

Secure Named Data Sharing

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<https://mm.aueb.gr/projects/snds>

Motivation

- Why is NDN not used for CDNs?
 - Content-based routing and security seem ideal!
- But these are not enough!
 - How do you get content into the servers?
 - How do you set access control policies?
 - How do you prove your identity?
 - How do you discover the data you need?
 - How do you retrieve subsets of the content?

Goal

- SNDS will turn NDN into a CDN underlay
 - Add the missing APIs to NDN
 - Introduce access control policies
 - Deploy decentralized identifiers
 - Exploit the NGSI-LD data spaces API
- Revolutionize the Next Generation Internet
 - Allow new players to create CDNs
 - Exploit the power of decentralized identifiers

Objectives

- Query-based content retrieval
 - Improves privacy by avoiding content names
- Server-side content management and access policies
 - Enhanced content and integrity protection
- Decentralized identifiers and BBS+ digital signatures
 - No reliance on a centralized PKI
- ETSI NGSI-LD API for data spaces
 - Bridge between HTTP and NDN
- Implementation in open source NDN codebase
 - Joint EU-US effort

Clients - Users

- Vehicular CDNs
 - Data exchange between vehicles and infrastructure
 - No need to set up a network
- Cloud providers
 - Service to small content providers
 - No need to set up a custom application
- Communities
 - E.g. High energy physics
 - No need to set up a server infrastructure

Economic impact

- Incremental NDN deployment
 - CDNs with private backhauls exist (e.g., Facebook)
 - An open-source NDN solution would be ideal for them
- Opportunities for new CDN types
 - ETSI Data Spaces aim to liberate data from silos
 - Community driven CDNs (e.g., high-energy physics)
 - Transient CDNs (e.g., between vehicles during traffic jams)
 - Cloud Provider CDNs (e.g. for small content publishers)

Environmental & social impact

- CDNs have major environmental impact
 - SNDS allows secure and flexible content placement
 - SNDS allows secure requests for subsets of content
 - No need to talk to origin servers all the time
- CDNs gather vast amounts of private data
 - Our ZKP-based access control will not reveal private data
- Decentralized Identities allow people to control their data
 - Opportunities for new decentralized applications
 - Fine-grained control of private information exposure

Thank you

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