



EUROPE'S LEADING AEM DEVELOPER CONFERENCE

27th - 29th SEPTEMBER 2021

Resource Resolution and Mapping

Fun and Simple

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Slides revision: 20210824-2a4dc0b

About me



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Outline

- Basics of resolution and mapping
- Influencing resource resolution
- Demo
- Non-functional considerations

Basics of resolution and mapping

Resolution

- Operation that takes request (or path) and returns a Resource
- Implicitly done for requests by the Sling Engine
- For special scenarios only -

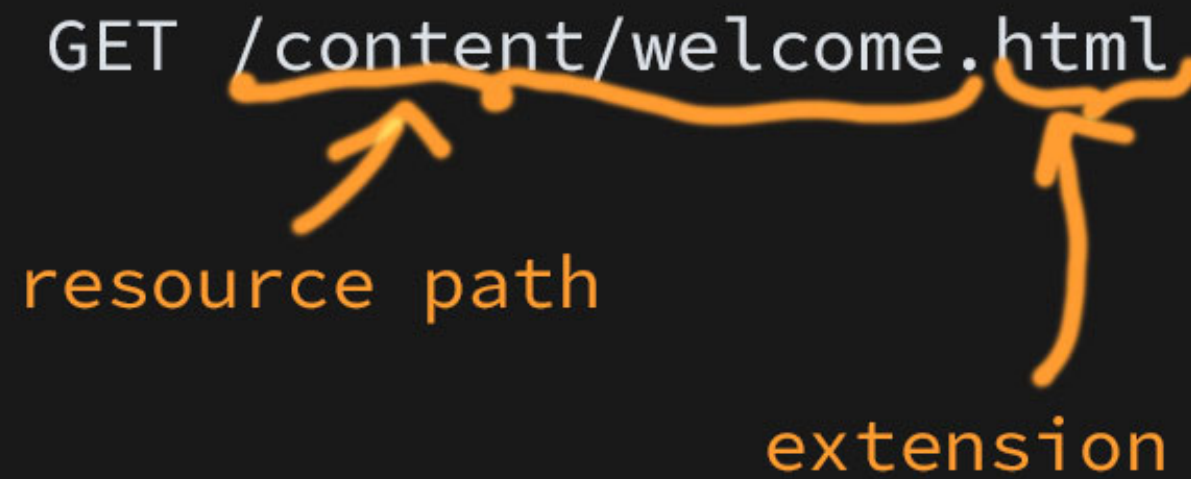
`ResourceResolver.resolve(...)`

```
var r = resourceResolver.resolve(request);  
if ( !ResourceUtil.isNonExistingResource(r) ) {  
    // ... actual work here  
}
```

URL decomposition

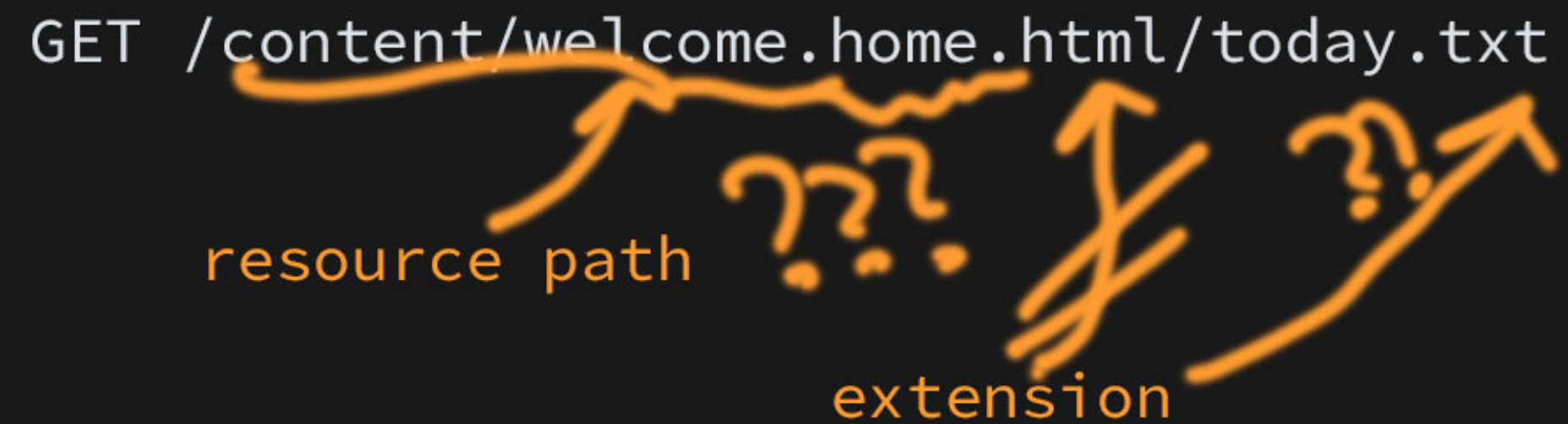
GET /content/welcome.html

resource path extension



GET /content/welcome.home.html/today.txt

resource path extension



Mapping

- Applies the reverse of the `resolve` operation
- Scenarios: canonical path for URLs references, authentication requirements
- **!** Result is percent-encoded (RFC3986)

```
// canonical mapping
resourceResolver.map(request, "/an/absolute/path");
// for special circumstances
resourceResolver.adaptTo(ResourceMapper.class)
    .getAllMappings(request, "/an/absolute/path")
```

Apache Sling Web Console Resource Resolver



Component: Path: /content/remade: Sling: Resource Resolver: Web Console

Configuration

| | |
|----------------------|-----------------|
| Resource Search Path | /content/remade |
| Resource Mapping | Enabled |
| Mapping Location | /content/remade |

Configuration Test

To test the configuration, enter an URL or a resource path into the field and click 'Resolve' to resolve the URL or click 'Map' to map the resource path. To simulate a map call that takes the current request into account, provide a full URL whose scheme/host/port prefix will then be used as the request information. The path passed to map will always be the path part of the one, which would be returned by ResourceResolver.map, is clearly marked, and the others listed for completeness.

Test Resolve Map

JcrNodeResource, type=sling:Folder, superType=null, path=/content/remade

Resolver Map Entries

Lists the entries used by the ResourceResolver.resolve methods to map URLs to Resources

| Pattern | Replacement | Redirect |
|---|-------------------------------------|----------|
| ^[^/]+/[^^/]+/nested/virtual/path(\..*) | /content/remade/welcome\$1 | internal |
| ^[^/]+/[^^/]+/nested/virtual/path\$ | /content/remade/welcome.html | internal |
| ^http/remade\.example\.com\d*/\$ | /content/remade/deep/link/page.html | internal |
| ^[^/]+/[^^/]+/virtual(\..*) | /content/remade/welcome\$1 | internal |
| ^[^/]+/[^^/]+/virtual\$ | /content/remade/welcome.html | internal |
| ^[^/]+/[^^/]+/ | /content/ /system/docroot/ | internal |

Influencing resource resolution

OSGi configs

Apache Sling Resource Resolver Factory

Configures the Resource Resolver for request URL and resource path rewriting.

Resource Search Path
 ⓘ The list of absolute path profiles applied to that resource whose path is just specified with a relative path. The default value is { "/app/", "/lib/" }. If an empty path is specified a single entry path of { "/" } is used. (Resource resolver search path)

Resource Mapping ☒
 ⓘ Defines whether resource profiles of resource names inside the path (e.g. "bin" in "bin/resource/content") are mapped or not. Mapping means that any resource profile contained in the path is replaced with the substitution pattern "/bin/" (or "/" if not set) when calling the "map" method of the resource resolver. Otherwise the "map" method will arrange such resource profiles according to the substitution pattern. It is provided since there may be systems out there in the wild which cannot cope with other containing values, even though they are perfectly valid characters in the path part of URL references with a scheme. The default configuration is provided as "true". (Resource resolver mapping/mapping)

Allow Direct Mapping ☒
 ⓘ Whether to add a direct URL mapping to the front of the mapping list. (Resource resolver allow direct)

Required Providers (Optional)
 ⓘ A resource resolver factory is only available (registered) if all resource providers mentioned in this configuration are available. Each entry is either a service ID or a filter expression. Invalid filters are ignored. (Resource resolver required providers)

Registered Providers
 ⓘ A resource resolver factory is only available (registered) if all resource providers mentioned in this configuration are available. Each entry is either the name of a registered provider. (Resource resolver registered providers)

Virtual URLs
 ⓘ List of virtual URLs and their mappings to real URLs. Format is: <virtualURL>=<realURL>. Mappings are applied on the complete request URL only. (Resource resolver virtual)

URL Mappings

 ⓘ List of mappings to apply to paths. Incoming mappings are applied to request paths to map to resource paths, outgoing mappings are applied to map resource paths to paths used in subsequent requests. The map->resourceMappingFilter allows input to be "i" for incoming mappings, "o" for outgoing mappings and "b" for mappings applied to both directions. Mappings are applied in configuration order by comparing the keys. The use of "*" as the right value indicating a mapping in both directions is deprecated. (Resource resolver mapping)

Aliases

- Alternate names for resources

```
/content/welcome  
- sling:alias = ["bun-venit", "willkommen"]
```

```
$ http :8080/content/welcome.txt | sha256sum  
c9b08ad1c05a4d102e5166ba08c62559 -
```

```
$ http :8080/content/willkommen.txt | sha256sum  
c9b08ad1c05a4d102e5166ba08c62559 -
```

```
$ http :8080/content/bun-venit.txt | sha256sum  
c9b08ad1c05a4d102e5166ba08c62559 -
```

Vanity paths

- Alternative paths for resources
- Powerful, but can lead to unpredictable results

```
/content/foo/bar  
+ sling:vanityPath = ["/welcome", "/nested/path/here"]
```

Mapping entries - basics

- Parallel resource tree, under `/etc/map` by default
- Maps requests to a tree structure:
`scheme/serverName.serverPort/path/info`
- <http://sling.apache.org/content> converted to
`http/sling.apache.org.80/content`

```
.
|- etc
  |- map
    |- http
      |- sling.apache.org.80
        |- content
```

Mapping entries - overrides

`sling:match` replaces the resource name as the match key

```
.
  \- etc
    \- map
      \- http
        \- localhost_any ← http/localhost\.\d*/
          + sling:match = localhost\.\d*
        \- content ← http/localhost.\d*/content
```



Mapping entries - modularising

`sling:match` can be used to prevent clashes from occurring

```
.
  \- etc
    \- map
      \- http
        \- fancy_app ← http/localhost\.\d*/
          + sling:match = localhost\.\d*
        \- content ← http/localhost.\d*/content
```

Mapping entries - interpolation

Uses externalised values for matches:

- Environment variables
- Bundle Context Properties
- OSGi configuration

```
/etc/map/http/my_fancy_app  
+ sling:match = ${env:LOCAL_HOSTNAME}
```




Mapping entries - simple redirect

Generates an HTTP redirect to the target resource

```
/etc/map/http/localhost_any/nachrichten  
+ sling:redirect = /news
```



Mapping entries - internal redirect

Replaces the current path internally during resolution

```
/etc/map/http/localhost_any/nachrichten  
+ sling:internalRedirect = /news
```

Mapping entries - regular expression matching

- Allow capture groups to be used in replacements
- **!** Can prevent entries from being used in reverse mappings

```
/etc/map/http/links.example.com  
+ sling:match = links.example.com/(.+)  
+ sling:redirect = http://example.com/links?link=$1
```



Demo

Non-functional considerations

Performance

- Optimised alias resolution: startup time vs runtime performance
- Query performance: recent versions exclude /jcr:system
- Explicitly configure allowed paths for vanity paths and aliases

Security

- Authentication requirements are hierarchical
- Additional mappings are registered automatically
- Edge case not captured: child resource with vanity path ([SLING-9689](#))

Resources

- <https://sling.apache.org/documentation/the-sling-engine/mappings-for-resource-resolution.html>