Content sharing network based on ICN and Multi-service Tag
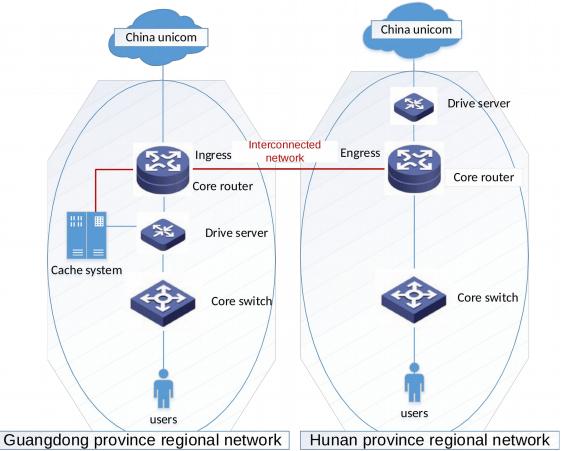
draft-xia-icn-multiservtag-04

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Background

- Internet resources are distributed unevenly.
  - In China, three national-wide giant network operators coexist with many small regional network operators.
  - CDN and cache systems are provided by these operators for each content providers.
- These small regional network operators encounter more difficulties than before with the video contributes the most of internet traffic
  - The investment for CDN and cache systems is higher and higher, and becomes too expensive to afford.
  - Inter-network settlements with giant network operators cost almost the half of its total revenue.

Business Motivation

- **Small regional network operators wish to connect together and share resource**
  - Sharing resource can reduce the inter-network traffic from giant operators and improve the efficiency of the CDN and cache systems

Limitations of existing technologies

- The requirement can be achieved by using existing technologies, i.e., content sharing can be based on IP addresses pool.

- However, there are some limitations and difficulties.
  - Regional network almost use private IP addresses, due to the lack of public IP addresses.
  - it's impossible to track the content among different CDN in terms of its IP address
  - The flow tag of IPv6 changes along with the specific traffic flow

- Using URL for sharing content is ineffectual
  - Video hosting sites use CDN with a range of servers to serve the same content. The same video on each of these hosts have different URLs
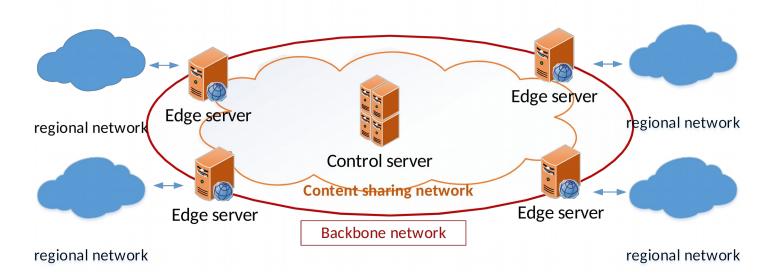
The advantage of ICN

- ICN can evolve the Internet architecture to directly support information distribution by named data.

- ICN requires unique names for individual NDOs, since names are used for identifying objects independently of their location

- With sufficiently unique hash-based identifiers, different application could also share identical NDOs in a transparent way.

Design of content sharing network based on ICN

- According to ICN, we can interconnect regional networks by ov erlay structure;
- Regional network almost use private IP addresses. In order to s hare content resources, we need named data objects which are location independent
- Multi-service Tag is designed according to named data objects.
- It can be used to schedule content resources to share among re gional networks

Content sharing network using Multi-service Tag

- Edge server: interface with Regional networks content resources ； make Multi-service Tags and upload them to control server ； share resources and to be scheduled by Control server;

- Control server: receive the Multi-service Tags from each edge servers, schedule resources among edge servers.

Multi-Service Tag Design

- Multi-service tag is a scheme like URI hierarchy naming scheme follows certain principles
  - xlables = base64(CID + content summary + type + random number + signature)
  - It's a string which identifies tags and encrypts the contained information using base64.

Next Step

- Welcome reviews.
- Seeking for suggestions on the follow-up.