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De Kleetlaan 2
B – 1831 Diegem

INDEPENDENT ASSURANCE REPORT

To the management of Verizon Terremark NV ("Verizon Terremark")

Scope

We have been engaged, in a reasonable assurance engagement, to report on Verizon Terremark management's assertion that, except for matters described in the assertion, for its Certification Authority (CA) operations at Culliganlaan 2E, Diegem (Belgium), throughout the period May 1, 2017 through April 30, 2018 for its CAs as enumerated in Appendix B, Verizon Terremark has:

► Disclosed its SSL certificate lifecycle management business practices in the applicable versions of the Certificate Practice Statement and Certificate Policy, as stipulated in Appendix A, including its commitment to provide SSL certificates in conformity with the CA/Browser Forum Requirements on the Verizon Terremark website, and provided such services in accordance with its disclosed practices

► Maintained effective controls to provide reasonable assurance that:
  ► the integrity of keys and SSL certificates it manages is established and protected throughout their lifecycles; and
  ► SSL subscriber information is properly authenticated (for the registration activities performed by Verizon Terremark)

► 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 - SSL Baseline with Network Security v2.2.

Verizon Akamai SureServer CA G14-SHA1 (Appendix B, CA #1) ,Verizon Akamai SureServer CA G14-SHA2 (Appendix B, CA #2) ,Verizon Public SureServer CA G14-SHA1 (Appendix B, CA #3) ,Cybertrust Public SureServer SV CA (Appendix B, CA #5) ,Verizon Global Issuing CA (Appendix B, CA #6) did not issue certificates during the period May 1, 2017 through April 30, 2018 and were maintained online to provide revocation status information only.

Certification authority's responsibilities

Verizon Terremark's 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 - SSL Baseline with Network Security v2.2.

Our independence and quality control

We have complied with the independence and other ethical requirements of the *Code of Ethics for Professional Accountants* issued by the International Ethics Standards Board for Accountants, which is founded on fundamental principles of integrity, objectivity, professional competence and due care, confidentiality and professional behaviour.

The firm applies International Standard on Quality Control 1, 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.

Société civile ayant emprunté la forme d'une société coopérative à responsabilité limitée
Burgelijke vennootschap die de rechtsvorm van een coöperatieve vennootschap met beperkte aansprakelijkheid heeft aangenomen
RPM Bruxelles – RPR Brussel – T.V.A. – B.T.W. BE 0446.334.711
Banque BNP Paribas Fortis Bank 210-0905900-69

Auditor's responsibilities

Our responsibility is to express an opinion on management's assertion based on our procedures. We conducted our procedures in accordance with International Standard on *Assurance Engagements 3000, Assurance Engagements Other than Audits or Reviews of Historical Financial Information*, issued by the International Auditing and Assurance Standards Board. This standard requires that we plan and perform our procedures to obtain reasonable assurance about whether, in all material respects, management's assertion is fairly stated, and, accordingly, included:

1. obtaining an understanding of Verizon Terremark's SSL certificate lifecycle management business practices, including its relevant controls over the issuance, renewal, and revocation of SSL certificates, and obtaining an understanding of Verizon Terremark's network and certificate system security to meet the requirements set forth by the CA/Browser Forum;
2. selectively testing transactions executed in accordance with disclosed SSL certificate lifecycle management 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 Verizon Terremark 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, Verizon Terremark's ability to meet the aforementioned criteria may be affected. For example, controls may not prevent, or detect and correct, error, fraud, unauthorized 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.

Basis for qualified opinion

During our procedures, we noted the following that caused a qualification of our opinion:

Observation	Relevant WebTrust Criteria

We noted that the CA CP and CPS have not been updated on an annual basis. This caused WebTrust Principles and Criteria for Certification Authorities - SSL Baseline with Network Security v2.2, Criterion 1.4 to not be met.	1.4: The Certificate Authority has controls to provide reasonable assurance that the CA CP and/or CPS that describes how the CA implements the latest version of the Baseline Requirements are updated annually.
We noted that the CPS does not document whether the CA reviews CAA (Certification Authority Authorization) DNS records. This caused WebTrust Principles and Criteria for Certification Authorities - SSL Baseline with Network Security v2.2, Criterion 1.6 to not be met.	1.6: The CA discloses in its Certificate Policy (CP) and/or Certification Practices Statement (CPS) under section 4.2 (if the CA's disclosures follow RFC 3647) or under section 4.1 (if the CA's disclosures follow RFC 2527) whether the CA reviews CAA (Certification Authority Authorisation) DNS Records, and if so, the CA's policy or practice on processing CAA Records for Fully Qualified Domain Names. The CA maintains controls to provide reasonable assurance that it logs all actions taken, if any, consistent with its processing practice.
We noted that a penetration test has not been performed on the CA Certificate Systems on an annual basis. This caused WebTrust Principles and Criteria for Certification Authorities - SSL Baseline with Network Security v2.2, Criterion 4.4.4 to not be met.	4.4.4: The CA maintains controls to provide reasonable assurance that a Penetration Test is performed on the CA's and each Delegated Third Party's Certificate Systems on at least an annual basis and after infrastructure or application upgrades or modifications that the CA determines are significant.

Qualified opinion

In our opinion, except for the matters described in the basis for qualified opinion section above, throughout the period May 1, 2017 through April 30, 2018, Verizon Terremark has, in all material respects:

▶ Disclosed its SSL certificate lifecycle management business practices in the applicable versions of the Certificate Practice Statement and Certificate Policy, as stipulated in Appendix A, including its commitment to provide SSL certificates in conformity with the CA/Browser Forum Requirements on the Verizon Terremark website, and provided such services in accordance with its disclosed practices

▶ Maintained effective controls to provide reasonable assurance that:
  - ▶ the integrity of keys and SSL certificates it manages is established and protected throughout their lifecycles; and
  - ▶ SSL subscriber information is properly authenticated (for the registration activities performed by Verizon Terremark)

▶ 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 - SSL Baseline with Network Security v2.2.

This report does not include any representation as to the quality of Verizon Terremark's services beyond those covered by the WebTrust Principles and Criteria for Certification Authorities - SSL Baseline with Network Security v2.2, nor the suitability of any of Verizon Terremark's services for any customer's intended purpose.

Ernst & Young Bedrijfsrevisoren BCVBA
Diegem, Belgium

Christel Weymeersch, Partner
July 27, 2018

Appendix A - Certification Practice Statements and Certificate Policies in Scope

Certificate Policies	Begin Effective Date	End Effective Date
Version 2.8	April 2017	July 2018

Certification Practice Statements	Begin Effective Date	End Effective Date
Version 5.9	April 2017	July 2018

Appendix B - In-Scope CAs

OV SSL Issuing CAs		
#	**Subject**	**SHA**
1	C=NL, L=Amsterdam, O=Verizon Enterprise Solutions, OU=Cybertrust, CN=Verizon Akamai SureServer CA G14-SHA1	9c:fb:49:f8:52:05:72:fd:a3:43:69:8b:c0:43:07:c8: 56:b4:f1:81:9b:1d:73:4b:cd:40:aa:c8:f1:e1:6c:2d
2	C=NL, L=Amsterdam, O=Verizon Enterprise Solutions, OU=Cybertrust, CN=Verizon Akamai SureServer CA G14-SHA2	73:73:d2:19:b4:25:47:e4:1b:cb:75:2b:cb:cb:e9:3f: 59:2f:f6:f9:9c:34:0c:e5:7b:73:d3:8c:3e:c0:ba:98
3	CN=Verizon Public SureServer CA G14-SHA1, OU=Cybertrust, O=Verizon Enterprise Solutions, L=Amsterdam, C=NL	e3:78:e4:39:73:6c:19:6b:47:29:42:fe:7f:bf:a1:e1: 78:cc:7b:8a:f0:c1:c8:6a:b6:88:e2:d0:39:78:24:32
4	CN=Verizon Public SureServer CA G14-SHA2, OU=Cybertrust, O=Verizon Enterprise Solutions, L=Amsterdam, C=NL	67:5c:1c:5d:bb:08:e9:fa:2c:81:7b:86:d5:fc:89:68: 10:34:9a:2f:47:dd:64:93:8a:2b:ac:a6:49:97:c8:bb
5	CN=Cybertrust Public SureServer SV CA, O=Cybertrust Inc	48:29:e6:06:69:1f:5e:55:b4:48:58:7d:5c:09:99:b0: da:5d:d3:1c:12:73:e3:57:38:cb:92:e5:3c:d7:88:e1
6	CN=Verizon Global Issuing CA, OU=Cybertrust, O=Verizon Enterprise Solutions, L=Amsterdam, C=NL	cf:58:df:be:c6:68:2f:eb:ba:a4:26:c9:2a:5a:ab:92: 29:a1:2d:bd:1c:71:bf:0f:b0:3f:7f:eb:76:99:5f:9a

Verizon Terremark Management's Assertion

Verizon Terremark NV ("Verizon Terremark") operates the Certification Authority (CA) services known as the Subordinate CAs as disclosed in appendix B and provides SSL CA services.

Verizon Terremark management has assessed its disclosures of its certificate practices and controls over its SSL CA services. During our assessment, we noted the following observations which caused the relevant criteria to not be met:

Observation	Relevant WebTrust Criteria
The CA CP and CPS have not been updated on an annual basis. This caused WebTrust Principles and Criteria for Certification Authorities - SSL Baseline with Network Security v2.2, Criterion 1.4 to not be met.	1.4: The Certificate Authority has controls to provide reasonable assurance that the CA CP and/or CPS that describes how the CA implements the latest version of the Baseline Requirements are updated annually.
The CPS does not document whether the CA reviews CAA (Certification Authority Authorization) DNS records. This caused WebTrust Principles and Criteria for Certification Authorities - SSL Baseline with Network Security v2.2, Criterion 1.6 to not be met.	1.6: The CA discloses in its Certificate Policy (CP) and/or Certification Practices Statement (CPS) under section 4.2 (if the CA's disclosures follow RFC 3647) or under section 4.1 (if the CA's disclosures follow RFC 2527) whether the CA reviews CAA (Certification Authority Authorisation) DNS Records, and if so, the CA's policy or practice on processing CAA Records for Fully Qualified Domain Names. The CA maintains controls to provide reasonable assurance that it logs all actions taken, if any, consistent with its processing practice.
A penetration test has not been performed on an annual basis on the CA Certificate Systems. This caused WebTrust Principles and Criteria for Certification Authorities - SSL Baseline with Network Security v2.2, Criterion 4.4.4 to not be met.	4.4.4: The CA maintains controls to provide reasonable assurance that a Penetration Test is performed on the CA's and each Delegated Third Party's Certificate Systems on at least an annual basis and after infrastructure or application upgrades or modifications that the CA determines are significant.

Based on that assessment, in Verizon Terremark management's opinion, except for the matters described in the preceding table, in providing its SSL and non-SSL Certification Authority (CA) services at Culliganlaan 2E, Diegem (Belgium), throughout the period May 1, 2017 through April 30, 2018, Verizon Terremark has:

- Disclosed its SSL certificate lifecycle management business practices in the applicable versions of the Certificate Practice Statement and Certificate Policy, as stipulated in Appendix A, including its commitment to provide SSL certificates in conformity with the CA/Browser Forum Requirements on the Verizon Terremark website, and provided such services in accordance with its disclosed practices

- Maintained effective controls to provide reasonable assurance that:
    - the integrity of keys and SSL certificates it manages is established and protected throughout their lifecycles; and
    - SSL subscriber information is properly authenticated (for the registration activities performed by Verizon Terremark)

- 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

Maintained effective controls to provide reasonable assurance that it meets the Network and Certificate System Security Requirements as set forth by the CA/Browser Forum

in accordance with the WebTrust Principles and Criteria for Certification Authorities - SSL Baseline with Network Security v2.2.

Verizon Akamai SureServer CA G14-SHA1 (Appendix B, CA #1) ,Verizon Akamai SureServer CA G14-SHA2 (Appendix B, CA #2) ,Verizon Public SureServer CA G14-SHA1 (Appendix B, CA #3) ,Cybertrust Public SureServer SV CA (Appendix B, CA #5) ,Verizon Global Issuing CA (Appendix B, CA #6) did not issue certificates during the period May 1, 2017 through April 30, 2018 and were maintained online to provide revocation status information only.

Verizon Terremark
Diegem, Belgium

Signed by: **Tim Brophy**
Function: **Director, Risk & Compliance**
July 27, 2018

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2	C=NL, L=Amsterdam, O=Verizon Enterprise Solutions, OU=Cybertrust, CN=Verizon Akamai SureServer CA G14-SHA2	73:73:d2:19:b4:25:47:e4:1b:cb:75:2b:cb:cb:e9:3f:59:2f:f6:f9:9c:34:0c:e5:7b:73:d3:8c:3e:c0:ba:98
3	CN=Verizon Public SureServer CA G14-SHA1, OU=Cybertrust, O=Verizon Enterprise Solutions, L=Amsterdam, C=NL	e3:78:e4:39:73:6c:19:6b:47:29:42:fe:7f:bf:a1:e1:78:cc:7b:8a:f0:c1:c8:6a:b6:88:e2:d0:39:78:24:32
4	CN=Verizon Public SureServer CA G14-SHA2, OU=Cybertrust, O=Verizon Enterprise Solutions, L=Amsterdam, C=NL	67:5c:1c:5d:bb:08:e9:fa:2c:81:7b:86:d5:fc:89:68:10:34:9a:2f:47:dd:64:93:8a:2b:ac:a6:49:97:c8:bb
5	CN=Cybertrust Public SureServer SV CA, O=Cybertrust Inc	48:29:e6:06:69:1f:5e:55:b4:48:58:7d:5c:09:99:b0:da:5d:d3:1c:12:73:e3:57:38:cb:92:e5:3c:d7:88:e1
6	CN=Verizon Global Issuing CA, OU=Cybertrust, O=Verizon Enterprise Solutions, L=Amsterdam, C=NL	cf:58:df:be:c6:68:2f:eb:ba:a4:26:c9:2a:5a:ab:92:29:a1:2d:bd:1c:71:bf:0f:b0:3f:7f:eb:76:99:5f:9a