



cmlxwasp: Websphere Application Server
Performance Metric Probe

CML00049-01

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1 Introduction

This document describes how to use `cmlxwasp` which is a command line software utility to fetch WebSphere Application Server performance statistics from the Performance Monitoring Infrastructure (PMI) via the `perfServletApp` Application. The data is fed to a `Serfboard` server for use in displaying a real time dashboard and stored for post processing analysis.

In order to process metrics from the raw WebSphere Application Server platform and send them to `Serfboard` in the correct form `cmlxwasp` reads and applies a configuration file that describes the binding of the machine specific formatted metric data into the format required as input to `Serfboard`. In other words this binding is between the locally known PMI and the name by which the metric will be known remotely on the `Serfboard` server. The Metric definition statement as explained in section 3 on page 5 specifies this binding.

The `perfServletApp` Application must be deployed on the WebSphere Application Server. In order to maintain the WebSphere Application Server's security a "monitor" group should be created and a user created and added to it. This user should then be granted monitor role access to the `perfServletApp` Application. Once deployed the servlet is used to retrieve whatever PMI statistics have been enabled on the AppServer. Please note the WebSphere Application Server may need to be restarted for changes to take affect.

For `perfServletApp` documentation please refer to PerfServlet information in the WebSphere Application Server "Performance Monitoring Infrastructure" documentation.

For `Serfboard` documentation please refer to the following manuals:

- [Serfboard Configuration Guide and Reference Version 1 \[1\]](#)
- [Serfboard Instruments Guide and Reference Version 1 \[2\]](#)
- [Serfboard Installation Guide and Reference Version 1 \[3\]](#)
- [cmlxfeed: Metrics Feed Library API Reference Version 1 \[?\]](#)
- [Serfboard User Guide Version 1 \[4\]](#)

2 Synopsis

```
Code Magus Limited Websphere cmlxfeed probe V1.0: build 2011-10-28-17.10.52
[./cmlxwasp] $Id: cmlxwasp.c,v 1.11 2010/12/07 10:17:44 janvlok Exp $
Copyright (c) 2009 by Code Magus Limited. All rights reserved.
[Contact: stephen@codemagus.com].
Usage: cmlxwasp [OPTION...]
  -c, --config=<config-file>      Configuration file name
  -r, --record-file-name=<record-file> File name for recording server feed
                                   metrics
  -u, --use-udp                    Use UDP instead of TCP/IP to send
                                   metrics to the serfboard server
  -d, --metric-descriptions        Display all available performance
                                   metrics
  -a, --metric-values              Display the current value of all
                                   available performance metrics
  -v, --verbose                    Verbose output
  -V, --version                    Print CVS version
  -D, --do-not-feed-to-serfboard   Feed metrics to stderr or
                                   record-file-name - not to serfboard

Help options:
  -?, --help                       Show this help message
  --usage                           Display brief usage message
```

Where:

- ‘-c|--config’ Specifies the configuration file for cmlxwasp. see section 3 on page 5
- ‘-r|--record-file-name’ Write all the metrics, sent to Serfboard to the file specified. (Warning : this file may get large and is often used for setting up a replay to a dashboard). If used in conjunction with -r the output is written to record-file.
- ‘-u|--use-udp’ This parameter will cause the metrics to be sent via UDP, a connectionless transport without guarantee of delivery. The default connection to Serfboard is via TCP/IP.
- ‘-d|--metric-descriptions’ This parameter prints a list of all WebSphere Application Server performance metrics available, with their descriptions and terminates. Having specified WebSphere Application Server connectivity (section 3.2.2 on page 8) this option can be used to establish what metrics are available when modifying the config file. If used in conjunction with -r the output is written to record-file.
- ‘-a|--metric-values’ This parameter prints all WebSphere Application Server performance metrics available and their current value and terminates. Having specified WebSphere Application Server connectivity (section 3.2.2 on page 8) the metric names correspond to those available for inclusion in the metric defi-

nitions section of the config file(section [3.2.3](#) on page [14](#)). If used in conjunction with `-r` the output is written to record-file.

- `'-V|--version'` This parameter prints the software version and build date of `cmlxwasp` and exits.
- `'-v|--verbose'` and `'-D|--debug'` These parameters are for debugging. If used in conjunction with `-r` the output is written to record-file.

3 Configuration

This section describes the syntax of the contents of the configuration file specified by the `-c|--config` parameter. The configuration file describes the WebSphere Application Server connectivity, what metrics are captured and sent and the Serfboard instance to send them to. The user specifies any WebSphere Application Server security credentials and `perfServletApp` application query options via this file.

3.1 Command Elements

3.1.1 Comments

Comments are introduced by using a double minus (“--”) and continue up to the end of the current input line.

Examples:

```
-- File: waspmi_pixie.cfg
--
-- WebSphere Application Server PMI Statistics feed.
--
-- Author: Angie Gormley-McGlynn.
--
-- Copyright (c) 2009 Code Magus Limited. All rights reserved.
--
```

3.1.2 Reserved Words

Reserved words have a special meaning in terms of directing the parsing of commands. The reserved words are:

by	created	date	description
end	end.	host	polling
interval	label	list	metric
modified	notes	name	pmi
port	server	wasp	title
values	waspserver	waspnode	waspgroup
username	password	apiusername	apipassword
waspmo	modules		

3.1.3 Identifiers

Identifiers are case sensitive and they start with a letter which can be followed by any number of letters, digits, decimal point '.' or the under-score character.

Examples:

```
pixieNode01.server1.JVM_RunTime.UsedMemory
```

3.1.4 Strings

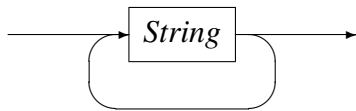
Strings are:

- any sequence of characters (except double quotes and the newline character) enclosed by double quotes.
- any sequence of characters (except single quotes and the newline character) enclosed by single quotes.

Examples:

```
"Clock seconds spent in user mode"  
'$Revision: 1.12 $'  
"User's log on time"
```

Strings can be concatenated:



This facilitates the splitting of a long string over multiple lines to aid readability.

Examples:

```
notes("$Source: /home/cvs/cvsroot/cmlxwasp/documents/cmlxwasp.tex,v $ "  
"$Revision: 1.12 $");  
description('WAS PMI feed to Serfboard from' "pixie" );
```

3.1.5 Integers

An integer consists of a nonempty sequence of decimal digits.

Examples:

```
1234  
0
```

3.1.6 PMIModuleName

A WebSphere Application Server PMI modulename consists of a nonempty sequence of alphabetic characters. The modules available via `perfServletApp` for a particular WebSphere Application Server can be obtained by running with the `-a` and `-c` options.

Examples:

```
alarmManagerModule
beanModule
cacheModule
connectionPoolModule
jvmRuntimeModule
j2cModule
objectPoolModule
orbPerfModule
schedulerModule
servletSessionsModule
systemModule
threadPoolModule
transactionModule
webAppModule
webServicesModule
wlmModule
wsgwModule
```

3.1.7 Numbers

A number consists of a nonempty sequence of decimal digits that

- possibly contains a radix character (decimal point ‘.’).
- is optionally followed by a decimal exponent; consisting of an ‘E’ or ‘e’ followed by an optional plus or minus sign followed by a nonempty sequence of decimal digits that indicates multiplication by a power of 10.

Examples:

```
1234
0.001
1.2
123.45E-12
```

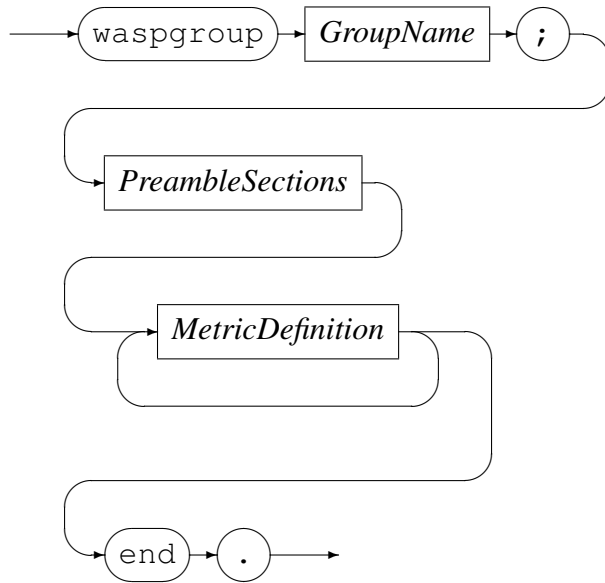
3.2 Syntax and Semantics

The configuration file for `cmlxwasp` starts by defining a WebSphere Application Server metrics group, followed by the `preamble` sections and then a list of WebSphere Application Server performance metrics to process and send to `Serfboard`.

See appendix A on page 17 for an example of a `cmlxwasp` configuration file.

3.2.1 Body

Imaginary Buffer Line



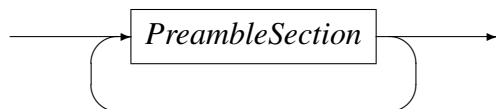
GroupName



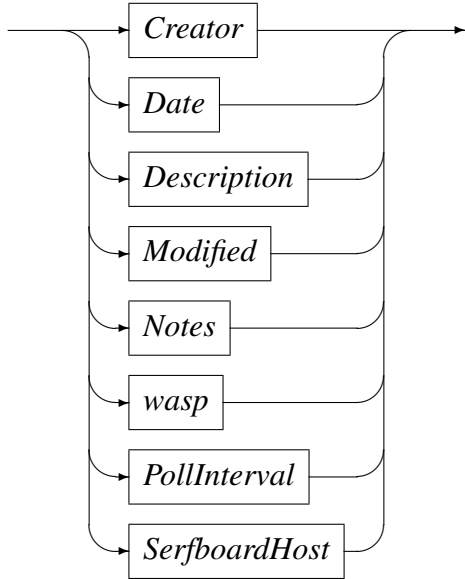
GroupName identifies the name of of the group to the Serfboard server and is required.

3.2.2 Preamble Sections

PreambleSections



PreambleSection



Creator



The *Creator* preamble section is required and Identifies the author.

Date



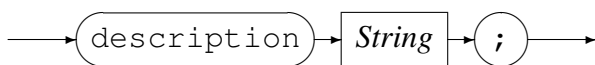
The *Date* section is provided so that a date can be associated with the configuration file. This date is interpreted as the date the configuration file was created. *ISODate* has the ISO date and time format:

yyyy-mm-ddThh:mm:ss

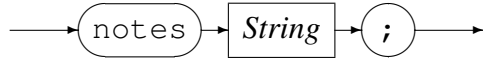
Where the portion before the T-character is the date and the portion after it is the time stamp. In the date portion, yyyy is the four digit year, mm is the two digit month number, and dd is the two digit day of the month. In the time stamp portion, hh is the hour of the day according to the twenty four hour clock format, mm is the two digit minutes past the hour and ss is the two digit seconds past the minute.

The *Date* preamble section is required.

Description



The *Description* section is required and provides a mechanism for assigning a descriptive comment as documentation to the configuration file.

Notes

The *Notes* section is optional and is provided so that any additional commentary can be included as part of the configuration file.

Modified

The *Modified by* section is optional and is provided as a means by which the name of the user modifying the configuration file can be recorded.

wasp

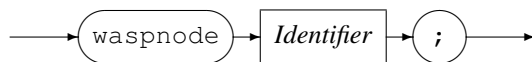


The *wasp* section is required and defines `perfServletApp` settings to be used when retrieving the metrics from the WebSphere AppServer. If Application security is enabled on the WebSphere Application Server server then `username` and `password` hold the appropriate values. `apiusername` and `apipassword` specifies the credentials of the user granted monitor access role on the `perfServletApp` application. To reduce traffic `waspmodules` can be used to specify which PMI modules to retrieve.

Example:

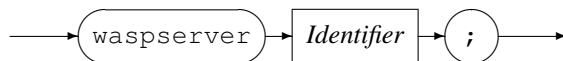
```
wasp
  host localhost;
  port 9080;
  waspnode pixieNode02;
  waspserver server3;
  password aPassword;
  password aPassword;
  apiusername cmlxwasp;
  apipassword cmlxwaspPassword;
  waspmodules "jvmRuntimeModule+cacheModule";
end;
```

Waspnode



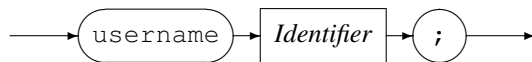
The *Waspnode* is optional and restricts the PMI statistics to just those for this node of the WebSphere Application Server.

Waspserver



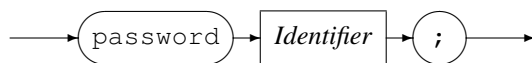
The *Waspserver* is optional and restricts the PMI statistics to just those for this server on the Waspnode of the WebSphere Application Server.

Username

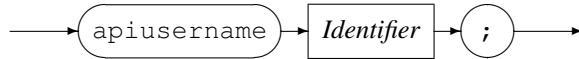


The *Username* is optional and is used when Basic Authentication Security is enabled on the WebSphere Application Server().

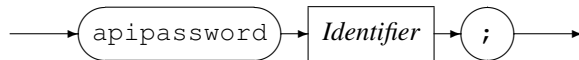
Password



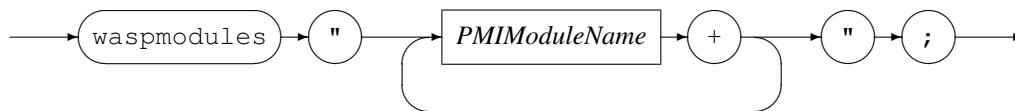
The *Password* is the password used for the *username*.

apiusername

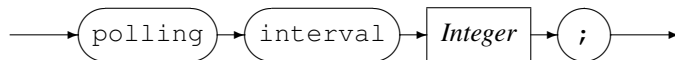
The *apiusername* is required and must correspond to the user granted monitor access role for `perfServletApp`.

apipassword

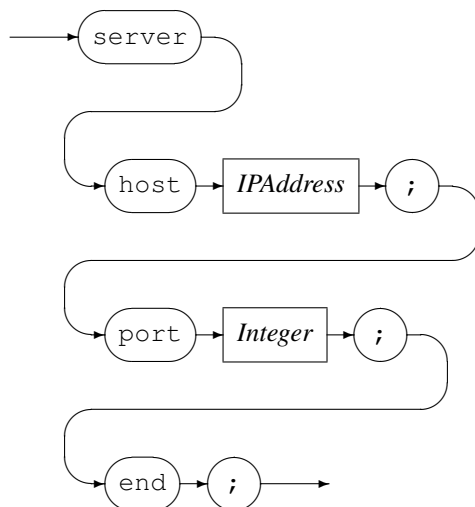
The *apipassword* is the password used for the *apiusername*.

Waspmodules

The *Waspmodules* is optional and if specified list the PMI module names to be passed to the `perfServletApp` servlet query. If set then this can be used to restrict PMI statistics gathered to just those for the module listed. A list of modules supported by the (wasp) can be obtained via the `-r` or `-a` option.

PollInterval

The *PollInterval* section is required and is the frequency (in seconds) at which the WebSphere Application Server host will be polled for metrics. The frequency must be greater than zero and less than 100.

SerfboardHost

The *SerfboardHost* section is required and defines the *Serfboard* server that the WebSphere Application Server performance metrics must be fed to. *IPAddress* can be specified as a host name or by using the Internet notation of dots and numbers.

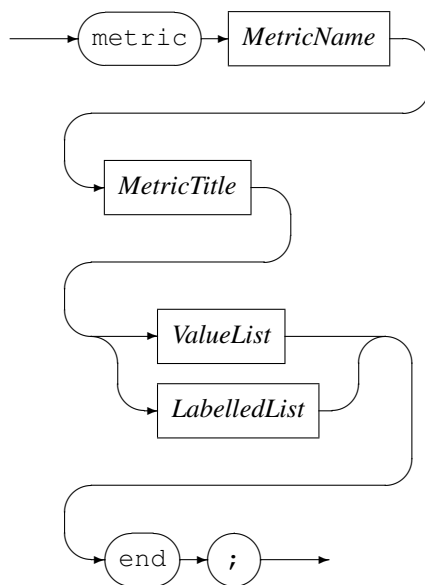
Example:

```
server
  host codemagus.it.nednet.co.za;
  port 41054;
end;
```

3.2.3 Metric Definition

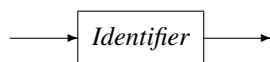
Serfboard server accepts either a 'Value' list metric or a 'Labelled' list metric as input. For a detailed specification of the *Serfboard* server metric inputs refer to the relevant *Serfboard* documentation.

MetricDefinition



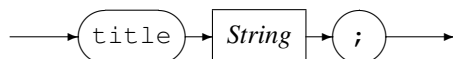
MetricDefinition is the statement that binds the metric as known on the local system to the name by which it is known remotely on *Serfboard*.

MetricName

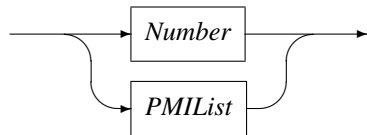
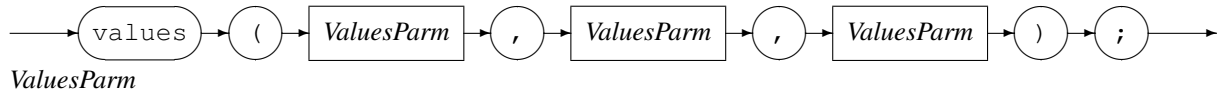


MetricName is the name of the configured metric in the *Serfboard* server.

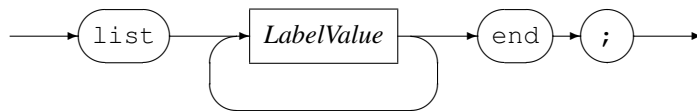
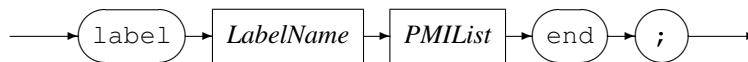
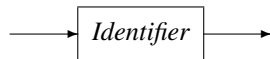
MetricTitle



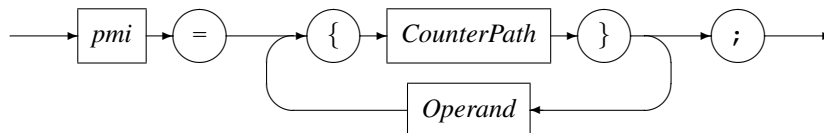
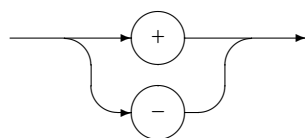
MetricTitle is used to populate the `title` in the metric that is sent to the *Serfboard* server.

ValueList

values has three parameters. Each parameter can be either be a *Number* or an WebSphere Application Server performance metric list.

LabelledList*LabelValue**LabelName*

A *LabelledList* metric has one or more '*LabelName*', with its associated *PMIList*.

CounterList*Operand*

The *PMIList* is the summation of all the WebSphere Application Server performance counters specified, using *operand*. A *CounterPath* is the WebSphere Application Server PMI statistic name. To obtain a list of all the available counters on a machine, execute `cmlxwasp` with parameter `--metric-descriptions`.

Examples of WebSphere Application Server PMI statistic lists:

```
pmi =
  {pixieNode01.server1.JDBC Connection Pools.PercentMaxed.lowWaterMark}, 0, 0
pmi =
  {pixieNode01.server1.JDBC Connection Pools.PoolSize.lowWaterMark}, 0, 0
```


Example of a 'Value' list metric:

```
metric cpu_cpu0_idle
  title "Clock ticks spent in idle mode";
  values (pmi statistic = {aNode.server1.JDBC Connection
Pools.Poolsize.count}, 0, 0); end;
```

In this example the "0 0" are constant values sent with every metric.

Example of a 'Labelled' list metric:

```
metric connection_pools
  title "JDBC Connection Pools";
  list
    label idle
      pmi = {aNode.server1.JDBC Connection Pools.PoolSize.HighWaterMark};
    end;
    label user
      pmi = {aNode.server1.JDBC Connection Pools.PoolSize.lowWaterMark};
    end;
  end;
end;
```

A Example Configuration File

```
-- File: waspmi_pixie.cfg
--
-- WSA Pmi Statistics feed.
--
-- Author: Angie Gormley-McGlynn.
--
-- Copyright (c) 2009 Code Magus Limited. All rights reserved.
--
-- $Author: angie $
-- $Date: 2009/10/09 22:08:55 $
-- $Id: waspmi_pixie.cfg,v 1.5 2009/10/09 22:08:55 angie Exp $
-- $Source: /home/cvs/cvsroot/cmlxwasp/documents/waspmi_pixie.cfg,v $
-- $Revision: 1.5 $
-- $State: Exp $
--
-- $Log: waspmi_pixie.cfg,v $
-- Revision 1.5 2009/10/09 22:08:55 angie
-- corrected error in cvs Log comments
--
--
waspgroup waspmi_pixie;
    created by "Angie Gormley-McGlynn";
    description "Websphere pmi feed to Serfboard from pixie.codemagus.com";
    date "2009-09-16T10:51:18";
    modified by "Angie Gormley-McGlynn";
    notes "$Source: /home/cvs/cvsroot/cmlxwasp/documents/waspmi_pixie.cfg,v $"
        " $Revision: 1.5 $";
    wasp
        host pixie.codemagus.com;
        port 9080;
        username websphere;
        password websphere;
        apiusername cmlxwasp;
        apipassword cmlxwasp;
    end;

    polling interval 10;
    server
        host pixie.codemagus.com;
        port 41090;
    end;

    metric JVM_Runtime_HeapSize_mean
        title "Mean JVM Runtime HeapSize in KILOBYTES";
        values (pmi = {pixieNode01.server1.JVM Runtime.HeapSize.mean}, 0, 0);
    end;

    metric JVM_Runtime_ProcessCpuUsage
        title "JVM Runtime Processor Usage";
        values (pmi = {pixieNode01.server1.JVM Runtime.ProcessCpuUsage.count}, 0, 0);
```

A EXAMPLE CONFIGURATION FILE

```
end;
metric JVM_Runtime_UsedMemory
  title "JVM Runtime UsedMemory in KILOBYTE";
  values (pmi = {pixieNode01.server1.JVM Runtime.UsedMemory.count}, 0, 0);
end;

end.
```

References

- [1] Serfboard Configuration Guide and Reference Version 1. CML Document CML00023-01, Code Magus Limited, July 2008. [PDF](#).
- [2] Serfboard Instruments Guide and Reference Version 1. CML Document CML00024-01, Code Magus Limited, July 2008. [PDF](#).
- [3] Serfboard Installation Guide and Reference Version 1. CML Document CML00025-01, Code Magus Limited, July 2008. [PDF](#).
- [4] Serfboard User Guide Version 1. CML Document CML00027-01, Code Magus Limited, July 2008. [PDF](#).