FatWire®
SOFTWARE

Gadget Server

Version 1.1

Developer's Guide

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Chapter 1

Introduction

This guide introduces template developers to the process of creating gadgets based on Content Server template code. Sample gadgets, which are included with Gadget Server, are used throughout this guide to illustrate the development task. This set of fully operational gadgets runs on the FirstSite II sample site. Their underlying asset model and template framework provide the tools developers need to get started with creating their own gadgets. One of the sample gadgets supports the OAuth protocol to provide an example of how developers can configure their own gadgets with OAuth support.

This chapter contains the following sections:

Before You Begin

Users of this guide must have:

- A developer's knowledge of Content Server's basic and flex asset models and templating.
- The Google Gadget API. Related resources are available at the following URLs:
  - The API Reference is available at:
    `http://code.google.com/apis/gadgets/docs/reference/`
  - The API Developer's Guide is available at:
    `http://code.google.com/apis/gadgets/docs/dev_guide.html`
- Familiarity with OpenSocial Standards, used to create the environment that enables gadget users to set preferences. OpenSocial documentation is available at:
  `http://wiki.opensocial.org/`
- Gadget Server sample gadgets installed on Content Server's FirstSite II sample site. Installation instructions are available in the *Gadget Server Installation Guide*. Information about managing gadgets can be found in the *Gadget Server User's Guide*. The product guides are available on our e-docs site:

  `http://support.fatwire.com`

  Accounts with FatWire Technical Support can be opened from the home page.
- An understanding of the OAuth protocol, which is used by the sample List Gadget. Information about OAuth is available at the following URLs:
  - The Beginner's Guide to OAuth is available at:
    `http://oauth.net/`
  - More information about the OAuth protocol is available at:
    `http://tools.etf.org/html/rfc5849`

Gadget Specifications

Four sample gadgets were created by FatWire. They are enabled on the FirstSite II sample site. You can develop your own gadgets, using the processes outlined in this guide. The sample gadgets are:

- **List Gadget**, which presents a listing of headlines and article summaries, linking to their respective full articles. This gadget supports OAuth, which means a visitor can authorize the gadget to retrieve her personalized data (in this case, the visitor's user name and profile picture) from the gadget's OAuth Service Provider (which is Gadget Sever in this example).
- **ThumbList Gadget**, which presents a list of products, with a thumbnail accompanying each product's description.
- **Slideshow Gadget**, which renders a series of product images into a slideshow, where the user can click on a thumbnail to view a larger image, then click the larger image to open the page containing full details on the product.
- **RSS Feed**, which presents a list of headlines retrieved from an RSS feed. Each headline links to a full article.

The rest of this chapter provides information about the gadgets' major components and describes the sample gadgets in detail. This chapter also describes the OAuth protocol, and the functionality OAuth enables when it is integrated with Gadget Server and supported by a gadget (List Gadget in this example).

Asset Model and Templates

Installing the sample gadgets on FirstSite II installs the basic components for creating and rendering gadgets. The components are the data model, templates, and sample assets that provide the gadgets' content:

- `FW_CSGadget` asset type (its description is `CS-Based Gadget`). All sample gadgets are of type `FW_CSGadget`.
- `FW_RSS` asset type (its description is `RSS Feed`). This asset type is used to specify a URL as the source of content for the RSS Feed gadget.
- `FW_CSGadget/GenerateGadgetXML` template, which is accessed by Gadget Server. This template is used to render the gadget descriptor XML (also referred to as gadget specification XML).
- `FW_CSGadget/ListSiteGadgets` template, which provides a gadget descriptor URL for each gadget on the current content management site.

Sample Assets

The sample assets either provide content for the gadgets or they render the gadgets. The sample assets are referenced by the sample gadgets as described below:

- Gadget content is provided by:
  - Content assets of type `Content_C` (with parent of type `Content_P`), representing sports articles. These assets are used by the List Gadget.
  - Product assets of type `Product_C` (with parent of type `Product_P`), representing sports products. These assets are used by the ThumbList and Slideshow gadgets.
  - Media assets of type `Media_C` (with parent of type `Media_P`), representing images used by the Product assets. These assets are used by the ThumbList and Slideshow gadgets.
  - Recommendation (AdvCols) assets, encapsulating the Content and Product assets. Recommendation assets are used by the List, ThumbList, and Slideshow sample gadgets.
  - Content of type `FW_RSS`, which specifies a URL as the source of content for the RSS Feed gadget.
- Templates render the gadgets:
  - The `GenerateGadgetXML` template is accessed by Gadget Server and calls the templates listed below.
  - An `FW_CSGadget`-typed template exists for each of the sample gadgets. Each of these templates outputs the body of a gadget descriptor XML understandable by Gadget Server. The templates are `G_List`, `G_RSS`, `G_Slideshow`, and `G_ThumbList`.

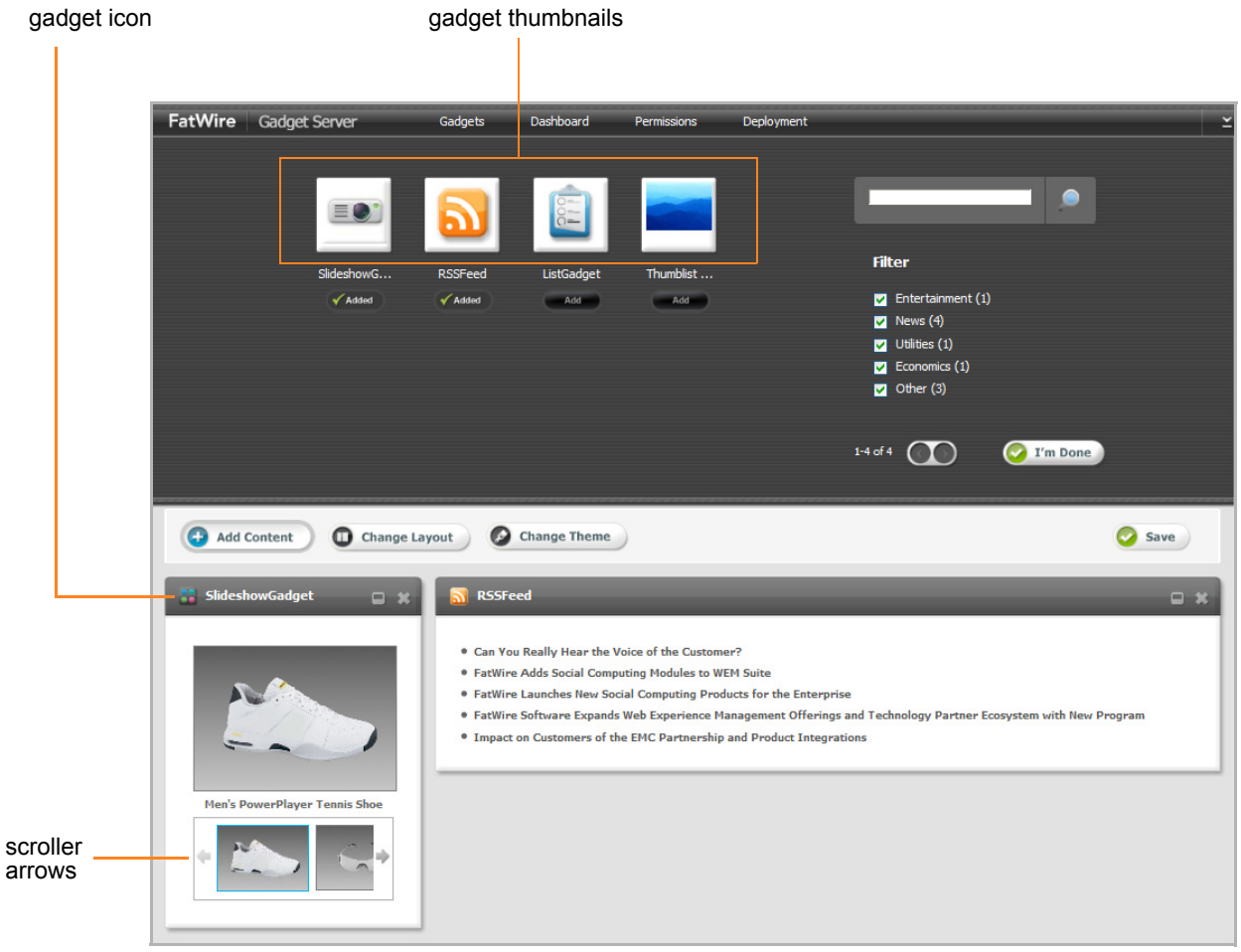
- A typed template named `G_JSON` exists for each of the asset types referenced by the sample gadgets: `Content_C`, `Media_C`, `Product_C`, and `Recommendation (AdvCols)`. These templates provide JSON-formatted output containing data necessary to render the HTML for each asset that is displayed in the gadgets. The templates are invoked via remote requests made in the gadget code.

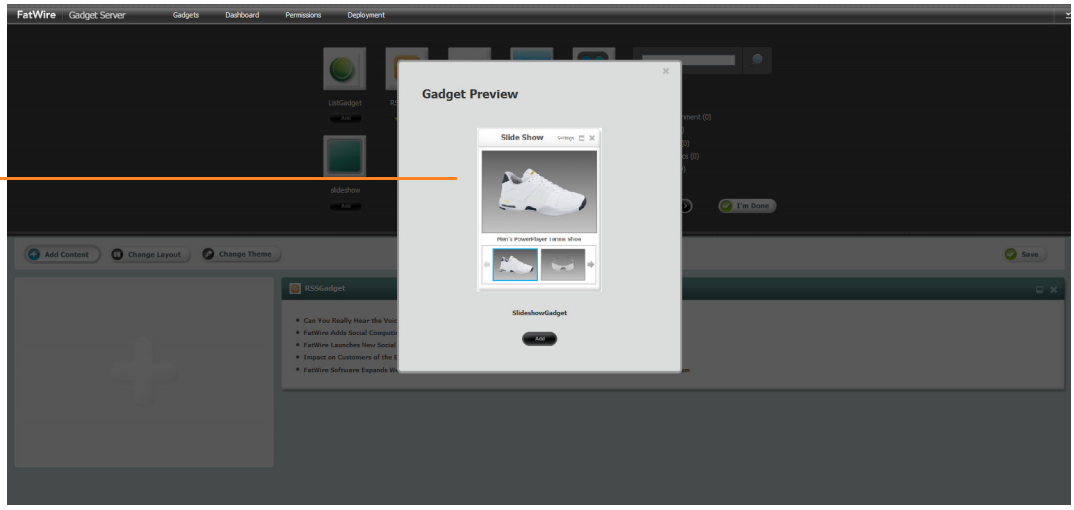
Auxiliary Files

The following image files are used by the sample gadgets:

- Scroller arrow images used by the Slideshow gadget (Figure 1, on page 8). These static images are located in the `FirstSiteII/gadgets` subdirectory under the Content Server web application.
- Images used as icons, thumbnails, and previews to represent a gadget's various sections. The default images are located in the `sample/GadgetImages` directory in the `gadgetserver.zip` installation package.

Figure 1: Images used by sample gadgets

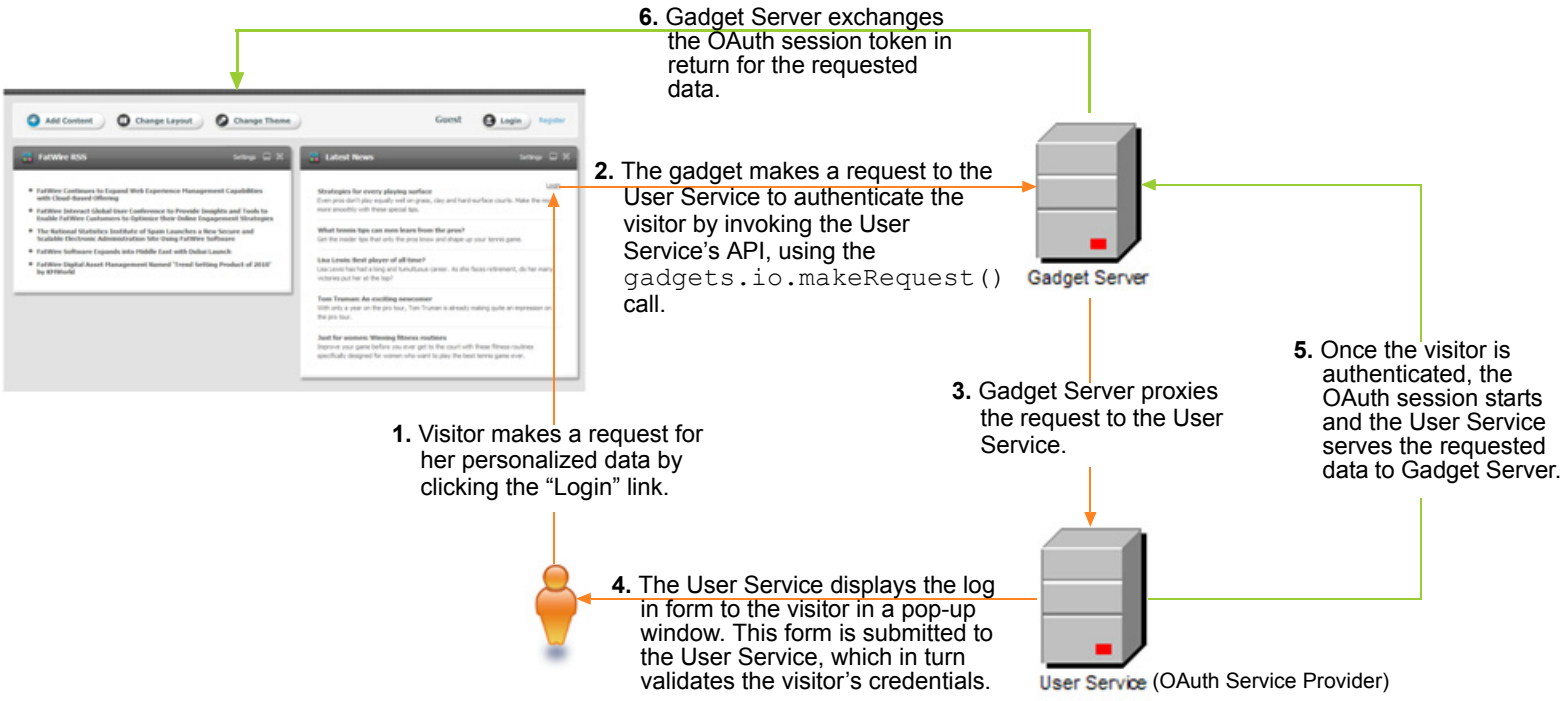




OAuth Protocol

The sample List Gadget supports the OAuth protocol. Gadget Server includes OAuth protocol support to enable visitors to personalize OAuth-enabled gadgets. The OAuth protocol communicates in a secure manner to enable a visitor to authorize a gadget to retrieve certain protected personal data from a third-party website by using Gadget Server as a proxy. This is achieved with the help of visitor redirects, handshakes, and digital signatures, as shown in Figure 2.

Figure 2: Personalized data retrieval as seen in the sample List Gadget



OAuth enables the List Gadget to retrieve a visitor's user name and profile picture from its **OAuth Service Provider** (local Gadget Server installation in this example), which is specified in the `OAuth` section of the gadget's descriptor XML file. Any gadget that is configured to support OAuth must define OAuth parameters in its descriptor XML file.

Gadgets with OAuth support:

- Can be configured to use either Gadget Server-based visitor authentication or third-party based visitor authentication (such as Google, Twitter, and so on).
- Contain an `OAuth` section in their descriptor XML files. The `OAuth` section specifies the gadget's OAuth Service Provider, which is the website from which the gadget requests visitor authentication.

  Note

  Some gadgets with OAuth support store data on one website, but authenticate visitors through another. In this case, the website that stores visitor credentials provides the log in form to Gadget Server. Once the visitor is authenticated, the website that hosts the data exchanges Gadget Server's session token for the visitor's requested data.

- Use secure APIs to display a pop-up authentication window from the website the gadget uses for visitor authentication. Once the visitor is authenticated, the gadget securely retrieves that visitor's personalized data from the website which hosts the data by using Gadget Server as a proxy, without storing the visitor's credentials on Gadget Server.

  All requests that Gadget Server transfers between the gadget and the gadget's OAuth Service Provider are secured with the following gadget-specific information:

  - **Consumer Key** – Also known as an API key, this is a value used by the gadget to identify itself to the OAuth Service Provider.
  - **Consumer Secret** – A secret used by the gadget to establish ownership of the consumer key to the OAuth Service Provider.
  - **Consumer Signature Method** – The type of digital signature algorithm used to sign requests secured with OAuth (`HMAC-SHA1` or `RSA-SHA1`). The signature process encodes the *consumer key* and *secret* into a verifiable value. This prevents unauthorized parties from using the gadget-specific *consumer key* and *secret* to access a visitor's protected resources.

- Include `"ouathpopup"` as a required feature in the `<ModulePrefs>` tag of their descriptor XMLs, which enables gadgets to access the Gadget Server OAuth library. This library is provided to the gadget automatically by Gadget Server, and when used together with the `gadgets.io.makeRequest` call, enables the gadget to make visitor redirects, handshakes, and digital signatures to securely retrieve a visitor's personalized data, without storing any of the visitor's credentials on the local Gadget Server installation.

Developers can create their own gadgets with OAuth support by using JavaScript APIs. For information about the parameters required to configure a gadget to use the OAuth protocol, see Appendix A, "Analyzing Gadget Descriptor XML Files."

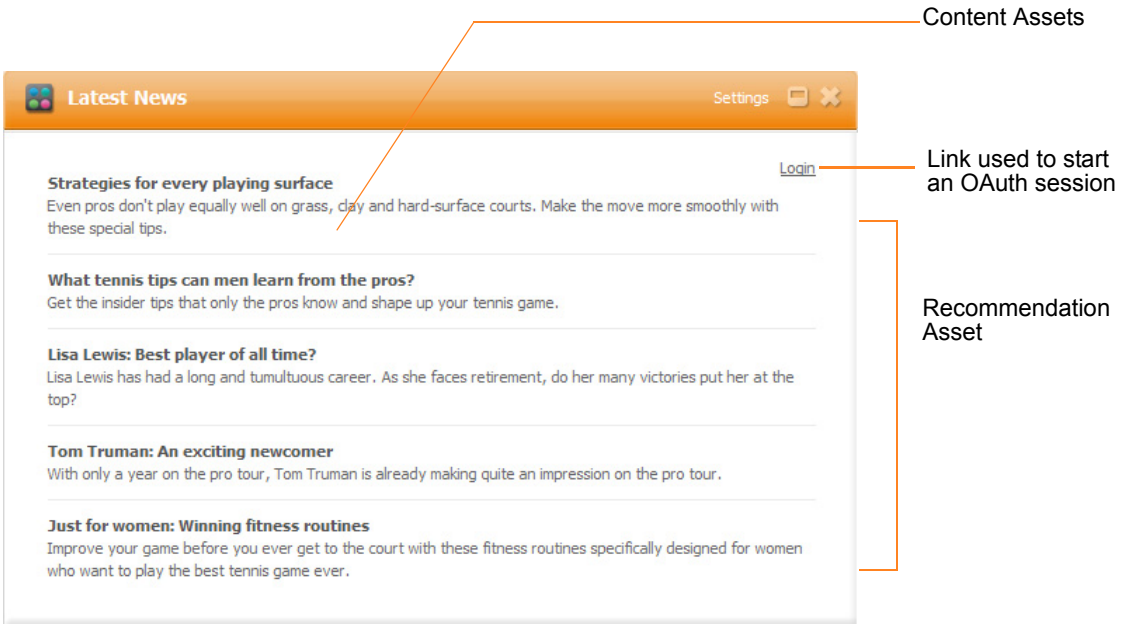
Administrators have permissions to register CS-Based and/or third-party gadgets with OAuth support to Gadget Server. For more information about registering OAuth-enabled gadgets to Gadget Server, see the *Gadget Server User's Guide*.

Sample Gadgets

This section outlines the FatWire sample gadgets and the assets they use. Each asset is listed in the same order in which it is called by Gadget Server when Gadget Server initiates the request. This guide uses the List Gadget in particular to illustrate various concepts.

List Gadget

The List Gadget renders a Recommendation asset containing a list view of Content assets. Each headline links to its full article.

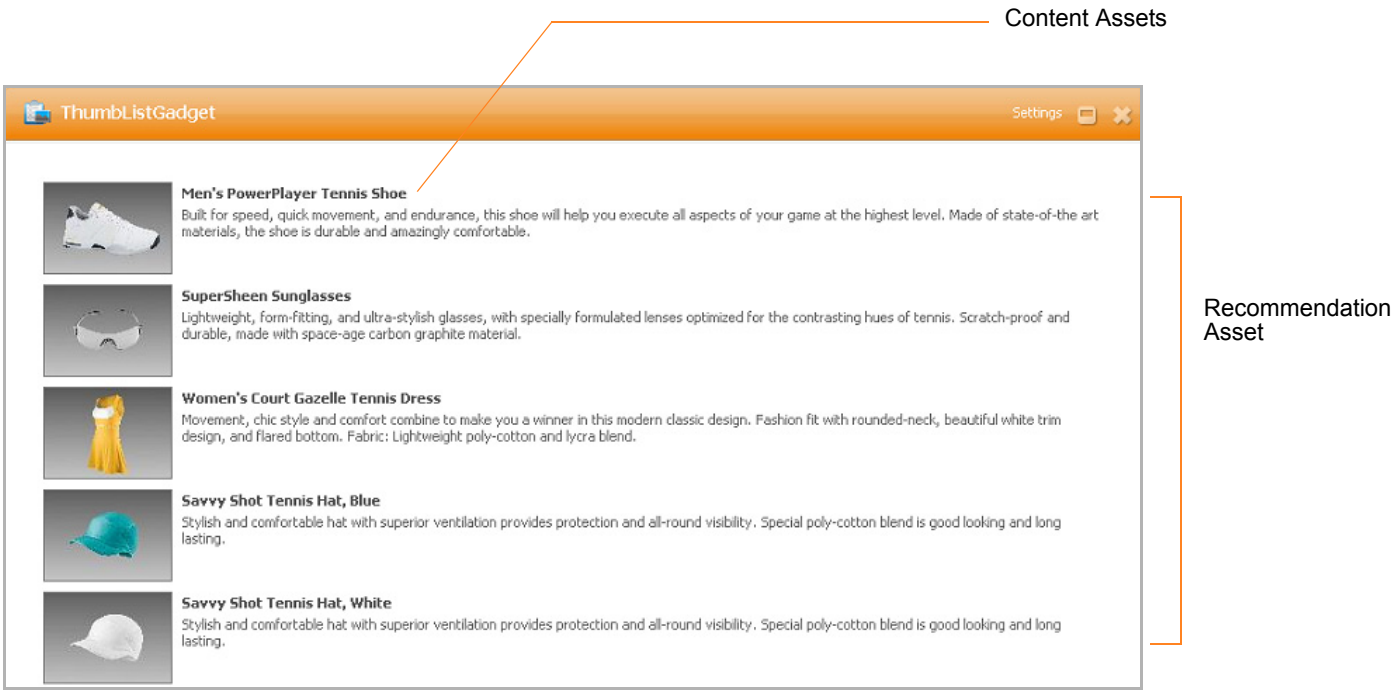


The List Gadget asset references the Recommendation asset to be rendered in the gadget and the template (`G_List`) that will render the gadget. The relevant assets are:

- The `ListGadget` asset of type `FW_CSGadget`, referencing the Recommendation asset to be rendered.
- The `G_List` template, which produces the body of the gadget descriptor XML used by Gadget Server to render the gadget. (This process is outlined in the Chapter 2, "Template Flow.")
- `G_JSON` templates, which render the Recommendation asset and its content: `AdvCols/G_JSON` and `Content_C/G_JSON`
- The Recommendation (AdvCols) asset to be rendered in the gadget.
- Content assets included in the Recommendation.

ThumbList Gadget

The ThumbList Gadget is similar to the List Gadget in that it also renders a Recommendation asset. The gadget contains a list view of Product assets. Each headline links to its product page. However, in this gadget, each product is accompanied by a thumbnail image from a Media asset, which is associated with the Product assets via their "Image" attribute.

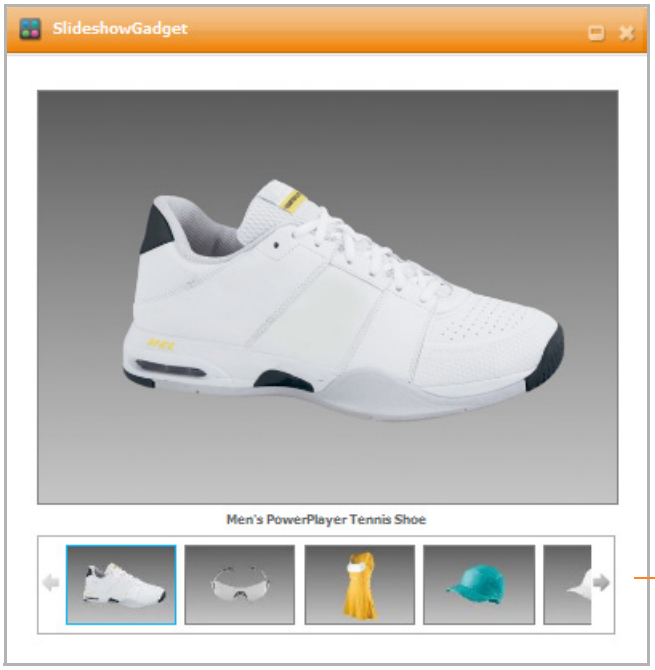


The relevant assets are:

- The `ThumbListGadget` asset of type `FW_CSGadget`, referencing the Recommendation to be rendered and the template (`G_ThumbList`) that will render the gadget.
- The `G_ThumbList` template which produces the body of the gadget descriptor XML used by Gadget Server to render the gadget.
- `G_JSON` templates, which render the Recommendation asset and its content: `AdvCols/G_JSON`, `Product_C/G_JSON`, and `Media_C/G_JSON`
- The `Recommendation (AdvCols)` asset to be rendered in the gadget.
- Product assets included in the Recommendation asset.
- Media assets referenced by the "Image" attribute of each of the Product assets.

Slideshow Gadget

The Slideshow gadget uses the same content as the ThumbList gadget, but presents the content in an entirely different manner. This gadget displays a thumbnail strip filled with product images. Clicking on an image in the strip displays the image at the maximum size allowed by the gadget area. Clicking the full-size image opens the product's detail page.



The relevant assets are:

- The `SlideshowGadget` asset referencing the Recommendation asset to be rendered and the template (`G_Slideshow`) that will render the gadget.
- The `G_Slideshow` template which produces the body of the gadget descriptor XML used by Gadget Server to render the gadget.
- `G_JSON` templates which render the Recommendation asset and its content: `AdvCols/G_JSON`, `Product_C/G_JSON`, and `Media_C/G_JSON`
- The `Recommendation (AdvCols)` asset to be rendered in the gadget.
- Product assets included in the Recommendation asset.
- Media assets referenced by the "Image" attribute of each Product asset.

RSS Feed Gadget

The RSS Feed gadget displays the most recent items from an RSS feed, utilizing the Google Gadget API for its built-in feed-reading functionality.

The relevant assets are:

- The `RSSGadget` asset of type `FW_CSGadget` referencing the feed (`FW_RSS`) to be requested and the template (`G_RSS`) that will render the gadget.
- The `G_RSS` template which produces the body of the gadget descriptor XML used by Gadget Server to render the gadget.
- An `FW_RSS` asset containing the feed URL to be requested in the gadget.

Asset Structure

The sample gadgets are based on a new asset type, `FW_CSGadget`, which is used to specify information required for rendering the gadgets. It is a basic asset type, containing the following attributes:

- `Name of descriptor template` is used to specify the name of the `FW_CSGadget` template that will be invoked to generate the gadget's descriptor XML. For the List Gadget, the template is `FW_CSGadget/G_List` (hence, `G_List` is specified in this field and later resolved as a typed template).
- The `DataAsset` association is a single, any-type asset association. This association references the asset that provides the main content of the gadget. For example, the `DataAsset` association for the List Gadget references a Recommendation asset containing a static list of Content assets to be rendered by the gadget.

The descriptor template attribute is read by the `FW_CSGadget/GenerateGadgetXML` template. The DataAsset association is read by the descriptor template itself (for example, `G_List`).

Chapter 2

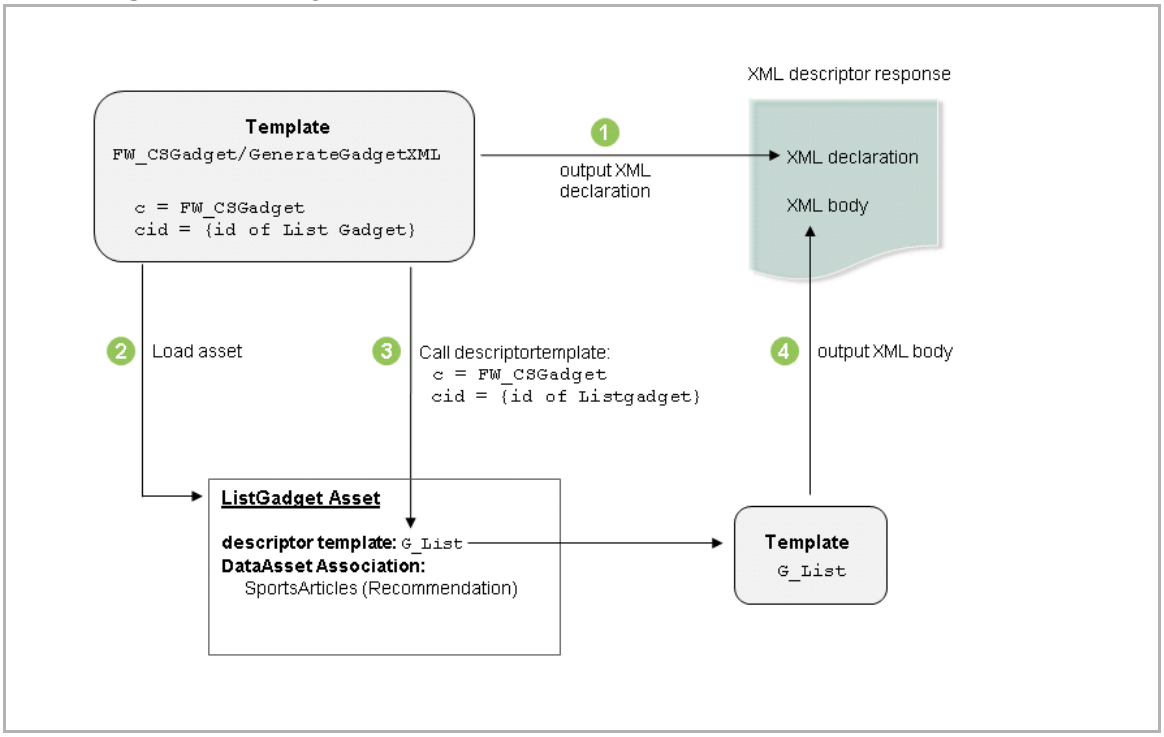
Template Flow

This chapter describes the flow of template execution, using the List Gadget as an example.

Template Flow for the List Gadget

By design, the only way to request a gadget's descriptor XML is by invoking the `GenerateGadgetXML` template on an `FW_CSGadget` asset. When the template is invoked, the rendering process begins, as shown in Figure 3 and outlined below:

Figure 3: Gadget XML output



1. `GenerateGadgetXML` first outputs the XML declaration, a recommended feature for all XML documents. Outputting the XML declaration at the beginning of the process saves gadget developers from having to consider it in every gadget they write.
2. `GenerateGadgetXML` then loads the asset that corresponds to the passed `c` (`FW_CSGadget`) and `cid` (id of `ListGadget`) and looks up its `descriptortemplate` value.

   Note

   Together, the `c` and `cid` point to a specific asset in the Content Server system. Parameter `c` is the type of asset and `cid` is the identifier of the asset. This information is required whenever a template is invoked.

3. `GenerateGadgetXML` invokes the template in the `descriptortemplate` field (`FW_CSTemplate/G_List` in the case of the List Gadget), passing it the same `c` and `cid` as in step 2.

   Notice that the `G_List` template is in itself not externally callable (its SiteCatalog entry's `pageletonly` field is set to `T`). This setting prevents these templates from being called directly (for example, in cases where they are not designed to be called).

4. The called template, `G_List`, outputs the entire body of the gadget descriptor XML. At this point, the gadget descriptor XML is complete.

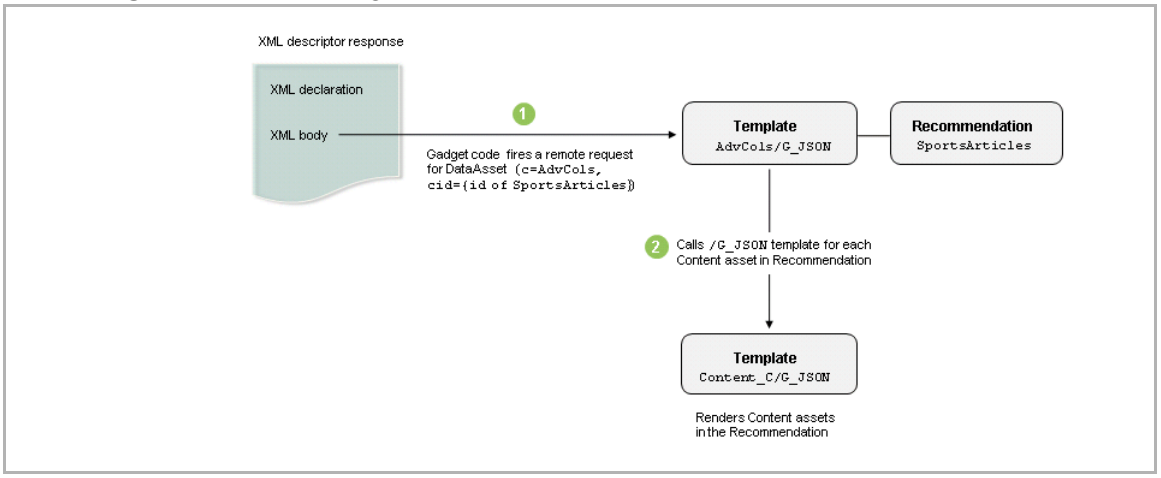
> **Note**
>
> Appendix A, "Analyzing Gadget Descriptor XML Files provides information about the features of the descriptor XML. The template code itself contains comments illuminating important concepts. See "Before You Begin," on page 6 for links to additional resources regarding the authoring of gadget descriptor XMLs.

Once the gadget is rendered based on its descriptor XML, the gadget retrieves its content. Figure 4 illustrates how the List Gadget retrieves content. This process varies, depending on the gadget. The List Gadget retrieves articles from Content Server via the following JavaScript output by the `G_List` template (this line of code calls a Google Gadgets API function):

```
gadgets.io.makeRequest(url, handleJson, params);
```

The `G_List` template crafts an additional Content Server URL, pointing to this gadget's `DataAsset` (in this case a Recommendation), via the `G_JSON` template for that asset type. That URL is eventually fed to the `gadgets.io.makeRequest` function, which can be used to make additional remote server calls expecting various forms of data such as XML, JSON, or even Atom/RSS. This request initiates the process of retrieving content.

Figure 4: Retrieving content



1. Gadget code in the XML body invokes the `AdvCols/G_JSON` template and prepares the beginning of a JSON response. Since Recommendations contain lists of other assets, the template simply begins the output of a JSON array, then loops through the list of assets, expecting to call a respective `G_JSON` template on each.
2. In the case of the List Gadget, all of the children are Content assets, so `Content_C/G_JSON` is invoked for each asset in the Recommendation. For each invocation, the `Content_C/G_JSON` template outputs a complete JSON object representation containing relevant fields of the asset.

3. In between individual `Content_C/G_JSON` calls, `AdvCols/G_JSON` outputs a comma to properly delimit objects in the array it is constructing. After the loop is completed, the `AdvCols/G_JSON` template closes the array.
4. This array is received by the gadget code (`gadgets.io.makeRequest`, page 17), which then executes the `handleJson` callback function as prescribed by the original `makeRequest` call. The `handleJson` function wraps the content in HTML, which renders that gadget's view (a list view in this example).

Differences in Template Flow

The previous section illustrated template flow for the List Gadget. While template flows for the other sample gadgets are very similar, differences in their Content Server template logic are worth noting.

ThumbList and Slideshow

Gadget rendering follows a path in Content Server that is very similar to the path of the List Gadget. The main difference is what is invoked by the `AdvCols/G_JSON` template. While the List Gadget references a Recommendation filled with Content assets, the ThumbList and Slideshow gadgets reference a Recommendation containing Product assets. These gadgets also inspect attributes specific to the response of the `Product_C/G_JSON` template (which includes data produced by the `Media_C/G_JSON` template).

RSS

The RSS Gadget's second request is fired straight to the URL of the RSS feed, which may or may not be on Content Server. The URL is read from the associated `FW_RSS` asset, which is loaded within the `G_RSS` template.

Why Server Calls are Done Separately

You may be asking why an additional server call is always involved. For instance, why not simply retrieve all of the articles for the List Gadget from the `G_List` template itself? The answer to this is twofold:

1. Gadget descriptor XML may be expected to be cacheable by the gadget container. This means that developers should avoid embedding volatile data in the XML.
2. An additional server call helps to separate presentation logic (for example, in `G_List`) from the underlying model (in the asset types' `G_JSON` templates).

Chapter 3

Creating Your Own Gadgets

Creating Gadgets on Different CM Sites

The sample gadgets must be enabled on FirstSite II. Developers will be interested in creating gadgets on different CM sites. The following steps outline the steps for enabling gadget support on additional CM sites:

1. Enable the `FW_CSGadget` asset type and its start menu items on the CM site. (By default, the start menu items are accessible to users with the Designer, Site Admin, or General Admin role.)
2. Share the following Template assets to the site: `FW_CSGadget/GenerateGadgetXML` and `FW_CSGadget/ListSiteGadgets`

   (If you are reusing the sample gadgets, share their templates from FirstSite II, enable the relevant asset types, and if necessary share the assets. For example, if you are reusing the RSS Feed Gadget, share the `FW_CSGadget/G_RSS` Template asset from FirstSite II and enable the `FW_RSS` asset type.)

Custom Gadgets

In addition to having a knowledge of sample gadget architecture, it is helpful to see what types of Content Server based gadgets can be created. This section outlines the requirements for creating different types of gadgets.

New Gadget, Content Server Generates Only XML

You may want to create a new gadget where the only additional content is from another website. The RSS Feed Gadget is an example of a gadget that functions in this way. See "RSS Feed Gadget," on page 14.

Requirements in this scenario are:

- A gadget of type `FW_CSGadget` referencing the template and asset listed below.
- `FW_CSGadget` template that generates the body of the gadget descriptor XML (for example, `FW_CSGadget/G_RSS`).
- An asset that specifies the URL to be requested in the gadget.

New Gadget, Content Server Generates XML and Fields Additional Requests

In this scenario, you will populate a gadget with content directly from one of Content Server's CM sites. The List, ThumbList, and Slideshow gadgets are examples of gadgets that function in this way. See Figures 3 and 4.

Requirements in this scenario are:

- A gadget of type `FW_CSGadget` referencing the template and asset listed below.
- `FW_CSGadget` template (such as `G_List`) for rendering the body of the gadget descriptor XML.
- Template(s) for rendering data to be returned in response to the additional requests made by the gadget code (for example, the `G_JSON` templates included with the sample gadgets).
- Assets to be referenced by the gadget (or its additional requests).

Same Gadget Logic, Different Content

You can create gadgets that have the same functionality but pull different sets of content. Requirements in this scenario are:

- An `FW_CSGadget` asset that references a pre-existing `FW_CSGadget` template.
- Assets that provide the gadget with content.

Prerequisites for Registering Gadgets

For gadgets to be recognized by Gadget Server, they must be registered (typically by administrators of the Gadget Server application). A gadget is accessed via the Content Server URL that generates the gadget descriptor XML. This URL can be quickly obtained for every `FW_CSGadget` asset on the content management site by querying the `FW_CSGadget/ListSiteGadgets` template. The template can be easily accessed in one of the following ways:

- In the Content Server Advanced interface, preview any `FW_CSGadget` on the site. In the InSite window, select `ListSiteGadgets` from the "Template" drop-down menu.

- Or -

- Open a browser and navigate directly to `http://<host>:<port>/<application context>/wem/<sitename>/FW_CSGadget/ListSiteGadgets` (where `host`, `port`, and `application context` correspond to the Content Server installation, and `sitename` is the name of the content management site where the gadget exists).

The list of sample gadgets and their corresponding URLs is shown in the following figure.

Appendix A

Analyzing Gadget Descriptor XML Files

Each gadget is defined by a descriptor XML. This appendix provides information about the parameters defined in the descriptor XMLs of the sample CS-Based gadgets.

This appendix contains the following:

Sample RSSFeed Gadget

A gadget's descriptor XML contains all the data defined for the gadget within the `Module` tag. This tag holds information about the gadget's dependencies, user preferences (if any), appearance settings, functionality, and so on.

This section analyzes CS-Based gadget asset descriptor XML files, using code snippets from the sample RSSFeed gadget as an example.

Analyzing the code of the RSSFeed Gadget's Descriptor XML File

These lines specify the properties and dependencies of the gadget:

```
<ModulePrefs title="FatWire RSS" height="350">
   screenshot="http://localhost:8100/cs/FirstSiteII/gadgets/RSS/
      screenshot.png"
   thumbnail="http://localhost:8100/cs/FirstSiteII/gadgets/RSS/
      thumbnail.png">
   <Require feature="dynamic-height"/>
</ModulePrefs>
```

The following lines define the gadget's user preferences, which are values for the gadget that visitor's can modify. In this code snippet, visitors will be able to select the amount of news feeds that the RSSFeed gadget displays at one time:

```
<UserPref name="max" display_name="Number of Items"
   datatype="enum" default_value="5">
      <EnumValue value="1" display_value="1"/>
      <EnumValue value="3" display_value="3"/>
      <EnumValue value="5" display_value="5"/>
      <EnumValue value="10" display_value="10"/>
</UserPref>
```

The `Content` tag contains all of the content for the RSSFeed gadget's descriptor XML file, including the gadget's CSS file, which defines the gadget's appearance, and the gadget's JavaScript (contained within the `<script>` tag), which specifies the interactive components and initialization functionality of the gadget.

For example, the CSS file defined within the RSSFeed gadget's `Content` tag looks as follows:

```
<style type="text/css">
/* === generic styles === */
body #container {
   padding: 15px;
   padding-bottom: 5px; /* 5 plus 10 from bottom-most entry */
   margin: 0;
}
body #container * {
   padding: 0;
   margin: 0;
   font-size: 11px;
   font-family: Tahoma,Arial,Helvetica,sans-serif;
   color: #666;
}
body #container a, body #container * a {
   text-decoration: none;
```

```
   color: #555;
}
body #container a:hover, body #container * a:hover {
   color: #3b9cce;
}
.error {
   background-color: #fcc;
   color: #c00;
}
/* === gadget-specific styles === */
#container .list {
   padding-left: 1em; /* provide proper indentation space for
   bullets */
}
#container .list li {
   padding-bottom: 10px;
}
#container .headline {
   font-weight: bold;
}
</style>
```

Sample List Gadget

The sample List Gadget supports the OAuth protocol. A gadget with OAuth support contains an `OAuth` section within the `ModulePrefs` tag of its descriptor XML. This tag specifies the following three endpoints related to OAuth operations:

Table 1: OAuth URL endpoints

URL Type	Description
Request Token URL	Initiates the authentication process by the gadget and issues the request token. The request token is a temporary token which is active only during the authentication phase. As soon as the visitor's credentials are validated and she is logged in, the request token is exchanged for an *access token*.
Access Token URL	Retrieves the access token in exchange for the request token.
Authorization URL	The location that will be opened in a pop-up window to display the authentication form.

Gadget Server sets pre-defined, system-level, gadget preferences in the List Gadget's descriptor XML. These preferences are only available to gadgets using Gadget Server's OAuth Service Provider:

Table 2: Pre-approved request tokens

Parameter	Description
`gs_request_token`	The pre-approved token that is passed to the gadget. The gadget can use this to start an OAuth session. It is a short-lived, single-use token with a 30 second lifespan.
`gs_request_token_secret`	The secret for the pre-approved request token, which is also needed to start the OAuth session.

The rest of this section analyzes code snippets from the sample List Gadget's descriptor XML that pertain to OAuth functionality.

Analyzing OAuth parameters within the sample List Gadget's code snippets

The `<ModulePrefs>` tag includes `"oauthpopup"` as a required feature to demonstrate OAuth support for this gadget:

```
<ModulePrefs title="Latest News" height="350">
   <Require feature="dynamic-height"/>
   <Require feature="oauthpopup"/>
```

These lines define the `OAuth` section, which is contained in the `ModulePrefs` tag:

```
<OAuth>
   <Service name="gs">
   <Request url="http://10.120.19.25:8480/user-service/
      request_token"/>
   <Access url="http://10.120.19.25:8480/user-service/
      access_token"/>
```

```
    <Authorization url="http://10.120.19.25:8480/user-service/
       authorize?oauth_callback=
       http%3A%2F%2F10.120.19.25%3A8480%2Fgas-
       os%2Fgadgets%2Foauthcallback&gateway=false"/>
    </Service>
</OAuth>
```

This line, located within the `fetchData` JavaScript function, specifies the URL to which OAuth requests fire:

```
var url = userServiceUrl + "/echo?siteId=" +
   prefs.getString("gs_site_id");
```

These lines specify information about the nature of the request. Gadget Server behaves accordingly based on these values. The `OAUTH_SERVICE_NAME` parameter specifies the service, defined in the `<OAuth>` section, from which data is requested:

```
var params = {};
params[gadgets.io.RequestParameters.CONTENT_TYPE] =
   gadgets.io.ContentType.JSON;
params[gadgets.io.RequestParameters.AUTHORIZATION] =
   gadgets.io.AuthorizationType.OAUTH;
params[gadgets.io.RequestParameters.METHOD] =
   gadgets.io.MethodType.GET;
params[gadgets.io.RequestParameters.OAUTH_SERVICE_NAME] = "gs";
```

This line loads the pre-approved request token. Pre-approved request tokens are valid only once:

```
var requestToken = prefs.getString("gs_request_token");
```

These lines specify the pre-approved request token. For more information about the request tokens, see Table 2:

```
params[gadgets.io.RequestParameters.OAUTH_REQUEST_TOKEN] =
   requestToken;
params[gadgets.io.RequestParameters.OAUTH_REQUEST_TOKEN_SECRET] =
   prefs.getString("gs_request_token_secret");
params[gadgets.io.RequestParameters.OAUTH_USE_TOKEN] = "always";
```

The remaining code in the `fetchData` function makes a request to the OAuth Service Provider, and defines the callback function which will handle the response once it is received:

```
gadgets.io.makeRequest(url, function (response){...},params)
```

The `if` conditions within the callback function define the three possible outcomes when a request is made and the OAuth signature is enabled:

- If authentication is needed, the response object contains an `oauthApprovalUrl` property, which can be used to open the authentication pop-up window containing the login form.

  ```
  if (response.oauthApprovalUrl) {
  var onOpen = function () {
  showOneSection('waiting');
  };
  var onClose = function () {
  fetchData();
  };
  ```

```
var popup = new gadgets.oauth.Popup(response.oauthApprovalUrl,
   null, onOpen, onClose);
$('personalize').onclick = popup.createOpenerOnClick();
$('approvaldone').onclick = popup.createApprovedOnClick();
showOneSection('approval');
}
```

- If the authentication is successful or the visitor has already been authenticated, the response object contains the data property. The data property contains the server's response for the requested URL.

```
else if (response.data) {
var res = response.data;
$('main').innerHTML = "<div><div style='display:inline;'><img
   height='50' src='" + userServiceUrl + res.userpicurl + "'/
   ></div><div style='margin-left:20px;display:inline;font-
   size:14pt;font-weight:bold;'>Hello, " + res.displayname +
   "</div></div>";
showOneSection('main');
```

This line clears the actual gadget's content and (re-)issues the request for the gadget's data, now that the user is authorized:

```
$('container').innerHTML = "";
makeRequest();
}
```

- These lines specify the `oauthError` property which is populated if there is an OAuth protocol error:

```
else {
var errmsg = document.createTextNode('OAuth error: ' +
   response.oauthError );
$('main').appendChild(errmsg);
showOneSection('main');
}
```