Augmented Reality & Video Service Emerging Technologies

CDN Video Streaming Technology

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CDN Video Streaming Technology

CDN Introduction

CDN

❖ **Lecture Sequence**

- CDN Motivation & Structure

- CDN Procedures

- Hierarchical Content Delivery Model

- CDN Market & Major Service Providers

- CDN Advanced Technologies

CDN

❖ **CDN Motivation**

- CDN is a network constructed from a group of strategically placed and geographically distributed caching servers

- CDN is one of the most efficient solutions for CPs (Content Providers) in serving a large number of user devices, for reduction in content download time and network traffic
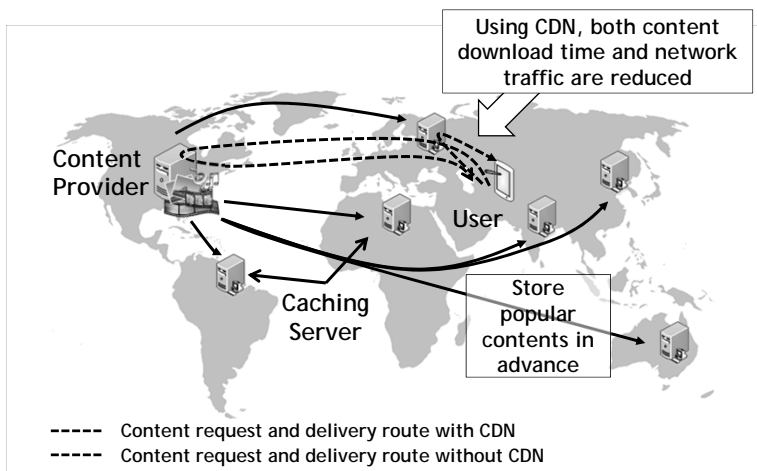
CDN

❖ CDN Motivation

- Network traffic that is accessed by mobile users (e.g., smart devices) is rapidly increasing

- Mobile network performance is highly dependent on the content download of multimedia data and applications

- Several mobile network operators have suffered from service outage or performance deterioration due to the significant increase in use of mobile devices

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❖ CDN Structure

Using CDN, both content download time and network traffic are reduced

Content Provider

User

Caching Server

Store popular contents in advance

----- Content request and delivery route with CDN
----- Content request and delivery route without CDN

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❖ CDN in Mobile Networks

- Mobile communication networks have a stronger need for both reduced traffic load and content delivery time compared to broadband backbone networks within an AS (Autonomous System)

- International & Intercontinental backbone networks have a critical need for CDN support
  - BGP4 (Boarder Gateway Protocol ver. 4) is used beyond AS networks

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❖ CDN Structure

- CDN usually consists of the CP (Content Provider) and Caching Servers

- CP possesses all contents to serve

- Caching Servers are distributed in the network containing selected copies of identical contents that the CP stores

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❖ CDN Structure

- When a user requests a content to its nearest caching server, the server can deliver the content if the requested content is in its cache
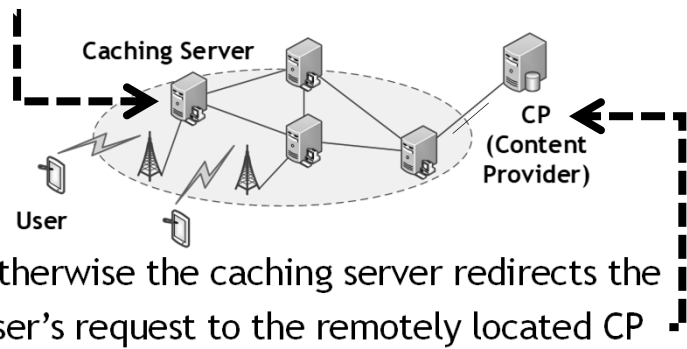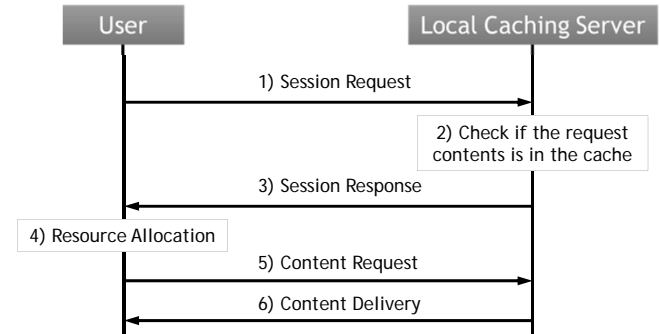

- Otherwise the caching server redirects the user's request to the remotely located CP

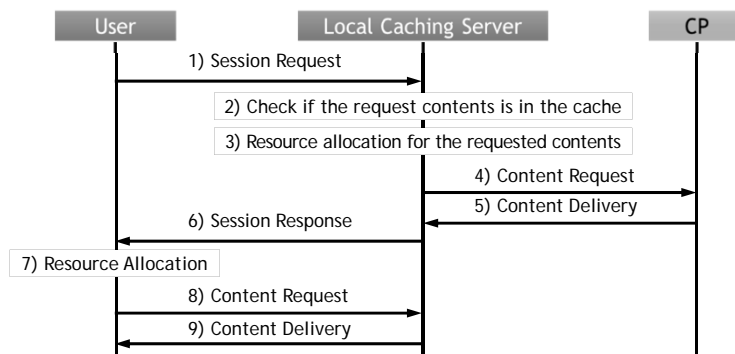## CDN

❖ CDN Procedures

- When a user requests a content to its nearest caching server, the server can deliver the content if the requested content is in its cache

CDN

❖ **CDN Procedures**

- If the requested content is not in the local
  server's cache, content request is redirected
  to the remotely located CP

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❖ **Content Aging Procedure**

- Content aging is focused on delivering the
  most popular contents to users in the most
  effective way

- Depending factors
  - Location of caching servers
  - Number of caching servers
  - Limited memory size of caching servers

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❖ **Content Aging Procedure**

- Content aging
  - Delete expired contents from the cache server
  - Download updated contents from the CP

- Each content has a content update period
  ➜ TTL (Time to Live)
  - Few seconds for on-line trading
  - Few seconds for auction information
  - 24 hours or more for movies

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