number of jobs that must be in the JOBQ. If more jobs are found, a warning alert is sent.
- LIMCRIT = Maximum number of jobs that must be in the JOBQ. If more jobs are found, a critical alert is sent.
- LIBM3 = Name of the library containing the M3 tables.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL1431 | 0 | The JOBQ &2 has a normal number of jobs NbJob=&1 |
| CTL2431 | 20 | Warning : &2 jobs in JOBQ &1 NbJob=&2 |
| CTL2432 | 20 | Warning : &1 JOBQ in error. The 4 first are (JOBQ – Nb jobs) : (&2 - &3), (&4 - &5), (&6 - &7), (&8 - &9) NbJobq=&1 |
| CTL3431 | 40 | Critical : &2 jobs in JOBQ &1 NbJob=&2 |
| CTL3432 | 40 | Critical : &1 JOBQ in error. The 4 first are (JOBQ – Nb jobs) : (&2 - &3), (&4 - &5), (&6 - &7), (&8 - &9) NbJobq=&1 |
| CTL3441 | 40 | Object &1 not found in library &2 |
| CTL3442 | 40 | Library &1 not found |

Using the command:

The JOBQ checked here are M3 internal JOBQs. To check system JOBQs, use command CTCHKJOBQ.

If a JOBQ name is entered at parameter JOBQ, only the jobs in this JOBQ will be checked.
If the name entered is *ALL, then every job of every JOBQ will be checked.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

7.14 CTM3JOBSTS, Control M3 jobs in error

This command created an alert if M3 jobs are in error. The error status are:

15 not able to run. (CMNGJOB tried & failed to start the job)

25 job ended abnormally

the number of errors is counted since the number of hours entered in parameter PERIOD.

The command parameters are as follows:

```

Control M3 jobs in error (CTM3JOBSTS)

Type choices, press Enter.

Search period (in h.) . . . . . PERIOD          24
Type of errors . . . . . ERRTYPE              *ALL
Severity level . . . . . LEVEL                *CRITICAL
M3 Library . . . . . LIBM3

```

Description of parameters:

- PERIOD = Enter the number of hours. The command will count the number of jobs in error since this time.
- ERRTYPE = Enter the type of errors to look for.
15= not able to run. (CMNGJOB tried & failed to start the job)
25 = job ended abnormally
*ALL = Errors type 15 and 25 are counted together
- LEVEL = Severity levels of the alert generated in the monitoring product
*CRITICAL = CRITICAL-type alert generated
*WARNING = WARNING-type alert generated

LIBM3 = Name of the library containing the M3 tables.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1451 | 0 | No job in error since last &1 hours |
| CTL2451 | 20 | &1 jobs in error since &2 hours : &3 type 15 and &4 type 25 |
| CTL2452 | 20 | &1 jobs in error of type &2 since &3 hours |
| CTL3441 | 40 | Object &1 not found in library &2 |
| CTL3442 | 40 | Library &1 not found |
| CTL3451 | 40 | &1 jobs in error since &2 hours : &3 of type 15 and |
| CTL3452 | 40 | &1 jobs in error of type &2 since &3 hours |

Using the command:

The LEVEL parameter specifies the severity level used for the alert in the monitoring product (Nagios) in the event of an error. In IBM i:

- An OK check corresponds to a 0-severity message
- a WARNING-type alert corresponds to a 20-severity message,
- a CRITICAL-type alert corresponds to a 40-severity message.

This command does not display a screen. The result of this command is a return message indicating the necessary information.

7.15 CTM3JOBUCUM, Checks cumulative M3 jobs data

The CTM3JOBUCUM command uses job information from the ServerView accumulated throughout the day to determine which jobs have too much accumulated activity, or have been active for a too long time.

The command parameters are as follows:

```

M3, Check aggregation of jobs (CTM3JOBUCUM)

Indiquez vos choix, puis appuyez sur ENTREE.

M3 server name *JOBS . . . . . SERVER
Jobs to control . . . . . JOBS          *ALL
                + si autres valeurs
Jobs to omit . . . . . OMITTS         *NONE
                + si autres valeurs
Job type . . . . . JOBTYP           *ALL
Activity Max Warning . . . . . MAXACT_W *NOCTL
Activity Max Critical . . . . . MAXACT_C *NOCTL
Maximum warning duration . . . . . MAXDUR_W *NOCTL
Maximum critical duration . . . . . MAXDUR_C *NOCTL

```

Description of parameters:

SERVER = (Required) Server name defined by the user when entering the parameters. The definition of this server via the CTPARAM command must indicate that the data is aggregated.

| | |
|----------|---|
| JOB | = (Required) List of jobs to check. A list of 10 job names can be indicated. *ALL = All the jobs are taken into account |
| OMITS | = If *ALL was indicated in the JOBS parameter, a list of jobs to exclude can be indicated here. *NONE = No job will be omitted |
| JOBTYPE | = Type of job to check *ALL = All types of job *AUTOJOB = Asynchronous jobs *INTERACT = Interactive jobs *BATCH = Batch jobs *MIJOBS = Specific jobs |
| MAXACT_W | = Specifies the level of activity above which a Warning-type alert will be generated *NOCTL = This value is not checked |
| MAXACT_C | = Specifies the level of activity above which a Critical-type alert will be generated *NOCTL = This value is not checked |
| MAXDUR_W | = Specifies a time in minutes. Jobs that have been active for a longer time will generate a Warning type alert. *NOCTL= This value is not checked |
| MAXDUR_C | = Specifies a time in minutes. Jobs that have been active for a longer time will generate a Critical type alert. *NOCTL= This value is not checked |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL1691 | 0 | Job &1, owner &2, thread ID &3, process ID &4 has a cumulative activity level of &5, greater than the warning limit &6. |
| CTL1692 | 0 | Job &1, owner &2, thread ID &3, process ID &4 has a cumulative activity level of &5, greater than the critical limit &6. |
| CTL1693 | 0 | Job &1, owner &2, thread ID &3, process ID &4 lasted &5 min. Greater than the warning limit &6. |
| CTL1694 | 0 | Job &1, owner &2, thread ID &3, process ID &4 lasted &5 min. Greater than the critical limit &6. |
| CTL1695 | 0 | bErrActW=&1err NbErrActC=&2err NbErrDurW=&3err NbErrDurC=&4err |
| CTL1696 | 0 | Ok, all jobs have a cumulative activity level lower than &1. &2 |
| CTL1697 | 0 | Ok, all jobs lasted less than &1 minutes. &2 |
| CTL1698 | 0 | Ok, all jobs have a cumulative activity level lower than &1 and lasted less than &2 minutes. &3 |
| CTL2690 | 20 | Warning, &1 jobs have a cumulative activity level greater than the warning limit &2. &3 |
| CTL2691 | 20 | Warning, &1 jobs lasted longer than the warning limit of &2 min. &3 |
| CTL1690 | 40 | The aggregation of data isn't enabled for the server &1. |
| CTL3690 | 40 | Critical, &1 jobs have a cumulative activity level greater than the critical limit &2, &3 have exceeded the warning limit &4. |
| CTL3691 | 40 | Critical, &1 jobs lasted longer than the critical limit of &2 min, &3 exceeded the warning limit of &4 min. &5 |
| CTL3692 | 40 | Critical, &1 jobs have a cumulative activity level greater than the critical limit &2. &3 |
| CTL3693 | 40 | Critical, &1 jobs lasted longer than the critical limit of &2 min. &3 |

Using the command:

The goal is to be able to track jobs (from M3) that have a very high activity during the day, or that last too long.

The command is based on the data extracted throughout the day for the *JOBS data. These data are consolidated by the CTAUTO job.

The consolidation is done based on the job name, user and thread ID of the jobs.

Indicate in the SERVER parameter the name of the server that you want the information for

The definition of this server via the CTPARAM command must indicate that the data are aggregated.

Indicate in the JOBS parameter the list of jobs that you want to check (or *ALL if you want to check them all). If *ALL has been indicated in the JOBS parameter, indicate in the OMITTS parameter the list of jobs that you do not want to check, or *NONE if you do not want to omit any.

Indicate in the JOBTYP parameter the type of job you want to check.

If an error occurred while retrieving information from the server jobs passed in parameter, an error message will be sent by the program.

If the values MAXDUR_C and MAXDUR_W, or MAXACT_W and MAXACT_C are identical (equal to 1, for example), this means that the command will return only critical errors.

8 Product management commands

The commands described in this section are used to manage the product.

- Obtain information about the product version and license
- Start and stop automatic processing
- Manage the product's parameters
- Display the log of operations performed by the product and display the content of the system Log

8.1 CTMENU, Display the product's main menu

The CTMENU command displays the main menu of the Control For i product. It displays the main available commands.

The displayed menu is as follows:

```
CTMENU                               Control for i Main menu

Select one of the following:

    1. Menu for Control for i management commands

    10. Menu for controls of jobs
    11. Menu for controls of backups
    12. Menu for controls of High Availability
    13. Menu for controls of network and IFS
    14. Menu for others System control commands

    20. Menu for controls of messages
    21. Menu for controls of libraries

    30. Menu for controls related to software M3
    31. Menu for controls related to software MQ

Selection or command
====>
```

This first menu is used to access to other menus of the product Control For i.

Option 1 displays a menu containing Control For i management commands. These commands are described later in this section.

```
CTMNUWRK                             Menu for Control for i management commands

Select one of the following:

    1. Start CONTROL4i subsystem                CTSTRSBS
    2. Stop CONTROL4i subsystem                CTENDSBS
    3. Work with Parameters                    CTPARAM
    4. Cleanup Log data                        CTCLEAR

    10. Save Control for i configuration        CTSVCFG
    11. Restore Control for i configuration     CTRSTCFG

    20. Send a command to the monitoring server CTSNDCMD
```

- 30. Menu for keys management
- 31. Menu for logs management

Option 30 of menu CTMNUWRK:

```
CTMNUKEY          Menu for license key management

Select one of the following:

    1. Display product information          CTDSPINF
    2. Enter the license key              CTADDKEY
    3. Work with license keys             CTWRKKEY
```

Option 31 of menu CTMNUWRK:

```
CTMNULOG          Menu for Control for i management commands

Select one of the following:

    1. Display product log                CTDSPLOG
    2. Add a log entry                   CTADDLOG
    3. Validate errors in the log        CTVLDLOG

    10. Display system log              CTDSPSLOG
```

Options 10, 11, 12, 13 and 14 display menus containing the check commands that can be used in Nagios to monitor the system's elements.

These commands are described in the "3 IBM i check commands" section.

```
CTMNUCHK          Menu for controls of jobs

Select one of the following:

    1. Check if a Batch has run          CTCHKBCH
    2. Check a job                      CTCHKJOB
    3. Check Job duration                CTCHKJOBDU
    4. Check number of JOB in JOBQ      CTCHKJOBQ
    5. Check JOB in LCKW status         CTCHKLCKW
    6. Check JOB in MSGW status         CTCHKMSGW
    7. Check JOB in specific status     CTCHKJOBS
    8. Check number of spools in OUTQ   CTCHKOUTQ
    9. Check subsystem status          CTCHKSBS
    10. Check system status             CTCHKSYSST
```

```
CTMNUCH2          Menu for controls of backups

Select one of the following:

    1. Check expired vol. for BRMS      CTCHKBRMEX
    2. Check FlashCopy status for BRMS  CTCHKBRMFC
```

Control for i
Reference document

- | | |
|-----------------------------------|------------|
| 3. Check the BRMS saves | CTCHKBRM |
| 4. Check DUPMEDBRM with BRMS | CTCHKBRMDP |
| 11. Check the save (without BRMS) | CTCHKSAV |

CTMNUHA Menu for controls of High Availability

Select one of the following:

- | | |
|-------------------------------------|------------|
| 1. Check Quick EDH status | CTCHKEDH |
| 2. Check MIMIX, Application Group | CTCHKMMXAG |
| 3. Check MIMIX, Data Group activity | CTCHKMMXDG |
| 4. Check MIMIX, Data Group errors | CTCHKMMXDS |
| 5. Check MIMIX or iTera Audits | CTCHKMMXAU |
| 6. Check iTera delays | CTCHKITADL |
| 7. Check iTera global state | CTCHKITAST |

CTMNUCH4 Menu for controls of network and IFS

Choisir une des options suivantes :

- | | |
|------------------------------------|-------------|
| 1. Check Certificate validity date | CTCHKCERT |
| 2. Check local IP address | CTCHKLCLIP |
| 3. Check remote IP connection | CTCHKPING |
| 4. Check Web services | CTCHKWEBSV |
| 11. Check Number of files in IFS | CTCHKIFS NF |
| 12. Check a text in IFS file | CTCHKIFSTX |

CTMNUCH3 Menu for others System control commands

Select one of the following:

- | | |
|------------------------------------|------------|
| 1. Check CPU usage | CTCHKCPU |
| 2. Check ASP usage | CTCHKDSK |
| 3. Check DTAARA content | CTCHKDTAA |
| 4. Check DTAQ content | CTCHKDTAQ |
| 5. Check System Problems | CTCHKPRB |
| 6. Check profiles status | CTCHKUSR |
| 7. Check status of Line/Ctl/Device | CTCHKCFGST |
| 8. Check object size | CTCHKOBJ |
| 9. Check attached journal receiver | CTCHKJRN |
| 10. Check time | CTCHKTIM |
| 11. Check system Up time | CTCHKUPTIM |

Options 20 and 21 display menus containing the commands that define the monitoring about messages and libraries.

These commands are described in the "5 Messages check commands" and "6 Libraries check commands" sections.

Select one of the following:

Check messages

- | | |
|--|------------|
| 1. Work with message scenario | CTWRKMSG |
| 2. Display alerts from MSGQ or JOBLOG | CTDSPALR |
| 3. Change control status for messages | CTCHGMSGST |
| 11. Check alerts in MSGQ | CTCHKMSGQ |
| 12. Check errors in Internal Control for i Log | CTCHKLOG |
| 21. Validate alerts | CTVLDALR |

CTMNUCH5 Menu for libraries check

Select one of the following:

Check libraries

- | | |
|---|------------|
| 1. Work with list of libraries to check | CTWRKLIB |
| 11. Check libraries size | CTCHKLIBSZ |
| 12. Check libraries size evolution | CTCHKLIBEV |
| 21. Display libraries statistics | CTDSPLIB |

Options 30 and 31 display menus containing the check commands that can be used in Nagios to monitor the M3 and MQ Series products.

For M3, these commands are described in the "7 M3 software check commands" section.

For MQ Series, these commands are described in the "3 IBM i check commands" section.

CTMNUM3 Menu for M3 software controls

Select one of the following:

- | | |
|-----------------------------------|------------|
| 1. Check number of autojobs | CTM3G_NBAJ |
| 2. Check jobs status | CTM3G_JOB |
| 3. Check nodes status | CTM3G_NOD |
| 4. Check services status | CTM3G_SVC |
| 5. Check applications status | CTM3APPSTS |
| 6. Check errors in applications | CTM3APPERR |
| 7. Check warnings in applications | CTM3APPWRN |
| 8. Check hosts status | CTM3HSTSTS |
| 9. Check Nb jobs in JOBQ | CTM3JOBQ |
| 10. Check Jobs status | CTM3JOBSTS |
| 11. Check ended batch jobs | CTM3CHKBCH |
| 12. Check aggregated jobs data | CTM3JOB2 |
| 20. Activate M3 data collection | CTM3CHGCOL |

CTMNUMQ Menu for MQ Series software controls

Choisir une des options suivantes :

| | |
|---|------------|
| 1. Check manager's state | CTCHKMQST |
| 2. Check number of messages in MQ queue | CTCHKMQMSG |

8.2 CTRSTPRD, Restore Control for i product

The CTRSTPRD command is used to upgrade the Control for i product. It must be used as part of a change of release or version of the product. The objects provided by M81 must first have been restored in QTEMP, or any other temporary library.

The command parameters are as follows:

```

Product upgrade (CTRSTPRD)

Type choices, press Enter.

Product name . . . . . PRDNAME          CONTROL4I
Temporary library . . . . . PGMLIB       QTEMP
Main language . . . . . MAINLNG
Secondary languages . . . . . SECLNG     *NONE
                                   + for more values

```

Description of parameters:

| | |
|---------|--|
| PRDNAME | Product name CONTROL4I = Only possible value |
| PGMLIB | Enter the name of the library into which the objects provided by M81 have been restored. |
| MAINLNG | Enter the main language to use for the product. This value is mandatory. EN = The product will be installed in English language FR = The product will be installed in French language |
| SECLNG | Indicate if a secondary language needs to be installed for the product. *NONE = No secondary language will be installed. EN = The English secondary language will be installed in library CTL4I_EN FR = The French secondary language will be installed in library CTL4I_FR |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CPF3D95 | 40 | Exit program processing failed. |
| CPF9898 | 40 | Not possible to do the security backup. |
| CTL0100 | 0 | Product &1 version &2 installation, build &3 completed successfully |

Using the command:

This command must be used to perform an initial installation or a version or release change of the Control for i product.

If the product is already installed, the data it contains is retained and migrated to the new tables.

It is advisable to make a backup of the CTL4I library before making the version change.

8.3 CTSVCFG: Save the Control for i settings

The CTSVCFG command saves all the Control for i product settings located in the partition to a backup file.

The command parameters are as follows:

```

Save CTL4I definitions (CTSAVCFG)

Type choices, press Enter.

Save file . . . . . SAVF
  Library . . . . . *CURLIB
Target release . . . . . TGTRLS          *CURRENT
  
```

Parameter Description:

- SAVF Name of the save file in which the definitions should be saved

- TGTRLS Indicate the destination version of the backup
 - *CURRENT = The current version of the partition
 - The other possible values depend on the partition version. See the possible values for the TGTRLS parameter of the SAVLIB command to know them.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL0155 | 0 | Definitions of Control For i saved in the save file &1/&2, target release &3. |
| CTL0150 | 40 | Library &1 does not exist. |
| CTL0151 | 40 | Error while creating the save file &1/&2 |
| CTL0152 | 40 | Error while clearing the save file &1/&2 |
| CTL0153 | 40 | Target release &1 is not a correct value. |
| CTL0154 | 40 | Error when saving Control For i definitions. |

Using the command:

This command allows to save all the parameters of Control for i stored on the partition. The saved data concern the following modules or options:

- *SCENARIO = Everything related to message alerts (CTWRKMSG command)
- *ACTIONS = Automatic actions (CTPARAM command then ACTIONS)
- *KEYDIST = The list of license keys provided by M81 in some cases.
- *LIB = The information for tracking the size of libraries (CTWRKLIB command)
- *PARAM = All parameters other than ACTIONS (CTPARAM command)

The settings entered in the monitoring tool are not taken into account by this command.

Use the CTRSTCFG command to restore all or part of the configuration to another partition.

Note on high availability:

If a production partition is replicated with a high availability product (Mimix, Quick EDD, ...) and the backup partition is also monitored with Control for i, it is likely that the settings are different on these 2 partitions. In the event of a switchover (role swap), the CTRSTCFG command can be used to restore the Control for i settings on the backup partition.

The proposed method is as follows:

- The CTL4I library must not be replicated, so that each partition (Prod and backup) can be monitored independently of the other.
- On the Production partition, use the CTSVCFG command at regular intervals to save the settings, and replicate the SAVF on the backup partition
- In case of a switch to the backup partition, save the current configuration with the CTSVCFG command in another SAVF
- Restore the Production configuration with the CTRSTCFG command

8.4 CTRSTCFG: Restore Control for i settings

The CTRSTCFG command allows you to restore all or part of the Control for i product settings located in the partition.

The command parameters are as follows:

```

Restore CTL4I definitions (CTRSTCFG)

Indicate your choices, then press ENTER.

Save file . . . . . SAVF
  Library . . . . . *LIBL
Functions to be restored . . . . FUNCTION *ALL
      + if other values
Scenarios to restore . . . . . SCENARIO *ALL
      + if other values
  
```

Parameter Description:

| | |
|-----------|---|
| SAVF | Indicate the name of the save file that was used for the CTSVCFG command |
| FUNCTION | Indicate which part of the settings should be restored *ALL = All settings will be restored *SCENARIO = Everything related to message alerts (CTWRKMSG command) *ACTIONS = Automatic actions (CTPARAM command then ACTIONS) *KEYDIST = The list of license keys provided by M81 in some cases. *LIB = The information for tracking the size of bibs (CTWRKLIB command) *PARAM = All parameters other than ACTIONS (CTPARAM command) |
| SCENARIOS | if the FUNCTION parameter contains the value *SCENARIO, indicate here the list of scenarios to restore. Only the information concerning these scenarios will be restored and will replace the existing information. The other scenarios will not be modified or deleted. *ALL = All scenarios will be restored, the scenarios present on the partition but absent in the SAVF will be deleted. |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|-------------------|-----------------|--|
| CTL0162 | 0 | Restoration of Control For i definitions performed correctly. |
| CTL0160 | 40 | Error when restoring Control For I definitions. Save file &1/&2. |
| CTL0161 | 40 | Error while copying data from file &1. |
| CTL0163 | 40 | Error when restoring Control For i definitions. |

Using the command:

This command allows you to restore the Control for i parameters that were previously saved with the CTSVAVCFG command.

It is possible to restore the whole configuration of Control for i by using the *ALL option. All the existing configuration on the local partition will be replaced by the one contained in the SAVF.

It is also possible to select one or more functions to restore from the following list:

- *SCENARIO = Everything related to message alerts (CTWRKMSG command)
- *ACTIONS = Automatic actions (CTPARAM command then ACTIONS)
- *KEYDIST = The list of license keys provided by M81 in some cases.
- *LIB = The information for tracking the size of libraries (CTWRKLIB command)
- *PARAM = All parameters other than ACTIONS (CTPARAM command)

If the *SCENARIO parameter is used, it is possible to select the scenario(s) to be restored.

If *ALL is specified, all scenarios defined on the partition will be replaced by those contained in the SAVF. Scenarios that exist locally but do not exist in the SAVF will be deleted.

If a list of scenarios is indicated, the data corresponding to this scenario will replace the existing local data. Scenarios that exist locally but are not part of the list of scenarios to be restored will not be deleted or modified.

The settings entered in the monitoring tool are not taken into account by this command.

Note on high availability:

If a production partition is replicated with a high availability product (Mimix, Quick EDD, ...) and the backup partition is also monitored with Control for i, it is likely that the settings are different on these 2 partitions. In the event of a switchover (role swap), the CTRSTCFG command can be used to restore the Control for i settings on the backup partition.

The proposed method is as follows:

- The CTL4I library must not be replicated, so that each partition (Prod and backup) can be monitored independently of the other.
- On the Production partition, use the CTSVAVCFG command at regular intervals to save the settings, and replicate the SAVF on the backup partition
- In case of a switch to the backup partition, save the current configuration with the CTSVAVCFG command in another SAVF
- Restore the Production configuration with the CTRSTCFG command

8.5 CTDPSLOG: View the system log

To make it easier to process messages from the system log (extracted from the DSPLOG system command), they are extracted automatically (by the CT_AUTO job). They can be viewed with the CTDSPSLOG command.

The CTDSPLOG and CTDSPSLOG commands are used in the same way. See the “8.6 CTDSPLOG: View the product's internal log” section for more details on using this command.

8.6 CTDSPLOG: View the product's internal log

This command is used to view the internal message log of the Control For i product.

The command parameters are as follows:

This command has no parameters.

Using the command:

The CTDSPLOG command is used to obtain the list of messages generated by Control For i.

Some operations performed by the product produce a message which is recorded in the log. The CTDSPLOG command is used to view this log.

To use this command more effectively, it is advisable to configure a session with 132 columns.

The command displays the list of messages

```

CTDSPLOG1                               Display Control for i Log                               22/11/17
                                                                                               16:44:06

Local system name . . . . . M81DEV
Position to . . . . . 0/00/00 0:00:00
Lookup for a text . . . . . (May be long)

Specify your options then press Enter
 5=Display 6=Validate

Opt Date      Time      Type  Sev Msg ID  System  Message text
-----
21/11/17 18:00:47 INF 00 CTL7112 M81FLASH Action CLR_HST completed
21/11/17 18:00:47 INF 00 CTL0112 M81FLASH System Log cleanup on the 2017-09-22. 1547 messages deleted
21/11/17 18:00:46 INF 00 CTL0111 M81FLASH Product Log cleanup on the 2017-09-22. 1 message deleted
20/11/17 18:00:55 INF 00 CTL7112 M81FLASH Action CLR_HST completed
20/11/17 18:00:55 INF 00 CTL0112 M81FLASH System Log cleanup on the 2017-09-21. 1701 messages deleted
20/11/17 18:00:53 INF 00 CTL0111 M81FLASH Product Log cleanup on the 2017-09-21. 6 messages deleted
19/11/17 18:00:05 INF 00 CTL7112 M81FLASH Action CLR_HST completed
19/11/17 18:00:05 INF 00 CTL0112 M81FLASH System Log cleanup on the 2017-09-20. 1518 messages deleted
19/11/17 18:00:05 INF 00 CTL0111 M81FLASH Product Log cleanup on the 2017-09-20. 0 message deleted
18/11/17 18:00:19 INF 00 CTL7112 M81FLASH Action CLR_HST completed
18/11/17 18:00:19 INF 00 CTL0112 M81FLASH System Log cleanup on the 2017-09-19. 1750 messages deleted
18/11/17 18:00:17 INF 00 CTL0111 M81FLASH Product Log cleanup on the 2017-09-19. 6 messages deleted
17/11/17 18:00:28 INF 00 CTL7112 M81FLASH Action CLR_HST completed
17/11/17 18:00:28 INF 00 CTL0112 M81FLASH System Log cleanup on the 2017-09-18. 1732 messages deleted

F3=Exit F5=Refresh F10=Errors only F12=Cancel F23=Validate all More...
```

The log of all the operations performed by the product is displayed.
The messages are sorted in reverse chronological order. The message at the top corresponds to the last message generated.

The columns have the following meanings:

| | |
|---------------|---|
| Date and Time | = Date and time at which the message was generated. |
| Type | = Message type. The possible types are as follows: INF = Information message. These messages are used to monitor the normal operations performed by the product. ERR = Error message. This information appears in reverse image on the screen to make it more noticeable. VAL = Error message which has been validated by the operator (see option 6 further on) |
| Sev | = Severity of the message. This is used to rank the severity of the message. The higher this number, the more severe the message is. 00 = Information message. 10 = Warning. The program may have taken a default value to solve a problem. 20 = An error was detected but does not require mandatory action. 40 = Serious error. Operator action is required to solve the problem. |
| Msg ID | = Message ID. |
| System | = Name of system on which the message was generated. |
| Message text | = Message text |

Possible inputs:

Display from

Specifies from which date and time messages need to be displayed.

As messages are sorted into decreasing order, entering a date only and leaving the time as 0 will display the first message from the previous date. For example, entering 170814 in the date field and nothing in the time field will display the last message available for Aug 16, 2014. The user needs to page up to see the first messages from the selected date.

Find a string

Used to search for a character string in the message text or ID.

NB: the whole log is searched. If the character string searched for is not present in any message, the search may take a long time before the following screen is displayed.

Options:

Option 5 = Display

Displays the detail of a message. See further information below.

Option 6 = Validate

Used to validate an error message.

This option can only be used on error messages (type = ERR) to indicate that an error has been taken into account and must no longer be processed. This enables the operator to concentrate on the remaining errors, without being concerned about the ones he/she has already validated.

This validation only has an effect for the operator. It has no effect on the product itself.

This option may be used for several messages at the same time.

A confirmation screen is displayed. Press Enter to confirm that the messages need to be validated.

Function keys

F3 = Exit the screen

F5 = Update the values

F10 = Display error messages only

F12 = Exit the screen

F23 = Validate every message between 2 date/time

8.6.1 Option 5 = Display

The detail of the selected message is displayed.

```

CTDSPLOG5                               Display Message Detail                               22/11/17 16:47:47

System Name . . . . M81DEV                Message Date . . . . 21/11/17                Message Time . . . . 18:00:45
Product Name . . . . CONTROL4I           Message Type . . . . INF                    Severity . . . . . 00
Message ID . . . . . CTL0112             Message Origin . . . 898121/CTL4I/CTAUTO

Message . . . . : System Log cleanup on the 2017-09-22. 3792 messages deleted

Press ENTER to continue

F3=Exit  F12=Cancel
    
```

8.7 CTVLDLOG, Validate the errors in internal log

The CTVLDLOG command allows errors to be validated without the need to use an interactive session. It has the same effect as using the CTDSPLOG command, then option 6.

This command can be used in a CLP program, or in a user-defined automation.

The command parameters are as follows:

```

                                Validate Log errors (CTVLDLOG)

Indiquez vos choix, puis appuyez sur ENTREE.

Message ID . . . . . MSGID          *ALL
Beginning date and time:          START
  Beginning date . . . . .          *BEGIN
  Beginning time . . . . .          *BEGIN
Ending date and time:            END
  Ending date . . . . .             *END
  Ending time . . . . .             *END

```

Description of parameters:

- MSGID = Indicate the ID of the messages that have to be validated. Only corresponding messages will be validated.
It is possible to indicate generic names containing either the ? sign to replace a character or the * sign at the end to end with any sequence of characters.
*ALL = All messages in the indicated time range will be validated.
- START = Indicate the date and time that constitute the beginning of the time slot. All the errors that have been generated from this date and time until the date and time contained in the END parameter will be validated.
*BEGIN = All errors will be validated from the beginning.
- END = Indicate the date and time that constitute the end of the time range. All errors that have been generated from the date and time contained in the START parameter to the date and time entered here will be enabled.
*END = All errors will be validated until the last one.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|------------------------------------|
| CTL0091 | 0 | &1 Log errors have been validated. |

Using the command:

This command allows you to validate errors without having to connect to an interactive session. It has the same effect as using the CTDSPLOG command, then option 6.

8.8 CTSTRSBS, Start the agent on the partition

The CTSTRSBS command starts the automatic functions required by the Control For i product.

The command parameters are as follows:

This command has no parameters.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL2101 | 0 | Subsystem &1 is already started |
| CTL2103 | 0 | Subsystem &1 is starting |
| CTL2102 | 40 | Unexpected error when starting the subsystem |

Using the command:

The CTSTRSBS command is used to start the CONTROL4I subsystem and the CTAGENT and CTAUTO automatic jobs.

It is advisable to add this command to the system start-up program (QSTRUP).

8.9 CTENDSBS, Stop the agent on the partition

The CTENDSBS command is used to stop the automatic functions of the Control For i product.

The command parameters are as follows:

```

                                Stop CONTROL4i subsystem (CTENDSBS)

Specify your choices then press Enter.

Controlled end delay time . . . DELAY           10

```

Description of parameters:

DELAY Specifies (in seconds) the time to allow for the system to stop in a controlled fashion.
 At the end of this time, an immediate stop will be carried out.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL0071 | 0 | CONTROL4I subsystem is stopping with the *CNTRLD option. |

Using the command:

The CTENDSBS command stops the CONTROL4I subsystem and the jobs it contains.

8.10 CTADDLOG, Add a Log entry

The CTADDLOG command is used to add a message to the product log.

The command parameters are as follows:

```

                                Add a log entry (CTADDLOG)

Specify your choices then press Enter.

Message type . . . . . TYPE
Product name . . . . . PRODUCT          CONTROL4I
Level 1 reference . . . . . REF1
Level 2 reference . . . . . REF2
Level 2 reference . . . . . REF3
Message ID . . . . . MSGID             *NONE
Message data . . . . . MSGDTA

...

Severity . . . . . GRAV                00
Message file . . . . . MSGF            *DFT
  Library . . . . .                    *LIBL
Send message in Joblog . . . . . SNDMSG *NO

```

Description of parameters:

| | |
|---------|---|
| TYPE | Message type: INF: Information-type message ERR: Error-type message |
| PRODUCT | Product name in 10 characters. The default value is CONTROL4I. This data is indicated for information purposes only. |
| REF1 | 10-character field enabling the user to specify a reference. This data is indicated for information purposes only. |
| REF2 | 10-character field enabling the user to specify a reference. This data is indicated for information purposes only. |
| REF3 | 10-character field enabling the user to specify a reference. This data is indicated for information purposes only. |
| MSGID | Message identifier. Specify the message ID as it is known in the message file. *NONE: No message ID is used. The text of the message will be fully contained in the MSGDTA parameter. CTL9898: This Message ID is provided as standard and allows the user to specify a 0 severity message (Information). The text of the message will be specified in the MSGDTA parameter. CTL9899: This Message ID is provided as standard and allows the user to specify a severity-40 message (Error). The text of the message will be specified in the MSGDTA parameter. |
| MSGDTA | Data to associate with the MSGID message |
| GRAV | Severity level to associate with the message. The value must be between 00 and 99. |
| MSGF | Name of message file. *DFT: The default message file will be used (CTMSGF) This parameter is not taken into account if the message ID is *NONE |
| SNDMSG | Send the message to the Job Log *YES = The message will be sent to the Job Log *NO = The message will not be sent to the Job Log |

This command generates the following messages in return:

No message is returned from this command

Using the command:

This command is used to add a message to the product operations log.
This message can be consulted via the CTDSPLOG command.
This same command is used internally by the product to monitor the performed operations.

The following 2 message IDs are used to add generic messages without having to create its own message file (*MSGF).

- CTL9898: Can be used as a basis for an information message
- CTL9899: Can be used as a basis for an error message

8.11 CTCLEAR, Clear data from the log

The CTCLEAR command is used to clear messages from the Control For i product log.

The command parameters are as follows:

```

                                Cleanup Log data (CTCLEAR)

Specify your choices then press Enter.

Log delay (d) . . . . . LOG                60
System log delay (d) . . . . . SLOG         5
MSGQ Alerts delay (d) . . . . . MSGQ       60
Lib. historic delay (d) . . . . . LIB       10
Disk used delay (d) . . . . . TRADSK       10
```

Description of parameters:

- LOG Specifies the number of days after which internal log messages will be deleted.
- SLOG Specifies the number of days after which the System Log messages will be deleted.
- MSGQ Specifies the number of days after which messages from MSGQ and JOBLOG will be deleted.
- LIB Specifies the number of days after which Library statistics will be deleted.
- DISK Specifies the number of days after which disk used statistics will be deleted.

Using the command:

The CTCLEAR command clears the message history. The LOG parameter specifies the number of days to keep messages.

This command must be executed regularly to clear messages contained in the product’s internal tables. By default, this command is executed automatically by the product every day at 6pm in the CTAUTO job. The following parameters are used:
CTCLEAR LOG(60) SLOG(5) MSGQ(60)

Use the CTPARAM command then option 1 before the ACTIONS keyword to change these parameters or the start-up frequency.

8.12 CTADDKEY, Add a license key

The CTADDKEY command is used to enter the Control For i product license key

The command parameters are as follows:

```

Enter the license key (CTADDKEY)

Type choices, press Enter.

Key value . . . . . KEY
New key position . . . . . POSITION          *FIRST
Replace or add key . . . . . OPTION        *ADD
Keys file . . . . . KEYFILE               CTKEYDIST
Library . . . . .                          *LIBL
  
```

Description of parameters:

- KEY Enter the key that was supplied by the partner. It has 15 digits.
*KEYFILE = The key will be extracted from a table delivered by M81 containing a list of keys of several partitions.
- POSITION Enter the position that will take the new key in the list of possible keys. As soon as a key is valid, the product can be used.
*FIRST = The new key will be placed at position 1
1- 6 = The new key will be placed at the specified position.
- OPTION Specify what becomes the current key at the position asked, and that will be replaced by the new one.
*ADD = The old key that is at the position asked will be moved to the next number. If position 6 has a key, it will be deleted.
*Replace = The old key that is at the asked position will be replaced by the new key.
- KEYFILE If the special value *KEYFILE is specified in the KEY parameter, specify here the name of the table containing the license keys.

This command generates the following messages in return:

This command does not generate return messages

Using the command:

The Control For i product is licensed by M81. Its use is protected by a license key. The CTADDKEY command is used to enter the key provided by M81. The key has 15 figures.

To confirm that the entered key is correct, use one of the 2 following methods:
1/ Start automatic jobs using the CTSTRSBS command and check that the 2 CTAGENT and CTAUTO jobs are active.
If this is not the case, check the entered key or request another key from M81.

2/ Use CTWRKKEY command to display the list of known keys, and their status.

The special value *KEYFILE in the KEY parameter allows the key to be entered automatically based on a table containing the keys for several partitions. This table must be provided by M81. This option is only useful when there are a large number of partitions to install.

8.13 CTWRKKEY, Work with license keys

The CTWRKKEY command is used to work with the list of license keys, and display their status.

The command parameters are as follows:

This command has no parameters.

Using the command:

The command displays the following screen :

```

CTWRKKEY                                Work with license keys                                M81DEV
                                                                                               20/08/18 16:41:30

Enter your options, then press Enter

The following list gives the license keys for product Control for i.
They will be used in this order for the controls.

Sequence                                If *TEMP
Number      License key                Type      Valid date
  10      362 677 538 868 455      *PERM
  20      123 456 789 012 345      *ERROR
  30      123 456 789 012 345      *ERROR
  40      323 456 789 012 345      *ERROR
  50      789 456 123 789 456      *ERROR
  60      *NONE

F3=Exit   F5=Refresh   F12=Cancel
  
```

The Control For i product is licensed by M81. Its use is protected by a license key.

The key has 15 digits.

The CTADDKEY command is used to enter the key provided by M81.

The product allows to enter until 6 license keys. This allows for example to enter the key that will be used on the production partition in first position, then to enter the key that will be used on a DRP partition (Metro mirror, High Availability product, ...) in second position.

In case of disaster and activation of the switch procedure to the DRP partition, the license key for Control for I will already be entered and active.

This can also be used when using LPM (Live Partition Mobility), or when migrating to a new server. For example.

The list displays all known license keys (entered by CTADDKEY command).

The first valid key is used to activate the Control for i product.

The columns have the following meanings:

Sequence number = Order number for key control
 License key = Value of the license key
 Type = Type of key

Valid date *PERM = Permanent key for this partition
 *TEMP = Temporary key for this partition
 *ERROR = Invalid key for this partition
 = Validity limit date for a temporary key

The type of key indicated is only available for the current partition.
 *ERROR means that the key is not valid for the current partition. But it could be valid for another partition.

Possible inputs:

It's possible to change the order for the keys, for them to be controlled in a different order.

Function keys

F3 = Exit the screen

F5 = Update the values

F12 = Exit the screen

8.14 CTDSPINF, Display information relating to the license

The CTDSPINF command displays a message containing minimal information enabling the license key for the Control For i product to be generated.

The command parameters are as follows:

```

                                Display product info (CTDSPINF)

Specify your choices then press Enter.

Product name . . . . . PRD                CONTROL4I
```

Description of parameters:

PRD Product name

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| GEN0005 | 0 | System name = &1, Partition = &3, Serial no. = &2, Model = &10, Product key &4 = &5, Version = &6, Generation date = &7/&8/&9 |

Using the command:

The Control For i product is licensed by M81. Its use is protected by a license key. The CTDSPINF command is used to display a message (at the bottom of the screen) containing the information required to generate the license key. Send this information to M81 to receive a product key in return.

Example of a message received when using this command (press F1 on the message displayed at the bottom of the screen):

```

Additional Message Information

Message ID . . . . . : GEN0005
Date sent . . . . . : 22/11/17      Time sent . . . . . : 16:04:41

Message . . . . . : System name = M81FLASH, Partition = 004, Serial N° =
4412345, Model = E4A, CONTROL4I product key = 501639503586167, Version =
V02, Generation date = 17/10/24

```

8.15 CTPARAM, Manage the product parameters

The CTPARAM command is used to manage the parameters used by the Control For i product.

The command parameters are as follows:

This command has no parameters.

Using the command:

Some of the commands delivered with this product may call parameters. The CTPARAM command is used to manage these parameters.

It is an interactive command which displays the following screen:

```

CTRADS00                      Select a parameter                      M81DEV
                                22/11/17 17:28:08

Position to . . . . .

Specify your options then press Enter
1=Select

Opt Radical      Description
  ACTIONS        Automatic jobs
  AUTOMATE        Time for automatic operations
  COMMAND         Thread incompatible commands
  CTCHKPRB        List source code to omit
  DIRECTORY        Product Directory
  EXTINFO         Extended information
  IPLIST          Authorized IP address
  MIMIXAUDIT      MIMIX Statuses
  MONSVR          Monitoring server
  M3SERVER        M3 servers
  PORT            IP port for communication

```

```

RESTART      Restart time period
RMTIPLIST    IP remote partitions

F3=Exit     F5=Refresh    F12=Cancel

Bottom
  
```

Type option 1 before the parameter to change.

8.15.1 ACTIONS parameter: Automatic jobs

This parameter is used to indicate the list of jobs to perform regularly and automatically.

The list of automatic actions is displayed.

```

FLACTS01          Work with actions          M81FLASH
                                           12/05/19 12:38:30

Position to . . . . .

Enter your options, then press Enter
  2=Change  4=Delete  5=Display

Opt Action      Description                               Next start
                                           Date      Time
CLR_HST         Historical data cleanup          12/05/19  18:00
RTVLIB          Collect libraries size          12/05/19  19:00

                                           End

F3=Exit     F5=Refresh    F6=Create    F12=Cancel
  
```

The product comes with 2 automatic actions CLR_HST and RTVLIB.

- CLR_HST Action cleans the internal tables of the product every day. This job is very fast and uses very few resources.
- RTVLIB action looks for information about libraries whose size should be tracked (command CTWRKLIB). This action can be relatively long. It must be submitted (SBMJOB) so as not to disrupt the operation of the CTAUTO job.

Its parameters can be modified by the user.

It is also possible to use this action management to define jobs that will be launched automatically.

```

FLACTS03          Change an action          M81FLASH
                                           12/05/19 12:40:39

Enter your options, then press Enter
  
```

Control for i
Reference document

```

Action name . . . . . CLR_HST                               Name
Action description . . . . . Historical data cleanup
Command to call . . . . . FLCLEAR LOG(60) SLOG(5)

Start time . . . . . 18:00                                0001-2400
Type of frequency . . . . . 1                             0, 1, 2, 3, 4, 9
Frequency type 1 : Some days, every week. Select the days.
                        M T W T F S S
                        Y Y Y Y Y Y Y

Next start date . . . . . 12/05/19

F3=Exit   F4=Prompt   F12=Cancel

```

There are 6 types of trigger frequencies for automatic jobs.
In all cases (except frequency 0), a job will be submitted in the JOBQ FLASH4I at the time indicated in the parameter "Start time"

Frequency type 0: Action held.
The action will not be performed. Only the definition is kept for later use.

```

Type of frequency . . . . . 0                               0, 1, 2, 3, 4, 9
Frequency type 0 : Action held.

Next start day . . . . . 99/99/99

```

Frequency type 1: Daily.
The action will be performed every day of the week where a Y is entered.

```

Type of frequency . . . . . 1                               0, 1, 2, 3, 4, 9
Frequency type 1 : Some days, every week. Select the days.
                        M T W T F S S
                        Y Y Y Y Y Y Y

Next start date . . . . . 12/05/19

```

Frequency type 2: One day in the month, at the indicated date.
The action will be performed one day in the month.

```

Type of frequency . . . . . 2                               0, 1, 2, 3, 4, 9
Frequency type 2 : The Xth day of every months
                    Choose the day number in the month
                    The job will start the 12 of every month

Next start day . . . . . 12/05/19

```

Frequency type 3: One day in the month.
The action will be performed one day in the month the first day that will be Monday, Tuesday, ...

```

Type of frequency . . . . . 3                               0, 1, 2, 3, 4, 9
Frequency type 3 : The first XXX of every month (XXX=Monday, Tuesday, ...)
                    Choose the day 1 (1=Monday, 2=Tuesday, ...)

```

```

The job will start the first Monday of every month
Next start day . . . . . 3/06/19

```

Frequency type 4: Last day of the month.

```

Type of frequency . . . . . 4 0, 1, 2, 3, 4, 9
Frequency type 4 : End of the month. This action will start the last day of
every month.
Next start day . . . . . 31/05/19

```

Frequency type 9: Only once.

The action will run only once, at the entered date

```

Type of frequency . . . . . 9 0, 1, 2, 3, 4, 9
Frequency type 9 : Action to run once. Enter the date to run this action:
99/99/99
Next start day . . . . . 99/99/99

```

8.15.2 AUTOMATE parameter: Time for automated components

This parameter is used to specify the time (in seconds) used by the CTAUTO job between sending 2 system log extractions (DSPLOG command).

8.15.3 COMMAND parameter: List of commands incompatible with the Threads

This parameter is used to give the list of commands which are incompatible with the threads. The commands appearing in this list will not be executed in a CTAGENT job thread but in a separate, autonomous job. If this list is changed, the agent must be stopped then restarted to take the new list into account.

ATTENTION :

If this list is modified, the agent must be stopped and then restarted to take into account the new list.

8.15.4 CTCHKPRB Parameter: List of SRC codes to be omitted

This parameter lists the SRC codes for which no alert should be generated by the CTCHKPRB command. The parameter must begin with SRC and corresponds to the code indicated in the problem details displayed by the WRKPRB command.

8.15.5 DIRECTORY parameter: Product directory

Specifies the name of the directory used by the Control for i product

By default, this directory is: /Ctl4i

This directory contains

- The plugins that come with the product
- Some temporary files used by the product commands.
- The private and public keys necessary for the communication between the IBM i partition and the monitoring server. These keys are generated by the CTINIT command and are only needed if commands are to be sent to the monitoring server. See more details in chapter “10 Send commands to the monitoring server”

8.15.6 EXTINFO parameter: Extended information

Some messages contain extended data containing additional information from the command being used. These messages are displayed in Nagios-type monitoring servers.

In some monitoring servers, this additional data is not compatible or makes the message longer, which makes it difficult to read.

The EXTINFO parameter allows you to enable or disable extended messages.

Enter *YES to take them into account

Enter *NO to ignore them

8.15.7 IPLIST parameter: List of authorized IP addresses

Indicate the list of IP addresses of the Nagios server(s) which will be authorized to send requests to the agent. This is a protective measure to prevent any user workstation being able to send an order to the agent.

```
CTIPLIST                Change the list of IP addresses                22/11/17
                                                                    17:32:22

Specify your options then press Enter

Parameter . . . . . IPLIST
                                Enter the list of IP addresses of the
                                Nagios servers that are authorized to
                                communicate with this partition

Authorized IP addresses . . *ALL                *ALL, IP Address

F3=Exit   F5=Refresh   F12=Cancel
```

If *ALL is specified, the IP address which sent the request will not be checked.

Up to 6 IP addresses can be entered. All these addresses are authorized to send requests to the agent.

Requests sent from another IP address will be rejected.

The CONTROL4I subsystem must be restarted after changing this parameter.

8.15.8 MIMIXAUDIT parameter: Define statuses recognized as errors

Specify for each status of Mimix audits if it must be considered as an error or not by command CTCHKMMXAU.

```

CTLSTMMXST      Definition of MIMIX states recognized as error      31/05/19
                                                         20:00:27

Type options, press Enter.
List of MIMIX states : allow to define MIMIX states that will be used to
define errors for the command CTCHKMMXAU.

*AUTORCVD . . . *OK          *OK, *ERROR
*COMPACT . . . *OK
*DIFFNORCY . . *ERROR
*DISABLED . . . *OK
*ENDED . . . *ERROR
*FAILED . . . *ERROR
*IGNATR . . . *OK
*IGNOBJ . . . *ERROR
*NEW . . . . *OK
*NODIFF . . . *OK
*NOTRCVD . . . *ERROR
*NOTRUN . . . *ERROR
*QUEUED . . . *OK
*USRRCVD . . . *OK

F3=Exit   F5=Refresh   F10=Default values   F12=Cancel

```

If the second column contains *ERROR, then the status will be considered as an error when the audits will be checked.

If it contains *OK, the status will not be considered as an error.

Those values are valid for every audit, and every DataGroup of Mimix.

The F10 key is used to restore the values as they are when the product is delivered (values indicated in this documentation).

8.15.9 MONSVR parameter: Monitoring server

This parameter is only necessary if commands are to be sent to the monitoring server. See more details in chapter "10 Send commands to the monitoring server"

It contains the list of monitoring servers to which commands will be sent.

The list of defined monitoring servers is displayed.

```

CTWRKSVR                                     Work with Monitoring Servers                                     M81DEV
                                                                                                     3/05/22 18:17:52

Radical . . . . . MONSVR      Monitoring server
Radical description . . . List of servers used for monitoring.
                          To be used by command CTSNDCMD

```

```

Position to . . . . .

Specify your options then press Enter
  2=Change  3=Copy  4=Delete  5=Display

Opt  Name      Type      IP Adress
   TEST      *CENTREON 10.43.43.67

F3=Exit  F5=Refresh  F6=Create  F12=Cancel

```

Bottom

The F6 key is used to define a new entry.
Options 2 and 5 are used to change or view the definition.
Option 4 is used to delete a definition

```

CTWRKSVR2          Create a monitoring server          PROD
                                                           3/05/22 18:23:21

Radical . . . . . MONSVR      Monitoring server
Radical description . . . List of servers used for monitoring.
                           To be used by command CTSNDCMD

Type options, press Enter.

Name . . . . . TEST
Server type . . . . . *CENTREON *CENTREON, *NAGIOS
IP address . . . . . 10.43.43.67
Profile . . . . . control4i
Command file name . . . . /var/lib/centreon-engine/rw/centengine.cmd

F3=Exit  F5=Refresh  12=Cancel

```

The fields have the following meanings:

- Name = Define a name that will be used in the CTSNDCMD command. This name does not correspond to any real element. The user must "invent" this name.
- Server type = Type of the monitoring server used. The possible types are:
*CENTREON = Centreon server
*NAGIOS = Nagios server, or any other server similar to Nagios
- IP address = IP address or DNS name of the monitoring server

Profile = Name of the user profile created on the monitoring server for communications.
Command file name = Name of the file used to submit commands to the monitoring server

8.15.10 M3SERVER parameter: Manage URLs for M3 servers

Specify the list of URL addresses that will enable the Control for i product to retrieve information provided by M3. These addresses are provided by the people responsible for M3.

```

CTM3DFN1          Work with M3 servers url          M81DEV
                                                    22/11/17 17:36:33
Radical . . . . . M3SERVER      M3 servers
Radical description . . . . List of url addresses used to check M3.

Position to . . . . .

Specify your options then press Enter
  2=Change  4=Delete  5=Display  6=Test url

Opt M3 server  Activ Type      Description
COTST1        *YES *APPSTS  Application status
COTST1        *YES *HOSTS   Hosts status
COTST1        *YES *JOBS    Jobs status
COTST1        *YES *NODES   Nodes status
COTST1        *YES *SERVICES Services

                                                    Bottom
F3=Exit  F5=Refresh  F6=Create  F12=Cancel
  
```

If the "Activ" column contains *YES, this indicates that data from the GRID server is being retrieved at regular intervals by the CTAUTO job (by default every 60 seconds) and it is this retrieved data that will be used by the CTM3* control commands.

The value *NO indicates that the definition is present, but no data is extracted from the GRID. These server definitions are not usable by CTM3* commands.

The Active or Inactive status can be changed with the CTM3CHGCOL command. This allows the collection process to be stopped if the GRID server or the ServeView is stopped.

The F6 key is used to define a new entry.

Options 2 and 5 are used to change or view the definition.

Option 6 is used to test the address by querying the entered URL address. The extracted data are displayed.

```

CTM3DFN2          Change a parameter          M81DEV
                                                    22/11/17 17:40:09
Radical . . . . . M3SERVER      M3 servers
Radical description . . . . List of URL addresses used to check M3.

Server name . . . . . COTST1
Server type . . . . . *APPSTS      *JOBS, *APPS, *APPSTS, *HOSTS,
Data format . . . . . *XML          *XML, *JSON
Server description . . Applications status
  
```

```

Data collection activ . *YES
Server URL address . . http://prodM3:26666/monitor

                                Enter a URL address, for example:
                                http://10.1.22.80:23004/grid/nodes

Authentic. on server . . . . . (Optional, Base64 format)
Aggregation of data . . *YES      *YES, *NO (Only for type *JOBS)

F3=Exit   F12=Cancel

```

The fields have the following meanings:

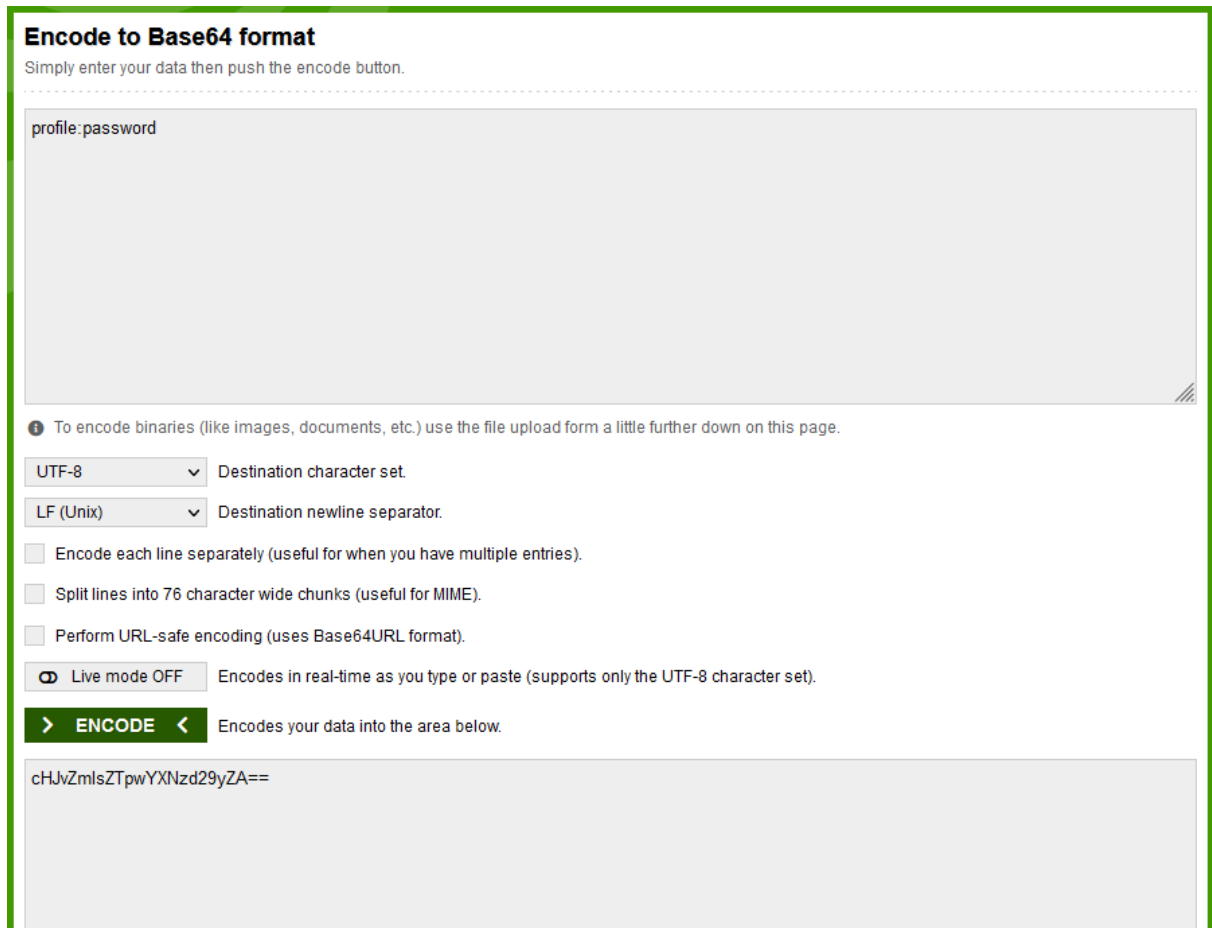
- Server name = Define a name that will be used in the check commands (CTM3xxxxxx). This name does not correspond to a real element. The user must "invent" this name.
- Server type = Type of information to extract. The possible types are as follows:
 - *JOBS (Asynchronous, interactive batch, myjobs)
 - *APPSTS
 - *HOSTS
 - *NODES
 - *SERVICES
- Data format = Starting with version 13.4 of M3, some information is provided in JSON format and some in XML format.
- Server description = Specify a text describing the provenance of the data
- Data collection active = Indicate whether the server definition is active or not. This status can also be changed using the CTM3CHGCOL command.
 - *YES= GRID server data is retrieved at regular intervals by the CTAUTO job (by default every 60 seconds), and it is this retrieved data that will be used by the CTM3* control commands.
 - *NO= the definition is present, but no data is extracted from the GRID. These server definitions are not usable by CTM3* commands.
- Server's URL address = Specify the full URL, starting with http:// or https://. Do not forget to specify the port to use. The extension ".html" must not be specified. For ServerView data, the address must end in /monitor.
- Authentic. on server = Specify the information allowing the authentication on the GRID or ServerView server
 - If no authentication is necessary, (No profile and no password), leave this field empty
 - If an authentication is required, it must be done in "Base 64" format. Follow the procedure below to convert the profile and password to Base 64 and enter the result in this field.
- Aggregation of data = Indicate if the data of type *JOBS must be cumulated to be used by the CTM3JOB2 command. See the documentation for this command for more details.
 - *YES = The data extracted for the *JOBS will be cumulated. This value is only allowed if the server type is *JOBS.
 - *NO = Data will not be aggregated.

To obtain the code in Base64 format, go to <https://www.base64encode.org/>
 Enter the profile and the password separated by ":", like this: profile:password
 Then click on "Encode".

The result for our example profile and password is cHJvZmlsZTpwYXNzd29yZA==
This is the value that must be indicated in the "Authenticate on server" field

If the profile is to reference a domain name, specify the domain name as follows
domain\profile:password

Be case sensitive when typing.



Encode to Base64 format
Simply enter your data then push the encode button.

profile:password

To encode binaries (like images, documents, etc.) use the file upload form a little further down on this page.

UTF-8 Destination character set

LF (Unix) Destination newline separator.

Encode each line separately (useful for when you have multiple entries).

Split lines into 76 character wide chunks (useful for MIME).

Perform URL-safe encoding (uses Base64URL format).

Live mode OFF Encodes in real-time as you type or paste (supports only the UTF-8 character set).

> ENCODE < Encodes your data into the area below.

cHJvZmlsZTpwYXNzd29yZA==

8.15.11 PORT parameter: Port used for communication between Nagios and the agent

This parameter contains the port number that will be used for communication between the check_Control4i plugin and the agent.

The default port is 7357.

If another port needs to be used, it is advisable to change the PORT parameter and change the same information in the check_Control4i_Config file on the Nagios server.

The CONTROL4I subsystem must be restarted after changing this parameter.

8.15.12 RESTART parameter: Restart time period

The CTAGENT job

- Uses threads to call commands sent by Nagios. The number of threads is limited to about 200,000 per job.

- Uses pre-started jobs to call commands that are not compatible with threads. The number of pre-started jobs that the agent can call is limited to about 50,000 per job.

Once these maximum reached, the job will stop, or the pre-started jobs will not start anymore.

In most installations, these maximums are reached after several weeks. A shutdown of the agent (of the CONTROL4I subsystem) once a month or once a week is sufficient.

However, in some cases with a lot of checks being performed by Nagios, these limits can be reached in 2 or 3 days.

To avoid this problem, the agent will automatically shut down and restart after 150,000 threads or 49,000 pre-started jobs. During this restart, it is likely that some checks will be in error because the agent is no longer responding.

The RESTART parameter must contain the time at which this restart is allowed. It will be allowed for 30 minutes from the time entered.

The time must be specified as 6 digits, in the format hhmmss. Leading zeros are not displayed.

For example, the value 20000 means 02h00m00s

8.15.1RMTIPLIST parameter: remote partitions IP address (for PROXY)

The Control for i product allows you to monitor a partition that is not directly accessible to the Nagios server by using another IBM i partition as a proxy partition.

For security reasons, it is necessary to list the partitions for which the remote monitoring function will be used.

This parameter contains the list of IP addresses of the remote partitions for which the local partition will be used as a proxy.

9 Specific probes

Specific probes can be developed and integrated into the product.
The CTEXAMPLE source file, supplied with the product in the CTL4I library, provides a model for this type of development.

9.1 Rules for specific probes

Specific probes must be developed in accordance with certain rules, which are detailed below.

The objects must be in the CTL4IUSR library

- All the objects used for the special probes must be placed in the CTL4IUSR library. The content of this library will not be changed during a Control For i product version change.
- No specific object must be placed in the CTL4I library. The content of this library will be deleted/replaced during a product version change.

Create a command for each probe

- The CALL command cannot be used by the check_Control4i plugin.
- Therefore, a command needs to be created to call the check program that will be created.
- The command and the program should be in the CTL4IUSR library.
- An example of a command is provided in the CTEXAMPLE source file.

The probe result is sent in a message

- The specific program will carry out the check then the result (OK, Warning or Critical) will be sent in a message.
- For a CLP or CLLE type program, the message will be sent with the SNDPGMMSG command.
- It is the message severity that determines the type of response
- A message of each type is provided with the product, with the option to use free text. These messages are in the CTL4I/CTMSGF message file.
 - o CTL1999 Severity 0 message OK
 - o CTL2999 Severity 20 message Warning
 - o CTL3999 Severity 40 message Critical
- These messages can be used by specifying the text to be displayed in the Data part.
- The developer can choose to create his/her own message ID (in a specific message file) to further customize the probes.

The written programs must be compatible with the Threads

- The Control For i agent uses thread technology to run the probes. The developed programs must therefore be compatible with this technology.
- CLLE-type programs must be compatible with the following parameters:
 - o CRTBNDCL DFACTGRP(*NO) ACTGRP(*NEW)
- RPGLE-type programs must have the following H specs:
 - o H ACTGRP(*new) DFACTGRP(*NO)
- Using threads means that the QTEMP library will be common to all the probes being run. If temporary objects need to be created in QTEMP, they must have a different name for each execution. For example by using the thread number in the name.
- The program CTGETTHR can be used to get the current thread number. It must be called with a 8 character long parameter. Hereunder is an example of CLLE program that uses the Thread number to create a Data area.

```
PGM
DCL          VAR(&THREAD) TYPE(*CHAR) LEN(8)
```



```
DCL          VAR(&DTAARA)  TYPE(*CHAR) LEN(10)

CALL        PGM(CTGETTHR) PARM(&THREAD)

CHGVAR     VAR(&DTAARA) VALUE('TP' *CAT &THREAD)
CRTDTAARA  DTAARA(QTEMP/&DTAARA) TYPE(*CHAR) LEN(10)
```

Programs incompatible with the Threads

If one of the programs of the new probe is not compatible with the threads, the command name needs to be added to the COMMAND parameter (use CTPARAM).

The agent needs to be stopped and restarted to recognize the new list.

9.2 Example of specific probe program and command

The Control For i program is supplied with a source file: CTEXAMPLE

This file contains examples of programs or commands which the users can use as a basis for developing their own probes.

In this example, the EXAMPLE_01 command calls the EXAMPLE_02 program.

The aim of this probe is to check the existence of an object by passing the object name, its type and the library it is in as a parameter.

The user can use this example to replace the check object (CHKOBJ command) with their own check program.

EXAMPLE 01: command source

```
CMD          PROMPT('Example, Check object exists')

PARM        KWD(OBJ) TYPE(*CNAME) LEN(10) MIN(1) +
            PROMPT('Object name')

PARM        KWD(LIB) TYPE(*CNAME) LEN(10) MIN(1) +
            PROMPT('Library name')

PARM        KWD(OBJTYPE) TYPE(*CHAR) LEN(7) MIN(1) +
            PROMPT('Object type')
```

This source simply provides an example of a command to users who are not used to this type of source.

In our case, there are 3 parameters (OBJ, LIB and OBJTYPE), but it is not mandatory to create commands with parameters (if the called program does not need parameters).

EXAMPLE 02: program source

```
/*
/*          Example program for Control For i          */
/*          -----          */
/* Program   : Example_02          */
/* Description : Base program to create a specific check.          */
/*          */
/* Parameters : &OBJ      (In ) Object name          */
/*          &LIB      (In ) Library name          */
```

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```

/*          &OBJTYPE (In ) object type          */
/*          */
/* This program provides an example for the customer to create a specific */
/* check.                                         */
/* It checks if the objects passed as a parameter exist.          */
/* To create a specific check, the customer needs to replace      */
/* the CHKOBJ command with their own program          */
/*          */
/* The result of the test must be sent using messages:          */
/* CTL1999 - Result is OK          */
/* CTL2999 - Result is Warning          */
/* CTL3999 - Result is Critical          */
/*          */
/* This program must be compiled in library CONTROLSPE with      */
/* the following parameters:          */
/* CRTBNDCL DFTACTGRP(*NO) ACTGRP(*NEW)          */
/*          */
/* Copyright M81, 2017          */
/*****

                PGM                PARM(&OBJ &LIB &OBJTYPE)

/* ***** */
/*          Variables for this example          */
/* ***** */
                DCL                VAR(&OBJ)                TYPE(*CHAR) LEN(10)
                DCL                VAR(&LIB)                TYPE(*CHAR) LEN(10)
                DCL                VAR(&OBJTYPE)            TYPE(*CHAR) LEN(7)

/* ***** */
/*          Program start          */
/* ***** */

                /* ***** */
                /* Check if the object exists          */
                /* ***** */

                CHKOBJ                OBJ(&LIB/&OBJ) OBJTYPE(&OBJTYPE)
                MONMSG                MSGID(CPF9801 CPF9810) EXEC(DO)
                        SNDPGMMSG    MSGID(CTL3999) MSGF(CTMSGF) MSGDTA('Object +
                                or library doesn't exist') +
                                TOPGMQ(*PRV) MSGTYPE(*ESCAPE)
                GOTO                CMDLBL(ENDPGM)
                ENDDO
                MONMSG                MSGID(CPF0000) EXEC(DO)
                        SNDPGMMSG    MSGID(CTL3999) MSGF(CTMSGF) +
                                MSGDTA('Unexpected error occurred') +
                                TOPGMQ(*PRV) MSGTYPE(*ESCAPE)
                GOTO                CMDLBL(ENDPGM)
                ENDDO

```

```

/* ***** */
/* No error. The object exists */
/* ***** */

        SNDPGMMSG MSGID(CTL1999) MSGF(CTMSGF) MSGDTA('The +
                object exist') TOPGMQ(*PRV) MSGTYPE(*COMP)

/* ***** */
/*          Program end */
/* ***** */

ENDPGM:      ENDPGM

```

EXAMPLE 04: program source SQLRPGLE

This is an example of RPGLE program using an SQL query.
Use this example when a specific probe must be done by using an SQL query.
Replace the SQL query in this example and the following test.

```

h ACTGRP(*new) DFTACTGRP(*NO)
h COPYRIGHT('Copyright M81, 2022')
h BNDDIR('QUSAPIBD')

//*****
//          Example program for Control4i
//          -----
// Program      : Example_04
// Description  : Base program to create a specific check based on
//                an SQL statement.
//
// Parameters   : None
//
// This program gives an example for customer to create a specific
// check.
// It controls if there are records in the table CTLOGP (an internal
// table of Control for i) where field LTYPE contains 'ERR'.
//
// To create a specific control, the customer has to replace
// the SQL query by his own query, and adapt the tests.
//
// The result of the test must be sent by using messages :
//   CTL1999 - Result is OK
//   CTL2999 - Result is Warning
//   CTL3999 - Result is Critical
//
//
// This program must be compiled in library CTL4IUSR
//
//
// Copyright M81, 2022
//*****

D EXAMPLE_04      PR

D EXAMPLE_04      PI

```

```

// Send a program message
D QMHSNDPDM          PR                EXTPGM('QMHSNDPDM')
D MSGID              7                CONST
D MSGF              20                CONST
D DATA             1000              CONST OPTIONS(*VARSIZE)
D DATALEN          10I 0            CONST
D MSGTYPE           10                CONST
D CSENT            10                CONST
D CSCOUNT           10I 0            CONST
D KEY               4
D ErrDS            15

D SndPgmMsg         PR
D MSGID              7                CONST
D DATA             1000              CONST OPTIONS(*VARSIZE)
D DATALEN          10I 0            CONST
D MSGTYPE           10                CONST
D DESTIN            10                CONST

//*****

// Variables for messages
d Msg_ID            S                  7
d Msg_Dta           S                  1000

d Nb_Errors         s                  10I 0
d Nb_Errors_c       s                  10

//*****

/free

// SQL query
EXEC SQL
  select count(*) into :Nb_Errors
  from CTLOGP
  where LTYPE = 'ERR';

if SQLCODE <> 0;
  Msg_ID = 'CTL3999';
  Msg_Dta = 'Error found in SQL statement';
  SndPgmMsg(Msg_ID:Msg_Dta:1000:'*ESCAPE': '*PRV');
else;
  if Nb_Errors <> 0;
    Nb_Errors_c = %char(Nb_Errors);
    Msg_ID = 'CTL3999';
    Msg_Dta = %trim(Nb_Errors_c) +
              ' Error messages found in file CTLOGP';
    SndPgmMsg(Msg_ID:Msg_Dta:1000:'*ESCAPE': '*PRV');
  else;
    Msg_ID = 'CTL1999';
    Msg_Dta = 'No error found';
    SndPgmMsg(Msg_ID:Msg_Dta:1000:'*COMP': '*PRV');
  ENDIF;
ENDIF;

*inlr = *on;

```

```

/end-free

// *****
//      Send a program message
// *****
P SndPgmMsg      B

D SndPgmMsg      PI
D MSGID          7      CONST
D DATA          1000   CONST options(*varsize)
D DATALEN       10I 0  CONST
D MSGTYPE        10     CONST
D DESTIN         10     CONST

D ErrDS          DS          Qualified
D BPr            10I 0  inz(%size(ErrDS))
D BAv            10I 0
D MSGID          7

D KEY            S          4
D CSCOUNT        S          10I 0

/free
  if DESTIN = '*PRV' ;
    CSCOUNT = 1;
  else ;
    CSCOUNT = 0;
  endif ;

  QMHSNDPM(MSGID:'CTMSGF *LIBL':DATA:DATALEN:MSGTYPE:
    '*PGMBDY':CSCOUNT:KEY:ErrDS);

/end-free
P SndPgmmsg      E

```

10 Send commands to the monitoring server

It is possible to send commands from the IBM i partition to the monitoring server (Nagios).

The accepted commands are the following:

- ENABLE_SVC_CHECK Enable a service
- DISABLE_SVC_CHECK Disable a service

This functionality is not available for all monitoring products. It is currently enabled for the following products:

- Nagios
- Centréon

It should work for all products that run on the same model as Nagios, but each user will need to validate it with the product they are using.

If your server has a specific configuration, please send this information to support@m81.eu so that we can update this documentation.

10.1 Configuration

The operations described below must be performed when the product is first configured.

They do not have to be performed when changing the version of the product.

10.1.1 Important note

The documentation below describes the operations to be performed so that an IBM i partition can connect to a monitoring server in order to launch commands.

Before starting, it is important to ask yourself how many IBM i partitions will use this function, and what type of security should be used. On these choices will depend certain operations to be performed, or the choice of names to be used.

This choice has no impact on the operating mode. It is only a choice concerning security.

A single IBM i partition

If only one IBM i partition is to use this function, there are no special precautions to be taken, and no special rules to be applied in the choice of names.

Multiple independent IBM i partitions

In this case, the goal is that each partition has its own rsa security key, and its own account to connect to the monitoring server.

- The CTINIT command must be used on each partition to generate a different rsa key
- On the monitoring server, an account must be created for each partition. For example, include the name of the partition in the account name as "control4i_PROD".
- The following procedure must be followed in full for all partitions

Multiple IBM i partitions with a single rsa key

In this case, only one configuration should be created on the monitoring server, and the same one should be used on all IBM i partitions.

- The installation described below must be performed in full for the first partition
- For the account on the monitoring server, use a generic name such as "control4i". This same account will be used for all IBM i partitions
- The rsa key generated on the first partition must be saved and restored on the other partitions
 - o Use the following procedure:

On the first partition installed

```
Save the rsa key
CRTSAVF FILE(CTL4IUSR/RSAKEY)
SAV DEV('/qsys.lib/CTL4IUSR.lib/RSAKEY.file') OBJ('/Ctl4i/ld_rsa*')
```

On the other partitions

```
Restore the rsa key
RST DEV('/qsys.lib/CTL4IUSR.lib/RSAKEY.file') OBJ('/Ctl4i/ld_rsa*')
```

```
Initialize the function without recreating the key
CTINIT RENEWSSH(*NO)
```

Test communication

Follow the instructions in the chapter “10.1.6 Test from IBM i partition”

Create the parameter

Follow the instructions in the chapter “10.1.7 Define the monitoring server in the parameters”

10.1.2 Names used in this documentation

Each monitoring server may have different file or directory names. You need to find out about this specific information.

If your server has a specific configuration, please send this information to support@m81.eu so that we can update this documentation.

The example below is for a Centreon version 19 server.

Some names are used as examples. They must be replaced by the user's names. Where possible, names used as examples have been underlined>.

| | |
|--|---|
| Monitoring server | Centreon version 19 |
| IBM i partition name | PROD |
| File containing the configuration of the monitoring server | <u>/etc/centreon-engine/centengine.cfg</u> |
| Name of the command file | <u>/var/lib/centreon-engine/rw/centengine.cmd</u> |
| Group owner of the command file | centreon-engine |
| Account created on the monitoring server to communicate from the IBM i partition | control4i_prod |
| IP address of the monitoring server | 10.43.43.67 |

10.1.3 Generate an rsa key

Use the following command:

```
CTINIT DIR(*DFT)
RSAKEY(*DFT)
```

The completion message is:

```
Installation of the Control for i product done correctly
```

The default values are as follows:

- The default directory is /Ctl4i
- The size of the ssh key depends on the IBM i version used

The command performs the following operations:

- Creation of the default directory (if it does not exist)
- Generation of the ssh key pair in the product directory. If these keys already exist, they are not modified.
- Creation of the directory /home/USER (USER being the name of the profile that performs this initialization)

Import the public key that was created from the Production partition to the PC that is performing the installation. Use FTP for example.

The file to transfer is: /Ctl4i/id_rsa.pub.Ctl4i.PROD

On the PC, type the following commands:

```
ftp Address-IP-Partition  
  
bin  
get /Ctl4i/id_rsa.pub.Ctl4i.PROD C:\temp\id_rsa.pub.Ctl4i.PROD
```

10.1.4 Check the information on the monitoring server

It is necessary to check that the monitoring server is set up to allow remote execution of commands, and certain information must be noted because it will be necessary to set up Control for i.

The Centreon configuration data are in the [/etc/centreon-engine/](#)directory.
The file containing the general config is [/etc/centreon-engine/centengine.cfg](#)

Open this file with an editor or use for example WinSCP.

Check the following parameters

Allow external commands:

check_external_commands=1

Check the delay between 2 external commands. For example:

command_check_interval=1s

Check the location of the order file

command_file=[/var/lib/centreon-engine/rw/centengine.cmd](#)

⇒ Note this name, it will be necessary in the setting of Control for i.

Search for the name of the group that owns the command file
With WinSCP :

| /var/lib/centreon-engine/rw/ | | | | | |
|------------------------------|--------|----------------------|-----------|-----------------|--|
| Nom | Taille | Date de modification | Droits | Propriétaire | |
| centengine.cmd | 0 KB | 10/05/2022 14:58:11 | rw-rw-r-- | centreon-engine | |

On the command line:

```
[root@demo-centreon control4i_prod]# ls /var/lib/centreon-engine/rw -al
total 8
drwxrwxr-x. 2 centreon-engine centreon-engine 4096 Apr 1 19:21 .
drwxrwxr-x. 4 centreon-engine centreon-engine 4096 Nov 12 11:02 .
prw-rw-r-- 1 centreon-engine centreon-engine 0 May 10 14:58 centengine.cmd
[root@demo-centreon control4i_prod]#
```

In our example, the owner group is centreon-engine

⇒ Note this name, it will be necessary in the setting of Control for i.

10.1.5 Create a profile on the monitoring server

Create a user account that will be used to log in from the IBM i partition.

Use putty, or a similar product, to open an ssh connection to the monitoring server.
Log in using the root account.

```
[root@demo-centreon ~]# useradd control4i_prod
```

Add the new user account to the owner group that was found in the previous step (in our example "centreon-engine")

```
[root@demo-centreon ~]# usermod -G centreon-engine control4i_prod
```

Copy the file containing the public key generated earlier to the monitoring server.

Using WinSCP for example

Copy the public key in the /home/control4i_prod directory

Create the configuration so that the new account can use ssh with this key

```
[root@demo-centreon ~]# mkdir /home/control4i_prod/.ssh

[root@demo-centreon ~]# cat /home/control4i_prod/id_rsa.pub.Ctl4i.PROD >>
/home/control4i_prod/.ssh/authorized_keys
```

10.1.6 Test from IBM i partition

From a 5250 session on the IBM i partition, test the communication.

```
QSH
> ssh -i /Ctl4i/id_rsa control4i_prod@10.43.43.67
tcgetattr: Invalid argument
[control4i_prod@demo-centreon ~]$.
```

The connection is established
Check using for example the ls command, then quit

```
> ls
ls
id_rsa.pub.Ctl4i.PROD
[control4i_prod@demo-centreon ~]$.
> exit
exit
logout
Connection to 10.43.43.67 closed.
$
```

10.1.7 Define the monitoring server in the parameters

Create a monitoring server definition in the Control for i settings. It will contain all the information needed to connect to the server, and will be used in the CTSNDCMD command.

Use the CTPARAM command to create the monitoring server definition.

Enter option 1 in front of "MONSVR Monitoring Servers"

Press F6 to create a new definition.

```
CTWRKSVR2 Modify a M81DEV Monitoring Server                                     3/05/22 18:18:08

Radical . . . . . MONSVR Monitoring Servers
Radical description . List of servers used for monitoring.
                        To be used with the CTSNDCMD command.

Specify your options, then press Enter.

Name . . . . . TEST
Server type . . . . . *CENTREON *CENTREON, *NAGIOS
IP address . . . . . 10.43.43.67
Profile . . . . . control4i_prod
Command file name . . /var/lib/centreon-engine/rw/centengine.cmd
```

F3=Exit F5=Display F12=Cancel

Warning:
All names are case sensitive.

10.1.8 Send a first order to test

Use the CTSNDCMD command to do a first test and validate the correct operation.

On the monitoring server interface, look for a service that can be temporarily disabled.

- Specify the host and service name in the CTSNDCMD command with the COMMAND(DISABLE_SVC_CHECK) parameter.
- Check after a few seconds or minutes (depending on the settings) that the service has been switched to Disabled
- Use the command again with the parameter COMMAND(ENABLE_SVC_CHECK)

10.2 CTINIT, Initialize the product

The CTINIT command is used to initialize or reinitialize the Control for i product.

This operation is only necessary to allow instructions to be sent to the monitoring server (Nagios) using the CTSNDCMD command.

It should not be used when changing the version of the product.

The command parameters are as follows:

```

Control for i Initialization (CTINIT)

Type choices, press Enter.

Directory . . . . . DIR          *CURRENT

ssh key size . . . . . RSAKEY    > *DFT
Recreate ssh key if exist . . . RENEWSSH > *YES
  
```

Description of parameters:

- | | |
|----------|--|
| DIR | Name of the directory that will be used by the product *DFT = The "/Ctl4i" default directory will be used *CURRENT = Indicates that the previously specified directory will be kept. This value cannot be used when installing the product for the first time. |
| RSAKEY | Enter the size of the rsa key for every ssh communications. The size of the rsa key may be changed in order to be compatible with old versions of Linux server for example. *DFT = The default size used the IBM i system is used 2048 = The rsa key will use 2048 bits 3096 = The rsa key will use 3096 bits |
| RENEWSSH | Specify whether the rsa / ssh key should be recreated if it exists. *YES = If an rsa key already exists, it will be replaced. The old key is not deleted. It is renamed by adding the date and time in the name. |

*NO = If an rsa key already exists, it will not be replaced.

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|--|
| CTL0851 | 40 | Error when creating the private key |
| CTL0852 | 0 | Private key created |
| CTL0853 | 40 | Error when creating directory &1 |
| CTL0854 | 0 | Directory &1 created |
| CTL0855 | 0 | The private key already exists. It is kept |
| CTL0857 | 0 | Public key renamed &1 |
| CTL0869 | 0 | Flash4i product correctly installed |
| CTL6001 | 40 | Parameter &1/&2/&3 does not exist. Initial installation has not been carried out |
| CTL6002 | 40 | Error when updating parameter &1/&2/&3 |

Using the command:

This command is used to initialize elements that will be necessary to send instructions to the monitoring server (Nagios) using command CTSNDCMD.

It must be run once when the product is installed.

It can be rerun later to reset, or change the following:

- Generate a new rsa / ssh key

The command performs the following operations:

- Creates the default directory (if it doesn't already exist)
- Generates the pair of ssh keys in the product directory. If these keys already exist, they are not modified.
- Creates the /home/USER directory (USER being the name passed as a parameter)

10.3 CTSNDCMD, send a command to the monitoring server

The CTSNDCMD command allows you to enable or disable a service defined on a monitoring server (Nagios or compatible).

The parameters of the command are as follows:

```

Send command monitoring serv. (CTSNDCMD)

Type choices, press Enter.

Monitoring server . . . . . MONSVR
Command . . . . . COMMAND
Host . . . . . HOST

Service . . . . . SERVICE
  
```

Parameter Description:

| | |
|---------|---|
| MONSVR | Name of the monitoring server. This definition must have been created in the CTPARAM command, MONSVR parameter. |
| COMMAND | Command to send to the monitoring server. ENABLE_SVC_CHECK = Enable a service DISABLE_SVC_CHECK = Disable a service |
| HOST | Name of the host for which a service must be enabled or disabled. The host name must exist on the monitoring server. Be case sensitive. |
| SERVICE | Name of the service that should be enabled or disabled. The service name must exist on the monitoring server. Be case sensitive. |

This command generates the following messages in return:

| Message ID | Severity | Message text |
|------------|----------|---|
| CTL0052 | 40 | The parameter &1 / &2 is not correctly filled in. Use the CTPARAM command and enter a correct value |
| CTL0381 | 40 | Monitoring server &1 does not exist in the MONSVR parameter. |
| CTL0382 | 40 | Error when connecting to the Monitoring server &1 |
| CTL0383 | 40 | Service &1 not found for host &2. |
| CTL0384 | 0 | OK, command sent to the monitoring server &1. |

Use of the command:

This command allows you to send a command to a monitoring server to enable or disable a particular service.

The configuration of this function must be done correctly and completely before you can use this command.

This command only works for Nagios or compatible monitoring servers.

No validity check of host or service names is performed by the command, except for Centreon servers.

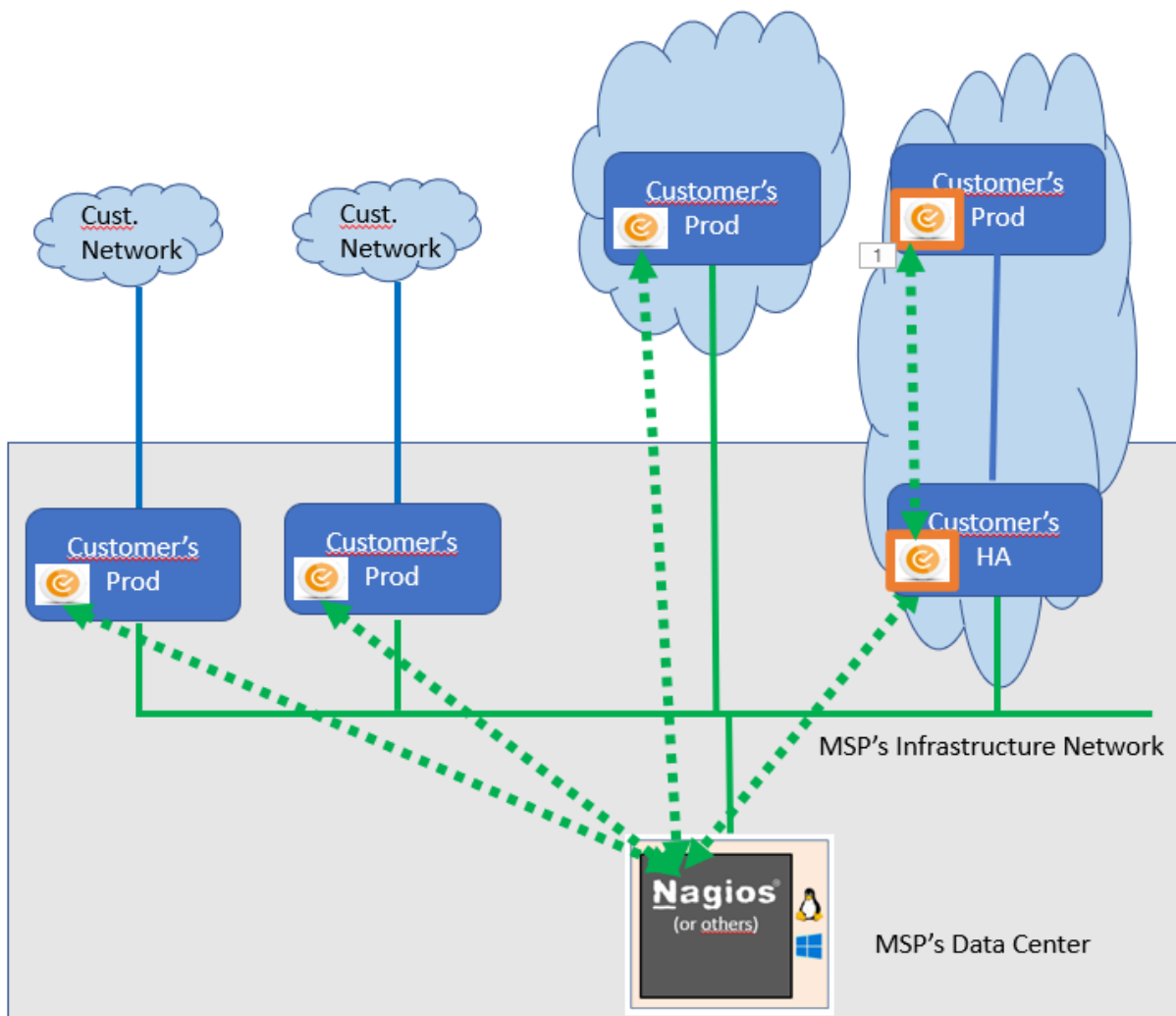
There may be a delay between the use of this command and its acceptance by the monitoring server. This depends on the value of the "command_check_interval" parameter in the monitoring server configuration file.

11 Using a Proxy partition

11.1 Principle

11.1.1 Statement

Monitoring products such as Nagios, for example, are designed to have access to the IP address of all the elements being monitored. This is the case in the vast majority of cases. But it happens with some MSPs that this is not possible. For example, in the example described in the right part of the diagram below.



The green line at the bottom represents the local network of the MSP that is in charge of monitoring the servers. It is called the infrastructure network and provides access to all servers and IBM i partitions that are hosted at the MSP's DC.

In the case of the rightmost partition, the HA partition is hosted at the MSP, and is therefore accessible. But the corresponding Production partition is hosted by the customer.

The only link between these 2 partitions is a network link from the customer.

There is no link between the MSP's infrastructure network and the customer's production partition, except when using the HA partition as a rebound.

This is sufficient for most maintenance operations on the production partition (5250 or FTP access from the HA partition), but not for the automatic monitoring performed by Nagios.

To overcome this drawback, Control for i allows you to use a partition as a "Proxy partition" or intermediate partition. The operating mode is as follows:

- Control for i is installed as standard on the 2 partitions
 - o The local partition which will be used as a Proxy
 - o The remote partition that is to be checked and to which Nagios does not have access.
- On the Nagios server, the specific `check_Control4i_remote` plugin will be used
 - o The `-H` parameter must contain the IP address of the Proxy partition
 - o The `-i` parameter must contain the IP address of the remote partition

11.2 Configuration

11.2.1 On the remote partition (partition to be monitored)

The Control for i product must be installed in the usual way, without any special settings, and the agent started. There is no minimum version required.

If the control of authorized IP addresses is set (CTPARAM command, IPLIST parameter) the IP address of the Proxy partition must be indicated, because it is the one that will communicate with the agent.

The IP port used between the Proxy partition and the remote partition is the same as the one used by the plugin. By default, the port is 7357.

If this value is changed, it must be the same for all controls in the plugin, on the Proxy partition and on the remote partition.

11.2.2 On the Proxy partition

The Control for i product must be installed in the usual way, without any particular setting. The minimum version is V3 - 2022 07 20

The list of remote partitions to which Control for i will be allowed to send requests must be entered. Use the CTPARAM command, then select the RMTIPLIST parameter.

Press F6 to add the list of all remote partitions.

11.2.3 Specific plugin

An additional plugin is delivered with the product. As for the standard plugin, it is delivered in 3 copies, depending on the type of monitoring product used.

The `check_Control4i_zabbix_remote` plugin must be used if the monitoring tool is Zabbix

The `check_Control4i_prtg_remote.exe` plugin must be used if the monitoring tool is PRTG (Windows system)

The `check_Control4i_remote` plugin must be used in all other cases (Linux system)

Note that the standard plugin and the configuration file must also be installed on the monitoring server.

The plugin accepts a number of parameters allowing to choose certain options.

The syntax of the plugin is as follows:

```
check -H host -i Remote_IP -c "IBMi_command"
```

`[-p port] [-t timeout] [-u] [-h]`

Meaning of the parameters:

- `-h` : Show help
- `-H`: IP address of the local IBM i host (Proxy partition) that Nagios has direct access to, which will be used as the Proxy partition
- `-i` : IP address of the remote IBM i host (partition to be monitored) on which the command will be run
- `-c` : The command to be executed. It must be surrounded by double quotes.
- `-p` : If the default port 7357 (defined in the configuration file) cannot be used, it is possible to modify the command to indicate which port will be used.
- `-t`: Specify the length of time (in seconds) that the plugin will wait for a response from the host before indicating an error. The default value is 10 seconds.
- `-u` : By default, when the plugin is in error because of a network problem, or because the agent is not responding, the service goes to the "Critical" state. Add the `-u` parameter to make the state "Unknown" (This parameter is not available for PRTG)
- Version (without the sign – in front) : Gives the plugin's version « Version: 3.21 date: 2023-06-01 »

11.3 Verify the correct operation of the plugin

On the remote IBM i partition (to be monitored)

- Check that the CONTROL4I subsystem is active. If it is not, start it with the CTSTRSBS command.

On the local IBM i partition (the Proxy partition)

- Check that the CONTROL4I subsystem is active. If it is not, start it with the CTSTRSBS command.
- Add the IP address of the remote partition in the RMTIPLIST parameter (CTPARAM command)

Open a putty session on the Nagios server (or a DOS access on the PRTG server), then type the following commands

```
# cd /usr/lib/nagios/plugins/  
  
# ./check_Control4i_remote -H x.x.x.x -i y.y.y.y. -c "ctchksbs control4i"  
CTL1015 - Le sous système CONTROL4I est à l'état *RUN
```

-H x.x.x.x represents the IP address of the Proxy partition

-I y.y.y.y represents the IP address of the remote partition to monitor.

If the return message is :

CTL1015 - The CONTROL4I subsystem is in *RUN state

Then the operation of the plugin is validated.

During the very first use, it is possible that there is no response from the IBM i partition. Indeed, when the agent is started (CTAGENT job) the first 3 requests are rejected, for technical reasons.

11.4 Configuration in the monitoring tool

The configuration to be set up in the monitoring tool is a bit unusual, because the server that will be contacted by this tool (the proxy partition) is not the one that will be monitored (the remote partition).

Several options are possible depending on the standards used or the internal preferences of the company.

We propose here a possible solution:

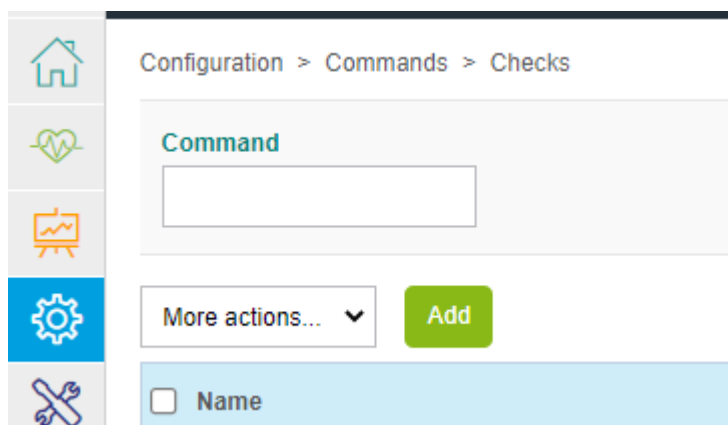
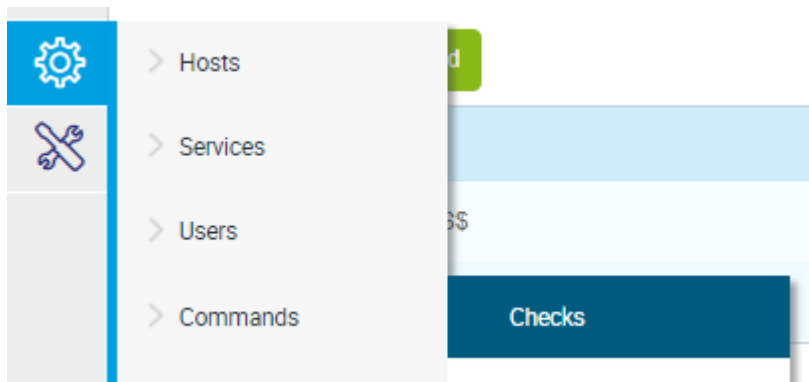
- The Control for i product must be installed and started on both partitions
- It is not mandatory to configure the Proxy partition in Nagios, but it is recommended to verify that it is working properly. In this case, it should be monitored as normal.
- The remote partition to monitor
 - o The remote host (the partition to be monitored) will be defined in the monitoring tool with its real IP address, although it will not be accessible live
 - o Do not ping this partition. This would always be in error.
 - o If Nagios or an equivalent product is used, use the "dummy" plugin, which always answers OK without performing a check.
- Use the plugin whose name ends with _remote to perform the check. See the usage below

11.4.1 Configuration in Nagios and equivalent products

The configuration is similar to the one done for the standard plugin.

Modify the Centreon config to add the definition of this new plugin.

In Centreon, access ► Configuration ► Commands ► Checks



Select "Add" to add a new command

Add the command using the following parameters:

Name: check_Control4i_remote

Command : \$USER1\$/check_Control4i_remote -i \$HOSTADDRESS\$ -c "\$ARG1\$" -H "\$ARG2\$"

For Argument 1, enter the text "IBM i command"

For Argument 2, enter the text "IP address of Proxy partition"

Check

Command Name *

Command Type Notification Check Misc Discovery

Command Line *

```
$USER1$/check_Control4i_remote -i $HOSTADDRESS$ -c "$ARG1$" -H "$ARG2$"
```

Enable shell

Argument Example \$HOSTADDRESS\$

Argument Descriptions
ARG1 : IBM i Command
ARG2 : IP address of Proxy partition

11.4.1 Configuration in PRTG

The configuration is similar to the one done for the standard plugin.

Select the device (remote IBM i partition) where the control must be configured.

Device Partition M81Flash ★★★★☆

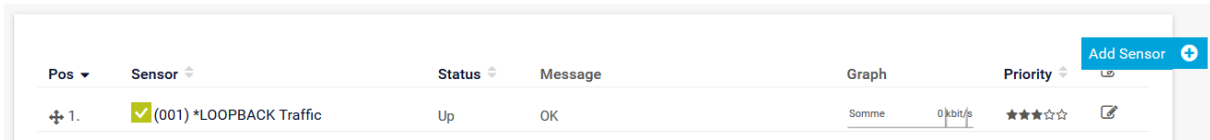
Overview | 2 days | 30 days | 365 days | Alarms | System Information | Log | Settings

To see sensor gauges here, please change the priority of one or more sensors to ★★★★★/★★★★★.

| Pos | Sensor | Status | Message | Graph | Priority |
|-----|----------------------------|--------|---|-----------------|----------|
| 1. | ✓ (001) *LOOPBACK Traffic | Up | OK | Somme 0 kbit/s | ★★★★☆ |
| 2. | ✓ (002) ETHERNET Traffic | Up | OK | Somme 11 kbit/s | ★★★★☆ |
| 3. | ✓ (003) *VIRTUALIP Traffic | Up | OK | Somme 0 kbit/s | ★★★★☆ |
| 4. | ✓ Subsystem QBATCH | Up | CTL1015 - The QBATCH subsystem is in the *... | Status 0 # | ★★★★☆ |
| 5. | ✓ Agent Control for i | Up | CTL1017 - The CONTROL4I subsystem is in th... | Status 0 # | ★★★★☆ |
| 6. | ✓ Disk space | Up | CTL1141 - 30% used on a total of 286 GB | Used 85 GB | ★★★★☆ |

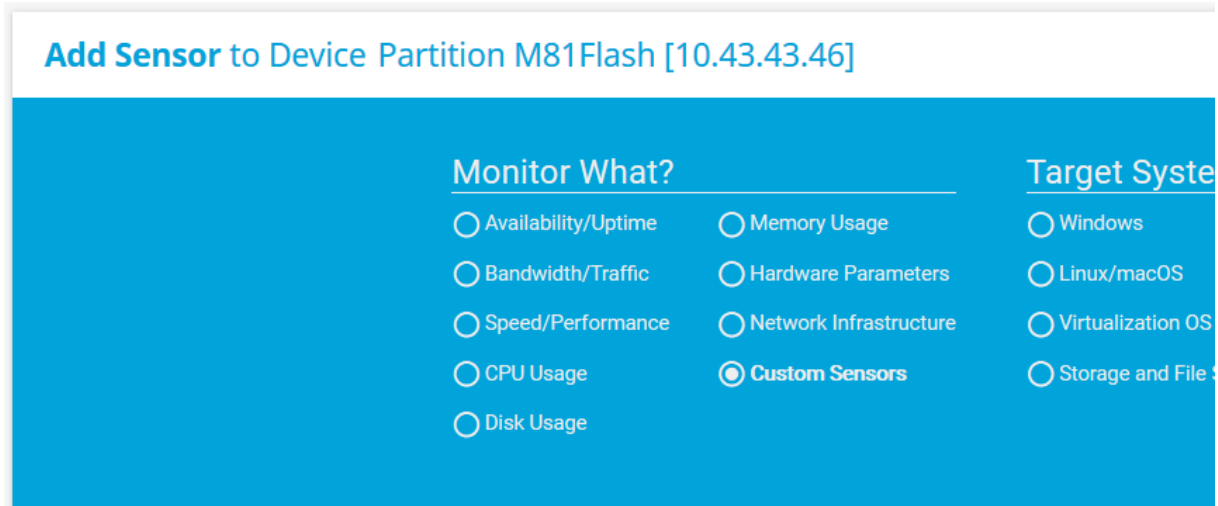
<< < 1 to 6 of 6 > >>

Click the + sign, then "Add Sensor"



| Pos | Sensor | Status | Message | Graph | Priority | |
|-----|---|--------|---------|-------|----------|-------|
| 1. | <input checked="" type="checkbox"/> (001) *LOOPBACK Traffic | Up | OK | Somme | 0kbit/s | ★★★★☆ |

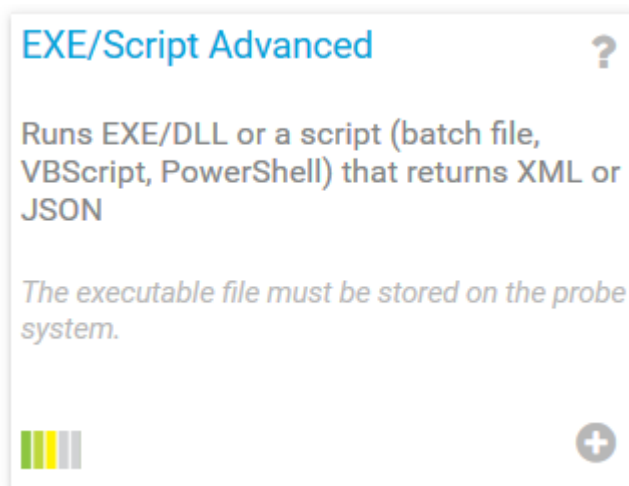
Select « Custom Sensors »



Add Sensor to Device Partition M81Flash [10.43.43.46]

| Monitor What? | Target System |
|---|--|
| <input type="radio"/> Availability/Uptime | <input type="radio"/> Windows |
| <input type="radio"/> Bandwidth/Traffic | <input type="radio"/> Linux/macOS |
| <input type="radio"/> Speed/Performance | <input type="radio"/> Virtualization OS |
| <input type="radio"/> CPU Usage | <input type="radio"/> Storage and File S |
| <input type="radio"/> Disk Usage | |
| <input type="radio"/> Memory Usage | |
| <input type="radio"/> Hardware Parameters | |
| <input type="radio"/> Network Infrastructure | |
| <input checked="" type="radio"/> Custom Sensors | |



Then select “EXE/Script Advanced”



EXE/Script Advanced ?

Runs EXE/DLL or a script (batch file, VBScript, PowerShell) that returns XML or JSON

The executable file must be stored on the probe system.

Enter the name of the new sensor,

Basic Sensor Settings

Sensor Name ⓘ Jobs in MSGW

Parent Tags ⓘ ftp imb-i prod

Tags ⓘ xmlksesensor X +

Priority ⓘ ★★☆☆☆

Then enter the following parameters:

- EXE/Script
 - o Select the script "check_Control4i_prtg_remote.exe"
- Parameters
 - o Enter all the parameters that the script needs
 - o -i %host
 - Gives the IP address of the IBM I partition where the control must be done (the remote partition)
 - o -H x.x.x.x
 - Gives the IP address of the Proxy partition. Replace x.x.x.x by the IP address of the Proxy partition.
 - o -c "IBMi_Command"
 - Keyword -c must be followed by the "Control for i" command to use
 - This command must be entered between double quotes (sign ")

Sensor Settings

The EXE file has to run on the computer where the parent probe is installed, not on the parent device. The working directory for EXE files is the probe directory. .vbs files, .ps1 files, or other script files may use different working directories.

EXE/Script ⓘ check_Control4i_prtg_remote.exe

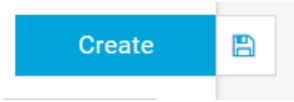
Parameters ⓘ -i %host -H 10.43.43.82 -c CTCHKMSGW

Environment ⓘ Default Environment
 Set placeholders as environment values

Security Context ⓘ Use security context of PRTG probe service
 Use Windows credentials of parent device

The other parameters of this sensor can be changed, they have no relationship with "Control for I"

Then click Create.



12 Centralized update

12.1 How it works

For companies that have a large number of partitions on which the Control for i product is installed, it can be tedious to log on to each partition to install a new version of the product, or to enter a new license key.

Control for i includes two remote update options that meet two different types of needs:

- From an IBM i partition that can connect to the remote IBM i partition to be updated, using the FTP protocol
- From a Windows or Linux PC that can connect to the remote IBM i partition to be updated, using Control for i's standard port: 7357.

The advantages and constraints of each method are different.

Remote upgrade from an IBM i partition

Method available from release 3.20 on 15/02/2023

The upgrade is performed from an IBM i partition on which the Control for i product must be installed (a licence is not required)

Advantages of this method:

- Can be used to perform a remote installation on a partition on which the product is not yet installed.
- Easy to automate for an IBM i specialist

Disadvantages of this method:

- Requires an IBM i partition that can connect to the remote partition (difficult for many MSPs)
- Requires the FTP service to be started on the remote partition, while many companies block this protocol
- Requires a security officer-type profile and password

Remote upgrade from a Windows or Linux PC

Method available from release 3.23 on 10/11/2023

The upgrade is performed from a Windows or Linux PC on which the new program and SAVFs are available.

The advantages of this method:

- Uses the standard Control for i 7357 port. No need for FTP
- Can be used on a PC with VPN access to the remote partition, or from the monitoring server for example.
- No profile or password required
- Secure transfer by checking that the SAVFs are those supplied by M81.

Disadvantages of this method:

- Control for i release 3.23 or later (10/11/2023) must already be installed and active on the remote partition.
- Impossible to install the product remotely for the first time

Comparison of possible operations

| | From IBM i | From Windows or Linux |
|----------------------------------|--|-----------------------|
| Minimum release of Control for i | 3.20 dated 13/02/2023 on the « central » partition | 3.23 dated 10/11/2023 |

| | | |
|---|------------------------------|-------------------------------|
| | None on the remote partition | |
| Minimum IBM i version on remote partition | V7R1 | V7R3 |
| Protocol used | FTP (port 21) | Port 7357 |
| Authentication type | Profile and password | Integrated with Control for i |
| Transfer of SAVF containing Control for i | Yes | Yes |
| Transfer of Licence keys list | Yes | Yes |
| Initial product installation | Yes | No |
| Product upgrade | Yes | Yes |
| Update licence keys | Yes | Yes |
| Check installed version | Yes | Yes |

12.2 Remote upgrade from an IBM i partition

The Control for i release 3.20 product, dated 13/02/2023, must be installed on an IBM i partition that we will call "central".

This central partition must be able to communicate with the remote partition using the FTP protocol. It is not necessary to have a Control for i licence on this partition. The product simply needs to be installed.

Control for i includes a remote update feature, from an IBM i partition where the product is installed, that automatically performs :

- Transfer the SAVF containing the product
- Restore and install the new version (CTRSTPRD command)
- Transfer the list of licence keys
- The addition of the new licence key (CTADDKEY command)

It is possible to perform these 4 operations at once, or to choose one of these operations individually. For example, it is possible to do only the transfer of the SAVF to the partitions, and then choose a time when there are fewer checks to trigger the upgrade of the product.

In addition, the CTRMTCHK command will allow to check remotely the validity date of the license keys.

Both commands perform the requested operations automatically. A message indicates at the end if the command was successful or if there was an error.

This message can be viewed in the job log, or by using the CTDSPLOG command.

During the update on the remote partition, if the product version change is requested, the CONTROL4I subsystem will be automatically stopped and then restarted. The controls will therefore be inactive for the duration of the update.

Caution. In some cases, the shutdown of the subsystem may take up to 2 or 3 minutes. This is particularly true if the controls are written in Java (this is the case for the M3 checks).

12.2.1 Prerequisites

A "central" IBM i partition

This operation must be performed from an IBM i partition.

The Control for i product must be installed on this IBM i partition, but it is not necessary to have a licence. It is sufficient that the product is installed.

This "central" partition must be able to connect to the partitions on which the product will be updated.

Network

The FTP protocol will be used to transfer to the other partitions.

The SAVF containing the version to be installed.

The SAVF containing the version to be installed must be present on this partition.

The SAVF containing the latest version can be downloaded from www.m81.eu. Select INTRANET, then DOWNLOAD.

A user account and password is required. It is possible to obtain one by sending an email request to support@m81.eu.

The file containing the keys

In some cases, the licence keys are temporary and must be renewed every year. It is possible to obtain from M81 (by email to support@m81.eu) a file containing the list of keys for all partitions.

If the licence key on remote partitions is permanent and already entered, this option should not be used.

On remote partitions

The FTP service must be started.

A user profile and password are required to log in.

The profile must have sufficient rights to perform the requested operation:

- For file transfer (TRANSFER parameter), the profile must be allowed to create or delete files in the CTL4IUSR library
- To add the license key (INSTALL(*KEY) parameter), the profile must be able to access the CTL4IUSR files, and use the CTADDKEY command
- To upgrade the product (INSTALL(*PRD) parameter), the profile must be able to create or modify the product's user profiles and use the CTRSTPRD command.

It is not necessary that the Control for i product is already installed on the remote partition. The CTRMTUPD command can be used to install the product. But you will have to log in to set up the automatic start of the subsystem.

If the product is already installed on the remote partition, there is no minimum version to use the CTRMTUPD command.

However, the CTRMTCHK command requires that the version on the clone partition be at least V3 Build 13/02/2023.

12.2.2 Performing multiple transfers automatically

The CTRMTUPD and CTRMTCHK commands allow you to perform operations on one remote partition at a time. In the case where operations need to be performed on a large number of partitions, it is possible to chain them together in a CLP program.

The program below provides an example for this type of chaining.

Example of a CLP pgm

```

PGM          PARM (&PWD)

/* ***** */
/*          Variables for this example          */
/* ***** */

DCL          VAR (&PWD)          TYPE (*CHAR)  LEN (10)
DCL          VAR (&USER)         TYPE (*CHAR)  LEN (10)

DCL          VAR (&COUNT)       TYPE (*DEC)   LEN (5 0)
DCL          VAR (&ERRORS)       TYPE (*DEC)   LEN (5 0)

```


Control for i
Reference document

```

DCL          VAR(&COUNT_C)  TYPE(*CHAR) LEN(5)
DCL          VAR(&ERRORS_C)  TYPE(*CHAR) LEN(5)

/* ***** */
/*      Initialisation      */
/* ***** */

/* ***** */
/* We suppose that the user profile EXPLOIT exist      */
/* on every partition to upgrade, with the same      */
/* password.                                          */
/* The password is passed in parameter to this program. */
/* ***** */
CHGVAR      VAR(&USER) VALUE('EXPLOIT')

CHGVAR      VAR(&COUNT) VALUE(0)
CHGVAR      VAR(&ERRORS) VALUE(0)

/* ***** */
/* Partition XXXX1, IP 10.1.1.29      */
/* ***** */

CHGVAR      VAR(&COUNT) VALUE(&COUNT + 1)
CTRMTUPD    IP('10.1.1.29') USER(&USER) PWD(&PWD) +
            TRANSFER(*ALL) INSTALL(*ALL) MAINLNG(EN) +
            SAVF(QGPL/CONTROL4I) KEYFILE(QGPL/LMKEYDIST)
MONMSG      MSGID(CPF0000 CTL0000) EXEC(DO)
CHGVAR      VAR(&ERRORS) VALUE(&ERRORS + 1)
CHGVAR      VAR(&COUNT) VALUE(&COUNT - 1)
ENDDO

/* ***** */
/* Partition XXXX2, IP 10.1.1.35      */
/* ***** */

CHGVAR      VAR(&COUNT) VALUE(&COUNT + 1)
CTRMTUPD    IP('10.1.1.35') USER(&USER) PWD(&PWD) +
            TRANSFER(*ALL) INSTALL(*ALL) MAINLNG(EN) +
            SAVF(QGPL/CONTROL4I) KEYFILE(QGPL/LMKEYDIST)
MONMSG      MSGID(CPF0000 CTL0000) EXEC(DO)
CHGVAR      VAR(&ERRORS) VALUE(&ERRORS + 1)
CHGVAR      VAR(&COUNT) VALUE(&COUNT - 1)
ENDDO

/* ***** */
/* If no error      */
/* ***** */
IF          COND(&ERRORS = 0) THEN(DO)
CHGVAR      VAR(&COUNT_C) VALUE(&COUNT)
SNDPGMMMSG  MSGID(CPF9898) MSGF(QCPFMSG) MSGDTA(&COUNT_C +
            *CAT ' partitions updated successfully') +
            *CAT ' partitions updated successfully') +
            TOPGMQ(*PRV) MSGTYPE(*COMP)
ENDDO

IF          COND(&ERRORS *NE 0) THEN(DO)
CHGVAR      VAR(&COUNT_C) VALUE(&COUNT)

```

```
CHGVAR      VAR(&ERRORS_C) VALUE(&ERRORS)
SNDPGMMSG   MSGID(CPF9898) MSGF(QCPFMSG) MSGDTA('errors +
           occurred for ' *CAT &ERRORS_C *BCAT +
           'partitions. ' *CAT &COUNT_C *BCAT +
           'partitions updated successfully') +
           TOPGMQ(*PRV) MSGTYPE(*ESCAPE)

          ENDDO

/* ***** */
/*           Program end                               */
/* ***** */

ENDPGM:      ENDPGM
```

12.3 Remote upgrade from a Windows or Linux PC

To enable wider use of the Control for i product distribution and key updates, it is now possible to perform the following operations

- From a Windows or Linux PC
- Using the standard Control for i port 7357, i.e. without using FTP.

This operation requires that at least release 3.23 (10/11/2023) has already been installed on the remote partitions, and that the agent has been started.

The operation will be performed from a Windows or Linux command line using the **M81_RmtUpg** program.

The transfer of SAVF files is secure.

Each SAVF supplied by M81 is associated with a CRC file containing a control key. This ensures that it will not be possible to use the distribution program with another SAVF. For each transfer, it is therefore necessary to obtain both the SAVF and its associated CRC file.

12.3.1 Prerequisites

On the PC which will perform the remote upgrade

The program M81_RmtUpg (for Linux) or M81_RmtUpg.exe (for Windows) must be present.

The PC must be able to connect to the remote partition using port 7357.

The files to be transferred must be present, with the associated CRC files.

On remote partitions

The Control for i product must be installed and operational on the remote partition in version 3.23 of 10/11/2023 or higher.

The agent must be started (CONTROL4I subsystem).

Network

The 7357 port will be used to transfer data to the partitions. This is the same port as the one used for monitoring from the monitoring server.

If a restriction on monitoring IP addresses has been set up (CTPARAM, IPLIST parameter), then the IP address of the PC used for the remote upgrade must be added to this list.

The SAVF containing the version to be installed

The SAVF containing the version to be installed must be present on the PC. It must be accompanied by the corresponding CRC file.

Each CRC file corresponds to one and only one SAVF. You must therefore ensure that you retrieve both files at the same time from www.m81.eu.

The SAVF and its associated CRC containing the latest version can be downloaded from www.m81.eu. Select INTRANET, then DOWNLOAD.

A user account and password are required. You can obtain one by sending a request by email to support@m81.eu.

The file containing the keys

In some cases, licence keys are temporary and must be renewed every year. It is possible to obtain a file containing the list of keys for all partitions from M81 (by email to support@m81.eu).

As with the product's SAVF, this file containing the keys is associated with a CRC file.

If the licence key on the remote partitions is permanent and has already been entered, this option should not be used.

12.3.2 The remote update program from a PC

The M81_RmtUpg program works in the same way under Windows and Linux.

The same program will be used for all operations:

- Transfer of the SAVF for the new version of the product
- Transfer of the list of licence keys
- Change product version
- Add licence keys
- Check installed version.

It is possible to carry out all 4 operations at once (except the version check), or to choose one of these operations individually.

For example, you can only transfer the SAVF to the partitions, and then choose a time when there are fewer checks to trigger the product upgrade.

The program is used on a Windows or Linux command line.

During the upgrade on the remote partition, if the product version change is requested, the CONTROL4I subsystem will be automatically stopped and then restarted. The controls will therefore be inactive for the duration of the update.

Warning. In some cases, shutting down the subsystem can take up to 2 or 3 minutes. Particularly if the controls are written in Java (this is the case for M3 sensors).

The syntax is as follows:

This help text can be obtained by typing the name of the program alone or
M81_RmtUpg -help

```
Usage: M81_RmtUpg -H host [-prdf prdf file] [-prdc prdchk] [-keyf keyfile -keyc  
keychk] [-upgrade [-ml EN|FR] [-sl EN|FR] [-ren YES|NO]] [-applykeys] [-p port]  
[-chkversion] [-debug] [-help]
```

Options:

```
[host]           = The address of the host running the Control for i agent.
```

At least one of the following parameters is mandatory.

Transfer the product's SAVF to the partition.

```
[prdf file]      = Path to product SAVF to be distributed.
```

```
[prdchk]        = Path to check file. Mandatory if -prdf selected.
```

```
Transfer the key's SAVF to the partition.
[keyfile]      = Path to key SAVF to be distributed.
[keychk]       = Path to check file. Mandatory if -keyf selected.

Upgrade the release of Control for i.
[-upgrade]     = The Control for i agent try to install the last
                product SAVF received.
[-ml EN|FR]    = Main language English EN or French FR. No mandatory.
                Default value EN.
[-sl EN|FR]    = Secondary language English EN or French FR. No mandatory.
                Default value NONE.
[-ren YES|NO]  = Rename French message file. No mandatory. Default value NO.

Apply the last key's SAVF transfered to the partition.
[-applykeys]   = The new key will be applied based on the last key file received.

[-chkversion] = Gets the host Control for i agent version.
[port]        = The port on which the agent is running (default=7357).
[-debug]      = Enables debug file.
[-help]       = Print this help.

Examples:
To transfer the product's SAF CONTROL4I.SAVF whose check file is control4i.crc to
the 10.43.43.71 host
M81_RmtUpg -H 10.43.43.71 -prdf CONTROL4I.SAVF -prdc control4i.crc

To transfer the key's SAVF M81KEYS.SAVF whose check file is keys.crc to the
10.43.43.71 host
M81_RmtUpg -H 10.43.43.71 -keysf CONTROL4I.SAVF -keysc keys.crc

To upgrade the release of Control for i (main language English)
and apply the key's SAVF previously transferred in the 10.43.43.71 host
M81_RmtUpg -H 10.43.43.71 -upgrade -ml EN -applykeys
```

12.3.3 12.3.3 How to obtain the components

Below is the procedure for obtaining the items required for a remote upgrade.

Obtain a new product release

- Log on to www.m81.eu, then select Intranet, then Download
- Enter your profile and password.
- Choose the Control for i product.
- Download the SAVFs for the latest release (.zip file)
 - o The .zip file contains both SAVF and the corresponding CRC file.

Obtain the licence key file

The companies concerned by this list of licence keys are those with a large number of licences to manage, and whose keys are temporary. These keys must be changed at least once a year.

Send a request to M81 at support@m81.eu.

2 files will be supplied

- A SAVF containing a list of all the company's keys
- A CRC file needed to transfer the SAVF to the partitions.

Obtaining the distribution program

The M81_RmtUpg program is available on the www.m81.eu website in the same place as the product, in the "M81 Product Distribution" sub-directory.

- M81_RmtUpg.exe for the Windows version
- M81_RmtUpg for the Linux version

12.3.4 Using the distribution program

Preparation

- Create a dedicated directory.
- Place the M81_RmtUpg.exe program in this directory.
- Place the SAVF and CRC files in this same directory
- Access a Windows command line (CMD)

The product is delivered in compressed .zip format. It must first be decompressed to obtain a .savf file.

In the example below, we will use the following names as examples.

- 1.1.1.1 IP address of the remote partition
- Control4i.savf SAVF file containing the version of the product to be installed
- Control4i.crc Control file associated with the product version
- M81keys.savf SAVF file containing a list of all the keys for the company
- M81keys.crc Control file associated with the list of keys

Where items are stored on the remote partition

The transferred items are stored in the CTL4IUSR library, under the following names:

- CONTROL4I *FILE SAVF containing the version of the product transferred by M81_RmtUpg
- CTKEYDIST *FILE SAVF containing the list of keys
- LMKEYDIST *FILE File containing the list of unencrypted keys.

Which jobs do the operations

File reception and restore operations are handled by the agent itself or by one of the CTAGENTSPW jobs. The product upgrade is performed by the CTL4I_UPD job submitted in the QSYSNOMAX JOBQ, in the QSYSWRK subsystem.

Basic operation of the distribution program

For help and a list of parameters

```
M81_RmtUpg -help
```

When it is used, the program will send the following messages in return

At the start of the connection

```
Connected to 1.1.1.1:7357
```

At the end of the connection

```
Disconnected from host
```

In the event of a connection error. For example :

- Wrong IP address
- IP address not accessible
- Agent stopped
- Control for i version prior to 3.23 dated 10/11/2023

```
Unable to connect to server: 1.1.1.1 port: 7357  
Disconnected from host
```

Checking the installed version

This version check can be used even on older versions of Control for i.

```
M81_RmtUpg -H 1.1.1.1 -chkversion  
  
Connected to 1.1.1.1:7357  
  
OGEN0005 - Control for i: System name = PROD, Serial Nb = 7830081, Partition =  
0010, Model = 41G, Version = V03, Generation date = 2023/11/10  
  
Disconnected from host
```

Send the new release without updating

This operation can take a long time (1 to 2 minutes).

```
M81_RmtUpg.exe -H 1.1.1.1 -prdf CONTROL4I.SAVF -prdc CONTROL4I.crc  
  
Connected to 1.1.1.1:7357  
Starting process  
  
Sending file  
0%#####10%#####20%#####30%#####40%#####50%#####60%#####  
##70%#####80%#####90%#####100%  
  
File sent: "CONTROL4I.SAVF"  
Waiting for system response...  
Product Savefile received OK  
  
Disconnected from host
```

Upgrading the product

When requesting an upgrade, you need to specify the following :

- -ml Primary language to be installed: "en" or "fr". "en" by default
- -sl Secondary language to be installed: "en" or "fr". none by default
- -ren Modify French messages to remove accents: "yes" or "no". "default -no

The CONTROL4I sub-system will be automatically stopped and restarted. The controls will therefore be inactive for the duration of the update.

Warning. In some cases, shutting down the subsystem may take up to 2 or 3 minutes. This is particularly the case if the controls are written in Java (this is the case for the sensors for M3).

```
M81_RmtUpg.exe -H 1.1.1.1 -upgrade -ml en -sl fr  
  
Connected to 1.1.1.1:7357  
Starting process  
Starting upgrade, the agent will:  
Stop SBS / Upgrade the product / start SBS  
Waiting for system response.....
```

```
Upgrade ended succesfully, check that all Control for i services are running  
Disconnected from host
```

Send the new release and update at the same time

The 2 operations can be carried out at the same time.

```
M81_RmtUpg.exe -H 1.1.1.1 -prdf CONTROL4I.SAVF -prdc CONTROL4I.crc -upgrade -ml  
en -sl fr
```

Send the list of licence keys and apply them.

This operation is relatively quick.

Only the keys corresponding to the current partition will be added.

```
M81_RmtUpg -H 1.1.1.1 -keyf M81KEYS.SAVF -keyc M81keys.crc -applykeys  
  
Connected to 1.1.1.1:7357  
Starting process  
  
Sending file  
0%#####10%#####20%#####30%#####40%#####50%#####60%#####  
##70%#####80%#####90%#100%  
  
File sent: "M81KEYS.SAVF"  
Waiting for system response...  
License key SAVF received OK  
  
License key file applied OK  
  
Disconnected from host
```

In the event of an error

In the event of an error, an error message is generated.
It will be visible on the PC and should be self-explanatory.

On the remote partition, the CTDSPLOG command will show the history of what has been done and the error in question.

If the problem occurred during the product upgrade, more information can be obtained by consulting the joblog for the CTL4I_UPD job.

12.3.5 History of operations performed on the remote partition

All operations performed on the remote partition are logged in the product's internal log. They can be viewed with the CTDSPLOG command.

12.4 CTRMTUPD: Upgrade Control for i remotely

The CTRMTUPD command allows you to upgrade the Control for i product and add a new license key on a remote partition, from a "central" partition

The command parameters are as follows:

```

Update remote site (CTRMTUPD)

Type choices, press Enter.

IP Address/Name . . . . . IP

Port . . . . . PORT          *DFT
Remote user profile . . . . . USER
Password . . . . . PWD

Transfer . . . . . TRANSFER    *ALL
Install . . . . . INSTALL      *ALL
Main language . . . . . MAINLNG
Secondary languages . . . . . SECLNG    *NONE
                        + for more values
Rename message file (FR) . . . . RNMSGF    *NO
Save file . . . . . SAVF
  Library . . . . .          *LIBL
Key file . . . . . KEYFILE
  Library . . . . .          *LIBL

```

Description of parameters:

| | |
|----------|--|
| IP | IP address or name of the remote partition |
| PORT | Port to use for the FTP connection. *DFT = The default FTP port (21) will be used |
| USER | User profile that will be used to connect to the remote partition. This profile must have sufficient rights to create or modify a user profile, and stop / restart the CONTROL4I subsystem |
| PWD | User profile password |
| TRANSFER | Specify which items should be transferred to the remote partition *ALL = The SAVF and the key file will be transferred *PRODUCT = Only the SAVF containing the new product version will be transferred *KEYFILE = Only the file containing the key list will be transferred *NO = No file will be transferred |
| INSTALL | Indicate if the installation should be done on the remote partition *ALL = The product upgrade will be performed, and the license key will be added *PRD = The product upgrade will be performed from the SAVF *KEY = The key will be added from the key file *NO = No operation will be performed on the remote partition |
| MAINLNG | If the upgrade is to be performed, indicate the main language to be installed. |
| SECLNG | If the upgrade is to be performed, indicate if a secondary language is to be installed. |

| | |
|---------|--|
| RNMMSGF | If the product is installed in French, it is possible to replace messages with accents by messages without accents. *YES = Messages will be replaced by messages without accents *NO = Messages will not be changed. |
| SAVF | Name of the SAVF (on the central partition) containing the new product version |
| KEYFILE | Name of the file (on the central partition) containing the list of license keys. |

Use of the command:

This command allows you to upgrade the version of the Control for i product, and add a license key to a remote partition from a central partition.

This command can be used from a central partition that does not have a license for the Control for i product. It is sufficient that the Control for i product is installed on this partition.

It is not necessary for the Control for i product to already be installed on the remote partition. The CTRMTUPD command can be used to install the product. But you will have to log in to set up the automatic start of the subsystem.

If the product is already installed on the remote partition, there is no minimum version required to use the CTRMTUPD command.

The file indicated in the SAVF parameter must have been retrieved from www.m81.eu beforehand, and placed on the central partition. It contains the new version of the Control for i product that will be installed on the remote partition.

Once transferred to the remote partition, the file will be placed in the CTL4IUSR library, under the name CONTROL4I (regardless of its original name on the central partition).

If the licence key already present on the remote partition is a permanent key, sending a key file should not be used.

If the licence key on the remote partition is to be updated (temporary key) a file containing the licence keys must be requested from M81 by sending a request to support@m81.eu.

The profile specified in the USER parameter must have sufficient rights to perform the requested operation:

- For file transfer (TRANSFER parameter), the profile must be allowed to create or delete files in the CTL4IUSR library
- To add the licence key (INSTALL(*KEY) parameter), the profile must be able to access the CTL4IUSR files, and use the CTADDKEY command
- To change the product version (INSTALL(*PRD) parameter), the profile must be able to create or modify the product user profiles and use the CTRSTPRD command.

The file specified in the KEYFILE parameter must have been placed on the central partition. It contains the list of license keys for all partitions in the company.

Once transferred to the remote partition, the file will be placed in the CTL4IUSR library, under the name CTKEYDIST (regardless of its original name on the central partition).

If the license key is requested to be added (INSTALL(*ALL) or INSTALL(*KEY) parameter), the key(s) contained in this file and corresponding to the remote partition will be added.

No validity check of the key will be performed.

To check if the key is valid, use the CTRMTCHK command.

If the product upgrade is requested (INSTALL(*ALL) or INSTALL(*PRD) parameter), the following sequence will be performed:

- Shutdown of the CONTROL4I subsystem
 - o This operation may take several minutes if some probes are developed in Java (this is the case for the M3 controls)

- Check that no product objects are used
 - o If this is the case, the operation is cancelled
- Upgrade the product with the CTRSTPRD command
- Add the key from the file if this operation is requested
- Restart the CONTROL4I subsystem if it was started before the upgrade

At the end of the operation, a message is sent in the job log, as well as in the product log. Use the CTDSPLOG command to see this message.

If the operation on the remote partition did not finish correctly, an error message will indicate this. It will contain only few information. If there is not enough information to determine the cause, you will have to connect to the remote partition to determine the error and complete the operation. In this case, the CONTROL4I subsystem will most likely not be restarted automatically.

12.5 CTRMTCHK: Check Remote Information

The CTRMTCHK command is used to obtain information about the Control for i product installed on a remote partition, such as the product version, or the validity date of the key.

The command parameters are as follows:

```

Remote partition info (CTRMTCHK)

Type choices, press Enter.

IP Address/Name . . . . . IP

Port . . . . . PORT          *DFT
Remote user profile . . . . . USER
Password . . . . . PWD
  
```

Description of parameters:

| | |
|------|--|
| IP | IP address or name of the remote partition |
| PORT | Port to use for FTP connection |
| | *DFT = The default FTP port (21) will be used |
| USER | User profile that will be used to connect to the remote partition. |
| PWD | Password for the user profile |

Use of the command:

The CTRMTCHK command is used to obtain information about the Control for i product installed on a remote partition, such as the product version, or the key validity date.

The result of the command is the following message:

```

Additional Message Information

Message ID . . . . . : CTL5175          Severity . . . . . : 00
  
```

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```
Message type . . . . . : Completion
Date sent . . . . . : 14/02/23      Time sent . . . . . : 19:20:44

Message . . . . . : System = PROD, Generation = 14/02/23, Product validity
  date = *PERM, Version = V03.
System name : PROD
IP Address/Name : 10.43.43.72
Product version : V03
Generation date : 14/02/23
Product validity date : *PERM
```

The validity date of the key is calculated using the most favorable date, i.e. the one furthest in time, or *PERM if the key is a permanent key.

This command can be used from a central partition that does not have a licence for the Control for i product. It is sufficient that the Control for i product is installed on this partition.

The Control for i product must be installed on the remote partition and at least in version V03, build 13/02/2023.

At the end of the operation, a message is sent in the job log and in the product log. Use the CTDSPLOG command to view this message.

If the operation on the remote partition did not complete successfully, an error message will be displayed. It will contain very few information. If the information is not sufficient to determine the cause, you will need to connect to the remote partition to determine the error and complete the operation.

13 Troubleshooting

13.1 “CTL8112 - Check_Control4i: No output returned from agent message

Problem description:

In Nagios, the service has an error and the returned message is:
CTL8112 - Check_Control4i: No output returned from agent

Solution:

The command was sent to the IBM i agent but it is not responding.

Check that the agent is started (subsystem CONTROL4I, which must contain 2 jobs CTAGENT and CTAUTO)

Check that the Nagios server's IP address is authorized.

CTPARAM command, put option 1 before IPLIST then check that the Nagios server's IP address is in the list of authorized addresses or that *ALL is specified.

14 Support

Thank you for choosing to use the Control for i product.

To receive support concerning installing or using this product:

Contact your retailer.

Or send a request to the following address:

support@m81.eu

Support is provided during working hours, subject to a maintenance contract.