Protecting your Privacy with FreeBSD and Tor

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Overview

- Who needs anonymity anyway?
- Anonymization concepts
- Tor
- FreeBSD
- What else to take care of?
- Demonstration
- Summary

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Who needs anonymity anyway?

- Journalists
- Informants, whistleblowers
- Dissidents (China, Myanmar...)
- Socially sensitive information (abuse, AIDS)
- Law enforcement (anonymous crime reporting, tips, surveillance...)
- Companies (research competition...)
- Military (covert operations...)

Who needs anonymity anyway?

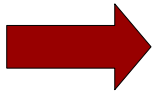
- You?
  - EU data retention directive
    - connection data gets stored for 6 – 24 months
    - phone, SMS, IP, e-mail, dial-in data
    - (finally we'll be safe from all those terrorists!)
  - which interests do you have?
  - who do you talk to?

Who needs anonymity anyway?

- Criminals
  - already do illegal stuff
  - no problem doing more illegal stuff to get anonymity
    - identity theft
    - renting bot-nets
    - creating bot-nets
    - cracking one of the thousands of insecure computers in the net

Who needs anonymity anyway?

- Very different groups
- All with the same goal



anonymity needs diversity

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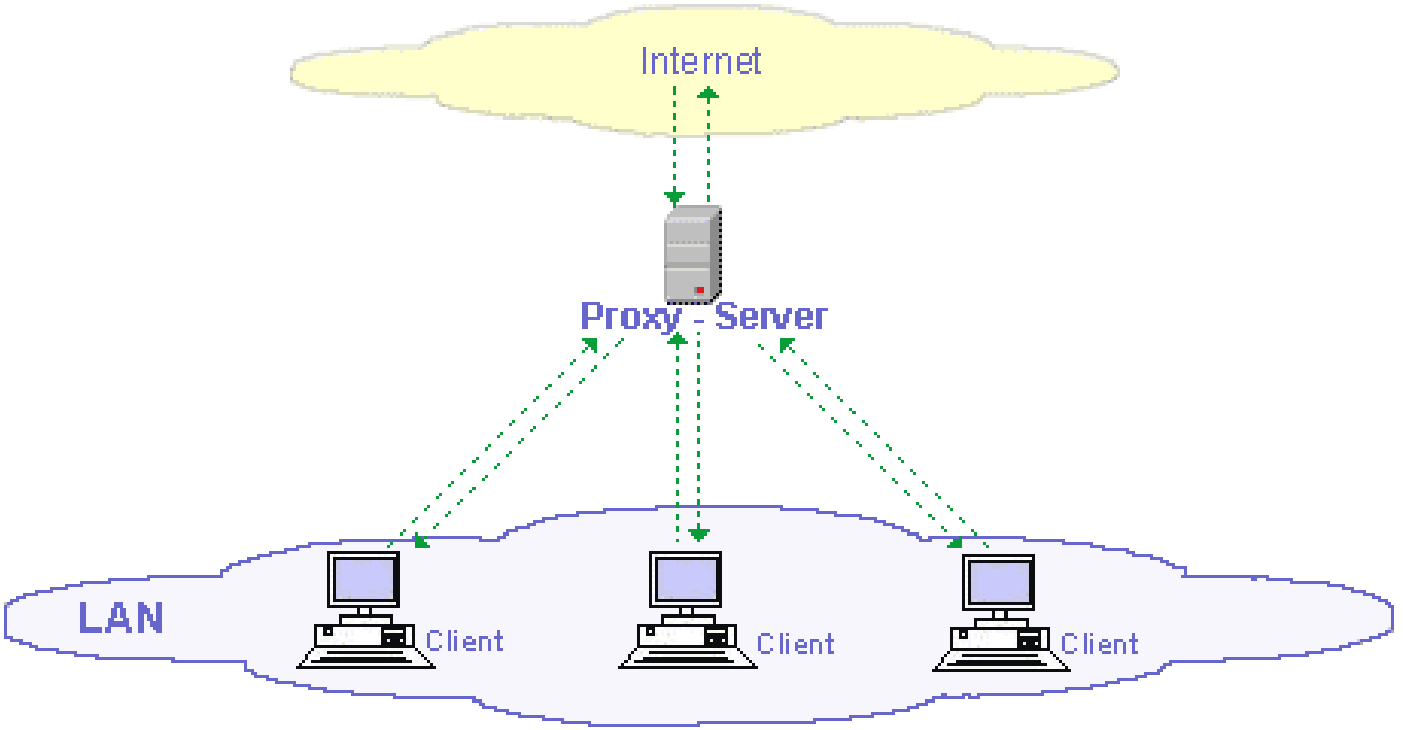
Anonymization concepts

- Proxy



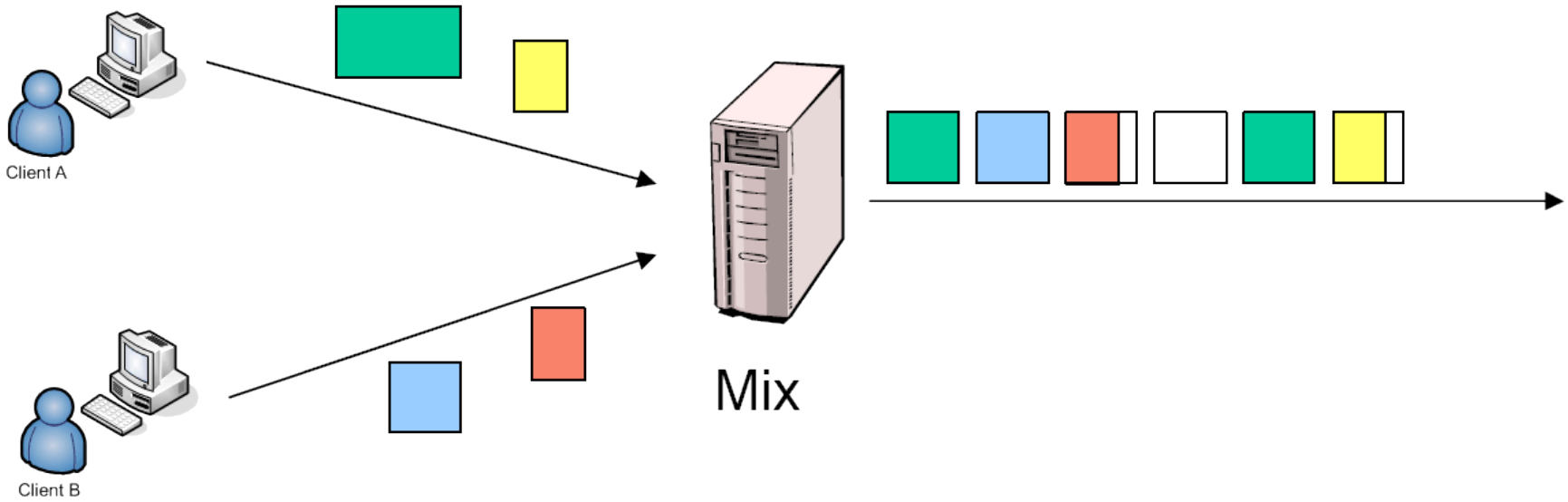
(Source: http://www.at-mix.de)

Anonymization concepts

- Proxy
  - fast
  - simple
  - single point of failure

Anonymization concepts

- Mix



(Source: http://www.tm.uka.de/itm)

Anonymization concepts

- Mix cascade

(Source: http://sarwiki.informatik.hu-berlin.de)

Anonymization concepts

- MIX cascade
  - slow
    - public key encryption
    - mixing
  - distributed trust
  - one MIX secure

     connection anonymous

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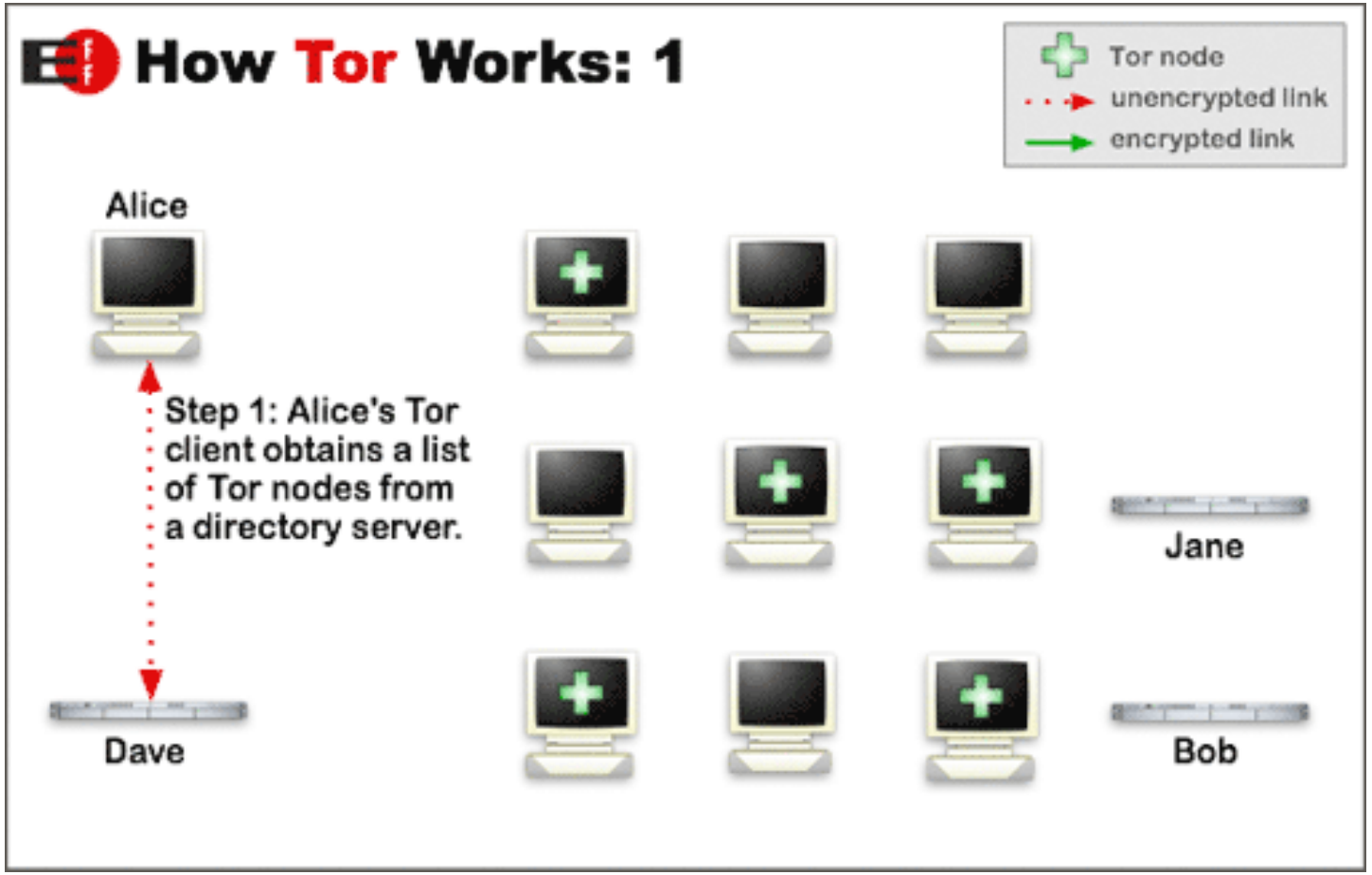
Tor

- The Onion Router
- Open source, BSD license
- TCP-overlay network
- Provides SOCKS interface
- Available on many platforms:
  - Windows, Linux, MacOS X
  - FreeBSD, OpenBSD, NetBSD
  - Solaris, other UNIX systems

Tor

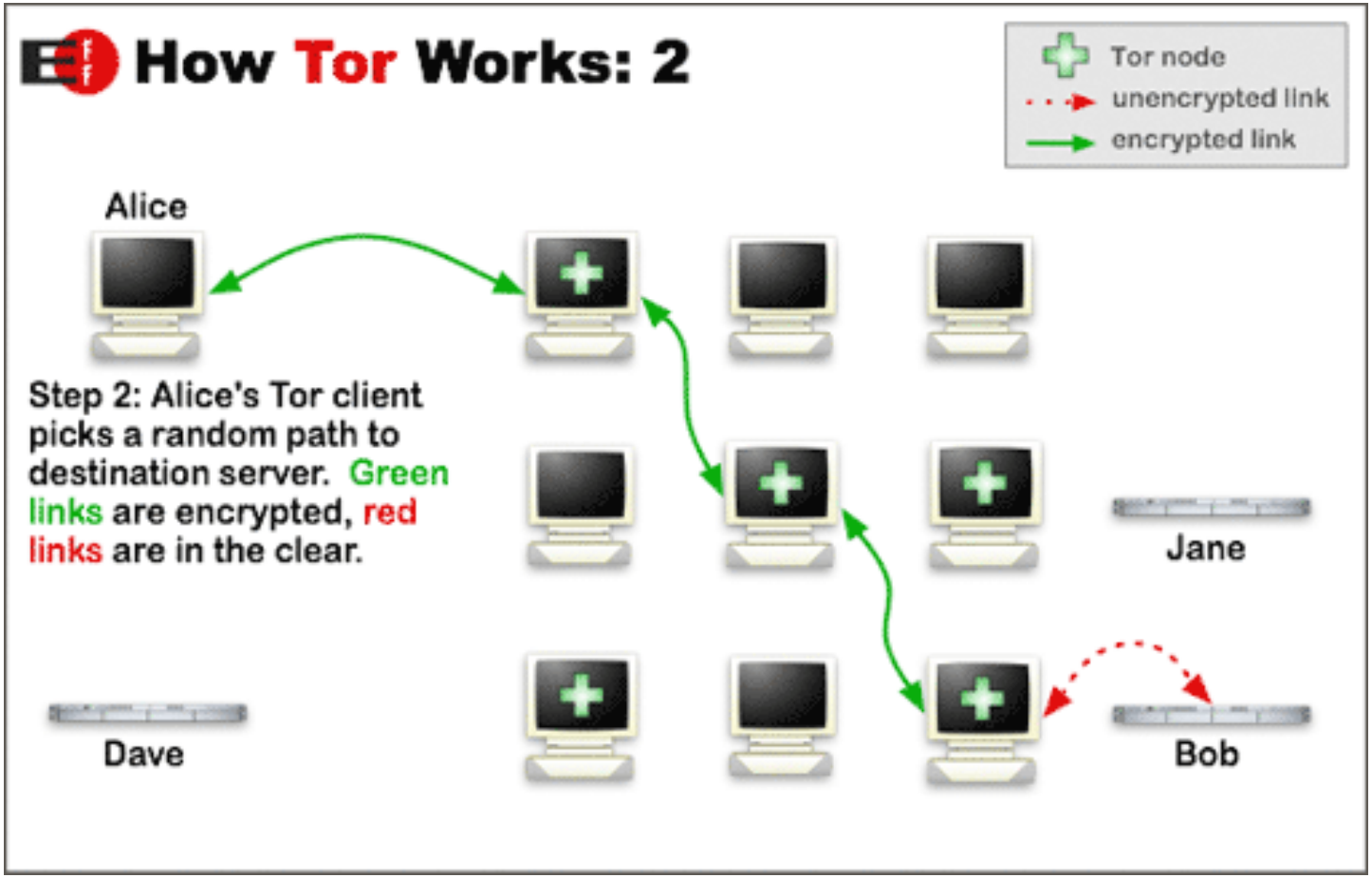
- Aims to combine positive attributes of proxies and mixes
  - speed (fast)
    - session keys
    - TCP multiplexing
  - distributed trust
- Design goals: deployability, usability, flexibility, simplicity

Tor



(Source: http://www.torproject.org)

Tor



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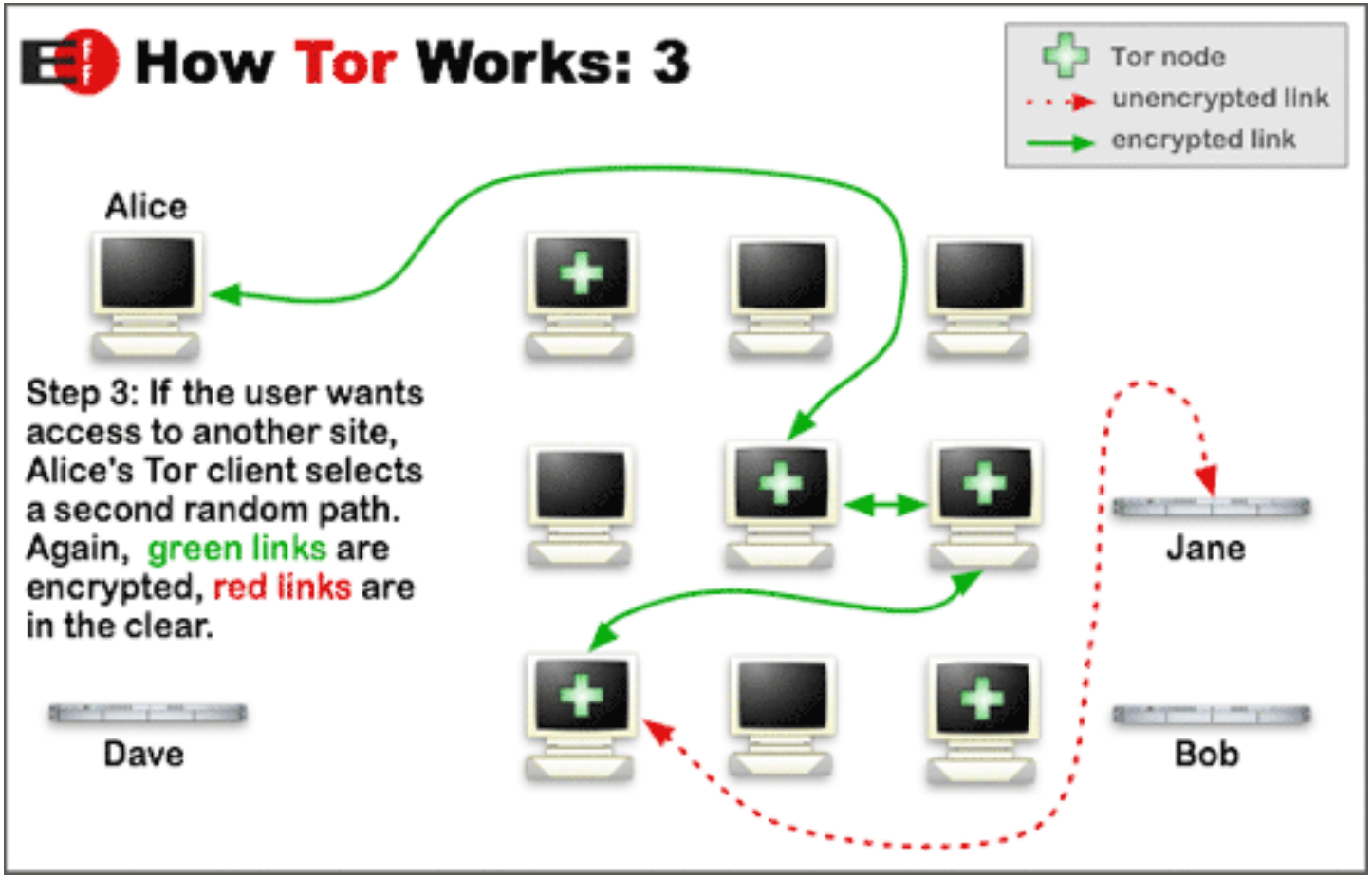


(Source: http://www.torproject.org)

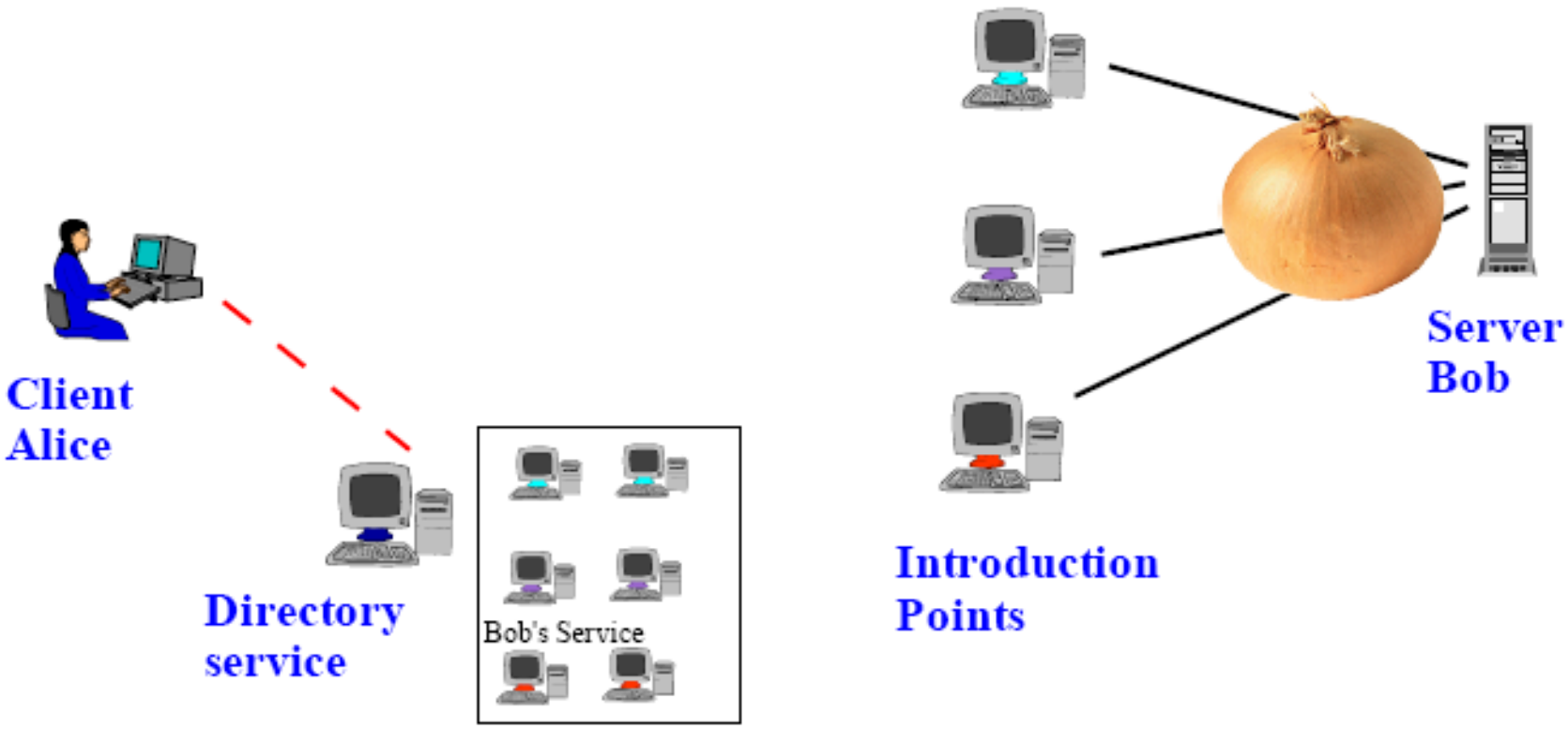
Tor

- Exit policies (for nodes)
  - control which TCP connections can exit your node
  - default policy blocks SMTP, NNTP and some others
  - allows the rest (HTTP, SSH...)
  - reject everything: middleman- or entry-node

Tor

- Hidden Services
  - Services with no published IP address
  - Cannot be physically found
  - Can be provided anywhere connection to Tor network is possible
  - Resist Denial of Service
  - Resist censorship
  - Addresses: `duskgytldkxiuqc6.onion`

Tor



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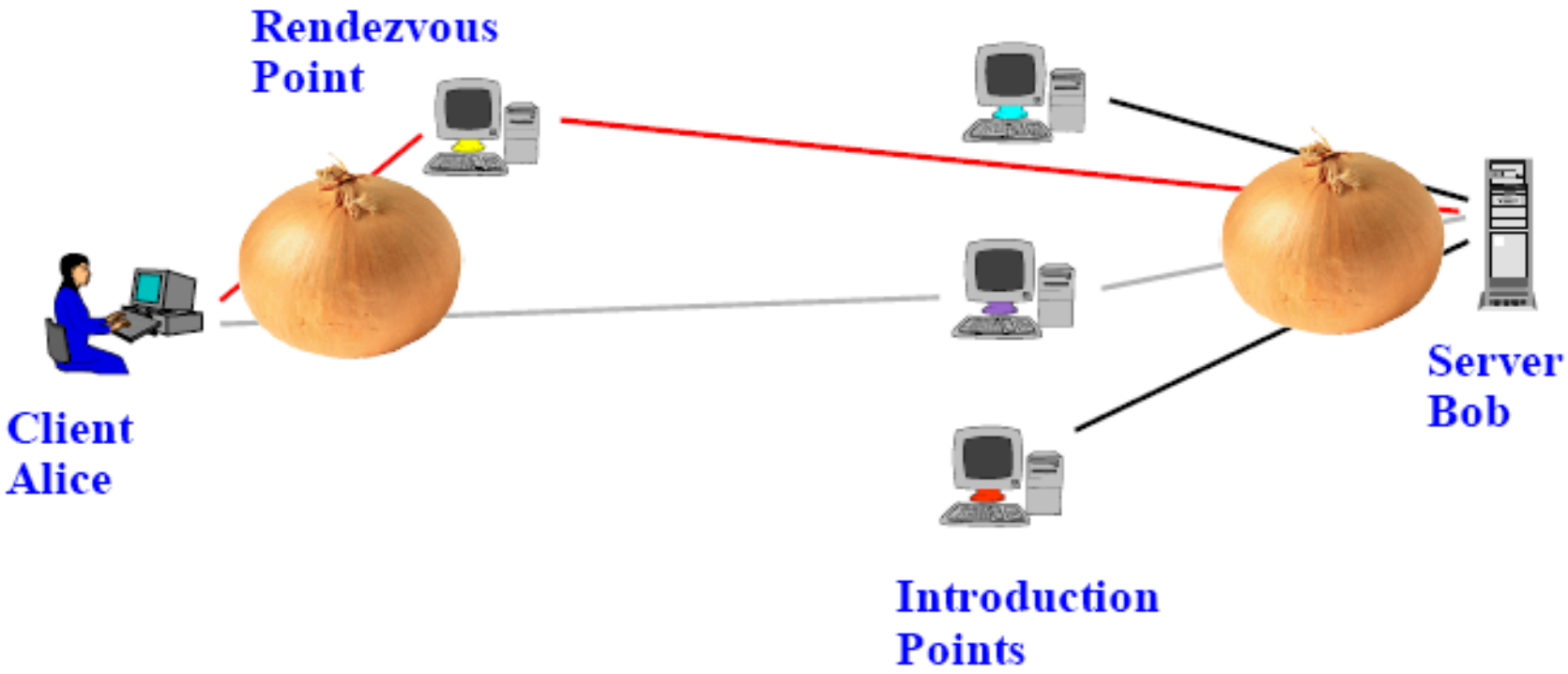

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Tor

- Legal issues
  - may be forbidden in some countries
  - crypto restrictions (Great Britain, “RIPA”)
  - special laws (Germany, “hacker paragraph”)
  - destination servers have Exit-Node IP in their logs
    - node operator has to answer if there is trouble
    - server may get ceized (happened before)
    - ...

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FreeBSD

- Well suited for Tor (node) operation
- Operational security
  - Jails (jail(8))
  - Disk/swap encryption (geli(8), gbde(4))
  - audit(4)
  - mac(4) framework
- Hardware crypto(4) acceleration
- Well maintained Tor-related ports

FreeBSD

- Important ports
  - security/tor
  - security/tor-devel
  - www/privoxy
  - net-mgmt/vidalia
  - security/trans-proxy-tor

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What else to take care of?

- Name resolution
  - Some applications bypass configured proxy (hi Firefox < version 1.5!)
- Cookies, web-bugs, referrer
  - Disable cookies/referrer or better use Privoxy
- Connection Exit-Node <-> Destination
  - Not encrypted! Use secure protocols
- Services that require registration
  - Tor cannot help you there

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- Tor useful for stealthy net usage
- Can be used to provide resilient services
- FreeBSD a very good choice as a platform

All this very much needed in light of recent laws etc

Tor website: http://www.torproject.org

Questions?

Thank you for your attention!