

W3C Web Intents

Local Network Service Discovery

Input to W3C Shenzhen meeting March 2012

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Web Intents for both cloud and local Services

Web Services



Web app

Movie



Music



Photo



Power



Training



Home theater

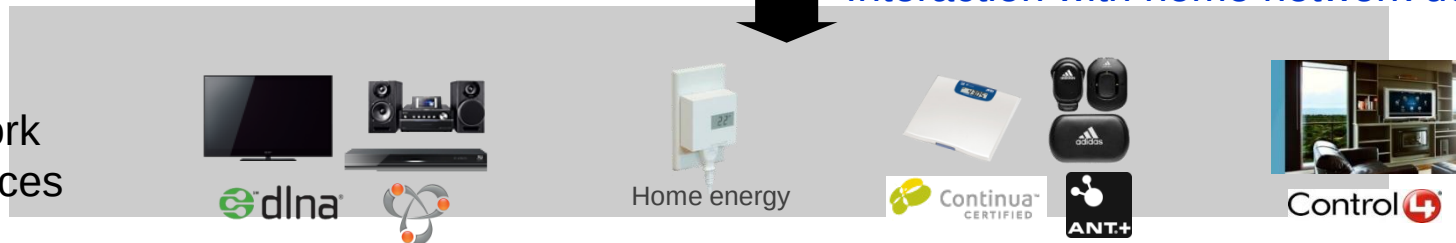


Browser



Interaction with home network devices

Home Network
Devices/Services

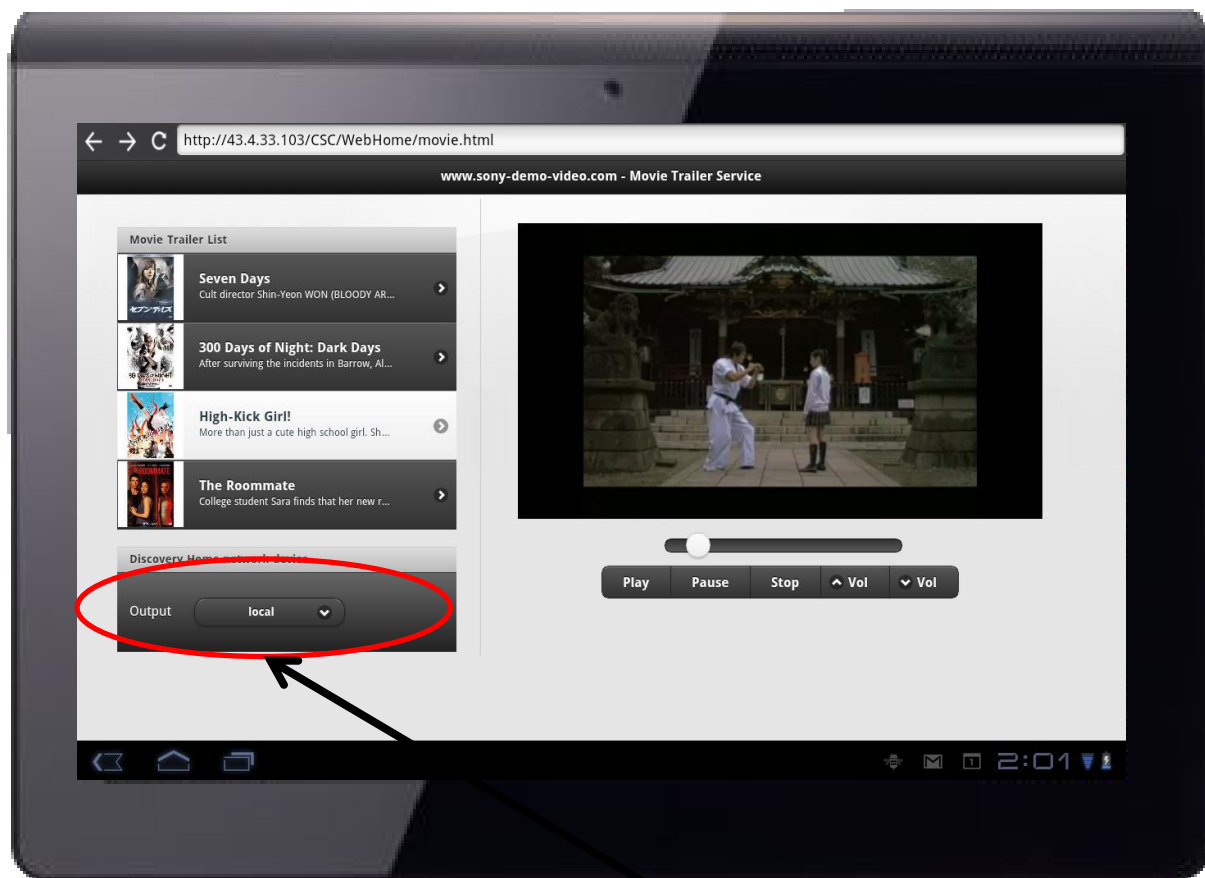


Use Case

Play video on remote device

Step 1: User invokes video play page

Mobile

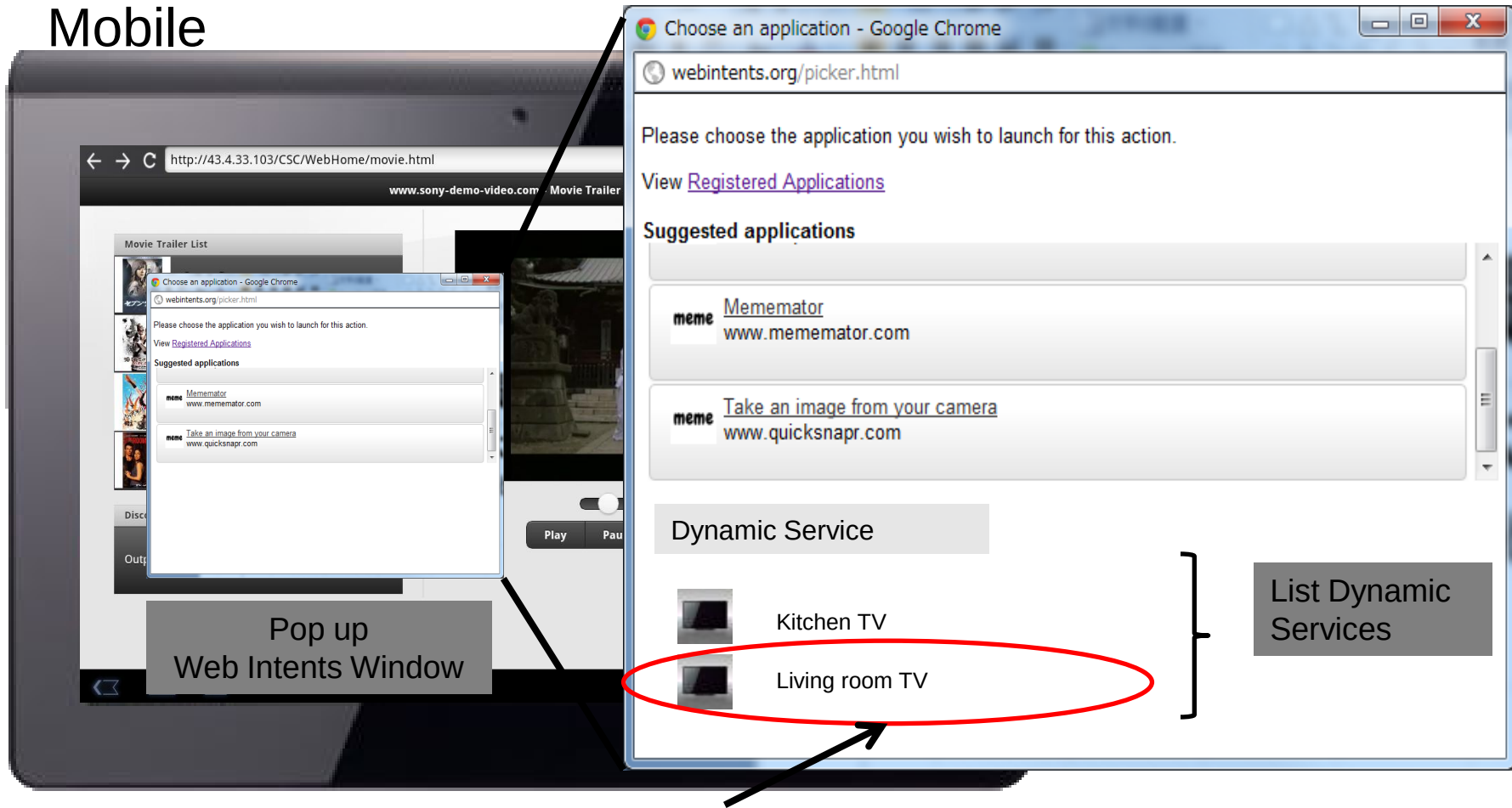


Movie Web
Service
page from
Internet

1) User pushes “Output” button and selects “remote”

Step 2: User selects the Service in Web Intents Service picker

Mobile



2) Select Service

Step 3: Two user experience alternatives

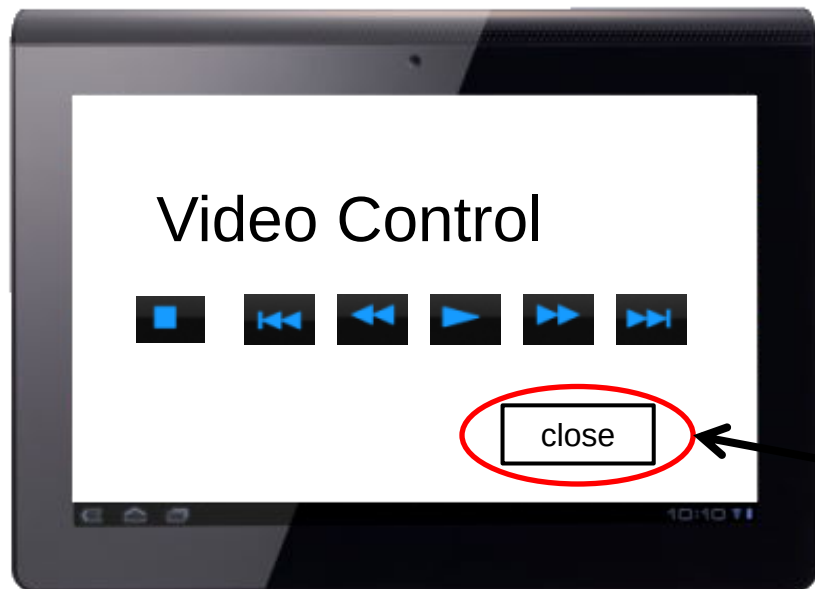
- Service page invoked and has UI that provides playback control buttons
- Control stays in Client page that provides playback control buttons

Step 3 – alt 1: Service control page is invoked

TV



Mobile



When “close” selected back to Client page.

Step 3 – alt 1

Implementation proposal with UPnP/DLNA

Invocation

```
var intent = new Intent(  
    "http://webintents.org/view",  
    "video/mp4v",  
    "http://demo-video-  
service.sony.com/content?id=462287");  
window.navigator.startActivity(intent,  
function(intentData) {});
```

Intent Registration

```
<intent  
    action="http://webintents.org/view"  
    type="video/mp4v"  
    href="video-control.html"  
    title = "Living room TV"  
    disposition="window"  
/>
```

SSDP registration page

UPnP Web Intents Device Description page

```
<?xml version="1.0"?>
<root xmlns="urn:schemas-upnp-org:device-1-0">
  <specVersion>
    <major>1</major>
    <minor>0</minor>
  </specVersion>
  <device>
    <UDN>uuid:ec0b57d7-f768-4f62-8843-dd7ab9487748</UDN>
    <friendlyName>Living room TV</friendlyName>
    <deviceType>urn:schemas-upnp
      org:device:WebIntents:1</deviceType>
    <Intents>
      <intent
        action="http://webintents.org/view"
        type="video/mp4v"
        href="video-control.html"
        title = "Living room TV"
        disposition="window"
      /> .....
    </Intents>
```

**New: Web intent
device type**

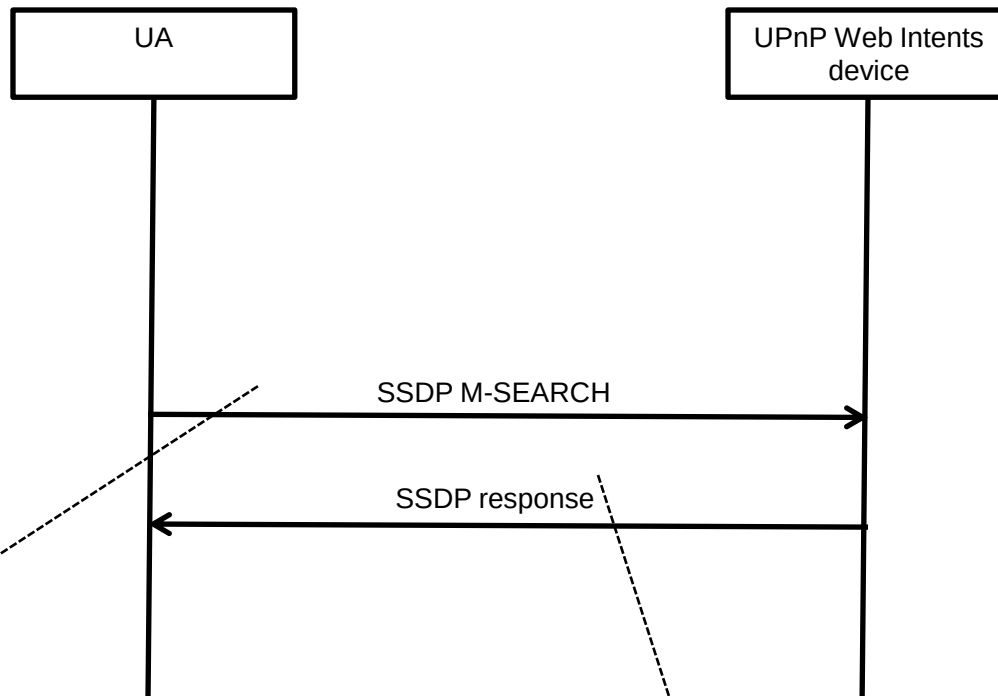
**New: Web Intent
Service registration**

Local UPnP discovery

Invocation

```
var intent = new Intent(  
    "http://webintents.org/view",  
    "video/mp4v",  
    "http://demo-video-  
service.sony.com/content?id=462287");  
  
window.navigator.startActivity(intent,  
    function(intentData) {});
```

```
M-SEARCH * HTTP/1.1  
Host:239.255.255.250:1900  
ST:urn:schemas-upnp-org:device:WebIntents:1  
Man:"ssdp:discover"  
MX:3
```

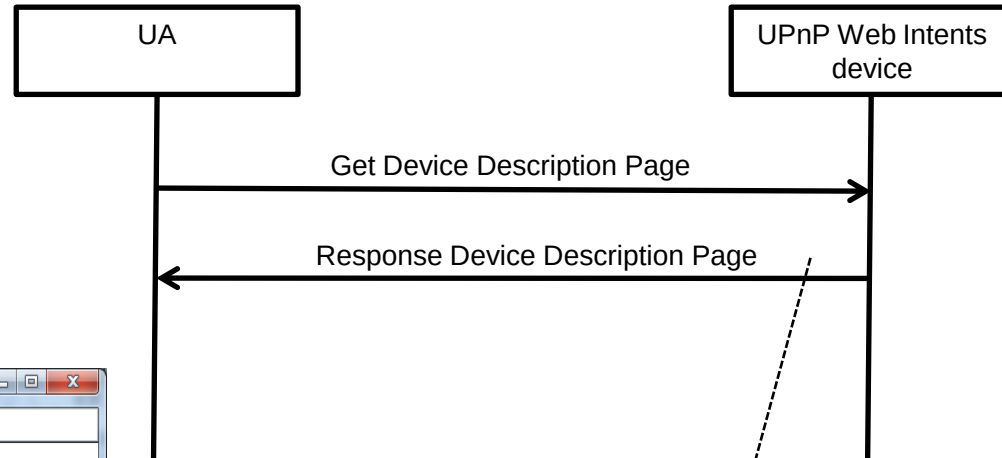
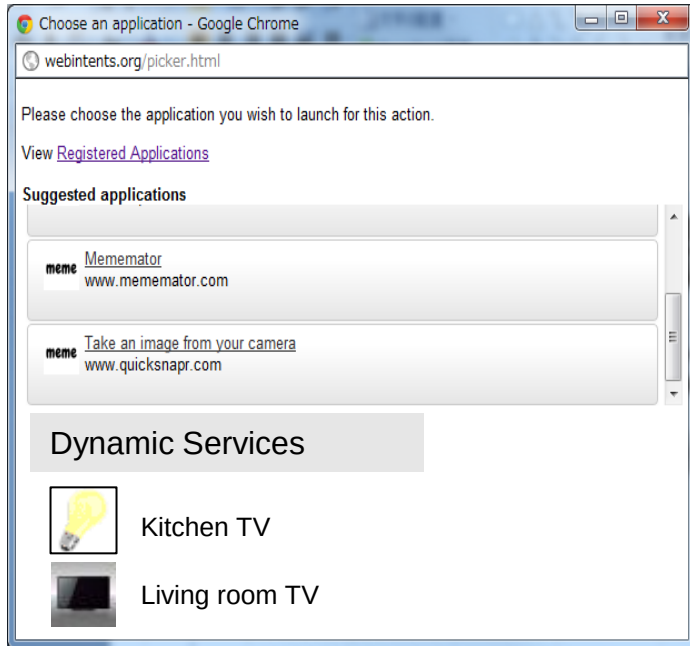


```
HTTP / 1.1 200 OK  
ST: urn:schemas-upnp-org:device:WebIntents:1  
CACHE-CONTROL: max-age=900  
HOST: 239.255.255.250:1900  
USN: uuid:67a89239-6ce9-4c6f-8527-aa457a481798::urn:schemas-  
upnp-org:device::WebIntents:1  
SERVER: Windows NT/5.0, UPnP/1.0, Intel CLR SDK/1.0  
LOCATION: http://43.4.33.103:57735/  
Content-Length: 0
```

Device Description page retrieved based on SSDP

Location header

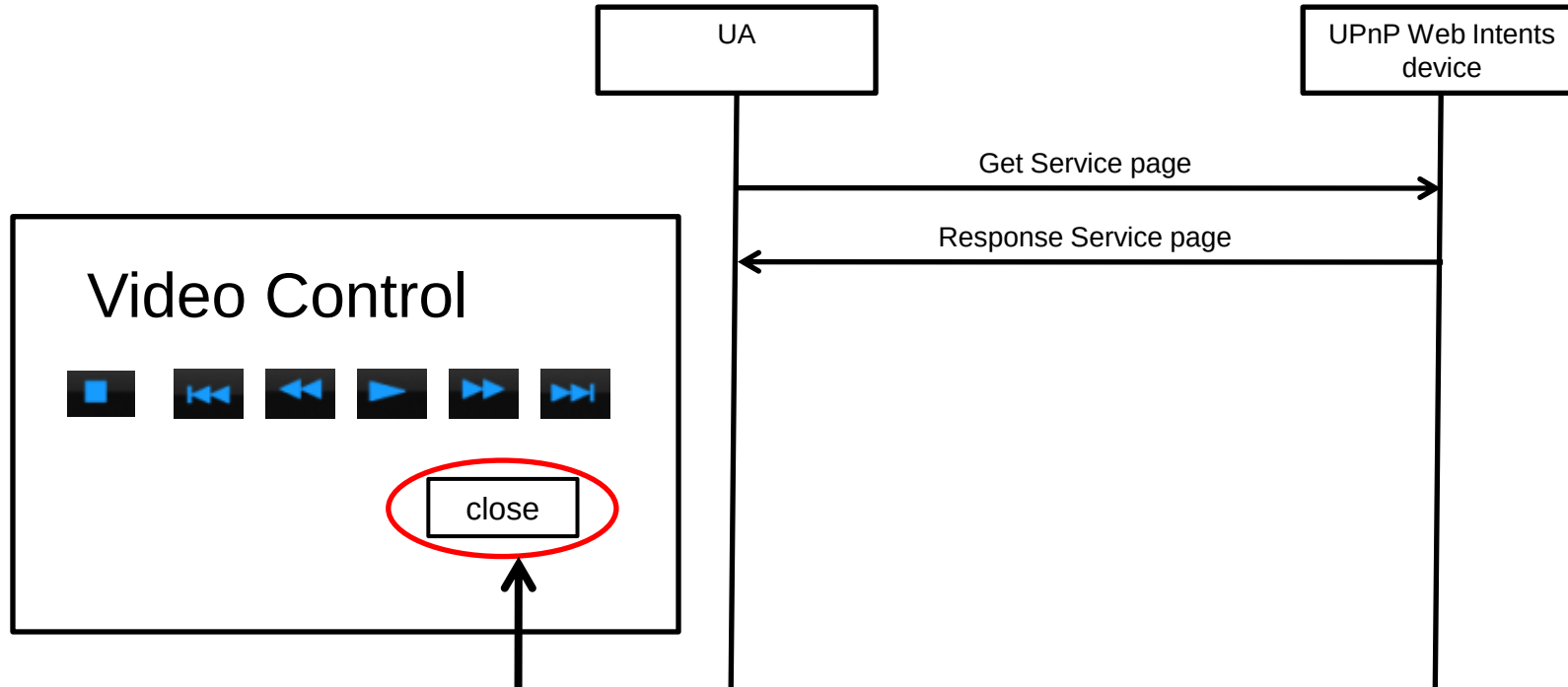
Update webintents
Service picker



```
<?xml version="1.0"?>
<root xmlns="urn:schemas-upnp-org:device-1-0">
  <specVersion>
    <major>1</major>
    <minor>0</minor>
  </specVersion>
  <device>
    <UDN>uuid:ec0b57d7-f768-4f62-8843-d7ab9487748</UDN>
    <friendlyName>:Living Room TV</friendlyName>
    <deviceType>urn:schemas-upnp
      org:device:WebIntents:1</deviceType>
    <Intents>
      <intent
        action="http://webintents.org/view"
        type="video/mp4v"
        href="video-control.html"
        title = "Living room TV"
        disposition="window"
      /> .....
    </Intents>
```

User selects Service

Service handler page is invoked



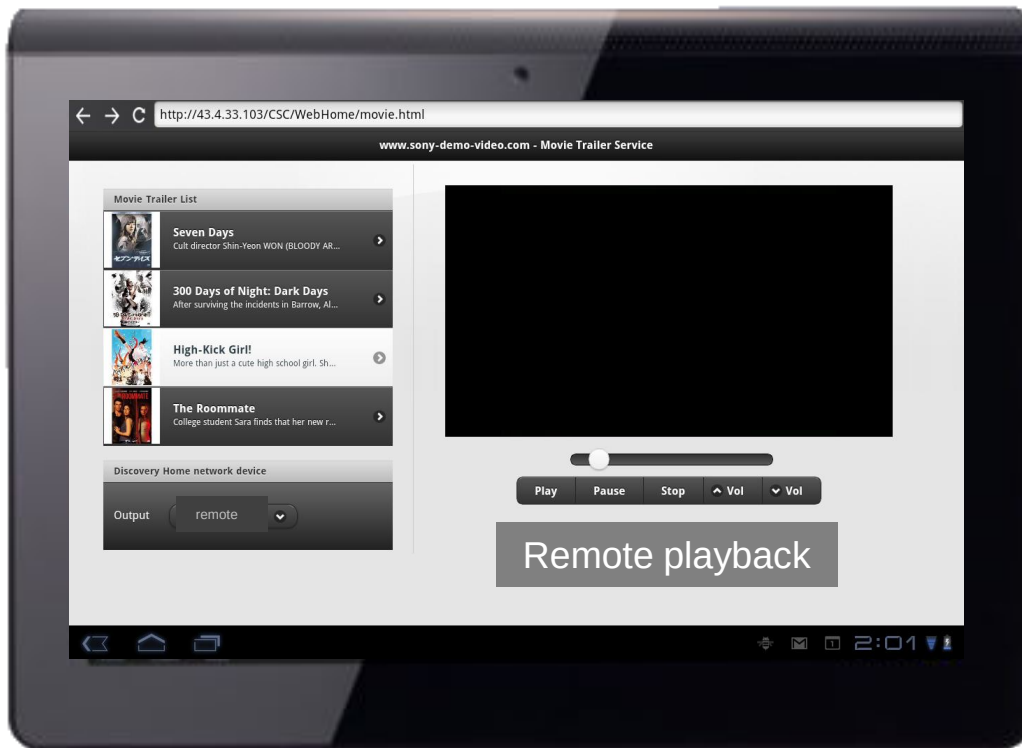
When user presses “close”
the original (Client) page is
invoked

Step 3 – alt 2: Control stays in Client page that provides playback control buttons

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TV

Mobile



User
controls
playback

Step 3 - alt 2

Implementation proposals with UPnP

2 options:

1. Client page communicates directly with remote UPnP device
2. Client communicates with "hidden" Service page that communicates with remote UPnP device

Implementation option 1

Client page communicates directly with remote
UPnP device

Invocation

```
var intent = new Intent(  
    "http://webintents.org/discover",  
    "urn:upnp-org:deviceId:MediaRenderer");  
  
window.navigator.startActivity(intent, function (data) {  
    // Communicate with the HN device using UPnP  
    // data is location of UPnP Description page  
    descriptionUrl = data[0];  
    // UPnP Description page is retrieved using XHR2  
    // Subsequent transactions using XHR2 are invoked  
    // based on the UPnP description.  
});
```

Intent Registration

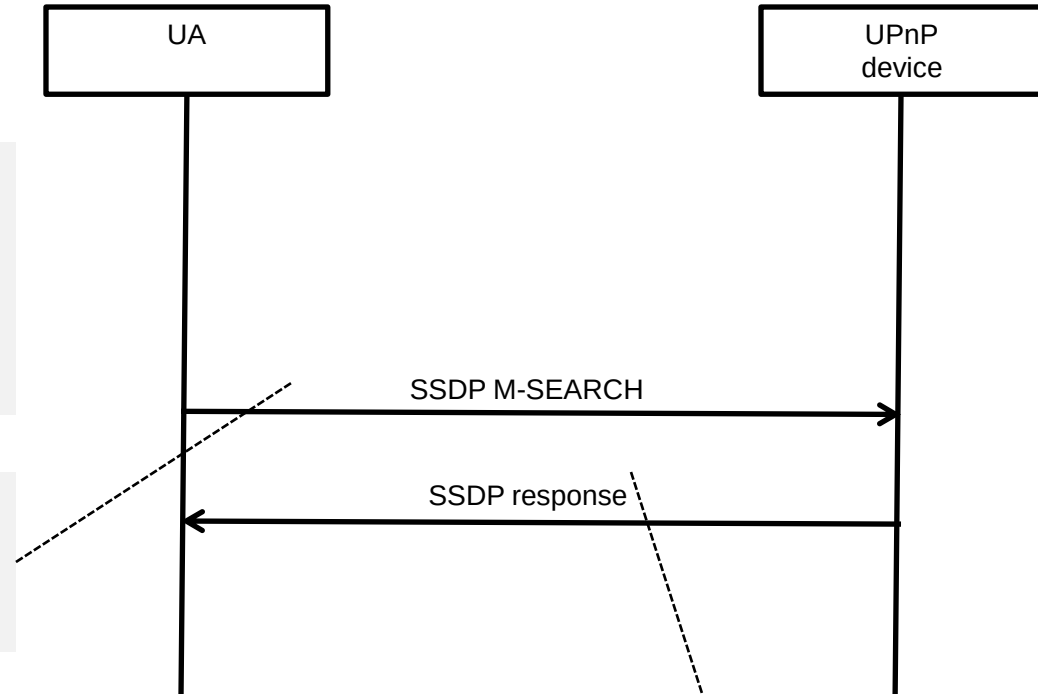
There is no registration page. Service is dynamically registered by the UA based on UPnP SSDP discovery and retrieved Device Description document.

Local UPnP discovery

Invocation

```
var channel = new MessageChannel();  
var intent = new Intent(  
    "http://webintents.org/discover",  
    "urn:upnp-  
    org:deviceId:MediaRenderer");  
  
window.navigator.startActivity(intent,  
    function(intentData) {});
```

```
M-SEARCH * HTTP/1.1  
Host:239.255.255.250:1900  
ST:urn:upnp-org:deviceId:MediaRenderer:1  
Man:"ssdp:discover"  
MX:3
```

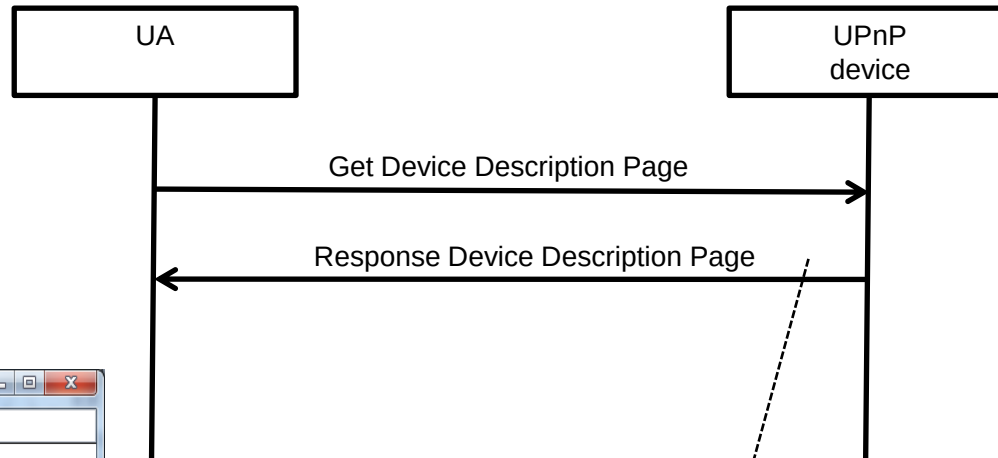
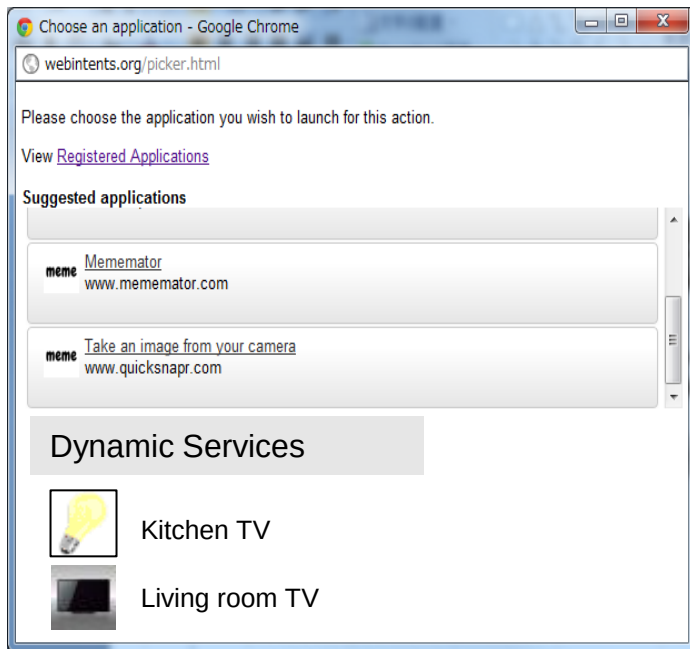


```
HTTP / 1.1 200 OK  
ST: urn:schemas-upnp-org:device:WebIntents:1  
CACHE-CONTROL: max-age=900  
HOST: 239.255.255.250:1900  
USN: uuid:67a89239-6ce9-4c6f-8527-aa457a481798::urn:upnp-  
org:deviceId:MediaRenderer1  
SERVER: Windows NT/5.0, UPnP/1.0, Intel CLR SDK/1.0  
LOCATION: http://43.4.33.103:57735/  
Content-Length: 0
```

Device description page retrieved based on SSDP

Location header

Update webintents
Service picker

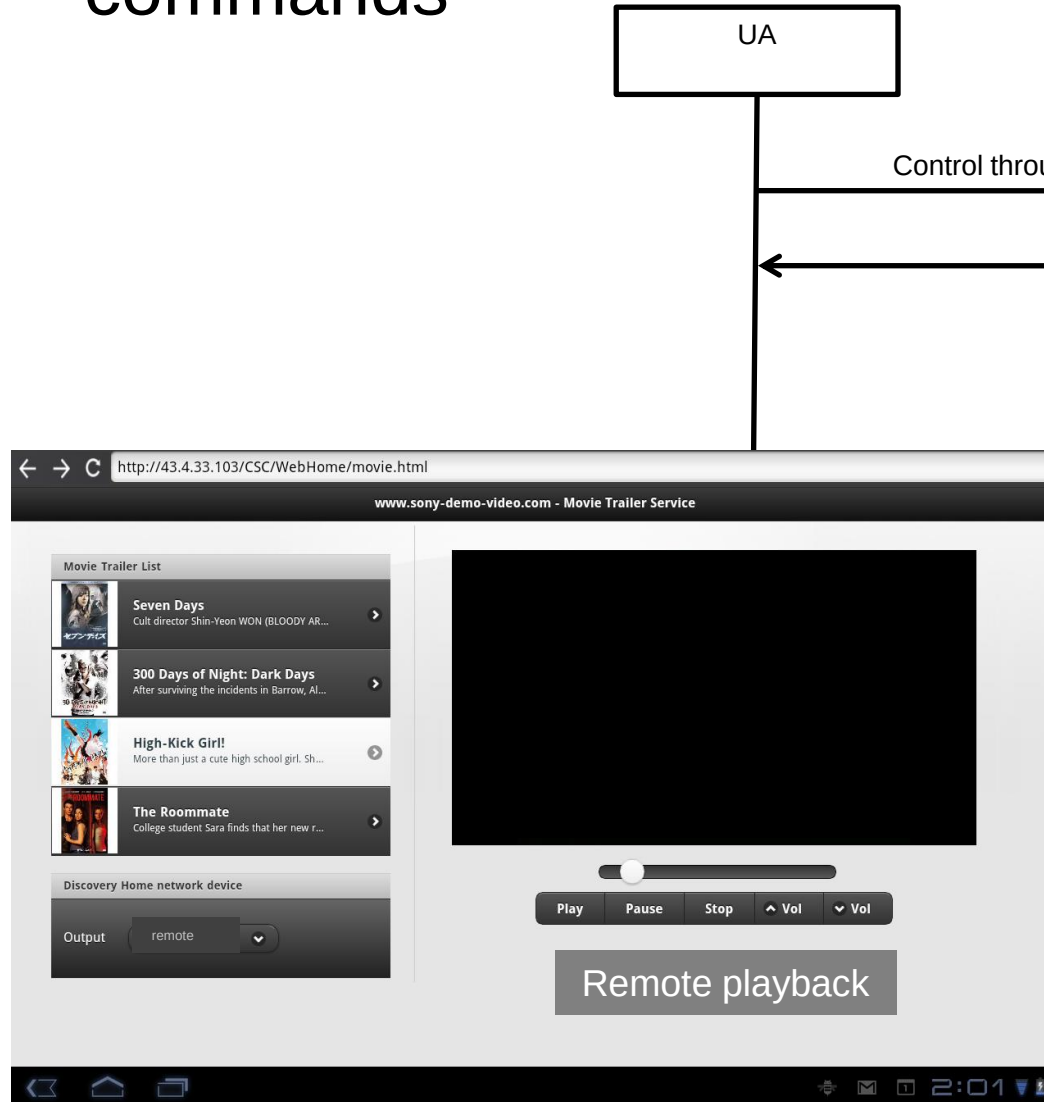


```
<?xml version="1.0"?>
<root xmlns="urn:schemas-upnp-org:device-1-0">
  <specVersion>
    <major>1</major>
    <minor>0</minor>
  </specVersion>
  <device>
    <UDN>uuid:ec0b57d7-f768-4f62-8843-d7ab9487748</UDN>
    <friendlyName>:Living Room TV</friendlyName>
    <deviceType> urn:upnp-
                        org:deviceId:MediaRenderer</deviceType>
    .....
  </device>
</root>
```

User selects Service

Client page controls TV through UPnP/DLNA commands

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UA stays in Client page.
When user presses “stop”
the background Service
is terminated.

Implementation option 2

Client page communicates with hidden/background
Service page that communicates with remote
UPnP device

Invocation / Service Registration

Invocation

```
var channel = new MessageChannel();
var intent = new Intent(
    "http://webintents.org/discover",
    "application/octet-stream+mytvprotocol",
    [channel.port2]);
window.navigator.startActivity(intent,
                                function(intentData) {});;
```

Note: Syntax
currently under
discussion on
WI TF mail list

Intent Registration

```
<intent
  action="http://webintents.org/discover"
  type="application/octet-stream+mytvprotocol"
  href="video-control.html"
  title = "Living room TV"
  disposition="background"
/>
```

SSDP registration page

UPnP Web Intents device description page

```
<?xml version="1.0"?>
<root xmlns="urn:schemas-upnp-org:device-1-0">
  <specVersion>
    <major>1</major>
    <minor>0</minor>
  </specVersion>
  <device>
    <UDN>uuid:ec0b57d7-f768-4f62-8843-dd7ab9487748</UDN>
    <friendlyName>Living room TV</friendlyName>
    <deviceType>urn:schemas-upnp
      org:device:WebIntents:1</deviceType>
    <Intents>
      <intent
        action=" http://webintents.org/discover"
        type="application/octet-stream+mytvprotocol"
        href="video-control.html"
        title = "Ling room TV"
        disposition="background"
      /> .....
    </Intents>
```

**New: Web intent
device type**

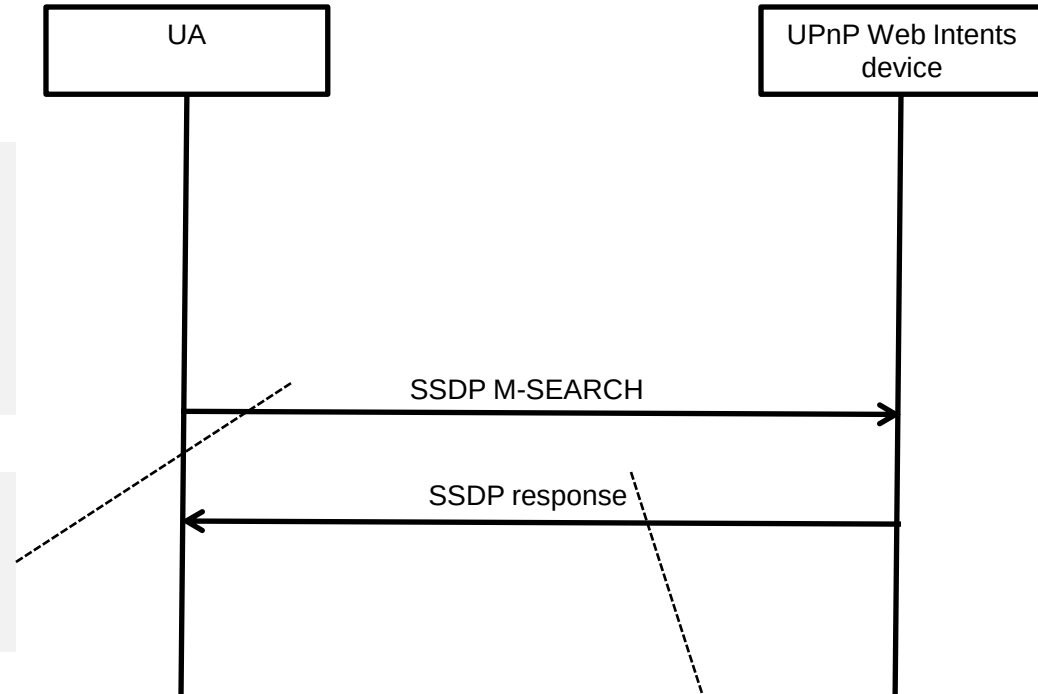
**New: Web Intent
Service registration**

Local UPnP discovery

Invocation

```
var channel = new MessageChannel();  
var intent = new Intent(  
    "http://webintents.org/discover",  
    "application/octet-  
    stream+mytvprotocol",  
    [channel.port2]);  
window.navigator.startActivity(intent,  
    function(intentData) {});
```

```
M-SEARCH * HTTP/1.1  
Host:239.255.255.250:1900  
ST:urn:schemas-upnp-org:device:WebIntents:1  
Man:"ssdp:discover"  
MX:3
```

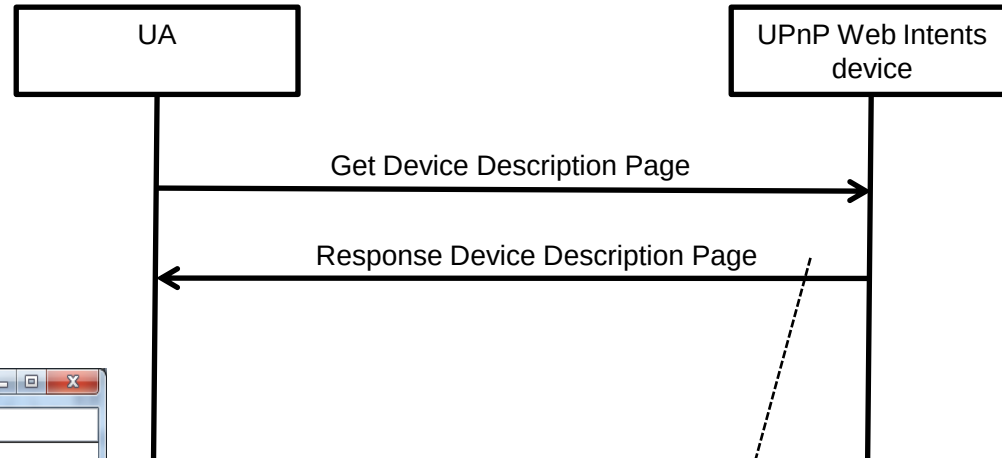
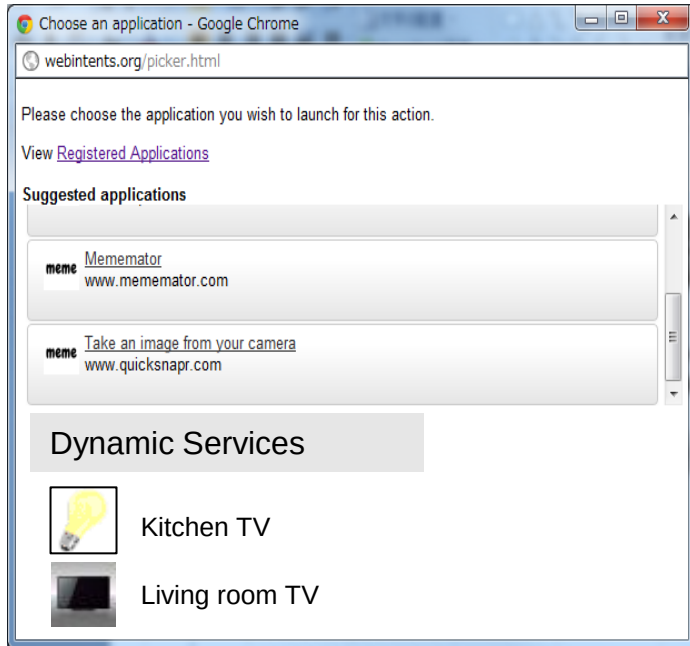


```
HTTP / 1.1 200 OK  
ST: urn:schemas-upnp-org:device:WebIntents:1  
CACHE-CONTROL: max-age=900  
HOST: 239.255.255.250:1900  
USN: uuid:67a89239-6ce9-4c6f-8527-aa457a481798::urn:schemas-  
upnp-org:device::WebIntents:1  
SERVER: Windows NT/5.0, UPnP/1.0, Intel CLR SDK/1.0  
LOCATION: http://43.4.33.103:57735/  
Content-Length: 0
```


Device Description page retrieved based on SSDP

Location header

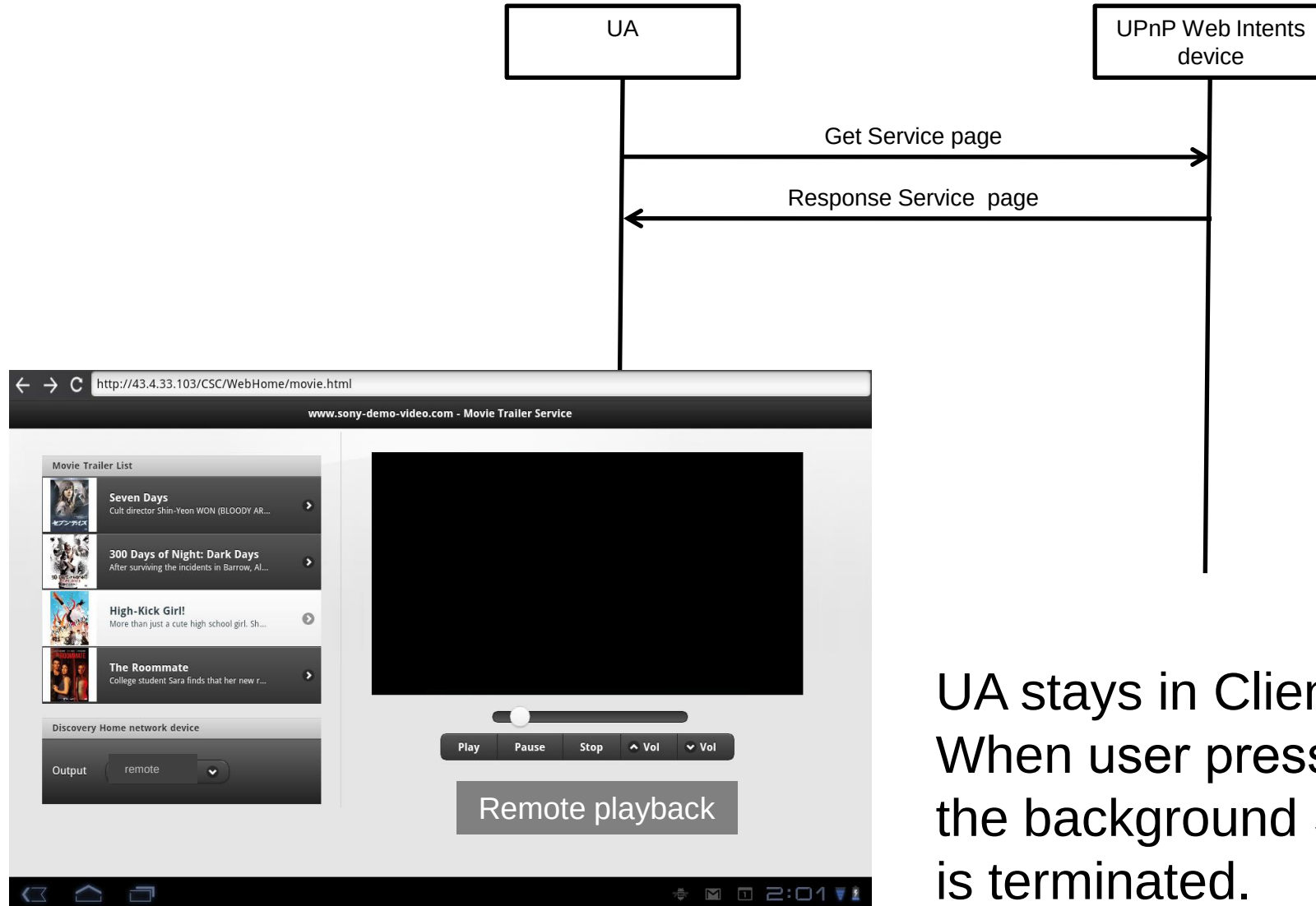
Update webintents
Service picker



```
<?xml version="1.0"?>
<root xmlns="urn:schemas-upnp-org:device-1-0">
  <specVersion>
    <major>1</major>
    <minor>0</minor>
  </specVersion>
  <device>
    <UDN>uuid:ec0b57d7-f768-4f62-8843-d7ab9487748</UDN>
    <friendlyName>:Living Room TV</friendlyName>
    <deviceType>urn:schemas-upnp
      org:device:WebIntents:1</deviceType>
    <Intents>
      <intent
        action=" http://webintents.org/discover"
        type="application/octet-stream+mytvprotocol"
        href="video-control.html"
        title = "Ling room TV"
        disposition="background"
      /> ....
    </Intents>
```

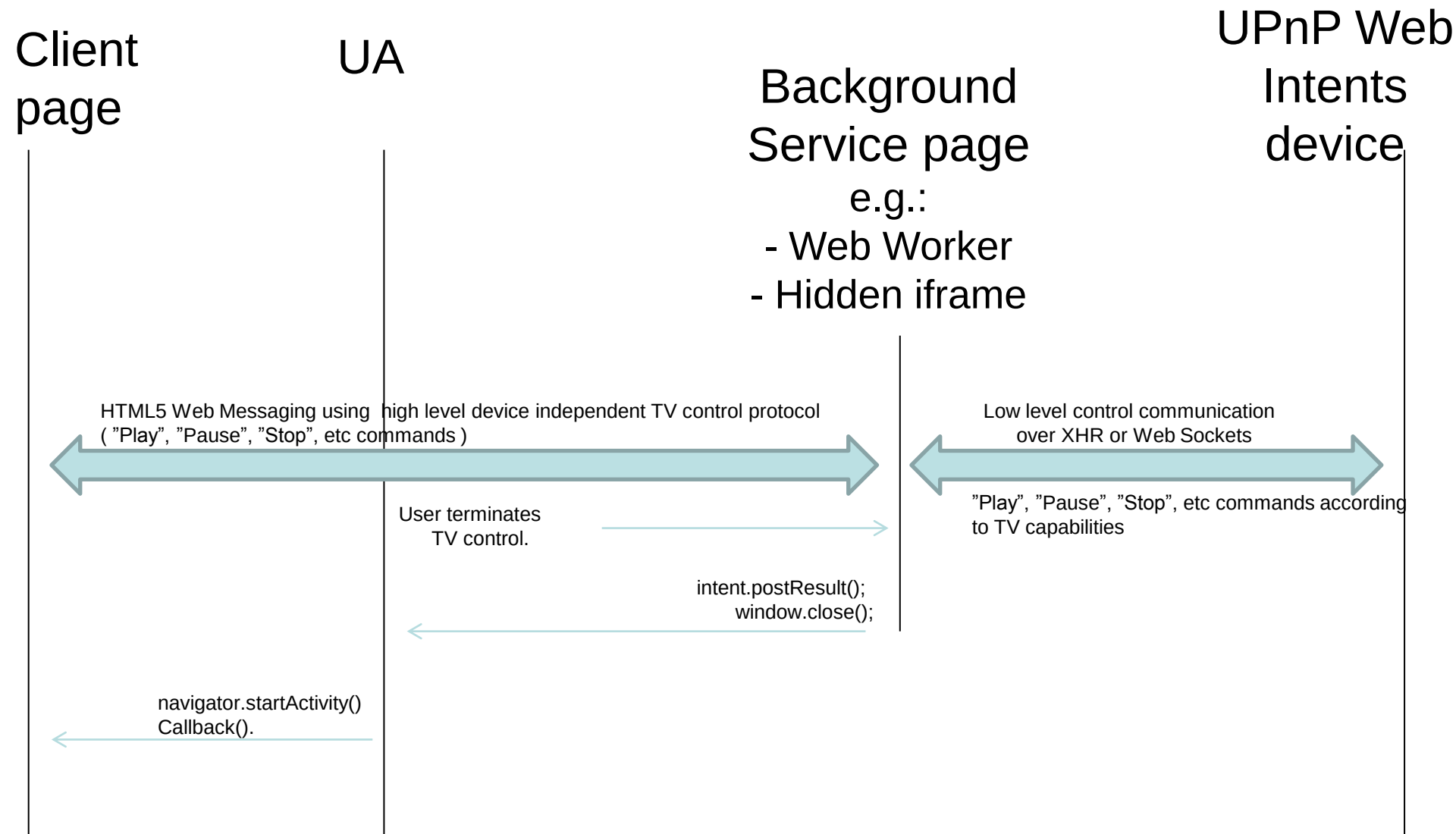
User selects Service

Background Service page is invoked



UA stays in Client page.
When user presses “stop”
the background Service
is terminated.

TV control communication



Conclusions

- Sony proposes:
 - WebIntent should support local discovery on the IP sub-network (UPnP and mDNS)
 - Web Intents Service as background/hidden web content must be supported. Proposes "disposition"=background
- To be considered and discussed
 - If Web Intents Service page is used registration could be done by including registration markup in SSDP Device Description document
 - For low level protocol agnostic Client applications high level Service specific protocols have to be specified.

Conclusions

- To be considered and discussed
 - UA must be able to manage Service availability as dynamic Services may come and go. Implementation specific or subject for standardization
 - It has to be considered if search for dynamic Services should explicitly be initiated by the user or in the intent invocation
 - For control communication same origin policy is an issue if a Service page is not retrieved from the UPnP device



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