

mUPnP for MacOSX Programming Guide

Document Version 2.2

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1 Introduction

UPnPTM*¹ architecture is based on open networking to enable discovery and control of networked devices and services, such as media servers and players at home.

UPnPTM architecture is based on many standard protocols, such as GENA, SSDP, SOAP, HTTPU and HTTP. Therefore you have to understand and implement these protocols to create your devices of UPnPTM.

mUPnP for MacOSX is a development package for UPnPTM developers. The mUPnP controls these protocols automatically, and supports to create your control points quickly.

Please see the following site and documents to know about UPnPTM in more detail.

| Document | URL |
|---|---|
| UPnP TM Forum | http://www.upnp.org/ |
| Universal Plug and Play Device Architecture | http://www.upnp.org/download/UPnPDA10_20000613.htm |
| Universal Plug and Play Vendor's Implementation Guide | http://www.upnp.org/download/UPnP_Vendor_Implementation_Guide_Jan2001.htm |

¹ UPnPTM is a certification mark of the UPnPTM Implementers Corporation.

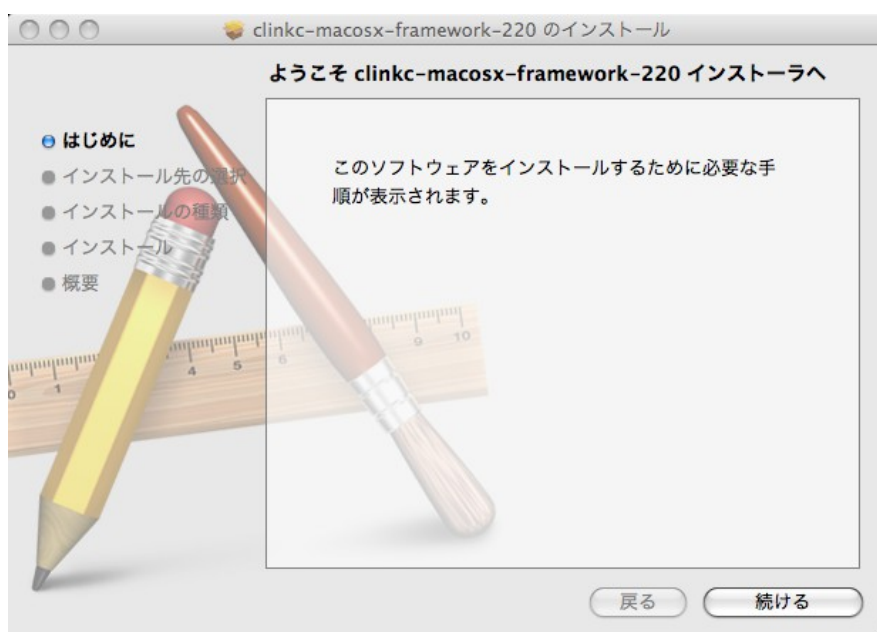
2 Setup

2.1 System Requirement

Currently, the framework is based on Objective-C 2.0. Thus, the current framework requires MacOSX v10.5, Leopard, later. In the future, I will support other lower MacOSX and iPhone v2.0.

2.2 Installer

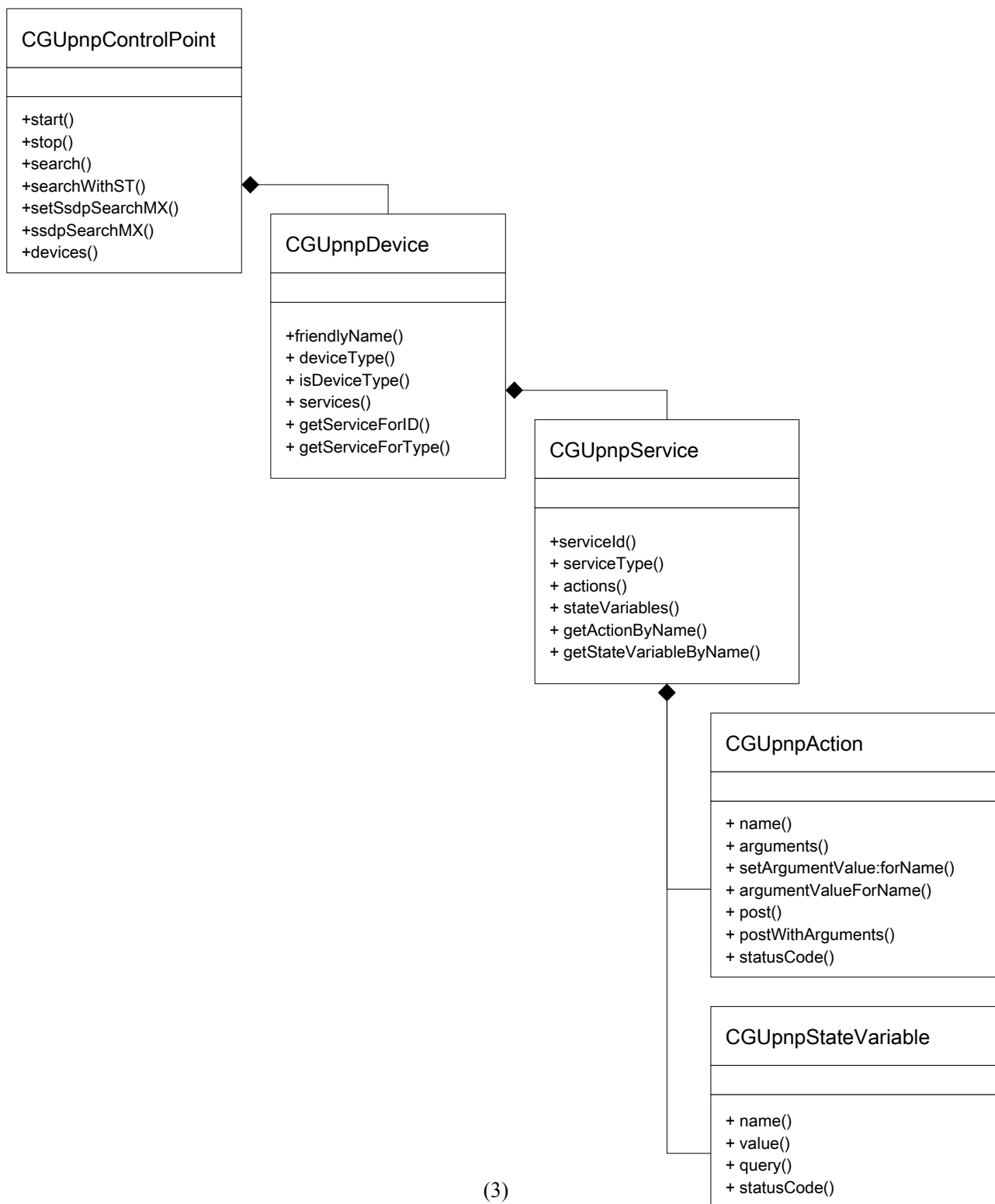
The framework is distributed as a install package as the following. Using the installer, the framework is installed into '/Library/Framework/mUPnP.framework' as default.



3 Control Point

3.1 Class Overview

The following static structure diagram is related classes of mUPnP to create your control point of UPnP™. The control point has some root devices in the UPnP™ network.



3.2 Initiating

To create a UPnP™ control point, create an instance of `CGUpnpControlPoint` class. The new instance is activated automatically using `CGUpnpControlPoint::start`. Use `CGUpnpControlPoint::search` or `searchWithST` to find the devices in the local network.

```
#import <mUPnP/UPnP.h>

.....

CGUpnpControlPoint *ctrlPoint = [[CGUpnpControlPoint alloc] init];

.....

[ctrlPoint search];
```

3.3 Root Devices

Use `CGUpnpControlPoint:devices` to get the all root devices which the control point found. The method returns a `NSArray` object which has the devices as instances of `CGUpnpDevice`.

```
#import <mUPnP/UPnP.h>

.....

CGUpnpControlPoint *ctrlPoint = [[CGUpnpControlPoint alloc] init];

.....

[ctrlPoint search];

NSArray *devArray = [ctrlPoint devices];
for (CGUpnpDevice *dev in devArray)
    NSLog(@"%@ ", [dev friendlyName]);
```

3.4 Control

The control point can send action or query control messages to the discovered devices. To send the action control message, use `CGUpnpAction:setArgumentValue:forName` and `CGUpnpAction:post`. You should set the action values to the all input arguments, and the output argument values is ignored if you set. The following sample posts a action control request that sets a new time, and output the response result.

```
CGUpnpDevice *clockDev = ...

CGUpnpService *timeService = [clockDev getServiceForType:@"urn:schemas-upnp-org:service:xxxx:1"];
CGUpnpAction *setTimeAct = [timeService getActionForName:@"SetTime"];

NSString *currTime = ....

[setTimeAct setArgumentValue: currTime forName:@"NewTime"];
if ([setTimeAct post]) {
    NSArray *argArray = [setTimeAct arguments];
    for (CGUpnpArgument *arg in argArray)
        NSLog(@"%@ = %@", [arg name], [arg value]);
}
```

```
}
```

Similarly, to send the query control message, use `CGUpnpStateVariable::query`. The following sample posts a query control request, and output the return value.

```
CGUpnpDevice *clockDev = ....  
CGUpnpService *timeService = [clockDev getServiceForType:@"urn:schemas-upnp-org:service:xxxx:1"];  
CGUpnpStateVariable *timeStateVar = [timeService "time"];  
if ([timeStateVar query])  
    NSLog(@"%@ = %@", [timeStateVar name], [timeStateVar value]);
```

4 License

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