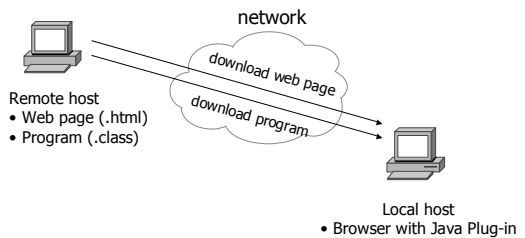## CS202 Java Object Oriented Programming
GUI Programming – Applets

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Applet

◆ Embed programs in web pages

network

Remote host
• Web page (.html)
• Program (.class)

download web page
download program

Local host
• Browser with Java Plug-in

Running Applet

◆ Browser
- URL of the web page
- Open File – WebPageName.html

◆ Appletviewer
- `appletviewer WebPageName.html`

Limitations of Applets

◆ Security restrictions
- Cannot read/write files
- Can only make network connections with the remote host where the applet is downloaded

◆ Limited support for graphics design

◆ Different browsers have different Java plug-ins

Dissecting a Simple Applet

◆ WelcomeApplet.html
◆ WelcomeApplet.java

WelcomeApplet.html

◆ Tags and attributes

```
<html>

  <head>
    <title> WelcomeApplet </title>
  </head>

  <body>
    <applet code="WelcomeApplet.class" width=300 height=300>
    </applet>
  </body>

</html>
```

WelcomeApplet.java

```
import java.awt.Graphics;
import javax.swing.JApplet;

public class WelcomeApplet extends JApplet {

  public void paint( Graphics g )
  {
    super.paint(g);

    g.drawString( "Welcome to Applet Programming!", 25, 25 );
    g.drawOval( 100, 100, 100, 100 );
  }

} // end of class WelcomeApplet
```

Applet as a Top-level Container

- Hold other components
  - getContentPane()
    - setLayout(LayoutManager)
    - add(Component)
  - setJMenuBar(JMenuBar)
- Handling various events

JEdit Revisited

- JEdit, the Applet version

- Off-topic question: how do we reference an outer class?

Applet-specific Issues

- How do we start an applet, or when is an applet object created?
- What happens if we leaves a web page?
- What happens if we reload a web page?
- How do we end an applet?
  - System.exit() does not work, for good reasons

Life Cycle of an Applet ... Sort Of

Browser	Applet
◆ loads the web page with the applet for the first time	◆ Applet object created ◆ Applet initializes itself ◆ Applet starts running
◆ leaves the web page, or ◆ minimizes the web page	◆ Applet stops running
◆ returns to the web page, or ◆ maximize the web page	◆ Applet starts running
◆ reload the web page	◆ Applet stops running ◆ Applet object is destroyed ◆ An new applet object is created, then it initializes and starts
◆ browser is closed	◆ Applet stops running ◆ Applet object is destroyed

The Milestone Methods

- Milestone methods
  - public void init()
  - public void start()
  - public void stop()
  - public void destroy()
- init() vs. constructor

Other Applet Methods

◆ showStatus(String)
  - AppletLife.java
◆ getWidth(), getHeigth()
◆ String getParameter(String name)