Frogans Slide Description Language (FSDL) – 3.0

EXTRACT

<resimage>, <respixels>, <resdraw>, <respath>, and <layer> elements

Status

This document is a preliminary draft, for examination, review, and evaluation by the developer community.

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Location

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6.3. Preparing Image Resources - <resimage> Element

   The <resimage> element prepares an image resource that is based on an
   image file. The image file contains a pre-authored image, which is
   created previously using image editing software.

   The <resimage> element is a child of the <frogans-fsdl> element (see
   Section 6.1). The <resimage> element does not contain any children.
   It does not contain text characters.

   As stated in the Frogans slide layout rules (Section 4.6):

   - The image resource is intended to be used in the Frogans slide as
      the foundation of a layer (see the <layer> element in
      Section 6.12) or as part of a merge resource (see the <resmerge>
      and <merge> elements in Section 6.11).

   - The image resource can be used once or several times in the
      Frogans slide.

   The image resource is identified using a component identifier
   (Section 4.5) which is determined by the value of the "resid"
   attribute of the <resimage> element.

   The size, in pixels, of the image resource depends on the value of
   the "size" attribute of the <resimage> element.

   The image file on which the image resource is based is defined using
   a <file> element (see Section 6.2). As a result, the image file is
   either a static or a dynamic auxiliary file in the Frogans site root
   directory (Section 4.1), or is embedded as text characters in the
   <file> element, depending on the value of the "nature" attribute of
   the <file> element.

   The image file is referred to using a component identifier which is
   determined by the value of the "fileref" attribute of the <resimage>
   element.

   The image file is encoded using one of the following image formats:
   PNG [PNG], JPEG [JPEG], or GIF [GIF].

   If the image file contains information on the degree of opacity of
   its pixels, such as an alpha channel that can be defined using the
   PNG image format, then this information is used when preparing the
   image resource. Otherwise, the pixels in the image file are
   considered fully opaque when preparing the image resource.

   In application of the FSDL design principle on avoiding on-screen

distractions (Section 1.4), if the image file is encoded using the
GIF image format and contains an animation, then only the first frame
is used when preparing the image resource.

For more information on the process to decode image files, see
Appendix B.1.

If the image file is an auxiliary file, then according to
Appendix B.1 on decoding image files, the image file extension is not
required in the "name" attribute of the <file> element.

In application of the FSDL design principle on saving device
resources (Section 1.4), the width and height of the pre-authored
image are both limited to 1,024 pixels.

A selection of the pre-authored image is used, representing either
the entire pre-authored image, or an extract of the pre-authored
image. Using an extract of the pre-authored image can be helpful if,
in order to reduce latency for loading the Frogans slide, the pre-
authored image is an image sprite, i.e. it contains a collection of
images.

The image selection depends on the values of the "selection" and
"bounds" attributes of the <resimage> element. By default, the image
selection is the entire pre-authored image.

The way in which the image selection is incorporated in the image
resource depends on the values of the "aspect", "adjust", and
"origin" attributes of the <resimage> element. The size, in pixels,
of the image selection is not necessarily the same as the size, in
pixels, of the image resource.

If the image file is an auxiliary file, then its size, in bytes, is
subject to the overall file size limitations applicable to the
Frogans slide (Section 4.4).

If the image file is embedded as text characters in the <file>
element, then the text characters represent the contents of the image
file encoded using Base64 (see Section 6.2).

Embedding an image file as text characters in the <file> element
reduces latency for loading the Frogans slide, since both the FSDL
document and the image file are loaded at the same time. Embedding
an image file can also simplify the task for generating both the FSDL
document and the image file on the fly (i.e. dynamically) on the
server hosting the Frogans site.

However, embedding an image file as text characters in the <file>

element leads to an overhead to be taken into account in the overall
file size limitations applicable to the Frogans slide (Section 4.4),
since the number of text characters required to encode the image file
is approximately 1.33 times the size in bytes of the image file.
Furthermore, depending on the character encoding of the FSDL document
(Section 5.3), more than one byte may be necessary to encode each
text character. Finally, an embedded image file cannot benefit from
potential inclusion in the auxiliary file cache (Section 4.3).

During the rendering of the Frogans slide, when preparing the image
resource, a placeholder image is used instead of the image selection
in the following cases:

*   if the image file is an auxiliary file in the Frogans site root
    directory and it cannot be retrieved for any reason (such as a
    network failure, or if the image file does not exist)

*   if the image file cannot be decoded, whether or not the image file
    is embedded as text characters in the <file> element

*   if the width or height of the pre-authored image, in pixels,
    exceeds the limits indicated above

*   If the size of the Frogans slide exceeds the overall file size
    limitations applicable to Frogans slides (Section 4.4).

If a placeholder image is used, then it has the same size, in pixels,
as the image resource. In this case, the values of the "selection",
"bounds", "aspect", "adjust", and "origin" attributes of the
<resimage> element are ignored.

For more information on the process to generate placeholder images,
see Appendix B.2.

The <resimage> element has the following attributes:

resid - Mandatory

    The identifier of the image resource.

    The value of the attribute is a component identifier. The value
    is compliant with the rules presented in Section 4.5.

    As a result, the value cannot have been utilized previously in the
    FSDL document as a component identifier.

          Examples of accepted values:
          resid='foo1'
          resid='Foo1'
          resid='foo2'
          resid='foo_1'

          Examples of refused values:
          resid=''
          resid='foo-1'
          resid='foo/1'
          resid='foo.1'
          resid='foo 1'
          resid='foo1,foo2'

     size - Mandatory

        The size of the image resource.

        The value of the attribute represents the width and height, in
        pixels, of the image resource.

        As stated in the Frogans slide layout rules (Section 4.6), the
        width of the image resource is an integer between 1 and 640
        (inclusive) and its height is an integer between 1 and 480
        (inclusive).

        The value of the attribute is a string in the 'width,height'
        pattern where: ',' is the U+002C COMMA character; and 'width' and
        'height' are each a substring representing respectively the width
        or height of the image resource. Each substring contains between
        one and three decimal characters (inclusive). Each decimal
        character of the substring is in the range from '0' to '9' (U+0033
        DIGIT ZERO to U+0039 DIGIT NINE, inclusive). The substring does
        not contain any leading '0' (U+0033 DIGIT ZERO) characters.

        As a result, the value of the attribute does not contain any of
        the following characters: white space characters defined in
        Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS),
        and '.' (U+002E FULL STOP).

          Examples of accepted values:
          size='40,200'
          size='400,200'

          Examples of refused values:
          size=''

```
        size='400,0'
        size='400,550'
        size='400'
        size='400 200'
        size='040,200'
        size='400, 200'
        size='+400,200'
        size='400,-200'
        size='400.5,200'
```

    fileref - Mandatory

        The identifier referencing the image file on which the image
        resource is based.

        The value of the attribute is a component identifier. The value
        is compliant with the rules presented in Section 4.5.

        The value of the attribute has been utilized previously in the
        FSDL document as a component identifier for a <file> element.

            Examples of accepted values:
            fileref='foo1'
            fileref='Foo1'
            fileref='foo2'
            fileref='foo_1'

            Examples of refused values:
            fileref=''
            fileref='foo-1'
            fileref='foo/1'
            fileref='foo.1'
            fileref='foo 1'
            fileref='foo1,foo2'

    selection - Optional

        The image selection used in the image resource.

        The attribute is based on a string set which represents the
        possible values of the attribute.

        The value of the attribute is case-sensitive.

        The value can be:

        * 'entire' indicates that the image selection is the entire pre-
           authored image.

     * 'extract' indicates that the image selection is an extract of
        the pre-authored image. The extract depends on the value of
        the "bounds" attribute of the <resimage> element.

     The default value is 'entire'.

   bounds - Applicable only if the value of the "selection" attribute
            equals 'extract'. Mandatory if applicable.

     The bounds of the image selection used in the image resource.

     The value of the attribute represents the left, top, right, and
     bottom coordinates, in pixels, of the image selection in the pre-
     authored image.

     The left and top coordinates are integers between 0 and 1,023
     (inclusive). The right and bottom coordinates are integers
     between 1 and 1,024 (inclusive).

     The image selection uses an x,y coordinate system where: the x and
     the y coordinates of the pixel at the top-left corner of the pre-
     authored image are both zero; values on the x axis increase
     towards the right; values on the y axis increase towards the
     bottom.

     The image selection is made as follows:

     * The left coordinate is equal to the x coordinate of the pixel
        at the top-left corner of the image selection.

     * The top coordinate is equal to the y coordinate of the pixel at
        the top-left corner of the image selection.

     * The right coordinate is equal to one plus the x coordinate of
        the pixel at the bottom-right corner of the image selection.
        The right coordinate is greater than the left coordinate.

     * The bottom coordinate is equal to one plus the y coordinate of
        the pixel at the bottom-right corner of the image selection.
        The bottom coordinate is greater than the top coordinate.

     As a result, the width of the image selection is equal to the
     right coordinate minus the left coordinate, and the height of the
     image selection is equal to the bottom coordinate minus the top
     coordinate.

     The value of the attribute is a string in the
     'left,top,right,bottom' pattern where: ',' is the U+002C COMMA

character; and 'left', 'top', 'right', and 'bottom' are each a
substring representing respectively the left, top, right, or
bottom coordinate. Each substring contains between one and four
decimal characters (inclusive). Each decimal character of each
substring is in the range from '0' to '9' (U+0030 DIGIT ZERO to
U+0039 DIGIT NINE, inclusive). The substrings do not contain any
leading '0' (U+0033 DIGIT ZERO) characters.

As a result, the value of the attribute does not contain any of
the following characters: white space characters defined in
Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS),
and '.' (U+002E FULL STOP).

    Examples of accepted values:
    bounds='50,30,150,130'
    bounds='250,30,450,130'

    Examples of refused values:
    bounds=''
    bounds='50,30,1500,130'
    bounds='150,30,50,130'
    bounds='50,30'
    bounds='50 30 150 130'
    bounds='050,30,150,130'
    bounds='50, 30,150,130'
    bounds='+50,30,150,130'
    bounds='50,-30,150,130'
    bounds='50.5,30,150,130'

During the rendering of the Frogans slide, when preparing the
image resource:

*   If the left coordinate is greater than the width of the pre-
    authored image minus one, then the image selection is empty.
    In this case, the prepared image resource is fully transparent.

*   If the top coordinate is greater than the height of the pre-
    authored image minus one, then the image selection is empty.
    In this case, the prepared image resource is fully transparent.

*   If the right coordinate is greater than the width of the pre-
    authored image, then the right coordinate is considered to be
    equal to the width of the pre-authored image.

*   If the bottom coordinate is greater than the height of the pre-
    authored image, then the bottom coordinate is considered to be
    equal to the height of the pre-authored image.

aspect - Optional

   The aspect of the image selection in the image resource.

   The attribute is based on a string set which represents the
   possible values of the attribute.

   The value of the attribute is case-sensitive.

   The value can be:

   * 'base' indicates that the image selection is resized,
      maintaining its original proportions, such that the whole image
      selection occupies either the entire width or the entire height
      of the image resource. Any remaining parts of the image
      resource that are not occupied by the image selection are fully
      transparent. The placement of the image selection in the image
      resource depends on the value of the "adjust" attribute of the
      <resimage> element.

   * 'spread' indicates that the image selection is resized, without
      maintaining its original proportions, such that the image
      selection occupies the entire width and height of the image
      resource.

   * 'zoom' indicates that the image selection is resized,
      maintaining its original proportions, such that the image
      selection occupies the entire width and height of the image
      resource. The image selection is cropped in order to fit in
      the image resource if its proportions are different from the
      proportions of the image resource. The placement of the image
      selection in the image resource depends on the value of the
      "adjust" attribute of the <resimage> element.

   * 'echo' indicates that the image selection is resized,
      maintaining its original proportions, such that the whole image
      selection occupies either the entire width or the entire height
      of the image resource. Any remaining parts of the image
      resource that are not occupied by the image selection are
      covered by copies of the image selection that are placed next
      to one another, either vertically or horizontally. Copies of
      the image selection are cropped in order to fit in the image
      resource if their placement makes them extend beyond the edge
      of the image resource. The placement of the image selection in
      the image resource depends on the value of the "adjust"
      attribute of the <resimage> element.

     * 'tile' indicates that the image selection is not resized. Any
        remaining parts of the image resource that are not occupied by
        the image selection are covered by copies of the image
        selection that are placed next to one another, both vertically
        and horizontally. The image selection and copies of the image
        selection are cropped in order to fit in the image resource if
        their placement makes them extend beyond the edge of the image
        resource. The placement of the image selection in the image
        resource depends on the value of the "origin" attribute of the
        <resimage> element.

     The default value is 'base'.

     For more information on the process to resize image selections,
     see Appendix B.3.

   adjust - Applicable only if the value of the "aspect" attribute of
            the <resimage> element equals 'base', 'zoom', or 'echo'.
            Optional if applicable.

     The adjustment of the image selection in the image resource.

     The value of the attribute represents an integer between -100 and
     100 (inclusive).

     The adjustment is applied, either horizontally or vertically, as
     follows:

     * An adjustment of -100 corresponds to the LT placement, where
        the image selection is placed so that its left or top edge
        matches the left or top edge of the image resource.

     * An adjustment of 0 corresponds to the central placement, where
        the image selection is centered vertically or horizontally in
        the image resource.

     * An adjustment of 100 corresponds to the RB placement, where the
        image selection is placed so that its right or bottom edge
        matches the right or bottom edge of the image resource.

     * An adjustment between -100 and 0 (exclusive) corresponds to a
        proportional placement, where the image selection is placed
        according to the absolute value of the adjustment, starting
        from the central placement and moving towards the LT placement.
        For instance, an adjustment of -25 corresponds to a placement
        where the image selection is placed one-quarter of the way from
        the central placement towards the LT placement.

   * An adjustment between 0 and 100 (exclusive) corresponds to a
      proportional placement, where the image selection is placed
      according to the value of the adjustment, starting from the
      central placement and moving towards the RB placement. For
      instance, an adjustment of 75 corresponds to a placement where
      the image selection is placed three-quarters of the way from
      the central placement towards the RB placement.

   The default value is 0.

   The value of the attribute is a string in the 'pd' pattern where:
   'p' is a substring representing the sign of the adjustment; and
   'd' is a substring representing the absolute value of the
   adjustment. The 'p' substring is either an empty string,
   indicating that the value of the adjustment is greater than or
   equal to zero, or is the '-' (U+002D HYPHEN-MINUS) character. The
   'd' substring contains between one and three decimal characters
   (inclusive). Each decimal character of the 'd' substring is in
   the range from '0' to '9' (U+0033 DIGIT ZERO to U+0039 DIGIT NINE,
   inclusive). The 'd' substring does not contain any leading '0'
   (U+0033 DIGIT ZERO) characters.

   As a result, the value of the attribute does not contain any of
   the following characters: white space characters defined in
   Section 5.5, '+' (U+002B PLUS SIGN), and '.' (U+002E FULL STOP).

      Examples of accepted values:
      adjust='0'
      adjust='-100'
      adjust='100'
      adjust='-25'
      adjust='75'

      Examples of refused values:
      adjust=''
      adjust='-0'
      adjust='-120'
      adjust='150'
      adjust='-025'
      adjust='075'
      adjust='- 25'
      adjust='+100'
      adjust='-25.5'

  origin - Applicable only if the value of the "aspect" attribute of
           the <resimage> element equals 'tile'. Optional if
           applicable.

The origin in the image selection used in the image resource.

The value of the attribute represents the x and y coordinates, in pixels, of the origin in the image selection. The x and y coordinates correspond to the horizontal and vertical coordinates, respectively, of the pixel in the image selection that is placed in the top-left corner of the image resource.

The x and y coordinates are integers between 0 and 1,023 (inclusive).

The x and y coordinates of the top-left corner of the image selection are both zero.

The default value is '0,0'.

The value of the attribute is a string in the 'x,y' pattern where: ',' is the U+002C COMMA character; and 'x' and 'y' are each a substring representing respectively the x or y coordinate. Each substring contains between one and four decimal characters (inclusive). Each decimal character of each substring is in the range from '0' to '9' (U+0033 DIGIT ZERO to U+0039 DIGIT NINE, inclusive). The substrings do not contain any leading '0' (U+0033 DIGIT ZERO) characters.

As a result, the value of the attribute does not contain any of the following characters: white space characters defined in Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS), and '.' (U+002E FULL STOP).

    Examples of accepted values:
    origin='0,0'
    origin='50,30'
    origin='250,30'

    Examples of refused values:
    origin=''
    origin='50,3000'
    origin='50'
    origin='50 30'
    origin='050,30'
    origin='50, 30'
    origin='+50,30'
    origin='50,-30'
    origin='50.5,30'

During the rendering of the Frogans slide, when preparing the image resource:

     * If the x coordinate is greater than the width of the pre-
        authored image minus one, then the x coordinate is considered
        to be equal to the width of the pre-authored image minus one.

     * If the y coordinate is greater than the height of the pre-
        authored image minus one, then the y coordinate is considered
        to be equal to the height of the pre-authored image minus one.

6.4.   Preparing Pixels Resources - <respixels> Element

   The <respixels> element prepares a pixels resource that is based on a
   miniature bitmap.

   The <respixels> element is a child of the <frogans-fsdl> element (see
   Section 6.1). The <respixels> element does not contain any children.
   It contains text characters.

   As stated in the Frogans slide layout rules (Section 4.6):

   - The pixels resource is intended to be used in the Frogans slide as
      the foundation of a layer (see the <layer> element in
      Section 6.12) or as part of a merge resource (see the <resmerge>
      and <merge> elements in Section 6.11).

   - The pixels resource can be used once or several times in the
      Frogans slide.

   The pixels resource is identified using a component identifier
   (Section 4.5) which is determined by the value of the "resid"
   attribute of the <respixels> element.

   The size, in pixels, of the pixels resource depends on the value of
   the "size" attribute of the <respixels> element.

   The miniature bitmap is made up of individual pixels, organized in
   columns and rows.

   The miniature bitmap is resized, without maintaining its original
   proportions, such that the miniature bitmap occupies the entire width
   and height of the pixels resource.

   The pixels resource can be used, for instance, as a background with
   color gradients, or as a mask with transparency gradients.

   For more information on the process to resize miniature bitmaps, see
   Appendix B.4.

   The number of columns of the miniature bitmap depends on the value of
   the "columns" attribute of the <respixels> element. The number of
   rows of the miniature bitmap depends on the value of the "rows"
   attribute of the <respixels> element.

   Each individual pixel of the miniature bitmap is defined using four
   components: the R, G and B components (color) and the A component
   (transparency).

The R, G, B, and A components of the individual pixels of the
miniature bitmap are all defined in the same way, depending on the
value of the "pix" attribute of the <respixels> element.

The definition of all the individual pixels of the miniature bitmap
can be either:

*   an rgba definition, where, for an individual pixel, the values of
    the R, G, B, and A components are defined in the text characters
    of the <respixels> element.

*   an rgb definition, where, for an individual pixel, the values of
    the R, G, and B components are defined in the text characters of
    the <respixels> element, and the value of the A component depends
    on the value of the "alpha" attribute of the <respixels> element.

*   an a definition, where, for an individual pixel, the values of the
    R, G, and B components depend on the value of the "color"
    attribute of the <respixels> element, and the value of the A
    component is defined in the text characters of the <respixels>
    element.

*   a y definition, where, for an individual pixel, the values of the
    R, G, and B components are defined in the text characters of the
    <respixels> element, and the value of the A component depends on
    the value of the "alpha" attribute of the <respixels> element.
    Using this definition, the R, G, and B components share the same
    value, corresponding to the luminance of the individual pixel,
    hence the color of the individual pixel is on a gray scale.

*   a ya definition, where, for an individual pixel, the R, G, B and A
    components are defined in the text characters of the <respixels>
    element. Using this definition, the R, G, and B components share
    the same value, corresponding to the luminance of the individual
    pixel, hence the color of the individual pixel is on a gray scale.

The text characters of the <respixels> element contain a list of
items. Each item corresponds to an individual pixel.

The individual pixels are ordered row by row, from the top-left to
the bottom-right pixel of the miniature bitmap. The number of items
in the list is the product of the number of rows and the number of
columns.

All items in the list are strings using one of the following
patterns:

   * '#rrggbbaa': this pattern corresponds to the rgba definition.

   * '#rrggbb': this pattern corresponds to the rgb definition.

   * '#aa': this pattern corresponds to the a definition.

   * '#yy': this pattern correponds to the y definition.

   * '#yyaa': this pattern correponds to the ya definition.

In the patterns above: '#' is the U+0013 NUMBER SIGN character; 'rr',
'gg', and 'bb' are each a substring representing respectively the R,
G, and B components; 'aa' is a substring representing the A
component; and 'yy' is a substring representing the value shared by
the R, G, and B components (luminance). Each substring contains two
hexadecimal characters. Each hexadecimal character of each substring
is in one of the following ranges: from '0' to '9' (U+0030 DIGIT ZERO
to U+0039 DIGIT NINE, inclusive), from 'A' to 'F' (U+0041 LATIN
CAPITAL LETTER A to U+0046 LATIN CAPITAL LETTER F, inclusive), from
'a' to 'f' (U+0061 LATIN SMALL LETTER A to U+0066 LATIN SMALL LETTER
F, inclusive).

As a result, the pattern does not contain any white space characters
defined in Section 5.5.

   Examples of accepted items:
   #004698bf
   #004698
   #bf
   #3a
   #3abf
   #3Abf
   #3ABF

   Examples of refused items:
   004698bf
   #
   #004698b
   #00469
   #b
   #3ab
   # 004698bf
   #004698 bf
   #0004698bf

   The separator character used to separate items in the list is the ';'
   (U+003B SEMICOLON) character.

White space characters, as defined in Section 5.5, can optionally be
included before and after the ';' (U+003B SEMICOLON) separator
characters in the list. These white space characters are ignored.

The list cannot contain empty items. As a result, there is no
separator character either before the first item or after the last
item in the list. Furthermore, there cannot be two consecutive
separator characters in the list.

    Examples of accepted item lists:
    #004698bf;#ffbf00ff;#00469840
    #004698;#ffbf00;#001c46
    #bf;#ff
    #3abf;#00ff;#3abf;#ff00

    Examples of refused item lists:
    #004698bf;#ffbf00;#00469840
    #004698;#bf;#3abf
    #004698bf#ffbf00ff
    #004698bf #ffbf00ff
    ;#004698bf;#ffbf00ff
    #004698bf;#ffbf00ff;
    #004698bf;;#ffbf00ff

During the rendering of the Frogans slide, when preparing the pixels
resource, individual pixels of the miniature bitmap can be invisible
pixels, i.e. the level of the A component (transparency) is equal to
zero. In this case, as stated in the Frogans slide layout rules, the
levels of the R, G and B components (color) of the individual pixel
are considered to be equal to zero.

The <respixels> element has the following attributes:

resid – Mandatory

    The identifier of the pixels resource.

    The value of the attribute is a component identifier. The value
    is compliant with the rules presented in Section 4.5.

    As a result, the value cannot have been utilized previously in the
    FSDL document as a component identifier.

        Examples of accepted values:
        resid='foo1'
        resid='Foo1'

```
      resid='foo2'
      resid='foo_1'

      Examples of refused values:
      resid=''
      resid='foo-1'
      resid='foo/1'
      resid='foo.1'
      resid='foo 1'
      resid='foo1,foo2'
```

   size - Mandatory

      The size of the pixels resource.

      The value of the attribute represents the width and height, in
      pixels, of the pixels resource.

      As stated in the Frogans slide layout rules (Section 4.6), the
      width of the pixels resource is an integer between 1 and 640
      (inclusive) and its height is an integer between 1 and 480
      (inclusive).

      The value of the attribute is a string in the 'width,height'
      pattern where: ',' is the U+002C COMMA character; and 'width' and
      'height' are each a substring representing respectively the width
      or height of the pixels resource. Each substring contains between
      one and three decimal characters (inclusive). Each decimal
      character of the substring is in the range from '0' to '9' (U+0033
      DIGIT ZERO to U+0039 DIGIT NINE, inclusive). The substring does
      not contain any leading '0' (U+0033 DIGIT ZERO) characters.

      As a result, the value of the attribute does not contain any of
      the following characters: white space characters defined in
      Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS),
      and '.' (U+002E FULL STOP).

```
      Examples of accepted values:
      size='40,200'
      size='400,200'

      Examples of refused values:
      size=''
      size='400,0'
      size='400,550'
      size='400'
```

```
        size='400 200'
        size='040,200'
        size='400, 200'
        size='+400,200'
        size='400,-200'
        size='400.5,200'
```

   columns - Mandatory

      The number of columns of the miniature bitmap on which the pixels
      resource is based.

      The value of the attribute represents an integer between 1 and 16
      (inclusive).

      The value of the attribute is a string containing between one and
      two decimal characters (inclusive). Each decimal character of the
      string is in the range from '0' to '9' (U+0030 DIGIT ZERO to
      U+0039 DIGIT NINE, inclusive). The string does not contain any
      leading '0' (U+0033 DIGIT ZERO) characters.

      As a result, the value of the attribute does not contain any of
      the following characters: white space characters defined in
      Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS),
      and '.' (U+002E FULL STOP).

         Examples of accepted values:
         columns='1'
         columns='16'
         columns='9'

         Examples of refused values:
         columns=''
         columns='-9'
         columns='20'
         columns='09'
         columns='+9'
         columns='9.5'

   rows - Mandatory

      The number of rows of the miniature bitmap on which the pixels
      resource is based.

      The value of the attribute represents an integer between 1 and 16
      (inclusive).

The value of the attribute is a string containing between one and
two decimal characters (inclusive). Each decimal character of the
string is in the range from '0' to '9' (U+0030 DIGIT ZERO to
U+0039 DIGIT NINE, inclusive). The string does not contain any
leading '0' (U+0033 DIGIT ZERO) characters.

As a result, the value of the attribute does not contain any of
the following characters: white space characters defined in
Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS),
and '.' (U+002E FULL STOP).

Examples of accepted values:
rows='1'
rows='16'
rows='9'

Examples of refused values:
rows=''
rows='-9'
rows='20'
rows='09'
rows='+9'
rows='9.5'

pix - Mandatory

The way of defining all the individual pixels of the miniature
bitmap on which the pixels resource is based.

The attribute is based on a string set which represents the
possible values of the attribute.

The value of the attribute is case-sensitive.

The value can be:

* 'rgba' indicates that all the individual pixels of the minature
   bitmap use an rgba definition.

* 'rgb' indicates that all the individual pixels of the minature
   bitmap use an rgb definition.

* 'a' indicates that all the individual pixels of the minature
   bitmap use an a definition.

* 'y' indicates that all the individual pixels of the minature
   bitmap use a y definition.

   * 'ya' indicates that all the individual pixels of the minature
      bitmap use a ya definition.

  color - Applicable only if the value of the "pix" attribute equals
          'a'. Optional if applicable.

      The color of the individual pixels of the miniature bitmap on
      which the pixels resource is based.

      The value of the attribute represents the levels of the R, G, and
      B components of the color. The level of each component is
      represented using two hexadecimal digits.

      As stated in the Frogans slide layout rules (Section 4.6), the
      level of each one of the R, G, and B components is in the range
      from 00 (0) to ff (255).

      The default value is '#0000ff'.

      The value of the attribute is a string in the '#rrggbb' pattern
      where: '#' is the U+0013 NUMBER SIGN character; and 'rr', 'gg',
      and 'bb' are each a substring representing respectively the R, G,
      and B components. Each substring contains two hexadecimal
      characters. Each hexadecimal character of each substring is in
      one of the following ranges: from '0' to '9' (U+0030 DIGIT ZERO to
      U+0039 DIGIT NINE, inclusive), from 'A' to 'F' (U+0041 LATIN
      CAPITAL LETTER A to U+0046 LATIN CAPITAL LETTER F, inclusive),
      from 'a' to 'f' (U+0061 LATIN SMALL LETTER A to U+0066 LATIN SMALL
      LETTER F, inclusive).

      As a result, the value of the attribute does not contain any white
      space characters defined in Section 5.5.

         Examples of accepted values:
         color='#0000ff'
         color='#004698'
         color='#001c46'
         color='#ffbf00'
         color='#Ffbf00'
         color='#FFBF00'

         Examples of refused values:
         color=''
         color='ffbf00'
         color='#'
         color='#ffbf'

```
        color='# ffbf00'
        color='#ffbf 00'
        color='#0ffbf00'
        color='#00f'
```

   alpha - Applicable only if the value of the "pix" attribute Xequals
           either 'rgb' or 'y'. Optional if applicable.

       The transparency of the individual pixels of the miniature bitmap
       on which the pixels resource is based.

       The value of the attribute represents the level of the A component
       of the individual pixels. The level of the A component is
       represented using two hexadecimal digits.

       As stated in the Frogans slide layout rules (Section 4.6), the
       level of the A component is in the range from 00 (0) to ff (255),
       where the level 00 corresponds to a fully transparent pixel and ff
       corresponds to a fully opaque pixel.

       The default value is '#ff'.

       The value of the attribute is a string in the '#aa' pattern where:
       '#' is the U+0013 NUMBER SIGN character; and 'aa' is a substring
       representing the A component. Each substring contains two
       hexadecimal characters. Each hexadecimal character of each
       substring is in one of the following ranges: from '0' to '9'
       (U+0030 DIGIT ZERO to U+0039 DIGIT NINE, inclusive), from 'A' to
       'F' (U+0041 LATIN CAPITAL LETTER A to U+0046 LATIN CAPITAL LETTER
       F, inclusive), from 'a' to 'f' (U+0061 LATIN SMALL LETTER A to
       U+0066 LATIN SMALL LETTER F, inclusive).

       As a result, the value of the attribute does not contain any white
       space characters defined in Section 5.5.

           Examples of accepted values:
           alpha='#ff'
           alpha='#00'
           alpha='#bf'
           alpha='#Bf'
           alpha='#BF'

           Examples of refused values:
           alpha=''
           alpha='bf'
           alpha='#'

```
        alpha='#b'
        alpha='# bf'
        alpha='#b f'
        alpha='#0bf'
```

6.5. Preparing Drawing Resources - <resdraw> Element

   The <resdraw> element prepares a drawing resource that is based on a
   geometric form.

   The <resdraw> element is a child of the <frogans-fsdl> element (see
   Section 6.1). The <resdraw> element does not contain any children.
   It does not contain text characters.

   As stated in the Frogans slide layout rules (Section 4.6):

   - The drawing resource is intended to be used in the Frogans slide
      as the foundation of a layer (see the <layer> element in
      Section 6.12) or as part of a merge resource (see the <resmerge>
      and <merge> elements in Section 6.11).

   - The drawing resource can be used once or several times in the
      Frogans slide.

   The drawing resource is identified using a component identifier
   (Section 4.5) which is determined by the value of the "resid"
   attribute of the <resdraw> element.

   The size, in pixels, of the drawing resource depends on the value of
   the "size" attribute of the <resdraw> element.

   The geometric form is either a rectangle, a rounded rectangle, or an
   ellipse, depending on the value of the "figure" attribute of the
   <resdraw> element.

   The geometric form is drawn either as a line or as a filled area,
   depending on the value of the "stroke" attribute of the <resdraw>
   element. If the geometric form is drawn as a line, then the
   thickness of the line depends on the value of the "thick" attribute
   of the <resdraw> element.

   The geometric form covers the entire width and height of the drawing
   resource.

   If the geometric form is drawn as a line, then the thickness of the
   line is fully included in the drawing resource, i.e. it does not
   extend beyond the edge of the drawing resource.

   A rounded rectangle is a rectangle with four rounded corners, where
   each corner is one quarter of an ellipse. For a rounded rectangle:

   * The width and height of the ellipse used to draw the corners
      depend on the value of the "round" attribute of the <resdraw>

element.

* The top-left, top-right, bottom-left, and bottom-right corners
  correspond respectively to the top-left, top-right, bottom-left,
  and bottom-right quarters of the ellipse.

* If the width of the ellipse is equal to the width of the drawing
  resource, then the top and bottom of the rounded rectangle are
  both a semi-ellipse.

* If the height of the ellipse is equal to the height of the drawing
  resource, then the left and right sides of the rounded rectangle
  are both a semi-ellipse.

* If the width and height of the ellipse are equal respectively to
  the width and height of the drawing resource, then the rounded
  rectangle becomes an ellipse.

The color of the drawing resource depends on the value of the "color"
attribute of the <resdraw> element.

For more information on the process to draw geometric forms, see
Appendix B.5.

The <resdraw> element has the following attributes:

resid - Mandatory

    The identifier of the drawing resource.

    The value of the attribute is a component identifier. The value
    is compliant with the rules presented in Section 4.5.

    As a result, the value cannot have been utilized previously in the
    FSDL document as a component identifier.

        Examples of accepted values:
        resid='foo1'
        resid='Foo1'
        resid='foo2'
        resid='foo_1'

        Examples of refused values:
        resid=''
        resid='foo-1'
        resid='foo/1'

```
        resid='foo.1'
        resid='foo 1'
        resid='foo1,foo2'
```

   size - Mandatory

      The size of the drawing resource.

      The value of the attribute represents the width and height, in
      pixels, of the drawing resource.

      As stated in the Frogans slide layout rules (Section 4.6), the
      width of the drawing resource is an integer between 1 and 640
      (inclusive) and its height is an integer between 1 and 480
      (inclusive).

      The value of the attribute is a string in the 'width,height'
      pattern where: ',' is the U+002C COMMA character; and 'width' and
      'height' are each a substring representing respectively the width
      or height of the drawing resource. Each substring contains
      between one and three decimal characters (inclusive). Each
      decimal character of the substring is in the range from '0' to '9'
      (U+0033 DIGIT ZERO to U+0039 DIGIT NINE, inclusive). The
      substring does not contain any leading '0' (U+0033 DIGIT ZERO)
      characters.

      As a result, the value of the attribute does not contain any of
      the following characters: white space characters defined in
      Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS),
      and '.' (U+002E FULL STOP).

         Examples of accepted values:
         size='40,200'
         size='400,200'

         Examples of refused values:
         size=''
         size='400,0'
         size='400,550'
         size='400'
         size='400 200'
         size='040,200'
         size='400, 200'
         size='+400,200'
         size='400,-200'
         size='400.5,200'

   figure - Mandatory

The geometric form on which the drawing resource is based.

The attribute is based on a string set which represents the possible values of the attribute.

The value of the attribute is case-sensitive.

The value can be:

*   'rect' indicates that the geometric form is a rectangle.

*   'roundrect' indicates that the geometric form is a rounded rectangle.

*   'ellipse' indicates that the geometric form is an ellipse. If the width and height of the drawing resource are equal, then the geometric form is a circle.

stroke - Mandatory

The way of drawing the geometric form on which the drawing resource is based.

The attribute is based on a string set which represents the possible values of the attribute.

The value of the attribute is case-sensitive.

The value can be:

*   'on' indicates that the geometric form is drawn as a line. The thickness of the line depends on the value of the "thick" attribute of the <resdraw> element.

*   'off' indicates that the geometric form is drawn as a filled area.

thick - Applicable only if the value of the "stroke" attribute of the <resdraw> element equals 'on'. Optional if applicable.

The thickness of the line in the drawing resource.

The value of the attribute represents an integer between 1 and 64 (inclusive).

The thickness is in pixels.

The default value is '8'.

The value of the attribute is a string containing between one and
two decimal characters (inclusive). Each decimal character of the
string is in the range from '0' to '9' (U+0030 DIGIT ZERO to
U+0039 DIGIT NINE, inclusive). The string does not contain any
leading '0' (U+0033 DIGIT ZERO) characters.

As a result, the value of the attribute does not contain any of
the following characters: white space characters defined in
Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS),
and '.' (U+002E FULL STOP).

    Examples of accepted values:
    thick='1'
    thick='64'
    thick='9'

    Examples of refused values:
    thick=''
    thick='-9'
    thick='80'
    thick='+9'
    thick='9.5'

  round - Applicable only if the value of the "figure" attribute of the
         <resdraw> element equals 'roundrect'. Optional if
         applicable.

    The dimensions of the ellipse used to draw the corners of the
    rounded rectangle on which the drawing resource is based.

    The value of the attribute represents the width and height, in
    pixels, of the ellipse.

    The width of the ellipse is an integer between 1 and 640
    (inclusive) and its height is an integer between 1 and 480
    (inclusive).

    The default value is '16,16'.

    The value of the attribute is a string in the 'width,height'
    pattern where: ',' is the U+002C COMMA character; and 'width' and
    'height' are each a substring representing respectively the width
    or height of the ellipse. Each substring contains between one and
    three decimal characters (inclusive). Each decimal character of
    each substring is in the range from '0' to '9' (U+0033 DIGIT ZERO
    to U+0039 DIGIT NINE, inclusive). The substrings do not contain

      any leading '0' (U+0033 DIGIT ZERO) characters.

      As a result, the value of the attribute does not contain any of
      the following characters: white space characters defined in
      Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS),
      and '.' (U+002E FULL STOP).

         Examples of accepted values:
         origin='16,16'
         origin='40,200'
         origin='400,200'

         Examples of refused values:
         origin=''
         origin='400,0'
         origin='400,550'
         origin='400'
         origin='400 200'
         origin='040,200'
         origin='400, 200'
         origin='+400,200'
         origin='400,-200'
         origin='400.5,200'

      During the rendering of the Frogans slide, when preparing the
      drawing resource:

      * If the width of the ellipse is greater than the width of the
         drawing resource, then the width of the ellipse is considered
         to be equal to the width of the drawing resource.

      * If the height of the ellipse is greater than the height of the
         drawing resource, then the height of the ellipse is considered
         to be equal to the height of the drawing resource.

   color - Optional

      The color of the drawing resource.

      The value of the attribute represents the levels of the R, G, and
      B components of the color. The level of each component is
      represented using two hexadecimal digits.

      As stated in the Frogans slide layout rules (Section 4.6), the
      level of each one of the R, G, and B components is in the range
      from 00 (0) to ff (255).

The default value is '#0000ff'.

The value of the attribute is a string in the '#rrggbb' pattern
where: '#' is the U+0013 NUMBER SIGN character; and 'rr', 'gg',
and 'bb' are each a substring representing respectively the R, G,
and B components. Each substring contains two hexadecimal
characters. Each hexadecimal character of each substring is in
one of the following ranges: from '0' to '9' (U+0030 DIGIT ZERO to
U+0039 DIGIT NINE, inclusive), from 'A' to 'F' (U+0041 LATIN
CAPITAL LETTER A to U+0046 LATIN CAPITAL LETTER F, inclusive),
from 'a' to 'f' (U+0061 LATIN SMALL LETTER A to U+0066 LATIN SMALL
LETTER F, inclusive).

As a result, the value of the attribute does not contain any white
space characters defined in Section 5.5.

    Examples of accepted values:
    color='#0000ff'
    color='#004698'
    color='#001c46'
    color='#ffbf00'
    color='#Ffbf00'
    color='#FFBF00'

    Examples of refused values:
    color=''
    color='ffbf00'
    color='#'
    color='#ffbf'
    color='# ffbf00'
    color='#ffbf 00'
    color='#0ffbf00'
    color='#00f'

6.6. Preparing Path Resources - <respath> Element

   The <respath> element prepares a path resource that is based on a
   plane containing Bezier curves.

   The <respath> element is a child of the <frogans-fsdl> element (see
   Section 6.1). The <respath> element does not contain any children.
   It contains text characters.

   As stated in the Frogans slide layout rules (Section 4.6):

   - The path resource is intended to be used in the Frogans slide as
      the foundation of a layer (see the <layer> element in
      Section 6.12) or as part of a merge resource (see the <resmerge>
      and <merge> elements in Section 6.11).

   - The path resource can be used once or several times in the Frogans
      slide.

   The path resource is identified using a component identifier
   (Section 4.5) which is determined by the value of the "resid"
   attribute of the <respath> element.

   The size, in pixels, of the path resource depends on the value of the
   "size" attribute of the <respath> element.

   Each Bezier curve contained in the plane is either:

   * a linear Bezier curve, which has a starting point and an ending
      point.

   * a conic Bezier curve, which has a starting point, an ending point,
      and one control point. A conic Bezier curve is also referred to
      as a quadratic Bezier curve.

   * a cubic Bezier curve, which has a starting point, an ending point,
      and two control points.

   Each Bezier curve can be used in the plane either as:

   * a simple Bezier curve, meaning that it is independent from all the
      other Bezier curves contained in the plane, or

   * a part of a composite Bezier curve. A composite Bezier curve is
      made up of two of more linear, conic, or cubic Bezier curves,
      joined end to end in any combination, such that the ending point
      of one curve coincides with the starting point of the next curve.

The plane can contain any combination of simple and composite Bezier curves.

In order to position the starting, ending, and control points of the simple and composite Bezier curves in the plane, the plane uses an x,y coordinate system where: the x and the y coordinates of a point in the plane represent the distances of the point from the x and y coordinate axes; the x coordinate is an integer which increases towards the right from 0 to 2,048; and the y coordinate is an integer which increases towards the bottom from 0 to 2,048.

The plane can be cropped in order to select which part of the plane is apparent in the path resource, depending on the values of the "crop" and "corners" attributes of the <respath> element.

For instance, the plane can be cropped automatically in cases where the x,y coordinates of the starting, ending, and control points of the Bezier curves contained in the plane do not use the full range from 0 to 2,048. Furthermore, the plane can be cropped using custom coordinates in order to exclude certain parts or control points of Bezier curves, or in order to draw, on a fixed scale, graphs representing data that is generated on the fly (i.e. dynamically) on the server hosting the Frogans site.

All the simple and composite Bezier curves are drawn either as lines or as filled areas, depending on the value of the "stroke" attribute of the <respath> element. If the simple and composite Bezier curves are drawn as lines, then the thickness of the lines depends on the value of the "thick" attribute of the <respath> element.

If the simple and composite Bezier curves are drawn as lines, then they can all be closed depending on the value of the "close" attribute of the <respath> element.

If a simple Bezier curve is closed, then a straight line is drawn from its ending point to its starting point.

If a composite Bezier curve is closed, then a straight line is drawn from the ending point of its last Bezier curve to the starting point of its first Bezier curve. A composite Bezier curve cannot be closed correctly by appending a linear Bezier curve whose ending point is the starting point of the first Bezier curve of the composite Bezier curve.

If the simple and composite Bezier curves are drawn as filled areas, then the rule used to determine these filled areas depends on the value of the "fill" attribute of the <respath> element.

The way in which the apparent part of the plane is mapped to the path
resource depends on the values of the "spread" and "adjust"
attributes of the <respath> element. The size, in x,y coordinates,
of the apparent part of the plane is not necessarily the same as the
size, in pixels, of the path resource.

If the simple and composite Bezier curves are drawn as lines, and if
their starting, ending, and control points are all included in the
apparent part of the plane, then the thickness of the lines is fully
included in the path resource, i.e. it does not extend beyond the
edge of the path resource.

The color of the path resource depends on the value of the "color"
attribute of the <respath> element.

The text characters of the <respath> element contain a list of items.
Each item can be either:

*   a jump item, which corresponds to the starting point of a simple
    or composite Bezier curve

*   a linear item, which corresponds to the ending point of a linear
    Bezier curve

*   a conic item, which corresponds to the ending point and the
    control point of a conic Bezier curve, or

*   a cubic item, which corresponds to the ending point and both
    control points of a cubic Bezier curve

Each simple and composite Bezier curve contained in the plane is
represented as a sequence of items in the list:

*   A simple Bezier curve is represented as a jump item followed by
    one linear, conic, or cubic item.

*   A composite Bezier curve is represented as a jump item followed by
    any combination of two or more linear, conic, or cubic items.

The simple and composite Bezier curves contained in the plane are
included one after another in the list.

As a result, the list starts with a jump item, cannot end with a jump
item, and cannot contain two consecutive jump items.

Each item in the list is a string using one of the following
patterns:

   * 'Ju:xstart,ystart': this pattern corresponds to a jump item.

   * 'Li:xend,yend': this pattern corresponds to a linear item.

   * 'Co:xend,yend,xcp1,ycp1': this pattern corresponds to a conic
      item.

   * 'Cu:xend,yend,xcp1,ycp1,xcp2,ycp2': this pattern correponds to a
      cubic item.

   In the patterns above: 'Ju', 'Li', 'Co', and 'Cu' are case-sensitive
   string constants representing the kind of item; ':' is the U+003A
   COLON character; ',' is the U+002C COMMA character; 'xstart' and
   'ystart' are each a substring representing the x and y coordinates of
   a starting point; 'xend' and 'yend' are each a substring representing
   the x and y coordinates of an ending point; 'xcp1' and 'ycp1' are
   each a substring representing the x and y coordinates of either the
   control point of a conic Bezier curve, or the first control point of
   a cubic Bezier curve; and 'xcp2' and 'ycp2' are each a substring
   representing the x and y coordinates of the second control point of a
   cubic Bezier curve. Each substring contains between one and four
   decimal characters (inclusive). Each decimal character of each
   substring is in the range from '0' to '9' (U+0030 DIGIT ZERO to
   U+0039 DIGIT NINE, inclusive). The substrings do not contain any
   leading '0' (U+0033 DIGIT ZERO) characters.

   As a result, the item does not contain any white space characters, as
   defined in Section 5.5any of the following characters: white space
   characters defined in Section 5.5, '+' (U+002B PLUS SIGN), '-'
   (U+002D HYPHEN-MINUS), and '.' (U+002E FULL STOP).

      Examples of accepted items:
      Ju:200,1000
      Li:200,1000
      Co:200,1000,450,1300
      Cu:200,1000,450,1300,1850,300

      Examples of refused items:
      200,1000
      J200,1000
      Ju200,1000
      Ju 200,1000
      Ju=200,1000
      ju:200,1000
      JU:200,1000
      Ju:200,2400

```
        Ju:200
        Ju:200 1000
        Ju:0200,1000
        Ju:200, 1000
        Ju:+200,1000
        Ju:200,-1000
        Ju:200.5,1000
        Li:200
        Co:200,1000
        Co:200,1000,450
        Cu:200,1000,450,1300
        Cu:200,1000,450,1300,1850
```

The separator character used to separate items in the list is the ';'
(U+003B SEMICOLON) character.

White space characters, as defined in Section 5.5, can optionally be
included before and after the ';' (U+003B SEMICOLON) separator
characters in the list. These white space characters are ignored.

The list cannot contain empty items. As a result, there is no
separator character either before the first item or after the last
item in the list. Furthermore, there cannot be two consecutive
separator characters in the list.

The number of items in the list is between 2 and 512 (inclusive).

```
        Examples of accepted item lists:
        Ju:10,50;Li:200,1000
        Ju:10,50;Co:200,1000,450,1300
        Ju:10,50;Cu:200,1000,450,1300,1850,300
        Ju:10,50;Li:500,100;Li:200,1000
        Ju:10,50;Li:500,100;Co:200,1000,450,1300
        Ju:10,50;Li:500,100;Cu:200,1000,450,1300,1850,300
        Ju:10,50;Li:75,1400;Ju:1400,1600;Li:500,100
        Ju:10,50;Li:75,1400;Ju:1400,1600;Li:500,100;Co:200,1000,450,1300

        Examples of refused item lists:
        Li:75,1400;Ju:1400,1600;Li:500,100
        Ju:10,50;Li:75,1400;Ju:1400,1600
        Ju:10,50;Li:75,1400;Ju:200,1000;Ju:1400,1600;Li:500,100
        Ju:10,50Li:200,1000
        Ju:10,50 Li:200,1000
        ;Ju:10,50;Li:200,1000
        Ju:10,50;Li:200,1000;
        Ju:10,50;;Li:200,1000
```

For more information on the process to draw Bezier curves, see

Appendix B.6.

The <respath> element has the following attributes:

resid - Mandatory

    The identifier of the path resource.

    The value of the attribute is a component identifier. The value
    is compliant with the rules presented in Section 4.5.

    As a result, the value cannot have been utilized previously in the
    FSDL document as a component identifier.

        Examples of accepted values:
        resid='foo1'
        resid='Foo1'
        resid='foo2'
        resid='foo_1'

        Examples of refused values:
        resid=''
        resid='foo-1'
        resid='foo/1'
        resid='foo.1'
        resid='foo 1'
        resid='foo1,foo2'

size - Mandatory

    The size of the path resource.

    The value of the attribute represents the width and height, in
    pixels, of the path resource.

    As stated in the Frogans slide layout rules (Section 4.6), the
    width of the path resource is an integer between 1 and 640
    (inclusive) and its height is an integer between 1 and 480
    (inclusive).

    The value of the attribute is a string in the 'width,height'
    pattern where: ',' is the U+002C COMMA character; and 'width' and
    'height' are each a substring representing respectively the width
    or height of the path resource. Each substring contains between
    one and three decimal characters (inclusive). Each decimal
    character of the substring is in the range from '0' to '9' (U+0033
    DIGIT ZERO to U+0039 DIGIT NINE, inclusive). The substring does
    not contain any leading '0' (U+0033 DIGIT ZERO) characters.

As a result, the value of the attribute does not contain any of
the following characters: white space characters defined in
Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS),
and '.' (U+002E FULL STOP).

Examples of accepted values:
size='40,200'
size='400,200'

Examples of refused values:
size=''
size='400,0'
size='400,550'
size='400'
size='400 200'
size='040,200'
size='400, 200'
size='+400,200'
size='400,-200'
size='400.5,200'

crop - Mandatory

The cropping applied to the plane on which the path resource is
based.

The attribute is based on a string set which represents the
possible values of the attribute.

The value of the attribute is case-sensitive.

The value can be:

*   'none' indicates that no cropping is applied to the plane. The
    x and y coordinates of the point at the top-left corner of the
    apparent part of the plane are both zero. The x and y
    coordinates of the point at the bottom-right corner of the
    apparent part of the plane are both 2048.

*   'auto' indicates that the plane is cropped automatically. The
    x and y coordinates of the point at the top-left corner of the
    apparent part of the plane are xmin and ymin, where xmin is the
    smallest x coordinate and ymin is the smallest y coordinate of
    all the starting, ending, and control points of all the Bezier
    curves contained in the plane. The x and y coordinates of the
    point at the bottom-right corner of the apparent part of the
    plane are xmax and ymax, where xmax is the largest x coordinate
    and ymax is the largest y coordinate of all the starting,

ending, and control points of all the Bezier curves contained in the plane.

   * 'custom' indicates that the plane is cropped using custom coordinates. The x,y coordinates of the points at the top-left and bottom-right corners of the apparent part of the plane depend on the value of the "corners" attribute of the <respath> element.

corners - Applicable only if the value of the "crop" attribute equals 'custom'. Mandatory if applicable.

   The top-left and bottom-right corners of the apparent part of the plane on which the path resource is based.

   The value of the attribute represents the x and y coordinates of the points at the top-left and bottom-right corners of the apparent part of the plane.

   The x and y coordinates of the point at the top-left corner are integers between 0 and 2,047 (inclusive). The x and y coordinates of the point at the bottom-right corner are integers between 1 and 2,048 (inclusive).

   The x and y coordinates of the point at the bottom-right corner are greater respectively than the x and y coordinates of the point at the top-left corner.

   The value of the attribute is a string in the 'xtl,ytl,xbr,ybr' pattern where: ',' is the U+002C COMMA character; and 'xtl' and 'ytl' are each a substring representing respectively the x and y coordinates of the point at the top-left corner and 'xbr' and 'ybr' are each a substring representing respectively the x and y coordinates of the point at the bottom-right corner. Each substring contains between one and four decimal characters (inclusive). Each decimal character of each substring is in the range from '0' to '9' (U+0030 DIGIT ZERO to U+0039 DIGIT NINE, inclusive). The substrings do not contain any leading '0' (U+0033 DIGIT ZERO) characters.

   As a result, the value of the attribute does not contain any of the following characters: white space characters defined in Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS), and '.' (U+002E FULL STOP).

      Examples of accepted values:

```
        corners='10,50,200,1000'
        corners='200,50,450,1000'

        Examples of refused values:
        corners=''
        corners='10,50,2400,1000'
        corners='450,50,200,1000'
        corners='10,50'
        corners='10 50 200 1000'
        corners='010,50,200,1000'
        corners='10, 50,200,1000'
        corners='+10,50,200,1000'
        corners='10,-50,200,1000'
        corners='10.5,50,200,1000'
```

   stroke - Mandatory

      The way of drawing all the simple and composite Bezier curves
      contained in the plane on which the path resource is based.

      The attribute is based on a string set which represents the
      possible values of the attribute.

      The value of the attribute is case-sensitive.

      The value can be:

      * 'on' indicates that all the simple and composite Bezier curves
         are drawn as lines. The thickness of the lines depends on the
         value of the "thick" attribute of the <respath> element.

      * 'off' indicates that all the simple and composite Bezier curves
         are drawn as filled areas.

   thick - Applicable only if the value of the "stroke" attribute of the
           <respath> element equals 'on'. Optional if applicable.

      The thickness of the lines in the path resource.

      The value of the attribute represents an integer between 1 and 64
      (inclusive).

      The thickness is in pixels.

      The default value is '8'.

The value of the attribute is a string containing between one and
two decimal characters (inclusive). Each decimal character of the
string is in the range from '0' to '9' (U+0030 DIGIT ZERO to
U+0039 DIGIT NINE, inclusive). The string does not contain any
leading '0' (U+0033 DIGIT ZERO) characters.

As a result, the value of the attribute does not contain any of
the following characters: white space characters defined in
Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS),
and '.' (U+002E FULL STOP).

    Examples of accepted values:
    thick='1'
    thick='64'
    thick='9'

    Examples of refused values:
    thick=''
    thick='-9'
    thick='80'
    thick='+9'
    thick='9.5'

close - Applicable only if the value of the "stroke" attribute of the
        <respath> element equals 'on'. Optional if applicable.

    Whether to close all the simple and composite Bezier curves
    contained in the plane on which the path resource is based.

    The attribute is based on a string set which represents the
    possible values of the attribute.

    The value of the attribute is case-sensitive.

    The value can be:

    * 'on' indicates that all the simple and composite Bezier curves
       are closed.

    * 'off' indicates that none of the simple and composite Bezier
       curves are closed.

    The default value is 'off'.

   fill - Applicable only if the value of the "stroke" attribute of the
          <respath> element equals 'off'. Optional if applicable.

      The rule used to determine the filled areas in the path resource.

      The attribute is based on a string set which represents the
      possible values of the attribute.

      The value of the attribute is case-sensitive.

      The value can be:

      * 'non-zero' indicates that the non-zero winding rule is used.

      * 'even-odd' indicates that the even-odd fill rule is used.

      The default value is 'non-zero'.

   spread - Mandatory

      Whether the apparent part of the plane is spread when mapped to
      the path resource.

      The attribute is based on a string set which represents the
      possible values of the attribute.

      The value of the attribute is case-sensitive.

      The value can be:

      * 'on' indicates that the apparent part of the plane is mapped to
         the path resource, without maintaining its original
         proportions, such that the apparent part of the plane covers
         the entire width and height of the path resource.

      * 'off' indicates that the apparent part of the plane is mapped
         to the path resource, maintaining its original proportions,
         such that the apparent part of the plane covers either the
         entire width or the entire height of the path resource. Any
         remaining parts of the path resource that are not covered by
         the apparent part of the plane are fully transparent. The
         placement of the apparent part of the plane in the path
         resource depends on the value of the "adjust" attribute of the
         <respath> element.

adjust - Applicable only if the value of the "spread" attribute of
         the <respath> element equals 'off'. Optional if applicable.

    The adjustment of the apparent part of the plane in the path
    resource.

    The value of the attribute represents an integer between -100 and
    100 (inclusive).

    The adjustment is applied, either horizontally or vertically, as
    follows:

    * An adjustment of -100 corresponds to the LT placement, where
       the apparent part of the plane is placed so that its left or
       top edge matches the left or top edge of the path resource.

    * An adjustment of 0 corresponds to the central placement, where
       the apparent part of the plane is centered vertically or
       horizontally in the path resource.

    * An adjustment of 100 corresponds to the RB placement, where the
       apparent part of the plane is placed so that its right or
       bottom edge matches the right or bottom edge of the path
       resource.

    * An adjustment between -100 and 0 (exclusive) corresponds to a
       proportional placement, where the apparent part of the plane is
       placed according to the absolute value of the adjustment,
       starting from the central placement and moving towards the LT
       placement. For instance, an adjustment of -25 corresponds to a
       placement where the apparent part of the plane is placed one-
       quarter of the way from the central placement towards the LT
       placement.

    * An adjustment between 0 and 100 (exclusive) corresponds to a
       proportional placement, where the apparent part of the plane is
       placed according to the value of the adjustment, starting from
       the central placement and moving towards the RB placement. For
       instance, an adjustment of 75 corresponds to a placement where
       the apparent part of the plane is placed three-quarters of the
       way from the central placement towards the RB placement.

    The default value is 0.

    The value of the attribute is a string in the 'pd' pattern where:
    'p' is a substring representing the sign of the adjustment; and
    'd' is a substring representing the absolute value of the
    adjustment. The 'p' substring is either an empty string,

indicating that the value of the adjustment is greater than or
equal to zero, or is the '-' (U+002D HYPHEN-MINUS) character. The
'd' substring contains between one and three decimal characters
(inclusive). Each decimal character of the 'd' substring is in
the range from '0' to '9' (U+0033 DIGIT ZERO to U+0039 DIGIT NINE,
inclusive). The 'd' substring does not contain any leading '0'
(U+0033 DIGIT ZERO) characters.

As a result, the value of the attribute does not contain any of
the following characters: white space characters defined in
Section 5.5, '+' (U+002B PLUS SIGN), and '.' (U+002E FULL STOP).

    Examples of accepted values:
    adjust='0'
    adjust='-100'
    adjust='100'
    adjust='-25'
    adjust='75'

    Examples of refused values:
    adjust=''
    adjust='-0'
    adjust='-120'
    adjust='150'
    adjust='-025'
    adjust='075'
    adjust='- 25'
    adjust='+100'
    adjust='-25.5'

color - Optional

    The color of the path resource.

    The value of the attribute represents the levels of the R, G, and
    B components of the color. The level of each component is
    represented using two hexadecimal digits.

    As stated in the Frogans slide layout rules (Section 4.6), the
    level of each one of the R, G, and B components is in the range
    from 00 (0) to ff (255).

    The default value is '#0000ff'.

    The value of the attribute is a string in the '#rrggbb' pattern
    where: '#' is the U+0013 NUMBER SIGN character; and 'rr', 'gg',
    and 'bb' are each a substring representing respectively the R, G,
    and B components. Each substring contains two hexadecimal

characters. Each hexadecimal character of each substring is in
one of the following ranges: from '0' to '9' (U+0030 DIGIT ZERO to
U+0039 DIGIT NINE, inclusive), from 'A' to 'F' (U+0041 LATIN
CAPITAL LETTER A to U+0046 LATIN CAPITAL LETTER F, inclusive),
from 'a' to 'f' (U+0061 LATIN SMALL LETTER A to U+0066 LATIN SMALL
LETTER F, inclusive).

As a result, the value of the attribute does not contain any white
space characters defined in Section 5.5.

    Examples of accepted values:
    color='#0000ff'
    color='#004698'
    color='#001c46'
    color='#ffbf00'
    color='#Ffbf00'
    color='#FFBF00'

    Examples of refused values:
    color=''
    color='ffbf00'
    color='#'
    color='#ffbf'
    color='# ffbf00'
    color='#ffbf 00'
    color='#0ffbf00'
    color='#00f'

6.12. Adding Layers to the Frogans Slide - <layer> Element

   The <layer> element defines a layer to be added to the Frogans slide.

   The <layer> element is a child either of the <frogans-fsdl> element
   (see Section 6.1) or of a <button> element (see Section 6.13.1). The
   <layer> element does not contain any children. It does not contain
   text characters.

   As stated in the Frogans slide layout rules (Section 4.6):

   - If the <layer> element is a child of the <frogans-fsdl> element,
      then the layer is intended to be included directly in the Frogans
      slide.

   - If the <layer> element is a child of the <button> element, then
      the layer is intended to be used for assembling a button.

   - The layer is added on top of any other layers defined previously
      in the FSDL document.

   - The foundation of the layer is a prepared resource, which can be
      either an image, pixels, draw, path, text, or merge resource (see
      respectively the <resimage> element in Section 6.3, the
      <respixels> element in Section 6.4, the <resdraw> element in
      Section 6.5, the <respath> element in Section 6.6, the <restext>
      element in Section 6.7.2, and the <resmerge> element in
      Section 6.11).

   The layer is identified using a component identifier (Section 4.5)
   which is determined by the value of the "layerid" attribute of the
   <layer> element.

   The size, in pixels, of the layer on the Frogans slide rendering
   canvas depends on the size, in pixels, of the prepared resource.

   The layer can be included in the lead representation, the vignette
   representation, or both representations of the Frogans slide,
   depending on the value of the "leapout" attribute of the <layer>
   element. The values of the other attributes of the <layer> element
   are applicable to the representations of the Frogans slide in which
   the layer is included.

   The resource used as the foundation of the layer is referred to using
   a component identifier which is determined by the value of the
   "resref" attribute of the <layer> element.

   The following optional transformations are applied successively to

the resource:

*   flip, depending on the value of the "flip" attribute in the
    <layer> element

*   filter, depending on the value of the "filterref" attribute in the
    <layer> element

*   relief, depending on the value of the "reliefref" attribute in the
    <layer> element

*   blur, depending on the value of the "blur" attribute in the
    <layer> element

*   opacity, depending on the value of the "opacity" attribute in the
    <layer> element

*   rotation, depending on the value of the "angle" attribute in the
    <layer> element

The transformations are applied to a copy of the prepared resource,
which is used for the layer only. As a result, if the prepared
resource is to be used as the foundation of other layers defined
subsequently in the FSDL document, then the transformations for the
layer do not apply to the other layers.

The position and alignment of the layer on the Frogans slide
rendering canvas depend on the values of the "pos" and "align"
attributes of the <layer> element.

The layer is combined into the Frogans slide rendering canvas in a
way that depends on the value of the "combine" attribute of the
<layer> element.

A shadow can be added underneath the layer, depending on the value of
the "shadowref" attribute of the <layer> element.

If the layer is to be used for assembling a button, then the
visibility of the layer in the button depends on the value of the
"visible" attribute of the <layer> element.

The <layer> element has the following attributes:

layerid - Mandatory

    The identifier of the layer.

The value of the attribute is a component identifier. The value
is compliant with the rules presented in Section 4.5.

As a result, the value cannot have been utilized previously in the
FSDL document as a component identifier.

    Examples of accepted values:
    layerid='foo1'
    layerid='Foo1'
    layerid='foo2'
    layerid='foo_1'

    Examples of refused values:
    layerid=''
    layerid='foo-1'
    layerid='foo/1'
    layerid='foo.1'
    layerid='foo 1'
    layerid='foo1,foo2'

leapout - Mandatory

    The way the layer leaps out in the Frogans slide.

    The value of the attribute belongs to a set of named values.

    The value of the attribute is case-sensitive.

    The value can be:

    *   'all' indicates that the layer is included in all
        representations of the Frogans slide, i.e. in both the lead and
        the vignette representations.

    *   'lead' indicates that the layer is included in the lead
        representation only.

    *   'vignette' indicates that the layer is included in the vignette
        representation only.

    If the <layer> element is a child of a <button> element, then the
    value of the attribute is 'lead'.

resref - Mandatory

    The identifier referencing the resource used as the foundation of
    the layer.

The value of the attribute is a component identifier. The value
is compliant with the rules presented in Section 4.5.

The value of the attribute has been utilized previously in the
FSDL document as a component identifier for one of the following
resource elements: <resimage>, <respixels>, <resdraw>, <respath>,
<restext>, or <resmerge>.

Examples of accepted values:
resref='foo1'
resref='Foo1'
resref='foo2'
resref='foo_1'

Examples of refused values:
resref=''
resref='foo-1'
resref='foo/1'
resref='foo.1'
resref='foo 1'
resref='foo1,foo2'

flip - Optional

The flip effect applied to the resource used as the foundation of
the layer.

The attribute is based on a string set which represents the
possible values of the attribute.

The value of the attribute is case-sensitive.

The value can be:

*   'none' indicates that the resource is not flipped, i.e. the
    resource is not modified.

*   'xdir' indicates that the resource is flipped in the x
    direction (i.e. horizontally), along the vertical axis.

*   'ydir' indicates that the resource is flipped in the y
    direction (i.e. vertically), along the horizontal axis.

*   'xydir' indicates that the resource is flipped in both the x
    direction (i.e. horizontally) and the y direction (i.e.
    vertically), respectively along the vertical and horizontal
    axes.

The default value is 'none'.

filterref - Optional

The identifier referencing the filter applied to the resource used
as the foundation of the layer.

The value of the attribute is either an empty string, or it is a
component identifier. In the latter case, the value is compliant
with the rules presented in Section 4.5.

If the value is an empty string, then no filter is applied to the
resource.

If the value is a component identifier, then it has been utilized
previously in the FSDL document as a component identifier for
<setfilter>.

The default value is '' (the empty string).

   Examples of accepted values:
   filterref=''
   filterref='foo1'
   filterref='Foo1'
   filterref='foo2'
   filterref='foo_1'

   Examples of refused values:
   filterref='foo-1'
   filterref='foo/1'
   filterref='foo.1'
   filterref='foo 1'
   filterref='foo1,foo2'

reliefref - Optional

The identifier referencing the relief effect applied to the
resource used as the foundation of the layer.

The value of the attribute is either an empty string, or it is a
component identifier. In the latter case, the value is compliant
with the rules presented in Section 4.5.

If the value is an empty string, then no relief effect is applied
to the resource.

If the value is a component identifier, then it has been utilized
previously in the FSDL document as a component identifier for

       <setrelief>.

       The default value is '' (the empty string).

          Examples of accepted values:
          reliefref=''
          reliefref='foo1'
          reliefref='Foo1'
          reliefref='foo2'
          reliefref='foo_1'

          Examples of refused values:
          reliefref='foo-1'
          reliefref='foo/1'
          reliefref='foo.1'
          reliefref='foo 1'
          reliefref='foo1,foo2'

   blur - Optional

      The blur effect applied to the resource used as the foundation of
      the layer.

      The value of the attribute represents the radius, in pixels, of
      the blur effect.

      The radius is an integer between 0 and 32 (inclusive).

      A radius of 0 corresponds to no blur effect.

      The layer includes all pixels, resulting from the blur effect,
      that extend beyond the edges of the resource.

      The default value is '0'.

      The value of the attribute is a string containing between one and
      two decimal characters (inclusive). Each decimal character of the
      string is in the range from '0' to '9' (U+0030 DIGIT ZERO to
      U+0039 DIGIT NINE, inclusive). The string does not contain any
      leading '0' (U+0033 DIGIT ZERO) characters.

      As a result, the value of the attribute does not contain any of
      the following characters: white space characters defined in
      Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS),
      and '.' (U+002E FULL STOP).

      Examples of accepted values:
      blur='0'
      blur='32'
      blur='5'

      Examples of refused values:
      blur=''
      blur='-5'
      blur='45'
      blur='05'
      blur='+5'
      blur='5.5'

For more information on the process to blur a resource, see
Appendix B.11.

opacity - Optional

The opacity effect applied to the resource used as the foundation
of the layer.

The value of the attribute represents an integer between 0 and 100
(inclusive).

The opacity effect is applied as follows:

*   An opacity of 0 corresponds to an opacity effect where the
    resource becomes fully transparent.

*   An opacity of 100 corresponds to no opacity effect, i.e. the
    resource is not modified.

*   An opacity between 0 and 100 (exclusive) corresponds to an
    opacity effect where the A component (transparency) of each
    visible pixel in the resource is reduced in proportion to the
    opacity. For instance, an opacity of 75 corresponds to
    reducing the A component (transparency) of each visible pixel
    in the resource to three-quarters of the its value.

As a result, the opacity effect does not increase the A component
(transparency) of any pixel in the resource.

The default value is '100'.

The value of the attribute is a string containing between one and
three decimal characters (inclusive). Each decimal character of
the string is in the range from '0' to '9' (U+0030 DIGIT ZERO to
U+0039 DIGIT NINE, inclusive). The string does not contain any

leading '0' (U+0033 DIGIT ZERO) characters.

As a result, the value of the attribute does not contain any of
the following characters: white space characters defined in
Section 5.5, '+' (U+002B PLUS SIGN), '-' (U+002D HYPHEN-MINUS),
and '.' (U+002E FULL STOP).

    Examples of accepted values:
    opacity='100'
    opacity='0'
    opacity='75'

    Examples of refused values:
    opacity=''
    opacity='-25'
    opacity='150'
    opacity='075'
    opacity='+75'
    opacity='75.5'

  angle - Optional

    The angle of rotation, in degrees, applied to the resource used as
    the foundation of the layer.

    The value of the attribute represents an integer between -180 and
    180 (inclusive).

    The rotation is applied as follows:

    * An angle between -180 and -1 (inclusive) corresponds to a
       counterclockwise rotation.

    * An angle of 0 corresponds to no rotation, i.e. the resource is
       not modified.

    * An angle between 1 and 180 (inclusive) corresponds to a
       clockwise rotation.

    The default value is 0.

    The value of the attribute is a string in the 'pn' pattern where:
    'p' is a substring representing the sign of the angle; and 'n' is
    a substring representing the absolute value of the angle. The 'p'
    substring is either an empty string, indicating that the value of
    the angle is greater than or equal to zero, or is the '-' (U+002D
    HYPHEN-MINUS) character. The 'n' substring contains between one
    and three decimal characters (inclusive). Each decimal character

of the 'n' substring is in the range from '0' to '9' (U+0033 DIGIT
ZERO to U+0039 DIGIT NINE, inclusive). The 'n' substring does not
contain any leading '0' (U+0033 DIGIT ZERO) characters.

As a result, the value of the attribute does not contain any of
the following characters: white space characters defined in
Section 5.5, '+' (U+002B PLUS SIGN), and '.' (U+002E FULL STOP).

```
Examples of accepted values:
angle='0'
angle='-180'
angle='180'
angle='-45'
angle='90'

Examples of refused values:
angle=''
angle='-0'
angle='-240'
angle='360'
angle='-045'
angle='090'
angle='- 45'
angle='+90'
angle='-45.5'
```

pos - Mandatory

The position of the layer on the Frogans slide rendering canvas.

The value of the attribute represents the x and y coordinates, in
pixels, of the position of the layer on the Frogans slide
rendering canvas.

The x coordinate is an integer between -640 and 1,280 (inclusive).
The y coordinate is an integer between -480 and 960 (inclusive).

The value of the attribute is a string in the 'px,qy' pattern
where: ',' is the U+002C COMMA character; 'p' and 'q' are each a
substring representing respectively the sign of the x and the y
coordinate; and 'x' and 'y' are each a substring representing
respectively the absolute value of the x and the y coordinate.
The 'p' substring is either an empty string, indicating that the
value of the x coordinate is greater than or equal to zero, or is
the '-' (U+002D HYPHEN-MINUS) character. The 'x' substring
contains between one and four decimal characters (inclusive). The
'q' substring is either an empty string, indicating that the value
of the y coordinate is greater than or equal to zero, or is the

'-' (U+002D HYPHEN-MINUS) character. The 'y' substring contains
between one and three decimal characters (inclusive). Each
decimal character of the 'x' and 'y' substrings is in the range
from '0' to '9' (U+0033 DIGIT ZERO to U+0039 DIGIT NINE,
inclusive). The 'x' and 'y' substrings do not contain any leading
'0' (U+0033 DIGIT ZERO) characters.

As a result, the value of the attribute does not contain any of
the following characters: white space characters defined in
Section 5.5, '+' (U+002B PLUS SIGN), and '.' (U+002E FULL STOP).

    Examples of accepted values:
    pos='500,300'
    pos='1050,300'
    pos='-90,300'
    pos='500,630'
    pos='500,-110'

    Examples of refused values:
    pos=''
    pos='-0,300'
    pos='2000,300'
    pos='-900,300'
    pos='500'
    pos='500 300'
    pos='0500,300'
    pos='500, 300'
    pos='+500,300'
    pos='500.5,300'

align - Optional

    The way the resource used as the foundation of the layer is
    aligned relative to the position of the layer on the Frogans slide
    rendering canvas.

    The attribute is based on a string set which represents the
    possible values of the attribute.

    The value of the attribute is case-sensitive.

    The value can be:

    * 'left-top' indicates that the resource is aligned in a way such
       that the top-left corner of the resource, as determined before
       any blur effect or rotation is applied, coincides with the
       position of the layer.

* 'center-top' indicates that the resource is aligned in a way
  such that the point half-way between the top-left and top-right
  corners of the resource, as determined before any blur effect
  or rotation is applied, coincides with the position of the
  layer.

* 'right-top' indicates that the resource is aligned in a way
  such that the top-right corner of the resource, as determined
  before any blur effect or rotation is applied, coincides with
  the position of the layer.

* 'left-middle' indicates that the resource is aligned in a way
  such that the point half-way between the top-left and bottom-
  left corners of the resource, as determined before any blur
  effect or rotation is applied, coincides with the position of
  the layer.

* 'center-middle' indicates that the resource is aligned in a way
  such that the vertical and horizontal center of the resource,
  as determined before any blur effect or rotation is applied,
  coincides with the position of the layer.

* 'right-middle' indicates that the resource is aligned in a way
  such that the point half-way between the top-right and bottom-
  right corners of the resource, as determined before any blur
  effect or rotation is applied, coincides with the position of
  the layer.

* 'left-bottom' indicates that the resource is aligned in a way
  such that the bottom-left corner of the resource, as determined
  before any blur effect or rotation is applied, coincides with
  the position of the layer.

* 'center-bottom' indicates that the resource is aligned in a way
  such that the point half-way between the bottom-left and
  bottom-right corners of the resource, as determined before any
  blur effect or rotation is applied, coincides with the position
  of the layer.

* 'right-bottom' indicates that the resource is aligned in a way
  such that the bottom-right corner of the resource, as
  determined before any blur effect or rotation is applied,
  coincides with the position of the layer.

The default value is 'center-middle'.

During the rendering of the Frogans slide, when determing, in
pixels, the points half-way between two corners of the resource,

as well as the vertical and horizontal center of the resource,
non-integer values are rounded down, i.e. towards the top-left
corner of the resource.

combine - Mandatory

The way the layer is combined into the Frogans slide rendering
canvas.

The attribute is based on a string set which represents the
possible values of the attribute.

The value of the attribute is case-sensitive.

The value can be:

*   'add' indicates that the layer is added into the Frogans slide
    rendering canvas. This way of combining can modify both the A
    component (transparency) and the R, G, and B components (color)
    of pixels of the Frogans slide rendering canvas.

*   'clip' indicates that the layer is clipped into the Frogans
    slide rendering canvas. This way of combining can modify the
    R, G, and B components (color) of pixels in the Frogans slide
    rendering canvas. It cannot modify the transparency (A
    component) of any pixels of the Frogans slide rendering canvas.

*   'cutout' indicates that the layer is cut out from the Frogans
    slide rendering canvas. This way of combining can modify the A
    component (transparency) of pixels of the Frogans slide
    rendering canvas. It cannot modify the R, G, and B components
    (color) of any pixels of the Frogans slide rendering canvas.

*   'inter' indicates that the layer is intersected with the
    Frogans slide rendering canvas. This way of combining can
    modify the A component (transparency) of pixels of the Frogans
    slide rendering canvas. It cannot modify the R, G, and B
    components (color) of any pixels of the Frogans slide rendering
    canvas.

As a result, if the layer is the first layer defined in the FSDL
document, and the value is not equal to 'add', then the layer is
not visible in the Frogans slide.

If the <layer> element is a child of a <button> element, then the
value of the attribute is 'clip'.

     For more information on the process to combine layers, see
     Appendix B.14.

   shadowref - Optional

     The identifier referencing the shadow added underneath the layer.

     The value of the attribute is either an empty string, or it is a
     component identifier. In the latter case, the value is compliant
     with the rules presented in Section 4.5.

     If the value is an empty string, then no shadow is added
     underneath the layer.

     If the value is a component identifier, then it has been utilized
     previously in the FSDL document as a component identifier for
     <setshadow>.

     The default value is '' (the empty string).

        Examples of accepted values:
        shadowref=''
        shadowref='foo1'
        shadowref='Foo1'
        shadowref='foo2'
        shadowref='foo_1'

        Examples of refused values:
        shadowref='foo-1'
        shadowref='foo/1'
        shadowref='foo.1'
        shadowref='foo 1'
        shadowref='foo1,foo2'

   visible - Applicable only if the <layer> element is a child element
              of a <button> element. Mandatory if applicable.

     The visibility of the layer in the button.

     As stated in the Frogans slide layout rules (Section 4.6), the
     visibility of the layer in the button depends on whether the
     button has the focus, i.e. is selected by the end-user and is
     ready to be activated.

     The attribute is based on a string set which represents the
     possible values of the attribute.

The value of the attribute is case-sensitive.

The value can be:

* 'always' indicates that the layer is always visible in the
  button, i.e. whether or not the button has the focus.

* 'nofocus' indicates that the layer is visible in the button
  only if the button does not have the focus.

* 'focus' indicates that the layer is visible in the button only
  if the button has the focus.