Augmented Reality & Video Service Emerging Technologies

CDN Video Streaming Technology

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CDN Video Streaming Technology

CDN Hierarchical
Content Delivery

Hierarchical Content Delivery

❖ **Hierarchical Content Delivery**

- It is not possible for a caching server to save all contents that the CP (Content Providers) serves

- Retrieving contents from the remotely located CP can cause a long content download time

- A large amount of traffic will be generated by each server in support of the content's packet routing

Hierarchical Content Delivery

❖ **Hierarchical Content Delivery**

- For the given cache size of each server, it is important to maximize the hit rate of the local caching server such that the requested contents do not have to be retrieved from the CP

- Hierarchical CDN accomplishes this objective in the Internet in a scalable way

- Hierarchical cooperative content delivery techniques are used in providing content delivery to local caching servers
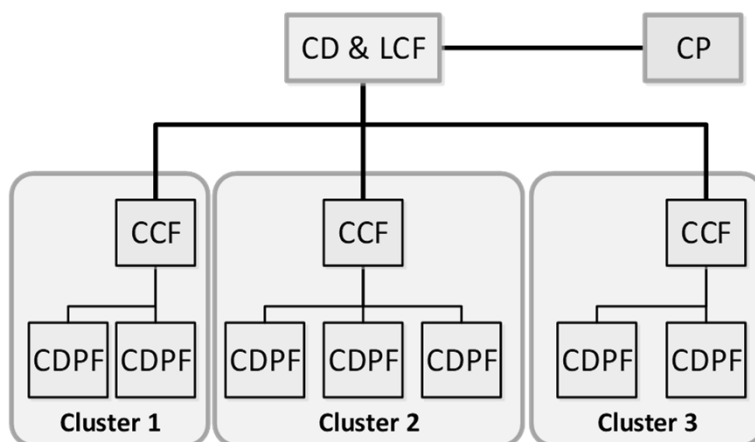
Hierarchical Content Delivery

❖ **Hierarchical Content Delivery**

- CD & LCF (Content Distribution & Location Control Functions) controls the overall content delivery process, and has all content IDs of the CDN

- CCF (Cluster Control Function) controls multiple CDPFs (Content Delivery Processing Functions) and saves content IDs of the cluster

- CDPF stores and delivers the contents to the users

Hierarchical Content Delivery

❖ **Hierarchical Content Delivery Network Example**

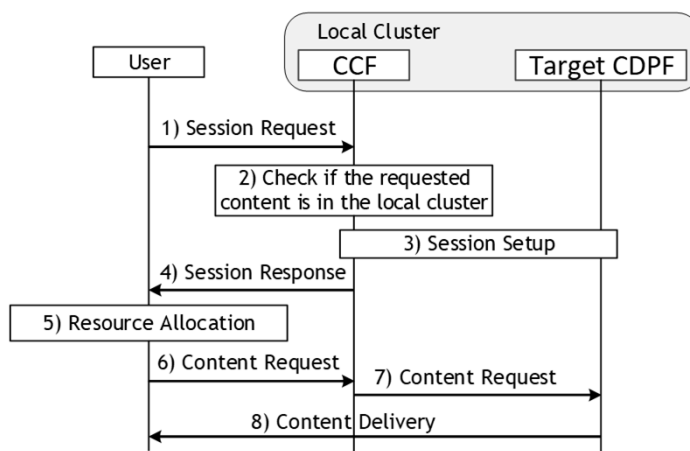## Hierarchical Content Delivery

❖ **Content Delivery Procedures**

▪ Case 1
  • Requested content is in the local cluster
    - Content request message is delivered to the CCF
    - CCF sends a session request message to the CDPF to deliver the content to the user
    - CDPF delivers the content to the user

Hierarchical Content Delivery

❖ **Content Delivery Procedures**
  ▪ Case 1 Procedures

Hierarchical Content Delivery

❖ **Content Delivery Procedures**

- Case 2
  - Requested content is not in the local cluster, but another local cluster (i.e., target cluster) has the content
  - Procedures
    - Content request message is redirected from the local cluster to the CD & LCF
    - CD & LCF checks if the requested content is in the other cluster
    - Continued..
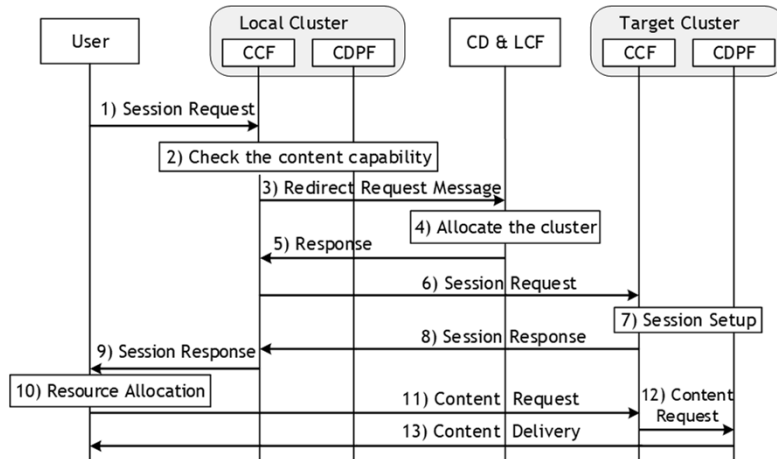
Hierarchical Content Delivery

❖ **Content Delivery Procedures**

- Case 2
  - Procedures
    - Requested content can be delivered from the target cluster to the user directly, or through the local cluster

    - Local cluster can store the requested content

Hierarchical Content Delivery

❖ **Content Delivery Procedures**

▪ Case 2 Procedures
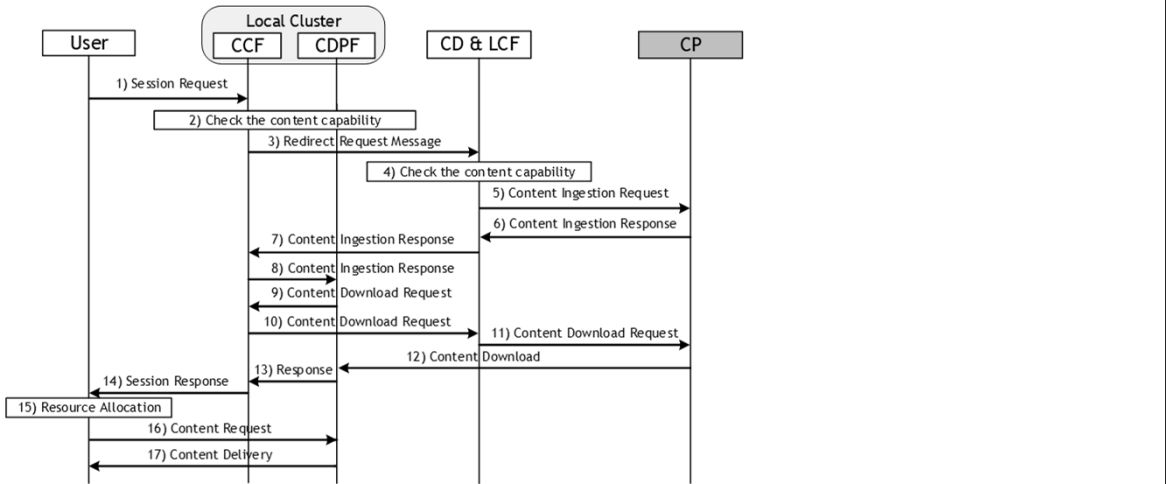

Hierarchical Content Delivery

❖ **Content Delivery Procedures**

▪ Case 3

- When the requested content is not in the CDN

  - Content request message is sent from the CD & LCF to the CP

  - CP delivers the content to the user through the local cluster

  - Requested content can be stored in the local cluster

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Hierarchical Content Delivery

❖ **Content Delivery Procedures**
  - *Case 3 Procedures*

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Reference

References

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