Highlights of NDN Packet Format Specification

v0.2a2

http://named-data.net/doc/ndn-tlv/

Presented by Alex Afanasyev

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Outline

• TLV encoding
• Interest and Data are TLVs
• Signature Encoding
• Name encoding
• Encoding Key-Value in Names
Goals

• Support the architecture
• Allow experimentation
  – A set of TLV that can be extended or reduced; no fixed part
• Universality, the same wire format support
  – Today’s constrained environments
  – Future’s > 64k MTUs
• Self-contained
  – same bits on l3-wire and applications
• Be as efficient as possible
  – Quick access to Name
  – Interest: group elements that can be used to match “similar” interests
  – Data packet: contiguous memory block for signing
TLV Encoding

• TYPE and LENGTH use variable length encoding
Interest and Data NDN packets

**Interest TLV**
- Name
- Selectors
- MinSuffixComponent?
- MaxSuffixComponent?
- PublisherPublicKeyLocator?
- Exclude?
- ChildSelector?
- MustBeFresh?
- Nonce
- Scope?
- InterestLifetime?

**Data TLV**
- Name
- MetaInfo
- ContentType?
- FreshnessPeriod?
- FinalBlockId?
- Content
- SignatureInfo
- SignatureType
- KeyLocator?
- <other opt fields>?
- SignatureValue

Signed part (continuous block)
Updated Encoding of Name

Name ::= NAME-TYPE TLV-LENGTH NameComponent*

NameComponent ::= GenericNameComponent | ImplicitSha256DigestComponent

GenericNameComponent ::= NAME-COMPONENT-TYPE TLV-LENGTH BYTE*

ImplicitSha256DigestComponent ::= IMPLICIT-SHA256-DIGEST-COMPONENT-TYPE TLV-LENGTH(=32) BYTE{32}
Encoding Key-Value in Names

- Application have freedom to use **names** to express anything they desire

```
Name
- NameComponent
- NameComponent
- ...
- NameComponent (key=value)
%
```

```
Name
- NameComponent
- NameComponent
- ...
- MarkedComponent
- NameComponent (=key)
- NameComponent (=value)
%00%22

*discussed proposal*

```
Name
- NameComponent
- NameComponent
- ...
- MarkedComponent
- NameComponent (=key)
- NameComponent (=value)
%seg%22
```

```
Name
- NameComponent
- NameComponent
- ...
- NameComponent (=key)
- NameComponent (=value)
_%seg%22
```

%22
Signature Encoding

- SignatureSha256WithRsa
  - SignatureInfo
    - SignatureType = 1
    - KeyLocator
  - SignatureValue = Signature bits

- SignatureEcdsa256WithRsa
  - SignatureInfo
    - SignatureType = 3
    - KeyLocator
  - SignatureValue = Signature bits

- DigestSha256
  - SignatureInfo
    - SignatureType = 0
  - SignatureValue = Sha256 value