| | [**Overview**](http://docs.google.com/overview-summary.html) | [**Package**](http://docs.google.com/package-summary.html) | **Class** | [**Use**](http://docs.google.com/class-use/ComponentSampleModel.html) | [**Tree**](http://docs.google.com/package-tree.html) | [**Deprecated**](http://docs.google.com/deprecated-list.html) | [**Index**](http://docs.google.com/index-files/index-1.html) | [**Help**](http://docs.google.com/help-doc.html) | | --- | --- | --- | --- | --- | --- | --- | --- | | | ***Java™ Platform***  ***Standard Ed. 6*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [**PREV CLASS**](http://docs.google.com/java/awt/image/ComponentColorModel.html)   [**NEXT CLASS**](http://docs.google.com/java/awt/image/ConvolveOp.html) | [**FRAMES**](http://docs.google.com/index.html?java/awt/image/ComponentSampleModel.html)    [**NO FRAMES**](http://docs.google.com/ComponentSampleModel.html)     [**All Classes**](http://docs.google.com/allclasses-noframe.html) |
| SUMMARY: NESTED | [FIELD](#3znysh7) | [CONSTR](#tyjcwt) | [METHOD](#3dy6vkm) | DETAIL: [FIELD](#2s8eyo1) | [CONSTR](#44sinio) | [METHOD](#3j2qqm3) |

## **java.awt.image**

Class ComponentSampleModel

[java.lang.Object](http://docs.google.com/java/lang/Object.html)  
 [java.awt.image.SampleModel](http://docs.google.com/java/awt/image/SampleModel.html)  
 **java.awt.image.ComponentSampleModel**

**Direct Known Subclasses:** [BandedSampleModel](http://docs.google.com/java/awt/image/BandedSampleModel.html), [PixelInterleavedSampleModel](http://docs.google.com/java/awt/image/PixelInterleavedSampleModel.html)

public class **ComponentSampleModel**extends [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html)

This class represents image data which is stored such that each sample of a pixel occupies one data element of the DataBuffer. It stores the N samples which make up a pixel in N separate data array elements. Different bands may be in different banks of the DataBuffer. Accessor methods are provided so that image data can be manipulated directly. This class can support different kinds of interleaving, e.g. band interleaving, scanline interleaving, and pixel interleaving. Pixel stride is the number of data array elements between two samples for the same band on the same scanline. Scanline stride is the number of data array elements between a given sample and the corresponding sample in the same column of the next scanline. Band offsets denote the number of data array elements from the first data array element of the bank of the DataBuffer holding each band to the first sample of the band. The bands are numbered from 0 to N-1. This class can represent image data for which each sample is an unsigned integral number which can be stored in 8, 16, or 32 bits (using DataBuffer.TYPE\_BYTE, DataBuffer.TYPE\_USHORT, or DataBuffer.TYPE\_INT, respectively), data for which each sample is a signed integral number which can be stored in 16 bits (using DataBuffer.TYPE\_SHORT), or data for which each sample is a signed float or double quantity (using DataBuffer.TYPE\_FLOAT or DataBuffer.TYPE\_DOUBLE, respectively). All samples of a given ComponentSampleModel are stored with the same precision. All strides and offsets must be non-negative. This class supports [TYPE\_BYTE](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_BYTE), [TYPE\_USHORT](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_USHORT), [TYPE\_SHORT](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_SHORT), [TYPE\_INT](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_INT), [TYPE\_FLOAT](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_FLOAT), [TYPE\_DOUBLE](http://docs.google.com/java/awt/image/DataBuffer.html#TYPE_DOUBLE),

**See Also:**[PixelInterleavedSampleModel](http://docs.google.com/java/awt/image/PixelInterleavedSampleModel.html), [BandedSampleModel](http://docs.google.com/java/awt/image/BandedSampleModel.html)

| **Field Summary** | |
| --- | --- |
| protected  int[] | [**bandOffsets**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#bandOffsets)            Offsets for all bands in data array elements. |
| protected  int[] | [**bankIndices**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#bankIndices)            Index for each bank storing a band of image data. |
| protected  int | [**numBands**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#numBands)            The number of bands in this ComponentSampleModel. |
| protected  int | [**numBanks**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#numBanks)            The number of banks in this ComponentSampleModel. |
| protected  int | [**pixelStride**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#pixelStride)            Pixel stride (in data array elements) of the region of image data described by this ComponentSampleModel. |
| protected  int | [**scanlineStride**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#scanlineStride)            Line stride (in data array elements) of the region of image data described by this ComponentSampleModel. |

| **Fields inherited from class java.awt.image.**[**SampleModel**](http://docs.google.com/java/awt/image/SampleModel.html) |
| --- |
| [dataType](http://docs.google.com/java/awt/image/SampleModel.html#dataType), [height](http://docs.google.com/java/awt/image/SampleModel.html#height), [width](http://docs.google.com/java/awt/image/SampleModel.html#width) |

| **Constructor Summary** | |
| --- | --- |
| [**ComponentSampleModel**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#ComponentSampleModel(int,%20int,%20int,%20int,%20int,%20int%5B%5D))(int dataType, int w, int h, int pixelStride, int scanlineStride, int[] bandOffsets)            Constructs a ComponentSampleModel with the specified parameters. |
| [**ComponentSampleModel**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#ComponentSampleModel(int,%20int,%20int,%20int,%20int,%20int%5B%5D,%20int%5B%5D))(int dataType, int w, int h, int pixelStride, int scanlineStride, int[] bankIndices, int[] bandOffsets)            Constructs a ComponentSampleModel with the specified parameters. |

| **Method Summary** | |
| --- | --- |
| [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) | [**createCompatibleSampleModel**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#createCompatibleSampleModel(int,%20int))(int w, int h)            Creates a new ComponentSampleModel with the specified width and height. |
| [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) | [**createDataBuffer**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#createDataBuffer())()            Creates a DataBuffer that corresponds to this ComponentSampleModel. |
| [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) | [**createSubsetSampleModel**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#createSubsetSampleModel(int%5B%5D))(int[] bands)            Creates a new ComponentSampleModel with a subset of the bands of this ComponentSampleModel. |
| boolean | [**equals**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#equals(java.lang.Object))([Object](http://docs.google.com/java/lang/Object.html) o)            Indicates whether some other object is "equal to" this one. |
| int[] | [**getBandOffsets**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getBandOffsets())()            Returns the band offset for all bands. |
| int[] | [**getBankIndices**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getBankIndices())()            Returns the bank indices for all bands. |
| [Object](http://docs.google.com/java/lang/Object.html) | [**getDataElements**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getDataElements(int,%20int,%20java.lang.Object,%20java.awt.image.DataBuffer))(int x, int y, [Object](http://docs.google.com/java/lang/Object.html) obj, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Returns data for a single pixel in a primitive array of type TransferType. |
| int | [**getNumDataElements**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getNumDataElements())()            Returns the number of data elements needed to transfer a pixel with the [getDataElements(int, int, Object, DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getDataElements(int,%20int,%20java.lang.Object,%20java.awt.image.DataBuffer)) and [setDataElements(int, int, Object, DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setDataElements(int,%20int,%20java.lang.Object,%20java.awt.image.DataBuffer)) methods. |
| int | [**getOffset**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getOffset(int,%20int))(int x, int y)            Gets the offset for the first band of pixel (x,y). |
| int | [**getOffset**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getOffset(int,%20int,%20int))(int x, int y, int b)            Gets the offset for band b of pixel (x,y). |
| int[] | [**getPixel**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getPixel(int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer))(int x, int y, int[] iArray, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Returns all samples for the specified pixel in an int array, one sample per array element. |
| int[] | [**getPixels**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getPixels(int,%20int,%20int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer))(int x, int y, int w, int h, int[] iArray, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Returns all samples for the specified rectangle of pixels in an int array, one sample per array element. |
| int | [**getPixelStride**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getPixelStride())()            Returns the pixel stride of this ComponentSampleModel. |
| int | [**getSample**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getSample(int,%20int,%20int,%20java.awt.image.DataBuffer))(int x, int y, int b, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Returns as int the sample in a specified band for the pixel located at (x,y). |
| double | [**getSampleDouble**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getSampleDouble(int,%20int,%20int,%20java.awt.image.DataBuffer))(int x, int y, int b, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Returns the sample in a specified band for a pixel located at (x,y) as a double. |
| float | [**getSampleFloat**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getSampleFloat(int,%20int,%20int,%20java.awt.image.DataBuffer))(int x, int y, int b, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Returns the sample in a specified band for the pixel located at (x,y) as a float. |
| int[] | [**getSamples**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getSamples(int,%20int,%20int,%20int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer))(int x, int y, int w, int h, int b, int[] iArray, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Returns the samples in a specified band for the specified rectangle of pixels in an int array, one sample per data array element. |
| int[] | [**getSampleSize**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getSampleSize())()            Returns the number of bits per sample for all bands. |
| int | [**getSampleSize**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getSampleSize(int))(int band)            Returns the number of bits per sample for the specified band. |
| int | [**getScanlineStride**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getScanlineStride())()            Returns the scanline stride of this ComponentSampleModel. |
| int | [**hashCode**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#hashCode())()            Returns a hash code value for the object. |
| void | [**setDataElements**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setDataElements(int,%20int,%20java.lang.Object,%20java.awt.image.DataBuffer))(int x, int y, [Object](http://docs.google.com/java/lang/Object.html) obj, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Sets the data for a single pixel in the specified DataBuffer from a primitive array of type TransferType. |
| void | [**setPixel**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setPixel(int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer))(int x, int y, int[] iArray, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Sets a pixel in the DataBuffer using an int array of samples for input. |
| void | [**setPixels**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setPixels(int,%20int,%20int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer))(int x, int y, int w, int h, int[] iArray, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Sets all samples for a rectangle of pixels from an int array containing one sample per array element. |
| void | [**setSample**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setSample(int,%20int,%20int,%20double,%20java.awt.image.DataBuffer))(int x, int y, int b, double s, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Sets a sample in the specified band for the pixel located at (x,y) in the DataBuffer using a double for input. |
| void | [**setSample**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setSample(int,%20int,%20int,%20float,%20java.awt.image.DataBuffer))(int x, int y, int b, float s, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Sets a sample in the specified band for the pixel located at (x,y) in the DataBuffer using a float for input. |
| void | [**setSample**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setSample(int,%20int,%20int,%20int,%20java.awt.image.DataBuffer))(int x, int y, int b, int s, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Sets a sample in the specified band for the pixel located at (x,y) in the DataBuffer using an int for input. |
| void | [**setSamples**](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setSamples(int,%20int,%20int,%20int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer))(int x, int y, int w, int h, int b, int[] iArray, [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)            Sets the samples in the specified band for the specified rectangle of pixels from an int array containing one sample per data array element. |

| **Methods inherited from class java.awt.image.**[**SampleModel**](http://docs.google.com/java/awt/image/SampleModel.html) |
| --- |
| [getDataElements](http://docs.google.com/java/awt/image/SampleModel.html#getDataElements(int,%20int,%20int,%20int,%20java.lang.Object,%20java.awt.image.DataBuffer)), [getDataType](http://docs.google.com/java/awt/image/SampleModel.html#getDataType()), [getHeight](http://docs.google.com/java/awt/image/SampleModel.html#getHeight()), [getNumBands](http://docs.google.com/java/awt/image/SampleModel.html#getNumBands()), [getPixel](http://docs.google.com/java/awt/image/SampleModel.html#getPixel(int,%20int,%20double%5B%5D,%20java.awt.image.DataBuffer)), [getPixel](http://docs.google.com/java/awt/image/SampleModel.html#getPixel(int,%20int,%20float%5B%5D,%20java.awt.image.DataBuffer)), [getPixels](http://docs.google.com/java/awt/image/SampleModel.html#getPixels(int,%20int,%20int,%20int,%20double%5B%5D,%20java.awt.image.DataBuffer)), [getPixels](http://docs.google.com/java/awt/image/SampleModel.html#getPixels(int,%20int,%20int,%20int,%20float%5B%5D,%20java.awt.image.DataBuffer)), [getSamples](http://docs.google.com/java/awt/image/SampleModel.html#getSamples(int,%20int,%20int,%20int,%20int,%20double%5B%5D,%20java.awt.image.DataBuffer)), [getSamples](http://docs.google.com/java/awt/image/SampleModel.html#getSamples(int,%20int,%20int,%20int,%20int,%20float%5B%5D,%20java.awt.image.DataBuffer)), [getTransferType](http://docs.google.com/java/awt/image/SampleModel.html#getTransferType()), [getWidth](http://docs.google.com/java/awt/image/SampleModel.html#getWidth()), [setDataElements](http://docs.google.com/java/awt/image/SampleModel.html#setDataElements(int,%20int,%20int,%20int,%20java.lang.Object,%20java.awt.image.DataBuffer)), [setPixel](http://docs.google.com/java/awt/image/SampleModel.html#setPixel(int,%20int,%20double%5B%5D,%20java.awt.image.DataBuffer)), [setPixel](http://docs.google.com/java/awt/image/SampleModel.html#setPixel(int,%20int,%20float%5B%5D,%20java.awt.image.DataBuffer)), [setPixels](http://docs.google.com/java/awt/image/SampleModel.html#setPixels(int,%20int,%20int,%20int,%20double%5B%5D,%20java.awt.image.DataBuffer)), [setPixels](http://docs.google.com/java/awt/image/SampleModel.html#setPixels(int,%20int,%20int,%20int,%20float%5B%5D,%20java.awt.image.DataBuffer)), [setSamples](http://docs.google.com/java/awt/image/SampleModel.html#setSamples(int,%20int,%20int,%20int,%20int,%20double%5B%5D,%20java.awt.image.DataBuffer)), [setSamples](http://docs.google.com/java/awt/image/SampleModel.html#setSamples(int,%20int,%20int,%20int,%20int,%20float%5B%5D,%20java.awt.image.DataBuffer)) |

| **Methods inherited from class java.lang.**[**Object**](http://docs.google.com/java/lang/Object.html) |
| --- |
| [clone](http://docs.google.com/java/lang/Object.html#clone()), [finalize](http://docs.google.com/java/lang/Object.html#finalize()), [getClass](http://docs.google.com/java/lang/Object.html#getClass()), [notify](http://docs.google.com/java/lang/Object.html#notify()), [notifyAll](http://docs.google.com/java/lang/Object.html#notifyAll()), [toString](http://docs.google.com/java/lang/Object.html#toString()), [wait](http://docs.google.com/java/lang/Object.html#wait()), [wait](http://docs.google.com/java/lang/Object.html#wait(long)), [wait](http://docs.google.com/java/lang/Object.html#wait(long,%20int)) |

| **Field Detail** |
| --- |

### bandOffsets

protected int[] **bandOffsets**

Offsets for all bands in data array elements.

### bankIndices

protected int[] **bankIndices**

Index for each bank storing a band of image data.

### numBands

protected int **numBands**

The number of bands in this ComponentSampleModel.

### numBanks

protected int **numBanks**

The number of banks in this ComponentSampleModel.

### scanlineStride

protected int **scanlineStride**

Line stride (in data array elements) of the region of image data described by this ComponentSampleModel.

### pixelStride

protected int **pixelStride**

Pixel stride (in data array elements) of the region of image data described by this ComponentSampleModel.

| **Constructor Detail** |
| --- |

### ComponentSampleModel

public **ComponentSampleModel**(int dataType,  
 int w,  
 int h,  
 int pixelStride,  
 int scanlineStride,  
 int[] bandOffsets)

Constructs a ComponentSampleModel with the specified parameters. The number of bands will be given by the length of the bandOffsets array. All bands will be stored in the first bank of the DataBuffer.

**Parameters:**dataType - the data type for storing samplesw - the width (in pixels) of the region of image data describedh - the height (in pixels) of the region of image data describedpixelStride - the pixel stride of the region of image data describedscanlineStride - the line stride of the region of image data describedbandOffsets - the offsets of all bands **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if w or h is not greater than 0 [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if pixelStride is less than 0 [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if scanlineStride is less than 0 [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if numBands is less than 1 [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if the product of w and h is greater than Integer.MAX\_VALUE [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if dataType is not one of the supported data types

### ComponentSampleModel

public **ComponentSampleModel**(int dataType,  
 int w,  
 int h,  
 int pixelStride,  
 int scanlineStride,  
 int[] bankIndices,  
 int[] bandOffsets)

Constructs a ComponentSampleModel with the specified parameters. The number of bands will be given by the length of the bandOffsets array. Different bands may be stored in different banks of the DataBuffer.

**Parameters:**dataType - the data type for storing samplesw - the width (in pixels) of the region of image data describedh - the height (in pixels) of the region of image data describedpixelStride - the pixel stride of the region of image data describedscanlineStride - The line stride of the region of image data describedbankIndices - the bank indices of all bandsbandOffsets - the band offsets of all bands **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if w or h is not greater than 0 [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if pixelStride is less than 0 [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if scanlineStride is less than 0 [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if the length of bankIndices does not equal the length of bankOffsets [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if any of the bank indices of bandIndices is less than 0 [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if dataType is not one of the supported data types

| **Method Detail** |
| --- |

### createCompatibleSampleModel

public [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **createCompatibleSampleModel**(int w,  
 int h)

Creates a new ComponentSampleModel with the specified width and height. The new SampleModel will have the same number of bands, storage data type, interleaving scheme, and pixel stride as this SampleModel.

**Specified by:**[createCompatibleSampleModel](http://docs.google.com/java/awt/image/SampleModel.html#createCompatibleSampleModel(int,%20int)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**w - the width of the resulting SampleModelh - the height of the resulting SampleModel **Returns:**a new ComponentSampleModel with the specified size **Throws:** [IllegalArgumentException](http://docs.google.com/java/lang/IllegalArgumentException.html) - if w or h is not greater than 0

### createSubsetSampleModel

public [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **createSubsetSampleModel**(int[] bands)

Creates a new ComponentSampleModel with a subset of the bands of this ComponentSampleModel. The new ComponentSampleModel can be used with any DataBuffer that the existing ComponentSampleModel can be used with. The new ComponentSampleModel/DataBuffer combination will represent an image with a subset of the bands of the original ComponentSampleModel/DataBuffer combination.

**Specified by:**[createSubsetSampleModel](http://docs.google.com/java/awt/image/SampleModel.html#createSubsetSampleModel(int%5B%5D)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**bands - a subset of bands from this ComponentSampleModel **Returns:**a ComponentSampleModel created with a subset of bands from this ComponentSampleModel.

### createDataBuffer

public [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) **createDataBuffer**()

Creates a DataBuffer that corresponds to this ComponentSampleModel. The DataBuffer object's data type, number of banks, and size are be consistent with this ComponentSampleModel.

**Specified by:**[createDataBuffer](http://docs.google.com/java/awt/image/SampleModel.html#createDataBuffer()) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Returns:**a DataBuffer whose data type, number of banks and size are consistent with this ComponentSampleModel.

### getOffset

public int **getOffset**(int x,  
 int y)

Gets the offset for the first band of pixel (x,y). A sample of the first band can be retrieved from a DataBuffer data with a ComponentSampleModel csm as

data.getElem(csm.getOffset(x, y));

**Parameters:**x - the X location of the pixely - the Y location of the pixel **Returns:**the offset for the first band of the specified pixel.

### getOffset

public int **getOffset**(int x,  
 int y,  
 int b)

Gets the offset for band b of pixel (x,y). A sample of band b can be retrieved from a DataBuffer data with a ComponentSampleModel csm as

data.getElem(csm.getOffset(x, y, b));

**Parameters:**x - the X location of the specified pixely - the Y location of the specified pixelb - the specified band **Returns:**the offset for the specified band of the specified pixel.

### getSampleSize

public final int[] **getSampleSize**()

Returns the number of bits per sample for all bands.

**Specified by:**[getSampleSize](http://docs.google.com/java/awt/image/SampleModel.html#getSampleSize()) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Returns:**an array containing the number of bits per sample for all bands, where each element in the array represents a band.

### getSampleSize

public final int **getSampleSize**(int band)

Returns the number of bits per sample for the specified band.

**Specified by:**[getSampleSize](http://docs.google.com/java/awt/image/SampleModel.html#getSampleSize(int)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**band - the specified band **Returns:**the number of bits per sample for the specified band.

### getBankIndices

public final int[] **getBankIndices**()

Returns the bank indices for all bands.

**Returns:**the bank indices for all bands.

### getBandOffsets

public final int[] **getBandOffsets**()

Returns the band offset for all bands.

**Returns:**the band offsets for all bands.

### getScanlineStride

public final int **getScanlineStride**()

Returns the scanline stride of this ComponentSampleModel.

**Returns:**the scanline stride of this ComponentSampleModel.

### getPixelStride

public final int **getPixelStride**()

Returns the pixel stride of this ComponentSampleModel.

**Returns:**the pixel stride of this ComponentSampleModel.

### getNumDataElements

public final int **getNumDataElements**()

Returns the number of data elements needed to transfer a pixel with the [getDataElements(int, int, Object, DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getDataElements(int,%20int,%20java.lang.Object,%20java.awt.image.DataBuffer)) and [setDataElements(int, int, Object, DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setDataElements(int,%20int,%20java.lang.Object,%20java.awt.image.DataBuffer)) methods. For a ComponentSampleModel, this is identical to the number of bands.

**Specified by:**[getNumDataElements](http://docs.google.com/java/awt/image/SampleModel.html#getNumDataElements()) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Returns:**the number of data elements needed to transfer a pixel with the getDataElements and setDataElements methods.**See Also:**[SampleModel.getNumDataElements()](http://docs.google.com/java/awt/image/SampleModel.html#getNumDataElements()), [SampleModel.getNumBands()](http://docs.google.com/java/awt/image/SampleModel.html#getNumBands())

### getDataElements

public [Object](http://docs.google.com/java/lang/Object.html) **getDataElements**(int x,  
 int y,  
 [Object](http://docs.google.com/java/lang/Object.html) obj,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Returns data for a single pixel in a primitive array of type TransferType. For a ComponentSampleModel, this is the same as the data type, and samples are returned one per array element. Generally, obj should be passed in as null, so that the Object is created automatically and is the right primitive data type.

The following code illustrates transferring data for one pixel from DataBuffer db1, whose storage layout is described by ComponentSampleModel csm1, to DataBuffer db2, whose storage layout is described by ComponentSampleModel csm2. The transfer is usually more efficient than using getPixel and setPixel.

ComponentSampleModel csm1, csm2;  
 DataBufferInt db1, db2;  
 csm2.setDataElements(x, y,  
 csm1.getDataElements(x, y, null, db1), db2);

Using getDataElements and setDataElements to transfer between two DataBuffer/SampleModel pairs is legitimate if the SampleModel objects have the same number of bands, corresponding bands have the same number of bits per sample, and the TransferTypes are the same.

If obj is not null, it should be a primitive array of type TransferType. Otherwise, a ClassCastException is thrown. An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds, or if obj is not null and is not large enough to hold the pixel data.

**Specified by:**[getDataElements](http://docs.google.com/java/awt/image/SampleModel.html#getDataElements(int,%20int,%20java.lang.Object,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - the X coordinate of the pixel locationy - the Y coordinate of the pixel locationobj - if non-null, a primitive array in which to return the pixel datadata - the DataBuffer containing the image data **Returns:**the data of the specified pixel **Throws:** [NullPointerException](http://docs.google.com/java/lang/NullPointerException.html) - if data is null. [ArrayIndexOutOfBoundsException](http://docs.google.com/java/lang/ArrayIndexOutOfBoundsException.html) - if the coordinates are not in bounds, or if obj is too small to hold the ouput.**See Also:**[setDataElements(int, int, Object, DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setDataElements(int,%20int,%20java.lang.Object,%20java.awt.image.DataBuffer))

### getPixel

public int[] **getPixel**(int x,  
 int y,  
 int[] iArray,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Returns all samples for the specified pixel in an int array, one sample per array element. An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds.

**Overrides:**[getPixel](http://docs.google.com/java/awt/image/SampleModel.html#getPixel(int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - the X coordinate of the pixel locationy - the Y coordinate of the pixel locationiArray - If non-null, returns the samples in this arraydata - The DataBuffer containing the image data **Returns:**the samples of the specified pixel. **Throws:** [NullPointerException](http://docs.google.com/java/lang/NullPointerException.html) - if data is null. [ArrayIndexOutOfBoundsException](http://docs.google.com/java/lang/ArrayIndexOutOfBoundsException.html) - if the coordinates are not in bounds, or if iArray is too small to hold the output.**See Also:**[setPixel(int, int, int[], DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setPixel(int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer))

### getPixels

public int[] **getPixels**(int x,  
 int y,  
 int w,  
 int h,  
 int[] iArray,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Returns all samples for the specified rectangle of pixels in an int array, one sample per array element. An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds.

**Overrides:**[getPixels](http://docs.google.com/java/awt/image/SampleModel.html#getPixels(int,%20int,%20int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - The X coordinate of the upper left pixel locationy - The Y coordinate of the upper left pixel locationw - The width of the pixel rectangleh - The height of the pixel rectangleiArray - If non-null, returns the samples in this arraydata - The DataBuffer containing the image data **Returns:**the samples of the pixels within the specified region.**See Also:**[setPixels(int, int, int, int, int[], DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setPixels(int,%20int,%20int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer))

### getSample

public int **getSample**(int x,  
 int y,  
 int b,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Returns as int the sample in a specified band for the pixel located at (x,y). An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds.

**Specified by:**[getSample](http://docs.google.com/java/awt/image/SampleModel.html#getSample(int,%20int,%20int,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - the X coordinate of the pixel locationy - the Y coordinate of the pixel locationb - the band to returndata - the DataBuffer containing the image data **Returns:**the sample in a specified band for the specified pixel**See Also:**[setSample(int, int, int, int, DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setSample(int,%20int,%20int,%20int,%20java.awt.image.DataBuffer))

### getSampleFloat

public float **getSampleFloat**(int x,  
 int y,  
 int b,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Returns the sample in a specified band for the pixel located at (x,y) as a float. An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds.

**Overrides:**[getSampleFloat](http://docs.google.com/java/awt/image/SampleModel.html#getSampleFloat(int,%20int,%20int,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - The X coordinate of the pixel locationy - The Y coordinate of the pixel locationb - The band to returndata - The DataBuffer containing the image data **Returns:**a float value representing the sample in the specified band for the specified pixel.

### getSampleDouble

public double **getSampleDouble**(int x,  
 int y,  
 int b,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Returns the sample in a specified band for a pixel located at (x,y) as a double. An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds.

**Overrides:**[getSampleDouble](http://docs.google.com/java/awt/image/SampleModel.html#getSampleDouble(int,%20int,%20int,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - The X coordinate of the pixel locationy - The Y coordinate of the pixel locationb - The band to returndata - The DataBuffer containing the image data **Returns:**a double value representing the sample in the specified band for the specified pixel.

### getSamples

public int[] **getSamples**(int x,  
 int y,  
 int w,  
 int h,  
 int b,  
 int[] iArray,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Returns the samples in a specified band for the specified rectangle of pixels in an int array, one sample per data array element. An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds.

**Overrides:**[getSamples](http://docs.google.com/java/awt/image/SampleModel.html#getSamples(int,%20int,%20int,%20int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - The X coordinate of the upper left pixel locationy - The Y coordinate of the upper left pixel locationw - the width of the pixel rectangleh - the height of the pixel rectangleb - the band to returniArray - if non-null, returns the samples in this arraydata - the DataBuffer containing the image data **Returns:**the samples in the specified band of the specified pixel**See Also:**[setSamples(int, int, int, int, int, int[], DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#setSamples(int,%20int,%20int,%20int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer))

### setDataElements

public void **setDataElements**(int x,  
 int y,  
 [Object](http://docs.google.com/java/lang/Object.html) obj,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Sets the data for a single pixel in the specified DataBuffer from a primitive array of type TransferType. For a ComponentSampleModel, this is the same as the data type, and samples are transferred one per array element.

The following code illustrates transferring data for one pixel from DataBuffer db1, whose storage layout is described by ComponentSampleModel csm1, to DataBuffer db2, whose storage layout is described by ComponentSampleModel csm2. The transfer is usually more efficient than using getPixel and setPixel.

ComponentSampleModel csm1, csm2;  
 DataBufferInt db1, db2;  
 csm2.setDataElements(x, y, csm1.getDataElements(x, y, null, db1),  
 db2);

Using getDataElements and setDataElements to transfer between two DataBuffer/SampleModel pairs is legitimate if the SampleModel objects have the same number of bands, corresponding bands have the same number of bits per sample, and the TransferTypes are the same.

A ClassCastException is thrown if obj is not a primitive array of type TransferType. An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds, or if obj is not large enough to hold the pixel data.

**Specified by:**[setDataElements](http://docs.google.com/java/awt/image/SampleModel.html#setDataElements(int,%20int,%20java.lang.Object,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - the X coordinate of the pixel locationy - the Y coordinate of the pixel locationobj - a primitive array containing pixel datadata - the DataBuffer containing the image data**See Also:**[getDataElements(int, int, Object, DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getDataElements(int,%20int,%20java.lang.Object,%20java.awt.image.DataBuffer))

### setPixel

public void **setPixel**(int x,  
 int y,  
 int[] iArray,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Sets a pixel in the DataBuffer using an int array of samples for input. An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds.

**Overrides:**[setPixel](http://docs.google.com/java/awt/image/SampleModel.html#setPixel(int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - The X coordinate of the pixel locationy - The Y coordinate of the pixel locationiArray - The input samples in an int arraydata - The DataBuffer containing the image data**See Also:**[getPixel(int, int, int[], DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getPixel(int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer))

### setPixels

public void **setPixels**(int x,  
 int y,  
 int w,  
 int h,  
 int[] iArray,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Sets all samples for a rectangle of pixels from an int array containing one sample per array element. An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds.

**Overrides:**[setPixels](http://docs.google.com/java/awt/image/SampleModel.html#setPixels(int,%20int,%20int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - The X coordinate of the upper left pixel locationy - The Y coordinate of the upper left pixel locationw - The width of the pixel rectangleh - The height of the pixel rectangleiArray - The input samples in an int arraydata - The DataBuffer containing the image data**See Also:**[getPixels(int, int, int, int, int[], DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getPixels(int,%20int,%20int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer))

### setSample

public void **setSample**(int x,  
 int y,  
 int b,  
 int s,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Sets a sample in the specified band for the pixel located at (x,y) in the DataBuffer using an int for input. An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds.

**Specified by:**[setSample](http://docs.google.com/java/awt/image/SampleModel.html#setSample(int,%20int,%20int,%20int,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - The X coordinate of the pixel locationy - The Y coordinate of the pixel locationb - the band to sets - the input sample as an intdata - the DataBuffer containing the image data**See Also:**[getSample(int, int, int, DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getSample(int,%20int,%20int,%20java.awt.image.DataBuffer))

### setSample

public void **setSample**(int x,  
 int y,  
 int b,  
 float s,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Sets a sample in the specified band for the pixel located at (x,y) in the DataBuffer using a float for input. An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds.

**Overrides:**[setSample](http://docs.google.com/java/awt/image/SampleModel.html#setSample(int,%20int,%20int,%20float,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - The X coordinate of the pixel locationy - The Y coordinate of the pixel locationb - The band to sets - The input sample as a floatdata - The DataBuffer containing the image data**See Also:**[getSample(int, int, int, DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getSample(int,%20int,%20int,%20java.awt.image.DataBuffer))

### setSample

public void **setSample**(int x,  
 int y,  
 int b,  
 double s,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Sets a sample in the specified band for the pixel located at (x,y) in the DataBuffer using a double for input. An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds.

**Overrides:**[setSample](http://docs.google.com/java/awt/image/SampleModel.html#setSample(int,%20int,%20int,%20double,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - The X coordinate of the pixel locationy - The Y coordinate of the pixel locationb - The band to sets - The input sample as a doubledata - The DataBuffer containing the image data**See Also:**[getSample(int, int, int, DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getSample(int,%20int,%20int,%20java.awt.image.DataBuffer))

### setSamples

public void **setSamples**(int x,  
 int y,  
 int w,  
 int h,  
 int b,  
 int[] iArray,  
 [DataBuffer](http://docs.google.com/java/awt/image/DataBuffer.html) data)

Sets the samples in the specified band for the specified rectangle of pixels from an int array containing one sample per data array element. An ArrayIndexOutOfBoundsException might be thrown if the coordinates are not in bounds.

**Overrides:**[setSamples](http://docs.google.com/java/awt/image/SampleModel.html#setSamples(int,%20int,%20int,%20int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer)) in class [SampleModel](http://docs.google.com/java/awt/image/SampleModel.html) **Parameters:**x - The X coordinate of the upper left pixel locationy - The Y coordinate of the upper left pixel locationw - The width of the pixel rectangleh - The height of the pixel rectangleb - The band to setiArray - The input samples in an int arraydata - The DataBuffer containing the image data**See Also:**[getSamples(int, int, int, int, int, int[], DataBuffer)](http://docs.google.com/java/awt/image/ComponentSampleModel.html#getSamples(int,%20int,%20int,%20int,%20int,%20int%5B%5D,%20java.awt.image.DataBuffer))

### equals

public boolean **equals**([Object](http://docs.google.com/java/lang/Object.html) o)

**Description copied from class:** [**Object**](http://docs.google.com/java/lang/Object.html#equals(java.lang.Object)) Indicates whether some other object is "equal to" this one.

The equals method implements an equivalence relation on non-null object references:

* It is *reflexive*: for any non-null reference value x, x.equals(x) should return true.
* It is *symmetric*: for any non-null reference values x and y, x.equals(y) should return true if and only if y.equals(x) returns true.
* It is *transitive*: for any non-null reference values x, y, and z, if x.equals(y) returns true and y.equals(z) returns true, then x.equals(z) should return true.
* It is *consistent*: for any non-null reference values x and y, multiple invocations of x.equals(y) consistently return true or consistently return false, provided no information used in equals comparisons on the objects is modified.
* For any non-null reference value x, x.equals(null) should return false.

The equals method for class Object implements the most discriminating possible equivalence relation on objects; that is, for any non-null reference values x and y, this method returns true if and only if x and y refer to the same object (x == y has the value true).

Note that it is generally necessary to override the hashCode method whenever this method is overridden, so as to maintain the general contract for the hashCode method, which states that equal objects must have equal hash codes.

**Overrides:**[equals](http://docs.google.com/java/lang/Object.html#equals(java.lang.Object)) in class [Object](http://docs.google.com/java/lang/Object.html) **Parameters:**o - the reference object with which to compare. **Returns:**true if this object is the same as the obj argument; false otherwise.**See Also:**[Object.hashCode()](http://docs.google.com/java/lang/Object.html#hashCode()), [Hashtable](http://docs.google.com/java/util/Hashtable.html)

### hashCode

public int **hashCode**()

**Description copied from class:** [**Object**](http://docs.google.com/java/lang/Object.html#hashCode()) Returns a hash code value for the object. This method is supported for the benefit of hashtables such as those provided by java.util.Hashtable.

The general contract of hashCode is:

* Whenever it is invoked on the same object more than once during an execution of a Java application, the hashCode method must consistently return the same integer, provided no information used in equals comparisons on the object is modified. This integer need not remain consistent from one execution of an application to another execution of the same application.
* If two objects are equal according to the equals(Object) method, then calling the hashCode method on each of the two objects must produce the same integer result.
* It is *not* required that if two objects are unequal according to the [Object.equals(java.lang.Object)](http://docs.google.com/java/lang/Object.html#equals(java.lang.Object)) method, then calling the hashCode method on each of the two objects must produce distinct integer results. However, the programmer should be aware that producing distinct integer results for unequal objects may improve the performance of hashtables.

As much as is reasonably practical, the hashCode method defined by class Object does return distinct integers for distinct objects. (This is typically implemented by converting the internal address of the object into an integer, but this implementation technique is not required by the JavaTM programming language.)

**Overrides:**[hashCode](http://docs.google.com/java/lang/Object.html#hashCode()) in class [Object](http://docs.google.com/java/lang/Object.html) **Returns:**a hash code value for this object.**See Also:**[Object.equals(java.lang.Object)](http://docs.google.com/java/lang/Object.html#equals(java.lang.Object)), [Hashtable](http://docs.google.com/java/util/Hashtable.html)

| | [**Overview**](http://docs.google.com/overview-summary.html) | [**Package**](http://docs.google.com/package-summary.html) | **Class** | [**Use**](http://docs.google.com/class-use/ComponentSampleModel.html) | [**Tree**](http://docs.google.com/package-tree.html) | [**Deprecated**](http://docs.google.com/deprecated-list.html) | [**Index**](http://docs.google.com/index-files/index-1.html) | [**Help**](http://docs.google.com/help-doc.html) | | --- | --- | --- | --- | --- | --- | --- | --- | | | ***Java™ Platform***  ***Standard Ed. 6*** |
| --- | --- | --- | --- | --- | --- | --- | --- | --- | --- | --- |
| [**PREV CLASS**](http://docs.google.com/java/awt/image/ComponentColorModel.html)   [**NEXT CLASS**](http://docs.google.com/java/awt/image/ConvolveOp.html) | [**FRAMES**](http://docs.google.com/index.html?java/awt/image/ComponentSampleModel.html)    [**NO FRAMES**](http://docs.google.com/ComponentSampleModel.html)     [**All Classes**](http://docs.google.com/allclasses-noframe.html) |
| SUMMARY: NESTED | [FIELD](#3znysh7) | [CONSTR](#tyjcwt) | [METHOD](#3dy6vkm) | DETAIL: [FIELD](#2s8eyo1) | [CONSTR](#44sinio) | [METHOD](#3j2qqm3) |

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For further API reference and developer documentation, see [Java SE Developer Documentation](http://docs.google.com/webnotes/devdocs-vs-specs.html). That documentation contains more detailed, developer-targeted descriptions, with conceptual overviews, definitions of terms, workarounds, and working code examples.

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