

Songbird Development 101

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What is Songbird?

UI Layout and Terminology

Extensions

Feathers

Webpage API

Search Plug-ins

Resource Roundup



What is Songbird?

(in one slide)

- Cross platform media player
- Built on Mozilla
- Customizable
 - Extensions
 - Skins Feathers
- Open APIs
 - Client side via Extensions
 - Web side via Webpage API





Built on Mozilla

- XPCOM (Cross Platform Component Object Model)
- XPIDL (Cross Platform Interface Description Language)
- XUL (XML User Interface Language)
- XBL (eXtensible Binding Language)
- Gecko 1.9 Layout Engine
- XULRunner



XPCOM

- Cross Platform, very similar to CORBA & Microsoft's COM
- Multiple language bindings (C, C++, Javascript, Python, Perl, Ruby, .Net)
- All features of Gecko available as re-usable cross-platform components
- XPConnect used to connect to objects in JS
- Allows for rapid development

- <http://www.mozilla.org/projects/xpcom/>



XPIDL

- Same language neutral interface descriptions as IDL
- Uses `xpidl` IDL compiler
- Generates language specific descriptions
 - .h, .java, .xpt, etc.
- <http://developer.mozilla.org/en/docs/XPIDL>
- <http://www.mozilla.org/scriptable/xpidl/idl-authors-guide/index.html>
- <http://developer.mozilla.org/en/docs/XPIDL:xpidl>



XUL

- XML based way of building UI
- Widget based
- Cross platform
- Generally, used for defining UI/presentation layer
- Use predefined XUL elements, or elements defined in XBL
- Localizable

- http://developer.mozilla.org/en/docs/The_Joy_of_XUL
- http://developer.mozilla.org/en/docs/XUL_Tutorial



XBL

- “Visual objects” - visible elements wrapped inside behaviour
- Bind behavior to XUL widgets
- Bind event handlers, methods, properties, style & content
- <http://developer.mozilla.org/en/docs/XBL>
- [http://developer.mozilla.org/en/docs/XUL Tutorial:Introduction to XBL](http://developer.mozilla.org/en/docs/XUL_Tutorial:Introduction_to_XBL)

XBL file:

```
<?xml version="1.0"?>
<bindings xmlns="http://www.mozilla.org/xbl">
  <binding id="binding1">
    <!-- content, property, method and event descriptions go here -->
  </binding>
  <binding id="binding2">
    <!-- content, property, method and event descriptions go here -->
  </binding>
</bindings>
```

Bind binding to a XUL element with CSS:

```
scrollbar {
  -moz-binding: url('chrome://findfile/content/findfile.xml#binding1');
}
```



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Songbird

Music

Library

- Music
- Videos
- Downloads
- First Love
- Services
 - Concerts
 - New Releases
 - 7digital Store
- Radio
 - SHOUTcast
- Playlists
 - Create Playlist
 - Highest Rated
 - Most Played
 - Recently Added
 - Recently Played

Title	Time	Artist	Album	Genre	Rating
真的想你II(Ambient R&B 新版)	5:09	杜德偉	Timeless Classics	Pop	★★★
絕不後悔	5:31	杜德偉	Timeless Classics	Pop	★★★★
放一顆心	4:42	杜德偉	Timeless Classics	Pop	★★
讓愛那麼愉快	4:25	杜德偉	Timeless Classics	Pop	★★★★
一起看月亮	4:38	杜德偉	Timeless Classics	Pop	★★
True Love	4:07	杜德偉	Timeless Classics	Pop	★★
Don't Go	4:58	杜德偉	Timeless Classics	Pop	★★★★
無心傷害	4:58	杜德偉	Timeless Classics	Pop	★★
鍾愛一生(Gospel 1998 新版)	5:01	杜德偉	Timeless Classics	Pop	★★★
真的想你	4:46	杜德偉	Timeless Classics	Pop	★★★
讓自己快樂(Funk Mix Version)	3:17	杜德偉	Timeless Classics	Pop	★★
Automatic (Johnny Vicious Remix)	4:37	宇多田ヒカル	First Love	R&B	★★★★
Give Me A Reason	6:28	宇多田ヒカル	First Love	R&B	★★
Interlude	0:18	宇多田ヒカル	First Love	R&B	★★
Another Chance	5:23	宇多田ヒカル	First Love	R&B	★★★
B&C (Album Version)	4:21	宇多田ヒカル	First Love	R&B	★★★
Never Let Go	3:58	宇多田ヒカル	First Love	R&B	★★★★
time will tell	5:27	宇多田ヒカル	First Love	R&B	★★
甘いワナ ~Paint It, Black	5:02	宇多田ヒカル	First Love	R&B	★
First Love	4:18	宇多田ヒカル	First Love	R&B	★★★★
In My Room	4:19	宇多田ヒカル	First Love	R&B	★★★

Now Selected

Nothing selected

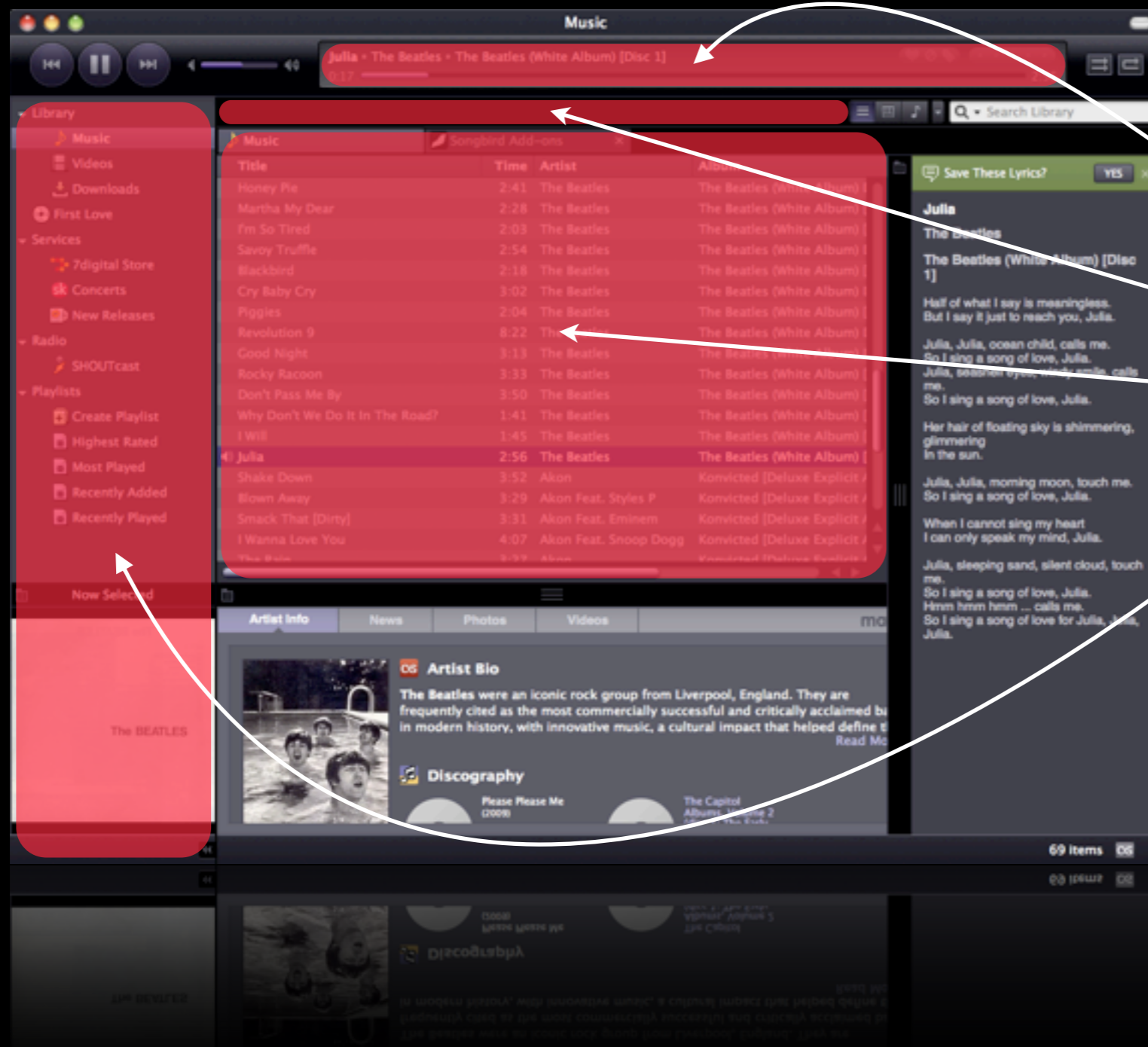
mashTape

Play a track and discover related Flickr photos, YouTube videos, Last.fm biographies, Google News articles, and more!

23 Items

53 Items

Main Window (Songbird:Main)



Faceplate
Toolbar
Tab Browser
Service Pane



Display Panes



Right Sidebar
Content Pane Bottom
Service Pane Bottom



The Tab Browser

The screenshot shows a web browser window with a single tab titled "Plastic Beach by Gorillaz". The browser's address bar shows the URL "http://us.7digital.com/songbird/album/gorillaz/plastic-beach". The page content includes the 7digital logo, a search bar, and navigation links like "Sign In", "Locker", and "Help". The main content area displays the album "Plastic Beach" by Gorillaz, released on Mar 08, 2010, with a price of \$7.77. A "File Details" box lists 16 tracks in MP3 format at 320kbps. Below this is a tracklist table.

Tr...	Title	Time	Artist	Album	Track Pr...	Ad
1	Orchestral Intro (Feat. sinfonia VIVA)	1:09	Gorillaz	Plastic Beach	\$0.99	
2	Welcome To The World of The Plastic Beach (F...	3:34	Gorillaz	Plastic Beach	\$0.99	
3	White Flag (Feat. Bashy, Kano and The Nation...	3:44	Gorillaz	Plastic Beach	\$0.99	
4	Rhinestone Eyes	3:20	Gorillaz	Plastic Beach	\$0.99	
5	Stylo (Album Version) (Feat. Mos Def and Bob...	4:30	Gorillaz	Plastic Beach	\$0.99	
6	Superfast Jellyfish (Feat. Gruff Rhys and De La...	2:54	Gorillaz	Plastic Beach	\$0.99	
7	Empire Ants (Feat. Little Dragon)	4:44	Gorillaz	Plastic Beach	\$0.99	
8	Glitter Freeze (Feat. Mark E Smith)	4:03	Gorillaz	Plastic Beach	\$0.99	
9	Some Kind of Nature (Feat. Lou Reed)	2:59	Gorillaz	Plastic Beach	\$0.99	



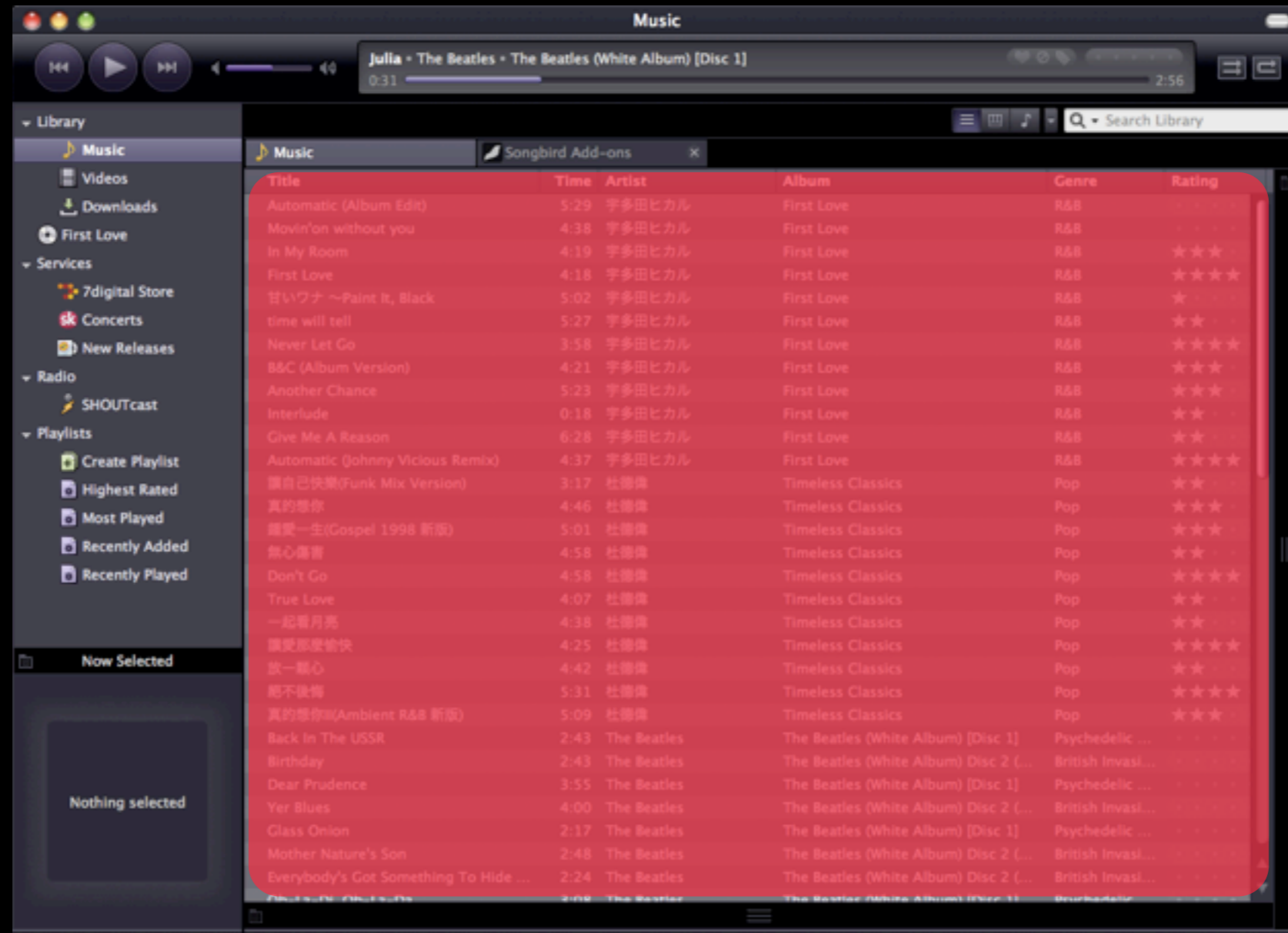
Media Tab (First Tab)

The screenshot shows the iTunes Music application window. At the top, there is a playback control bar with buttons for play/pause, previous, and next, along with a progress slider. The current track is "Julia" by The Beatles from the album "The Beatles (White Album) [Disc 1]". Below the playback bar is a sidebar on the left with a "Library" section containing "Music", "Videos", "Downloads", "First Love", "Services" (7digital Store, Concerts, New Releases), "Radio" (SHOUTcast), and "Playlists" (Create Playlist, Highest Rated, Most Played, Recently Added, Recently Played). The main area displays a table of music tracks. The table has columns for Title, Time, Artist, Album, Genre, and Rating. The tracks listed include songs by The Beatles (e.g., "Automatic (Album Edit)", "Movin'on without you", "In My Room") and other artists like 宇多田ヒカル and 杜德偉. The bottom right corner of the window shows "69 Items" and a search bar.

Title	Time	Artist	Album	Genre	Rating
Automatic (Album Edit)	5:29	宇多田ヒカル	First Love	R&B	. . . .
Movin'on without you	4:38	宇多田ヒカル	First Love	R&B	. . . .
In My Room	4:19	宇多田ヒカル	First Love	R&B	★ ★ ★ .
First Love	4:18	宇多田ヒカル	First Love	R&B	★ ★ ★ ★
甘いワナ ~Paint It, Black	5:02	宇多田ヒカル	First Love	R&B	★ . . .
time will tell	5:27	宇多田ヒカル	First Love	R&B	★ ★ . .
Never Let Go	3:58	宇多田ヒカル	First Love	R&B	★ ★ ★ ★
B&C (Album Version)	4:21	宇多田ヒカル	First Love	R&B	★ ★ ★ .
Another Chance	5:23	宇多田ヒカル	First Love	R&B	★ ★ ★ .
Interlude	0:18	宇多田ヒカル	First Love	R&B	★ ★ . .
Give Me A Reason	6:28	宇多田ヒカル	First Love	R&B	★ ★ . .
Automatic (Johnny Vicious Remix)	4:37	宇多田ヒカル	First Love	R&B	★ ★ ★ ★
讓自己快樂(Funk Mix Version)	3:17	杜德偉	Timeless Classics	Pop	★ ★ . .
真的想你	4:46	杜德偉	Timeless Classics	Pop	★ ★ ★ .
鍾愛一生(Gospel 1998 新版)	5:01	杜德偉	Timeless Classics	Pop	★ ★ ★ .
無心傷害	4:58	杜德偉	Timeless Classics	Pop	★ ★ . .
Don't Go	4:58	杜德偉	Timeless Classics	Pop	★ ★ ★ ★
True Love	4:07	杜德偉	Timeless Classics	Pop	★ ★ . .
一起看月亮	4:38	杜德偉	Timeless Classics	Pop	★ ★ . .
讓愛那麼愉快	4:25	杜德偉	Timeless Classics	Pop	★ ★ ★ ★
放一顆心	4:42	杜德偉	Timeless Classics	Pop	★ ★ . .
絕不後悔	5:31	杜德偉	Timeless Classics	Pop	★ ★ ★ ★
真的想你III(Ambient R&B 新版)	5:09	杜德偉	Timeless Classics	Pop	★ ★ ★ .
Back In The USSR	2:43	The Beatles	The Beatles (White Album) [Disc 1]	Psychedelic ...	. . . .
Birthday	2:43	The Beatles	The Beatles (White Album) Disc 2 (...)	British Invasi...	. . . .
Dear Prudence	3:55	The Beatles	The Beatles (White Album) [Disc 1]	Psychedelic ...	. . . .
Yer Blues	4:00	The Beatles	The Beatles (White Album) Disc 2 (...)	British Invasi...	. . . .
Glass Onion	2:17	The Beatles	The Beatles (White Album) [Disc 1]	Psychedelic ...	. . . .
Mother Nature's Son	2:48	The Beatles	The Beatles (White Album) Disc 2 (...)	British Invasi...	. . . .
Everybody's Got Something To Hide ...	2:24	The Beatles	The Beatles (White Album) Disc 2 (...)	British Invasi...	. . . .
Ob-La-Di, Ob-La-Do	3:08	The Beatles	The Beatles (White Album) [Disc 1]	Psychedelic ...	. . . .



Media Page (songbird:MediaPage)



Songbird:MediaPage

refers specifically to the media browser
NOT all tab/web browser instances



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Web Playlist

The screenshot shows a web browser window with the URL `http://us.7digital.com/songbird/album/gorillaz/plastic-beach`. The page displays the album 'Plastic Beach' by Gorillaz, released on Mar 08, 2010, for \$7.77. The track list is as follows:

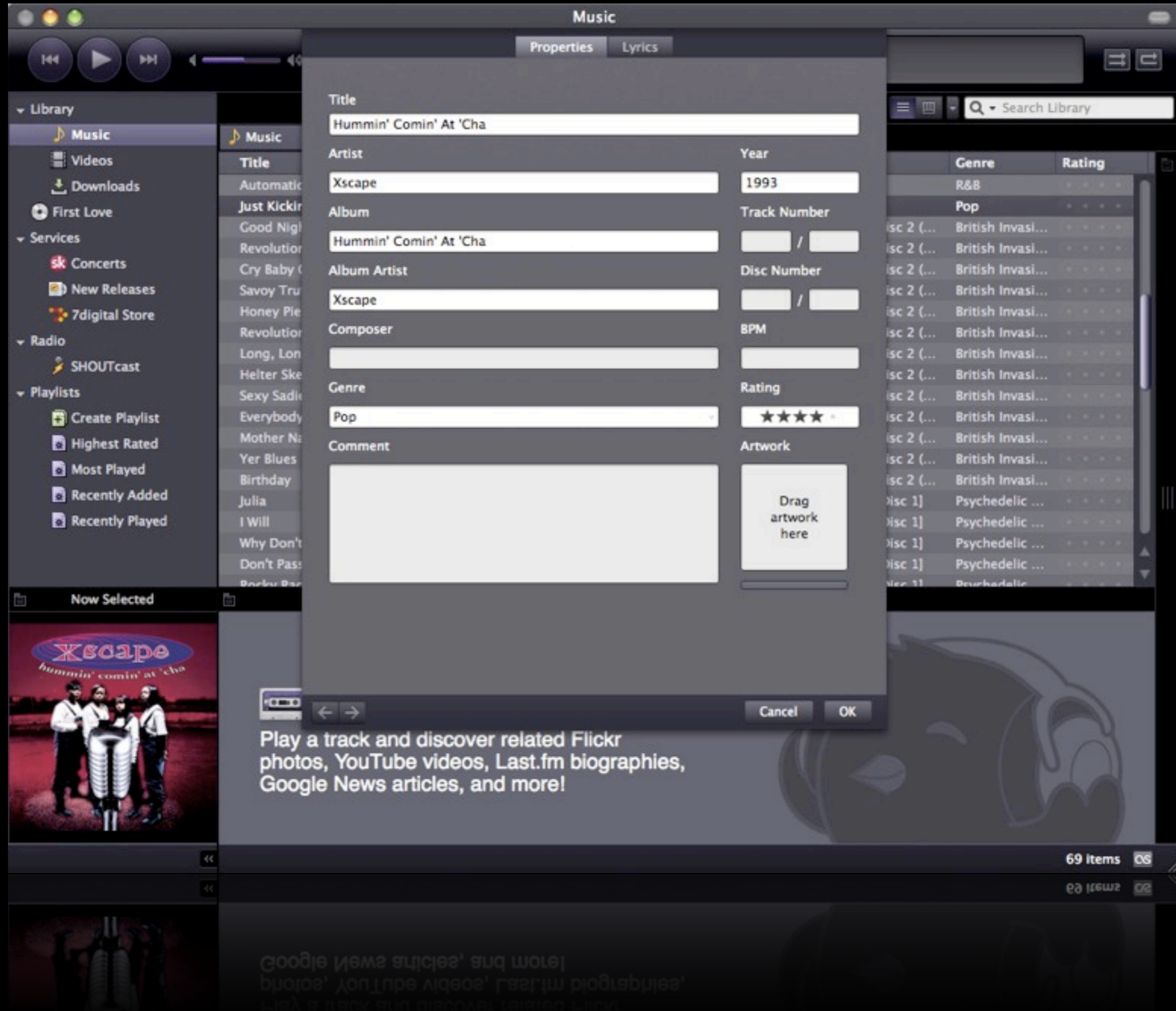
Track	Title	Time	Artist	Album	Track Price
1	Orchestral Intro (Feat. sinfonia VIVA)	1:09	Gorillaz	Plastic Beach	\$0.99
2	Welcome To The World of The Plastic Beach (F...	3:34	Gorillaz	Plastic Beach	\$0.99
3	White Flag (Feat. Bashy, Kano and The Nation...	3:44	Gorillaz	Plastic Beach	\$0.99
4	Rhinestone Eyes	3:20	Gorillaz	Plastic Beach	\$0.99
5	Stylo (Album Version) (Feat. Mos Def and Bob...	4:30	Gorillaz	Plastic Beach	\$0.99
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7	Empire Ants (Feat. Little Dragon)	4:44	Gorillaz	Plastic Beach	\$0.99
8	Glitter Freeze (Feat. Mark E Smith)	4:03	Gorillaz	Plastic Beach	\$0.99
9	Some Kind of Nature (Feat. Lou Reed)	2:59	Gorillaz	Plastic Beach	\$0.99

The interface also includes a sidebar with navigation options like Library, Music, Videos, Downloads, and Playlists. A 'Now Selected' section is currently empty, showing 'Nothing selected'. The bottom of the browser shows a playlist with 16 items and a search bar.



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Track Editor Dialog



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Preferences

Add-ons

Extensions Languages

-  **7digital Music Store** 1.7.2b1.1610
Integration with the 7digital music store
-  **Concerts** 1.0.5pre.1610
See when your library's artists are touring in your city. Concert and ticketing informatio...
-  **Gracenote Metadata Lookup Provider** 1.0.3.1610
Enables Gracenote metadata provider for CD lookup.
-  **Hype Machine site** 1.0.1
Integrate the Hype Machine site into Songbird
-  **Last.fm** 1.0.3.1610
Publish your playback history to Last.fm and listen to Last.fm Radio
-  **LyricMaster** 1.7.5
Displays and Gathers Lyrics







Install... Find Updates [Get Extensions](#)



PrefPane

Add-ons

Extensions Languages

-  **7digital Music Store** 1.7.2b1.1610
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Publish your playback history to Last.fm and listen to Last.fm Radio
-  **LyricMaster** 1.7.5
Displays and Gathers Lyrics

Install... Find Updates Get Extensions



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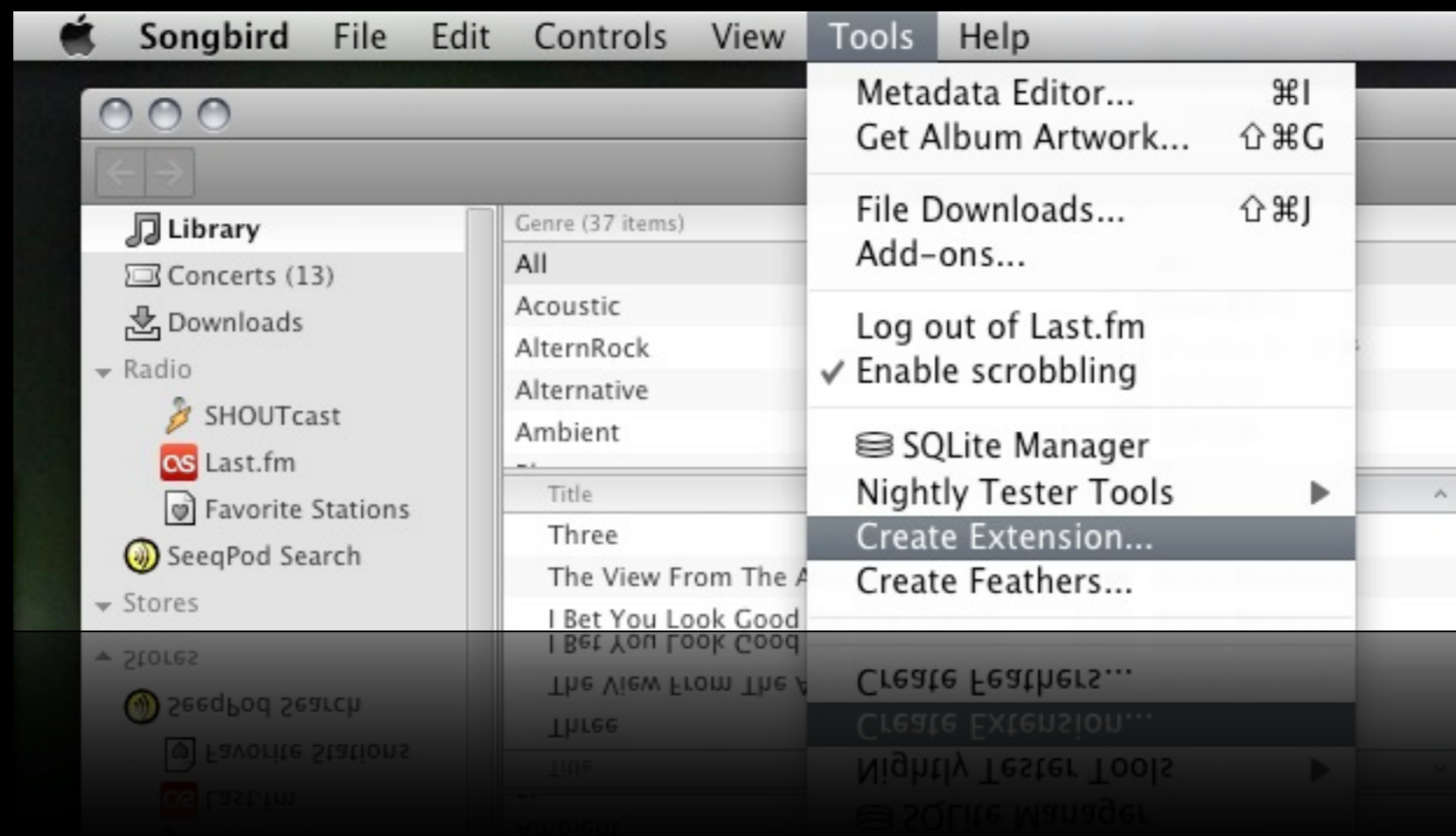


Extensions

- Just like Mozilla or Firefox extensions
- An XPI (just a ZIP!) self-contained
- Cross platform, or platform specific
- Client side install, requires restart
- Javascript, Chrome
- Not a browser plugin



Extension Wizard



Extension Wizard

New Extension

This wizard will help you create a Songbird extension. It will generate the necessary project files, and then register the project folder as a test add-on.

To build an extension we recommend you have:

- A text editor such as MetaPad or TextMate
- A basic understanding of JavaScript, XUL, and CSS
- An image manipulation tool such as Photoshop or GIMP

[Learn about creating extensions](#)

Cancel Go Back Continue

Extension Wizard

General Information

Add-On Name:

Description:

Homepage URL:

Version:

[Learn about install manifest entries](#)

Cancel Go Back Continue

Extension Wizard

General Information

Files in Songbird are referenced using chrome package URLs such as `chrome://packagename/content/example.html`. Enter a unique package name for your add-on.

Package Name:

[Learn about chrome package URLs](#)

Cancel Go Back Continue

Extension Wizard

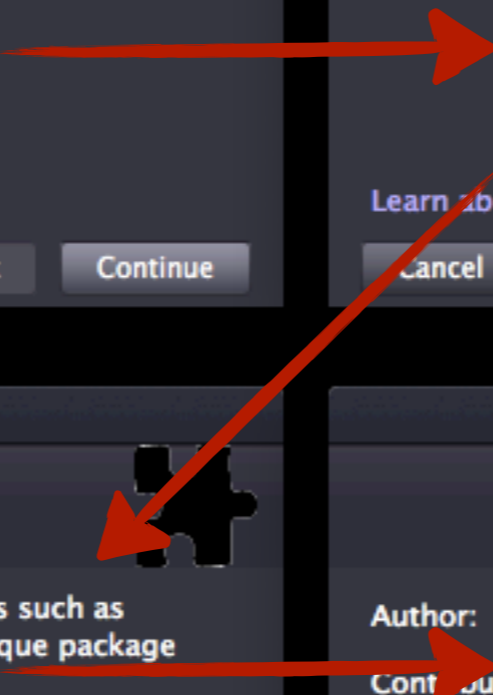
General Information

Author:

Contributors:

[Learn about install manifest entries](#)

Cancel Go Back Continue



Extension Wizard

UI Options

- Toolbar button
- Display pane
- Media page
- Main menu
- Preferences
- About box


Cancel Go Back Continue

Extension Wizard

Add-On Project Folder

This wizard will generate the content and manifest files needed for an add-on.

Please select a project folder. We recommend you use an empty folder to make development and packaging easier.

Folder: 

Cancel Go Back Continue

Extension Wizard

Ready to Generate

Completing this wizard will:

- Create manifest files with your information
- Generate JavaScript, XUL, and CSS for the selected UI items
- Register your project folder as a test add-on

To load your extension, restart Songbird.

Restart Songbird automatically

Then, you can make changes to your project files and see the changes in your Songbird by simply selecting 'Refresh UI' from the Tools menu.

[Learn about creating extensions](#)

Cancel Go Back Done

and then ...



Extension Loaded

[JavaScript Application]
Hawtness: Hello World!

OK

Library

- Music
- Videos
- Downloads

Playlists

- Create Playlist
- Highest Rated
- Most Played
- Recently Added
- Recently Played

Now Selected



Nothing selected

Your Extension Has Been Loaded

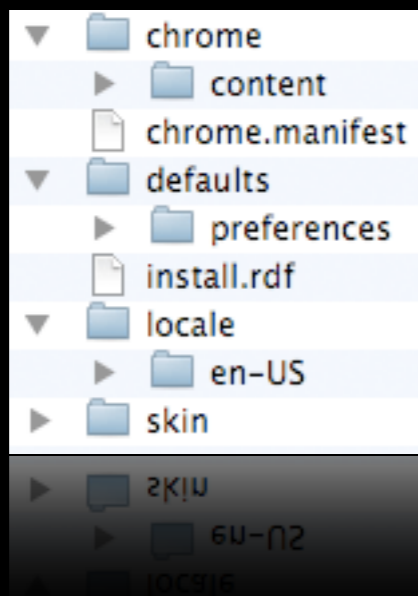
The extension project at `/Users/pj/Desktop/hawtness/chrome/content` has been installed as a [test add-on](#), and is now being displayed.

To begin customizing Songbird, try editing the files in the `chrome/content` folder. To see your changes, select the Refresh UI command from the Tools menu.

To learn more about creating extensions, visit the [Songbird Developer Site](#), [XULPlanet](#), and the [Mozilla Developer Center](#).



Extension Setup



Key Files:

install.rdf

- describes your extension
- compatibility
- versioning

chrome.manifest

- tells Songbird what to do with your code
- overlays to install
- locales available
- chrome/skin paths

http://wiki.songbirdnest.com/Developer/Articles/Getting_Started/Developing_Extensions

<http://www.robertnyman.com/2009/01/24/how-to-develop-a-firefox-extension/>



Overlays

XUL files that describe UI content

- Add additional UI
- Override small pieces of a XUL file
 - Reuse specific UI pieces
- Can load Javascript via `<script/>`
- Use the `ID` attribute to determine placement
 - `position` attribute hint
 - `insertafter`, `insertbefore`



TM

Common XUL Overlays

<http://src.songbirdnest.com/source/xref/client/app/content/xul/>

<http://src.songbirdnest.com/source/xref/client/feathers/gonzo/chrome/content/xul/>

windowtype:Songbird:Main

- main Songbird window itself

windowtype:Songbird:MediaPage

- Songbird media pages (library, playlists, etc.)

chrome://songbird/content/xul/layoutBaseOverlay.xul

- general good initialization overlay

chrome://songbird/content/xul/layoutWithBrowserOverlay.xul

chrome://songbird/content/xul/layoutWithoutBrowserOverlay.xul

- specific layout templates (for Feathers that either do or don't incorporate browsers)

chrome://browser/content/preferences/preferences.xul

chrome://songbird/content/xul/statusBarOverlay.xul

chrome://songbird/content/xul/menuOverlay.xul

chrome://songbird/content/xul/browserToolbarOverlay.xul

- other good UI points



Enhancing the Library Example

```
chrome.manifest:  
content blinky chrome/content  
overlay windowtype:Songbird:MediaPage chrome://blinky/content/foo.xul
```

```
foo.xul:  
<?xml version="1.0"?>  
<overlay  
  xmlns="http://www.mozilla.org/keymaster/gatekeeper/there.is.only.xul"  
  xmlns:html="http://www.w3.org/1999/xhtml"  
  id="no_significance_whatsoever">  
  <hbox>  
    <html:blink>h0ttac0z!</html:blink>  
  </hbox>  
</overlay>
```



TM

Music

Library

- Music
- Videos
- Downloads
- Playlists
 - Create Playlist
 - Highest Rated
 - Most Played
 - Recently Added
 - Recently Played

Title	Time	Artist	Album	Genre	Rating
Dance Tonight	4:06	Lucy Pearl	We Got It Covered!	R&B	☆☆☆☆
Fortunate	4:59	Maxwell	Life	Soundtracks	☆☆☆☆
Return Of The Mack	3:42	Mo' Reese Marks	Return Of The Mack	Dance & DJ	☆☆☆☆
Damn I Wish I Was Your Lover	5:24	Sophie B. Hawkins	Beautiful Girl	R&B	☆☆☆☆
Heard It All Before	4:58	Sunshine Anderson	We Got It Covered!	R&B	☆☆☆☆


Now Selected

Nothing selected

h0ttac0z!

5 items

2 [G]M?



The Songbird Library



Adding an item

```
// Get the library manager service
var libraryManager = Components.classes["@songbirdnest.com/Songbird/library/Manager;1"]
    .getService(Components.interfaces.sbILibraryManager);

// Get the user's main library
var mainLib = libraryManager.mainLibrary;

// Need to construct an IO URI representing the actual resource (e.g. test.mp3)
var ioService = Components.classes["@mozilla.org/network/io-service;1"]
    .getService(Components.interfaces.nsIIOService);
var songURI = ioService.newURI("http://whacked.net/test.mp3", null, null);

// Set any properties we may want to set
var props = Components.classes["@songbirdnest.com/Songbird/Properties/MutablePropertyArray;1"]
    .createInstance(Ci.sbIMutablePropertyArray);
props.appendProperty("http://whacked.net/#myWhizzyProperty", "OMG! BEST SONG EVER!");

// Add the song to the user's library
var mySong = mainLib.createMediaItem(songURI, props);
```



Finding an item

```
// If you know the GUID....
var mySong = mainLib.getItemByGuid("some_guid_here");

// ... or you can get it by index in the list/library
var mySong = mainLib.getItemByIndex(42);

// ... or you can enumerate it by a property
var myListener = {
  items: [],
  onEnumerationBegin: function() {},
  onEnumeratedItem: function(list, item) {
    this.items.push(item);
  }
  onEnumerationEnd: function() {}
};

mainLib.enumerateItemsByProperty("http://whacked.net/#myWhizzyProperty",
  "OMG! BEST SONG EVER!", myListener,
  Components.interfaces.sblMediaList.ENumerationType.Locking);

alert(myListener.items.length + " items found with 'Some Arbitrary Value'");
```



Removing an item

```
// ... from previous slide

// iterate through each item that matched our enumeration
for (mySong in myListener.items) {
    // remove it from the library
    mainLib.remove(mySong);
}
```



TM

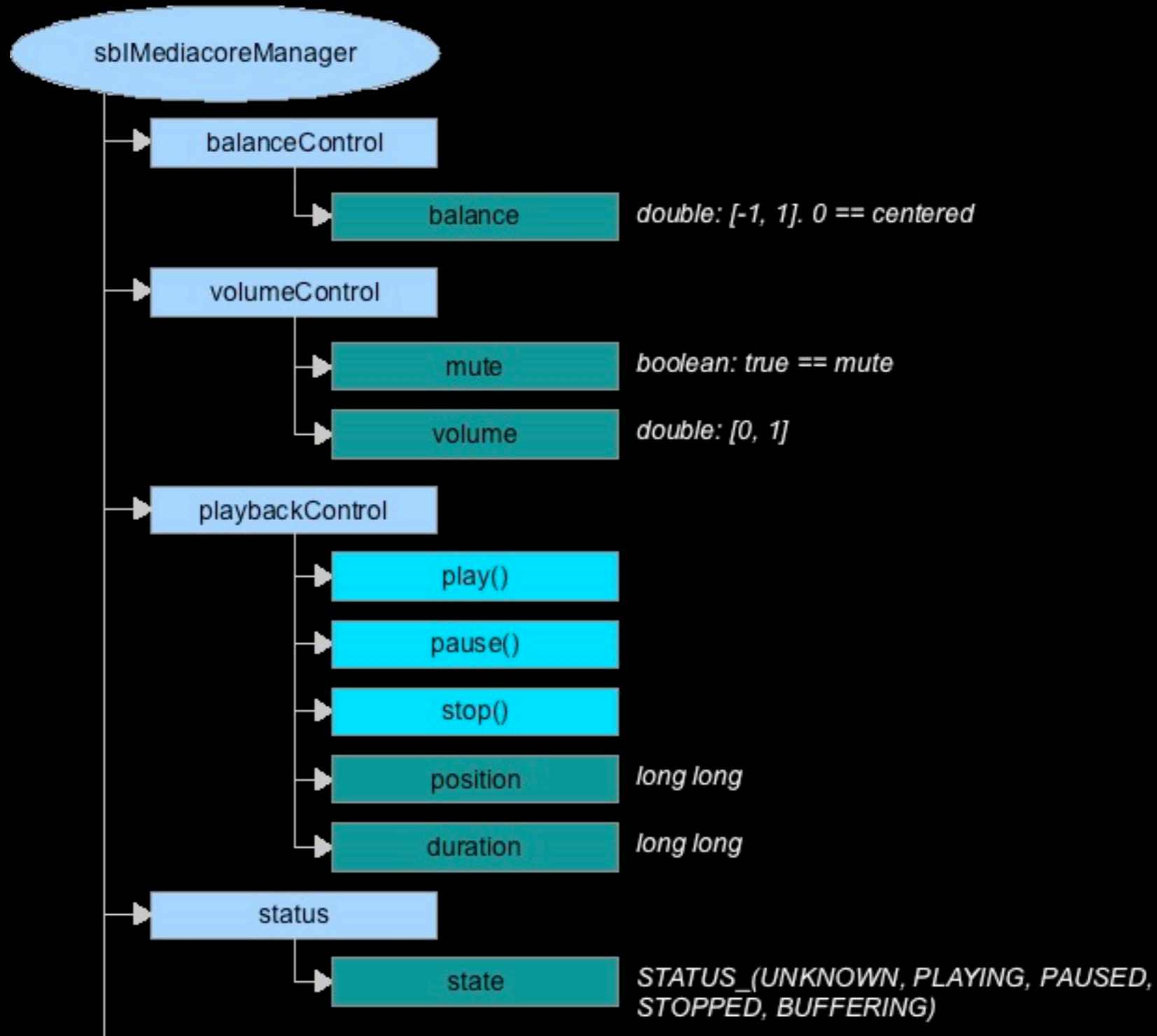


Managing Playback

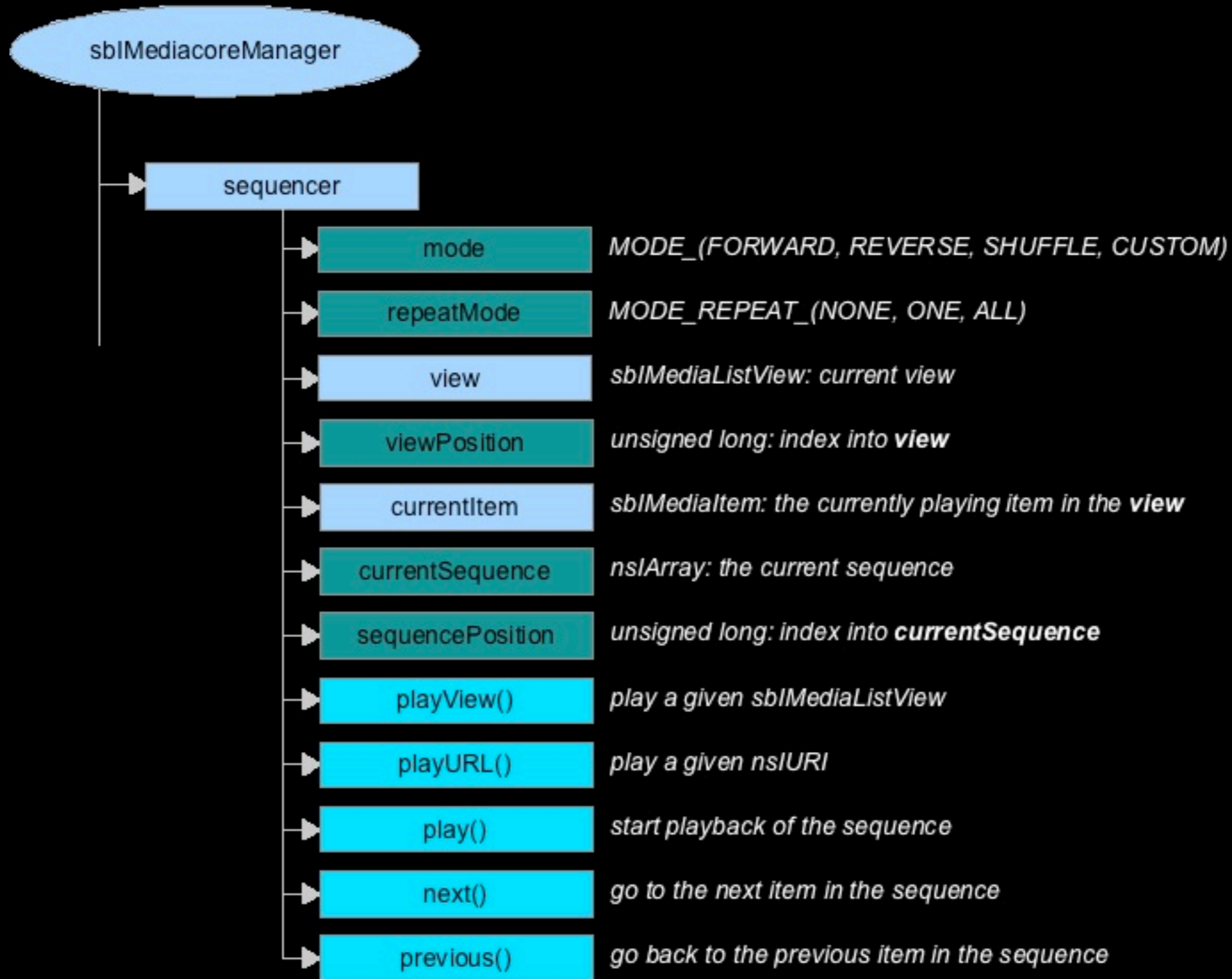


TM

Media Core APIs



Media Core APIs



Mediacore Manager

IDL: <http://src.songbirdnest.com/source/xref/client/components/mediacore/base/public/sbIMediacoreManager.idl>

API Reference: <http://developer.songbirdnest.com/add-on-api/docs/trunk/interfaces/sbIMediacoreManager.html>

- Get a reference to the Mediacore Manager:

```
var gMM = Components.classes["@songbirdnest.com/Songbird/Mediacore/Manager;1"]  
          .getService(Components.interfaces.sbIMediacoreManager);
```

- The central point for all media playback/event management
- Most playback/sequence/control handled by `.playbackControl` or `.sequencer`



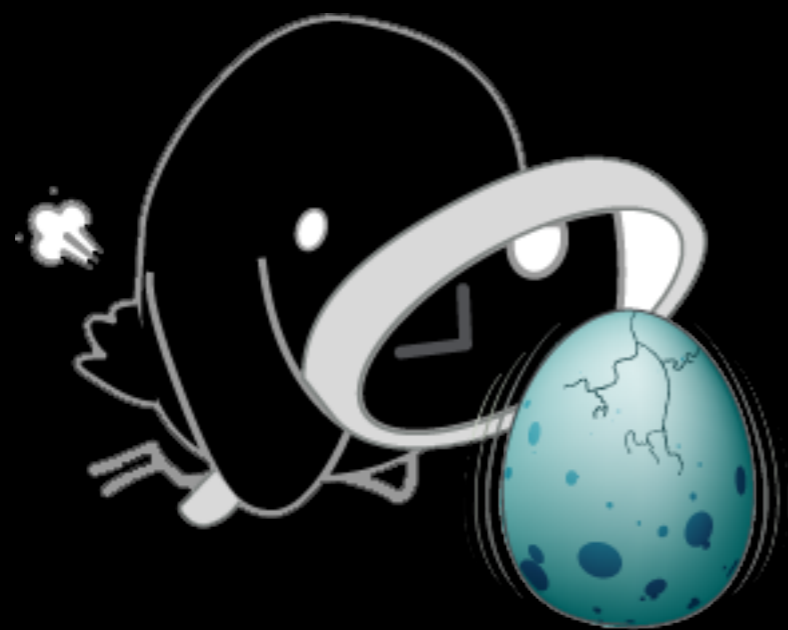
Mediacore Manager

- Events:
 - sbIMediacoreEvent
 - http://developer.songbirdnest.com/add-on-api/docs/trunk/interfaces/sb_i_mediacore_event.html
 - Sample events: Metadata change, Duration change, Track change
 - Stream start, Stream End, etc.

- Add a listener:

```
const Ci = Components.interfaces;
var myListener = {
  onMediacoreEvent: function(ev) {
    switch (ev.type) {
      case Ci.sbIMediacoreEvent.TRACK_CHANGE:
        var mediaItem = ev.data;
        alert("track changed to: " + mediaItem.guid);
        break;
      case Ci.sbIMediacoreEvent.STREAM_END:
        alert("track has ended");
        break;
      case Ci.sbIMediacoreEvent.STREAM_STOP:
        alert("track was stopped");
        break;
    }
  }
}
gMM.addListener(myListener);
```





What's going on?



TM

Data Remotes

Asynchronously observe specific data remotes and trigger listeners based on data changes in the player, e.g.

- Track change
- Play/pause state
- Volume change/mute

What's playing?

- metadata.title
- metadata.artist
- metadata.album



Data Remotes

Example:

```
myObserver = {  
  observe: function ( aSubject, aTopic, aData) {  
    if (aTopic == "faceplate.playing" && aData == 1) {  
      var medialtem = gMM.sequencer.currentItem;  
      var artist = medialtem.getProperty(SBProperties.artistName);  
      alert(artist + "? weren't they a one-hit wonder?");  
    }  
  }  
}
```

```
Components.utils.import("resource://app/components/sbProperties.jsm");  
const SB_NewDataRemote = new Components.Constructor(  
  "@songbirdnest.com/Songbird/DataRemote;1", "sbIDataRemote", "init");
```

```
var sbDataRemote = SB_NewDataRemote("faceplate.playing", null);  
sbDataRemote.bindObserver(myObserver, true);
```



Components/Services

<http://src.songbirdnest.com/source/xref/client/components/>

Important components of note:

albumart
commandline
dataremote
dbengine
devices
displaypanes
draganddrop
faceplate
feathers
filesystemevents
integration
job



Components/Services

```
jscodelib  
library  
mediacore  
mediaimport  
mediapages  
playlistcommands  
property  
remoteapi  
servicepane  
watchfolder
```

trunk/components/<component_name>/public/*.idl
are your friends. know them. love them.



Service Pane

- Composed of service pane nodes (`sbIServicePaneNode`)

<http://src.songbirdnest.com/source/xref/client/components/servicepane/public/sbIServicePaneService.idl>

- Libraries
- Devices
 - Download Device
 - Portable Music Players
- Bookmarks
- History
- Playlists



Service Pane

```
// Get the service pane first, and initialize it
var SPS = Components.classes['@songbirdnest.com/servicepane/service;1']
                .getService(Components.interfaces.sblServicePaneService);
SPS.init();

// Now get the bookmark service
var BMS = Components.classes['@songbirdnest.com/servicepane/bookmarks;1']
                .getService(Components.interfaces.sblBookmarks);

// Create the "Music Blogs" folder
var musicBlogsFolderNode = BMS.addFolder("Music Blogs");

// Make a HTTP request to get the Birdhouse Media Web Directory (synchronously for now)
req = new XMLHttpRequest();
req.open('GET', 'http://birdhouse.songbirdnest.com/directory', false);
req.send(null);

// Parse the output
req.responseText.match(/Play Music Blogs\s*<ul>\s*([\s\S]*?)<\ul>/);
musicBlogsList = RegExp.$1;

var pattern = /<a href="([^\"]+)">(.)<\a>/g;
// For each blog, parse the URL and add it to our folder we created above
while ((result = pattern.exec(musicBlogsList)) != null) {
    var node = BMS.addBookmarkAt(result[1], result[2], null, musicBlogsFolderNode, null);
}

// Tell the service pane to save our bookmarks
SPS.save();
```



TM

Media Views/Pages

- Extensible custom views of a user's media
- Applicable to:
 - Libraries
 - Playlists
 - Downloads
- HTML or XUL
- Can incorporate album art, Flash, SVG, etc.





Search Library

Library

Concerts (13)

Downloads

Radio

SHOUTcast

Last.fm

Favorite Stations

SeeqPod Search

Stores

7digital Music Store

Playlists

Purchased

Genius

On-The-Go 1

On-The-Go 2

Random

Vienna Teng Best



The Shins

Now Playing

Nothing playing

Title	Time	Artist	Album	Genre	Rating	Lyr
最終電車	5:09	奥華子	恋手紙	JPop	★★★★☆	
ガーネット (弾き語り)	5:16	奥華子	ガーネット	JPop	☆☆☆☆	
しあわせの鏡	5:17	奥華子	恋手紙	JPop	★★★★☆	
変わらないもの	4:45	奥華子	ガーネット	JPop	★★★★☆	

1914 items CS



TM

- Library
- Concerts (13)
- Downloads
- Radio
 - SHOUTcast
 - Last.fm
 - Favorite Stations
 - SeeqPod Search
- Stores
 - 7digital Music Store
- Playlists
 - Purchased
 - Genius
 - On-The-Go 1
 - On-The-Go 2
 - Random
 - Vienna Teng Best



My Space

Title	Time	Artist	Album	Genre	Rating
Santa Fe	4:59	アンジェラ・アキ	Kiss Me Good-Bye	JPop	☆☆☆☆
青い影	4:49	アンジェラ・アキ	Kiss Me Good-Bye	JPop	☆☆☆☆
Kiss Me Good-Bye -featured in FINA...	4:58	アンジェラ・アキ	Kiss Me Good-Bye	JPop	☆☆☆☆
越來越不懂	3:49	蔡健雅	My Space	Chinese Pop	☆☆☆☆
連雨文	5:08	蔡健雅	My Space	Chinese Pop	☆☆☆☆
Blower's Daughter	4:48	蔡健雅	My Space	Chinese Pop	☆☆☆☆
Change the World	4:15	蔡健雅	My Space	Chinese Pop	☆☆☆☆
空白格	3:53	蔡健雅	My Space	Chinese Pop	☆☆☆☆
記念	3:58	蔡健雅	My Space	Chinese Pop	☆☆☆☆
思念	3:56	蔡健雅	My Space	Chinese Pop	★★★★☆
呼吸	4:52	蔡健雅	My Space	Chinese Pop	☆☆☆☆
Is it over now?	3:30	蔡健雅	My Space	Chinese Pop	☆☆☆☆
依賴	2:59	蔡健雅	My Space	Chinese Pop	☆☆☆☆
對愛渴望	4:25	蔡健雅	My Space	Chinese Pop	☆☆☆☆
We're All Alone	4:25	アンジェラ・アキ	ONE [Mini Album]	JPop	☆☆☆☆

Now Playing

Nothing playing

1914 items OS

Media control bar with play/pause, stop, next, previous buttons, a volume slider, and shuffle/repeat icons.



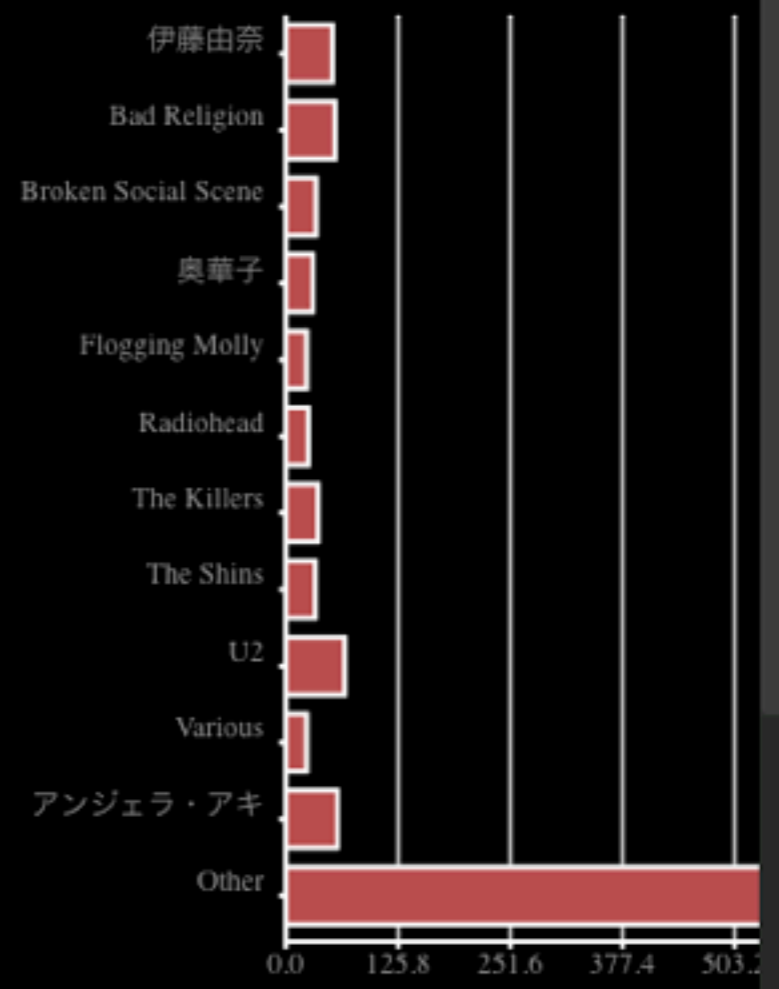
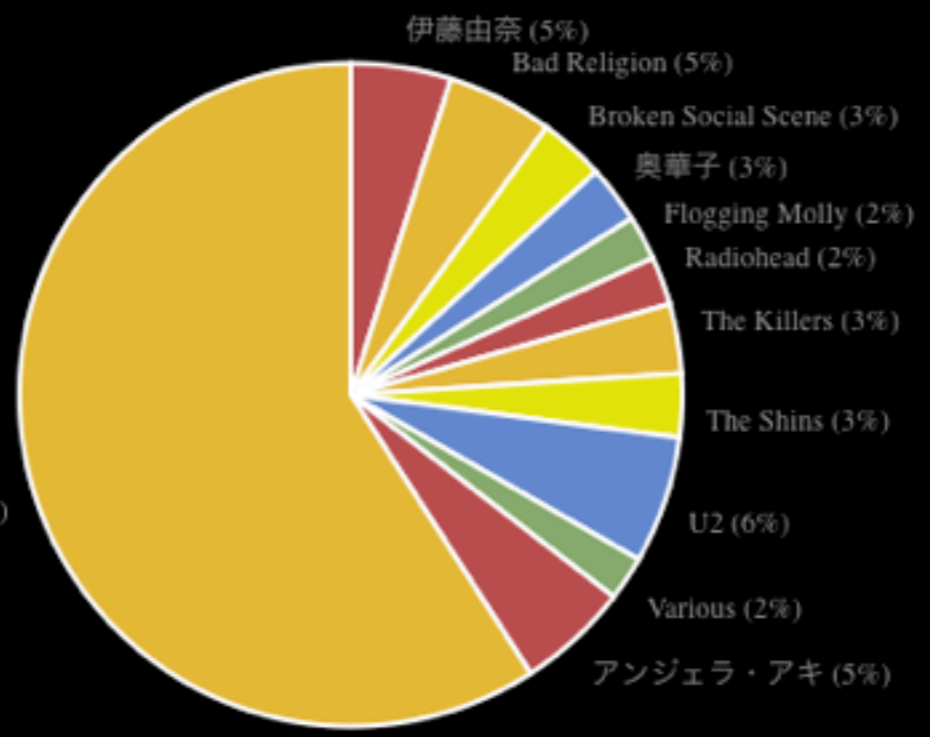
TM



- Birdhouse
- Library
- Downloads
- Playlists
 - Now playing
 - Purchased
 - On-The-Go 1
- Bookmarks
 - Songbird Add-ons
 - Developer Center
 - Report a Bug
 - The Hype Machine
 - Insound
 - SkreemR
 - Web Media History

Library Library

Playlist Metrics



Show information about Artist

at a gl
Number of tracks:
Play length:

1064 items



Test Cases

Test cases are your friends.
Look at them.
Learn from them.
Blatantly copy^W^WLeverage them.

http://src.songbirdnest.com/source/xref/client/components/*/test

e.g. "How do I interact with the library?"

<http://src.songbirdnest.com/source/xref/client/components/library/base/test/>

"How do I use interact with the media core APIs?"

<http://src.songbirdnest.com/source/xref/client/components/mediacore/base/test/>



Debugging

- Setup a development profile
- Install Songbird Developer Tools extension
 - <http://addons.songbirdnest.com/extensions/detail/68>
 - Disable the XUL cache
- Outputting
 - alert() - pop up a user viewable dialog
 - dump() - output to the system console/terminal
 - Components.utils.reportError()
- Use the Error Console



(Real) Debugging

- Venkman Javascript Debugger
 - Built into Songbird
 - <http://www.mozilla.org/projects/venkman/> (for docs)
 - http://www.svendtofte.com/code/learning_venkman/
 - <http://www.webreference.com/programming/javascript/venkman/>



What is Songbird?
UI Layout and Terminology
Extensions
Feathers
Webpage API
Search Plug-ins
Resource Roundup



Feathers

- A way of skinning/theming Songbird
- Underneath, the exact same as an extension
 - XPI, cross platform, self-contained
 - Client side install, requires restart
- Typically just CSS and images
- Optional layout changes involve XUL
- Use Web technologies:
 - Flash
 - SVG



- Library
- (Concerts (13
- Downloads
- Radio
 - SHOUTcast
 - Last.fm
 - Favorite Stations
 - SeeqPod Search
- Stores
 - 7digital Music Store
- Playlists
 - Purchased
 - Genius
 - On-The-Go 1
 - On-The-Go 2
 - Random
 - Vienna Teng Best

Genre (37 items)	Artist (320 items)	Album (272 items)
All	All	All
Acoustic	HowL&早ナ	あたらしい日々
AlternRock	アンジェラ・アキ	ガーネット
Alternative	コブクロ	ブレイス・オブ・ビリオド
Ambient	上木彩矢	ロッタラ ロッタラ

Title	Time	Artist	Album	Genre	Rating
最終電車	5:09	奥華子	恋手紙	JPop	★★★★★
ガーネット (弾き語り)	5:16	奥華子	ガーネット	JPop	★★★★★
しあわせの鏡	5:17	奥華子	恋手紙	JPop	★★★★★
変わらないもの	4:45	奥華子	ガーネット	JPop	★★★★★
忘れられた記念日	3:18	奥華子	奥華子 vol.3	JPop	★★★★★
DROP	4:47	奥華子	恋手紙	JPop	★★★★★
ガーネット(主題歌)	5:19	奥華子	ガーネット	JPop	★★★★★
空に光るクローバー	4:11	奥華子	恋手紙	JPop	★★★★★
透明傘	5:32	奥華子	恋手紙	JPop	★★★★★
迷路	5:29	奥華子	恋手紙	JPop	★★★★★
太陽の下で	4:09	奥華子	恋手紙	JPop	★★★★★
三度目の冬	4:12	奥華子	恋手紙	JPop	★★★★★
鏡	4:31	奥華子	恋手紙	JPop	★★★★★
めぐり逢う世界	6:12	奥華子	恋手紙	JPop	★★★★★
手紙	5:11	奥華子	恋手紙	JPop	★★★★★
あした晴れたら	3:35	奥村初音	ありがとう	JPop	★★★★★
I'm your side	3:19	上木彩矢	Are you happy now?	JPop	★★★★★
ホントはね	4:38	奥村初音	ありがとう	JPop	★★★★★
Good-bye my love	3:53	上木彩矢	Are you happy now?	JPop	★★★★★
It's a beautiful day	3:57	上木彩矢	Are you happy now?	JPop	★★★★★
Are you happy now?	2:58	上木彩矢	Are you happy now?	JPop	★★★★★
Just take my heart	3:54	上木彩矢	Are you happy now?	JPop	★★★★★

Now Playing

Nothing playing

1914 items

Control buttons: Play/Pause, Previous, Next, Repeat, Shuffle, Volume, and a progress bar.





I'm looking for

Enter product name

All Products

Go

Home Music **Film & TV** Games Gossip

What's Hot This Week



Prepare for Valentines with a mushy love classic!

See more

Top Albums

Top Games

Top Tracks

1. Just Dance

Lady GaGa, ...

£0.77

2. Day 'N' Nite

Kid Cudi Vs. ...

£0.77

3. Broken Strings

James Morrison

£0.77

4. Take Me Back

Tinchy Stryder

£0.77

5. Issues

The Saturdays

£0.77

6. Let It Rock

Kevin Rudolf

£0.77

7. Single Ladies

Beyoncé

£0.77

8. Use Somebody

Kings Of Leon

£0.77

9. Heartless

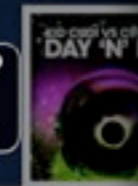
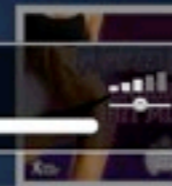
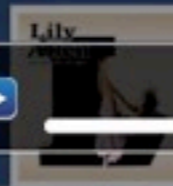
Kanye West

£0.77

10. Sober

Pink

£0.77



eWallet: To shop smarter sign-in or register

Shopping Basket:

0 item(s) £0.00

Maximise basket

Checkout

How to Download

Step by Step Guide

TESCO Digital My Collection HARMONY MEDIA CENTRE

Music Tv & Film View Search your collection

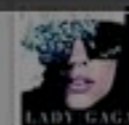
Title	Time	Artist	Album	Genre	Rating
Hallelujah	3:36	Alexandra Burke	Hallelujah	Pop	★★★★★
Warm This Winter	2:34	Gabriella Cilmi	Warm This Winter	Pop	★★★★★
Broken Strings	4:10	James Morrison/Nell...	Songs For You, Truths For Me	Pop	★★★★★
The Circus	3:33	Take That	The Circus	Pop	★★★★★



Working On A Dream
Bruce Springsteen
Released: 26/01/2009

From £7.80

Get it



The Fame
Lady GaGa
Released: 11/01/2009

From £7.80

Get it



Day 'N' Nite
Kid Cudi Vs. Crookers
Released: 11/01/2009

From £0.77

Get it



To Lose My Life...
White Lies
Released: 19/01/2009

From £7.80

Get it



Single Ladies (Pu...
Beyoncé
Released: 10/11/2008

From £0.77

Get it



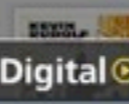
Slumdog Millionai...
Various Artists
Released: 12/01/2009

From £7.80

Get it



Take Me Back (Rad...
Tinchy Stryder, Talo ...
Released: 16/01/2009



Let It Rock (Feat...
Kevin Rudolf, Lil Wa...
Released: 24/11/2008

HITPAC 5
Instant Digital Collections for just £2.97

Tonight: Franz Ferdinand
Only £5.97

Album Of The Week

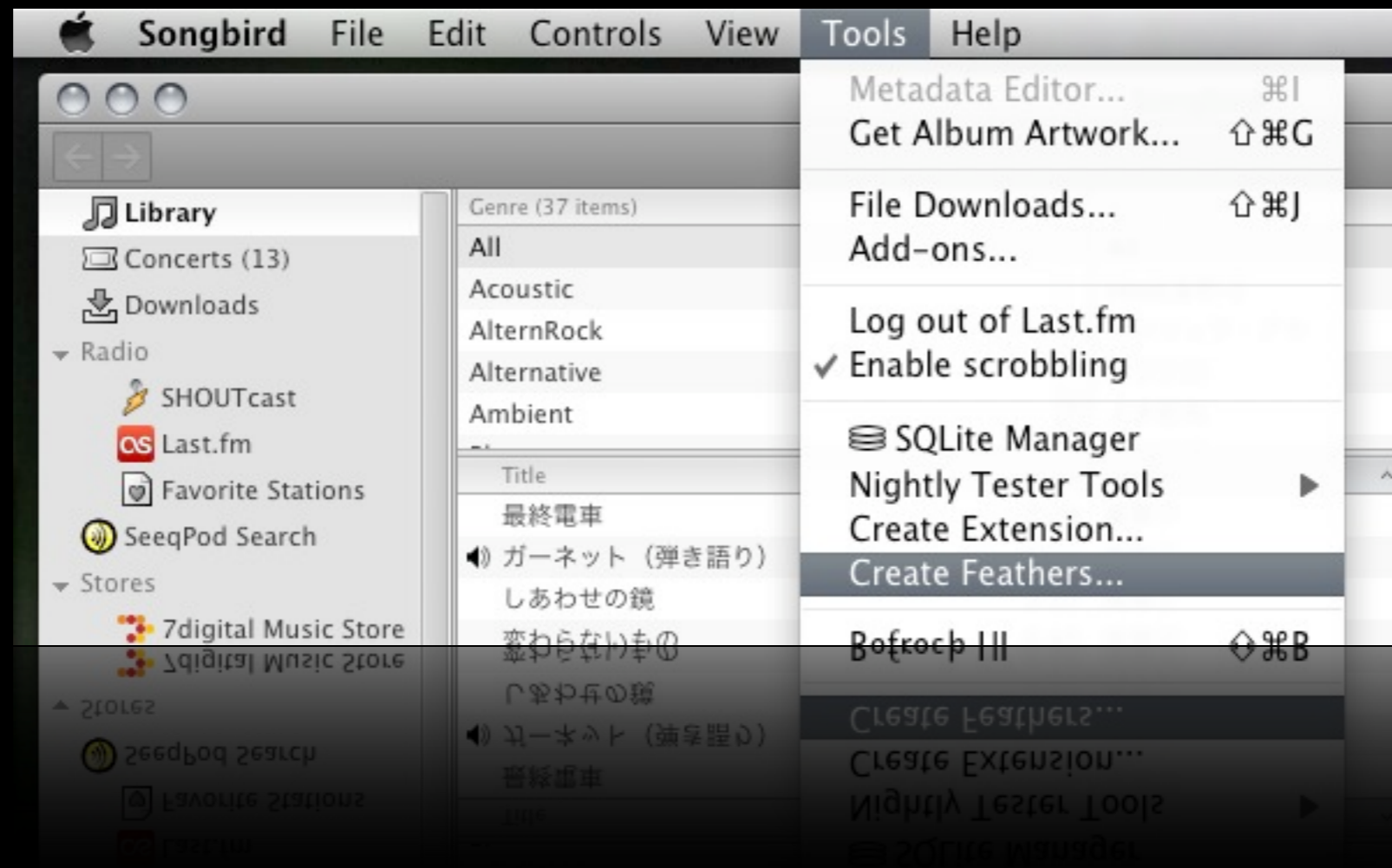
eGift Voucher
From The Ting-Tings to The West Wing
Everyone loves the gift of choice!

CSS

- chrome/skin/*
- colors.css
 - Sets paddings, font, look & feel, some backgrounds
- feathers.css
 - Sets general look & feel, colors, etc.
- html.css
 - Sets add-on HTML iframe L&F (mashTape, LyricMaster, etc.)
- images.css
 - Loads images and sets background images, etc.
- songbird.css
 - Loaded by all Songbird specific XUL windows (e.g. Track Editor)
 - Not loaded by Mozilla/Firefox dialogs (e.g. Preferences)



Feathers Wizard



TM

DOM Inspector / XUL Tools



What is Songbird?
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Search Plug-ins
Resource Roundup



Webpage API

- `songbird` Javascript object
- Full featured remote interaction
- Create site-specific libraries and playlists
- ... or integrate/interact with the user's library
 - User can set privacy settings/rules
 - Web Playlist
- Distinct from Songbird's webpage scraping



TM

Web Playlist

The screenshot shows a web browser window with the URL `http://us.7digital.com/songbird/album/gorillaz/plastic-beach`. The page displays the album 'Plastic Beach' by Gorillaz, released on Mar 08, 2010, by EMI UK. The price is \$7.77. The tracklist is as follows:

Track	Title	Time	Artist	Album	Track Price
1	Orchestral Intro (Feat. sinfonia VIVA)	1:09	Gorillaz	Plastic Beach	\$0.99
2	Welcome To The World of The Plastic Beach (F...	3:34	Gorillaz	Plastic Beach	\$0.99
3	White Flag (Feat. Bashy, Kano and The Nation...	3:44	Gorillaz	Plastic Beach	\$0.99
4	Rhinestone Eyes	3:20	Gorillaz	Plastic Beach	\$0.99
5	Stylo (Album Version) (Feat. Mos Def and Bob...	4:30	Gorillaz	Plastic Beach	\$0.99
6	Superfast Jellyfish (Feat. Gruff Rhys and De La...	2:54	Gorillaz	Plastic Beach	\$0.99
7	Empire Ants (Feat. Little Dragon)	4:44	Gorillaz	Plastic Beach	\$0.99
8	Glitter Freeze (Feat. Mark E Smith)	4:03	Gorillaz	Plastic Beach	\$0.99
9	Some Kind of Nature (Feat. Lou Reed)	2:59	Gorillaz	Plastic Beach	\$0.99

The browser interface includes a sidebar with navigation options like Library, Music, Videos, Downloads, First Love, Services, Radio, and Playlists. The bottom of the browser shows a playlist with 16 items.



WebPlaylist

Can be populated either automatically (i.e. via Songbird's automatic scraping) or programmatically via Webpage API

Example of a site which populates it programmatically:
<http://www.7digital.com/songbird>

Tra...	Title	Time	Artist	Album	Track Pr...	Ad
1	Orchestral Intro (Feat. sinfonia VIVA)	1:09	Gorillaz	Plastic Beach	\$0.99	
2	Welcome To The World of The Plastic Beach (F...	3:34	Gorillaz	Plastic Beach	\$0.99	
3	White Flag (Feat. Bashy, Kano and The Nation...	3:44	Gorillaz	Plastic Beach	\$0.99	
4	Rhinestone Eyes	3:20	Gorillaz	Plastic Beach	\$0.99	
5	Stylo (Album Version) (Feat. Mos Def and Bob...	4:30	Gorillaz	Plastic Beach	\$0.99	
6	Superfast Jellyfish (Feat. Gruff Rhys and De La...	2:54	Gorillaz	Plastic Beach	\$0.99	
7	Empire Ants (Feat. Little Dragon)	4:44	Gorillaz	Plastic Beach	\$0.99	
8	Glitter Freeze (Feat. Mark E Smith)	4:03	Gorillaz	Plastic Beach	\$0.99	
9	Some Kind of Nature (Feat. Lou Reed)	2:59	Gorillaz	Plastic Beach	\$0.99	



8	Some Kind of Nature (Feat. Lou Reed)	2:59	Gorillaz	Plastic Beach	20:00	
8	Glitter Freeze (Feat. Mark E Smith)	4:03	Gorillaz	Plastic Beach	20:00	



But what can I do with it?

Integrate music and video services like stores, subscriptions, radio...

- Query what's currently playing
- Attach listeners/observers to media player actions
- Enumerate user library
- Build site-local libraries and playlists
- Download playlists and items



Current Media Player Activity

Metadata on the currently playing track:

- songbird.currentArtist
- songbird.currentTrack
- songbird.currentAlbum

Current activity and state:

- songbird.playing
- songbird.paused
- songbird.repeat
- songbird.shuffle
- songbird.position
- songbird.volume
- songbird.mute



Current Media Player Activity

```
<script type="text/javascript">
function onLoad() {
    if (songbird.playing) {
        alert("I love " + songbird.currentArtist + " too");
    }
}
</script>
```



Observing Your Media Player

Attach listeners to topics for asynchronous notification

Listener Topics:

metadata.artist

metadata.title

metadata.album

metadata.genre

metadata.url

playlist.shuffle

playlist.repeat

faceplate.volume

faceplate.playing

faceplate.paused

<http://developer.songbirdnest.com/webpage-api/docs/trunk/files2/ListenerTopics-txt.html>



Observing Your Media Player

```
var obs = {  
  observe: function ( aSubject, aTopic, aData) {  
    if (aTopic == "metadata.artist") {  
      alert("Current artist:" + aData);  
    } else if (aTopic == "metadata.album") {  
      alert("Current album:" + aData);  
    } else if (aTopic == "metadata.title") {  
      alert("Current track:" + aData);  
    }  
  }  
}
```

```
songbird.addListener("metadata.title", obs);  
songbird.addListener("metadata.artist", obs);  
songbird.addListener("metadata.album", obs);
```



TM

Observing Your Media Player

More asynchronous events:

`downloadstart`
`downloadcomplete`

Fired when Songbird downloads triggered
by Library integration APIs (covered later)
are initiated or completed

`beforetrackchange`
`trackchange`
`playerstopped`

Fired when media track events happen.

`event.item` argument is the `mediaitem`



Enumerate User Libraries

User library:

- medialtems (represent items/tracks)
- mediaLists (ordered lists of medialtems)
- mediaLibraries (unordered collection of medialtems & lists)

- songbird.mainLibrary
 - .createMedialtem()
 - .createSimpleMediaList()
 - .getPlaylists()
 - .getItemByGuid()
 - .enumerateAllItems()
 - .enumerateItemsByProperty()

- <http://developer.songbirdnest.com/webpage-api/docs/files/trunk/sblRemoteLibrary-idl.html#Library>



Enumerate User Libraries

```
var propArtist = "http://songbirdnest.com/data/1.0#artistName";
var listener = {
  onEnumerationBegin: function() {
    this.artists = new Object();
    return true;
  },
  onEnumeratedItem: function(list, item) {
    metadata = item.getProperty(propArtist);
    if ((metadata != null) && (metadata != '') && (metadata != '\\\"\\\"')) {
      if (this.artists[metadata])
        this.artists[metadata]++;
      else
        this.artists[metadata] = 1;
    }
    return true;
  },
  onEnumerationEnd: function() {
    return true;
  }
};

var mainlib = songbird.mainLibrary;
songbird.mainLibrary.enumerateAllItems(listener, 0);
for (artist in listener.artists) {
  alert("You have " + this.artists[artist] + " tracks by " + artist);
}
```



List & Library Integration

- Use lists to represent playlists, or conceptual lists:
 - Shopping cart
 - Favourite songs/tracks
 - Recommended tracks (“You might also like...”)
 - Relevant songs (“Other people who bought also bought...”)
- Playback main library (e.g. the user’s) lists
- Playback site library (e.g. local to the website) lists
 - Remote playlists, e.g. .m3u, .pls
 - Playlists built programmatically using the Webpage API
- Download lists and individual media items to the user’s library



List & Library Integration

```
// Create a default site-specific library
var library = songbird.siteLibrary;

// Set the scope of the site library
songbird.setSiteScope("whacked.net", "/music");

// Create a media item and put it in the library
var mediaItem = library.createMediaItem("http://whacked.net/music/wired-01.mp3");

// Make a playlist
var mediaList = library.createSimpleMediaList("TheWiredCD");
mediaList.add(mediaItem);

// Let's be obnoxious and play it, whether the user requested it or not
songbird.playMediaList(mediaList);

// I'm sure the user loved it so much - let's integrate it into their library for them
songbird.downloadItem(mediaItem);
```



Download Event Monitoring

```
var trackNameProp = "http://songbirdnest.com/data/1.0#trackName"
function onDLStart(aEvent) {
    alert(aEvent.item.getProperty(trackNameProp) +
        " started downloading")
}
function onDLComplete(aEvent) {
    alert(aEvent.item.getProperty(trackNameProp) +
        " finished downloading");
    alert(aEvent.status);
}

document.addEventListener("downloadstart", onDLStart, false);
document.addEventListener("downloadcomplete", onDLComplete, false);

songbird.downloadItem(mediaItem);
```



Examples

Music Store

<http://developer.songbirdnest.com/webpage-api/examples/musicstore/>

Music Blog

<http://developer.songbirdnest.com/webpage-api/examples/musicblog/>

music explorr ©®™

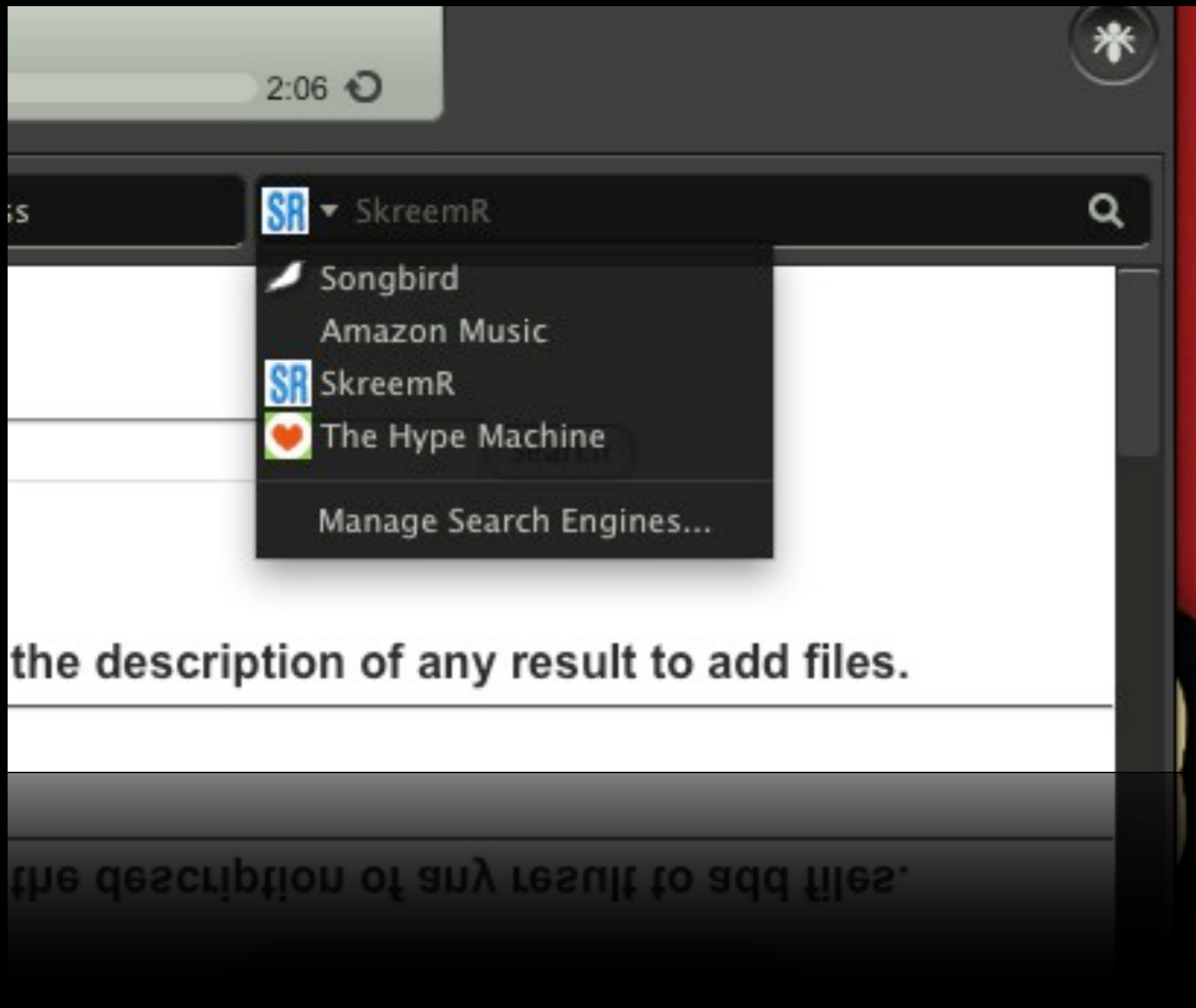
<http://whacked.net/explore/>



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Search Plugins



OpenSearch

- Search plugins use the standard OpenSearch format
<http://opensearch.org>
as supported by Mozilla, Firefox, Opera, Internet Explorer, etc.
 - Loaded by extension
 - Loaded by webpage



OpenSearch Format

```
<?xml version="1.0" encoding="utf-8" ?>
<OpenSearchDescription xmlns="http://a9.com/-/spec/opensearch/1.1/">
  <ShortName>Amazon Music</ShortName>
  <Description>Amazon MP3 Music Store Search</Description>
  <Image width="16" height="16">chrome://sansa/skin/amazon_favicon.gif</Image>
  <Url type="text/html" method="get"
    template="http://www.amazon.com/s/ref=nb_ss_dmusic/
103-8870396-6868602?url=search-alias%3Ddigital-music&field-
keywords={searchTerms}&x=0&y=0" />
  <InputEncoding>utf-8</InputEncoding>
</OpenSearchDescription>
```



Extension Loading

```
// Get the search engine service
var searchSvc = Components.classes["@mozilla.org/browser/search-service;1"]
    .getService(Components.interfaces.nsiBrowserSearchService);

// Register our new search engine
searchSvc.addEngine("chrome://myextension/content/amazon.xml",
    Components.interfaces.nsiSearchEngine.DATA_XML,
    "chrome://myextension/skin/amazon_favicon.gif", false);

// Get a reference back to our new search engine we just registered
var searchEngine = searchSvc.getEngineByName("Amazon Music");

// Move it to be the first/primary search engine
if (searchEngine)
    searchSvc.moveEngine(searchEngine, 1);

// Make it active
searchSvc.currentEngine = searchEngine;
```



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Webpage Loading

```
<html>
  <head>
    <link rel="search"
      type="application/opensearchdescription+xml"
      href="http://example.com/content-search.xml"
      title="Content search" />
    <title>yay</title>
    .
    .
  </head>
  .
  .
  .
</html>
```



What is Songbird?
UI Layout and Terminology
Extensions
Feathers
Webpage API
Search Plug-ins
Resource Roundup



Songbird Developer Resources

Songbird Developer Center:

- <http://developer.songbirdnest.com/>

Source Browser for Songbird Source:

- <http://src.songbirdnest.com/>

Bugzilla:

- <http://bugzilla.songbirdnest.com>

Add-ons Site:

- <http://addons.songbirdnest.com>

Translations:

- <http://translate.songbirdnest.com>

Recipe Book:

- <http://developer.songbirdnest.com/recipes>



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Extension Resources

Songbird Developer Center:

- <http://developer.songbirdnest.com/add-on-api>

API Reference:

- <http://developer.songbirdnest.com/add-on-api/docs/trunk>

Getting Started Developing Add-ons Guide:

- http://wiki.songbirdnest.com/Developer/Articles/Getting_Started/Developing_Extensions

General Mozilla Extension Development Guides:

- <http://developer.mozilla.org/en/docs/Extensions>
- http://developer.mozilla.org/en/docs/XUL_Overlays
- <http://www.robertnyman.com/2009/01/24/how-to-develop-a-firefox-extension/>
- http://kb.mozillazine.org/Getting_started_with_extension_development
- http://developer.mozilla.org/en/docs/Using_JavaScript_code_modules

XPCOM in Songbird:

- <http://wiki.songbirdnest.com/Developer/Articles/XPCOM/>

Media Libraries/Playlists/Tracks

- http://wiki.songbirdnest.com/Developer/Articles/Libraries,_Playlists,_Tracks
- http://wiki.songbirdnest.com/Developer/Articles/Filtering,Searching_Playlists_Libraries



Feather Resources

Songbird Developer Center:

- <http://developer.songbirdnest.com/feathers>

Getting Started with Feathers Guide:

- http://wiki.songbirdnest.com/Developer/Articles/Getting_Started/Creating_Feathers

Introduction to the DOM Inspector:

- <http://www.brownhen.com/DI/>

DOM Inspector (MozillaZine):

- http://kb.mozillazine.org/DOM_Inspector



Webpage API Resources

Songbird Developer Center:

- <http://developer.songbirdnest.com/webpage-api>
- (Example music store & music blog linked off above)

Getting Started with the Webpage API Guide:

- http://wiki.songbirdnest.com/Developer/Articles/Getting_Started/Web_Integration_with_the_Webpage_API

API Reference Documentation:

- <http://developer.songbirdnest.com/webpage-api/docs/trunk>



Songbird Developer Resources

Songbird Developer Google Group Mailing List:

- <http://groups.google.com/group/songbird-dev>

IRC:

- <irc://irc.mozilla.org/#songbird>

me!

- pjople@songbirdnest.com

