Guide to Installing and Using WATCHER

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This manual describes the installation, configuration, and operation of WATCHER, an idle terminal monitor for VMS systems.

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Preface

One of the first programs a new VMS system manager usually needs is an ‘‘idle terminal monitor’’ (ITM). That is, a program to monitor terminal activity and logout those users whose terminals remain inactive for an extended period of time. An ITM helps ensure that system resources are not wasted and helps reduce the possibility of intruders using unattended terminals as a means of entry into the system.

Unfortunately, an ITM can also be an annoyance to system users. A simple ITM can victimize legitimate users who may need to remain logged in but idle while they are at work. This can lead to clever users devising ‘‘hacks’’ to evade the ITM, defeating the purpose of using the ITM in the first place.

WATCHER has a high degree of flexibility, allowing system managers to decide how to accommodate users' needs while still addressing operational and security issues. WATCHER is fully configurable, providing the following features:

- You can tell WATCHER which terminals to watch, and on a per-terminal basis, what measurements (CPU use, process I/O count, terminal I/O count) to use as criteria for determining idleness, and how long a terminal should be idle before the user should be forced off.
- Users can be excluded from interference by WATCHER based on any combination of username, UIC, a held identifier, privileges, terminal device and/or port name, and time-of-day/day-of-week.
- You can override or modify the watch criteria and/or idle times for any user based on any combination of username, UIC, a held identifier, privileges, terminal device and/or port name, and time-of-day/day-of-week.

Through the use of these features, the system manager should be able to configure WATCHER to handle most types of terminals and accommodate most users.

Intended Audience

This manual is intended for the system manager or other person responsible for installing and configuring WATCHER.

Document Structure

This document consists of two parts. The first describes the installation and use of WATCHER. The second describes all of the WATCHER Control Program (WCP) commands in detail.

Contacting the Author

There is no formal support for WATCHER. If you have electronic mail capability, however, you can send your questions and comments to the author at **madison@vms.ecs.rpi.edu** (Internet) or **MADISON@RPIECSVX** (BITNET). The author is also available on DECUServe as user MADISON.

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New Features and Changes

WATCHER V2.1 includes the following new features and changes.

1. Support for DECwindows workstations was added.
2. The WATCHER Control Program (WCP), which replaces WCFG, eases the configuration process by reading and generating command files, and alowing limited editing of configurations.
3. The WATCHER process can now be told to reload its configuration without stopping and restarting the process.
4. WATCHER now supports override records, exclusion-type records that modify WATCH settings instead of preventing a user from being watched.
5. Debug/trace information can now be requested, to simplify the debugging of configurations.
6. Port names are supported in a more general way. Remote port names are now supported for any terminal device driver that provides port information.
7. Terminals may now be grouped together, so that activity on any terminal in the group counts as activity for the entire group. This improves the way WATCHER handles workstations running the VWS software.
8. Activity thresholds may now be specified for measurements. The measurements must exceed the specified thresholds to be counted as activity.
9. The formatting of warning and logout messages has been improved, and may now optionally ring the terminal bell when displayed.
10. The hack for dealing with help windows on workstations running VWS was removed.

1 Installing WATCHER

To use WATCHER, you need the following files:

WATCHER.EXE	The main WATCHER image
WCP.EXE	The WATCHER Control Program
WCP_HELPLIB.HLB	Help library for WCP
DECW_STARTLOGIN.COM	Part of DECwindows support
WATCHER_STARTUP.COM	Sample startup command procedure
WATCHER_SHUTDOWN.COM	Sample shutdown command procedure
SAMPLE_CONFIG.WCP	Sample configuration commands

The package comes with the object code files and libraries and a command procedure called LINK.COM, for creating the two images.

It is easiest to simply place all of the files in the distribution in one directory, run LINK.COM to create the images, then edit WATCHER_STARTUP.COM and the sample configuration commands in SAMPLE_CONFIG.WCP as needed on your system to get WATCHER configured and up and running.

1.1 Required Logical Names

The three system-wide logical names WATCHER requires are:

WATCHER_DIR	Should point to location of images and command procedures
WATCHER_CONFIG	Configuration file to be used
WATCHER_TRACE	Trace file; use NL: if debug disabled

They should all be defined in executive mode.

1.1.1 Logical Name for Help Library

The help library for WCP may be placed in SYS$HELP, or, if you define the logical name WCP_HELPLIB to be the full path name of the file, anywhere else on the system.

1.2 Privileges Required

The account that is used for the WATCHER process requires the following privileges:

WORLD	For getting information about and killing processes
CMKRNL	Required for DECwindows support
SYSNAM	For defining the command mailbox

PRMMBX	For defining the command mailbox
SHARE	For sending warning messages to other users' terminals
SYSPRV	(optional) to ensure access to appropriate files

SYSPRV is not needed if you make sure that WATCHER has enough access to read its configuration files and the system rightslist (if using identifiers as an exclusion criterion), and write its log and trace files (if used). Both CMKRNL and SYSPRV are required for DECwindows support.

1.3 Other Requirements

The RUN command in WATCHER_STARTUP.COM should provide the WATCHER process with sufficient quotas to operate on most systems. CPU and memory requirements will vary depending on the number of rules in the WATCHER configuration, peak number of interactive users, and peak number of watched users. You may wish to refer to the following table in computing expected memory resources needed by the WATCHER process:

Memory required per WATCH rule	206 bytes
Memory required per EXCLUDE or OVERRIDE rule	250 bytes
Memory required per interactive process	208 bytes
Memory required per watched process	254 bytes
Size of WATCHER code (approximate)	13K bytes

Allow a small increase in CPU, memory, and I/O requirements if identifiers are used as an exclusion mechanism, since WATCHER will require access to the rightslist database for each interactive process. DECwindows support also requires additional overhead for access to the job logical name table of all interactive and detached processes on the system.

2 Configuring WATCHER

The WATCHER Control Program (WCP) is used to create WATCHER configurations. WCP is designed to be executed as a VMS foreign command. To set up the foreign command, define the symbol

```
$ WCP :== $WATCHER_DIR:WCP
```

Once the symbol is set up, you can invoke WCP with the command:

```
$ WCP
```

2.1 Setting up WATCH Rules

The WATCH command sets up rules that determine which terminals get watched, how to determine whether the terminals are active, and how long terminals must be inactive before a user can be forced off. For example:

```
WCP> WATCH *$RT*/MEASURE=PROCESS_IO/LOGOUT=00:15:00
```

This command sets up a rule for watching all DECnet remote logins, using changes in total process I/O (buffered plus direct) to determine process activity, and causing logouts to occur after 15 minutes of activity.

2.1.1 Identifying Terminals

WATCH commands take any wildcard pattern. All terminal device names that match the specified pattern are watched. The device names used by WATCHER are the physical device names of terminals; if the system is part of a VAXcluster, SCS node name is prefixed to the device name, as is normally done by VMS with cluster-accessible devices.

If the terminal device driver supports remote port identification, as does the LTDRIVER for LAT terminals, the remote port information can also be used as a match criterion by using the /ACCPORNAM qualifier. The port name can be specified as a wildcard pattern. For example:

```
WCP> WATCH *$LT*/ACCPORNAM="TRMSRV/*"
```

This command would cause the terminals attached to terminal server TRMSRV to be watched.

2.1.2 WATCH Criteria

WATCHER gives you the choice of using one or more of the following measurements as criteria for judging whether a terminal or user is active:

TERMINAL_IO	the I/O operation count on the terminal device

CPU	The total CPU time used by the process owning the terminal plus all of its subprocesses, in centiseconds
PROCESS_IO	the sum of the buffered and direct I/O counts of the process owning the terminal plus all of its subprocesses

The TERMINAL_IO measurement is useful for conventional terminals but cannot be used for workstations (running either VWS or DECwindows) due to the nature of workstation activity. PROCESS_IO is recommended for use on workstation terminal devices.

For any of these measurements you can specify a minimum threshold value. When WATCHER performs a comparison, the difference between the current measured value and the last measured value must be greater than the specified threshold to be counted as activity. The default threshold value is zero, so that any difference at all counts as activity.

2.1.3 Terminal Groupings

You can group WATCH rules together by using the /GROUP qualifier. When WATCHER applies its rules for determining terminal activity, activity on one terminal in the group counts as activity for all the terminals in the group. The main use for this feature is with multi-windowed terminals and workstations running VWS (DECwindows workstations are handled in this manner automatically). For example, the following rules handle all the workstation terminal types on a standalone VWS workstation:

```
WCP> WATCH WTA*/GROUP=VWS   ! normal VT200-series windows
WCP> WATCH TKA*/GROUP=VWS   ! Tek 4010 emulation windows
WCP> WATCH TJA*/GROUP=VWS   ! Tek 4125 emulation windows
```

The user can then create any number of any type of terminal window, and as long as one of them is active, they will all remain logged in.

2.2 Exclusions and Overrides

WATCHER's behaviour towards a terminal or user can be modified through the definition of exclusion and override rules. Exclusions and overrides can be based on any combination of username, terminal/port name, UIC, privileges, a held identifier, and time of day. Exclusion rules prevent WATCHER from taking any action towards a user, while override rules merely modify how the terminal is watched (i.e., the activity criteria and inactivity periods). For example (taken from a VAXcluseter system):

```
WCP> EXCLUDE SYSTEM/TERMINAL=*$OPA0:
WCP> OVERRIDE JONES/TERMINAL=NODE1$TXA3:/DURING=(PRIMARY:8-16)-
_WCP>          /LOGOUT=02:00:00
```

The first command prevents WATCHER from taking any action against the SYSTEM account while it is logged into the system console. The second command extends the logout inactivity period to two hours for user JONES weekdays from 8 am to 4:59 pm, while JONES is logged into the terminal in her office, which is on port TXA3 on system NODE1.

2.3 Saving Configurations

Once you have established the rules you need for your configuration, you should create the configuration file with the SAVE command:

```
WCP> SAVE WATCHER_CONFIG
```

If WATCHER is currently running, you can have the new configuration take effect immediately with the RESET command, which will cause the WATCHER process to reload its configuration information from the file.

2.3.1 VAXcluster Environments

For mainly homogeneous VAXcluster environments, you should be able to use one configuration file for all nodes in the cluster. If you have a mix of nodes, however, it may be easier to create multiple configuration files and define the WATCHER_CONFIG logical name differently depending on the system.

2.3.2 Editing Configurations

You can make changes to the current configuration by invoking WCP with the /FILE qualifier:

```
$ WCP/FILE=WATCHER_CONFIG
```

The WATCH, EXCLUDE, and OVERRIDE commands all have a /DELETE to allow you to remove rules from the database, and you can add rules as well. However, you cannot control the order of the new rules (order is important because WATCHER searches the rule lists in the order you enter them until one matches). To assist in making complex changes to the configuration, the SHOW command has a /COMMAND qualifier that causes the configuration information to be displayed as commands you would enter to build the configuration:

```
WCP> SHOW/COMMAND/OUTPUT=CONFIG.WCP ALL
```

Once you dump the commands to the command file, you can edit the command file as needed and create a new configuration with the commands:

```
$ WCP
WCP> @CONFIG
WCP> SAVE WATCHER_CONFIG
```

Instead of editing the configuration, it may be easier just to maintain a WCP command file with the necessary commands in it and build a new configuration each time you need to make a change.

2.4 DECwindows Support

The VMS DECwindows implementation makes it difficult for a WATCHER-type program to properly identify, warn, and logout DECwindows sessions. However, WATCHER does provide limited support for watching DECwindows sessions, enabled with the following commands:

```
WCP> SET DECWINDOWS
WCP> WATCH *WSA*/MEASURE=PROCESS_IO/NOWARNING
```

Note that you cannot use TERMINAL_IO as a measurement when watching DECwindows sessions, nor can WATCHER give warnings to idle DECwindows sessions.

WATCHER identifies DECwindows sessions by searching the job logical name table for each interactive process for the logical name DECW$DISPLAY, defined in executive mode. Each interactive job related to a single DECwindows session will have the same value for DECW$DISPLAY. WATCHER immediately changes the terminal device name it uses to the WSA device name (even for DECterm sessions) and also sets the group name to the WSA device name. In this way, activity in any of the DECwindows jobs will be counted as activity for all jobs related to that session.

The DECwindows window manager and DECterm controller processes are detached processes that are also needed by WATCHER (when forcing off a DECwindows session). To identify these processes, WATCHER searches for detached processes with DECW$DISPLAY defined in user mode. WATCHER tracks these processes, but does not use them in activity determination (it calls them ‘‘fake’’ processes in debug/trace logs).

When WATCHER identifies a DECwindows session to be forced off, it looks for all processes (including the detached processes, which are important) with a matching WSA device name and forces them off. This should destroy all the windows on the workstation and return it to a blank, background screen. It then creates a detached process that executes the DECW_STARTLOGIN command procedure (which must be WATCHER_DIR:), which, after waiting a few seconds for other activity to die down, restarts the login process on the affected WSA device.

This technique should be effective for VMS DECwindows implementations under VMS V5.1 through V5.3. It may not work with future DECwindows implementations.

3 Troubleshooting WATCHER

If WATCHER is not behaving as expected, there may be a problem with your WATCHER configuration. There is debug/trace code built into WATCHER to allow you to monitor three categories of activities: the mainline WATCHER code, the exclusion-checking code, and the override-checking code. Through the use of the SET DEBUG command, you can turn on tracing for any or all of these debugging categories.

If WATCHER is already running, the best way to set up a test configuration is with the following command sequence:

```
$ SET PROCESS/PRIVILEGE=(SYSNAM,SYSPRV)
$ WCP/FILE=WATCHER_CONFIG
WCP> SET DEBUG=n
WCP> SAVE WATCHER_DIR:TEST_CONFIG
WCP> EXIT
$ DEFINE/SYSTEM/EXEC WATCHER_CONFIG WATCHER_DIR:TEST_CONFIG
$ DEFINE/SYSTEM/EXEC WATCHER_TRACE  trace-file-spec
$ WCP RESET
```

The debug level *n* is described in the SET DEBUG command description, but usually will be 1 (just mainline) or 15 (full). You can direct the trace information to any file accessible to WATCHER, or to an unowned terminal.

Subsequent WCP RESET commands will cause the trace file to be closed and a new version created, so you can easily view past trace information. To go back to ‘‘production’’ mode, just redefine WATCHER_CONFIG back to the name of the real configuration file, define WATCHER_TRACE to be NL:, and issue another WCP RESET command.

3.1 Forcing Wakeups

To assist in debugging, you may want to have WATCHER wake up more often than normal. You can do this by setting a shorter wakeup interval in the test configuration, or you can force a wakeup to occur by writing to the WATCHER control mailbox. From a suitably privileged account (SYSPRV), you can use the commands:

```
$ OPEN/WRITE WMBOX WATCHER_MBOX:
$ WRITE WMBOX ""
$ CLOSE WMBOX
```

Each WRITE command will trigger a wakeup, and WATCHER will go through its processing sequence.

Part II Command Descriptions

WCP

Executes the WATCHER Control Program.

FORMAT

WCP *[command]*

Command Qualifiers	Defaults
/FILE=file-spec	

PARAMETERS

[command]

Any WCP command except the input redirection operator (@). The specified command is executed and control is returned to DCL immediately thereafter.

DESCRIPTION

WCP was written to be used as a DCL ''foreign'' command. To use it as a foreign command, you must define a symbol as follows:

```
$ WCP :== $WATCHER_EXE:WCP
```

Defining the symbol in this way allows you to use the /FILE qualifier and specify ''one-shot'' commands on the command line.

QUALIFIERS

/FILE=file-spec

Loads the specified WATCHER configuration file for editing. If not specified, no configuration information is loaded. The default file type is WCFG.

@ (Redirect Command Input)

Executes WCP commands read from a file.

FORMAT

@ *file-spec*

PARAMETERS

file-spec

Name of the file containing WCP commands. If omitted, the default file type is WCP.

DESCRIPTION

Use this command to have WCP take further command input from the specified file. There is no built-in limit on the number of levels of nesting of command files, so be careful when using input redirection from within a command file. Commands read from command files are not displayed unless you SET VERIFY.

Command redirection can only be used at the WCP command prompt, not as a ''one-shot'' WCP command. To have a file be used for input for an entire WCP session, use the following sequence of DCL commands.

```
$ DEFINE/USER SYS$INPUT file-spec
$ WCP
```

EXCLUDE

Defines an exclusion rule.

FORMAT

EXCLUDE *username-pat*

Command Qualifiers	Defaults
/ACCPORNAM=port-pat	*/ACCPORNAM=**
/DELETE	
/DURING=daytim-list	*(all the time)*
/HOLDING=identifier	*(ignored)*
/PRIVILEGES=priv-list	*(ignored)*
/TERMINAL=dev-pat	*/TERMINAL=**
/UIC=uic	*/UIC=[*,*]*

PARAMETERS

username-pat

A VMS username or pattern containing wildcards, identifying the user to be excluded.

DESCRIPTION

This command is used to add or remove (with /DELETE) an exclusion rule to the WATCHER configuration. When WATCHER is running, any process that matches all of the specified criteria is not watched. Omitted criteria are not used or always match.

QUALIFIERS

/ACCPORNAM=port-pat

Port name or pattern containing wildcards, identifying the terminal port (for terminal servers and other devices using port names) on which the user must be logged in to be excluded. The default is any port.

/DELETE

Specifies that the rule should be deleted from the configuration. All criteria must match exactly for the rule to be deleted.

/DURING=daytim-list

Specifies a list of days and times during which the user is to be excluded from watching. The day/time specifications are of the form

day:(hour-range[,...])

where *day* is a day of the week or the word PRIMARY or SECONDARY, identifying the primary and secondary days set with SET DAYS, and *hour-range* is either a single hour number (0 through 23) or two hour numbers separated by a hyphen. Multiple hour ranges may be specified per day.

/HOLDING=identifier

Specifies that the user should be excluded if holding the specified identifier. The identifier is converted to binary format before being stored in the configuration, so you must create the configuration file on the target system, or on a node with the same RIGHTSLIST database as the target system, to prevent misinterpretation of the identifier.

WATCHER obtains identifier information from the RIGHSTLIST rather than the process (because there is no supported way to obtain process identifier information), so identifers to be used by WATCHER cannot be dynamically granted to a process.

Note that if you do not use /HOLDING on any EXCLUDE or OVERRIDE command, the rights identifier information is not collected by WATCHER, resulting in some savings in processing time.

/PRIVILEGES=priv-list

Specifies that the user is to be excluded only when holding the specified privilege or privileges. If omitted, privileges are not used as a criterion.

/TERMINAL=dev-pat

Specifies a terminal device name or pattern containing wildcards. The user must be logged into a matching terminal to be excluded.

/UIC=uic

Specifies a UIC or UIC pattern. A process is excluded only when owned by a matching UIC. You may use an asterisk for the member part of the UIC to have all UIC's in a group match. If omitted, any UIC will match.

EXIT

Ends a WCP session.

FORMAT EXIT

DESCRIPTION

Ends the current WCP session and returns control to DCL. If you have modified the configuration, EXIT will ask for a file name for saving the configuration before exiting.

HELP

Displays help information.

FORMAT

HELP *[topic...]*

PARAMETERS

topic

The name of a topic in the help library. If omitted, a list of topics is displayed.

DESCRIPTION

This command is pretty straightforward.

OVERRIDE

Defines an override rule.

FORMAT

OVERRIDE *username-pat*

Command Qualifiers	Defaults
/ACCPORNAM=port-pat	*/ACCPORNAM=**
/DELETE	
/DURING=daytim-list	*(all the time)*
/HOLDING=identifier	*(ignored)*
/PRIVILEGES=priv-list	*(ignored)*
/TERMINAL=dev-pat	*/TERMINAL=**
/UIC=uic	*/UIC=[*,*]*
/[NO]LOGOUT[=deltatime]	
/MEASURE=(measurement[,...])	
/[NO]WARNING[=deltatime]	

PARAMETERS

username-pat

A VMS username or pattern containing wildcards, identifying the user for which the override is to take effect.

DESCRIPTION

This command is used to add or remove (with /DELETE) an override rule to the WATCHER configuration. When WATCHER is running, any process that matches all of the specified criteria will have the warning, logout, and measurement information, if specified, taken from the override rule instead of the WATCH rule.

QUALIFIERS

/ACCPORNAM=port-pat

Port name or pattern containing wildcards, identifying the terminal port (for terminal servers and other devices using port names) on which the user must be logged in to be excluded. The default is any port.

/DELETE

Specifies that the rule should be deleted from the configuration. All criteria must match exactly for the rule to be deleted.

/DURING=daytim-list

Specifies a list of days and times during which the user is to be excluded from watching. The day/time specifications are of the form

day:(hour-range[,...])

where *day* is a day of the week or the word PRIMARY or SECONDARY, identifying the primary and secondary days set with SET DAYS, and *hour-range* is either a single hour number (0 through 23) or two hour numbers separated by a hyphen. Multiple hour ranges may be specified per day.

/HOLDING=identifier

Specifies that the user should be excluded if holding the specified identifier. The identifier is converted to binary format before being stored in the configuration, so you must create the configuration file on the target system, or on a node with the same RIGHTSLIST database as the target system, to prevent misinterpretation of the identifier.

WATCHER obtains identifier information from the RIGHSTLIST rather than the process (because there is no supported way to obtain process identifier information), so identifers to be used by WATCHER cannot be dynamically granted to a process.

Note that if you do not use /HOLDING on any EXCLUDE or OVERRIDE command, the rights identifier information is not collected by WATCHER, resulting in some savings in processing time.

/PRIVILEGES=priv-list

Specifies that the user is to be excluded only when holding the specified privilege or privileges. If omitted, privileges are not used as a criterion.

/TERMINAL=dev-pat

Specifies a terminal device name or pattern containing wildcards. The user must be logged into a matching terminal to be excluded.

/UIC=uic

Specifies a UIC or UIC pattern. A process is excluded only when owned by a matching UIC. You may use an asterisk for the member part of the UIC to have all UIC's in a group match. If omitted, any UIC will match.

/[NO]LOGOUT[=deltatime]

Specifies that the logout information should be overridden. The logout inactivity interval can be overridden by specifying a *deltatime*, or logouts can be prevented by specifying /NOLOGOUT (although it is more efficient to use EXCLUDE for this).

/MEASURE=(measurement[,...])

Specifies that the activity measurements should be overridden. For *measurement*, specify one of the following:

CPU[:*threshold*]	CPU time (the sum of the CPU time used by the process and all its subprocesses, in centiseconds) should be used as a criterion. If *threshold* is specified, the difference in CPU time between passes must exceed the specified threshold for a process to be considered active.

PROCESS_IO[:*threshold*]	Process I/O (the sum of the buffered and direct I/O counts for the process and all its subprocesses) should be used as a criterion. If *threshold* is specified, the difference in I/O counts between passes must exceed the specified threshold for a process to be considered active.
TERMINAL_IO[:*threshold*]	Terminal I/O (the operation count on the terminal device) should be used as a criterion. If *threshold* is specified, the difference in I/O counts between passes must exceed the specified threshold for a process to be considered active.

Any combination of PROCESS_IO, CPU, and TERMINAL_IO is permitted. If omitted, *threshold* values default to zero. Note that threshold values should be chosen as a function of the wakeup interval (defined with SET INTERVAL).

/[NO]WARNING[=deltatime]

Specifies that the warning information should be overridden. The warning inactivity interval can be overridden by specifying a *deltatime*, or warnings can be prevented by specifying /NOWARNING.

QUIT

Quits WCP without saving configuration changes.

FORMAT QUIT

DESCRIPTION

If changes to the configuration have been made, you are asked for confirmation before quitting.

RESET

Sends a reset command to the WATCHER process.

FORMAT RESET

DESCRIPTION

This command sends a reset command to the WATCHER process, which causes WATCHER to flush all process and configuration information, close its log and trace files, and read in the configuration again.

SAVE

Saves a WATCHER configuration.

FORMAT SAVE *[file-spec]*

PARAMETERS *file-spec*

Name of the file to which the configuration should be written. If omitted, it defaults to the name of the file read in with the WCP/FILE qualifier (if any). If specified, the default file type is WCFG and the default location is the current default directory.

SET BELL

Enables or disables the ringing of the terminal bell on warnings and logouts.

FORMAT SET [NO]BELL

DESCRIPTION

By default, the terminal bell is not rung when WATCHER displays a warning or logout message on a terminal. SET BELL will cause WATCHER to send a BEL character with the message to cause the terminal bell to ring.

SET DAYS

Establishes the primary and secondary day settings for subsequent commands.

FORMAT

SET DAYS

Command Qualifiers	Defaults
/PRIMARY=(day-list)	
/SECONDARY=(day-list)	

DESCRIPTION

This command is used to move one or more days from the primary day list to the secondary day list or vice-versa. These lists are used as shorthand by other commands when you specify PRIMARY or SECONDARY on a /DURING qualifier.

SET DEBUG

Enables or disables debug tracing and sets the level of debug information.

FORMAT SET [NO]DEBUG[=mask]

DESCRIPTION

SET DEBUG turns on debug tracing. WATCHER will send debug output to the file or device identified by the WATCHER_TRACE logical name. For *mask*, specify a decimal number representing a bitmask indicating which kinds of debugging information you want logged.

Value	Bit no.	Description
1	0	main line code
2	1	exclusion checks
4	2	override checks
8	3	measurement checks

The *mask* value can be any one of the above, or a sum of any of the above values. Use SET NODEBUG to disable debug tracing.

SET DECWINDOWS

Enables or disables extra processing required for DECwindows support.

FORMAT SET [NO]DECWINDOWS

DESCRIPTION

Since the DECwindows support requires additional processing beyond that used for watching normal terminals, it is by default turned off. You should only SET DECWINDOWS when you will be running WATCHER on a DECwindows workstation (or a system with DECwindows terminals). You will also need to include a WATCH rule for WSA terminal devices to watch DECwindows sessions (as described in Section 2.4).

SET EVENT_LOG

Establishes how normal WATCHER events are recorded.

FORMAT

SET [NO]EVENT_LOG

Command Qualifiers	Defaults
/FILE=file-spec	
/OPERATOR=oper-list	

DESCRIPTION

This command specifies how normal WATCHER events (startup, shutdown, reset, and logout events) are recorded. By default, WATCHER events are logged to the CENTRAL operator class.

QUALIFIERS

/FILE=file-spec

Directs event logging to the specified file.

/OPERATOR=oper-list

Specifies a list of one or more operator classes to which WATCHER events should be logged. If more than one operator class name is specified, the list should be comma-separated and surrounded by parentheses.

SET INTERVAL

Sets the hibernation interval between processing passes.

FORMAT SET INTERVAL=delta-time

DESCRIPTION

This command sets the length of time WATCHER hibernates between processing passes. The default is 5 minutes. The value you should use should be smaller than the warning and logout intervals for all terminals and smaller than the difference between the logout and warning intervals for any single terminal. Too small a value, however, will cause WATCHER to waste CPU time.

SET VERIFY

Enables or disables echoing of commands in command files.

FORMAT SET [NO]VERIFY

DESCRIPTION

The SET VERIFY command turns on command verification, so that commands read from WCP command files are echoed to the terminal. SET NOVERIFY turns off verification, which is the default.

SET WATCH_DEFAULT

Establishes defaults for subsequent WATCH commands.

FORMAT SET WATCH_DEFAULT

Command Qualifiers	Defaults
/[NO]LOGOUT[=deltatime] */MEASURE=(measurement[,...])* */[NO]WARNING[=deltatime]*	

DESCRIPTION

The SET WATCH_DEFAULT command is used to set logout, warning, and measurement defaults for subsequent WATCH commands.

QUALIFIERS

/[NO]LOGOUT[=deltatime]

Sets the default for logouts, to be used if not specified on subsequent WATCH commands.

/MEASURE=(measurement[,...])

Sets the default measurements to be used for activity determination if not specified on subsequent WATCH commands. For *measurement*, specify one of the following:

CPU[:*threshold*]	CPU time (the sum of the CPU time used by the process and all its subprocesses, in centiseconds) should be used as a criterion. If *threshold* is specified, the difference in CPU time between passes must exceed the specified threshold for a process to be considered active.
PROCESS_IO[:*threshold*]	Process I/O (the sum of the buffered and direct I/O counts for the process and all its subprocesses) should be used as a criterion. If *threshold* is specified, the difference in I/O counts between passes must exceed the specified threshold for a process to be considered active.
TERMINAL_IO[:*threshold*]	Terminal I/O (the operation count on the terminal device) should be used as a criterion. If *threshold* is specified, the difference in I/O counts between passes must exceed the specified threshold for a process to be considered active.

Any combination of PROCESS_IO, CPU, and TERMINAL_IO is permitted. If omitted, *threshold* values default to zero. Note that threshold values should be chosen as a function of the wakeup interval (defined with SET INTERVAL).

/[NO]WARNING[=deltatime]

Sets the defaults for warnings, to be used if not specified on subsequent WATCH commands.

SHOW

Displays all or part of the current configuration.

FORMAT

SHOW { *ALL* | *BELL* | *DAYS* | *DEBUG* | *DEFAULTS* | *EVENT_LOG* | *EXCLUDE* | *FILE* | *GLOBALS* | *INTERVAL* | *OVERRIDE* | *WATCH* }

Command Qualifiers	Defaults
/[NO]COMMAND	*/NOCOMMAND*
/OUTPUT=file-spec	*/OUTPUT=SYS$OUTPUT:*

DESCRIPTION

The SHOW command displays information about the current configuration and the WCP default settings.

QUALIFIERS

/[NO]COMMAND

The /COMMAND qualifier indicates that the display should be formatted as the commands that would be entered to create the specified records. Use /COMMAND with the /OUTPUT qualifier to create an MCP command file that can be altered with your favorite editor, then read back into MCP to create a new configuration.

/OUTPUT=file-spec

The /OUTPUT qualifier is used to direct the SHOW result to a file or other device. By default, the result is displayed on the current output device, SYS$OUTPUT.

SHUTDOWN

Sends a shutdown command to the WATCHER process.

FORMAT SHUTDOWN

DESCRIPTION

This command sends a shutdown command to the WATCHER process, which causes WATCHER to close its log files and exit.

WATCH

Defines a watch rule.

FORMAT

WATCH *device-pat*

Command Qualifiers	Defaults
/ACCPORNAM=port-pat	*/ACCPORNAM=**
/DELETE	
/[NO]LOGOUT[=deltatime]	
/MEASURE=(measurement[,...])	
/[NO]WARNING[=deltatime]	

PARAMETERS

device-pat

A terminal device name or pattern containing wildcards, to identify the terminal(s) to be watched.

DESCRIPTION

This command is used to add or remove (with /DELETE) a watch rule to the WATCHER configuration. When WATCHER is running, a process running on any terminal matching the specified criteria will be watched for inactivity, using the specified parameters.

QUALIFIERS

/ACCPORNAM=port-pat

Port name or pattern containing wildcards, identifying the terminal port(s) (for terminal servers and other devices using port names) to be watched. The default is any port.

/DELETE

Specifies that the rule should be deleted from the configuration. All criteria must match exactly for the rule to be deleted.

/[NO]LOGOUT[=deltatime]

Specifies whether the terminal should be logged out, and if so, how long the terminal should be inactive before logout occurs. If omitted, the default is taken from the current SET WATCH_DEFAULT setting.

/MEASURE=(measurement[,...])

Specifies the measurements that should be used for activity determination. For *measurement*, specify one of the following:

CPU[:*threshold*]	CPU time (the sum of the CPU time used by the process and all its subprocesses, in centiseconds) should be used as a criterion. If *threshold* is specified, the difference in CPU time between passes must exceed the specified threshold for a process to be considered active.
PROCESS_IO[:*threshold*]	Process I/O (the sum of the buffered and direct I/O counts for the process and all its subprocesses) should be used as a criterion. If *threshold* is specified, the difference in I/O counts between passes must exceed the specified threshold for a process to be considered active.
TERMINAL_IO[:*threshold*]	Terminal I/O (the operation count on the terminal device) should be used as a criterion. If *threshold* is specified, the difference in I/O counts between passes must exceed the specified threshold for a process to be considered active.

Any combination of PROCESS_IO, CPU, and TERMINAL_IO is permitted. If omitted, *threshold* values default to zero. Note that threshold values should be chosen as a function of the wakeup interval (defined with SET INTERVAL). If no /MEASUREMENT qualifier is specified, the measurement settings are taken from the SET WATCH_DEFAULT settings.

/[NO]WARNING[=deltatime]

Specifies whether the terminal should be warned about inactivity, and if so, how long the terminal should be inactive before warning is sent. The warning interval should be less than the logout interval. If omitted, the default is taken from the current SET WATCH_DEFAULT setting.