

Question 1 *Clickjacking*

(10 min)

In this question we'll investigate some of the click-jacking methods that have been used to target smartphone users.

- (a) In many smartphone browsers, the address bar containing the page's URL can be hidden when the user scrolls. What types of problems can this cause?

Solution: If the real address bar is hidden, it's much easier for an attacker to create and place their own on the website, fooling victims into thinking they're browsing on sites they aren't. JavaScript can scroll the page, hiding the address bar as soon as the page loads, allowing an attacker complete freedom to place a fake address bar.

For more info, check out

https://www.usenix.org/legacy/event/upsec/tech/full_papers/niu/niu_html/niu_html.html (section 4.2.2)

- (b) Smartphone users are used to notifications popping up over their browsers as texts and calls arrive. How can attackers use this to their advantage?

Solution: By simulating an alert or popup on the website, an attacker can fool users into clicking malicious links. This can allow attackers to pose as phone applications such as texting apps or phone apps, which enables phishing.

- (c) QR codes haven't taken off and become ubiquitous like some thought they would. Can you think of any security reasons why this might be the case? (If you aren't familiar with QR codes, ask another group!)

Solution: QR codes placed in public places are perfect targets for people with malicious websites. They can post their own, pretending to be links to useful websites, and instead linking to phishing sites. Or, they can modify and paste over existing codes, which only keen observers would notice.

Question 2 *Phishing***(10 min)**

Phishing tries to gain sensitive user information by tricking users into going to a fake version of a website they trust. The attacker might convince the user to go to what appears to be their bank and to enter their username and password.

- (a) What are some ways that attackers try to fool users about the site they are going to? How do they convince people to click on links to sites?
- (b) What are some defenses you should employ against phishing?

Solution:

- (a) Attacks include:

Sub domains that look like top level domains.

Look alike UNICODE urls: bankofamerca.com, bankofthevest.com

Look alike unicode characters.

Mentioning recent information. Compromising an email account and then sending emails to people that account has recently corresponded with.

- (b) Defenses include:

Use a browser-integrated password manager, it will automatically fail to fill in your password if the website is not legitimate.

Do not click on unexpected links in emails.

If your bank sends you an email about your account, go to your browser and separately type in the banks url, or call them. Do not click on links to sensitive sites that others provide you.

Type sensitive domains directly into the address bar, or create a short cut that way and then use it.

Some phishing emails or sites are not very well crafted. Subtle language or spelling errors, that should be out of place for the legitimate site, can be a warning sign that you should heed.

Question 3 *Web tracking*

(15 min)

Sites use information about us to better display information, but also to sell us services, or to sell access to our screen views to advertisers.

- (a) What kind of information do sites gain about you when you visit them?
- (b) What other information could a site learn about you? How could a business learn about many of the sites you visit and construct a detailed profile of you based on your web habits.
- (c) What measures do you have to restrict this tracking?

Solution:

- (a) Technical information that sites learn includes: the time of the request, your browser, OS, language, IP, and general location from your IP address, screen size, screen resolution. What you requested: a search term, a news article.

They also receive any cookies for that domain, allowing the site to provide continuity of an activity that spans several pages, or required a login.

- (b) A business that provides ads analytics services can have client websites provide any information about you to the ads company as part of an image request.

- (c) Defenses include:

Personal defenses include using browser modes that limit tracking, such as incognito mode, and or using extensions that block unwanted scripts.

Legal protections of user agreements.