Clickjacking Attack

CS392

iframe

- An inline frame can be defined with HTML tag **<iframe>**
- An inline frame is used to embed another document within the current HTML document.

Example

```
<!DOCTYPE html>
<html>
 <head>
   <title>HTML Iframes
  </title>
</head>
<body>
 <p>Document content goes here...</p>
 <iframe src = "https://www.iitp.ac.in" width = "1000" height = "500">
 </iframe>
 <p>Document content also go here...</p>
</body>
</html>
```

Iframe example

Document content goes here...

Document content goes here...

Clickjacking (UI Redressing)

- Attacker overlays multiple transparent or opaque frames to trick a user into clicking on a button or link on another page

- Clicks meant for the visible page are hijacked and routed to another, invisible page

Clickjacking

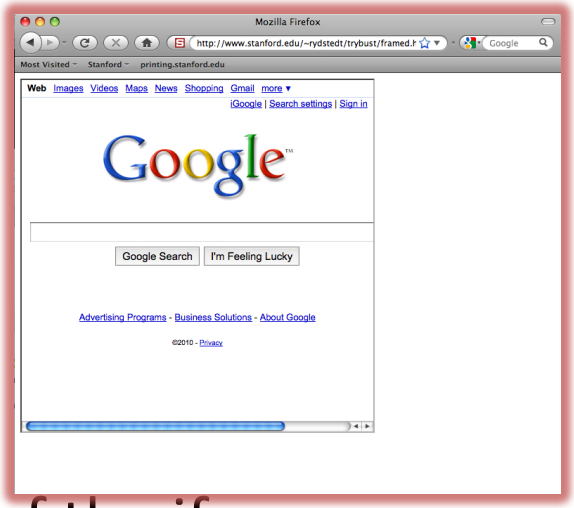
- Summer 2010: Facebook worm superimposes an invisible iframe over the entire page that links back to the victim's Facebook page
  - If victim is logged in, automatically recommends link to new friends as soon as the page is clicked on
- Many clickjacking attacks against Twitter
  - Users send out tweets against their will

Clickjacking Meets Spamming

It’s All About iFrame

- Any site may try to frame any other site

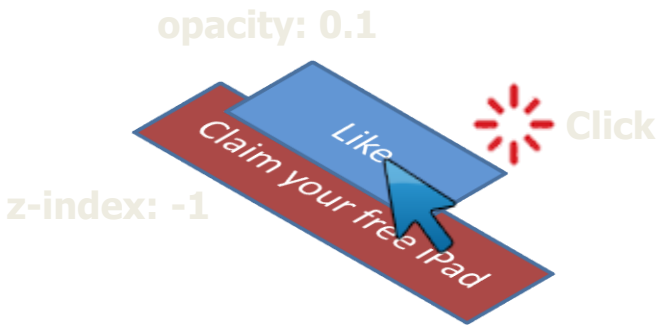
```
<iframe
  src=“http://www.google.com/...”>
</iframe>
```



- HTML attributes
  - Style
  - Opacity defines visibility percentage of the iframe
    - 1.0: completely visible
    - 0.0: completely invisible

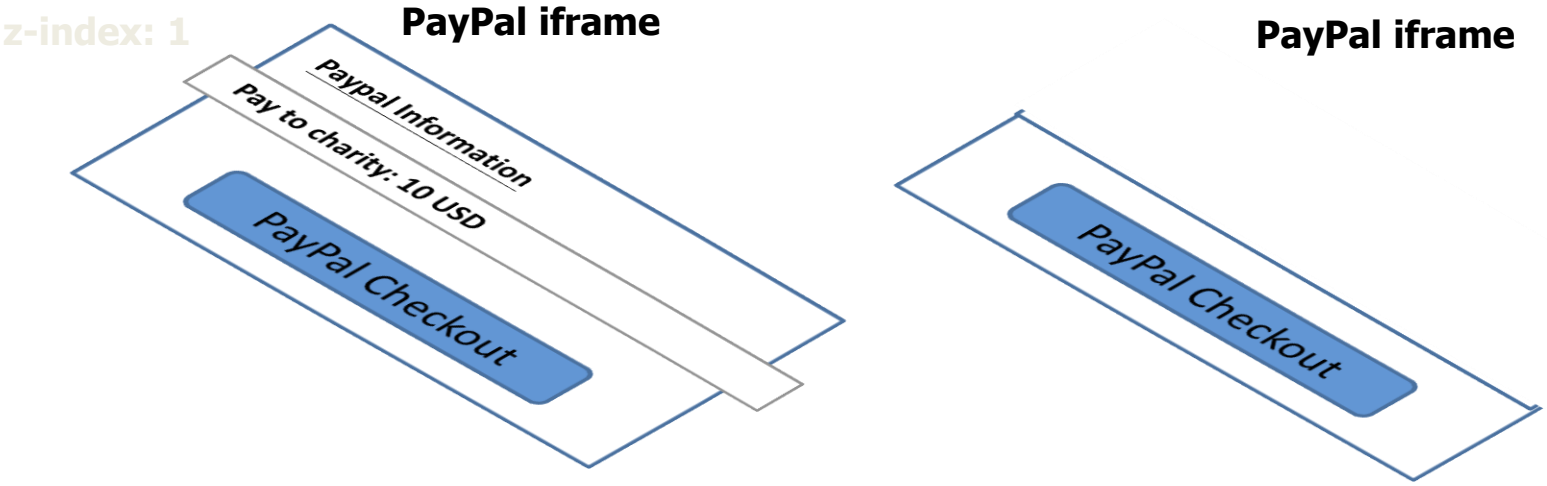
Hiding the Target Element

- Use CSS `opacity` property and `z-index` property to hide target element and make other element float under the target element



Partial Overlays and Cropping

- Overlay other elements onto an iframe using CSS `z-index` property or Flash Window Mode `wmode=direct` property
- Wrap target element in a new iframe and choose CSS position offset properties



Another Example

```
<!DOCTYPE html>
<html>
  <head>
    <title>Clickjacking Times</title>
  </head>
  <body>
  <h1>Clickjacking Example</h1>
    <div style="z-index:2; position:absolute; top:0; left:0; width: 100%; height: 100%">
      <iframe src="http://www.iitp.ac.in" id="frame1" style="opacity:0.1; filter:alpha(opacity=0);"
width="100%" height="100%" />
     </iframe>
    </div>
    <div align="right" style="position:absolute; top:500px; left:500px; z-index:1; width: 100%;
height:100%; background-color: white; text-align:left;">
      <p><input type="submit" value="Press Here" /><br />Press this button for an iPhone</p>
    </div>
 </body>
</html>
```

Clickjacking Example

Countermeasures

- Framebuster or Framekiller
- Content Security Policy (CSP)
- X-Frame-Options

Framebuster

```
<html>
<body>
<p>Document content goes here...</p>
<script>
if(self==top){
document.documentElement.style.display='block';
}else{
 top.location=self.location;
}
</script>
<p>This is a good page</p>

</body>
</html>
```

Content Security Policy (CSP)

- The frame-ancestors directive can be used in a Content-Security-Policy HTTP response header to indicate whether or not a browser should be allowed to render a page in a <frame> or <iframe>

CSP

- Content-Security-Policy: frame-ancestors 'none';
  - This prevents any domain from framing the content. This setting is recommended unless a specific need has been identified for framing.
- Content-Security-Policy: frame-ancestors 'self';
  - This only allows the current site to frame the content.
- Content-Security-Policy: frame-ancestors 'self' *.somesite.com https://myfriend.site.com;
  - This allows the current site, as well as any page on somesite.com (using any protocol), and only the page myfriend.site.com, using HTTPS only on the default port

X-Frame-Options

```
<?php
header("X-Frame Option: DENY")
?>
<html>
<body>
<p>This is a protected page using X-Frame-Options</p>
</body>
</html>
```

X-Frame-Options:

- DENY
- SAMEORIGIN
- ALLOW-FROM %URL%