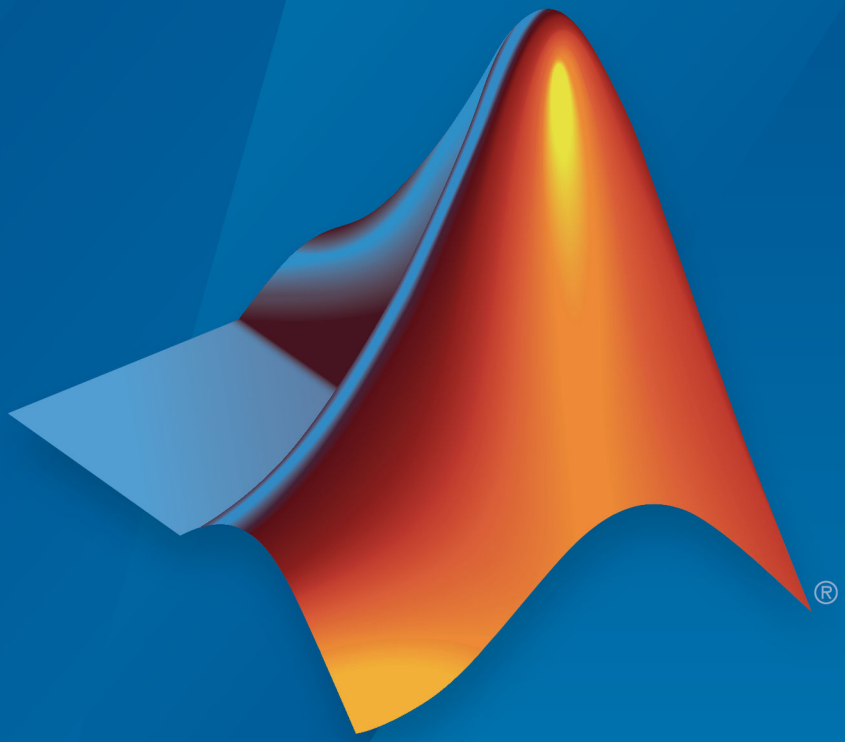
MATLAB® Production Server™

Server Management Guide



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MATLAB® Production Server™ Management Guide

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2 Manage Licenses for MATLAB Production Server

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Server Management

Server Overview

In this section...

What Is a Server?

You can create any number of server instances using MATLAB Production Server software. Each server instance can host any number of deployable archives containing MATLAB code. You may find it helpful to create one server for all archives relating to a particular application. You can also create one server to host code strictly for testing, and so on.

A server instance is considered to be one unique configuration of the MATLAB Production Server product. Each configuration has its own options file (`main_config`) and diagnostic files (`log` files, Process Identification (`pid`) files, and `endpoint` files).

In addition, each server has its own `auto_deploy` folder, which contains the deployable archives you want the server to host for clients.

The server also manages the MATLAB Runtime (MATLAB Compiler), which enables MATLAB code to execute. The settings in `main_config` determine how each server interacts with the MATLAB Runtime to process clients requests. You can set these parameters according to your performance requirements and other variables in your IT environment.

How Does a Server Manage Work?

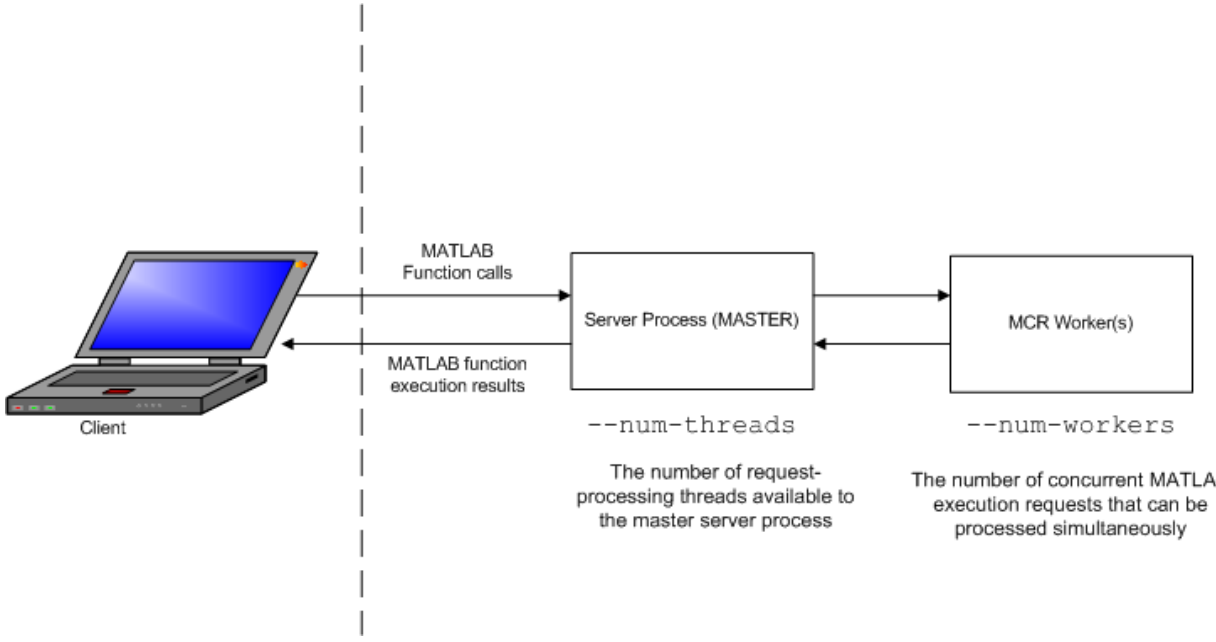
A server processes a transaction using these steps:

1. The client sends MATLAB function calls to the master server process (the main process on the server).
2. MATLAB function calls are passed to one or more MATLAB Runtime workers.
3. MATLAB functions are executed by the MATLAB Runtime worker.
4. Results of MATLAB function execution are passed back to the master server process.
5. Results of MATLAB function execution are passed back for processing by the client.

The server is the middleman in the MATLAB Production Server environment. It simultaneously accepts connections from clients, and then dispatches MATLAB Runtime workers—MATLAB sessions—to process client requests to the MATLAB Runtime. By defining and adjusting the number of workers and threads available to a server, you tune capacity and throughput respectively.

- Workers (capacity management) (num-workers) — The number of MATLAB Runtime workers available to a server.

  Each worker dispatches one MATLAB execution request to the MATLAB Runtime, interacting with one client at a time. By defining and tuning the number of workers available to a server, you set the number of concurrent MATLAB execution requests that can be processed simultaneously. `num-workers` should roughly correspond to the number of cores available on the local host.
- Threads (throughput management) (num-threads) — The number of threads (units of processing) available to the master server process.



MATLAB Production Server Data Flow from Client to Server and Back

The server does not allocate a unique thread to each client connection. Rather, when data is available on a connection, the required processing is scheduled on a pool of threads. `--num-threads` sets the size of that pool (the number of available request-processing threads) in the master server process. The threads in the pool do not execute MATLAB code directly. Instead, there is a single thread within each MATLAB Runtime worker process that executes MATLAB code on the client's behalf.

See Also

mcr-root | mps-setup

More About

- “Create a Server” on page 1-5
- “Support Multiple MATLAB Versions” on page 1-15

Create a Server

In this section...

Prerequisites

Before creating a server, ensure you have:

- Installed MATLAB Production Server software.
- Added the `script` folder to your system `PATH` environment variable. Doing so enables you to run server commands such as `mps-new` from any folder on your system.

> **Note** You can run server commands from the `script` folder. The script folder is located at *`$MPS_INSTALL`*`\script`, where *`$MPS_INSTALL`* is the location where MATLAB Production Server is installed. For example, on Windows, the default location is: `C:\Program Files\MATLAB\MATLAB Production Server\`*`ver`*`\script`. *`ver`* is the version of MATLAB Production Server.

Procedure

Before you can deploy your MATLAB code with MATLAB Production Server, you need to create a server to host your deployable archive.

A server instance is considered to be one unique configuration of the MATLAB Production Server product. Each configuration has its own parameter settings file (`main_config`) as well as its own set of diagnostic files.

To create a server configuration or instance:

1. From the system command prompt, navigate to where you want to create your server instance.
2. Enter the `mps-new` command from the system prompt:

   ```
   mps-new [path/]server_name [-v]
   ```

   where:

- *path* is the path to the server instance and configuration you want to create for use with the MATLAB Production Server product. When specifying a path, ensure the path ends with the *server_name*.

  If you are creating a server instance in the current folder, you do not need to specify a full path. Only specify the server name.
- *server_name* — is the name of the server instance and configuration you want to create.
- `-v` — enables verbose output, giving you information and status about each folder created in the server configuration.

See Also

`mps-service`

More About

- “Install a Server Instance as a Windows Service” on page 1-19

Edit the Configuration File

In this section...

About the Server Configuration File

To change any MATLAB Production Server properties, edit the `main_config` configuration file that corresponds to your specific server instance:

`server_name``/config/main_config`

When editing `main_config`, remember these coding considerations:

- Each server has its own `main_config` configuration file.
- You enter only one configuration property and related options per line. Each configuration property entry starts with two dashes (`--`).
- Any line beginning with a pound sign (#) is ignored as a comment.
- Lines of white space are ignored.

Common Customizations

Setting Default Port Number for Client Requests

Use the `http` property to set the default port number on which the server listens for client requests.

Setting Number of Available Workers

Use the `num-workers` property to set the number of concurrent MATLAB execution requests that can be processed simultaneously.

Setting Number of Available Threads

Use the `num-threads` property to set the number of request-processing threads available to the master server process.

Note For .NET Clients, the HTTP 1.1 protocol restricts the maximum number of concurrent connections between a client and a server to two.

This restriction only applies when the client and server are connected remotely. A local client/server connection has no such restriction.

To specify a higher number of connections than two for remote connection, use the NET classes `System.Net.ServicePoint` and `System.Net.ServicePointManager` to modify maximum concurrent connections.

For example, to specify four concurrent connections, code the following:

```
ServicePointManager.DefaultConnectionLimit = 4;
MWClient client = new MWHttpClient(new MyConfig());
MPSClient mpsExample = client.CreateProxy(
            new Uri("http://user01:9910/mpsexample"));
```

See Also

https

More About

- “Create a Server” on page 1-5
- “Control Worker Restarts” on page 1-17

Specify the Default MATLAB Runtime for New Server Instances

Each server that you create with MATLAB Production Server has its own configuration file that defines various server management criteria.

The `mps-setup` command line wizard searches for MATLAB Runtime instances and sets the default path to the MATLAB Runtime for all server instances you create.

To run the command line wizard, do the following after first downloading and performing the “Download and Install the MATLAB Runtime”.

1. Ensure you are logged on with `administrator` privileges.
2. At the system command prompt, run `mps-setup` from the `script` folder.

   Alternatively, add the `script` folder to your system `PATH` environment variable to run `mps-setup` from any folder on your system. The `script` folder is located at *`$MPS_INSTALL`*`\script`, where *`$MPS_INSTALL`* is the location in which MATLAB Production Server is installed. For example, on Windows®, the default location is `C:\Program Files\MATLAB\MATLAB Production Server\`*`ver`*`\script\mps-setup`.

   `ver` is the version of MATLAB Production Server to use.
3. Follow the instructions in the command line wizard.

   The wizard will search your system and display installed MATLAB Runtime instances.
4. Enter `y` to confirm or `n` to specify a default MATLAB Runtime for all server configurations created with MATLAB Production Server.

   If `mps-setup` cannot locate an installed MATLAB Runtime on your system, you will be prompted to enter a path name to a valid instance.

Run mps-setup in Non-Interactive Mode for Silent Install

You can also run `mps-setup` without interactive command input for silent installations.

To run `mps-setup`, specify the path name of the MATLAB Runtime as a command line argument. For example, on Windows:

```
mps-setup "C:\Program Files\MATLAB\MATLAB Runtime\mcrver"
```

mcrver is the version of the MATLAB Runtime to use.

See Also

mps-start

More About

- “Specify the MATLAB Runtime for a Server Instance” on page 1-11
- “Support Multiple MATLAB Versions” on page 1-15

Specify the MATLAB Runtime for a Server Instance

To specify the installed location of the MATLAB Runtime for your server instance:

1. If the server instance is running, stop it.
2. Open the configuration file for the instance in a text editor.

   The configuration file is located at *`instanceRoot`*`/config/main_config`.
3. Locate the entry for the mcr-root property.

   ```
   --mcr-root mCRuNsETtOKEN
   ```
4. Modify the `mcr_root` property to point to the installed MATLAB Runtime you want to work with.

   For example:

   ```
   --mcr-root C:\Program Files\MATLAB\MATLAB Runtime\vnnn
   ```

   Note You *must* specify the version number of the MATLAB Runtime (v*nnn*). MATLAB Runtime versions you specify must be compatible with MATLAB Production Server.
5. Restart the server instance.

See Also

mps-start

More About

- “Specify the Default MATLAB Runtime for New Server Instances” on page 1-9
- “Edit the Configuration File” on page 1-7
- “Support Multiple MATLAB Versions” on page 1-15

Start a Server Instance

In this section...

Prerequisites

Before attempting to start a server, verify that you have:

- Installed the MATLAB Runtime
- Created a server instance on page 1-5
- Specified the default MATLAB Runtime for the instance on page 1-9

Procedure

To start a server instance, complete the following steps:

1. Open a system command prompt.
2. Enter the `mps-start` command:

   ```
   mps-start [-C path/]server_name [-f]
   ```

   where:

   - `-C` *`path/`* — Path to the server instance you want to create. *`path`* should end with the server name.
   - *`server_name`* — Name of the server instance you want to start or stop.
   - `-f` — Forces command to succeed, regardless or whether the server is already started or stopped.

   Note If needed, use the `mps-status` command to verify the server is running.

See Also

mps-new | mps-service

More About

- “Install a Server Instance as a Windows Service” on page 1-19
- “Share the Deployable Archive” on page 1-14

Share the Deployable Archive

After you create the deployable archive, share it with clients of MATLAB Production Server by copying it to your server, for hosting. For information on how to create a deployable archive, see “Package Deployable Archives with Production Server Compiler App” and “Package Deployable Archives from Command Line”.

In order to share the deployable archive, a server must be created and started.

1. Locate your deployable archive in the `for_redistribution_files_only` folder of your compiler project folder.

   It is named *`project_name`*`.ctf`.

2. Copy *`project_name`*`.ctf` to the `\`*`server_name`*`\auto_deploy` folder in your server instance.

   For example, if your server is named `prod_server_1` and located in `C:\tmp`, copy *`project_name`*`.ctf` to `C:\tmp\prod_server_1\auto_deploy`.

See Also

More About

- “Create a Server” on page 1-5
- “Enable HTTPS” on page 3-3

Support Multiple MATLAB Versions

In this section...

MATLAB Production Server instances can host deployable archives compiled using multiple versions of MATLAB Compiler SDK™. You configure a server instance to do this by adding multiple mcr-root properties to the configuration file for the instance:

1. Install the required versions of the MATLAB Runtime.

   Note

   - A server instance should only be configured to use MATLAB Runtime roots on a local file system. Otherwise, a network partition may cause worker processes to fail.
   - All values for `mcr-root` must be for the same OS/hardware combination.

2. If the server instance is running, stop it.
3. Open the configuration file for the instance in a text editor.

   The configuration file is at *`instanceRoot`*`/config/main_config`.
4. Locate the entry for the `mcr-root` property.

   ```
   --mcr-root mCRuNsETtOKEN
   ```
5. For each version of the MATLAB Runtime the instance supports, add an instance of the `mcr_root` property.

   For example, to configure the instance to use the v81 and v82 versions of the MATLAB Runtime.

   ```
   --mcr-root C:\Program Files\MATLAB\MATLAB Compiler Runtime\v81
   --mcr-root C:\Program Files\MATLAB\MATLAB Runtime\v82
   ```
6. Restart the server instance.

How the Server Instance Selects the MATLAB Runtime to Use

Once the server instance is configured to use multiple versions of MATLAB Runtime, it scans the list of provided MATLAB Runtime installations in order from first to last and

chooses the first MATLAB Runtime installation capable of processing the request. A MATLAB Runtime installation can process a request if it is compatible with the version of MATLAB used to create the deployable archive containing the function being evaluated.

Note Since the server instance always chooses the first compatible version of MATLAB Runtime, configuring the server instance with multiple instances of the same MATLAB Runtime version has no effect on performance.

Changes to Worker Management

Configuring a server instance to use multiple MATLAB Runtime versions also changes to how the server instance manages the workers used to process requests.

When using a single MATLAB Runtime installation, the server instance starts workers as needed until `num-workers` workers are running. Once running, workers maybe restarted in response to the `worker-restart-interval` property or the `worker-restart-memory-limit` property. Workers are never fully stopped.

Once a server instance starts using multiple MATLAB Runtime versions, it dynamically manages the worker pool. The server instance starts new workers as needed until `num-workers` workers are running. The worker instances are spread out over the different MATLAB Runtime versions. Once `num-workers` workers are running, the server instance returns workers to the pool of available workers based on the `worker-memory-trigger` property and the `queue-time-trigger` property. Once worker is returned to the pool, it can be allocated to process new requests using any of the configured MATLAB Runtime versions.

See Also

More About

- “Specify the Default MATLAB Runtime for New Server Instances” on page 1-9
- “Specify the MATLAB Runtime for a Server Instance” on page 1-11
- “Edit the Configuration File” on page 1-7
- “Start a Server Instance” on page 1-12

Control Worker Restarts

In this section...

Restart Workers Based on Up Time

As worker processes evaluate MATLAB functions, the MATLAB workspace accumulates saved state and other data. This accumulated data can occasionally cause a worker process to fail. One way to avoid random worker failures is to configure the server instances to restart worker processes when they have been running for set period.

1. If the server instance is running, stop it.
2. Open the configuration file for the instance in a text editor.

   The configuration file is at *`instanceRoot`*`/config/main_config`.
3. Locate the entry for the `worker-restart-interval` property.

   ```
   --worker-restart-interval 12:00:00
   ```
4. Change the value to the desired restart interval.

   For example, restart workers at intervals of 1 hour, 29 minutes, 5 seconds.

   ```
   --worker-restart-interval 1:29:05
   ```
5. Restart the server instance.

Restart Workers Based on Amount of Memory in Use

As worker processes evaluate MATLAB functions, the MATLAB workspace accumulates saved state and other data. This accumulated data can occasionally cause a worker process to fail. One way to avoid random worker failures is to configure the server instances to restart worker processes when they begin consuming a predefined amount of memory.

This is done by adjusting three configuration properties:

- worker-memory-check-interval— Interval at which workers are polled for memory usage

- worker-restart-memory-limit — Size threshold at which to consider restarting a worker
- worker-restart-memory-limit-interval — Interval for which a worker can exceed its memory limit before restart

To adjust memory-based restart thresholds:

1. If the server instance is running, stop it.
2. Open the configuration file for the instance in a text editor.

   The configuration file is at *instanceRoot*`/config/main_config`.
3. Locate the entry for the `worker-memory-check-interval` property.

   ```
   --worker-memory-check-interval 0:00:30
   ```
4. Change the value to the desired restart interval.

   For example, restart workers at intervals of 1 hour, 29 minutes, 5 seconds.

   ```
   --worker-memory-check-interval 1:29:05
   ```
5. Add an entry for the `worker-restart-memory-limit` property.

   For example, consider restarting workers when they consume 1 GB of memory.

   ```
   --worker-restart-memory-limit 1GB
   ```
6. Add an entry for the `worker-restart-memory-limit-interval` property.

   For example, restart workers when they exceed the memory limit for 1 hour.

   ```
   worker-restart-memory-limit-interval 1:00:00
   ```
7. Restart the server instance.

See Also

num-workers

More About

- “Edit the Configuration File” on page 1-7
- “Support Multiple MATLAB Versions” on page 1-15

Install a Server Instance as a Windows Service

In this section...

Create a New Server Instance as a Windows Service

To create a new MATLAB Production Server instance and register it as a Windows service, use the `mps-new` command with the `--service` option.

```
mps-new /tmp/server_1 --service
```

You can change the name, description, and user for the Windows service from the defaults using optional flags to the `mps-new` command.

The Windows service created for the server instance does not start automatically. You can edit the configuration for the instance before starting it using the `mps-start` command.

The Windows service created for the server instance is configured to start when the machine starts. When the host machine is restarted, the server instance restarts with it.

Make an Existing Server Instance a Windows Service

To create a new Windows service for an existing MATLAB Production Server instance, use the `mps-service` command with the `create` option.

```
mps-service -C /tmp/server_1 create
```

You can change the name, description, and user for the Windows service from the defaults using optional flags to the `mps-service` command.

The Windows service created for the server instance is configured to start when the machine starts. When the host machine is restarted, the server instance restarts with it.

See Also

More About

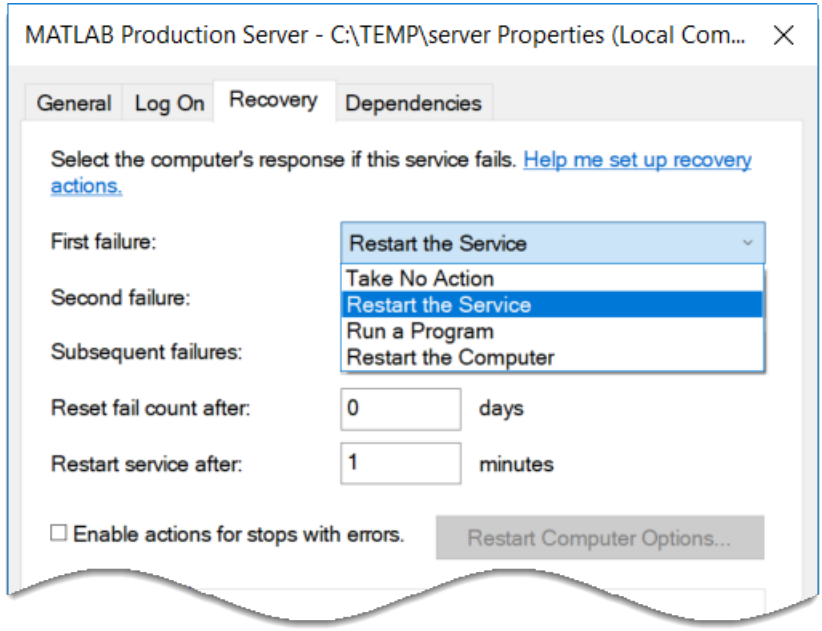
- “Recovery Options for a Server Instance Running as a Windows Service” on page 1-21

Recovery Options for a Server Instance Running as a Windows Service

You can install a MATLAB Production Server instance to run as a Windows service. For more information on how to set this up, see “Install a Server Instance as a Windows Service” on page 1-19.

You can specify how your system responds if the server instance running as a Windows service fails.

1. Open Service Control Manager in Windows.
2. Locate and double-click the server instance service that you want to configure for failure recovery.
3. Specify recovery options in the **Recovery** tab.



See Also

`mps-service`

More About

- “Server Overview” on page 1-2
- “Enable HTTPS” on page 3-3

Manage Licenses for MATLAB Production Server

Specify or Verify License Server Options in Server Configuration File

Specify or verify values for License Server options in the server configuration file (`main_config`). You create a server by using the `mps-new` command.

Edit the configuration file for the server. Open the file *`server_name`*`/config/main_config` and specify or verify parameter values for the following options. See the comments in the server configuration file for complete instructions and default values.

- `license` — Configuration option to specify the license servers and/or the license files. You can specify multiple license servers including port numbers (*`port_number`*`@`*`license_server_name`*), as well as license files, with one entry in `main_config`. List where you want the product to search, in order of precedence, using semi-colons (;) as separators on Windows or colons (:) as separators on Linux.

  For example, on a Linux system, you specify this value for `license`:

  ```
  --license 27000@hostA:/opt/license/license.dat:27001@hostB:./license.dat
  ```

  The system searches these resources in this order:

  1. `27000@hostA:` (`hostA` configured on port `27000`)
  2. `/opt/license/license.dat` (local license data file)
  3. `27001@hostB:` (`hostB` configured on port `27001`)
  4. `./license.dat` (local license data file)
- `license-grace-period` — The maximum length of time MATLAB Production Server responds to HTTP requests, after license server heartbeat has been lost. See the network license manager documentation for more on heartbeats and related license terminology.
- `license-poll-interval` — The interval of time that must pass, after license server heartbeat has been lost and MATLAB Production Server stops responding to HTTP requests, before license server is polled, to verify and checkout a valid license. Polling occurs at the interval specified by `license-poll-interval` until license has been successfully checked-out. See the network license manager documentation for more on heartbeats and related license terminology.

Verify Status of License Server using mps-status

When you enter an `mps-status` command, the status of the server *and* the associated license is returned.

For detailed descriptions of these status messages, see “License Server Status Information”.

Force a License Checkout Using mps-license-reset

Use the `mps-license-reset`command to force MATLAB Production Server to checkout a license. You can use this command at any time, providing you do not want to wait for MATLAB Production Server to verify and checkout a license at an interval established by a server configuration option such as `license-grace-period` or `license-poll-interval`.

Secure a Server

Security Overview

MATLAB Production Server uses HTTPS to establish secure connections between server instances and clients. The HTTPS layer provides certificate-based authentication for both clients and server instances. It also provides an encrypted data path between the clients and server instances. For more information, see “Enable HTTPS” on page 3-3.

The default security settings enable all security protocols and cipher suites, except for the eNULL cipher suite. You can configure the level of security provided by the HTTPS layer and the security protocols it supports. For more information, see “Adjust Security Protocols” on page 3-9.

The default security settings allow all clients to access all programs hosted by the server instance. The server instance does not authenticate the clients, nor does it perform any authorization. MATLAB Production Server provides a certificate-based authorization mechanism for restricting access to specific programs. Using this mechanism, you specify the MATLAB programs that a client can access. To configure client authorization, see “Specify Access to MATLAB Programs” on page 3-7. To ensure that only trusted client applications have access to a server instance, configure the server instance to require client authentication. For more information, see “Configure Client Authentication” on page 3-5.

Enable HTTPS

MATLAB Production Server uses HTTPS to establish secure connections between server instances and clients. HTTPS provides certificate-based authentication for the client to validate the connection to the server. Optionally, you can configure HTTPS such that the server can provide certificate-based authentication of the client. For more information on configuring client authentication, see “Configure Client Authentication” on page 3-5. HTTPS also provides an encrypted data path between the clients and server instances.

To configure HTTPS, specify the following properties in the `main_config` configuration file of the server instance:

- https: HTTPS port
- x509-cert-chain: Valid certificate stored in a PEM-format certificate chain
- x509-private-key: Valid private key stored in PEM format

For more information about the server configuration file, see “Edit the Configuration File” on page 1-7.

The following configuration excerpt configures a server instance to accept secure connections on port *port*, using the certificate stored in `./x509/my-cert.pem` and the unencrypted private key stored in `./x509/my-key.pem`.

```
...
--https port
--x509-cert-chain ./x509/my-cert.pem
--x509-private-key ./x509/my-key.pem
...
```

Starting in R2019b, if `https` is enabled on the server, you must set both the `x509-cert-chain` and `x509-private-key` properties; otherwise, the server fails to start.

In production settings that require greater security than that provided by an unencrypted private key, use an encrypted private key. You specify the passphrase for decrypting the private key in a file with owner-read-only access, and use the x509-passphrase property to tell the server instance about it.

```
...
--https port
--x509-cert-chain ./x509/my-cert.pem
--x509-private-key ./x509/my-key.pem
```

```
--x509-passphrase ./x509/my-passphrase
...
```

You must set either the http property, the `https` property or both properties for the server to start. To ensure that clients communicate with the server using only HTTPS and not HTTP, you must disable the `http` property. If both the `https` and `http` properties are enabled, clients can communicate with the server using both HTTPS and HTTP. It is recommended that you enable the `https` property unless HTTP support is required.

See Also

client-credential-delegation | ssl-protocols | ssl-tmp-ec-param

More About

- “Configure Client Authentication” on page 3-5
- “Specify Access to MATLAB Programs” on page 3-7
- “Adjust Security Protocols” on page 3-9

Configure Client Authentication

To ensure that only trusted client applications have access to a server instance, configure the server instance to require client authentication:

1. Set the ssl-verify-peer-mode configuration property to `verify-peer-require-peer-cert`.
2. Configure the server instance to use the system provided certificate authority (CA) store, a server specific CA store, or both.

   Use these configuration properties to control the CA stores used by the server instance:

   - x509-ca-file-store specifies a PEM-format CA store to authenticate clients.
   - x509-use-system-store directs the server instance to use the system CA store to authenticate clients.

   Note `x509-use-system-store` does not work on Windows.
3. Optionally configure the server instance to respect any certificate revocation lists (CRLs) in the CA store.

   Specify this behavior by adding the x509-use-crl property to the server's configuration. If this property is not specified, the server instance ignores the CRLs and may authenticate clients using revoked credentials.

   Caution You must add a CRL list to the server's CA store before adding the `x509-use-crl` property. If the CA store does not include a CRL list, the server crashes.

This configuration excerpt configures a server instance to authenticate clients using the system CA store and to respect CRLs:

```
...
--https port
--x509-cert-chain ./x509/my-cert.pem
--x509-private-key ./x509/my-key.pem
--x509-passphrase ./x509/my-passphrase
--ssl-verify-peer-mode verify-peer-require-cert
--x509-use-system-store
--x509-use-crl
...
```

The server must be configured to use HTTPS in order to configure client authentication.

See Also

https | x509-cert-chain | x509-private-key

More About

- “Enable HTTPS” on page 3-3
- “Adjust Security Protocols” on page 3-9
- “Specify Access to MATLAB Programs” on page 3-7

Specify Access to MATLAB Programs

By default, server instances allow all clients to access all hosted MATLAB programs. MATLAB Production Server provides a certificate-based authorization mechanism for restricting access to specific programs. The ssl-allowed-client property uses this mechanism to specify the MATLAB programs that a client can access. The property specifies a comma-separated list of clients, identified by their certificate's common name, that are allowed to access MATLAB programs. You also use the property to list specific MATLAB programs that a client is allowed to access.

If you do not specify the `ssl-allowed-client` property, the server instance does not restrict access to the hosted MATLAB programs. After you add an entry for the `ssl-allowed-client` property, the server instance authorizes only the listed clients to access the hosted MATLAB programs.

For example, to only authorize clients with the common names `jim`, `judy`, and `ash` to use the MATLAB programs hosted on a server instance, add this configuration excerpt:

```
--ssl-allowed-client jim,judy,ash
```

You can restrict access further by only authorizing specific clients to have access to specific MATLAB programs. Do this by adding `:`*`allowedPrograms`* to the value of the `ssl-allowed-client` property. *`allowedPrograms`* is a comma-separated list of program names.

For example, to allow clients with the common name `jim` access to all hosted programs, allow clients with the common name `judy` access to the programs `tail` and `zap`, and allow clients with the common name `ash` or `joe` access to the programs `saw` and `travel`, add this configuration excerpt:

```
--ssl-allowed-client jim
--ssl-allowed-client judy:tail,zap
--ssl-allowed-client ash,joe:saw,travel
```

The server must be configured to use HTTPS in order to use the property.

See Also

https | x509-cert-chain | x509-private-key

More About

- “Enable HTTPS” on page 3-3
- “Configure Client Authentication” on page 3-5
- “Adjust Security Protocols” on page 3-9

Adjust Security Protocols

The default security settings for MATLAB Production Server enable all security protocols and cipher suites, except for the eNULL cipher suite. Use the ssl-protocols and ssl-ciphers properties to adjust the level of security.

By default, MATLAB Production Server instances try to use TLSv1.2 to secure connections between client and server. The server supports connections using TLSv1, TLSv1.1, and TLSv1.2. Use the `ssl-protocols` property to specify a list of allowed SSL protocols.

For example, to disable the TLSv1.1 and TLSv1.2 protocols, add this configuration excerpt:

```
--ssl-protocols TLSv1
```

Because TLSv1.1 and TLSv1.2 are not included in the list, the server instance does not enable the protocols.

Set the `ssl-ciphers` property in the server instance configuration to restrict the cipher suites used by the server instance.

For example, to enable only high-strength cipher suites, add this configuration excerpt:

```
--ssl-ciphers HIGH
```

See Also

ssl-tmp-ec-param | x509-private-key

More About

- “Enable HTTPS” on page 3-3
- “Configure Client Authentication” on page 3-5
- “Specify Access to MATLAB Programs” on page 3-7

Improve Startup Time When Security Is Activated

When a server instance is configured to use HTTPS, it generates an ephemeral DH key at startup. Generating the DH key at startup provides more security than reading it from a file on disk. However, this can add a couple of minutes to a server instance's startup time.

If you need the server instance to start up without delay and are not concerned about the loss of security, you can configure the server instance to read the ephemeral DH key from a file using the ssl-tmp-dh-param configuration property. The `ssl-tmp-dh-param` property specifies the file storing the DH key in PEM format.

See Also

https | ssl-ciphers | ssl-tmp-ec-param

More About

- "Enable HTTPS" on page 3-3
- "Configure Client Authentication" on page 3-5
- "Specify Access to MATLAB Programs" on page 3-7
- "Adjust Security Protocols" on page 3-9

Access Control

Access Control Configuration File

To provide an identity to each user, you define an access control configuration file in JSON format. Each identity provider has a different configuration file to enable authorization. The default name for the JSON file for Azure® Active Directory is `azure_ad.json`.

Azure Active Directory configuration parameters are as follows:

- `tenantId` (Required): Azure Active Directory tenant ID. To locate your tenant ID, go to https://portal.azure.com. On the left panel, select **Azure Active Directory**, then on the **Overview** panel, select **Properties**. The hexadecimal code under **Directory ID** is your tenant ID.
- `serverAppId` (Required): MATLAB Production Server application ID as registered in Azure Active Directory. To locate your `serverAppID`, go to https://portal.azure.com. On the left panel, select **Azure Active Directory**, then on the **Overview** panel, select **App registrations**. Then select **MPS server** to find the **Application ID**, which is your `serverAppID`.
- `jwksUri` (Optional): Used to get Azure Active Directory JSON Web Key Set that is used to verify token signature. Default is https://login.microsoftonline.com/common/discovery/keys.
- `issuerBaseUri` (Optional): Used with `tenantId` to validate issuer of the token. For Azure Active Directory, default is https://sts.windows.net/.
- `jwksTimeOut` (Optional): Maximum time the `jwks` request is allowed to take. Default is 120 seconds.

The format of the configuration file is as follows:

```
{
  "tenantId": "54ss4lk1-8428-7256-5fvh-d5785gfhkjh6",
  "serverAppId": "j21n12bg-3758-3r78-v25j-35yj4c47vhmt",
  "jwksUri": "https://login.microsoftonline.com/common/discovery/keys",
  "issuerBaseUri": "https://sts.windows.net/",
  "jwksTimeOut": 120
}
```

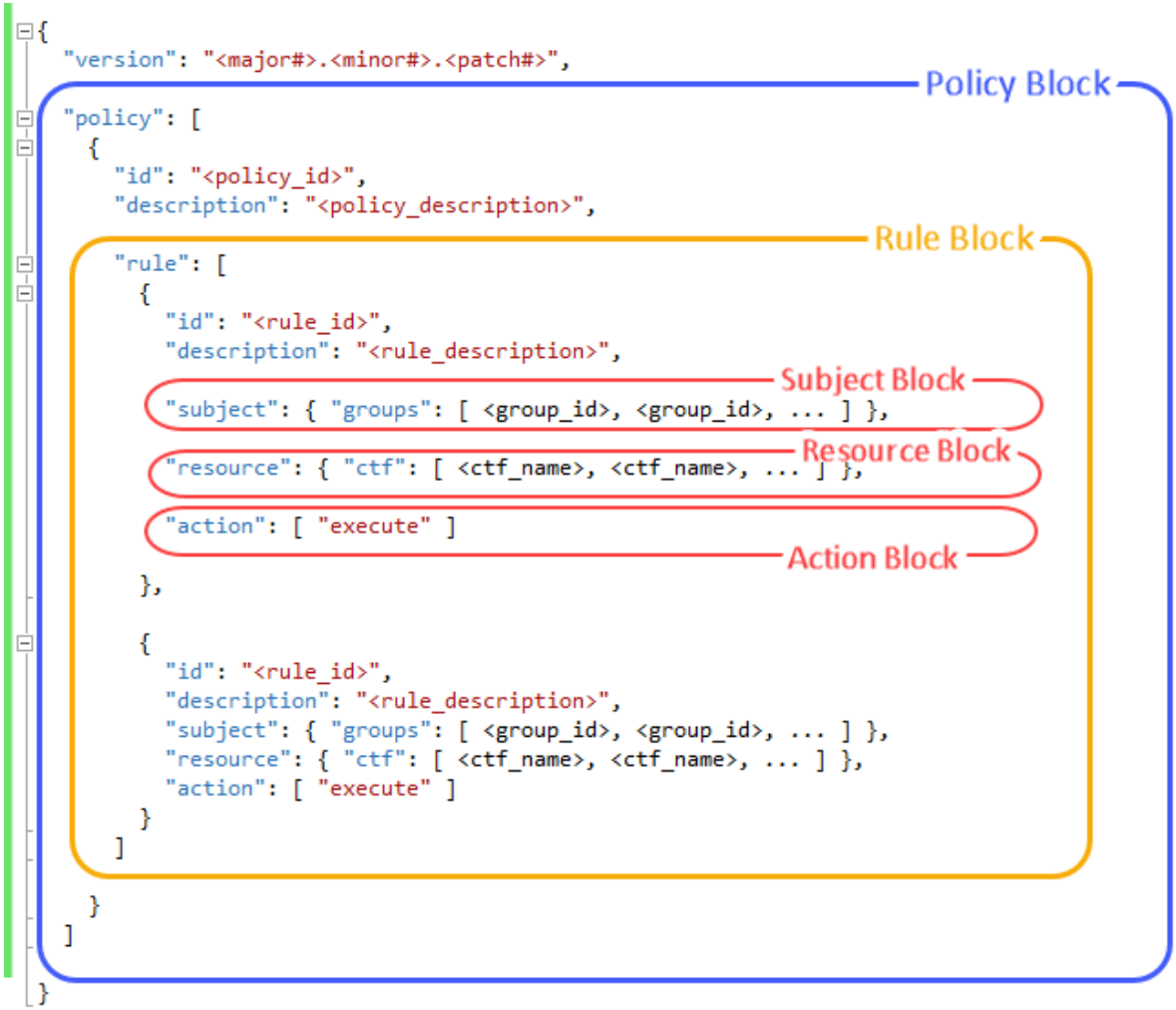
Access Control Policy File

To use access control for MATLAB Production Server, the server admin should define an access control policy file in JSON format. The default name for the JSON file is `ac_policy.json`.

The policy file is read on server startup. If it does not exist or contains errors, the server does not start, and an error message is written to `main.log` file found in the log-root directory.

Once the server has started, the policy file is scanned every five seconds for changes. If the policy file is deleted or contains errors, the server continues to run, but all requests are denied. Again, an error message is written to the `main.log` file.

The JSON file has a single JSON object that defines the schema version and a *Policy Block*. The *Policy Block* consists of a list of policies. Each policy contains a *Rule Block* that defines a set of rules and consists of a *Subject Block*, a *Resource Block*, *and* an *Action Block*.



The schema version has a value that is a JSON string in the format `<major#>.<minor#>.<patch#>`, with each number specified as a nonnegative integer.

Policy Block

The policy block contains a list of policies required for access control. Currently, only a single policy can be specified in a policy file.

```
"policy" : [
   {
     "id": "<policy_id>",
     "description": "<policy_description>",
     <rule_block>
   }
]
```

An ID is required for each policy. `<policy_id>` must be unique for each policy. Any leading or trailing white space is removed.

The `description` is optional for a policy.

Rule Block

The rule block contains a list of rule objects.

```
"rule":[
  {
    "id": "<rule_id>",
    "description": "<rule_description>",
    <subject_block>,
    <resource_block>,
    <action_block>
  }
]
```

Multiple rules can exist in a rule block, for example: `"rule": [<rule>, <rule>, ...]`.

An ID is required for each rule. `<rule_id>` must be unique for each rule. Any leading or trailing white space is removed.

The `description` is optional for a rule.

Subject Block

The subject block of a rule defines who can access the resources. Currently, only the *groups* attribute is supported.

```
"subject" : {"groups": ["<group_id>", "<group_id>", ...]}
```

For Azure Active Directory, a list of group IDs can be specified to control which groups can access the resources defined in the rule.

Get Group ID from Azure Active Directory Based on Group Display Name

1. Open Azure Active Directory graph explorer on https://graphexplorer.azurewebsites.net, and login.
2. Use query `https://graph.windows.net/<tenant>/groups?$filter=startswith(displayName,'<groupname>')` where `<tenant>` is the tenant name, and `<groupname>` is the name of a specific group.
3. Search for `objectId` of the specific group in the response.

Get All Group IDs for a Certain User from Azure Active Directory

1. Open Azure Active Directory graph explorer on https://graphexplorer.azurewebsites.net, and login.
2. Use query `https://graph.windows.net/<tenant>//<tenant>/users/<username>@<tenant>/memberOf` where `<tenant>` is the tenant name, and `<username>` is the name of a specific user.
3. For all groups where **securityEnabled** is true, search for `objectId` in the response.

Resource Block

The resource block of a rule describes the object being accessed. Currently, only a `ctf` file can be accessed.

```
"resource" : {"ctf": ["<ctf_name>", "<ctf_name>", ...]}
```

You can use `ctf_name` to access multiple `ctf` files by using the wildcard character *. For example, if you want to access all `ctf` files whose names start or end with 'test', you would specify `<ctf_name>` as `test*` or `*test`, respectively. If you use * as the `<ctf_name>`, you can access all the `ctf` files.

Action Block

The action block of a rule describes the action being attempted on the resource. Currently, only the action `execute` is supported.

```
"action" : ["execute"]
```

Example of a JSON Policy File

The following example defines an access control policy with three rules.

- All users belonging to a group with ID `aaaaaaaa-aaaa-aaaa-aaaa-aaaaaaaaaaaa` can execute the `ctf` file `magic`.

- All users belong to groups with id `aaaaaaaa-aaaa-aaaa-aaaa-aaaaaaaaaaaa` and `bbbbbbbb-bbbb-bbbb-bbbb-bbbbbbbbbbbb` can execute the `ctf` files `monteCarlo` and `fastFourier`.
- All users belong to Quality Engineering group `cccccccc-cccc-cccc-cccc-cccccccccccc` can execute all `ctf`s starting with test.

Access is denied for all other requests.

```
{
  "version": "1.0.0",
  "policy" : [
    {
      "id": "policy1",
      "description": "MPS Access Control policy for XYZ Corp.",
      "rule": [
        {
          "id": "rule1",
          "description": "group A can execute ctf magic",
          "subject": { "groups": ["aaaaaaaa-aaaa-aaaa-aaaa-aaaaaaaaaaaa"] },
          "resource": { "ctf": ["magic"] },
          "action": ["execute"]
        },
        {
          "id": "rule2",
          "description": "group A and group B can execute ctf monteCarlo and fastFourie
          "subject": { "groups": ["aaaaaaaa-aaaa-aaaa-aaaa-aaaaaaaaaaaa", "bbbbbbbb-bb
          "resource": { "ctf": ["monteCarlo", "fastFourier"] },
          "action": ["execute"]
        },
        {
          "id": "rule3",
          "description": "QE group C can execute any ctf starts with test",
          "subject": { "groups": ["cccccccc-cccc-cccc-cccc-cccccccccccc"] },
          "resource": { "ctf": ["test*"] },
          "action": ["execute"]
        }
      ]
    }
  ]
}
```

See Also

access-control-policy

External Websites

- https://docs.microsoft.com/en-us/azure/active-directory/develop/active-directory-graph-api-quickstart

Use Kerberos and Kerberos Delegation

To authenticate user access to a MATLAB Production Server instance, you need to configure Kerberos. To delegate a client's credential to a next hop web server or a database server that is protected by Kerberos, you need to configure Kerberos Delegation. Configuring Kerberos and Kerberos Delegation requires domain administrator privileges. Currently, you can use Kerberos and Kerberos Delegation with MATLAB Production Server instances running on Windows Server® operating systems with a Windows Key Distribution Center. To configure Kerberos and Kerberos delegation, consult your IT / Windows System Administrator, and follow these steps:

- Set up a service account for the MATLAB Production Server and register a *service principal name* for MATLAB Production Server service instance.
- Configure constrained delegation without protocol transition for the service account.
- Configure the local security privilege for the MATLAB Production Server service account.
- Enable Kerberos and Kerberos Delegation in the MATLAB Production Server configuration file (`main_config`). For more information, see http-authentication-method and client-credential-delegation.

Only the following MATLAB functions within a deployable archive (`.ctf`) support using Kerberos Delegation:

- `webread`
- `webwrite`
- "HTTP Interface" (MATLAB) functions
- Database Toolbox™ functions (requires an ODBC driver)

All other functions within a deployable archive (`.ctf`) are executed using the credential of the MATLAB Production Server instance.

Supported Environment

Option	Requirement
Operating system	Windows Server
Kerberos Delegation	Constrained delegation without protocol transition

Option	Requirement
Key distribution center	Windows Server 2003 or later
Client	• RESTful client over HTTP/HTTPS (HTTP 1.1) with JSON payload • The RESTful client must be one that supports SPNEGO/Kerberos—for example, `curl` with the `--negotiate` option or .NET HttpClient
MATLAB Runtime	MATLAB Runtime R2019b or later.
Deployable archive packaging	MATLAB Compiler SDK R2019b or later
Database server	Microsoft® SQL Server® 2012 or later
Database driver	Microsoft SQL Server ODBC driver version 11 or later

See Also

client-credential-delegation | http-authentication-method

Troubleshooting

Verify Server Status

In this section...

Use the `mps-status` command to verify the status of a server.

Procedure

1. Open a system command prompt.
2. Enter the following command:

   `mps-status [-C` *`path/`*`]`*`server_name`*

   where:

   - `-C` *`path/`* — Path to the server instance. *`path`* should end with the name of the server to be queried for status.
   - *`server_name`* — Name of the server to be queried for status.

Example

To verify the status of a server instance `prod_server_1` located at `\tmp\prod_server_1`, type at the system command prompt

```
mps-status -C \tmp\prod_server_1
```

Output:

- If `prod_server_1` is running and operating with a valid license.

  ```
  \tmp\prod_server_1 STARTED
  License checked out
  ```

- If `prod_server_1` is unable to check out valid license.

  ```
  \tmp\prod_server_1 STARTED
  WARNING: lost connection to license server -
  request processing will be disabled at 2019-Jun-27
  15:40:31.002137 Eastern Daylight Time unless
  connection to license server is restored.
  ```

or

```
\tmp\prod_server_1 STARTED
ERROR: lost connection to license server -
request processing disabled.
```

To verify whether the server has started or stopped after issuing `mps-restart` and `mps-stop` commands, use `mps-status`.

License Server Status Information

In addition to the status of the server, `mps-status` also displays the status of the license server associated with the server you are querying.

License Server Status Message	Message Description
`License checked out`	The server is operating with a valid license. The server is communicating with the License Manager, and the required number of license keys are checked out.
`WARNING: lost connection to license server - request processing will be disabled at` *`time`* `unless connection to license server is restored`	The server has lost communication with the License Manager, but the server is still fully operational and will remain operational until the specified *`time`*. At *`time`*, if connectivity to the license server has not been restored, request processing will be disabled until licensing is reestablished.
`ERROR: lost connection to license server - request processing disabled`	The server has lost communication with the License Manager for a period of time exceeding the grace period. Request processing has been suspended, but the server is actively attempting to reestablish communication with the License Manager. Request processing resumes if the sever is able to reestablish communication with the License Manager.

See Also

`mps-restart` | `mps-stop`

More About

- “Health Check”

Diagnose a Server Instance

To diagnose a problem with a server instance or configuration of MATLAB Production Server, do the following, as needed:

- Check the logs for warnings, errors, or other informational messages.
- Check Process Identification Files (PID files) for information relating to problems with MATLAB Runtime worker processes.
- Check Endpoint Files for information relating to problems relating to the server's bound external interfaces — for example, a problem connecting a client to a server.
- Use server diagnostic tools, such as `mps-which`, as needed.

Diagnose a Corrupted MATLAB Runtime

This example shows a typical diagnostic procedure you might follow to solve a problem starting server `prod_server_x`.

After you issue the command:

```
mps-start prod_server_x
```

from within the server instance folder (`prod_server_x`), you get the following error:

```
Server process exited with return code: 4
(check logs for more information)
Error while waiting for server to start: The I/O operation
has been aborted because of either a thread exit
or an application request
```

To solve this issue, you might check the `log` files for more detailed messages, as follows:

1. Navigate to the server instance folder (`prod_server_x`) and open the `log` folder.
2. Open `main.err` with any text editor. Note the following message listed under `Server startup error:`

   ```
   Dynamic exception type: class std::runtime_error
   std::exception::what: bad MATLAB Runtime installation:
   C:\Program Files\MATLAB\MATLAB Runtime\v82
   (C:\Program Files\MATLAB\MATLAB Runtime\v82\bin\
   win64\mps_worker_app could not be found)
   ```
3. The message indicates the installation of the MATLAB Runtime is incomplete or has been corrupted. To solve this problem, reinstall the MATLAB Runtime.

Server Diagnostic Tools

In this section...

Log Files

Each server writes a log file containing data from both the main server process, as well as the workers, named *`server_name`*`/log/main.log`. You can change the primary log folder name from the default value (`log`) by setting the option `log-root` in `main_config`.

The primary log folder contains the `main.log` file, as well as a symbolic link to this file with the auto-generated name of `main_`*`date_fileID`*`.log`.

The `stdout` stream of the main server process is captured as `log/main.out`.

The `stderr` stream of the main server process is captured as `log/main.err`.

Process Identification Files (PID Files)

Each process that the server runs generates a Process Identification File (PID File) in the folder identified as `pid-root` in `main_config`.

The main server PID file is `main.pid`; for each MATLAB Runtime worker process, it is `worker-`*`n`*`.pid`, where *`n`* is the unique identifier of the worker.

PID files are automatically deleted when a process exits.

Endpoint Files

Endpoint files are generated to capture information about the server’s bound external interfaces. The files are created when you start a server instance and deleted when you stop it.

server_name/endpoint/http contains the IP address and port of the clients connecting to the server. This information can be useful in the event that zero (0) is specified in main_config, indicating that the server bind to a free port.

Manage Log Files

In this section...

Best Practices for Log Management

Use these recommendations as a guide when defining values for the options listed in “Log Retention and Archive Settings” on page 4-9.

- Avoid placing `log-root` and `log-archive-root` on different physical file systems.
- Place log files on local drives, not on network drives.
- Send MATLAB output to `stdout`. Develop an appropriate, consistent logging strategy following best MATLAB coding practices. See *MATLAB Programming Fundamentals* for guidelines.

Log Retention and Archive Settings

Log data is written to the server’s `main.log` file for as long as a specific server instance is active, or until midnight. When the server is restarted, log data is written to an archive log, located in the archive log folder specified by `log-archive-root`.

You can set parameters that define when `main.log` is archived using the following options in each server’s `main_config` file.

- `log-rotation-size` — When `main.log` reaches this size, the active log is written to an archive log (located in the folder specified by `log-archive-root`).
- `log-archive-max-size` — When the combined size of all files in the archive folder (location defined by `log-archive-root`) reaches this limit, archive logs are purged until the combined size of all files in the archive folder is less than `log-archive-max-size`. Oldest archive logs are deleted first.

Specify values for these options using the following units and notations:

Represent these units of measure...	Using this notation...	Example
Byte	`b`	`900b`
Kilobyte (1024 bytes)	`k`	`700k`
Megabytes (1024 kilobytes)	`m`	`40m`
Gigabytes (1024 megabytes)	`g`	`10g`
Terabytes (1024 gigabytes)	`t`	`2t`
Petabytes (1024 terabytes)	`p`	`1p`

Note The minimum value you can specify for `log-rotation-size` is 1 megabyte.

On Windows 32-bit systems, values larger than 2^{32} bytes are not supported. For example, specifying `5g` is not valid on Windows 32-bit systems.

Setting Log File Detail Levels

The log level provides different levels of information for troubleshooting:

- `error` — Notification of problems or unexpected results.
- `warning` — Events that could lead to problems if unaddressed.
- `information` — High-level information about major server events.
- `trace` — Detailed information about the internal state of the server.

The log level is set using the `log-severity` configuration property.

Before you call support, you should set logging levels to `trace`.

Common Error Messages and Resolutions

In this section...

(404) Not Found

Commonly caused by requesting a component that is not deployed on the server, or trying to call a function that is not exported by the given component.

Verify that the name of the deployable archive specified in your `Uri` is the same as the name of the deployable archive hosted in your `auto_deploy` folder.

Error: Bad MATLAB Runtime Instance

Common causes of this message include:

- You are not properly qualifying the path to the MATLAB Runtime. You must include the version number. For example, you need to specify:

  `C:\Program Files\MATLAB\MATLAB Runtime\v`*`n.n`*

  not

  `C:\Program Files\MATLAB\MATLAB Runtime`

Error: Server Instance not Specified

MATLAB Production Server can’t find the server you are specifying.

Ensure you are either entering commands from the folder containing the server instance, or are using the `-C` command argument to specify a precise location of the server instance.

For example, if you created `server_1` in `C:\tmp\server_1`, you would issue the `mps-start` command from within that folder to avoid specifying a path with the `-C` argument:

```
cd c:\tmp\server_1
mps-start server_1
```

For more information, see “Start a Server Instance” on page 1-12.

Error: invalid target host or port

The port number specified has not been properly defined to your computer. Define a valid port and retry the command.

Error: HTTP error: HTTP/x.x 404 Component not found

This error can be caused by a number of reasons. Consult the “Log Files” on page 4-7 for further details on the precise cause of the problem.

5

Impact of Server Configurations on Processing Asynchronous Requests

Impact of Server Configurations on Processing Asynchronous Requests

MATLAB Production Server supports asynchronous execution of client requests. The following configurations in the server's `main_config` file impact the how the server supports this functionality:

- request-timeout
- server-memory-threshold
- server-memory-threshold-overflow-action

The `request-timeout` configuration parameter specifies the duration after which a request in a terminal states times out and gets deleted.

The `server-memory-threshold` configuration parameter specifies the size threshold of the server process at which point action needs to be taken to manage the responses. The size threshold includes both the size of the base server process plus any growth in the server process resulting from processing a client request.

The `server-memory-threshold-overflow-action` configuration parameter specifies the action to be taken when the memory size threshold of server process has been breached. The possible actions are that the responses be archived to disk or the request be purged.

Setting too small a `request-timeout` can lead to a request being timed out before a client fetches the response.

Since the `server-memory-threshold` includes both the size of the base server process plus any growth in the server process resulting from processing client requests, setting too small a `server-memory-threshold` can lead to responses being archived or purged before being retrieved.

Since the operating system governs memory management, the memory footprint size of the base server process may not return to its original size even after a response has been archived or purged. The size of the base server process in most cases ends up being larger than its original size. As a result, subsequent requests to the server may have a much smaller range of memory to work with before reaching the `server-memory-threshold`.

Setting the `server-memory-threshold` to be too large will result in a large server process footprint which may not be required.

These configuration parameters need to be set appropriately and carefully balanced in order to provide a suitable contract between a client and a server.

See Also

cors-allowed-origins | response-archive-limit | response-archive-root

More About

- “Edit the Configuration File” on page 1-7

Set Up MATLAB Production Server Dashboard

Set Up and Log In to MATLAB Production Server Dashboard

In this section...

Set Up the Dashboard

Warning You must have admin privileges on Windows to complete setup.

To set up an instance of the MATLAB Production Server dashboard:

1. Open a Terminal or Command Window, and navigate to the `dashboard` folder in the MATLAB Production Server installation directory.

Platform	Default Directory Where the MATLAB Production Server dashboard is Installed
Windows *(Administrator)*	`C:\Program Files\MATLAB\MATLAB Production Server\R2019b\dashboard`
Linux®	`/usr/local/MATLAB/MATLAB_Production_Server/R2019b/dashboard`

2. Execute the script `mps-dashboard` with the `setup` option, and when prompted, specify the directory for dashboard setup. You must have write privileges to the directory from where you are running the `mps-dashboard` script, and to the directory where the dashboard is going to be set up.

Platform	Script for Dashboard Setup

Windows *(Administrator)*	`> mps-dashboard.bat setup`
	
	For example:
	
	`> mps-dashboard.bat setup`
	`Specify a workspace directory for MATLAB Production Server Dashboa`

Linux	`$ ./mps-dashboard.sh setup`
	
	For example:
	
	`$ ./mps-dashboard.sh setup`
	`Specify a workspace directory for MATLAB Production Server Dashboard: /opt/mps/dash`

You receive a message acknowledging that the dashboard has been successfully setup.

Tip To directly specify a directory when setting up the dashboard, use the `-C` option after the `setup` option and provide a directory name.

For example, in Windows: `> mps-dashboard.bat setup -C D:\mps\dashboard`

For example, in Linux: `$ ./mps-dashboard.sh setup -C /opt/mps/dashboard`

Note For a complete list of options that can be passed to the `mps-dashboard` script, pass a `?` as an option to the `mps-dashboard` script.

For example, in Windows type:

```
> mps-dashboard.bat ?
```

In Linux, type:

```
$ ./mps-dashboard.sh ?
```

The complete list of options are:

```
setup | start | stop | remove | reset_admin_password
```

Note Windows only: If your setup fails when using the command `> mps-dashboard.bat setup`, verify that your system has Visual C++ Redistributable Packages for Visual Studio® 2013 installed.

You can also fix this issue by appending your system path with `$MPS_ROOT/bin/win64` where `$MPS_ROOT` is the directory where MATLAB Production Server is installed.

3. Execute the `mps-dashboard` script with the `start` option to start the dashboard.

Platform	Script to Start Dashboard
Windows *(Administrator)*	`> mps-dashboard.bat start`
Linux	`$ ./mps-dashboard.sh start`

You will get a message indicating the host and port where the dashboard is running. The default host and port are `localhost` and `9090`, respectively.

Tip Windows only: To run the dashboard instance as a background process in Windows, precede the `mps-dashboard` script with command `start /B`.

For example: `> start /B mps-dashboard.bat start`

Note You can change the default port used by dashboard by editing the `--node_server_port` option in `config.txt` file. You can find the `config.txt` file here:

Platform	Location of `config.txt` File
Windows	`C:\Program Files\MATLAB\MATLAB Production Server\R2019b\dashboard\config\config.txt`
Linux	`/usr/local/MATLAB/MATLAB_Production_Server/R2019b/dashboard/config/config.txt`

Other customizations to the setup process can be made by editing relevant parts of the `config.txt` file.

4. Open a web browser, and type the host and port number that were displayed in the previous step.

For example:

```
http://localhost:9090
```

Log In to the Dashboard

To log in to MATLAB Production Server Dashboard follow this procedure:

1. Open a web browser, and type the host and port number that were displayed at the end of the install process.

   For example:

   ```
   http://localhost:9090
   ```
2. Type the following information at the login screen for the username and password:

   Username: `admin`

   Password: `admin`

You are now logged into the MATLAB Production Server Dashboard.

Reset the Admin Password

You can use the `mps-dashboard` script with the option `reset_admin_password` to change the admin password.

Platform	Script to Reset the Admin Password
Windows *(Administrator)*	`> mps-dashboard.bat reset_admin_password`
Linux	`$ ./mps-dashboard.sh reset_admin_password`

Warning The `reset_admin_password` option should not be executed while dashboard is still running. First, stop dashboard execution using the `mps-dashboard` script with the `stop` option and then reset the admin password.

See Also

Related Examples

- “Remove MATLAB Production Server Dashboard” on page 6-7

Remove MATLAB Production Server Dashboard

To remove MATLAB Production Server Dashboard:

1. Open a Terminal or Command Window, and navigate to the `dashboard` folder in the MATLAB Production Server installation directory.

Platform	Default Directory Where MATLAB Production Server Dashboard is Installed
Windows *(Administrator)*	`C:\Program Files\MATLAB\MATLAB Production Server\R2017b\dashboard`
Linux	`/usr/local/MATLAB/MATLAB_Production_Server/R2017b/dashboard`

2. Execute the `mps-dashboard` script with the `stop` option.

Platform	Script to Stop Dashboard
Windows *(Administrator)*	`> mps-dashboard.bat stop`
Linux	`$ ./mps-dashboard.sh stop`

Note You need to complete this step only if dashboard is running.

3. Execute the `mps-dashboard` script with the `remove` option.

Platform	Script to Remove Dashboard
Windows *(Administrator)*	`> mps-dashboard.bat remove`
Linux	`$ ./mps-dashboard.sh remove`

You receive a message acknowledging that dashboard was successfully removed.

Note Attempting to remove the dashboard while it is still running will result in an error.

The procedure will remove the following directories and files from the directory where dashboard was set up:

```
data
mps_workspace
.pid
```

If you run into any issues while removing dashboard, manually delete the `.pid` file and re-run the `mps-dashboard` script with the `remove` option.

Note In Linux, if you started the dashboard using the & control operator, you don't need to open a new Terminal. The & control operator makes command run in the background.

In Windows, if dashboard is running, you will not have access to the command prompt. Therefore, you need to open a new Command Window to stop any running dashboard instances.

Note Removing dashboard does not uninstall it from the system. It removes the instance that was set up. The dashboard remains installed as part of MATLAB Production Server. If you want to set up the dashboard again, use the `mps-dashboard` script with the `setup` option.

See Also

Related Examples

- “Set Up and Log In to MATLAB Production Server Dashboard” on page 6-2

Commands — Alphabetical List

mps-check

Test and diagnose a MATLAB Production Server instance for problems

Syntax

`mps-check [--timeout` *`seconds`*`] `*`host`*`:`*`port`*

Description

`mps-check` sends a request to a MATLAB Production Server instance and receives a status report that is used to identify issues that cause the product to run less than optimally.

Information reported by `mps-check` to `stdout` include:

- Status of the server instance
- Port the HTTP interface is listening on
- Deployed archives for a server instance

Before using `mps-check`, you must deploy *`mcrroot`*`/bin/`*`arch`*`/mps_check.ctf` to the server instance.

- *`mcrroot`* is the path to the MATLAB Runtime installation folder.
- *`arch`* is standard abbreviation for the system's operating system and hardware architecture.

Input Arguments

- `--timeout` *`seconds`* — The time, in seconds, to wait for a response from the server before timing out. The default is two minutes.
- *`host`* — The host name of the machine running the server instance.
- *`port`* — The port number on which the server instance listens for requests.

Examples

Display diagnostic information for the server instance running on port 9910 of the local computer.

```
mps-check localhost:9910
```

```
Connecting to localhost:9910
Connected
Sending HTTP request
HTTP request sent
HTTP response received
MPS status check completed successfully
```

More About

Server Instance

Server instance is an instance of the MATLAB Production Server. The files contained in the folder created by `mps-new`, defined by *`path/`*, comprise one configuration of the MATLAB Production Server product.

Introduced in R2012b

mps-license-reset

Force a server instance to immediately attempt license checkout

Syntax

`mps-license-reset [-C path/]server_name`

Description

`mps-license-reset [-C path/]server_name` triggers the server to checkout a license immediately, regardless of the current license status. License keys that are currently checked out are checked in first.

Input Arguments

`-C path/`

Specify a path to the server instance. If this option is omitted, the current working folder and its parents are searched to find the server instance.

`server_name`

Server checking out license

Examples

Create a new server instance and display the status of each folder in the file hierarchy, as the server instance is created:

```
mps-license-reset -C /tmp/server_2
```

See Also

`mps-status`

Topics

“Force a License Checkout Using mps-license-reset” on page 2-4

Introduced in R2012b

mps-new

Create a server instance

Syntax

```
mps-new [path/]server_name [-v] [--service] [--service-name name]
[--service-description description] [--service-user user] [--
service-password password] [--noprompt]
```

Description

`mps-new [path/]server_name [-v] [--service] [--service-name name] [--service-description description] [--service-user user] [--service-password password] [--noprompt]` makes a new folder at *path* and populates it with the default folder hierarchy for a server instance.

Input Arguments

path

Path to server instance.

server_name

Name of the server instance to create.

If you are creating a server instance in the current working folder, you do not need to specify a full path; specify only the server name.

-v

Display the status of each folder in the file hierarchy created to form a server instance

--service

On Windows, register the server instance as a Windows service.

The Windows service default settings are:

- Service Display Name: MATLAB Production Server – *path**server_name*
- Service Description: MATLAB Production Server running instance *path**server_name*
- Service User: LocalSystem

The Windows service is configured to start when the machine starts, not at creation of the service. After you have made configuration changes, start the server instance using `mps-start`.

`--service-name` *`name`*

Display name for the Windows service associated with the server instance

`--service-description` *`description`*

Informational statement describing the Windows service associated with the server instance

`--service-user` *`user`*

Windows account under which the service associated with the server instance should run. The user account must have read, write, and, delete permissions for the instance directory as well read and execute permissions for the MATLAB Production Server installation directory.

`--service-password` *`password`*

Password for the service user account

`--noprompt`

Indicates that no prompts are generated

Examples

Create a Server Instance

Create a new server instance, and display the status of each folder in the file hierarchy, as the server instance is created:

```
mps-new /tmp/server_1 -v

server_1/.mps-version...ok
server_1/config/...ok
server_1/config/main_config...ok
server_1/endpoint/...ok
server_1/auto_deploy/...ok
server_1/.mps-socket/...ok
server_1/log/...ok
server_1/pid/...ok
```

Create a Windows Service

Create a new server instance, and register it as a Windows service:

```
mps-new /tmp/server_1 --service
```

Tips

- Before creating a server instance, ensure that no file or folder with the specified *`path`* currently exists on your system.
- After issuing `mps-new`, issue `mps-start` to start the server instance.

See Also

`mps-start` | `mps-status`

Topics

“Create a Server” on page 1-5
“Install a Server Instance as a Windows Service” on page 1-19
“Server Overview” on page 1-2

Introduced in R2012b

mps-profile

Turn profiling on or off

Syntax

```
mps-profile [-C [path/]instance_name] {on|off} [object...]
```

Description

`mps-profile` turns profiling on or off for specified objects.

Input Arguments

- `-C` — Specify a path to the server instance. If this option is omitted, the current working folder and its parents are searched to find the server instance.
- `on` — Activate profiling.
- `off` — Deactivate profiling.
- *`object`* — The list of objects whose profiling behavior is changed.

  Valid object values are:

  - `requests`
  - `worker_pool`

  If no object is specified the command changes all objects.

Examples

Turn profiling on.

```
mps-profile on
```

Turn request profiling on without turning on worker pool profiling.

```
mps-profile on requests
```

Introduced in R2015b

mps-restart

Stop and start a server instance

Syntax

`mps-restart [-C [`*`path/`*`]`*`server_name`*`] [-f]`

Description

`mps-restart [-C [`*`path/`*`]`*`server_name`*`] [-f]` stops a server instance, then restarts the same server instance. Issuing `mps-restart` is equivalent to issuing the `mps-stop` and `mps-start` commands in succession.

Input Arguments

`-C` ***`path/`***

Specify a path to the server instance. If this option is omitted, the current working folder and its parents are searched to find the server instance. If you are restarting a server instance in the current working folder, you do not need to specify a full path. Only specify the server name.

`server_name`

Name of the server to be restarted.

`-f`

Force success even if the server instance is stopped. Restarting a stopped instance returns an error.

Examples

Restart a server instance named `server_1`, located in folder `tmp`. Force successful completion of `mps-restart`.

```
mps-restart -f -C /tmp/server_1
```

Tips

- After issuing `mps-restart`, issue the `mps-status` command to verify the server instance has started.
- If you are restarting a server instance in the current working folder, you do not need to specify a full path. Only specify the server name.

See Also

`mps-start` | `mps-status` | `mps-stop`

Introduced in R2012b

mps-service

Create or modify a Windows service for a server instance

Syntax

```
mps-service [-C [path/]server_name] create [--name name] [--
description description] [--user user] [--password password] [--
noprompt]

mps-service [-C [path/]server_name] update [--name name] [--
description description] [--user user] [--password password] [--
instance-root new_path] [--noprompt]

mps-service [-C [path/]server_name] delete
mps-service delete service_name [[--force]|[-f]]
mps-service clean [[--force]|[-f]][[--verbose]|[-v]]

mps-service [-C [path/]server_name] undelete

mps-service [-C [path/]server_name]
mps-service list
```

Description

`mps-service [-C [path/]server_name] create [--name name] [--description description] [--user user] [--password password] [--noprompt]` creates a Windows service for the server instance.

The Windows service default settings are:

- Service Display Name: MATLAB Production Server – *`path\server_name`*
- Service Description: MATLAB Production Server running instance *`path\server_name`*
- Service User: LocalSystem

The Windows service is configured to start when the machine starts, not at creation of the service. After you have made configuration changes, start the server instance using `mps-start`.

`mps-service [-C [path/]server_name] update [--name name] [--description description] [--user user] [--password password] [--instance-root new_path] [--noprompt]` updates the Windows service entry for the server instance.

`mps-service [-C [path/]server_name] delete` deletes the Windows service entry for the server instance.

`mps-service delete service_name [[--force]|[-f]]` deletes the Windows service entry by name.

`mps-service clean [[--force]|[-f]][[--verbose]|[-v]]` deletes invalid Windows service entries.

Invalid Windows service entries are entries where either the target version of MATLAB Production Server is not present or the associated server instance no longer exists.

`mps-service [-C [path/]server_name] undelete` restores the deleted Windows service entry for the server instance.

`mps-service [-C [path/]server_name]` displays the Windows service entry for the server instance.

`mps-service list` lists the Windows service entries for all server instances.

Input Arguments

`-C` *`path/`*

Path to server instance

`server_name`

Name of the server instance

`--name` *`name`*

Display name for the Windows service associated with the server instance

`--description` *`description`*

Informational statement describing the Windows service associated with the server instance

`--user` *`user`*

Windows account under which the service associated with the server instance should run. The user account must have read, write, and, delete permissions for the instance directory as well read and execute permissions for the MATLAB Production Server installation directory.

`--password` *`password`*

Password for the service user account

`--instance-root` *`new_path`*

Updated path to server instance

`--noprompt`

Indicate that no prompts are generated

`--force`, `-f`

Force deletion without prompting

`--verbose`, `-v`

Include details about why the service is not valid.

Examples

Create a Windows Service

Create a default Windows service for the server instance `server_1`:

```
mps-service -C tmp/server_1 create
```

Delete a Windows Service

Delete the Windows service entry for the server instance `server_1`:

```
mps-service -C tmp/server_1 delete
```

List Existing Windows Services

List the Windows service entries for all the server instances installed on the local machine:

```
mps-service list
```

```
Service Name:  MATLAB Production Server {01234567-89ab-cdef-0123-456789abcdef}
Display Name:  MATLAB Production Server - My Custom Name
Description:   My Description
Instance Root: C:\instances\instance1
MPS Root:      C:\Program Files\MATLAB\MATLAB Production Server\R2014b
Status:        Started

Service Name:  MATLAB Production Server {01234567-89ab-cdef-0123-456789abcdef}
Display Name:  MATLAB Production Server - c:\instances\instance2
Description:   MATLAB Production Server running instance C:\instances\instance2
Instance Root: C:\instances\instance2
MPS Root:      C:\Program Files\MATLAB\MATLAB Production Server\R2015a
Status:        Stopped
```

See Also

`mps-new`

Topics

“Install a Server Instance as a Windows Service” on page 1-19

Introduced in R2015a

mps-setup

Set up a server environment

Syntax

`mps-setup [`*`mcrroot`*`]`

Description

`mps-setup [`*`mcrroot`*`]` sets location of MATLAB Runtime and other start-up options.

The `mps-setup` command sets the default path to the MATLAB Runtime for all server instances you create with the product. This is equivalent to presetting the `--mcr-root` option in each server's `main_config` configuration file.

If a default value already exists in *`server_name`*`/config/mcrroot`, it is updated with the value specified when you run the command line wizard.

Tips

- Run `mps-setup` from the script folder. Alternatively, add the `script` folder to your system `PATH` environment variable to run `mps-setup` from any folder on your system.
- Run `mps-setup` without arguments and it will search your system for MATLAB Runtime instances you may want to use with MATLAB Production Server.
- Run `mps-setup` by passing the path to the MATLAB Runtime as an argument. This method is ideal for non-interactive (silent) installations.

Input Arguments

`mcrroot`

Specify a path to the MATLAB Runtime if running `mps-setup` in non-interactive, or silent, mode.

Examples

Run `mps-setup` non-interactively, by passing in a path to the MATLAB Runtime instance that you want MATLAB Production Server to use.

```
mps-setup "C:\Program Files\MATLAB\MATLAB Runtime\mcrver"
```

`mcrver` is the version of the MATLAB Runtime to use.

See Also

`mps-new` | `mps-start` | `mps-status`

Introduced in R2012b

mps-start

Start a server instance

Syntax

`mps-start [-C [`*`path/`*`]`*`server_name`*`] [-f]`

Description

`mps-start [-C [`*`path/`*`]`*`server_name`*`] [-f]` starts a server instance

Input Arguments

`-C` ***`path/`***

Specify a path to the server instance. If this option is omitted, the current working folder and its parents are searched to find the server instance.

`server_name`

Name of the server to be started.

`-f`

Force success even if the server instance is currently running. Starting a running server instance is considered an error.

Examples

Start a server instance named `server_1`, located in folder `tmp`. Force successful completion of `mps-start`.

```
mps-start -f -C /tmp/server_1
```

Tips

- After issuing `mps-start`, issue the `mps-status` command to verify the server instance has `STARTED`.
- If you are starting a server instance in the current working folder, you do not need to specify a full path. Only specify the server name.

See Also

`mps-new` | `mps-restart` | `mps-status` | `mps-stop`

Topics

“Start a Server Instance” on page 1-12
“Server Overview” on page 1-2

Introduced in R2012b

mps-status

Display status of a server instance

Syntax

```
mps-status [-C [path/]server_name][--statistics|-s
[sample_interval]] [--json|-j]
```

Description

`mps-status [-C [path/]server_name][--statistics|-s [sample_interval]] [--json|-j]` displays the status of the server (`STARTED`, `STOPPED`), along with a full path to the server instance. Additionally, it can display performance statistics about the server including:

- sample interval in milliseconds
- CPU utilization
- number of active worker processes
- number of requests in queue
- memory usage
- request throughput per second
- total queue time in milliseconds

Input Arguments

`-C path/`

Specify a path to the server instance. If this option is omitted, the current working folder and its parents are searched to find the server instance.

`server_name`

Server to be queried for status

`--statistics [`*`sample_interval`*`], -s [`*`sample_interval`*`]`

Specify that statistics are to be collected and displayed.

The optional *`sample_interval`* allows you to specify the interval, in milliseconds, over which statistics are collected. The default is 500.

Note If you specify a sample interval of 0, only one sample is taken. Two samples are required to compute some statistics such as CPU utilization and throughput.

`--json, -j`

Specify that statistics are output in JSON format:

```
{
    "$schema": "http://json-schema.org/draft-04/schema#",
    "title": "Instance Status",
    "description": "Status and Statistics for a MATLAB Production
                    Server Instance",
    "type": "object",
    "properties": {
        "instancePath": {
            "description": "Filesystem path for the server
                            instance",
            "type": "string"
        },
        "started": {
            "type": "boolean"
        },
        "license": {
            "type": "object",
            "properties": {
                "status": {
                    "enum": [ "CHECKED_OUT", "IN_GRACE_PERIOD",
                              "GRACE_PERIOD_EXPIRED" ]
                },
                "type": {
                    "enum": [ "INVALID", "UNKNOWN", "COMPILED",
                              "TRIAL", "EDU", "COMM" ]
                },
                "number": {"type": "string"}
            },
```

```
    "required": ["status"]
},
"statistics": {
    "type": "object",
    "properties": {
        "sampleIntervalMS": {
            "description": "The difference in upTime
                            between the two samples, 0 if
                            only a single sample was
                            taken",
            "type": "number"
        },
        "localTime": {
            "description": "Local Time at server in format
                            YYYY.MM.DD HH.MM.SS.SSSSSS",
            "type": "string"
        },
        "upTime": {
            "description": "Time since server start in
                            fractional seconds",
            "type": "number"
        },
        "cpuTime": {
            "description": "CPU time consumed by all server
                            processes in fractional
                            seconds",
            "type": "number"
        },
        "cpuPercentage": {
            "description": "CPU utilzation, computed using
                            change in cpuTime and upTime
                            between two samples",
            "type": "number"
        },
        "totalRequestsReceived": {
            "description": "The number of valid requests
                            received",
            "type": "integer"
        },
        "totalRequestsStarted": {"type": "integer"},
        "totalRequestsFailedToStart": {
            "description": "The number of requests that
                            could not be started",
            "type": "integer"
```

```
                },
                "totalRequestsFinishedHttpSuccess": {
                    "type": "integer"
                },
                "totalRequestsFinishedHttpError": {
                    "description": "Note: does not includes
                                    requests that failed to start",
                    "type": "integer"
                },
                "memoryWorkingSet": {
                    "description": "Amount of memory resident in
                                    physical memory for all
                                    processes (KiB)",
                    "type": "number"
                },
                "throughput": {
                    "description": "Requests retired per second,
                                    computed using the number of
                                    requests finished or failed to
                                    start over two samples",
                    "type": "number"
                },
                "totalQueueTimeMS": {
                    "description": "Sum of the wait times for
                                    currently queued requests",
                    "type": "number"
                }
            }
        }
    },
    "required": ["instancePath", "started"]
}
```

Examples

Check if a Server is Running

Display status of server instance `server_1`, residing in `tmp` folder.

```
mps-status -C /tmp/server_1
```

If server is running and running with a valid license:

```
'/tmp/server_1' STARTED
license checked out
```

If server is not running:

```
'/tmp/server_1' STOPPED
```

Report Statistics in a Human Readable Format

Display statistics for the server instance `server_1`, residing in `tmp` folder.

```
mps-status -C /tmp/server_1 -s
```

If server is running and running with a valid license:

```
'/tmp/server_1' STARTED
license checked out
Statistics:
Sample Interval (ms):     500
CPU Utilization (%):      40
Active Worker Processes:  2
Requests in Queue:        1
Memory Usage (KiB):       1024
Throughput (requests/s):  10
Total Queue Time (ms):    100
```

Report Statistics in JSON Format

Display statistics for the server instance `server_1`, residing in `tmp` folder.

```
mps-status -C /tmp/server_1 -s -j
```

If server is running and running with a valid license:

```
{
    "instancePath":"L:\\MPS\\stats",
    "license":{
        "number":"unknown",
        "status":"CHECKED_OUT",
        "type":"COMM"
    },
    "started":true,
    "statistics":{
        "cpuPercentage":0,
```

```
        "cpuTime":1.7628113000000001,
        "localTime":"2015.04.28 16:52:49.874483",
        "memoryWorkingSet":393468,
        "sampleIntervalMS":500.31748899999951,
        "throughput":0,
        "totalQueueTimeMS":0,
        "totalRequestsFailedToStart":0,
        "totalRequestsFinishedHttpError":0,
        "totalRequestsFinishedHttpSuccess":0,
        "totalRequestsReceived":0,
        "totalRequestsStarted":0,
        "upTime":6.9780032949999997
    }
}
```

See Also

`mps-restart` | `mps-start` | `mps-stop` | `mps-which`

Topics

“Start a Server Instance” on page 1-12
“Server Overview” on page 1-2
“License Server Status Information” on page 4-3

Introduced in R2012b

mps-stop

Stop a server instance

Syntax

```
mps-stop [-C [path/]server_name] [-f] [-p | --purge] [-k | --kill]
[-v] [--timeout hh:mm:ss]
```

Description

`mps-stop [-C [path/]server_name] [-f] [-p | --purge] [-k | --kill] [-v] [--timeout hh:mm:ss]` closes HTTP server socket and all open client connections immediately. All function requests that were executing when the command was issued are allowed to complete before the server shuts down.

Input Arguments

`-C path/`

Specify a path to the server instance. If this option is omitted, the current working folder and its parents are searched to find the server instance.

`server_name`

Name of the server to be stopped.

`-f`

Force success even if the server instance is not currently stopped. Stopping a stopped instance is considered an error.

`-p | --purge`

Removes working files in the instance directory. These files are usually removed during a graceful shutdown.

-k | --kill

Immediately and forcibly terminate any running processes for this instance. Use this option if a graceful shutdown has failed.

-v

Displays system messages relating to termination of server instance.

--timeout *hh*:*mm*:*ss*

Set a limit on how long `mps-stop` will run before returning either success or failure. For example, specifying `--timeout 00:02:00` indicates that `mps-stop` should exit with an error status if the server takes longer than two (2) minutes to shut down. The instance continues to attempt to terminate even if `mps-stop` times out. If this option is not specified, the default behavior is to wait as long as necessary (infinity) for the instance to stop.

Examples

Stop server instance `server_1`, located in `tmp` folder. Force successful completion of `mps-stop`. Timeout with an error status if `mps-stop` takes longer than three (3) minutes to complete.

In this example, the verbose (`-v`) option is specified, which produces an output status message.

```
mps-stop -f -v -C /tmp/server_1 --timeout 00:03:00
```

Example Output

```
waiting for stop... (timeout = 00:03:00)
```

Tips

- After issuing `mps-stop`, issue the `mps-status` command to verify the server instance has `STOPPED`.
- If you are stopping a server instance in the current working folder, you do not need to specify a full path. Only specify the server name.

- Note that the timeout option (`--timeout` *`hh`*:*`mm`*:*`ss`*) is specified with two (2) dashes, not one dash.

See Also

`mps-new` | `mps-restart` | `mps-start` | `mps-status`

Introduced in R2012b

mps-support-info

Display licensing and configuration information of a MATLAB Production Server instance

Syntax

```
mps-support-info [-C [path/]server_name]
```

Description

`mps-support-info` displays licensing and configuration information of a MATLAB Production Server instance.

Input Arguments

- *`path`* — The path to where the server instance is installed.
- *`server_name`* — The name of the server instance to locate in the current folder.

Examples

Display licensing and configuration information of server instance `fred`, residing in `/` folder.

```
mps-support-info -C /fred
```

```
Instance Version:           1.0
License Number:             UNKNOWN -- MPS stopped
MPS Version:                UNKNOWN -- MPS stopped
Available License Number:   857812
Client Version:             1.0.1 R2013a
Operating System:           Microsoft Windows 7 Enterprise Edition (build 7601), 64-bit
Number of CPU cores:        8
CPU Info:                   Intel(R) Xeon(R) CPU           W3550  @ 3.07GHz 64-bit Compatible
Memory:                     11.9915 GB ( 1.2574e+007 KB )
```

Introduced in R2012b

mps-which

Display path to server instance that is currently using the configured port

Syntax

`mps-which [-C [`*`path/`*`]`*`server_name`*`]`

Description

`mps-which [-C [`*`path/`*`]`*`server_name`*`]` is useful when running multiple server instances on the same machine. If you attempt to start two server instance on the same port, the latter server instance will fail to start, displaying an `address-in-use` error. `mps-which` identifies which server instance is using the port.

Input Arguments

`-C` ***`path/`***

Specify a path to the server instance. If this option is omitted, the current working folder and its parents are searched to find the server instance.

`server_name`

Server to be queried for path.

Examples

`server_1` and `server_2`, both residing in folder `tmp`, are configured to use to same port, defined by the `http` configuration property.

Run `mps-which` for both servers:

```
mps-which -C /tmp/server_1
```

```
mps-which -C /tmp/server_2
```

Example Output

In both cases, the server that has allocated the configured port displays (`server_1`):

```
/tmp/server_1
```

Tips

- If you are creating a server instance in the current working folder, you do not need to specify a full path. Only specify the server name.

See Also

`mps-status`

Introduced in R2012b

mps-cache

Control persistence service

Syntax

```
mps-cache [operation] [-C server_path] [--connection
connection_name] [--configFile provider_config_file_path] [--key
cache_access_key_string] [--timeout seconds] [--verbose | -v] [--
help |-h]
```

Description

`mps-cache [operation] [-C server_path] [--connection connection_name] [--configFile provider_config_file_path] [--key cache_access_key_string] [--timeout seconds] [--verbose | -v] [--help |-h]` controls the persistence service based on the specified *`operation`*. The supported operations are `start`, `stop`, `restart`, `ping`, `attach`, and `detach`.

The option *`connection_name`* is obtained from the JSON file `mps_cache_config`. This file must be created by an administrator and placed in the `config` folder of the server instance. The JSON structure of the `mps_cache_config` file is:

```
{
  "Connections": {
    "<connection_name>": {
      "Provider": "Redis",
      "Host": "<hostname>",
      "Port": <port_number>
    }
  }
}
```

<`connection_name`>, *<`host_name`>* and *<`port_number`>* are the only fields that can be set by the administrator and *<`port_number`>* has to be a non-SSL port. Currently, Redis™ is the only supported persistence service provider. You can have multiple connections to the persistence provider.

Input Arguments

operation

`start | stop | restart | ping | attach | detach`

- `start` — Start a persistence service.
- `stop` — Stop a persistence service.
- `restart` — Restart a persistence service.
- `ping` — Test whether the persistence service is reachable.
- `attach` — Connect persistence service to server instance process.
- `detach` — Disconnect persistence service from server instance process.

Note You cannot start, stop, or restart a remote persistence service.

`-C` *`server_path`*

Path to the server instance.

`--connection` *`connection_name`*

Name of connection to persistence service.

`--configFile` *`provider_config_file_path`*

Path to the persistence provider configuration file.

`--key` *`cache_access_key_string`*

Access key string to connect to an Azure Redis Cache instance obtained from the Azure portal. For an example, see “Ping a Remote Persistence Service” on page 7-35.

`--timeout` *`ss`*

Set a limit on how long `mps-cache` will run before returning either success or failure. The default duration is `30` seconds. For example, specifying `--timeout 15` indicates that `mps-cache` should exit with an error status if it takes longer than `15` seconds to access the service.

`--verbose | -v`

Displays system messages relating to controlling the persistence service.

`--help | -h`

Displays options for using the `mps-cache` command.

Examples

Start a Persistence Service

Start a persistence service on Windows assuming a connection name `myConnection` has been defined in the file `mps_cache_config`.

```
mps-cache start -C "h:\server\mps_instance" --connection myRedisConnection
mps-cache ping -C "h:\server\mps_instance" --connection myRedisConnection

Sending ping to Redis on localhost:9710.
Redis service running on localhost:9710.
```

The corresponding `mps_cache_config` file for the example is:

```
{
  "Connections": {
    "myRedisConnection": {
      "Provider": "Redis",
      "Host": "localhost",
      "Port": 9710
    }
  }
}
```

Ping a Remote Persistence Service

Assuming an Azure Redis Cache instance has been setup in the Azure portal and a connection name `myRemoteAzureRedisCacheConnection` has been defined in the file `mps_cache_config`.

```
mps-cache ping -C "h:\server\mps_instance"
               --connection myRemoteAzureRedisCacheConnection
               --key +WcI8pU0YodDMsw1LLC7gInkjtrjamLBRoq9rQQdMTU=
```

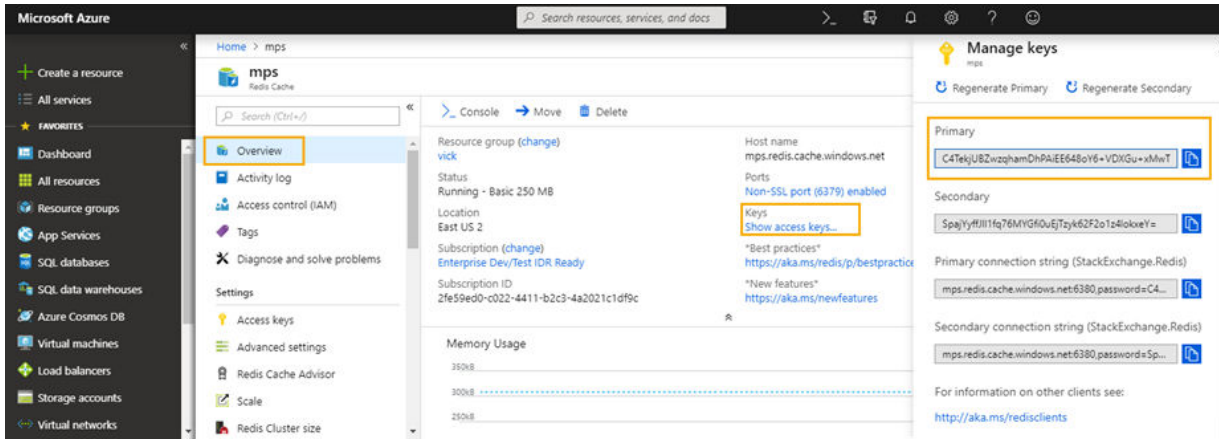
```
Sending ping to Redis on azure.redis.cache.windows.net:6379.
Redis service running on azure.redis.cache.windows.net:6379.
```

The corresponding `mps_cache_config` file for the example is:

```
{
  "Connections": {
    "myRedisConnection": {
      "Provider": "Redis",
      "Host": "localhost",
      "Port": 9710
    },
    "myRemoteAzureRedisCacheConnection": {
      "Provider": "Redis",
      "Host": "azure.redis.cache.windows.net",
      "Port": 6379
    }
  }
}
```

Tips

- To retrieve an access key to connect to an Azure Redis Cache instance:
  - Log in to your Azure portal and select your Azure Redis Cache instance.
  - Select **Overview** and under **Keys** click **Show access keys**.
  - In the resulting blade, copy the access key string listed under **Primary**.



See Also

Topics

“Use a Data Cache to Persist Data”

Introduced in R2018b

8

Configuration Properties—Alphabetical List

access-control-provider

Identity management service provider name

Syntax

`--access-control-provider` *`provider`*

Description

`--access-control-provider` *`provider`* enables access control by identity provider.

`ssl-allowed-clients` and `--access-control-provider` are incompatible flags, and only one of them can be enabled. If both are enabled, MATLAB Production Server fails to start.

Parameters

`provider` specifies the identity provider that is used by the MATLAB Production Server instance for access control. Supported values for *`provider`* include: `AzureAD`.

Examples

Enable Access Control Using Azure Active Directory

```
--access-control-provider AzureAD
```

See Also

access-control-config | access-control-policy

Introduced in R2018b

access-control-config

Path to the identity management service provider configuration file

Syntax

```
--access-control-config path
```

Description

`--access-control-config path` specifies the path to the identity provider specific configuration file. This syntax is optional. The default path for `AzureAD` is ./config/azure_ad.json. If access control is enabled by specifying access-control-provider, the access control configuration file must exist in *`path`*, otherwise MATLAB Production Server fails to start.

Parameters

`path` specifies the path to access the configuration file.

Examples

Specify Path to `AzureAD`.

```
--access-control-config ./config/azure_ad.json
```

See Also

access-control-policy | access-control-provider

Topics

“Access Control Configuration File” on page 3-11

Introduced in R2018b

access-control-policy

Path to the access control policy file

Syntax

`--access-control-policy` *`path`*

Description

`--access-control-policy` *`path`* specifies the path to the access control policy file. This syntax is optional. The default path is ./config/ac_policy.json. If access control is enabled by specifying access-control-provider, the access control policy file must exist in *`path`*, otherwise MATLAB Production Server fails to start.

Once the server has started, the policy file is scanned every five seconds for changes. If the policy file is deleted or contains errors, the server continues to run, but all requests are denied. An error message is written to the `main.log` file.

Parameters

`path` specifies the path to access the policy file.

Examples

Specify Path to the JSON Access Control Policy File.

```
--access-control-policy ./config/ac_policy.json
```

See Also

access-control-config | access-control-provider

Topics

“Access Control Policy File” on page 3-12

Introduced in R2018b

auto-deploy-root

Folder the server instance scans for deployable archives

Syntax

`--auto-deploy-root` *`path`*

Description

`--auto-deploy-root` *`path`* specifies the folder the server instance scans for deployable archives. Deployable archives placed in this folder are automatically unpacked and deployed when the instance is started. No restart is necessary when a deployable archive is added, updated, or removed. Many instances may share a single `auto-deploy-root`. Using this folder allows near-simultaneous hot deployment to multiple instances. The folder is scanned every five seconds for changes.

Parameters

`path`

Path to the folder scanned for deployable archives relative to the server instance's root folder.

Examples

Scan the `auto_deploy` folder for deployable archives to hot deploy.

```
--auto-deploy-root ./auto_deploy
```

client-credential-delegation

Client credential delegation method name

Syntax

```
--client-credential-delegation method
```

Description

`--client-credential-delegation` *`method`* specifies the client credential delegation method that the server uses. Currently, `kerberos-without-protocol-transition` is the only supported method. If you set `client-credential-delegation` to `kerberos-without-protocol-transition`, then you must set http-authentication-method to `spnego`; otherwise, the server fails to start.

Parameters

`method`

Name of the client credential delegation method. `kerberos-without-protocol-transition` is the only supported method.

Examples

Use `kerberos-without-protocol-transition` as the client credential delegation method.

```
--client-credential-delegation kerberos-without-protocol-transition
```

See Also

http-authentication-method

Topics

“Use Kerberos and Kerberos Delegation” on page 3-18

Introduced in R2019b

cors-allowed-origins

Specify the domain origins from which clients are allowed to make requests to the server

Syntax

```
--cors-allowed-origins [ LIST | * ]
```

Description

`cors-allowed-origins` specifies the set of domain origins from which clients are allowed to make requests to a MATLAB Production Server instance. Cross-Origin Resource Sharing or CORS defines a way in which client-side web applications and a server can interact to safely determine whether or not to allow a cross-origin request. Most clients such as browsers use the `XMLHttpRequest` object to make a cross-domain request. This is especially true for client code written using JavaScript®. For MATLAB Production Server to support such requests, you must enable `cors-allowed-origins` on the server.

Parameters

*

Requests from any domain origin are allowed access to the sever.

LIST

Requests from a list of comma-separated domain origins are allowed access to the server.

Examples

Requests from any domain origin are allowed access to the sever.

```
--cors-allowed-origins *
```

Requests from a specific list of domain origins are allowed access to the server.

```
--cors-allowed-origins http://www.w3.org, https://www.apache.org
```

See Also

http

disable-control-c

Disable keyboard interruptions for server instance

Syntax

```
--disbable-control-c
```

Description

`disable-control-c` disables keyboard interruption for the server instance. The server instance does not respond to **CTRL-C**.

Examples

Disable the **CTRL-C** button.

```
--disable-control-c
```

endpoint-root

Folder used to store server named endpoints

Syntax

`--endpoint-root` *`path`*

Description

`--endpoint-root` *`path`* specifies the location for storing server named endpoints. Each interface used to communicate with the outside world generates an endpoint file in this folder. Normally that means:

- http - The HTTP function execution interface.
- control - The local control interface used by the scripting commands.

These files contain the `host:post` portion of the URL used to communicate with the named service.

Note While modifying this location is allowed, each instance must have a unique endpoint directory; otherwise behavior is undefined.

Parameters

`path`

Path to the folder used to store endpoint files relative to the server instance's root folder.

Examples

Store endpoint files in the `endpt` folder.

```
--endpoint-root ./endpt
```

extract-root

Root folder used to store contents of deployed archives

Syntax

`--extract-root` *`path`*

Description

`--extract-root` *`path`* specifies the root folder used to store the expanded contents of the deployable archives deployed on the server instance. Deployable archives are unpacked to a hidden subdirectory of `extract-root`.

Parameters

`path`

Path to the root folder used to store contents of deployable archives relative to the server instance's root folder.

Examples

Extract deployable archives into the `archives` folder.

```
--extract-root ./archives
```

hide-matlab-error-stack

Hide the MATLAB stack from the clients

Syntax

```
--hide-matlab-error-stack
```

Description

`hide-matlab-error-stack` controls whether the MATLAB stack is exposed to the client. The stack can be sent to the client during development and debug phase, but can be turned off in production.

Examples

Do not transmit the error stack to clients.

```
--hide-matlab-error-stack
```

http

URL for insecure connections

Syntax

```
--http host:port
```

Description

`http` specifies the interface port and optional address or host name.

Parameters

`host`

Host name or IP address of the machine running the server instance. If you do not specify the host, the server binds to any available interface.

`port`

Port number used by the server instance to accept connections. Bind to any available port by specifying `0`.

Examples

Restrict access to the HTTP interface for local clients only on port 9910.

```
--http localhost:9910
```

Bind to any free port. The bound address is written to `$INSTANCE/endpoint/https`.

```
--http 0
```

Bind to a specific IP address and port.

```
--http 234.27.101.3:9920
```

Bind to a specific host name on any free port

```
--http my.hostname.com:0
```

http-authentication-method

HTTP authentication method name

Syntax

`--http-authentication-method` *`method`*

Description

`--http-authentication-method` *`method`* specifies the HTTP authentication method that the server uses to authenticate the client.

If you do not specify this property, the server does not perform HTTP authentication. You can still authenticate using an HTTPS client certificate. For more information on configuring client authentication, see “Configure Client Authentication” on page 3-5.

Parameters

`method`

Name of HTTP authentication method. `spnego` (Simple and Protected Negotiation Mechanism) is the only supported method.

Examples

Specify `spnego` as the HTTP authentication method.

```
--http-authentication-method spnego
```

See Also

client-credential-delegation

Topics

“Use Kerberos and Kerberos Delegation” on page 3-18

Introduced in R2019b

http-linger-threshold

Amount of data the server instance discards after an HTTP error and before the server instance closes the TCP connection

Syntax

```
--http-linger-threshold size
```

Description

`http-linger-threshold` sets the amount of data a server instance reads after an error. If an HTTP request is rejected and the server instance sends back an HTTP error response such as HTTP 404/413, the server instance does not close the TCP connection immediately. Instead it waits for the client to shut down the TCP connection. This ensures that the client receives the HTTP error response sent by the server instance. During this time, the server instance receives, and discards, data from the client, until the amount of data received equals `http-linger-threshold`. After that, the server instance resets the TCP connection.

By default, the threshold is unlimited and the server instance waits to receive the whole HTTP request.

Parameters

size

Amount of data received before the TCP connection is reset.

Examples

Set the linger threshold to be 64 MB.

```
--http-linger-threshold 64MB
```

Set the linger threshold to be 32 KB.

```
--http-linger-threshold 32KB
```

Set the linger threshold to be 1024 B.

```
--http-linger-threshold 1024
```

https

URL for secure connections

Syntax

```
--https host:port
```

Description

`https` specifies the interface port and the optional address or host name to use for secure client-server communication.

Starting in R2019b, if you set the `https` property, you must set the x509-private-key and x509-cert-chain properties; otherwise, the server fails to start.

Parameters

`host`

Host name or IP address of the machine running the server instance. If you do not specify the host, the server binds to any available interface.

`port`

Port number used by the server instance to accept connections. Bind to any available port by specifying `0`.

Examples

Restrict access to the HTTPS interface for local clients only on port 9920.

```
--https localhost:9920
```

Bind to any free port. The bound address is written to `$INSTANCE/endpoint/https`.

```
--https 0
```

Bind to a specific IP address and port.

```
--https 234.27.101.3:9920
```

Bind to a specific host name on any free port.

```
--https my.hostname.com:0
```

See Also

x509-cert-chain | x509-private-key

Topics

“Enable HTTPS” on page 3-3

license

Locations searched for valid licenses

Syntax

```
--license pathList
```

Description

`license` specifies the license servers or the license files used by the server instance. You can specify multiple license sources with this option.

If this option is not specified, the server searches in the default locations for the license files.

Parameters

`pathList`

Path to one or more license servers or license files. Multiple entries are separated by the appropriate path separator for the platform.

Examples

A Unix server looks for licenses using a license server hosted on port 27000 of `hostA` and in `/opt/license/license.dat`.

```
--license 27000@hostA
--license /opt/license/license.dat
```

The same configuration in one line.

```
--license 27000@hostA:/opt/license/license.dat
```

A Windows server looks for licenses using a license server hosted on port 27000 of `hostA` and in `c:\license\license.dat`.

```
--license 27000@hostA
--license c:\license\license.dat
```

The same configuration in one line.

```
--license 27000@hostA;c:\license\license.dat
```

license-grace-period

Maximum length of time the server instance responds to HTTP requests after license server heartbeat has been lost

Syntax

`--license-grace-period` *`hr`*`:`*`min`*`:`*`sec`*`.`*`fractSec`*

Description

`license-grace-period` specifies the grace period, which starts at the first heartbeat loss event. Once the grace period expires, the server instance rejects any new incoming HTTP requests.

The default grace period is 2 hours 30 minutes. The maximum value is 2 hours 30 minutes. The minimum value is 10 minutes.

Parameters

`hr`

Hours in interval.

`min`

Minutes in interval.

`sec`

Seconds in interval.

`fractSec`

Fractional seconds in interval.

Examples

The grace period lasts for 1 hour, 29 minutes, 5 seconds.

```
--license-grace-period 1:29:05
```

The grace period lasts for 10 minutes and 250 ms.

```
--license-grace-period 00:10:00.25
```

license-poll-interval

Interval of time before license server is polled to verify and check out a valid license after the grace period expires

Syntax

`--license-poll-interval` *`hr`*`:`*`min`*`:`*`sec`*`.`*`fractSec`*

Description

`license-poll-interval` specifies interval at which the server instance polls the license server after the license server has timed out or after the grace period has expired.

The default poll interval is 10 minutes. The minimum value is 10 minutes.

Parameters

`hr`

Hours in interval.

`min`

Minutes in interval.

`sec`

Seconds in interval.

`fractSec`

Fractional seconds in interval.

Examples

Poll for licenses at intervals of 1 hour, 29 minutes, 5 seconds.

```
--license-poll-interval 1:29:05
```

Poll for licenses at intervals of 10 minutes and 250 ms.

```
--license-poll-interval 00:10:00.25
```

log-archive-max-size

Maximum size of the log archive folder

Syntax

```
--log-archive-max-size size
```

Description

`log-archive-max-size` specifies the maximum size to which the log archive folder can grow before old log files are deleted.

If this property is not specified, then the log archive grows without limit.

Parameters

size

Size, in bytes, of the archive folder.

Examples

Reap log archives when they reach 5 MB.

```
--log-archive-max-size 5MB
```

log-archive-root

Path to the folder containing archived log files

Syntax

`--log-archive-root` *`path`*

Description

`--log-archive-root` *`path`* specifies the path to directory that stores rotated log files.

Note If you omit this property, rotated logs remain in the log root directory, which grows unbounded as logs are rotated.

Parameters

`path`

Path to the folder where log files are archived relative to the server instance's root folder.

Examples

Archive logs to *`server_root`*`/old_logs`.

```
--log-archive-root ./old_logs
```

log-handler

Add custom log handler

Syntax

`--log-handler` *`format command`*

Description

`--log-handler` *`format command`* adds a log handler that writes log data to the application specified by *`command`* in the format specified by *`format`*.

The server instance launches an instance of the log handler at startup. All log events are sent to the `STDIN` stream of the log handler. The `STDOUT` and `STDERR` streams of the log handler are captured and written to *`INSTANCE_ROOT`*`/log/custom_logger_`*`N`*`.out` and *`INSTANCE_ROOT`*`/log/custom_logger_`*`N`*`.err`.

Parameters

`format`

Format used to write log events. Valid values are:

- `text/plain`
- `text/json`
- `text/xml`

`command`

Application launched to process log events.

Examples

Send log events to a custom JSON parser that prepares performance graphs.

```
--log-handler text/json perf_grapher
```

log-root

Path to the log file folder

Syntax

`--log-root` *`path`*

Description

`--log-root` *`path`* specifies the location for log files.

When a server instance starts, the following log files are created:

- `main__`*`DATE`*`__`*`SERIAL`*`.log` — The head process main log
- `main.log` — A link to the mostly recently written main log file
- `main.out` — Captured standard output from the main process
- `main.err` — Captured standard error output from the main process

When the server instance stops, the head process main log is moved to the log archive folder.

Note Omitting this property disables all logging except for `stdout` and `stderr` capture of main.

Parameters

`path`

Path to the folder where log files are stored relative to the root folder of the server instance.

Examples

Archive logs to *server_root*/logs.

```
--log-root ./logs
```

log-rotation-size

Size at which the log is archived

Syntax

`--log-rotation-size` *size*

Description

`log-rotation-size` specifies the maximum size to which the log can grow before it is rotated into the archive area. If specified as less than 1 MB, a warning is issued and the effective size is increased to 1 MB.

No entry signifies that logs are never archived.

Parameters

size

Size, in bytes, of the log file.

Examples

Rotate logs when they reach 5 MB.

```
--log-rotation-size 5MB
```

log-severity

Severity at which messages are logged

Syntax

`--log-severity` *`level`*

Description

`log-severity` specifies the level of detail at which to add information to the main log.

Parameters

`level`

Severity threshold at which messages are logged. Valid values are:

- `error` — Notification of problems or unexpected results.
- `warning` — Events that could lead to problems if not addressed.
- `information` — High-level information about major server events.
- `trace` — Detailed information about the internal state of the server.

The levels are cumulative; specifying `information` implies `warning` and `error`.

Examples

Enable all log messages.

```
--log-severity trace
```

mcr-root

Location of a MATLAB Runtime installation

Syntax

`--mcr-root` *path*

Description

`mcr-root` specifies the location of an installed MATLAB Runtime instance. If multiple MATLAB Runtime installations are available, then specify each installation on a separate line.

Note Specifying multiple MATLAB Runtime installations allows one MATLAB Production Server instance to support multiple versions of the MATLAB Runtime. Specifying multiple MATLAB Runtime installations of the same version has no effect on performance.

If multiple `mcr-root` settings are present, then the server uses dynamic worker pool management, where worker processes are started in response to demand and shut down in response to system resource utilization.

The server instance scans the list of provided MATLAB Runtime installations in order from first to last and chooses the first MATLAB Runtime installation capable of processing the request. A MATLAB Runtime installation can process a request if it is compatible with the deployable archive containing the function being evaluated.

Note

- A server instance should only be configured to use MATLAB Runtime roots on a local file system. Otherwise, a network partition may cause worker processes to fail.
- All values for `mcr-root` must be for the same OS/hardware combination.

Parameters

path

Path to the root folder of the MATLAB Runtime installation.

Note The special value `mCRuNsETtOKEN` indicates to the `mps-start` command that there is no MATLAB Runtime installation configured for this instance. Running the `mps-start` command results in an error.

Examples

Use the v80 version of the MATLAB Runtime.

```
--mcr-root /usr/local/MCR/v80
```

Use the v80 and v81 versions of the MATLAB Runtime.

```
--mcr-root /usr/local/MCR/v80
--mcr-root /usr/local/MCR/v81
```

See Also

Topics

“Specify the MATLAB Runtime for a Server Instance” on page 1-11
“Support Multiple MATLAB Versions” on page 1-15

num-threads

Number of request-processing threads within the server instance

Syntax

```
--num-threads count
```

Description

`num-threads` sets the size of the thread pool available to process requests. Server instances do not allocate a unique thread to each client connection. Rather, when data is available on a connection, the required processing is scheduled on the pool of threads in the server main process.

The threads in this pool do not directly evaluate MATLAB functions. There is a single thread within each worker process that executes MATLAB code on behalf of the client.

Set this parameter to 1, and increase it only if the expected load consists of a high volume of short-running requests. This strategy ensures that the available processor resources are balanced between MATLAB function evaluation and processing client-server requests. There is usually no benefit to increasing this parameter to more than the number of available cores.

Parameters

`count`

Number of threads available in the thread pool.

This value must be one or greater.

Examples

Create a pool of 10 threads for processing requests.

```
--num-threads 10
```

See Also

request-size-limit

num-workers

Maximum number of workers allowed to process work simultaneously

Syntax

```
--num-workers count
```

Description

`num-workers` defines the number of concurrent MATLAB execution requests that can be processed simultaneously. It should correspond to the number of hardware threads available on the local host.

If you specify a single value for the `mcr-root` property, this setting determines the fixed size of the worker pool.

If you specify more than one value for the `mcr-root`, this setting specifies a maximum limit on the size of each subpool specific to MATLAB Runtime. There can be more than specified number of worker processes at a time, but at a maximum only the specified number of workers are allowed to be processing a request.

Parameters

`count`

Number of workers available evaluate functions.

This value must be one or greater.

The maximum value is determined by the number of license keys available for MATLAB Production Server.

Examples

Allow 10 workers to process requests at a time.

```
--num-workers 10
```

pid-root

Folder used to store PID files

Syntax

`--pid-root` *`path`*

Description

`--pid-root` *`path`* specifies the folder used to store PID files. PID files record the system-specific process identifiers for all processes associated with the server instance. This includes:

- `main.pid` — The process identifiers of the server's head process.
- `worker_`*`N`*`.pid` — The process identifiers of each worker process *`N`*.

In some circumstances, `worker_2.pid` may be present when `worker_1.pid` is not. This is a strong indication that `worker_1` crashed and was restarted automatically. You can confirm this by checking the main log file.

The format of these files is a single decimal integer, the process identifier.

Parameters

`path`

Path to the folder used to store PID files relative to the server instance's root folder.

Examples

Store PID files in the `pid` folder.

```
--pid-root ./pid
```

profile

Turn profiling on or off

Syntax

`--profile` *`state object`*

Description

`profile` turns profiling on or off for different objects.

Note Activating profiling has a negative impact on performance.

In some circumstances, `worker_2.pid` may be present when `worker_1.pid` is not. This is a strong indication that `worker_1` stopped and was restarted automatically. You can confirm this by checking the main log file.

When profiling is activated, messages similar to the following are included in the log.

```
12 [2014.02.27 10:13:28.075126] [profile] [SERVICE:http-connection]
[endpoint:[::]:9910] [client:163.72.158.2:57611] [request-id:0:1:5]
[type:arrive] [component:mymagic] [function:magic]
Request arrived and was placed in the queue
13 [2014.02.27 10:13:28.087752] [profile] [SERVICE:http-connection]
[endpoint:[::]:9910] [client:163.72.158.2:57611] [request-id:0:1:5]
[type:start] [worker:3] Request started executing on worker-3
...
15 [2014.02.27 10:13:31.397266] [profile] [SERVICE:http-connection]
[endpoint:[::]:9910] [client:163.72.158.2:57611] [request-id:0:1:5]
[type:finish] [status:200] Request completed with HTTP status 200
```

Parameters

state

Specifies if profiling is active. Valid values are:

- `on` — Activate profiling.
- `off` — Activate profiling.

object

The list of objects to change. Supported objects are:

- `requests`
- `worker_pool`

If no object is specified, all objects are changed.

Examples

Turn on request profiling.

```
--profile on requests
```

Turn on profiling for all objects.

```
--profile on
```

request-size-limit

Set the maximum size of a request

Syntax

```
--request-size-limit  size
```

Description

`request-size-limit` specifies the maximum size of a request specified by *`size`*. The default request size is 64MB.

Parameters

`size`

Size, in bytes, of the request.

Examples

Set the request size to 128MB.

```
--request-size-limit 128MB
```

See Also

`num-threads`

ssl-allowed-client

MATLAB programs a client can access

Syntax

```
--ssl-allowed-client client1,...,clientN:archive1,...,archiveN
```

Description

`ssl-allowed-client` authorizes clients based on the client certificate common name. Only authorized clients can request the evaluation of MATLAB functions.

If there are no archive names following the common name, the client can access all of the deployed archives. Otherwise, the client can access only the specified archives.

Parameters

`client`

Common name of the client.

`archive`

Name of an archive the clients can access.

Examples

Allow `client1` and `client2` to access `magic.ctf` and `helloworld.ctf`. Allow `client3` access to all deployed archives.

```
--ssl-allowed-client client1,client2:magic,helloworld
--ssl-allowed-client client3
```

ssl-ciphers

List of cipher suites used for encryption

Syntax

`--ssl-ciphers` *ciphers*

Description

`ssl-ciphers` provides a list of cipher suites that the server uses for encryption.

Parameters

ciphers

Cipher suites the server instance uses for encryption. Valid values are:

- `ALL` — Use all available cipher suites except eNULL.
- `HIGH` — Use all available high encryption cipher suites.
- *list* — Comma-separated list of cipher suites to use.

All OpenSSL configuration strings can be passed with the ciphers. This provides finer control over the selected cipher.

Examples

Use only high encryption cipher suites.

```
--ssl-ciphers HIGH
```

Disable the use of ADH ciphers.

```
--ssl-ciphers ALL:!ADH
```

Use the strongest available ECDHE ciphers.

```
--ssl-ciphers ALL:@STRENGTH
```

Disable the use of ADH ciphers and use the strongest available ECDHE ciphers.

```
--ssl-ciphers ALL:!ADH@STRENGTH
```

See Also

https | ssl-protocols

Topics

“Enable HTTPS” on page 3-3
“Adjust Security Protocols” on page 3-9

ssl-protocols

List of allowed SSL protocols

Syntax

```
--ssl-protocols protocols
```

Description

`ssl-protocols` lists the allowed SSL protocols. If you do not set this property, the server allows the use of all supported SSL protocols. Supported protocols are TLSv1, TLSv1.1, and TLSv1.2. The default server behavior is to attempt to use TLSv1.2.

Starting in R2019b, SSLv3 is no longer supported.

Parameters

protocols

Comma-separated list of allowed protocols. Valid entries are:

- `TLSv1`
- `TLSv1.1`
- `TLSv1.2`

Examples

Allow only TLSv1.

```
--ssl-protocols TLSv1
```

See Also

https | ssl-ciphers

Topics

“Enable HTTPS” on page 3-3
“Adjust Security Protocols” on page 3-9

ssl-tmp-ec-param

Elliptic curve used for the ECDHE ciphers

Syntax

`--ssl-tmp-ec-param` *`elliptic_curve_name`*

Description

`--ssl-tmp-ec-param` *`elliptic_curve_name`* specifies the name of the elliptic curve used for the ECDHE ciphers.

Starting in R2019b, ECDHE ciphers are enabled by default. If you do not specify the elliptic curve name, ECDHE ciphers use a default elliptic curve. The default elliptic curves are in the following order: x25519, secp256r1, x448, secp521r1, secp384r1. During the SSL/TLS handshake, the client advertises the curves that it supports. Based on this client-server negotiation, one of the default curves is used to establish a secure connection for the subsequent data exchange.

For earlier releases, if this property is not specified, all ECDHE ciphers are disabled.

Parameters

`elliptic_curve_name`

Name of curve. All curves supported by OpenSSL are supported.

Examples

Use the prime256v1 curve.

```
--ssl-tmp-ec-param prime256v1
```

ssl-tmp-dh-param

File containing a pregenerated ephemeral DH key

Syntax

`--ssl-tmp-dh-param` *`path`*

Description

`ssl-tmp-dh-param` specifies the path to the pre-generated ephemeral DH key. If this parameter is not provided, the server instance automatically generates the DH key at start-up. Providing a pre-generated DH key can decrease instance start time.

Parameters

`path`

Path to the pre-generated DH key. Relative and absolute paths are valid.

Examples

The instance loads the DH key from `dh_param.pem` which is located at *`instance_root`*`/x509`.

```
--ssl-tmp-dh-param ./x509/dh_param.pem
```

ssl-verify-peer-mode

Level of client verification required by the server instance

Syntax

```
--ssl-verify-peer-mode mode
```

Description

`ssl-verify-peer-mode` specifies whether the server requires clients to present a valid certificate to connect to it. Server instances allow clients to connect to it with or without providing a valid certificate. All requests will still require authorization.

If you set `ssl-verify-peer-mode` to `verify-peer-require-peer-cert`, you must set either the x509-ca-file-store or x509-use-system-store property.

Parameters

mode

Mode used to authenticate clients. Valid values are:

- `no-verify-peer` — No peer certificate verification. The client side does not need to provide a certificate.
- `verify-peer-require-peer-cert` — The client must provide a certificate and the certificate will be verified.

The default is `no-verify-peer`.

Examples

Require clients to provide a certificate.

```
--ssl-verify-peer-mode verify-peer-require-peer-cert
```

See Also

https | x509-ca-file-store | x509-use-crl | x509-use-system-store

Topics

“Configure Client Authentication” on page 3-5

use-single-comp-thread

Start MATLAB Runtime with a single computational thread

Syntax

```
--use-single-comp-thread
```

Description

`--use-single-comp-thread` specifies that workers start the MATLAB Runtime with a single computational thread.

Examples

Start the MATLAB Runtime with a single computational thread.

```
--use-single-comp-thread
```

worker-memory-check-interval

Interval at which workers are polled for memory usage

Syntax

```
--worker-memory-check-interval hr:min:sec.fractSec
```

Description

`worker-memory-check-interval` specifies how often to poll the memory usage of a worker process. This setting affects the behavior of all other settings that act based on worker memory usage such as `worker-memory-trigger`, `worker-memory-target`, and `worker-restart-memory-limit`.

Parameters

hr

Hours in interval.

min

Minutes in interval.

sec

Seconds in interval.

fractSec

Fractional seconds in interval.

Examples

Check memory usage every one and a half minutes.

```
--worker-memory-check-interval 0:01:30
```

See Also

`worker-restart-memory-limit` | `worker-restart-memory-limit-interval`

Topics

“Control Worker Restarts” on page 1-17

worker-restart-interval

Time interval at which a server instance stops and restarts its workers

Syntax

`--worker-restart-interval` *`hr`*`:`*`min`*`:`*`sec`*`.`*`fractSec`*

Description

`worker-restart-interval` specifies the interval at which the server instance stops and restarts its worker processes. If this setting is not given, the workers are not restarted in response to time.

Parameters

`hr`

Hours in interval.

`min`

Minutes in interval.

`sec`

Seconds in interval.

`fractSec`

Fractional seconds in interval.

Examples

Restart workers at intervals of 1 hour, 29 minutes, 5 seconds.

```
--worker-restart-interval 1:29:05
```

Restart workers at intervals of 10 minutes and 250 ms.

```
--worker-restart-interval 00:10:00.25
```

See Also

Topics

“Control Worker Restarts” on page 1-17

worker-restart-memory-limit

Size threshold at which to consider restarting a worker

Syntax

```
--worker-restart-memory-limit size
```

Description

`worker-restart-memory-limit` sets the memory usage limit of a worker process. If a worker's working set size exceeds `worker-restart-memory-limit` for an interval of time greater than `worker-restart-memory-limit-interval`, then that worker is restarted.

Parameters

`size`

Amount of memory used by worker.

Examples

Restart any worker whose working set size exceeds 1 GB for more than 1 hour.

```
--worker-restart-memory-limit 1GB
--worker-restart-memory-limit-interval 1:00:00
```

See Also

`worker-memory-check-interval` | `worker-restart-memory-limit-interval`

Topics

“Control Worker Restarts” on page 1-17

worker-restart-memory-limit-interval

Interval for which a worker can exceed its memory limit before restart

Syntax

```
--worker-restart-memory-limit-interval hr:min:sec.fractSec
```

Description

`worker-restart-memory-limit-interval` sets the interval for which a worker process can exceed its memory limit before restart. If a worker's working set size exceeds `worker-restart-memory-limit` for an interval of time greater than `worker-restart-memory-limit-interval`, then that worker is restarted.

Parameters

hr

Hours in interval.

min

Minutes in interval.

sec

Seconds in interval.

fractSec

Fractional seconds in interval.

Examples

Restart any worker whose working set size exceeds 1 GB for more than 1 hour.

```
--worker-restart-memory-limit 1GB
--worker-restart-memory-limit-interval 1:00:00
```

See Also

`worker-memory-check-interval` | `worker-restart-memory-limit`

Topics

“Control Worker Restarts” on page 1-17

x509-ca-file-store

File containing the server certificate authority file

Syntax

```
--x509-ca-file-store path
```

Description

`x509-ca-file-store` specifies the certificate authority (CA) file to verify peer certificates. This file contains trusted certificates and certificate revocation lists.

You can also put intermediate certificates into the CA file. An intermediate certificate in the CA file becomes a trusted certificate.

Parameters

path

Path to the certificate CA file store. Relative and absolute paths are valid.

Examples

The instance loads the CA store from `ca_file.pem` which is located at *instance_root*`/x509`.

```
--x509-ca-file-store ./x509/ca_file.pem
```

See Also

https | ssl-verify-peer-mode | x509-use-crl | x509-use-system-store

Topics

“Configure Client Authentication” on page 3-5

x509-cert-chain

File containing the server certificate chain

Syntax

`--x509-cert-chain` *`path`*

Description

`x509-cert-chain` specifies the server certificate chain file. It contains one or more PEM-format certificates. The chain begins with the server certificate. The server certificate is followed by a chain of untrusted certificates. To use the certificate chain file, specify the x509-private-key.

Starting in R2019b, if https is enabled on the server, you must set the `x509-cert-chain` and `x509-cert-chain` properties; otherwise, the server fails to start.

Note Do not specify trusted certificates in the certificate chain file.

Parameters

`path`

Path to the certificate chain file. Relative and absolute paths are valid.

Examples

The instance loads the certificate chain from `cert_chain.pem` which is located at *`instance_root`*`/x509`.

```
--x509-cert-chain ./x509/cert_chain.pem
```

See Also

https | x509-private-key

Topics

“Enable HTTPS” on page 3-3

x509-passphrase

File containing the passphrase that decodes the private key

Syntax

```
--x509-passphrase path
```

Description

`x509-passphrase` specifies the path to the file containing the passphrase of the encrypted private-key. This is required if `x509-private-key` is specified and the private key file is encrypted. Otherwise, the private key fails to load.

Note This file must be owner read-only.

Parameters

path

Path to the passphrase file. Relative and absolute paths are valid.

Examples

The instance loads the passphrase from `key_passphrase.pem` which is located at *instance_root*`/x509`.

```
--x509-passphrase ./x509/key_passphrase.pem
```

x509-private-key

File containing the private key in PEM format

Syntax

```
--x509-private-key path
```

Description

`x509-private-key` specifies the path to the private key. The key must be in PEM format.

If you do not set this property, the server instance does not load the private key or the server-side certificates.

Starting in R2019b, if https is enabled on the server, you must set the `x509-private-key` and `x509-cert-chain` properties; otherwise, the server fails to start.

Parameters

path

Path to the PEM-format private key file. Relative and absolute paths are valid.

Examples

The instance loads the private key from `private_key.pem`, which is located at *instance_root*`/x509`.

```
--x509-private-key ./x509/private_key.pem
```

See Also

https | x509-cert-chain

Topics

“Enable HTTPS” on page 3-3

x509-use-crl

Use the certificate revocation list

Syntax

```
--x509-use-crl
```

Description

`x509-use-crl` specifies that the server instance uses the certificate revocation list (CRL). By default, instances do not use any CRLs. In this case, the CRLs in the certificate authority store are ignored.

If `x509-use-crl` is added, the CRLs are loaded and participate in the client certificate verification. If the CRL has expired, the SSL handshake is rejected.

Examples

The instance uses certificate revocation list when authenticating clients.

```
--x509-use-crl
```

See Also

https | ssl-verify-peer-mode | x509-ca-file-store | x509-use-system-store

Topics

“Configure Client Authentication” on page 3-5

x509-use-system-store

Use the certificate authority store provided by the system

Syntax

```
--x509-use-system-store
```

Description

`x509-use-system-store` specifies that the server instance uses the system provided certificate authority (CA) store. By default, the server uses the file `/etc/ssl/certs/ca-certificates.crt` as trusted CA store and searches for trusted certificates under the folder `/etc/ssl/certs`. You can override these locations by setting the environment variables `SSL_CERT_FILE` and `SSL_CERT_DIR`.

Examples

The instance uses the system CA store.

```
--x509-use-system-store
```

See Also

https | ssl-verify-peer-mode | x509-ca-file-store | x509-use-crl

Topics

“Configure Client Authentication” on page 3-5

request-timeout

Duration after which the request times out and gets deleted after reaching a terminal state

Syntax

`--request-timeout` *`hr`*`:`*`min`*`:`*`sec`*`.`*`fractSec`*

Description

`request-timeout` specifies the duration after which the request times out upon reaching a terminal state. At this point, the request gets deleted unless a client process has already deleted the request.

Parameters

`hr`

Hours in interval.

`min`

Minutes in interval.

`sec`

Seconds in interval.

`fractSec`

Fractional seconds in interval.

Examples

Set the request to time-out after 2 hours.

```
--request-timeout 2:00:00
```

See Also

`server-memory-threshold`

Introduced in R2016b

server-memory-threshold

Size threshold of server process at which action needs to be taken to manage responses

Syntax

```
--server-memory-threshold SIZE
```

Description

`server-memory-threshold` sets the memory size limit of a server process. If a server process's size exceeds `SIZE` set by `server-memory-threshold`, then responses need to be either archived or purged by setting `server-memory-threshold-overflow-action` to `archive_responses` or `purge_responses` respectively. If `server-memory-threshold` is not set, then the responses will be bound to the server process causing the memory footprint of the server process to keep increasing. As a best practice, it is recommended that a client process delete a request after usage in order to prevent the memory of the server process from growing.

Parameters

size

Threshold size of the server process.

Examples

Archive responses if the size of the server process in memory exceeds 500 MB.

```
--server-memory-threshold 500MB
--server-memory-threshold-overflow-action archive_responses
```

Purge responses if the size of the server process in memory exceeds 2 GB.

```
--server-memory-threshold 2GB
--server-memory-threshold-overflow-action purge_responses
```

See Also

server-memory-threshold-overflow-action

server-memory-threshold-overflow-action

Action taken when the memory size threshold of server process is breached

Syntax

```
--server-memory-threshold-overflow-action ACTION
```

Description

`server-memory-threshold-overflow-action` acts by either archiving responses or purging them when the size of the server process in memory set by `server-memory-threshold` is breached.

Parameters

ACTION

`archive_responses`

`purge_responses`

Examples

Archive responses if the size of the server process in memory exceeds 500 MB.

```
--server-memory-threshold 500MB
--server-memory-threshold-overflow-action archive_responses
```

Purge responses if the size of the server process in memory exceeds 2 GB.

```
--server-memory-threshold 2GB
--server-memory-threshold-overflow-action purge_responses
```

See Also

server-memory-threshold

response-archive-root

Path to the location where responses are archived

Syntax

```
--response-archive-root PATH
```

Description

`response-archive-root` shows the location where responses specified by *PATH* are archived. This option must be set if the server-memory-threshold-overflow-action option is set to `archive_responses`. The server process must have read & write permissions to the *PATH*.

Parameters

PATH

Location specified as a string.

Examples

Set the archive root.

```
--response-archive-root ./.response_archive
```

See Also

`response-archive-limit`

response-archive-limit

Maximum disk space available to the server process for archiving

Syntax

```
--response-archive-limit SIZE
```

Description

`response-archive-limit` specifies the maximum disk space available to the server process for archiving. If the limit set by *`SIZE`* is reached, the archives will be deleted in a 'First-In First-Out' order until the space for the server process fall below *`SIZE`*. If this limit is not specified, the server process will assume there is no limit to disk usage for archiving.

Parameters

`size`

Size of the server process.

Examples

Set the size of the archive to be 5GB

```
--response-archive-limit 5GB
```

See Also

`response-archive-root`

Introduced in R2016b

user-data

Associate MATLAB data value with string key

Syntax

```
--user-data KEY VALUE
```

Description

`user-data` associates MATLAB data value with key string. *`KEY`* and *`VALUE`* are strings. Use the double quotes (`"`) character around strings with spaces. The backslash (`\`) character is the escape character and is used to insert double quotes or backslash characters: `\" \\`. The application can retrieve the data value by using `getmcruserdata(key)`.

Parameters

`KEY VALUE`

MATLAB *`value`* to be associated with *`key`*.

Examples

Set user data with parallel profile settings.

```
--user-data ParallelProfile c:\\MPS\\myprofile.settings
```

Use quotes.

```
--user-data MyValue "Quoted string with escaped \"quotes\" and \\backslash."
```

See Also

Introduced in R2016a