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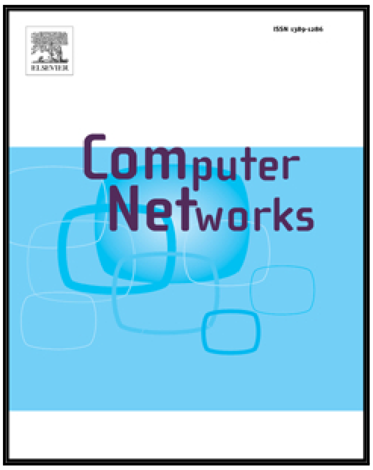

Up-to-date Key Retrieval for Information Centric Networking

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Up-to-date Key Retrieval for Information Centric Networking ☆

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Abstract

Information Centric Networking (ICN) leverages in-network caching to provide efficient data distribution and better performance by replicating contents in multiple nodes to bring content nearer the users. Since contents are stored and replicated into node caches, the content validity must be assured end-to-end. Each content object carries a digital signature to provide a proof of its integrity, authenticity, and provenance. However, the use of digital signatures requires a key management infrastructure to manage the key life cycle. To perform a proper signature verification, a node needs to know whether the signing key is valid or it has been revoked. This paper discusses how to retrieve up-to-date signing keys in the ICN scenario. In the usual public key infrastructure, the Certificate Revocation Lists (CRL) or the Online Certificate Status Protocol (OCSP) enable applications to obtain the revocation status of a certificate. However, the push-based distribution of Certificate Revocation Lists and the request/response paradigm of Online Certificate Status Protocol should be fit in the mechanism of named-data. We consider three possible approaches to distribute up-to-date keys in a similar way to the current CRL and OCSP. Then, we suggest a fourth protocol leveraging a set of distributed notaries, which naturally fits the ICN scenario. Finally, we evaluate the number and size of exchanged messages of each solution, and then we compare the methods considering the perceived latency by the end nodes and the throughput on the network links.

Keywords: Information Centric Networking, Named Data Networking, Digital Signature, Public Key Updating, Key Revocation, CRL, OCSP;

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