SHARKFEST '13

Wireshark Developer and User Conference

Understanding Encryption Services Using Wireshark

Sunday June 16th 2013

Larry Greenblatt

Jedi Knight | InterNetwork Defense

SHARKFEST '13

UC Berkeley

June 16-19, 2013

About me

Musician:

Gung Ho! - Lead Guitar / Vocals / Songwriter

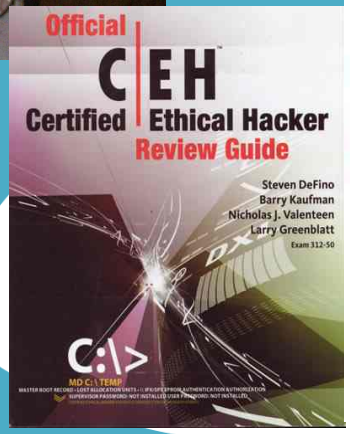
- *Philly's #1 Cyber Punk Band since 1980*
- *Produced by Otto Capobianco*

Martial Artist:

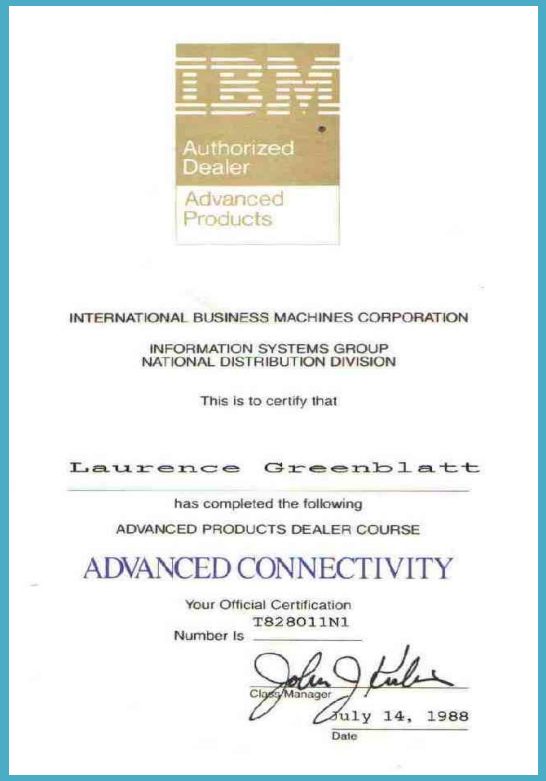
Black Sash Taiji
3rd Degree Black Belt JLFS

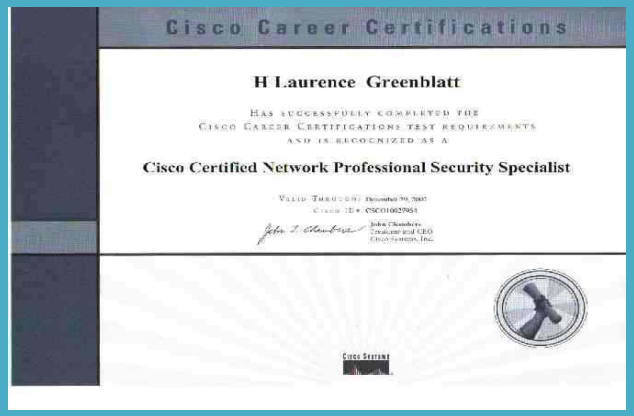
Hobbies (my day job):

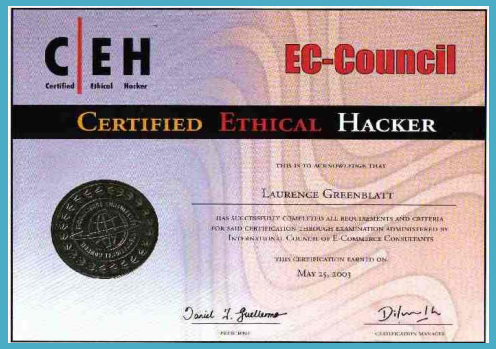
Network nerd (& InfoSec geek) 1984
Consultant / Instructor / Author
CISM, CISSP, CEH, ECSA, Security+
Co-Founder of InterNetwork Defense

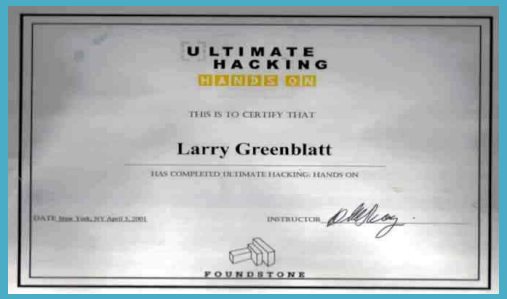


Just How Long Have I Been a Network Dweeb?









Guidelines from my Mother

Always suspect of anyone:

- “That's what they want you to think”
- “That's how they get you”
- “They get you coming and going”

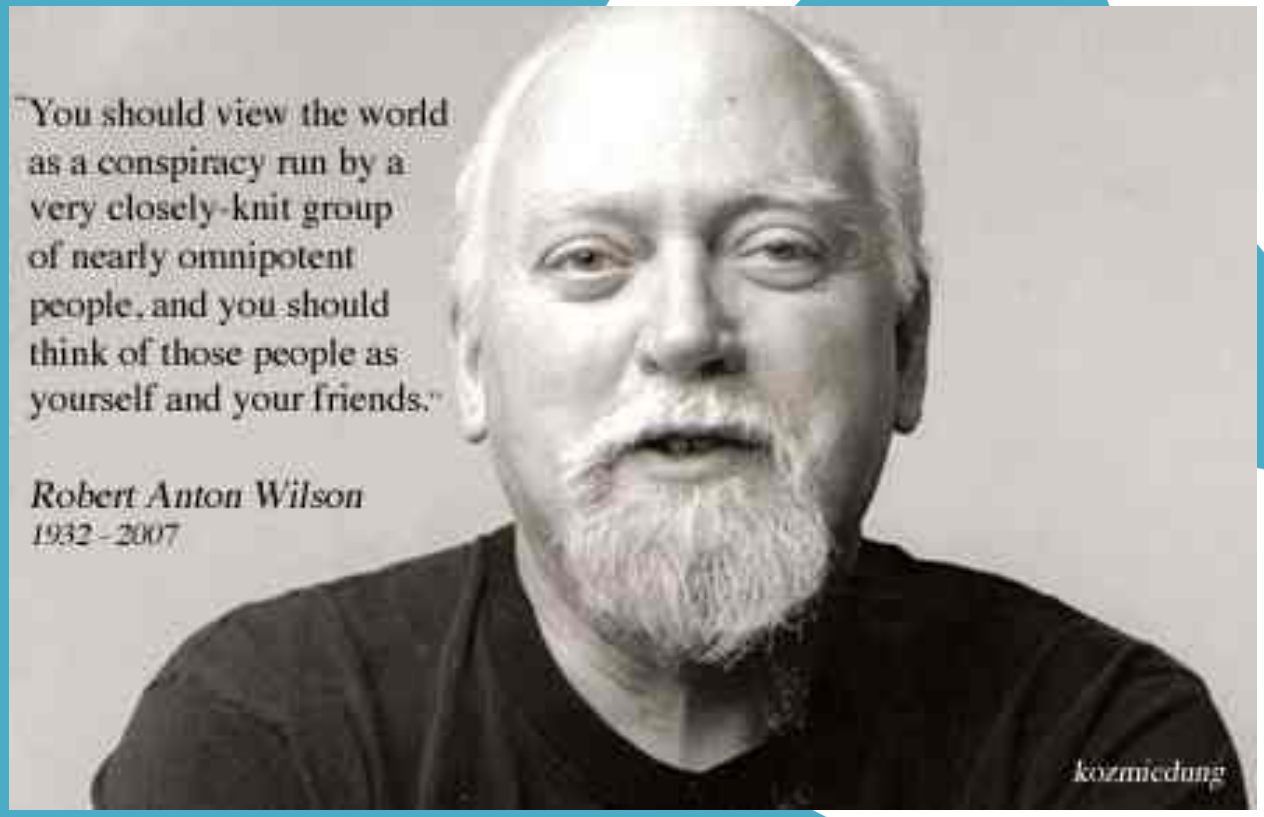
Can tell you the Greek origin of any word

Guidelines from my band

You know you could mess somebody up wit dat!

Guidelines from Robert Anton Wilson

"You Can't Speak Matter of Factually About Anything You Can't Measure"



What is a Hacker?

RFC-2828

"someone who figures things out and makes something cool happen"

Intro to Crypt0

with Bob & Alice

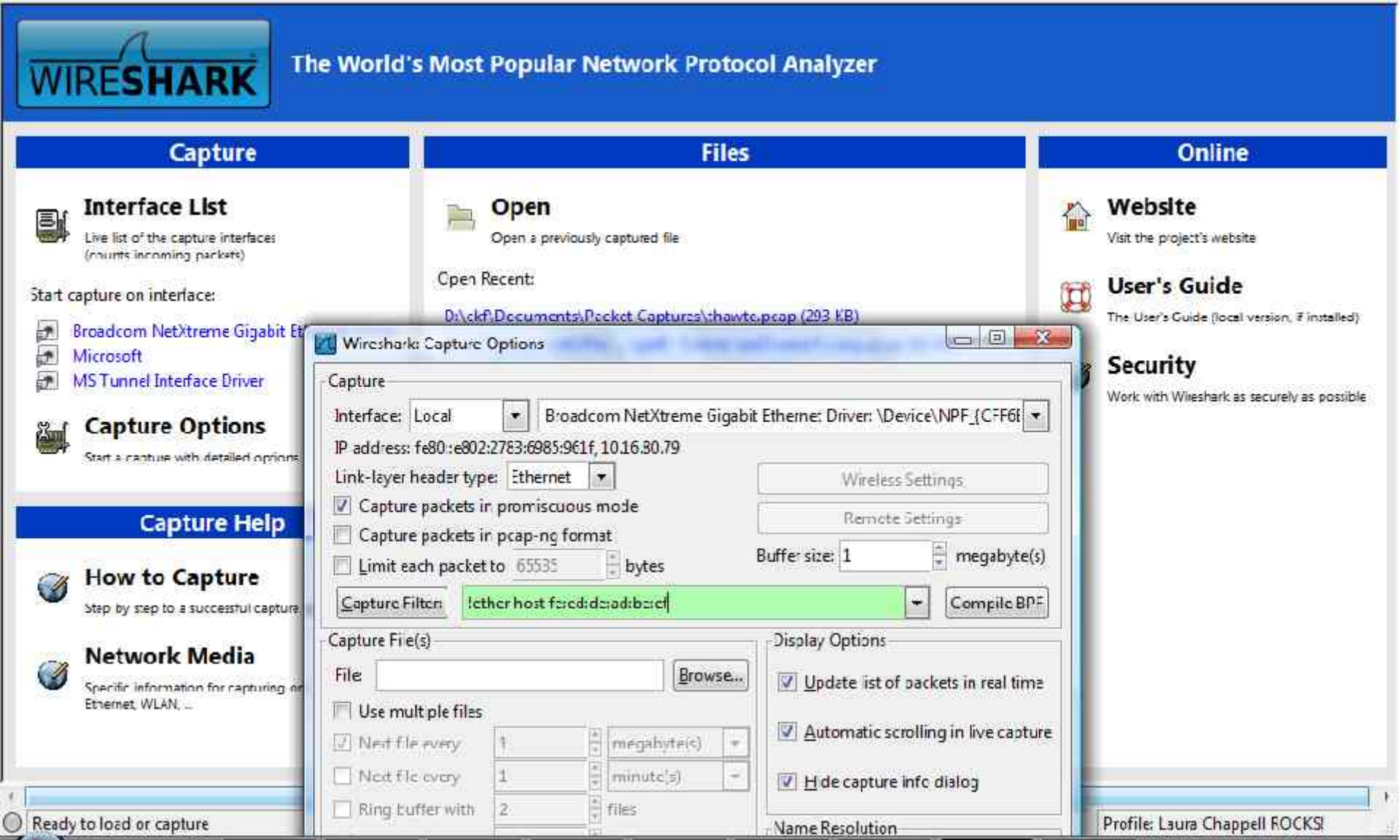
A Consumers Guide to:

1) Confidentiality
2) Authentication
3) Integrity
4) Non-Repudiation

By Employing:

Symmetric, **Asymmetric** and **Hashing** Algorithms

It is said that “Packets Do Not Lie”



The Intelligent Consumer

Welcome to the Crypto-Mart

Aisle 1
Symmetric Algorithms (Shared Secret)

RC4
AES
Twofish
Blowfish
DES &3DES
E0

Aisle 2
Asymmetric Algorithms (Public/Private)

Diffie-Hellman
RSA
ECC
El Gamal

Aisle 3
Hashing Algorithms (Message Digests)

MD5
SHA1, SHA2 & SHA3
Skein
Whirlpool

Sharkfest 2013 - Awesome!.pcap [Wireshark 1.10.0 (SVN Rev 49790 from /trunk-1.10)]

File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: ssl.handshake.ciphersuites | Expression... Clear Apply Save SSL Handshake Syn TAF

Number	Delta	Source	Destination	Protocol	Sequence number	Info
2152	000364	192.168.1.1	74.125.226.2	TLSv1	1	Client Hello

```
    Cipher Suite: TLS_ECDHE_ECDSA_WITH_AES_256_CBC_SHA (0xc00a)
    Cipher Suite: TLS_DHE_DSS_WITH_AES_128_CBC_SHA (0x0032)
    Cipher Suite: TLS_DHE_DSS_WITH_AES_256_CBC_SHA (0x0038)
    Cipher Suite: TLS_DHE_DSS_WITH_3DES_EDE_CBC_SHA (0x0013)
    Cipher Suite: TLS_RSA_WITH_RC4_128_MD5 (0x0004)
  Compression Methods Length: 1
⊞ Compression Methods (1 method)
  Extensions Length: 54
⊞ Extension: renegotiation_info
⊞ Extension: server_name
⊞ Extension: status_request
⊞ Extension: elliptic_curves
⊞ Extension: ec_point_formats
```

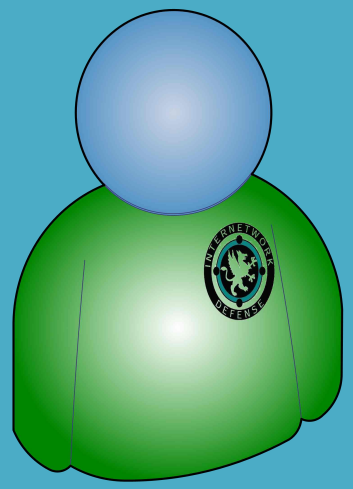
```
0090  c0 09 c0 0a 00 32 00 38  00 13 00 04 01 00 00 36   .....2.8 .....
00a0  ff 01 00 01 00 00 00 00  14 00 12 00 00 0f 73 73   ........ ......
00b0  6c 2e 67 73 74 61 74 69  63 2e 63 6f 6d 00 05 00   l.gstati c.com.
00c0  05 01 00 00 00 00 00 0a  00 06 00 04 00 17 00 18   ........ ......
00d0  00 0b 00 02 01 00                                  ......
```

Text item (text), 6 bytes Profile: SSL-TLS

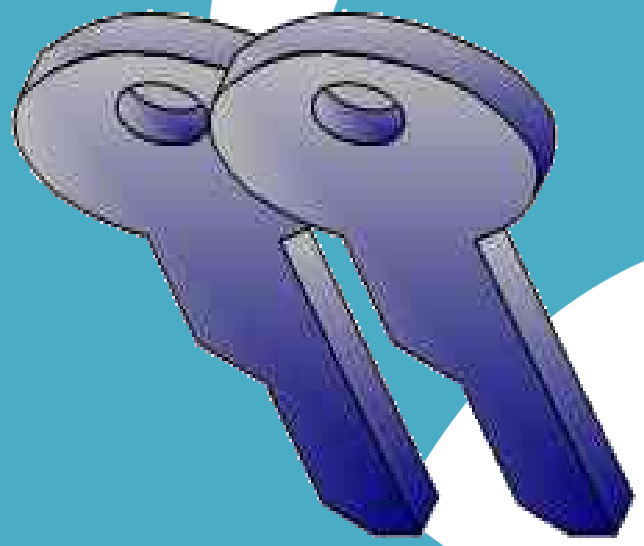
Part 1

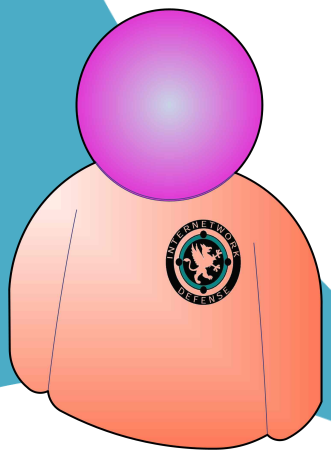
Symmetric Encryption

- **Bob wants to share a secret with Alice**
  - *First they must both secretly agree on a shared key.* ***How?***



Bob





Alice

Symmetric Encryption

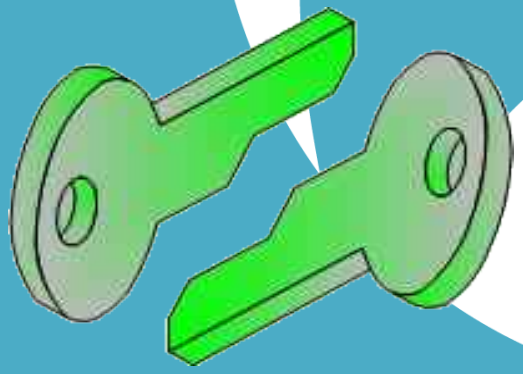
- **Strengths**
  - Fast
- **Challenges**
  - Key Agreement
  - Scalability
    - *N(N-1)/2*
- **Security Services:**
  - Confidentiality
  - Limited* authenticity

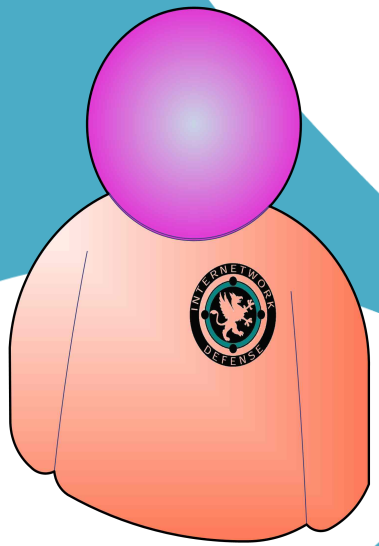
**Alice knows it is Bob, but she can't prove it!*

Part 2

Asymmetric Encryption

- **Alice creates a related key pair**
  - She keeps one to herself *(private key will sign)*
  - Gives the other to anyone who wants it *(public)*
    - **<u>Public key:</u>**
      - ***ID card***
      - ***PKI: Validates x.500 name***





File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: x509af.subjectPublicKey | Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Length	Info
2251	0.268880	173.194.43.54	192.168.1.14	TLSv1	558	Certificate, Server Ke

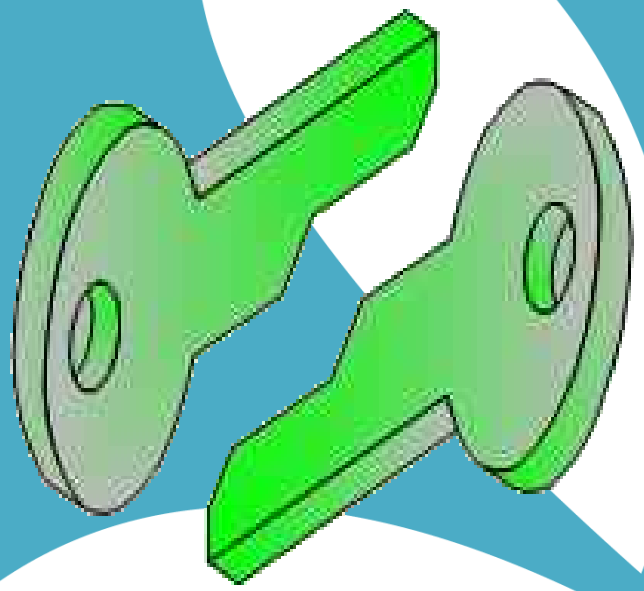
```
⊟ Certificate (id-at-commonName=mail.google.com,id-at-organizationName=(
  ⊟ signedCertificate
      version: v3 (2)
      serialNumber : 0x2b9f7ee5ca25a62514204782753a9bb9
    ⊞ signature (shaWithRSAEncryption)
    ⊞ issuer: rdnSequence (0)
    ⊞ validity
    ⊟ subject: rdnSequence (0)
      ⊞ rdnSequence: 5 items (id-at-commonName=mail.google.com,id-at-orga
    ⊟ subjectPublicKeyInfo
      ⊞ algorithm (rsaEncryption)
```

```
0110  6c 65 2e 63 6f 6d 30 81  9f 30 0d 06 09 2a 86 48   le.com0. .0...*.H
0120  86 f7 0d 01 01 01 05 00  03 81 8d 00 30 81 89 02   ........ ....0...
0130  81 81 00 af 39 15 98 68  e4 92 fe 4f 4f f1 bb ff   ....9..h ...OO...
0140  0d 2e b0 fe 25 aa bd 68  04 67 27 ea 6c 43 4c a7   ....%..h .g'.lCL.
0150  6d cb c8 8f 7e 81 ee 87  26 25 10 12 54 33 9e aa   m...~... &%..T3..
0160  3d 9b 8f 8e 92 b3 4b 01  e3 f9 4a 29 c3 0f fd ac   =.....K. ..J)....
0170  b7 d3 4c 97 29 3f 69 55  cf 70 83 04 af 2e 04 6e   ..L.)?iU .p.....n
0180  74 d6 0f 17 09 fe 9e 20  24 24 e3 c7 68 9c ac 11   t...... $$..h...
0190  bd 92 e4 b2 1b 09 f2 02  32 bb 55 1b 2d 16 5f 30   ........ 2.U.-._0
01a0  12 23 e2 4c 4a 8d c2 da  3f e1 b8 bf f7 3a b1 86   .#.LJ... ?.....:..
01b0  be f0 c5 02 03 01 00 01  a3 81 e7 30 81 e4 30 0c   ........ ...0..0.
```

Frame (558 bytes) | Reassembled TCP (1848 bytes)

Asymmetric Encryption

- **Advantages over symmetric**
  - Key Distribution
  - Scalability (2N)
  - Provides Non-Repudiation
- **Disadvantages**
  - Much slower
  - Requires Trusted 3rd Party
    - PKI Hierarchy
    - OpenPGP Web of Trust



File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: ssl.handshake.certificate | Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Length	Info
2251	0.268880	173.194.43.54	192.168.1.14	TLSv1	558	Certificate, Server Ke

```
- Certificate (id-at-commonName=mail.google.com,id-at-organizationName=(
  - signedCertificate
    version: v3 (2)
    serialNumber : 0x2b9f7ee5ca25a62514204782753a9bb9
    + signature (shaWithRSAEncryption)
    + issuer: rdnSequence (0)
    + validity
    - subject: rdnSequence (0)
      + rdnSequence: 5 items (id-at-commonName=mail.google.com,id-at-orga
    - subjectPublicKeyInfo
      + algorithm (rsaEncryption)
        Padding: 0
        subjectPublicKey: 30818902818100af39159868e492fe4f4ff1bbff0d2eb0f
    + extensions: 4 items
  + algorithmIdentifier (shaWithRSAEncryption)
```

```
0000  16 03 01 06 5a 0b 00 06  56 00 06 53 00 03 26 30   ....Z... V..S..&0
0010  82 03 22 30 82 02 8b a0  03 02 01 02 02 10 2b 9f   ..."0.... ......+.
0020  7e e5 ca 25 a6 25 14 20  47 82 75 3a 0b b9 30 0d   ~..%.%.  G.u:..0.
```

Frame (558 bytes) | Reassembled TCP (1848 bytes)

File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: x509if.id | Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Length	Info
2251	0.268880	173.194.43.54	192.168.1.14	TLSv1	558	Certificate, Server Ke

```
⊟ Certificate (id-at-commonName=mail.google.com,id-at-organizationName=G
  ⊟ signedCertificate
      version: v3 (2)
      serialNumber : 0x2b9f7ee5ca25a62514204782753a9bb9
    ⊞ signature (shaWithRSAEncryption)
    ⊞ issuer: rdnSequence (0)
    ⊞ validity
    ⊟ subject: rdnSequence (0)
      ⊞ rdnSequence: 5 items (id-at-commonName=mail.google.com,id-at-orga
    ⊟ subjectPublicKeyInfo
      ⊞ algorithm (rsaEncryption)
        Padding: 0
        subjectPublicKey: 30818902818100af39159868e492fe4f4ff1bbff0d2eb0f
    ⊞ extensions: 4 items
  ⊞ algorithmIdentifier (shaWithRSAEncryption)
```

```
0000  16 03 01 06 5a 0b 00 06  56 00 06 53 00 03 26 30   ....Z... V..S..&0
0010  82 03 22 30 82 02 8b a0  03 02 01 02 02 10 2b 9f   ..."0.... ......+.
```

Frame (558 bytes) | Reassembled TCP (1848 bytes)

File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: ssl.handshake.ciphersuite | Expression... Clear Apply

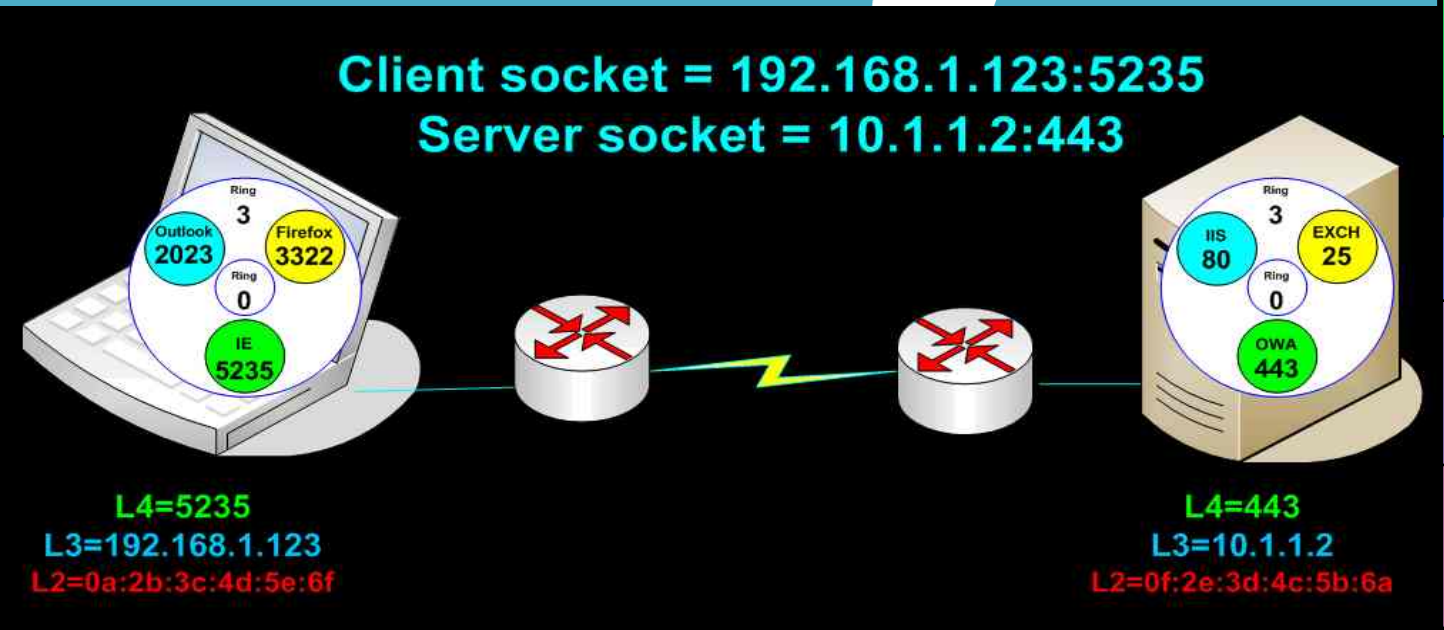
No.	Time	Source	Destination	Protoc	Length	Info
2127	0.005072	173.194.43.30	192.168.1.14	TLSv1	1484	Server H

```
⊟ Handshake Protocol: Server Hello
    Handshake Type: Server Hello (2)
    Length: 77
    Version: TLS 1.0 (0x0301)
  ⊞ Random
    Session ID Length: 32
    Session ID: adf7fc0895c40eacdc257aa8f5093536cd2556b95ed611
    Cipher Suite: TLS_ECDHE_RSA_WITH_AES_128_CBC_SHA (0xc013)
    Compression Method: null (0)
    Extensions Length: 5
  ⊞ Extension: renegotiation_info
```

```
0080  49 c6 c0 13 00 00 05 ff  01 00 01 00 16 03 01 06   I.......
0090  e4 0b 00 06 e0 00 06 dd  00 04 23 30 82 04 1f 30   .......
00a0  82 03 88 a0 03 02 01 02  02 0a 2c 09 98 87 00 00   .......
00b0  00 00 58 1c 30 0d 06 09  2a 86 48 86 f7 0d 01 01   X.0
```

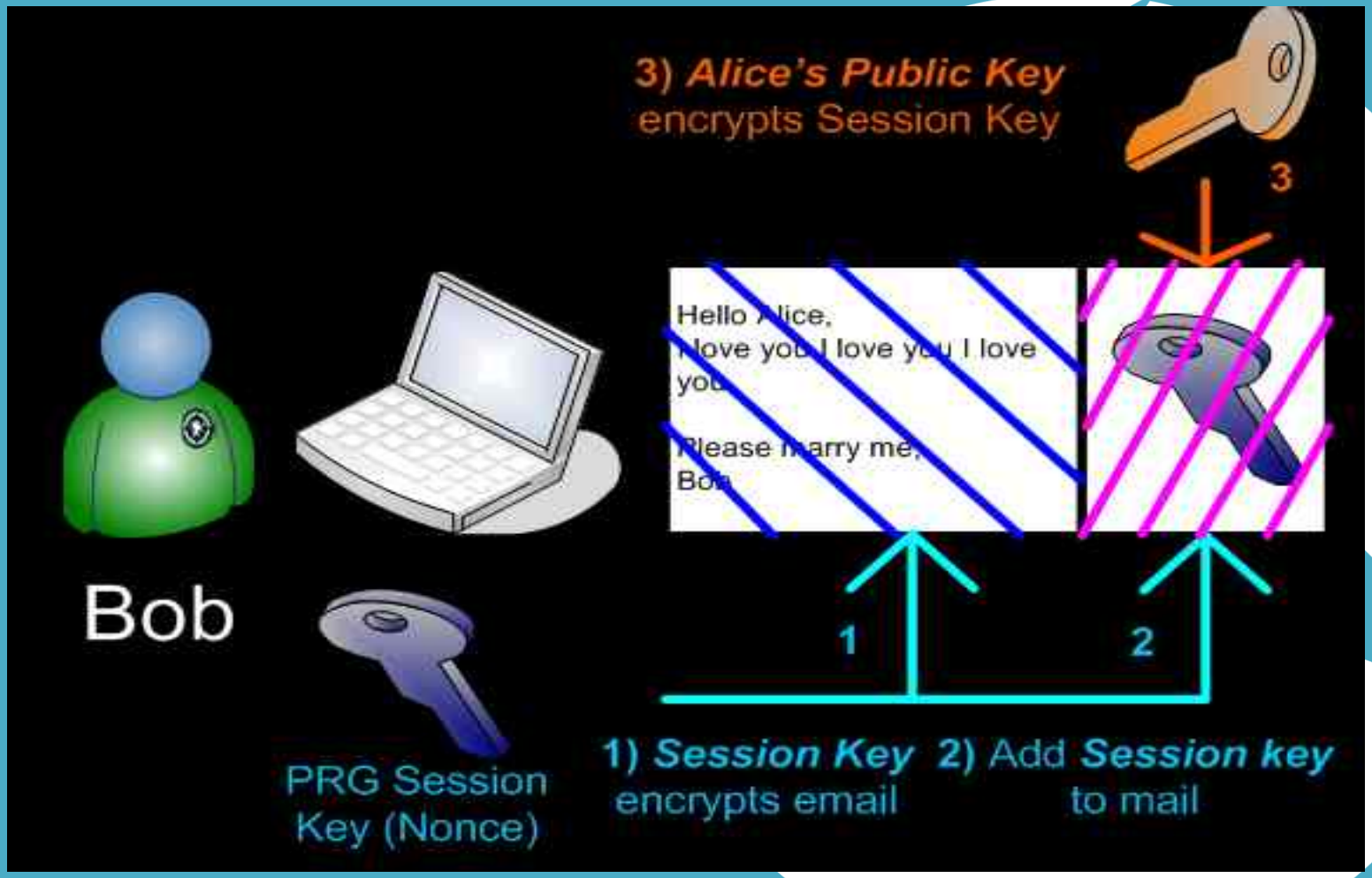
Where & What to Encrypt?

- **Application** (S/MIME, OpenPGP, SSH)
- **Presentation** (TrueCrypt, PKZip)
- **Transport** (SSL/TLS)
- **Network** (IPSec)
- **Link layer** (watch out! router support)

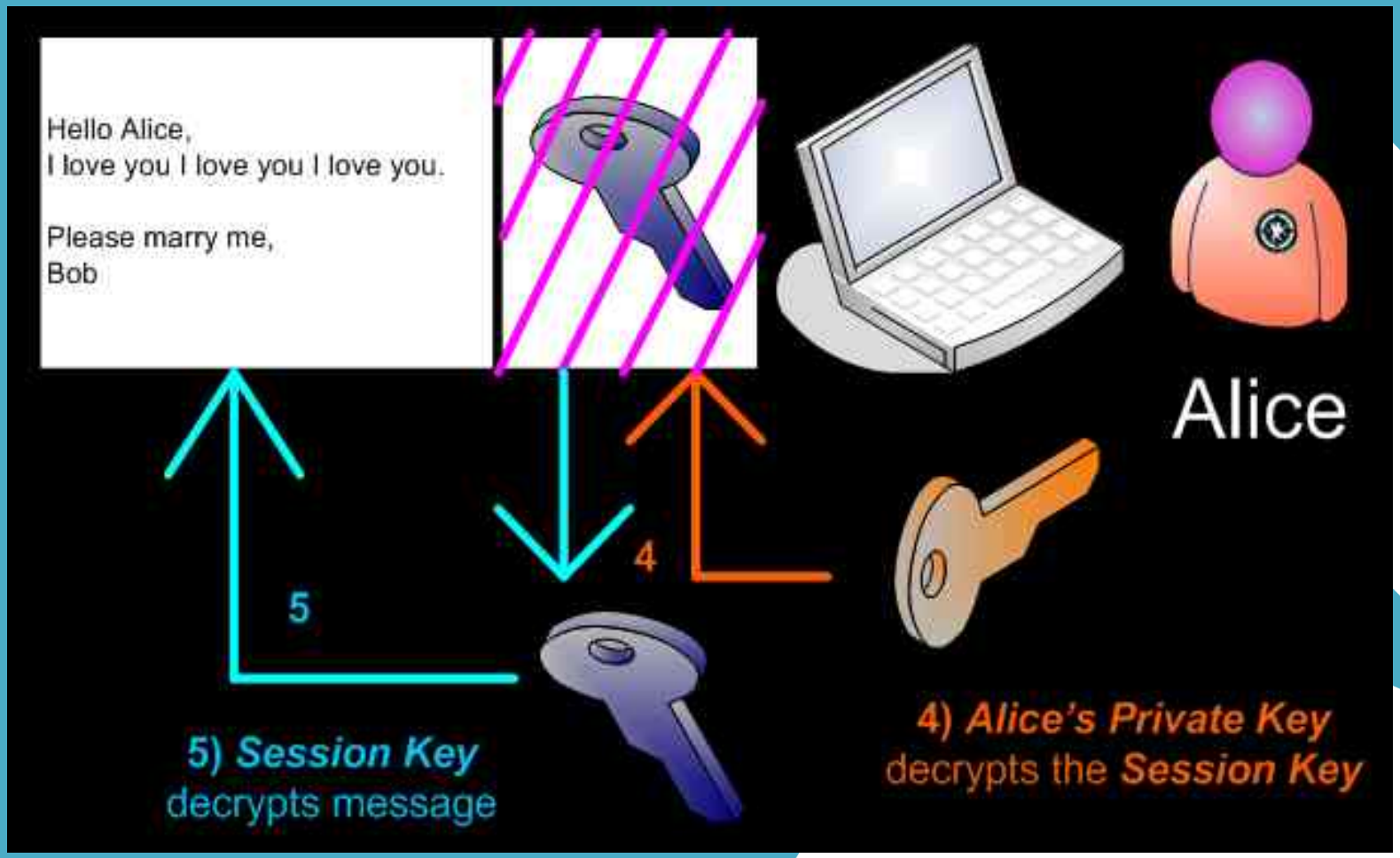


Application
Presentation
Session
Transport
Network
Data Link
Physical

Encrypting eMail



Decrypting eMail



Part 3

Hashing Algorithms

Understand Integrity checks with:

a) Message Digests

b) Message Authentication Codes

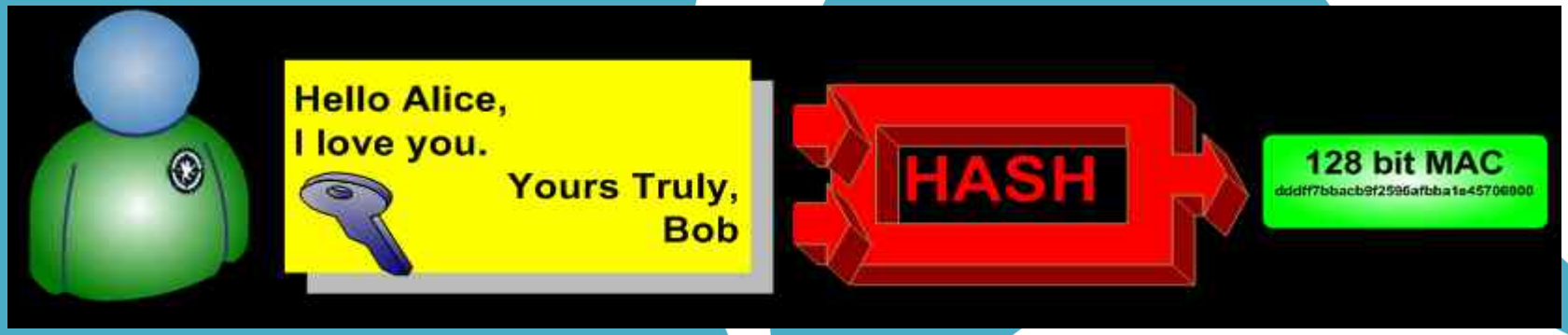
c) Digital Signatures

Authenticating the Hash

- **Message Digest**
  - Not-Authenticated
- **Message Authentication Code (MAC)**
  - Authenticated Symmetrically
    - Authentication only *(message can be repudiated)*
- **Digital Signatures**
  - Authenticated Asymmetrically
    - Authentication
    - Non-Repudiation

Message Authentication Codes

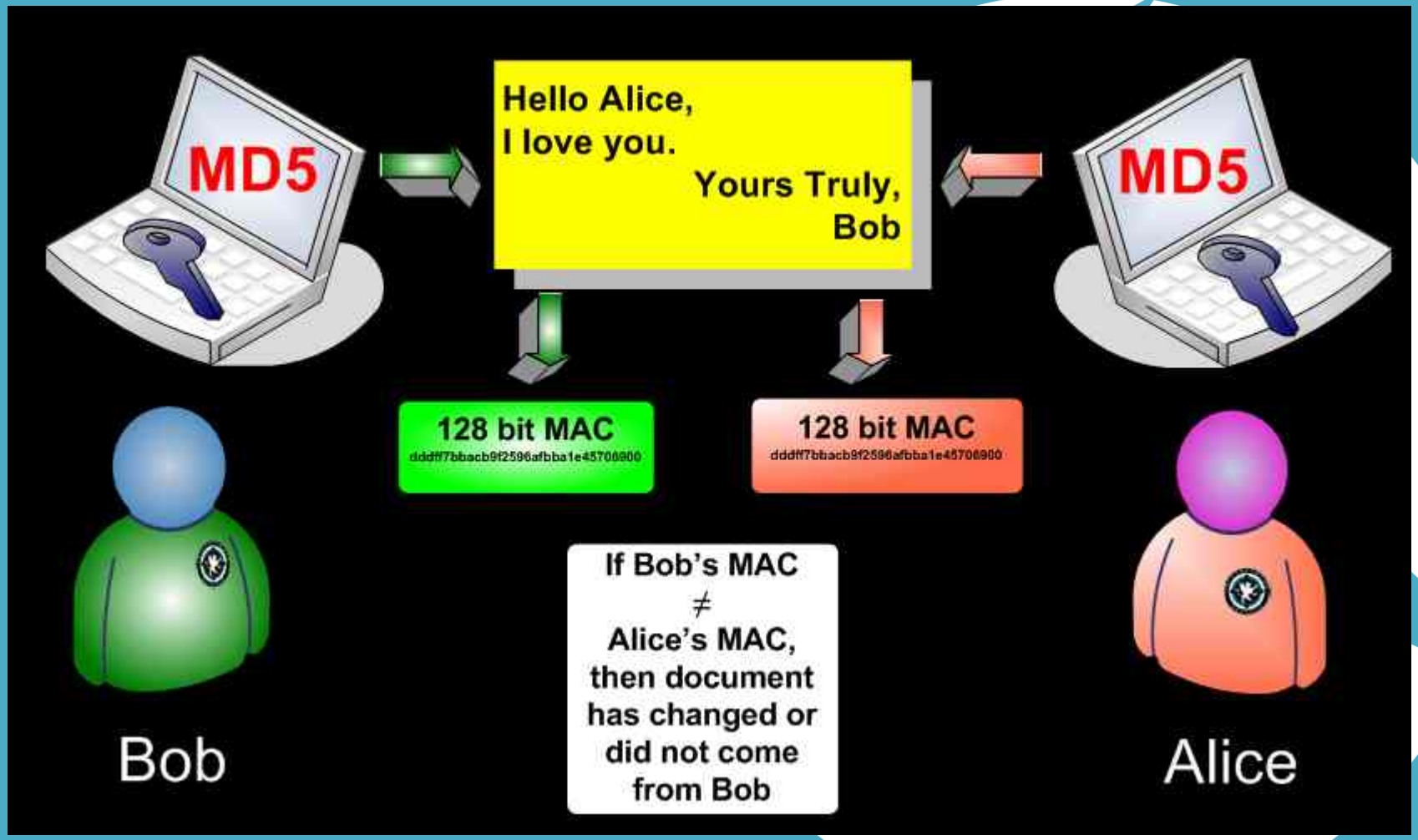
- Message digest is salted with symmetric key
  - Hash provides integrity
  - Symmetric key provides authenticity



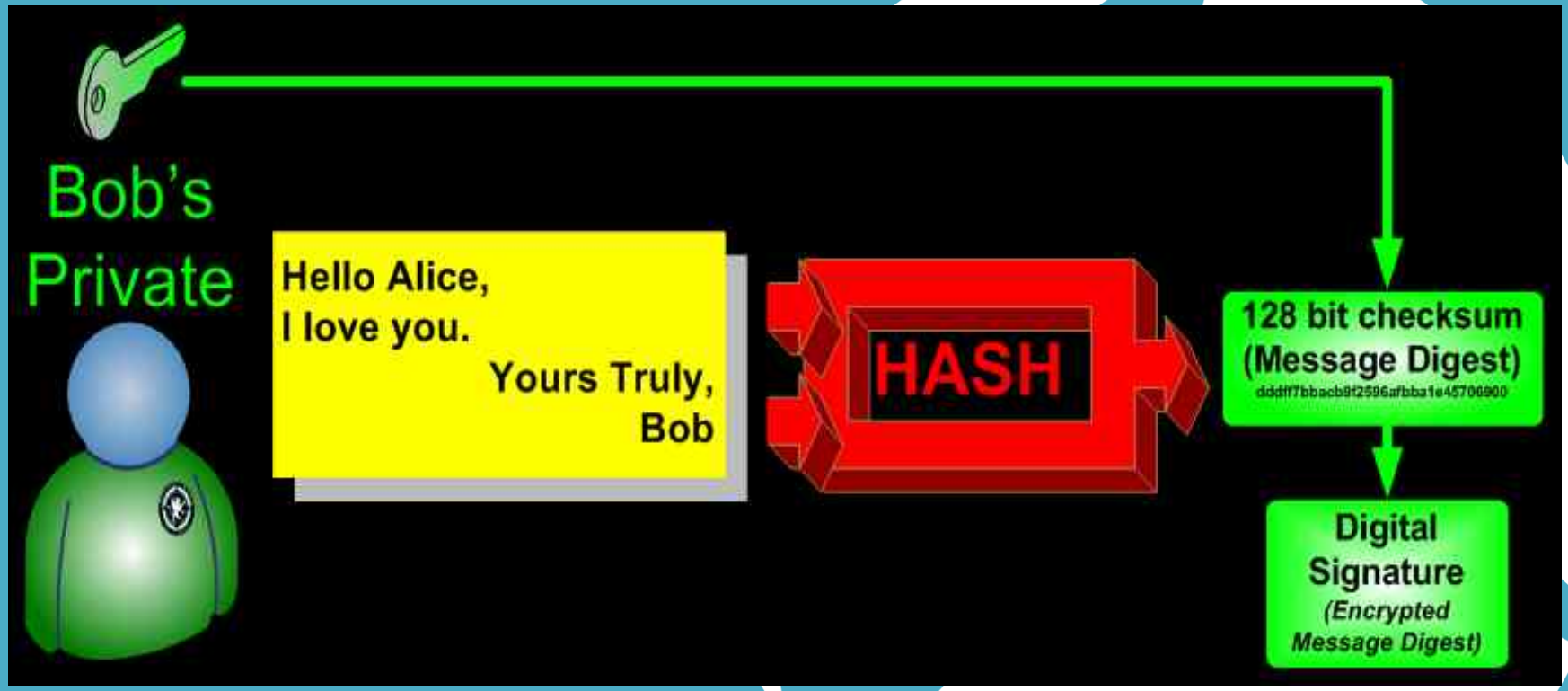
Important! - Does not provide non-repudiation

- Bob Claims “Alice sent the message”

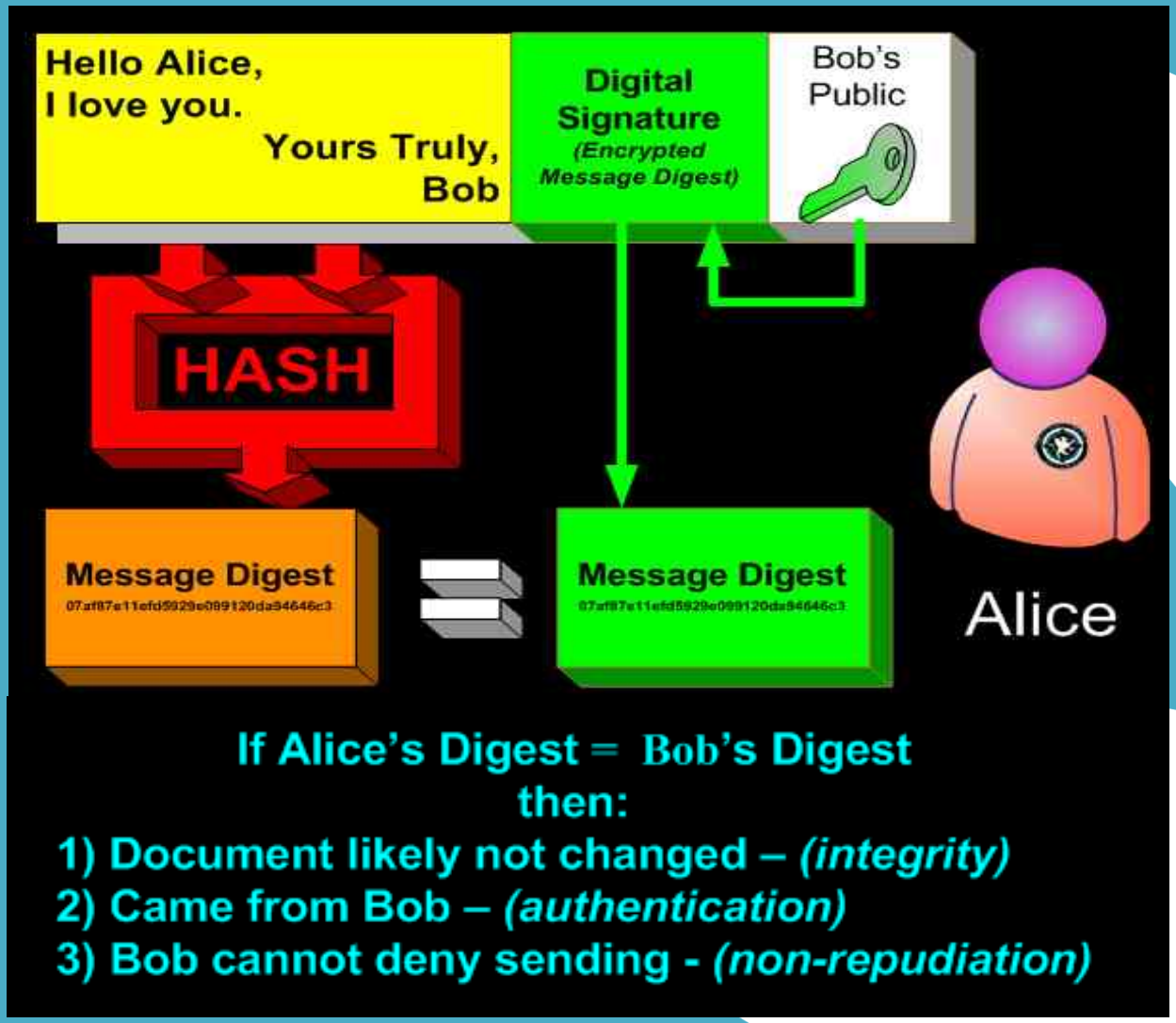
Message Authentication Codes



Signing a message



Validating the Signature



File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: ssl.handshake.certificate | Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Length	Info
2251	0.268880	173.194.43.54	192.168.1.14	TLSv1	558	Certifica

```
⊟ signedCertificate
    version: v3 (2)
    serialNumber : 0x2b9f7ee5ca25a6251420478275 3a9bb9
  ⊞ signature (shaWithRSAEncryption)
  ⊟ issuer: rdnSequence (0)
    ⊞ rdnSequence: 3 items (id-at-commonName=Thawte SGC CA
  ⊞ validity
  ⊟ subject: rdnSequence (0)
    ⊞ rdnSequence: 5 items (id-at-commonName=mail.google.c
  ⊟ subjectPublicKeyInfo
    ⊞ algorithm (rsaEncryption)
```

```
0020  7e e5 ca 25 a6 25 14 20  47 82 75 3a 9b b9 30 0d   ~..%.%.
0030  06 09 2a 86 48 86 f7 0d  01 01 05 05 00 30 4c 31   ..*.H...
0040  0b 30 09 06 03 55 04 06  13 02 5a 41 31 25 30 23   .0...U..
0050  06 03 55 04 0a 13 1c 54  68 61 77 74 65 20 43 6f   ..U....T
0060  6e 73 75 6c 74 69 6e 67  20 28 50 74 79 29 20 4c   nsulting
0070  74 64 2e 31 16 30 14 06  03 55 04 03 13 0d 54 68   td.1.0..
```

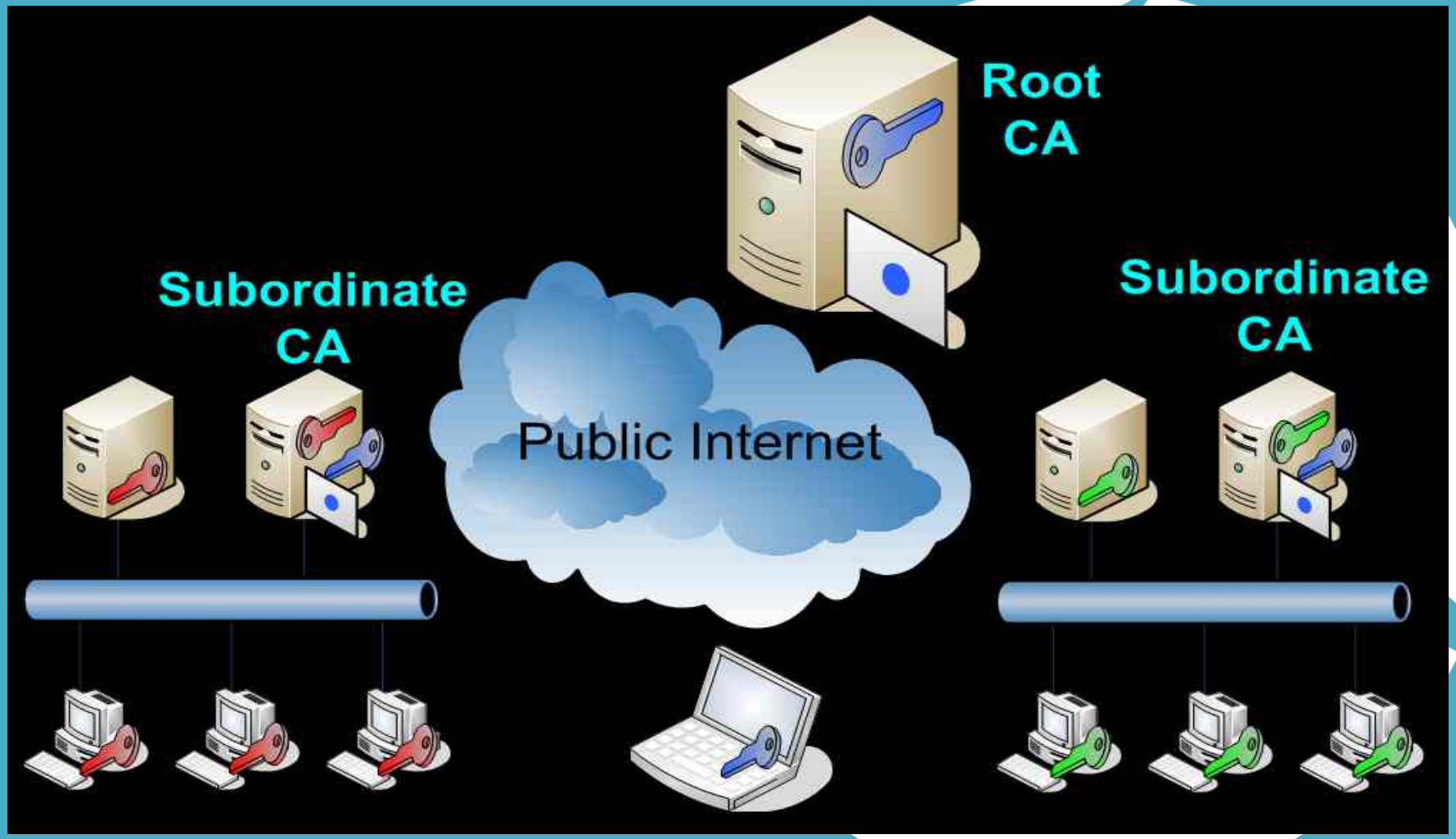
Frame (558 bytes) | Reassembled TCP (1848 bytes)

Who is a *“Trusted 3rd party”*

“Captain, the Federation's x.500 based hierarchical trust model of **PKI** is very logical. Perhaps we can trust the public **Certificate Authorities**”

“But Spock, I have never met **Thawte** or **Verisign**. I feel I can trust my friends. Call it a hunch, I trust OpenPGP more”

PKI Hierarchical Trust Model



File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: x509af.issuer | Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Length	Info
2251	0.268880	173.194.43.54	192.168.1.14	TLSv1	558	Certifica

```
⊟ Certificate (id-at-commonName=mail.google.com,id-at-organ
  ⊟ signedCertificate
      version: v3 (2)
      serialNumber : 0x2b9f7ee5ca25a6251420478275 3a9bb9
    ⊞ signature (shaWithRSAEncryption)
    ⊟ issuer: rdnSequence (0)
      ⊞ rdnSequence: 3 items (id-at-commonName=Thawte SGC CA
    ⊞ validity
    ⊟ subject: rdnSequence (0)
      ⊞ rdnSequence: 5 items (id-at-commonName=mail.google.c
    ⊟ subjectPublicKeyInfo
```

```
0030  06 09 2a 86 48 86 f7 0d  01 01 05 05 00 30 4c 31   ..*.H...
0040  0b 30 09 06 03 55 04 06  13 02 5a 41 31 25 30 23   .0...U..
0050  06 03 55 04 0a 13 1c 54  68 61 77 74 65 20 43 6f   ..U....T
0060  6e 73 75 6c 74 69 6e 67  20 28 50 74 79 29 20 4c   nsulting
0070  74 64 2e 31 16 30 14 06  03 55 04 03 13 0d 54 68   td.1.0..
0080  61 77 74 65 20 53 47 43  20 43 41 30 1e 17 0d 31   awte SGC
```

Frame (558 bytes) | Reassembled TCP (1848 bytes)

Why Trust a CA?

RFC-3280 (updated in 4630)

- **Top tier**
  - Internet Policy Registration Authority (IPRA)
    - *Internet PCA Registration Authority (MIT),?*
- **Second tier**
  - Policy Certification Authorities (PCAs)
    - *UNINETT, DFN-PCA, SURFnetPCA*
- **Third tier**
  - Certification Authorities (CAs)
    - *VeriSign, Duetsche Telekom, Thawte, etc.*

Internet PCA Registration Authority

Internet PCA Registration Authority Key Information - Microsoft Internet Explorer

File Edit View Favorites Tools Help

Back Search Favorites

Address http://bs.mit.edu:8001/ipra.html Go Links Norton Internet Security Norton AntiVirus

Internet PCA Registration Authority

Root Key

Note: The IPRA Certificate has been re-issued. The public key remains the same, but the expiration date has been advanced through 9/15/99.

NOTE: It is not known whether or not the Safekeyper box is Y2K compliant or whether or not we will be able to issue a certificate that expires (or is issued) beyond the year 2000!

I am pleased to inform you that we have (finally) created the Internet Society sponsored "Internet PCA Registration Authority" (IPRA). I have enclosed a uuencoded file that contains its self-signed certificate, as well as a version where it is "exploded" (courtesy of the trval program which is part of the TIS/PEM distribution) and finally a more human readable version.

In addition to being available on this Web Page we will shortly be submitting an Internet Informational RFC which will contain it.

The IPRA will be operated under the authority of the Internet Society by MIT for a period of time after which physical control will be turned over to Internet Society staff (or other designated party as determined by the Society).

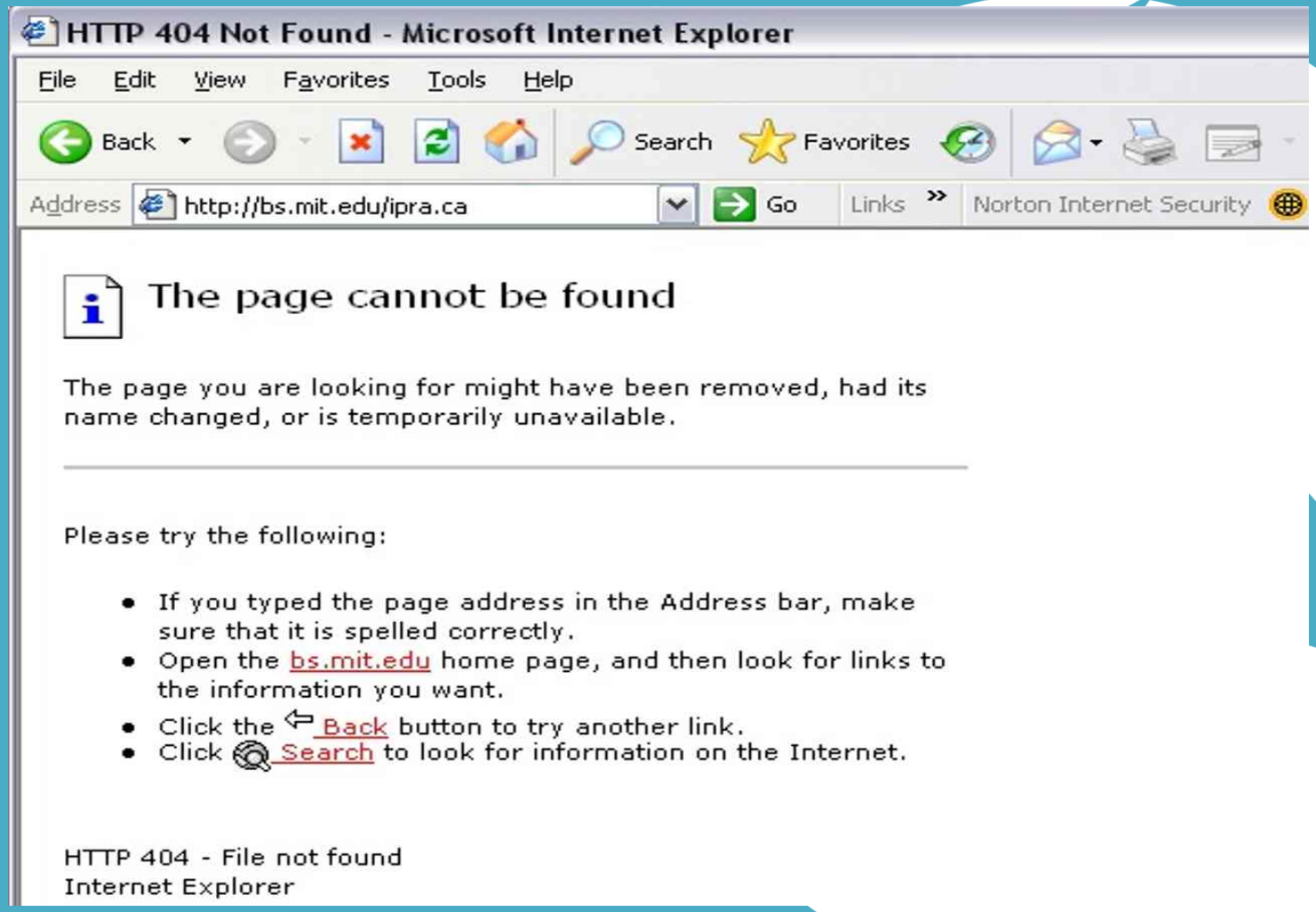
The IPRA Private Key is protected via a Certificate Signature Unit. Click here to read more about this technology

-*Jeff Schiller*

You can get the IPRA Certificate in a form downloadable into Netscape version 2.0 (or greater) here: http://bs.mit.edu/ipra.ca.

Internet

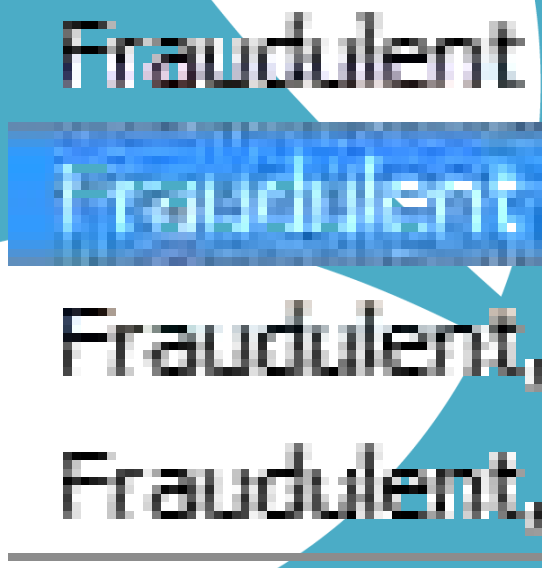
Internet PCA Registration Authority



Certificate Revocation

Compromised Private Keys

- **Certificate Revocation Lists (CRL)**
- **Online Certificate Status Protocol (OCSP)**
- **Problems:**
  - Client checking may be disabled
  - Browsers configured to fail soft
  - Upstream servers may block CRL
  - Compromised CA certificates
  - Algorithms cracked
  - More...



File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: x509ce.GeneralName == 6 Expression... Clear Apply

No.	Time	Source	Destination	Protocol	Length	Info
2251	0.268880	173.194.43.54	192.168.1.14	TLSv1	558	Certificate, Server Key Exchang

```
⊟ extensions: 4 items
  ⊟ Extension (id-ce-basicConstraints)
      Extension Id: 2.5.29.19 (id-ce-basicConstraints)
      critical: True
      BasicConstraintsSyntax
  ⊟ Extension (id-ce-cRLDistributionPoints)
      Extension Id: 2.5.29.31 (id-ce-cRLDistributionPoints)
    ⊟ CRLDistPointsSyntax: 1 item
      ⊟ DistributionPoint
        ⊟ distributionPoint: fullName (0)
          ⊟ fullName: 1 item
            ⊟ GeneralName: uniformResourceIdentifier (6)
                uniformResourceIdentifier: http://crl.thawte.com/ThawteSGCCA.crl
  ⊟ Extension (id-ce-extKeyUsage)
      Extension Id: 2.5.29.37 (id-ce-extKeyUsage)
```

```
01c0  06 03 55 1d 13 01 01 ff  04 02 30 00 30 36 06 03   ..U..... ..0.06..
01d0  55 1d 1f 04 2f 30 2d 30  2b a0 29 a0 27 86 25 68   U.../0-0 +.).'.%h
01e0  74 74 70 3a 2f 2f 63 72  6c 2e 74 68 61 77 74 65   ttp://cr l.thawte
```

Frame (558 bytes) Reassembled TCP (1848 bytes)

File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: pkix1implicit.accessLocation == 6 | Expression... Clear Apply Save

No.	Time	Source	Destination	Protocol	Length	Info
2251	0.000283	173.194.43.54	192.168.1.14	TLSv1	558	Certificate, Server Key Exchang

```
⊟ Certificate (id-at-commonName=mail.google.com,id-at-organizationName=Google Inc,
  ⊟ signedCertificate
      version: v3 (2)
      serialNumber : 0x2b9f7ee5ca25a62514204782753a9bb9
    ⊞ signature (shaWithRSAEncryption)
    ⊞ issuer: rdnSequence (0)
    ⊞ validity
    ⊞ subject: rdnSequence (0)
    ⊞ subjectPublicKeyInfo
    ⊟ extensions: 4 items
      ⊞ Extension (id-ce-basicConstraints)
      ⊞ Extension (id-ce-cRLDistributionPoints)
      ⊞ Extension (id-ce-extKeyUsage)
      ⊟ Extension (id-pe-authorityInfoAccessSyntax)
          Extension Id: 1.3.6.1.5.5.7.1.1 (id-pe-authorityInfoAccessSyntax)
        ⊟ AuthorityInfoAccessSyntax: 2 items
          ⊟ AccessDescription
              accessMethod: 1.3.6.1.5.5.7.48.1 (id-pkix.48.1)
            ⊟ accessLocation: 6
                uniformResourceIdentifier: http://ocsp.thawte.com
```

```
0240  06 08 2b 06 01 05 05 07  30 01 86 16 68 74 74 70   ..+..... 0...http
0250  3a 2f 2f 6f 63 73 70 2e  74 68 61 77 74 65 2e 63   ://ocsp. thawte.c
0260  6f 6d 30 3e 06 08 2b 06  01 05 05 07 30 02 86 32   om0>..+. ....0..2
0270  68 74 74 70 3a 2f 2f 77  77 77 2e 74 68 61 77 74   http://w ww.thawt
0280  65 2e 63 6f 6d 2f 72 65  70 6f 73 69 74 6f 72 79   e.com/re pository
```

Frame (558 bytes) | Reassembled TCP (1848 bytes)

Microsoft

File Edit View Go Capture Analyze Statistics Telephony Tools Internals Help

Filter: ocsp | Expression... Clear Apply

802.11 Channel: | Channel Offset: | FCS Filter: All Frames | Wireshark | Wireless Settings... Decryption Keys...

	Source	Destination	Protocol	Info
0000	192.168.1.7	199.7.55.72	OCSP	Request
3512	199.7.55.72	192.168.1.7	OCSP	Response

```
Online Certificate Status Protocol
  tbsRequest
    requestList: 1 item
      Request
        reqCert
          hashAlgorithm (SHA-1)
            Algorithm Id: 1.3.14.3.2.26 (SHA-1)
          issuerNameHash: 1e9209aa713c794bca1e931a0a61ad3fd0ba6
          issuerKeyHash: 3b349a709173b28a1b0cf4e937cdb370329e18
          serialNumber : 0x2b9f7ee5ca25a6251420478275 3a9bb9
    requestExtensions: 1 item
```

```
0200  54 02 10 2b 9f 7e e5 ca 25 a6 25 14 20 47 82 75   T.
0210  3a 9b b9 a2 1e 30 1c 30 1a 06 09 2b 06 01 05 05   :.
```

Text item (text), 16 bytes | Packets: 333 Displayed: 4 Marked: 0 Dropped: 0 | Profile: Laura Chappell ROCKS!

Certificates

Intended purpose: <All>

Trusted Root Certification Authorities | Trusted Publishers | Untrusted Publishers

Issued To	Issued By	Expiratio...	Friendly Name
global trustee	UTN-USERFirst-Hardw...	3/14/2014	Fraudulent
login.live.com	UTN-USERFirst-Hardw...	3/14/2014	Fraudulent
login.skype.com	UTN-USERFirst-Hardw...	3/14/2014	Fraudulent
login.yahoo.com	UTN-USERFirst-Hardw...	3/14/2014	Fraudulent
login.yahoo.com	UTN-USERFirst-Hardw...	3/14/2014	Fraudulent
login.yahoo.com	UTN-USERFirst-Hardw...	3/14/2014	Fraudulent
mail.google.com	UTN-USERFirst-Hardw...	3/14/2014	Fraudulent
Microsoft Corporation	VeriSign Commercial S...	1/31/2002	Fraudulent, NOT...
Microsoft Corporation	VeriSign Commercial S...	1/30/2002	Fraudulent, NOT...

Import... Export... Remove Advanced

Certificate intended purposes

Server Authentication, Client Authentication

How Well Does Certificate Revocation Really Work?

Detecting Certificate Authority compromises and web browser collusion

Posted March 22nd, 2011 by ioerror in ssl tls ca tor certificates torbrowser

Thanks to Ian Gallagher, Seth Schoen, Jesse Burns, Chris Palmer, and other anonymous birds for their invaluable feedback on this writeup.

The Tor Project has long understood that the certification authority (CA) model of trust on the internet is susceptible to various methods of compromise. Without strong anonymity, the ability to perform targeted attacks with the blessing of a CA key is serious. In the past, I've worked on attacks relating to SSL/TLS trust models and for quite some time, I've hunted for evidence of non-academic CA compromise in the wild.

I've also looked for special kinds of cooperation between CAs and browsers. Proof of collusion will give us facts. It will also give us a real understanding of the faith placed in the strength of the underlying systems.

Does certificate revocation really work? **No, it does not**. How much faith does a vendor actually put into revocation, when verifiable evidence of malice is detected or known? Not much, and that's the subject of this writing.

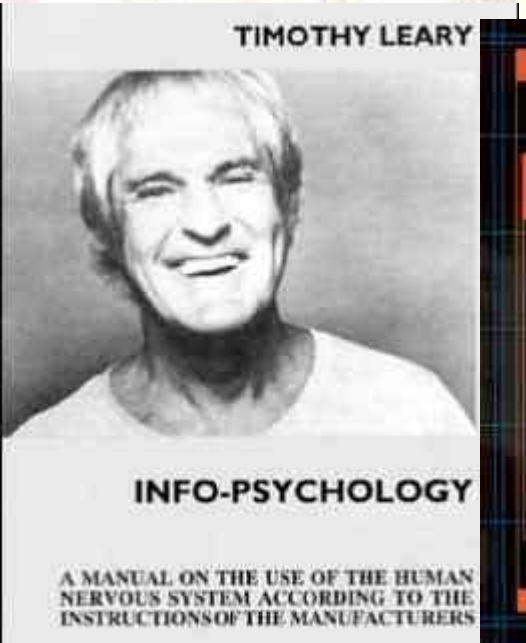
Last week, a smoking gun came into sight: A Certification Authority appeared to be compromised in some capacity, and the attacker issued themselves valid HTTPS

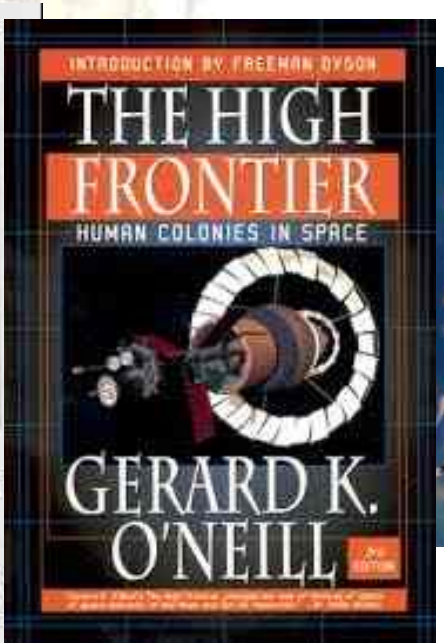
https://blog.torproject.org/blog/detecting-certificate-authority-compromises-and-web-browser-collusion

Where Are We Going?

Life on the Planet Earth, through the instrumentality of the human nervous system, has begun to migrate from the Womb Planet, to escape from gene pools, to establish colonies in high orbit, from whence it can more accessibly contact and communicate with Life in the Galaxy.

Men and women who know from whence they come and where they are going, who share a vision beyond the local-mundane will emerge from the larval gene-pools and as cyber (pilot) individuals, who learn quickly, work effectively, grow naturally, socialize lovingly and evolve gracefully. It is probably true that species coast along on serene stupidity until faced with an evolutionary challenge; at which point individuals leave the primitive collectives and become very smarter very faster. (Timothy Leary -1976)





Bruce Schneier Facts

Things you might not know about Bruce Schneier

Contact Random RSS Feed Top 10 Facts Suggest Fact

Top 10 voted Bruce Schneier Facts

When Bruce Schneier observes a quantum particle, it remains in the same state until he has finished observing it.

17646 votes

Bruce Schneier knows Alice and Bob's shared secret.

6579 votes

Vs lbh nfxrq Oehpr Fpuarvre gb qrpelcg guvf, ur'q pehfu lbhe fxhyy jvgu uvf ynhtu.

2048 votes

Most people use passwords. Some people use passphrases. Bruce Schneier uses an epic passpoem, detailing the life and works of seven mythical Norse heroes.

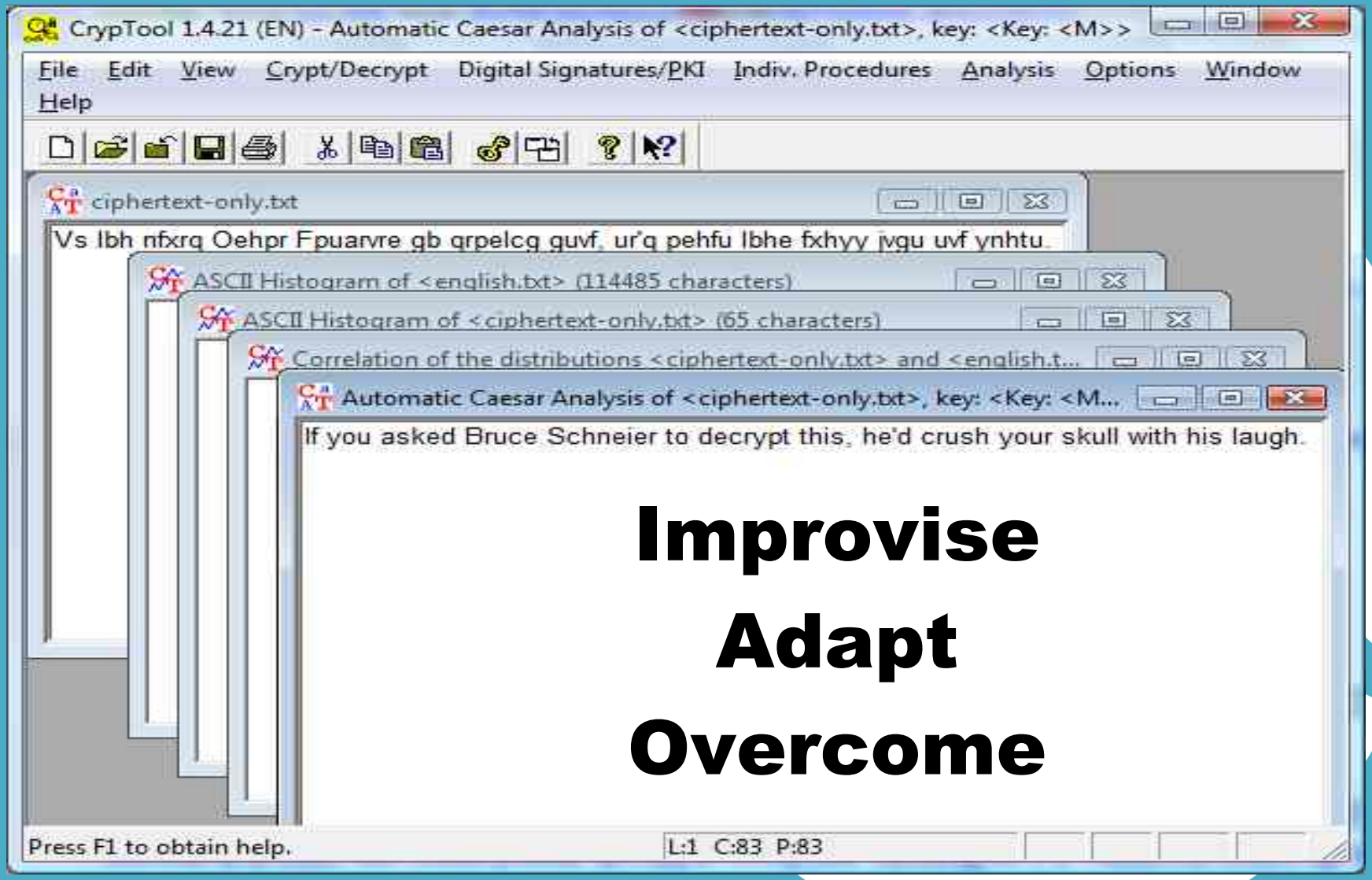
1976 votes

Bruce Schneier's secure handshake is so strong, you won't be able to exchange keys with anyone else for days.

1925 votes

Bruce Schneier once decrypted a box of AlphaBits.

Thank You!



Improvise

Adapt

Overcome