Towards Measuring and Mitigating Social Engineering Software Download Attacks

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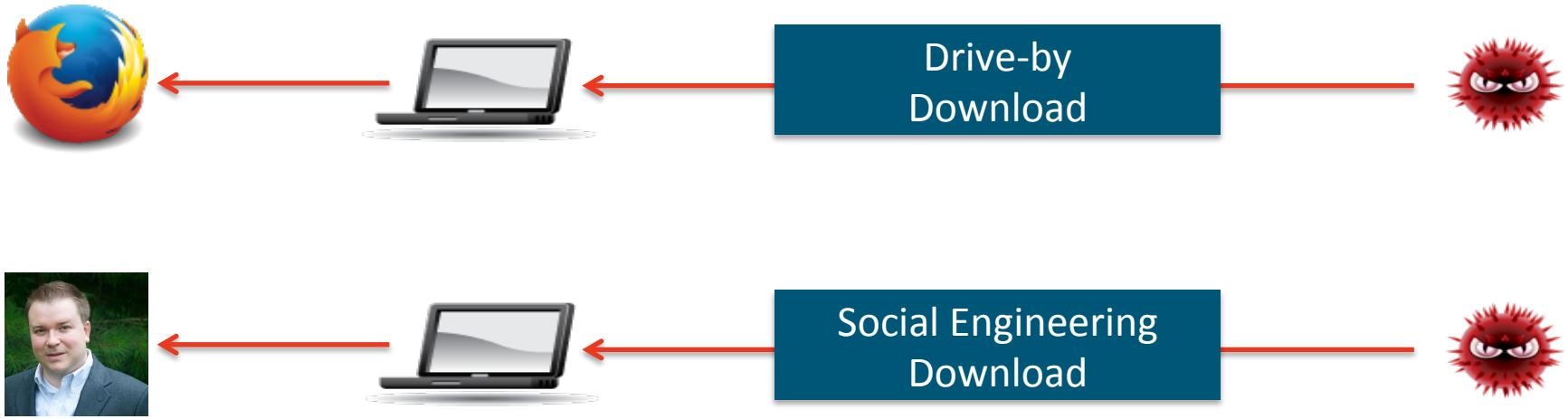
How Modern Malware Infections Occur



Study of Web-Based Social Engineering Downloads

- Data collection on a large academic network for two months.
- Real-time deep packet inspection of network traffic.
- Maintain a data buffer of all recent HTTP transactions.
- On executable download record all web traffic from client.

Study of Web-Based Social Engineering Downloads

- Collected a total of 35,638 downloads
- 2,004 real world successful SE downloads
- Full web path reconstruction
- Extensive manual analysis

Outline

- Categorizing SE Download Tactics
- Measuring SE Download Properties
- Detecting SE Download Attacks

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- Categorizing SE Download Tactics
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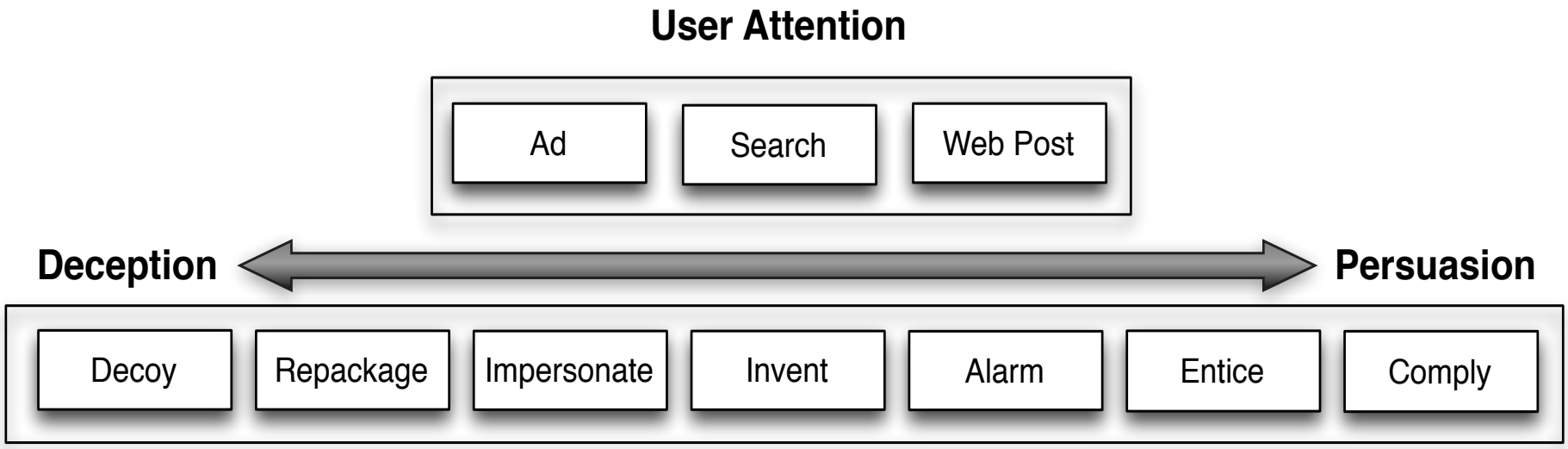
- Detecting SE Download Attacks

SE Download Categorization



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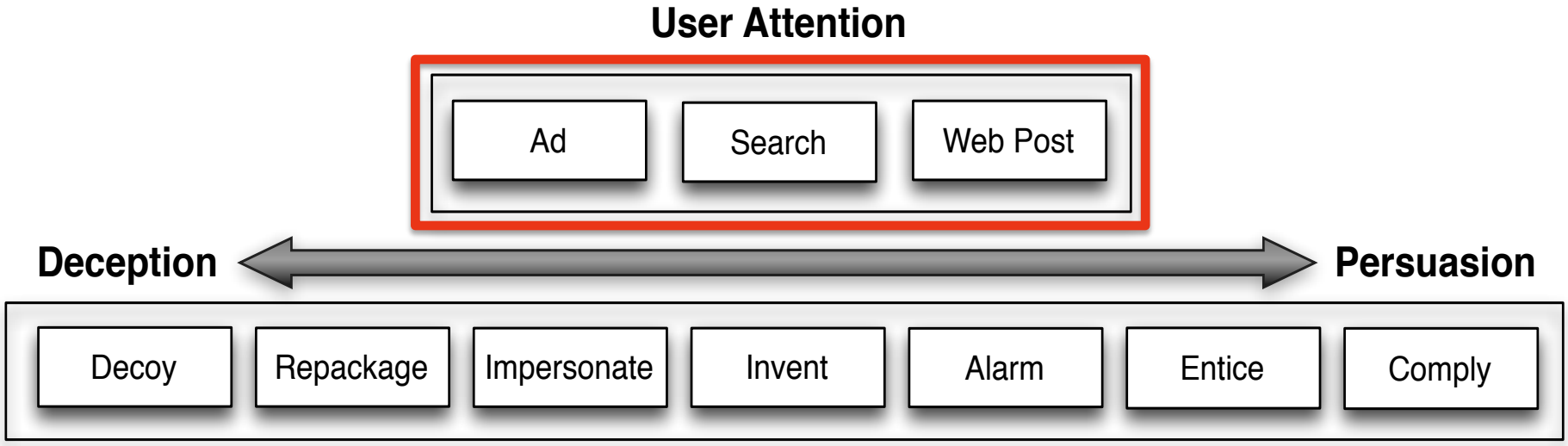

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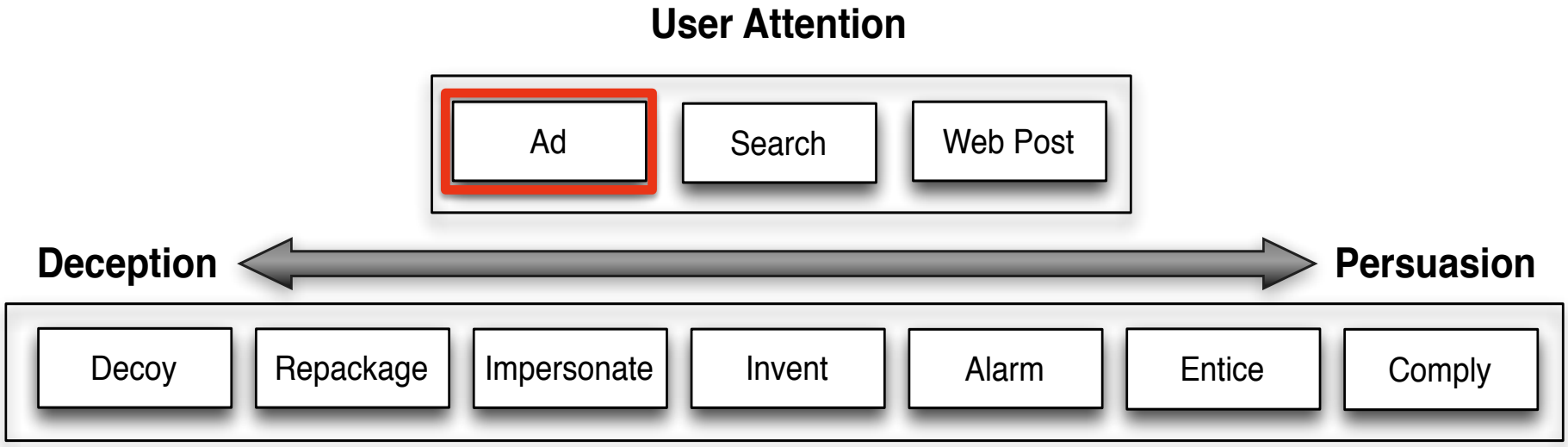

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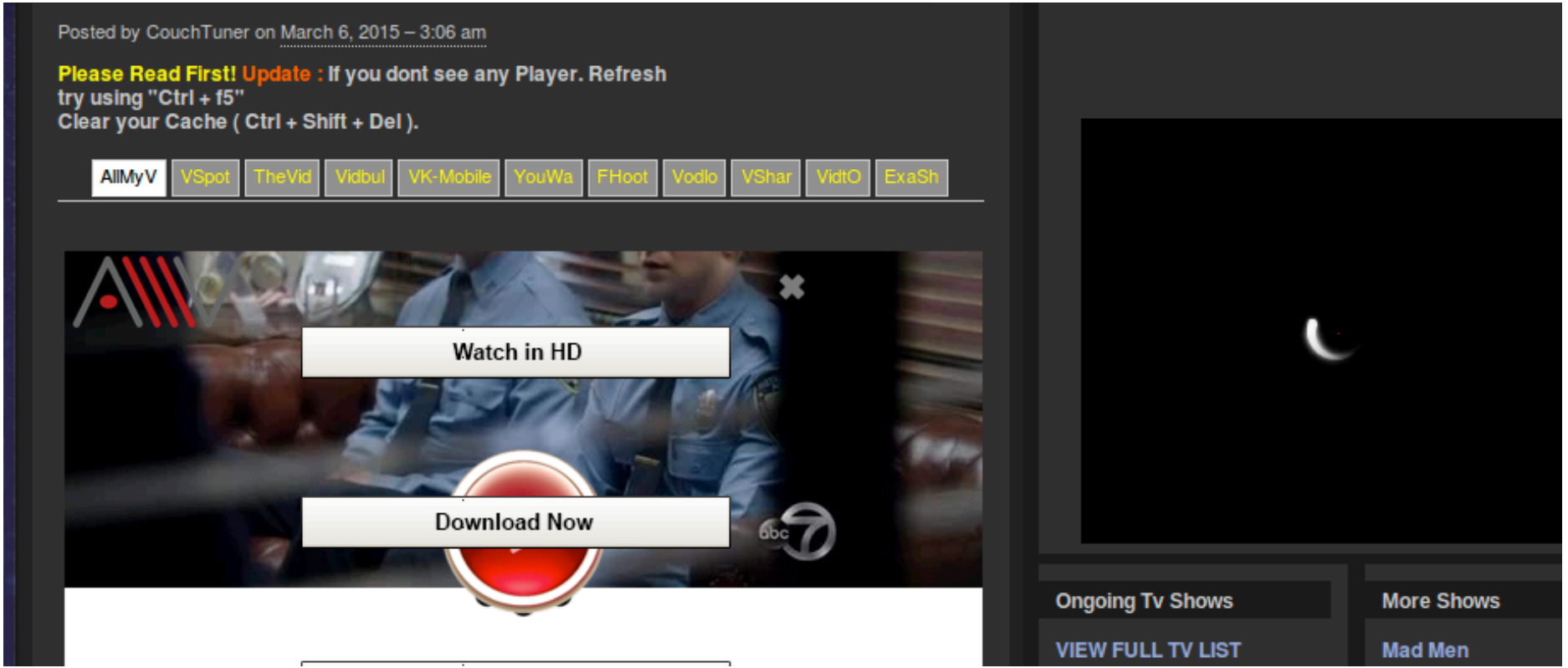

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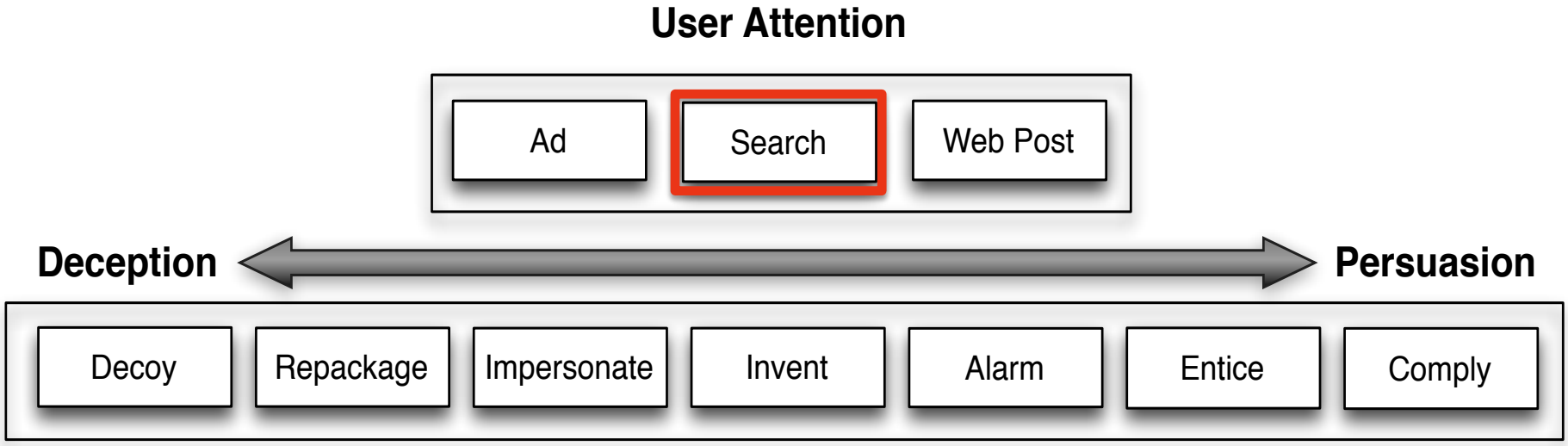

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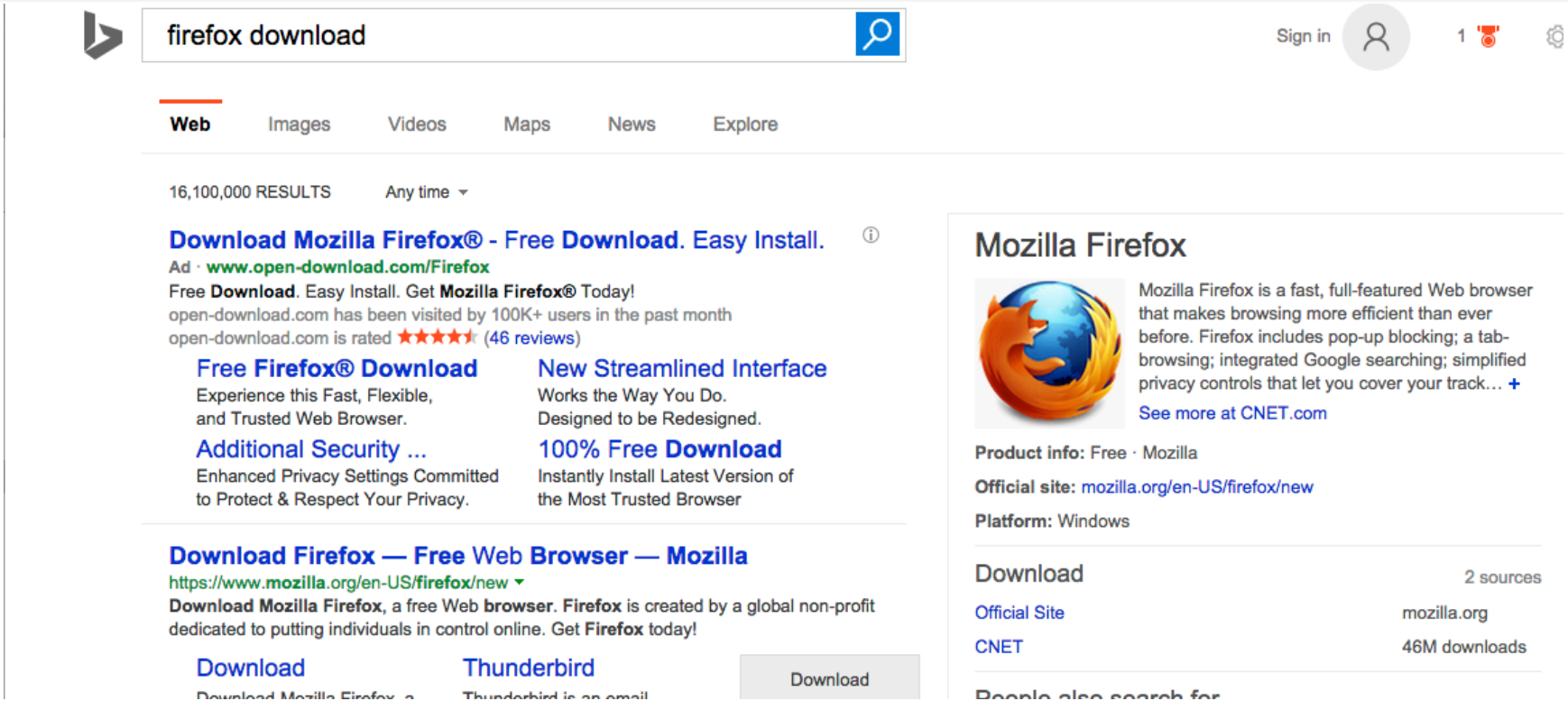
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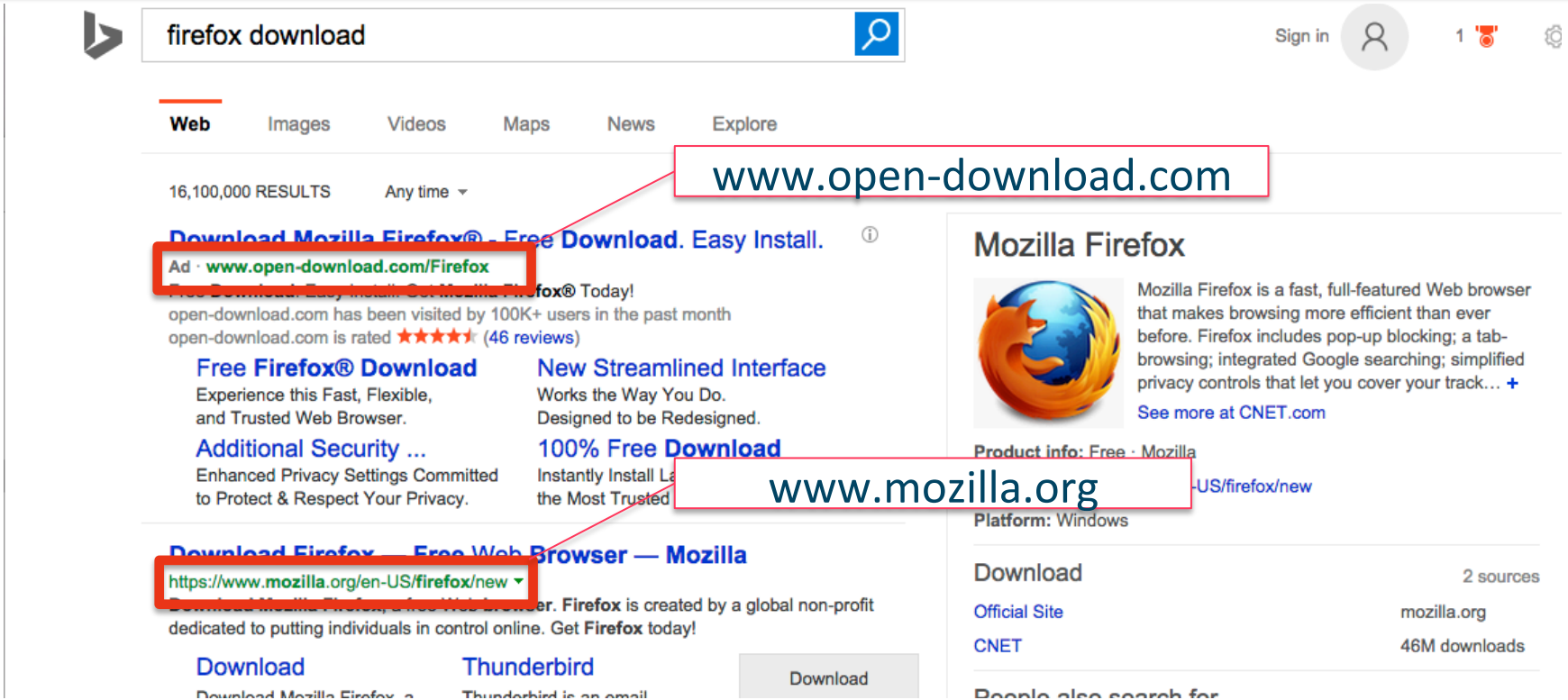
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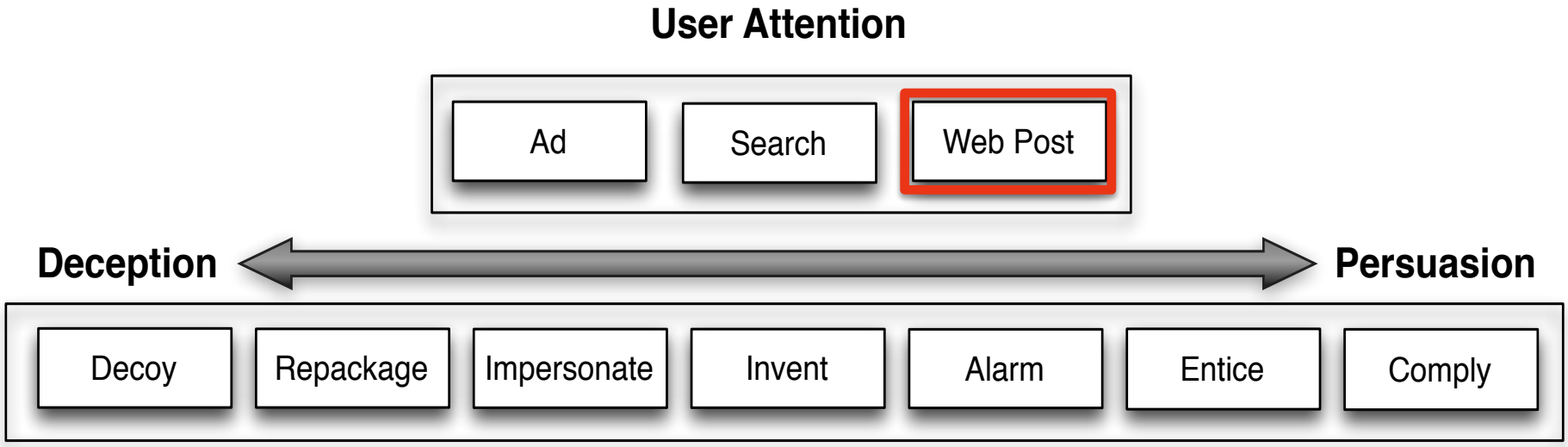

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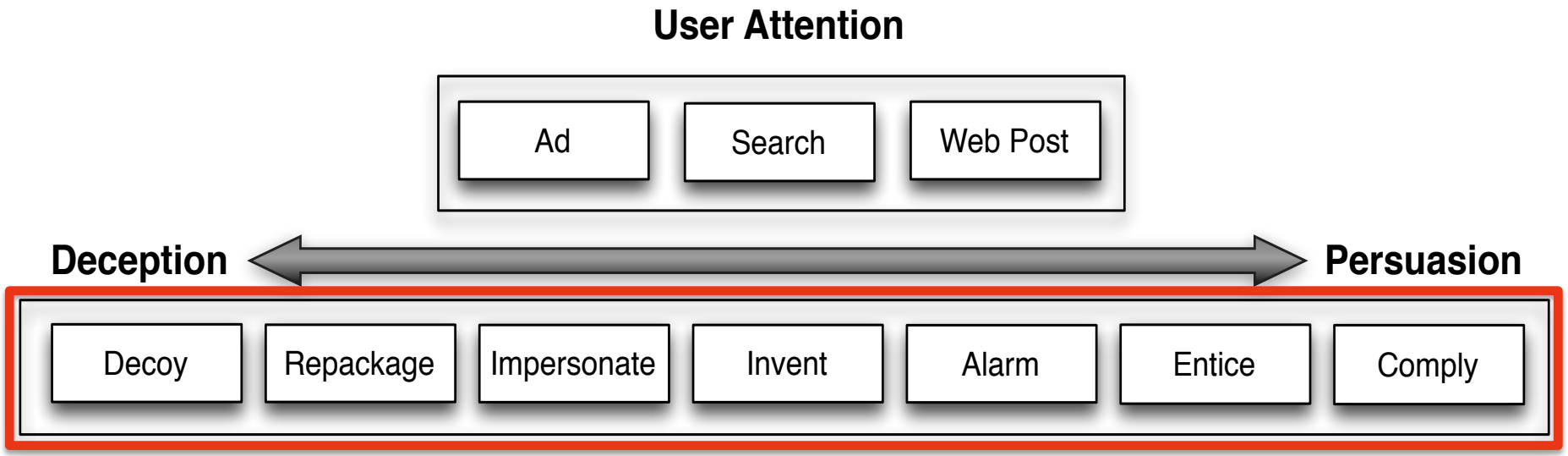

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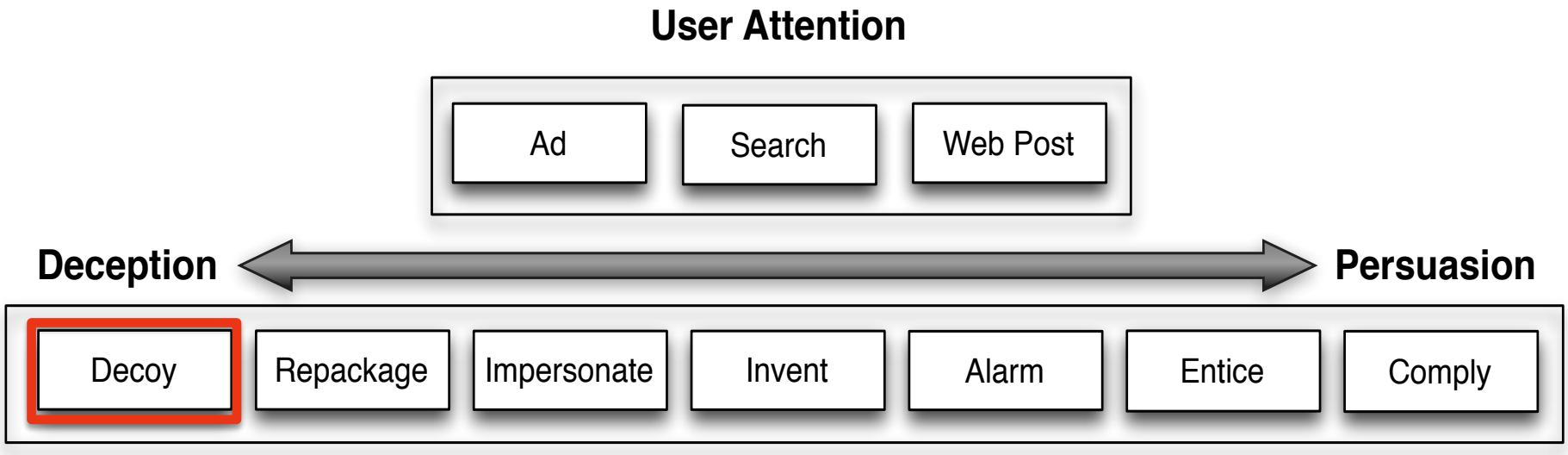
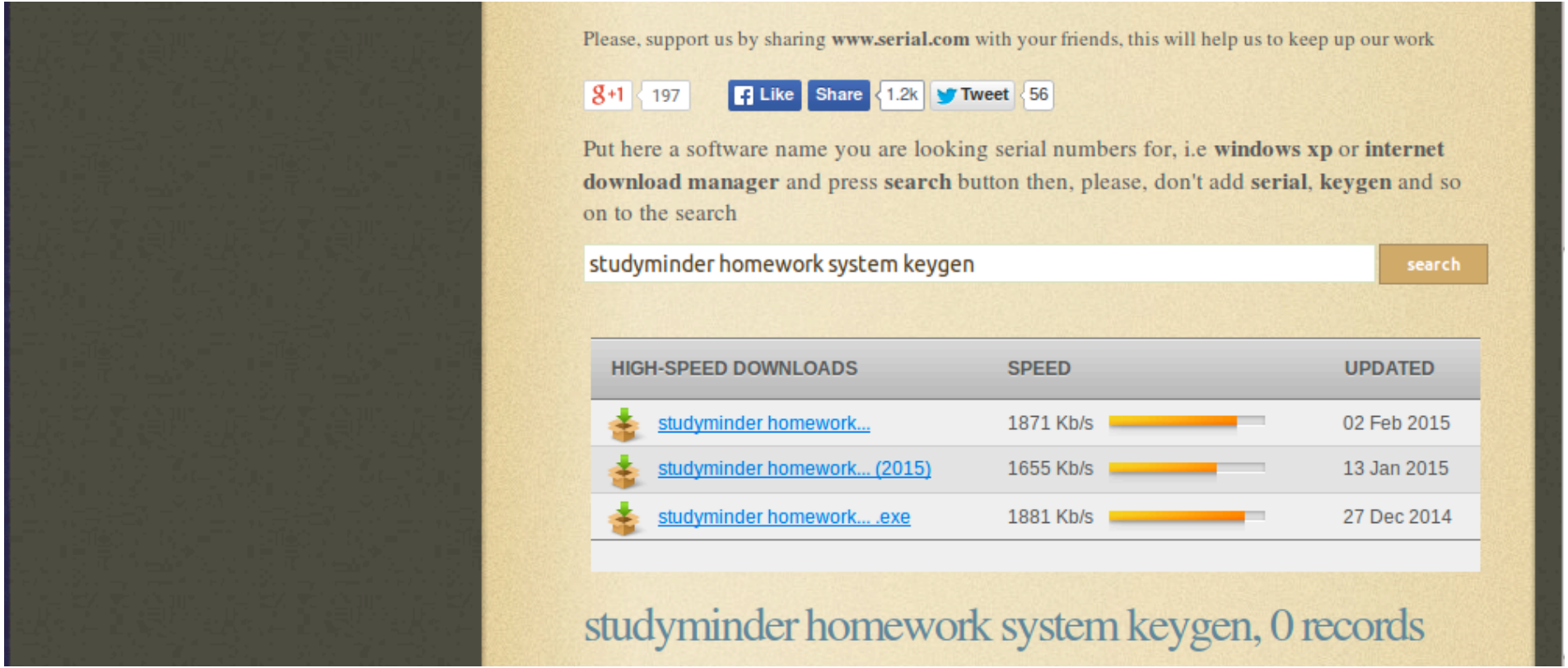


Decoy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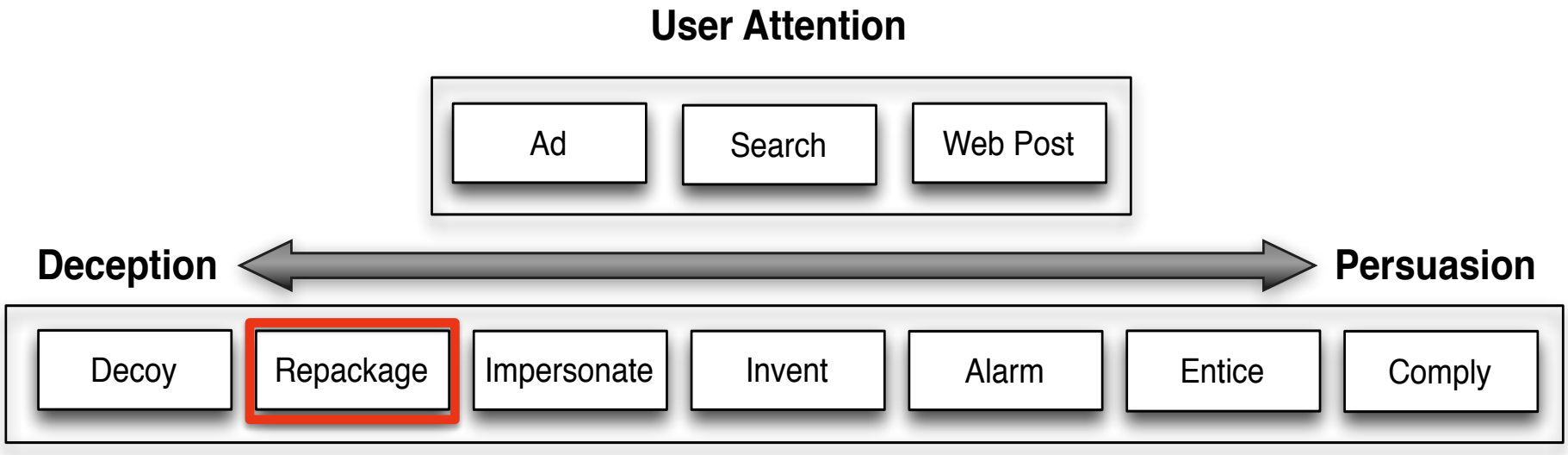

Repackage

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Rating:	★★★★☆
Version:	29.0.1
Price:	Free
Compatibility:	Windows XP, Windows Vista, Windows 7, Windows 8

Firefox Overview

Firefox Review

Firefox jumped into the browser wars 11 years ago, managing to offer a cleaner and faster alternative to Internet Explorer. Mozilla, the creators of Firefox, seemed to slow down after a few years though, and their browser market share dropped significantly. Now that there are 3 leading competitors in the web browser market, Mozilla has a lot of work they need to do if they want to stay or improve upon their current 25% browser usage.With Firefox version 29.0.1, Mozilla has released hundreds of improvements for their flagship browser software. The desktop version of the browser has seen a new and updated interface for its 29th iteration, and the new interface works really well. The standard design has been cleaned up significantly. Customization is the most important new feature that Mozilla wants people to know about. The menu now features a grid with 3 columns of icons instead of a vertical list of text buttons. This menu holds the options, history, print, and all other standard browser tools. It also can contain add-ons downloaded from Mozilla's download center. These options and add-ons can be rearranged in the order the user wants the buttons to appear. Buttons that the user doesn't want can be removed entirely from the menu. If this is done though, Mozilla did not leave a button to see all of the menu items. The only way to access that application or option again would be to add it to the menu first and then launch it. Additional new features in Firefox 29.0.1 include improved Firefox Sync, allowing browser history, tabs, passwords, bookmarks, and preferences. Syncing is done by either creating a Mozilla account or by pairing up

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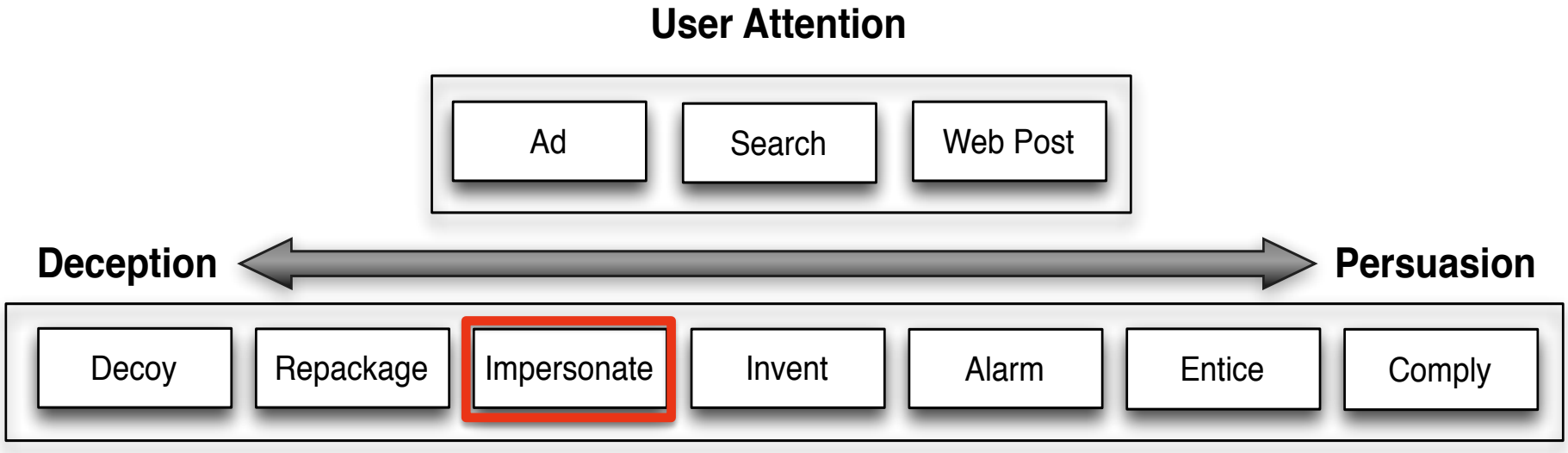

Impersonate

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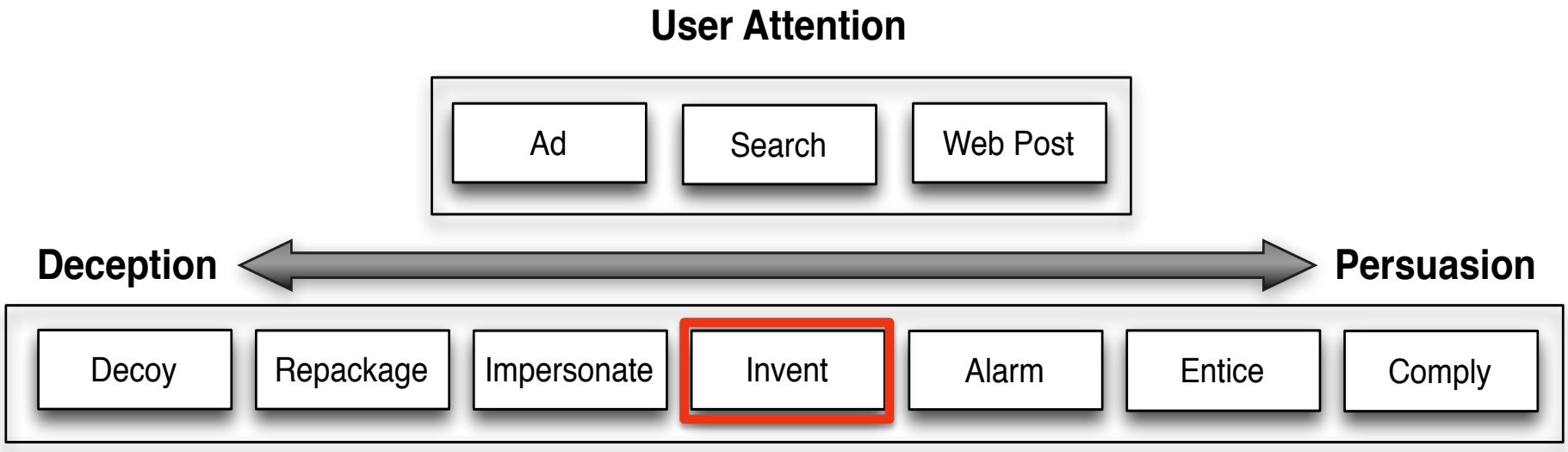
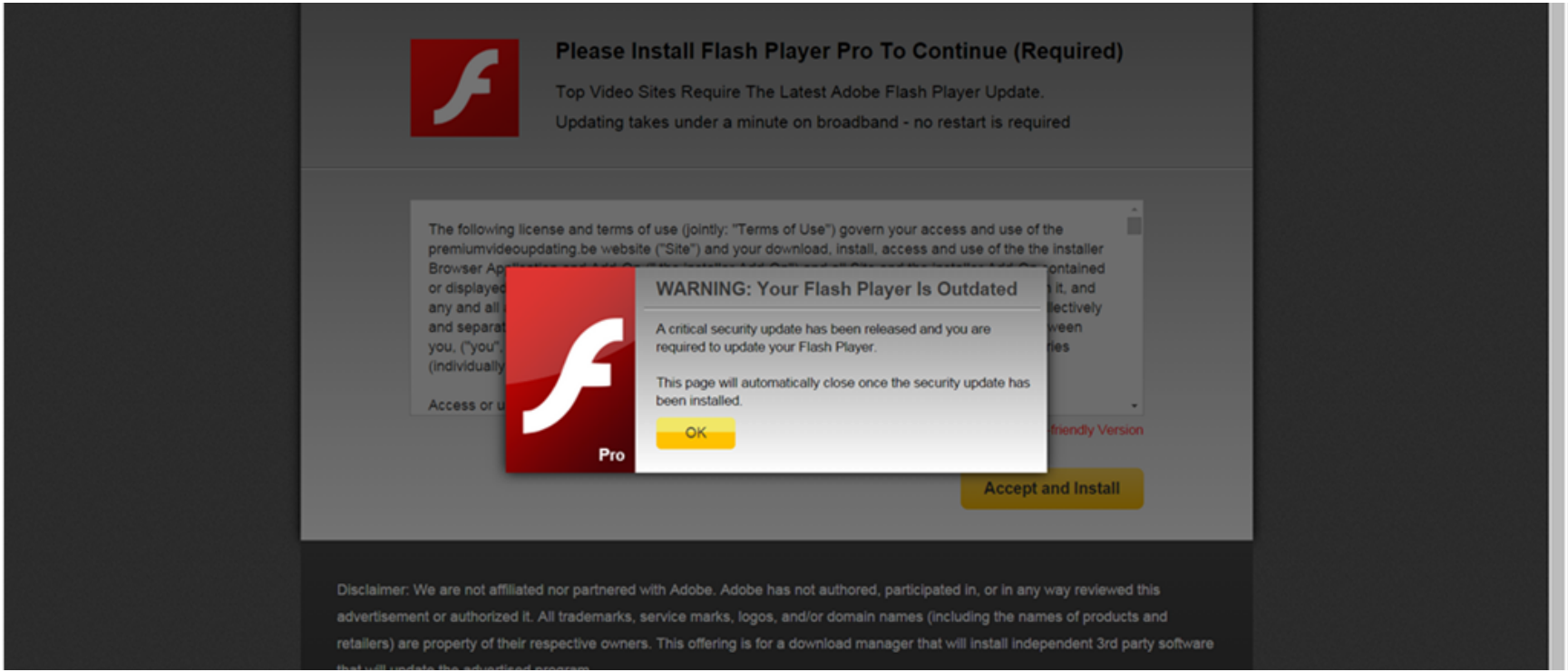


Invent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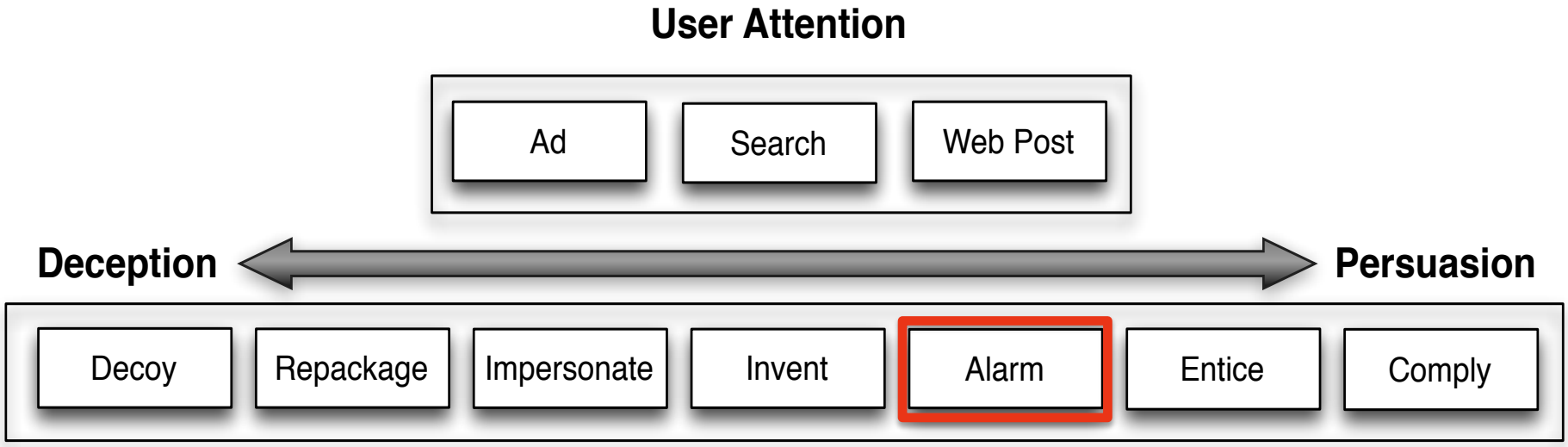

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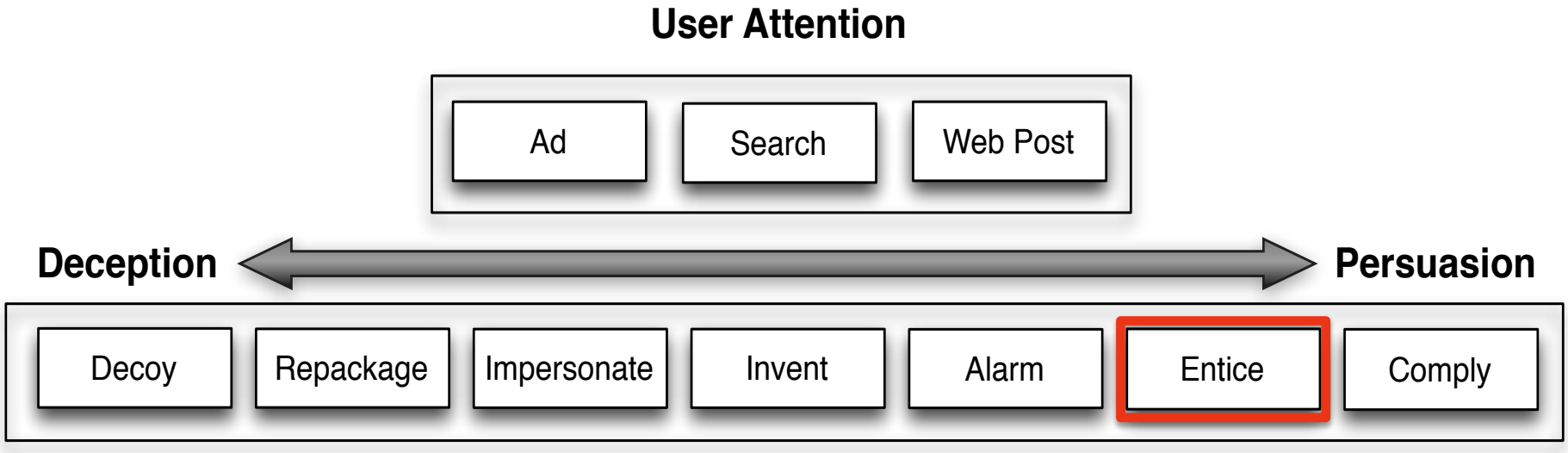

Entice

Info

download the latest minecraft x-ray mod 1.8 / 1.8.1 .This mod is nice and useful to players who have difficult time of cave hunting or are for endless minecraft diamond search.I is easy to use and simple as 1.2.3. to install. I could say some of the features would be that you can customize almost everything you can chose what block can be hidden or whit what key you can enable x-ray mod.As well you can use it too find players, mobs , mob spawns and a lot more.
==========

Default Key bind

X toggles X Ray
R toggles Red stone finder
C toggles Cave finder
B toggles Fullbright
J toggles Coordinates

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Download

Minecraft x-ray mod 1.8 / 1.8.1

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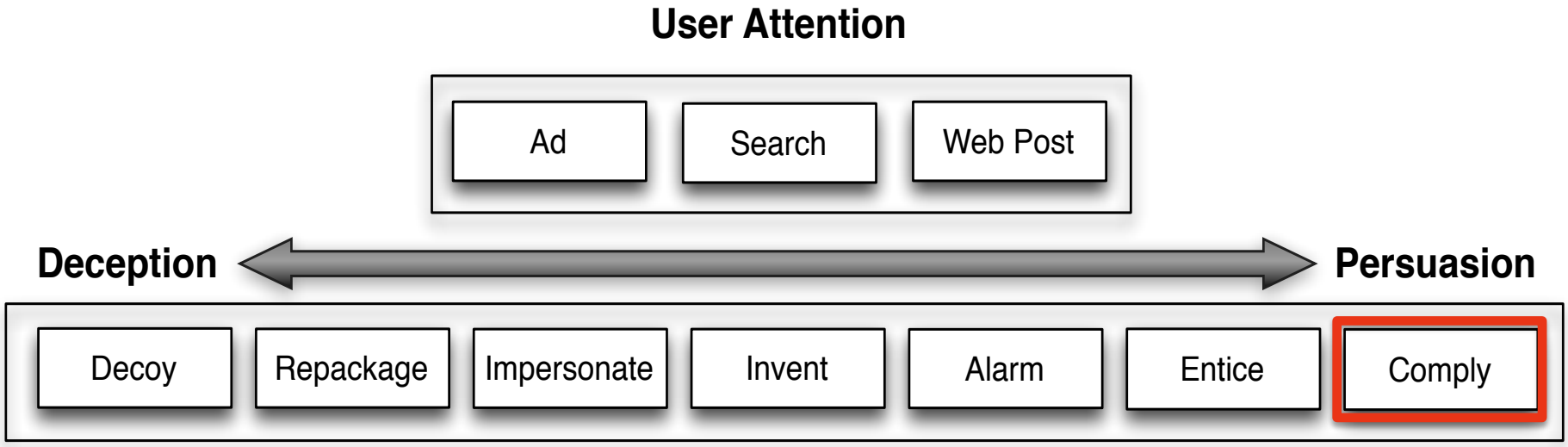

Comply


Install Media Downloader
in order to watch videos (required)
• Watch HD videos online
• Enhanced video and audio files support
• Supports multi video formats and resolution
• Supports FLV/Flash
See details User license Agreement
Installing takes under a minute - No restart is required

Outline

- Categorizing SE Download Tactics
- Measuring SE Download Properties
- Detecting SE Download Attacks

Popularity of SE Tactics for Tricking the User

Trick	Total	Percentage
Repackage+Entice	972	48.5%
Invent+Impersonate+Alarm	434	21.7%
Invent+Impersonate+Comply	384	19.2%
Repackage+Decoy	155	7.7%
Impersonate+Decoy	46	2.3%
Impersonate+Entice+Decoy	12	0.6%
Invent+Comply	4	0.2%
Impersonate+Alarm	1	0.1%

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Top 3 Responsible for over 89%.

Repackage + Entice (48.5%)

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Version:	29.0.1
Price:	Free
Compatibility:	Windows XP, Windows Vista, Windows 7, Windows 8

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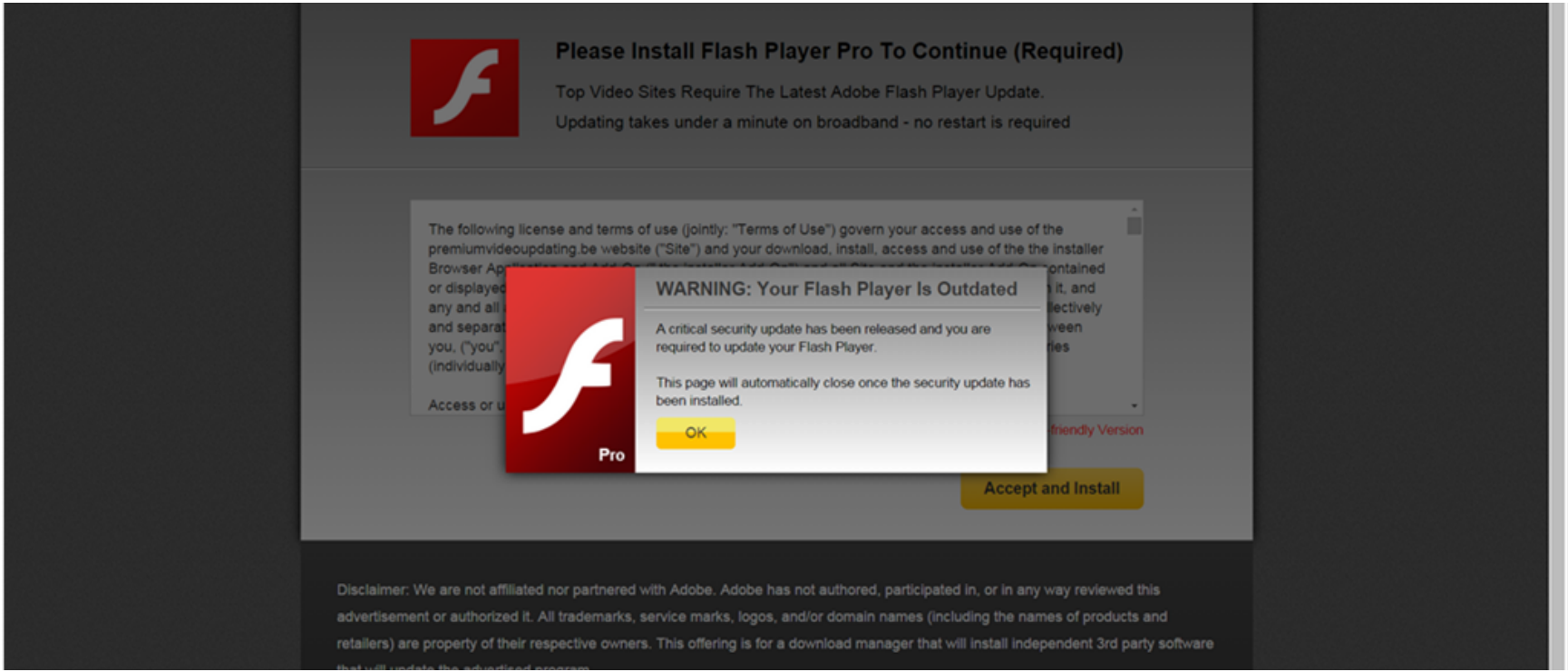
Invent + Impersonate + Alarm (21.7)



Invent + Impersonate + Comply (19.2%)

Invent + Impersonate Subclass (Tactics Popularity)

	Alarm	Comply
Fake Flash	68%	20%
Fake Java	30%	0%
Fake AV	1%	0%
Fake Browser	1%	0%
Fake Player	0%	80%

Popularity of SE Tactics for Gaining the User's Attention

User's Attention	Total	Percentage
Ad	1,616	80.6%
Search+Ad	146	7.3%
Search	127	6.3%
Web Post	115	5.7%

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Search+Ad	146	7.3%
Search	127	6.3%
Web Post	115	5.7%

Almost 88% used advertisements.

Benign Ad Based Downloads

- 7% of all benign downloads are ad-based.
- 40% chance that an ad-based download is benign.
- Trion Worlds is the most popular followed by Spotify.

Category	Percentage
Games	32%
Utilities	30%
Music	15%
Business	11%
Video	8%
Graphics	2%
Social	2%

Top 5 Ad Entry Point Domains

Comply	Alarm	Entice
26% onclickads.net	16% adcash.com	20% doubleclick.net
10% adcash.com	7% onclickads.net	16% google.com
10% popads.net	7% msn.com	12% googleadservices.com
7% putlocker.is	6% yesadsrv.com	11% msn.com
3% allmyvideos.net	4% yu0123456.com	8% coupons.com

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Comply	Alarm	Entice
26% onclickads.net	16% adcash.com	20% doubleclick.net
10% adcash.com	7% onclickads.net	16% google.com
10% popads.net	7% msn.com	12% googleadservices.com
7% putlocker.is	6% yesadsrv.com	11% msn.com
3% allmyvideos.net	4% yu0123456.com	8% coupons.com

Outline

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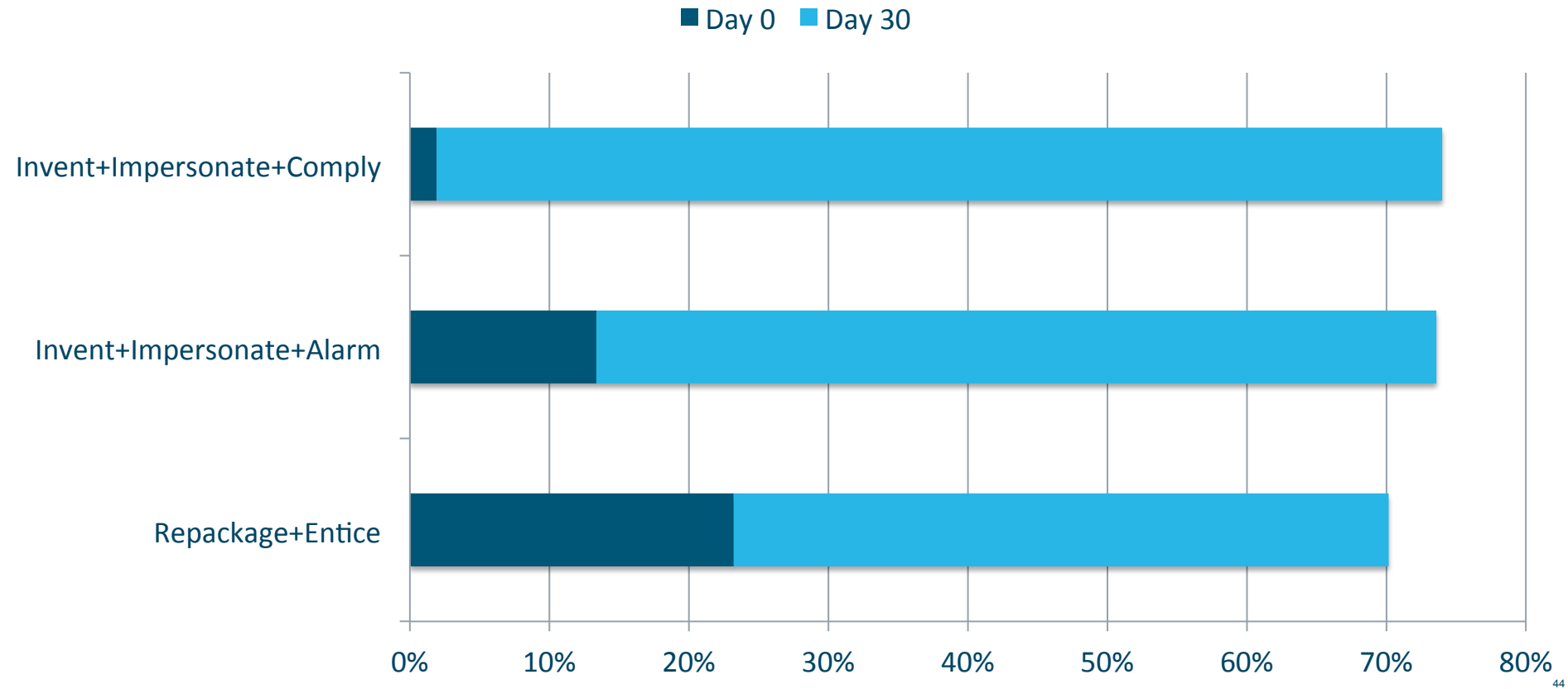
- Measuring SE Download Properties
- Detecting SE Download Attacks

AV Detection (Day 0 and Day 30)



Classifying Social Engineering Downloads

- **Ad Chain Features**
  - Ad-Driven
  - Minimum Ad Domain Age
  - Maximum Ad Domain Popularity
- **Download URL Features**
  - Download Domain Age
  - Download Domain Alexa Rank

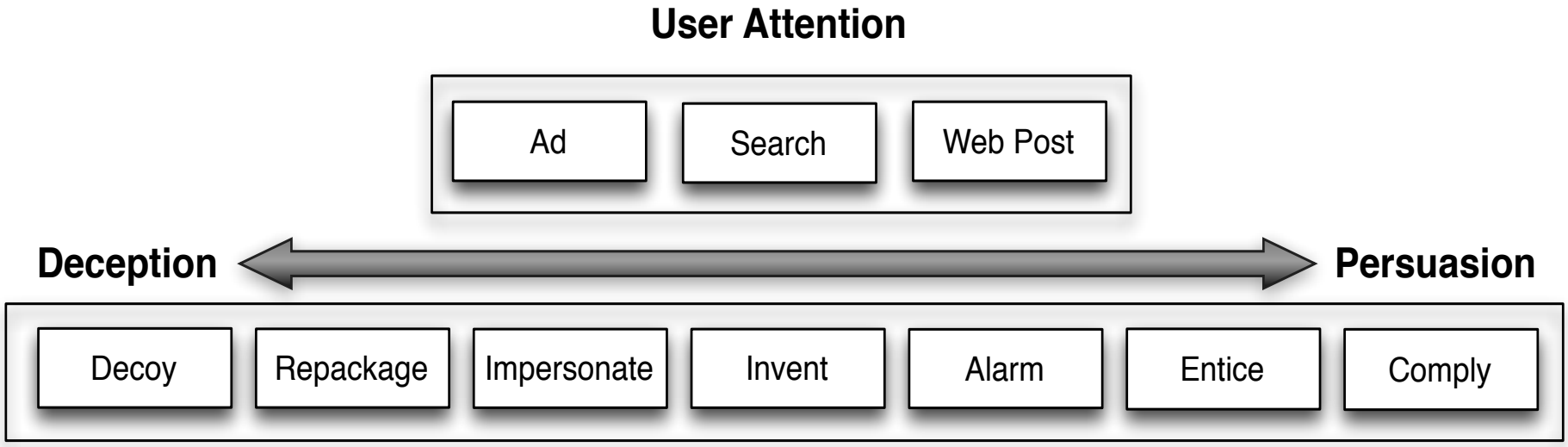
Classifying Social Engineering Downloads

	Predicted Class: Ad-Based SE	Predicted Class: Benign
Ad-Based SE	91.2%	8.8%
Benign	0.5%	99.5%

True Positive Rate

False Positive Rate

Conclusion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Ad
Search
Web Post
Deception
Persuasion
Decoy
Repackage
Impersonate
Invent
Alarm
Entice
Comply

Conclusion

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Comply	Alarm	Entice
26% onclickads.net	16% adcash.com	20% doubleclick.net
10% adcash.com	7% onclickads.net	16% google.com
10% popads.net	7% msn.com	12% googleadservices.com
7% putlocker.is	6% yesadsrv.com	11% msn.com
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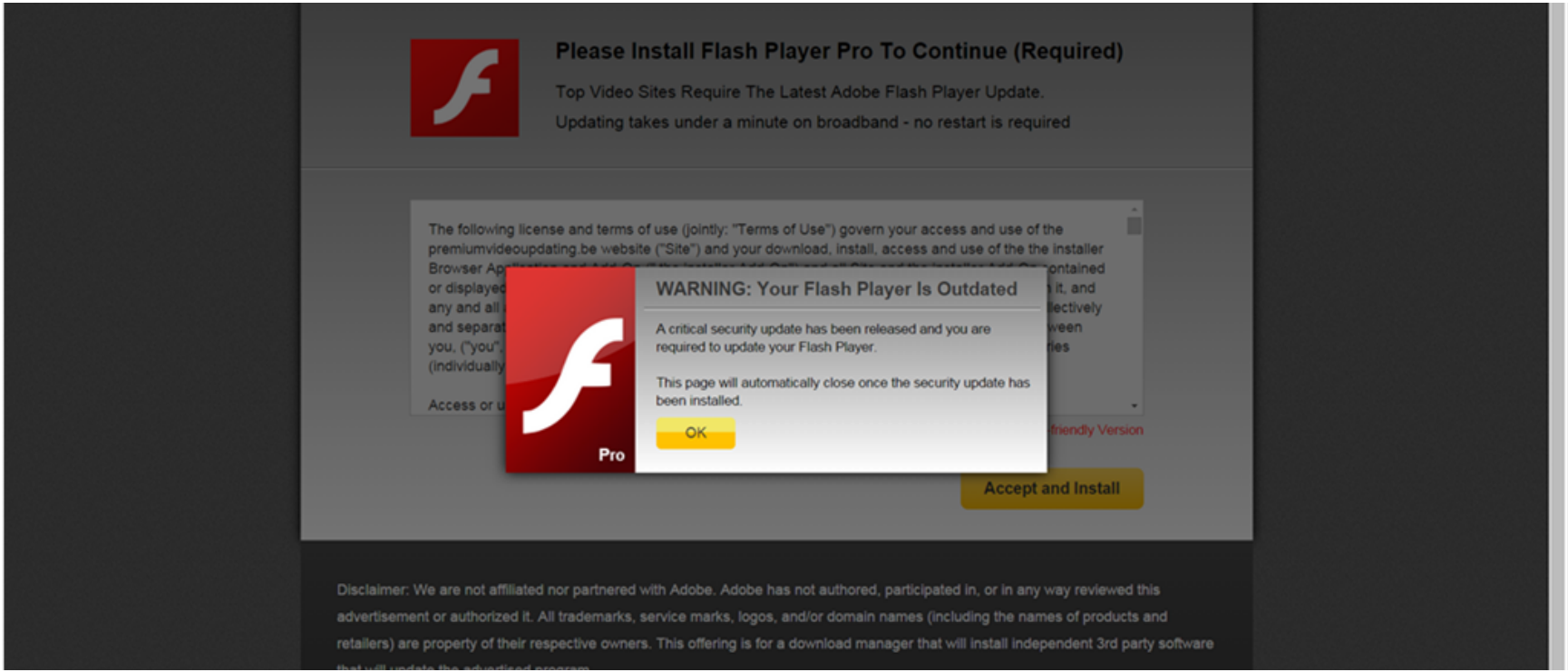
Conclusion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Questions?

Towards Measuring and Mitigating Social Engineering Software Download Attacks

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