java.applet Reference

Introduction to the Reference Chapters

The preceding seventeen chapters cover just about all there is to know about AWT. We have tried to organize them logically, and provide all the information that you would expect in a reference manual—plus much more in the way of examples and practical information about how to do things effectively. However, there are many times when you just need a reference book, pure and simple: one that's organized alphabetically, and where you can find any method if you know the class and package that it belongs to, without having to second guess the author's organizational approach. That's what the rest of this book provides. It's designed to help you if you need to look something up quickly, and find a brief but accurate summary of what it does. In these sections, the emphasis is on *brief*; if you want a longer description, look in the body of the book.

The reference sections describe the following packages:

- `java.applet` (Chapter 18, *java.applet Reference*)
- `java.awt` (Chapter 1, *java.awt Reference*)
- `java.awt.datatransfer` (Chapter 20, *java.awt.datatransfer Reference*)
- `java.awt.event` (Chapter 21, *java.awt.event Reference*)
- `java.awt.image` (Chapter 22, *java.awt.image Reference*)
- `java.awt.peer` (Chapter 23, *java.awt.peer Reference*)

Within each package, classes and interfaces are listed alphabetically. There is a description and a pseudo-code definition for each class or interface. Each variable and method is listed and described. New Java 1.1 classes are marked with a black

star (★), as are new methods and new variables. Of course, if a class is new, all its methods are new. We didn't mark individual methods in new classes. Methods that are deprecated in Java 1.1 are marked with a white star (☆).

Inheritance presents a significant problem with documenting object-oriented libraries, because the bulk of a class's methods tend to be hiding in the super-classes. Even if you're very familiar with object-oriented software development, when you're trying to look up a method under the pressure of some deadline, it's easy to forget that you need to look at the superclasses in addition to the class you're interested in itself. Nowhere is this problem worse than in AWT, where some classes (in particular, components and containers) inherit well over 100 methods, and provide few methods of their own. For example, the `Button` class contains seven public methods, none of which happens to be `setFont()`. The font used to display a button's label is certainly settable—but to find it, you have to look in the superclass `Component`.

So far, we haven't found a way around this problem. The description of each class has an abbreviated class hierarchy diagram, showing superclasses (all the way back to Object), immediate subclasses, and the interfaces that the class implements. Ideally, it would be nice to have a list of all the inherited methods—and in other parts of Java, that's possible. For AWT, the lists would be longer than the rest of this book, much too long to be practical, or even genuinely useful. Someday, electronic documentation may be able to solve this problem, but we're not there yet.

Package diagrams

The following figures provide a visual representation of the relationships between the classes in the AWT packages.

`java.awt`, as the mother of all AWT packages, is better represented by two diagrams, one for the graphics classes and one for the component and layout classes.
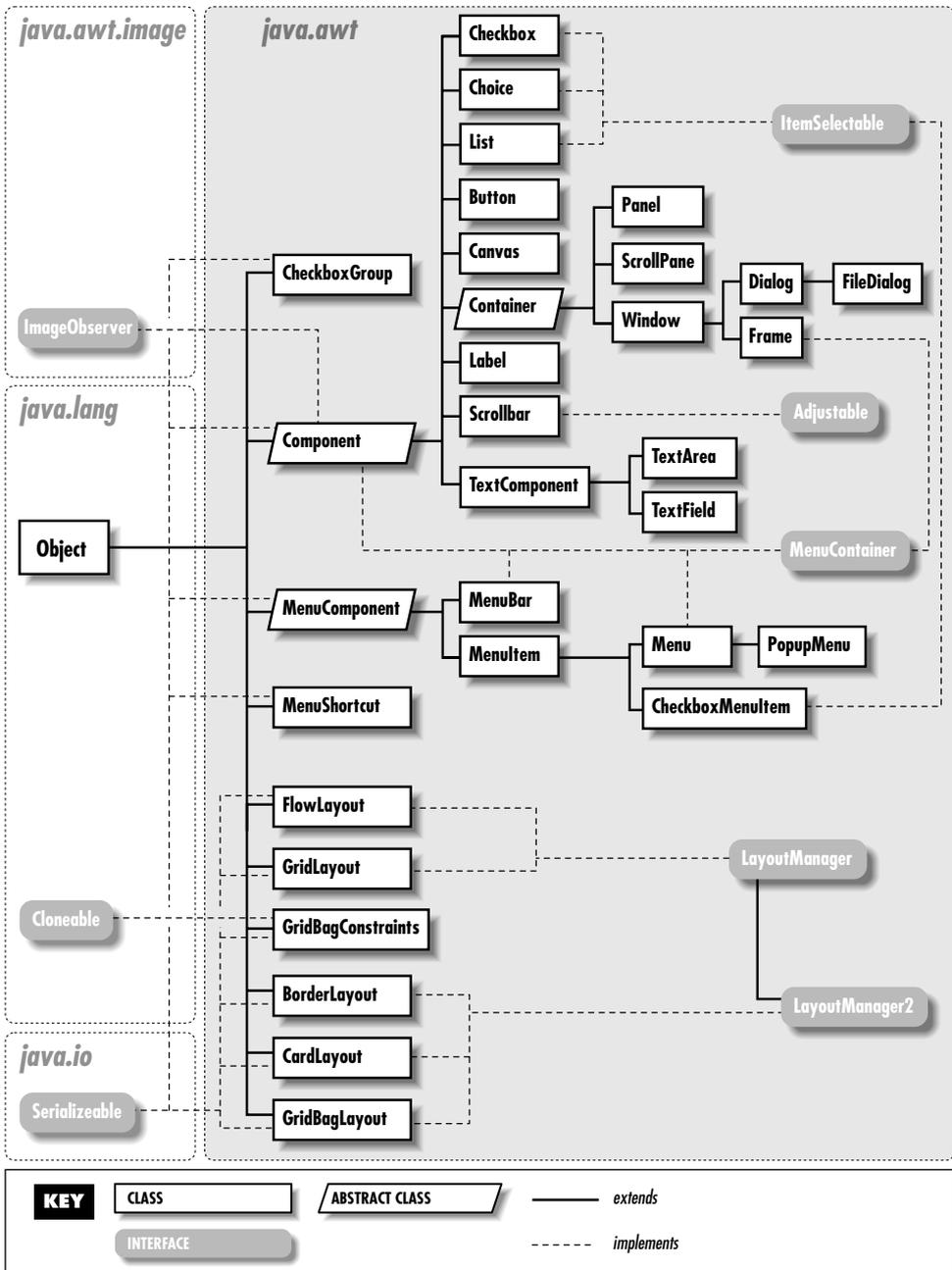
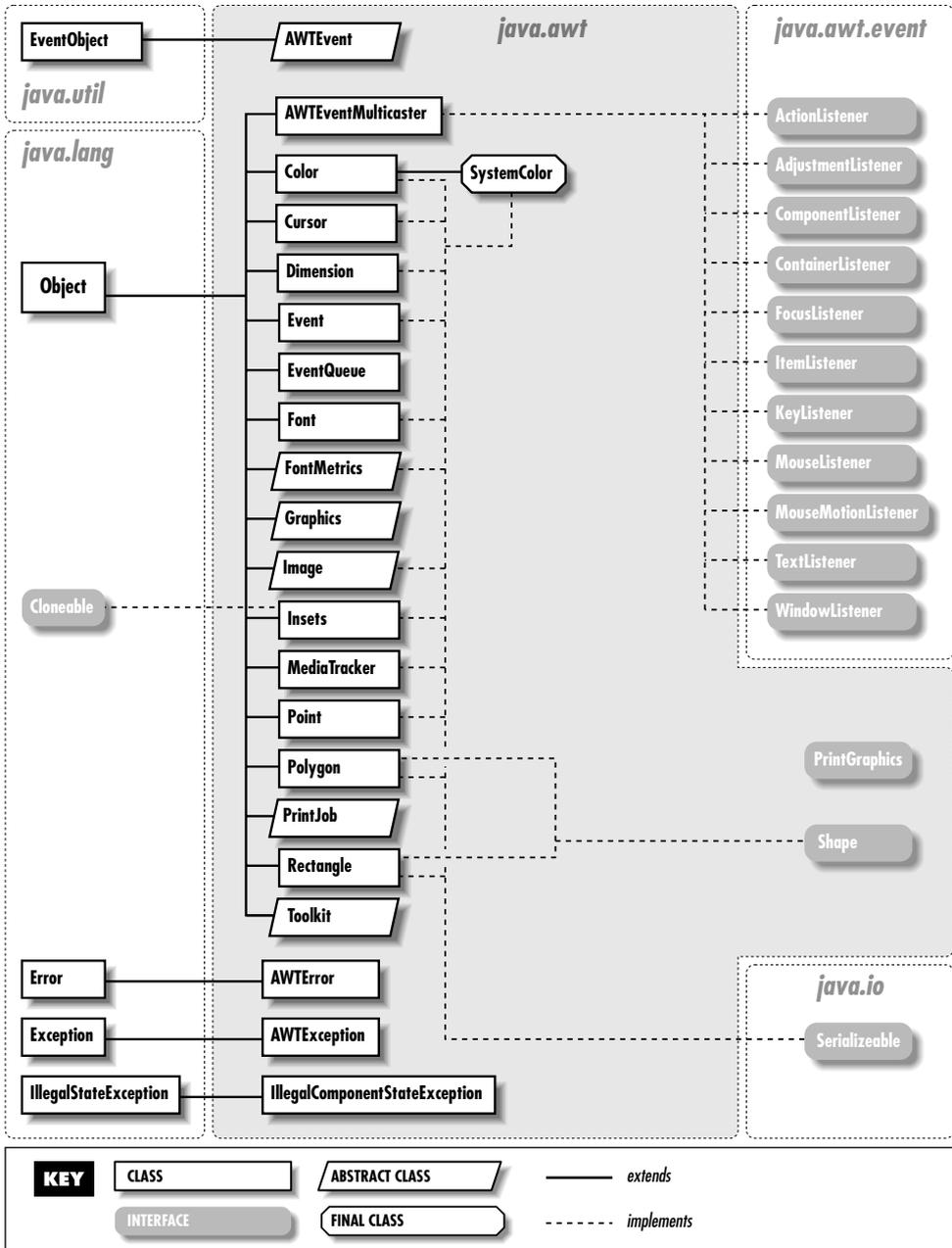*Figure 18–1: Component and Layout classes of the java.awt package.*

| EventObject | | AWTEvent | | *java.awt* | | *java.awt.event* |

java.util

java.lang

AWTEventMulticaster ---- ActionListener

Color ---- SystemColor ---- AdjustmentListener

Cursor ---- ComponentListener

Object ---- Dimension ---- ContainerListener

Event ---- FocusListener

EventQueue ---- ItemListener

Font ---- KeyListener

FontMetrics ---- MouseListener

Graphics ---- MouseMotionListener

Image ---- TextListener

Cloneable ---- Insets ---- WindowListener

MediaTracker

Point

Polygon

PrintJob ---- PrintGraphics

Rectangle ---- Shape

Toolkit

| Error | | AWTError | | *java.io* |

| Exception | | AWTException | | Serializeable |

| IllegalStateException | | IllegalComponentStateException |

KEY | CLASS | ABSTRACT CLASS | ——— extends |
| INTERFACE | FINAL CLASS | - - - - - implements |

Figure 18–2: Graphics classes of java.awt package
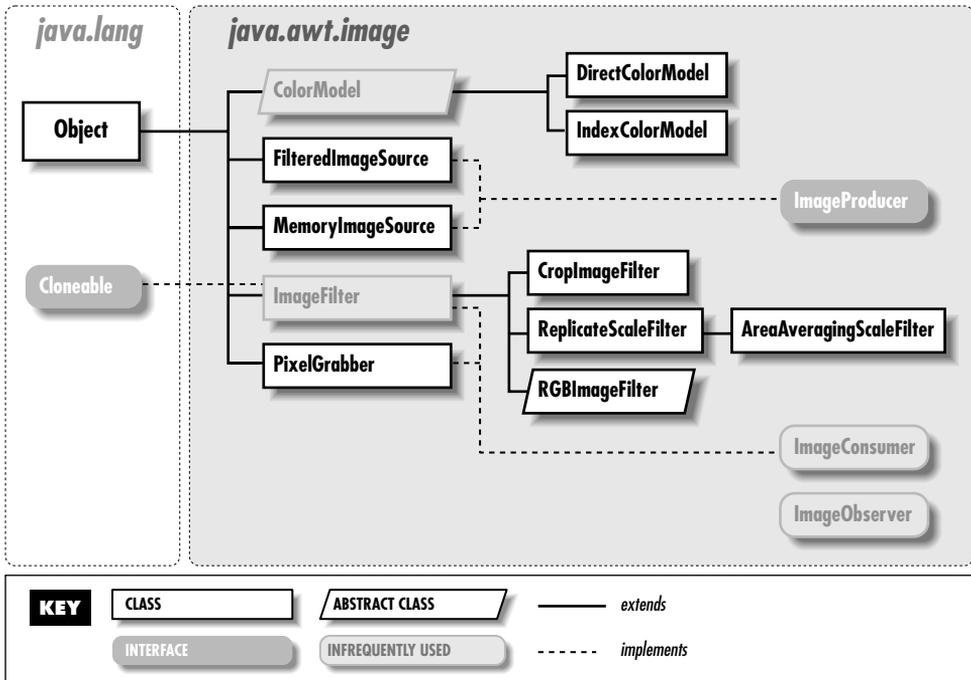
Figure 18–3: The java.awt.image package
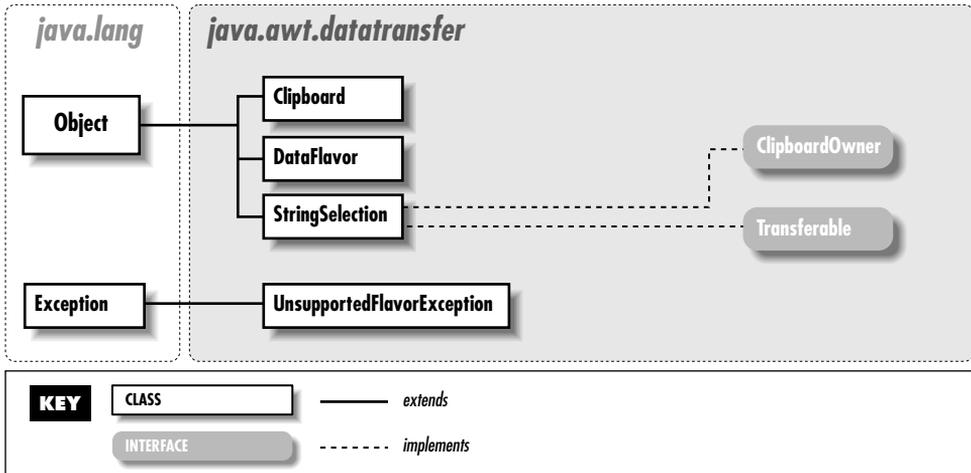
Figure 18–4: The java.awt.datatransfer package
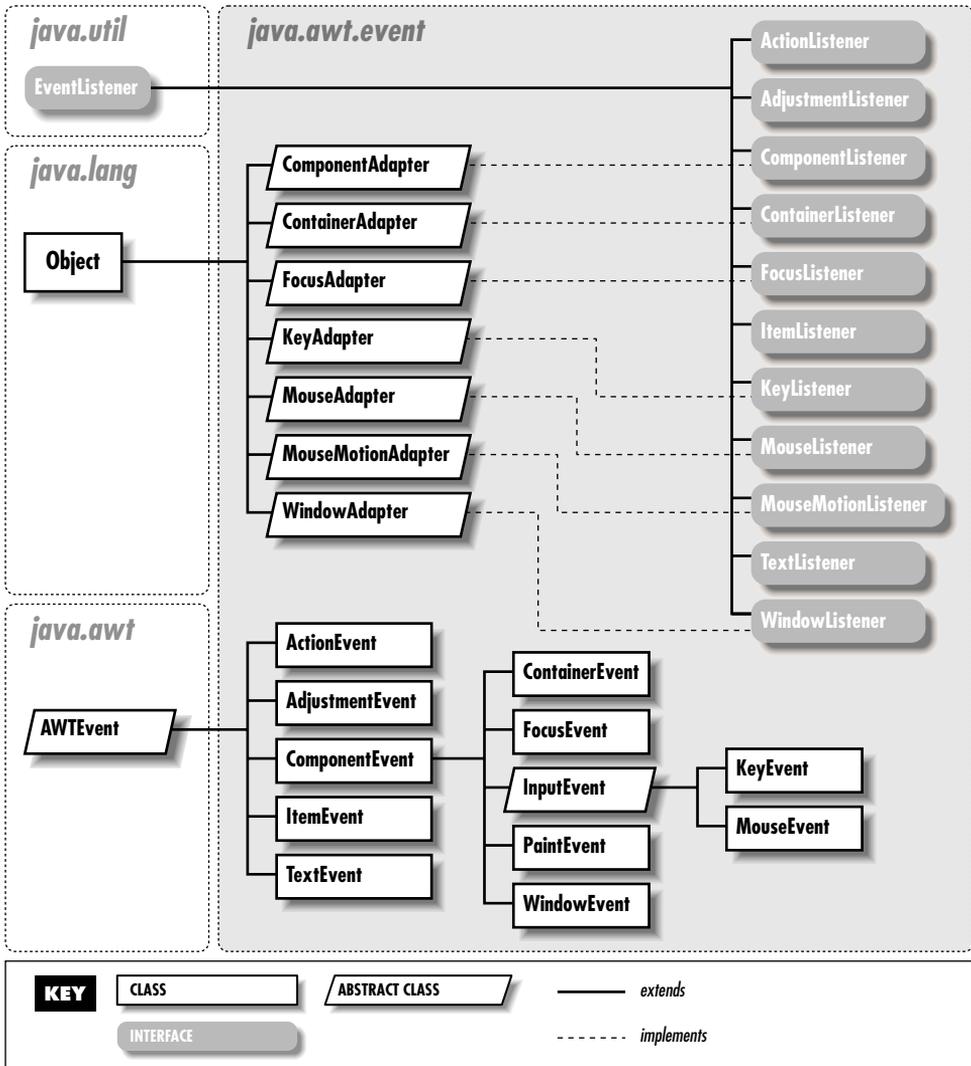
java.util

EventListener

java.lang

Object

java.awt.event

ComponentAdapter
ContainerAdapter
FocusAdapter
KeyAdapter
MouseAdapter
MouseMotionAdapter
WindowAdapter

ActionListener
AdjustmentListener
ComponentListener
ContainerListener
FocusListener
ItemListener
KeyListener
MouseListener
MouseMotionListener
TextListener
WindowListener

java.awt

AWTEvent

ActionEvent
AdjustmentEvent
ComponentEvent
ItemEvent
TextEvent

ContainerEvent
FocusEvent
InputEvent
PaintEvent
WindowEvent

KeyEvent
MouseEvent

KEY	CLASS	ABSTRACT CLASS	——— extends
	INTERFACE		- - - - - implements

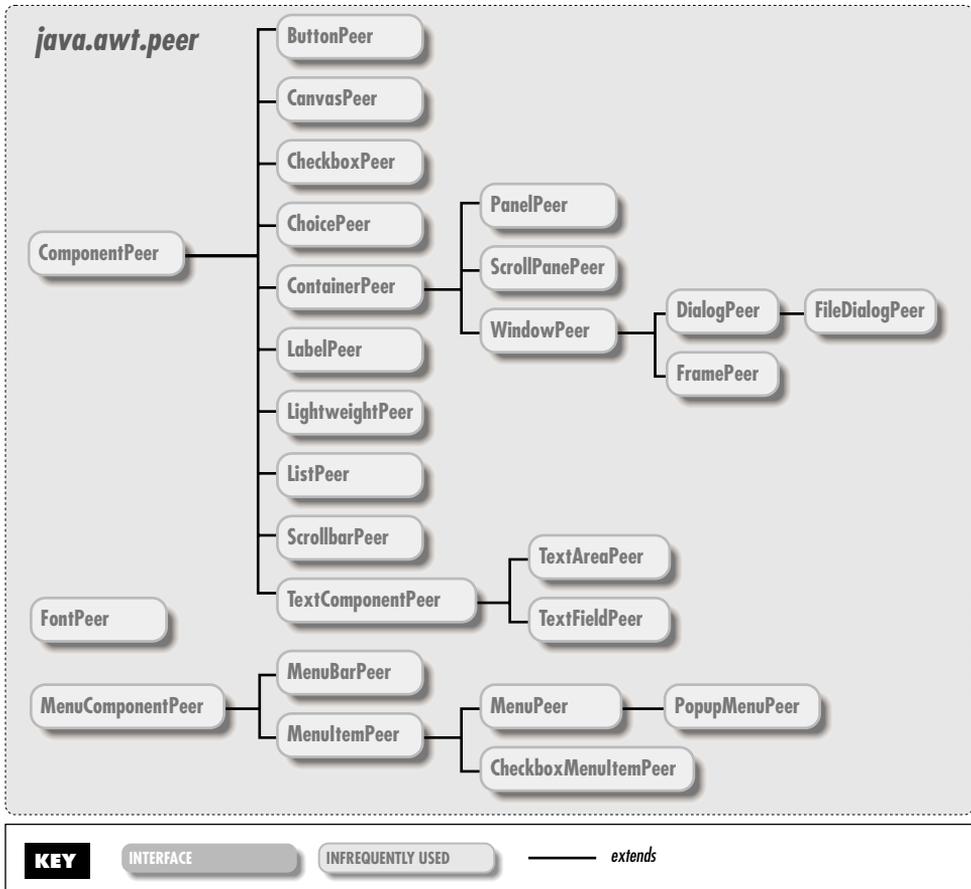*Figure 18–5: The java.awt.event package*
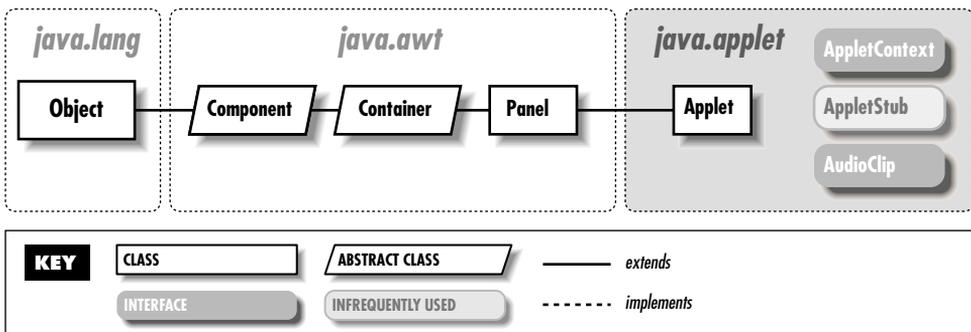
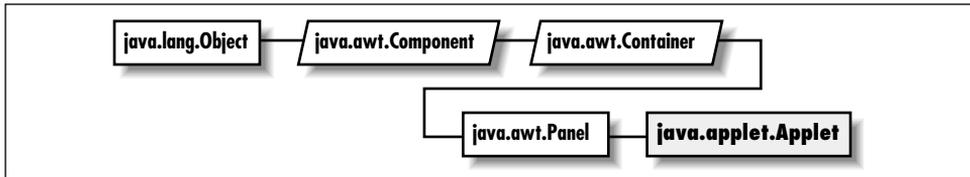*Figure 18–6: The java.awt.peer package*

Figure 18–7: The java.applet package

18.1   Applet

Description

The Applet class provides the framework for delivering Java programs within web pages.

Class Definition

```
public class java.applet.Applet
    extends java.awt.Panel {
  // Constructors
  public Applet();

  // Instance Methods
  public void destroy();
  public AppletContext getAppletContext();
  public String getAppletInfo();
  public AudioClip getAudioClip (URL url);
  public AudioClip getAudioClip (URL url, String filename);
  public URL getCodeBase();
  public URL getDocumentBase();
  public Image getImage (URL url);
  public Image getImage (URL url, String filename);
  public Locale getLocale(); ★
  public String getParameter (String name);
  public String[][] getParameterInfo();
  public void init();
  public boolean isActive();
  public void play (URL url);
  public void play (URL url, String filename);
  public void resize (int width, int height);
  public void resize (Dimension dim);
  public final void setStub (AppletStub stub);
  public void showStatus (String message);
```

```
   public void start();
   public void stop();
}
```

Constructors

Applet

```
public Applet()
```

Description   Constructs an `Applet` object.

Instance Methods

destroy

```
public void destroy()
```

Description   Called when the browser determines that it doesn't need to keep the applet around anymore.

getAppletContext

```
public AppletContext getAppletContext()
```

Returns   The current `AppletContext` of the applet.

getAppletInfo

```
public String getAppletInfo()
```

Returns   A short information string about the applet to be shown to the user.

getAudioClip

```
public AudioClip getAudioClip (URL url)
```

Parameters   *url*   URL of an audio file.
Returns   Object that implements the `AudioClip` interface for playing audio files.
Description   Fetches an audio file to play with the `AudioClip` interface.

```
public AudioClip getAudioClip (URL url , String filename)
```

Parameters   *url*   Base URL of an audio file.
              filename   Specific file, relative to `url`, that contains an audio file.
Returns   Object that implements `AudioClip` interface for playing audio file.

Description   Fetches an audio file to play with the `AudioClip` interface.

getCodeBase

`public URL getCodeBase()`

Returns   The complete URL of the *.class* file that contains the applet.

getDocumentBase

`public URL getDocumentBase()`

Returns   The complete URL of the *.html* file that loaded the applet.

getImage

`public Image getImage (URL url)`

Parameters   *url*   URL of an image file.
Returns   `Image` to be displayed.
Description   Initiates the image loading process for the file located at the specified location.

`public Image getImage (URL url, String filename)`

Parameters   *url*   Base URL of an image file.
              filename   Specific file, relative to `url`, that contains an image file.
Returns   Image to be displayed.
Description   Initiates the image loading process for the file located at the specified location.

getLocale

`public Locale getLocale()` ★

Returns   `Applet`'s locale.
Overrides   `Component.getLocale()`
Description   Used for internationalization support.

getParameter

`public String getParameter (String name)`

Parameters   *name*   Name of parameter to get.
Returns   The value associated with the given parameter in the HTML file, or `null`.
Description   Allows you to get parameters from within the <APPLET> tag of the *.html* file that loaded the applet.

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getParameterInfo

  `public String[][] getParameterInfo()`

  Returns   Overridden to provide a series of three-string arrays that describes the parameters this applet reads.

init

  `public void init()`

  Description   Called by the system when the applet is first loaded.

isActive

  `public boolean isActive()`

  Returns   `true` if the applet is active, `false` otherwise.

play

  `public void play (URL url)`

  Parameters   *url*   URL of an audio file .
  Description   Plays an audio file once.

  `public void play (URL url, String filename)`

  Parameters   *url*   Base URL of an audio file .
                filename   Specific file, relative to `url`, that contains an audio file.
  Description   Plays an audio file once.

resize

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

  Parameters   *width*   New width for the `Applet`.

                height   New height for the `Applet`.
  Description   Changes the size of the applet.

  `public void resize (Dimension dim)`

  Parameters   *dim*   New dimensions for the applet.
  Description   Changes the size of the applet.

setStub

```
public final void setStub (AppletStub stub)
```

Parameters   *stub*   Platform specific stubfor environment.
Description   Called by the system to setup `AppletStub`.

showStatus

```
public void showStatus (String message)
```

Parameters   *message*   Message to display to user.
Description   Displays a message on the status line of the browser.

start

```
public void start()
```

Description   Called by the system every time the applet is displayed.

stop

```
public void stop()
```

Description   Called by the system when it wants the applet to stop execution;
               typically, every time the user leaves the page that includes the
               applet.

See Also

`AppletContext, AppletStub, AudioClip, Container, Dimension, Image, Locale, Panel, String, URL`

18.2   AppletContext

java.applet.AppletContext

Description

AppletContext is an interface that provides the means to control the browser environment in which the applet is running.

Interface Definition

```
public abstract interface java.applet.AppletContext {

   // Interface Methods
   public abstract Applet getApplet (String name);
```

```
   public abstract Enumeration getApplets();
   public abstract AudioClip getAudioClip (URL url);
   public abstract Image getImage (URL url);
   public abstract void showDocument (URL url);
   public abstract void showDocument (URL url, String frame);
   public abstract void showStatus (String message);
}
```

Interface Methods

getApplet

```
public abstract Applet getApplet (String name)
```

Parameters	*name*	Name of applet to locate.
Returns	`Applet` fetched.	
Description	Gets a reference to another executing applet.	

getApplets

```
public abstract Enumeration getApplets()
```

Returns	List of applets executing.
Description	Gets references to all executing applets.

getAudioClip

```
public abstract AudioClip getAudioClip (URL url)
```

Parameters	*url*	Location of an audio file.
Returns	`AudioClip` fetched.	
Description	Loads an audio file.	

getImage

```
public abstract Image getImage (URL url)
```

Parameters	*url*	Location of an image file.
Returns	Image fetched.	
Description	Loads an image file.	

showDocument

```
public abstract void showDocument (URL url)
```

Parameters	*url*	New web page to display.
Description	Changes the displayed web page.	

```
public abstract void showDocument (URL url, String frame)
```

Parameters   *url*   New web page to display.
             frame   Name of the frame in which to display the new
                            page.
Description   Displays a web page in another frame.

showStatus

```
public abstract void showStatus (String message)
```

Parameters   *message*   Message to display.
Description   Displays a message on the status line of the browser.

See Also

Applet, AudioClip, Enumeration, Image, Object, String, URL

18.3   AppletStub

java.applet.AppletStub

Description

AppletStub is an interface that provides the means to get information from the run-time browser environment.

Interface Definition

```
public abstract interface java.applet.AppletStub {

  // Interface Methods
  public abstract void appletResize (int width, int height);
  public abstract AppletContext getAppletContext();
  public abstract URL getCodeBase();
  public abstract URL getDocumentBase();
  public abstract String getParameter (String name);
  public abstract boolean isActive();
}
```

Interface Methods

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

Parameters   *width*   Requested new width for applet.
               height   Requested new height for applet.
Description   Changes the size of the applet.

getAppletContext
```
public abstract AppletContext getAppletContext()
```

Returns   Current `AppletContext` of the applet.

getCodeBase
```
public abstract URL getCodeBase()
```

Returns   Complete `URL` for the applet's *.class* file.

getDocumentBase
```
public abstract URL getDocumentBase()
```

Returns   Complete `URL` for the applet's *.html* file.

getParameter
```
public abstract String getParameter (String name)
```

Parameters   *name*   Name of a `<PARAM>` tag.
Returns   Value associated with the parameter.
Description   Gets a parameter value from the `<PARAM>` tag(s) of the applet.

isActive
```
public abstract boolean isActive()
```

Returns   `true` if the applet is active, `false` otherwise
Description   Returns current state of the applet.

See Also

`AppletContext`, `Object`, `String`, `URL`

18.4   AudioClip

java.applet.AudioClip

Description

`AudioClip` is an interface for playing audio files.

Interface Definition

```
public abstract interface java.applet.AudioClip {

  // Interface Methods
  public abstract void loop();
  public abstract void play();
  public abstract void stop();
}
```

Interface Methods

loop

```
public abstract void loop()
```

Description   Plays an audio clip continuously.

play

```
public abstract void play()
```

Description   Plays an audio clip once from the beginning.

stop

```
public abstract void stop()
```

Description   Stops playing an audio clip.

See Also

`Object`