---

package java.awt.image

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Class java.awt.image.ColorModel

```
java.lang.Object
    |
    +----java.awt.image.ColorModel
```

---

public class **ColorModel**
extends Object

A class that encapsulates the methods for translating from pixel values to alpha, red, green, and blue color components for an image. This class is abstract.

See Also:
IndexColorModel, DirectColorModel

Variable Index

- **pixel_bits**

Constructor Index

- **ColorModel**(int)
  Constructs a ColorModel which describes a pixel of the specified number of bits.

Method Index

- **getAlpha**(int)
  The subclass must provide a function which provides the alpha color compoment for the specified pixel.
- **getBlue**(int)
  The subclass must provide a function which provides the blue color compoment for the specified pixel.
- **getGreen**(int)
  The subclass must provide a function which provides the green color compoment for the specified pixel.

- **getPixelSize**()
  Returns the number of bits per pixel described by this ColorModel.
- **getRGB**(int)
  Returns the color of the pixel in the default RGB color model.
- **getRGBdefault**()
  Return a ColorModel which describes the default format for integer RGB values used throughout the AWT image interfaces.
- **getRed**(int)
  The subclass must provide a function which provides the red color compoment for the specified pixel.

Variables

pixel_bits

```
protected int pixel_bits
```

Constructors

ColorModel

```
public ColorModel(int bits)
```

Constructs a ColorModel which describes a pixel of the specified number of bits.

Methods

getRGBdefault

```
public static ColorModel getRGBdefault()
```

Return a ColorModel which describes the default format for integer RGB values used throughout the AWT image interfaces. The format for the RGB values is an integer with 8 bits each of alpha, red, green, and blue color components ordered correspondingly from the most significant byte to the least significant byte, as in: 0xAARRGGBB

getPixelSize

```
public int getPixelSize()
```

Returns the number of bits per pixel described by this ColorModel.

getRed

```
public abstract int getRed(int pixel)
```

The subclass must provide a function which provides the red color compoment for the specified pixel.

Returns:

The red color component ranging from 0 to 255

getGreen

```
public abstract int getGreen(int pixel)
```

The subclass must provide a function which provides the green color compoment for the specified pixel.

Returns:

The green color component ranging from 0 to 255

getBlue

```
public abstract int getBlue(int pixel)
```

The subclass must provide a function which provides the blue color compoment for the specified pixel.

Returns:

The blue color component ranging from 0 to 255

getAlpha

```
public abstract int getAlpha(int pixel)
```

The subclass must provide a function which provides the alpha color compoment for the specified pixel.

Returns:

The alpha transparency value ranging from 0 to 255

getRGB

```
public int getRGB(int pixel)
```

Returns the color of the pixel in the default RGB color model.

See Also:

getRGBdefault

Class java.awt.image.CropImageFilter

```
java.lang.Object
   |
   +----java.awt.image.ImageFilter
            |
            +----java.awt.image.CropImageFilter
```

---

public class **CropImageFilter**
extends ImageFilter

An ImageFilter class for cropping images. This class extends the basic ImageFilter Class to extract a given rectangular region of an existing Image and provide a source for a new image containing just the extracted region. It is meant to be used in conjunction with a FilteredImageSource object to produce cropped versions of existing images.

See Also:
FilteredImageSource, ImageFilter

Constructor Index

- **CropImageFilter**(int, int, int, int)
  Constructs a CropImageFilter that extracts the absolute rectangular region of pixels from its source Image as specified by the x, y, w, and h parameters.

Method Index

- **setDimensions**(int, int)
  Override the source image's dimensions and pass the dimensions of the rectangular cropped region to the ImageConsumer.
- **setPixels**(int, int, int, int, ColorModel, byte[], int, int)
  Determine whether the delivered byte pixels intersect the region to be extracted and passes through only that subset of pixels that appear in the output region.
- **setPixels**(int, int, int, int, ColorModel, int[], int, int)
  Determine if the delivered int pixels intersect the region to be extracted and pass through only that subset of pixels that appear in the output region.
- **setProperties**(Hashtable)

Passes along the properties from the source object after adding a property indicating the cropped region.

Constructors

CropImageFilter

```
public CropImageFilter(int x,
                       int y,
                       int w,
                       int h)
```

Constructs a CropImageFilter that extracts the absolute rectangular region of pixels from its source Image as specified by the x, y, w, and h parameters.

Parameters:

x – the x location of the top of the rectangle to be extracted
y – the y location of the top of the rectangle to be extracted
w – the width of the rectangle to be extracted
h – the height of the rectangle to be extracted

Methods

setProperties

```
public void setProperties(Hashtable props)
```

Passes along the properties from the source object after adding a property indicating the cropped region.

Overrides:

setProperties in class ImageFilter

setDimensions

```
public void setDimensions(int w,
                          int h)
```

Override the source image's dimensions and pass the dimensions of the rectangular cropped region to the ImageConsumer.

Overrides:

setDimensions in class ImageFilter

See Also:

ImageConsumer

setPixels

```
public void setPixels(int x,
```

```
                        int y,
                        int w,
                        int h,
                        ColorModel model,
                        byte pixels[],
                        int off,
                        int scansize)
```

Determine whether the delivered byte pixels intersect the region to be extracted and passes through only that subset of pixels that appear in the output region.

Overrides:

setPixels in class ImageFilter

setPixels

```
public void setPixels(int x,
                      int y,
                      int w,
                      int h,
                      ColorModel model,
                      int pixels[],
                      int off,
                      int scansize)
```

Determine if the delivered int pixels intersect the region to be extracted and pass through only that subset of pixels that appear in the output region.

Overrides:

setPixels in class ImageFilter

Class java.awt.image.DirectColorModel

```
java.lang.Object
   |
   +----java.awt.image.ColorModel
            |
            +----java.awt.image.DirectColorModel
```

---

public class **DirectColorModel**
extends ColorModel

A ColorModel class that specifies a translation from pixel values to alpha, red, green, and blue color components for pixels which have the color components embedded directly in the bits of the pixel itself. This color model is similar to an X11 TrueColor visual.

Many of the methods in this class are final. This is because the underlying native graphics code makes assumptions about the layout and operation of this class and those assumptions are reflected in the implementations of the methods here that are marked final. You can subclass this class for other reaons, but you cannot override or modify the behaviour of those methods.

See Also:
ColorModel

Constructor Index

- **DirectColorModel**(int, int, int, int)
  Constructs a DirectColorModel from the given masks specifying which bits in the pixel contain the red, green and blue color components.
- **DirectColorModel**(int, int, int, int, int)
  Constructs a DirectColorModel from the given masks specifying which bits in the pixel contain the alhpa, red, green and blue color components.

Method Index

- **getAlpha**(int)
  Return the alpha transparency value for the specified pixel in the range 0–255.
- **getAlphaMask**()

Returns the mask indicating which bits in a pixel contain the alpha transparency component.

- **getBlue**(int)
  Returns the blue color compoment for the specified pixel in the range 0–255.
- **getBlueMask**()
  Returns the mask indicating which bits in a pixel contain the blue color component.
- **getGreen**(int)
  Returns the green color compoment for the specified pixel in the range 0–255.
- **getGreenMask**()
  Returns the mask indicating which bits in a pixel contain the green color component.
- **getRGB**(int)
  Returns the color of the pixel in the default RGB color model.
- **getRed**(int)
  Returns the red color compoment for the specified pixel in the range 0–255.
- **getRedMask**()
  Returns the mask indicating which bits in a pixel contain the red color component.

Constructors

DirectColorModel

```
public DirectColorModel(int bits,
                        int rmask,
                        int gmask,
                        int bmask)
```

Constructs a DirectColorModel from the given masks specifying which bits in the pixel contain the red, green and blue color components. Pixels described by this color model will all have alpha components of 255 (fully opaque). All of the bits in each mask must be contiguous and fit in the specified number of least significant bits of the integer.

DirectColorModel

```
public DirectColorModel(int bits,
                        int rmask,
                        int gmask,
                        int bmask,
                        int amask)
```

Constructs a DirectColorModel from the given masks specifying which bits in the pixel contain the alhpa, red, green and blue color components. All of the bits in each mask must be contiguous and fit in the specified number of least significant bits of the integer.

Methods

getRedMask

```
public final int getRedMask()
```

Returns the mask indicating which bits in a pixel contain the red color component.

getGreenMask

```
public final int getGreenMask()
```

Returns the mask indicating which bits in a pixel contain the green color component.

getBlueMask

```
public final int getBlueMask()
```

Returns the mask indicating which bits in a pixel contain the blue color component.

getAlphaMask

```
public final int getAlphaMask()
```

Returns the mask indicating which bits in a pixel contain the alpha transparency component.

getRed

```
public final int getRed(int pixel)
```

Returns the red color compoment for the specified pixel in the range 0–255.
Overrides:
getRed in class ColorModel

getGreen

```
public final int getGreen(int pixel)
```

Returns the green color compoment for the specified pixel in the range 0–255.
Overrides:
getGreen in class ColorModel

getBlue

```
public final int getBlue(int pixel)
```

Returns the blue color compoment for the specified pixel in the range 0–255.
Overrides:
getBlue in class ColorModel

getAlpha

```
public final int getAlpha(int pixel)
```

Return the alpha transparency value for the specified pixel in the range 0–255.

Overrides:

getAlpha in class ColorModel

getRGB

```
public final int getRGB(int pixel)
```

Returns the color of the pixel in the default RGB color model.

Overrides:

getRGB in class ColorModel

See Also:

getRGBdefault

Class java.awt.image.FilteredImageSource

```
java.lang.Object
    |
    +----java.awt.image.FilteredImageSource
```

---

public class **FilteredImageSource**
extends Object
implements ImageProducer

This class is an implementation of the ImageProducer interface which takes an existing image and a filter object and uses them to produce image data for a new filtered version of the original image. Here is an example which filters an image by swapping the red and blue compents:

```
Image src = getImage("doc:///demo/images/duke/T1.gif");
ImageFilter colorfilter = new RedBlueSwapFilter();
Image img = createImage(new FilteredImageSource(src.getSource(),
                                                colorfilter));
```

See Also:
ImageProducer

Constructor Index

- **FilteredImageSource**(ImageProducer, ImageFilter)
  Constructs an ImageProducer object from an existing ImageProducer and a filter object.

Method Index

- **addConsumer**(ImageConsumer)
  Adds an ImageConsumer to the list of consumers interested in data for this image.
- **isConsumer**(ImageConsumer)
  Determines whether an ImageConsumer is on the list of consumers currently interested in data for this image.
- **removeConsumer**(ImageConsumer)
  Removes an ImageConsumer from the list of consumers interested in data for this image.
- **requestTopDownLeftRightResend**(ImageConsumer)
  Requests that a given ImageConsumer have the image data delivered one more time in

top−down, left−right order.

- **startProduction**(ImageConsumer)
  Adds an ImageConsumer to the list of consumers interested in data for this image, and immediately starts delivery of the image data through the ImageConsumer interface.

Constructors

FilteredImageSource

```
public FilteredImageSource(ImageProducer orig,
                           ImageFilter imgf)
```

Constructs an ImageProducer object from an existing ImageProducer and a filter object.

See Also:

ImageFilter, createImage

Methods

addConsumer

```
public synchronized void addConsumer(ImageConsumer ic)
```

Adds an ImageConsumer to the list of consumers interested in data for this image.

See Also:

ImageConsumer

isConsumer

```
public synchronized boolean isConsumer(ImageConsumer ic)
```

Determines whether an ImageConsumer is on the list of consumers currently interested in data for this image.

Returns:

true if the ImageConsumer is on the list; false otherwise

See Also:

ImageConsumer

removeConsumer

```
public synchronized void removeConsumer(ImageConsumer ic)
```

Removes an ImageConsumer from the list of consumers interested in data for this image.

See Also:

ImageConsumer

startProduction

```
public void startProduction(ImageConsumer ic)
```

Adds an ImageConsumer to the list of consumers interested in data for this image, and immediately starts delivery of the image data through the ImageConsumer interface.

See Also:

ImageConsumer

requestTopDownLeftRightResend

```
public void requestTopDownLeftRightResend(ImageConsumer ic)
```

Requests that a given ImageConsumer have the image data delivered one more time in top−down, left−right order. The request is handed to the ImageFilter for further processing, since the ability to preserve the pixel ordering depends on the filter.

See Also:

ImageConsumer

Interface java.awt.image.ImageConsumer

public interface **ImageConsumer**
extends Object

The interface for objects expressing interest in image data through the ImageProducer interfaces. When a consumer is added to an image producer, the producer delivers all of the data about the image using the method calls defined in this interface.

See Also:
ImageProducer

Variable Index

- **COMPLETESCANLINES**
  The pixels will be delivered in (multiples of) complete scanlines at a time.
- **IMAGEABORTED**
  The image creation process was deliberately aborted.
- **IMAGEERROR**
  An error was encountered while producing the image.
- **RANDOMPIXELORDER**
  The pixels will be delivered in a random order.
- **SINGLEFRAME**
  The image contain a single static image.
- **SINGLEFRAMEDONE**
  One frame of the image is complete but there are more frames to be delivered.
- **SINGLEPASS**
  The pixels will be delivered in a single pass.
- **STATICIMAGEDONE**
  The image is complete and there are no more pixels or frames to be delivered.
- **TOPDOWNLEFTRIGHT**
  The pixels will be delivered in top−down, left−to−right order.

Method Index

- **imageComplete**(int)
  The imageComplete method is called when the ImageProducer is finished delivering all of the pixels that the source image contains, or when a single frame of a multi−frame animation has been completed, or when an error in loading or producing the image has occured.

- **setColorModel**(ColorModel)
  The ColorModel object used for the majority of the pixels reported using the setPixels method calls.
- **setDimensions**(int, int)
  The dimensions of the source image are reported using the setDimensions method call.
- **setHints**(int)
  The ImageProducer can deliver the pixels in any order, but the ImageConsumer may be able to scale or convert the pixels to the destination ColorModel more efficiently or with higher quality if it knows some information about how the pixels will be delivered up front.
- **setPixels**(int, int, int, int, ColorModel, byte[], int, int)
  The pixels of the image are delivered using one or more calls to the setPixels method.
- **setPixels**(int, int, int, int, ColorModel, int[], int, int)
  The pixels of the image are delivered using one or more calls to the setPixels method.
- **setProperties**(Hashtable)
  Sets the extensible list of properties associated with this image.

RANDOMPIXELORDER

```
public final static int RANDOMPIXELORDER
```

The pixels will be delivered in a random order. This tells the ImageConsumer not to use any optimizations that depend on the order of pixel delivery, which should be the default assumption in the absence of any call to the setHints method.

See Also:

setHints

TOPDOWNLEFTRIGHT

```
public final static int TOPDOWNLEFTRIGHT
```

The pixels will be delivered in top−down, left−to−right order.

See Also:

setHints

COMPLETESCANLINES

```
public final static int COMPLETESCANLINES
```

The pixels will be delivered in (multiples of) complete scanlines at a time.

See Also:

setHints

SINGLEPASS

```
public final static int SINGLEPASS
```

The pixels will be delivered in a single pass. Each pixel will appear in only one call to any of the setPixels methods. An example of an image format which does not meet this criterion is a progressive JPEG image which defines pixels in multiple passes, each more refined than the previous.

See Also:

setHints

SINGLEFRAME

```
public final static int SINGLEFRAME
```

The image contain a single static image. The pixels will be defined in calls to the setPixels methods and then the imageComplete method will be called with the STATICIMAGEDONE flag after which no more image data will be delivered. An example of an image type which would not meet these criteria would be the output of a video feed, or the representation of a 3D rendering being manipulated by the user. The end of each frame in those types of images will be indicated by calling imageComplete with the SINGLEFRAMEDONE flag.

See Also:

setHints, imageComplete

IMAGEERROR

```
public final static int IMAGEERROR
```

An error was encountered while producing the image.

See Also:

imageComplete

SINGLEFRAMEDONE

```
public final static int SINGLEFRAMEDONE
```

One frame of the image is complete but there are more frames to be delivered.

See Also:

imageComplete

STATICIMAGEDONE

```
public final static int STATICIMAGEDONE
```

The image is complete and there are no more pixels or frames to be delivered.

See Also:

imageComplete

IMAGEABORTED

```
public final static int IMAGEABORTED
```

The image creation process was deliberately aborted.

See Also:

imageComplete

Methods

setDimensions

```
public abstract void setDimensions(int width,
                                   int height)
```

The dimensions of the source image are reported using the setDimensions method call.

setProperties

```
public abstract void setProperties(Hashtable props)
```

Sets the extensible list of properties associated with this image.

setColorModel

```
public abstract void setColorModel(ColorModel model)
```

The ColorModel object used for the majority of the pixels reported using the setPixels method calls. Note that each set of pixels delivered using setPixels contains its own ColorModel object, so no assumption should be made that this model will be the only one used in delivering pixel values. A notable case where multiple ColorModel objects may be seen is a filtered image when for each set of pixels that it filters, the filter determines whether the pixels can be sent on untouched, using the original ColorModel, or whether the pixels should be modified (filtered) and passed on using a ColorModel more convenient for the filtering process.

See Also:

ColorModel

setHints

```
public abstract void setHints(int hintflags)
```

The ImageProducer can deliver the pixels in any order, but the ImageConsumer may be able to scale or convert the pixels to the destination ColorModel more efficiently or with higher quality if it knows some information about how the pixels will be delivered up front. The setHints method should be called before any calls to any of the setPixels methods with a bit mask of hints about the manner in which the pixels will be delivered. If the ImageProducer does not follow the guidelines for the indicated hint, the results are undefined.

setPixels

```
public abstract void setPixels(int x,
                               int y,
```

```
                                int w,
                                int h,
                                ColorModel model,
                                byte pixels[],
                                int off,
                                int scansize)
```

The pixels of the image are delivered using one or more calls to the setPixels method. Each call specifies the location and size of the rectangle of source pixels that are contained in the array of pixels. The specified ColorModel object should be used to convert the pixels into their corresponding color and alpha components. Pixel (m,n) is stored in the pixels array at index (n * scansize + m + off). The pixels delivered using this method are all stored as bytes.

See Also:

ColorModel

setPixels

```
public abstract void setPixels(int x,
                               int y,
                               int w,
                               int h,
                               ColorModel model,
                               int pixels[],
                               int off,
                               int scansize)
```

The pixels of the image are delivered using one or more calls to the setPixels method. Each call specifies the location and size of the rectangle of source pixels that are contained in the array of pixels. The specified ColorModel object should be used to convert the pixels into their corresponding color and alpha components. Pixel (m,n) is stored in the pixels array at index (n * scansize + m + off). The pixels delivered using this method are all stored as ints.

See Also:

ColorModel

imageComplete

```
public abstract void imageComplete(int status)
```

The imageComplete method is called when the ImageProducer is finished delivering all of the pixels that the source image contains, or when a single frame of a multi−frame animation has been completed, or when an error in loading or producing the image has occured. The ImageConsumer should remove itself from the list of consumers registered with the ImageProducer at this time, unless it is interested in successive frames.

See Also:

removeConsumer

Class java.awt.image.ImageFilter

```
java.lang.Object
   |
   +----java.awt.image.ImageFilter
```

---

public class **ImageFilter**
extends Object
implements ImageConsumer, Cloneable

This class implements a filter for the set of interface methods that are used to deliver data from an ImageProducer to an ImageConsumer. It is meant to be used in conjunction with a FilteredImageSource object to produce filtered versions of existing images. It is a base class that provides the calls needed to implement a "Null filter" which has no effect on the data being passed through. Filters should subclass this class and override the methods which deal with the data that needs to be filtered and modify it as necessary.

See Also:
FilteredImageSource, ImageConsumer

Variable Index

- **consumer**
  The consumer of the particular image data stream for which this instance of the ImageFilter is filtering data.

Constructor Index

- **ImageFilter**()

Method Index

- **clone**()
  Clones this object.
- **getFilterInstance**(ImageConsumer)

Returns a unique instance of an ImageFilter object which will actually perform the filtering for the specified ImageConsumer.

- **imageComplete**(int)
  Filters the information provided in the imageComplete method of the ImageConsumer interface.
- **resendTopDownLeftRight**(ImageProducer)
  Responds to a request for a TopDownLeftRight (TDLR) ordered resend of the pixel data from an ImageConsumer.
- **setColorModel**(ColorModel)
  Filter the information provided in the setColorModel method of the ImageConsumer interface.
- **setDimensions**(int, int)
  Filters the information provided in the setDimensions method of the ImageConsumer interface.
- **setHints**(int)
  Filters the information provided in the setHints method of the ImageConsumer interface.
- **setPixels**(int, int, int, int, ColorModel, byte[], int, int)
  Filters the information provided in the setPixels method of the ImageConsumer interface which takes an array of bytes.
- **setPixels**(int, int, int, int, ColorModel, int[], int, int)
  Filters the information provided in the setPixels method of the ImageConsumer interface which takes an array of integers.
- **setProperties**(Hashtable)
  Passes the properties from the source object along after adding a property indicating the stream of filters it has been run through.

Variables

consumer

```
protected ImageConsumer consumer
```

The consumer of the particular image data stream for which this instance of the ImageFilter is filtering data. It is not initialized during the constructor, but rather during the getFilterInstance() method call when the FilteredImageSource is creating a unique instance of this object for a particular image data stream.

See Also:

getFilterInstance, ImageConsumer

Constructors

ImageFilter

```
public ImageFilter()
```

Methods

getFilterInstance

```
public ImageFilter getFilterInstance(ImageConsumer ic)
```

Returns a unique instance of an ImageFilter object which will actually perform the filtering for the specified ImageConsumer. The default implementation just clones this object.

setDimensions

```
public void setDimensions(int width,
                          int height)
```

Filters the information provided in the setDimensions method of the ImageConsumer interface.
See Also:
setDimensions

setProperties

```
public void setProperties(Hashtable props)
```

Passes the properties from the source object along after adding a property indicating the stream of filters it has been run through.

setColorModel

```
public void setColorModel(ColorModel model)
```

Filter the information provided in the setColorModel method of the ImageConsumer interface.
See Also:
setColorModel

setHints

```
public void setHints(int hints)
```

Filters the information provided in the setHints method of the ImageConsumer interface.
See Also:
setHints

setPixels

```
public void setPixels(int x,
                      int y,
                      int w,
                      int h,
                      ColorModel model,
                      byte pixels[],
```

```
                        int off,
                        int scansize)
```

Filters the information provided in the setPixels method of the ImageConsumer interface which takes an array of bytes.

See Also:

setPixels

setPixels

```
public void setPixels(int x,
                      int y,
                      int w,
                      int h,
                      ColorModel model,
                      int pixels[],
                      int off,
                      int scansize)
```

Filters the information provided in the setPixels method of the ImageConsumer interface which takes an array of integers.

See Also:

setPixels

imageComplete

```
public void imageComplete(int status)
```

Filters the information provided in the imageComplete method of the ImageConsumer interface.

See Also:

imageComplete

resendTopDownLeftRight

```
public void resendTopDownLeftRight(ImageProducer ip)
```

Responds to a request for a TopDownLeftRight (TDLR) ordered resend of the pixel data from an ImageConsumer. The ImageFilter can respond to this request in one of three ways.

1. If the filter can determine that it will forward the pixels in TDLR order if its upstream producer object sends them in TDLR order, then the request is automatically forwarded by default to the indicated ImageProducer using this filter as the requesting ImageConsumer, so no override is necessary.
2. If the filter can resend the pixels in the right order on its own (presumably because the generated pixels have been saved in some sort of buffer), then it can override this method and simply resend the pixels in TDLR order as specified in the ImageProducer API.
3. If the filter simply returns from this method then the request will be ignored and no resend will occur.

@see ImageProducer#requestTopDownLeftRightResend

Parameters:

ip – The ImageProducer that is feeding this instance of the filter – also the ImageProducer that the request should be forwarded to if necessary.

clone

```
public Object clone()
```

Clones this object.

Overrides:

clone in class Object

Interface java.awt.image.ImageObserver

public interface **ImageObserver**
extends Object

An asynchronous update interface for receiving notifications about Image information as the Image is constructed.

Variable Index

- **ABORT**
  An image which was being tracked asynchronously was aborted before production was complete.
- **ALLBITS**
  A static image which was previously drawn is now complete and can be drawn again in its final form.
- **ERROR**
  An image which was being tracked asynchronously has encountered an error.
- **FRAMEBITS**
  Another complete frame of a multi−frame image which was previously drawn is now available to be drawn again.
- **HEIGHT**
  The height of the base image is now available and can be taken from the height argument to the imageUpdate callback method.
- **PROPERTIES**
  The properties of the image are now available.
- **SOMEBITS**
  More pixels needed for drawing a scaled variation of the image are available.
- **WIDTH**
  The width of the base image is now available and can be taken from the width argument to the imageUpdate callback method.

Method Index

- **imageUpdate**(Image, int, int, int, int, int)
  This method is called when information about an image which was previously requested using an asynchronous interface becomes available.

Variables

WIDTH

```
public final static int WIDTH
```

The width of the base image is now available and can be taken from the width argument to the imageUpdate callback method.

See Also:

getWidth, imageUpdate

HEIGHT

```
public final static int HEIGHT
```

The height of the base image is now available and can be taken from the height argument to the imageUpdate callback method.

See Also:

getHeight, imageUpdate

PROPERTIES

```
public final static int PROPERTIES
```

The properties of the image are now available.

See Also:

getProperty, imageUpdate

SOMEBITS

```
public final static int SOMEBITS
```

More pixels needed for drawing a scaled variation of the image are available. The bounding box of the new pixels can be taken from the x, y, width, and height arguments to the imageUpdate callback method.

See Also:

drawImage, imageUpdate

FRAMEBITS

```
public final static int FRAMEBITS
```

Another complete frame of a multi−frame image which was previously drawn is now available to be drawn again. The x, y, width, and height arguments to the imageUpdate callback method should be ignored.

See Also:

drawImage, imageUpdate

ALLBITS

```
public final static int ALLBITS
```

A static image which was previously drawn is now complete and can be drawn again in its final form. The x, y, width, and height arguments to the imageUpdate callback method should be ignored.

See Also:

drawImage, imageUpdate

ERROR

```
public final static int ERROR
```

An image which was being tracked asynchronously has encountered an error. No further information will become available and drawing the image will fail. As a convenience, the ABORT flag will be indicated at the same time to indicate that the image production was aborted.

See Also:

imageUpdate

ABORT

```
public final static int ABORT
```

An image which was being tracked asynchronously was aborted before production was complete. No more information will become available without further action to trigger another image production sequence. If the ERROR flag was not also set in this image update, then accessing any of the data in the image will restart the production again, probably from the beginning.

See Also:

imageUpdate

imageUpdate

```
public abstract boolean imageUpdate(Image img,
                                    int infoflags,
                                    int x,
                                    int y,
                                    int width,
                                    int height)
```

This method is called when information about an image which was previously requested using an asynchronous interface becomes available. Asynchronous interfaces are method calls such as getWidth(ImageObserver) and drawImage(img, x, y, ImageObserver) which take an ImageObserver object as an argument. Those methods register the caller as interested either in

information about the overall image itself (in the case of getWidth(ImageObserver)) or about an output version of an image (in the case of the drawImage(img, x, y, [w, h,] ImageObserver) call).

This method should return true if further updates are needed or false if the required information has been acquired. The image which was being tracked is passed in using the img argument. Various constants are combined to form the infoflags argument which indicates what information about the image is now available. The interpretation of the x, y, width, and height arguments depends on the contents of the infoflags argument.

See Also:

getWidth, getHeight, drawImage

Interface java.awt.image.ImageProducer

public interface **ImageProducer**
extends Object

The interface for objects which can produce the image data for Images. Each image contains an ImageProducer which is used to reconstruct the image whenever it is needed, for example, when a new size of the Image is scaled, or when the width or height of the Image is being requested.

See Also:
ImageConsumer

Method Index

- **addConsumer**(ImageConsumer)
  This method is used to register an ImageConsumer with the ImageProducer for access to the image data during a later reconstruction of the Image.
- **isConsumer**(ImageConsumer)
  This method determines if a given ImageConsumer object is currently registered with this ImageProducer as one of its consumers.
- **removeConsumer**(ImageConsumer)
  This method removes the given ImageConsumer object from the list of consumers currently registered to receive image data.
- **requestTopDownLeftRightResend**(ImageConsumer)
  This method is used by an ImageConsumer to request that the ImageProducer attempt to resend the image data one more time in TOPDOWNLEFTRIGHT order so that higher quality conversion algorithms which depend on receiving pixels in order can be used to produce a better output version of the image.
- **startProduction**(ImageConsumer)
  This method both registers the given ImageConsumer object as a consumer and starts an immediate reconstruction of the image data which will then be delivered to this consumer and any other consumer which may have already been registered with the producer.

Methods

addConsumer

```
public abstract void addConsumer(ImageConsumer ic)
```

This method is used to register an ImageConsumer with the ImageProducer for access to the

image data during a later reconstruction of the Image. The ImageProducer may, at its discretion, start delivering the image data to the consumer using the ImageConsumer interface immediately, or when the next available image reconstruction is triggered by a call to the startProduction method.

See Also:

startProduction

isConsumer

```
public abstract boolean isConsumer(ImageConsumer ic)
```

This method determines if a given ImageConsumer object is currently registered with this ImageProducer as one of its consumers.

removeConsumer

```
public abstract void removeConsumer(ImageConsumer ic)
```

This method removes the given ImageConsumer object from the list of consumers currently registered to receive image data. It is not considered an error to remove a consumer that is not currently registered. The ImageProducer should stop sending data to this consumer as soon as is feasible.

startProduction

```
public abstract void startProduction(ImageConsumer ic)
```

This method both registers the given ImageConsumer object as a consumer and starts an immediate reconstruction of the image data which will then be delivered to this consumer and any other consumer which may have already been registered with the producer. This method differs from the addConsumer method in that a reproduction of the image data should be triggered as soon as possible.

See Also:

addConsumer

requestTopDownLeftRightResend

```
public abstract void requestTopDownLeftRightResend(ImageConsumer ic)
```

This method is used by an ImageConsumer to request that the ImageProducer attempt to resend the image data one more time in TOPDOWNLEFTRIGHT order so that higher quality conversion algorithms which depend on receiving pixels in order can be used to produce a better output version of the image. The ImageProducer is free to ignore this call if it cannot resend the data in that order. If the data can be resent, then the ImageProducer should respond by executing the following minimum set of ImageConsumer method calls:

```
ic.setHints(TOPDOWNLEFTRIGHT | < otherhints >);
ic.setPixels(...);      // As many times as needed
ic.imageComplete();
```

See Also:

setHints

Class java.awt.image.IndexColorModel

```
java.lang.Object
   |
   +----java.awt.image.ColorModel
           |
           +----java.awt.image.IndexColorModel
```

---

public class **IndexColorModel**
extends ColorModel

A ColorModel class that specifies a translation from pixel values to alpha, red, green, and blue color components for pixels which represent indices into a fixed colormap. An optional transparent pixel value can be supplied which indicates a completely transparent pixel, regardless of any alpha value recorded for that pixel value. This color model is similar to an X11 PseudoColor visual.

Many of the methods in this class are final. The reason for this is that the underlying native graphics code makes assumptions about the layout and operation of this class and those assumptions are reflected in the implementations of the methods here that are marked final. You can subclass this class for other reaons, but you cannot override or modify the behaviour of those methods.

See Also:
ColorModel

Constructor Index

- **IndexColorModel**(int, int, byte[], byte[], byte[])
  Constructs an IndexColorModel from the given arrays of red, green, and blue components.
- **IndexColorModel**(int, int, byte[], byte[], byte[], int)
  Constructs an IndexColorModel from the given arrays of red, green, and blue components.
- **IndexColorModel**(int, int, byte[], byte[], byte[], byte[])
  Constructs an IndexColorModel from the given arrays of red, green, blue and alpha components.
- **IndexColorModel**(int, int, byte[], int, boolean)
  Constructs an IndexColorModel from a single arrays of packed red, green, blue and optional alpha components.
- **IndexColorModel**(int, int, byte[], int, boolean, int)
  Constructs an IndexColorModel from a single arrays of packed red, green, blue and optional alpha components.

Method Index

- **getAlpha**(int)
  Returns the alpha transparency value for the specified pixel in the range 0–255.
- **getAlphas**(byte[])
  Copies the array of alpha transparency values into the given array.
- **getBlue**(int)
  Returns the blue color compoment for the specified pixel in the range 0–255.
- **getBlues**(byte[])
  Copies the array of blue color components into the given array.
- **getGreen**(int)
  Returns the green color compoment for the specified pixel in the range 0–255.
- **getGreens**(byte[])
  Copies the array of green color components into the given array.
- **getMapSize**()
  Returns the size of the color component arrays in this IndexColorModel.
- **getRGB**(int)
  Returns the color of the pixel in the default RGB color model.
- **getRed**(int)
  Returns the red color compoment for the specified pixel in the range 0–255.
- **getReds**(byte[])
  Copies the array of red color components into the given array.
- **getTransparentPixel**()
  Returns the index of the transparent pixel in this IndexColorModel or –1 if there is no transparent pixel.

Constructors

IndexColorModel

```
public IndexColorModel(int bits,
                       int size,
                       byte r[],
                       byte g[],
                       byte b[])
```

Constructs an IndexColorModel from the given arrays of red, green, and blue components. Pixels described by this color model will all have alpha components of 255 (fully opaque). All of the arrays specifying the color components must have at least the specified number of entries.

Parameters:

bits – The number of bits each pixel occupies.
size – The size of the color component arrays.
r – The array of red color components.
g – The array of green color components.
b – The array of blue color components.

IndexColorModel

```
public IndexColorModel(int bits,
                       int size,
                       byte r[],
                       byte g[],
                       byte b[],
                       int trans)
```

Constructs an IndexColorModel from the given arrays of red, green, and blue components. Pixels described by this color model will all have alpha components of 255 (fully opaque), except for the indicated transparent pixel. All of the arrays specifying the color components must have at least the specified number of entries.

Parameters:

bits – The number of bits each pixel occupies.
size – The size of the color component arrays.
r – The array of red color components.
g – The array of green color components.
b – The array of blue color components.
trans – The index of the transparent pixel.

IndexColorModel

```
public IndexColorModel(int bits,
                       int size,
                       byte r[],
                       byte g[],
                       byte b[],
                       byte a[])
```

Constructs an IndexColorModel from the given arrays of red, green, blue and alpha components. All of the arrays specifying the color components must have at least the specified number of entries.

Parameters:

bits – The number of bits each pixel occupies.
size – The size of the color component arrays.
r – The array of red color components.
g – The array of green color components.
b – The array of blue color components.
a – The array of alpha value components.

IndexColorModel

```
public IndexColorModel(int bits,
                       int size,
                       byte cmap[],
                       int start,
                       boolean hasalpha)
```

Constructs an IndexColorModel from a single arrays of packed red, green, blue and optional alpha components. The array must have enough values in it to fill all of the needed component

arrays of the specified size.

Parameters:

bits – The number of bits each pixel occupies.
size – The size of the color component arrays.
cmap – The array of color components.
start – The starting offset of the first color component.
hasalpha – Indicates whether alpha values are contained in the cmap array.

IndexColorModel

```
public IndexColorModel(int bits,
                       int size,
                       byte cmap[],
                       int start,
                       boolean hasalpha,
                       int trans)
```

Constructs an IndexColorModel from a single arrays of packed red, green, blue and optional alpha components. The specified transparent index represents a pixel which will be considered entirely transparent regardless of any alpha value specified for it. The array must have enough values in it to fill all of the needed component arrays of the specified size.

Parameters:

bits – The number of bits each pixel occupies.
size – The size of the color component arrays.
cmap – The array of color components.
start – The starting offset of the first color component.
hasalpha – Indicates whether alpha values are contained in the cmap array.
trans – The index of the fully transparent pixel.

Methods

getMapSize

```
public final int getMapSize()
```

Returns the size of the color component arrays in this IndexColorModel.

getTransparentPixel

```
public final int getTransparentPixel()
```

Returns the index of the transparent pixel in this IndexColorModel or –1 if there is no transparent pixel.

getReds

```
public final void getReds(byte r[])
```

Copies the array of red color components into the given array. Only the initial entries of the array as specified by getMapSize() are written.

getGreens

```
public final void getGreens(byte g[])
```

Copies the array of green color components into the given array. Only the initial entries of the array as specified by getMapSize() are written.

getBlues

```
public final void getBlues(byte b[])
```

Copies the array of blue color components into the given array. Only the initial entries of the array as specified by getMapSize() will be written.

getAlphas

```
public final void getAlphas(byte a[])
```

Copies the array of alpha transparency values into the given array. Only the initial entries of the array as specified by getMapSize() will be written.

getRed

```
public final int getRed(int pixel)
```

Returns the red color compoment for the specified pixel in the range 0–255.
Overrides:
getRed in class ColorModel

getGreen

```
public final int getGreen(int pixel)
```

Returns the green color compoment for the specified pixel in the range 0–255.
Overrides:
getGreen in class ColorModel

getBlue

```
public final int getBlue(int pixel)
```

Returns the blue color compoment for the specified pixel in the range 0–255.
Overrides:
getBlue in class ColorModel

getAlpha

```
public final int getAlpha(int pixel)
```

Returns the alpha transparency value for the specified pixel in the range 0–255.

Overrides:

getAlpha in class ColorModel

getRGB

```
public final int getRGB(int pixel)
```

Returns the color of the pixel in the default RGB color model.

Overrides:

getRGB in class ColorModel

See Also:

getRGBdefault

Class java.awt.image.MemoryImageSource

```
java.lang.Object
    |
    +----java.awt.image.MemoryImageSource
```

---

public class **MemoryImageSource**
extends Object
implements ImageProducer

This class is an implementation of the ImageProducer interface which uses an array to produce pixel values for an Image. Here is an example which calculates a 100x100 image representing a fade from black to blue along the X axis and a fade from black to red along the Y axis:

```
int w = 100;
int h = 100;
int pix[] = new int[w * h];
int index = 0;
for (int y = 0; y < h; y++) {
    int red = (y * 255) / (h - 1);
    for (int x = 0; x < w; x++) {
        int blue = (x * 255) / (w - 1);
        pix[index++] = (255
```

Constructor Index

- **MemoryImageSource**(int, int, ColorModel, byte[], int, int)
  Constructs an ImageProducer object which uses an array of bytes to produce data for an Image object.
- **MemoryImageSource**(int, int, ColorModel, byte[], int, int, Hashtable)
  Constructs an ImageProducer object which uses an array of bytes to produce data for an Image object.
- **MemoryImageSource**(int, int, ColorModel, int[], int, int)
  Constructs an ImageProducer object which uses an array of integers to produce data for an Image object.
- **MemoryImageSource**(int, int, ColorModel, int[], int, int, Hashtable)
  Constructs an ImageProducer object which uses an array of integers

to produce data for an Image object.

- **MemoryImageSource**(int, int, int[], int, int)
  Constructs an ImageProducer object which uses an array of integers in the default RGB ColorModel to produce data for an Image object.
- **MemoryImageSource**(int, int, int[], int, int, Hashtable)
  Constructs an ImageProducer object which uses an array of integers in the default RGB ColorModel to produce data for an Image object.

Method Index

- **addConsumer**(ImageConsumer)
  Adds an ImageConsumer to the list of consumers interested in data for this image.
- **isConsumer**(ImageConsumer)
  Determine if an ImageConsumer is on the list of consumers currently interested in data for this image.
- **removeConsumer**(ImageConsumer)
  Remove an ImageConsumer from the list of consumers interested in data for this image.
- **requestTopDownLeftRightResend**(ImageConsumer)
  Requests that a given ImageConsumer have the image data delivered one more time in top-down, left-right order.
- **startProduction**(ImageConsumer)
  Adds an ImageConsumer to the list of consumers interested in data for this image, and immediately start delivery of the image data through the ImageConsumer interface.

Constructors

MemoryImageSource

```
public MemoryImageSource(int w,
                         int h,
                         ColorModel cm,
                         byte pix[],
                         int off,
                         int scan)
```

Constructs an ImageProducer object which uses an array of bytes to produce data for an Image object.

See Also:

createImage

MemoryImageSource

```
public MemoryImageSource(int w,
                         int h,
                         ColorModel cm,
                         byte pix[],
                         int off,
                         int scan,
                         Hashtable props)
```

Constructs an ImageProducer object which uses an array of bytes to produce data for an Image object.

See Also:

createImage

MemoryImageSource

```
public MemoryImageSource(int w,
                         int h,
                         ColorModel cm,
                         int pix[],
                         int off,
                         int scan)
```

Constructs an ImageProducer object which uses an array of integers to produce data for an Image object.

See Also:

createImage

MemoryImageSource

```
public MemoryImageSource(int w,
                         int h,
                         ColorModel cm,
                         int pix[],
                         int off,
                         int scan,
                         Hashtable props)
```

Constructs an ImageProducer object which uses an array of integers to produce data for an Image object.

See Also:

createImage

MemoryImageSource

```
public MemoryImageSource(int w,
                         int h,
                         int pix[],
                         int off,
                         int scan)
```

Constructs an ImageProducer object which uses an array of integers in the default RGB ColorModel to produce data for an Image object.

See Also:

createImage, getRGBdefault

MemoryImageSource

```
public MemoryImageSource(int w,
                         int h,
                         int pix[],
                         int off,
                         int scan,
                         Hashtable props)
```

Constructs an ImageProducer object which uses an array of integers in the default RGB ColorModel to produce data for an Image object.

See Also:

createImage, getRGBdefault

Methods

addConsumer

```
public synchronized void addConsumer(ImageConsumer ic)
```

Adds an ImageConsumer to the list of consumers interested in data for this image.

See Also:

ImageConsumer

isConsumer

```
public synchronized boolean isConsumer(ImageConsumer ic)
```

Determine if an ImageConsumer is on the list of consumers currently interested in data for this image.

Returns:

true if the ImageConsumer is on the list; false otherwise

See Also:

ImageConsumer

removeConsumer

```
public synchronized void removeConsumer(ImageConsumer ic)
```

Remove an ImageConsumer from the list of consumers interested in data for this image.

See Also:

ImageConsumer

startProduction

```
public void startProduction(ImageConsumer ic)
```

Adds an ImageConsumer to the list of consumers interested in data for this image, and immediately start delivery of the image data through the ImageConsumer interface.

See Also:

ImageConsumer

requestTopDownLeftRightResend

```
public void requestTopDownLeftRightResend(ImageConsumer ic)
```

Requests that a given ImageConsumer have the image data delivered one more time in top−down, left−right order.

See Also:

ImageConsumer

Class java.awt.image.PixelGrabber

```
java.lang.Object
    |
    +----java.awt.image.PixelGrabber
```

---

public class **PixelGrabber**
extends Object
implements ImageConsumer

The PixelGrabber class implements an ImageConsumer which can be attached to an Image or ImageProducer object to retrieve a subset of the pixels in that image. Here is an example:

```
public abstract void handlesinglepixel(int x, int y, int pixel);
public void handlepixels(Image img, int x, int y, int w, int h) {
        int[] pixels = new int[w * h];
        PixelGrabber pg = new PixelGrabber(img, x, y, w, h, pixels, 0, w);
        try {
            pg.grabPixels();
        } catch (InterruptedException e) {
            System.err.println("interrupted waiting for pixels!");
            return;
        }
        if ((pg.status() & ImageObserver.ABORT) != 0) {
            System.err.println("image fetch aborted or errored");
            return;
        }
        for (int j = 0; j < h; j++) {
            for (int i = 0; i < w; i++) {
                handlesinglepixel(x+i, y+j, pixels[j * w + i]);
            }
        }
}
```

Constructor Index

- **PixelGrabber**(Image, int, int, int, int, int[], int, int)
  Create a PixelGrabber object to grab the (x, y, w, h) rectangular section of pixels from the specified image into the given array.
- **PixelGrabber**(ImageProducer, int, int, int, int, int[], int, int)
  Create a PixelGrabber object to grab the (x, y, w, h) rectangular section of pixels from the image produced by the specified ImageProducer into the given array.

Method Index

- **grabPixels**()
  Request the Image or ImageProducer to start delivering pixels and wait for all of the pixels in the rectangle of interest to be delivered.
- **grabPixels**(long)
  Request the Image or ImageProducer to start delivering pixels and wait for all of the pixels in the rectangle of interest to be delivered or until the specified timeout has elapsed.
- **imageComplete**(int)
  The imageComplete method is part of the ImageConsumer API which this class must implement to retrieve the pixels.
- **setColorModel**(ColorModel)
  The setColorModel method is part of the ImageConsumer API which this class must implement to retrieve the pixels.
- **setDimensions**(int, int)
  The setDimensions method is part of the ImageConsumer API which this class must implement to retrieve the pixels.
- **setHints**(int)
  The setHints method is part of the ImageConsumer API which this class must implement to retrieve the pixels.
- **setPixels**(int, int, int, int, ColorModel, byte[], int, int)
  The setPixels method is part of the ImageConsumer API which this class must implement to retrieve the pixels.
- **setPixels**(int, int, int, int, ColorModel, int[], int, int)
  The setPixels method is part of the ImageConsumer API which this class must implement to retrieve the pixels.
- **setProperties**(Hashtable)
  The setProperties method is part of the ImageConsumer API which this class must implement to retrieve the pixels.
- **status**()
  Return the status of the pixels.

Constructors

PixelGrabber

```
public PixelGrabber(Image img,
                    int x,
                    int y,
                    int w,
                    int h,
                    int pix[],
                    int off,
                    int scansize)
```

Create a PixelGrabber object to grab the (x, y, w, h) rectangular section of pixels from the specified image into the given array. The pixels are stored into the array in the default RGB

ColorModel. The RGB data for pixel (i, j) where (i, j) is inside the rectangle (x, y, w, h) is stored in the array at `pix[(j - y) * scansize + (i - x) + off]`.

Parameters:

img – the image to retrieve pixels from
x – the x coordinate of the upper left corner of the rectangle of pixels to retrieve from the image, relative to the default (unscaled) size of the image
y – the y coordinate of the upper left corner of the rectangle of pixels to retrieve from the image
w – the width of the rectangle of pixels to retrieve
h – the height of the rectangle of pixels to retrieve
pix – the array of integers which are to be used to hold the RGB pixels retrieved from the image
off – the offset into the array of where to store the first pixel
scansize – the distance from one row of pixels to the next in the array

See Also:

getRGBdefault

PixelGrabber

```
public PixelGrabber(ImageProducer ip,
                    int x,
                    int y,
                    int w,
                    int h,
                    int pix[],
                    int off,
                    int scansize)
```

Create a PixelGrabber object to grab the (x, y, w, h) rectangular section of pixels from the image produced by the specified ImageProducer into the given array. The pixels are stored into the array in the default RGB ColorModel. The RGB data for pixel (i, j) where (i, j) is inside the rectangle (x, y, w, h) is stored in the array at `pix[(j - y) * scansize + (i - x) + off]`.

Parameters:

img – the image to retrieve pixels from
x – the x coordinate of the upper left corner of the rectangle of pixels to retrieve from the image, relative to the default (unscaled) size of the image
y – the y coordinate of the upper left corner of the rectangle of pixels to retrieve from the image
w – the width of the rectangle of pixels to retrieve
h – the height of the rectangle of pixels to retrieve
pix – the array of integers which are to be used to hold the RGB pixels retrieved from the image
off – the offset into the array of where to store the first pixel
scansize – the distance from one row of pixels to the next in the array

See Also:

getRGBdefault

Methods

grabPixels

```
public boolean grabPixels() throws InterruptedException
```

Request the Image or ImageProducer to start delivering pixels and wait for all of the pixels in the rectangle of interest to be delivered.

Returns:

true if the pixels were successfully grabbed, false on abort, error or timeout

Throws: InterruptedException

Another thread has interrupted this thread.

grabPixels

```
public synchronized boolean grabPixels(long ms) throws InterruptedException
```

Request the Image or ImageProducer to start delivering pixels and wait for all of the pixels in the rectangle of interest to be delivered or until the specified timeout has elapsed.

Parameters:

ms – the number of milliseconds to wait for the image pixels to arrive before timing out

Returns:

true if the pixels were successfully grabbed, false on abort, error or timeout

Throws: InterruptedException

Another thread has interrupted this thread.

status

```
public synchronized int status()
```

Return the status of the pixels. The ImageObserver flags representing the available pixel information are returned.

Returns:

the bitwise OR of all relevant ImageObserver flags

See Also:

ImageObserver

setDimensions

```
public void setDimensions(int width,
                          int height)
```

The setDimensions method is part of the ImageConsumer API which this class must implement to retrieve the pixels.

setHints

```
public void setHints(int hints)
```

The setHints method is part of the ImageConsumer API which this class must implement to retrieve the pixels.

setProperties

```
public void setProperties(Hashtable props)
```

The setProperties method is part of the ImageConsumer API which this class must implement to retrieve the pixels.

setColorModel

```
public void setColorModel(ColorModel model)
```

The setColorModel method is part of the ImageConsumer API which this class must implement to retrieve the pixels.

setPixels

```
public void setPixels(int srcX,
                      int srcY,
                      int srcW,
                      int srcH,
                      ColorModel model,
                      byte pixels[],
                      int srcOff,
                      int srcScan)
```

The setPixels method is part of the ImageConsumer API which this class must implement to retrieve the pixels.

setPixels

```
public void setPixels(int srcX,
                      int srcY,
                      int srcW,
                      int srcH,
                      ColorModel model,
                      int pixels[],
                      int srcOff,
                      int srcScan)
```

The setPixels method is part of the ImageConsumer API which this class must implement to retrieve the pixels.

imageComplete

```
public synchronized void imageComplete(int status)
```

The imageComplete method is part of the ImageConsumer API which this class must

implement to retrieve the pixels.

Class java.awt.image.RGBImageFilter

```
java.lang.Object
   |
   +----java.awt.image.ImageFilter
           |
           +----java.awt.image.RGBImageFilter
```

---

public class **RGBImageFilter**
extends ImageFilter

This class provides an easy way to create an ImageFilter which modifies the pixels of an image in the default RGB ColorModel. It is meant to be used in conjunction with a FilteredImageSource object to produce filtered versions of existing images. It is an abstract class that provides the calls needed to channel all of the pixel data through a single method which converts pixels one at a time in the default RGB ColorModel regardless of the ColorModel being used by the ImageProducer. The only method which needs to be defined to create a useable image filter is the filterRGB method. Here is an example of a definition of a filter which swaps the red and blue components of an image:

```
class RedBlueSwapFilter extends RGBImageFilter {
    public RedBlueSwapFilter() {
        // The filter's operation does not depend on the
        // pixel's location, so IndexColorModels can be
        // filtered directly.
        canFilterIndexColorModel = true;
    }
    public int filterRGB(int x, int y, int rgb) {
        return ((rgb & 0xff00ff00)
                | ((rgb & 0xff0000) >> 16)
                | ((rgb & 0xff)
```

- **canFilterIndexColorModel**
  This boolean indicates whether or not it is acceptable to apply the color filtering of the filterRGB method to the color table entries of an IndexColorModel object in lieu of pixel by pixel filtering.
- **newmodel**

- **origmodel**

Constructor Index

- **RGBImageFilter**()

Method Index

- **filterIndexColorModel**(IndexColorModel)
  Filters an IndexColorModel object by running each entry in its color tables through the filterRGB function that RGBImageFilter subclasses must provide.
- **filterRGB**(int, int, int)
  Subclasses must specify a method to convert a single input pixel in the default RGB ColorModel to a single output pixel.
- **filterRGBPixels**(int, int, int, int, int[], int, int)
  Filters a buffer of pixels in the default RGB ColorModel by passing them one by one through the filterRGB method.
- **setColorModel**(ColorModel)
  If the ColorModel is an IndexColorModel, and the subclass has set the canFilterIndexColorModel flag to true, we substitute a filtered version of the color model here and wherever that original ColorModel object appears in the setPixels methods.
- **setPixels**(int, int, int, int, ColorModel, byte[], int, int)
  If the ColorModel object is the same one that has already been converted, then simply passes the pixels through with the converted ColorModel.

- **setPixels**(int, int, int, int, ColorModel, int[], int, int)
  If the ColorModel object is the same one that has already been converted, then simply passes the pixels through with the converted ColorModel, otherwise converts the buffer of integer pixels to the default RGB ColorModel and passes the converted buffer to the filterRGBPixels method to be converted one by one.
- **substituteColorModel**(ColorModel, ColorModel)
  Registers two ColorModel objects for substitution.

Variables

origmodel

```
protected ColorModel origmodel
```

newmodel

```
protected ColorModel newmodel
```

canFilterIndexColorModel

```
protected boolean canFilterIndexColorModel
```

This boolean indicates whether or not it is acceptable to apply the color filtering of the filterRGB method to the color table entries of an IndexColorModel object in lieu of pixel by pixel filtering. Subclasses should set this variable to true in their constructor if their filterRGB method does not depend on the coordinate of the pixel being filtered.

See Also:

substituteColorModel, filterRGB, IndexColorModel

Constructors

RGBImageFilter

```
public RGBImageFilter()
```

Methods

setColorModel

```
public void setColorModel(ColorModel model)
```

If the ColorModel is an IndexColorModel, and the subclass has set the canFilterIndexColorModel flag to true, we substitute a filtered version of the color model here and wherever that original ColorModel object appears in the setPixels methods. Otherwise overrides the default ColorModel used by the ImageProducer and specifies the default RGB ColorModel instead.

Overrides:

setColorModel in class ImageFilter

See Also:

ImageConsumer, getRGBdefault

substituteColorModel

```
public void substituteColorModel(ColorModel oldcm,
                                  ColorModel newcm)
```

Registers two ColorModel objects for substitution. If the oldcm is encountered during any of the setPixels methods, the newcm is substituted and the pixels passed through untouched (but with the new ColorModel object).

Parameters:

oldcm – the ColorModel object to be replaced on the fly
newcm – the ColorModel object to replace oldcm on the fly

filterIndexColorModel

```
public IndexColorModel filterIndexColorModel(IndexColorModel icm)
```

Filters an IndexColorModel object by running each entry in its color tables through the filterRGB function that RGBImageFilter subclasses must provide. Uses coordinates of –1 to indicate that a color table entry is being filtered rather than an actual pixel value.

Parameters:

icm – the IndexColorModel object to be filtered

Returns:

a new IndexColorModel representing the filtered colors

filterRGBPixels

```
public void filterRGBPixels(int x,
                            int y,
                            int w,
                            int h,
                            int pixels[],
                            int off,
                            int scansize)
```

Filters a buffer of pixels in the default RGB ColorModel by passing them one by one through the filterRGB method.

See Also:

getRGBdefault, filterRGB

setPixels

```
public void setPixels(int x,
                      int y,
                      int w,
                      int h,
                      ColorModel model,
                      byte pixels[],
                      int off,
                      int scansize)
```

If the ColorModel object is the same one that has already been converted, then simply passes the pixels through with the converted ColorModel. Otherwise converts the buffer of byte pixels to the default RGB ColorModel and passes the converted buffer to the filterRGBPixels method to be converted one by one.

Overrides:

setPixels in class ImageFilter

See Also:

getRGBdefault, filterRGBPixels

setPixels

```
public void setPixels(int x,
                      int y,
                      int w,
                      int h,
                      ColorModel model,
                      int pixels[],
                      int off,
                      int scansize)
```

If the ColorModel object is the same one that has already been converted, then simply passes the pixels through with the converted ColorModel, otherwise converts the buffer of integer pixels to the default RGB ColorModel and passes the converted buffer to the filterRGBPixels method to be converted one by one. Converts a buffer of integer pixels to the default RGB ColorModel and passes the converted buffer to the filterRGBPixels method.

Overrides:

setPixels in class ImageFilter

See Also:

getRGBdefault, filterRGBPixels

filterRGB

```
public abstract int filterRGB(int x,
                              int y,
                              int rgb)
```

Subclasses must specify a method to convert a single input pixel in the default RGB ColorModel to a single output pixel.

See Also:

getRGBdefault, filterRGBPixels