



Network of Information

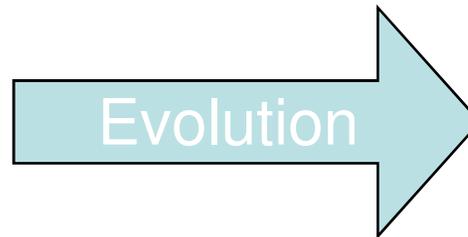
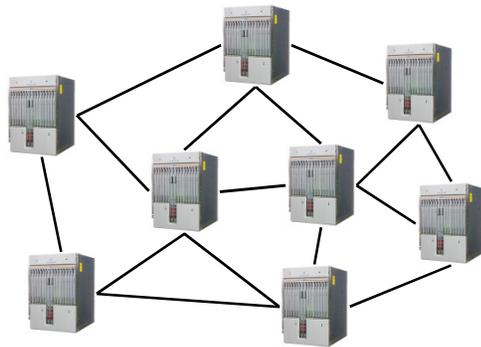
Börje Ohlman
& 4WARD colleagues





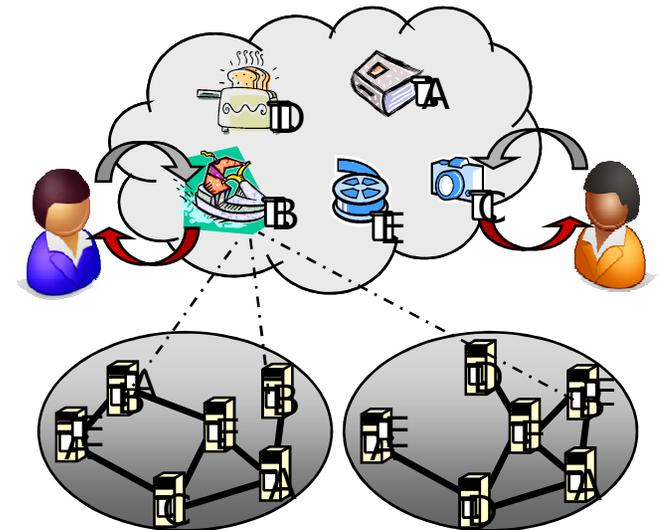
Network of Information

Today's Internet
focuses on
nodes



In today's Internet,
accessing information is
the dominating use case!

Future
Information-centric Network
focuses on
**information objects and
real world objects**





Problems Resulting from a Host-centric View

- ❖ No common *persistent naming scheme* for information
 - Information is named relative to the box they are located in, URLs resolves to IP-addresses
 - Moving information = changing it's name („404 file not found“ errors)
- ❖ Mobility and multihoming for hosts and networks is problematic due to the semantic overload of IP-addresses
- ❖ No consistent *representation of information* (copy-independent)
 - No consistent way to keep track of *identical copies*
 - Different *encodings* (e.g., mp3, wav) worsen problem
- ❖ Security is host-centric
 - Mainly based on *securing channels* (encryption) and *trusting servers* (authentication)
 - Can't generally trust a copy received from an untrusted server

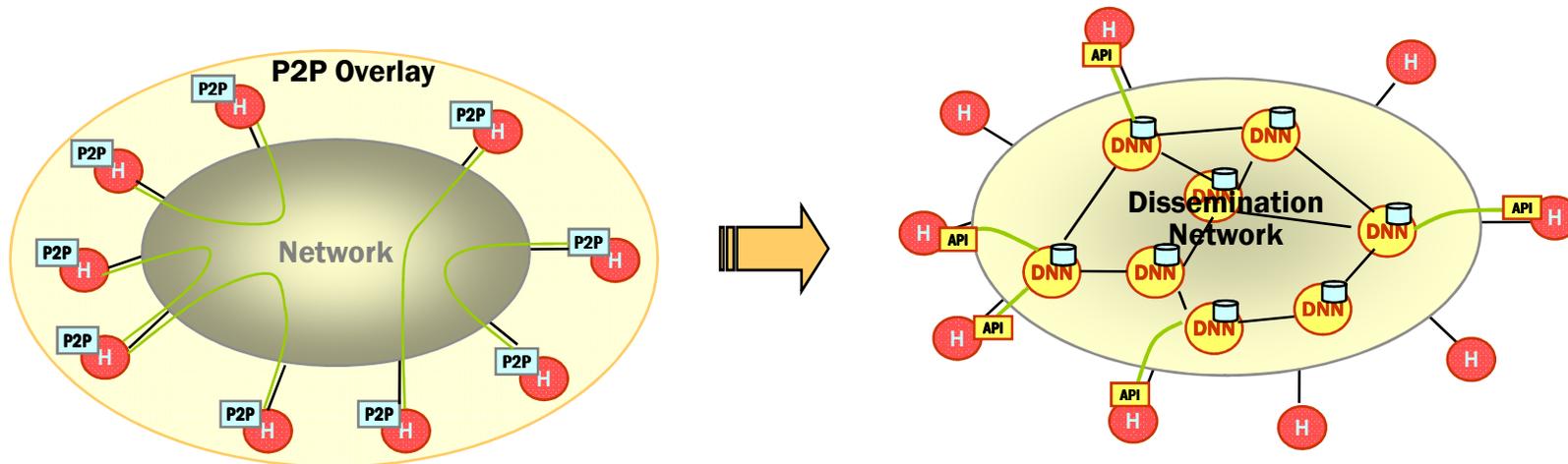
Problems can be solved in a consistent manner
via an information-centric architecture



NetInf Scenarios

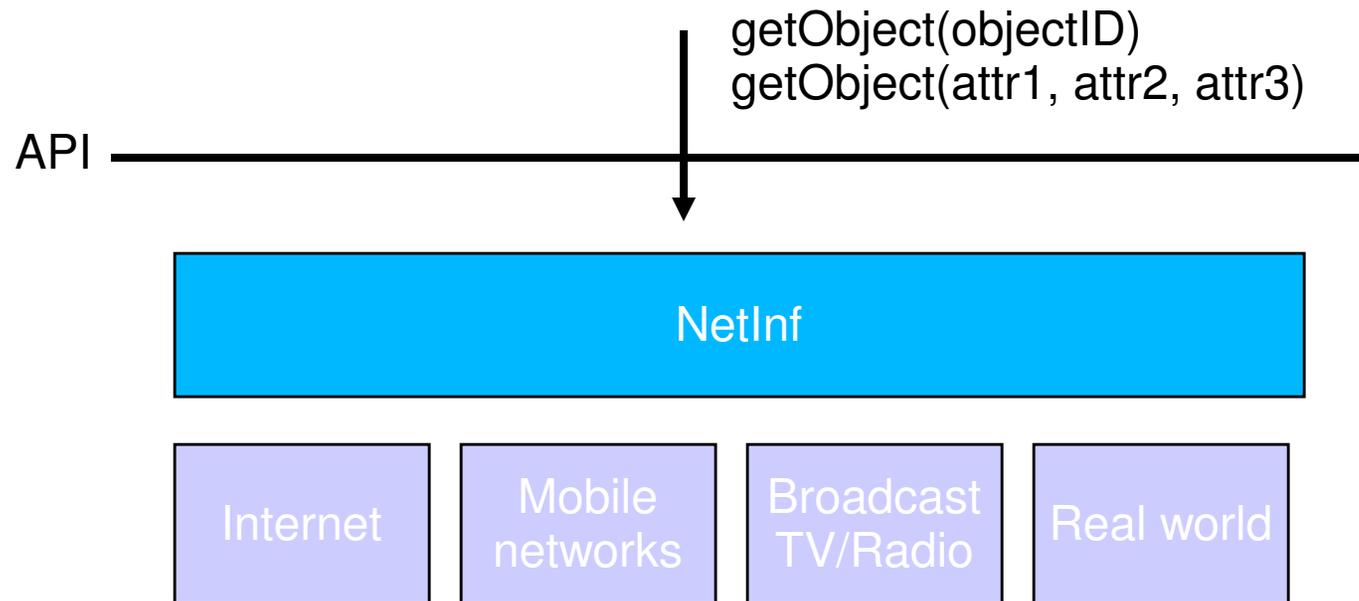
❖ Content distribution

- VideoOnDemand, Live TV, Web pages
- Caching can be built-in from the beginning
- Information can be retrieved from the closest available source
- Common dissemination infrastructure for all applications, including network support



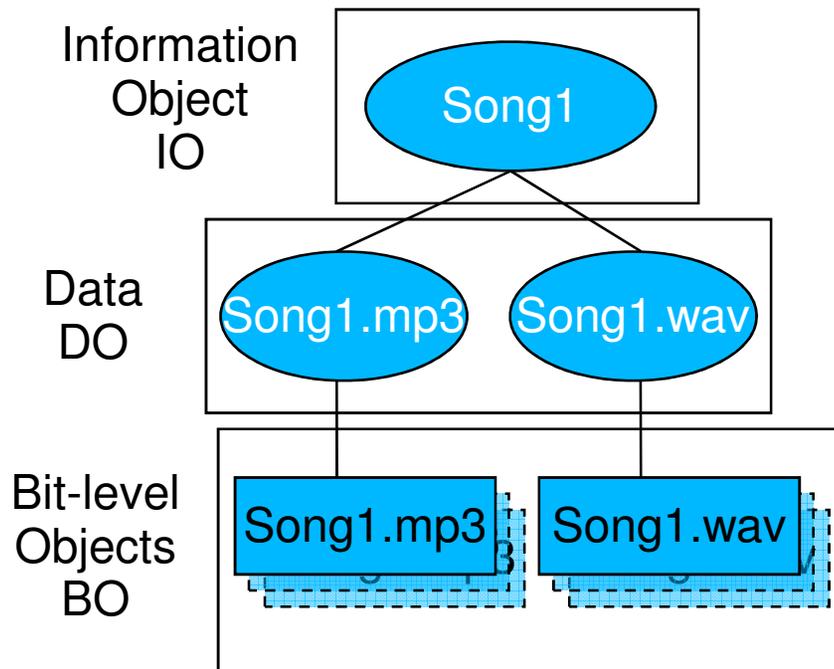


API for accessing any type of object, regardless of location





Organize Information – IO, DO and BO definitions



Information Object (IO)	<p>An Information Object is a set of attributes defining the semantics of a data object. An IO may refer to a piece of music, a film or a webpage.</p> <p>Can be static, dynamic or real-world objects, including streams and services</p>
Data Object (DO)	<p>Sub-class of IO holding attributes for bit-level objects and pointer(s) to the actual data.</p>
Bit-level Object (BO)	<p>A specific sequence of bits, independent of any semantic meaning, also independent of where they exist, like in a file, on the wire, in the air or in a primary memory.</p>



NetInf Naming

Tag	$P = \text{Hash}(\text{PublicKey}_{\text{Owner}})$	$L = \{\text{Hash}(C) \mid \text{String}\}$
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Tag

- ❖ Defines the format
 - Hash algorithm used (SHA1, MD5, ...)

Principal (P)

- ❖ Object 'publisher' (optional)
 - Owner
 - Creator
 - Anonymizing service

IDs have no hierarchical structure
Strong influence on name resolution!

Label (L)

- ❖ Identifying individual object published by Principal
 - Hash of object or label created by principal



NetInf Architecture Overview

