

The Onion Router

The inner and outer layers



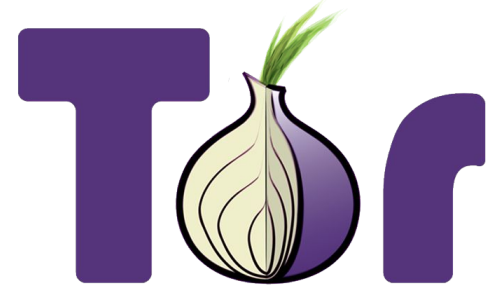
High Availability
Load Balancing
Web Scale
Security

made easy

Who I am?

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- ➔ Computer Science student at the University of Seville.
- ➔ Currently working at Zevenet.
- ➔ Tor Project contributor.
- ➔ Netfilter contributor.
- ➔ Privacy and free software advocate.



www.zevenet.com

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Little brief

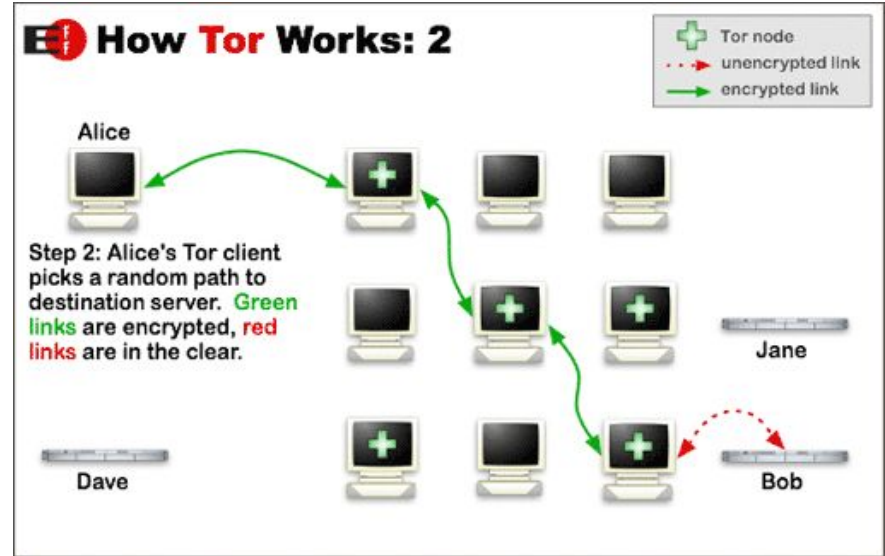
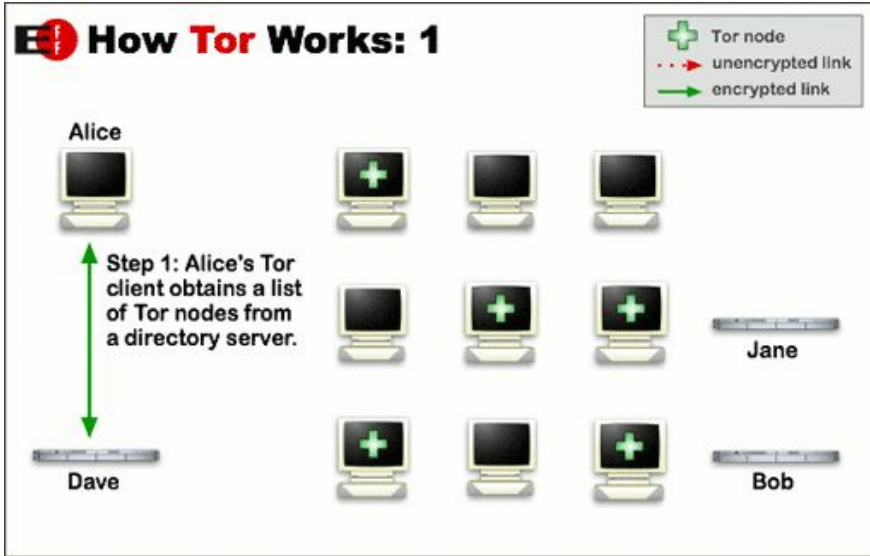
What is Tor?

- ★ Free software
- ★ Privacy and anonymity
- ★ Non-profit
- ★ Open and distributed network
- ★ Different applications
 - Tor Browser:
 - Web browser
 - Privacy by default
 - Uses the Tor network
 - Orbot
 - Onion services
 - Bidirectional anonymity



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How Tor works?



Alice wants to surf on the internet safe.

The green path is encrypted; the red one is not safe. Please, use HTTPS.

It is not just encryption, it is anonymity!

- Tor uses encryption to hide the data sent but encryption cannot protect you from some kinds of attacks or techniques.
- Tor hides your location, personal data, network metadata..

ANONYMITY

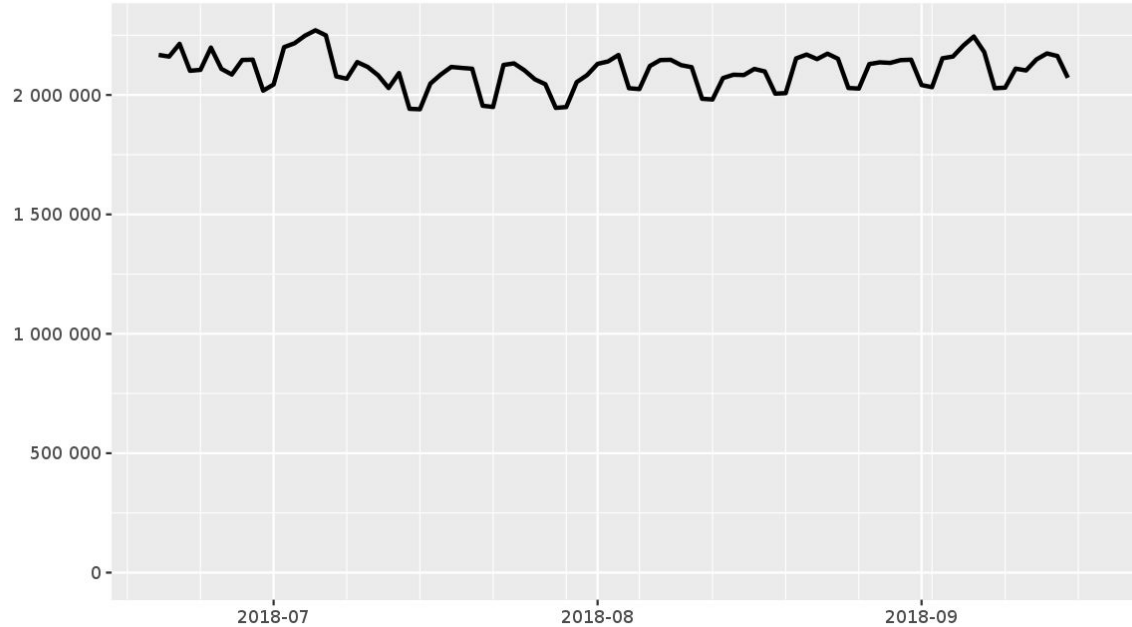
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Tor Traffic (I)

Directly connecting users



The Tor Project - <https://metrics.torproject.org/>

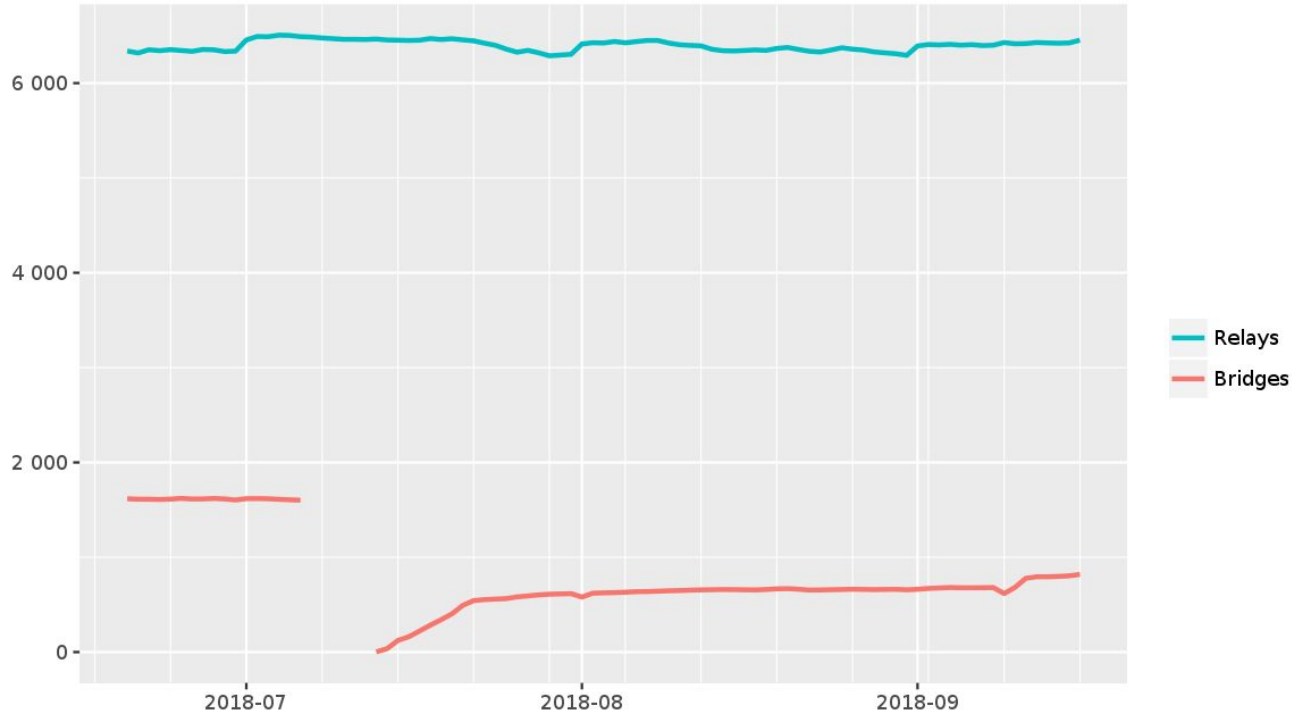
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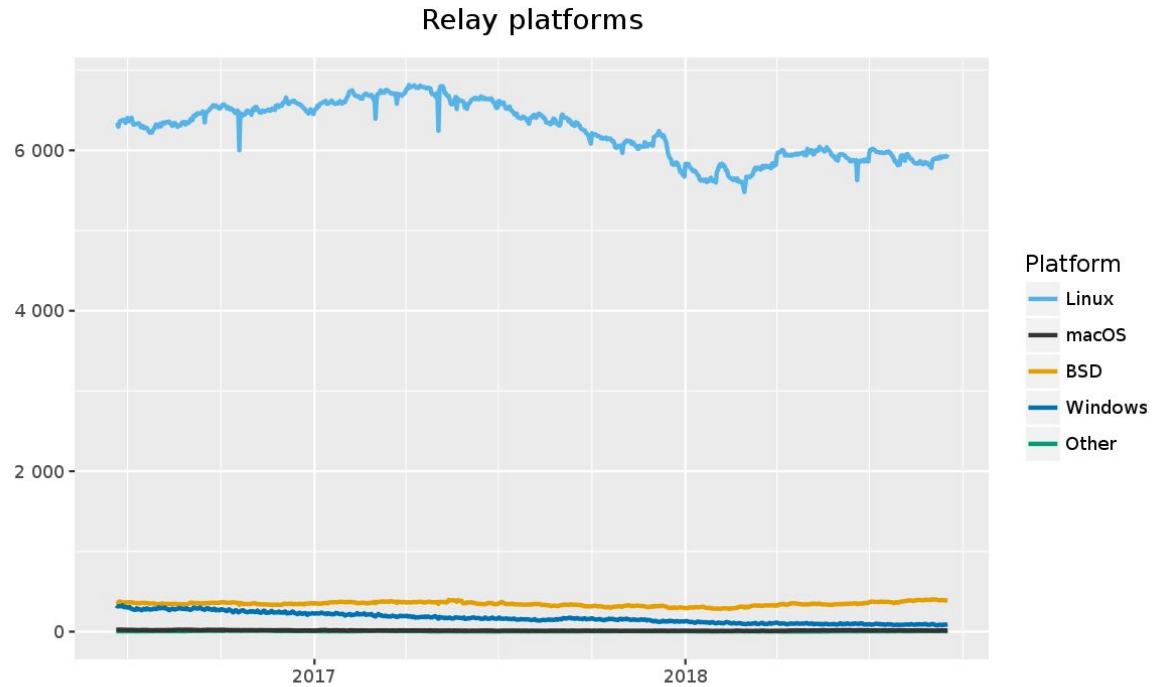
Tor Traffic (II)

Number of relays



The Tor Project - <https://metrics.torproject.org/>

Tor Traffic (III)



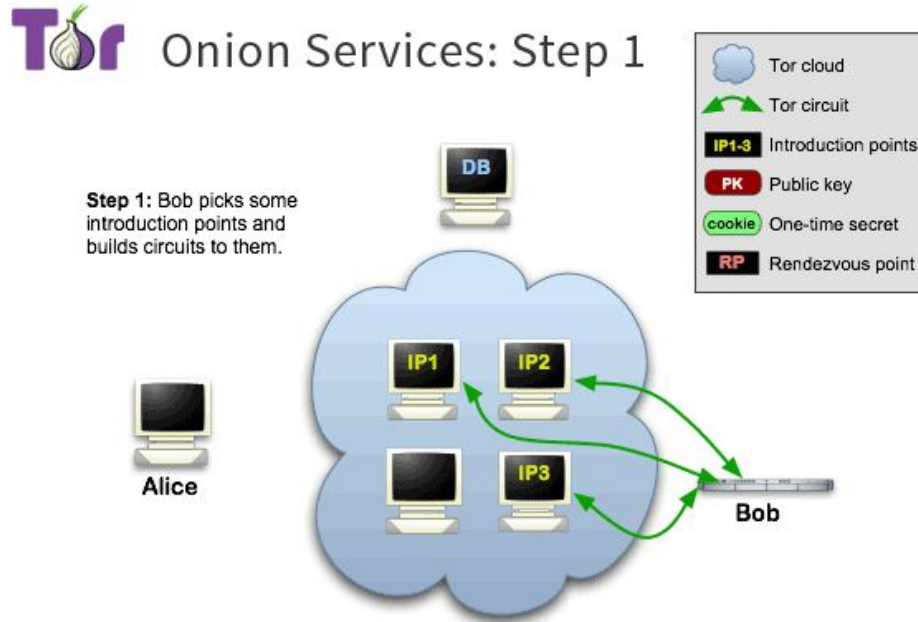
The Tor Project - <https://metrics.torproject.org/>

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How Onion Services work? (I)



Alice wants to use Bob's service. Both want to be safe :-)

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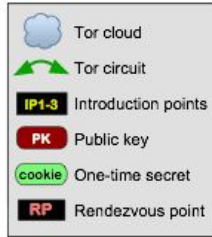
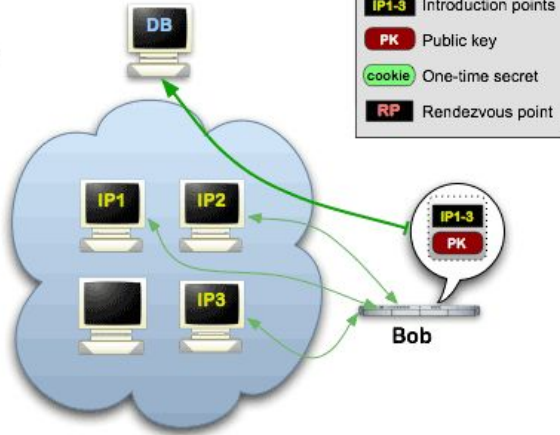
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How Onion Services work? (II)



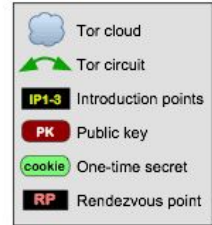
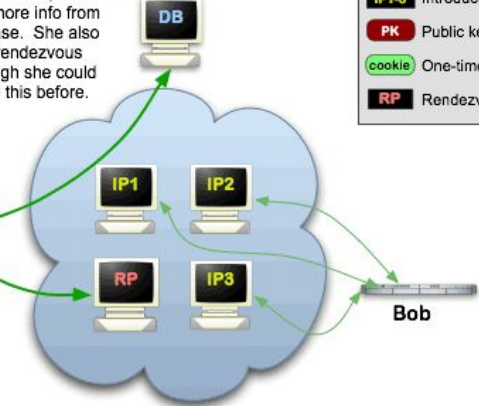
Onion Services: Step 2

Step 2: Bob advertises his service -- XYZ.onion -- at the database.



Onion Services: Step 3

Step 3: Alice hears that XYZ.onion exists, and she requests more info from the database. She also sets up a rendezvous point, though she could have done this before.



Bob builds a descriptor and upload it.

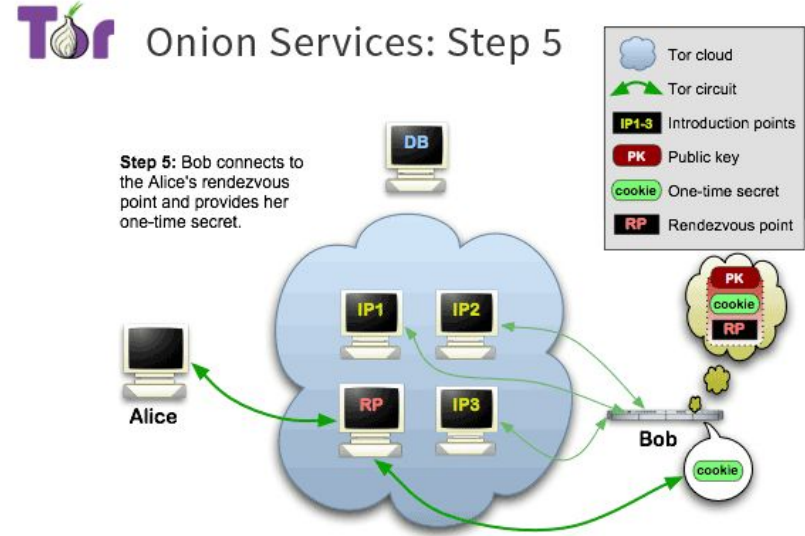
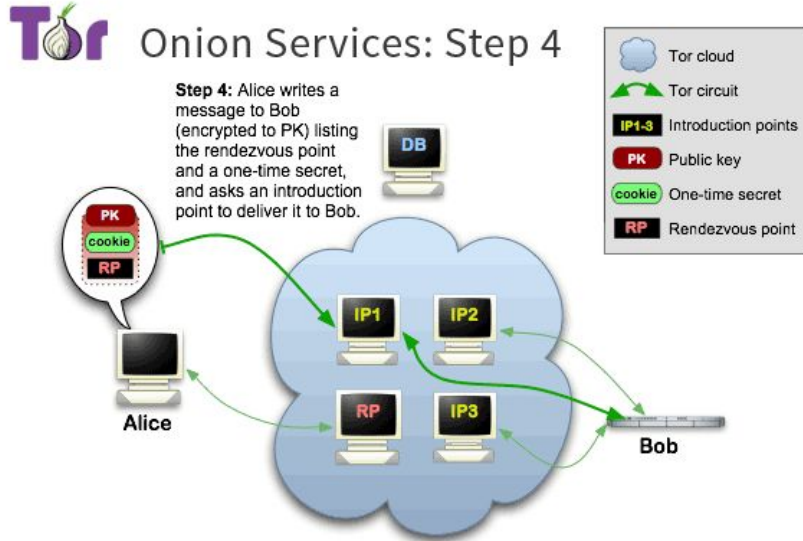
Alice fetches the descriptor and builds a rendezvous point.

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How Onion Services work? (III)



Alice send an introduce message to Bob indicating how to reach rendezvous point.

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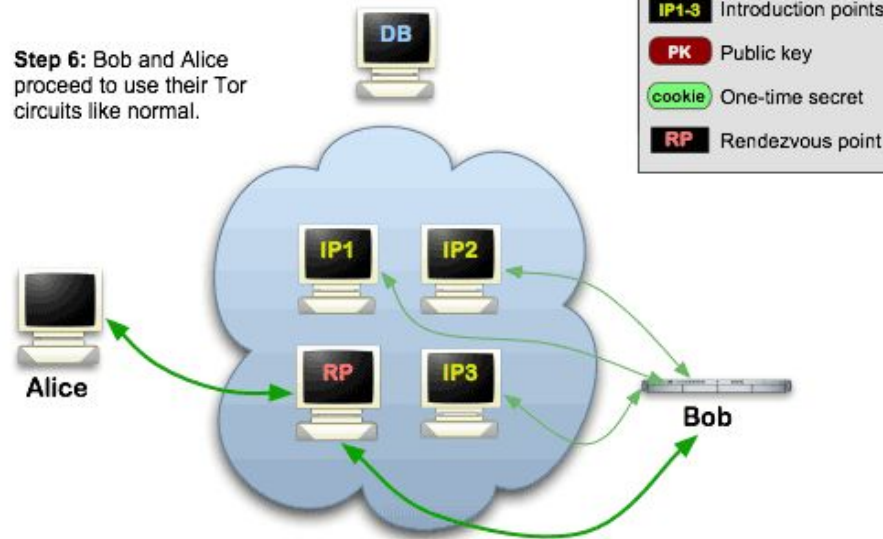
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How Onion Services work? (IV)

Onion Services: Step 6

Step 6: Bob and Alice proceed to use their Tor circuits like normal.



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