

Java applets

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applet?

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APPLE

APPLE

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What is an applet?

- An applet is a small Java program that is embedded and ran in some other Java

interpreter program such as

- a Java technology-enabled browser
- Sun's applet viewer program called appletviewer

DP-XChange Viewer

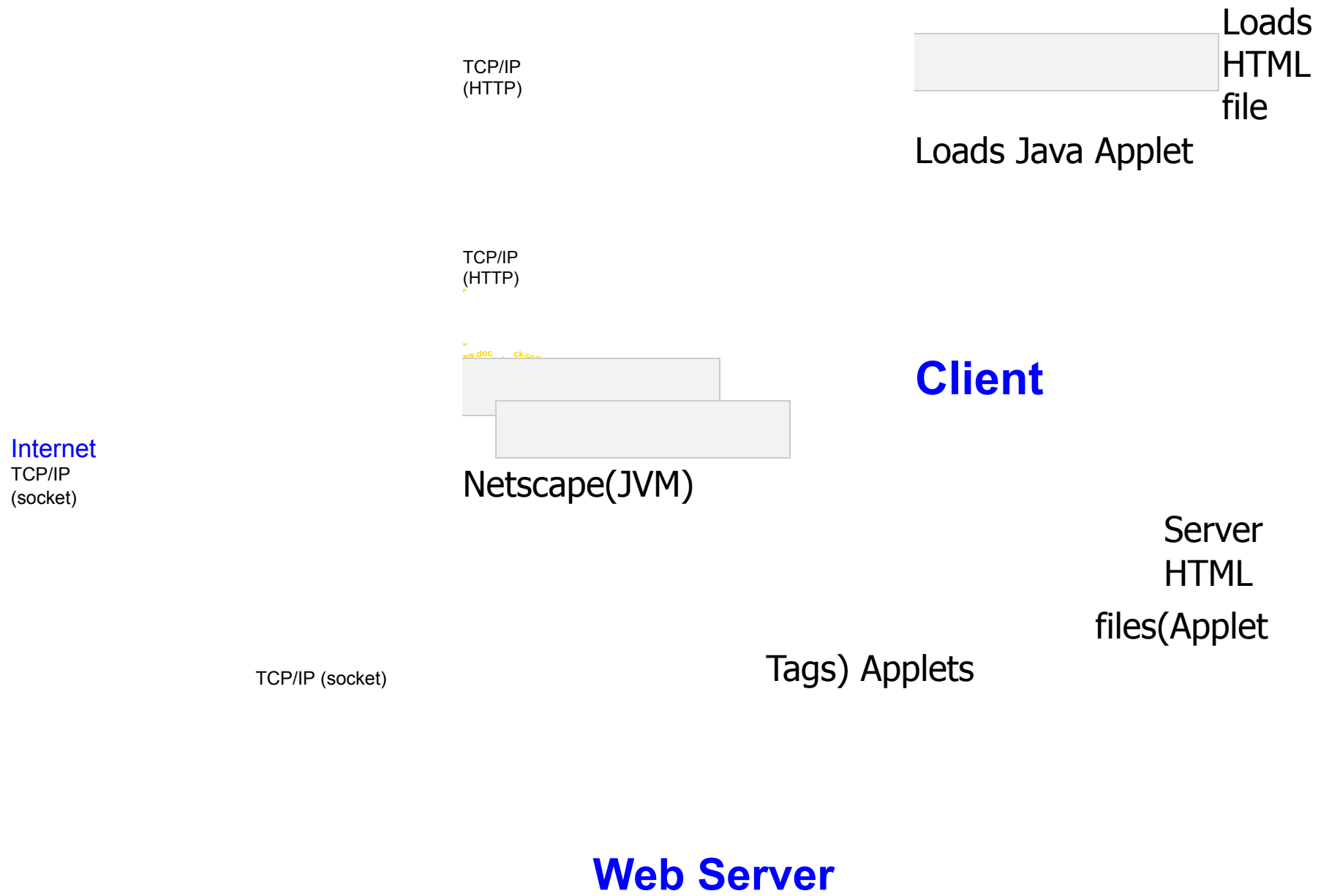
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Applets,
web page,
client,

server server

host

web server

myWebPage.html

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browser host

request for

myWebPage.html

browser

code=HelloWorld.class</apple HelloWorldclass

t> ...

HelloWorld.class

...

HelloWorld.class

myWebPage.html

HelloWorld.class

<applet

request for

Applet

Execution - 1

- An applet program is a written as a inheritance of
 - There is no
 - An applet
- the `java.Applet` class
- `main()` method in an Applet.
- uses AWT for graphics

Execution - 2

Applet

- Life Cycle of an Applet:
 - `init`: This method is intended for whatever initialization is needed for an applet.
 - `start`: This method is automatically called after `init` method. It is also called whenever user returns to the

page containing the applet after visiting other pages.

- **stop**: This method is automatically called whenever the user moves away from the page containing applets. This method can be used to stop an animation.
- **destroy**: This method is only called when the browser shuts down normally.

■ Ref: <http://java.sun.com/docs/books/tutorial/deployment/applet/index.html/>

Execution - 3

Applet

- The applet is running and rendered **on the web page.**

- Every Applet needs to implement **one or more** of the **init()**, the **start()** and the **paint()** methods.
- At the end of the execution, the **stop()** method is invoked, followed by the **destroy()** method to **deallocate the applet's resources**.

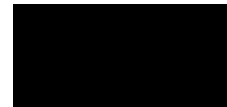
Applet life cycle

■ browser visits page containing an applet ■

browser calls init on that applet,
once ■ browser calls start on that applet

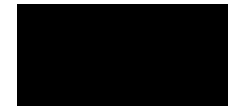
applet, once

- browser goes away from that page
- browser calls stop on that applet



- browser comes back to that page
- browser calls start again on that applet

do some work



destroy()

- browser shuts down
- browser calls destroy on the

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HTML tags for applets - 1

<APPLET

// the beginning of the HTML applet code

CODE="demoxx.class" here, or a full URL) // the physical
NAME="SWE622" height of the applet
// the actual name of the applet on this page
the applet (usually an instance of the
'class' file)
CODEBASE="demoxx/" // the physical width
WIDTH="100" space (top, bottom, center)
// the location of the applet on the page
applet (relative as
HEIGHT="50"

for applets - 2

HTML tags

<APPLET CODE="test.class" **CODEBASE**="example/"
WIDTH=460 HEIGHT=160
NAME="buddy" **>**

<**PARAM NAME**="imageSource" **VALUE**="images/Beans">
 <**PARAM NAME**="backgroundColor" **VALUE**="0xc0c0c0">
 <**PARAM NAME**="endImage" **VALUE**=10>
 </**APPLET**>

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Applet's Attribute

S

Attribute
Explanation
Example

Name of c

Width of a

Height of

Applet's D

Alternate t

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applet not a

Name of th

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Code Code="applet0.class" Width Width=300 height Height=60

Codebase Codebase="/applets" alt Alt="menu applet"

name Name="appletExam" Align(top,left,right,bottom) Justify the applet with

text Align="right"

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HTML

<html>

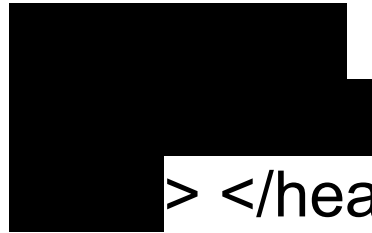
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For

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Your Turn! ■ You first

<head>



> </head>

<body>

<applet

code="HelloWor</applet>

Id.class"

width=300

height=200>

applet ■

</body>

</html>

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“Hello

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World”

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History of an Applet

■ Edit java
source code
& html ■

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```
<html>
<body>
```

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```
notepad
Hello.java
■ notepad
Hello.html
■ Compile
source to
```

```
<applet
```

```
ByteCodes ■ (Java Virtual
javac Machine) ■
Hello.java
■ produces
Hello.class
■ View appletHello.html
```

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```
code="Hell width=300
o.class" height=300
```

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```
>
</applet>
</body>
</html>
```

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File

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```
<html>
<body>

<applet
```

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File

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```
import
java.applet.A
pplet;
```

```
code="Hell
o.class"
width=300
height=300
>
```

```
import
java.awt.*;
public class
```

```
Hello extends Applet {
    public void
    init() {
        repaint();
    }
    public void
    paint(Graphics
```

Save as
Hello.html

```
sg) {
g.drawString(
"Hello
World!",30,30
); }
```

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History of an Applet

■ Edit java
source code
& html ■

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notepad
Hello.java
■ notepad
Hello.html
■ Compile
source to

what to
draw where
to draw it

**Save as
Hello.java**

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ByteCodes ■ (Java Virtual
Machine) ■
javac
Hello.java
■ produces
Hello.class
■ View appletHello.html

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History of an Applet

■ Edit java source code & html ■

The

notepad
Hello.java
■ notepad
Hello.html
■ Compile source to

ByteCodes ■ (Java Virtual Machine) ■
javac
Hello.java
■ produces
Hello.class
■ View appletHello.html

coordinate system

drawn in a
rectangle,

The applet is

which consists
of **pixels**.

The
coordinate
system

width

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coordinate (x,y)

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Each **pixel** has a

(0,0) (width,0) **x**

Graphics methods

Sample

- A Graphics is something you can paint on
- ```
g.drawString("Hello", 20, 20); Hello
g.drawRect(x, y, width, height);
```

```
g.fillRect(x, y, width, height);
g.drawOval(x, y, width, height);
g.fillOval(x, y, width, height);
g.setColor(Color.red);
```

## Applet Security

For security reasons, applets that are loaded over the network have **several restrictions**. ■ an **applet cannot** ordinarily **read** or **write** files **on the computer that it's executing on**. ■ an applet

cannot **make** network connections except to the **host** that it came from.

- Ref: <http://java.sun.com/docs/books/tutorial/deployment/applet/index.html/>

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What are the disadvantages of applets?

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- Applets can't run any local executable programs
- Applets can't with any host other than the originating server

- Applets can't read/write to local computer's file system

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## What are the disadvantages of applets

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(Cont'd)

- Applets can't find any information about the local computer
- All java-created pop-up windows carry a warning



message

- Stability depends on stability of the client's web server
- Performance directly depend on client's machine

**What are the advantages of applets?**

- Automatically integrated with HTML; hence, resolved virtually all installation issues.

- Can be accessed from various platforms and various java-enabled web browsers.
- Can provide dynamic, graphics capabilities and visualizations
- Implemented in Java, an easy-to-learn OO programming language

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## What are the advantages o applets

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## (Cont'd)

- Alternative to HTML GUI design
- Safe! Because of the security built into the core Java language and the applet structure, you don't have to worry about bad code causing damage to someone's system
- Can be launched as a standalone web application independent of the host web server

## Summary

- An **applet** is a Java class
- Its code is **downloaded** from a web server
- It is invoked by a browser when it scans a web page and encounters a class specified with the *APPLET* tag
- For security reason, the execution of an applet is normally subject to restrictions:
  - applets cannot access files in the file system on the client host
  - Applets cannot make network connection exception to the server host from which it originated

## Resources

- <http://java.sun.com/>

- Java[tm] 2 Platform, Standard Edition v1.6.1
  - java, javac, jar, jre, etc.
  - Any platform... FREE!
- Online documentation and tutorials
- <http://www.eclipse.org/>
  - Integrated development environment (IDE) for nothing in particular ■
  - Java[tm] development tools (JDT) (comes with Eclips) ■ Project management
    - Editor
    - Incremental compiler
    - CVS support
  - C/C++ extension in progress
  - AspectJ support
  - Windows, Linux, and Mac.... FREE!