MapleNet Services Guide

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Overview

About MapleNet

Use MapleNet™to share your Maple documents, calculators, and technical applications.

Maple provides the most intuitive interface available for creating web applications that rely on mathematical computations. You simply drag buttons, sliders, math input regions, and other interactive components into your Maple document to create the interface, and add the functionality behind those components using Maple's high-level, mathematically sophisticated programming language. Once completed, you simply save the Maple document on the MapleNet server to make your application available online

MapleNet Resources

Resource	Description
MapleNet Server Installation Guide	System requirements and installation instructions for MapleNet. The **MapleNet Installation Guide** is available in the **Install.html** file located either on your MapleNet installation DVD or the folder where you installed MapleNet.
MapleNet Administrator Guide	Instructions for using environment variables to configure the MapleNet server. Security issues are also discussed.
MapleNet Services Guide	Outline of MapleNet services. Information on limitations of services provided as well as a summary of MapleNet API endpoints.
MapleNet API Programming Guide	A detailed description of the MapleNet API with examples.

For additional resources, visit **http://www.maplesoft.com/site_resources**.

Getting Help

To request customer support or technical support, visit **http://www.maplesoft.com/support**.

Customer Feedback

Maplesoft welcomes your feedback. For comments related to the MapleNet product documentation, contact doc@maplesoft.com.

1 MapleNet Services

1.1 About MapleNet Services

MapleNet provides two primary services for clients, HTML5 versions of Maple documents and a Maple compute interface. In addition MapleNet provides interfaces for hosting Maple help databases online, monitoring MapleNet status and health checking.

1.2 Documents

MapleNet hosts Maple worksheets (.mw files) and workbooks (.maple files) and allows them to be viewed in a web browser. In addition, embedded components in those document are interactive, allowing the hosted documents to be used as applications. This section documents the level of support of Maple document features in MapleNet.

- Text and math content (both 1-D and 2-D) should render similarly in a browser and in Maple.
- Start up code will be executed, however auto execute regions will not.
- Most embedded components are supported, although some properties are not. The following table summarizes the embedded component support.

Component	**Supported**	**Limitations**
Button	Yes	fontcolor is not supported.
Check Box	Yes	fontcolor and fillcolor are not supported.
Combo Box	Yes	fontcolor is not supported.
Data Table	No	
Dial	Yes	
Label	Yes	fontcolor and fillcolor are not supported.
List Box	Yes	fontcolor and fillcolor are not supported.
Math Expression	Yes	fillcolor are not supported.
Meter	Yes	
Microphone	No	
Plot	Yes	fillcolor and mouseMode are not supported.
Radio Button	Yes	fillcolor and fontcolor are not supported.
Rotary Gauge	Yes	
Shortcut	Yes	
Slider	Yes	fontcolor and fillcolor are not supported.
Speaker	No	
Text Area	Yes	fontcolor and fillcolor are not supported.
Toggle Button	Yes	
Video	No	
Volume Gauge	Yes	

- The use of "this" to refer to the current embedded component is not supported in MapleNet.
- Most plots will be rendered natively in HTML5. HTML5 plots are interactive, allowing panning, scaling and zooming. In addition, HTML5 3-D plots can be rotated.
- Some plot types and options are not supported by HTML5 plots. For these plots either an image will be rendered or the plot will be rendered without the missing feature. The following table summarizes the unsupported for plots features.

Option	Limitations
Polar Plot	Rendered as an image
Logarithmic Axis	Rendered as an image
Dual Axis	Rendered as an image
2-D Grid Plot	Unsupported
2-D Mesh Plot	Rendered as an image
Background image for a plot	Rendered as an image
transparency	If an HTML5 plot contains transparency data, the transparency values are ignored.
2-D colorscheme	Uses one color from the scheme for the plot
Array Plots	Unsupported
smartplot	Unsupported

Downloading Maple Documents

MapleNet can be configured to allow Maple documents to be downloaded as well as displayed. Setting the MAPLENET_WEBSERVER_ENDPOINTS_DOWNLOAD configuration variable to `true`, instructs MapleNet to allow documents to be downloaded by adding the `download` url parameter to a document's url. For example if a document could be displayed by accessing

```
http://$HOSTNAME/document.mw
```

Then adding the `download` paramter as follows

```
http://$HOSTNAME/document.mw?download
```

causes the document to be downloaded instead of displayed.

Uploading Maple Documents

```
http://$HOSTNAME/mapleonline/upload/upload.html
```

This page allows users to select Maple documents from their web browser for uploading to MapleNet. All uploaded files are placed into an upload directory.

To enable uploading, the MAPLENET_WEBSERVER_ENDPOINTS_UPLOAD configuration variable must be set to `true`. The upload page will display the contents of the upload directory if the MAPLENET_WEBSERVER_ENABLEDIRECTORYLISTING configuration variable is set to `true`. An example of this configuration can be found in the Examples section.

The upload directory is /webroot/worksheet/upload which, by default, exists within the docker container. Therefore any uploaded documents will be lost when the container is restarted. If you want uploads to persist between MapleNet restarts you should mount a host directory on top of the upload directory. An example of this configuration can also be found in the Examples section.

The API of the upload endpoint itself is not documented as its interface is not considered stable. Applications that attempt to use the upload endpoint directly will be broken by future versions of MapleNet.

1.3 Compute

The MapleNet Compute Service allows for applications to send a Maple computation to MapleNet and receive the result of executing that computation. This service is an application programming interface, not an end user interface. For more details about the Compute Service, see the **MapleNet Application Programming Interface** document.

1.4 Additional Features

MapleNet provides some secondary features and server monitoring tools. These are described below. The term endpoint refers to a URL that MapleNet provides that can be accessed using standard HTTP requests. When these endpoints are accessed MapleNet replies with an HTTP response containing the requested information. There is no file on the server corresponding to these replies, they are generated by MapleNet itself.

Health Check

The Health Check endpoint is /healthcheck/. When an HTTP GET accesses this endpoint MapleNet will reply with an HTTP response with a status code of 200 and with no content. This is intended to be used by monitoring services to verify that MapleNet is available. A successful reply from the health check endpoint verifies that MapleNet is able to accept new connections, but it does not verify that MapleNet is able to execute commands or open a new document.

Help

The help endpoints allow access to Maple help pages hosted by MapleNet. By default MapleNet does not have any help databases installed. Instructions for adding help databases can be found in the Examples section of the Administrator's Guide. The following endpoints allow access to the contents of the help databases.

Table of Contents: HTTP GET to /help/toc

Display the Table of Contents [TOC] for the help databases as an HTML page. The displayed TOC will link to the help pages for display in MapleNet. The help pages linked to by the TOC can be filtered using the language, product and category url parameters. These parameters correspond to the options of the same name used when constructing the TOC for the help databases. For example to display English help pages for Maple, you would access /help/toc/?language=en&product=Maple. Parameters may also be given more than once to increase the matches (multiple parameters act as an "OR"), so /help/toc/?language=en&product=Maple&product=MapleSim would show all English help pages from Maple or MapleSim. By default help page links are relative links to the /help/display/ endpoint of the current MapleNet. To change this, the MAPLENET_WEBCLIENT_HELPURL configuration variable can be used.

Topic display: HTTP GET to /help/display/TOPIC

Display the help page corresponding to TOPIC. For example, /help/display/int or help/display/convert,rational. If there are multiple help pages matching the given topic, the page with the higher priority (as defined in the help database) will be displayed. You can filter by language, product and category, as with the Table of Contents, however in the case of displaying a help page the filtering behaves differently. The displayed page must match one value for each given parameter, with priority given to the value appearing earlier in the url. For example /help/display/int?language=ja&product=Maple would display Maple's int help page in Japanese if it existed or a 404 error if it did not. However using /help/display/int?language=ja&language=en&product=Maple, would display the Japanese page if it existed or the English page if it did not (and return a 404 if nether a Japanese or English help page existed).

Download help page: HTTP GET to /help/download/TOPIC

Download the help page corresponding to TOPIC. This endpoint is identical the the display endpoint, except that instead of opening the page in MapleNet the help page is downloaded.

Monitoring

The monitoring endpoint is /monitoring/. When an HTTP GET accesses this endpoint, a snapshot of the internal state of MapleNet as a string of JSON is returned. The information displayed can be divided into two types, static values and dynamic values. The static values are values defined at MapleNet start up time, for example configuration values and version information. Dynamic values are values that change as clients connect to MapleNet, for example connected clients and open documents. If you want to view the monitoring data in a web browser, plugins are available for pretty printing JSON. This makes the monitoring output more human readable.

Value	**Definition**
Limiter	The limiter describes the number of running Maple engines. A running Maple engine corresponds to the restrictions imposed by the license. A waitingEngine is an engine that can't run because the maximum number of running engines has been reached.
engineManager	The engineManager provides a detailed breakdown of the Maple engines in use by MapleNet. Document engines are engines connections to open documents. Compute engines are used for the compute endpoint. As compute engines are pooled and reused, there is list of pooled compute engines.
documentManager	The documentManager section describes the documents currently opened by clients. Each open document lists the following fields: id a unique id assigned to that copy of the open document, the name of the document, the working directory of the document and the source of the document. The working directory is where the content created for displaying the document is kept.
clients	The clients section describes the document clients currently connected to MapleNet Server. Each client lists the IP address from which they are connected and the id of the document that they have opened.
helpDatabases	The helpDatabases section describes the help database found for use with the help endpoints.
Version	The Version section describes the versions of the various pieces used by MapleNet. This include the MapleNet and Maple build dates, release ids and build ids. These values are useful when reporting bugs or contacting Maplesoft Support.
license	The license section describes the license being used.
Start Up Configuration	The Start Up Configuration section describes the values applied by the MapleNet configuration. This combines the options set with configuration variables and default values.
Logging	The Logging section describes the current logging settings, the level and whether AutoFlush or Synchronous options are enabled.

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