

# Bonjour

Apple Inc.'s trade name for its implementation of Zeroconf,  
a service discovery protocol

<http://developer.apple.com/networking/bonjour/faq.html>

# Apple's Bonjour

- ref: <http://opensource.apple.com/>
- A key component of Apple applications (e.g., iTunes, iPhoto), services (e.g., MobileMe) and devices (e.g., Apple TV, and Airport). *Partage de fichiers audio, image, vidéo, ...*
- Developers can *easily* leverage Bonjour from both Mac OS X and iOS.

# service discovery

- automatic discovery of computers, devices, and services on IP networks.
- no need to enter IP addresses or configure DNS servers.
- Bonjour enables automatic IP address assignment without a DHCP server, name to address translation without a DNS server, and service discovery without a directory server.
- exple: Bonjour Printing, game, ...

# Bonjour & IETF

- Dynamic Configuration of IPv4 Link-Local Addresses (RFC 3927 - Apple, Microsoft, Sun, May 2005) using 169.254.0.0/16
- Multicast DNS (Internet-Draft, Apple, Expires: August 18, 2011)
- DNS-Based Service Discovery (Internet-Draft, Apple, Expires: August 31, 2011)
- ~~DNS Long-Lived Queries and Dynamic DNS Update Leases (Internet-Draft, Apple, Expired: Feb. 10, 2007)~~
- ~~NAT Port Mapping Protocol (NAT-PMP) (Internet-Draft, Apple, Expired: Oct. 16, 2008)~~

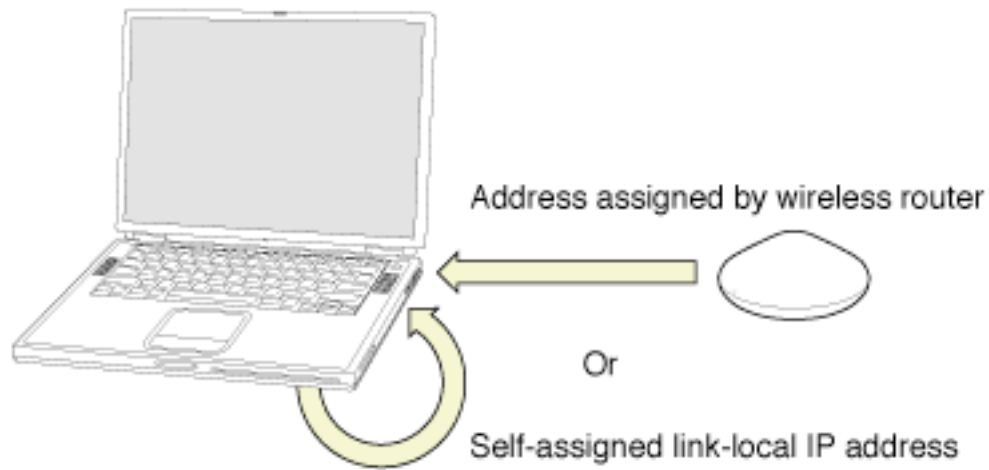
## Applications supporting NAT-PMP [[http://en.wikipedia.org/wiki/NAT\\_Port\\_Mapping\\_Protocol](http://en.wikipedia.org/wiki/NAT_Port_Mapping_Protocol)]

*This list is [incomplete](#); you can help by [expanding it](#).*

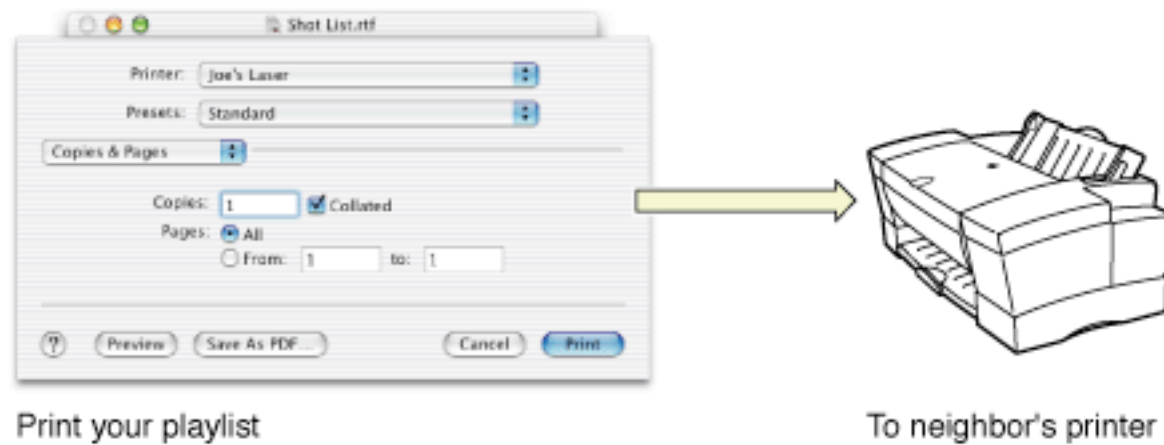
- [BitTorrent](#), a BitTorrent file-sharing client.
- [Bitcomet](#), a BitTorrent file-sharing client.
- [Colloquy](#), an Internet Relay Chat client.
- [Crashplan](#), an offsite backup program.
- [Deluge](#), a BitTorrent file-sharing client.
- [FarFinder](#), a remote file access application for OS X.
- [FreeSWITCH](#), an open source telephony platform.
- [Frostwire](#), a [Gnutella](#) file-sharing client.
- [Limewire](#), a Gnutella file-sharing client.
- [Mac OS X](#) 10.4 and above.
- [μTorrent](#), a BitTorrent file-sharing client.
- [Nicecast](#), a music streaming program.
- [Port Map](#), a manual port mapping configuration software for OS X.
- [qBittorrent](#), a BitTorrent file-sharing client.
- [Transmission](#), a BitTorrent file-sharing client.
- [Vuze](#), a BitTorrent file-sharing client.
- [RetroShare](#)
- [Stallone](#), a software implementation of NAT-PMP for linux/iptables: <http://tedp.id.au/stallone/>
- [ShareTool](#), an automated VPN program for OS X.
- [MobileMe](#), Apple Inc's mobile device synchronization service.

# Introduction to Bonjour Overview

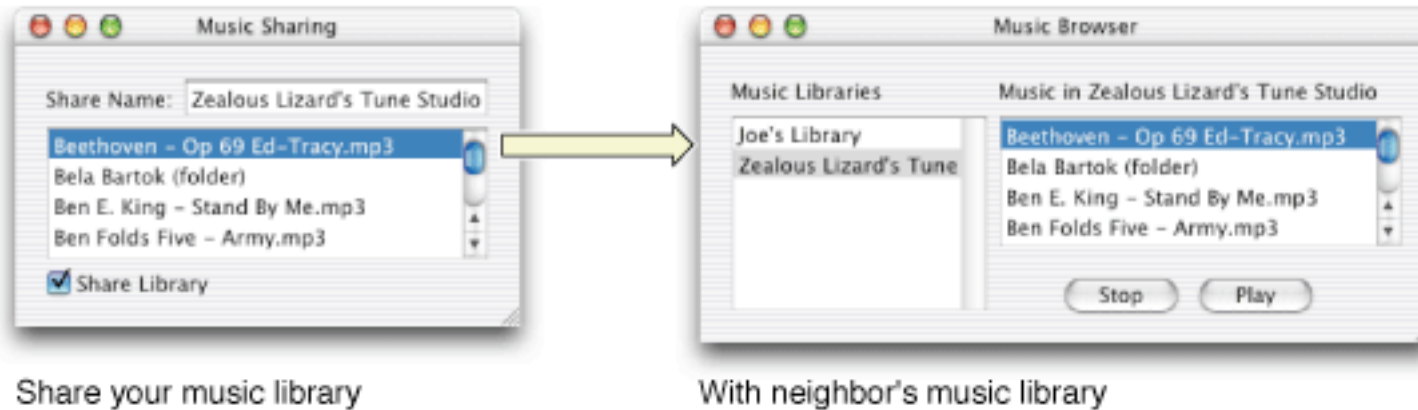
1.



2.

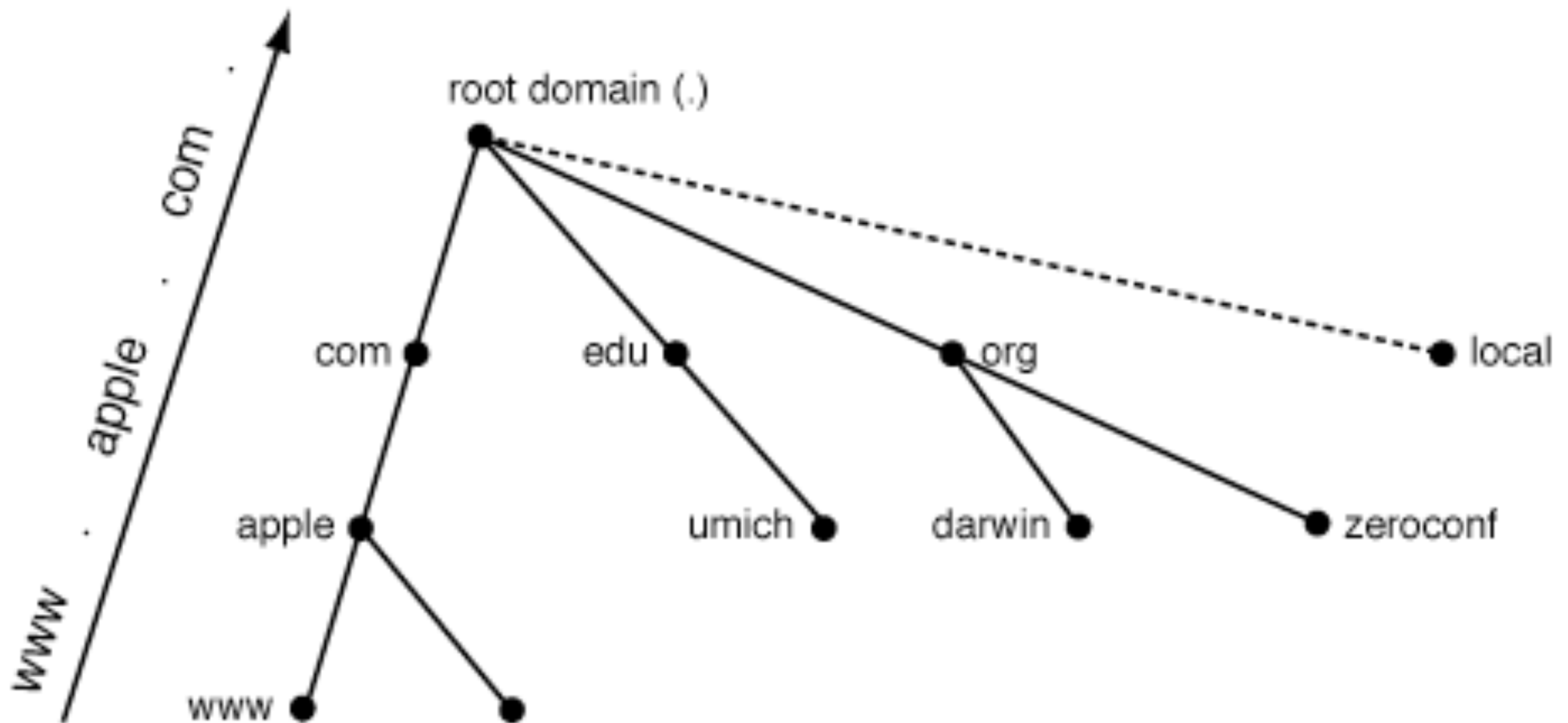


3.

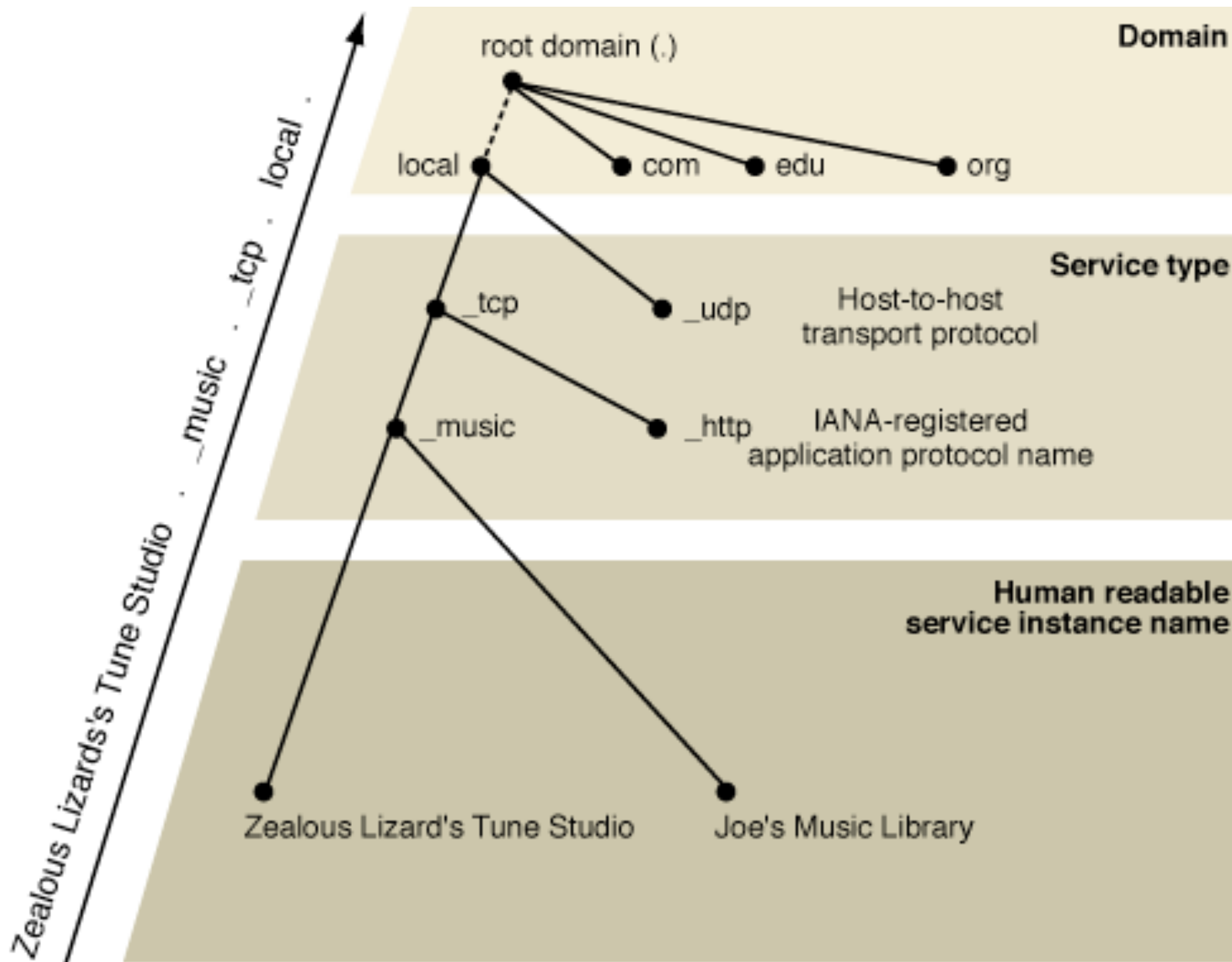


3 exples

# DNS & Bonjour



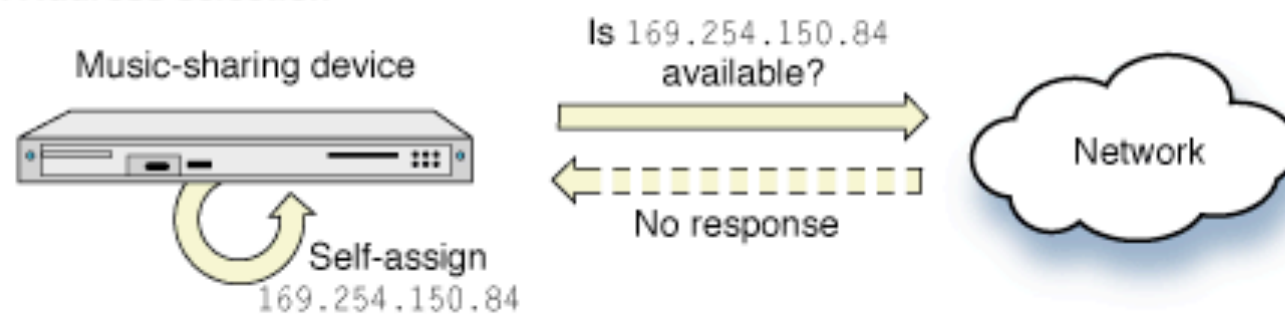
# Bonjour Names for Service Instances





**Figure 1** Publishing a music sharing service

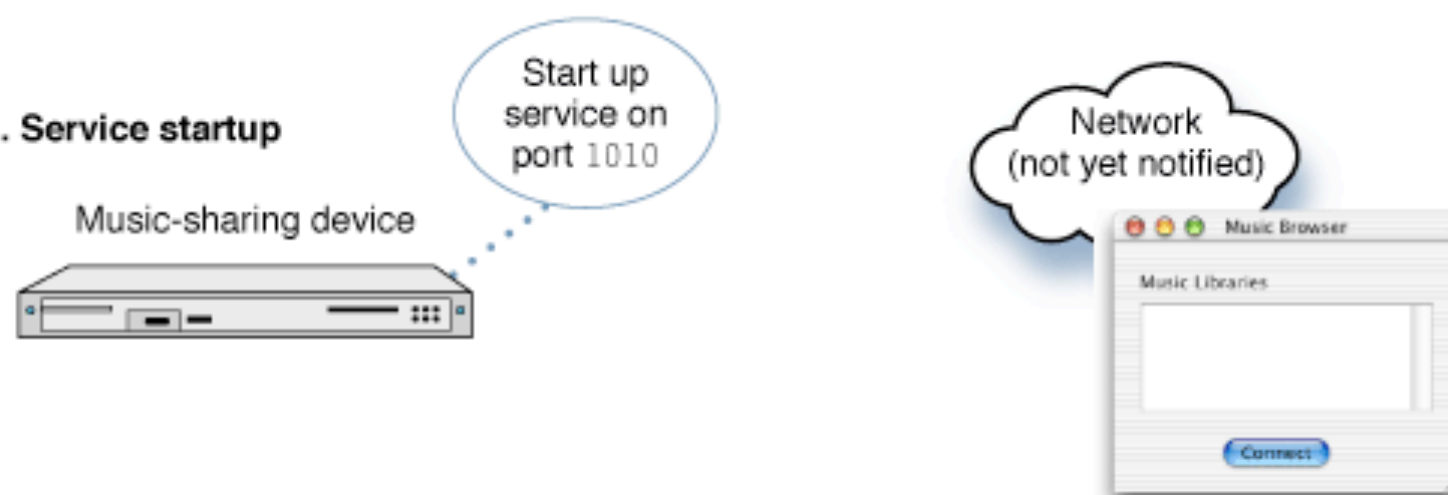
**1. Address selection**



**2. Name selection**



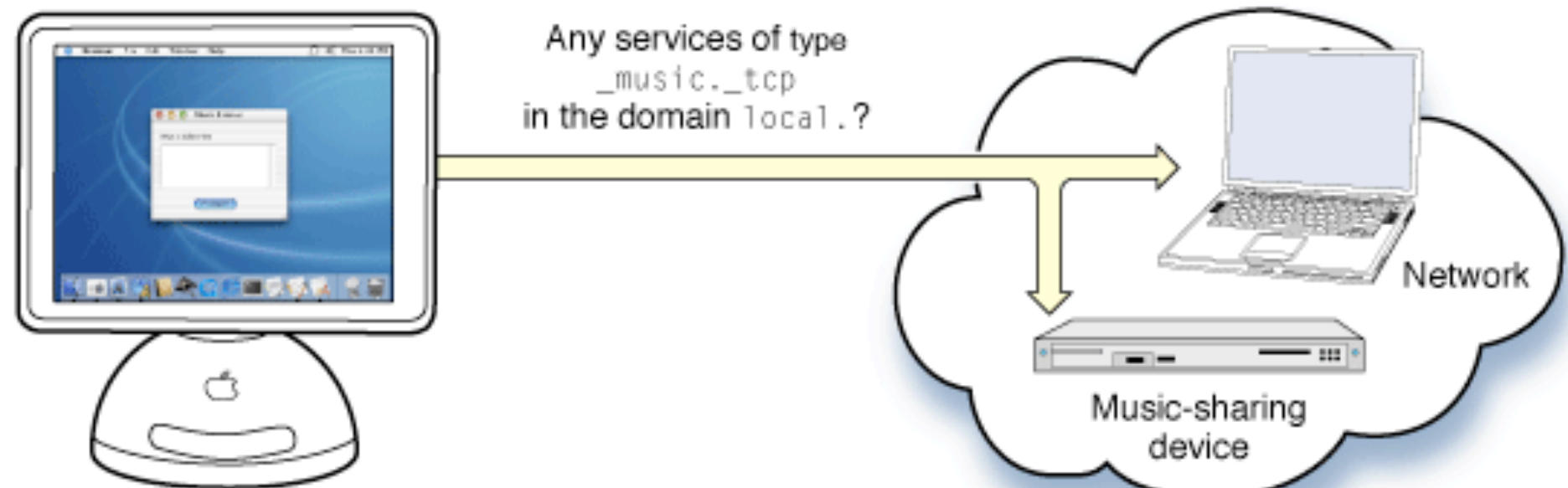
**3. Service startup**



**4. Service publication**



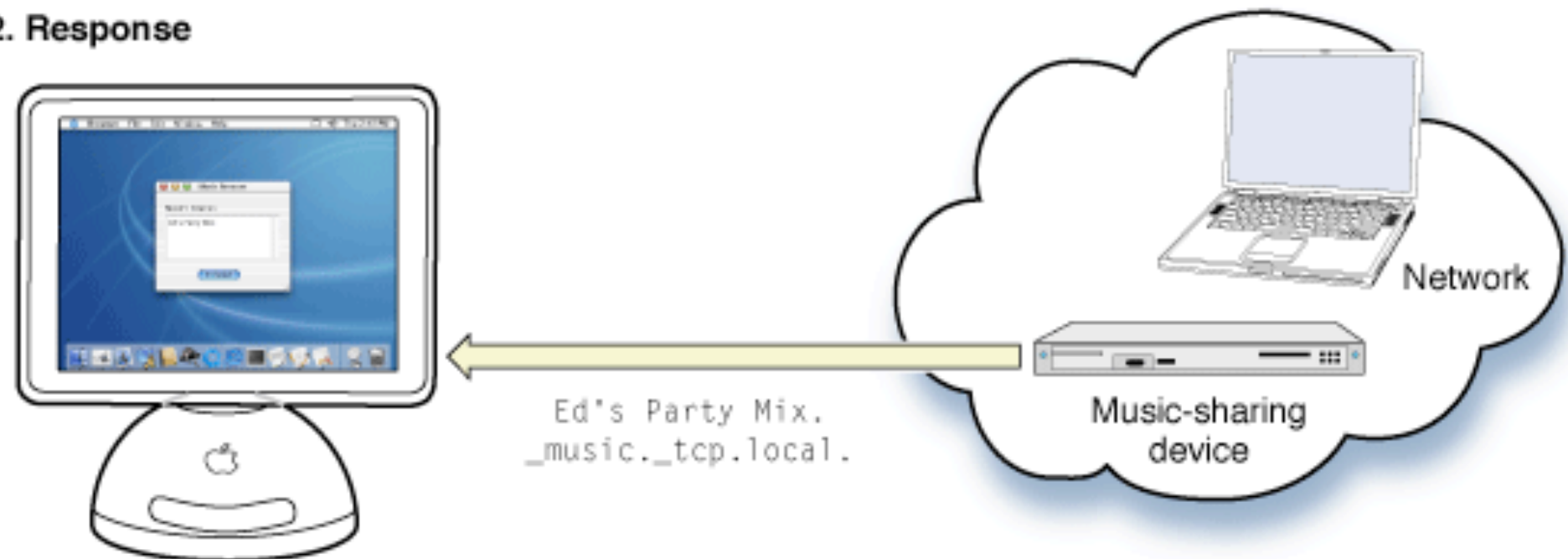
## 1. Query by service type



**Figure 2** Discovering music sharing services

Figure 2 illustrates a client application browsing for music sharing services. In step 1, the client application issues a query for services of type `_music._tcp` in the `local.` domain to the standard multicast address `224.0.0.251`. Every Multicast DNS responder on the network hears the request, but only the music sharing device responds with a PTR record (step 2). The resulting PTR record holds the service instance name, `Ed's Party Mix._music._tcp.local.` in this case.

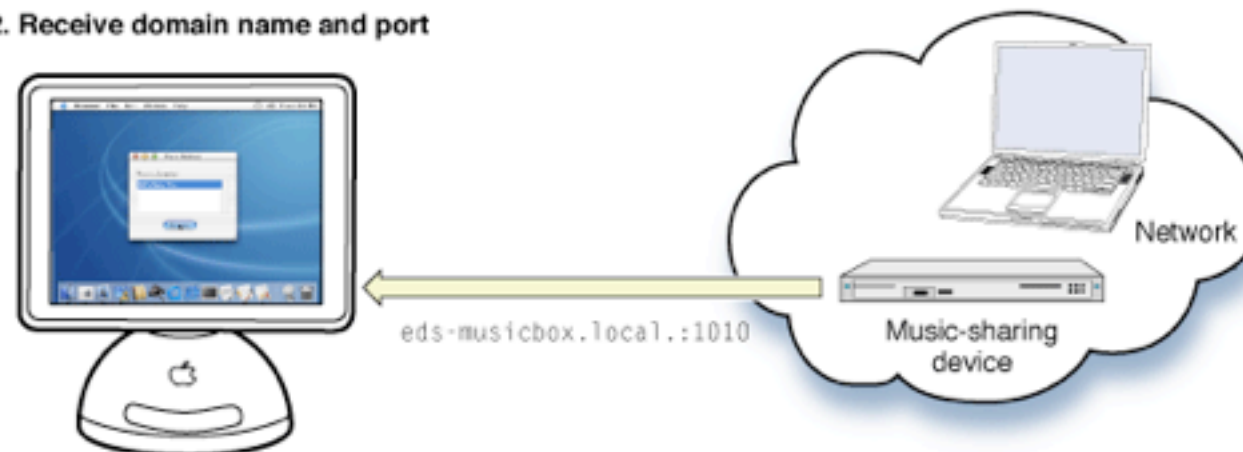
## 2. Response



1. Request domain name and port for instance name



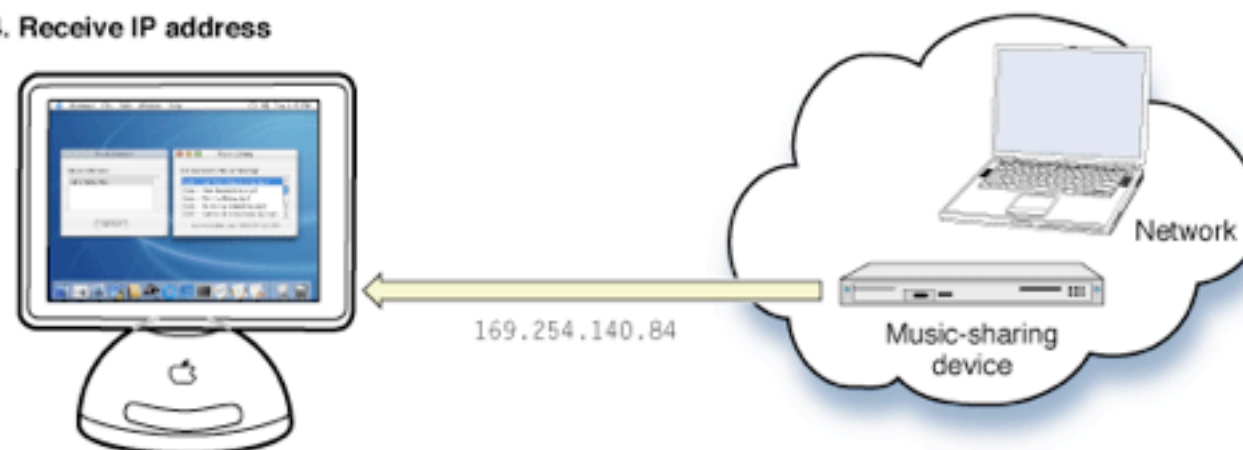
2. Receive domain name and port



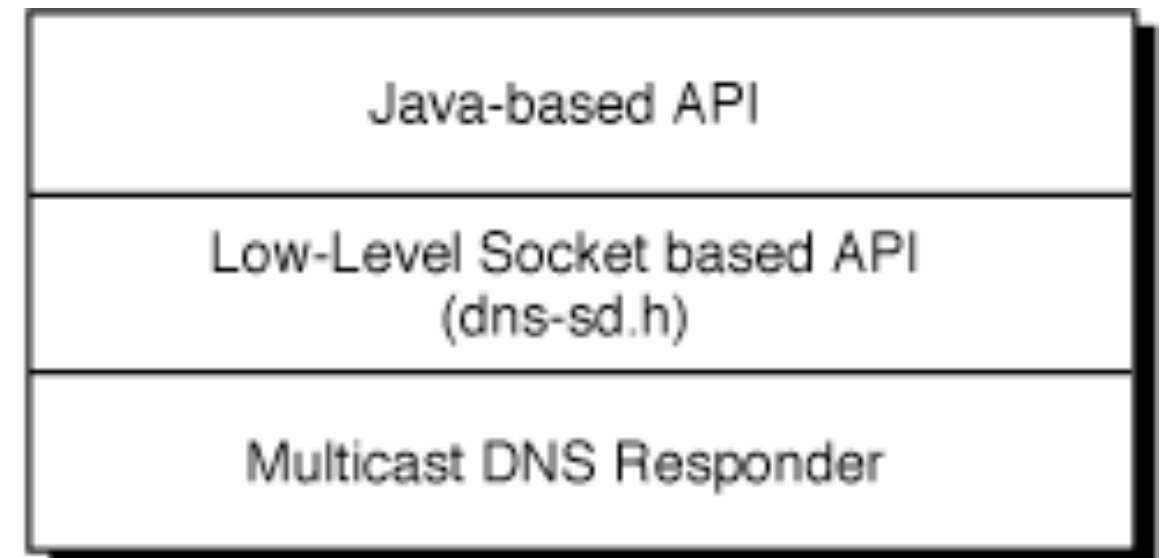
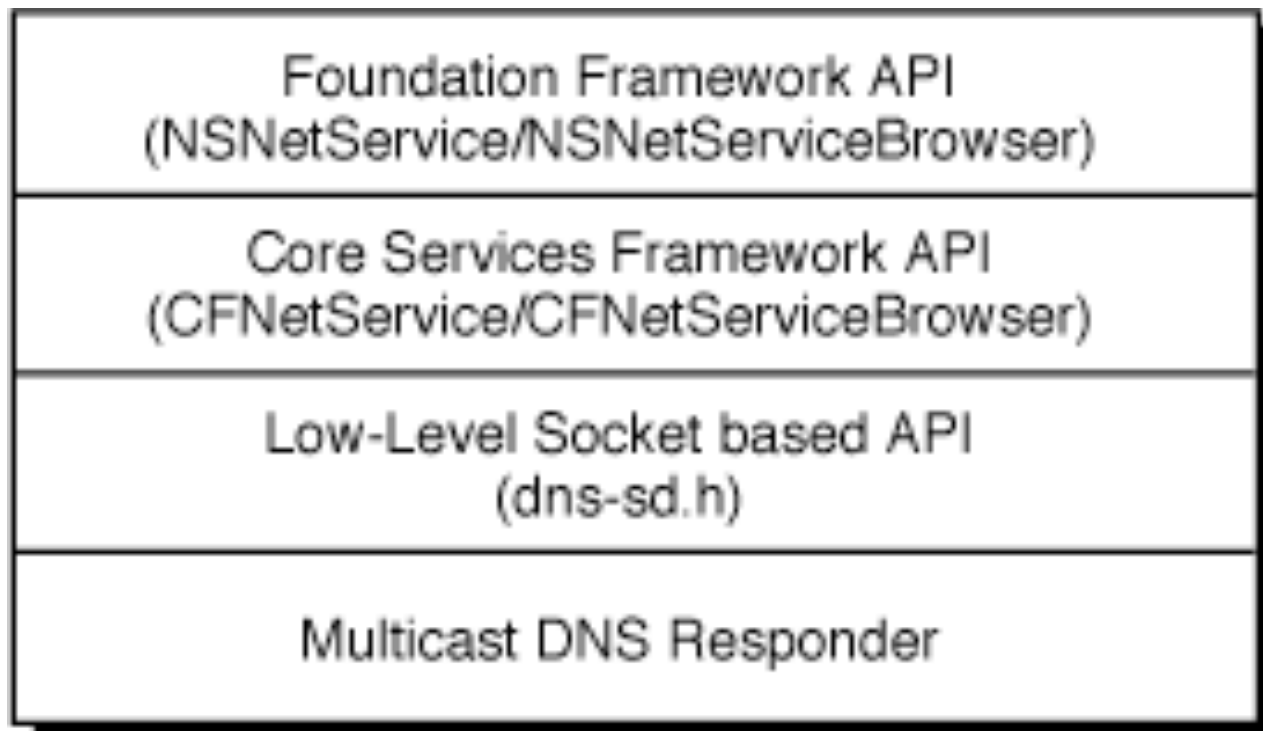
3. Request IP address for domain name



4. Receive IP address



# Bonjour API Architecture



## NSNetServiceBrowser

The NSNetServiceBrowser class provides methods for browsing for available Bonjour network services.

Browsing for Bonjour network services takes three steps:

1. Initialize an NSNetServiceBrowser instance and assign a delegate to the object.
2. Begin a search for services of a specific type in a given domain.

```
id delegateObject; // Assume this exists.

NSNetServiceBrowser *serviceBrowser;

serviceBrowser = [[NSNetServiceBrowser alloc] init];

[serviceBrowser setDelegate:delegateObject];

[serviceBrowser searchForServicesOfType:@"_music._tcp" inDomain:@""];
```

3. Handle search results and other messages sent to the delegate object.

```
- (void)netServiceBrowser:(NSNetServiceBrowser *)browser
    didFindService:(NSNetService *)aNetService
    moreComing:(BOOL)moreComing;
```

# NSNetServices and CFNetServices Programming Guide

**Publishing** a Bonjour network service takes four steps:

1. Set up a valid socket port for communication.
2. Initialize an NSNetService instance with name, type, domain and socket information, and assign a delegate to the object.

```
service = [[NSNetService alloc] initWithDomain:@" "  
                                                type:@"_music._tcp"  
[service setDelegate:delegateObject];      name:@" " port:port];
```

3. Publish the NSNetService instance

```
[service publish];
```

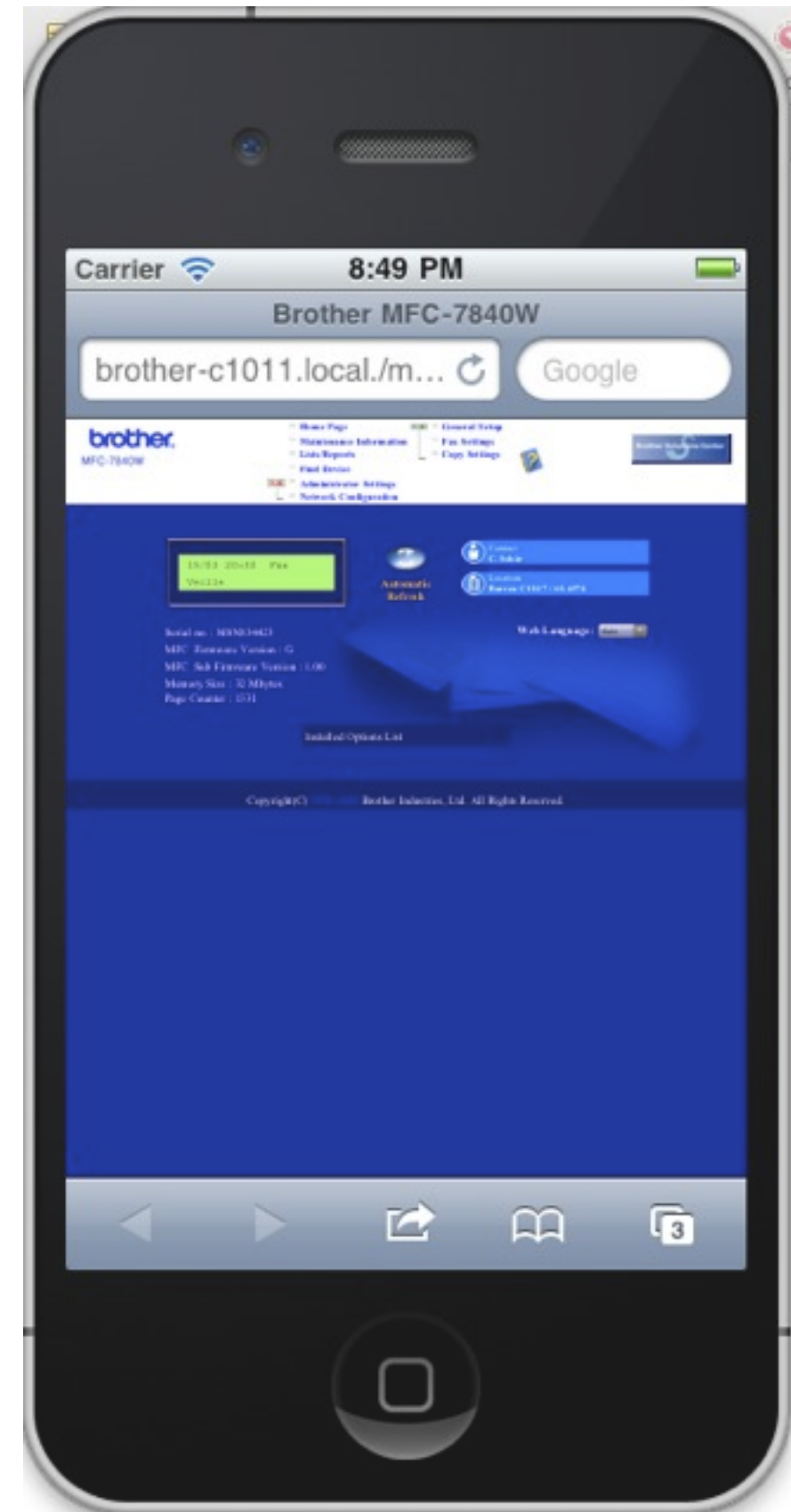
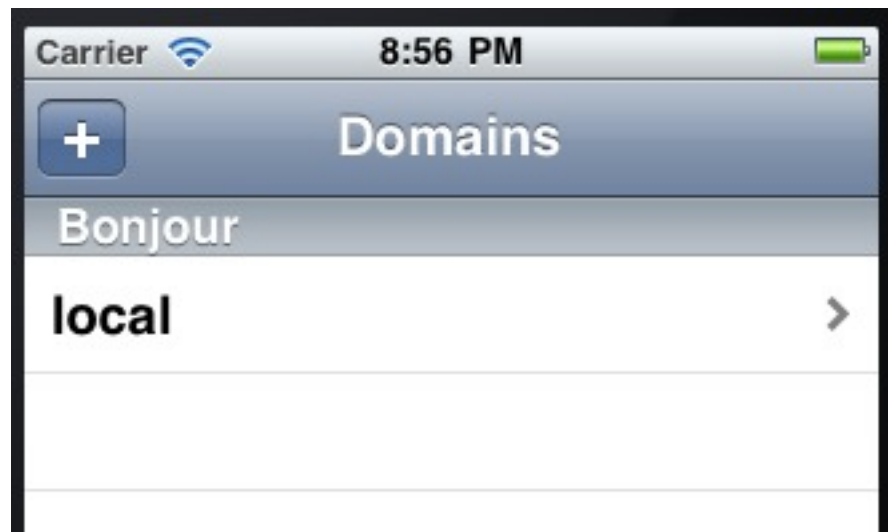
4. Respond to messages sent to the NSNetService object's delegate.

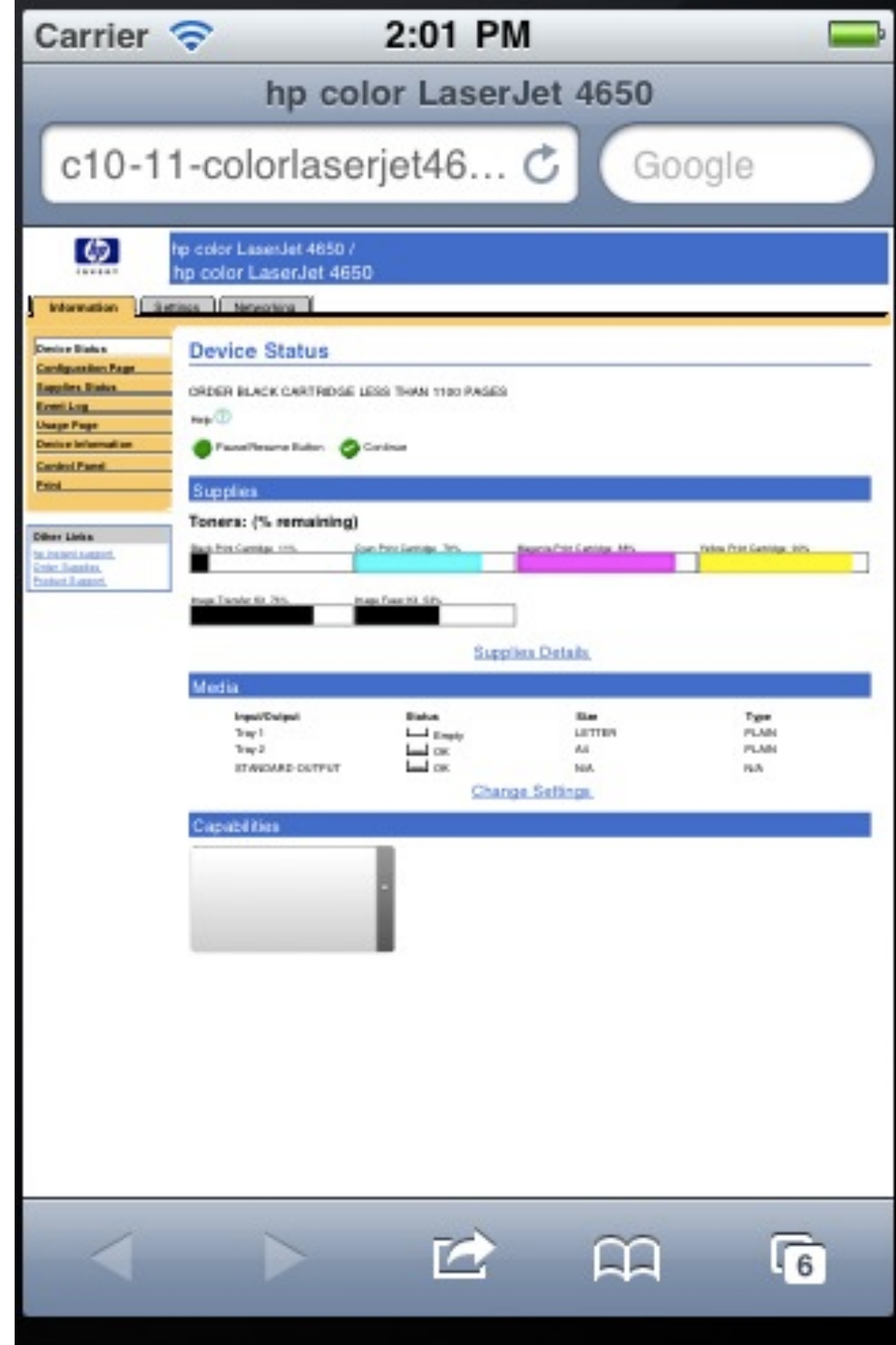
## NSNetServiceDelegate

- 1 — netServiceWillPublish:
- 2 — netService:didNotPublish:
- 3 — netServiceDidPublish:
- 4 — netServiceWillResolve:
- 5 — netService:didNotResolve:
- 6 — netServiceDidResolveAddress:
- 7 — netService:didUpdateTXTRecordData:
- 8 — netServiceDidStop:



# BonjourWeb







Brother MFC-7840W

http://brother-c1011.local./main/main.html

Bonjour Eval2010-round1 Helpdesk EIA Service Informatique iGoogle Moodle HES-SO

**brother**  
MFC-7840W

- Home Page
- Maintenance Information
- Lists/Reports
- Find Device
- Administrator Settings
- Network Configuration
- General Setup
- Fax Settings
- Copy Settings

Brother Solutions Center

15/03 20:35 Fax  
Veille

**Automatic Refresh**

Contact  
C. Schär

Location  
Bureau C10.17 / tél. 6574

Serial no. : M8N834423  
MFC Firmware Version : G  
MFC Sub Firmware Version : 1.00  
Memory Size : 32 Mbytes  
Page Counter : 1331

Web Language: Auto

Installed Options List

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# <http://brother-c1011.local./main/main.html>

Stream Content

```
GET /common/image/back_img.gif HTTP/1.1
Host: brother-c1011.local.
User-Agent: Mozilla/5.0 (iPhone Simulator; U; CPU iPhone OS 4_2 like Mac OS X; en-us) AppleWebKit/533.17.9
(KHTML, like Gecko) Version/5.0.2 Mobile/8C134 Safari/6533.18.5
Referer: http://brother-c1011.local./main/main.html?refresh=off
Accept: */*
Accept-Language: en-us
Accept-Encoding: gzip, deflate
Connection: keep-alive
```

```
HTTP/1.0 200 OK
Content-Length: 43457
Content-Type: image/gif
Connection: close
Server: debut/1.08
```

```
GIF89a.....&.....!..%..&..!.....
.....!.....%.....\..m..i....."....q.....!...(..v..z..}....
(..&...e.....#..(.....(.....a...$.....
$.....).....'.....*.....*.....i.....e.#...`.
$.....l.....l....*.....
.....q..}*...x...u.....q.....!.....,.....
.H.....*\.....#J.H.....*h..q
..k0..I.R.?.7.X.qe..0c.:9H....s.....)W
....Q.)U..y....IU.$...U~.Qr.`.....`
.:j..h.i..u)..p...K.....-..N.x.
.,....y.+^<.f..n?2.L....9]V..Y...."..L.4+.\..^..z.X.n[....([.S5...G.....A..6x.....^H.!.....z
+....wA..w.....7.....9$..[M.D7w....'.....p...VC...Q]v...5..h...
H.6.]b.#....aeu8!4.....c.Z...cR3.....F#V*....(.(.....KV.....kl5...32..."R9.V.,h";3...^@:C..D>.%
&g.A.!.....6.h..x..R.vVy.....c.....{.j....&z(.d...gn..f.j..b.mv.....
```