Security of the Electronic Transactions: Case of TLS

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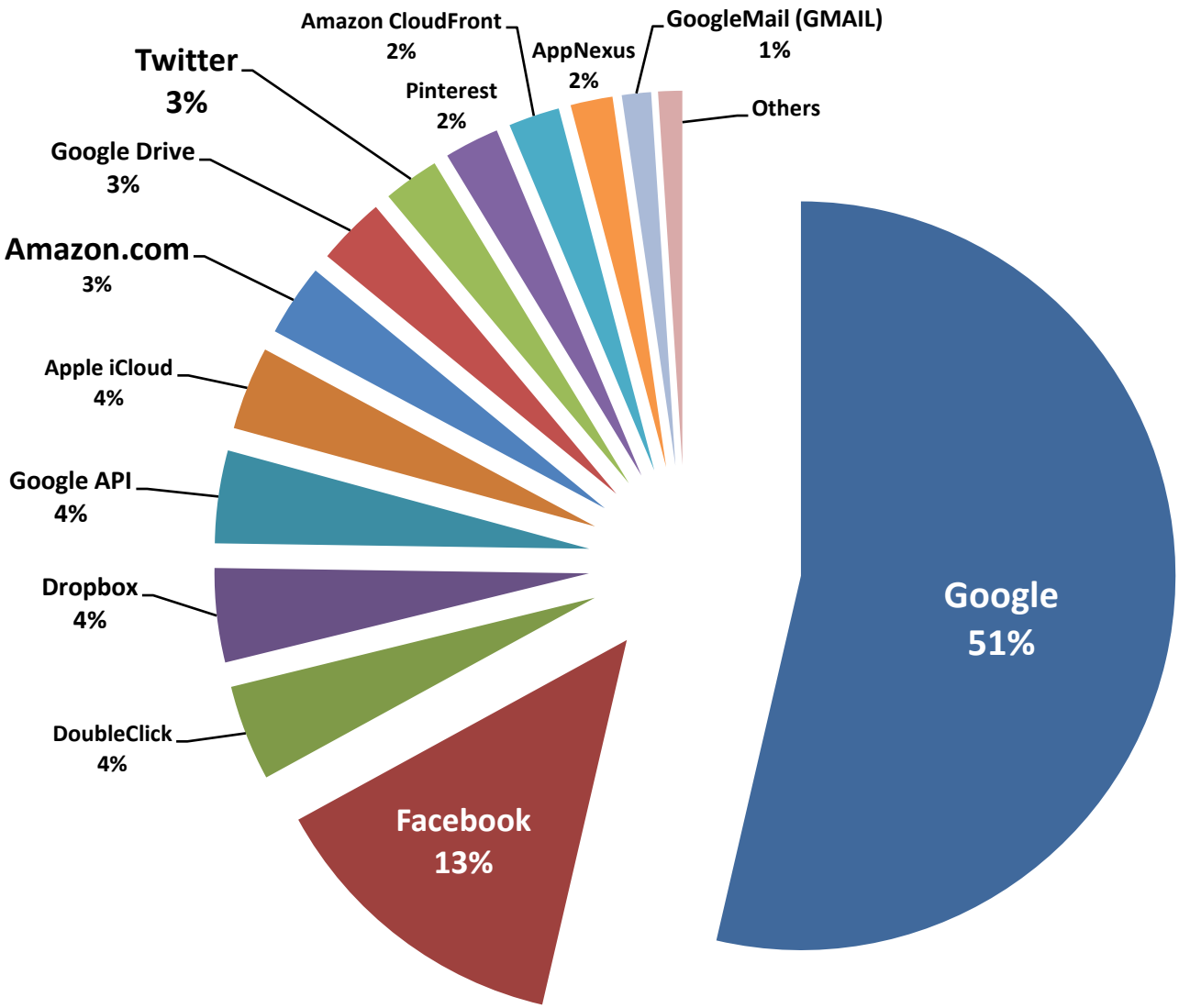
10% Internet Traffic is Encrypted

Distribution of Encrypted Traffic



Why SSL/TLS

- **Confidentiality** of data in transit over an un-trusted network connection (Internet)
- **Authentication** of the entity with which the transaction is being conducted (simple/double)
- It is best to **encrypt** sensitive data as **early** as possible and **decrypt** it as **late** as possible.
- Publicly **accessible** and **easy** to implement

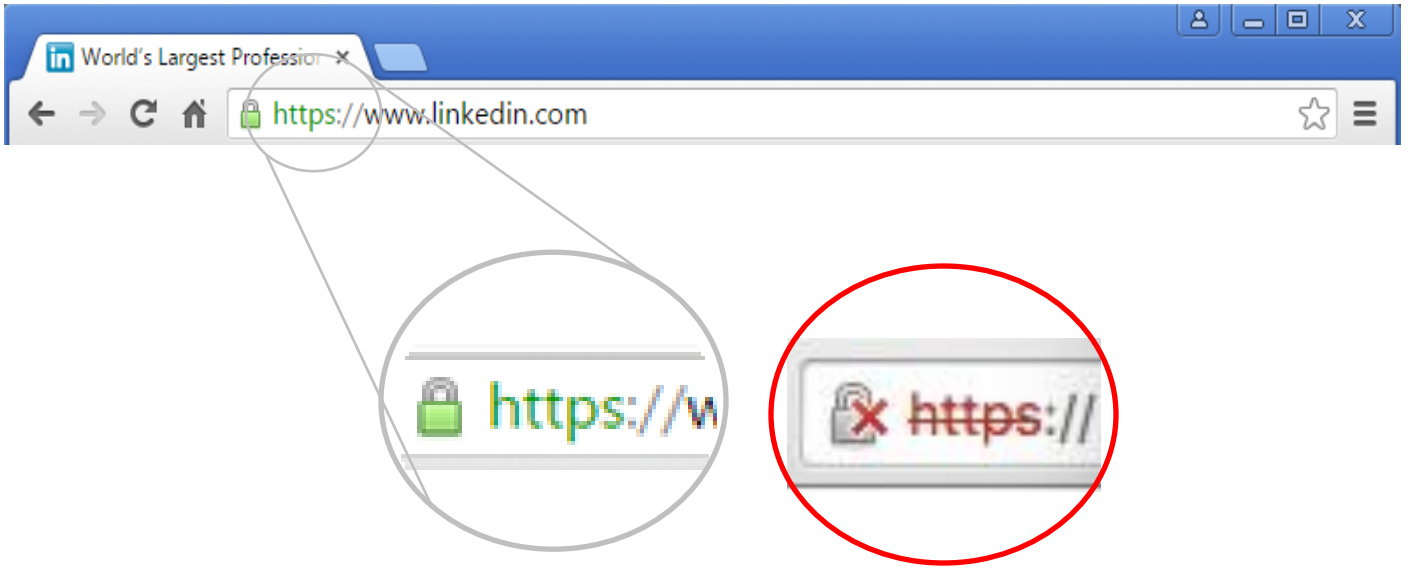
Not only Web

- **SSL/TLS** is used in several protocols not only with HTTP:
  - HTTP**S** (443)
  - LDAP**S** (636)
  - IMAP**S** (993)
  - POP**S** (995)
  - SMTP**S** (465)
  - …

Web Browsers (Firefox, IE, Opera, Chrome, ….)

LDAP Clients (JXPlorer, ….)

Messaging Client Tools (Thunderbird, MS Outlook, …)

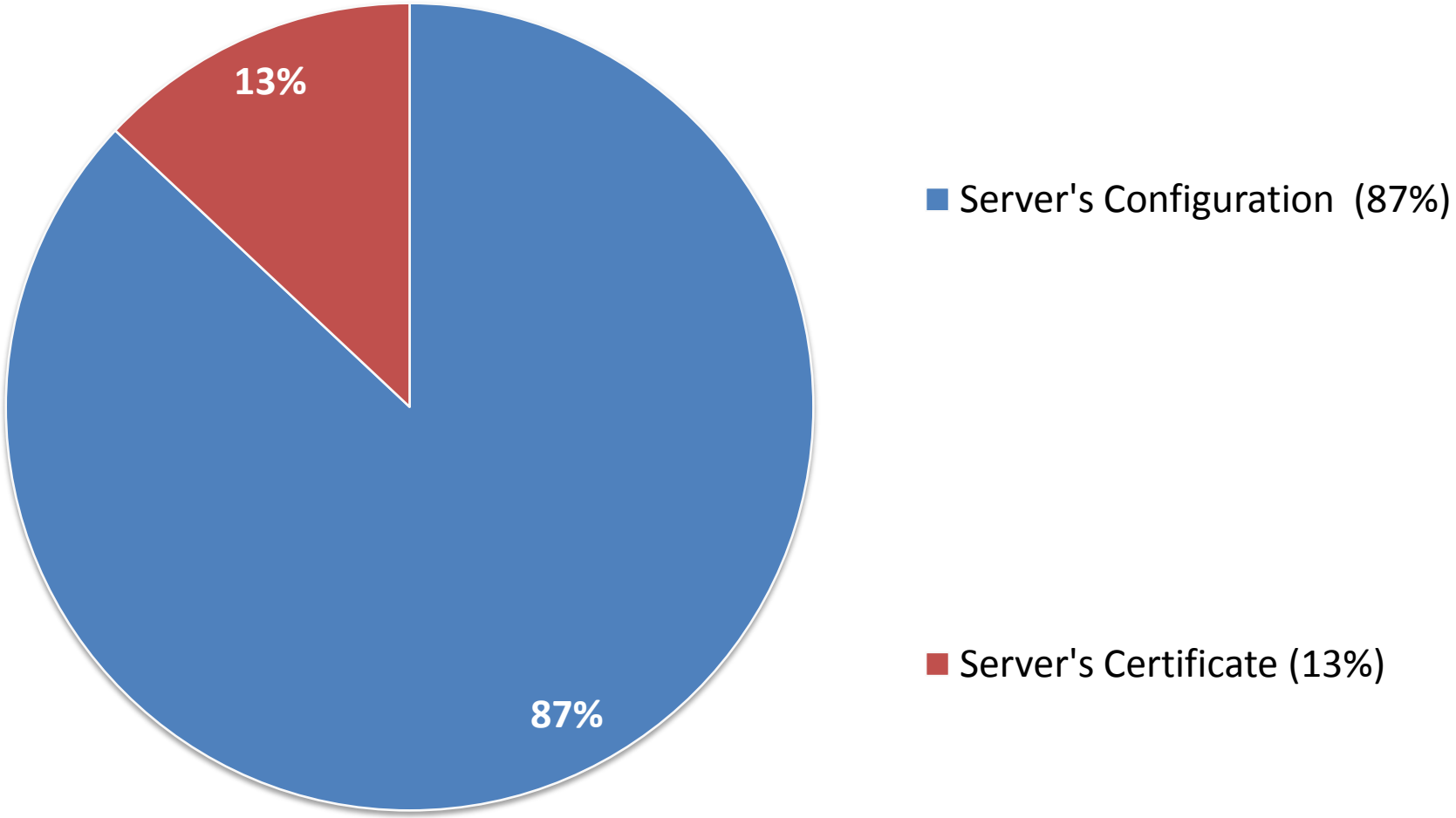


Problems with TLS configuration

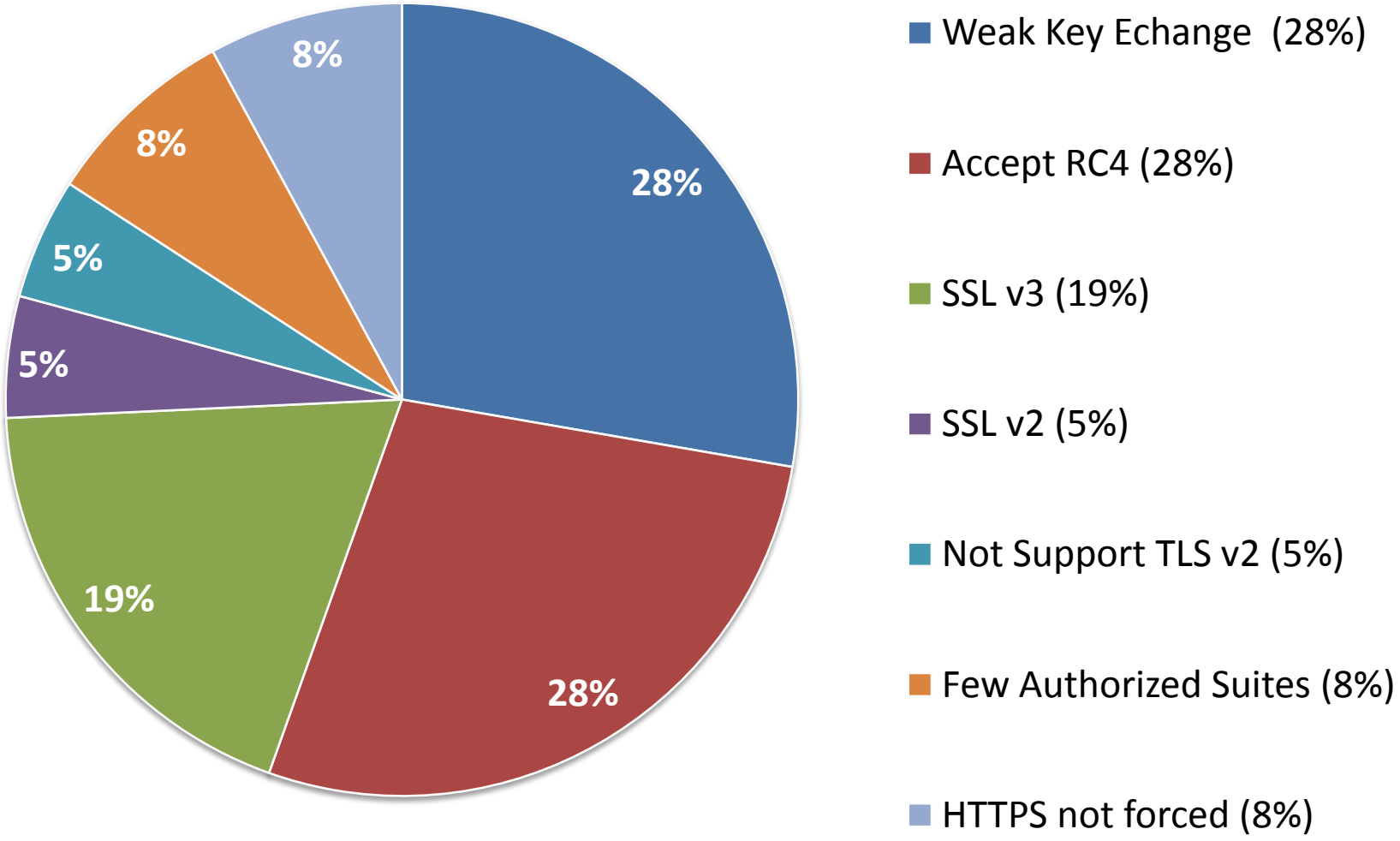
20 Bank Websites (Internet Banking Services) were SSL/TLS examined (Members of APTBEF Association)

	TLS-Related Problems	Number of Entities
1	Weak Key Exchange (< 128 bits)	12
2	Use of the insecure cipher algorithm RC4	12
3	Use of SSL v3 which is obsolete and unsecure	8
4	Use of SSL v2 which is obsolete and unsecure	2
5	Not supporting the best protocol TLS v1.2 (newest)	2
6	Few number of Authorized Cipher Suites	3
7	HTTPS not forced	3
8	Not trusted Server's Certificate	5
9	SHA 1 Certificate (Server or CA)	1
10	Not Valid Certificate (Expired, Revoked, …)	0

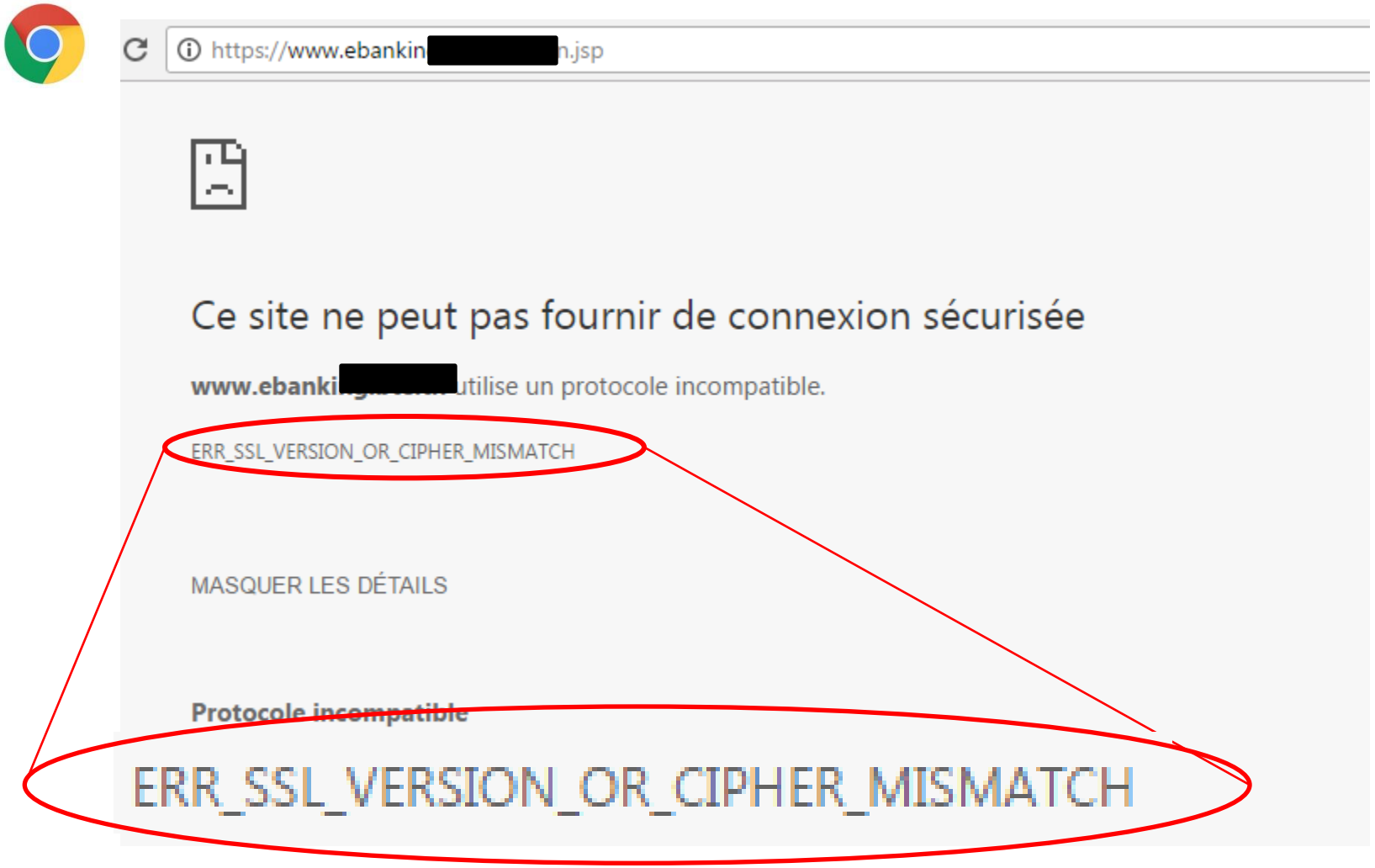
TLS Certificate vs Configuration Issues



Configuration's Issues



Common SSL/TLS Errors



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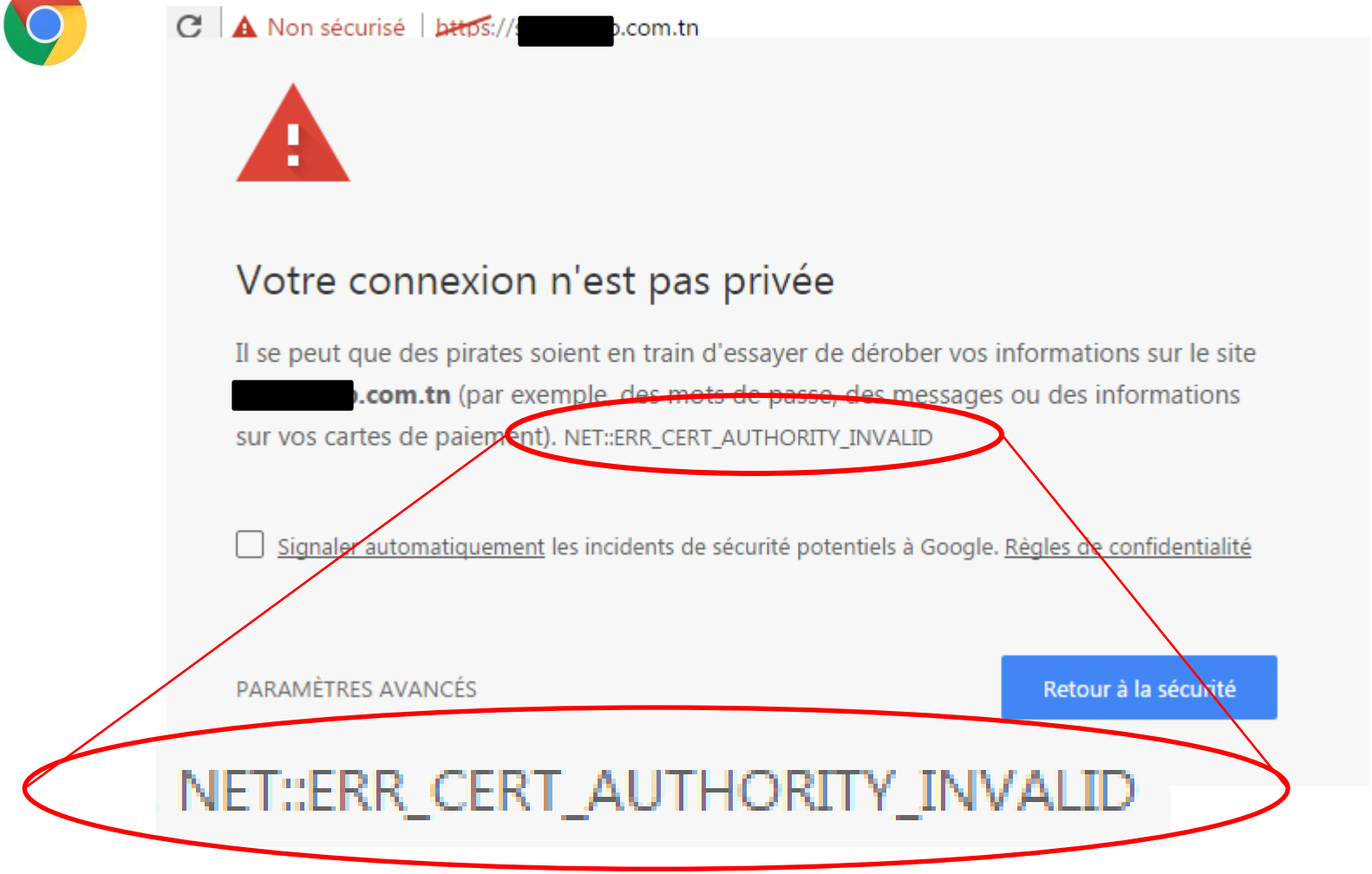
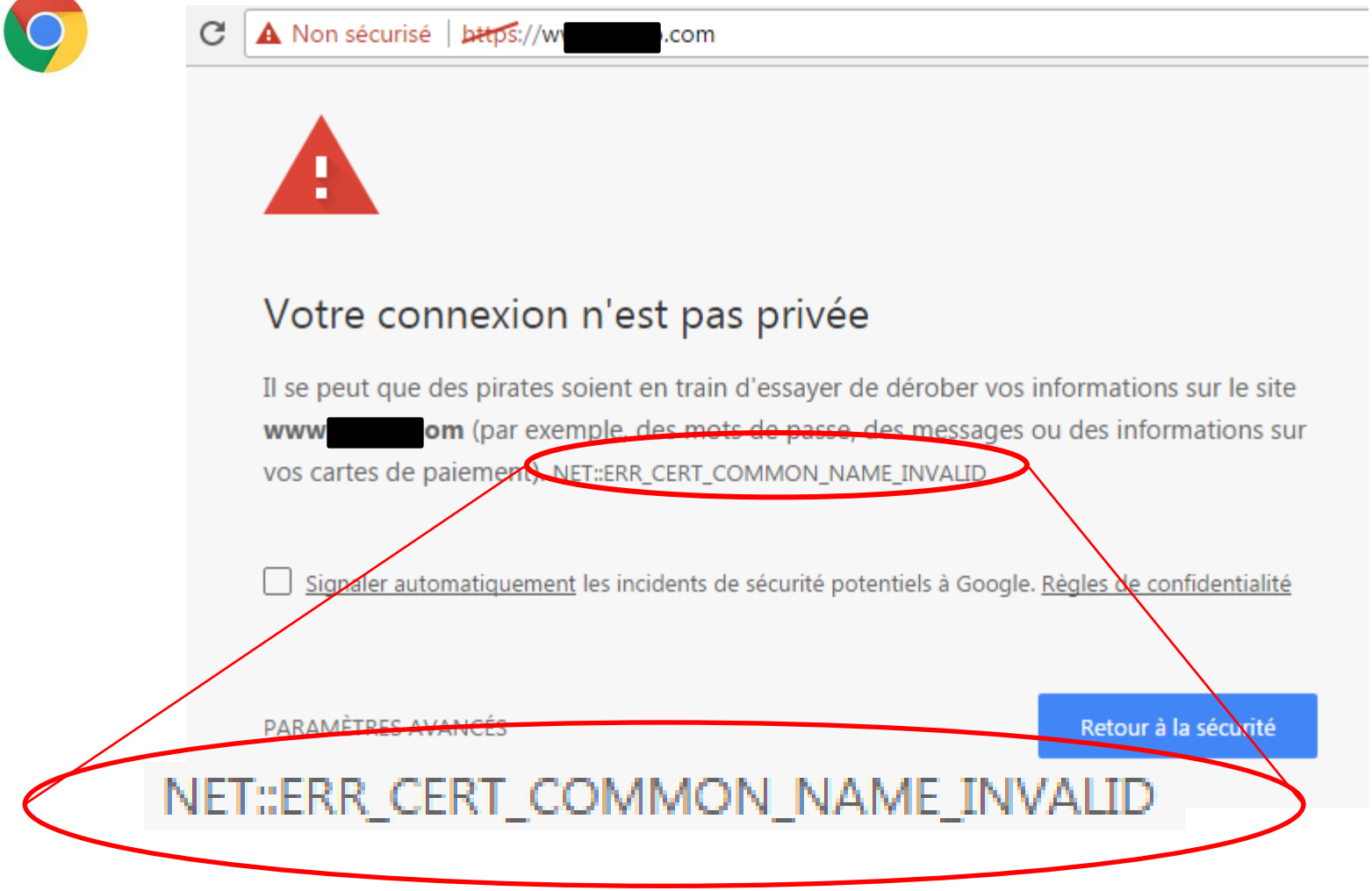
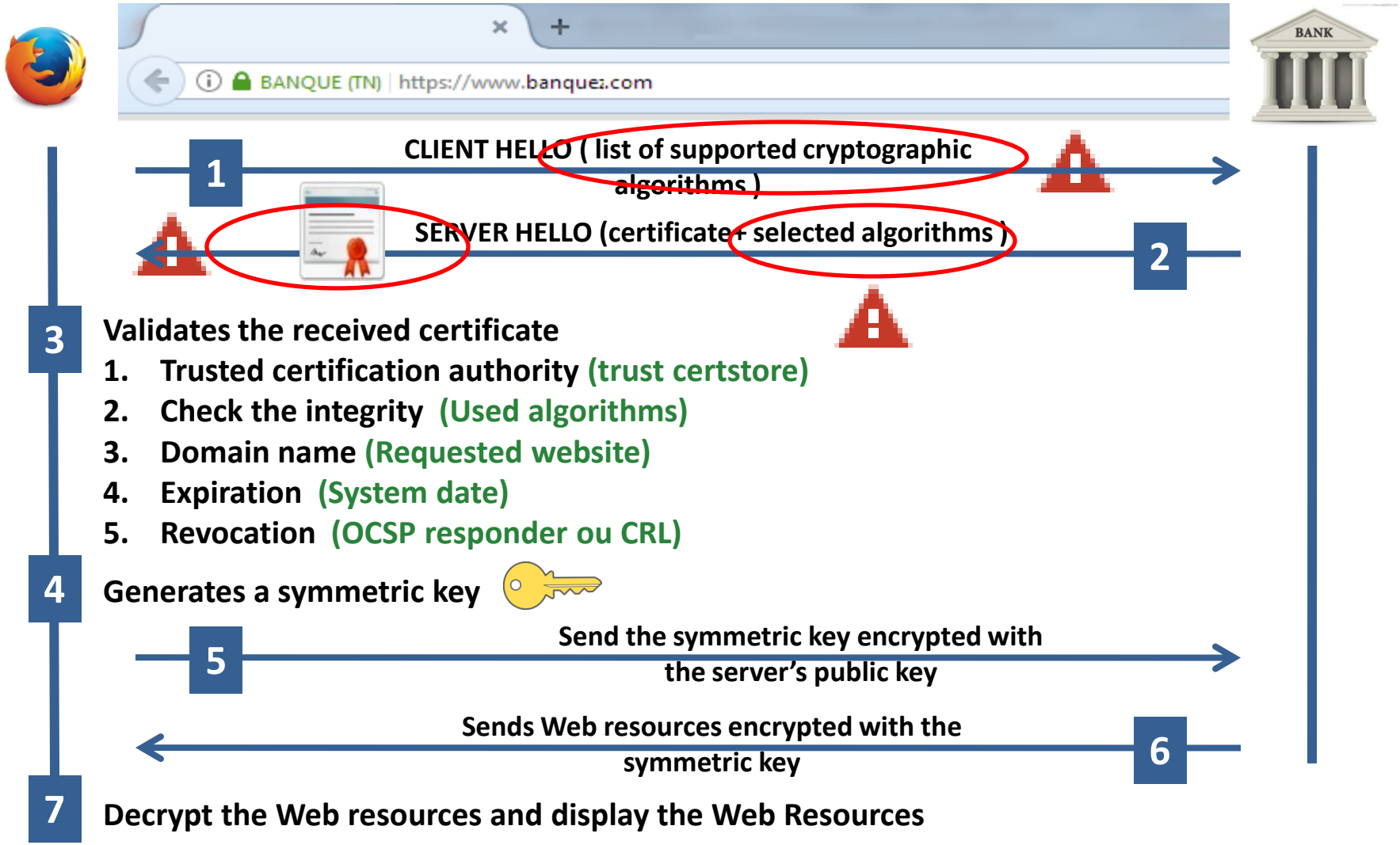


Common SSL/TLS Errors

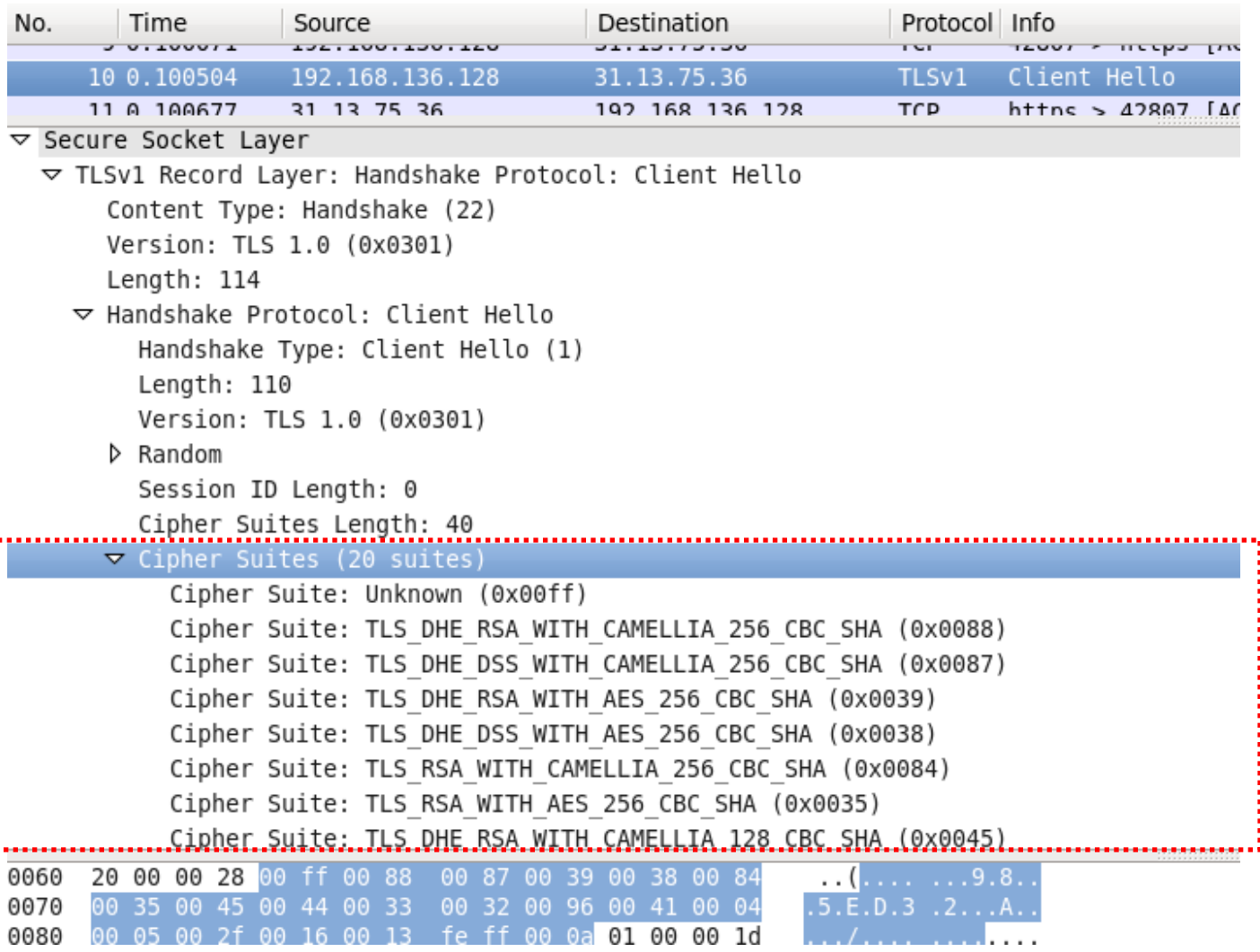


Common SSL/TLS Errors

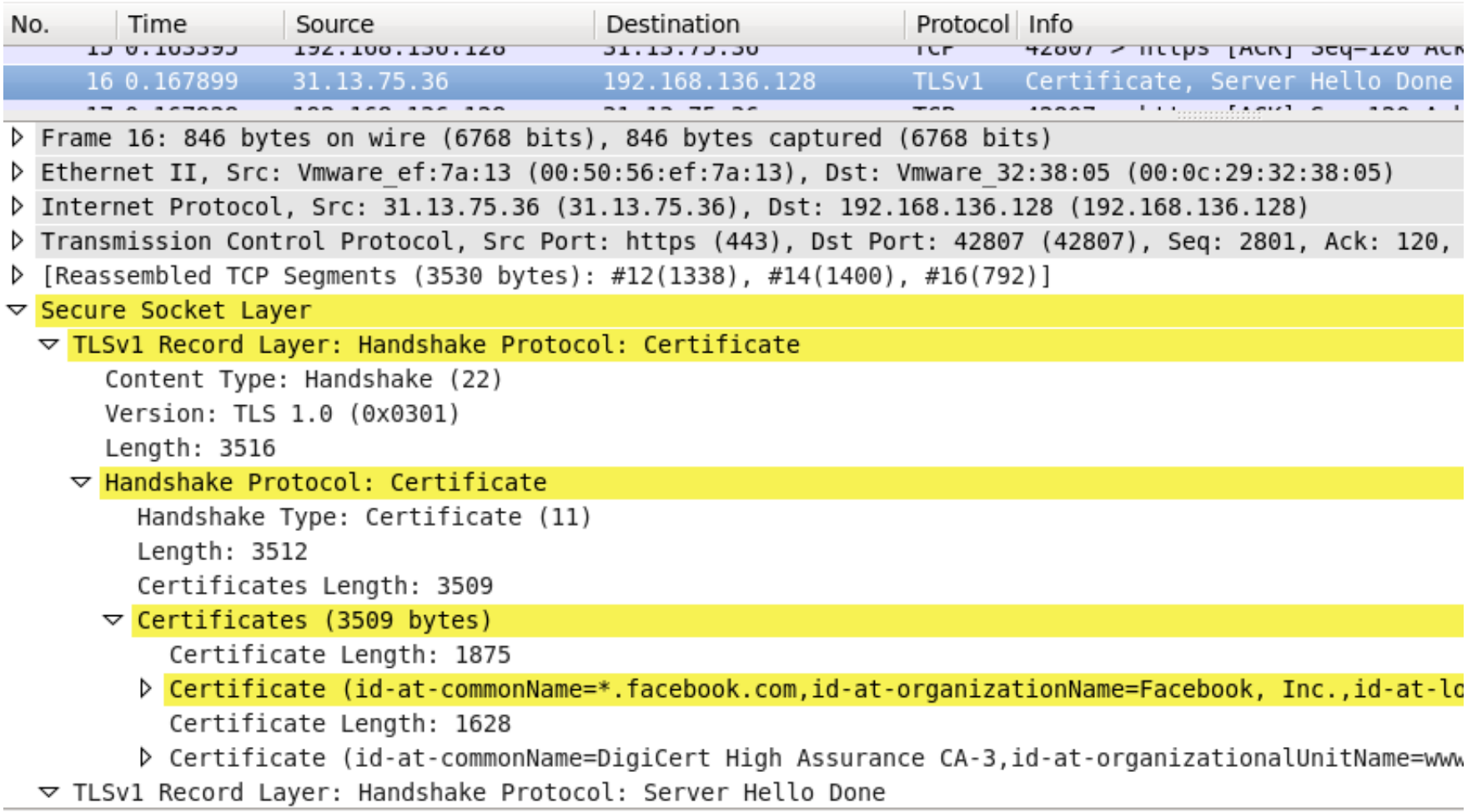
Handshake SSL/TLS



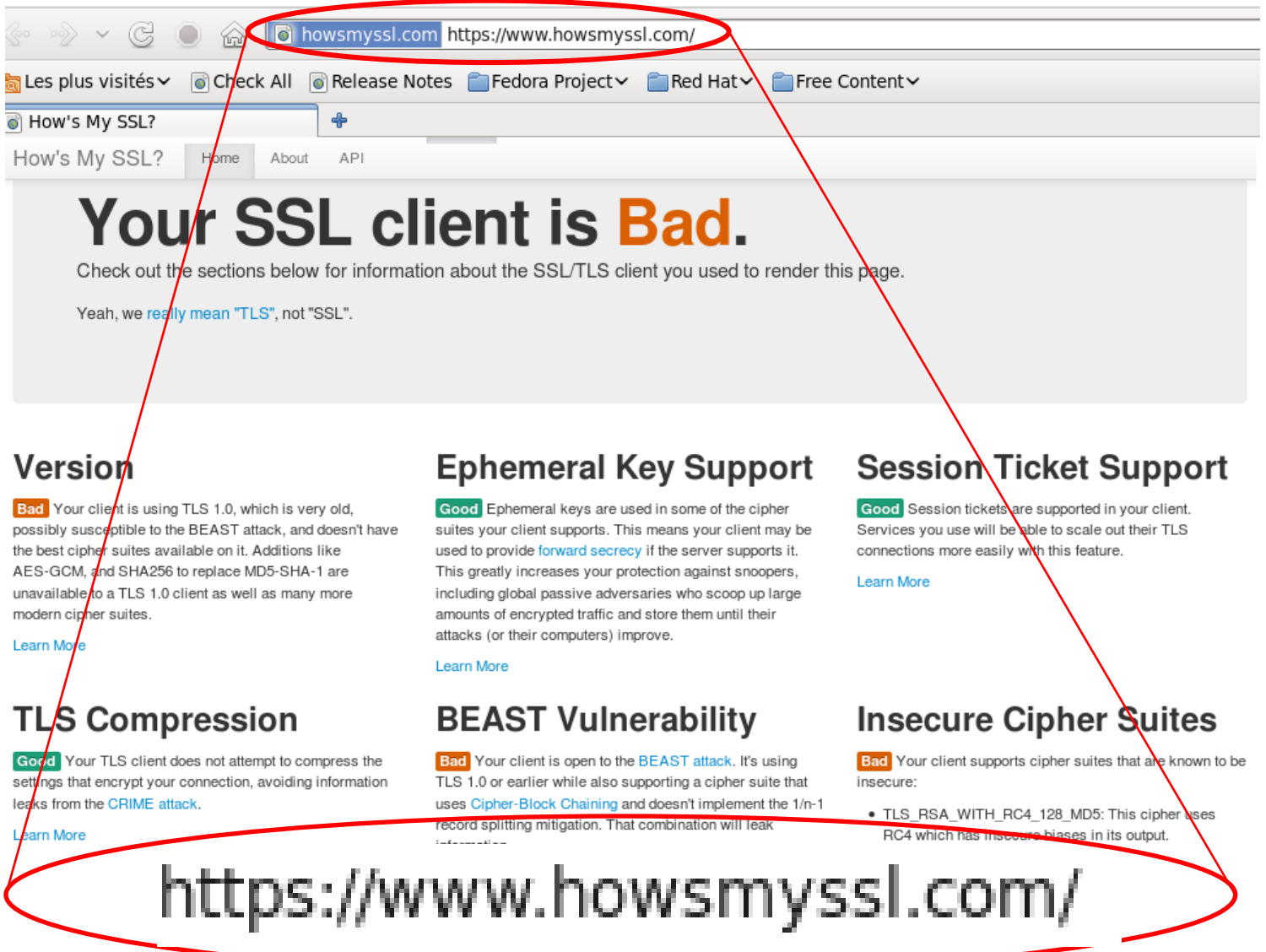
Client Hello



Server Hello



Evaluate your TLS Client



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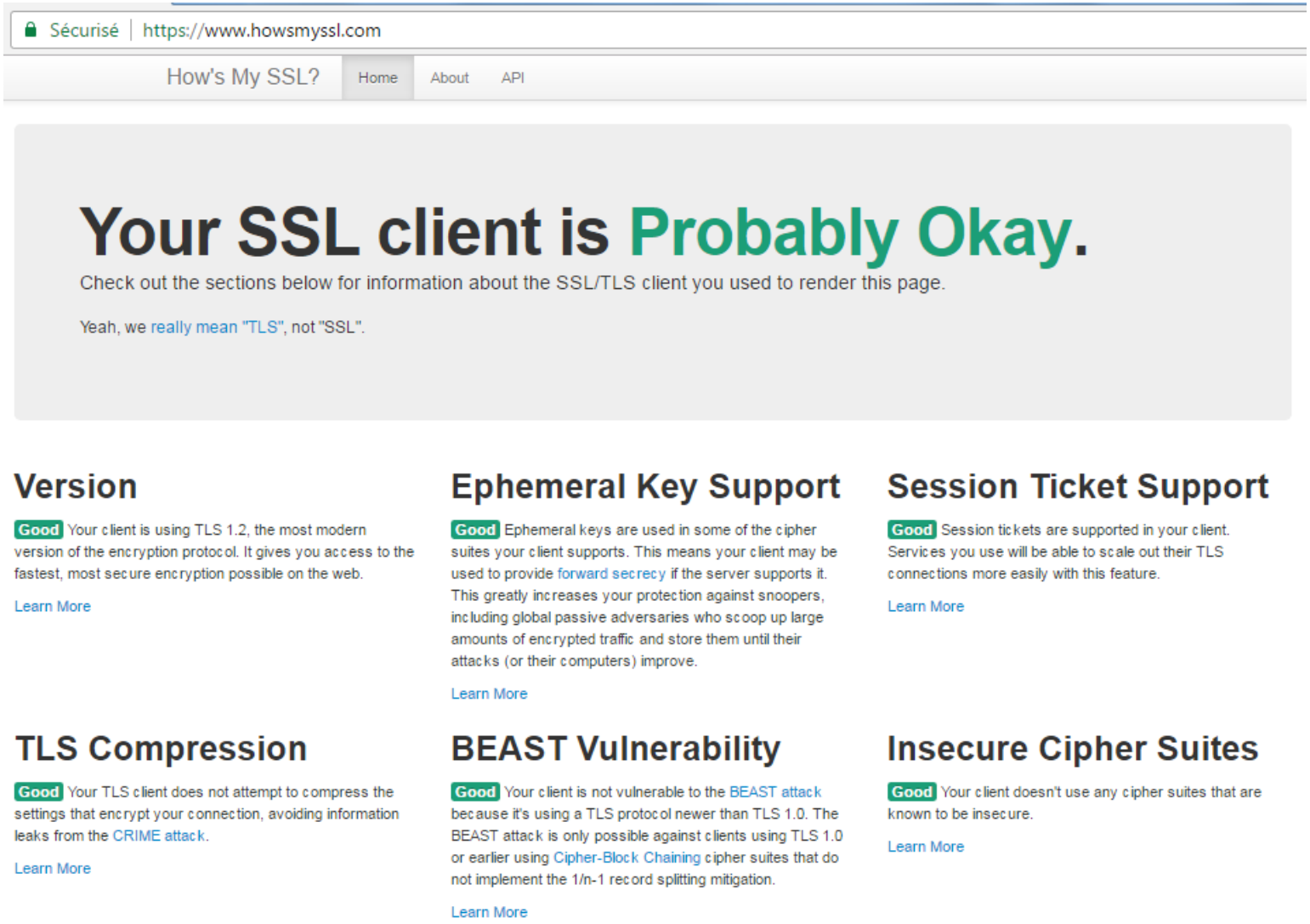
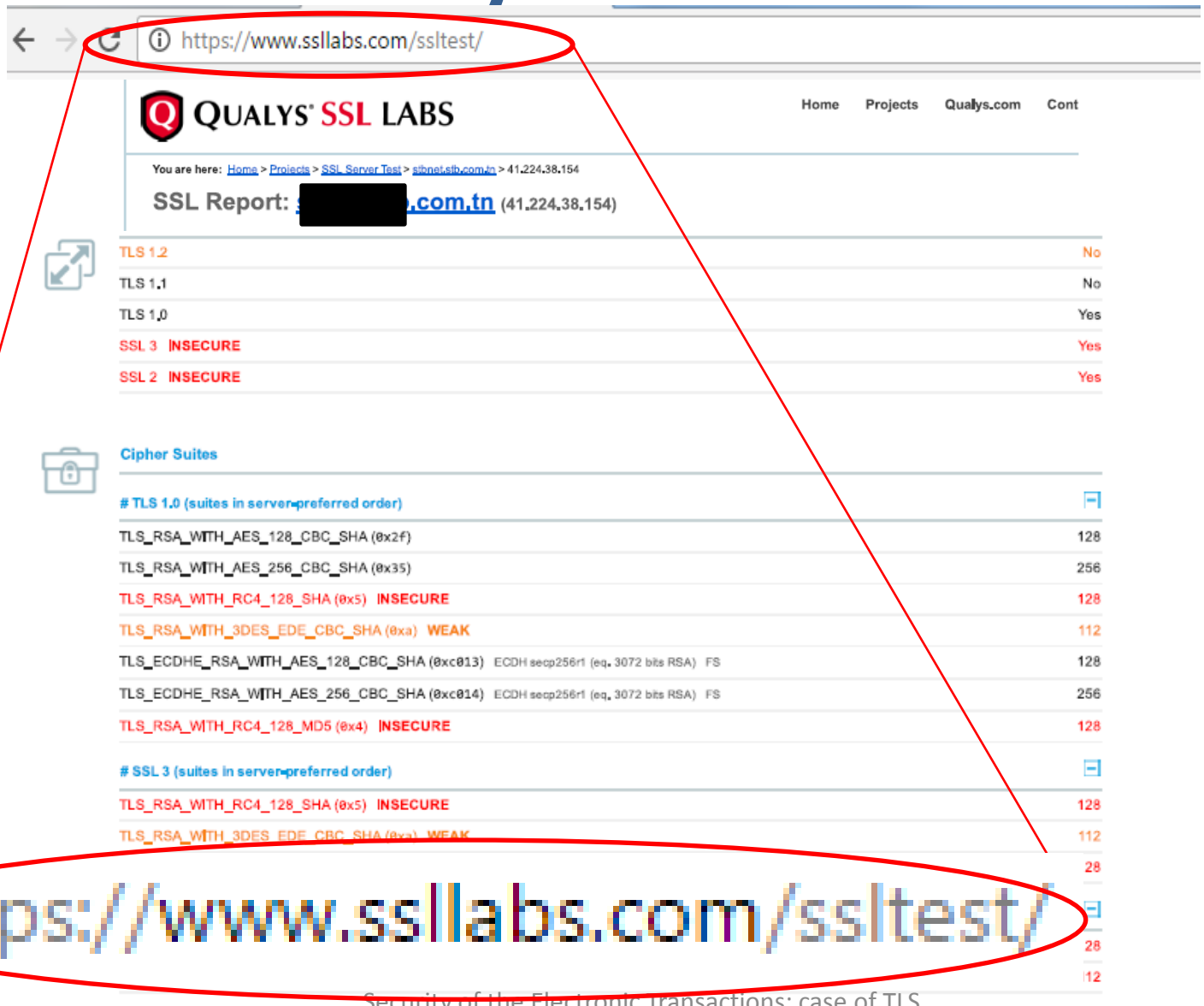


Evaluate your TLS Server



THANK YOU FOR YOUR ATTENTION

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