INFUZE C API USER GUIDE

Support

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WURFL InFuze for C: User Guide

Introduction

The WURFL C Application Programming Interface (API) is a high-performance and low-memory footprint mobile device detection software component written in C++ that can quickly and accurately detect over 500 capabilities of visiting devices. It can differentiate between portable mobile devices, desktop devices, SmartTVs and any other types of devices on which a web browser can be installed. The API library allows applications to perform real-time detection for a variety of uses, such as content adaptation, redirections, and data traffic analysis.

ScientiaMobile's WURFL C Module is also the core component for the Apache, Nginx, and Varnish-Cache Modules, offered by ScientiaMobile as separate products. Those modules allow you to add support for device detection in a variety of contexts, such as retrieving WURFL device data through the Apache Environment, FastCGI Environment, or data objects defined by Nginx and Varnish scripts. Other strategies may include injecting WURFL capabilities into HTTP Headers from your HTTP Proxy. This eliminates the need for application developers to maintain a WURFL library dependency in their code base.

> *Note: **Apache**, **Nginx**, and **Varnish-Cache** are the trademarks of the respective trademark holders.*

API Features

- Standard WURFL API (implements same logic as other standard WURFL APIs by ScientiaMobile)
- Accurately detect over 500 capabilities
- High performance & low memory footprint (as compared to other WURFL APIs)
- Automatic caching previous detections for faster response times
- Ability to adjust and configure different in-memory caching strategies
- Support for WURFL 'patch files' (custom device description profiles that enrich WURFL)

Technical Overview

WURFL InFuze for C, also referred to as libwurfl, is written in C++ with a C interface on top of it. The installed libwurfl library consists of a header file, wurfl.h, and a dynamic link library which an application can link to.

When running the WURFL InFuze for C, libwurfl will read and parse WURFL's Device Definition Repository (DDR) database file from run-time memory. If needed, you can also load WURFL Patch Files that extend or correct the WURFL repository with your own customizations of the device data.

The libwurfl C library has an in-memory cache technique to preserve the result of previous detections. This results in a great balance between accuracy of detection and fast response time in virtually all use cases. Finally, the strategies for

caching are configurable (more later).

> *Note: Full documentation for API methods can be found below.*

Supported Platforms

The libwurfl API is supported by multiple Linux distros such as Ubuntu, CentOS, RedHat, Fedora, and FreeBSD (other distros have similar building procedures). Other supported operating systems include Windows and Mac OS X. The libwurfl API was tested on SmartOS as well (actually 13.2.0 zone, released on September 25, 2013), but due to the very particular environment, you should contact ScientiaMobile for support. Please contact ScientiaMobile to inquire about specific platforms not listed here.

Installing libwurfl on Ubuntu/Debian

Once you have obtained the libwurfl deb package from ScientiaMobile, you can install it with:

```
sudo apt-get update
sudo dpkg -i libwurfl-1.9.1.0-x86_64.deb
```

Installing libwurfl on RedHat/Fedora/CentOS/Opensuse

Once you have obtained the libwurfl rpm package from ScientiaMobile, you can install it with:

```
sudo yum update
sudo rpm -i libwurfl-1.9.1.0-x86_64.rpm
```

Include file are installed under /usr/include and library in standard /usr/lib path so to compile code that uses libwurfl you will only have to add -lwurfl to your link step

Installing libwurfl on FreeBSD 10

The installation procedure for FreeBSD differs slightly from other Linux-based systems. In particular, you will need to use the pre-compiled files provided by ScientiaMobile. Just extract the tar file under / and everything should be set:

```
cd /
tar xzvf libwurfl-1.9.1.0-x86_64.tgz
```

Installing libwurfl on Mac OS X

Download the libwurfl-1.9.1.0-x86_64.pkg file from ScientiaMobile and install it by double clicking on it. Beware that from mac os x 10.11 (El Capitan), rootless mode is enabled by default so you should download the alternative installation package named libwurfl-1.8.3.0-x86_64-rootless.pkg. Since rootless mode we cannot install anymore the header file under /usr/include/wurfl and so both header file and library are installed under /usr/local/opt/libwurfl. When compiling use -I /usr/local/opt/libwurfl/include and -L /usr/local/opt/libwurfl/lib when linking your executables. When executing don't forget to set :

```
export DYLD_LIBRARY_PATH=/usr/local/opt/libwurfl/lib
```

from the shell that is running the application.

Installing libwurfl on Windows

Download the libwurfl-1.9.1.0-x64.msi file from ScientiaMobile and install it by double clicking on it.

Obtain the WURFL Repository file

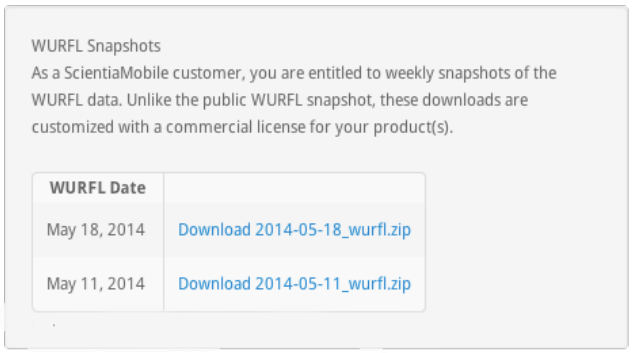
In order for the WURFL C API library to work, you need a WURFL file installed on your system. The libwurfl C API library package comes with a recent evaluation copy of the WURFL file called wurfl.zip. The file is automatically installed to /usr/share/wurfl/ path, or is included with the Windows installer.

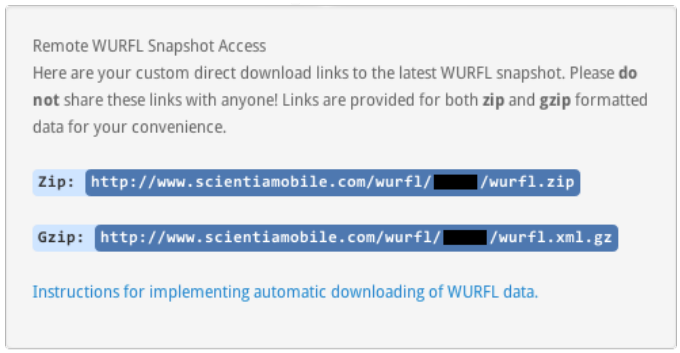
Updating the WURFL Repository

Commercial licensees of WURFL are granted access to "The Customer Vault", a personal virtual space containing purchased software licenses and weekly updated versions of the WURFL repository.

All licensed customers are given access to a direct download URL for obtaining the latest WURFL snapshot. This is either the weekly snapshot (released on Sunday night), or an Out-Of-Band snapshot that ScientiaMobile releases to customers between weekly snapshots in case of a significant improvement to the data (for example, if a high-profile device is released mid-week). The snapshots are licensed to your organization specifically as part of the agreement with ScientiaMobile.

To create a direct download URL, login to ScientiaMobile and click the "My Account" at the top-right corner of the screen. Then, click "Direct Download" to create a URL for your access. This URL is unique to you and must be kept private.





In addition to the weekly snapshots, the Vault contains a personal URL to the latest update, that can be used to update one's WURFL installation programmatically. Please refer to the following Forum post for details.

Getting Started

Using the WURFL InFuze for C is simple - all operations are performaned on a wurfl_handle, which is obtained typically during init phase:

```
wurfl_handle hWurfl = wurfl_create();
```

This operation returns wurfl_handle and creates an engine for further operations. The WURFL Engine is thread safe and is intentionally designed for sharing the same wurfl_handle across multiple threads.

In order to increase performance while processing real HTTP traffic, we suggest setting up an LRU cache in libwurfl. The LRU caching strategy will speed up lookup operations on processed User Agents by keeping them in an LRU map. The

size of this map can be configured with:

```
wurfl_set_cache_provider(hwurfl, WURFL_CACHE_PROVIDER_LRU, "100000");
```

By default the cache will be set to 30000 entries which accounts for 7 to 10 MB of additional memory usage. Users are advised to size their cache generously (100,000 or more) to increase performance.

> ***Important Note for Users of the Old DOUBLE LRU Cache Provider (pre 1.9.1):*** *for backwards compatibility, older configurations are still supported and will not generate errors or warnings, but internally the new SINGLE LRU Cache is adopted for better performance.*

For more information, please see LRU Cache Mechanism.

> ***Note:*** *wurfl_set_cache_provider and wurfl_set_engine_target must be set prior to calling wurfl_load().*

Before any device lookup you will need to load the DDR file, named wurfl.zip :

```
// Define wurfl db
error = wurfl_set_root(hwurfl, "/usr/share/wurfl/wurfl.zip");
if (error != WURFL_OK) {
  printf("%s\n", wurfl_get_error_message(hwurfl));
  return -1;
}

// Loads wurfl db into memory
error = wurfl_load(hwurfl);
if (error != WURFL_OK) {
  printf("%s\n", wurfl_get_error_message(hwurfl));
  return -1;
}
```

After properly loading the WURFL instance, device detection can start. For this example, we will manually inject the User-Agent string of a popular Android device and proceed to detect the device (with some error-handling):

```
// Example of an User-Agent
const char *userAgent = "Mozilla/5.0 (Linux; U; Android 3.2; en-gb; K3108 Build/HTJ85B) AppleWebKit/534.13 (KHTML, like Geck
o) Version/4.0 Safari/534.13";

wurfl_device_handle hdevice = wurfl_lookup_useragent(hwurfl, userAgent);

if (hdevice) {
    // DEVICE FOUND
    // ...
}
```

Once a device is detected, device capabilities can be retrieved as follows:

```
if (hdevice) {
    // DEVICE FOUND

    // Print out a capability
    printf("brand_name = %s\n", wurfl_device_get_capability(hdevice, "brand_name"));

}
```

Virtual Capabilities

Virtual capabilities are an important feature of the WURFL API that obtain values related to the requesting agent out of

the HTTP request as a whole (as opposed to limiting itself to capabilities that are found in WURFL).

In order to compute its final returned value, a virtual capability may look at regular (non-virtual) capabilities as well as parameters derived from the HTTP request at run-time. Virtual capabilities are useful to model aspects of the HTTP Client that are not easily captured through the finite number of profiles in WURFL.

```
// Print out a virtual capability
printf("is_smartphone = %s\n", wurfl_device_get_virtual_capability(hdevice, "is_smartphone"));
```

If your application needs to retrieve all static, and/or virtual, capabilities, you can use an enumerator to iterate through every static capability that was loaded into the runtime memory, and another enumerator to iterate through all the virtual capabilities. Thus, there is no need to provide a list of individual capability names.

```
if (hdevice) {
    // DEVICE FOUND
    // Iterate through all capabilities
    wurfl_device_capability_enumerator_handle hdevicecaps = wurfl_device_get_capability_enumerator(hdevice);

    while (wurfl_device_capability_enumerator_is_valid(hdevicecaps)) {
        printf("%s = %s\n", wurfl_device_capability_enumerator_get_name(hdevicecaps), wurfl_device_capability_enumerator_get_v
alue(hdevicecaps));

        wurfl_device_capability_enumerator_move_next(hdevicecaps);
    }

    wurfl_device_capability_enumerator_destroy(hdevicecaps);

    // Iterate through all virtual capabilities
    hdevicecaps = wurfl_device_get_virtual_capability_enumerator(hdevice);

    while (wurfl_device_capability_enumerator_is_valid(hdevicecaps)) {
        printf("%s = %s\n", wurfl_device_capability_enumerator_get_name(hdevicecaps), wurfl_device_capability_enumerator_get_v
alue(hdevicecaps));

        wurfl_device_capability_enumerator_move_next(hdevicecaps);
    }

    wurfl_device_capability_enumerator_destroy(hdevicecaps);
}
```

To avoid memory leaks, destroying pointer references to the **Device Handler** is recommended every time the processing of the device detection is complete.

```
// Destroys the Device Handler
wurfl_device_destroy(hdevice);
```

Code Example

This code allows you to create a **WURFL Handler** instance, define the path to the WURFL repository, and load the database into memory. For this example, we assume that the wurfl.zip file is located on the same path of the executable program file. However, the path name can be different depending on your requirements.

```
#include <stdio.h>
#include <wurfl/wurfl.h>


int main(int argc, char **argv)
{
    wurfl_handle hwurfl;
    wurfl_error error;
```

```
    // Create wurfl handler
    hwurfl = wurfl_create();

    // Define wurfl db
    error = wurfl_set_root(hwurfl, "wurfl.zip");
    if (error != WURFL_OK) {
        printf("%s\n", wurfl_get_error_message(hwurfl));
        return -1;
    }

    // Loads wurfl db into memory
    printf("Loading wurfl, api version %s\n", wurfl_get_api_version());

    error = wurfl_load(hwurfl);
    if (error != WURFL_OK) {
        printf("%s\n", wurfl_get_error_message(hwurfl));
        return -1;
    }

    char *userAgent = "Mozilla/5.0 (Linux; Android 5.0; SAMSUNG SM-G925 Build/LRX21V) AppleWebKit/537.36 (KHTML, like Ge
cko) SamsungBrowser/4.0 Chrome/44.0.2403.133 Mobile Safari/537.36";

    printf("Lookup >%s<\n", userAgent);

    wurfl_device_handle hdevice = wurfl_lookup_useragent(hwurfl, userAgent);

    // Print out a static capability
    printf("model_name = %s\n", wurfl_device_get_capability(hdevice, "model_name"));
    printf("brand_name = %s\n", wurfl_device_get_capability(hdevice, "brand_name"));
    printf("device_os = %s\n", wurfl_device_get_capability(hdevice, "device_os"));

    // Print out a virtual capability
    printf("complete_device_name = %s\n", wurfl_device_get_virtual_capability(hdevice, "complete_device_name"));
    printf("form_factor = %s\n", wurfl_device_get_virtual_capability(hdevice, "form_factor"));

}
```

Compile and run this code (on a linux box) with :

```
$ gcc example.c -o example -lwurfl
$ ./example
Loading wurfl, api version 1.9.2.0
Lookup >Mozilla/5.0 (Linux; Android 5.0; SAMSUNG SM-G925 Build/LRX21V) AppleWebKit/537.36 (KHTML, like Gecko) Samsun
gBrowser/4.0 Chrome/44.0.2403.133 Mobile Safari/537.36<
model_name = SM-G925
brand_name = Samsung
device_os = Android
complete_device_name = Samsung SM-G925 (Galaxy S6 Edge)
form_factor = Smartphone
$
```

On macosx 10.11 (El Capitan) up with rootless mode enabled you will have to run :

```
$ cc -I /usr/local/opt/libwurfl/include example.c -o example -L /usr/local/opt/libwurfl/lib -lwurfl
$ export DYLD_LIBRARY_PATH=/usr/local/opt/libwurfl/lib
$ ./example
```

Filtering Capabilities

By default WURFL will fetch the complete set of capabilities for all device detection. By selecting only the capabilities you need before engine load, you will achieve better load times and a smaller memory footprint.

Use

wurfl_add_requested_capability(wurfl_handle hwurfl, const char *requested_capability);

to add the capabilities you need.

wurfl_lookup function and http headers

For better accuracy in device detection and virtual capability computation you may use wurfl_lookup() which receives a header retrieve callback function pointer to be used to retrieve all HTTP headers needed by subsequent computations.

An example in C++ :

```
#include <map>
#include <string>
#include <wurfl/wurfl.h>

const char* get_header_value(const char* name, const void* headers) {
    const std::map<std::string, std::string> &headersMap = *((const std::map<std::string, std::string> *)headers);
    std::map<std::string, std::string>::iterator it = headersMap.find(header_name);

    if (it != headersMap.end()) {
        return it->second.c_str();
    }

    return 0;
}


int main() {
    std::map<std::string, std::string> headers;
    headers["User-Agent"] = "SomeUserAgent";
    headers["Device-Stock-UA"] = "SomeDeviceStockUserAgent";

    wurfl_handle hwurfl = wurfl_create();
      wurfl_error error = wurfl_set_root(hwurfl, "/usr/share/wurfl/wurfl.zip");
      if (error) {
        std::cout << wurfl_get_error_message(hwurfl) << std::endl;
        return 1;
    }

    error = wurfl_load();

    if (error) {
        std::cout << wurfl_get_error_message(hwurfl) << std::endl;
        return 1;
    }

    wurfl_device_handle hdevice = wurfl_lookup(hwurfl, get_header_value, (void*)(&headers));

    if (!hdevice) {
        std::cout << "Lookup failed with error: " << wurfl_get_error_message(hwurfl) << std::endl;
    } else {
        std::cout << "The matched device's ID: " << wurfl_get_wurfl_id(hdevice) << std::endl;
        /*
            do something else with the wurfl device handle here..
        */
        wurfl_device_destroy(hdevice);
    }

    wurfl_destroy(hwurfl);
    return 0;
}
```

WURFL Updater features

Since 1.8.3.0, WURFL InFuze for C provides a set of new functions to allow for seamless update of the DDR file (wurfl.zip or wurfl.xml.gz). Assuming your init code is as follows :

```
wurfl_handle hwurfl = wurfl_create();

// Define wurfl db
error = wurfl_set_root(hwurfl, "/usr/share/wurfl/wurfl.zip");
if (error != WURFL_OK) {
  printf("%s\n", wurfl_get_error_message(hwurfl));
  return -1;
}
```

If you wish to have your /usr/share/wurfl/wurfl.zip file automatically updated when a new DDR is released you will need to:

```
// substitute https://data.scientiamobile.com/xxxxxxx/wurfl.zip with your data url from scientiamobile vault
error = wurfl_updater_set_data_url(hwurfl, "https://data.scientiamobile.com/xxxxxxx/wurfl.zip");
if (error != WURFL_OK) {
  printf("Updater cannot run : %s\n", wurfl_get_error_message(hwurfl));
  return -1;
}

// specify how frequent shall we check for updates
error = wurfl_updater_set_data_frequency(hwurfl, WURFL_UPDATER_FREQ_DAILY);
```

Now everyting is set up and after loading your DDR:

```
// Loads wurfl db into memory
error = wurfl_load(c);
if (error != WURFL_OK) {
  printf("%s\n", wurfl_get_error_message(hwurfl));
  return -1;
}
```

You will want to start the updater thread:

```
wurfl_updater_start(hwurfl);
```

For better operations logging and to troubleshoot any problem you might have we suggest to enable logging (before the first set_data_url call) :

```
wurfl_updater_set_log_path(hwurfl, "updater.log");
```

File "updater.log" will contain detailed information of all background operations.

WURFL InFuze C++ Wrapper

A single-header object oriented C++ InFuze wrapper is available.

If interested, please check documentation here.

API Documentation

The wurfl.h interface gives you access to the main WURFL functionalities. Listed below is a quick overview of the functions, along with a few example on how to correctly use them.

> *Note: As of WURFL 1.5 the functions get_capability and get_virtual_capability return a zero-terminated string.*

Typedef Documentation:

typedef struct wurfl_device_capability_enumerator_tag* wurfl_device_capability_enumerator_handle

Description:

WURFL Device capability enumerator handle, used to enumerate capabilities in a specific WURFL device.

typedef struct wurfl_device_tag* wurfl_device_handle

WURFL Device handle, used to represent an instance of WURFL device.

typedef struct wurfl_tag* wurfl_handle

Description:

WURFL handle, used to represent an instance of WURFL database.

Enumeration Type Documentation:

enum wurfl_cache_provider

Enumerator:

WURFL_CACHE_PROVIDER_NONE : do not use caching mechanisms.

WURFL_CACHE_PROVIDER_LRU : use the least-recently-used cache mechanism.

enum wurfl_engine_target

Enumerator:

WURFL_ENGINE_TARGET_HIGH_ACCURACY : DEPRECATED - please read note about "decommissioning of engine target"

WURFL_ENGINE_TARGET_HIGH_PERFORMANCE : DEPRECATED - please read note about "decommissioning of engine target"

WURFL_ENGINE_TARGET_DEFAULT : engine default, high performance, generic traffic target mode

WURFL_ENGINE_TARGET_FAST_DESKTOP_BROWSER_MATCH : Use this option when you have significant amounts of desktop browser traffic compared to mobile device. Will return "generic_web_browser" wurfl_id for the majority of web browsers.

enum wurfl_error

Enumerator:

WURFL_OK : no error.

WURFL_ERROR_INVALID_HANDLE : handle passed to the function is invalid.

WURFL_ERROR_ALREADY_LOAD : wurfl_load has already been invoked on the specific wurfl_handle.

WURFL_ERROR_FILE_NOT_FOUND : file not found during wurfl_load or remote data file update.

WURFL_ERROR_UNEXPECTED_END_OF_FILE : unexpected end of file or parsing error during wurfl_load.

WURFL_ERROR_INPUT_OUTPUT_FAILURE : error reading stream during wurfl_load or updater accessing local updated data file.

WURFL_ERROR_DEVICE_NOT_FOUND : specified device is missing.

WURFL_ERROR_CAPABILITY_NOT_FOUND : specified capability is missing.

WURFL_ERROR_INVALID_CAPABILITY_VALUE : invalid capability value.

WURFL_ERROR_VIRTUAL_CAPABILITY_NOT_FOUND : specified virtual capability is missing.

WURFL_ERROR_CANT_LOAD_CAPABILITY_NOT_FOUND : specified capability is missing.

WURFL_ERROR_CANT_LOAD_VIRTUAL_CAPABILITY_NOT_FOUND : specified virtual capability is missing.

WURFL_ERROR_EMPTY_ID : missing id in searching device.

WURFL_ERROR_CAPABILITY_GROUP_NOT_FOUND : specified capability is missing in its group.

WURFL_ERROR_CAPABILITY_GROUP_MISMATCH : specified capability mismatch in its group.

WURFL_ERROR_DEVICE_ALREADY_DEFINED : specified device is already defined.

WURFL_ERROR_USERAGENT_ALREADY_DEFINED : specified user agent is already defined.

WURFL_ERROR_DEVICE_HIERARCHY_CIRCULAR_REFERENCE : circular reference in device hierarchy.

WURFL_ERROR_UNKNOWN : unknown error.

WURFL_ERROR_INVALID_USERAGENT_PRIORITY : specified override sideloaded browser user agent configuration not valid.

WURFL_ERROR_INVALID_PARAMETER : invalid parameter.

WURFL_ERROR_INVALID_CACHE_SIZE : specified an invalid cache size, 0 or a negative value.

WURFL_ERROR_XML_CONSISTENCY : WURFL data file is out of date or wrong - some needed device_id/capability is missing.

WURFL_ERROR_INTERNAL : internal error. If this is an updater issue, please enable and check updater log using wurfl_updater_set_log_path().

WURFL_ERROR_VIRTUAL_CAPABILITY_NOT_AVAILABLE : the requested virtual capability has not been licensed.

WURFL_ERROR_MISSING_USERAGENT : an XML device definition without mandatory UA has been detected.

WURFL_ERROR_XML_PARSE : the XML data file is malformed.

WURFL_ERROR_UPDATER_INVALID_DATA_URL : updater data URL is missing or invalid (note: only .zip and .gz formats allowed)

WURFL_ERROR_UPDATER_INVALID_LICENSE : client license is invalid, expired etc.

WURFL_ERROR_UPDATER_NETWORK_ERROR : updater request returned an HTTP response != 200, or SSL error, etc. Please enable and check updater log using wurfl_updater_set_log_path().

WURFL_ERROR_ENGINE_NOT_INITIALIZED : prerequisite for executing an update is that the engine has been initialized (i.e., wurfl_load() has been called)

WURFL_ERROR_UPDATER_ALREADY_RUNNING : wurfl_updater_start() can be called just once, when the updater is not running.

WURFL_ERROR_UPDATER_NOT_RUNNING : wurfl_updater_stop() can be called just once, when the updater is running.

WURFL_ERROR_UPDATER_TOO_MANY_REQUESTS : Updater encountered HTTP 429 error.

WURFL_ERROR_UPDATER_CMDLINE_DOWNLOADER_UNAVAILABLE : Curl executable not found. Please check path, etc

WURFL_ERROR_UPDATER_TIMEDOUT : Curl operation timed out.

WURFL_ERROR_ROOT_NOT_SET : set_root() must be called before any load() / reload() and update attempt.

WURFL_ERROR_WRONG_ENGINE_TARGET : set_engine_target() was called with a wrong/unrecognized parameter

enum wurfl_updater_frequency

Enumerator:

WURFL_UPDATER_FREQ_DAILY : check for any updated wurfl.zip every day.

WURFL_UPDATER_FREQ_WEEKLY : check for any updated wurfl.zip once a week.

Configuration Methods:

wurfl_error wurfl_add_patch(wurfl_handle hwurfl, const char* patch)

Availability:

1.4

Description:

Adds a WURFL patch to the patch collection.

Parameters:

wurfl_handle: The WURFL instance to add the patch to.

patch: The patch filename as a zero terminated ASCII string.

Returns:

WURFL_OK: If the function terminated correctly.

wurfl_error: If the function failed.

wurfl_error wurfl_add_requested_capability(wurfl_handle hwurfl, const char*

requested_capability)

Availability:

1.4

Description:

Adds a capability to the requested capabilities collection. If this function is never called on a wurfl_handle, the wurfl_load() function will automatically load all the features in the WURFL repository. If one or more of the capabilities are added to the requested capabilities collection, only the specified ones (if available) will be loaded from the repository, resulting in a reduced memory footprint.

Parameters:

wurfl_handle: The WURFL instance.

requested_capability: The capability name as a zero terminated ASCII string.

Returns:

WURFL_OK: If the function terminated correctly, or a different.

wurfl_error: If the function failed.

wurfl_error wurfl_set_cache_provider(wurfl_handle hwurfl, wurfl_cache_provider cache_provider, const char* config)

Availability:

1.4

Description:

Sets the cache provider. If not called, a default WURFL_CACHE_PROVIDER_LRU of size 30000 is used.

Parameters:

wurfl_handle: The WURFL instance.

wurfl_engine_target: The cache provider.

config: The cache configuration as a zero-terminated ASCII string representing the desired size (like "100000"), or a null pointer or empty string if the specified cache doesn't need any specific configuration.

Returns:

WURFL_OK: If the funciton terminated correctly, or another.

wurfl_error: If the function failed.

wurfl_error wurfl_set_engine_target(wurfl_handle hwurfl, wurfl_engine_target target)

Availability:

1.4

Description:

Sets the engine target. Default is WURFL_ENGINE_TARGET_DEFAULT.

Parameters:

wurfl_handle: The WURFL instance

wurfl_engine_target: The new engine target (WURFL_ENGINE_TARGET_DEFAULT or WURFL_ENGINE_TARGET_FAST_DESKTOP_BROWSER_MATCH)

Use WURFL_ENGINE_TARGET_FAST_DESKTOP_BROWSER_MATCH option when you have significant amounts of desktop browser traffic compared to mobile device. Will return "generic_web_browser" wurfl_id for the majority of web browsers.

Returns:

WURFL_OK: If the function terminated correctly.

wurfl_error: If the function failed

wurfl_error wurfl_set_root(wurfl_handle hwurfl, const char* root)

Availability:

1.4

Description:

Sets the WURFL root.

Parameters:

wurfl_handle: The WURFL instance to set the root to.

root: The root filename as a zero terminated ASCII string

Returns

WURFL_OK: If the function terminated correctly.

wurfl_error: If the function failed.

wurfl_error wurfl_set_useragent_priority(wurfl_handle hwurfl, wurfl_useragent_priority priority)

Availability:

1.5.2

Description:

Tells WURFL if it should prioritize use of the plain user agent (WURFL_USERAGENT_PRIORITY_USE_PLAIN_USERAGENT) over the default sideloaded browser user agent (WURFL_USERAGENT_PRIORITY_OVERRIDE_SIDELOADED_BROWSER_USERAGENT).

Parameters:

wurfl_handle: The WURFL instance to set the root to.

wurfl_useragent_priority: WURFL_USERAGENT_PRIORITY_USE_PLAIN_USERAGENT or WURFL_USERAGENT_PRIORITY_OVERRIDE_SIDELOADED_BROWSER_USERAGENT.

Returns:

WURFL_OK: If the function terminated correctly.

wurfl_error: If the function failed.

Example:

wurfl_set_useragent_priority(hwurfl, WURFL_USERAGENT_PRIORITY_USE_PLAIN_USERAGENT);

wurfl_error wurfl_load(wurfl_handle hwurfl)

Availability:

1.4

Description:

Performs WURFL root file and patch loading. Must be called after specifying root filename by calling wurfl_set_root to set the root file name, and optionally wurfl_add_patch and/or wurfl_add_requested_capability to respectively specify patches and requested capabilities (if no capability is requested, all capabilities from WURFL root file and patches are loaded).

Parameters:

wurfl_handle: The WURFL instance.

Returns:

WURFL_OK: If the function terminated correctly.

wurfl_error: If the function failed.

const char* wurfl_get_last_load_time_as_string(wurfl_handle hwurfl)

Availability:

1.5.1

Description:

Returns a zero terminated ASCII string of the most recently successful WURFL load phase. 0 will be returned if WURFL has not been successfully initialized. The returned string has the following format: Www Mmm dd hh:mm:ss yyyy where Www is the weekday, Mmm the month (in letters), dd the day of the month, hh:mm:ss the time, and yyyy the year.

Parameters:

wurfl_handle: The WURFL instance to use.

Returns:

wurfl_handle wurfl_create()

Availability:

1.4

Description:

Creates a new WURFL instance. All configuration settings must be set prior to calling this method.

Returns:

wurfl_handle or a null pointer if the function failed.

const char* wurfl_get_api_version()

Availability:

1.5.1

Description:

Returns a string representing the currently used Libwurfl API version.

const char* wurfl_get_wurfl_info(wurfl_handle hwurfl)

Availability:

1.5.1

Description:

Returns a zero terminated ASCII string containing infos on WURFL root and the loaded patches, or 0 if WURFL has not been initialized yet.

Parameters:

wurfl_handle: The WURFL instance to use.

const char* wurfl_get_engine_target_as_string(wurfl_handle hwurfl)

Availability:

1.5.1

Description:

Returns a string representing the currently set WURFL Engine Target. Possible values are "DEFAULT",

"FAST_DESKTOP_BROWSER_MATCH" or "INVALID".

Parameters:

wurfl_handle: The WURFL instance to use.

Returns:

DEFAULT: WURFL is running in high accuracy, generic traffic default mode.

FAST_DESKTOP_BROWSER_MATCH: WURFL is running in desktop broswer high traffic specialized mode. Please see "Decommissioning of engine target" note.

INVALID: An invalid mode has been set.

WURFL Query Methods:

wurfl_device_handle wurfl_lookup(wurfl_handle hwurfl, wurfl_header_retrieve_callback header_retrieve_callback, const void *header_retrieve_callback_data)

Availability:

1.5.0

Description:

WURFL Device lookup function. You must provide a header retrieve function which returns a header value given a header name. If there are no headers with that name the header retrieve callback function should return 0. Otherwise, it should return the header value associated to that name.

You must also provide the header container in which all the headers are stored using the header_retrieve_callback_data parameter, so the header retrieve callback function will look into it when searching for a header. The header_retrieve_callback function will be called at least one time during the lookup phase, but it can be called multiple times to check for additional headers.

Parameters:

wurfl_handle: The WURFL instance.

wurfl_header_retrieve_callback: A callback for function each time a header is looked up.

header_retrieve_callback_data: A header container in which all headers are stored.

Returns:

A new WURFL device instance (wurfl_device_handle).

wurfl_device_handle wurfl_lookup_useragent(wurfl_handle hwurfl, const char* useragent)

Availability:

1.5.0

Description:

User Agent lookup function.

Parameters:

wurfl_handle: The WURFL instance.

useragent: The User Agent to lookup as a zero terminated ASCIIZ string.

Returns:

A new WURFL device instance, or a null pointer if the function failed.

Example:

```
wurfl_device_handle hdevice = wurfl_lookup_useragent(hwurfl, "USERAGENT");

if (hdevice) {
    cout << wurfl_device_get_id(hdevice) << endl;
}
```

const char* wurfl_device_get_id(wurfl_device_handle hwurfldevice)

Availability:

1.4

Description:

Returns the device id of this device

Parameters:

hwurfldevice: The WURFL device instance.

Returns:

The WURFL device id as a zero terminated ASCIIZ string, or a null pointer if the function failed.

const char* wurfl_device_get_root_id(wurfl_device_handle hwurfldevice)

Description:

Retrieve the root device id of this device.

Parameters:

hwurfldevice: The WURFL device instance.

Returns:

The WURFL device root id as a zero terminated ASCIIZ string, or a null pointer if the function failed.

const char* wurfl_device_get_useragent(wurfl_device_handle hwurfldevice)

Availability:

1.4

Description:

Retrieve the User Agent for a device (as found in the WURFL repository).

Parameters:

hwurfldevice: The WURFL device instance

Returns:

The matched User Agent (as contained in the WURFL repository) as a zero terminated ASCIIZ string, or a null pointer if the function failed.

const char* wurfl_device_get_original_useragent(wurfl_device_handle hwurfldevice)

Availability:

1.5.1

Description:

Returns the original useragent of this device.

Parameters:

wurfl_device_handle: The WURFL device instance

Returns:

The original User Agent as a zero terminated ASCIIZ string, or a null pointer if the function failed.

const char* wurfl_device_get_normalized_useragent(wurfl_device_handle hwurfldevice)

Availability:

1.5.0

Description:

Returns the normalized useragent of this device as a zero terminated ASCIIZ string, or a null pointer if the function failed.

Parameters:

hwurfldevice: The WURFL device instance.

Returns:

Returns the normalized useragent of this device as a zero terminated ASCIIZ string, or a null pointer if the function failed

wurfl_device_handle wurfl_get_device(wurfl_handle hwurfl, const char* deviceid)

Availability:

1.4

Description:

Retrieve a device by device id.

Parameters:

wurfl_handle: The WURFL instance.

deviceid: The wurfl device id to lookup as a zero terminated ASCIIZ string.

Returns:

A new WURFL device instance, or a null pointer if the function failed.

void wurfl_device_destroy(wurfl_device_handle hwurfldevice)

Availability:

1.4

Description:

Releases a wurfl_device_handle. All wurfl_device_capability_enumerator_handle's relative to this device handle must be released by calling wurfl_device_capability_enumerator_destroy on them before calling this function.

Parameters:

hwurfldevice: The WURFL device instance to destroy.

void wurfl_destroy(wurfl_handle hwurfl)

Availability:

1.4

Description:

Releases a wurfl_handle. All wurfl_device_handles relative to this handle must be released by calling wurfl_device_destroy on them before calling this function.

Parameters:

wurfl_handle: The WURFL instance to destroy.

const char* wurfl_device_get_capability(wurfl_device_handle hwurfldevice, const char* capability)

Description:

Retrieves a capability value from a device.

Parameters:

hwurfldevice: The WURFL device instance.

capability: The capability name as a zero terminated ASCIIZ string.

Returns:

The capability value as a zero terminated ASCIIZ string, or a null pointer if the function failed.

const char* wurfl_device_get_virtual_capability(wurfl_device_handle hwurfldevice, const char* capability)

Description:

Retrieves a virtual capability value from a device.

Parameters:

hwurfldevice: The WURFL device instance.

capability: The virtual capability name as a zero terminated ASCIIZ string.

Returns:

The virtual capability value as a zero terminated ASCIIZ string, or a null pointer if the function failed.

int wurfl_device_get_capability_as_int(wurfl_device_handle hwurfldevice, const char *capability)

Availability:

1.5.0

Description:

Retrieves a capability value as an integer value from a device.

Parameters:

wurfl_device_handle: The WURFL device instance.

capability: The capability name as a zero terminated ASCIIZ string.

Returns:

Returns the capability value as an integer.

Example:

```
wurfl_device_handle hdevice = wurfl_lookup_useragent(hwurfl, "USERAGENT");

if (hdevice) {

    int resolutionWidth = wurfl_device_get_capability_as_int(hdevice, "resolution_width");

    if (resolutionWidth == 800) {
        cout << "Do something useful for device with a 800 width resolution" << endl;
    }
    else if (resolutionWidth == 1200) {
        cout << "Do something useful for device with a 1200 width resolution" << endl;
    }
}
```

int wurfl_device_get_virtual_capability_as_int(wurfl_device_handle hwurfldevice, const char *virtual_capability)

Availability:

1.5.0

Description:

Retrieves a virtual capability value as an integer value from a device.

Parameters:

wurfl_device_handle: The WURFL device instance.

virtual_capability: The virtual capability name as a zero terminated ASCIIZ string.

Returns:

Returns the virtual capability value as an integer.

Example:

```
wurfl_device_handle hdevice = wurfl_lookup_useragent(hwurfl, "USERAGENT");

if (hdevice) {

    int browserVersion = wurfl_device_get_virtual_capability_as_int(hdevice, "advertised_browser_version");

    if (browserVersion == 26) {
        cout << "Use special layout" << endl;
```

```
    }
    else {
        cout << "Use common layout" << endl;
    }
}
```

int wurfl_device_get_capability_as_bool(wurfl_device_handle hwurfldevice, const char *capability)

Availability:

1.5.0

Description:

Retrieves a capability value as a boolean value from a device.

Parameters:

wurfl_device_handle: The WURFL device instance.

capability: The capability name as a zero terminated ASCIIZ string.

Returns:

Returns the capability value as a boolean.

Example:

```
wurfl_device_handle hdevice = wurfl_lookup_useragent(hwurfl, "USERAGENT");

if (hdevice) {

    bool isWireless = wurfl_device_get_capability_as_bool(hdevice, "is_wireless_device");

    if (isWireless) {
        cout << "Do something useful for a wireless device" << endl;
    }
    else {
        cout << "Do something useful for a non wireless device" << endl;
    }
}
```

int wurfl_device_get_virtual_capability_as_bool(wurfl_device_handle hwurfldevice, const char *virtual_capability)

Availability:

1.5.0

Description:

Retrieves a virtual capability value as a boolean value from a device.

Parameters:

wurfl_device_handle: The WURFL device instance.

virtual_capability: The virtual capability name as a zero terminated ASCIIZ string.

Returns:

Returns the virtual capability value as a boolean.

Example:

```
wurfl_device_handle hdevice = wurfl_lookup_useragent(hwurfl, "USERAGENT");

if (hdevice) {

    bool isAndroid = wurfl_device_get_virtual_capability_as_bool(hdevice, "is_android");

    if (isAndroid) {
        cout << "Do something useful for Android devices" << endl;
    }
    else {
        cout << "Do something useful for non Android devices" << endl;
    }
}
```

int wurfl_device_is_actual_device_root(wurfl_device_handle hwurfldevice)

Description:

Verifies if the device is an actual device root.

Parameters

hwurfldevice: The WURFL device instance.

Returns:

1 if the specified device is an actual device root, 0 otherwise.

wurfl_useragent_priority wurfl_get_useragent_priority(wurfl_handle hwurfl)

Availability:

1.5.2

Description:

Tells if WURFL is using the plain user agent or the sideloaded browser user agent for device detection. Returns either WURFL_USERAGENT_PRIORITY_USE_PLAIN_USERAGENT or WURFL_USERAGENT_PRIORITY_OVERRIDE_SIDELOADED_BROWSER_USERAGENT.

Parameters:

wurfl_handle: The WURFL instance to set the root to.

Returns:

wurfl_useragent_priority: WURFL_USERAGENT_PRIORITY_OVERRIDE_SIDELOADED_BROWSER_USERAGENT or WURFL_USERAGENT_PRIORITY_USE_PLAIN_USERAGENT.

const char* wurfl_get_useragent_priority_as_string(wurfl_handle hwurfl)

Availability:

1.5.2

Description:

Tells if WURFL is using the plain user agent or the sideloaded browser user agent for device detection, returning a zero terminated ASCIIZ string.

Parameters:

wurfl_handle: The WURFL instance to set the root to.

Returns:

WURFL_USERAGENT_PRIORITY_OVERRIDE_SIDELOADED_BROWSER_USERAGENT or WURFL_USERAGENT_PRIORITY_USE_PLAIN_USERAGENT as a string.

int wurfl_device_has_capability(wurfl_device_handle hwurfldevice, const char* capability)

Availability:

1.5.0

Description:

Verifies if the device has a specific capability.

Parameters:

hwurfldevice: The WURFL device instance. capability: The capability name as a zero terminated ASCIIZ string.

Returns:

1 if the specified device has the requested capability, 0 otherwise.

Example:

```
wurfl_device_handle hdevice = wurfl_lookup_useragent(hwurfl, "USERAGENT");

if (hdevice && wurfl_device_has_capability(hdevice, "requested_capability")) {
    cout << "Requested capability has been found" << endl;
}
```

int wurfl_device_has_virtual_capability(wurfl_device_handle hwurfldevice, const char* capability)

Availability:

1.5.0

Description:

Verifies if the device has a specific virtual capability.

Parameters:

hwurfldevice: The WURFL device instance.

capability: The virtual capability name as a zero terminated ASCIIZ string.

Returns:

1 if the specified device has the requested virtual capability, 0 otherwise.

Example:

```
wurfl_device_handle hdevice = wurfl_lookup_useragent(hwurfl, "USERAGENT");

if (hdevice && wurfl_device_has_capability(hdevice, "requested_virtual_capability")) {
    cout << "Requested virtual capability has been found" << endl;
}
```

int wurfl_has_capability(wurfl_handle hwurfl, const char *capability)

Availability:

1.5.3

Description:

Verify if a capability is a valid wurfl capability.

Parameters:

wurfl_handle: The WURFL instance to use. capability: The capility to verify.

Returns:

1 if the capility exists, otherwise 0.

int wurfl_has_virtual_capability(wurfl_handle hwurfl, const char *virtual_capability)

Availability:

1.5.3

Description:

Verify if a virtual capability is a valid wurfl virtual capability.

Parameters:

wurfl_handle: The WURFL instance to use. virtual_capability: The capility to verify.

Returns:

1 if the capility exists, otherwise 0.

WURFL Device Methods:

wurfl_capability_enumerator_handle wurfl_get_capability_enumerator(wurfl_handle hwurfl)

Availability:

1.5.1

Description:

Returns a new WURFL capability enumerator instance.

Parameters:

wurfl_handle: The WURFL handle instance to use.

Example:

```
wurfl_handle hwurfl = [...];

wurfl_capability_enumerator_handle hcapabilityenumerator = wurfl_get_capability_enumerator(hwurfl);

while (wurfl_capability_enumerator_is_valid(hcapabilityenumerator)) {
    const char *name = wurfl_capability_enumerator_get_name(hcapabilityenumerator);

    // do something with name

    wurfl_capability_enumerator_move_next(hcapabilityenumerator);
}

wurfl_capability_enumerator_destroy(hcapabilityenumerator);
```

wurfl_capability_enumerator_handle wurfl_get_virtual_capability_enumerator(wurfl_handle hwurfl)

Availability:

1.5.1

Description:

Returns a new WURFL virtual capability enumerator instance

Parameters:

wurfl_handle: The WURFL handle instance to use.

Returns:

wurfl_capability_enumerator_handle: A new capability enumerator handle.

Example:

```
wurfl_handle hwurfl = [...];
wurfl_capability_enumerator_handle hvirtualcapabilityenumerator = wurfl_get_virtual_capability_enumerator(hwurfl);

while (wurfl_capability_enumerator_is_valid(hvirtualcapabilityenumerator)) {

    const char *name = wurfl_capability_enumerator_get_name(hvirtualcapabilityenumerator);
```

```
    // do something with name

    wurfl_capability_enumerator_move_next(hvirtualcapabilityenumerator);
}

wurfl_capability_enumerator_destroy(hvirtualcapabilityenumerator);
```

void wurfl_capability_enumerator_destroy(wurfl_capability_enumerator_handle hwurflcapabilityenumeratorhandle)

Availability:

1.5.1

Description:

Releases a wurfl_capability_enumerator_handle instance.

Parameters:

wurfl_capability_enumerator_handle: The capability enumerator instance to destroy.

int wurfl_capability_enumerator_is_valid(wurfl_capability_enumerator_handle hwurflcapabilityenumeratorhandle)

Availability:

1.5.1

Description:

Verifies if the WURFL enumerator instance is still valid.

Parameters:

wurfl_capability_enumerator_handle: The WURFL enumerator handler instance to check.

Returns:

1 if the specified device is valid, 0 otherwise.

void wurfl_capability_enumerator_move_next(wurfl_capability_enumerator_handle hwurflcapabilityenumeratorhandle)

Availability:

1.5.1

Description:

Moves the WURFL enumerator instance to the next capability

Parameters:

wurfl_capability_enumerator_handle: The WURFL enumerator handler instance to check.

const char* wurfl_capability_enumerator_get_name(wurfl_capability_enumerator_handle hwurflcapabilityenumeratorhandle)

Availability:

1.5.1

Description:

Returns the name of the current capability as a string.

Parameters:

wurfl_capability_enumerator_handle: The WURFL enumerator handler instance to check.

Returns:

Returns the name of the current capability as an ASCIIZ string, or a null pointer if the function failed.

wurfl_device_id_enumerator_handle wurfl_get_device_id_enumerator(wurfl_handle hwurfl)

Availability:

1.5.2

Description:

Returns a new WURFL device id enumerator instance.

Parameters:

wurfl_handle: The WURFL instance.

Example:

```
wurfl_handle hwurfl = [...];
wurfl_device_id_enumerator_handle hdeviceidenumerator = wurfl_get_device_id_enumerator(hwurfl);

while (wurfl_device_id_enumerator_is_valid(hdeviceidenumerator)) {
    const char *name = wurfl_device_id_enumerator_get_device_id(hdeviceidenumerator);

    // do something with name

    wurfl_device_id_enumerator_move_next(hdeviceidenumerator);
}

wurfl_device_id_enumerator_destroy(hdeviceidenumerator);
```

int wurfl_device_id_enumerator_is_valid(wurfl_device_id_enumerator_handle hdeviceidenumerator)

Availability:

1.5.2

Description:

Verifies if the WURFL enumerator instance is still valid

Parameters:

wurfl_device_id_enumerator_handle: The WURFL device id enumerator to verify.

Returns:

1 if the enumerator is valid, otherwise 0.

void wurfl_device_id_enumerator_move_next(wurfl_device_id_enumerator_handle hdeviceidenumerator)

Availability:

1.5.2

Description:

Moves the WURFL enumerator instance to the next capability.

Parameters:

wurfl_device_id_enumerator_handle: The WURFL device id enumerator to use.

void wurfl_device_id_enumerator_destroy(wurfl_device_id_enumerator_handle hdeviceidenumerator)

Availability:

1.5.2

Description:

Releases a wurfl_device_id_enumerator_handle instance.

Parameters:

wurfl_device_id_enumerator_handle: The WURFL device id enumerator to use.

const char* wurfl_device_id_enumerator_get_device_id(wurfl_device_id_enumerator_handle hdeviceidenumerator)

Availability:

1.5.2

Description:

Returns the name of the current capability as an ASCIIZ string, or a null pointer if the function failed.

Parameters:

wurfl_device_id_enumerator_handle: The WURFL device id enumerator to use.

Returns:

The current capability as an ASCIIZ string, or a null pointer if the function failed.

void wurfl_device_capability_enumerator_destroy(wurfl_device_capability_enumerator_handle enumerator_handle)

Availability:

1.5.0

Description:

Releases a wurfl_device_capability_enumerator_handle (see wurfl_device_get_capability_enumerator).

Parameters:

hwurfl_device_capability_enumerator_handle: The enumerator instance to be released.

Example:

```
if (hdevice) {
    const char *capabilityValue = wurfl_device_get_capability(hdevice, "brand_name");

    if (capabilityValue == "Nokia") {
        cout << "Do something useful for Nokia device" << endl;
    }
    else if (capabilityValue == "HTC") {
        cout << "Do something useful for HTC device" << endl;
    }
}
```

const char* wurfl_device_capability_enumerator_get_name(wurfl_device_capability_enumerator_handle)

Availability:

1.5.0

Description:

The current capability name (see wurfl_device_get_capability_enumerator).

Parameters:

hwurfl_device_capability_enumerator_handle: The enumerator instance.

Returns:

The name of the current capability as an ASCIIZ string, or a null pointer if the function failed.

const char*
wurfl_device_capability_enumerator_get_value(wurfl_device_capability_enumerator_handle)

Availability:

1.5.0

Description:

The current capability value (see wurfl_device_get_capability_enumerator).

Parameters:

hwurfl_device_capability_enumerator_handle: The enumerator instance.

Returns:

The value of the current capability as an ASCIIZ string, or a null pointer if the function failed.

int
wurfl_device_capability_enumerator_get_value_as_int(wurfl_device_capability_enumerator_han
enumerator_handle)

Availability:

1.5.0

Description:

The current capability value as an integer (see wurfl_device_get_capability_enumerator).

Parameters:

hwurfl_device_capability_enumerator_handle: The enumerator instance.

Returns:

The value of the current capability value as an integer, or a null pointer if the function failed.

int
wurfl_device_capability_enumerator_get_value_as_bool(wurfl_device_capability_enumerator_ha

enumerator_handle)

Availability:

1.5.0

Description:

The current capability value as an boolean value (see wurfl_device_get_capability_enumerator).

Parameters:

hwurfl_device_capability_enumerator_handle: The enumerator instance.

Returns:

The value of the current capability value as an boolean value, or a null pointer if the function failed.

int wurfl_device_capability_enumerator_is_valid(wurfl_device_capability_enumerator_handle)

Availability:

1.5.0

Description:

Verifies if the enumerator is still valid (see wurfl_device_get_capability_enumerator).

Parameters:

hwurfl_device_capability_enumerator_handle: The enumerator instance.

Returns:

1 if the enumerator is valid, 0 otherwise.

void wurfl_device_capability_enumerator_move_next(wurfl_device_capability_enumerator_handle)

Availability:

1.5.0

Description:

Moves the enumerator to the next capability (see wurfl_device_get_capability_enumerator).

Parameters:

hwurfl_device_capability_enumerator_handle: The enumerator instance.

wurfl_device_capability_enumerator_handle wurfl_device_get_capability_enumerator(wurfl_device_handle hwurfldevice)

Availability:

1.5.0

Description:

Creates a new capability enumerator for a device

Parameters:

hwurfldevice: The WURFL device instance.

Returns:

A new WURFL capability enumerator instance.

Example:

```
wurfl_device_handle hdevice = wurfl_lookup_useragent(hwurfl, "USERAGENT");

if (hdevice) {
   wurfl_device_capability_enumerator_handle hdevicecaps = wurfl_device_get_capability_enumerator(hdevice);

   while (wurfl_device_capability_enumerator_is_valid(hdevicecaps)) {
      cout << "  " << wurfl_device_capability_enumerator_get_name(hdevicecaps) << "=" << wurfl_device_capability_enumer
ator_get_value(hdevicecaps) << endl;
      wurfl_device_capability_enumerator_move_next(hdevicecaps);
   }
   wurfl_device_capability_enumerator_destroy(hdevicecaps);
}
```

wurfl_device_capability_enumerator_handle wurfl_device_get_virtual_capability_enumerator(wurfl_device_handle hwurfldevice)

Availability:

1.5.0

Description:

Creates a new virtual capability enumerator for a device.

Parameters:

hwurfldevice: The WURFL device instance.

Returns:

A new WURFL virtual capability enumerator instance.

Example:

```
wurfl_device_handle hdevice = wurfl_lookup_useragent(hwurfl, "USERAGENT");

if (hdevice) {
   wurfl_device_capability_enumerator_handle hdevicecaps = wurfl_device_get_virtual_capability_enumerator(hdevice);

   while (wurfl_device_capability_enumerator_is_valid(hdevicecaps)) {
      cout << "  " << wurfl_device_capability_enumerator_get_name(hdevicecaps) << "=" << wurfl_device_capability_enumer
ator_get_value(hdevicecaps) << endl;
      wurfl_device_capability_enumerator_move_next(hdevicecaps);
   }

   wurfl_device_capability_enumerator_destroy(hdevicecaps);
}
```

WURFL Updater Methods:

wurfl_error wurfl_updater_set_log_path(wurfl_handle hwurfl, const char* log_path)

Availability:

1.8.3.0

Description:

Instructs the internal WURFL InFuze updater to log to file any operation/error. This is an optional call: if not used, the updater will not log anything.

Parameters:

wurfl_handle: The WURFL instance.

log_path: the path where the updater log file is created.

Returns:

WURFL_OK: If the function terminated correctly.

wurfl_error: If the function failed.

wurfl_error wurfl_updater_set_data_url(wurfl_handle hwurfl, const char* data_url)

Availability:

1.8.3.0

Description:

Set remote data URL to be downloaded via internal WURFL InFuze updater. This is a MANDATORY call if you want to use the InFuze Updater.

Parameters:

wurfl_handle: The WURFL instance.

data_url: the ScientiaMobile updater URL where to seek for updated WURFL data file, in the form "https://data.scientiamobile.com/xxxxx/wurfl.zip". "xxxxx" must be replaced with your personal access token, which is located in your license account page.

Notes

- The WURFL data file and the path where it resides, specified in the setRoot() call, MUST have write/rename access: the old data file will be replaced (i.e, a rename operation will be performed) with his updated version upon successful update operation completion, and the directory will be used for remote file download, etc.
- ScientiaMobile does not distribute uncompressed XML data files via updater. This means that, if you plan to use the updater feature, you MUST use a compressed (i.e, a ZIP or a XML.GZ) file as data root in the setRoot() call.
- The WURFL InFuze Updater functionality relies on availability and features of the well-known and widely available curl command-line utility. Among others, also a check for curl avaliabilty is done in the wurfl_updater_set_data_url() call.

Returns:

WURFL_OK: If the function terminated correctly.

wurfl_error: If the function failed.

wurfl_error wurfl_updater_set_data_frequency(wurfl_handle hwurfl, wurfl_updater_frequency

freq)

Availability:

1.8.3.0

Description:

Sets how often the updater checks for any new/updated WURFL data file to be downloaded and used by the engine.

Parameters:

wurfl_handle: The WURFL instance.

freq: the frequency of online checks, one of WURFL_UPDATER_FREQ_DAILY (default) or WURFL_UPDATER_FREQ_WEEKLY

Notes

wurfl_updater_set_data_frequency() sets how often the updater checks for any updated data file, not how often the engine data file is actually updated.

Returns:

WURFL_OK: If the function terminated correctly.

wurfl_error: If the function failed.

wurfl_error wurfl_updater_set_data_url_timeouts(wurfl_handle hwurfl, int connection_timeout, int data_transfer_timeout)

Availability:

1.8.3.0

Description:

Set internal WURFL InFuze Updater timeouts, in milliseconds.

Parameters:

wurfl_handle: The WURFL instance.

connection_timeout: timeout for the connection phase of updater data file download operation

data_transfer_timeout: timeout for the data transfer phase of updater data file download operation

Notes

The values are mapped to curl --connect-timeout and --max-time parameters (after millisecs-to-secs conversion). Connection timeout has a WURFL InFuze default value of 10 seconds (10000 ms) and refers only to connection phase. Passing 0 will use curl value "no timeout used". Data transfer timeout has a InFuze default value of 600 seconds (600000 ms). Passing 0 will use curl default value "no timeout used". So, pass 0 to either parameter to invoke curl "no timeout used" behaviour. Pass -1 to either parameter to use WURFL InFuze default values (10 secs, 600 secs). The specified timeouts (if any) are only used in the synchronous (i.e., runonce_updater()) API call. The asynchronous background updater invoked by start_updater()/stop_updater() always runs with curl behaviour and timeouts (i.e., it will wait "as long as needed" for a new data file to be downloaded)

Returns:

WURFL_OK: If the function terminated correctly.

wurfl_error: If the function failed.

wurfl_error wurfl_updater_reload_root(wurfl_handle hwurfl, const char* newroot)

Availability:

1.8.3.0

Description:

Reload a given WURFL data file, rebooting engine and overwriting the old one.

Parameters:

wurfl_handle: The WURFL instance.

newroot : the WURFL data file to reload.

Returns:

WURFL_OK: If the function terminated correctly.

wurfl_error: If the function failed.

wurfl_error wurfl_updater_runonce(wurfl_handle hwurfl)

Availability:

1.8.3.0

Description:

Call a WURFL InFuze synchronous update.

Parameters:

wurfl_handle: The WURFL instance.

Returns:

WURFL_OK: If the function terminated correctly.

wurfl_error: If the function failed.

wurfl_error wurfl_updater_start(wurfl_handle hwurfl)

Availability:

1.8.3.0

Description:

Starts the asynchronous WURFL InFuze background update thread.

Parameters:

wurfl_handle: The WURFL instance.

Returns:

WURFL_OK: If the function terminated correctly.

wurfl_error: If the function failed.

wurfl_error wurfl_updater_stop(wurfl_handle hwurfl)

Availability:

1.8.3.0

Description:

Stops the asynchronous WURFL InFuze background update thread.

Parameters:

wurfl_handle: The WURFL instance.

Returns:

WURFL_OK: If the function terminated correctly.

wurfl_error: If the function failed.

Error Handling:

void wurfl_has_error_message(wurfl_handle hwurfl)

Availability:

1.5.0

Description:

Indicates if the last call to the WURFL library on a specific wurfl_handl instance was successful.

Parameters:

wurfl_handle: The WURFL instance.

Example:

```
wurfl_add_requested_capability(hwurfl, "unavailable_capability");

if (wurfl_has_error_message(hwurfl)) {
    cout << wurfl_get_error_message(hwurfl) << endl;
}
```

const char* wurfl_get_error_message(wurfl_handle hwurfl)

Availability:

1.5.0

Description:

Returns the last error message (if any) produced by a call to the WURFL library on a specific wurfl_handle instance.

Parameters:

wurfl_handle: The WURFL instance.

Returns:

The last error message as a zero terminated ASCII string, or a null pointer if the function failed.

Example:

```
if (error != WURFL_OK) {
    cout << wurfl_get_error_message(hwurfl) << endl;
}
```

void wurfl_clear_error_message(wurfl_handle hwurfl)

Availability:

1.5.0

Description:

Clears the last error message (if any) produced by the last call to the WURFL library on a specific wurfl_handle instance.

Parameters:

wurfl_handle: The WURFL instance.

Example:

```
wurfl_add_requested_capability(hwurfl, "unavailable_capability");

if (wurfl_has_error_message(hwurfl)) {
    cout << wurfl_get_error_message(hwurfl) << endl;
    wurfl_clear_error_message(hwurfl);
}
```

IMPORTANT - Decommissioning of MatchMode options

Prior to version 1.9 of the API, users could choose between MatchMode.Performance and MatchMode.Accuracy engine optimization options. These options had been introduced years ago to manage the behavior of certain web browsers and their tendency to present "always different" User-Agent strings that would baffle strategies to cache similar WURFL queries in memory.
As the problem has been solved by browser vendors, the need to adopt this strategy has diminished and ultimately disappeared (i.e. there was no longer much to be gained with the performance mode in most circumstances) and ScientiaMobile elected to "remove" this option to simplify configuration and go in the direction of uniform API behavior in different contexts.

Customers who may find themselves in the unlikely situation of having to analyze significant amounts of legacy web traffic, may still enable the old high-performance internal behavior by calling wurfl_set_engine_target(..., WURFL_ENGINE_TARGET_FAST_DESKTOP_BROWSER_MATCH) in their engine configuration. Please note that users with the old HIGH_PERFORMANCE target engine will

not receive an error. The old behavior will not be triggered, though. The default target (corresponding to the old High Accuracy) will be used instead.