22- Making Anonymity Tools Usable

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Usable Privacy and Security

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Today!

- General discussion of anonymity
- An introduction to Tor
- Attempts to help users achieve anonymity
- A design activity to communicate guarantees to users

Why is anonymity valuable?

Why do people criticize censorship?

Press censorship in practice

Techniques for censoring the Internet

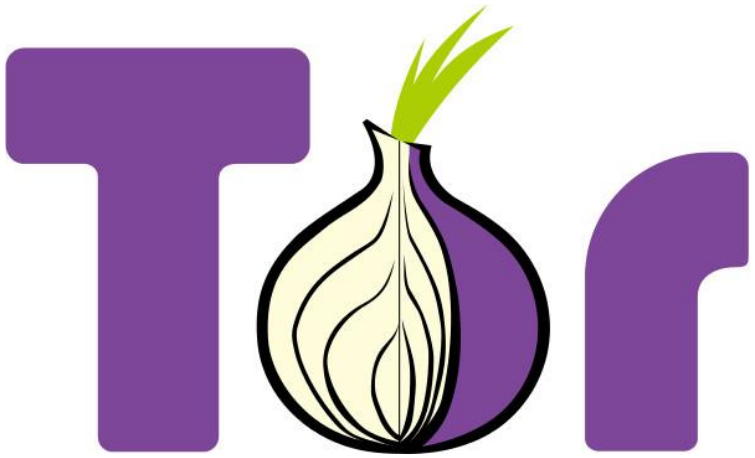
- Methods (see, e.g., Aryan et al. FOCI '13):
  - DNS hijacking / prefix hijacking
  - HTTP header (host and keyword) filtering
  - Connection throttling on SSH
  - Physical threats
  - Dropping HTTPS / TLS traffic
  - IP, Keyword, DNS poisoning
  - Deep packet inspection
  - Active probes against Tor bridges
  - Self-censorship (chilling effect)

Techniques for being anonymous

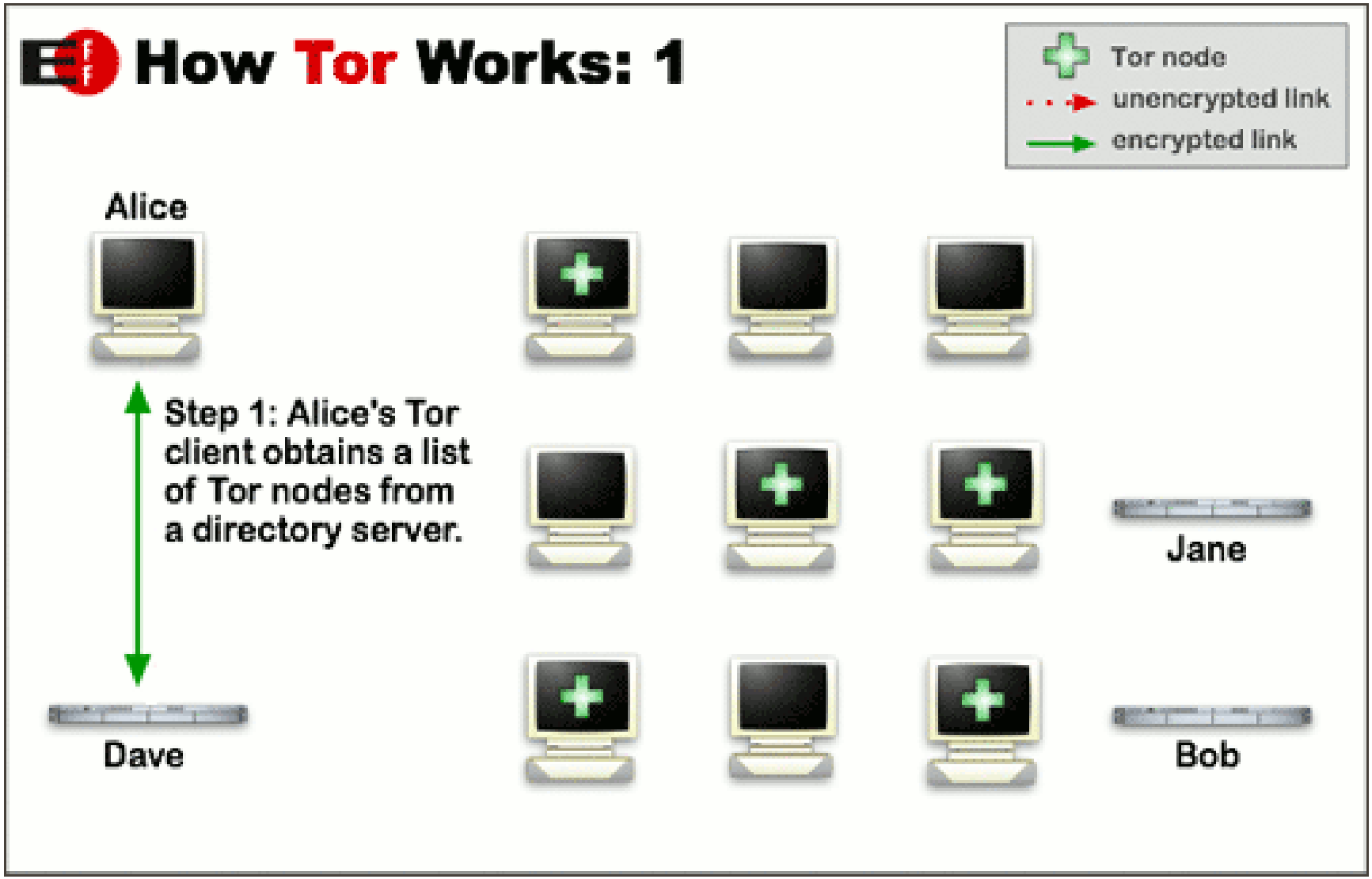
- Encrypt everything
- Use onion routing to communicate
- OTR messaging
- Don’t use services that track you

Overview of Tor

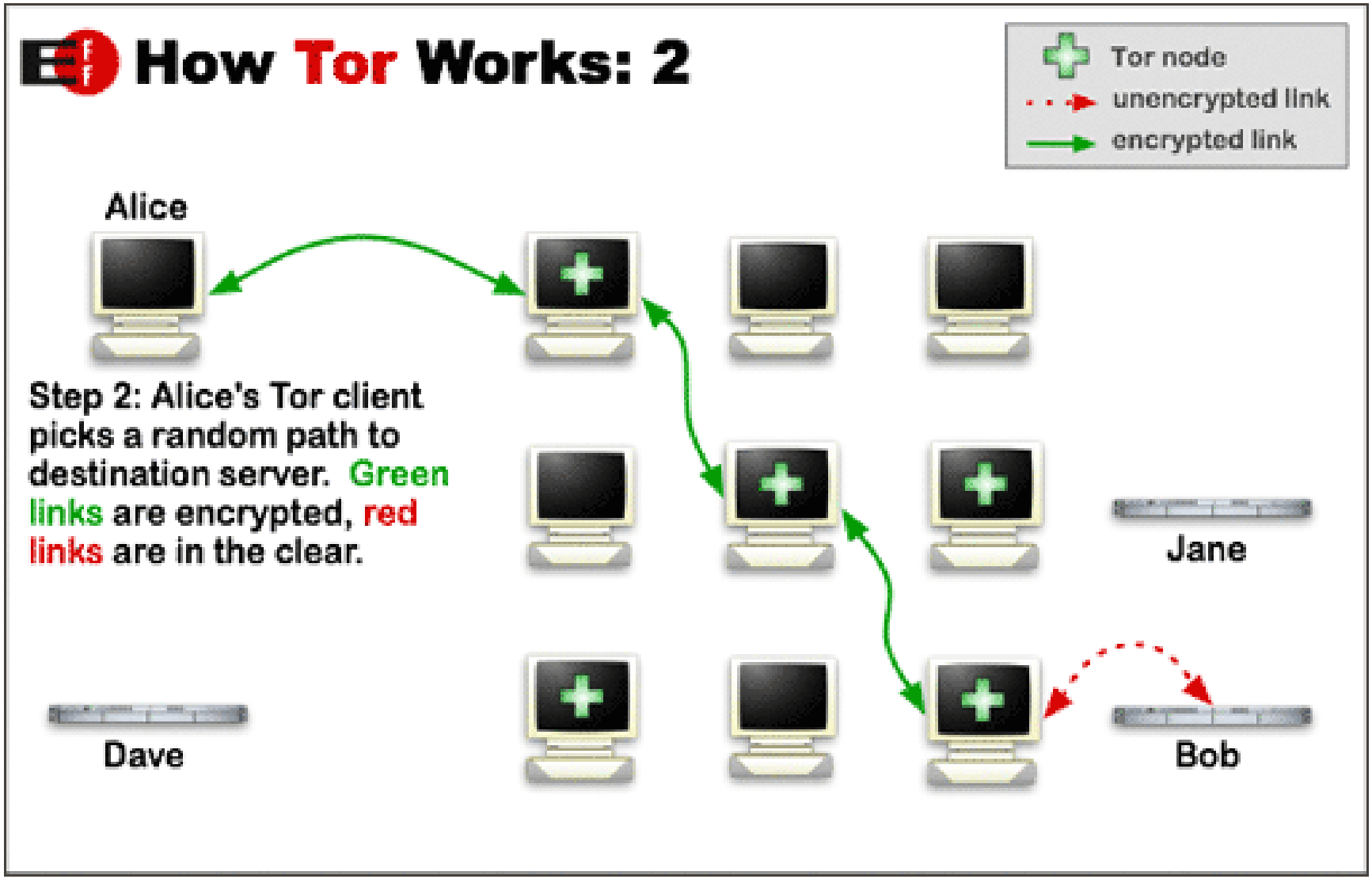
- The Onion Router (Tor)
  - Onion routing introduced by U.S. Naval Research Labs ~ 20 years ago
  - Dingledine, Matthewson, Syverson introduced Tor in a USENIX Security paper in ‘04



How Tor works (graphics from EFF)



How Tor works (graphics from EFF)



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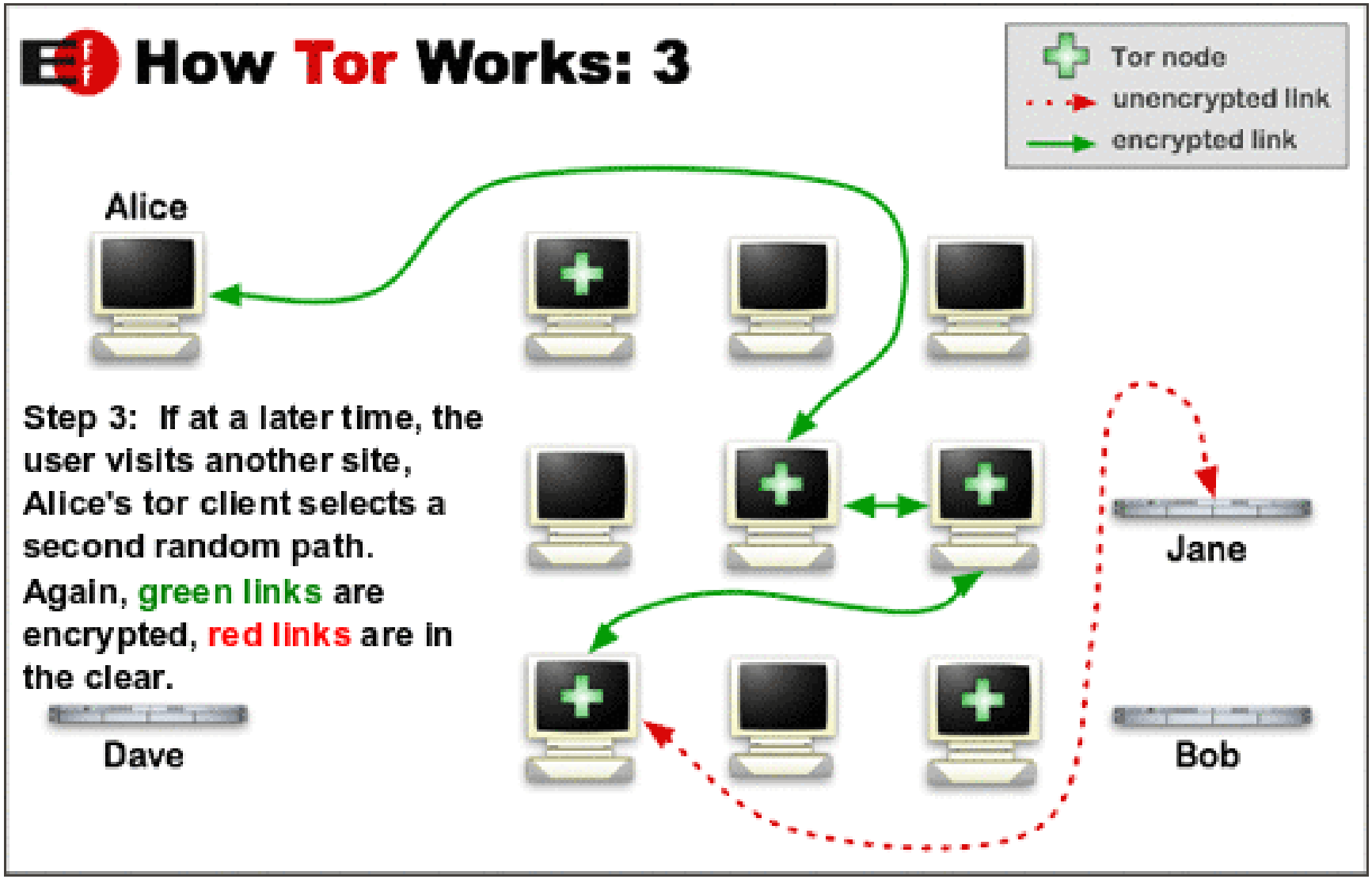

How Tor works

What does Tor protect against?

What does Tor NOT protect against?

Threats Against Tor

- Vulnerabilities in the protocol
- Vulnerabilities in the implementation
- Adversaries controlling large parts of the network and analyzing traffic/timing
- Vulnerabilities on the user's end
  - E.g., old version of Firefox
- Human error on the part of the user
- Not enough users! (no hiding in the crowd)

Making anonymity usable (example)

- Tor browser bundle
- TAILS (The Amnesic Incognito Live System)
- OTR (off-the-record) messaging tools

Why Johnny Can’t Blow the Whistle

- Identify stop-points in Tor Browser Bundle
- Highlight the security reason behind delays
- Combine Vidalia control window & browser
- Change icon
- Direct users to the right OS version

Design activity

- Imagine you have a friend, Rich, who is unfortunately poor in his ability to communicate anonymously
- Tell him everything he needs to know to browse the web anonymously and submit information to a whistleblower site
  - What should he be worried about?
  - What guarantees does he have?
- Deliverable: outline of your advice