
A Unified Framework for Software Defined Information-centric Network

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ICN architectures

- Various ICN architectures have been proposed recent years
 - NDN
 - PURSUIT
 - CONET
 - etc.

Similar theory

- Different ICN architectures share similar design
 - assumptions
 - objectives
 - even function modules

But, Different details

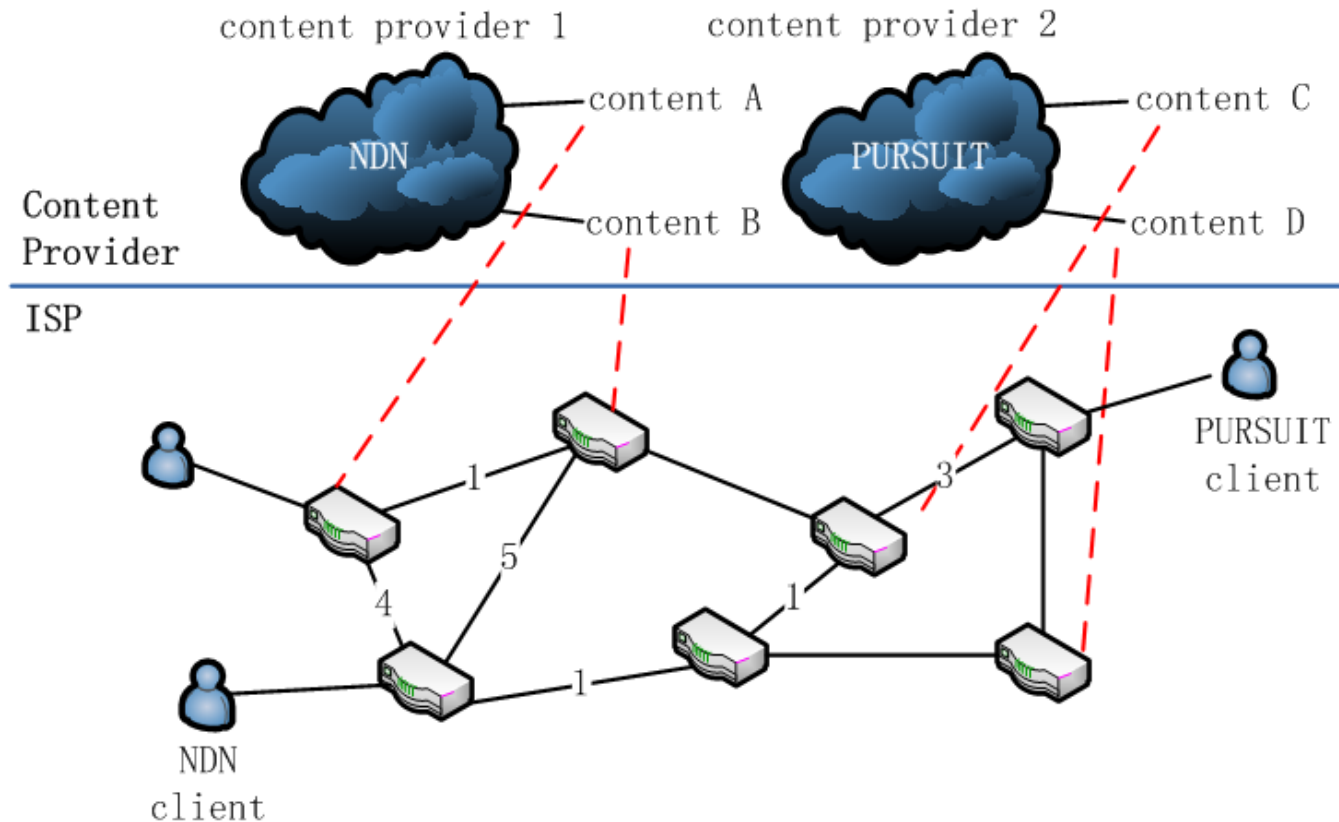
- Different architectures employ different
 - transmission techniques
 - packet formats
 - deployment schemes
 - etc.

Problems

- With different ICNs, it is not easy to achieve
 - co-existence
 - inter-operability

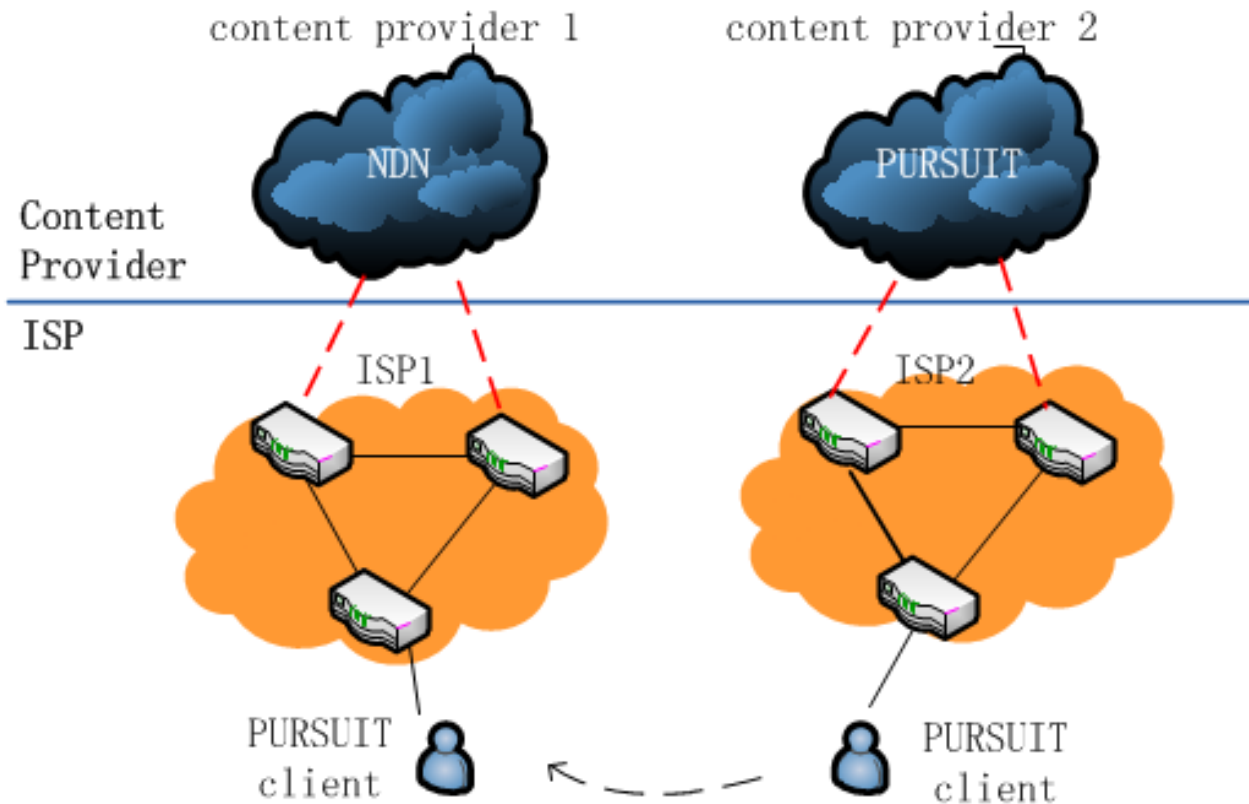
Potential Scenarios (1/2)

- Clients try to access the content only provided in another ICN
- But the two ICNs run with architectures



Potential Scenarios (2/2)

- Mobility issue - clients may move to a network which adopts a different ICN architecture



Proposed solution

- We introduce “*A unified framework for SD-ICN*” to overcome the problems
- It achieves coexistence, interoperability, and
 - provides universal API to makes the deployment of ICNs easier and faster
 - makes no change at ICN clients

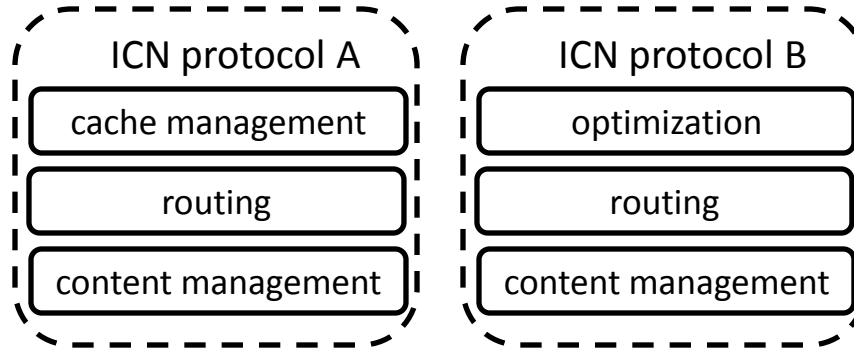
Methodology

- Based on software-defined networking (SDN)
 - decoupling control plane from data plane

- The *framework* leverages
 - generic ICN function modules
 - unified packet format for forwarding

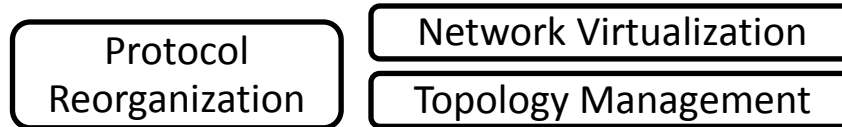
SD-ICN Overview

Unified framework

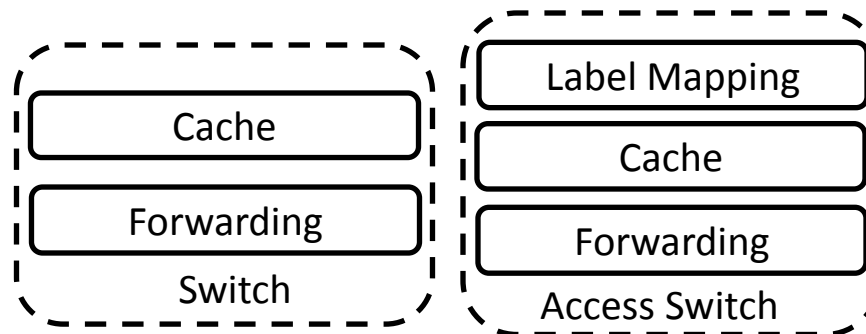


Control Program

Controller

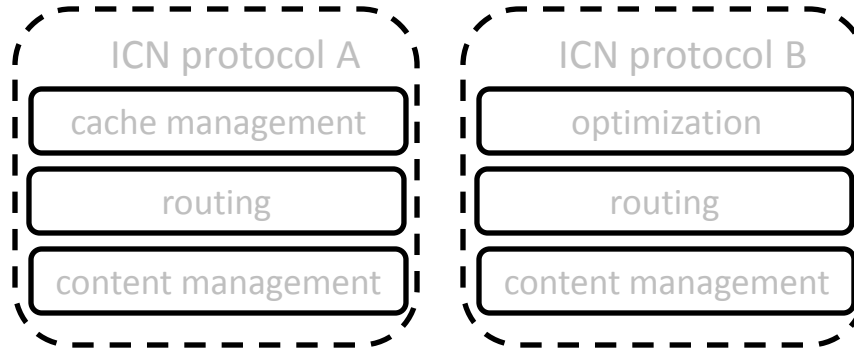


Switch



SD-ICN Overview

Unified framework

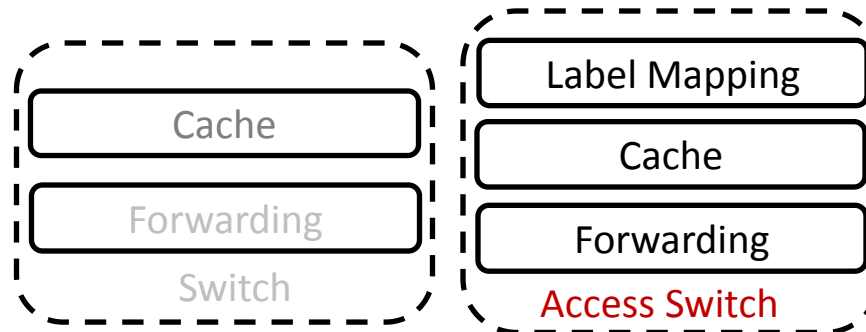


Control Program



Controller

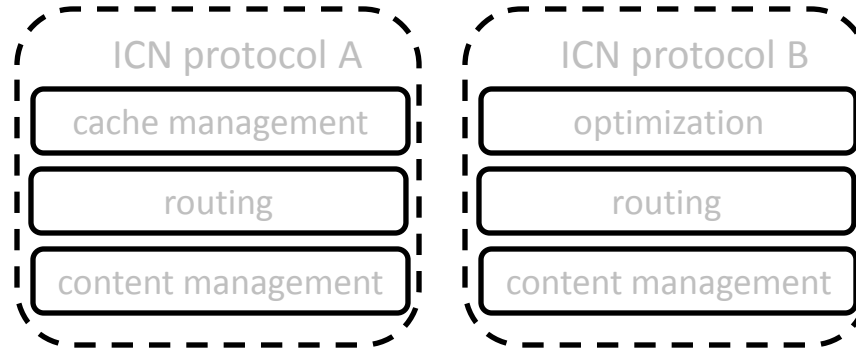
Switch



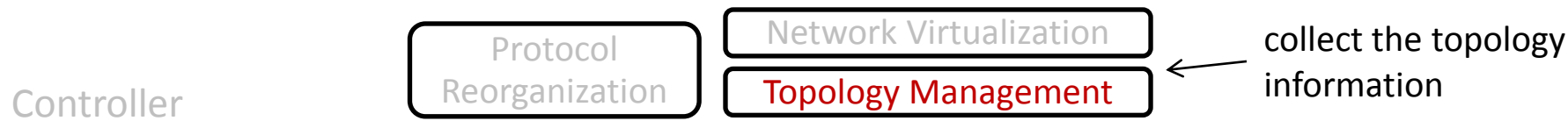
← encapsulate the original ICN packet according to mapping rules configured by the controller

SD-ICN Overview

Unified framework

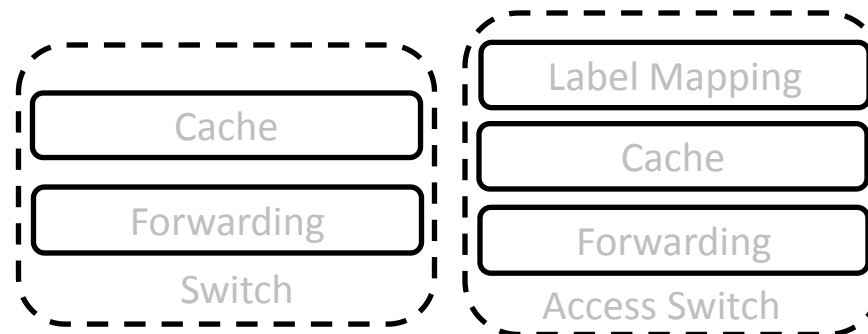


Control Program



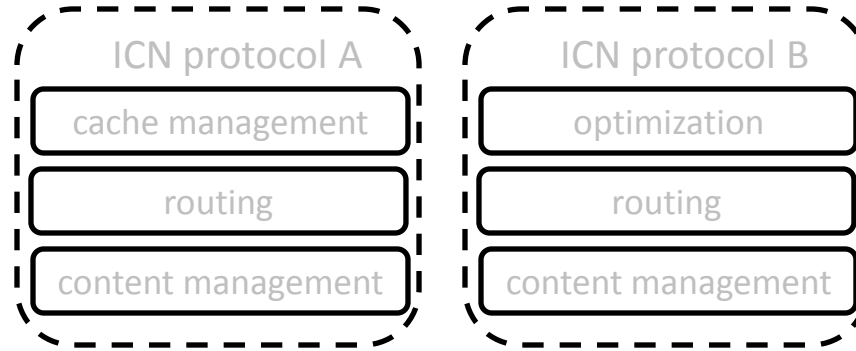
Controller

Switch



SD-ICN Overview

Unified framework



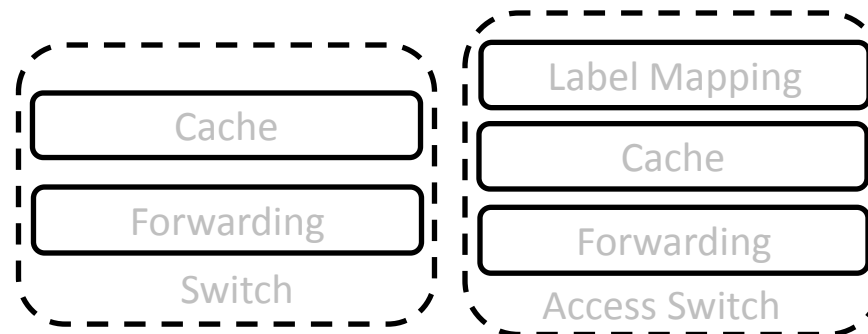
Control Program

Controller



Switch

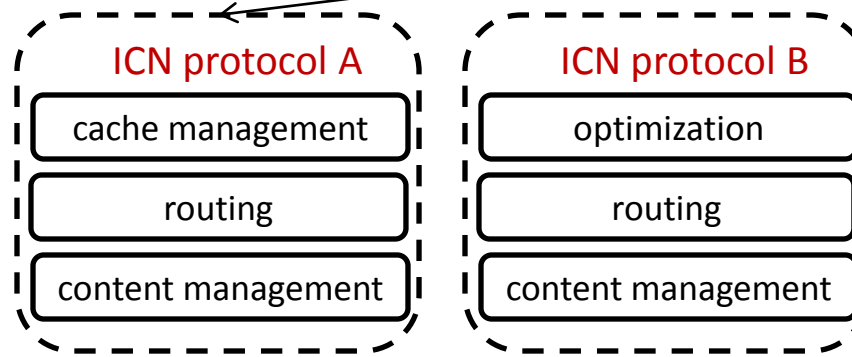
recognize the packet protocol, send the packet to the corresponding control program



SD-ICN Overview

execute protocol-related operations

Unified framework

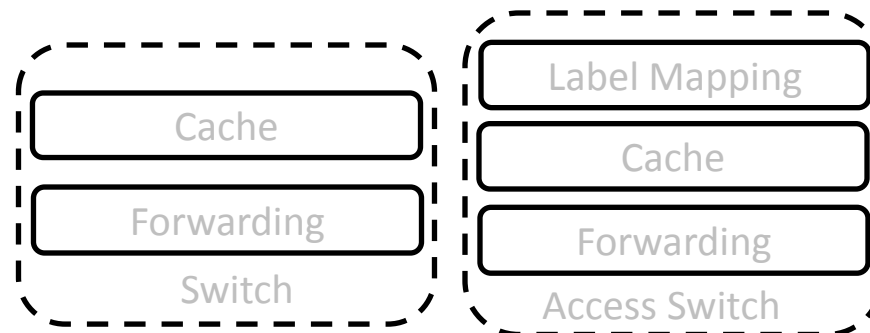


Control Program

Controller



Switch



THANKS!