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# AMPS Monitoring Reference Guide

## 60East Technologies

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## 1. administrator

The `administrator` interface provides administrative actions for this AMPS instance.

**clients.** Selecting the `clients` resource will list all connected clients by name. Selecting a single client will permit them to be disconnected.

**authorization .** Selecting the `authorization` resource will allow the authentication or entitlement resources to be reset. Selecting either one of these will present a `reset link`, which calls the reset function as defined by the respective authentication or entitlement resource.

**minidump .** Selecting the `minidump` resource will create a minidump of the currently running AMPS instance. The minidump will be saved in directory specified by the `MiniDumpDirectory`, or `/tmp` if no directory is specified. See the *AMPS Configuration Guide* for more information.

**replication .** Selecting the `replication` resource will list all currently configured replications. Selecting any individual replication destination will permit them to be downgraded.

**transports .** Selecting the `transports` resource will list all currently configured transports. Selecting any individual transport will permit the transport to be enabled or disabled.

## 2. Host Interface

The `host` URI contains information about the current operating system devices, such as the CPU, memory, disk and network. In addition, a host's network hostname and system timestamp time are also exposed through the monitoring interface.

### CPUs

The `cpu` resource allows an administrator to view the CPU devices attached to the host. Selection of the `cpu` link in the `host` resource generates a list of all CPUs attached to the host, and also an aggregate `all` option.

Table 1. CPU Statistics

Element	Description
<code>idle_percent</code>	Percent of CPU time that the system did not spend waiting on an I/O request to complete.
<code>iowait_percent</code>	Percent of CPU time spent waiting for I/O requests to complete.

Element	Description
system_percent	Percent of CPU utilization time which occurred while executing kernel processes.
user_percent	Percent of CPU utilization time which occurred while running at the application level.

## Disks

The `disks` resource lists each of the disk devices attached to the host and permits the inspection of disk usage statistics. This information is a readily consumable version of the file `/proc/diskstats`. Statistics reported are based on the statistics monitoring update frequency (see the *AMPS Configuration Guide* for details). This means, for example, that `reads` is the number of disk-reads for the given statistics update interval.

**Table 2. Disks Statistics**

filesystem_free_percent	Percentage of the filesystem currently free.
in_progress	Number of I/O requests waiting to be processed.
read_await	Average read time completion in milliseconds.
write_await	Average write time completion in milliseconds.

## Memory

The `memory` resource gives details about the system memory statistics. All statistics reported are based on the current system statistics reported by examining the file `/proc/meminfo`. These statistics are updated based on the statistics monitoring update frequency (see `Interval` in *AMPS Configuration Reference Guide*). All memory statistics are reported in kB.

**Table 3. Memory Statistics**

Element	Description
available	The total amount of memory available. Calculated as the sum of <code>free</code> , <code>buffers</code> and <code>cached</code> .
buffers	The amount of physical memory available for file buffers.
cached	The amount of physical memory used as cache memory.
free	The amount of physical memory left unused by the system.
in_use	The amount of memory currently in use. Calculated as <code>total - (free + buffers + cached)</code> .
swap_free	The amount of swap memory which is unused.
swap_total	The total amount of physical swap memory.
total	Total amount of RAM.

## Name

The `name` resource displays the network DNS name for the host.

## Network

The `network` resource allows an administrator to examine networking interface statistics on the host. Selecting the `network` resource displays a list of the network interfaces attached to the host. Selecting one of the interfaces will list the available properties. Reported statistics are rate-based and based on the statistics monitoring update frequency (see the *AMPS Configuration Guide* for details). For example, `collisions` for interface `eth0` would report the total number of collisions since the last statistics update interval.

**Table 4. Network Statistics**

Element	Description
<code>bytes_in</code>	Number of bytes received by the interface.
<code>bytes_out</code>	Number of bytes transmitted by the interface.
<code>errors</code>	Total errors both incoming and outgoing. This number includes packets dropped, collisions, fifo, frame, and carrier errors.
<code>packets_in</code>	The total number of packets received by the interface.
<code>packets_out</code>	The total number of packets sent by the interface.

## UTC time

The `utc_time` resource displays the system time on the host. Note: the `utc_time` time reflects the time on the host that the HTTP GET was processed. This differs from all other resources in the `host` interface as their update frequencies are determined by the `Interval` tag in the configuration for the Admin interface. For more information on configuring the Administrative Interface and the `Interval` tag, see the *AMPS Configuration Guide*.

## 3. Instance Interface

The `Instance` resource provided by the AMPS monitoring interface is the administrative overview of a running AMPS instance. At a glance an administrator has access to a wide view of statistic and configuration information related to AMPS usage.

### api

Selecting the `api` resource lists information about the AMPS internal api.

**Table 5. Client Statistics**

Element	Description
<code>command_queue_depth</code>	The number of pending commands.

### clients

Selecting the `clients` resource will list all connected clients by name. Selecting a single client will grant the user the ability to view various properties regarding a client.

**Table 6. Client Statistics**

<b>Element</b>	<b>Description</b>
authenticated_id	The id used to authenticate this client, if any.
bytes_in	Number of bytes received.
bytes_in_per_sec	Rate of bytes received.
bytes_out	Number of bytes sent.
bytes_out_per_sec	Rate of bytes sent.
client_name	Identifier for the client, set during the logon.
client_version	Version string provided by the client.
connect_time	UTC time client connection is established.
connection_name	Name of the connection.
correlation_id	The CorrelationId provided with the logon command, if any.
denied_reads	Number of read requests which have been denied.
denied_writes	Number of write requests which have been denied.
messages_in	Number of messages received from client.
messages_in_per_sec	Rate of messages received.
messages_out	Number of messages sent to the client.
messages_out_per_sec	Rate of messages sent to the client.
query_time	The amount of time spent for queries from this client.
queue_depth_out	Number of messages queued to be sent to client.
queue_max_latency	The age of the oldest item in the queue which has not yet been sent. This is used as a measure of how far behind AMPS believes a subscribing client is.
queued_bytes_out	Number of queued bytes waiting to be sent.
remote_address	IP and port of the client connection.
subscription_count	Number of subscriptions the client has requested.

## config.xml

Selecting this will display the current AMPS configuration file, by default called `config.xml`.

## config\_path

Filesystem location of the configuration file.

## conflated topics

Selecting the `conflated_topics` resource will display a list of the conflated topics in the instance.

Table 7. Conflated Topics

Element	Description
conflation_ratio	Ratio representing the amount of conflation for this topic.
interval	Conflation interval
message_type	Message type for this topic.
topic	Name of this conflating topic replica.
total_executions	Total number of times the conflation algorithm has been executed.
total_time	Amount of time spent processing this topic.
underlying_topic	Name of the underlying topic that this topic conflates.

## cpu

The CPU resource lists properties related to overall CPU usage of the AMPS instance. Selecting the items below give more specific information to the type of CPU utilization being consumed by the AMPS user.

Table 8. CPU Statistics

Element	Description
system_percent	Percent of CPU utilization time consumed while executing kernel processes.
total_percent	Total percent of CPU utilization.
user_percent	Percent of CPU utilization time consumed while processing non-I/O events.

## cwd

The current working directory from which the AMPS instance was invoked.

## logging

The logging resource contains information about the resources consumed during various AMPS logging processes. Selecting a logging mechanism (console, file or syslog) will first list all logs of that particular type. Drilling down into one of those logs will pull up more granular information about logging. If a logging mechanism is not defined in the configuration, then the results will be blank when the logging resource is selected.

**console .** Below are the options available for reporting when console logging is enabled.

Table 9. Console Logging Statistics

Element	Description
bytes_written	Number of bytes written to the console.
exclude_errors	Errors which are excluded from logging.
include_errors	Errors which are included during logging.
log_levels	Log level used to control logging output.
target	Console to which logging output is directed. Default is stdout.

**file .** Below are the options available for reporting when `file` logging is enabled.

**Table 10. File Logging Statistics**

Element	Description
<code>bytes_written</code>	Number of bytes written to the console.
<code>exclude_errors</code>	Errors which are excluded from logging.
<code>file_name</code>	File defined in the <code>config.xml</code> where the log file is written to.
<code>file_name_mask</code>	Mask of the logging output file name, if available.
<code>file_system_free_percent</code>	Amount of file system available.
<code>include_errors</code>	Errors which are included during logging.
<code>log_levels</code>	Log level used to control logging output.
<code>rotation</code>	Boolean representation denoting if log rotation is turned on.
<code>rotation_threshold</code>	Log size at which log rotation will occur.

**syslog .** Below are the options available for reporting when `syslog` logging is enabled

**Table 11. System Logging Statistics**

Element	Description
<code>bytes_written</code>	Number of bytes written to the console.
<code>exclude_errors</code>	Errors which are excluded from logging.
<code>facility</code>	Integer enumeration of the logging facility used by <code>syslog</code> .
<code>ident</code>	Syslog name of the logging instance.
<code>include_errors</code>	Errors which are included during logging.
<code>log_levels</code>	Log level used to control logging output.
<code>logopt</code>	Bitfield of possible log options included. These values are configured in the <code>config.xml</code> file in the <code>&lt;Options&gt;</code> tag.

## memory

AMPS can provide information regarding the process's memory usage in its RSS and VMSize via the memory resource in the monitoring interface.

**Table 12. AMPS Instance Memory**

Element	Description
<code>caches</code>	Information about AMPS memory caches.
<code>maps</code>	Information about AMPS memory maps.
<code>rss</code>	The resident set size of the AMPS process.
<code>vmsize</code>	The virtual memory size of the AMPS process.

**Table 13. AMPS Instance Memory Caches**

Element	Description
<code>allocations</code>	Number of memory allocations for this cache.

Element	Description
bytes	Number of bytes allocated to this cache.
description	Description of the cache.
efficiency	Ratio of hits to requests for this cache.
entries	Number of entries in this cache.
evictions	Count of evictions from this cache.
fetches	Count of fetches from this cache.

## message\_types

Information regarding the message types used by AMPS are maintained in the `message_types` resource. AMPS can track the following information for all message types loaded into the instance. By default, AMPS loads `fix`, `nfvi`, `xml`, and `json` message types.

**Table 14. AMPS Instance Message Types**

Element	Description
module	The name of the module that implements the message type.
name	The name of the message type.
options	Any options provided to the module.
type	The Type configured for the message type module. <i>this configuration parameter is obsolete in 4.0 and later releases</i>

## name

Name of the AMPS Instance.

## pid

The process ID of the current `ampServer` process.

## processors

Selecting the `processors` resource will list all the available message processors that the AMPS instance has invoked to handle messages. Each AMPS message processor will be listed individually, or selecting the `all` resource will list an aggregate of the available message processors. All AMPS message processors have the following attributes available:

**Table 15. AMPS Message Processors**

Element	Description
denied_reads	Number of read requests which have been denied.

Element	Description
denied_writes	Number of write requests which have been denied.
description	Descriptor of the processors resource.
last_active	Number of seconds since a processor was last active.
matches_found	Number of messages found.
matches_found_per_sec	Rate of messages found.
messages_received	Number of messages received.
messages_received_per_sec	Rate of messages received.
throttle_count	Number of times the processor had to wait to add a message to the processing pipeline due to the instance reaching capacity limits on the number of in-progress messages.

## queues

The `queues` resource lists available information regarding the queues defined for this instance.

**Table 16. Queues**

Element	Description
age_of_oldest_lease	The age of the oldest current lease, in microseconds.
backlog	The number of leased messages awaiting acknowledgement.
expired_leases	The number of leases that have expired for this queue.
max_backlog	The configured <code>MaxBacklog</code> for the queue.
message_type	The message type for the queue.
queue_depth	Total number of unacknowledged messages in the queue.
seconds_behind	Age of the oldest unacknowledged, unleased message in the queue.
topic	Name of the queue topic.

## queries

The `queries` resource lists all available information regarding the query messages sent to AMPS.

## queued queries

A count of all queries which have not yet completed processing.

## replication

Selecting the `replication` resource will display a list of available downstream replication instances used by this instance of AMPS. Selecting an individual replication instance will display the following statistics.

**Table 17. Replication**

Element	Description
authenticated_id	The ID used to authenticate this connection.
bytes_out	Number of bytes sent.
bytes_out_per_sec	Rate of bytes sent.
client_type	Specifies whether client is a replication source or destination.
connect_time	Time connected to replication instance.
destination_admin_addr	The admin address of the destination.
destination_group_name	The group name of the destination.
destination_name	The name of the destination.
disconnect_count	Number of times replication destination has been disconnected.
disconnect_time	Total amount of time in which the replication destination has been disconnected.
is_connected	Boolean telling whether replication destination is currently connected.
messages_out	Number of messages sent.
messages_out_per_sec	Rate of messages sent.
name	Name of replication configuration.
pass_through	Boolean stating whether messages can only be sent to one client, or can messages be sent on to other downstream clients.
replication_type	One of either <code>sync</code> or <code>async</code> .
seconds_behind	The number of seconds the destination is behind, as measured by the oldest message which has not yet been replicated.

The replication resource also provides options for managing replication instances. The following management functions are available.

**Table 18. Replication**

Element	Description
downgrade	Change the replication type of this connection from <code>sync</code> to <code>async</code> .
reconnect	Close and reopen the connection to the remote instance.

## SOW

Clicking the `sow` link will list all available SOW topics for the AMPS instance. Selecting a single `sow` topic will list the following available statistics about the `sow` topic:

**Table 19. SOW Interface**

Element	Description
delete_count	Number of deletes processed by the SOW.
deletes_per_sec	Number of deletes per second processed by the SOW.
historical_granularity	The granularity at which this SOW maintains history, if one is set.

Element	Description
historical_window	The window for which the SOW maintains history, if one is set.
insert_count	Count of the number of records inserted into the SOW.
inserts_per_sec	Rate of inserts into the SOW.
memory_bytes	The number of bytes of memory used for this SOW.
msg_type	Message type for this topic.
path	File system location of the SOW topics file store.
queries_per_sec	Rate of queries for this SOW topic.
query_count	Number of queries processed for this SOW.
record_size	Configured record size for the SOW.
stored_bytes	Number of bytes stored for this SOW
topic	Name of this SOW topic.
update_count	Number of updates processed by this SOW
updates_per_sec	Number of updates each second
valid_keys	Number of distinct messages in the SOW - defined by the SOW topic key.

## statistics

The `statistics` resource contains information regarding how AMPS monitors its own statistics.

**Table 20. Statistics Interface**

Element	Description
disk_per_sample	Amount of storage the stats database has grown since the last sample interval.
file_name	Location where statistics are stored. Default is <code>:memory:</code> , which stores the statistics database in system memory.
file_size	Size on disk of the statistics database.
interval	Time in milliseconds between statistics database updates.
memory_used	Size in bytes of the system memory consumption of the statistics database.
queries	Number of queries processed from the statistics database.
time_per_sample	Time taken to process each statistics database query.
total_samples	Number of statistics database updates that have taken place since the AMPS server started.
total_time	Total amount of time spent publishing statistics.

## subscriptions

Each client that submits a `subscribe` command message is tracked by AMPS, and their relevant metrics are captured in the monitoring instance database. Selecting the `subscriptions` resource lists the available subscribers. Selecting a subscriber will list the available statistics below:

**Table 21. Subscriptions Interface**

<b>Element</b>	<b>Description</b>
client_id	The ID of the subscribing client.
entitlement_filter	The filter applied by the entitlement module, if any.
filter	The filter requested on the subscription, if any.
is_bookmark	Boolean value to determine if the subscription is a bookmark.
is_oof_enabled	Boolean value to determine if the subscription has OOF (Out Of Focus Processing) enabled.
is_replication	Boolean value to determine if the subscription is applied to a replication.
message_type	Transport type of the subscription message. All return acknowledgments and messages use the same transport as the subscription.
seconds_behind	For bookmark subscriptions, the number of seconds the subscription is running behind, as measured by the age of the last message enqueued for the client.
send_emptyies	Boolean to determine if sending empty messages is required/permitted.
subscription_type	Type of subscription.
topic	Subscription topic.

## transports

Clicking the [transports](#) link will give a list of the transports defined in the configuration file for the AMPS instance. Clicking a view will display the detailed resources for views.

**Table 22. Transports Interface**

<b>Element</b>	<b>Description</b>
is_enabled	Indicates whether the transport is enabled.
message_type	The message type for this transport.
name	The name of this transport.
options	The options provided for this transport.
type	The type of transport.

## tuning

Clicking the [tuning](#) link will give a list of the tuning parameters for the instance. Clicking a parameter will give the current value for the instance.

**Table 23. Tuning Interface**

<b>Element</b>	<b>Description</b>
NUMA	Indicates whether AMPS NUMA tuning is enabled.

## uptime

The length of time that the AMPS instance has been running, which conforms to a `hh:mm:ss.aaaaaa` format. This format is explained in the table below.

**Table 24. Time formatting used in `uptime`**

Element	Description
hh	hours
mm	minutes
ss	seconds
aaaaaa	microseconds

## user\_id

The username for the owner for the `ampServer` process.

## version

Version of the current running instance of AMPS.

## views

Clicking the `views` link will give a list of the views defined in the configuration file for the AMPS instance. Clicking a view will display the detailed resources for views.

**Table 25. Views Interface**

Element	Description
<code>grouping</code>	List of one or more fields, which are used to determine message aggregation.
<code>message_type</code>	The message type of messages produced by this view.
<code>projection</code>	The formula defined in the AMPS config for the computed transformation of one or more fields onto a new field.
<code>queue_depth</code>	The number of messages in the view that have not yet completed processing.
<code>topic</code>	The name of the new AMPS topic created by this view.
<code>underlying_topic</code>	The source topic used to compute the projected view.