REST

15th June 2015

Overview

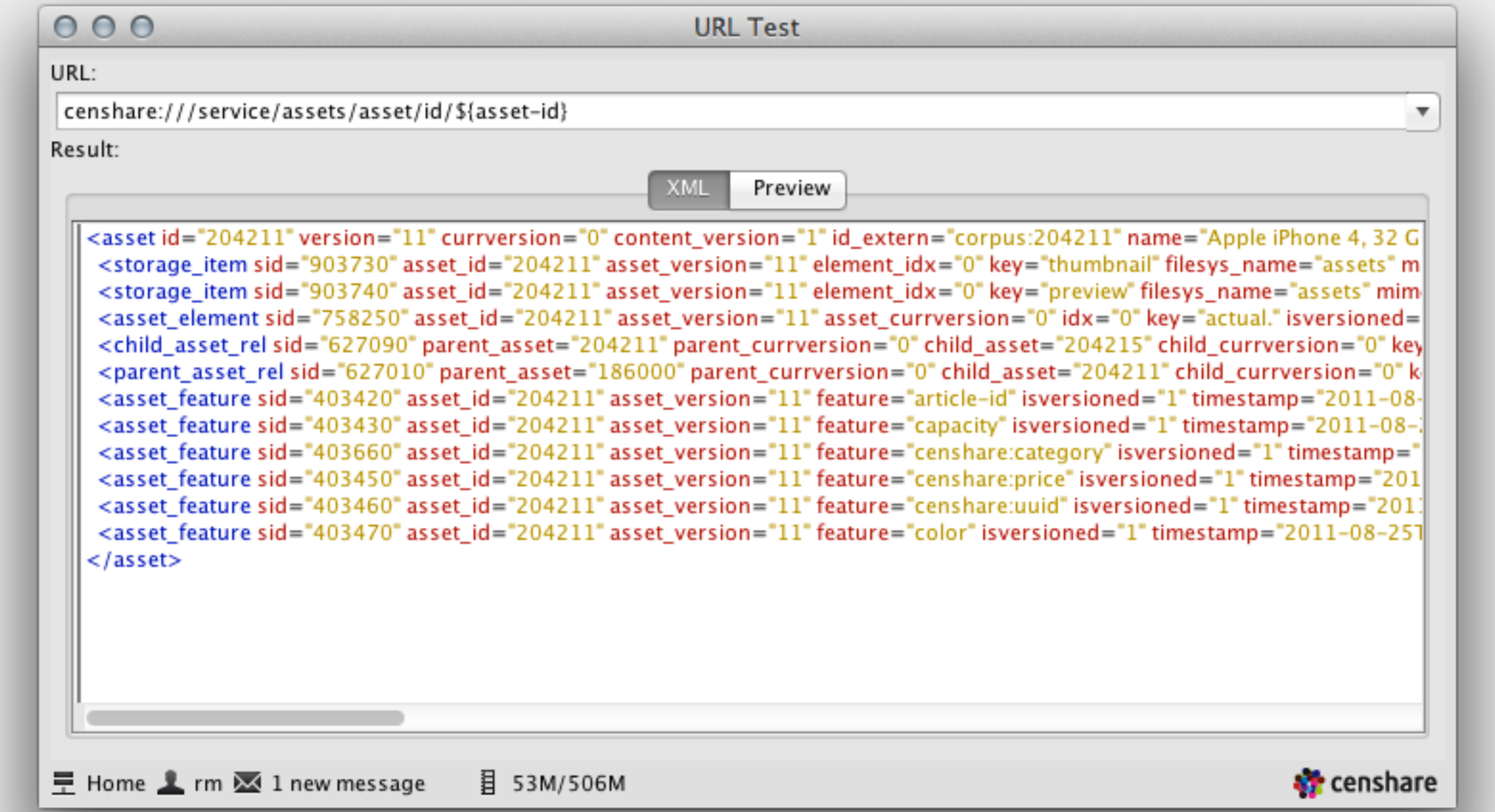
- Definitions of Wikipedia
  - REST
    - REST (Representational state transfer) is a style of software architecture for distributed hypermedia systems such as the World Wide Web
    - REST-style architectures consist of clients and servers. Clients initiate requests to servers; servers process requests and return appropriate responses. Requests and responses are built around the transfer of representations of resources. A resource can be essentially any coherent and meaningful concept that may be addressed. A representation of a resource is typically a document that captures the current or intended state of a resource.

Overview

- censhare
  - censhare has implemented a REST interface to have access over HTTP requests to
    - Assets
      - Search
      - XML
      - Icon
      - Files
      - Result of transformations
    - Resources
      - Icons
    - Temporary file systems
      - Files
  - This presentation describes the functionality of censhare versions 4.5.14, 4.6.9 and 4.7.2 or higher

Overview

- censhare
  - Provides a test window in all censhare Clients in admin mode with menu item „URL Test“
  - ID of current asset selection can be used in URL with placeholder „${asset-id}“, if one asset is selected



URL: censhare:///service/assets/asset/id/${asset-id}

Result:

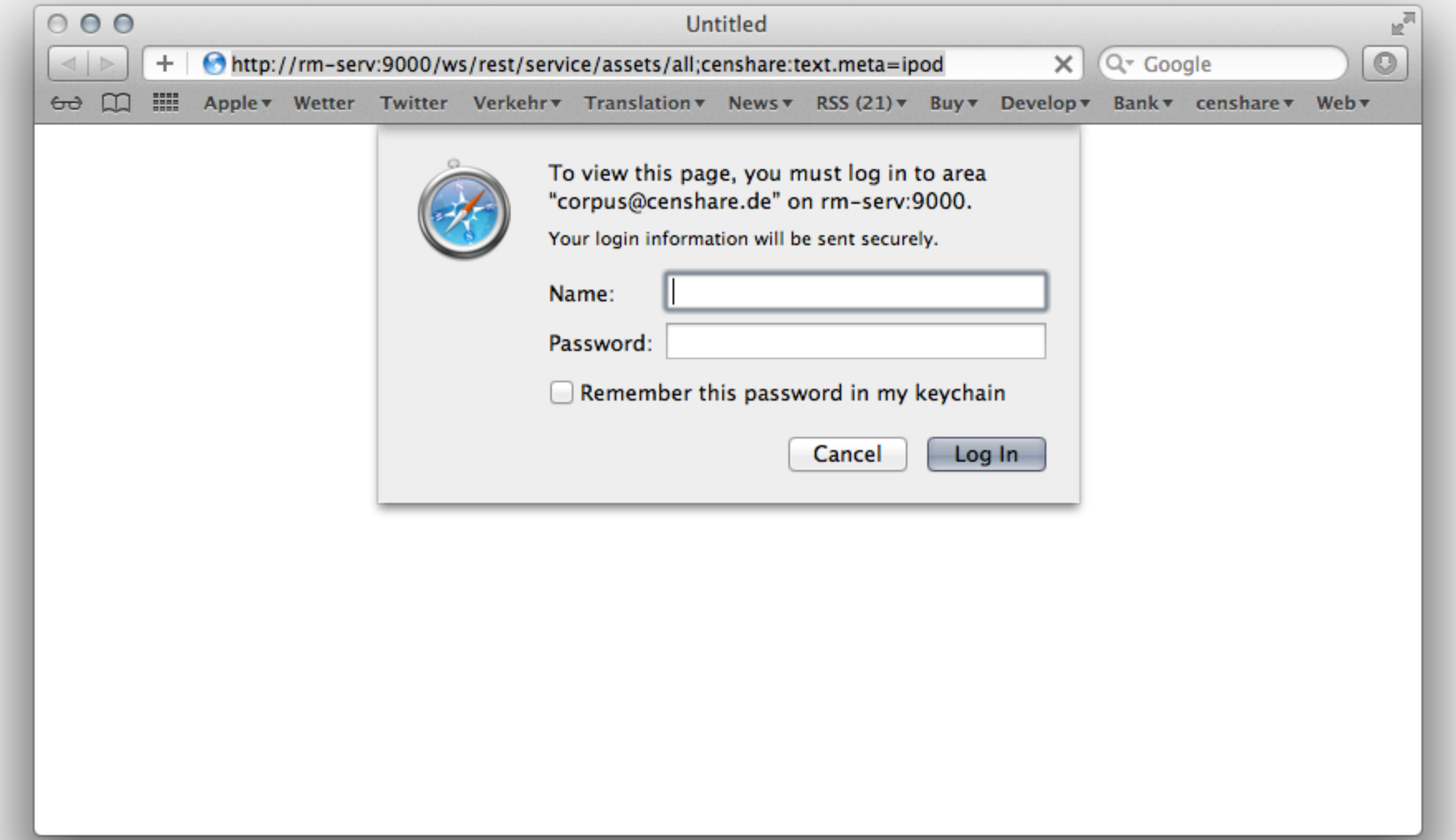
```
<asset id="204211" version="11" currversion="0" content_version="1" id_extern="corpus:204211" name="Apple iPhone 4, 32 G
  <storage_item sid="903730" asset_id="204211" asset_version="11" element_idx="0" key="thumbnail" filesys_name="assets" m
  <storage_item sid="903740" asset_id="204211" asset_version="11" element_idx="0" key="preview" filesys_name="assets" mim
  <asset_element sid="758250" asset_id="204211" asset_version="11" asset_currversion="0" idx="0" key="actual." isversioned=
  <child_asset_rel sid="627090" parent_asset="204211" parent_currversion="0" child_asset="204215" child_currversion="0" key
  <parent_asset_rel sid="627010" parent_asset="186000" parent_currversion="0" child_asset="204211" child_currversion="0" k
  <asset_feature sid="403420" asset_id="204211" asset_version="11" feature="article-id" isversioned="1" timestamp="2011-08-
  <asset_feature sid="403430" asset_id="204211" asset_version="11" feature="capacity" isversioned="1" timestamp="2011-08-
  <asset_feature sid="403660" asset_id="204211" asset_version="11" feature="censhare:category" isversioned="1" timestamp="
  <asset_feature sid="403450" asset_id="204211" asset_version="11" feature="censhare:price" isversioned="1" timestamp="201
  <asset_feature sid="403460" asset_id="204211" asset_version="11" feature="censhare:uuid" isversioned="1" timestamp="201
  <asset_feature sid="403470" asset_id="204211" asset_version="11" feature="color" isversioned="1" timestamp="2011-08-25T
</asset>
```

Configuration

- Interfaces
  - Internal (censhare Server and censhare Clients)
    - Is always enabled and has not to be configured
    - URL of censhare Server and censhare Client starts with „censhare:///service/“
    - URL of censhare Web-Client starts with relative path „webclient/url/“
    - Use „system-property('censhare:url-prefix')“ to get correct value for Client or Web-Client
  - External (Access over HTTP)
    - REST service is provided by the „HTTP Server“ service
      - Embedded web server based on Jetty on each censhare application server
    - Is disabled per default and has to be enabled
    - Port is „9000“ as default and can be modified at file „jetty.xml“ in folder „httpserver“ of folder „services“
    - Access over URL starting with „http://[host]:[port]/ws/rest/service/"

Permissions

- Interfaces
  - Internal (censhare Clients)
    - Requests are execute from the logged-in user
    - Only the information is returned to the logged-in user has access
  - External (Access over HTTP)
    - User has to login with censhare user and password information
    - Only the information is returned to the logged-in user has access
    - You may need to use „https“ protocol for more security



http://rm-serv:9000/ws/rest/service/assets/all;censhare:text.meta=ipod

To view this page, you must log in to area "corpus@censhare.de" on rm-serv:9000.

Your login information will be sent securely.

Name:

Password:

□ Remember this password in my keychain

Communication

- External (Access over HTTP)
  - Implemented requests methods in censhare 4.3
    - GET
      - All parameters are transferred in the URL
    - POST
      - Submits data to be processed

Parameter

- Part „search“
  - Syntax
    - Search items are separated with „;“
    - Search items are combined as „and“ search
    - Search items consists of index name of censhare database + „=“ + search value
    - If search items contains one or more „*“ then a like search is executed
  - Examples
    - „censhare:asset.name=test.txt“ search for assets whose name is „test.txt“
    - „censhare:resource-key=transform:product“ search for assets whose resource key is „transform:product“
    - „censhare:asset.name=test.txt;censhare:asset.type=text.“ search for assets whose name is „test.txt“ and type is text

Parameter

- Part „asset“
  - „/asset/id/“ + asset ID
    - and „/version/“ + asset version
    - or „/currversion/“ + asset current version
  - „/asset/uuid/“ + asset UUID
    - and „/version/“ + asset version
    - or „/currversion/“ + asset current version
  - „asset;“ + [search parameter part]

Parameter

- Part „element“
  - „/element/“ + [target] or [actual]
    - and „/“ + [element index]
    - or „/page/“ + [page number starting with „0“ for first page]

Parameter

- Part „storage“
  - „/storage/“ + storage key
    - Storage key is e.g. „master“, „preview“, „thumbnail“, …

Parameter

- Part „icon“
  - „/iconset/“ + name of iconset
    - Optional, default is „default“
  - and „/background/“ + name of the background
    - Optional, „dark“ or „bright“ („dark“ is default)
  - and „/minsize/“ + size in pixel
    - Optional, default is „16“

Get asset XML (original model)

- Returns XML (original model) of asset of given parameters
- Syntax
  - „assets/“ + [asset parameter part]
- Examples
  - „assets/asset/id/123“ returns XML of asset ID „123“
  - „assets/asset/id/123/version/1“ returns XML of version „1“ of asset ID „123“
  - „assets/asset/id/123/currversion/-2“ returns XML of checked out version of asset ID „123“
  - „assets/asset;censhare:asset.id=123;censhare:asset.currversion=-2“ returns XML of checked out version of asset ID „123“
  - „assets/asset;censhare:resource-key=transform:product“ returns XML of current version of first asset with resource key „transform:product“

Get asset JSON/XML (logical model)

- Returns JSON or XML (logical model) of asset of given parameters
- Syntax
  - „assets/“ + [asset parameter part] + “/model;format=logical/” + “json” or “xml”
- Examples
  - „assets/asset/id/123/model;format=logical/json“ returns JSON of asset ID „123“
  - „assets/asset/id/123/version/1/model;format=logical/xml“ returns XML of version „1“ of asset ID „123“
  - „assets/asset/id/123/currversion/-2/model;format=logical/json“ returns JSON of checked out version of asset ID „123“
  - „assets/asset;censhare:asset.id=123;censhare:asset.currversion=-2/model;format=logical/xml“ returns XML of checked out version of asset ID „123“

Get asset JSON/XML (update model)

- Returns JSON or XML (update model) of asset of given parameters
- Parameters
  - “traits”: list of traits separated mit comma. All features with this traits are included in this data model
  - “generator-inline-limit”: optional maximum inline options
- Syntax
  - „assets/“ + [asset parameter part] + “/model;format=update;traits=” + [traits] + “;generator-inline-limit=0/” + “json” or “xml”
- Examples
  - „assets/asset/id/123/model;format=update;traits=default/json“ returns JSON of asset ID „123“
  - „assets/asset/id/123/version/1/model;format=update;traits=default/xml“ returns XML of version „1“ of asset ID „123“
  - „assets/asset/id/123/currversion/-2/model;format=update;traits=default,twitter;generator-inline-limit=10/json“ returns JSON of checked out version of asset ID „123“

Get files

- Returns file with given parameters of asset with given parameters
- Syntax
  - „assets/“ + [asset parameter part] + „/“ + [optional element part] + „/“ + [storage parameter part] + „/file“
- Examples
  - „assets/asset/id/123/storage/master/file“ returns master file of asset ID „123“
  - „assets/asset/id/123/storage/preview/file“ returns preview file of asset ID „123“
  - „assets/asset/id/123/element/actual/page/1/storage/preview/file“ returns preview of first page of asset ID „123“
  - „assets/asset/id/123/element/actual/0/storage/preview/file“ returns preview of element index 0 of asset ID „123“
  - „assets/asset;censhare:resource-key=transform:product/storage/master/file“ returns master file of first asset with resource key „transform:product“

Get files

- Examples
  - „assets/asset/id/123/storage/master/file;container=zip/docProps/thumbnail.jpeg“ returns file „thumbnail.jpeg“ of folder „docProps“ of master ZIP file of asset ID „123“

Get asset icon description

- Returns description of asset icon with given parameters
- Syntax:
  - „assets/“ + [asset parameter part] + „/icon/“ + [icon parameter part]
- Examples
  - „assets/asset/id/123/icon“ returns asset icon of asset ID „123“
  - „assets/asset/id/123/version/1/icon“ returns asset icon of version 1 of asset ID „123“
  - „assets/asset/id/123/currversion/-2/icon“ returns asset icon of checked-out version of asset ID „123“
  - „assets/asset/id/123/icon/iconset/default“ returns asset icon of default iconset of asset ID „123“
  - „assets/asset/id/123/icon/iconset/default/background/dark“ returns asset icon of default iconset for dark background look&feel of asset ID „123“

Get asset icon file

- Returns asset icon with given parameters
- Syntax:
  - „assets/“ + [asset parameter part] + „/icon/“ + [icon parameter part] + „/file“
- Examples
  - „assets/asset/id/123/icon/file“ returns asset icon of asset ID „123“
  - „assets/asset/id/123/version/1/icon/file“ returns asset icon of version 1 of asset ID „123“
  - „assets/asset/id/123/currversion/-2/icon/file“ returns asset icon of checked-out version of asset ID „123“
  - „assets/asset/id/123/icon/iconset/default/file“ returns asset icon of default iconset of asset ID „123“
  - „assets/asset/id/123/icon/iconset/default/background/dark/file“ returns asset icon of default iconset for dark background look&feel of asset ID „123“

Get result of asset transformations

- Returns result of transformation of asset with given parameters
- Parameters
  - Standard parameters
    - „asset-id“: Asset ID of the transformation
    - „key“: Transformation key
  - Optional parameters can be added
  - Parameters are available with the given names in XSLT
    - e.g. „<param name="asset-id"/>“
- Syntax
  - „assets/“ + [asset parameter part] + „/transform;key=“ + [transformation key] + [„;“ + transformation parameter]

Get result of asset transformations

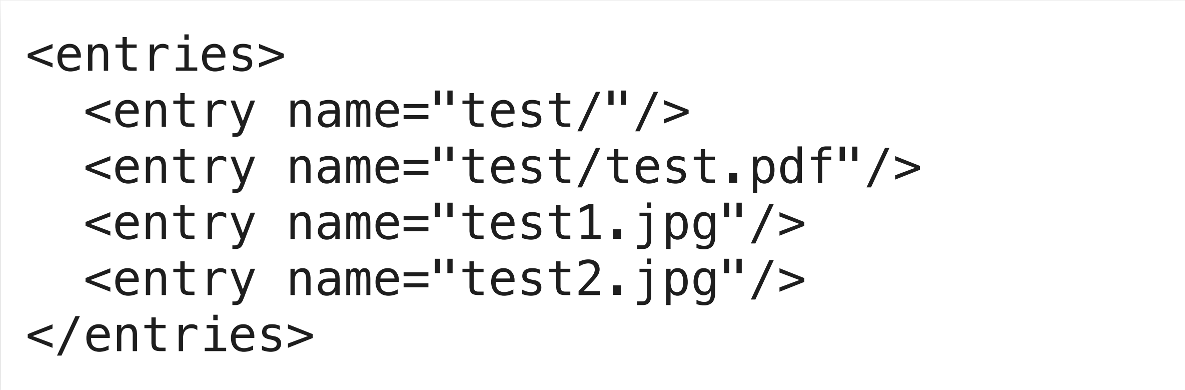
- Examples
  - „assets/asset/id/123/transform;key=test;format=xml“ returns result of transformation with key „test“ and additional parameter „format“ with value „xml“
  - „assets/asset/id/123/transform;key=test;format=xml;param1=a;param2=b“ returns result of transformation with key „test“ and additional parameter. Following parameters are available in XSLT
    - „<param name="asset-id"/>“ with value „123“
    - „<param name="key"/>“ with value „test“
    - „<param name="format"/>“ with value „xml“
    - „<param name="param1"/>“ with value „a“
    - „<param name="param2"/>“ with value „b“

Get result of asset transformations

- Localization with transformations
  - The transformation key „localize“ is used to localize the XML
  - Placeholder, e.g. „${asset}“ is converted to „Asset“ with global properties
  - Example
    - censhare:///service/assets/asset/id/205371/transform;key=localize

Get directory of ZIP files

- Returns a list of all files of ZIP files as XML
- Can be added to all REST URLs based on file results
- Syntax
  - [REST URL to ZIP file] + „;container=zip
- Example
  - „assets/asset/id/123/storage/master/file;container=zip“
  - „filesystem/assets/13/89/138931.zip;container=zip“
- Example result



```
<entries>
  <entry name="test/"/>
  <entry name="test/test.pdf"/>
  <entry name="test1.jpg"/>
  <entry name="test2.jpg"/>
</entries>
```

Get files of ZIP files

- Returns defined files of ZIP files
- Can be added to all REST URLs based on file results
- Relative path is separated with „/“
- Syntax
  - [REST URL to ZIP file] + „;container=zip/” + [file path]
- Example
  - „assets/asset/id/123/storage/master/file;container=zip/docProps/thumbnail.jpeg“
  - „filesystem/assets/13/89/138931.zip;container=zip/designmap.xml“

Get icon

- Returns asset icon with given parameters
- Syntax
  - „resources/icon/“ + [icon key] + „/“ + [icon parameter part] + „/file“
- Examples
  - „resources/icon/add/file“ returns icon with key „add“
  - „resources/icon/add/iconset/default/file“ returns icon of default iconset with key „add“
  - „resources/icon/add/iconset/default/background/dark/file“ returns icon of default iconset for dark look&feel with key „add“

Search for asset XML (GET request)

- Returns XML of any assets that matches with given search criterias
- Syntax
  - „assets/all;“ + [search parameter part]
- Examples
  - „assets/all;censhare:asset.type=picture.“ returns every asset XML whose type is „picture“
  - „assets/all;censhare:asset.type=picture.;censhare:text.meta=ipod“ returns every asset XML whose type is „picture“ and meta data contains „ipod“
  - „assets/all;censhare:asset.type=picture.;censhare:asset.name=*ipod*/transform;key=test“ returns a transformation with key „test“ of every asset XML whose type is „picture“ and name contains „ipod“

Search for asset XML (POST request)

- Returns XML of any assets that matches with given search criterias
- Syntax
  - URL „assets/query“
  - Client uploads query XML file as POST parameter
    - Query XML file has same syntax as standard asset query requests from client to server
- Example with „curl“ (Client for URLs)
  - „curl -X POST -T "/Users/rm/censhare/Präsentationen/censhare REST Training/asset-query.xml" -u rm: http://rm-serv:9000/ws/rest/service/assets/query“
  - „curl“ parameters
    - -X -X/--request <command>
    - -T -T/--upload-file <file>
    - -u -u/--user <user:password>

Search for asset XML (POST request)

- Example query XML file
  - Query for assets with „my tasks“ and (asset type is picture or asset type is video)

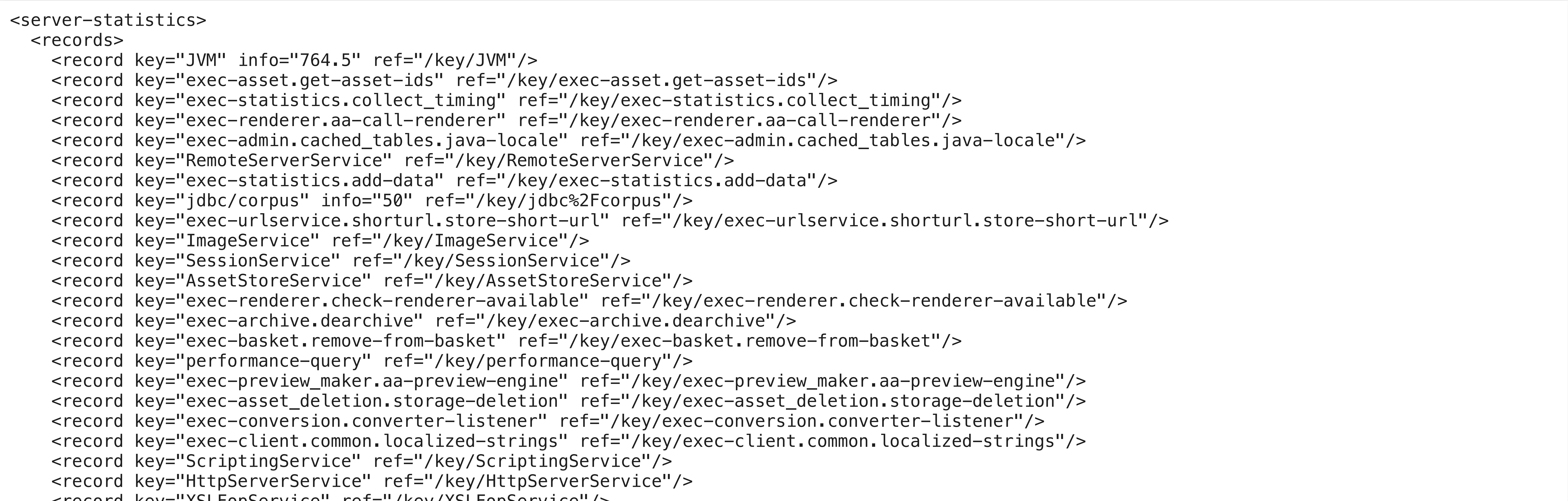
    -
      ```
      <query count-rows="false" expand-limit="1000" full="200" limit="200" rel-limit="2147483647" start-full="0" start-row="0"
      type="asset" xmlns:corpus="http://www.censhare.com/xml/3.0.0/corpus">
        <condition name="censhare:function.my-tasks" op="=" value="1"/>
        <or>
          <condition expanded-nodes="picture." name="censhare:asset.type" op="=" partial-load-tree="true" value="picture.*"/>
          <condition expanded-nodes="video." name="censhare:asset.type" op="=" partial-load-tree="true" value="video.*"/>
        </or>
      </query>
      ```

Get file of file system

- Returns file of given file system and URL
- External access is limited to the temporary file system
- Syntax
  - „filesystem“ + [name of file system] + „/“ + [URL to file]
- Examples
  - „filesystem/temp/1234456/10000.pdf“ returns file „10000.pdf“ in folder „1234456“ of temporary file system „temp“
  - „filesystem/assets/13/89/138931.jpg“ returns file „138931.jpg“ of the „assets“ file system

Get server statistics services (censhare 4.8.0 or higher)

- Returns available server services for statistics
  - Statistics data can be used for diagrams or for monitoring
- Syntax
  - „server-statistics“
- Example result



```
<server-statistics>
  <records>
    <record key="JVM" info="764.5" ref="/key/JVM"/>
    <record key="exec-asset.get-asset-ids" ref="/key/exec-asset.get-asset-ids"/>
    <record key="exec-statistics.collect_timing" ref="/key/exec-statistics.collect_timing"/>
    <record key="exec-renderer.aa-call-renderer" ref="/key/exec-renderer.aa-call-renderer"/>
    <record key="exec-admin.cached_tables.java-locale" ref="/key/exec-admin.cached_tables.java-locale"/>
    <record key="RemoteServerService" ref="/key/RemoteServerService"/>
    <record key="exec-statistics.add-data" ref="/key/exec-statistics.add-data"/>
    <record key="jdbc/corpus" info="50" ref="/key/jdbc%2Fcorpus"/>
    <record key="exec-urlservice.shorturl.store-short-url" ref="/key/exec-urlservice.shorturl.store-short-url"/>
    <record key="ImageService" ref="/key/ImageService"/>
    <record key="SessionService" ref="/key/SessionService"/>
    <record key="AssetStoreService" ref="/key/AssetStoreService"/>
    <record key="exec-renderer.check-renderer-available" ref="/key/exec-renderer.check-renderer-available"/>
    <record key="exec-archive.dearchive" ref="/key/exec-archive.dearchive"/>
    <record key="exec-basket.remove-from-basket" ref="/key/exec-basket.remove-from-basket"/>
    <record key="performance-query" ref="/key/performance-query"/>
    <record key="exec-preview_maker.aa-preview-engine" ref="/key/exec-preview_maker.aa-preview-engine"/>
    <record key="exec-asset_deletion.storage-deletion" ref="/key/exec-asset_deletion.storage-deletion"/>
    <record key="exec-conversion.converter-listener" ref="/key/exec-conversion.converter-listener"/>
    <record key="exec-client.common.localized-strings" ref="/key/exec-client.common.localized-strings"/>
    <record key="ScriptingService" ref="/key/ScriptingService"/>
    <record key="HttpServerService" ref="/key/HttpServerService"/>
    <record key="XSLFopService" ref="/key/XSLFopService"/>
```

Get server statistics services (censhare 4.8.0 or higher)

- Returns statistic data of server service with given key
  - Returned are the values of the last 60 seconds, the last 240 minutes and the last 96 hours
  - Available keys are available at the result of “server-statistics”
- Syntax
  - „server-statistics/key/“+ [key of service]
- Example

```
server-statistics/key/JVM
```

- Returns

```
<server-statistics>
  <record key="JVM" type="performance" info="764.5">
    <components>
      <component title="used memory"/>
      <component title="total memory"/>
    </components>
    <entries level="seconds" size="60">
      <entry value1="440.88" value2="764.5"/>
      <entry value1="440.81" value2="764.5"/>
      <entry value1="440.75" value2="764.5"/>
      <entry value1="440.63" value2="764.5"/>
      <entry value1="440.56" value2="764.5"/>
      <entry value1="440.44" value2="764.5"/>
      <entry value1="440.37" value2="764.5"/>
      <entry value1="440.29" value2="764.5"/>
      <entry value1="440.2" value2="764.5"/>
      <entry value1="440.13" value2="764.5"/>
```

Returns the used and total memory of the
Java Virtual Machine of the censhare server

Components describes the columns of the entry elements

There are 3 “entries” elements defined by the
level attribute “seconds”, “minutes”, “hours”

Get server statistics services (censhare 4.8.0 or higher)

- Returns latest statistic data of server service with given key
- Available keys are available at the result of “server-statistics”
- The min and max values are calculated based on the last 60 seconds
- Syntax
  - „server-statistics/key/“+ [key of service] + “/latest”
- Example

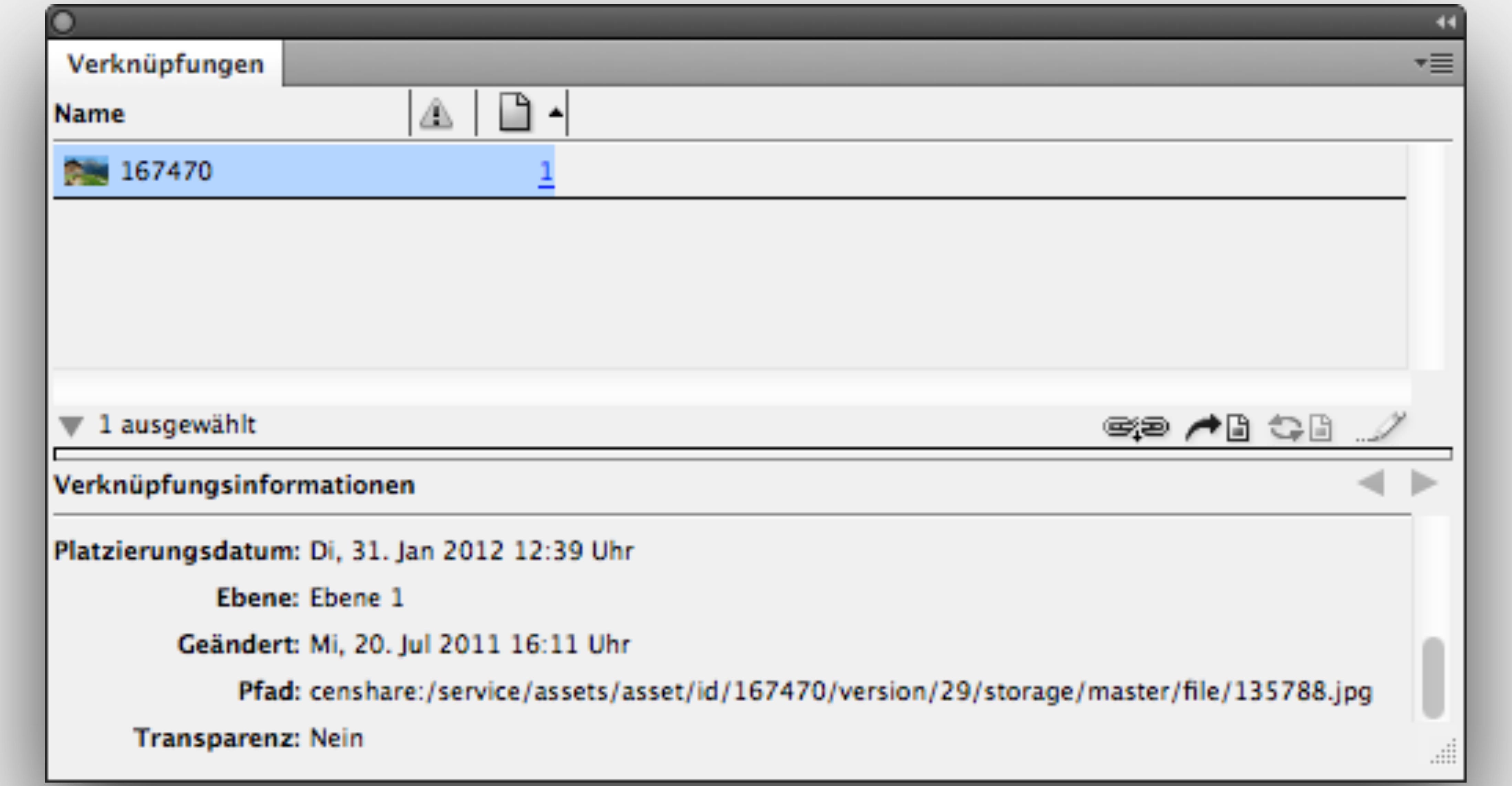
```
server-statistics/key/JVM/latest
```

- Returns

```
<server-statistics>
  <record timestamp="1385035030259" key="JVM" type="performance">
    <components>
      <component title="used memory" value="248.18369" min="242.9569" max="248.18369"/>
      <component title="total memory" value="764.5" min="764.5" max="764.5"/>
    </components>
  </record>
</server-statistics>
```

Usage in censhare

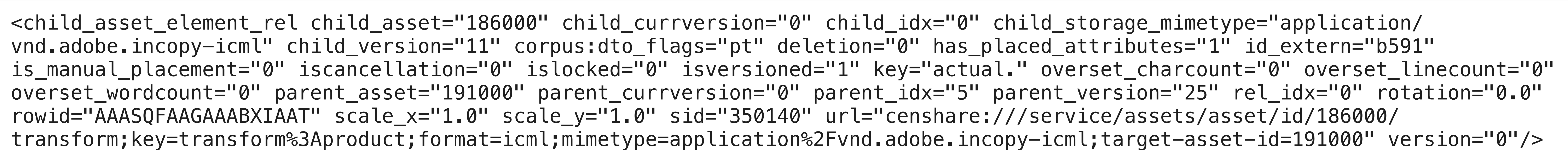
- Adobe InDesign
  - URLs for placed files without mounted volumes are REST-URLs (censhare 4.4 and above)



Platzierungsdatum: Di, 31. Jan 2012 12:39 Uhr
Ebene: Ebene 1
Geändert: Mi, 20. Jul 2011 16:11 Uhr
Pfad: censhare:/service/assets/asset/id/167470/version/29/storage/master/file/135788.jpg
Transparenz: Nein

Usage in censhare

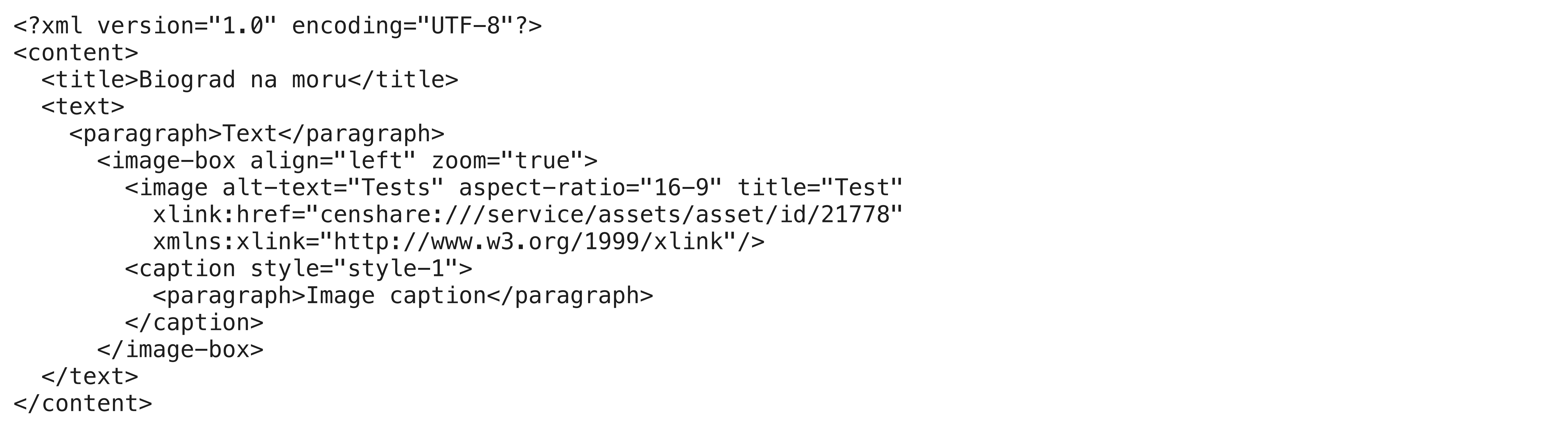
- Adobe InDesign
  - URLs for placed transformation assets are REST-URLs



```
<child_asset_element_rel child_asset="186000" child_currversion="0" child_idx="0" child_storage_mimetype="application/
vnd.adobe.incopy-icml" child_version="11" corpus:dto_flags="pt" deletion="0" has_placed_attributes="1" id_extern="b591"
is_manual_placement="0" iscancellation="0" islocked="0" isversioned="1" key="actual." overset_charcount="0" overset_linecount="0"
overset_wordcount="0" parent_asset="191000" parent_currversion="0" parent_idx="5" parent_version="25" rel_idx="0" rotation="0.0"
rowid="AAASQFAAGAAABXIAAT" scale_x="1.0" scale_y="1.0" sid="350140" url="censhare:///service/assets/asset/id/186000/
transform;key=transform%3Aproduct;format=icml;mimetype=application%2Fvnd.adobe.incopy-icml;target-asset-id=191000" version="0"/>
```

Usage in censhare

- Content-Editor
  - URLs for placed assets or content-in-content structures are REST-URLs



```
<?xml version="1.0" encoding="UTF-8"?>
<content>
  <title>Biograd na moru</title>
  <text>
    <paragraph>Text</paragraph>
      <image-box align="left" zoom="true">
        <image alt-text="Tests" aspect-ratio="16-9" title="Test"
          xlink:href="censhare:///service/assets/asset/id/21778"
          xmlns:xlink="http://www.w3.org/1999/xlink"/>
        <caption style="style-1">
          <paragraph>Image caption</paragraph>
        </caption>
      </image-box>
  </text>
</content>
```

Usage in censhare

- Image widget
  - Attribute „url“ of widget „xe:image“ supports REST-URLs (censhare 4.4 and above)

```
<xe:image url="=:concat('censhare:///service/assets/asset/id/', asset/@id, '/storage/thumbnail/file')"/>
```

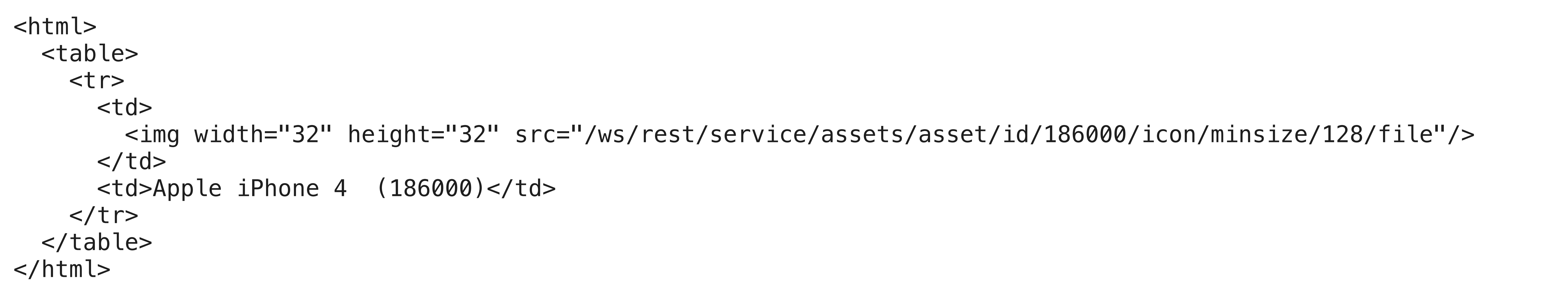
Usage in censhare

- HTML widget
  - Attribute „url“ of widget „xe:html“ supports REST-URLs (censhare 4.4 and above)

```
<xe:html url="=:concat('censhare:///service/assets/asset/id/', asset/@id, '/transform;key=transform:icon-name)"/>
```

Usage in censhare

- Transformations
  - Images in HTML results of transformations are REST-URLs



```
<html>
  <table>
    <tr>
      <td>
        <img width="32" height="32" src="/ws/rest/service/assets/asset/id/186000/icon/minsize/128/file"/>
      </td>
      <td>Apple iPhone 4  (186000)</td>
    </tr>
  </table>
</html>
```

More infos

- Links
  - Wikipedia – REST
    - http://en.wikipedia.org/wiki/REST
  - Principled Design of the Modern Web Architecture
    - http://www.ics.uci.edu/~taylor/documents/2002-REST-TOIT.pdf

Thank you

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