Cross Site Scripting

OWASP – Edmonton
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What are we going to discuss?

- XSS Definition
- XSS-Friendly Environment
- What is the role of the web-browsers?
- XSS Types: DOM-based, non-persistent and persistent
- Discussion

Definition

OWASP: When attacker uses a web-site to send malicious code to a different user

Wikipedia: A type of vulnerability in web-apps which allow code injection

My Definition: When one web-site gains partial or complete control over another web-site. XSS is:
- Not necessarily web-site's fault
- Not necessarily browser's fault

Prerequisites & Causes

Prerequisites

- The victim web-site must accept user input
- The attacker has to know the document structure of the victim web-site

Causes

- Weak user input validation which allows passing blocks of client-side executable script, e.g. JavaScript/JScript, VBScript
- Unencoded user-provided information being rendered as part of a web-page

Web Browser's Part

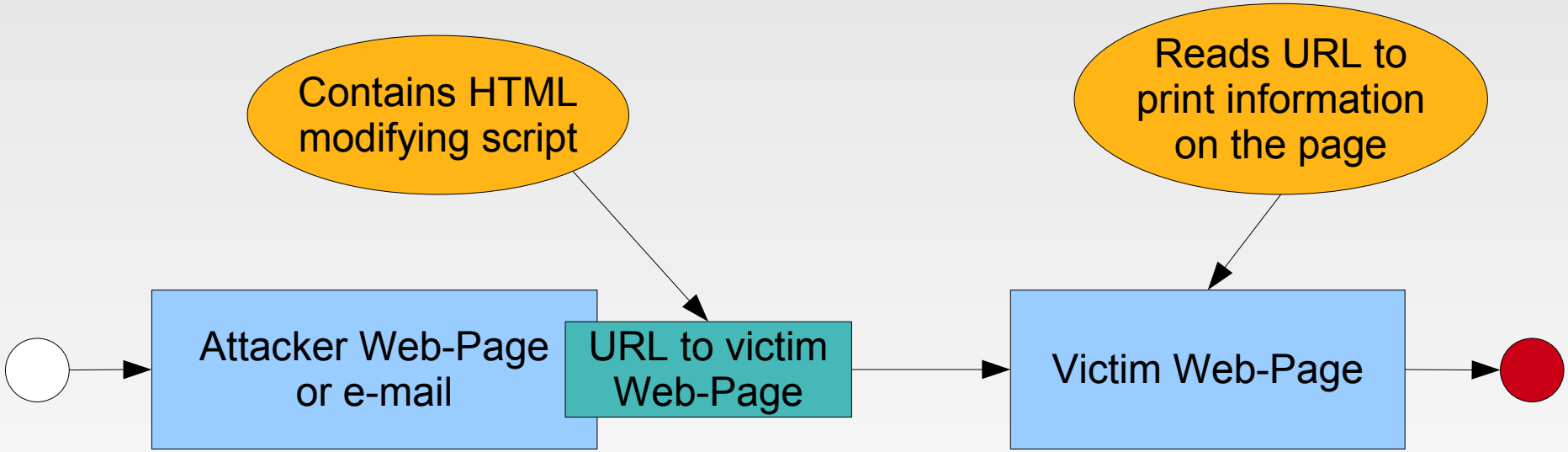
There are at least two known techniques that a web-browser can employ to make XSS more difficult. However, a web-browser alone cannot prevent all kinds XSS attacks.

	Local Objects	Encoded URLs
Internet Explorer	Yes	No
Opera	Yes	No
Firefox/Netscape	Yes	Yes

Because all of the most popular web-browsers implement Local Objects technique in order to perform XSS the script must be injected into the web-page (see OWASP and Wikipedia definitions).

Type 0: DOM-based XSS

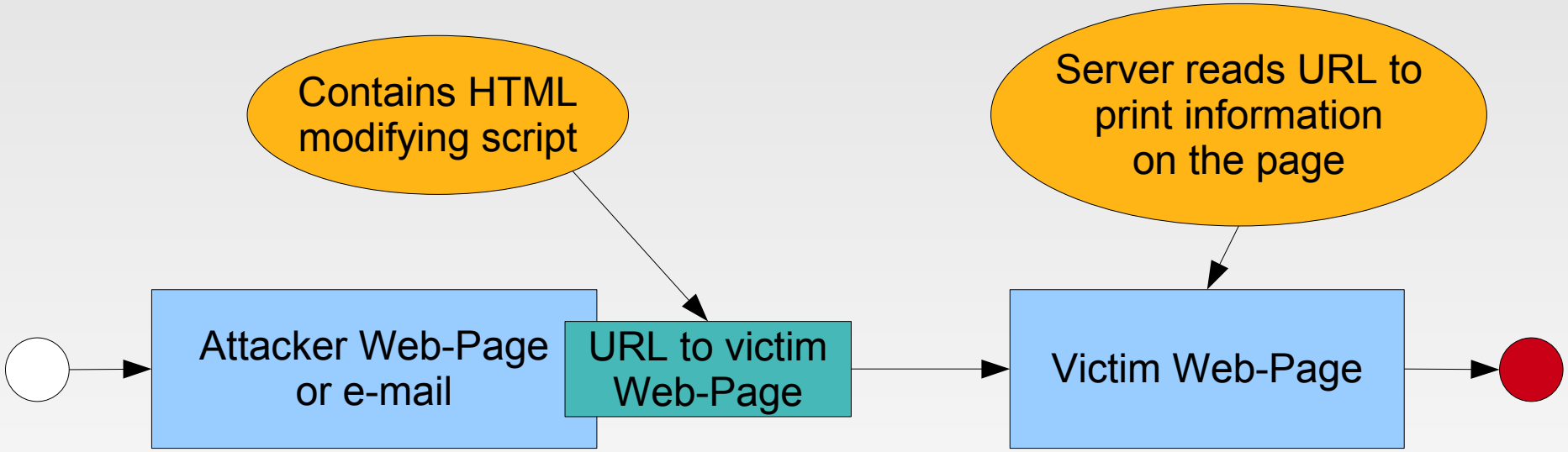
DOM-based XSS is a kind of attack which uses the fact that a web-page receives and uses user-provided data inside the client-side script. The script may never even reach the server.



Scope: Directly affects only one user at a time when the user visits attacker's site
Example: Bugzilla used document.location to print current URL on the page
Fix: Character escaping

Type 1: Non-persistent

Non-persistent (also reflected) XSS is a kind of attack which uses the fact that a web-page is rendered by the server immediately using user-provided data without saving it.



Scope: Directly affects only one user at a time when the user visits attacker's site
Example: Common in web-site searching when the search term is shown immediately on the web-page but not stored on the server. Happened on www.bbc.co.uk
Fix: Character escaping

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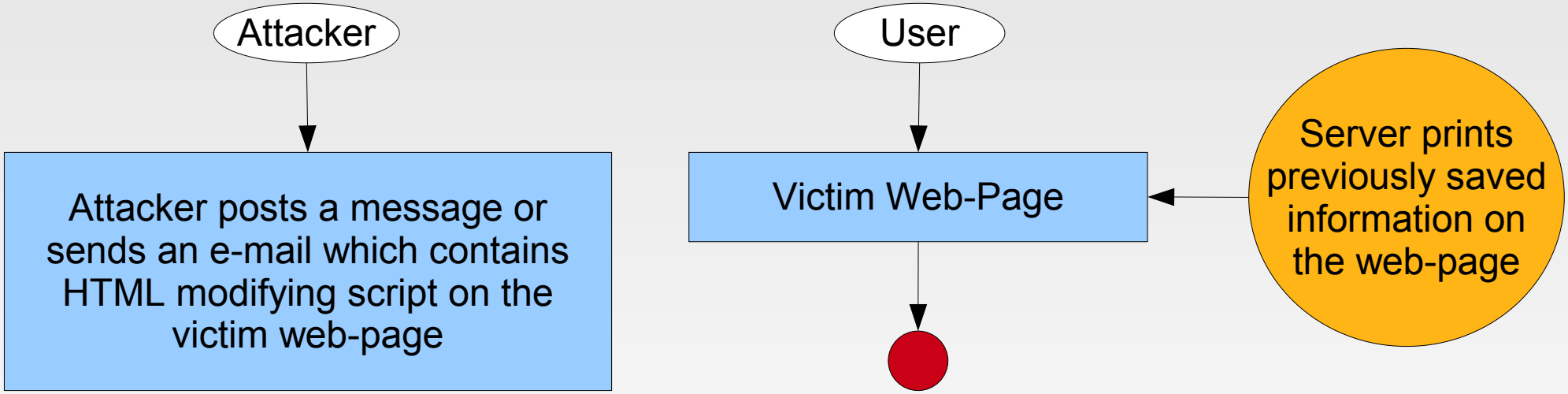
Type 2: Persistent

Persistent XSS is a kind of attack which uses the fact that a web-application allows storing user-provided data on the server without a strong validation and viewed later.



Scope: May directly affect all users visiting victim's site containing attacker's post
Example: Common in online e-mail systems and message boards, e.g. Microsoft's Hotmail e-mail system would print JavaScript stored in an e-mail message.
Fix: Stronger content filtering

Questions?

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