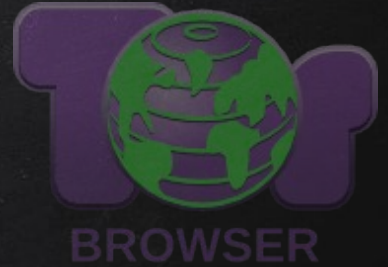


# TOR-BROWSER



- Modified version of Firefox ESR.
- Uses the TOR network by default.
- Disables insecure features/plugins .
- Disables features/plugins that could deanonymize you.
- Forces all connections over **HTTPS** (using https-everywhere plugin).
- Disables scripts (using noscript plugin).

## Note:

With TOR Browser **only** traffic sent via the browser is routed through the TOR network.

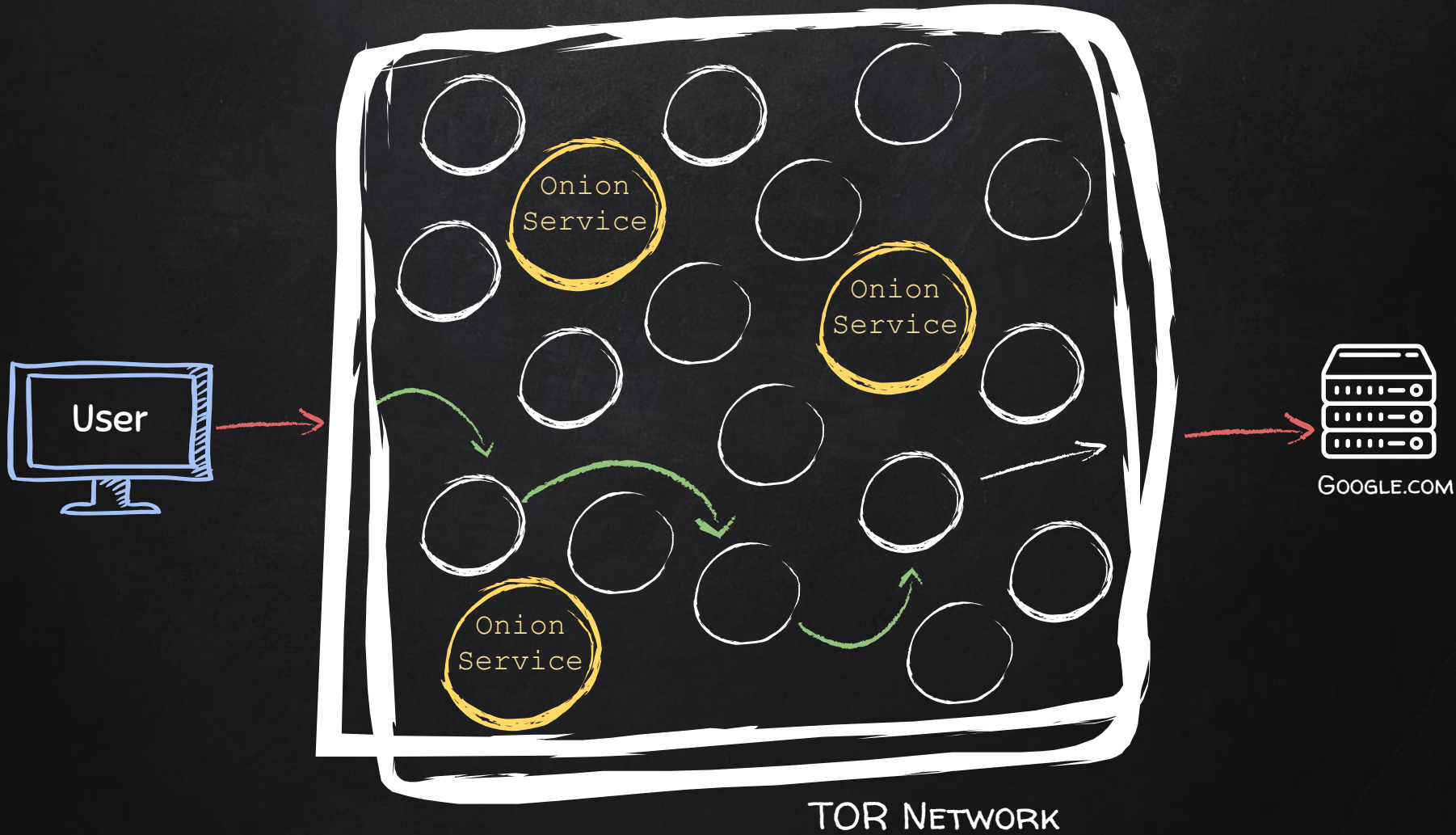
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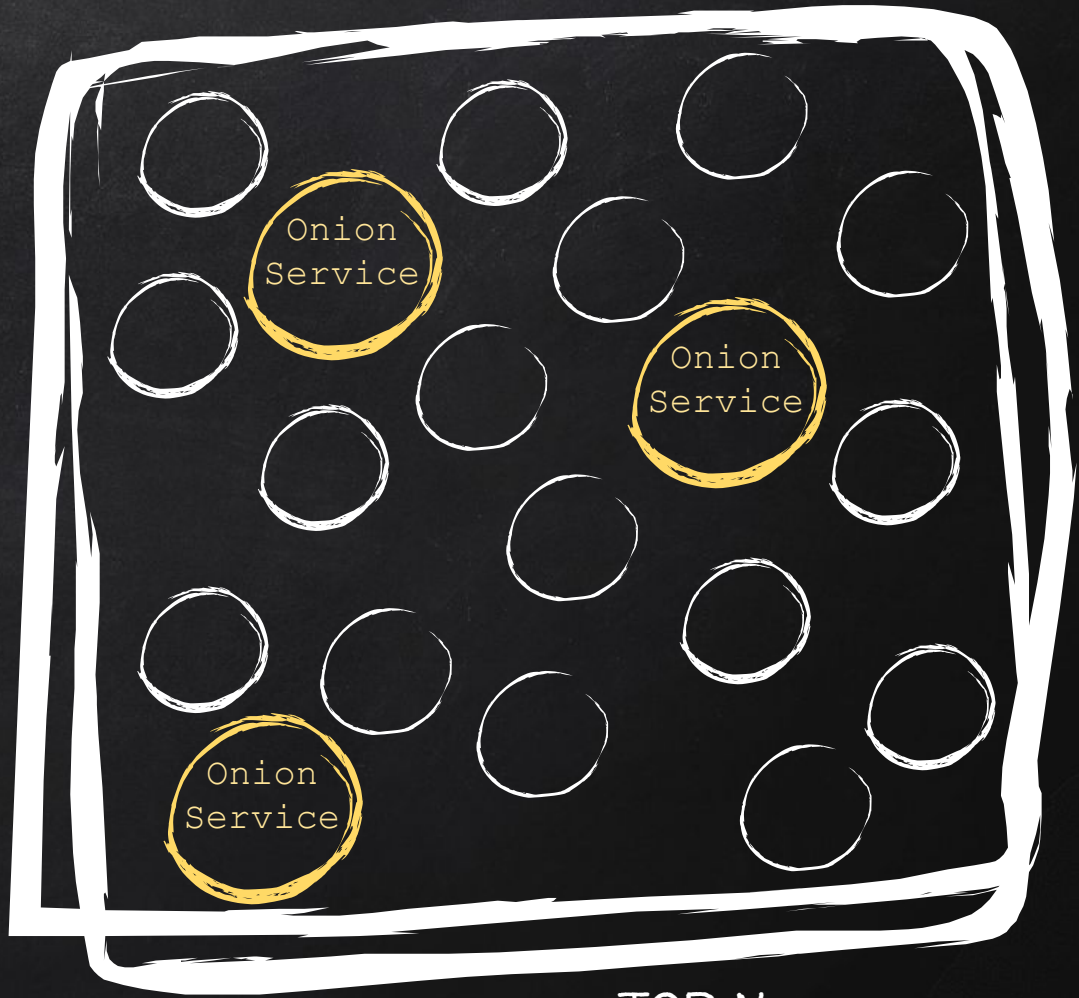
With TOR Browser **only** traffic sent via the browser is routed through the TOR network.



1. **Block** ALL tor relays.



ISP



TOR NETWORK

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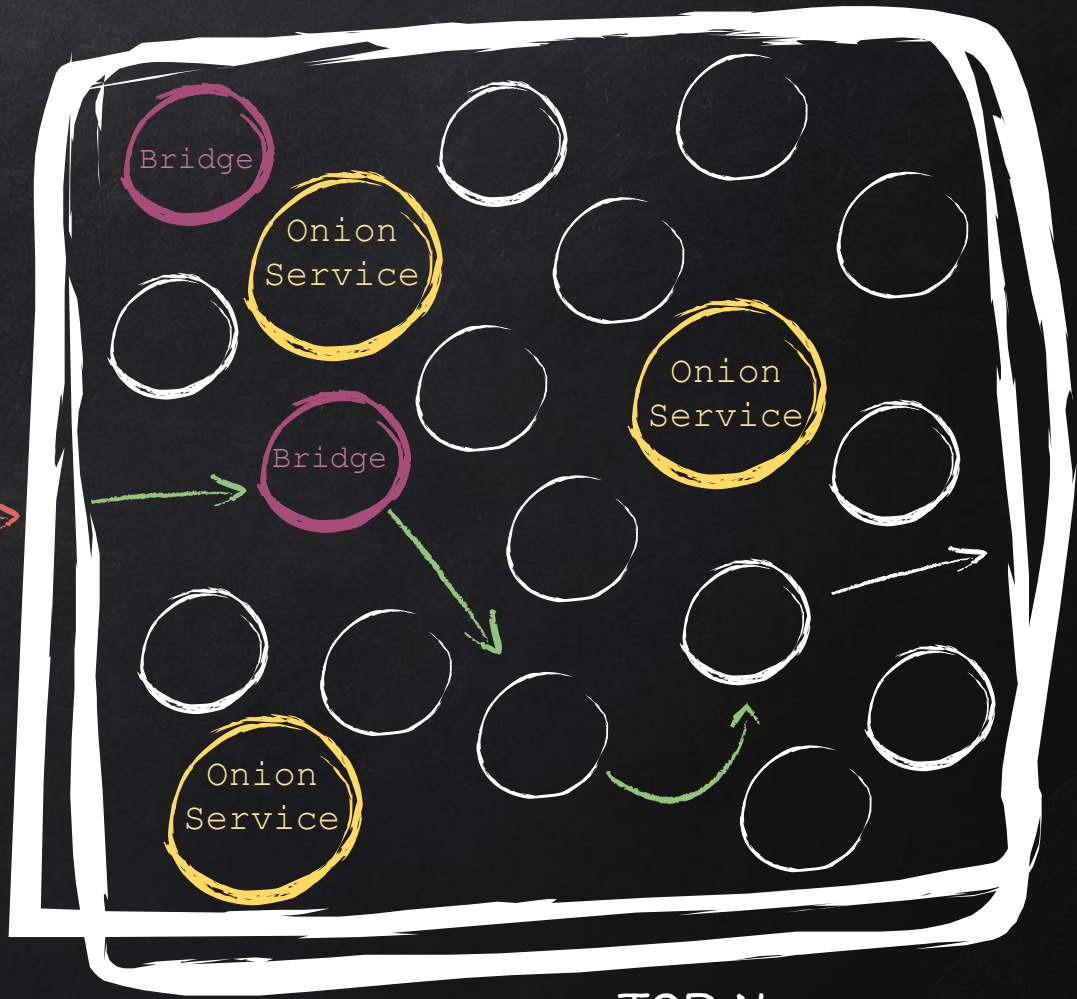


User



ISP

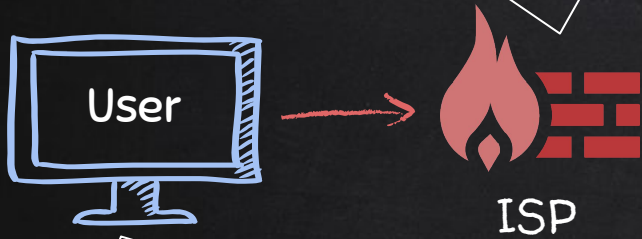
1. Use unpublished relays (**bridges**).



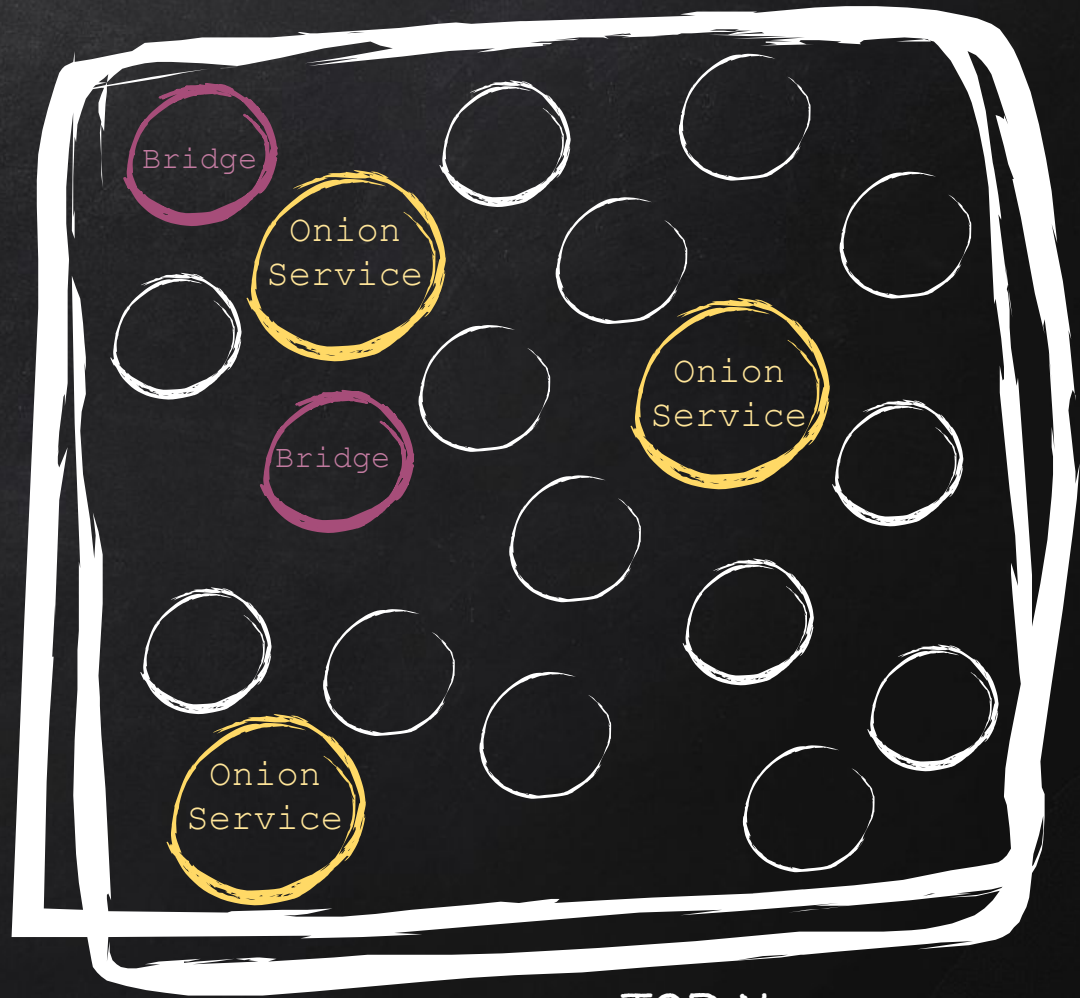
TOR NETWORK



1. **Block** ALL tor relays.
2. Use DPI (Deep Packet Filtering) to identify and **block TOR traffic**.



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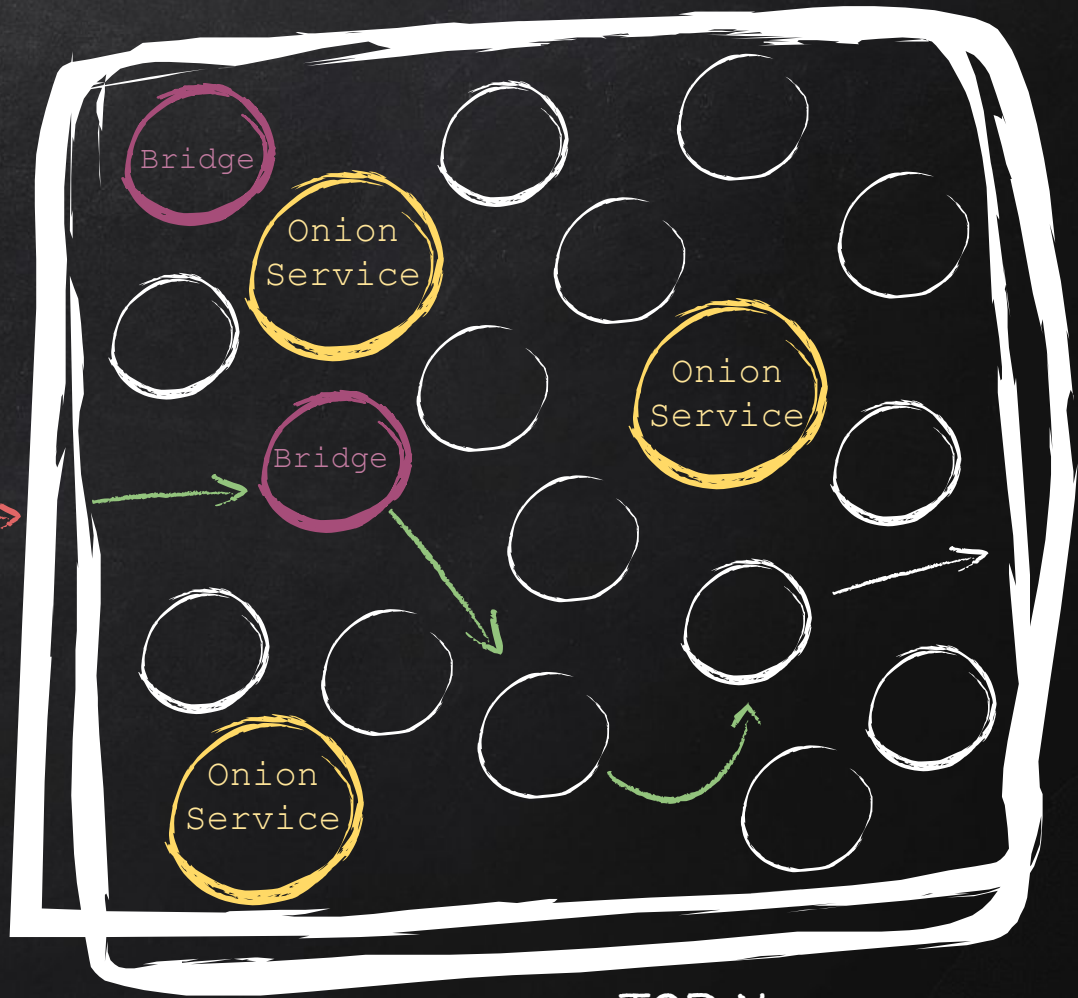


TOR NETWORK

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1. Use unpublished relays (**bridges**).
2. Use **pluggable transports** to obfuscate traffic.

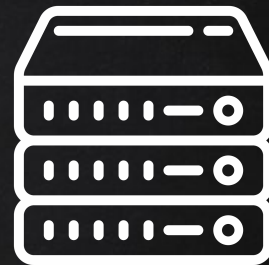
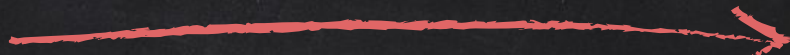


TOR NETWORK

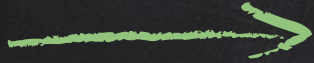
VPN - VIRTUAL PRIVATE NETWORK

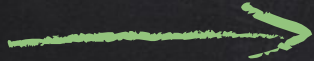






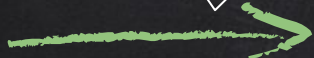
GOOGLE.COM





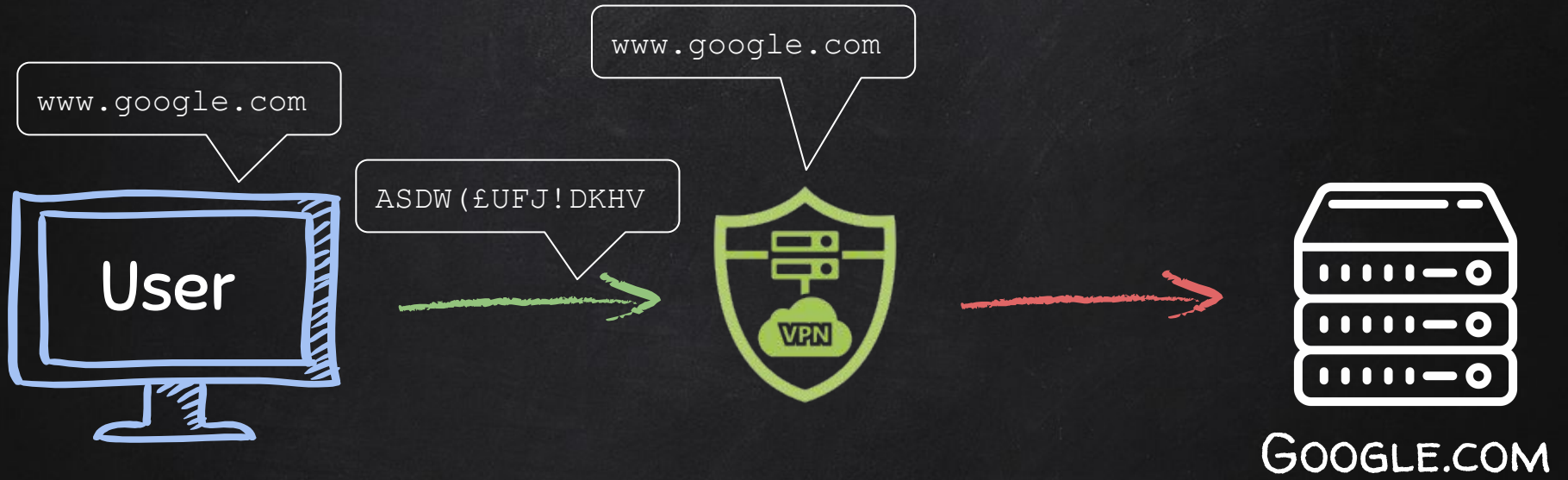


ASDW (£UFJ!DKHV

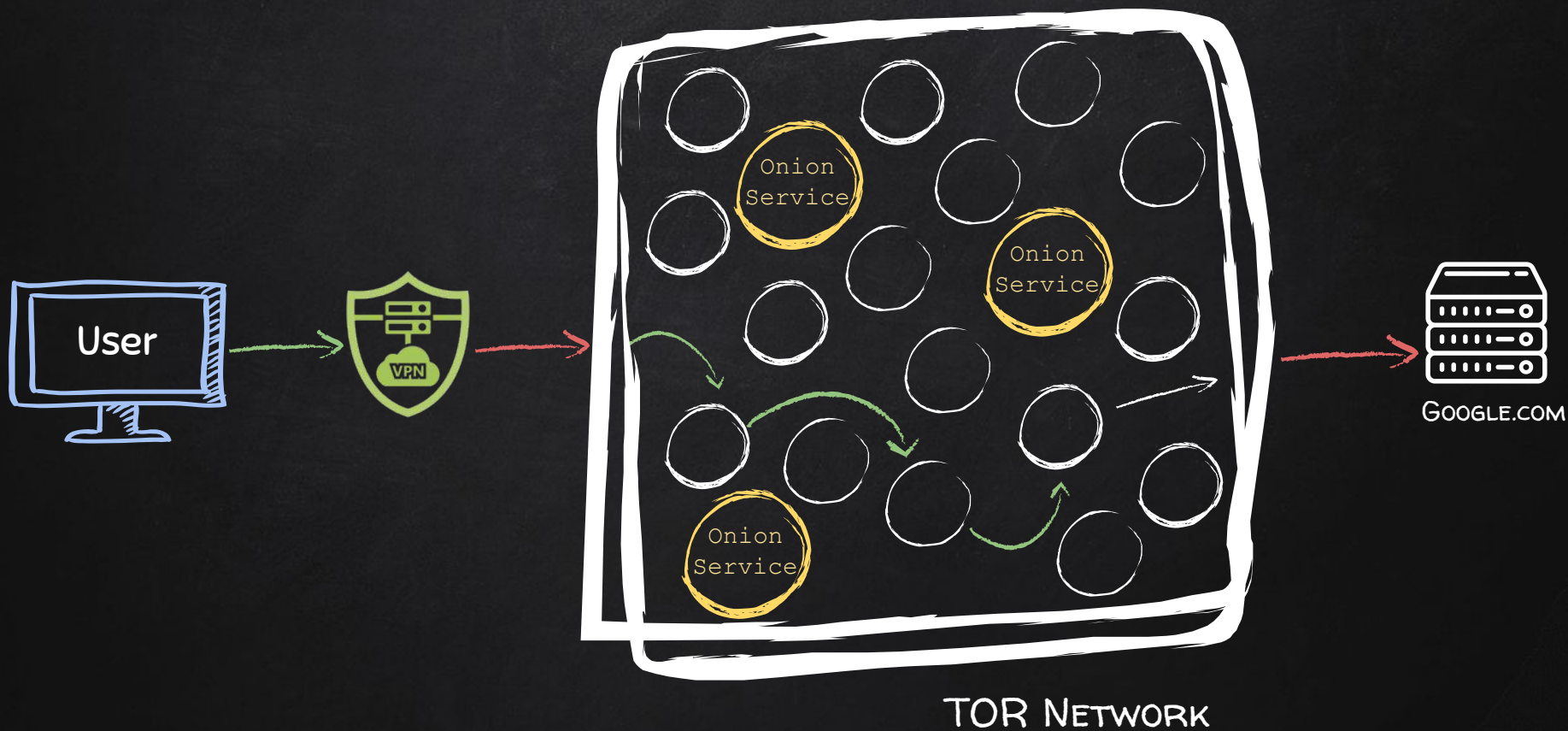


www.google.com





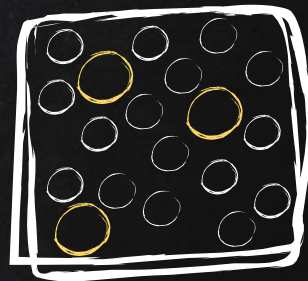




TOR NETWORK



TOR Network



Internet

Benefits:

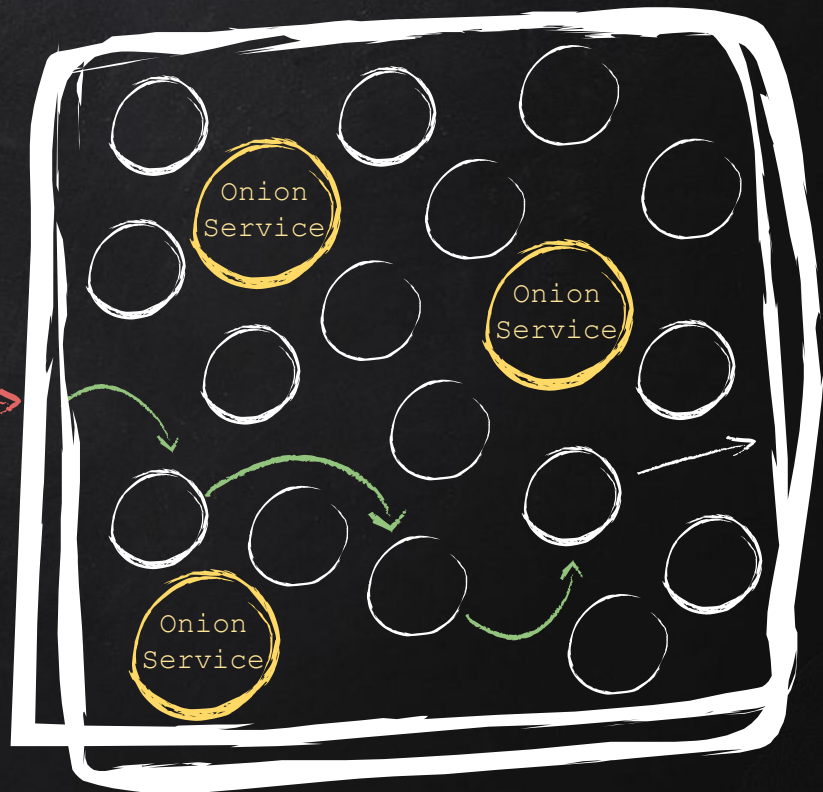
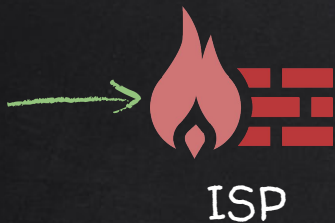
- Extra layer of encryption.
- More privacy & anonymity.
- Bypass censorship.



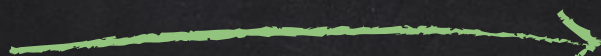
TOR NETWORK

# WORST CASE SCENARIO

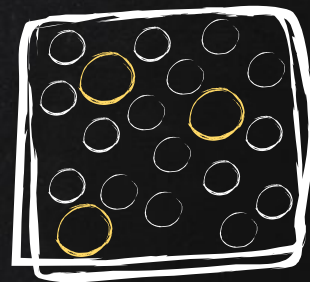
Pluggable transports & Bridges	VPN
Connecting to TOR	Connecting to a VPN.



TOR NETWORK



TOR Network



Internet

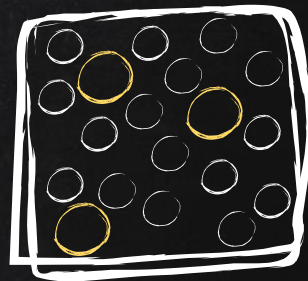
Benefits:

- Extra layer of encryption.
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- Protection from hackers.





TOR Network



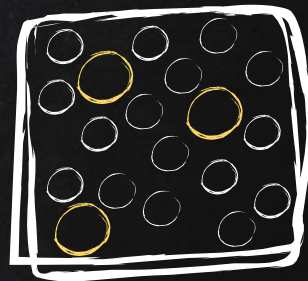
Internet

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TOR Network



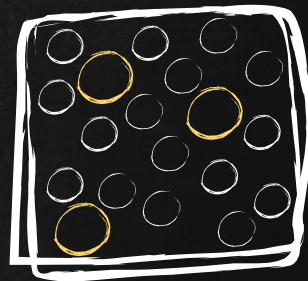
Internet

Notes:

- Use reputable VPN.



TOR Network



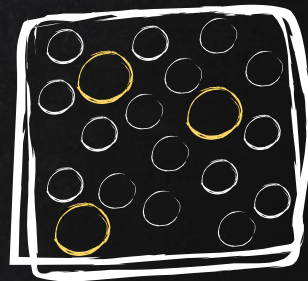
Internet

Notes:

- Use reputable VPN.
- Avoid free providers.



TOR Network



Internet

Notes:

- Use reputable VPN.
- Avoid free providers.
- Make sure they keep **no logs**.



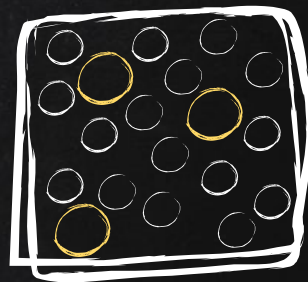
VPN encryption  
+ TLS



TLS



TOR Network



Internet

Notes:

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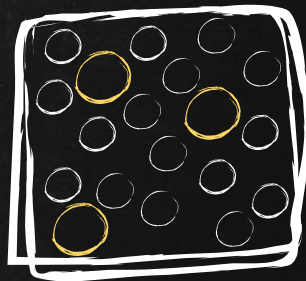
VPN encryption  
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TLS



TOR Network



Internet

Notes:

- Use reputable VPN.
- Avoid free providers.
- Make sure they keep **no logs**.
- Use HTTPS everywhere.
- Optional – pay with crypto.



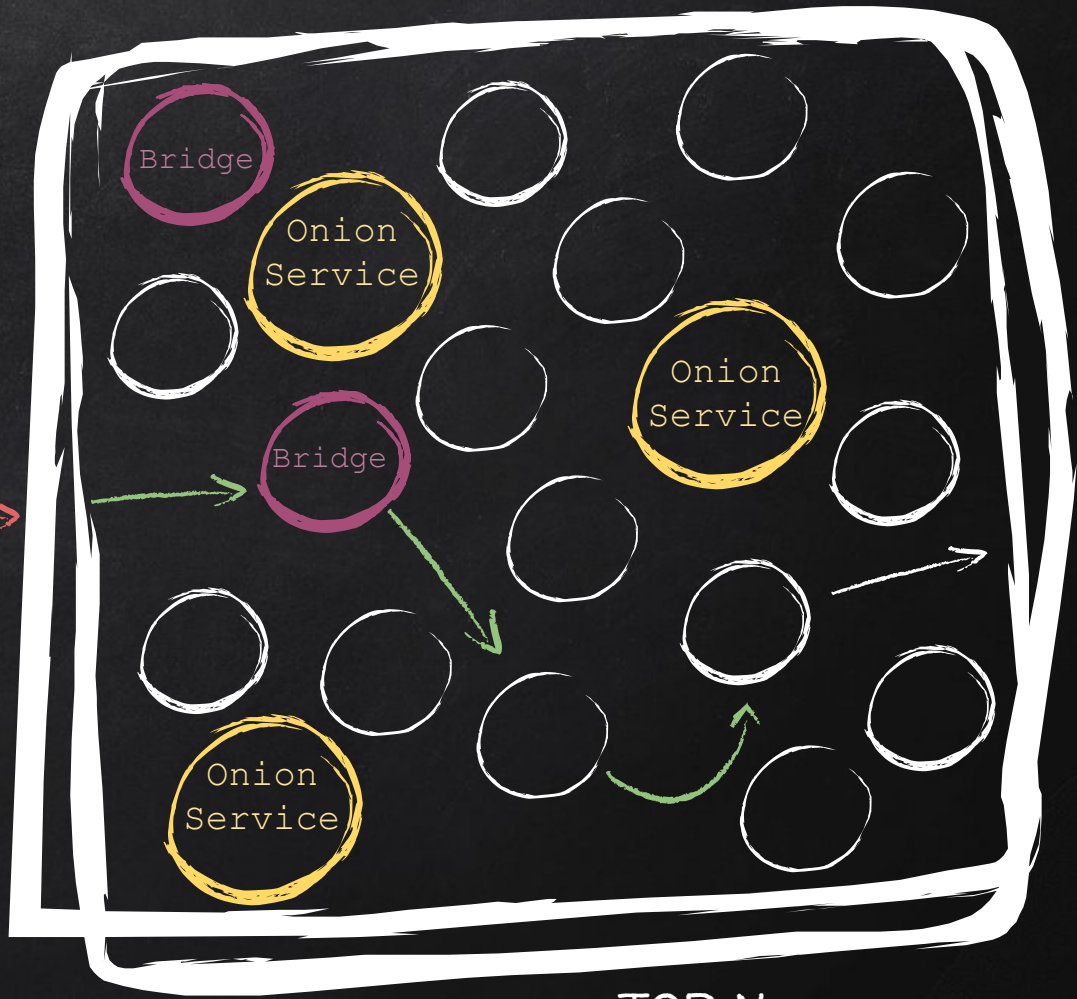
GOOGLE.COM

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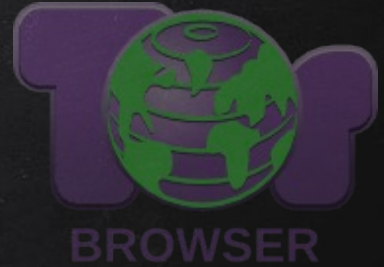
TOR NETWORK







# INFORMATION THEORY



$$\Delta S = -\log_2 \Pr(X=x)$$

- The amount of info a fact gives about an entity is measured in bits.
- Entropy ( $S$ ) measures information in bits.
- $\Delta S$  measures how many bits of information the fact  $X$  reveals about a target.
- Population of earth at the time of recording this lecture is 7714576923.
- Therefore we need  $\log_2(1 / 7714576923) = 32.8$  bits of information to deduce the identity of a person!