日盛聯合會計師事務所
SUN RISE CPAS' FIRM
DFK INTERNATIONAL

19F.-5, No.171, Songde Rd., Sinyi District,
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INDEPENDENT ASSURANCE REPORT

To the management of Chunghwa Telecom(CHT):

We have been engaged, in a reasonable assurance engagement, to report on CHT management's assertion that for its Certification Authority (CA) operations at Taipei and Taichung, Taiwan, as of 22 February 2019 for its CAs as enumerated in Appendix A, CHT has:

- disclosed its business, key lifecycle management, certificate lifecycle management, and CA environmental control practices in its:
  - HiPKI EV TLS CA Certification Practice Statement Version 1.0;
  - HiPKI Root Certification Authority Certification Practice Statement Version 1.0; and
  - HiPKI Certificate Policy Version 1.0

- suitably designed, and placed into operation, controls to provide reasonable assurance that:
  - CHT's Certification Practice Statements are consistent with its Certificate Policy
  - CHT provides its services in accordance with its Certificate Policy and Certification Practice Statements

- suitably designed, and placed into operation, 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; o subscriber information is properly authenticated (for the registration activities performed by CHT); and

- suitably designed, and placed into operation, controls to provide reasonable assurance that:
  - logical and physical access to CA systems and data is restricted to authorized individuals;

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- 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

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

Certification authority's responsibilities

CHT'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 v2.1.

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 behavior.

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.

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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 CHT'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) evaluating the suitability of the design of the controls; and

(3) performing such other procedures as we considered necessary in the circumstances.

We did not perform procedures to determine the operating effectiveness of controls for any period. Accordingly, we express no opinion on the operating effectiveness of any aspects of CHT's controls, individually or in the aggregate.

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

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Suitability of controls

The suitability of the design of the controls at CHT 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 suitability of the design of the controls at individual subscriber and relying party locations.

Inherent limitations

Because of the nature and inherent limitations of controls, CHT'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.

Opinion

In our opinion, as of 22 February, 2019, CHT management's assertion, as referred to above, is fairly stated, in all material respects, in accordance with the WebTrust Principles and Criteria for Certification Authorities v2.1.

This report does not include any representation as to the quality of CHT's services beyond those covered by the WebTrust Principles and Criteria for Certification Authorities v2.1, nor the suitability of any of CHT's services for any customer's intended purpose.

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February 22, 2019

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Appendix A – HiPKI Root and Intermediate CAs within the Audit Report Scope

HiPKI Root CA - G1	**Root CA Certificate**	
	Subject	Issuer
	CN = HiPKI Root CA - G1 O = Chunghwa Telecom Co., Ltd. C = TW	CN = HiPKI Root CA - G1 O = Chunghwa Telecom Co., Ltd. C = TW
	Certificate related Information	Key Related Information
	Serial Number: 2d:dd:ac:ce:62:97:94:a1:43:e8:b0:cd:76:6a:5e:60 Signature Algorithm: sha256RSA Not Before: 2019-02-22 05:46:04 p.m. (UTC +8:00) Not After : 2037-12-31 11:59:59 p.m. (UTC +8:00) Thumbprint Algorithm: sha1 Thumbprint: 6a:92:e4:a8:ee:1b:ec:96:45:37:e3:29:57:49:cd:96:e3:e5:d2:60 Thumbprint Algorithm: sha256 Thumbprint: f0:15:ce:3c:c2:39:bf:ef:06:4b:e9:f1:d2:c4:17:e1:a0:26:4a:0a:94:be:1f:0c:8d:12:18:64:eb:69:49:cc	Subject Public Key: RSA(4096 bits) Subject Key Identifiers: f2:77:17:fa:5e:a8:fe:f6:3d:71:d5:68:ba:c9:46:0c:38:d8:af:b0
	Additional Information	Remark
	■ URL of HiPKI Repository for Certificate Policy and Certification Practice Statement Distribution: http://eca.hinet.net/repository-h	■ Self-signed by 1st Generation of HiPKI Root CA - G1.
HiPKI EV TLS CA - G1	**Intermediate CA Certificate**	
	Subject	Issuer
	CN = HiPKI EV TLS CA - G1 O = Chunghwa Telecom Co., Ltd. C = TW	CN = HiPKI Root CA - G1 O = Chunghwa Telecom Co., Ltd. C = TW
	Certificate related Information	Key Related Information

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	Serial Number: 3c:43:cd:cd:dc:f2:3b:00:4f:0e:a0:73:fc:3e:a3:89 Signature Algorithm: sha256RSA Not Before: 2019-02-22 05:56:03 p.m. (UTC +8:00) Not After : 2037-12-31 11:59:59 p.m. (UTC +8:00) Thumbprint Algorithm: sha1 Thumbprint: 98:7e:11:0f:a2:3e:88:82:89:47:65:19:47:2f:40:2f:1e:42:28:37 Thumbprint Algorithm: sha256 Thumbprint: 2a:8e:6a:86:e7:4d:10:ed:b2:02:6c:81:69:3d:64:95:7a:0f:08:1c:16:31:91:2a:c9:5e:fd:fc:b5:62:56:57	Subject Public Key: RSA(4096 bits) Authority Key Identifiers: f2:77:17:fa:5e:a8:fe:f6:3d:71:d5:68:ba:c9:46:0c:38:d8:af:b0 Subject Key Identifiers: a9:0d:ea:63:ae:e3:8c:03:40:e7:ff:dc:33:28:e5:23:8e:cb:10:9b Basic Constraint: Subject Type=CA Path Length Constraint=0 Key Usage: Certificate Signing, Off-line CRL Signing, CRL Signing (06)
	Additional Information	Remark
	■ CRL Distribution Point: http://eca.hinet.net/repository/HRCA_G1/CA.crl ■ Certificate Policy: [1]2.23.140.1.1 ■ URL of HiPKI Repository for Certificate Policy and Certification Practice Statement Distribution: http://eca.hinet.net/repository-h	■ CA certificate of 1st Generation of HiPKI EV TLS CA signed by HiPKI Root CA - G1.

中華電信

MANAGEMENT'S ASSERTION

Chunghwa Telecom (CHT) operates the Certification Authority (CA) services known as HiPKI Root CA - G1 and HiPKI EV TLS CA - G1, and provides the following CA services:

- Subscriber registration
- Certificate rekey
- Certificate issuance
- Certificate distribution
- Certificate revocation
- Certificate validation

The management of CHT is responsible for establishing 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. 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, controls placed into operation can only provide reasonable assurance with respect to CHT's Certification Authority operations.

CHT management has assessed its disclosures of its certificate practices and controls over its CA services. Based on that assessment, in CHT management's opinion, in providing its CA services at Taipei and Taichung, Thailand for its CAs as enumerated in Appendix A, as of February 22, 2019, CHT has:

- disclosed its business, key lifecycle management, certificate lifecycle management, and CA environmental control practices in its:
  - HiPKI EV TLS CA Certification Practice Statement Version 1.0;

- HiPKI Root Certification Authority Certification Practice Statement Version 1.0; and
- HiPKI Certificate Policy Version 1.0

- suitably designed, and placed into operation, controls to provide reasonable assurance that:
  - CHT's Certification Practice Statements are consistent with its Certificate Policy
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  - subscriber information is properly authenticated (for the registration activities performed by CHT); and

- suitably designed, and placed into operation, 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 v2.1, including the following:

CA Business Practices Disclosure

- Certification Practice Statement (CPS)

- Certificate Policy (CP)

CA Business Practices Management

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

CA Environmental Controls

- Security Management
- Asset Classification and Management
- Personnel Security
- Physical & Environmental Security
- Operations Management
- System Access Management
- System Development and Maintenance
- 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 and Destruction
- CA Key Compromise
- CA Cryptographic Hardware Lifecycle Management

Certificate Lifecycle Management Controls

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

- Certificate Validation

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

Signature: Chung, Ming

Title: Principal Engineer

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	Subject	Issuer
	CN = HiPKI Root CA - G1 O = Chunghwa Telecom Co., Ltd. C = TW	CN = HiPKI Root CA - G1 O = Chunghwa Telecom Co., Ltd. C = TW
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	Additional Information	Remark
	■ URL of HiPKI Repository for Certificate Policy and Certification Practice Statement Distribution: http://eca.hinet.net/repository-h	■ Self-signed by 1st Generation of HiPKI Root CA - G1.
HiPKI EV TLS CA - G1	**Intermediate CA Certificate**	
	Subject	Issuer
	CN = HiPKI EV TLS CA - G1 O = Chunghwa Telecom Co., Ltd. C = TW	CN = HiPKI Root CA - G1 O = Chunghwa Telecom Co., Ltd. C = TW
	Certificate related Information	Key Related Information

	Serial Number: 3c:43:cd:cd:dc:f2:3b:00:4f:0e:a0:73:fc:3e:a3:89 Signature Algorithm: sha256RSA Not Before: 2019-02-22 05:56:03 p.m. (UTC +8:00) Not After : 2037-12-31 11:59:59 p.m. (UTC +8:00) Thumbprint Algorithm: sha1 Thumbprint: 98:7e:11:0f:a2:3e:88:82:89:47:65:19:47:2f:40:2f:1e:42:28:37 Thumbprint Algorithm: sha256 Thumbprint: 2a:8e:6a:86:e7:4d:10:ed:b2:02:6c:81:69:3d:64:95:7a:0f:08:1c:16:31:91:2a:c9:5e:fd:fc:b5:62:56:57	Subject Public Key: RSA(4096 bits) Authority Key Identifiers: f2:77:17:fa:5e:a8:fe:f6:3d:71:d5:68:ba:c9:46:0c:38:d8:af:b0 Subject Key Identifiers: a9:0d:ea:63:ae:e3:8c:03:40:e7:ff:dc:33:28:e5:23:8e:cb:10:9b Basic Constraint: Subject Type=CA Path Length Constraint=0 Key Usage: Certificate Signing, Off-line CRL Signing, CRL Signing (06)
	Additional Information	Remark
	■ CRL Distribution Point: http://eca.hinet.net/repository/HRCA_G1/CA.crl ■ Certificate Policy: [1]2.23.140.1.1 ■ URL of HiPKI Repository for Certificate Policy and Certification Practice Statement Distribution: http://eca.hinet.net/repository-h	■ CA certificate of 1st Generation of HiPKI EV TLS CA signed by HiPKI Root CA - G1.