EMu Documentation

Supplementary Media

Document Version 1.2

EMu Version 4.1

Contents

SECTION 1

Overview

The EMu Multimedia repository stores and manages a wide range of document types. These may be:

- In electronic format (e.g. images, Word documents, video, etc.).
- URLs identifying a resource on the World Wide Web.
- An identifier used to locate a particular resource (e.g. the ISBN for a book, or the location of a slide in the slide library).

Each record in the Multimedia repository describes exactly one resource. Data describing the resource may be added to the record, allowing quite detailed information to be associated with it (as a minimum, the full set of Dublin Core fields is available).

An issue arises when there's a need to store resources *associated* with a Multimedia record. For example, let's say a Multimedia resource is an image of a page containing text. Along with the image it may be desirable to have a text document that contains the words in the image so that users may view the image of the text but also have the option of reading the text in the associated document.

Prior to EMu 4.1 there was only one way to implement such a solution:

1. Each associated resource required its own Multimedia record.
2. A relationship was then established between the master resource and the associated resources via either a text field in the Multimedia record or via an over-arching record in another module that links the resources (typically the Narratives module).

In some cases the setting up of such structures is overkill. In the example above, the text document containing the words in the image may not be important enough to warrant its own Multimedia record.

Other examples:

- The master resource is an image and a cropped thumbnail is required to display on the web.

  The Multimedia repository generates images of various resolutions when an image is added but each of these resolutions is an exact copy of the master. In some instances it may be desirable to have cropped versions of the master, or even a different image completely.
- The master resource is a video. There may also be a separate audio track describing the video and an image of the first frame of the video.

  Rather than creating separate Multimedia records for the audio and image resources it may be more appropriate to store them with the master video itself.

The purpose of supplementary media is to allow associated resources to be stored with a master resource in the same Multimedia record. Supplementary media does not replace the use of over-arching records to related multimedia where each resource is important in its own right, rather it provides a mechanism for storing other media with the master resource that may be used along with the master resource.

In order to provide support for supplementary media, a Supplementary tab has been added to the Multimedia module. The tab is similar to the Resolutions tab and allows media to be added, deleted, modified, viewed and saved. The Multimedia drop-down menu available in each module has been extended to allow supplementary media to be viewed and saved. It is also possible:

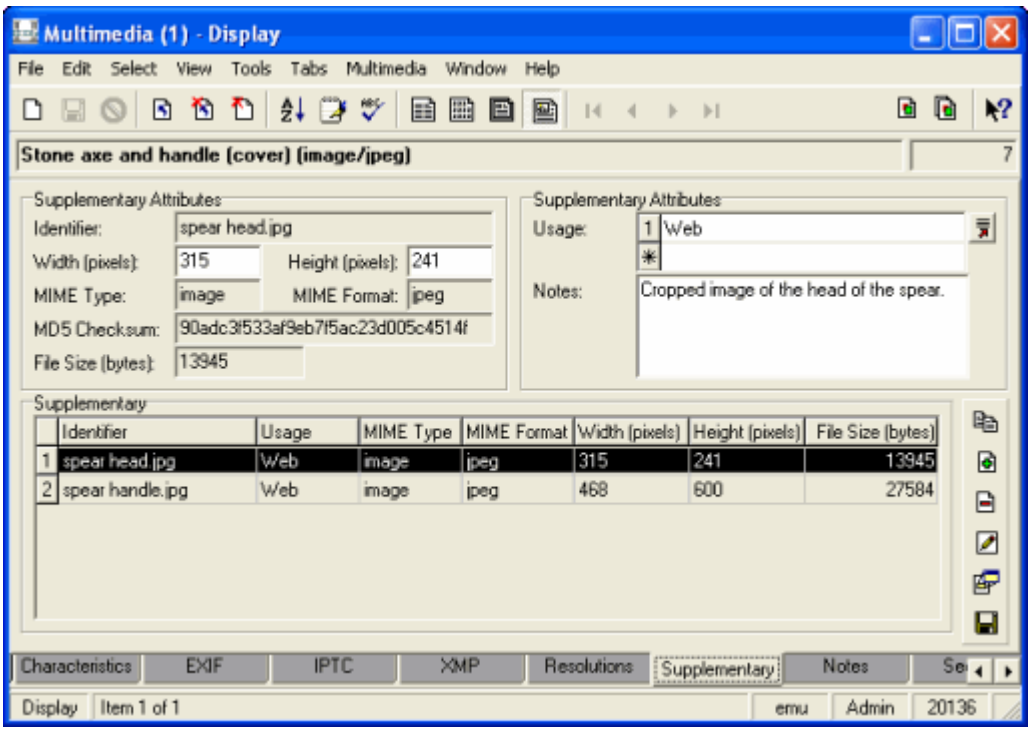
- To import supplementary media using the EMu Import facility (page 25).
- To use supplementary media in reports (page 27).

IMu has been extended to allow supplementary data to be accessed (page 33).

SECTION 2

Supplementary tab

All management of supplementary media is performed via the Supplementary tab in the Multimedia module. The bottom half of the tab consists of a *Supplementary* table that lists all supplementary media. The set of fields above the table display data about the media currently selected in the *Supplementary* table:



The following fields are available:

Field Name	Description
Identifier	The file name given to the media on the EMu server. This must be provided and must be unique in the *Supplementary* table for the current record. When adding new media the name of the file being imported is used as the default identifier. An identifier may consist of any characters, including spaces, except for: `\ / : * ? " < > |`
Width (pixels)	If the supplementary media is an image, the width in pixels is calculated automatically and stored. For other types of media that have a width in pixels (e.g. video) the value may be entered manually.
Height (pixels)	If the supplementary media is an image, the height in pixels is calculated automatically and stored. For other types of media that have a height in pixels (e.g. video) the value may be entered manually.
MIME Type	The type of the supplementary media. EMu calculates the MIME Type automatically and adds the value to this field. The MIME Type is a high level term describing the overall category into which the media belongs. Example values are: image, video, audio, application, etc. MIME Types available in EMu are defined by RFC 2046.
MIME Format	The format used to store the supplementary media. The value is used to determine how the media should be decoded for viewing, playing, etc. For each MIME Type there is a wide range of available formats. As with the MIME Type, EMu calculates the MIME Format automatically and adds the value to this field.
MD5 Checksum	A calculated value used to determine whether the media has been modified. EMu calculates the checksum automatically and adds it to this field. The checksum should be used where the authenticity of the supplementary media needs to be verified.
File Size (bytes)	The size of the supplementary file in bytes. EMu calculates the size of the media automatically and adds the value to this field. The value may be used to determine download times, storage requirements, etc.
Usage	A list of values outlining what the supplementary media may be used for. The usage field allows supplementary media to be searched for based on its purpose. For example, the IMu server may be queried to determine whether a given resource has a preferred thumbnail, which is a cropped version of the original image. In this case the *Usage* field may contain the term `Thumbnail`. A Look-up List is provided to allow some vocabulary control over the available values.
Notes	An area where notes about the supplementary media may be stored. The notes may describe what the media contains, or it may be information that is displayed along with the media when displayed on a website (e.g. copyright information, a credit line, a textual label).

Only the *Usage*, *Notes*, *Width* and *Height* fields may be altered. All other fields are calculated by EMu automatically and cannot be modified.

SECTION 3

Supplementary media functionality

The Supplementary tab provides a rich set of functions allowing media to be:

Permissions

In order to manipulate supplementary data, users require permission to alter the *Supplementary_tab* column. They also require certain multimedia operations depending on the command to be performed and must be able to modify the Multimedia record with appropriate record level permissions. The table below outlines the permissions required for each of the supplementary functions available:

Function	Column Permissions	Record Permissions	Multimedia Permissions
Add	`dvInsert, duInsert, dvEdit, duEdit`	`Edit`	`Add`
Import	`dvInsert, duInsert, dvEdit, duEdit`	`Edit`	`Add`
Delete	`dvEdit, duEdit`	`Edit`	`Delete`
Edit	`dvEdit, duEdit`	`Edit`	`Add`
View	`dvDisplay`	`Display`	
Save	`dvDisplay`	`Display`	
Update	`dvEdit, duEdit`	`Edit`	`Update`

Note:

- Column Permissions are controlled via the `Column Access` Registry entry.
- Record Permissions are based on record level security settings.
- The `Security` Registry entry may be used to set the default permissions.
- The record level permissions on an individual record may be altered by users with sufficient privileges.
- Multimedia permissions are determined by the `Multimedia|Operations` Registry entry.

 See the EMu Help for details.

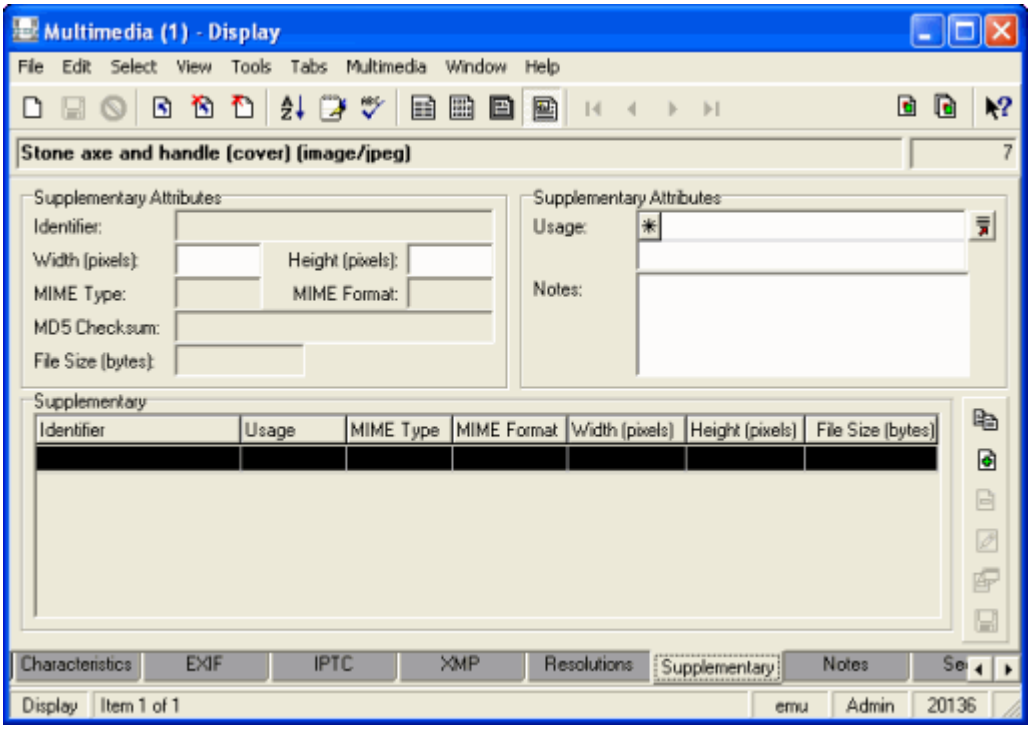
How to add supplementary media

One way to add supplementary media to a record is to take a copy of the master resource and modify it in an editor. When the modified image is saved, EMu asks whether it should be added as supplementary media. An affirmative response allows an identifier to be specified, after which the media is appended to the *Supplementary* table.

In order to add supplementary media in this way the Multimedia record must have a master resource available in electronic form.

In the Multimedia module:

1. Locate the record to which supplementary media is to be added.
2. Select the **Supplementary** tab:



3. Select **Multimedia>Add>Supplementary** in the Menu bar

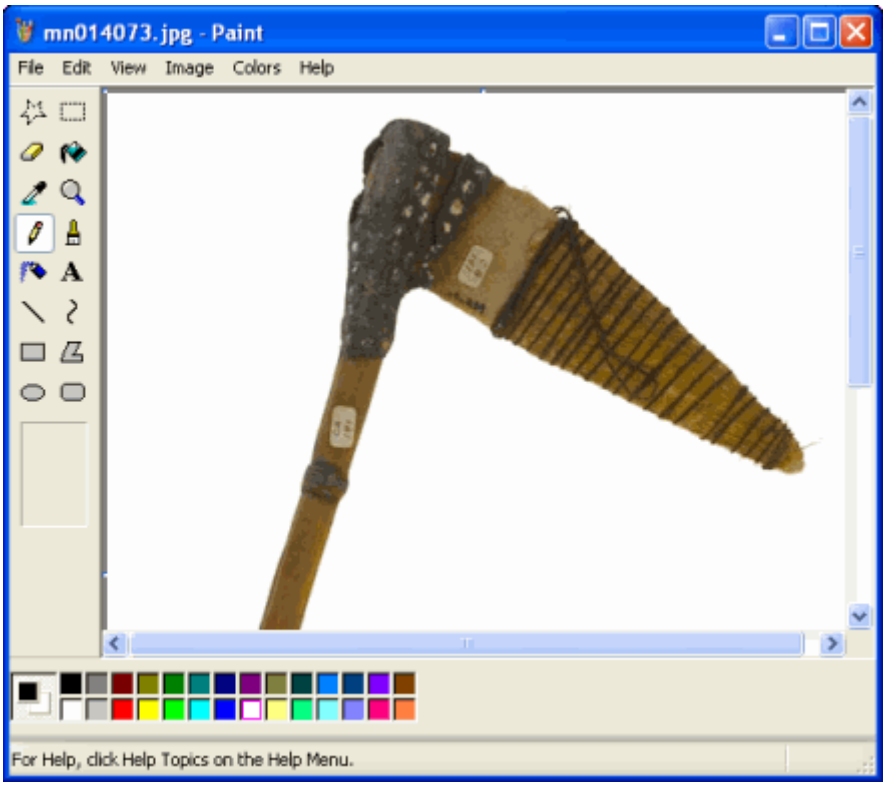
   -OR-

   Select **Add Supplementary**  from the Toolbar beside the *Supplementary* table

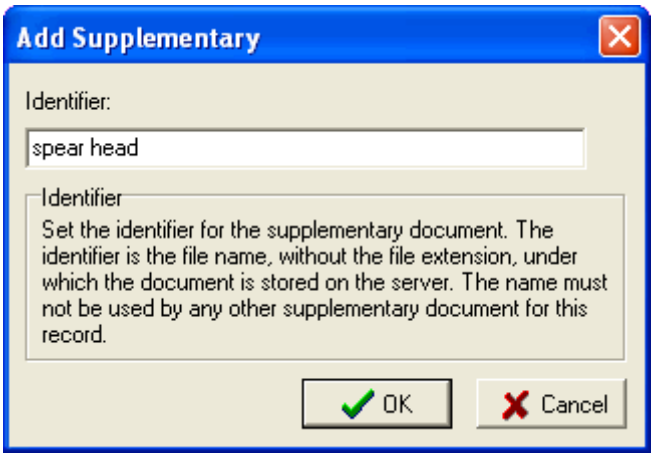
   -OR-

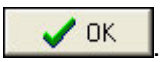
   Use the keyboard shortcut, `ALT+M+A+S`.

   The master resource displays inside the editor associated with the resource type (in this example, the Paint application is associated with jpg images):



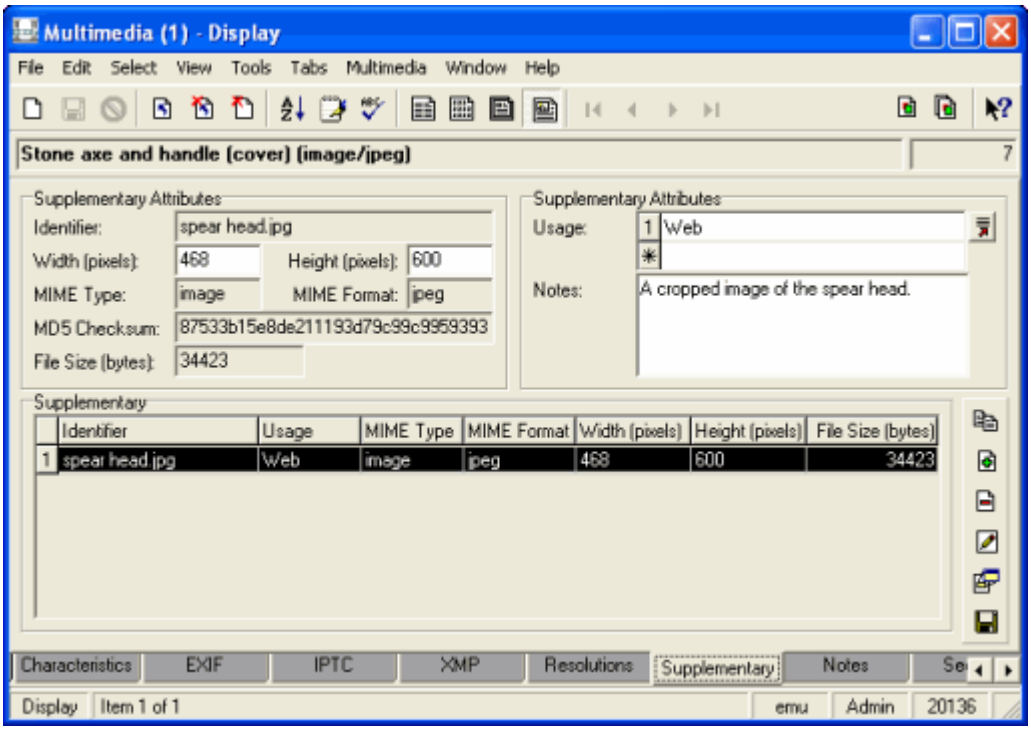
4. Modify the resource and save the image.
5. Either exit the editor or switch back to EMu.
   The Add Supplementary dialogue box displays:



6. Accept or edit the *Identifier* to use for the supplementary resource.
   The *Identifier* is the file name under which the supplementary media is stored on the EMu server.
7. Select 

.
   The new media is appended to the *Supplementary* table.

8. Add any *Usage* and *Notes* data and save the record:

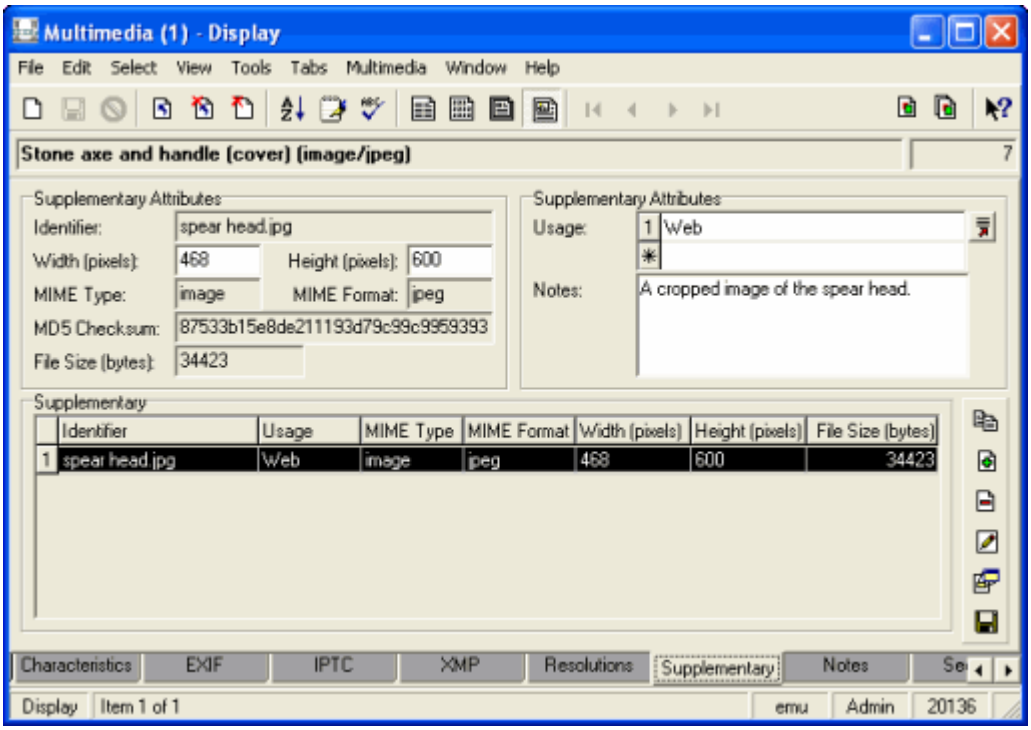


How to import supplementary media

If the supplementary media already exists as an electronic file outside of EMu, it can be imported into the *Supplementary* table. The process is very similar to adding a master resource to a Multimedia record.

In the Multimedia module:

1. Locate the record into which supplementary media is to be imported.
2. Select the **Supplementary** tab:



3. Select **Multimedia>Add>File** in the Menu bar

   -OR-

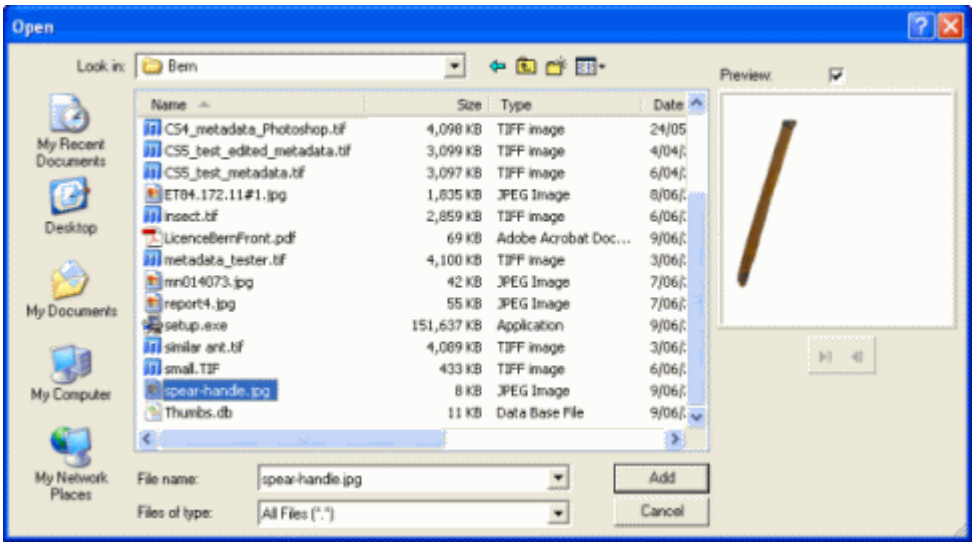
   Select **Import Supplementary** from the Toolbar beside the *Supplementary* table

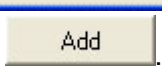
   -OR-

   Use the keyboard shortcut, `ALT+M+A+F`.

   The Open dialogue box displays.

4. Locate and select the media file to be imported:

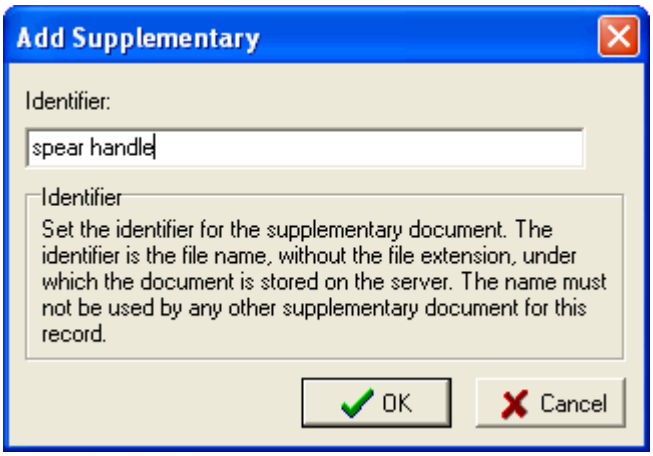


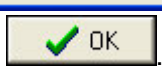
5. Click  .

The Add Supplementary dialogue box displays.

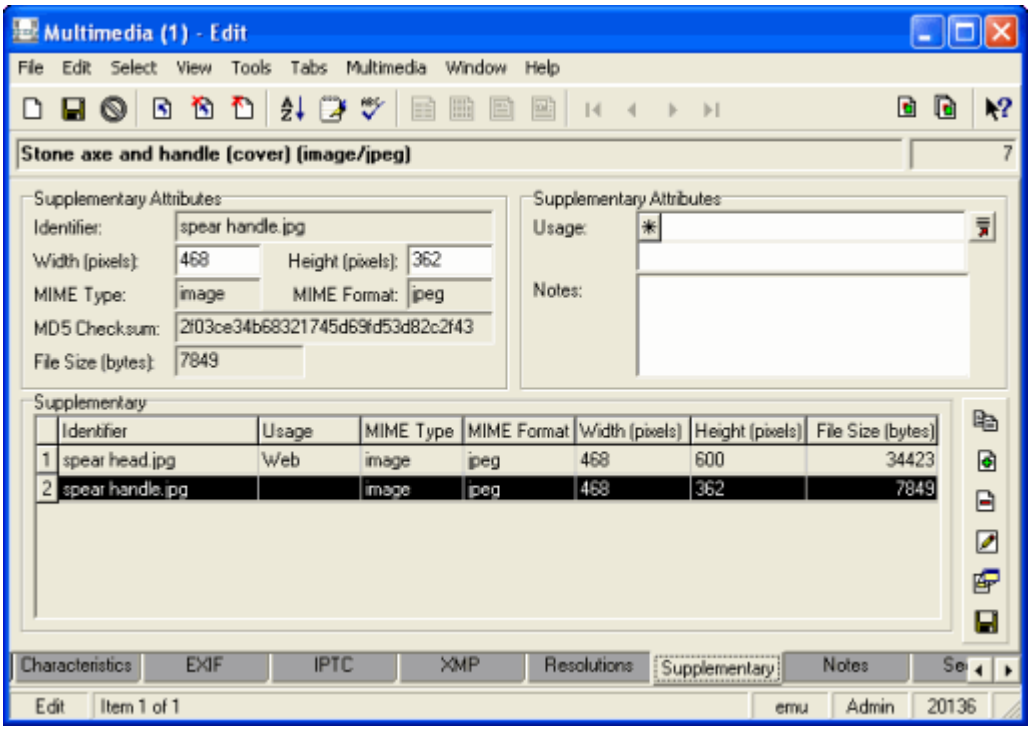
6. Enter the *Identifier* to use for the resource.

The *Identifier* is the file name under which the supplementary media is stored on the EMu server:



7. Select  .

The file is imported and appended to the *Supplementary* table:



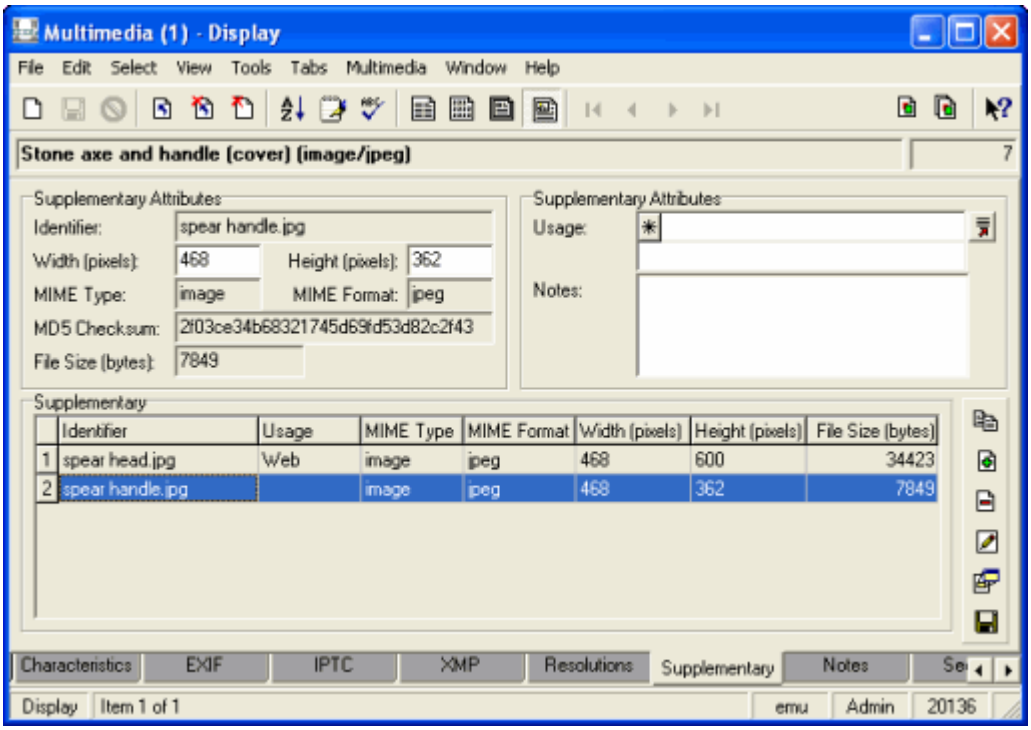
8. Add any *Usage* and *Notes* data and save the record.

How to delete supplementary media

Supplementary media may be removed from the *Supplementary* table. When the Multimedia record is saved, any media removed will be deleted from the EMu server permanently.

In the Multimedia module:

1. Locate the record with the supplementary media to be deleted.
2. On the Supplementary tab, click the row in the *Supplementary* table to be deleted:



3. Select **Multimedia>Delete Resource** in the Menu bar

   -OR-

   Select **Delete Supplementary**  from the Toolbar beside the *Supplementary* table

   -OR-

   Use the keyboard shortcut, `ALT+M+D`.

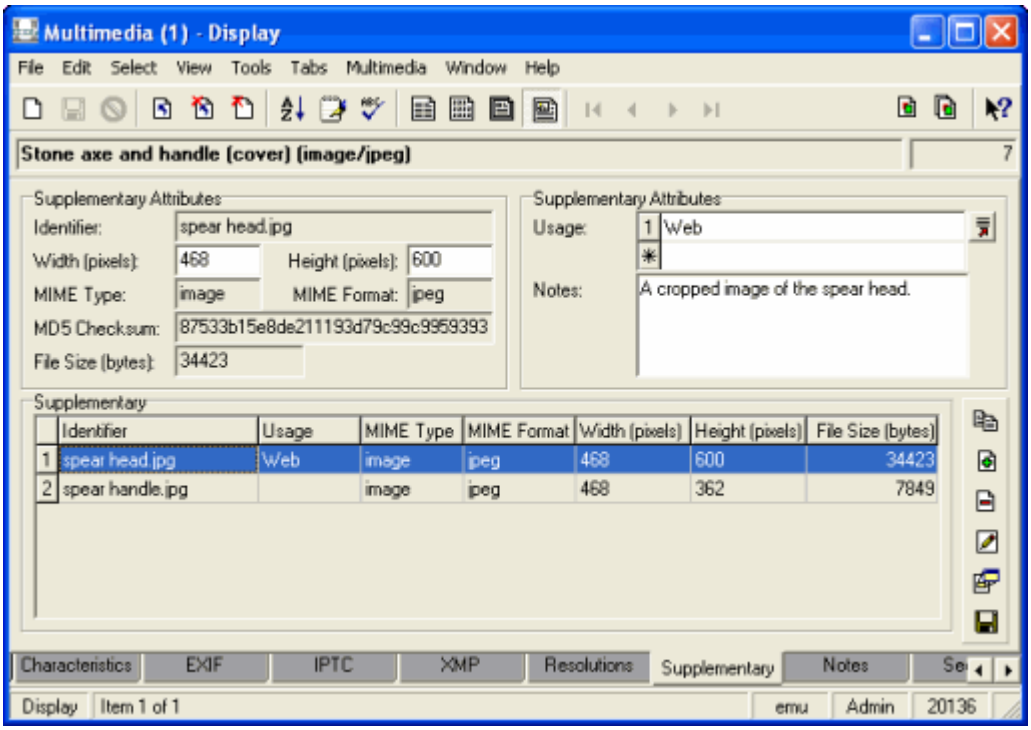
   The selected media is removed from the *Supplementary* table.
4. Save the record.

   The media is removed from the EMu server.

How to edit supplementary media

In the Multimedia module:

1. Locate the record with the supplementary media to be edited.
2. On the Supplementary tab, click the row in the *Supplementary* table for the media to be edited:



3. Select **Multimedia>Edit Resource** in the Menu bar

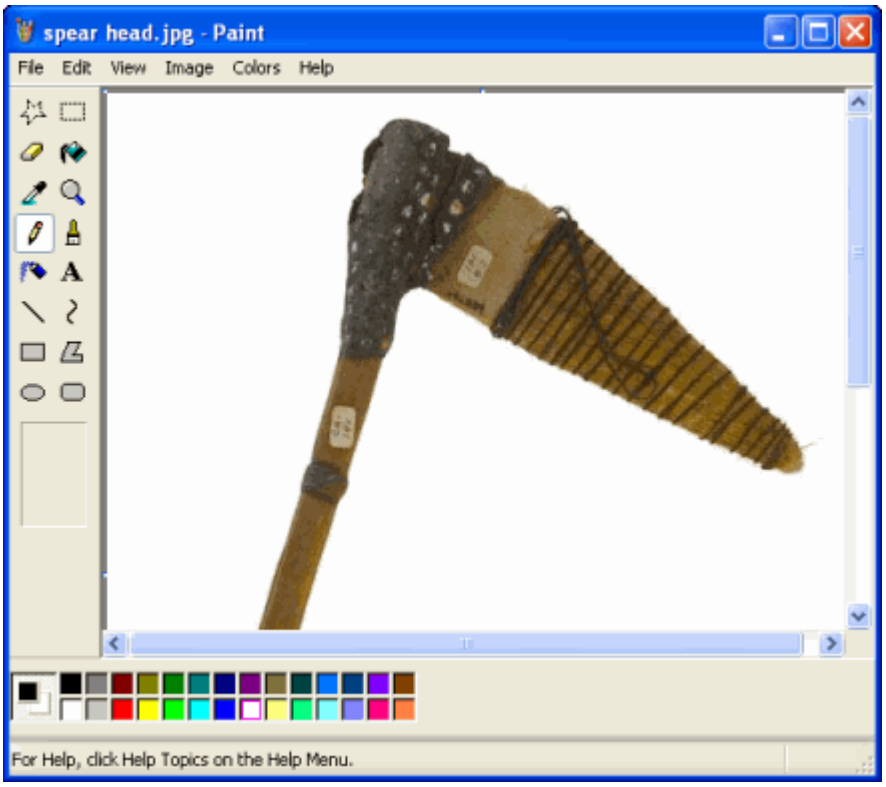
   -OR-

   Select **Edit Supplementary**  from the Toolbar beside the *Supplementary* table

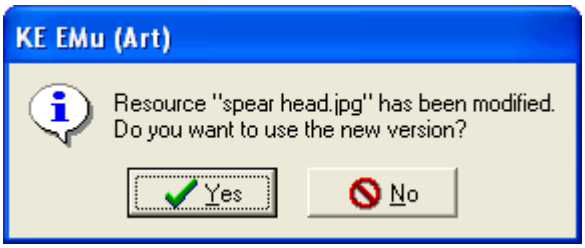
   -OR-

   Use the keyboard shortcut, `ALT+M+E`.

   The selected supplementary resource displays inside the editor associated with the resource type (in this example, the Paint application is associated with jpg images):

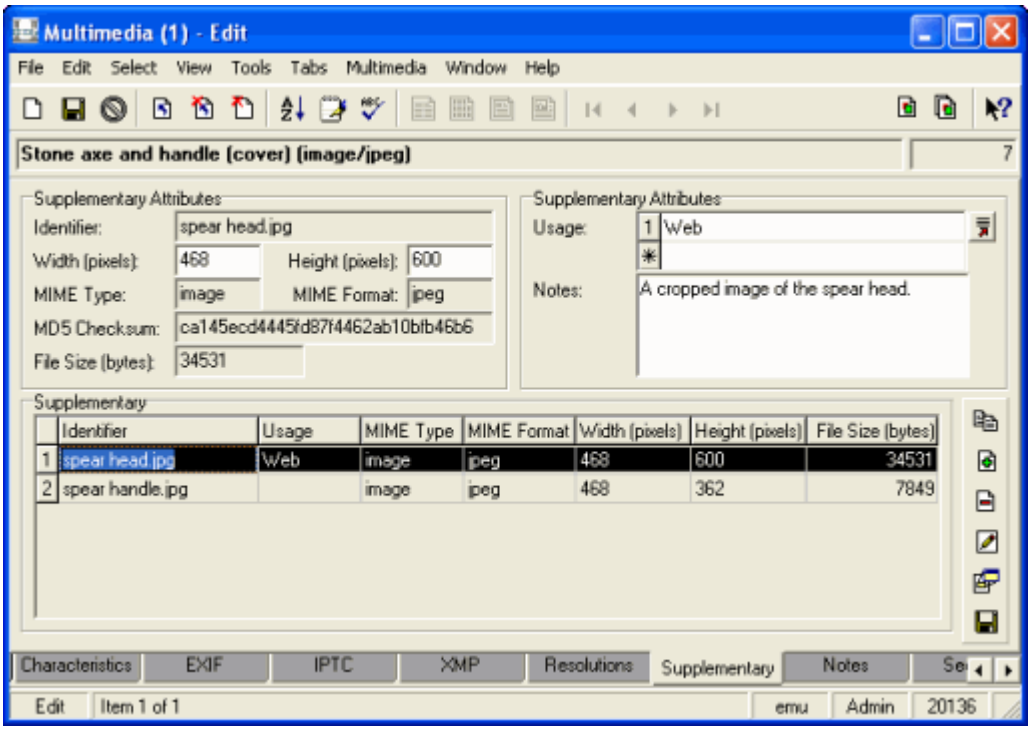


4. Modify the resource and save the image.
5. Close the editor and switch back to EMu.
   A dialogue box requesting confirmation of the changes displays:



6. Select 

   The media details are updated in the *Supplementary* table:



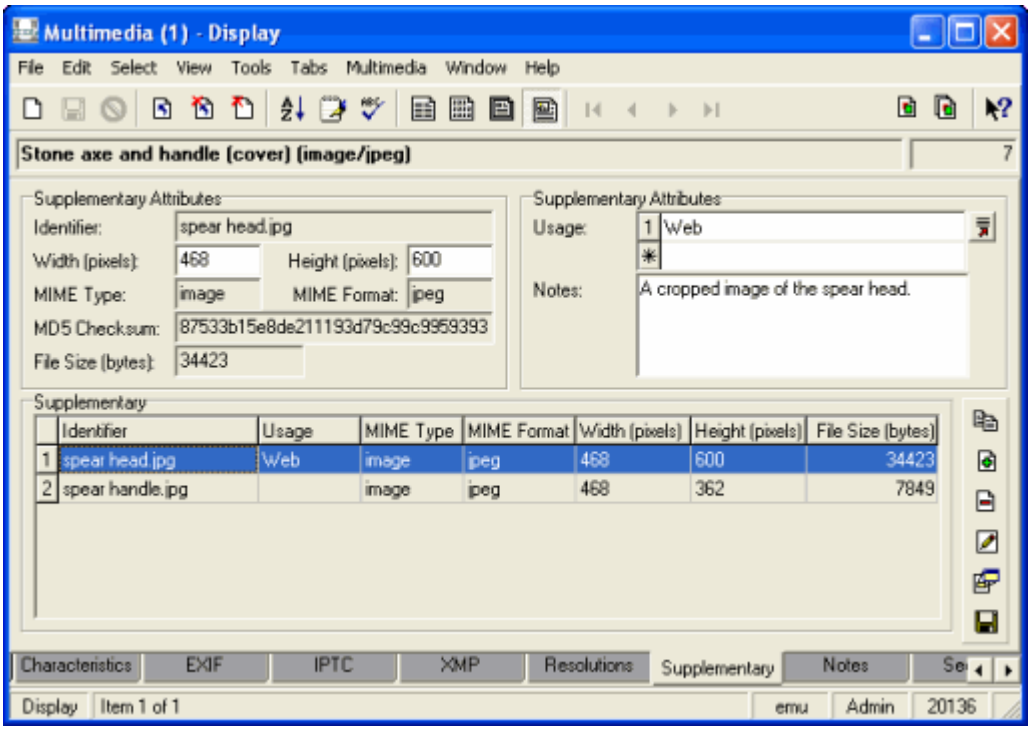
7. Save the record.
   The modified media is saved to the EMu server.

How to view supplementary media

Supplementary media can be viewed using external applications.

In the Multimedia module:

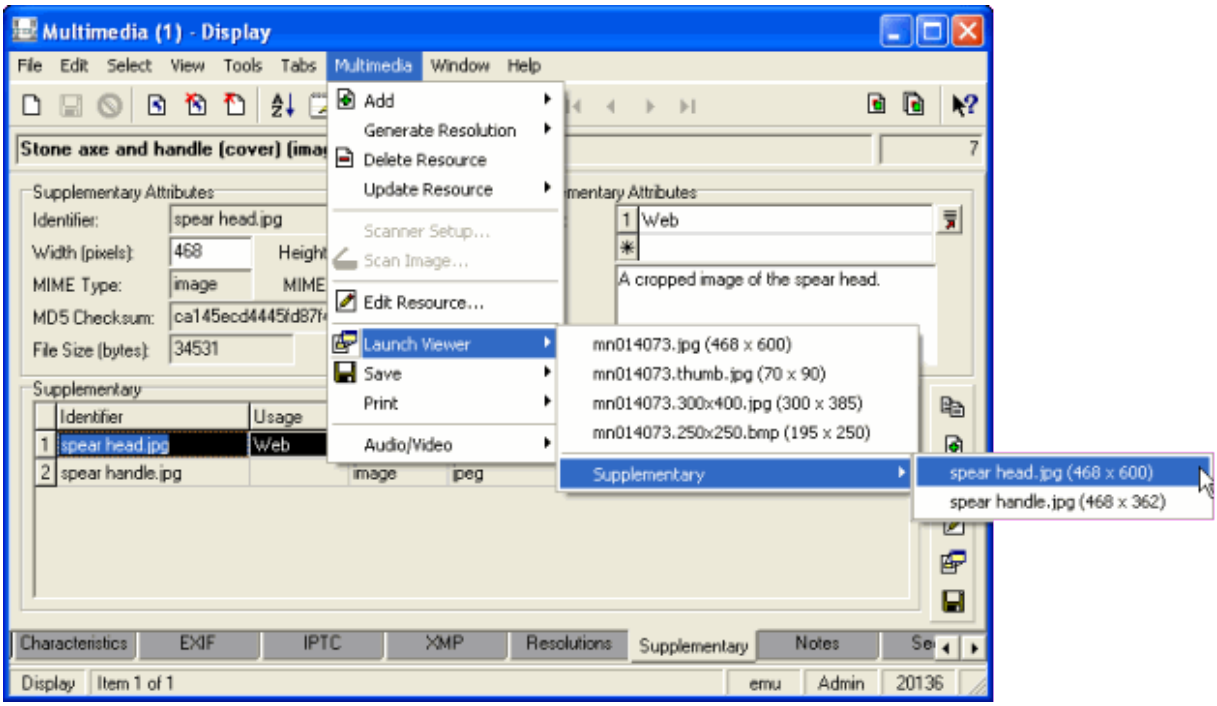
1. Locate the record with supplementary media to be viewed.
2. On the Supplementary tab, click the row in the *Supplementary* table with the media to be viewed:



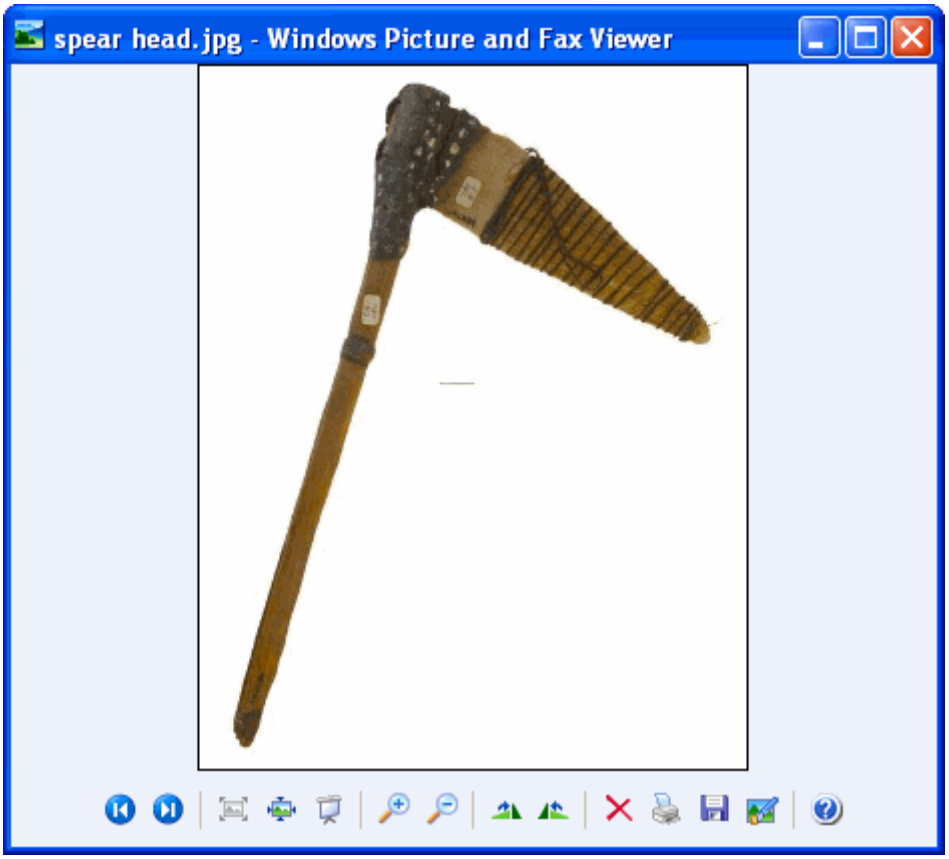
3. Select **View Supplementary**  from the Toolbar beside the *Supplementary* table

   -OR-

   Select **Multimedia>Launch Viewer>Supplementary** in the Menu bar and select the supplementary resource to view:



The selected supplementary resource displays inside the viewer associated with the resource type (in this example, the Windows Picture and Fax Viewer is associated with jpg images):

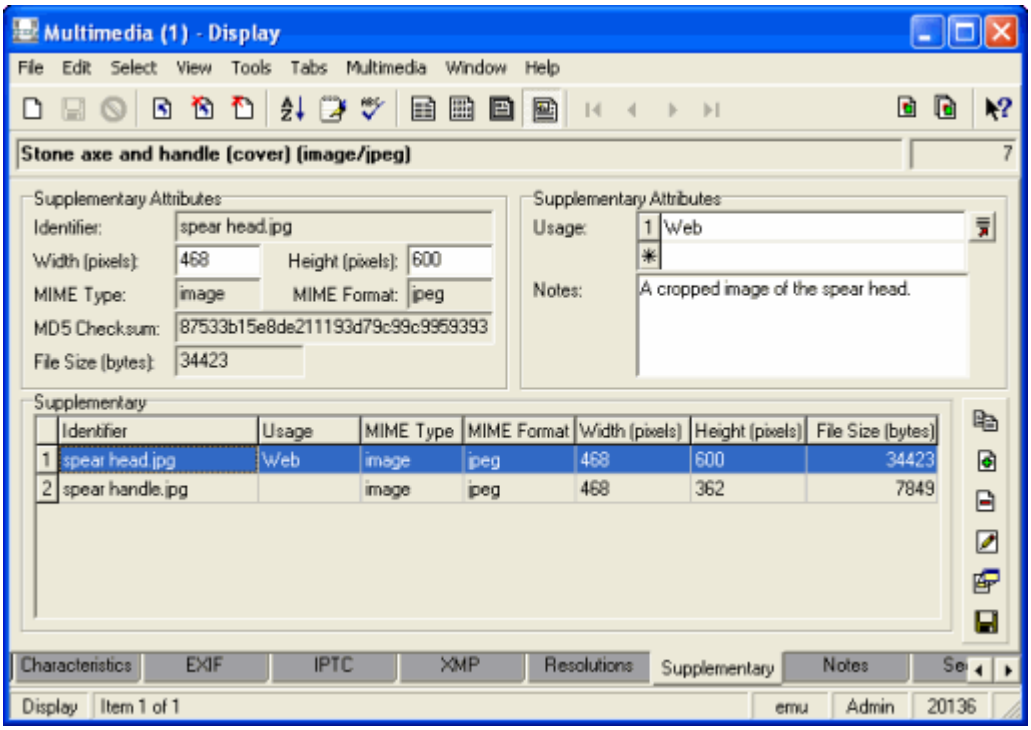


How to save supplementary media

Supplementary media in the *Supplementary* table may be saved to an external location.

In the Multimedia module:

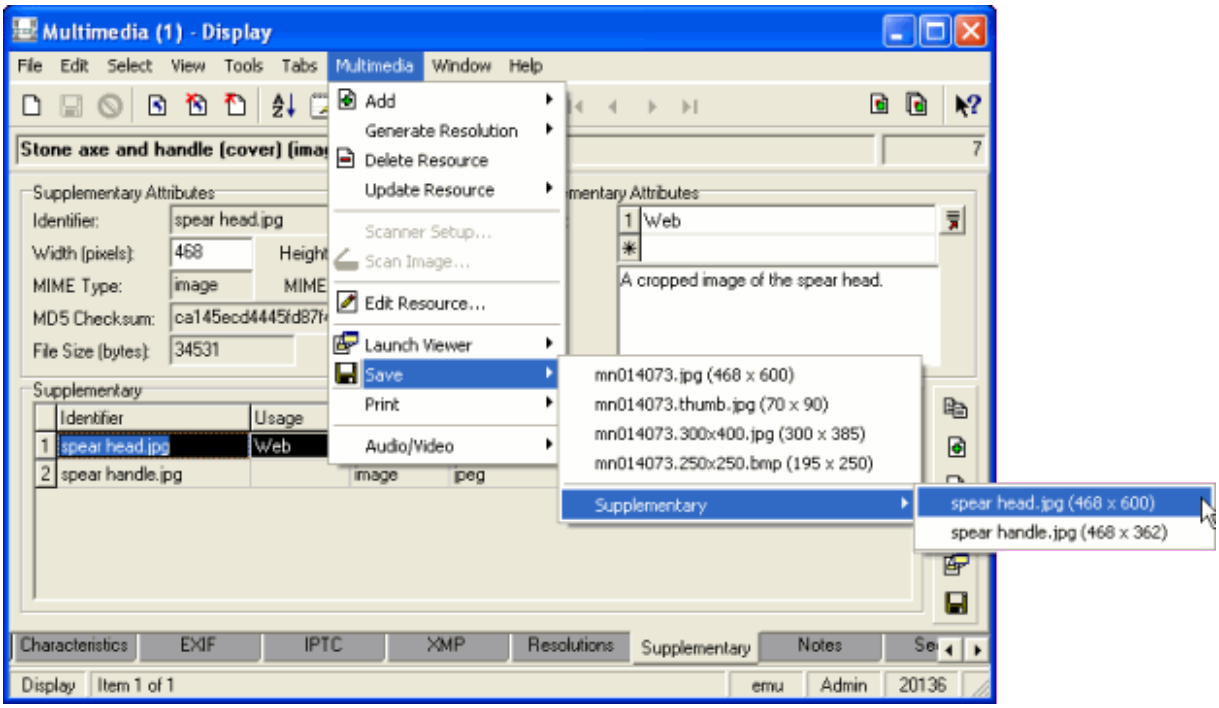
1. Locate the record with the supplementary media to be saved.
2. On the Supplementary tab, click the row in the *Supplementary* table with the media to be saved:



3. Select  from the Toolbar beside the *Supplementary* table

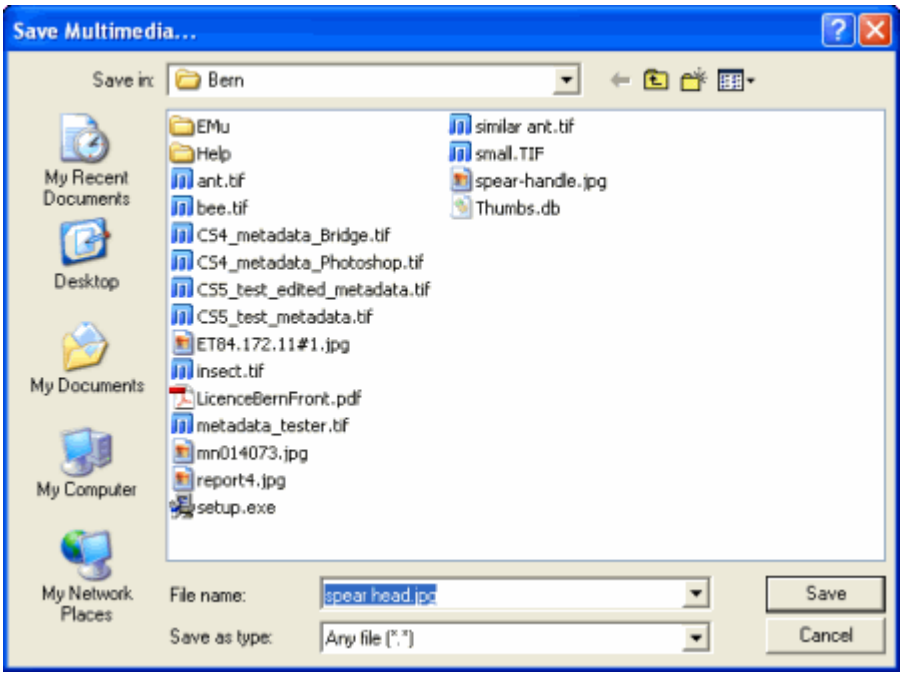
-OR-

Select **Multimedia>Save>Supplementary** in the Menu bar and select the supplementary resource to save:



The Save Multimedia dialogue box displays.

4. Navigate to the location where the file is to be saved:



5. Select Save.

The media is saved to the specified file.

How to update supplementary media

Single record

Many of the attributes (e.g. MIME Type, Checksum, etc.) for supplementary media are calculated automatically. As new media is added, the *Supplementary Attributes* fields on the Supplementary tab are maintained by EMu.

While it is possible to batch load supplementary media to the EMu server, the calculated values are not computed. The Update command recalculates all computed values for all media in the current record's *Supplementary* table.

In the Multimedia module:

1. Locate the record with supplementary media to be updated.
2. Select the **Supplementary** tab.
3. Select **Multimedia>Update Resource>Current Record** in the Menu bar

   -OR-

   Use the keyboard shortcut, `ALT+M+U+C`.

   The Updating Multimedia dialogue box displays:

4. Save the record once the update is complete.

Selected records

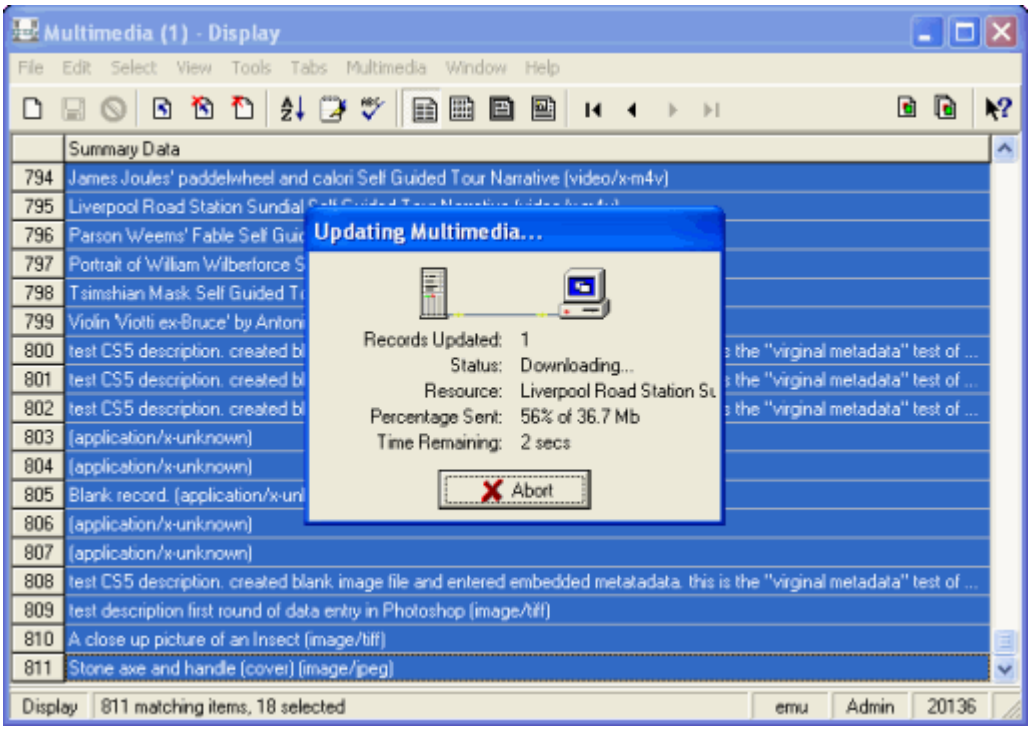
The computed values for supplementary media may also be updated for a batch of records. This version of the command is useful after a large import of supplementary media has occurred via the EMu server (that is, not imported via the EMu client).

In the Multimedia module:

1. Locate the records with supplementary media to be updated.
2. Select **View>List** in the Menu bar
   -OR-
   Select **View List**  in the Toolbar
   -OR-
   Use the keyboard shortcut, `ALT+V+I`.
3. Select the records to be updated.

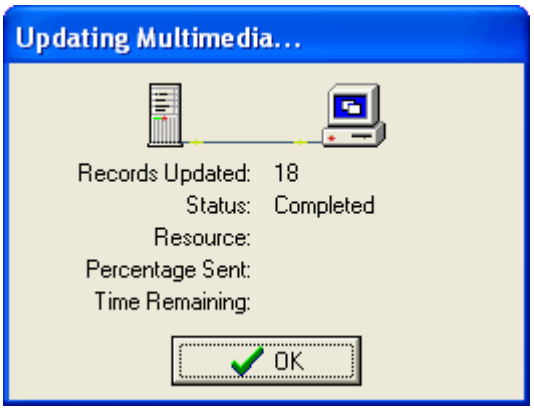
   See *Selecting Records* in the EMu help for more details.

4. Select **Multimedia>Update Resource>Selected Records** in the Menu bar
   -OR-
   Use the keyboard shortcut, `ALT+M+U+S`.
   The Updating Multimedia dialogue box displays:



5. Select 

once the update is complete.



SECTION 4

Importing supplementary media

The EMu Import tool can be used to import supplementary media files and data into Multimedia records. The mechanism used is the same as for importing multimedia, except that the virtual column *Supplementary_tab* is used to contain the path of the media to be loaded.

The example import file below adds supplementary media to the *Supplementary* table of existing Multimedia records (identified by their IRN):

IRN	Supplementary_tab(+)
1324	E:\Media\Image Text.txt
54765	E:\Media\Cropped Thumbnail.jpg
945632	E:\Media\Audio for 945632.mp3

EMu calculates all the computed values and loads them into the appropriate fields as the media is loaded. The identifier assigned to the supplementary media is the file name (without the path) of the imported media.

Multimedia and supplementary media may be loaded in the same import file, as the following import file demonstrates:

MulTitle	Multimedia	Supplementary_tab(1)	Supplementary_tab(2)
A close-up of a bee.	E:\Media\Bee\Bee.tif	E:\Media\Bee\Antenna.tif	E:\Media\Bee\Eyes.tif
An 18th century arm chair.	E:\Media\Chair\Arm Chair.tif	E:\Media\Chair\Specifications.doc	
The Canonball Express (Casey Jones).	E:\Media\Casey Jones\Canonball Express.avi	E:\Media\Casey Jones\First Frame.jpg	

It is also possible to import *Usage* and *Notes* values along with the media, as the following import file demonstrates:

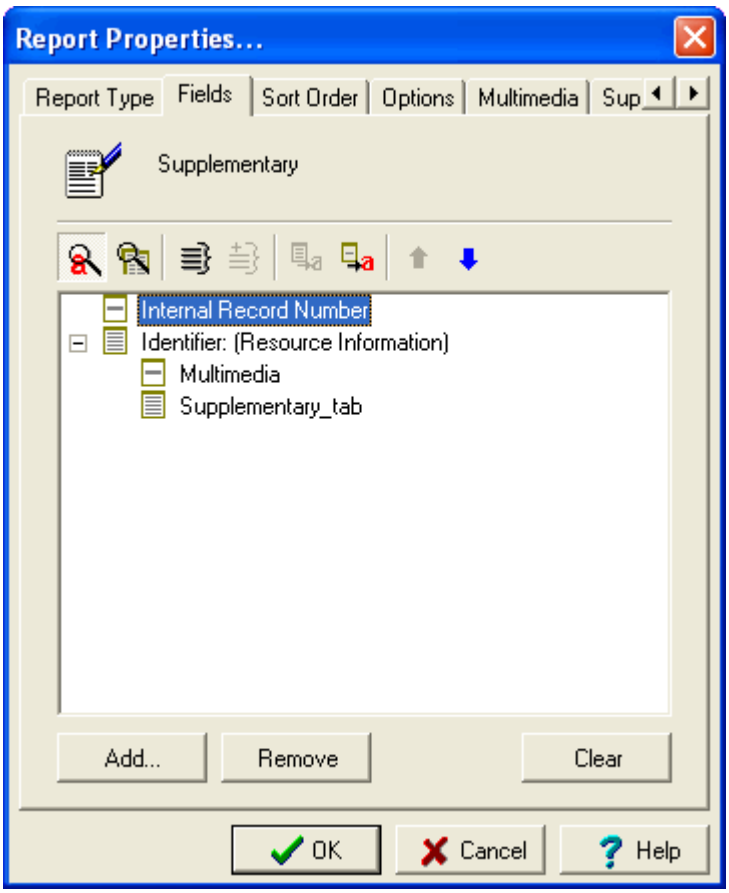
IRN	Supplementary_tab(+, group='import')	SupUsage_nesttab(+, group='import':1)	SupUsage_nesttab(+, group='import':2)	SupNotes0(+, group='import')
1324	E:\Media\Image Text.txt	Web Text		The text in the document contains an English translation of the audio track in the video.
54765	E:\Media\Cropped Thumbnail.jpg	Web Thumbnail	Cropped	A cropped thumbnail of the master image showing the spear head only.
945632	E:\Media\Audio for 945632.mp3	Web Audio		An audio description of the objects found inside the painting.

Notice how the `group=` import feature is used to ensure the media, usage and notes are all added on the same row in the *Supplementary* table.

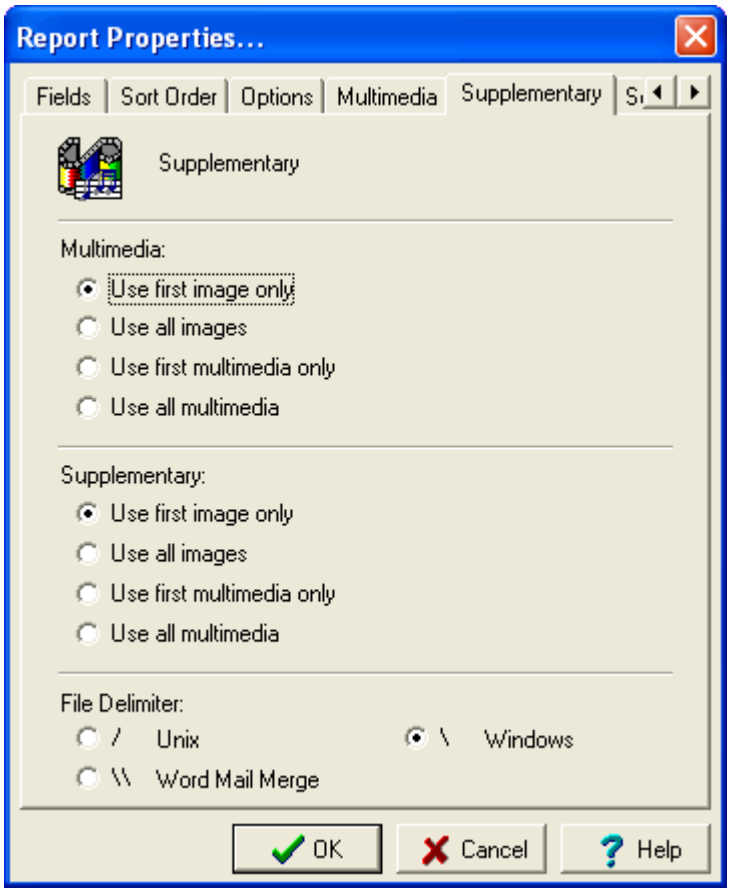
SECTION 5

Reporting with supplementary media

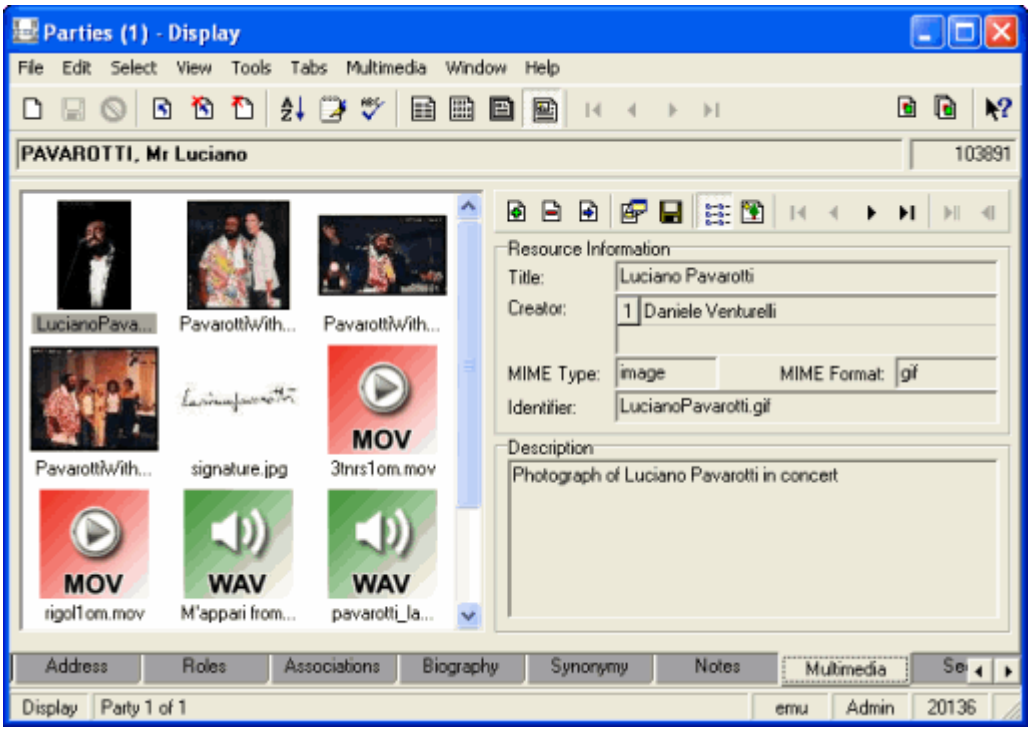
Supplementary media can be included in reports by adding the *Supplementary_tab* column to the list of fields on which to report. The Report Properties dialogue below shows a report containing both the Multimedia and Supplementary media fields (*Multimedia* and *Supplementary_tab* respectively)*:*



When the *Supplementary_tab* column is added to the list of fields on which to report, the Supplementary tab is added to the Report Properties dialogue box. The Supplementary tab provides options that determine which supplementary media is included in the report:



The *Multimedia* set of options controls which Multimedia records attached to a record in a report are included in the report. Consider the Parties record below:



A number of Multimedia records (images, video and audio) are attached to this Parties record. The *Multimedia* options determine which of these will be included in the report:

Option	Description
Use first image only	Only the Multimedia record for the first image is included in the report.
Use all images	The Multimedia records for all images are included in the report.
Use first multimedia only	Only the Multimedia record for the first attached record is included in the report.
Use All multimedia	The Multimedia records for all attached records are included in the report.

For the Multimedia records specified by the *Multimedia* options, the *Supplementary* options then control which media listed in the *Supplementary* table will be included in the report. The options have the same meaning as in the table above, except that they apply to the *Supplementary* table in the Multimedia record.

The *File Delimiter* option determines how the paths to the media included in the report are to be built:

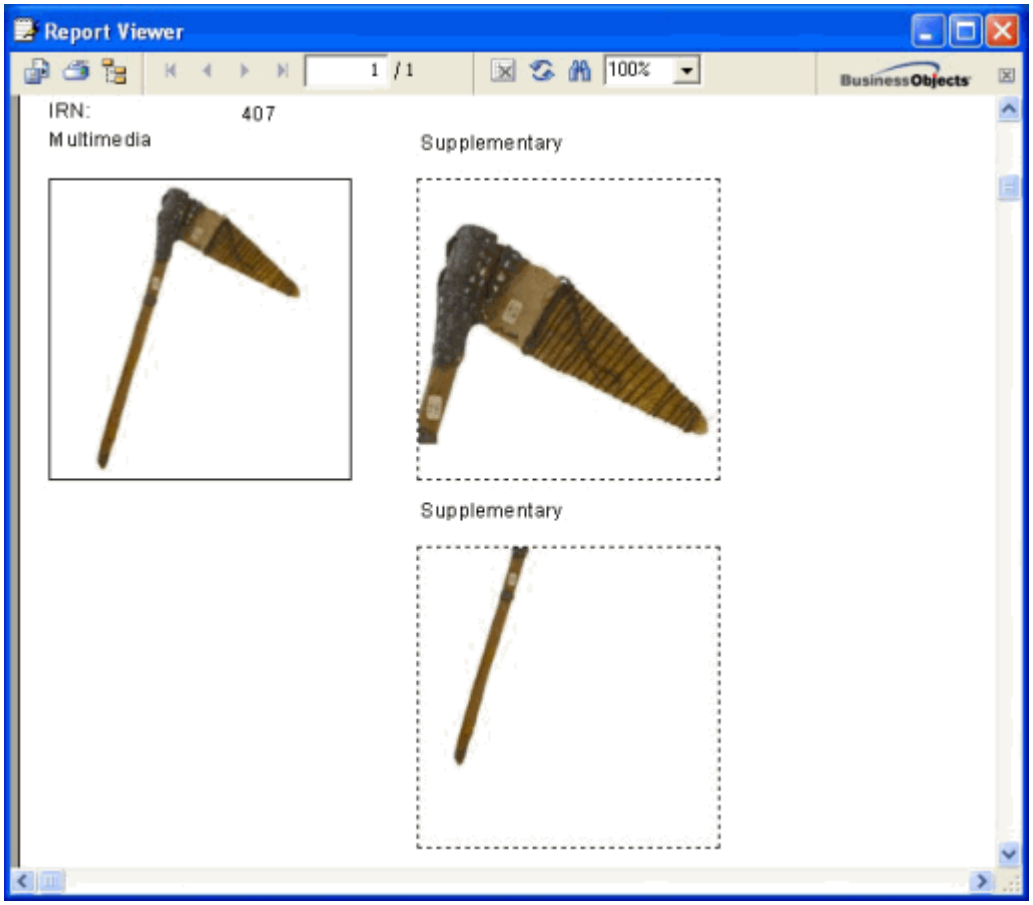
Option	Description
/ Unix	Use this option if the report is to be placed on a UNIX based computer. This is useful if the output is to be stored on the EMu server.
\ *Windows*	Use this option if the report is to be stored on a Windows based computer. In most cases this will be the option required as most reports are displayed on the user's computer.
\\ *Word Mail Merge*	Only use this option if the media is to be included in a Microsoft Word mail merge document.

The report below shows a record with one Multimedia image and two associated supplementary images. In order to produce this output the following options were selected:

Multimedia: *Use first image only*

Supplementary: *Use all images*

File Delimiter: \ *Windows* [This option is used as the report is viewed on the user's Windows computer.]



SECTION 6

Supplementary media on the EMu server

The supplementary media for a Multimedia record is stored in a directory called `supplementary` under the directory in which the master image is stored on the EMu server. The location of the master image is determined by the ServerMediaPath Registry entry (or in the absence of this entry, the ServerPath Registry entry). The Registry entry contains a list of paths to consult when locating multimedia on the EMu server. The first path in the Registry entry is used to store new multimedia, while all paths are searched to locate multimedia.

There is a special case in which an *exec* entry may be used to interface between EMu and a third party imaging system (see EMu Help topic - *Integrating 3rd party imaging systems* for more details). In order to support supplementary media while still maintaining the same interface to third party systems, the *filepath* supplied to the `get`, `save`, `ping` and `remove` calls may now include the supplementary directory. For example, the file path passed to the `ping` call for a supplementary image called `Image.jpg` for the Multimedia record with IRN 4254 would be:

```
4/254/supplementary/Image.jpg
```

The `list` call should now return not only all media in the folder passed to it, but all media in the supplementary directory. For example, the call `list 4/254` may result in the following response being returned:

```
Status: success
4/254/master.jpg
4/254/master.thumbnail.jpg
4/254/master.300x300.jpg
4/254/supplementary/video.avi
4/254/supplementary/image.tif
```

SECTION 7

Supplementary media and IMu

Supplementary media may be accessed from IMu via the virtual *supplementary* column in the Multimedia module. The PHP code below returns all supplementary media for the Multimedia record with irn 965:

```
$module = new IMuModule('emultimedia', $session);
$module->findKey(965);
$columns = array
(
    'irn',
    'supplementary'
);
$result = $module->fetch('start', 0, 1, $columns);
$supplementary = $result->rows[0]['supplementary'];
```

The data structure returned is an array in which each entry represents one row in the *Supplementary* table. For example:

```
Array
(
    [0] => Array
        (
            [width] => 468
            [usage] => Array
                (
                    [0] => Web,
                    [1] => Crop,
                )

            [mimeFormat] => jpeg
            [height] => 600
            [size] => 31073
            [index] => 4
            [identifier] => spear head.jpg
            [kind] => supplementary
            [fileSize] => 31073
            [notes] => A cropped image of the spear head.
            [mimeType] => image
            [md5Sum] => 5a7147c4f27ced997458b8171f2a44a6
            [md5Checksum] => 5a7147c4f27ced997458b8171f2a44a6
            [supplementary] => 0/007/supplementary/spear head.jpg
        )

    [1] => Array
        (
            [width] => 468
            [usage] => Array
                (
                    [0] => Web
                )

            [mimeFormat] => jpeg
            [height] => 600
            [size] => 27584
            [index] => 5
            [identifier] => spear handle.jpg
            [kind] => supplementary
            [fileSize] => 27584
            [notes] => A cropped image of the spear handle.
            [mimeType] => image
            [md5Sum] => ff57b2f343df44c4c8979cfd2d1f45d2
            [md5Checksum] => ff57b2f343df44c4c8979cfd2d1f45d2
            [supplementary] => 0/007/supplementary/spear
handle.jpg
        )
)
```

To get a filtered list, a filter may be added to the column name. Filters are specified in parentheses after the column name. It's possible to filter on almost any value that comes back (with the exception of *notes*). So, if we only want supplementary media with images, the following PHP code segment could be used:

```
$columns = array
(
    'irn',
    'supplementary(mimeType=image)'
);
```

The filter reduces the set of supplementary media to only those that are images. It's possible to specify multiple filters. For example, if you only want JPEG images, the following column construct could be used:

```
supplementary(mimeType=image;mimeFormat=jpeg)
```

or if you want all images except TIFFs:

```
supplementary(mimeType=image;mimeFormat!=tiff)
```

or if you want non-TIFF images with a width over 300 pixels:

```
supplementary(mimeType=image;mimeFormat!=tiff;width>300)
```

All of these filters simply discard supplementary entries from the result set which do not match the specified criteria.

Two other operators are available:

- `@`
- `^`

If you want the single image which is closest to 300 pixels wide, use:

```
supplementary(mimeType=image;width@300)
```

This will return only one entry (at most), which is the image which is closest to 300 pixels wide (may be bigger or smaller than 300).

If you want to get the image that is closest to but bigger than 300 pixels, use:

```
supplementary(mimeType=image;width^300)
```

All these filters return information associated with the resource but not the resource itself. If you want the resource as well, the following construct is required:

```
supplementary(mimeType=image;width^300){resource:include}
```

This will return a structure that looks like:

```
Array
(
    [0] => Array
        (
            [width] => 468
            [usage] => Array
                (
                    [0] => Web
                )

            [mimeFormat] => jpeg
            [height] => 600
            [size] => 31073
            [resource] => Array
                (
                    [width] => 468
                    [identifier] => spear head.jpg
                    [file] => Resource id #12
                    [mimeFormat] => jpeg
                    [mimeType] => image
                    [height] => 600
                    [size] => 31073
                )

            [index] => 4
            [identifier] => spear head.jpg
            [kind] => supplementary
            [fileSize] => 31073
            [notes] => A cropped image of the spear head.
            [mimeType] => image
            [md5Sum] => 5a7147c4f27ced997458b8171f2a44a6
            [md5Checksum] => 5a7147c4f27ced997458b8171f2a44a6
            [supplementary] => 0/007/supplementary/spear head.jpg
        )
)
```

Notice there is now a `resource` entry. This includes information about the resource and, most importantly, includes an open file handle to the resource contents (`file` attribute).

If you want the resource to be reformatted in some way, you can specify the reformatting in the same way as you can for the existing `resource` column. For example, if you want the resource as a 200x200 gif, use:

```
supplementary(mimeType=image;width^300){resource:include;format:gi
f;width:200;height:200}
```

This works just as before, but with the reformatted image as the resource:

```
Array
(
    [0] => Array
        (
            [width] => 468
            [usage] => Array
                (
                    [0] => Web
                )

            [mimeFormat] => jpeg
            [height] => 600
            [size] => 31073
            [resource] => Array
                (
                    [width] => 156
                    [identifier] => spear head.gif
                    [file] => Resource id #12
                    [mimeFormat] => gif
                    [mimeType] => image
                    [height] => 200
                    [size] => 18917
                )

            [index] => 4
            [identifier] => spear head.jpg
            [kind] => supplementary
            [fileSize] => 31073
            [notes] => A cropped image of the spear head.
            [mimeType] => image
            [md5Sum] => 5a7147c4f27ced997458b8171f2a44a6
            [md5Checksum] => 5a7147c4f27ced997458b8171f2a44a6
            [supplementary] => 0/007/supplementary/spear head.jpg
        )
)
```

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