

# Windows Root Certificate Program Members

For the Root Update Available on: November 24, 2009

## Table of Contents

[INTRODUCTION](#)

[NEW CERTIFICATION AUTHORITIES](#)

[NEW ROOT CERTIFICATES](#)

[NEW CERTIFICATE ATTRIBUTES](#)

[CERTIFICATES REMOVED FROM DISTRIBUTION](#)

[CERTIFICATES IN DISTRIBUTION FROM ALL MEMBER CAs](#)

[EXPLANATION OF TERMS](#)

[THE WINDOWS ROOT CERTIFICATE PROGRAM](#)

[HOW WINDOWS UPDATES ROOT CERTIFICATES \(ROOT UPDATE MECHANISMS\)](#)

## INTRODUCTION

The following table lists all Windows Root Certificate Program members. In all cases the information provided about root certificates is reproduced to the best of our ability, its accuracy is not warranted or guaranteed in any way. To confirm actual root certificate details, you are advised to follow the hyperlink to the Certification Authority's (CA's) website, and confirm the details there.

Microsoft qualifies member CAs for the Windows Root Certificate Program according to certain general and technical requirements. See the Windows Root Certificate Program [Web site](#) for a list of all the current general and technical requirements.

[⬆️ Back to the top](#)

## NEW CERTIFICATION AUTHORITIES

Microsoft welcomes the following 2 new Certification Authorities (CAs) to the Windows Root Certificate Program in November 2009:

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
<a href="#">Government of Brazil, Instituto Nacional de Tecnologia da Informação (ITI)</a>	Brazil	Autoridade Certificadora Raiz Brasileira v1	2048	SHA1	Thursday, July 29, 2021 11:17:10 AM	70 5d 2b 45 65 c7 04 7a 54 06 94 a7 9a f7 ab b8 42 bd c1 61
<a href="#">Government of India, Ministry of Communications &amp; Information Technology, Controller of Certifying Authorities (CCA)</a>	India	CCA India 2007	2048	SHA1	Friday, July 03, 2015 11:02:48 PM	97 22 6a ae 4a 7a 64 a5 9b d1 67 87 f2 7f 84 1c 0a 00 1f d0

## NEW ROOT CERTIFICATES

Microsoft also adds the following new 5 root certificates for 4 existing member CAs; (ipsCA's root certificates were added via auto root update in October 2009):

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
<a href="#">Autoridad de Certificacion Firmaprofesional</a>	Spain	Autoridad de Certificacion Firmaprofesional CIF A62634068	4096	SHA1	Tuesday, December 31, 2030 12:38:15 AM	ae c5 fb 3f c8 e1 bf c4 e5 4f 03 07 5a 9a e8 00 b7 f7 b6 fa
<a href="#">Entrust</a>	Canada	Entrust.net Certification Authority (2048)	2048	SHA1	Tuesday, July 24, 2029 6:15:12 AM	50 30 06 09 1d 97 d4 f5 ae 39 f7 cb e7 92 7d 7d 65 2d 34 31
<a href="#">Internet Publishing Services s.l. (ipsCA)</a>	Spain	ipsCA Global CA Root	2048	SHA1	Tuesday, December 25, 2029 6:38:44 AM	3c 71 d7 0e 35 a5 da a8 b2 e3 81 2d c3 67 74 17 f5 99 0d f3

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		ipsCA Main CA Root	2048	SHA1	Tuesday, December 25, 2029 6:54:36 AM	cf e4 31 3d ba 05 b8 a7 c3 00 63 99 5a 9e b7 c2 47 ad 8f d5
<a href="#">SECOM Trust Systems Co. Ltd.</a>	Japan	Security Communication RootCA2	2048	SHA256	Monday, May 28, 2029 9:00:39 PM	5f 3b 8c f2 f8 10 b3 7d 78 b4 ce ec 19 19 c3 73 34 b9 c7 74

### NEW CERTIFICATE ATTRIBUTES

Additionally, existing CA Izenpe S.A. is enabled to support the issuance of [Extended Validation \(EV\) SSL certificates](#). The root certificates added this month for Entrust and SECOM Trust Systems, Co. Ltd. are also enabled to support EV SSL.

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
<a href="#">Government of Spain (CAV), Izenpe S.A.</a>	Spain	Izenpe.com	4096	SHA1	Sunday, December 13, 2037 12:27:25 AM	30 77 9e 93 15 02 2e 94 85 6a 3f f8 bc f8 15 b0 82 f9 ae fd

### CERTIFICATES REMOVED FROM DISTRIBUTION

We also remove the following root certificate from distribution based either on certificate expiration, the CA migrating to another root certificate, or the controlling entity having ceased to function as a CA.

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
<a href="#">Comodo</a>	USA	Comodo Trusted Certificate Services	2048	SHA1	Sunday, December 31, 2028 4:59:59 PM	e1 9f e3 0e 8b 84 60 9e 80 9b 17 0d 72 a8 c5 ba 6e 14 09 bd

[↑ Back to the top](#)

## CERTIFICATES IN DISTRIBUTION FROM ALL MEMBER CAs

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
Actalis S.p.A.	Italy	Actalis Authentication CA G1	2048	SHA1	Saturday, June 25, 2022 7:06:00 AM	91 58 c5 ef 98 73 01 a8 90 3c fd ab 03 d7 2d a1 d8 89 09 c9
Agencia Catalana de Certificacio (CATCert)	Spain	Agencia Catalana de Certificacio (NIF Q-0801176-I)	2048	SHA1	1/7/2031	28 90 3a 63 5b 52 80 fa e6 77 4c 0b 6d a7 d6 ba a6 4a f2 e8
Agencia Notarial de Certificación (ANCERT)	Spain	ANCERT Corporaciones de Derecho Publico	2048	SHA1	2/11/2024	0c fd 83 db ae 44 b9 a0 c8 f6 76 f3 b5 70 65 0b 94 b6 9d bf
		ANCERT Certificados CGN	2048	SHA1	2/11/2024	11 c5 b5 f7 55 52 b0 11 66 9c 2e 97 17 de 6d 9b ff 5f a8 10
		Agencia Notarial de Certificacion S.L. Unipersonal - CIF B83395988	2048	SHA1	2/11/2024	c0 9a b0 c8 ad 71 14 71 4e d5 e2 1a 5a 27 6a dc d5 e7 ef cb
AOL	USA	America Online Root Certification Authority 2	4096	SHA1	9/27/2037	85 b5 ff 67 9b 0c 79 96 1f c8 6e 44 22 00 46 13 db 17 92 84
AS Sertifitseerimiskeskuse (SK)	Estonia	America Online Root Certification Authority 1	2048	SHA1	Thursday, November 19, 2037 1:43:00 PM	39 21 c1 15 c1 5d 0e ca 5c cb 5b c4 f0 7d 21 d8 05 0b 56 6a
		Juur-SK AS Sertifitseerimiskeskuses	2048	SHA1	Friday, August 26, 2016 7:23:01 AM	40 9d 4b d9 17 b5 5c 27 b6 9b 64 cb 98 22 44 0d cd 09 b8 89
A-Trust	Austria	A-Trust-nQual-01	2048	SHA1	Sunday, November 30, 2014 4:00:00 PM	51 a4 4c 28 f3 13 e3 f9 cb 5e 7c 0a 1e 0e 0d d2 84 37 58 ae
		A-Trust-Qual-02	2048	SHA1	Tuesday, December 02, 2014 4:00:00 PM	67 9a 4f 81 fc 70 5d de c4 19 77 8d d2 eb d8 75 f4 c2 42 c6

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		A-Trust-nQual-03	2048	SHA1	Monday, August 17, 2015 3:00:00 PM	d3 c0 63 f2 19 ed 07 3e 34 ad 5d 75 0b 32 76 29 ff d5 9a f2
		A-Trust-Qual-01	2048	SHA1	Sunday, November 30, 2014 4:00:00 PM	e6 19 d2 5b 38 0b 7b 13 fd a3 3e 8a 58 cd 82 d8 a8 8e 05 15
		A-Trust Qual-01	2048	SHA1	Sunday, February 06, 2005 4:00:00 PM	f8 25 57 8f 8f 54 84 df b4 0f 81 86 7c 39 2d 6c b0 01 2b 92
		A-Trust-Qual-03a	2048	SHA1	Tuesday, April 24, 2018 3:00:00 PM	42 ef dd e6 bf f3 5e d0 ba e6 ac dd 20 4c 50 ae 86 c4 f4 fa
<a href="#">Austrian Society for Data Protection (Arge Daten)</a>	Austria	Arge Daten Oesterreichische Gesellschaft fuer Datenschutz	1024	MD5	Thursday, February 12, 2009 4:30:30 AM	8e 10 32 e9 24 59 44 f8 47 91 98 3e c9 e8 29 cb 10 59 b4 d3
		A-CERT Certification Service	2048	SHA1	Sunday, October 23, 2011 7:14:14 AM	29 64 b6 86 13 5b 5d fd dd 32 53 a8 9b bc 24 d7 4b 08 c6 4d
		Austrian Society for Data Protection GLOBALTRUST Certification Service	4096	SHA1	Thursday, September 18, 2036 7:12:35 AM	34 2c d9 d3 06 2d a4 8c 34 69 65 29 7f 08 1e bc 2e f6 8f dc
<a href="#">Autoridad de Certificacion Firmaprofesional</a>	Spain	Autoridad de Certificacion Firmaprofesional CIF A62634068	2048	SHA1	Thursday, October 24, 2013 3:00:00 PM	a9 62 8f 4b 98 a9 1b 48 35 ba d2 c1 46 32 86 bb 66 64 6a 8c
		Autoridad de Certificacion Firmaprofesional CIF A62634068	4096	SHA1	Tuesday, December 31, 2030 12:38:15 AM	ae c5 fb 3f c8 e1 bf c4 e5 4f 03 07 5a 9a e8 00 b7 f7 b6 fa
<a href="#">Buypass</a>	Norway	Buypass Class 2 CA 1	2048	SHA1	10/13/2016	a0 a1 ab 90 c9 fc 84 7b 3b 12 61 e8 97 7d 5f d3 22 61 d3 cc

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		Buypass Class 3 CA 1	2048	SHA1	5/9/2015	61 57 3a 11 df 0e d8 7e d5 92 65 22 ea d0 56 d7 44 b3 23 71
CA Disig a.s.	Slovak Republic	CA Disig	2048	SHA1	Monday, March 21, 2016 5:39:34 PM	2a c8 d5 8b 57 ce bf 2f 49 af f2 fc 76 8f 51 14 62 90 7a 41
Camerfirma	Spain	Chambersign Chambers of Commerce Root	2048	SHA1	Wednesday, September 30, 2037 9:13:44 AM	6e 3a 55 a4 19 0c 19 5c 93 84 3c c0 db 72 2e 31 30 61 f0 b1
		Chambersign Global Root	2048	SHA1	Wednesday, September 30, 2037 9:14:18 AM	33 9b 6b 14 50 24 9b 55 7a 01 87 72 84 d9 e0 2f c3 d2 d8 e9
		Chambersign Public Notary Root	2048	SHA1	Wednesday, September 30, 2037 9:14:49 AM	ee 29 d6 ea 98 e6 32 c6 e5 27 e0 90 6f 02 80 68 8b df 44 dc
		Chambers of Commerce Root - 2008	4096	SHA1	Saturday, July 31, 2038 5:29:50 AM	78 6a 74 ac 76 ab 14 7f 9c 6a 30 50 ba 9e a8 7e fe 9a ce 3c
		Global Chambersign Root - 2008	4096	SHA1	Saturday, July 31, 2038 5:31:40 AM	4a bd ee ec 95 0d 35 9c 89 ae c7 52 a1 2c 5b 29 f6 d6 aa 0c
CertEurope France	France	CertEurope Root CA 2	4096	SHA1	Friday, March 27, 2037 4:00:00 PM	fa 08 82 59 5f 9c a6 a1 1e cc be af 65 c7 64 c0 cc c3 11 d0
Certicámara S.A.	Colombia	Certicámara S.A.	2048	SHA1	Monday, February 23, 2015 10:10:37 AM	4f 55 5c e2 0d cd 33 64 e0 dc 7c 41 ef dd 40 f5 03 56 c1 22
		Certicámara S.A.	2048	SHA1	Monday, May 23, 2011 3:00:00 PM	8b 1a 11 06 b8 e2 6b 23 29 80 fd 65 2e 61 81 37 64 41 fd 11
		AC Raíz Certicámara S.A.	4096	SHA1	Tuesday, April 02, 2030 1:42:02 PM	cb a1 c5 f8 b0 e3 5e b8 b9 45 12 d3 f9 34 a2 e9 06 10 d3

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
Certigna	France	Certigna	2048	SHA1	Tuesday, June 29, 2027 8:13:05 AM	b1 2e 13 63 45 86 a4 6f 1a b2 60 68 37 58 2d c4 ac fd 94 97
Certipost s.a./n.v.	Belgium	Certipost E-Trust Primary TOP Root CA	2048	SHA1	Saturday, July 26, 2025 3:00:00 AM	05 60 a2 c7 38 ff 98 d1 17 2a 94 fe 45 fb 8a 47 d6 65 37 1e
		Certipost E-Trust Primary Qualified CA	2048	SHA1	Sunday, July 26, 2020 3:00:00 AM	74 2c df 15 94 04 9c bf 17 a2 04 6c c6 39 bb 38 88 e0 2e 33
		Certipost E-Trust Primary Normalised CA	2048	SHA1	Sunday, July 26, 2020 3:00:00 AM	a5 9c 9b 10 ec 73 57 51 5a bb 66 0c 4d 94 f7 3b 9e 6e 92 72
CertiSign	Brazil	Certisign Autoridade Certificadora AC1S	1024	MD5	Tuesday, June 26, 2018 5:00:00 PM	00 48 f8 d3 7b 15 3f 6e a2 79 8c 32 3e f4 f3 18 a5 62 4a 9e
		Certisign - Autoridade Certificadora - AC2	1024	MD5	Tuesday, June 26, 2018 5:00:00 PM	4e fc ed 9c 6b dd 0c 98 5c a3 c7 d2 53 06 3c 5b e6 fc 62 0c
		Certisign Autoridade Certificadora AC4	1024	MD5	Tuesday, June 26, 2018 5:00:00 PM	54 f9 c1 63 75 9f 19 04 51 21 a3 19 f6 4c 2d 05 55 b7 e0 73
		Certisign Autoridade Certificadora AC3S	1024	MD5	Monday, July 09, 2018 1:56:32 PM	cf f8 10 fb 2c 4f fc 01 56 bf e1 e1 fa bc b4 18 c6 8d 31 c5
certSIGN	Romania	certSIGN ROOT CA	2048	SHA1	7/4/2031	fa b7 ee 36 97 26 62 fb 2d b0 2a f6 bf 03 fd e8 7c 4b 2f 9b
China Internet Network Information Center (CNNIC)	China	CNNIC Root	2048	SHA1	4/15/2027	8b af 4c 9b 1d f0 2a 92 f7 da 12 8e b9 1b ac f4 98 60 4b 6f
Chunghwa Telecom Corporation	Taiwan ROC	ePKI Root Certification Authority	4096	SHA1	Tuesday, December 19, 2034 7:31:27 PM	67 65 0d f1 7e 8e 7e 5b 82 40 a4 f4 56 4b cf e2 3d 69 c6 f0



Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
Cisco Systems	USA	Cisco Root CA 2048	2048	SHA1	Monday, May 14, 2029 12:25:42 PM	de 99 0c ed 99 e0 43 1f 60 ed c3 93 7e 7c d5 bf 0e d9 e5 fa
Colegio de Registradores Mercantile (Spanish Property & Commerce Registry)	Spain	Spanish Property & Commerce Registry CA	2048	SHA1	Friday, April 27, 2012 2:39:50 AM	fa aa 27 b8 ca f5 fd f5 cd a9 8a c3 37 85 72 e0 4c e8 f2 e0
Comodo	USA	UTN - DATACorp SGC	2048	SHA1	Monday, June 24, 2019 12:06:30 PM	58 11 9f 0e 12 82 87 ea 50 fd d9 87 45 6f 4f 78 dc fa d6 d4
		UTN - USERFirst-Client Authentication and Email	2048	SHA1	Tuesday, July 09, 2019 10:36:58 AM	b1 72 b1 a5 6d 95 f9 1f e5 02 87 e1 4d 37 ea 6a 44 63 76 8a
		UTN-USERFirst-Object	2048	SHA1	Tuesday, July 09, 2019 11:40:36 AM	e1 2d fb 4b 41 d7 d9 c3 2b 30 51 4b ac 1d 81 d8 38 5e 2d 46
		COMODO Certification Authority	2048	SHA1	Monday, December 31, 2029 4:59:59 PM	66 31 bf 9e f7 4f 9e b6 c9 d5 a6 0c ba 6a be d1 f7 bd ef 7b
		Comodo AAA Certificate Services	2048	SHA1	Sunday, December 31, 2028 4:59:59 PM	d1 eb 23 a4 6d 17 d6 8f d9 25 64 c2 f1 f1 60 17 64 d8 e3 49
		COMODO ECC Certification Authority	ECC384	SHA2	Monday, January 18, 2038 3:59:59 PM	9f 74 4e 9f 2b 4d ba ec 0f 31 2c 50 b6 56 3b 8e 2d 93 c3 11
		AddTrust External CA Root	2048	SHA1	Saturday, May 30, 2020 3:48:38 AM	02 fa f3 e2 91 43 54 68 60 78 57 69 4d f5 e4 5b 68 85 18 68
ComSign	Israel	ComSign Advanced Security CA	4096	SHA1	Saturday, March 24, 2029 2:55:55 PM	80 bf 3d e9 a4 1d 76 8d 19 4b 29 3c 85 63 2c db c8 ea 8c f7
		ComSign CA	2048	SHA1	Monday, March 19, 2029 8:02:18 AM	e1 a4 5b 14 1a 21 da 1a 79 f4 1a 42 a9 61 d6 69 cd 06 34 c1

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		ComSign Secured CA	2048	SHA1	Friday, March 16, 2029 8:04:56 AM	f9 cd 0e 2c da 76 24 c1 8f bd f0 f0 ab b6 45 b8 f7 fe d5 7a
DanID	Denmark	TDC Internet Root CA	2048	SHA1	Monday, April 05, 2021 10:03:17 AM	21 fc bd 8e 7f 6c af 05 1b d1 b3 43 ec a8 e7 61 47 f2 0f 8a
		TDC OCES CA	2048	SHA1	Wednesday, February 11, 2037 2:09:30 AM	87 81 c2 5a 96 bd c2 fb 4c 65 06 4f f9 39 0b 26 04 8a 0e 01
Deutsche Telekom	Germany	Deutsche Telekom Root CA 2	2048	SHA1	Tuesday, July 09, 2019 4:59:00 PM	85 a4 08 c0 9c 19 3e 5d 51 58 7d cd d6 13 30 fd 8c de 37 bf
DigiCert	USA	DigiCert Assured ID Root CA	2048	SHA1	Sunday, November 09, 2031 5:00:00 PM	05 63 b8 63 0d 62 d7 5a bb c8 ab 1e 4b df b5 a8 99 b2 4d 43
		DigiCert High Assurance EV Root CA	2048	SHA1	Sunday, November 09, 2031 5:00:00 PM	5f b7 ee 06 33 e2 59 db ad 0c 4c 9a e6 d3 8f 1a 61 c7 dc 25
		DigiCert Global Root CA	2048	SHA1	Sunday, November 09, 2031 5:00:00 PM	a8 98 5d 3a 65 e5 e5 c4 b2 d7 d6 6d 40 c6 dd 2f b1 9c 54 36
DigiNotar B.V.	The Netherlands	DigiNotar Root CA	4096	SHA1	Monday, March 31, 2025 10:19:21 AM	c0 60 ed 44 cb d8 81 bd 0e f8 6c 0b a2 87 dd cf 81 67 47 8c
D-Trust GmbH	Germany	D-TRUST Root Class 3 CA 2007	2048	SHA1	Sunday, May 15, 2022 10:20:47 PM	fd 1e d1 e2 02 1b 0b 9f 73 e8 eb 75 ce 23 43 6b bc c7 46 eb
		D-TRUST Root Class 2 CA 2007	2048	SHA1	Sunday, May 15, 2022 10:20:47 PM	4a 05 8f df d7 61 db 21 b0 c2 ee 48 57 9b e2 7f 42 a4 da 1c
		D-TRUST Qualified Root CA 1 2007:PN	2048	SHA1	Friday, June 08, 2012 4:47:46 AM	e3 d7 36 06 99 6c df ef 61 fa 04 c3 35 e9 8e a9 61 04 26 4a

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
E-Certchile	Chile	E-CERT ROOT CA	4096	SHA1	Tuesday, September 05, 2028 11:39:41 AM	c1 82 11 32 8a 92 b3 b2 38 09 b9 b5 e2 74 0a 07 fb 12 eb 5e
Echoworx	Canada	Echoworx Root CA2	2048	SHA1	Monday, October 07, 2030 3:49:13 AM	cb 65 82 64 ea 8c da 18 6e 17 52 fb 52 c3 97 36 7e a3 87 be
EDICOM	Spain	ACEDICOM Root	4096	SHA1	Thursday, April 13, 2028 9:24:22 AM	e0 b4 32 2e b2 f6 a5 68 b6 54 53 84 48 18 4a 50 36 87 43 84
e-Guven Elektronik Bilgi Guvenligi A.S.	Turkey	e-Guven Kok Elektronik Sertifika Hizmet Saglayicisi	2048	SHA1	Wednesday, January 04, 2017 4:32:48 AM	dd e1 d2 a9 01 80 2e 1d 87 5e 84 b3 80 7e 4b b1 fd 99 41 34
Entrust	Canada	Entrust.net Client Certification Authority	2048	MD5	Friday, February 07, 2020 9:46:40 AM	cf 74 bf ff 9b 86 81 5b 08 33 54 40 36 3e 87 b6 b6 f0 bf 73
		Entrust.net Secure Server Certification Authority	1024	SHA1	Saturday, May 25, 2019 9:39:40 AM	99 a6 9b e6 1a fe 88 6b 4d 2b 82 00 7c b8 54 fc 31 7e 15 39
		Entrust.net Certification Authority (2048)	2048	SHA1	Tuesday, December 24, 2019 11:20:51 AM	80 1d 62 d0 7b 44 9d 5c 5c 03 5c 98 ea 61 fa 44 3c 2a 58 fe
		Entrust.net Secure Server Certification Authority	1024	MD5	Tuesday, February 04, 2020 10:50:00 AM	89 39 57 6e 17 8d f7 05 78 0f cc 5e c8 4f 84 f6 25 3a 48 93
		Entrust Root Certification Authority	2048	SHA1	Friday, November 27, 2026 1:53:42 PM	b3 1e b1 b7 40 e3 6c 84 02 da dc 37 d4 4d f5 d4 67 49 52 f9
		Entrust.net Client Certification Authority	1024	MD5	Saturday, October 12, 2019 12:54:30 PM	da 79 c1 71 11 50 c2 34 39 aa 2b 0b 0c 62 fd 55 b2 f9 f5 80

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		Entrust Root Certification Authority - G2	2048	SHA256	Saturday, December 07, 2030 10:55:54 AM	8c f4 27 fd 79 0c 3a d1 66 06 8d e8 1e 57 ef bb 93 22 72 d4
e-tugra	Turkey	Entrust.net Certification Authority (2048)	2048	SHA1	Tuesday, July 24, 2029 6:15:12 AM	50 30 06 09 1d 97 d4 f5 ae 39 f7 cb e7 92 7d 7d 65 2d 34 31
GlobalSign	UK	EBG Elektronik Sertifika Hizmet Sağlayıcısı	4096	SHA1	Saturday, August 13, 2016 5:31:09 PM	8c 96 ba eb dd 2b 07 07 48 ee 30 32 66 a0 f3 98 6e 7c ae 58
		GlobalSign Root CA	2048	SHA1	Friday, January 28, 2028 5:00:00 AM	b1 bc 96 8b d4 f4 9d 62 2a a8 9a 81 f2 15 01 52 a4 1d 82 9c
		GlobalSign Root CA - R2	2048	SHA1	Wednesday, December 15, 2021 1:00:00 AM	75 e0 ab b6 13 85 12 27 1c 04 f8 5f dd de 38 e4 b7 24 2e fe
GoDaddy	USA	GlobalSign SGC CA	2048	SHA1	Tuesday, January 28, 2014 12:00:00 AM	e5 21 5d 34 60 c2 c2 0b be 2d 9f e5 fb 66 5d aa 2c 0e 22 5c
		Go Daddy Class 2 Certification Authority	2048	SHA1	Thursday, June 29, 2034 10:06:20 AM	27 96 ba e6 3f 18 01 e2 77 26 1b a0 d7 77 70 02 8f 20 ee e4
		Starfield Class 2 Certification Authority	2048	SHA1	Thursday, June 29, 2034 10:39:16 AM	ad 7e 1c 28 b0 64 ef 8f 60 03 40 20 14 c3 d0 e3 37 0e b5 8a
		Starfield Services Root Certificate Authority	2048	SHA1	Monday, December 31, 2029 3:59:59 PM	5d 00 38 60 f0 02 ed 82 9d ea a4 18 68 f7 88 18 6d 62 12 7f
		ValiCert Class 2 Policy Validation Authority	1024	SHA1	Tuesday, June 25, 2019 5:19:54 PM	31 7a 2a d0 7f 2b 33 5e f5 a1 c3 4e 4b 57 e8 b7 d8 f1 fc a6
Government of Austria, Austria Telekom-Control Commission	Austria	Telekom-Control-Kommission Top 1	2048	SHA1	Saturday, September 24, 2005 5:40:00 AM	e7 07 15 f6 f7 28 36 5b 51 90 e2 71 de e4 c6 5e be ea ca f3

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
Government of Brazil, Autoridade Certificadora Raiz Brasileira	Brazil	Autoridade Certificadora Raiz Brasileira	2048	SHA1	Wednesday, November 30, 2011 4:59:00 PM	8e fd ca bc 93 e6 1e 92 5d 4d 1d ed 18 1a 43 20 a4 67 a1 39
Government of Brazil, Instituto Nacional de Tecnologia da Informação (ITI)	Brazil	Autoridade Certificadora Raiz Brasileira v1	2048	SHA1	Thursday, July 29, 2021 11:17:10 AM	70 5d 2b 45 65 c7 04 7a 54 06 94 a7 9a f7 ab b8 42 bd c1 61
Government of Finland, Population Register Centre	Finland	VRK Govt Root CA	2048	SHA1	Monday, December 18, 2023 6:51:08 AM	fa a7 d9 fb 31 b7 46 f2 00 a8 5e 65 79 76 13 d8 16 e0 63 b5
Government of France	France	Secrétariat Général de la Défense Nationale	2048	SHA1	Saturday, October 17, 2020 7:29:22 AM	60 d6 89 74 b5 c2 65 9e 8a 0f c1 88 7c 88 d2 46 69 1b 18 2c
Government of Hong Kong (SAR), Hongkong Post	Hong Kong (SAR)	Hongkong Post Root CA 1	2048	SHA1	Sunday, May 14, 2023 9:52:29 PM	d6 da a8 20 8d 09 d2 15 4d 24 b5 2f cb 34 6e b2 58 b2 8a 58
		Hongkong Post Root CA	2048	SHA1	Saturday, January 16, 2010 4:59:00 PM	e0 92 5e 18 c7 76 5e 22 da bd 94 27 52 9d a6 af 4e 06 64 28
Government of India, Ministry of Communications & Information Technology, Controller of Certifying Authorities (CCA)	India	CCA India 2007	2048	SHA1	Friday, July 03, 2015 11:02:48 PM	97 22 6a ae 4a 7a 64 a5 9b d1 67 87 f2 7f 84 1c 0a 00 1f d0
Government of Japan, Ministry of Internal Affairs and Communications	Japan	Japan Local Government PKI Application CA	2048	SHA1	Thursday, March 31, 2016 7:59:59 AM	96 83 38 f1 13 e3 6a 7b ab dd 08 f7 77 63 91 a6 87 36 58 2e
Government of Japan, Ministry of Internal Affairs and Communications	Japan	Application CA, Japanese Government	2048	SHA1	Tuesday, December 12, 2017 8:00:00 AM	7f 8a b0 cf d0 51 87 6a 66 f3 36 0f 47 c8 8d 8c d3 35 fc 74
Government of Korea, Korea Information Security Agency (KISA)	South Korea	KISA RootCA 3	2048	SHA1	Tuesday, November 18, 2014 11:39:51 PM	5f 4e 1f cf 31 b7 91 3b 85 0b 54 f6 e5 ff 50 1a 2b 6f c6 cf
		KISA RootCA 1	2048	SHA1	Sunday, August 24, 2025 1:05:46 AM	02 72 68 29 3e 5f 5d 17 aa a4 b3 c3 e6 36 1e 1f 92 57 5e aa

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		CertRSA01	2048	SHA1	Wednesday, March 03, 2010 7:59:59 AM	f5 c2 7c f5 ff f3 02 9a cf 1a 1a 4b ec 7e e1 96 4c 77 d7 84
Government of Korea, Ministry of Government Administration and Home Affairs (MOGAHA)	S Korea	Root CA	2048	SHA1	Saturday, April 21, 2012 1:07:23 AM	63 4c 3b 02 30 cf 1b 78 b4 56 9f ec f2 c0 4a 86 52 ef ef 0e
		GPKIRootCA	2048	SHA1	Tuesday, March 14, 2017 10:00:04 PM	20 cb 59 4f b4 ed d8 95 76 3f d5 25 4e 95 9a 66 74 c6 ee b2
Government of Latvia, Latvian Post	Latvia	VAS Latvijas Pasts SSI (RCA)	4096	SHA1	Friday, September 13, 2024 2:27:57 AM	08 64 18 e9 06 ce e8 9c 23 53 b6 e2 7f bd 9e 74 39 f7 63 16
Government of Latvia, Latvian State Radio & Television Centre (LVRTC)	Latvia	E-ME SSI (RCA)	4096	SHA1	Wednesday, May 19, 2027 1:48:15 AM	c9 32 1d e6 b5 a8 26 66 cf 69 71 a1 8a 56 f2 d3 a8 67 56 02
Government of Macao, Macao Post	Macao SAR	Macao Post eSignTrust Root Certification Authority	2048	MD5	1/29/2013	89 c3 2e 6b 52 4e 4d 65 38 8b 9e ce dc 63 71 34 ed 41 93 a3
Government of Mexico, Autoridad Certificadora Raiz de la Secretaria de Economia	Mexico	Secretaria de Economia Mexico	2048	SHA1	Wednesday, May 07, 2025 5:00:00 PM	34 d4 99 42 6f 9f c2 bb 27 b0 75 ba b6 82 aa e5 ef fc ba 74
Government of Portugal, Sistema de Certificação Electrónica do Estado (SCEE) / Electronic Certification System of the State	Portugal	ECRaizEstado	4096	SHA1	Sunday, June 23, 2030 6:41:27 AM	39 13 85 3e 45 c4 39 a2 da 71 8c df b6 f3 e0 33 e0 4f ee 71
Government of Serbia, PTT saobraćaja „Srbija“ (Serbian Post)	Serbia	Posta CA Root	2048	SHA1	Friday, October 20, 2028 5:52:08 AM	d6 bf 79 94 f4 2b e5 fa 29 da 0b d7 58 7b 59 1f 47 a4 4f 22

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
Government of Slovenia, Posta Slovenije (POSTArCA)	Slovenia	POSTArCA	2048	SHA1	Tuesday, February 07, 2023 4:06:58 AM	b1 ea c3 e5 b8 24 76 e9 d5 0b 1e c6 7d 2c c1 1e 12 e0 b4 91
Government of Slovenia, Slovenian General Certification Authority (SIGEN-CA)	Slovenia	SIGEN-CA	2048	SHA1	Tuesday, June 29, 2021 1:57:46 PM	3e 42 a1 87 06 bd 0c 9c cf 59 47 50 d2 e4 d6 ab 00 48 fd c4
Government of Slovenia, Slovenian Governmental Certification Authority (SIGOV-CA)	Slovenia	SIGOV-CA	2048	SHA1	Sunday, January 10, 2021 6:22:52 AM	7f b9 e2 c9 95 c9 7a 93 9f 9e 81 a0 7a ea 9b 4d 70 46 34 96
Government of Spain (CAV), Izenpe S.A.	Spain	Izenpe.com	2048	SHA1	Tuesday, January 30, 2018 4:00:00 PM	4a 3f 8d 6b dc 0e 1e cf cd 72 e3 77 de f2 d7 ff 92 c1 9b c7
		Izenpe.com	4096	SHA1	Sunday, December 13, 2037 12:27:25 AM	30 77 9e 93 15 02 2e 94 85 6a 3f f8 bc f8 15 b0 82 f9 ae fd
Government of Spain, Dirección General de la Policía – Ministerio del Interior – España.	Spain	DIRECCION GENERAL DE LA POLICIA	4096	SHA1	Friday, February 08, 2036 3:59:59 PM	b3 8f ec ec 0b 14 8a a6 86 c3 d0 0f 01 ec c8 84 8e 80 85 eb
Government of Spain, Fábrica Nacional de Moneda y Timbre (FNMT)	Spain	Fabrica Nacional de Moneda y Timbre	1024	SHA1	Monday, March 18, 2019 8:26:19 AM	43 f9 b1 10 d5 ba fd 48 22 52 31 b0 d0 08 2b 37 2f ef 9a 54
		AC RAIZ FNMT-RCM	4096	SHA1	Monday, December 31, 2029 5:00:00 PM	b8 65 13 0b ed ca 38 d2 7f 69 92 94 20 77 0b ed 86 ef bc 10
Government of Spain, Autoritat de Certificació de la Comunitat Valenciana (ACCV)	Spain	Root CA Generalitat Valenciana	2048	SHA1	Thursday, July 01, 2021 8:22:47 AM	a0 73 e5 c5 bd 43 61 0d 86 4c 21 13 0a 85 58 57 cc 9c ea 46
Government of Switzerland, Bundesamt für Informatik und Telekommunikation (BIT)	Switzerland	AdminCA-CD-T01	2048	SHA1	Monday, January 25, 2016 5:36:19 AM	6b 81 44 6a 5c dd f4 74 a0 f8 00 ff be 69 fd 0d b6 28 75 16

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		Admin-Root-CA	2048	SHA1	Wednesday, November 10, 2021 12:51:07 AM	25 3f 77 5b 0e 77 97 ab 64 5f 15 91 55 97 c3 9e 26 36 31 d1
Government of Taiwan, Government Root Certification Authority (GRCA)	Taiwan ROC	TW Government Root Certification Authority	4096	SHA1	Sunday, December 05, 2032 6:23:33 AM	f4 8b 11 bf de ab be 94 54 20 71 e6 41 de 6b be 88 2b 40 b9
Government of The Netherlands, PKIoverheid	The Netherlands	Staat der Nederlanden Root CA	2048	SHA1	Wednesday, December 16, 2015 2:15:38 AM	10 1d fa 3f d5 0b cb bb 9b b5 60 0c 19 55 a4 1a f4 73 3a 04
		Staat der Nederlanden Root CA - G2	4096	SHA256	3/5/2020	59 af 82 79 91 86 c7 b4 75 07 cb cf 03 57 46 eb 04 dd b7 16
Government of the United States of America, Federal PKI	USA	U.S. Government FBCA	2048	SHA1	Wednesday, October 06, 2010 11:53:56 AM	76 b7 60 96 dd 14 56 29 ac 75 85 d3 70 63 c1 bc 47 86 1c 8b
		Common Policy	2048	SHA1	10/15/2027	cb 44 a0 97 85 7c 45 fa 18 7e d9 52 08 6c b9 84 1f 2d 51 b5
Government of Tunisia, Agence National de Certification Electronique / National Digital Certification Agency (ANCE/NDCA)	Tunisia	Agence Nationale de Certification Electronique	2048	MD5	Wednesday, August 12, 2037 2:58:14 AM	30 70 f8 83 3e 4a a6 80 3e 09 a6 46 ae 3f 7d 8a e1 fd 16 54
		Agence Nationale de Certification Electronique	2048	MD5	Wednesday, August 12, 2037 2:03:17 AM	d9 04 08 0a 49 29 c8 38 e9 f1 85 ec f7 a2 2d ef 99 34 24 07
Government of Turkey, Kamu Sertifikasyon Merkezi (Kamu SM)	Turkey	Kamu Sertifikasyon Merkezi	2048	SHA1	Monday, August 21, 2017 3:37:07 AM	1b 4b 39 61 26 27 6b 64 91 a2 68 6d d7 02 43 21 2d 1f 1d 96
Government of Uruguay, Correo Uruguayo	Uruguay	Correo Uruguayo - Root CA	4096	SHA1	Monday, December 30, 2030 7:59:59 PM	f9 dd 19 26 6b 20 43 f1 fe 4b 3d cb 01 90 af f1 1f 31 a6 9d
Halcom D.D.	Slovenia	Halcom CA FO	2048	SHA1	Friday, June 05, 2020 2:33:31 AM	04 09 56 5b 77 da 58 2e 64 95 ac 00 60 a7 23 54 e6 4b 01 92



Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
.		Halcom CA PO 2	2048	SHA1	Thursday, February 07, 2019 10:33:31 AM	7f bb 6a cd 7e 0a b4 38 da af 6f d5 02 10 d0 07 c6 c0 82 9c
I.CA První certifikační autorita, a.s.	Czech Republic	I.CA Czech Accredited Certification Services	2048	SHA1	Saturday, March 31, 2018 5:00:00 PM	64 90 2a d7 27 7a f3 e3 2c d8 cc 1d c7 9d e1 fd 7f 80 69 ea
		I.CA Czech Certification Services	2048	SHA1	Saturday, March 31, 2018 5:00:00 PM	ab 16 dd 14 4e cd c0 fc 4b aa b6 2e cf 04 08 89 6f de 52 b7
IdenTrust	USA	DST (ABA.ECOM) CA	2048	SHA1	Thursday, July 09, 2009 10:33:53 AM	7a 74 41 0f b0 cd 5c 97 2a 36 4b 71 bf 03 1d 88 a6 51 0e 9e
		DST RootCA X2	2048	SHA1	Thursday, November 27, 2008 3:46:16 PM	67 eb 33 7b 68 4c eb 0e c2 b0 76 0a b4 88 27 8c dd 95 97 dd
		Xcert EZ by DST	2048	SHA1	Saturday, July 11, 2009 9:14:18 AM	68 ed 18 b3 09 cd 52 91 c0 d3 35 7c 1d 11 41 bf 88 38 66 b1
		DST ACES CA X6	2048	SHA1	Monday, November 20, 2017 2:19:58 PM	40 54 da 6f 1c 3f 40 74 ac ed 0f ec cd db 79 d1 53 fb 90 1d
		DST (ANX Network) CA	1024	SHA1	Sunday, December 09, 2018 9:16:48 AM	76 39 c7 18 47 e1 51 b5 c7 ea 01 c7 58 fb f1 2a ba 29 8f 7a
		DSTCA E1	1024	SHA1	Monday, December 10, 2018 11:40:23 AM	81 96 8b 3a ef 1c dc 70 f5 fa 32 69 c2 92 a3 63 5b d1 23 d3
		DST (Baltimore EZ) CA	2048	SHA1	Friday, July 03, 2009 12:56:53 PM	a3 e3 1e 20 b2 e4 6a 32 85 20 47 2d 0c de 95 23 e7 26 0c 6d

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		DSTCA E2	1024	SHA1	Sunday, December 09, 2018 12:47:26 PM	ab 48 f3 33 db 04 ab b9 c0 72 da 5b 0c c1 d0 57 f0 36 9b 46
		DST RootCA X1	2048	SHA1	Friday, November 28, 2008 11:18:55 AM	b7 2f ff 92 d2 ce 43 de 0a 8d 4c 54 8c 50 37 26 a8 1e 2b 93
		DST-Entrust GTI CA	1024	SHA1	Saturday, December 08, 2018 5:32:24 PM	bc 92 19 dd c9 8e 14 bf 1a 78 1f 6e 28 0b 04 c2 7f 90 27 12
		DST (National Retail Federation) RootCA	2048	SHA1	Monday, December 08, 2008 9:14:16 AM	cf de fe 10 2f da 05 bb e4 c7 8d 2e 44 23 58 90 05 b2 57 1d
		DST Root CA X3	2048	SHA1	Thursday, September 30, 2021 7:01:15 AM	da c9 02 4f 54 d8 f6 df 94 93 5f b1 73 26 38 ca 6a d7 7c 13
		DST (United Parcel Service) RootCA	2048	SHA1	Saturday, December 06, 2008 5:25:46 PM	ec 0c 37 16 ea 9e df ad d3 5d fb d5 56 08 e6 0a 05 d3 cb f3
<a href="#">Infonotary Plc</a>	Bulgaria	Infonotary CSP Root	4096	SHA1	Friday, March 06, 2026 9:33:05 AM	04 46 c8 bb 9a 69 83 c9 5c 8a 2e 54 64 68 7c 11 15 aa b7 4a
<a href="#">Internet Publishing Services s.l. (ipsCA)</a>	Spain	IPS SERVIDORES	1024	MD5	Tuesday, December 29, 2009 4:21:07 PM	24 ba 6d 6c 8a 5b 58 37 a4 8d b5 fa e9 19 ea 67 5c 94 d2 17
		ipsCA Global CA Root	2048	SHA1	Tuesday, December 25, 2029 6:38:44 AM	3c 71 d7 0e 35 a5 da a8 b2 e3 81 2d c3 67 74 17 f5 99 0d f3
		ipsCA Main CA Root	2048	SHA1	Tuesday, December 25, 2029 6:54:36 AM	cf e4 31 3d ba 05 b8 a7 c3 00 63 99 5a 9e b7 c2 47 ad 8f d5
<a href="#">Japan Certification Services, Inc. (JCSI)</a>	Japan	Japan Certification Services, Inc. SecureSign RootCA2	2048	SHA1	Tuesday, September 15, 2020 7:59:59 AM	00 ea 52 2c 8a 9c 06 aa 3e cc e0 b4 fa 6c dc 21 d9 2e 80 99

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		SecureSign RootCA3	2048	SHA1	Tuesday, September 15, 2020 7:59:59 AM	8e b0 3f c3 cf 7b b2 92 86 62 68 b7 51 22 3d b5 10 34 05 cb
		SecureSign RootCA1	2048	SHA1	Tuesday, September 15, 2020 7:59:59 AM	ca bb 51 67 24 00 58 8e 64 19 f1 d4 08 78 d0 40 3a a2 02 64
		SecureSign RootCA11	SHA-1	2048	Saturday, April 07, 2029 9:56:47 PM	3b c4 9f 48 f8 f3 73 a0 9c 1e bd f8 5b b1 c3 65 c7 d8 11 b3
KEYNECTSIS	France	CertPlus Class 1 Primary CA	2048	SHA1	Monday, July 06, 2020 4:59:59 PM	6a 17 45 70 a9 16 fb e8 44 53 ee d3 d0 70 a1 d8 da 44 28 29
		CertPlus Class 3P Primary CA	2048	SHA1	Saturday, July 06, 2019 4:59:59 PM	21 6b 2a 29 e6 2a 00 ce 82 01 46 d8 24 41 41 b9 25 11 b2 79
		CertPlus Class 2 Primary CA	2048	SHA1	Saturday, July 06, 2019 4:59:59 PM	74 20 74 41 72 9c dd 92 ec 79 31 d8 23 10 8d c2 81 92 e2 bb
		Class 3 Primary CA	2048	SHA1	Saturday, July 06, 2019 4:59:59 PM	d2 ed f8 8b 41 b6 fe 01 46 1d 6e 28 34 ec 7c 8f 6c 77 72 1e
		CertPlus Class 3TS Primary CA	2048	SHA1	Saturday, July 06, 2019 4:59:59 PM	f4 40 95 c2 38 ac 73 fc 4f 77 bf 8f 98 df 70 f8 f0 91 bc 52
Microsec e-Szignó CA	Hungary	Microsec e-Szigno Root CA	2048	SHA1	Thursday, April 06, 2017 5:28:44 AM	23 88 c9 d3 71 cc 9e 96 3d ff 7d 3c a7 ce fc d6 25 ec 19 0d
		Microsec e-Szigno Root CA 2009	2048	SHA256	Sunday, December 30, 2029 4:30:18 AM	a6 5c b4 73 3d 94 a5 c8 65 a8 64 64 7c 2c 01 27 2c 89 b1 43

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
Microsoft Corporation	USA	Microsoft Authenticode(tm) Root Authority	2048	MD5	Friday, December 31, 1999 4:59:59 PM	7f 88 cd 72 23 f3 c8 13 81 8c 99 46 14 a8 9c 99 fa 3b 52 47
		Microsoft Root Authority	2048	MD5	Thursday, December 31, 2020 12:00:00 AM	a4 34 89 15 9a 52 0f 0d 93 d0 32 cc af 37 e7 fe 20 a8 b4 19
NetLock Ltd.	Hungary	Microsoft Root Certificate Authority	4096	SHA1	Sunday, May 09, 2021 4:28:13 PM	cd d4 ee ae 60 00 ac 7f 40 c3 80 2c 17 1e 30 14 80 30 c0 72
		Microsoft Time Stamping Service Root	1024	MD5	Thursday, December 30, 1999 4:59:59 PM	24 5c 97 df 75 14 e7 cf 2d f8 be 72 ae 95 7b 9e 04 74 1e 85
		NetLock Uzleti (Class B) Tanusitvanykiado	1024	MD5	Wednesday, February 20, 2019 7:10:22 AM	87 9f 4b ee 05 df 98 58 3b e3 60 d6 33 e7 0d 3f fe 98 71 af
		NetLock Minositett Kozjegyzoi (Class QA) Tanusitvanykiad	2048	SHA1	Wednesday, December 14, 2022 6:47:11 PM	01 68 97 e1 a0 b8 f2 c3 b1 34 66 5c 20 a7 27 b7 a1 58 e2 8f
Netrust Pte Ltd	Singapore	NetLock Kozjegyzoi (Class A) Tanusitvanykiado	2048	MD5	Tuesday, February 19, 2019 4:14:47 PM	ac ed 5f 65 53 fd 25 ce 01 5f 1f 7a 48 3b 6a 74 9f 61 78 c6
		NetLock Expressz (Class C) Tanusitvanykiado	1024	MD5	Wednesday, February 20, 2019 7:08:11 AM	e3 92 51 2f 0a cf f5 05 df f6 de 06 7f 75 37 e1 65 ea 57 4b
		NetLock Arany (Class Gold) Fótanúsítvány	2048	SHA256	12/6/2028	06 08 3f 59 3f 15 a1 04 a0 69 a4 6b a9 03 d0 06 b7 97 09 91
		NetLock Platina (Class Platinum) Fótanúsítvány	4096	SHA256	12/6/2028	ec 93 de 08 3c 93 d9 33 a9 86 b3 d5 cd e2 5a cb 2f ee cf 8e
Netrust CA1	2048	SHA1	Monday, March 29, 2021 7:57:45 PM	55 c8 6f 74 14 ac 8b dd 68 14 f4 d8 6a f1 5f 37 10 e1 04 d0		

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
Network Solutions	USA	Network Solutions Certificate Authority	2048	SHA1	Monday, December 31, 2029 4:59:59 PM	74 f8 a3 c3 ef e7 b3 90 06 4b 83 90 3c 21 64 60 20 e5 df ce
		UTN-USERFirst-Hardware	2048	SHA1	Tuesday, July 09, 2019 11:19:22 AM	04 83 ed 33 99 ac 36 08 05 87 22 ed bc 5e 46 00 e3 be f9 d7
Nova Ljubljanska Banka d.d. (NLB)	Slovenia	NLB Nova Ljubljanska Banka d.d. Ljubljana	2048	SHA1	Monday, May 15, 2023 4:22:45 AM	04 56 f2 3d 1e 9c 43 ae cb 0d 80 7f 1c 06 47 55 1a 05 f4 56
Post.Trust	Ireland	Post.Trust Root CA	2048	SHA1	Tuesday, July 05, 2022 1:12:33 AM	c4 67 4d dc 6c e2 96 7f f9 c9 2e 07 2e f8 e8 a7 fb d6 a1 31
		Post.Trust Root CA	2048	SHA1	Friday, August 20, 2010 6:56:21 AM	bc 7b 3c 6f ef 26 b9 f7 ab 10 d7 a1 f6 b6 7c 5e d2 a1 2d 3d
QuoVadis	Bermuda	QuoVadis Root CA 3	4096	SHA1	Monday, November 24, 2031 12:06:44 PM	1f 49 14 f7 d8 74 95 1d dd ae 02 c0 be fd 3a 2d 82 75 51 85
		QuoVadis Root CA 2	4096	SHA1	Monday, November 24, 2031 11:23:33 AM	ca 3a fb cf 12 40 36 4b 44 b2 16 20 88 80 48 39 19 93 7c f7
		QuoVadis Root Certification Authority	2048	SHA1	Wednesday, March 17, 2021 11:33:33 AM	de 3f 40 bd 50 93 d3 9b 6c 60 f6 da bc 07 62 01 00 89 76 c9
Red Abogacía	Spain	Autoridad de Certificacion de la Abogacia	2048	SHA1	Thursday, June 13, 2030 3:00:00 PM	7f 8a 77 83 6b dc 6d 06 8f 8b 07 37 fc c5 72 54 13 06 8c a4
RSA Security	USA	RSA Security 2048 V3	2048	SHA1	Sunday, February 22, 2026 1:39:23 PM	25 01 90 19 cf fb d9 99 1c b7 68 25 74 8d 94 5f 30 93 95 42

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		ValiCert Class 3 Policy Validation Authority	1024	SHA1	Tuesday, June 25, 2019 5:22:33 PM	69 bd 8c f4 9c d3 00 fb 59 2e 17 93 ca 55 6a f3 ec aa 35 fb
SECOM Trust Systems Co. Ltd.	Japan	Security Communication EV RootCA1	2048	SHA1	Friday, June 05, 2037 7:12:32 PM	fe b8 c4 32 dc f9 76 9a ce ae 3d d8 90 8f fd 28 86 65 64 7d
		Security Communication RootCA1	2048	SHA1	Friday, September 29, 2023 9:20:49 PM	36 b1 2b 49 f9 81 9e d7 4c 9e bc 38 0f c6 56 8f 5d ac b2 f7
		ValiCert Class 1 Policy Validation Authority	1024	SHA1	Tuesday, June 25, 2019 3:23:48 PM	e5 df 74 3c b6 01 c4 9b 98 43 dc ab 8c e8 6a 81 10 9f e4 8e
		Security Communication RootCA2	2048	SHA256	Monday, May 28, 2029 9:00:39 PM	5f 3b 8c f2 f8 10 b3 7d 78 b4 ce ec 19 19 c3 73 34 b9 c7 74
Serasa	Brazil	Serasa Certificate Authority III	2048	SHA1	Thursday, November 21, 2024 6:24:14 AM	9e d1 80 28 fb 1e 8a 97 01 48 0a 78 90 a5 9a cd 73 df f8 71
		Serasa Certificate Authority II	2048	SHA1	Thursday, November 21, 2024 5:44:48 AM	31 e2 c5 2c e1 08 9b ef fd da db 26 dd 7c 78 2e bc 40 37 bd
		Serasa Certificate Authority I	2048	SHA1	Thursday, November 21, 2024 7:12:45 AM	a7 f8 39 0b a5 77 05 09 6f d3 69 41 d4 2e 71 98 c6 d4 d9 d5
Shanghai Electronic Certification Authority Co. Ltd. (SHECA)	China	UCA Global Root	4096	SHA1	Wednesday, December 30, 2037 4:00:00 PM	0b 97 2c 9e a6 e7 cc 58 d9 3b 20 bf 71 ec 41 2e 72 09 fa bf
		UCA Root	2048	SHA1	Sunday, December 30, 2029 4:00:00 PM	82 50 be d5 a2 14 43 3a 66 37 7c bc 10 ef 83 f6 69 da 3a 67
Skaitmeninio sertifikavimo centras (SSC)	Lithuania	SSC Root CA C	4096	SHA1	Tuesday, December 22, 2026 5:11:30 AM	23 e8 33 23 3e 7d 0c c9 2b 7c 42 79 ac 19 c2 f4 74 d6 04 ca

Current CA Owner		Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
			SSC Root CA B	4096	SHA1	Friday, December 25, 2026 5:08:26 AM	3e 84 d3 bc c5 44 c0 f6 fa 19 43 5c 85 1f 3f 2f cb a8 e8 14
			SSC Root CA A	4096	SHA1	Monday, December 28, 2026 5:05:04 AM	5a 5a 4d af 78 61 26 7c 4b 1f 1e 67 58 6b ae 6e d4 fe b9 3f
Start Commercial (StartCom) Ltd.	Israel		StartCom Certification Authority	4096	SHA1	Wednesday, September 17, 2036 12:46:36 P	3e 2b f7 f2 03 1b 96 f3 8c e6 c4 d8 a8 5d 3e 2d 58 47 6a 0f
S-TRUST		Germany	S-TRUST Authentication and Encryption Root CA 2005:PN	2048	SHA1	Friday, June 21, 2030 4:59:59 PM	be b5 a9 95 74 6b 9e df 73 8b 56 e6 df 43 7a 77 be 10 6b 81
Swisscom Solutions AG		Switzerland	Swisscom Root CA 1	4096	SHA1	Monday, August 18, 2025 3:06:20 PM	5f 3a fc 0a 8b 64 f6 86 67 34 74 df 7e a9 a2 fe f9 fa 7a 51
SwissSign AG		Switzerland	SwissSign Silver CA - G2	4096	SHA1	Saturday, October 25, 2036 1:32:46 AM	9b aa e5 9f 56 ee 21 cb 43 5a be 25 93 df a7 f0 40 d1 1d cb
			SwissSign Platinum CA - G2	4096	SHA1	Saturday, October 25, 2036 1:36:00 AM	56 e0 fa c0 3b 8f 18 23 55 18 e5 d3 11 ca e8 c2 43 31 ab 66
			SwissSign Gold CA - G2	4096	SHA1	Saturday, October 25, 2036 1:30:35 AM	d8 c5 38 8a b7 30 1b 1b 6e d4 7a e6 45 25 3a 6f 9f 1a 27 61
Taiwan-CA Inc. (TWCA)		Taiwan	TWCA Root Certification Authority 1	2048	SHA1	Tuesday, December 31, 2030 8:59:59 AM	cf 9e 87 6d d3 eb fc 42 26 97 a3 b5 a3 7a a0 76 a9 06 23 48
			TWCA Root Certification Authority 2	4096	SHA256	Tuesday, December 31, 2030 8:59:59 AM	df 64 6d cb 7b 0f d3 a9 6a ee 88 c6 4e 2d 67 67 11 ff 9d 5f

Current CA Owner		Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
TeliaSonera	Finland		Sonera Class2 CA	2048	SHA1	Tuesday, April 06, 2021 12:29:40 AM	37 f7 6d e6 07 7c 90 c5 b1 3e 93 1a b7 41 10 b4 f2 e4 9a 27
			Sonera Class1 CA	2048	SHA1	Tuesday, April 06, 2021 3:49:13 AM	07 47 22 01 99 ce 74 b9 7c b0 3d 79 b2 64 a2 c8 55 e9 33 ff
TrustCenter ( a company of Chosen Security)	Germany		TC TrustCenter Universal CA I	2048	SHA1	Wednesday, December 31, 2025 3:59:59 PM	6b 2f 34 ad 89 58 be 62 fd b0 6b 5c ce bb 9d d9 4f 4e 39 f3
			TC TrustCenter Universal CA II	2048	SHA1	Tuesday, December 31, 2030 3:59:59 PM	8c c4 30 7b c6 07 55 e7 b2 2d d9 f7 fe a2 45 93 6c 7c f2 88
			TC TrustCenter Class 3 CA	1024	MD5	Saturday, January 01, 2011 4:59:59 AM	9f c7 96 e8 f8 52 4f 86 3a e1 49 6d 38 12 42 10 5f 1b 78 f5
			TC TrustCenter Class 1 CA	1024	MD5	Saturday, January 01, 2011 4:59:59 AM	72 0f c1 5d dc 27 d4 56 d0 98 fa bf 3c dd 78 d3 1e f5 a8 da
			TC TrustCenter Class 2 CA	1024	MD5	Saturday, January 01, 2011 4:59:59 AM	83 8e 30 f7 7f dd 14 aa 38 5e d1 45 00 9c 0e 22 36 49 4f aa
			TC TrustCenter Class 3 CA II	2048	SHA1	Wednesday, December 31, 2025 3:59:59 PM	80 25 ef f4 6e 70 c8 d4 72 24 65 84 fe 40 3b 8a 8d 6a db f5
			TC TrustCenter Class 4 CA II	2048	SHA1	Wednesday, December 31, 2025 3:59:59 PM	a6 9a 91 fd 05 7f 13 6a 42 63 0b b1 76 0d 2d 51 12 0c 16 50
			TC TrustCenter Time Stamping CA	1024	MD5	Saturday, January 01, 2011 4:59:59 AM	a3 99 f7 6f 0c bf 4c 9d a5 5e 4a c2 4e 89 60 98 4b 29 05 b6
			TC TrustCenter Class 2 CA II	2048	SHA1	Wednesday, December 31, 2025 3:59:59 PM	ae 50 83 ed 7c f4 5c bc 8f 61 c6 21 fe 68 5d 79 42 21 15 6e



Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		TC TrustCenter Class 4 CA	1024	MD5	Saturday, January 01, 2011 4:59:59 AM	d2 9f 6c 98 be fc 6d 98 65 21 54 3e e8 be 56 ce bc 28 8c f3
Trustis Limited	United Kingdom	Trustis FPS Root CA	2048	SHA1	Sunday, January 21, 2024 4:36:54 AM	3b c0 38 0b 33 c3 f6 a6 0c 86 15 22 93 d9 df f5 4b 81 c0 04
		Trustis EVS Root CA	2048	SHA1	Saturday, January 09, 2027 4:56:00 AM	ed 8d c8 38 6c 48 86 ae ee 07 91 58 aa c3 bf e6 58 e3 94 b4
Trustwave	USA	Secure Global CA	2048	SHA1	Monday, December 31, 2029 12:52:06 PM	3a 44 73 5a e5 81 90 1f 24 86 61 46 1e 3b 9c c4 5f f5 3a 1b
		SecureTrust CA	2048	SHA1	Monday, December 31, 2029 12:40:55 PM	87 82 c6 c3 04 35 3b cf d2 96 92 d2 59 3e 7d 44 d9 34 ff 11
		XRamp Global Certification Authority	2048	SHA1	Sunday, December 31, 2034 10:37:19 PM	b8 01 86 d1 eb 9c 86 a5 41 04 cf 30 54 f3 4c 52 b7 e5 58 c6
TurkTrust	Turkey	TÜRKTRUST Bilgi İletişim ve Bilişim Güvenliği Hizmetleri A.Ş.	2048	SHA1	Sunday, March 22, 2015 3:27:17 AM	79 98 a3 08 e1 4d 65 85 e6 c2 1e 15 3a 71 9f ba 5a d3 4a d9
		TURKTRUST Elektronik İşlem Hizmetleri	2048	SHA1	Sunday, March 22, 2015 3:04:51 AM	75 02 51 b2 c6 32 53 6f 9d 91 72 79 54 3c 13 7c d7 21 c6 e0
		TURKTRUST Elektronik Sertifika Hizmet Sağlayıcısı	2048	SHA1	Wednesday, September 16, 2015 3:07:57 AM	b4 35 d4 e1 11 9d 1c 66 90 a7 49 eb b3 94 bd 63 7b a7 82 b7
		TURKTRUST Elektronik İşlem Hizmetleri	2048	SHA1	Wednesday, September 16, 2015 5:13:05 AM	c0 db 57 81 57 e9 ee 82 b5 91 7d f0 dd 6d 82 ee 90 39 c4 e2

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		TÜRKTRUST Elektronik Sertifika Hizmet Sağlayıcısı	2048	SHA1	Friday, December 22, 2017 10:37:19 AM	f1 7f 6f b6 31 dc 99 e3 a3 c8 7f fe 1c f1 81 10 88 d9 60 33
Unizeto Certum	Poland	Certum CA	2048	SHA1	Friday, June 11, 2027 3:46:39 AM	62 52 dc 40 f7 11 43 a2 2f de 9e f7 34 8e 06 42 51 b1 81 18
		Certum Trusted Network CA	2048	SHA1	Monday, December 31, 2029 5:07:37 AM	07 e0 32 e0 20 b7 2c 3f 19 2f 06 28 a2 59 3a 19 a7 0f 06 9e
VeriSign	USA	Equifax Secure Certificate Authority	1024	SHA1	Wednesday, August 22, 2018 9:41:51 AM	d2 32 09 ad 23 d3 14 23 21 74 e4 0d 7f 9d 62 13 97 86 63 3a
		Equifax Secure eBusiness CA-1	1024	MD5	Saturday, June 20, 2020 9:00:00 PM	da 40 18 8b 91 89 a3 ed ee ae da 97 fe 2f 9d f5 b7 d1 8a 41
		Primary Utility Root CA	2048	MD5	Wednesday, May 23, 2012 4:59:59 PM	6a 6f 2a 8b 6e 26 15 08 8d f5 9c d2 4c 40 24 18 ae 42 a3 f1
		eSign Imperito Primary Root CA	2048	MD5	Wednesday, May 23, 2012 4:59:59 PM	70 30 aa bf 84 32 a8 00 66 6c cc c4 2a 88 7e 42 b7 55 3e 2b
		eSign Australia: Gatekeeper Root CA	2048	MD5	Friday, May 23, 2014 4:59:59 PM	c7 30 26 e3 25 fe 21 91 6b 55 c4 b5 3a 56 b1 3d ca f3 d6 25
		Equifax Secure Global eBusiness CA-1	1024	MD5	Saturday, June 20, 2020 9:00:00 PM	7e 78 4a 10 1c 82 65 cc 2d e1 f1 6d 47 b4 40 ca d9 0a 19 45
		Equifax Secure eBusiness CA-2	1024	SHA1	Sunday, June 23, 2019 5:14:45 AM	39 4f f6 85 0b 06 be 52 e5 18 56 cc 10 e1 80 e8 82 b3 85 cc
		GeoTrust Primary Certification Authority	2048	SHA1	Wednesday, July 16, 2036 4:59:59 PM	32 3c 11 8e 1b f7 b8 b6 52 54 e2 e2 10 0d d6 02 90 37 f0 96

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		GeoTrust Universal CA 2	4096	SHA1	Saturday, March 03, 2029 10:00:00 PM	37 9a 19 7b 41 85 45 35 0c a6 03 69 f3 3c 2e af 47 4f 20 79
		GeoTrust Global CA 2	2048	SHA1	Sunday, March 03, 2019 10:00:00 PM	a9 e9 78 08 14 37 58 88 f2 05 19 b0 6d 2b 0d 2b 60 16 90 7d
		GeoTrust Global CA	2048	SHA1	Friday, May 20, 2022 9:00:00 PM	de 28 f4 a4 ff e5 b9 2f a3 c5 03 d1 a3 49 a7 f9 96 2a 82 12
		GeoTrust Universal CA	4096	SHA1	Saturday, March 03, 2029 10:00:00 PM	e6 21 f3 35 43 79 05 9a 4b 68 30 9d 8a 2f 74 22 15 87 ec 79
		Thawte Server CA	1024	MD5	Thursday, December 31, 2020 4:59:59 PM	23 e5 94 94 51 95 f2 41 48 03 b4 d5 64 d2 a3 a3 f5 d8 8b 8c
		Thawte Personal Basic CA	1024	MD5	Thursday, December 31, 2020 4:59:59 PM	40 e7 8c 1d 52 3d 1c d9 95 4f ac 1a 1a b3 bd 3c ba a1 5b fc
		Thawte Primary Root CA	2048	SHA1	Wednesday, July 16, 2036 4:59:59 PM	91 c6 d6 ee 3e 8a c8 63 84 e5 48 c2 99 29 5c 75 6c 81 7b 81
		Thawte Premium Server CA	1024	MD5	Thursday, December 31, 2020 4:59:59 PM	62 7f 8d 78 27 65 63 99 d2 7d 7f 90 44 c9 fe b3 f3 3e fa 9a
		Thawte Personal Freemail CA	1024	MD5	Thursday, December 31, 2020 4:59:59 PM	20 99 00 b6 3d 95 57 28 14 0c d1 36 22 d8 c6 87 a4 eb 00 85
		Thawte Personal Premium CA	1024	MD5	Thursday, December 31, 2020 4:59:59 PM	36 86 35 63 fd 51 28 c7 be a6 f0 05 cf e9 b4 36 68 08 6c ce
		Thawte Timestamping CA	1024	MD5	Thursday, December 31, 2020 4:59:59 PM	be 36 a4 56 2f b2 ee 05 db b3 d3 23 23 ad f4 45 08 4e d6 56

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		UTN-USERFirst-Network Applications	2048	SHA1	Tuesday, July 09, 2019 11:57:49 AM	5d 98 9c db 15 96 11 36 51 65 64 1b 56 0f db ea 2a c2 3e f1
		Secure Server Certification Authority	1000	MD2	Thursday, January 07, 2010 4:59:59 PM	44 63 c5 31 d7 cc c1 00 67 94 61 2b b6 56 d3 bf 82 57 84 6f
		CA	1024	SHA1	Tuesday, August 01, 2028 4:59:59 PM	0b 77 be bb cb 7a a2 47 05 de cc 0f bd 6a 02 fc 7a bd 9b 52
		VeriSign Trust Network (G2)	1024	SHA1	Friday, May 18, 2018 4:59:59 PM	3f 85 f2 bb 4a 62 b0 b5 8b e1 61 4a bb 0d 46 31 b4 be f8 ba
		VeriSign Class 3 Public Primary Certification Authority - G5	2048	SHA1	Wednesday, July 16, 2036 4:59:59 PM	4e b6 d5 78 49 9b 1c cf 5f 58 1e ad 56 be 3d 9b 67 44 a5 e5
		Class 3 Public Primary Certification Authority	1024	MD2	Wednesday, January 07, 2004 4:59:59 PM	4f 65 56 63 36 db 65 98 58 1d 58 4a 59 6c 87 93 4d 5f 2a b4
		VeriSign Time Stamping Service Root	1024	MD5	Wednesday, January 07, 2004 4:59:59 PM	18 f7 c1 fc c3 09 02 03 fd 5b aa 2f 86 1a 75 49 76 c8 dd 25
		VeriSign Commercial Software Publishers CA	1024	MD2	Wednesday, January 07, 2004 4:59:59 PM	24 a4 0a 1f 57 36 43 a6 7f 0a 4b 07 49 f6 a2 2b f2 8a bb 6b
		VeriSign Class 2 Public Primary Certification Authority - G3	2048	SHA1	Wednesday, July 16, 2036 4:59:59 PM	61 ef 43 d7 7f ca d4 61 51 bc 98 e0 c3 59 12 af 9f eb 63 11
		Class 1 Public Primary Certification Authority	1024	MD2	Tuesday, January 07, 2020 4:59:59 PM	78 e9 dd 06 50 62 4d b9 cb 36 b5 07 67 f2 09 b8 43 be 15 b3
		Class 1 Public Primary Certification Authority	1024	MD2	Tuesday, August 01, 2028 4:59:59 PM	90 ae a2 69 85 ff 14 80 4c 43 49 52 ec e9 60 84 77 af 55 6f

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		Class 3 Public Primary Certification Authority - G2	1024	SHA1	Friday, May 18, 2018 4:59:59 PM	97 e2 e9 96 36 a5 47 55 4f 83 8f ba 38 b8 2e 74 f8 9a 83 0a
		VeriSign Class 3 Public Primary Certification Authority - G3	2048	SHA1	Wednesday, July 16, 2036 4:59:59 PM	13 2d 0d 45 53 4b 69 97 cd b2 d5 c3 39 e2 55 76 60 9b 5c c6
		Class 1 Public Primary Certification Authority - G2	1024	SHA1	Tuesday, August 01, 2028 4:59:59 PM	27 3e e1 24 57 fd c4 f9 0c 55 e8 2b 56 16 7f 62 f5 32 e5 47
		VeriSign Commercial Software Publishers CA	1024	MD2	Friday, December 31, 1999 2:35:58 AM	68 8b 6e b8 07 e8 ed a5 c7 b1 7c 43 93 d0 79 5f 0f ae 15 5f
		Class 3 Public Primary Certification Authority	1024	MD2	Tuesday, August 01, 2028 4:59:59 PM	74 2c 31 92 e6 07 e4 24 eb 45 49 54 2b e1 bb c5 3e 61 74 e2
		Class 2 Public Primary Certification Authority	1024	MD2	Tuesday, August 01, 2028 4:59:59 PM	67 82 aa e0 ed ee e2 1a 58 39 d3 c0 cd 14 68 0a 4f 60 14 2a
		Class 3 Public Primary Certification Authority - G2	1024	SHA1	Tuesday, August 01, 2028 4:59:59 PM	85 37 1c a6 e5 50 14 3d ce 28 03 47 1b de 3a 09 e8 f8 77 0f
		VeriSign Individual Software Publishers CA	1024	MD2	Wednesday, January 07, 2004 4:59:59 PM	96 97 4c d6 b6 63 a7 18 45 26 b1 d6 48 ad 81 5c f5 1e 80 1a
		VeriSign Class 1 Public Primary Certification Authority - G3	2048	SHA1	Wednesday, July 16, 2036 4:59:59 PM	20 42 85 dc f7 eb 76 41 95 57 8e 13 6b d4 b7 d1 e9 8e 46 a5
		Class 1 Public Primary Certification Authority - G2	1024	SHA1	Friday, May 18, 2018 4:59:59 PM	04 98 11 05 6a fe 9f d0 f5 be 01 68 5a ac e6 a5 d1 c4 45 4c
		Class 2 Public Primary Certification Authority	1024	MD2	Wednesday, January 07, 2004 4:59:59 PM	a5 ec 73 d4 8c 34 fc be f1 00 5a eb 85 84 35 24 bb fa b7 27

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		Class 2 Public Primary Certification Authority - G2	1024	SHA1	Tuesday, August 01, 2028 4:59:59 PM	b3 ea c4 47 76 c9 c8 1c ea f2 9d 95 b6 cc a0 08 1b 67 ec 9d
		VeriSign Individual Software Publishers CA	1024	MD2	Friday, December 31, 1999 2:37:48 AM	b1 9d d0 96 dc d4 e3 e0 fd 67 68 85 50 5a 67 2c 43 8d 4e 9c
		VeriSign Class 4 Public Primary Certification Authority - G3	2048	SHA1	Wednesday, July 16, 2036 4:59:59 PM	c8 ec 8c 87 92 69 cb 4b ab 39 e9 8d 7e 57 67 f3 14 95 73 9d
		Class 2 Public Primary Certification Authority - G2	1024	SHA1	Friday, May 18, 2018 4:59:59 PM	cf f3 60 f5 24 cb 20 f1 fe ad 89 00 6f 7f 58 6a 28 5b 2d 5b
		VeriSign Universal Root Certification Authority	2048	SHA2 56	Tuesday, December 01, 2037 4:59:59 PM	36 79 ca 35 66 87 72 30 4d 30 a5 fb 87 3b 0f a7 7b b7 0d 54
		thawte Primary Root CA - G3	2048	SHA2 56	Tuesday, December 01, 2037 4:59:59 PM	f1 8b 53 8d 1b e9 03 b6 a6 f0 56 43 5b 17 15 89 ca f3 6b f2
		GeoTrust Primary Certification Authority - G3	2048	SHA2 56	Tuesday, December 01, 2037 4:59:59 PM	03 9e ed b8 0b e7 a0 3c 69 53 89 3b 20 d2 d9 32 3a 4c 2a fd
		VeriSign Class 3 Public Primary Certification Authority - G4	ECDSA	SHA3 84	Monday, January 18, 2038 4:59:59 PM	22 d5 d8 df 8f 02 31 d1 8d f7 9d b7 cf 8a 2d 64 c9 3f 6c 3a
		thawte Primary Root CA - G2	ECDSA	SHA3 84	Monday, January 18, 2038 4:59:59 PM	aa db bc 22 23 8f c4 01 a1 27 bb 38 dd f4 1d db 08 9e f0 12

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
		GeoTrust Primary Certification Authority - G2	ECC384	ECDSA	Monday, January 18, 2038 4:59:59 PM	8d 17 84 d5 37 f3 03 7d ec 70 fe 57 8b 51 9a 99 e6 10 d7 b0
Verizon Business	USA	Baltimore CyberTrust Root	2048	SHA1	Monday, May 12, 2025 4:59:00 PM	d4 de 20 d0 5e 66 fc 53 fe 1a 50 88 2c 78 db 28 52 ca e4 74
		SecureNet CA Class B	2048	MD5	Friday, October 16, 2009 2:59:00 AM	7a c5 ff f8 dc bc 55 83 17 68 77 07 3b f7 51 73 5e 9b d3 58
		Cybertrust Global Root	2048	SHA1	Wednesday, December 15, 2021 1:00:00 AM	5f 43 e5 b1 bf f8 78 8c ac 1c c7 ca 4a 9a c6 22 2b cc 34 c6
		GTE CyberTrust Root	1024	MD5	Thursday, February 23, 2006 4:59:00 PM	90 de de 9e 4c 4e 9f 6f d8 86 17 57 9d d3 91 bc 65 a6 89 64
		GTE CyberTrust Global Root	1024	MD5	Monday, August 13, 2018 4:59:00 PM	97 81 79 50 d8 1c 96 70 cc 34 d8 09 cf 79 44 31 36 7e f4 74
		GTE CyberTrust Root	1024	MD5	Saturday, April 03, 2004 4:59:00 PM	db ac 3c 7a a4 25 4d a1 aa 5c aa d6 84 68 cb 88 ee dd ee a8
Visa	USA	Visa eCommerce Root	2048	SHA1	Thursday, June 23, 2022 5:16:12 PM	70 17 9b 86 8c 00 a4 fa 60 91 52 22 3f 9f 3e 32 bd e0 05 62
		Visa Information Delivery Root CA	2048	SHA1	Sunday, June 29, 2025 10:42:42 AM	5a 4d 0e 8b 5f dc fd f6 4e 72 99 a3 6c 06 0d b2 22 ca 78 e4
Wells Fargo Bank N.A.	USA	Wells Fargo Root Certificate Authority	2048	SHA1	Thursday, January 14, 2021 9:41:28 AM	93 e6 ab 22 03 03 b5 23 28 dc da 56 9e ba e4 d1 d1 cc fb 65
		WellsSecure Public Root CA	2048	SHA1	Tuesday, December 13, 2022 4:07:54 PM	e7 b4 f6 9d 61 ec 90 69 db 7e 90 a7 40 1a 3c f4 7d 4f e8 ee

Current CA Owner	Country	CA Root Name	CA Root Size	Signature Hash	CA Root Expires	Thumbprint
<a href="#">WISeKey</a>	Switzerland	OISTE WISeKey Global Root GA CA	2048	SHA1	Friday, December 11, 2037 9:09:51 AM	59 22 a1 e1 5a ea 16 35 21 f8 98 39 6a 46 46 b0 44 1b 0f a9

## EXPLANATION OF TERMS

**Current CA Owner** indicates the Certification Authority who currently operates the CA Root Name with the unique Thumbprint and CA Root expiration date indicated. Over time CA root certificates have changed hands, and this resource attempts to identify the current CA owner for each identified root certificate. Each Current CA owner should contain a hyperlink to the CA's website, where you can obtain additional information about their root certificates and their certificate policies.

**Country** is the main country from which the CA operates.

**CA Root Name** is the common name applied to the root certificate, which may or may not also indicate the current name of the CA.

**CA Root Size** is the modulus of the RSA algorithm – typically 1024-bit, 2048-bit, or 4096-bit RSA. In the future you may see reference to other algorithms such as ECC or ECDSA.

**Signature Hash** indicates the hash algorithm chosen by the CA for this root certificate – MD2, MD5, SHA1, or SHA2 (SHA256). The hash algorithm used to issue end-use certificates may not be the same as the hash algorithm used for the root certificate: as of January 15, 2009 for example, to Microsoft's knowledge no CA issues MD5 end-use certificates from any MD5 root certificate distributed by the Windows Root Certificate Program.

**CA Root Expires** is the expiration date of the root certificate, after which the CA cannot issue any more end-use certificates from it. Root certificates are typically kept in distribution after expiration by the Program until the last of these end-use certificates expires.



**Thumbprint** is the hash value which uniquely identifies the root certificate in question. It can be confirmed in the actual root certificate by examining the certificate properties (Details), under the Thumbprint field.

## **THE WINDOWS ROOT CERTIFICATE PROGRAM**

Microsoft provides third-party contact information to help you find technical support. This contact information may change without notice. Microsoft does not guarantee the accuracy of this third-party contact information.

For more information about the Microsoft root certificate program requirements, visit the following Microsoft TechNet Web site:

<http://technet.microsoft.com/en-us/library/cc751157.aspx>

For more information about the support for EV certificates in Internet Explorer 7, visit the following Web site:

<http://www.microsoft.com/windows/products/winfamily/ie/ev/default.msp>

[↑ Back to the top](#)

## **HOW WINDOWS UPDATES ROOT CERTIFICATES**

Windows XP, Windows Server 2003, Windows Vista and Windows Server 2008 automatically check the list of trusted CAs on the Windows Update Web site. Then, Windows installs root certificates after the certificates are validated by an application of the user.

For more information about how Windows updates root certificates in Windows Vista, visit the following Web site:

<http://technet.microsoft.com/en-us/library/cc749331.aspx>

For more information about how Windows updates root certificates in Windows Server 2008, visit the following Web site:

<http://technet.microsoft.com/en-us/library/cc771121.aspx>

For more information about how Windows updates root certificates in Windows XP, visit the following Web site:

<http://technet.microsoft.com/en-us/library/bb457160.aspx>

For more information about how Windows updates root certificates in Windows Server 2003, visit the following Web site:

<http://technet.microsoft.com/en-us/library/cc738920.aspx>

### **Notes**

- In Windows Server 2003, the issuer list cannot be greater than 0x3000. When you update root certificates, the list of trusted CAs increases significantly in size and may cause the list to grow too long. The list is then truncated and may cause problems with authorization. This behavior may also cause schannel event ID 36885.
- The Root Update package is available for Windows XP client SKUs only. It is not available for Server SKUs. If you install the Root Update package on Server SKUs, you may exceed the limit for how many root certificates that Schannel can handle when reporting the list of roots to clients in a TLS or SSL handshake, as the number of root certificates distributed in the Root Update package exceeds that limit. For more information about this issue, click the following article number to view the article in the Microsoft Knowledge Base:

[933430](#) Clients cannot make connections if you require client certificates on a Web site or if you use IAS in Windows Server 2003

[↑ Back to the top](#)