

INDEPENDENT ASSURANCE REPORT

To the management of Entrust Corporation ("Entrust"):

Scope

We have been engaged, in a reasonable assurance engagement, to report on Entrust management's [statement](#) that for its Certification Authority (CA) operations in Ottawa, Ontario, Canada, Toronto, Ontario, Canada, Denver, Colorado, USA, Dallas, Texas, USA, and Berkshire, United Kingdom, throughout the period 1 March 2021 to 28 February 2022 (the "Period") for its CAs as enumerated in [Attachment A](#), Entrust has:

- disclosed its business, key lifecycle management, certificate lifecycle management, and CA environmental control practices in its Certification Practice Statements as enumerated in [Attachment B](#)
- maintained effective controls to provide reasonable assurance that Entrust provides its services in accordance with its Certification Practice Statements
- maintained effective controls to provide reasonable assurance that:
 - the integrity of keys and certificates it manages is established and protected throughout their lifecycles;
 - the integrity of subscriber keys and certificates it manages is established and protected throughout their lifecycles;
 - subscriber information is properly authenticated (for the registration activities performed by Entrust); and
 - subordinate CA certificate requests are accurate, authenticated, and approved
- maintained effective controls to provide reasonable assurance that:
 - logical and physical access to CA systems and data is restricted to authorised individuals;
 - the continuity of key and certificate management operations is maintained; and
 - CA systems development, maintenance, and operations are properly authorised and performed to maintain CA systems integrity

in accordance with the [WebTrust Principles and Criteria for Certification Authorities v2.2.1](#).

Entrust does not escrow its CA keys and does not provide certificate suspension services. Accordingly, our procedures did not extend to controls that would address those criteria.

Entrust has issued cross-certificates to third-party certification authorities which were valid during the Period. The operations of these third-party certification authorities were not in scope for our engagement, and, accordingly, we express no opinion on these third-party certification authorities.

Entrust has additional Issuing CAs not in the scope of this report that chain to Root and/or Intermediate CAs within the scope of this report. These Issuing CAs do not issue TLS Web Server, Code Signing, or Time Stamping certificates. Our procedures did not extend to these Issuing CAs, and, accordingly, we express no opinion on them.

Certification authority's responsibilities

Entrust's management is responsible for its statement, including the fairness of its presentation, and the provision of its described services in accordance with the WebTrust Principles and Criteria for Certification Authorities v2.2.1.

Our independence and quality control

We have complied with the relevant rules of professional conduct / code of ethics applicable to the practice of public accounting and related to assurance engagements, issued by various professional accounting bodies, which are founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.



The firm applies Canadian Standard on Quality Control 1, *Quality Control for Firms that Perform Audits and Reviews of Financial Statements, and Other Assurance Engagements*, and accordingly maintains a comprehensive system of quality control including documented policies and procedures regarding compliance with ethical requirements, professional standards and applicable legal and regulatory requirements.

Practitioner’s responsibilities

Our responsibility is to express an opinion on management’s statement based on our procedures. We conducted our procedures in accordance with Canadian Standard on Assurance Engagements 3000, *Attestation Engagements Other than Audits or Reviews of Historical Financial Information*, set out in the CPA Canada Handbook – Assurance. This standard requires that we plan and perform our procedures to obtain reasonable assurance about whether, in all material respects, management’s statement is fairly stated, and, accordingly, included:

- (1) obtaining an understanding of Entrust’s key and certificate lifecycle management business practices and its controls over key and certificate integrity, over the authenticity and confidentiality of subscriber and relying party information, over the continuity of key and certificate lifecycle management operations and over development, maintenance and operation of systems integrity;
- (2) selectively testing transactions executed in accordance with disclosed key and certificate lifecycle management business practices;
- (3) testing and evaluating the operating effectiveness of the controls; and
- (4) performing such other procedures as we considered necessary in the circumstances.

We believe that the evidence we have obtained is sufficient and appropriate to provide a basis for our opinion.

Relative effectiveness of controls

The relative effectiveness and significance of specific controls at Entrust and their effect on assessments of control risk for subscribers and relying parties are dependent on their interaction with the controls, and other factors present at individual subscriber and relying party locations. We have performed no procedures to evaluate the effectiveness of controls at individual subscriber and relying party locations.

Inherent limitations

Because of the nature and inherent limitations of controls, Entrust’s ability to meet the aforementioned criteria may be affected. For example, controls may not prevent, or detect and correct, error, fraud, unauthorised access to systems and information, or failure to comply with internal and external policies or requirements. Also, the projection of any conclusions based on our findings to future periods is subject to the risk that changes may alter the validity of such conclusions.

Other matters

Without modifying our opinion, we noted the following other matters during our procedures:

Matter topic	Matter description
1 Mozilla ‘bug’ responses	As described in management’s statement, management has reported or responded to certain ‘bugs’ on Mozilla’s Bugzilla reporting system. Management’s statement contains information on their outcome or resolution.

Practitioner’s opinion

In our opinion, throughout the period 1 March 2021 to 28 February 2022, Entrust management’s statement, as referred to above, is fairly stated, in all material respects, in accordance with the WebTrust Principles and Criteria for Certification Authorities v2.2.1.

This report does not include any representation as to the quality of Entrust’s services beyond those covered by the WebTrust Principles and Criteria for Certification Authorities v2.2.1, nor the suitability of any of Entrust’s services for any customer’s intended purpose.



Use of the WebTrust seal

Entrust's use of the WebTrust for Certification Authorities Seal constitutes a symbolic representation of the contents of this report and it is not intended, nor should it be construed, to update this report or provide any additional assurance.

A handwritten signature in black ink that reads "Deloitte LLP." The signature is written in a cursive, flowing style.

Deloitte LLP
Chartered Professional Accountants
Toronto, Ontario, Canada
11 May 2022

ATTACHMENT A

LIST OF IN SCOPE CAs

Root CAs
<ol style="list-style-type: none"> 1. Entrust.net Certification Authority (2048) 2. Entrust Root Certification Authority 3. Entrust Root Certification Authority – G2 4. Entrust Root Certification Authority – G4 5. Entrust Root Certification Authority – EC1 6. Entrust Root Certification Authority – EC2 7. Entrust Code Signing Root Certification Authority - CSBR1 8. Entrust Digital Signing Root Certification Authority - DSR1 9. Entrust Verified Mark Root Certification Authority - VMCR1
Intermediate CAs
<ol style="list-style-type: none"> 10. Entrust Certification Authority - AATL1 11. Entrust Enterprise Intermediate CA - ICA1 12. Siemens Intermediate CA 2021
OV SSL Issuing CAs
<ol style="list-style-type: none"> 13. Entrust Certification Authority – L1C 14. Entrust Certification Authority – L1F 15. Entrust Certification Authority – L1K 16. CRYPTAS OV Issuing CA 17. Siemens Issuing CA Internet Server 2020
EV SSL Issuing CAs
<ol style="list-style-type: none"> 18. Entrust Certification Authority – L1E 19. Entrust Certification Authority – L1J 20. Entrust Certification Authority – L1M 21. Entrust Certification Authority – L1N 22. CRYPTAS OV Issuing CA
Qualified Certificate EV SSL Issuing CAs
<ol style="list-style-type: none"> 23. Entrust Certification Authority - QTSP1 24. Entrust Certification Authority - DE QWAC1 25. Entrust Certification Authority - ES QWAC2
Code Signing Issuing CAs
<ol style="list-style-type: none"> 26. Entrust Code Signing Certification Authority – L1D 27. Entrust Code Signing CA - OVCS1 28. Entrust Code Signing CA - OVCS2
EV Code Signing Issuing CAs
<ol style="list-style-type: none"> 29. Entrust Extended Validation Code Signing CA – EVCS1 30. Entrust Extended Validation Code Signing CA – EVCS2
Secure Email (S/MIME) CAs
<ol style="list-style-type: none"> 31. Entrust Class 1 Client CA 32. Entrust Class 1 Client CA - SHA256 33. Entrust Class 2 Client CA 34. Entrust Class 2 Client CA - C2CA2
Timestamp CAs
<ol style="list-style-type: none"> 35. Entrust Timestamping CA – TS1 36. Entrust Time Stamping CA – TS2
Verified Mark Certificate CAs
<ol style="list-style-type: none"> 37. Entrust Certificate Authority - VMC1 38. Entrust Verified Mark CA - VMC2



CA IDENTIFYING INFORMATION

CA #	Cert #	Subject	Issuer	Serial Number	Key Type	Hash Type	Not Before	Not After	Revoked Date	Extended Key Usage	Subject Key Identifier	SHA256 Fingerprint
1	1	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	3863def8	RSA 2048-bits	RSA SHA-1	1999-12-24 17:50:51	2029-07-24 14:15:12			55e481d11180bed889b908a331f9a1240916b970	6dc47172e01c1cb0bf62580d895fe2b8ac9ad4f873801e0c10b9c837d21eb177
2	1	CN=Entrust Root Certification Authority OU=(c) 2006 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority OU=(c) 2006 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	456b5054	RSA 2048-bits	RSA SHA-1	2006-11-27 20:23:42	2026-11-27 20:53:42			6890e467a4a65380c78666a4f174b43fb84bd6d	73c176434f1bc6d5ad4f5b0e76e727287c8de57616c1e6e6141a2b2cb7d8e4c
3	1	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	4a538c28	RSA 2048-bits	RSA SHA-256	2009-07-07 17:25:54	2030-12-07 17:55:54			6a72267ad01eef7de73b6951d46c8d9f901266ab	43df5774b03e7ef5fe40d931a7bedf1bb2e6b42738c4e6d3841103d3aa7f339
3	2	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority OU=(c) 2006 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	51d33f09	RSA 2048-bits	RSA SHA-1	2014-09-12 17:28:27	2024-09-13 03:12:02			6a72267ad01eef7de73b6951d46c8d9f901266ab	cbce622d06f9d2c093fad75cebb7852ef53ffff146ad522ab321b3a4b2bd8f8
3	3	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority OU=(c) 2006 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	51d33f24	RSA 2048-bits	RSA SHA-1	2014-09-12 19:23:57	2024-09-13 03:12:23			6a72267ad01eef7de73b6951d46c8d9f901266ab	16296e3bef9a64cfede3509f36d700a5cd61cf938ec3a955bf36d17d97e16e8d
3	4	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority OU=(c) 2006 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	51d34044	RSA 2048-bits	RSA SHA-256	2014-09-22 17:14:57	2024-09-23 01:31:53			6a72267ad01eef7de73b6951d46c8d9f901266ab	6b143c2005d5539cc22eab5772db2a9fe87467effa07fc0a9f7d28274ca7a
4	1	CN=Entrust Root Certification Authority - G4 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G4 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	00d9b5437afa9390f00000005565ad58	RSA 4096-bits	RSA SHA-256	2015-05-27 11:11:16	2037-12-27 11:41:16			9f38c45623c339e8a0716ce8544ce4e83ab1bf67	db3517d1f6732a2d5ab97c533ec70779ee3270a62fb4ac4238372460e6f01e88
5	1	CN=Entrust Root Certification Authority - EC1 OU=(c) 2012 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - EC1 OU=(c) 2012 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	00a68b7929000000050d091f9	EC 384-bits	ECDSA SHA-384	2012-12-18 15:25:36	2037-12-18 15:55:36			b763e71add8de908a65583a4e06a504165114249	02ed0e28c14da45165c566791700d6451d7fb56f0b2ab1d3b8eb070e56edff5
5	2	CN=Entrust Root Certification Authority - EC1 OU=(c) 2012 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority OU=(c) 2006 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	008011196de613db16000000051d3575e	EC 384-bits	RSA SHA-256	2016-06-10 14:58:55	2026-11-10 15:28:55			b763e71add8de908a65583a4e06a504165114249	3fde0d36e026b6e8be2c28883607c8651de10bd6c1fad365e60f4ea2f3b03
6	1	CN=Entrust Root Certification Authority - EC2 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - EC2 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	00bbd3315a80485c9900000005565cdaf	EC 521-bits	ECDSA SHA-256	2015-05-27 13:29:11	2037-12-27 13:59:11			a1f88d67c167c938a415d6005a20823d8f2e0ef3	f11aaa40753fda0629cbda80e56bb73f3dea1ce2a8b3aa9bc3abfd0123725159
7	1	CN=Entrust Code Signing Root Certification Authority - CSBR1 O=Entrust, Inc. C=US	CN=Entrust Code Signing Root Certification Authority - CSBR1 O=Entrust, Inc. C=US	7ff1a8f9f43ae8876e2dc6ff5e433db2ee30a643	RSA 4096-bits	RSA SHA-512	2021-05-07 13:26:36	2040-12-30 13:26:36			82bad63d97ce9fc71e89237affdb3b5693557cf	b80847fda453bf6ed876ca7bc046a2481909e15bed376e665e7ad09f3864e71
7	2	CN=Entrust Code Signing Root Certification Authority - CSBR1 O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	4e40e43754ede68c000000051d3947f	RSA 4096-bits	RSA SHA-256	2021-05-07 15:43:45	2030-11-07 16:13:45		Code Signing, Time Stamping	82bad63d97ce9fc71e89237affdb3b5693557cf	18dd9a467054c74a5ae46182843a6f4ec46d5e338d91adf4e5980b50193fb94b
8	1	CN=Entrust Digital Signing Root Certification Authority - DSR1 O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G4 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	2d37bcd092d2cb88b67f5ccadab71b39b	RSA 4096-bits	RSA SHA-512	2021-11-12 00:00:00	2030-12-30 00:00:00		1.3.6.1.4.1.311.10.3.12, Time Stamping	a6654181f25b87056addfd8a544e8f987bdc23b8	20fc75acb2cad7978c7b006a9b1523bdfaf5490afcf49652c585e4a12f601c85
8	2	CN=Entrust Digital Signing Root Certification Authority - DSR1 O=Entrust, Inc. C=US	CN=Entrust Digital Signing Root Certification Authority - DSR1 O=Entrust, Inc. C=US	6c73c936b185e50b804d5bcec29f83d21a51c1a3	RSA 4096-bits	RSA SHA-512	2021-11-12 18:28:47	2040-12-30 18:28:47			a6654181f25b87056addfd8a544e8f987bdc23b8	e874fe2531eae4a4b6b62f37496bbae90eb1d8fc8cedbebb00a182cfacdc7e61



CA #	Cert #	Subject	Issuer	Serial Number	Key Type	Hash Type	Not Before	Not After	Revoked Date	Extended Key Usage	Subject Key Identifier	SHA256 Fingerprint
9	1	CN=Entrust Verified Mark Root Certification Authority - VMCR1 O=Entrust, Inc. C=US	CN=Entrust Verified Mark Root Certification Authority - VMCR1 O=Entrust, Inc. C=US	743900bd5b07fc63d7e9150452c89bb701680463	RSA 4096-bits	RSA SHA-512	2021-05-07 13:31:48	2040-12-30 13:31:48			7323567b2b7845809ab8c27ccca586398b2678c5	7831d95a47d42508cd5c9e6264f9096bac19f04eb9b7c8bdd35fff71c189617
10	1	C=US O=Entrust, Inc. CN=Entrust Certification Authority - AATL1	CN=Entrust Root Certification Authority - G4 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	00c727f51f8f922b0200000005565d8ad	RSA 4096-bits	RSA SHA-512	2020-07-20 15:46:21	2037-12-20 16:16:21		1.3.6.1.4.1.311.10.3.12, 1.2.840.113583.1.1.5, E-mail Protection	63f184dd03bea39f64fa767a47c4567ec06da020	839f9b91c2e49218a66416df181b984e9be634d12a95483d98a6199fc0788d74
11	1	CN=Entrust Enterprise Intermediate CA - ICA1 O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	3eeb174d9b443ba9000000051ce1981	RSA 2048-bits	RSA SHA-256	2021-05-07 15:32:00	2029-07-07 16:02:00		TLS Web Client Authentication, E-mail Protection, Microsoft Smartcardlogin, Microsoft Encrypted File System, 1.3.6.1.4.1.311.10.3.4.1, 1.3.6.1.4.1.311.67.1.1	c838d40a70dda357a8e596592d1313c920d5bcb3	c54d8b12c438725c2755b4ad81825f975cbda6c258a2fbfb8247a14f03bd22a
12	1	CN=Siemens Intermediate CA 2021 O=Siemens C=DE	CN=Entrust Enterprise Intermediate CA - ICA1 O=Entrust, Inc. C=US	22c541ff0bb7bf2214f84b9669f69d75	RSA 4096-bits	RSA SHA-256	2021-06-09 00:00:00	2025-08-09 00:00:00		E-mail Protection, TLS Web Client Authentication, Microsoft Smartcardlogin, Microsoft Encrypted File System, 1.3.6.1.4.1.311.10.3.4.1, 1.3.6.1.4.1.311.67.1.1	8e47059c577d6060cb48ccf7a2604ed2eb00ba62	817d76354988c8e88d799e6ebb873a1033d54e1718f026d7835987932d3bc7b6
12	2	CN=Siemens Intermediate CA 2021 O=Siemens C=DE	CN=Entrust Enterprise Intermediate CA - ICA1 O=Entrust, Inc. C=US	1cc223abe7a3f1461e85a6b8a92af2f7	RSA 4096-bits	RSA SHA-256	2021-06-15 00:00:00	2025-08-15 00:00:00	2021-10-14 17:03:35	E-mail Protection, TLS Web Client Authentication, Microsoft Smartcardlogin, Microsoft Encrypted File System, 1.3.6.1.4.1.311.10.3.4.1, 1.3.6.1.4.1.311.67.1.1	8e47059c577d6060cb48ccf7a2604ed2eb00ba62	455aaf6e80421171e484b3115a8383a07f09596bd9ba8c9bc540c9cbb8f92b3
13	1	CN=Entrust Certification Authority - L1C OU=(c) 2009 Entrust, Inc. OU=www.entrust.net/rpa is incorporated by reference O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	4c0e8c1d	RSA 2048-bits	RSA SHA-256	2011-11-11 15:26:22	2021-11-11 17:45:09			1ef1ab8906f8490f013377ee147aee197c93284d	ca971c936c699bc5d6a609d2529f03a60f6e141a2cf12be721313da50ca64e17
13	2	CN=Entrust Certification Authority - L1C OU=(c) 2009 Entrust, Inc. OU=www.entrust.net/rpa is incorporated by reference O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	4c0e8c39	RSA 2048-bits	RSA SHA-1	2011-11-11 15:40:40	2021-11-12 02:51:17			1ef1ab8906f8490f013377ee147aee197c93284d	0ee4daf71a85d842d23f4910fd4c909b7271861931f1d5feac868225f2700e2
14	1	CN=Entrust Certification Authority - L1F OU=(c) 2016 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - EC1 OU=(c) 2012 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	00b601913d8553bafa000000051d4c1f6	EC 384-bits	ECDSA SHA-384	2016-04-05 20:17:29	2037-10-05 20:47:29		TLS Web Server Authentication, TLS Web Client Authentication	2e62f014ee87c335033defe4b99efd3bb8a3c9	1835b0e482ea65536fc010e4bc13c060f65668165fba97e2f542ce96ca6dfefc
14	2	CN=Entrust Certification Authority - L1F OU=(c) 2016 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	00a25b1769bad80ad7000000051ce1941	EC 384-bits	RSA SHA-256	2021-02-05 16:34:34	2029-07-05 17:04:34		TLS Web Server Authentication, TLS Web Client Authentication	2e62f014ee87c335033defe4b99efd3bb8a3c9	0c5a09db8aedf7d2d1dde14dccc2db6ea959bcf6f010360d836c342c624d7e0e
15	1	CN=Entrust Certification Authority - L1K OU=(c) 2012 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	51d360ce	RSA 2048-bits	RSA SHA-256	2014-08-26 17:07:28	2024-08-27 05:48:52			82a27074ddbc533fc7bd4f7cd7fa760c60a4cbf	3b6dd5581c9853092007db1bb0106fc61205e88e360543d7cae02d68e7a25ac3
15	2	CN=Entrust Certification Authority - L1K OU=(c) 2012 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	51d360cf	RSA 2048-bits	RSA SHA-256	2014-08-26 17:14:49	2024-08-27 08:34:47			82a27074ddbc533fc7bd4f7cd7fa760c60a4cbf	3b0cc20384ad7f24eb438f2b80c63ebe003f7f215b8877e418ebb0484028db57
15	3	CN=Entrust Certification Authority - L1K OU=(c) 2012 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	51ce00fe	RSA 2048-bits	RSA SHA-256	2014-10-10 15:23:17	2024-10-11 06:22:47			82a27074ddbc533fc7bd4f7cd7fa760c60a4cbf	d6c3fc493bacd1df8a1ba30f4ae26254b2a4528e4876081eacc6a16a090aa36a
15	4	CN=Entrust Certification Authority - L1K OU=(c) 2012 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	51d360ee	RSA 2048-bits	RSA SHA-256	2014-10-22 17:05:14	2024-10-23 07:33:22			82a27074ddbc533fc7bd4f7cd7fa760c60a4cbf	f5c2f23c6518f9d19b6f39beaea4fbae10031ba9dc985ce1563a520da0ad4116
15	5	CN=Entrust Certification Authority - L1K OU=(c) 2012 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	0ee94cc3000000051d37785	RSA 2048-bits	RSA SHA-256	2015-10-05 19:13:56	2030-12-05 19:43:56			82a27074ddbc533fc7bd4f7cd7fa760c60a4cbf	13efb39a2f6654e8c67bd04f4c6d4c90cd6cab5091bcedc73787f6b77d3d3fe7
16	1	CN=CRYPTAS OV Issuing CA O=CRYPTAS it-Security GmbH C=AT	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	325141290f2323266b9d21c1f7bea575	RSA 2048-bits	RSA SHA-256	2021-06-18 00:00:00	2030-12-01 00:00:00	2022-02-24 00:00:00	TLS Web Server Authentication, TLS Web Client Authentication	b8d708f51ca58fa6455213f2f4d505b773aa204a	faecdd05d9f2e5fe8498de56cdf895c0a697094e1773dede5fce2001b4c7b152



CA #	Cert #	Subject	Issuer	Serial Number	Key Type	Hash Type	Not Before	Not After	Revoked Date	Extended Key Usage	Subject Key Identifier	SHA256 Fingerprint
16	2	CN=CRYPTAS OV Issuing CA O=CRYPTAS it-Security GmbH C=AT	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	7650788c314c05b358d4c2da8d4d69a2	RSA 2048-bits	RSA SHA-256	2021-07-09 00:00:00	2030-12-01 00:00:00	2021-06-18 00:00:00	TLS Web Server Authentication, TLS Web Client Authentication	b8d708f51ca58fa6455213f2f4d505b773aa204a	452f1df0e4eb3943f5d0714f55f5bc15597083eb9297b025e8e53049504cd1de
17	1	C=DE O=Siemens CN=Siemens Issuing CA Internet Server 2020	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	00fab27dfff80d09a000000051d39440	RSA 2048-bits	RSA SHA-256	2020-08-10 14:11:48	2030-11-10 14:41:48		TLS Web Server Authentication, TLS Web Client Authentication	c9a757cb86c96107c6c2b48665a91ec1cae1029b	a665007a05efe1889d66a40deecbc6c1a271e919006811fdb8dbd7e0675212d1
18	1	CN=Entrust Certification Authority - L1E OU=(c) 2009 Entrust, Inc. OU=www.entrust.net/rpa is incorporated by reference O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority OU=(c) 2006 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	008666b02ac1cb5440000000051d3589c	RSA 2048-bits	RSA SHA-256	2019-06-19 16:52:08	2026-11-19 17:22:08		TLS Web Server Authentication, TLS Web Client Authentication	5b418ab2c443c1bdfc85441559de096adff9a1	232f6367cf561e00c83e180a9fca8546b3771fb450ebcb4a0526f8349c8ca139
19	1	CN=Entrust Certification Authority - L1J OU=(c) 2016 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - EC1 OU=(c) 2012 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	0a83d4803e7e9f51000000051d4c1f7	EC 384-bits	ECDSA SHA-384	2016-04-05 20:19:54	2037-10-05 20:49:54		TLS Web Server Authentication, TLS Web Client Authentication	c3f94503bec8f90b3c4535f3eb72ece7e8eb949b	3447b74b5e500a549983fa2ced73a5642e6aac78829546158437df66d7435b8
20	1	CN=Entrust Certification Authority - L1M OU=(c) 2014 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority OU=(c) 2006 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	51d346e1	RSA 2048-bits	RSA SHA-256	2014-11-18 20:59:32	2024-11-19 06:33:02		TLS Web Client Authentication, TLS Web Server Authentication	c3f7d0b52a30adaf0d9121703954ddbc8970c73a	ca290389e0d8c62a4083f628a39f52fe3f38b73199cfa7c0372378a440fb6a
20	2	CN=Entrust Certification Authority - L1M OU=(c) 2014 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	61a1e7d2000000051d366a6	RSA 2048-bits	RSA SHA-256	2014-12-15 15:25:03	2030-10-15 15:55:03		TLS Web Client Authentication, TLS Web Server Authentication	c3f7d0b52a30adaf0d9121703954ddbc8970c73a	75c5b3f01fd1f51a2c447ab7c785d72e69fa9c472c08571e7eadf3b8eabae70c
21	1	CN=Entrust Certification Authority - L1N OU=(c) 2014 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G4 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	00abec77ff1b410c0700000005565d805	RSA 2048-bits	RSA SHA-256	2017-11-22 20:04:20	2030-12-22 20:34:20		TLS Web Server Authentication, TLS Web Client Authentication	ee47d18571f1fd2db73fbb3e6358771749400e95	b14d5089079c1d8f7649db9a5d3cefb1aac06f66afc49225c5be2aa19fd41a35
22	1	CN=CRYPTAS EV Issuing CA O=CRYPTAS it-Security GmbH C=AT	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	1d6a0a7890840919beb89ebc49aa288	RSA 2048-bits	RSA SHA-256	2021-06-18 00:00:00	2030-12-01 00:00:00	2022-02-24 00:00:00	TLS Web Server Authentication, TLS Web Client Authentication	fcdb7e9a08c2549d98185dba2d116e08617ea75f	1ec0afc3ed9f2badca068e0c2d81f9c62ef9752316317b788662b3edad38075
22	2	CN=CRYPTAS EV Issuing CA O=CRYPTAS it-Security GmbH C=AT	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	3a132e504ef6a5c1e3276851e0f462be	RSA 2048-bits	RSA SHA-256	2021-07-09 00:00:00	2030-12-01 00:00:00	2021-06-18 00:00:00	TLS Web Server Authentication, TLS Web Client Authentication	fcdb7e9a08c2549d98185dba2d116e08617ea75f	679b5d3305a168c4b7642b34337e57c4679ba0b1e3639127fcb74c6e62919eb
22	2	CN=CRYPTAS EV Issuing CA O=CRYPTAS it-Security GmbH C=AT	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	4ee7fe99fe7320e41b2b6ed671a57480	RSA 2048-bits	RSA SHA-256	2021-07-09 00:00:00	2030-12-01 00:00:00	2021-06-18 00:00:00	TLS Web Server Authentication, TLS Web Client Authentication	fcdb7e9a08c2549d98185dba2d116e08617ea75f	eff58b03b76bab94b092f603752bfff7b0812be1d159fbc44ca746c77a652d576
23	1	C=ES O=Entrust Datacard Europe S.L. organizationIdentifier=VATES-B81188047 CN=Entrust Certification Authority - QTSP1	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	009c6cf695700c600000000051d393a6	RSA 2048-bits	RSA SHA-256	2019-07-26 18:31:45	2030-11-26 19:01:45		TLS Web Server Authentication, TLS Web Client Authentication	1cad3f9cd72d2219a19c4be9daf12a33f7fba0d	681ebc1822b079b97e0404e4687d9b6c0c0892c820f5738a282aae62529bdd8
24	1	C=DE O=Entrust Datacard Deutschland GmbH organizationIdentifier=VATDE-119264316 CN=Entrust Certification Authority - DE QWAC1	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	00ec8a269b09be4e9d000000051d39423	RSA 2048-bits	RSA SHA-256	2020-07-29 19:16:08	2030-11-29 19:46:08	2022-02-24 00:00:00	TLS Web Server Authentication, TLS Web Client Authentication	19233ae746ebe4d894e2f7daf1b3f8aa95340e63	ca14cf9b309ba032bb21910c1aedae4d29fe0656b4f8bffa23cbe94d431c0674
25	1	CN=Entrust Certification Authority - ES QWAC2 organizationIdentifier=VATES-B81188047 O=Entrust EU, S.L. C=ES	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	7a8872b868a359dab1b02ecf4c9718d	RSA 2048-bits	RSA SHA-256	2021-11-16 00:00:00	2030-12-01 00:00:00		TLS Web Server Authentication, TLS Web Client Authentication	41cfae2b1d633bcb4cf5904479b65a2489df929c	c97f2f6e6a8adb6ecfe4978f08ca8f6f0123a94784522b610adf6ab51439f62
26	1	CN=Entrust Code Signing Certification Authority - L1D OU=(c) 2009 Entrust, Inc. OU=www.entrust.net/rpa is incorporated by reference O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	4c0e8c1e	RSA 2048-bits	RSA SHA-256	2011-11-11 15:29:00	2021-11-12 03:28:50			a7b1aac4b60edddca9f88949682d5e74341d125	fa9d6df1af0275300d52a485d0360543b5dfb4441bec08bc9a0dff811b6d88



CA #	Cert #	Subject	Issuer	Serial Number	Key Type	Hash Type	Not Before	Not After	Revoked Date	Extended Key Usage	Subject Key Identifier	SHA256 Fingerprint
26	2	CN=Entrust Code Signing Certification Authority - L1D OU=(c) 2009 Entrust, Inc. OU=www.entrust.net/rpa is incorporated by reference O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	4c0e8c3a	RSA 2048-bits	RSA SHA-1	2011-11-11 15:41:26	2021-11-12 08:51:52			a7b1aac4b606edddca9f88949682d5e74341d125	8b16d48f721dfab157214b9ace9dda8efba5a06b4eed901806f086d1df8ead37
27	1	CN=Entrust Code Signing CA - OVCS1 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	7ab8c4fc0000000051d373d4	RSA 2048-bits	RSA SHA-256	2015-06-09 18:03:40	2025-06-09 18:33:40		Code Signing	7e1a1f1a11745c64c90c1f9401abfd81642ea12c	7fba43a4ccb37b1ccc2dd11ce0c911da3a2917b0ca0e846056854ef464c50c4
27	2	CN=Entrust Code Signing CA - OVCS1 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	43c10b1c0000000051d373da	RSA 2048-bits	RSA SHA-256	2015-06-10 13:46:05	2030-11-10 14:16:05		Code Signing	7e1a1f1a11745c64c90c1f9401abfd81642ea12c	cc5b7a0e5d6771ba348d3d763752f0667026b3531c5396edbe24adce93215723
28	1	CN=Entrust Code Signing CA - OVCS2 O=Entrust, Inc. C=US	CN=Entrust Code Signing Root Certification Authority - CSBR1 O=Entrust, Inc. C=US	71ef574af3554c35a2c69f66f4b6bcd	RSA 4096-bits	RSA SHA-512	2021-05-07 19:20:45	2040-12-29 23:59:00		Code Signing	ef9fba79b073f2251e789c03529c1b5384de8ded	95f843046bac035572a3ba1b821df8b759467f5b512ddfa8a72f0799447d6368
29	1	CN=Entrust Extended Validation Code Signing CA - EVCS1 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	417ace390000000051d373bb	RSA 2048-bits	RSA SHA-256	2015-06-09 17:54:53	2025-06-09 18:24:53		Code Signing	2a0a6f322c292021766ab1ac8c3caf938e0e6ba2	57bc151d924c5a43b57b6433a58a93885f773b4631fdec8b5c9fc3545529f274
29	2	CN=Entrust Extended Validation Code Signing CA - EVCS1 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	00d9d6b8f20000000051d373d8	RSA 2048-bits	RSA SHA-256	2015-06-10 13:39:51	2025-06-10 14:09:51		Code Signing	2a0a6f322c292021766ab1ac8c3caf938e0e6ba2	091c6319936f0cac4c7b5e027dcca2b2a2af4561ea2c71e650c1e3fb905fd0
29	3	CN=Entrust Extended Validation Code Signing CA - EVCS1 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	0087825260000000051d373d9	RSA 2048-bits	RSA SHA-256	2015-06-10 13:42:49	2030-11-10 14:12:49		Code Signing	2a0a6f322c292021766ab1ac8c3caf938e0e6ba2	d04db927c663aa8c853d54716dd6dc2a4b2fef9c3ae1fbf250447f5d7771e57
30	1	CN=Entrust Extended Validation Code Signing CA - EVCS2 O=Entrust, Inc. C=US	CN=Entrust Code Signing Root Certification Authority - CSBR1 O=Entrust, Inc. C=US	35afb77b9d341f6afc8f8446ab31352b	RSA 4096-bits	RSA SHA-512	2021-05-07 19:19:52	2040-12-29 23:59:00		Code Signing	ce894f8251aa15a28462ca312361d261fbf8fe78	6510dc50a0d17dc438c2a85d738f558582b6c25361884f3882e207a51f4ed152
31	1	CN=Entrust Class 1 Client CA OU=(c) 2010 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	4c0e8c1b	RSA 2048-bits	RSA SHA-256	2011-11-11 15:25:51	2021-11-11 23:27:50			4790a4a10a4320bfd07454b894fac47bb5b61c05	8cb3d21bbb255dbfeafa1a27d1d1f70320dc84564297bce82e29b8f2e461f270
31	2	CN=Entrust Class 1 Client CA OU=(c) 2010 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	4c0e8c37	RSA 2048-bits	RSA SHA-1	2011-11-11 15:34:41	2021-11-12 07:51:23			4790a4a10a4320bfd07454b894fac47bb5b61c05	c23a1f8315538a8651816e9932c044eb856c01fd99771690c863671d2c48564
31	3	CN=Entrust Class 1 Client CA OU=(c) 2010 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	0b67c935a1727c830000000051ce1708	RSA 2048-bits	RSA SHA-256	2017-06-20 20:30:55	2028-12-20 21:00:55	2022-02-24 00:00:00	E-mail Protection, TLS Web Client Authentication	4790a4a10a4320bfd07454b894fac47bb5b61c05	357decc5622f89239ffd1c91c1366a0951ba4db5fd384f518cc4ae85d2dae3a5
32	1	CN=Entrust Class 1 Client CA - SHA256 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	6e61669872bc9c300000000051d3931e	RSA 2048-bits	RSA SHA-256	2019-04-16 15:35:52	2030-11-16 16:05:52		TLS Web Client Authentication, E-mail Protection	e249b9ec25deb70cdee550185b48cc0c8e15f2a6	c6e9e993c258b72124aad3c9c068b6ef23576155f310b305733361e20b17c943
33	1	CN=Entrust Class 2 Client CA OU=(c) 2010 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	4c0e8c1c	RSA 2048-bits	RSA SHA-256	2011-11-11 15:26:05	2021-11-12 00:18:35			0991a5bae9f22e2a75dfcd7efe77caf2de6b9b24	27524e32bb2177cbbf0a716f78a71242714fc92f0a447130d91666c716a78107
33	2	CN=Entrust Class 2 Client CA OU=(c) 2010 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	4c0e8c38	RSA 2048-bits	RSA SHA-1	2011-11-11 15:38:34	2021-11-12 00:17:34			0991a5bae9f22e2a75dfcd7efe77caf2de6b9b24	8504a0350036b18594b1f47b6a3bd3513e28b045bc7dbfe5b08d8f3049cd3cfe
33	3	CN=Entrust Class 2 Client CA OU=(c) 2010 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	00bcb4d843035b759f0000000051ce1709	RSA 2048-bits	RSA SHA-256	2017-06-20 20:34:33	2028-12-20 21:04:33		E-mail Protection, TLS Web Client Authentication	0991a5bae9f22e2a75dfcd7efe77caf2de6b9b24	95ad94e88f5b8604e40e5fff36b0d34b646c1d5ba06c0e735b72aa396735c415



CA #	Cert #	Subject	Issuer	Serial Number	Key Type	Hash Type	Not Before	Not After	Revoked Date	Extended Key Usage	Subject Key Identifier	SHA256 Fingerprint
33	4	CN=Entrust Class 2 Client CA OU=(c) 2010 Entrust, Inc. OU=www.entrust.net/CPS is incorporated by reference O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	00af1c04b2ac8c9b0000000051ce18e3	RSA 2048-bits	RSA SHA-256	2020-07-29 15:48:30	2029-06-29 16:18:30		E-mail Protection, TLS Web Client Authentication	0991a5bae9f22e2a75dfcd7efe77caf2de6b9b24	1a20fef46482a98bac6f6c7397c017310ac7fb78495438bc7a7de9035c246679
34	1	CN=Entrust Class 2 Client CA - C2CA2 O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	0088068b45c3fdd464000000051ce1961	RSA 2048-bits	RSA SHA-256	2021-03-16 14:22:40	2029-07-16 14:52:40		TLS Web Client Authentication, E-mail Protection	a2714ad5c264652f8dce2ae2c1b6e70dd0f932e4	b14cf550d8f573d93e90963c32a85fb51c983c98164f54d78915f6358c954f0e
35	1	CN=Entrust Timestamping CA - TS1 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	51ce0dd8	RSA 2048-bits	RSA SHA-1	2015-07-15 17:42:06	2029-06-15 23:05:07		Time Stamping	c3c271d27bd76805ae3b399b34250c6203c75768	5f84398236b7e58fa365bf1ae5aa3e441c265fdbc50cf7471799060a27a2381a
35	2	CN=Entrust Timestamping CA - TS1 OU=(c) 2015 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust.net Certification Authority (2048) OU=(c) 1999 Entrust.net Limited OU=www.entrust.net/CPS_2048 incorp. by ref. (limits liab.) O=Entrust.net	58da13ff0000000051ce0df7	RSA 2048-bits	RSA SHA-256	2015-07-22 19:02:54	2029-06-22 19:32:54		Time Stamping	c3c271d27bd76805ae3b399b34250c6203c75768	44dfcd2c573110e74bf4e85903595f660650ed925b7306542c54e87396671f03
36	1	CN=Entrust Time Stamping CA - TS2 O=Entrust, Inc. C=US	CN=Entrust Code Signing Root Certification Authority - CSBR1 O=Entrust, Inc. C=US	25bc2bf329ca107f1ea9ba8885d49d3b	RSA 4096-bits	RSA SHA-512	2021-05-07 19:22:14	2040-12-29 23:59:00		Time Stamping	260ff0c448081bccdd91f55454b6b3b3fc99f108	21e81685b352955b9ed48fb969bd2e4f95cfb85ed1260cf6b7fa70a035d0028f
37	1	CN=Entrust Certificate Authority - VMC1 OU=(c) 2018 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	CN=Entrust Root Certification Authority - G2 OU=(c) 2009 Entrust, Inc. - for authorized use only OU=See www.entrust.net/legal-terms O=Entrust, Inc. C=US	00b3d227db33085e17000000051d3931f	RSA 2048-bits	RSA SHA-256	2019-04-16 15:45:43	2030-11-16 16:15:43	2022-02-24 00:00:00	1.3.6.1.5.5.7.3.31	8bb63976d03490a63f62e164ea3ebcf47c46a173	7dbdfc6bd4463d4e22479bda4e4a973f58ac94845db0bf86c0f69eb3d719691a
38	1	CN=Entrust Verified Mark CA - VMC2 O=Entrust, Inc. C=US	CN=Entrust Verified Mark Root Certification Authority - VMCR1 O=Entrust, Inc. C=US	699d8fd758c2c39c1e53d1aa1476d1e6	RSA 4096-bits	RSA SHA-512	2021-05-07 19:23:23	2040-12-29 23:59:00		1.3.6.1.5.5.7.3.31	efbc3cb4af3ad0455e7654dfc76478e92d1d743f	c269504b491dbf451a695b953711adc5cd70975b5fca1e181ebbd2172cb07e0c



ATTACHMENT B

LIST OF ENTRUST CERTIFICATION PRACTICE STATEMENTS

CPS Name	Version	Date
Entrust Certificate Services Certification Practice Statement	3.8	31 Dec 2020
Entrust Certificate Services Certification Practice Statement	3.9	19 Jul 2021
Entrust Certificate Services Certification Practice Statement	3.10	18 Feb 2022
ENTRUST DATACARD EUROPE S.L. Certification Practice Statement (CPS)	1.4	18 Dec 2020
ENTRUST DATACARD EUROPE S.L. Certification Practice Statement (CPS)	1.5	7 May 2021
ENTRUST DATACARD EUROPE S.L. Certification Practice Statement (CPS)	1.5.1	15 Nov 2021
ENTRUST DATACARD EUROPE S.L. Certification Practice Statement (CPS)	1.6	30 Nov 2021
ENTRUST DATACARD DEUTSCHLAND GMBH Certification Practice Statement (CPS)	1.3	18 Dec 2020



ENTRUST MANAGEMENT'S STATEMENT

Entrust Corporation ("Entrust") operates the Certification Authority (CA) services as enumerated in [Attachment A](#), and provides the following CA services:

- Subscriber registration
- Certificate renewal
- Certificate rekey
- Certificate issuance
- Certificate distribution
- Certificate revocation
- Certificate validation
- Subscriber key generation and management
- Subordinate CA cross-certification

The management of Entrust is responsible for establishing and maintaining effective controls over its CA operations, including its CA business practices disclosure on its [website](#), CA business practices management, CA environmental controls, CA key lifecycle management controls, subscriber key lifecycle management controls, certificate lifecycle management controls, and subordinate CA certificate lifecycle management controls. These controls contain monitoring mechanisms, and actions are taken to correct deficiencies identified.

There are inherent limitations in any controls, including the possibility of human error, and the circumvention or overriding of controls. Accordingly, even effective controls can only provide reasonable assurance with respect to Entrust's Certification Authority operations. Furthermore, because of changes in conditions, the effectiveness of controls may vary over time.

Entrust management has assessed its disclosures of its certificate practices and controls over its CA services. Based on that assessment, in Entrust management's opinion, in providing its Certification Authority (CA) services at Ottawa, Ontario, and Toronto, Ontario, throughout the period 1 March 2021 to 28 February 2022 Entrust has:

- disclosed its business, key lifecycle management, certificate lifecycle management, and CA environment control practices in its Certification Practice Statements as enumerated in [Attachment B](#)
- maintained effective controls to provide reasonable assurance that Entrust provides its services in accordance with its Certification Practice Statements
- maintained effective controls to provide reasonable assurance that:
 - the integrity of keys and certificates it manages is established and protected throughout their lifecycles;
 - the integrity of subscriber keys and certificates it manages is established and protected throughout their lifecycles;
 - subscriber information is properly authenticated (for the registration activities performed by Entrust); and
 - subordinate CA certificate requests are accurate, authenticated, and approved
- maintained effective controls to provide reasonable assurance that:
 - logical and physical access to CA systems and data is restricted to authorized individuals;
 - the continuity of key and certificate management operations is maintained; and
 - CA systems development, maintenance, and operations are properly authorized and performed to maintain CA systems integrity

in accordance with the [WebTrust Principles and Criteria for Certification Authorities v2.2.1](#), including the following:

CA Business Practices Disclosure

- Certification Practice Statement (CPS)

CA Business Practices Management

- Certification Practice Statement Management

CA Environmental Controls

- Security Management



- Asset Classification and Management
- Personnel Security
- Physical and Environmental Security
- Operations Management
- System Access Management
- System Development, Maintenance, and Change Management
- Disaster Recovery, Backups, and Business Continuity Management
- Monitoring and Compliance
- Audit Logging

CA Key Lifecycle Management Controls

- CA Key Generation
- CA Key Storage, Backup, and Recovery
- CA Public Key Distribution
- CA Key Usage
- CA Key Archival
- CA Key Destruction
- CA Key Compromise
- CA Cryptographic Hardware Lifecycle Management
- CA Key Transportation
- CA Key Migration

Subscriber Key Lifecycle Management Controls

- CA-Provided Subscriber Key Generation Services
- CA-Provided Subscriber Key Storage and Recovery Services
- Integrated Circuit Card (ICC) Lifecycle Management
- Requirements for Subscriber Key Management

Certificate Lifecycle Management Controls

- Subscriber Registration
- Certificate Renewal
- Certificate Rekey
- Certificate Issuance
- Certificate Distribution
- Certificate Revocation
- Certificate Validation

Subordinate CA and Cross Certificate Lifecycle Management Controls

- Subordinate CA and Cross Certificate Lifecycle Management

Entrust does not escrow its CA keys and does not provide certificate suspension services. Accordingly, our statement does not extend to controls that would address those criteria.

Entrust management has also reported or responded to the following 'bugs' on Mozilla's Bugzilla reporting system:

Bug ID	Summary	Opened	Closed
1696227	Entrust – Incorrect Jurisdiction Country Value in an EV Certificate	2021-03-03	2021-07-15
1712106	Invalid localityName	2021-05-20	2021-12-13
1728796	Incorrect value in Business Category field for Government Entities	2021-09-02	2021-12-13
1731887	Test Website Certificates Expired	2021-09-21	2021-10-20
1737057	CRLs and OCSP responses not issued as specified in the CPS	2021-10-21	2022-03-08
1744827	SSL Certificates issued with Unverified IP Addresses	2021-12-07	2022-01-14
1748634	Late Revocation for SSL Certificates issued with Unverified IP Addresses	2022-01-05	2022-03-08

Bruce Morton
Director, Entrust Certificate Services
10 May 2022



ATTACHMENT A

LIST OF IN SCOPE CAs

Root CAs
1. Entrust.net Certification Authority (2048) 2. Entrust Root Certification Authority 3. Entrust Root Certification Authority – G2 4. Entrust Root Certification Authority – G4 5. Entrust Root Certification Authority – EC1 6. Entrust Root Certification Authority – EC2 7. Entrust Code Signing Root Certification Authority - CSBR1 8. Entrust Digital Signing Root Certification Authority - DSR1 9. Entrust Verified Mark Root Certification Authority - VMCR1
Intermediate CAs
10. Entrust Certification Authority - AATL1 11. Entrust Enterprise Intermediate CA - ICA
OV SSL Issuing CAs
12. Entrust Certification Authority – L1C 13. Entrust Certification Authority – L1F 14. Entrust Certification Authority – L1K 15. CRYPTAS OV Issuing CA 16. Siemens Issuing CA Internet Server 2020
EV SSL Issuing CAs
17. Entrust Certification Authority – L1E 18. Entrust Certification Authority – L1J 19. Entrust Certification Authority – L1M 20. Entrust Certification Authority – L1N 21. CRYPTAS EV Issuing CA
Qualified Certificate EV SSL Issuing CAs
22. Entrust Certification Authority - QTSP1 23. Entrust Certification Authority - DE QWAC1 24. Entrust Certification Authority - ES QWAC2
Code Signing Issuing CAs
25. Entrust Code Signing Certification Authority – L1D 26. Entrust Code Signing CA - OVCS1 27. Entrust Code Signing CA - OVCS2
EV Code Signing Issuing CAs
28. Entrust Extended Validation Code Signing CA – EVCS1 29. Entrust Extended Validation Code Signing CA – EVCS2
Secure Email (S/MIME) CAs
30. Entrust Class 1 Client CA 31. Entrust Class 1 Client CA - SHA256 32. Entrust Class 2 Client CA 33. Entrust Class 2 Client CA - C2CA2
Timestamp CAs
34. Entrust Timestamping CA – TS1 35. Entrust Time Stamping CA – TS2
Verified Mark Certificate CAs
36. Entrust Certificate Authority - VMC1 37. Entrust Verified Mark CA - VMC2



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