



REPORT OF THE INDEPENDENT ACCOUNTANT

To the management of Amazon Trust Services, LLC (“ATS”):

Scope

We have examined ATS management’s [assertion](#) that for its Certification Authority (“CA”) operations in Washington and Virginia, in the United States of America, for its CAs as enumerated in [Attachment B](#), ATS has:

- disclosed its business, key lifecycle management, certificate lifecycle management, and CA environment control practices in the applicable versions of its Amazon Trust Services Certification Practice Statement (“CPS”) and Amazon Trust Services Certificate Policy (“CP”) enumerated in [Attachment A](#)
- maintained effective controls to provide reasonable assurance that:
 - ATS’ CPS is consistent with its CP; and
 - ATS provides its services in accordance with its CP and CPS
- 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; 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

throughout the period January 16, 2021 to January 15, 2022, based on the [WebTrust Principles and Criteria for Certification Authorities v2.2.1](#).

ATS does not escrow CA keys, does not provide certificate suspension services, and does not provide the subscriber key lifecycle management services. Accordingly, our examination did not extend to controls that would address those criteria.

Certification Authority’s Responsibilities

ATS’ management is responsible for its assertion, 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](#).



Independent Accountant's Responsibilities

Our responsibility is to express an opinion on ATS management's assertion based on our examination. Our examination was conducted in accordance with attestation standards established by the American Institute of Certified Public Accountants. Those standards require that we plan and perform the examination to obtain reasonable assurance about whether management's assertion is fairly stated, in all material respects. An examination involves performing procedures to obtain evidence about management's assertion. The nature, timing, and extent of the procedures selected depend on our judgment, including an assessment of the risks of material misstatement of management's assertion, whether due to fraud or error. We believe that the evidence we obtained is sufficient and appropriate to provide a reasonable basis for our opinion.

We are required to be independent and to meet our other ethical responsibilities in accordance with relevant ethical requirements relating to the engagement.

The relative effectiveness and significance of specific controls at ATS 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. Our examination did not extend to controls at individual subscriber and relying party locations and we have not evaluated the effectiveness of such controls.

Inherent limitations

There are inherent limitations in the effectiveness of any system of internal control, including the possibility of human error and the circumvention of controls. For example, because of their nature, controls may not prevent, or detect unauthorized access to systems and information, or failure to comply with internal and external policies or requirements. Also, the projection to the future of any conclusions based on our findings is subject to the risk that controls may become ineffective.

Independent Accountant's Opinion

In our opinion management's assertion, as referred to above, is fairly stated, in all material respects.

This report does not include any representation as to the quality of ATS' services other than its CA operations in various locations in the United States of America, nor the suitability of any of ATS' services for any customer's intended purpose.

Other Matter

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



Matter Topic		Matter Description
1	Certificate Validation	Amazon Trust Services disclosed in Mozilla Bug #1713978 that its CP included the deprecated domain validation Method 3.2.2.4.6.
2	Certificate Revocation	Amazon Trust Services disclosed in Mozilla Bug #1713976 that neither its CP nor its CPS specifies the methods parties may use to demonstrate key compromise.
3	Subject Registration	Amazon Trust Services disclosed in Mozilla Bug #1746945 that it did not perform the CAA records check for its test website certificates.
4	CA Certificate Content	Amazon Trust Services disclosed in Mozilla Bug #1743935 that it had misissued CA certificates per its CP and CPS policy.
		Amazon Trust Services disclosed in Mozilla Bug #1743943 that revocation of one of the misissued CA certificates was delayed beyond the required timeline.

While the ATS assertion notes all issues disclosed on Bugzilla during the engagement period, we have only noted those instances relevant to the CAs enumerated in [Attachment B](#) and applicable to the [WebTrust Principles and Criteria for Certification Authorities v2.2.1](#).

Use of the WebTrust Seal

ATS' 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.

BDO USA, LLP

April 8, 2022



ATTACHMENT A - CERTIFICATION PRACTICE STATEMENT AND CERTIFICATE POLICY VERSIONS IN-SCOPE

Policy Name	Version	Effective Date
Amazon Trust Services Certificate Policy	1.0.11	August 18, 2021
Amazon Trust Services Certificate Policy	1.0.10	July 23, 2021
Amazon Trust Services Certificate Policy	1.0.9	April 23, 2021
Amazon Trust Services Certificate Policy	1.0.8	March 30, 2020
Amazon Trust Services Certification Practice Statement	1.0.12	August 18, 2021
Amazon Trust Services Certification Practice Statement	1.0.11	July 23, 2021
Amazon Trust Services Certification Practice Statement	1.0.10	April 23, 2021
Amazon Trust Services Certification Practice Statement	1.0.9	March 30, 2020



ATTACHMENT B - IN-SCOPE CAs

Root CAs				
Subject DN	SHA2 Thumbprint	SPKI SHA256	Valid From	Valid To
CN = Amazon Root CA 1 O = Amazon C = US	8ECDE6884F3D87B1125BA31AC3FCB13D7016DE7F57CC904FE1CB97C6AE98196E	FBE3018031F9586BCBF417 27E417B7D1C45C2F47F93B E372A17B96B50757D5A2	5/25/2015	1/16/2038
CN = Amazon Root CA 2 O = Amazon C = US	1BA5B2AA8C65401A82960118F80BEC4F62304D83CEC4713A19C39C011EA46DB4	7F4296FC5B6A4E3B35D3C3 69623E364AB1AF381D8FA7 121533C9D6C633EA2461	5/25/2015	5/25/2040
CN = Amazon Root CA 3 O = Amazon C = US	18CE6CFE7BF14E60B2E347B8DFE868CB31D02EBB3ADA271569F50343B46DB3A4	36ABC32656ACFC645C61B7 1613C4BF21C787F5CABBEE 48348D58597803D7ABC9	5/25/2015	5/25/2040
CN = Amazon Root CA 4 O = Amazon C = US	E35D28419ED02025CFA69038CD623962458DA5C695FBDEA3C22B0BFB25897092	F7ECDED5C66047D28ED64 66B543C40E0743ABE81D10 9254DCF845D4C2C7853C5	5/25/2015	5/25/2040
CN = Starfield Services Root Certificate Authority - G2 ¹ O = Starfield Technologies, Inc. L = Scottsdale S = Arizona C = US	568D6905A2C88708A4B3025190EDCFEDB1974A606A13C6E5290FCB2AE63EDAB5	2B071C59A0A0AE76B0EAD B2BAD23BAD4580B69C360 1B630C2EAF0613AFA83F92	8/31/2009	12/31/2037

Cross-Signed Root CAs				
Subject DN	SHA2 Thumbprint	SPKI SHA256	Valid From	Valid To
CN = Amazon Root CA 1 O = Amazon C = US	87DCD4DC74640A322CD205552506D1BE64F12596258096544986B4850BC72706	FBE3018031F9586BCBF417 27E417B7D1C45C2F47F93B E372A17B96B50757D5A2	5/25/2015	12/31/2037
	391220705B75BCF3ED3CD4B3631213F569D2CF8226101E170799A5354AB12861		10/21/2015	12/31/2037
CN = Amazon Root CA 2 O = Amazon C = US	8B358466D66126312120645A5875A6A57E3C81D98476A967604244254EAC00F0	7F4296FC5B6A4E3B35D3C3 69623E364AB1AF381D8FA7 121533C9D6C633EA2461	5/25/2015	12/31/2037

¹ ATS assumed operation of this Root CA on June 10, 2015. Starfield Technologies operated this CA prior to June 10, 2015 and was responsible for its key generation.



Cross-Signed Root CAs				
Subject DN	SHA2 Thumbprint	SPKI SHA256	Valid From	Valid To
CN = Amazon Root CA 3 O = Amazon C = US	40C826FDB22BA32A2F9DB4F94770F72B8B1DA9C8FFDA7B11E6F27AF245C89B5E	36ABC32656ACFC645C61B7 1613C4BF21C787F5CABBEE 48348D58597803D7ABC9	5/25/2015	12/31/2037
CN = Amazon Root CA 4 O = Amazon C = US	543D9B7FC2A6471CD84FCA52C2CF6159DF83EBFCD88D8B08B5AF3F88737F52E6	F7ECDE5C66047D28ED64 66B543C40E0743ABE81D10 9254DCF845D4C2C7853C5	5/25/2015	12/31/2037

Intermediate CAs				
Subject DN	SHA2 Thumbprint	SPKI SHA256	Valid From	Valid To
CN = Amazon OU = Server CA 0A O = Amazon C = US	DFCC775C644DB4A33AD71293433F463C8E31057CE22CB267F9D31A0353F4FC2F	B58539ECAA13921CCDB80 D38D34875FDE6471C5A159 D9BEEF2FA6F99983BD611	10/21/2015	10/18/2025
CN = Amazon OU = Server CA 1A O = Amazon C = US	39C763A9CF19D923F977D23626AB890449A444AB8B795C815EF1EF81FEBCE1E38	64BB5BD80311FA3F53BD99 404CAB8762AD6E048447D0 A97F219FCECA1661F37C	10/21/2015	10/18/2025
CN = Amazon OU = Server CA 2A O = Amazon C = US	72130E3B28900349214617F4D6F3FB85D08475EE78BF095C59458A14D1828866	1BDA5AFF83781380BF708 198F9F7D2DB1E067F14BB9 EA7BAE70AAC0B0305E7B	10/21/2015	10/18/2025
CN = Amazon OU = Server CA 3A O = Amazon C = US	205154B777EDC55A5146585A5E54E054A70BE4AAD3B85D02318DA27BF807ADF1	7C53B5DF79135D9AF6195E F6BB73AB98C2C89950B892 B192DFFD784DB925A41C	10/21/2015	10/18/2025
CN = Amazon OU = Server CA 4A O = Amazon C = US	7BED29276ACBED9F176F38BBA3A67CE5815B5CBF1522C7BB59ECD86B09E16ED2	17708DFF2B7FAEC9CB1B52 15EBB2421D97B0543C936F AC9D6E02B92F20E5C707	10/21/2015	10/18/2025



AMAZON TRUST SERVICES, LLC MANAGEMENT'S ASSERTION

Amazon Trust Services, LLC ("ATS") operates the Certification Authority ("CA") services for the CAs enumerated in [Attachment B](#), and provides the following CA services:

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

The management of ATS is responsible for establishing and maintaining effective controls over its CA operations, including its CA business practices disclosure on its [repository](#), CA business practices management, CA environmental controls, CA 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 ATS' CA operations. Furthermore, because of changes in conditions, the effectiveness of controls may vary over time.

ATS management has assessed its disclosures of its certificate practices and controls over its CA services. Based on that assessment, in ATS management's opinion, in providing its CA services in Washington and Virginia, in the United States of America, ATS has:

- disclosed its business, key lifecycle management, certificate lifecycle management, and CA environment control practices in the applicable versions of its Amazon Trust Services Certification Practice Statement ("CPS") and Amazon Trust Services Certificate Policy ("CP") enumerated in [Attachment A](#)
- maintained effective controls to provide reasonable assurance that:
 - ATS' CPS is consistent with its CP; and
 - ATS provides its services in accordance with its CP and CPS
- 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; 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

throughout the period January 16, 2021 to January 15, 2022, based on the [WebTrust Principles and Criteria for Certification Authorities v2.2.1](#), including the following:

CA Business Practices Disclosure

- Certification Practice Statement (CPS)
- Certificate Policy (CP)

CA Business Practices Management

- Certification Practice Statement (CPS) Management
- Certificate Policy (CP) Management
- CP and CPS Consistency

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 Life Cycle Management
- CA Key Transportation
- CA Key Migration

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 Certificate and Cross Certificate Lifecycle Management

ATS does not escrow CA keys, does not provide certificate suspension services, and does not provide subscriber key lifecycle management services. Accordingly, our assertion does not extend to controls that would address those criteria.

ATS did not delegate subscriber information authentication to any third parties. ATS maintained controls over subscriber information authentication for all certificates issued.

ATS has disclosed the following matters publicly on Mozilla's Bugzilla platform:

Bug ID	Summary	Opened	Closed	Resolution
1713668	Amazon Trust Services: ALV Errors	5/31/2021	7/30/2021	Fixed
1713978	Amazon Trust Services: Forbidden Domain Validation Method 3.2.2.4.6	6/1/2021	7/30/2021	Fixed
1713976	Amazon Trust Services: CP/CPS does not specify key compromise methods	6/1/2021	9/7/2021	Fixed
1719920	Amazon Trust Services: Revocation Time for Intermediate Certificates	7/9/2021	9/7/2021	Fixed
1743943	Amazon Trust Services - Delayed Revocation of Subordinate CA	12/1/2021	Open as of Report Date	---
1743935	Amazon Trust Services - Misissuance of Subordinate Per CPS	12/1/2021	12/22/2021	Fixed
1746945	Amazon Trust Services - Missing CAA Check For Test Website Certificates	12/20/2021	1/14/2022	Fixed

Jonathan Kozolchyk

Jonathan Kozolchyk
Vice President
Amazon Trust Services LLC

April 8, 2022

ATTACHMENT A - CERTIFICATION PRACTICE STATEMENT AND CERTIFICATE POLICY VERSIONS IN-SCOPE

Policy Name	Version	Effective Date
Amazon Trust Services Certificate Policy	1.0.11	August 18, 2021
Amazon Trust Services Certificate Policy	1.0.10	July 23, 2021
Amazon Trust Services Certificate Policy	1.0.9	April 23, 2021
Amazon Trust Services Certificate Policy	1.0.8	March 30, 2020
Amazon Trust Services Certification Practice Statement	1.0.12	August 18, 2021
Amazon Trust Services Certification Practice Statement	1.0.11	July 23, 2021
Amazon Trust Services Certification Practice Statement	1.0.10	April 23, 2021
Amazon Trust Services Certification Practice Statement	1.0.9	March 30, 2020

ATTACHMENT B - IN-SCOPE CAs

Root CAs				
Subject DN	SHA2 Thumbprint	SPKI SHA256	Valid From	Valid To
CN = Amazon Root CA 1 O = Amazon C = US	8ECDE6884F3D87B1125BA31AC3FCB13D7016DE7F57CC904FE1CB97C6AE98196E	FBE3018031F9586BCBF417 27E417B7D1C45C2F47F93B E372A17B96B50757D5A2	5/25/2015	1/16/2038
CN = Amazon Root CA 2 O = Amazon C = US	1BA5B2AA8C65401A82960118F80BEC4F62304D83CEC4713A19C39C011EA46DB4	7F4296FC5B6A4E3B35D3C3 69623E364AB1AF381D8FA7 121533C9D6C633EA2461	5/25/2015	5/25/2040
CN = Amazon Root CA 3 O = Amazon C = US	18CE6CFE7BF14E60B2E347B8DFE868CB31D02EBB3ADA271569F50343B46DB3A4	36ABC32656ACFC645C61B7 1613C4BF21C787F5CABBEE 48348D58597803D7ABC9	5/25/2015	5/25/2040
CN = Amazon Root CA 4 O = Amazon C = US	E35D28419ED02025CFA69038CD623962458DA5C695FBDEA3C22B0BFB25897092	F7ECDED5C66047D28ED64 66B543C40E0743ABE81D10 9254DC8F45D4C2C7853C5	5/25/2015	5/25/2040
CN = Starfield Services Root Certificate Authority - G2 ¹ O = Starfield Technologies, Inc. L = Scottsdale S = Arizona C = US	568D6905A2C88708A4B3025190EDCFEDB1974A606A13C6E5290FCB2AE63EDAB5	2B071C59A0A0AE76B0EAD B2BAD23BAD4580B69C360 1B630C2EAF0613AFA83F92	8/31/2009	12/31/2037

Cross-Signed Root CAs				
Subject DN	SHA2 Thumbprint	SPKI SHA256	Valid From	Valid To
CN = Amazon Root CA 1 O = Amazon C = US	87DCD4DC74640A322CD205552506D1BE64F12596258096544986B4850BC72706	FBE3018031F9586BCBF417 27E417B7D1C45C2F47F93B E372A17B96B50757D5A2	5/25/2015	12/31/2037
	391220705B75BCF3ED3CD4B3631213F569D2CF8226101E170799A5354AB12861		10/21/2015	12/31/2037
CN = Amazon Root CA 2 O = Amazon C = US	8B358466D66126312120645A5875A6A57E3C81D98476A967604244254EAC00F0	7F4296FC5B6A4E3B35D3C3 69623E364AB1AF381D8FA7 121533C9D6C633EA2461	5/25/2015	12/31/2037
CN = Amazon Root CA 3 O = Amazon C = US	40C826FDB22BA32A2F9DB4F94770F72B8B1DA9C8FFDA7B11E6F27AF245C89B5E	36ABC32656ACFC645C61B7 1613C4BF21C787F5CABBEE 48348D58597803D7ABC9	5/25/2015	12/31/2037

¹ ATS assumed operation of this Root CA on June 10, 2015. Starfield Technologies operated this CA prior to June 10, 2015 and was responsible for its key generation.

Cross-Signed Root CAs				
Subject DN	SHA2 Thumbprint	SPKI SHA256	Valid From	Valid To
CN = Amazon Root CA 4 O = Amazon C = US	543D9B7FC2A6471CD84FCA52C2CF6159DF83EBFCD88D8B08B5AF3F88737F52E6	F7ECDEED5C66047D28ED64 66B543C40E0743ABE81D10 9254DCF845D4C2C7853C5	5/25/2015	12/31/2037

Intermediate CAs				
Subject DN	SHA2 Thumbprint	SPKI SHA256	Valid From	Valid To
CN = Amazon OU = Server CA 0A O = Amazon C = US	DFCC775C644DB4A33AD71293433F463C8E31057CE22CB267F9D31A0353F4FC2F	B58539ECAA13921CCDB80 D38D34875FDE6471C5A159 D9BEEF2FA6F99983BD611	10/21/2015	10/18/2025
CN = Amazon OU = Server CA 1A O = Amazon C = US	39C763A9CF19D923F977D23626AB890449A444AB8B795C815EF1EF81FEBC1E38	64BB5BD80311FA3F53BD99 404CAB8762AD6E048447D0 A97F219FCECA1661F37C	10/21/2015	10/18/2025
CN = Amazon OU = Server CA 2A O = Amazon C = US	72130E3B28900349214617F4D6F3FB85D08475EE78BF095C59458A14D1828866	1BDA5AFF83781380BF708 198F9F7D2DB1E067F14BB9 EA7BAE70AAC0B0305E7B	10/21/2015	10/18/2025
CN = Amazon OU = Server CA 3A O = Amazon C = US	205154B777EDC55A5146585A5E54E054A70BE4AAD3B85D02318DA27BF807ADF1	7C53B5DF79135D9AF6195E F6BB73AB98C2C89950B892 B192DFFD784DB925A41C	10/21/2015	10/18/2025
CN = Amazon OU = Server CA 4A O = Amazon C = US	7BED29276ACBED9F176F38BBA3A67CE5815B5CBF1522C7BB59ECD86B09E16ED2	17708DFF2B7FAEC9CB1B52 15EBB2421D97B0543C936F AC9D6E02B92F20E5C707	10/21/2015	10/18/2025