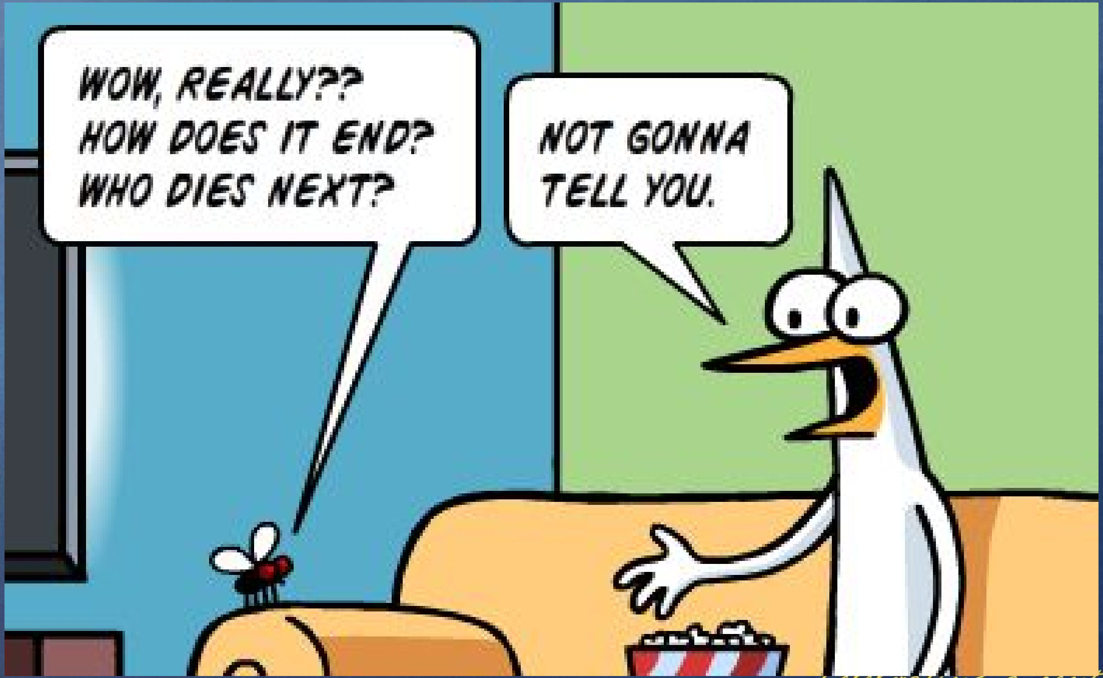
No Stranger Things discussions



What's up in Security

WPA 2 is broken (https://www.krackattacks.com/)

New IOT Malware (https://krebsonsecurity.com/2017/10/fear-the-reaper-or-reaper-madness/)

UNIVERSITY OF ALASKA FAIRBANKS

Introduction to SSL and HTTPS

Arsh Chauhan

10/28/17

Celebrating a century 1917–2017

What is HTTPS?

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Take plain old HTTP and add some encryption on top of it

See how it’s TLS?

I.e. sits on top (or below) the application

Uses ?

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Verification: Verify you're actually talking to Amazon and not Arsh pretending to be Amazon

So how does it work ?

Secrecy

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We’ll say the secrecy is magic

Verification

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HTTPS verification works due something known as the Certificate Authority (CA) system.

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The CA system is based on trust

Certificate Authorities

Chain of Trust

The CA system depends on a chain of trust

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When I ask for a HTTPS certificate:

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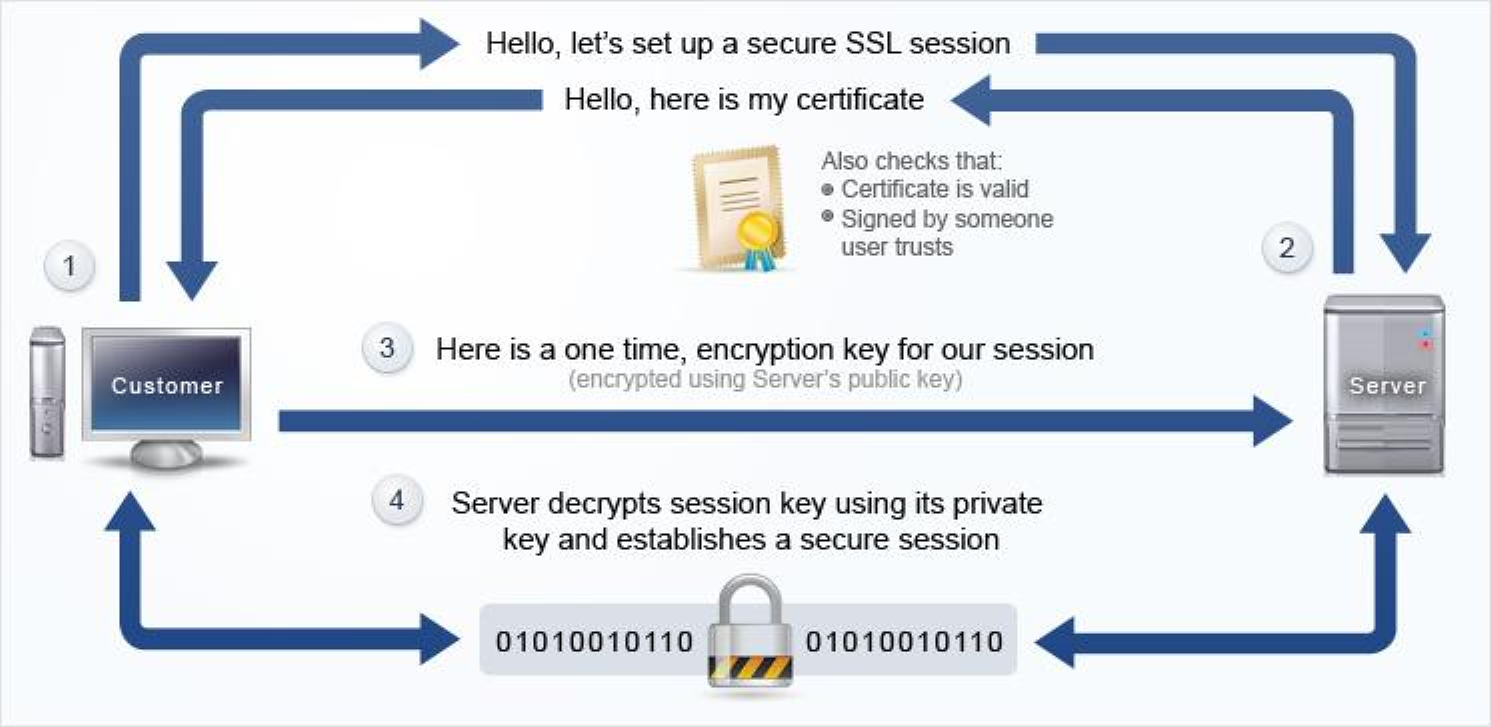
2. The CA signs my cert with their key
3. The CA's key is probably signed by a root CA


Hello, let's set up a secure SSL session
Hello, here is my certificate
Also checks that:
● Certificate is valid
● Signed by someone user trusts
1
2
Customer
Server
3
Here is a one time, encryption key for our session
(encrypted using Server's public key)
4
Server decrypts session key using its private key and establishes a secure session
01010010110
01010010110

Site Verification

CA’s use various ways to verify the I’m authorized to request a key for the site. I’ve seen 4 common ones

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- Email Verification
- DNS Record
- File
- Enterprise

Establishing Trust

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2. The browser trusts a list of root CA's

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Short answer…Most of the time

The Flaws in the System

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Superfish: Embedded malware in Lenovo computers

Can We Fix This

Yes…

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That ain't gonna happen, so we have technical solutions

- DNSSEC
- HTTP Public Key Pinning (HPKP)
- DNS Certification Authority Authorization(CAA) record

Implementing SSL Lab

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