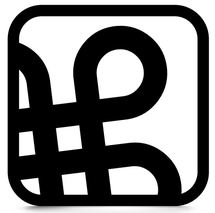


Macoun

Applied Crypto Hardening

@MacLemon

System-Administration

Datenschutz & Privatsphäre

Sicher nach iOS

Macoun 2011, Klaus M. Rodewig

Torwächter und Schlüsselmeister

2012, @MacLemon

NSURLConnection: Safety First!

Macoun 2013, Alex v. Below, @MacLemon

Datenschutz und Apps

Macoun 2014, Thomas Biedorf

Samstag, 15:00, kleiner Saal

Sicher ganz einfach

Macoun 2014, Klaus M. Rodewig

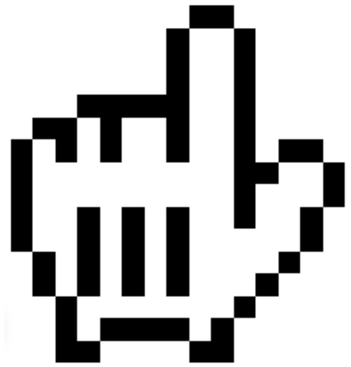
Sonntag, 11:00, Terrassensaal

Datenschutz

Gespeicherte Daten

Daten in Bewegung

Deine Apps



Deine Infrastruktur

Stundenwiederholung

Verschlüsselung

Vier Ziele

Vertraulichkeit

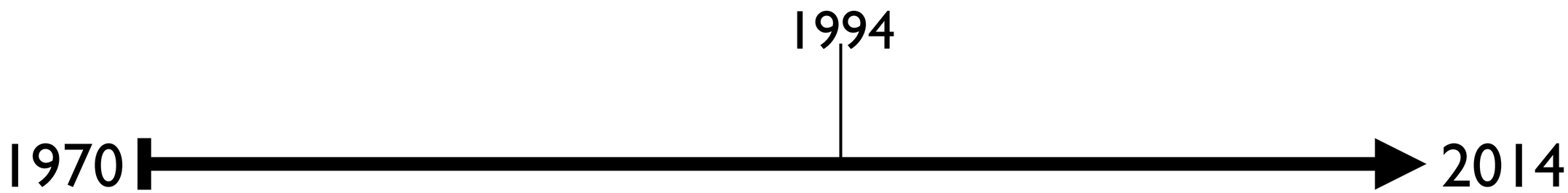
2 Integrität

3 Authentizität

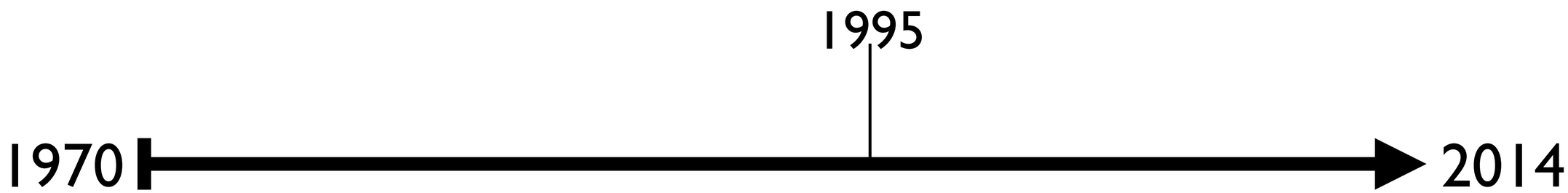
4 Nichtabstreitbarkeit

Geschichte

SSLv1



SSLv2



SSLv3

TLS 1.0

TLS 1.1

TLS 1.2

Transportverschlüsselung

TLS 1.2

TLS 1.1

TLS 1.0

~~*SSLv3*~~

~~*SSLv2*~~

OS X Support 10.6 - 10.8

TLS 1.2

TLS 1.1

TLS 1.0

~~*SSLv3*~~

~~*SSLv2*~~

OS X Support 10.9+

TLS 1.2

TLS 1.1

TLS 1.0

~~*SSLv3*~~

~~*SSLv2*~~

iOS Support seit 5.0

TLS 1.2

TLS 1.1

TLS 1.0

~~*SSLv3*~~

~~*SSLv2*~~

 http://istheinternetonfire.com/

Yep.

Weitergehen…

 https://isitchristmas.com/

NEIN

Voraussetzungen

RSA Schlüsselpaar

4096bit

Zertifikat

SHA-256

Server

Konfiguration

Ciphersuites

TLS_DHE_RSA_WITH_AES_256_GCM_SHA384

DHE-RSA-AES256-GCM-SHA384

$ openssl ciphers ALL

```
ECDHE-RSA-AES256-GCM-SHA384:ECDHE-ECDSA-AES256-GCM-SHA384:ECDHE-RSA-AES256-SHA384:ECDHE-ECDSA-
AES256-SHA384:ECDHE-RSA-AES256-SHA:ECDHE-ECDSA-AES256-SHA:SRP-DSS-AES-256-CBC-SHA:SRP-RSA-AES-256-
CBC-SHA:SRP-AES-256-CBC-SHA:DHE-DSS-AES256-GCM-SHA384:DHE-RSA-AES256-GCM-SHA384:DHE-RSA-AES256-
SHA256:DHE-DSS-AES256-SHA256:DHE-RSA-AES256-SHA:DHE-DSS-AES256-SHA:DHE-RSA-CAMELLIA256-SHA:DHE-DSS-
CAMELLIA256-SHA:AECDH-AES256-SHA:ADH-AES256-GCM-SHA384:ADH-AES256-SHA256:ADH-AES256-SHA:ADH-
CAMELLIA256-SHA:ECDH-RSA-AES256-GCM-SHA384:ECDH-ECDSA-AES256-GCM-SHA384:ECDH-RSA-AES256-SHA384:ECDH-
ECDSA-AES256-SHA384:ECDH-RSA-AES256-SHA:ECDH-ECDSA-AES256-SHA:AES256-GCM-SHA384:AES256-
SHA256:AES256-SHA:CAMELLIA256-SHA:PSK-AES256-CBC-SHA:ECDHE-RSA-DES-CBC3-SHA:ECDHE-ECDSA-DES-CBC3-
SHA:SRP-DSS-3DES-EDE-CBC-SHA:SRP-RSA-3DES-EDE-CBC-SHA:SRP-3DES-EDE-CBC-SHA:EDH-RSA-DES-CBC3-SHA:EDH-
DSS-DES-CBC3-SHA:AECDH-DES-CBC3-SHA:ADH-DES-CBC3-SHA:ECDH-RSA-DES-CBC3-SHA:ECDH-ECDSA-DES-CBC3-
SHA:DES-CBC3-SHA:PSK-3DES-EDE-CBC-SHA:ECDHE-RSA-AES128-GCM-SHA256:ECDHE-ECDSA-AES128-GCM-
SHA256:ECDHE-RSA-AES128-SHA256:ECDHE-ECDSA-AES128-SHA256:ECDHE-RSA-AES128-SHA:ECDHE-ECDSA-AES128-
SHA:SRP-DSS-AES-128-CBC-SHA:SRP-RSA-AES-128-CBC-SHA:SRP-AES-128-CBC-SHA:DHE-DSS-AES128-GCM-
SHA256:DHE-RSA-AES128-GCM-SHA256:DHE-RSA-AES128-SHA256:DHE-DSS-AES128-SHA256:DHE-RSA-AES128-SHA:DHE-
DSS-AES128-SHA:DHE-RSA-SEED-SHA:DHE-DSS-SEED-SHA:DHE-RSA-CAMELLIA128-SHA:DHE-DSS-CAMELLIA128-
SHA:AECDH-AES128-SHA:ADH-AES128-GCM-SHA256:ADH-AES128-SHA256:ADH-AES128-SHA:ADH-SEED-SHA:ADH-
CAMELLIA128-SHA:ECDH-RSA-AES128-GCM-SHA256:ECDH-ECDSA-AES128-GCM-SHA256:ECDH-RSA-AES128-SHA256:ECDH-
ECDSA-AES128-SHA256:ECDH-RSA-AES128-SHA:ECDH-ECDSA-AES128-SHA:AES128-GCM-SHA256:AES128-
SHA256:AES128-SHA:SEED-SHA:CAMELLIA128-SHA:PSK-AES128-CBC-SHA:ECDHE-RSA-RC4-SHA:ECDHE-ECDSA-RC4-
SHA:AECDH-RC4-SHA:ADH-RC4-MD5:ECDH-RSA-RC4-SHA:ECDH-ECDSA-RC4-SHA:RC4-SHA:RC4-MD5:PSK-RC4-SHA:EDH-
RSA-DES-CBC-SHA:EDH-DSS-DES-CBC-SHA:ADH-DES-CBC-SHA:DES-CBC-SHA:EXP-EDH-RSA-DES-CBC-SHA:EXP-EDH-DSS-
DES-CBC-SHA:EXP-ADH-DES-CBC-SHA:EXP-DES-CBC-SHA:EXP-RC2-CBC-MD5:EXP-ADH-RC4-MD5:EXP-RC4-MD5
```

```
DHE-RSA-AES256-GCM-SHA384:DHE-
RSA-AES256-SHA256:ECDHE-RSA-
AES256-GCM-SHA384:ECDHE-RSA-
AES256-SHA384:DHE-RSA-
CAMELLIA256-SHA:DHE-RSA-AES256-
SHA:ECDHE-RSA-AES256-SHA
```

Testen

http*secure*

http*stinkt*

Testen

Testen, Testen, Testen

Webserver

https://SSLLabs.com/

SSL Server Test

This free online service performs a deep analysis of the configuration of any SSL web server on the public Internet. **Please note that the information you submit here is used only to provide you the service. We don't use the domain names or the test results, and we never will.**

Domain name: Submit

Do not show the results on the boards

Recently Seen

- opdrachtenregister.org
- horisen.info
- irphe.fr
- fsf.org

Recent Best

cofone.org	A+
fischer-markenschuh.net	A
sip.fiskeridir.no	A
s2.derky.nl	A

Recent Worst

tasklifecycle.de	F
fbnhffmnn.de	F
asurion.com	F
enescousa.com	F

SSL Report: macoun.de (95.143.172.231)

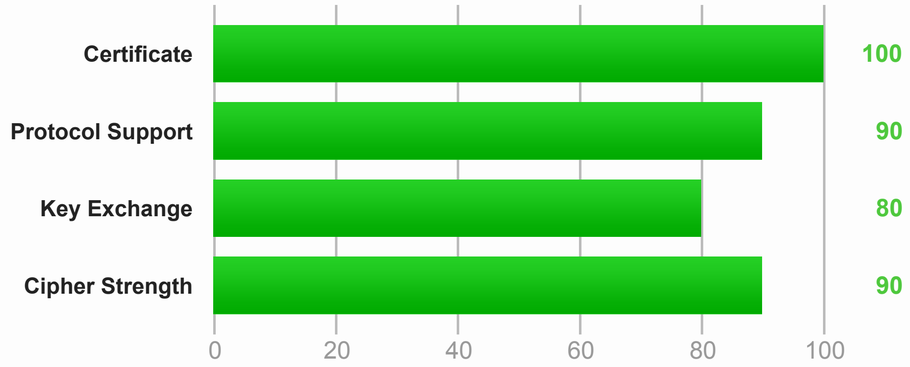
Assessed on: Sat Sep 27 00:19:12 UTC 2014 | **HIDDEN** | Clear cache

Scan Another »

Summary

Overall Rating

A-



Visit our documentation page for more information, configuration guides, and books. Known issues are documented here.

Certificate uses SHA1. When renewing, ensure you upgrade to SHA256. MORE INFO »

The server does not support Forward Secrecy with the reference browsers. Grade reduced to A-. MORE INFO »

This site works only in browsers with SNI support.

Configuration

Protocols

TLS 1.2	Yes
TLS 1.1	Yes
TLS 1.0	Yes
SSL 3 [2]	Yes
SSL 2	No

(2) This site requires support for virtual SSL hosting, but SSL 2.0 and SSL 3.0 do not support this feature.

Cipher Suites (SSL 3+ suites in server-preferred order; deprecated and SSL 2 suites always at the end)

TLS_DHE_RSA_WITH_AES_256_GCM_SHA384 (0x9f)	DH 1024 bits (p: 128, g: 1, Ys: 128) FS	256
TLS_DHE_RSA_WITH_AES_256_CBC_SHA256 (0x6b)	DH 1024 bits (p: 128, g: 1, Ys: 128) FS	256
TLS_DHE_RSA_WITH_AES_256_CBC_SHA (0x39)	DH 1024 bits (p: 128, g: 1, Ys: 128) FS	256
TLS_DHE_RSA_WITH_CAMELLIA_256_CBC_SHA (0x88)	DH 1024 bits (p: 128, g: 1, Ys: 128) FS	256
TLS_DHE_RSA_WITH_AES_128_GCM_SHA256 (0x9e)	DH 1024 bits (p: 128, g: 1, Ys: 128) FS	128

Handshake Simulation

Android 2.3.7 No SNI [2]	TLS 1.0	TLS_DHE_RSA_WITH_AES_128_CBC_SHA (0x33) FS	128
Android 4.0.4	TLS 1.0	TLS_DHE_RSA_WITH_AES_256_CBC_SHA (0x39) FS	256
Android 4.1.1	TLS 1.0	TLS_DHE_RSA_WITH_AES_256_CBC_SHA (0x39) FS	256
Android 4.2.2	TLS 1.0	TLS_DHE_RSA_WITH_AES_256_CBC_SHA (0x39) FS	256
Android 4.3	TLS 1.0	TLS_DHE_RSA_WITH_AES_256_CBC_SHA (0x39) FS	256
Android 4.4.2	TLS 1.2	TLS_DHE_RSA_WITH_AES_256_GCM_SHA384 (0x9f) FS	256
BingBot Dec 2013 No SNI [2]	TLS 1.0	TLS_RSA_WITH_AES_256_CBC_SHA (0x35) No FS	256
BingPreview Jun 2014	TLS 1.0	TLS_DHE_RSA_WITH_AES_256_CBC_SHA (0x39) FS	256
Chrome 36 / Win 7 R	TLS 1.2	TLS_DHE_RSA_WITH_AES_256_CBC_SHA (0x39) FS	256
Firefox 24.2.0 ESR / Win 7	TLS 1.0	TLS_DHE_RSA_WITH_AES_256_CBC_SHA (0x39) FS	256
Firefox 31 / OS X R	TLS 1.2	TLS_DHE_RSA_WITH_AES_256_CBC_SHA (0x39) FS	256
Googlebot Jun 2014	TLS 1.0	TLS_DHE_RSA_WITH_AES_256_CBC_SHA (0x39) FS	256
IE 6 / XP No FS [1] No SNI [2]	Protocol or cipher suite mismatch		Fail[3]
IE 7 / Vista	TLS 1.0	TLS_RSA_WITH_AES_256_CBC_SHA (0x35) No FS	256
IE 8 / XP No FS [1] No SNI [2]	Protocol or cipher suite mismatch		Fail[3]

Secure Client-Initiated Renegotiation	No
Insecure Client-Initiated Renegotiation	No
BEAST attack	Not mitigated server-side (more info) SSL 3: `0x39`, TLS 1.0: `0x39`
TLS compression	No
RC4	No
Heartbeat (extension)	Yes
Heartbleed (vulnerability)	No (more info)
OpenSSL CCS vuln. (CVE-2014-0224)	No (more info)
Forward Secrecy	**With some browsers** (more info)
Next Protocol Negotiation	No
Session resumption (caching)	Yes
Session resumption (tickets)	Yes
OCSP stapling	No
Strict Transport Security (HSTS)	No
Long handshake intolerance	No
TLS extension intolerance	No
TLS version intolerance	**TLS 2.98**
SSL 2 handshake compatibility	Yes

SSL Report: nsa.gov (23.39.50.161)

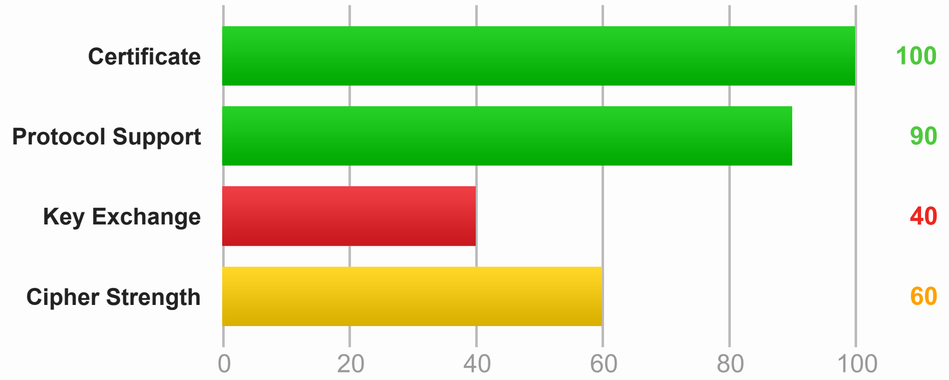
Assessed on: Fri Sep 26 18:23:02 UTC 2014 | Clear cache

Scan Another »

Summary

Overall Rating

C



Visit our documentation page for more information, configuration guides, and books. Known issues are documented here.

Certificate uses SHA1. When renewing, ensure you upgrade to SHA256. MORE INFO »

The server does not support Forward Secrecy with the reference browsers. MORE INFO »

SSL Report: openbsd.org (129.128.5.194)

Assessed on: Fri Sep 26 13:36:00 UTC 2014 | **HIDDEN** | Clear cache

Scan Another »

Assessment failed: Unable to connect to server

Known Problems

There are some errors that we cannot fix properly in the current version. They will be addressed in the next generation version, which is currently being developed.

- **No secure protocols supported** - if you get this message, but you know that the site supports SSL, wait until the cache expires on its own, then try again, making sure the hostname you enter uses the "www" prefix (e.g., "www.ssllabs.com", not just "ssllabs.com").
- **no more data allowed for version 1 certificate** - the certificate is invalid; it is declared as version 1, but uses extensions, which were introduced in version 3. Browsers might ignore this problem, but our parser is strict and refuses to proceed. We'll try to find a different parser to avoid this problem.
- **Failed to obtain certificate** and **Internal Error** - errors of this type will often be reported for servers that use connection rate limits or block connections in response to unusual traffic. Problems of this type are very difficult to diagnose. If you have access to the server being tested, before reporting a problem to us, please check that there is no rate limiting or IDS in place.
- **NetScaler issues** - some NetScaler versions appear to reject SSL handshakes that do not include certain suites or handshakes that use a few suites. If the test is failing and there is a NetScaler load balancer in place, that's most likely the reason.
- **Unexpected failure** - our tests are designed to fail when unusual results are observed. This usually happens when there are multiple TLS servers

SSL Report: openbsd.org (129.128.5.194)

Assessed on: Fri Sep 26 13:36:00 UTC 2014 | **HIDDEN** | Clear cache

Scan Another »

Assessment failed: Unable to connect to server

Known Problems

There are some errors that we cannot fix properly in the current version. They will be addressed in the next generation version, which is currently being developed.

- **No secure protocols supported** - if you get this message, but you know that the site supports SSL, wait until the cache expires on its own, then try again, making sure the hostname you enter uses the "www" prefix (e.g., "www.ssllabs.com", not just "ssllabs.com").
- **no more data allowed for version 1 certificate** - the certificate is invalid; it is declared as version 1, but uses extensions, which were introduced in version 3. Browsers might ignore this problem, but our parser is strict and refuses to proceed. We'll try to find a different parser to avoid this problem.
- **Failed to obtain certificate** and **Internal Error** - errors of this type will often be reported for servers that use connection rate limits or block connections in response to unusual traffic. Problems of this type are very difficult to diagnose. If you have access to the server being tested, before reporting a problem to us, please check that there is no rate limiting or IDS in place.
- **NetScaler issues** - some NetScaler versions appear to reject SSL handshakes that do not include certain suites or handshakes that use a few suites. If the test is failing and there is a NetScaler load balancer in place, that's most likely the reason.
- **Unexpected failure** - our tests are designed to fail when unusual results are observed. This usually happens when there are multiple TLS servers

 https://isitchristmas.com/

SSL Report: isitchristmas.com (54.235.64.112)

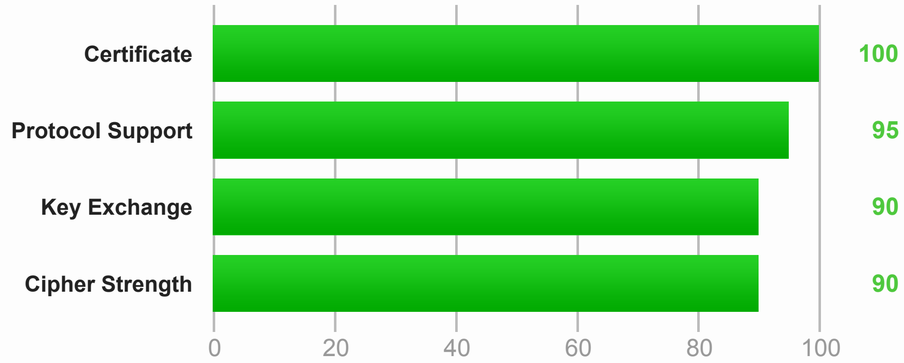
Assessed on: Mon Jul 28 06:42:17 UTC 2014 | Clear cache

Scan Another »

Summary

Overall Rating

A+



Documentation: SSL/TLS Deployment Best Practices, SSL Server Rating Guide, and OpenSSL Cookbook.

This server supports HTTP Strict Transport Security with long duration. Grade set to A+. MORE INFO »

This server is not vulnerable to the Heartbleed attack.

Experimental: This server is not vulnerable to the OpenSSL CCS vulnerability (CVE-2014-0224).

SSL Report: ecb.europa.eu (184.25.151.166)

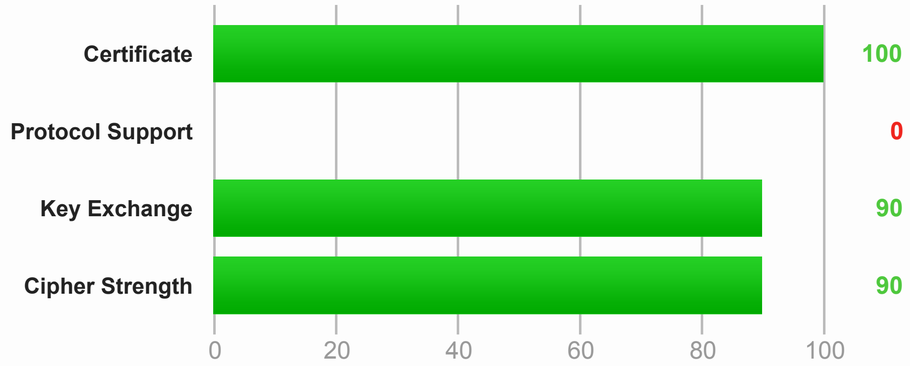
Assessed on: Sat Sep 27 00:27:51 UTC 2014 | **HIDDEN** | Clear cache

Scan Another »

Summary

Overall Rating

F



Visit our documentation page for more information, configuration guides, and books. Known issues are documented here.

This server supports SSL 2, which is obsolete and insecure. Grade set to F.

Certificate uses SHA1. When renewing, ensure you upgrade to SHA256. MORE INFO »

The server does not support Forward Secrecy with the reference browsers. MORE INFO »

Configuration

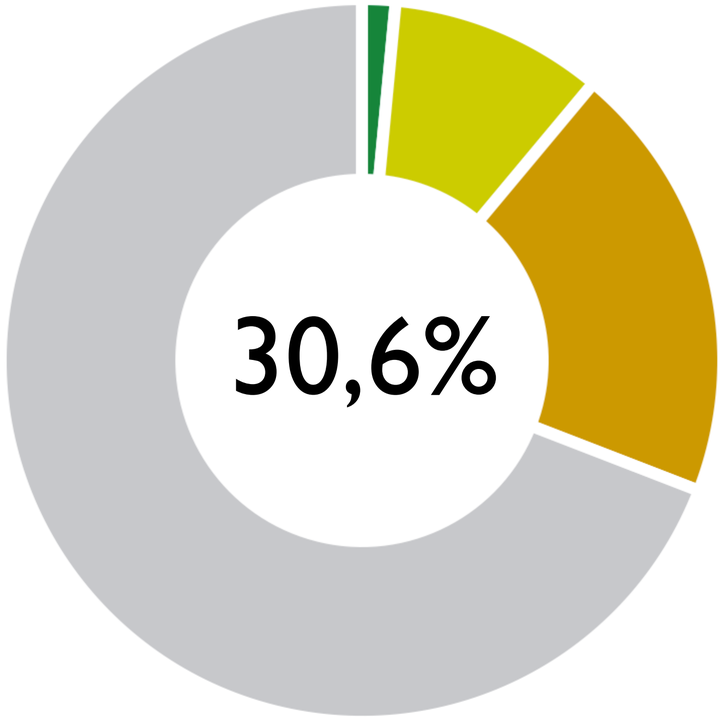
Protocols

TLS 1.2	Yes
TLS 1.1	Yes
TLS 1.0	Yes
SSL 3	Yes
SSL 2 **INSECURE**	Yes

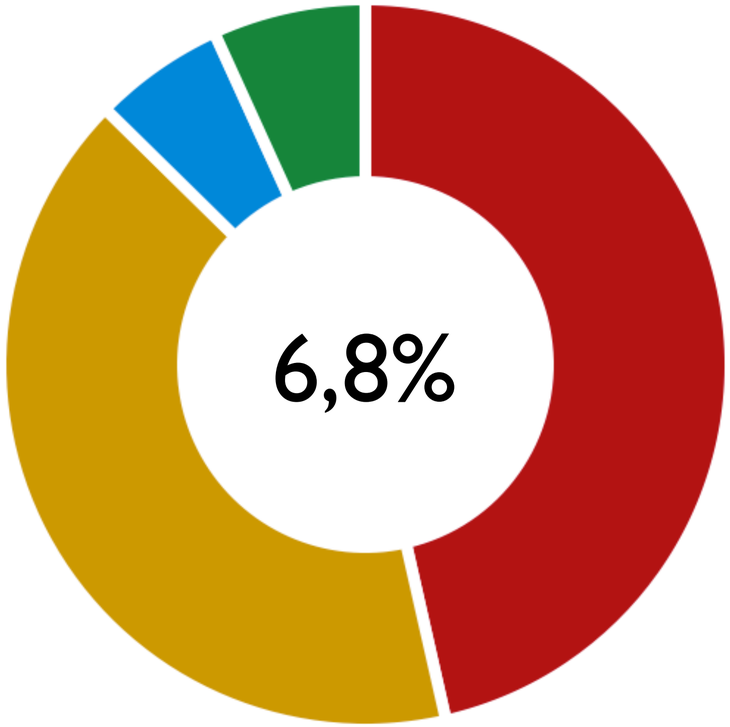
Cipher Suites (SSL 3+ suites in server-preferred order; deprecated and SSL 2 suites always at the end)

TLS_RSA_WITH_AES_128_CBC_SHA (0x2f)	128
TLS_RSA_WITH_AES_256_CBC_SHA (0x35)	256
TLS_RSA_WITH_3DES_EDE_CBC_SHA (0xa)	112
TLS_RSA_WITH_RC4_128_MD5 (0x4)	128
TLS_RSA_WITH_RC4_128_SHA (0x5)	128
SSL_CK_RC4_128_WITH_MD5 (0x10080) **INSECURE**	128

Sichere Seiten



Forward Secrecy



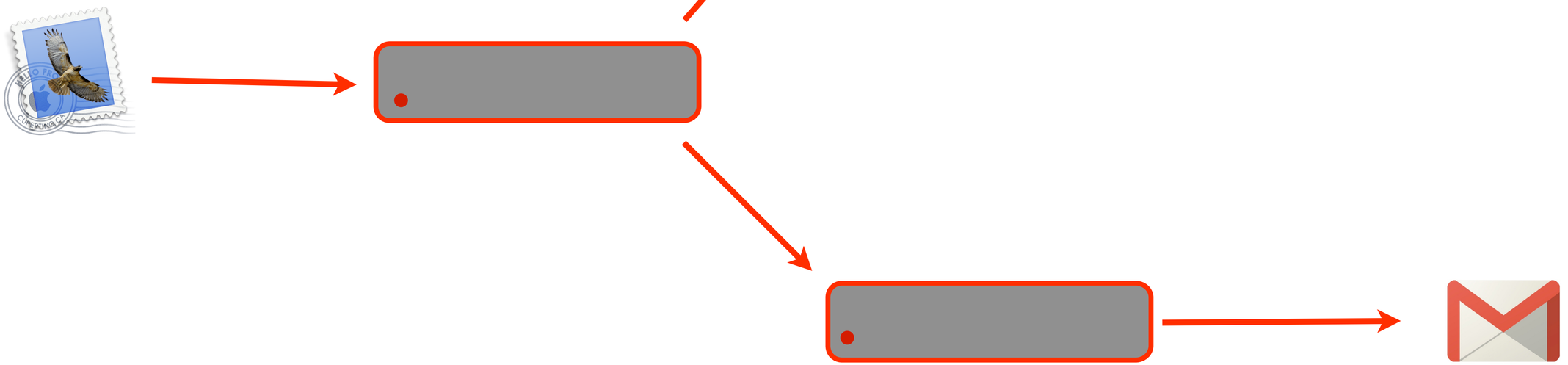
DHE

ECDHE


RC4

Email

https://starttls.info/



Does your mail server support STARTTLS?

If you care about privacy, it should. Read more in the blog.

Enter a hostname, IP- or e-mail address

Test it!

This site is a beta. | Read about this. | Check the stats.

Developed by Einar Otto Stangvik.

Does your mail server support STARTTLS?

If you care about privacy, it should. Read more in the blog.

Results for: macoun.de

Mail server	Result
macoun.de	Grade: B (76.0%)

Certificate

- The certificate is not valid for the server's hostname.

There are validity issues for the certificate. Certificates are seldom verified for SMTP servers, so this doesn't mean that STARTTLS won't be used.

Generally speaking it's a bad practice not to have a valid certificate, and an even worse practice not to verify them. Any attempted encrypted communication is left all but wide open to Man-in-the-Middle attacks.

Does your mail server support STARTTLS?

If you care about privacy, it should. Read more in the blog.

Results for: ubermorgen.com

Mail server	Result
ubermorgen.com	Grade: A (93.4%)

Certificate

- No remarks.

Protocol

- Supports SSLV3.
- Supports TLSV1.
- Supports TLSV1.1.
- Supports TLSV1.2.

Key exchange

- Key size is 4096 bits; that's very good.

Cipher

- Weakest accepted cipher: 128.
- Strongest accepted cipher: 256.

Click the score for details.

Test another!

Does your mail server support STARTTLS?

If you care about privacy, it should. Read more in the blog.

Results for: bnd.bund.de

Mail server	Result
mx2.bund.de	Grade: D (44.3%)

Certificate

- There is a self-signed certificate in the trust chain. It may be a configuration problem.
- There are one or more fatal problems which causes the certificate not to be trusted.

There are validity issues for the certificate. Certificates are seldom verified for SMTP servers, so this doesn't mean that STARTTLS won't be used.

Generally speaking it's a bad practice not to have a valid certificate, and an even worse practice not to verify them. Any attempted encrypted communication is left all but wide open to Man-in-the-Middle attacks.

Protocol

- Supports SSLV3.
- Supports TLSV1.

Key exchange

- Anonymous Diffie-Hellman is accepted. This is suspectible to Man-in-the-Middle attacks.
- Key size is 2048 bits; that's good.

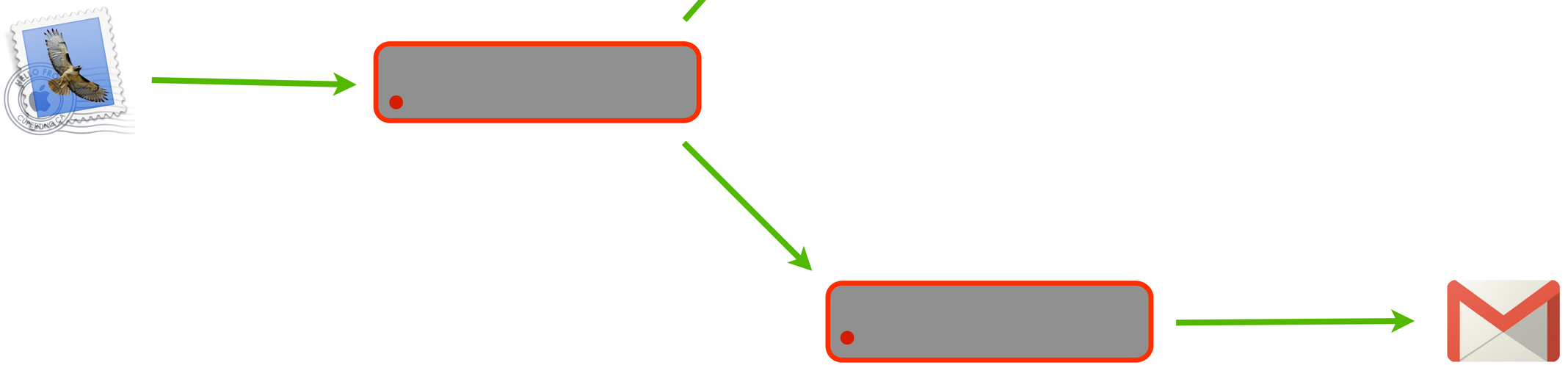
Cipher

- Weakest accepted cipher: 0.
- Strongest accepted cipher: 256.

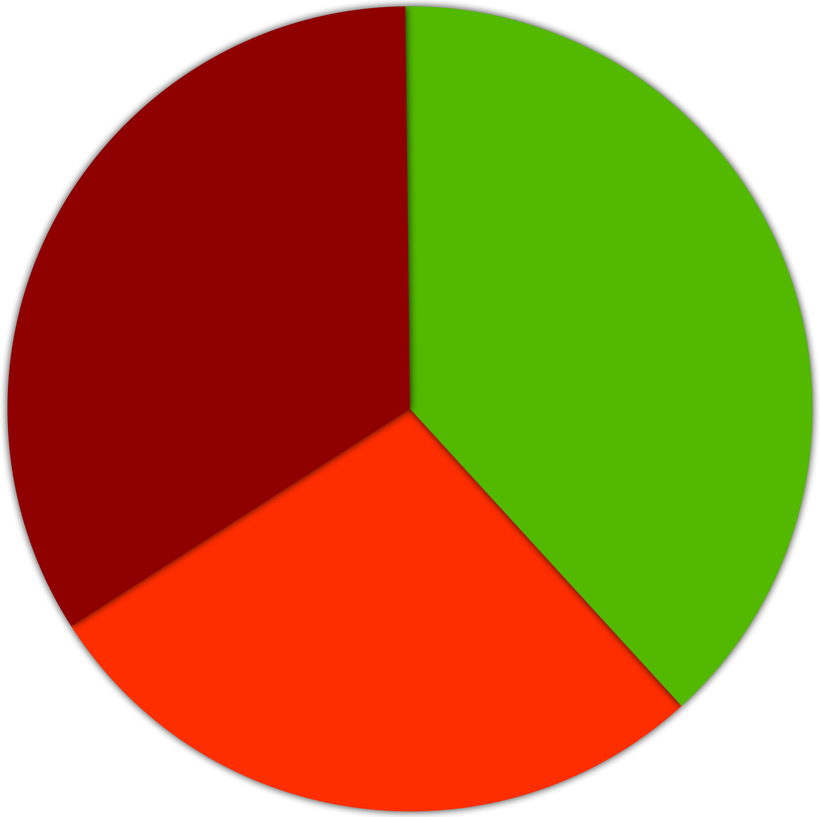
mx1.bund.de	Grade: D (44.3%)

Click the score for details.

Test another!



https://starttls.info/stats



38%

Chat

https://xmpp.net/

IM Observatory client report for jabber.maclemon.at

Test started 2014-09-20 20:38:05 UTC 28 minutes ago.

Show server to server result | Permalink to this report

Score

jabber.maclemon.at:5222

Certificate score:	100
Key exchange score:	100
Protocol score:	95
Cipher score:	90

Grade:


A

Handlungsbedar F

Verschlüsselung muß Standard sein!


bettercrypto·org


PDF

Praktische Einstellungen

Kopieren/Einsetzen

Server Tests

Webserver

Mailserver

Schlüssel

Verfahren

Zufallszahlen

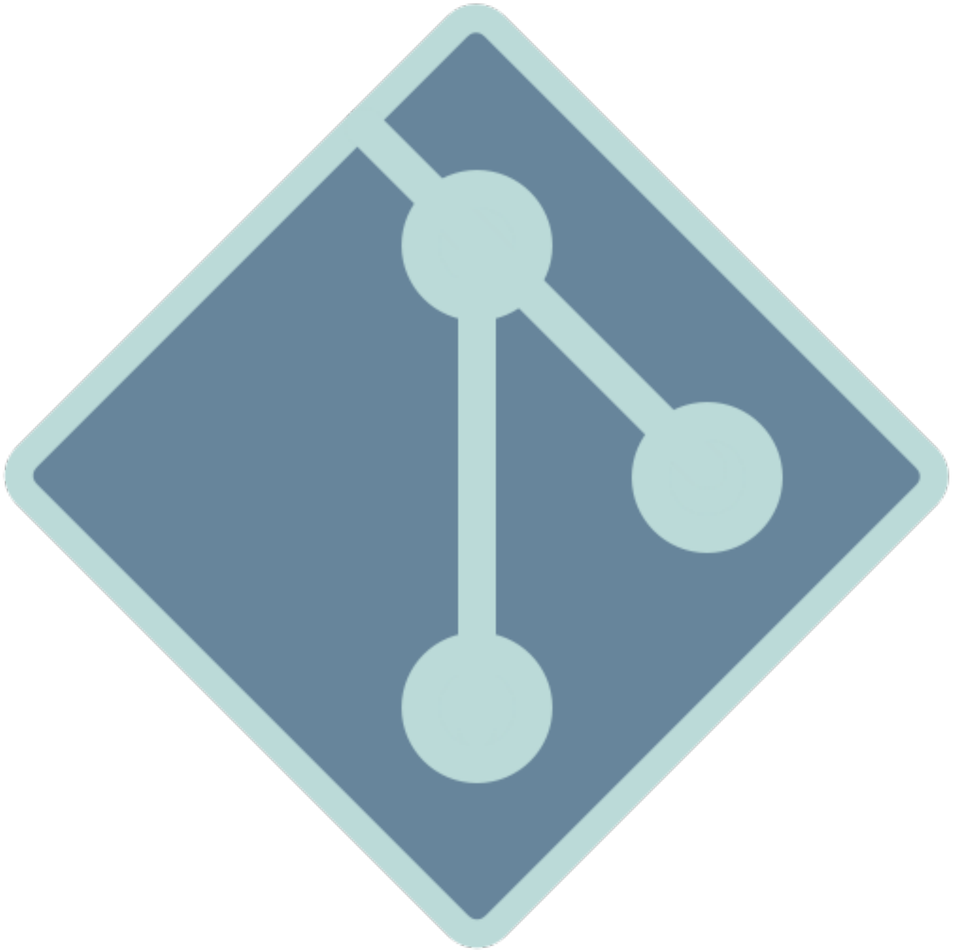
VPN

SSH

PGP/GnuPG

Instant Messaging

Datenbanken




bettercrypto·org

Hausübung

Teste ALLE Server

TLS 1.2 überall

Forward Secrecy

Nur noch verschlüsselte Kommunikation

Fragen?

Links

Applied Crypto Hardening Guide: https://BetterCrypto.org/
Webseiten/API mit https: https://SSLLabs.com/
Mailserver TLS: https://StartTLS.com/
Jabber/XMPP TLS: https://xmpp.net/

Pepi Zawodsky: https://MacLemon.at/
Twitter, ADN @MacLemon

Macoun Referenzen

2011: Sicher nach iOS - Klaus M. Rodewig
2012: Torwächter und Schlüsselmeister, Pepi Zawodsky
2013: NSURLConnection: Safety First! - Alexander von Below
2014: Applied Crypto Hardening - Pepi Zawodsky
2014: Datenschutz und Apps - Thomas Biedorf
2014: Sicher ganz einfach - Klaus M. Rodewig

Danke

Quellennachweis:

Folie Nr.; Titel; Urheber; Datum; Quelle/Link. Rechte.

1: „Macoun Logo“; Chris Hauser; 2009; Macoun GbR.
Unentgeltliche Nutzung im Rahmen der Veranstaltung und Berichterstattung gestattet.

Hand Icon: CC-BY-SA-NC, 3.0 Unported Pepi Zawodsky

Fire Emoji: UTF-8 Character Code F0 9F 94 A5

Christmal Tree Emoji: UTF-8 Character Code F0 9F 8E 84

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TLS_DHE_RSA_WITH_AES_256_GCM_SHA384