

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, time-of-day/day-of-week, and name of image being run.
- 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, time-of-day/day-of-week, and name of image being run.

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.

Support for WATCHER

There is no formal support for WATCHER.

1 Installing WATCHER

To use WATCHER, you need the following files:

WATCHER.COM	Command procedure that executes WATCHER
WATCHER.EXE	The main WATCHER image
WCP.EXE	The WATCHER Control Program
FORCE_EXIT.EXE	\$FORCEX program for use in custom logout procedures
WCP_HELPLIB.HLB	Help library for WCP
DECW_STARTLOGIN.COM	Part of DECwindows support
WATCHER_CONFIG.WCFG	You create this file with WCP
WATCHER_STARTUP.COM	Sample startup command procedure
WATCHER_SHUTDOWN.COM	Sample shutdown command procedure
SAMPLE_CONFIG.WCP	Sample configuration commands
WATCHER_LOGOUT.TEMPLATE	Template for custom logout procedures

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 for your system. Then all you need to do is to run WCP, execute the WCP command file you created from the sample, which in turn creates a WATCHER_CONFIG.WCFG file, then execute WATCHER_STARTUP.COM to start the Watcher process.

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. The sample WATCHER_STARTUP.COM includes the necessary DEFINE command to do this for you.

1.2 Privileges Required

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

CMKRNL	Required for DECwindows support and disconnects
PRMMBX	For defining the command mailbox
PSWAPM	Required for disconnects
SHARE	For sending warning messages to other users' terminals
SYSNAM	For defining the command mailbox
SYSPRV	(optional) to ensure access to appropriate files
WORLD	For getting information about and killing processes

SYSPRV is not needed if you make sure that WATCHER has enough access to read its configuration files and write its log and trace files (if used). Both CMKRNL and SYSPRV are required for DECwindows support. CMKRNL and PSWAPM are required to perform virtual terminal disconnections.

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	507 bytes
Memory required per interactive process	465 bytes
Memory required per watched process	531 bytes
Size of WATCHER code (approximate)	18K bytes

DECwindows support also requires additional overhead for access to the job logical name tables 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
```

WCP will automatically load the contents of your defined WATCHER_CONFIG file, if it exists.

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@0:15:00
```

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 inactivity.

Note: You must have at least one WATCH command in your configuration.

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 VMS cluster, 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 LTDRIVE R 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.

Command Descriptions

@ (Redirect Command Input)

@ (Redirect Command Input)

Executes WCP commands read from a %ole.

FORMAT @ %ole-spec

PARAMETERS %ole-spec
Name of the %olecontaining WCP commands. If omitted, the default %ole type is WCP.

DESCRIPTION Use this command to have WCP take further command input from the specified %ole. There is no built-in limit on the number of levels of nesting of command %oles, so be careful when using input redirection from within a command %ole. Commands read from command %oles 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 %ole 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=daytime-list	(all the time)
/HOLDING=identifier	(ignored)
/IMAGE=fspec-pat	/IMAGE=*
/OPERATOR	
/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 which do not match the specified criteria are not watched.

Command Descriptions

SET EVENT_LOG

SET EVENT_LOG

Establishes how normal WATCHER events are recorded.

FORMAT SET [NO]EVENT_LOG

Command Qualifiers	Defaults
/FILE=%le-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=%le-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.

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 filename for saving the configuration before exiting.

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.

Several samples of WATCH commands with different criteria and threshold values are provided in SAMPLE_CONFIG.WCP.

2.1.3 Terminal Several

OVERRIDE

Defines an override rule.

FORMAT **OVERRIDE** *username-pat*

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

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 have the override apply. 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 override is to apply. The day/time specifications are of the form
day:(hour-range[,...])

Command Descriptions
OVERRIDE

where day is a day of the week

the user is at DCL command level, the forced exit is skipped. The inactivity interval can be overridden by specifying a `deltatime`, or exits/logouts/disconnects can be prevented altogether by specifying `/NOFORCE_EXIT` (although it is more efficient to use `EXCLUDE` for this).

`/[NO]LOGOUT[=deltatime]`

Specifies that the logout/disconnect information should be overridden, performing a process deletion instead of a virtual terminal disconnection. The 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:

<code>CPU[:threshold]</code>	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.
<code>PROCESS_IO[:threshold]</code>	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.
<code>TERMINAL_IO[:threshold]</code>	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`.

Command Descriptions

QUIT

QUIT

Quits WCP without saving con%figurationchanges.

FORMAT

QUIT

DESCRIPTION

If changes to the con%oguation have been made, you are asked for con%ormation 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.

OPER and SYSPRV privileges are required for this command.

Command Descriptions

SAVE

SAVE

Saves a WATCHER con%oguration.

FORMAT SAVE [%ole-spe]

PARAMETERS %ole-spec
Name of the %oleto which the con%oguration should be written. If omitted, it defaults to the name of the %oleread in with the WCP/FILE qualif%oer (if any). If speci%oed,the default %oletype is WCFG and the default location is the current default directory .

SET ACTION

Controls whether WATCHER performs warning and logout actions.

FORMAT **SET [NO]AC TION**

DESCRIPTION To test out a WATCHER installation or configuration change, you may want to SET NOACTIO N to prevent WATCHER from actually notifying any terminals or logging any users out. The SET NOACTION setting allows you to test your configuration safely, and use the DEBUG and trace facilities to see how WATCHER would have performed.

When you are through testing, return the setting back to the default, SET ACTION, to have WATCHER actually perform warnings, disconnections, logouts, etc.

Command Descriptions

SET BELL

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.

Command Descriptions

SET DEBUG

Command Descriptions

SET EVENT_LOG

SET EVENT_LOG

Establishes how normal WATCHER events are recorded.

FORMAT	SET [NO]EVENT_LOG
---------------	--------------------------

Command Qualifiers	Defaults
/FILE=%le-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=%le-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 INSWAP

Sets the \$GETJPI NOINSWAP control flag used by WATCHER.

FORMAT **SET [NO]IN SWAP**

DESCRIPTION Under VAX/VMS V5.2 and later (and all versions of OpenVMS Alpha and OpenVMS Industry Standard 64), the \$GETJPI system service supports a control flag that prevents it from taking any action that would result in the swapping in of a process that is currently swapped out. SET NOINSWAP enables the use of this control flag in WATCHER, causing WATCHER to ignore any swapped-out processes. The default setting is INSWAP.

Using SET NOINSWAP may result in inactive processes not being logged out by WATCHER, or in some cases may result in processes getting logged out prematurely, because activity of swapped-out processes cannot be determined when NOINSWAP is set.

Command Descriptions

SET INTERVAL

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 MULTIWARN

Enables or disables multiple warnings.

FORMAT SET [NO]MULTIWARN

Command Qualifiers	Defaults
/INTERVAL=delta-time	/INTERVAL="0 00:05:00"

DESCRIPTION By default, WATCHER displays only one warning on terminals, at the time specified on the /WARNING qualifier. SET MULTIWARN enables multiple warnings; one at the /WARNING time and again every %veminutes (or whatever interval you specify) until the /LOGOUT or /DISCONNECT time is reached.

This is a system-wide setting.

QUALIFIERS

/INTERVAL=delta-time

Specifies the interval of time that should occur between warnings. If omitted, defaults to %veminutes. This value should equal or exceed the wakeup interval value (specified by SET INTERVAL). The actual interval between warnings may be longer than the specified time, since checks are made only at each processing pass (the interval between which is controlled by the wakeup interval value).

Command Descriptions

SET VERIFY

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]DISCONNECT[=deltatime]	
/[NO]FORCE_EXIT[=deltatime]	
/[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.

The defaults set by this command are saved between WCP sessions.

QUALIFIERS

/[NO]DISCONNECT[=deltatime]

Sets the default for disconnects, to be used if not specified on subsequent WATCH commands. /DISCONNECT, /FORCE_EXIT, and /LOGOUT are mutually exclusive.

/[NO]FORCE_EXIT[=deltatime]

Sets the default for forced image exits to be used on subsequent WATCH commands. /DISCONNECT, /FORCE_EXIT, and /LOGOUT are mutually exclusive.

/[NO]LOGOUT[=deltatime]

Sets the default for logouts, to be used if not specified on subsequent WATCH commands. /DISCONNECT, /FORCE_EXIT, and /LOGOUT are mutually exclusive.

/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.

Command Descriptions

SET WATCH_DEFAULT

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 INTER VAL).

/[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	ACTION
	ALL
	BELL
	DAYS
	DEBUG
	DEFAULTS
	EVENT_LOG
SHOW	EXCLUDE
	FILE
	GLOBALS
	INSWAP
	INTERVAL
	MULTIWARN
	OVERRIDE
	WATCH

Command Qualifiers	Defaults
/[NO]COMMAND	/NOCOMMAND
/OUTPUT=%ole-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=%ole-spec
 The /OUTPUT qualifier is used to direct the SHOW result to a local or other device. By default, the result is displayed on the current output device, SYS\$OUTPUT.

Command Descriptions

SHUTDOWN

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 %les and exit. OPER and SYSPRV privileges are required for this command.
-------------	---

WATCH

Defines a watch rule.

FORMAT

WATCH device-pat

Command Qualifiers	Defaults
/ACCPORNAM=port-pat	/ACCPORNAM=*
/DELETE	
/[NO]DISCONNECT[=deltatime]	
/[NO]FORCE_EXIT[=deltatime]	
/[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]DISCONNECT[=deltatime]

For systems with virtual terminals enabled, this qualifier specifies whether the terminal should be disconnected from the system, and if so, how long the terminal should be inactive before the disconnection occurs. If virtual terminals are not enabled, or the terminal to be forced off is not connected through a virtual terminal, the process is logged out (the same effect as for the /LOGOUT qualifier). If both this qualifier and /LOGOUT are omitted, the disconnect/logout default is taken from the current SET WATCH_DEFAULT setting.

Command Descriptions

WATCH

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

