Moodle Load Monitor: web service

This page describes the web service exposed by `tool_moodleload`: the functions, their parameters and their responses. It is aimed at integrators and at the MoodleLoad engine.

The service

Property	Value
Name	Moodle Load Monitor
Short name	`moodleload_monitor`
Protocol	REST
Users	Restricted: only authorised users (the `moodleload` account created at installation)
File upload	Allowed (`webservice/upload.php`)
File download	Disabled

General call:

```
POST /webservice/rest/server.php
  wstoken=<TOKEN>
  wsfunction=<function>
  moodlewsrestformat=json
  <function parameters>
```

The token is that of the `moodleload` account (see Installation and configuration). Never put it in a shared URL or in a document.

Function	Role	Type	Required capability
`tool_moodleload_get_metrics`	Host metrics	Read	`tool/moodleload:readmetrics`
`tool_moodleload_authorize_load`	Test authorisation handshake	Read	`tool/moodleload:readmetrics`
`app_moodleload_commit`	Validate an uploaded test material file	Write	`tool/moodleload:setuptests`
`app_moodleload_restore_course`	Restore a test course	Write	`tool/moodleload:setuptests`
`app_moodleload_bulk_create_install_users`	Create or update test users	Write	`tool/moodleload:setuptests`

tool_moodleload_get_metrics

Returns a snapshot of the resources of the server running Moodle.

Parameter

Name	Type	Default	Description
include_loopback	boolean	false	Includes the loopback interface (lo) in the network statistics.

Response

Field	Type	Description
timestamp	integer	Unix timestamp of the snapshot.
cpu_percent	decimal	CPU usage from 0 to 100. -1 on the first call (the calculation needs two snapshots) or if /proc/stat is not available.
memory.total, memory.available, memory.used	integer	Memory in bytes. -1 if unavailable.
memory.used_percent	decimal	Percentage of memory used.
load_avg.avg1, avg5, avg15	decimal	Load average over 1, 5 and 15 minutes. -1 if unavailable.
processes.total, running, blocked	integer	Number of processes, runnable, blocked on I/O. -1 if unavailable.
network	list	One entry per network interface: interface, rx_bytes, rx_packets, rx_errors, rx_dropped, tx_bytes, tx_packets, tx_errors, tx_dropped (totals since startup) and delta_rx_bytes, delta_tx_bytes, delta_seconds, rx_bps, tx_bps (differences since the previous call, -1 on the first call). Empty list if /proc/net/dev is unreadable.
error	text	Not empty if a measurement could not be collected.
hostname	text	Name of the host that produced the snapshot (useful on a server cluster).

Example of an abridged response:

```
{
  "timestamp": 1727600000,
  "cpu_percent": 14.73,
  "memory": {"total": 16777216000, "available": 9663676416, "used":
7113539584, "used_percent": 42.40},
  "load_avg": {"avg1": 0.85, "avg5": 1.02, "avg15": 0.97},
  "processes": {"total": 312, "running": 2, "blocked": 0},
  "network": [],
  "error": "",
  "hostname": "web01"
}
```

The CPU measurement is a difference between two snapshots kept in Moodle's universal cache (adjustable lifetime). Call the function twice at least 5 seconds apart to get a meaningful value. The function is also called by the tool's dashboard with the administrator's Moodle session (no token is written in the page).

tool_moodleload_authorize_load

Handshake that MoodleLoad performs before launching a load test on the site. The engine refuses to fire on a site that does not answer it.

Parameters

Name	Type	Description
nonce	alphanumeric	Random challenge generated by MoodleLoad, 16 to 64 characters.
wwwroot	text	The root address of the site MoodleLoad is about to load.

Response

Field	Type	Description
protocol	integer	Handshake protocol version (1).
nonce	text	The challenge received, returned as is.
wwwroot	text	The actual root address of this Moodle.
timestamp	integer	Server time.
allowload	integer	1 if the administrator allows load tests.
maxload	integer	Maximum number of simultaneous user sessions. 0: no limit.
allowedhours	text	Allowed time ranges (server time). Empty: any hour.
inallowedhours	integer	1 if the current server time is within the allowed ranges.
pluginversion	text	Plugin version.
siteidentifier	text	Moodle site identifier.
message	text	Message to the operator (test not allowed, outside time range).
signature	text	HMAC-SHA256 signature of the signed fields, computed with the call's token.

The signature covers the following string, the fields being separated by | in this order: protocol, nonce, wwwroot, timestamp, allowload, maxload, allowedhours, inallowedhours. The engine recomputes it with the token it knows and compares: an unsigned response, or one from another site, is rejected. The test is refused if allowload is 0 or if inallowedhours is 0.

Preparing the test material

These three functions require the tool/moodleload:setuptests capability in the system context. The normal sequence is:

1. Upload the file (course backup or users CSV) to /webservice/upload.php with the token: the upload returns a draft area identifier (itemid).
2. Call app_moodleload_commit to validate the file.
3. Call app_moodleload_restore_course or app_moodleload_bulk_create_install_users with the identifier of the validated file.

app_moodleload_commit

Validates the single file of a draft area as the test material for a given purpose. A new file replaces the

previous one for the same purpose.

Parameter	Type	Description
`draftitemid`	integer	Identifier of the draft area of the uploaded file. The area must contain exactly one file.
`purpose`	alphabetic	`testcourse` (course backup) or `testusers` (users CSV).

Response	Description
`storedfileid`	Identifier of the validated file, to pass to the following functions.
`purpose`	The purpose of the file.
`filename`	File name.
`filesize`	Size in bytes.

app_moodleload_restore_course

Restores a validated course backup. A course with the same short name is deleted before the restore, so that the test material is refreshed.

Parameter	Type	Description
`storedfileid`	integer	Identifier of the file validated with the `testcourse` purpose.
`categoryid`	integer, optional	Destination category. 0 or absent: the *Load Tests* category.

The caller must be able to create courses and restore into the targeted category. Response: `courseid`, `shortname` and `categoryid` of the restored course. An unreadable backup causes an error.

app_moodleload_bulk_create_install_users

Creates or updates the users of a CSV file validated with the `testusers` purpose, then enrols them in the indicated courses. Accounts are identified by their login.

Parameter	Type	Description
`storedfileid`	integer	Identifier of the file validated with the `testusers` purpose.

File format: the first line is the header. The separator is `;` or `,` (whichever appears most in the header).

Column	Mandatory	Description
`username`, `firstname`, `lastname`, `email`	yes	Account identity.
`password`, `city`, `country`	no	Password, city, country.
`enrol1` to `enrol4`	no	Enrolment method (installed and enabled on the site).
`enrolcourse1` to `enrolcourse4`	no	Course short name.
`role1` to `role4`	with `enrol<n>`	Role short name.
`groupname1` to `groupname4`	no	Course group, created if it does not exist.

When the course has no enabled instance of the requested method, a default instance is added. A user or enrolment in error is reported with its line and does not stop the other lines.

Response	Description
`created`	Number of accounts created.
`updated`	Number of accounts updated.
`enrolled`	Number of enrolments made.
`errors`	List of errors: `line` (file line number) and `message`.

Security

- The service is reserved for authorised users. The `moodleload` account holds the Manager role: the token must be protected like an administration credential.
- Deleting a course with the same short name during a restore is intentional: do not use the short name of a real course for the test material.
- The write functions have no place on a production site.

Frequent errors

Message or symptom	Cause
`invalidtoken` or access denied	Token expired (3 months), web services or REST not enabled, user not authorised on the service.
Missing capability	The account does not have `tool/moodleload:readmetrics` or `tool/moodleload:setuptests` (Manager role).
Single file required	The draft area passed to `app_moodleload_commit` does not contain exactly one file.
Invalid purpose	`purpose` other than `testcourse` and `testusers`.
Nonce error	Challenge length outside 16 to 64 characters.

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