# Sling API Redesign

## Redesign of the Sling API

Status: IMPLEMENTED

There have been a number of threads on the Sling Dev Mailing List on simplifying the current *Component API* and turn it into a new Sling API. This page starts at the current state of the discussion as of Oct. 10, 2007, and tries to summarize what has been discussed and to resolve this into a modified proposal.

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#### References

- SLING-28, Simplify the Sling (aka Component) API
- SLING-47, microsling, "Sling reduced to the max"
- Simplifying our component api The original thread launched by Carsten
- Move ContentManager to Sling API My own proposal to make the ContentManager part of the Sling API
- · Breaking Sling into smaller pieces? Bertrand's proposal to further modularize parts of Sling such as the current sling-core bundle

#### **Current State**

Currently, request processing is controlled by the *sling-core* bundle using two sets of filters: one set called at the time the client request enters Sling - so called request level filters - and the other set called for each Content object processed during request processing - so called content level filters.

Amongst the request level filters is the ContentResolverFilter which takes the request URL and finds a Content object for the URL. This filter implements the ContentResolver interface and is also registered as this service. So other parts of the system may use the same mechanism to resolve paths to Content objects. The ContentResolver also implements the default content loading described here.

Amongst the content level filters is the ComponentResolverFilter which asks the Content object for its component ID and resolves this ID using the registered {{Component}}s. This filter also implements the default component resolution described here.

To manage content Sling provides two interfaces:

- ContentManager Basic interface allowing CRUD operations using Content objects. This interface is completely agnostic of the actual
  persistence used.
- JcrContentManager Extends the ContentManager interface integrating with the Jackrabbit OCM ObjectContentManager interface. This provides the API actually used by the ContentResolverFilter to load Content objects from the JCR repository according to the request

If components would want to create, update and delete content, they would access the ContentManager by retrieving the org.apache.sling.jcr.content\_manager request attribute. If JCR tasks would have to be executed, that retrieved object would be cast to JcrContentManager and the session retrieved.

#### Examples:

#### Update Modified Content

After having modified the content, a component might do the following to persisted the modified content:

```
Content content = componentRequest.getContent();

// modify content

ContentManager contentManager = (ContentManager) componentRequest.getAttribute("org.apache.sling.jcr.content_manager");
contentManager.store(content);
contentManager.save();
```

#### JCR based Operations

To operate on a JCR level or to directly access the JCR Node underlying the request Content the following might be done:

```
// get the JCR content manager
JcrContentManager jcrContentManager = (JcrContentManager) componentRequest.getAttribute("org.apache.sling.jcr.
content_manager");

// get the session
Session session = jcrContentManager.getSession();

// access the node addressed by the request URL
String contentPath = componentRequest.getContent().getPath();
Node contentNode = (Node) session.getItem(contentPath);
```

Arguably, this is tedious. So a first simplification proposal suggested to move the JCR agnostic ContentManager interface to the Sling API and to provide a getter method on the ComponentRequest interface. The returned object might also be cast to a JcrContentManager to then access the repository.

This proposal sparked a series of reactions (see references above) and so based on Bertrands thoughts, we propose the following change.

## Replace Content by Resource

The "problem" of the current Component API is that is centered around a Content interface which presumably is data provided to the component loaded from the persistence (the JCR repository of course) actually hiding the repository. This also predefines how data is acquired and used, namely by using Object Content Mapping.

Starting off this situation, we propose replacing the (fully loaded) Content by a data representation we will call Resource:

```
public interface Resource {
 \ensuremath{//} the original request URL leading to the resource
 // this is not necessairily the same as ServletRequest.getRequestURL as
 // it may have been processed by some URL mapping and folding
 String getOriginalURI();
 \ensuremath{//} the path to the actual resource providing the data
 // from the point of view of Sling this is just a string
 String getURI();
 // the selectors of the request or empty array if none
 \ensuremath{//} the selectors are dot-separated strings after the part of
 \ensuremath{//} original URI addressing the resource upto the extension
 // Examples:
       - /a/b/c has no selectors for resource /a/b/c
 //
       - /a/b/c.html has no selectors for resource /a/b/c
      - /a/b/c.sl.s2.html has selectors [ sl, s2 ] for resource /a/b/c
 //
       - /a/b/c.s.html/suffix has selector [ s ] for resource /a/b/c
 String[] getSelectors();
 // the extension of the request or empty string if none
 // the extension is a string after the last dot after the
 // part of the original URI addressing the resource upto the
 // end of the original URI or a slash
 // Examples:
 //
       - /a/b/c has no extension for resource /a/b/c
 11
       - /a/b/c.html has extension html for resource /a/b/c
       - /a/b/c.sl.s2.html has extension html for resource /a/b/c
       - /a/b/c.s.html/suffix has extension html for resource /a/b/c
 String getExtension();
 // the suffix of the request or empty string if none
 // the suffix is the string after the next slash after the part
 // of the original URI addressing the resource
 // Examples:
     - /a/b/c has no suffix for resource /a/b/c
 //
      - /a/b/c.html has no suffix for resource /a/b/c
      - /a/b/c.sl.s2.html has no suffix for resource /a/b/c
 //
       - /a/b/c.s.html/suffix has suffix suffix for resource /a/b/c
 String getSuffix();
}
```

The ComponentRequest interface would be modified as follows:

- The getExtension(), getSelector(int), getSelectors(), getSelectorString() and getSuffix() methods are removed as this information can now be obtained from the Resource directly.
- The getContent(), getContent(String), getChildren(Content) and getRequestDispatcher(Content) methods are replaced as follows:

```
public interface ComponentRequest extends HttpServletRequest {
    ...

// Returns the Resource to which the getRequestURL method maps
Resource getResource();

// Returns a Resource to which the given URI String maps
// Implicit: getResource().equals(getResource(getRequestURL()))
Resource getResource(String uri);

// Returns an Enumeration child Resources of the given Resource
// If resource parameter is null, getResource() is used as parent
// (use Enumeration to stay in line with the HttpServletRequest)
Enumeration<Resource> getChildren(Resource resource);

// Gets a RequestDispatcher to include the given resource
RequestDispatcher getRequestDispatcher(Resource resource);
...
}
```

#### Extensions to the Resource interface

The Resource interface may be extended depending on the way, the resource is acquired. For example, there might be a MappedContentResource which would return an object mapped from any persistence layer, a JcrResource may encapsulate a JCR based resource. A resolver loading content from a JCR repository using Jackrabbit OCM might return a resource which implements both the MappedContentResource and the JcrResource interfaces.

```
MappedContentResource

public interface MappedContentResource extends Resource {
    // Returns the mapped data object
    Object getObject();
}
```

```
public interface JcrResource extends Resource {
    // Returns the JCR session used to acquire the Node
    // (this is actually convenience as getNode().getSession()
    // must return the same session)
    Session getSession();

    // Returns the JCR Node addressed by the Resource URI
    // this is the same as getSession().getItem(getURI());
    Node getNode();
}
```

The existing ContentResolver will be retargeted to the Resource interface and return an object implementing the MappedContentResource and the Jcr Resource interfaces if a mapping exists. Otherwise an object just implementing the JcrResource interface is returned providing just the resolved node.

## Open Issues

This above definition leaves a series of issues open.

### Resolving the Servlet



The Component interface is removed and the Servlet interface is used.

Currently the Content interface defines a method getComponentId() which returns the identifier of a Component to which processing of the request is dispatched. With the new Resource interface, no such method exists any more.

The intent is, that Servlet resolver would know about the concrete implementations of the Resource interface and could handle the respective resources. For example the Sling standard servlet resolver could try the following:

- 1. If the Resource is a JcrResource check the sling:servletId property of the resource node. If such a property exists and denotes a registered Servlet service, that servlet is used.
- 2. Otherwise, if the Resource is a MappedContentResource, find a Servlet service willing to handle requests for the actual object class of the mapped object. The Servlet service could be registered with a service property listing the names of the mapped object classes supported.
- 3. Otherwise try to find a registered Servlet interface willing to handle the request using the resource path, selectors and/or extensions.

Alternatively, the Resource interface might have a getServletId() method providing the identifier of the servlet to use. It might well be that the first solution is the better one.