

CS 925

Lecture 20

CDNs and Beyond

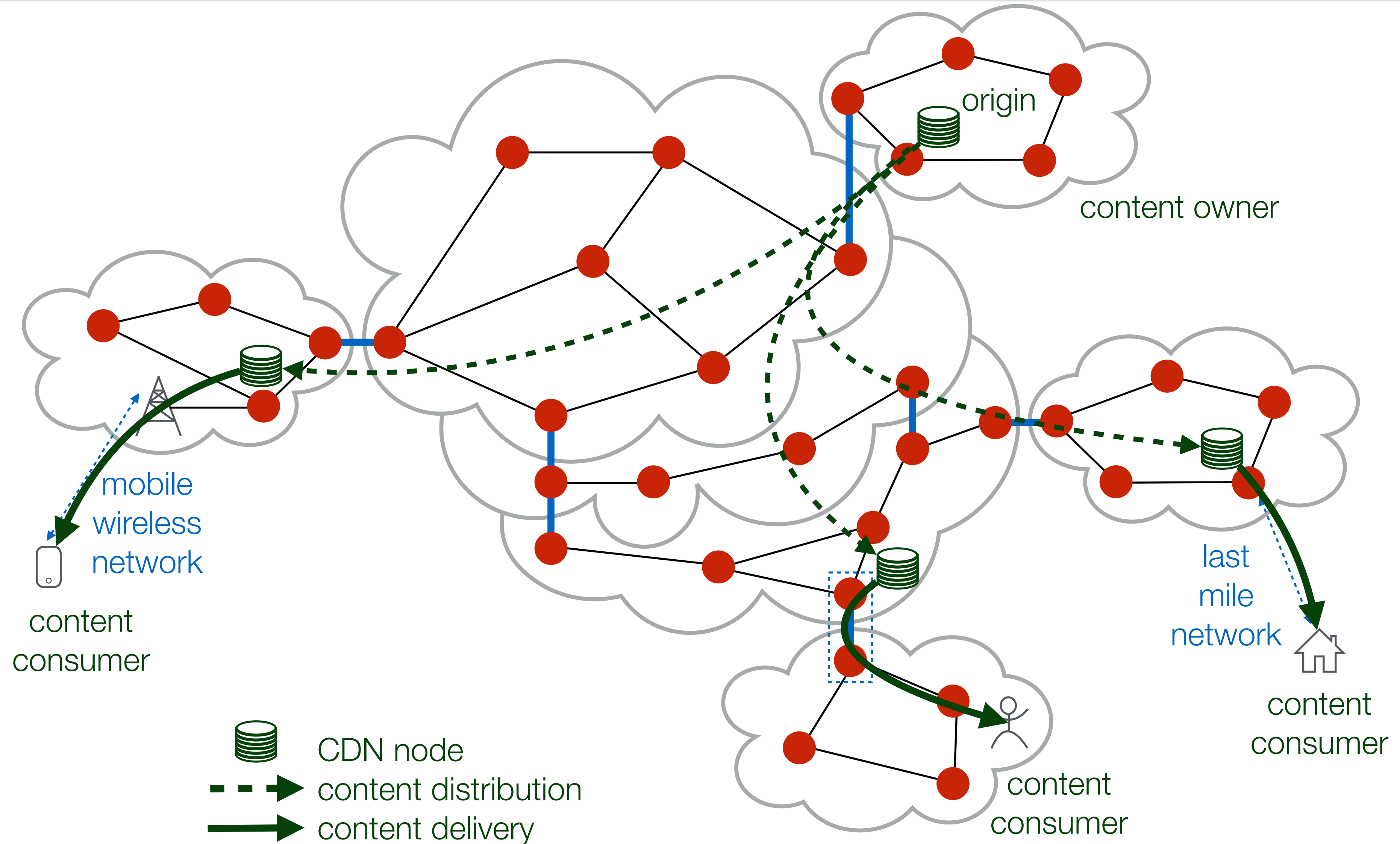
Thursday, April 11, 2024

Content Delivery Networks

▶ Observation:

- small subset of content is requested by a large subset of clients (e.g., just released episode of a popular video, static logo of a popular website, a breaking-news article). Popular content can be replicated and widely distributed to servers close to users.
- ▶ Domain name resolution (DNS) provides a mechanism through which user requests are pointed to the nearest server that holds the content.
- ▶ The resulting mechanism is called Content Delivery Networks (CDN). There are many commercial CDN providers

Content Delivery Networks



Video content delivery

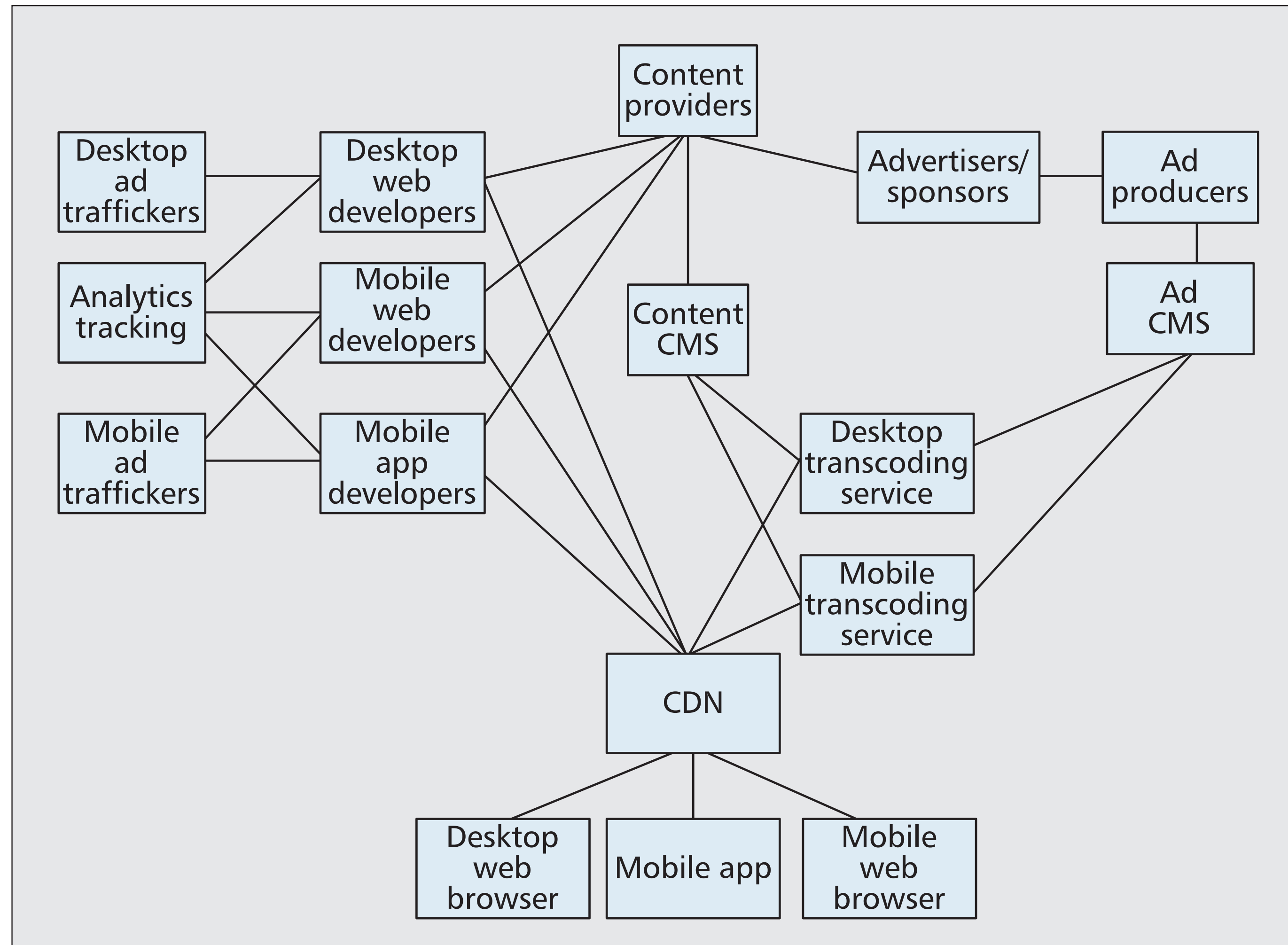


Figure 1. *Video delivery ecosystem.*

Mobile video delivery

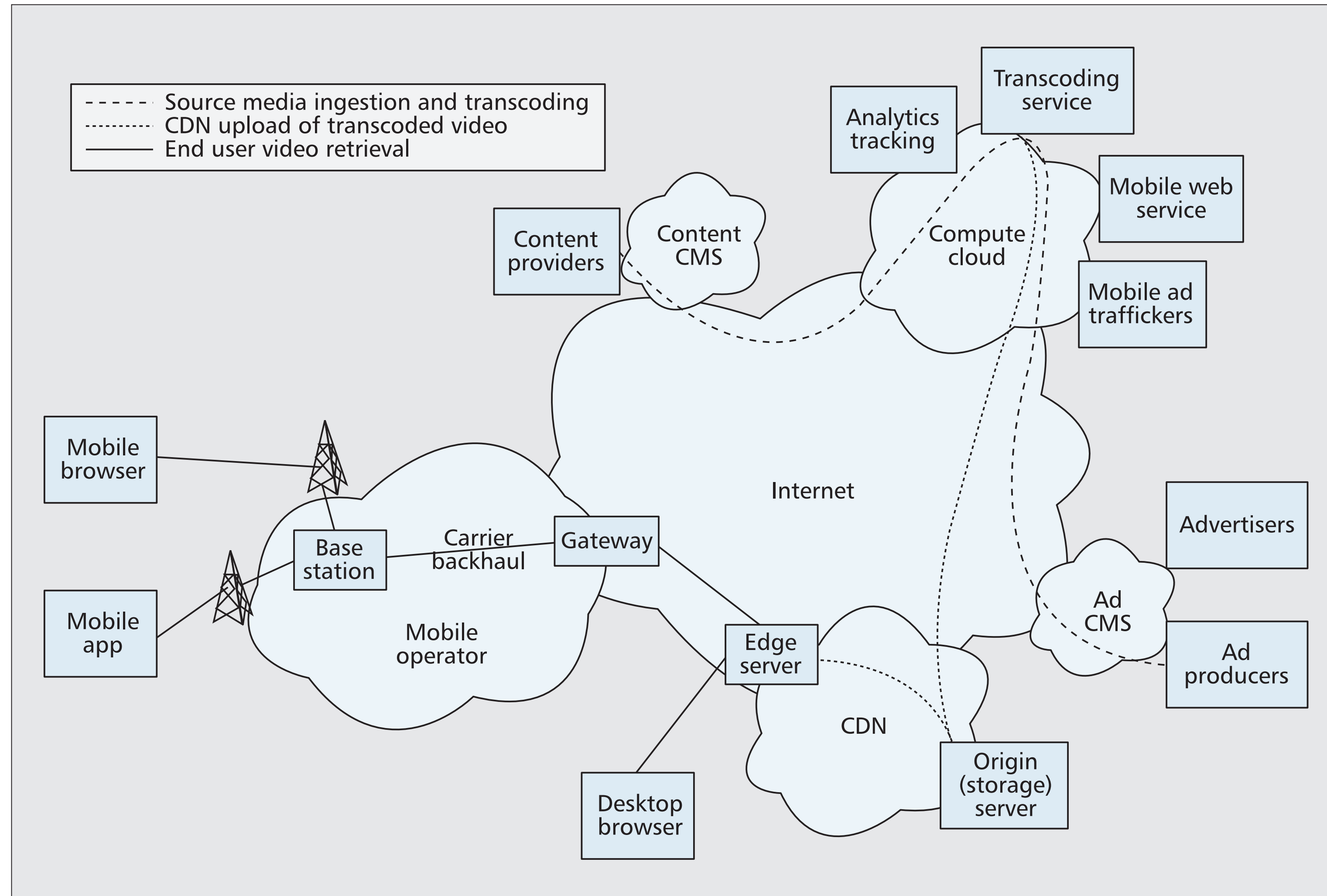



Figure 2. Mobile video delivery network.

Content Delivery Networks

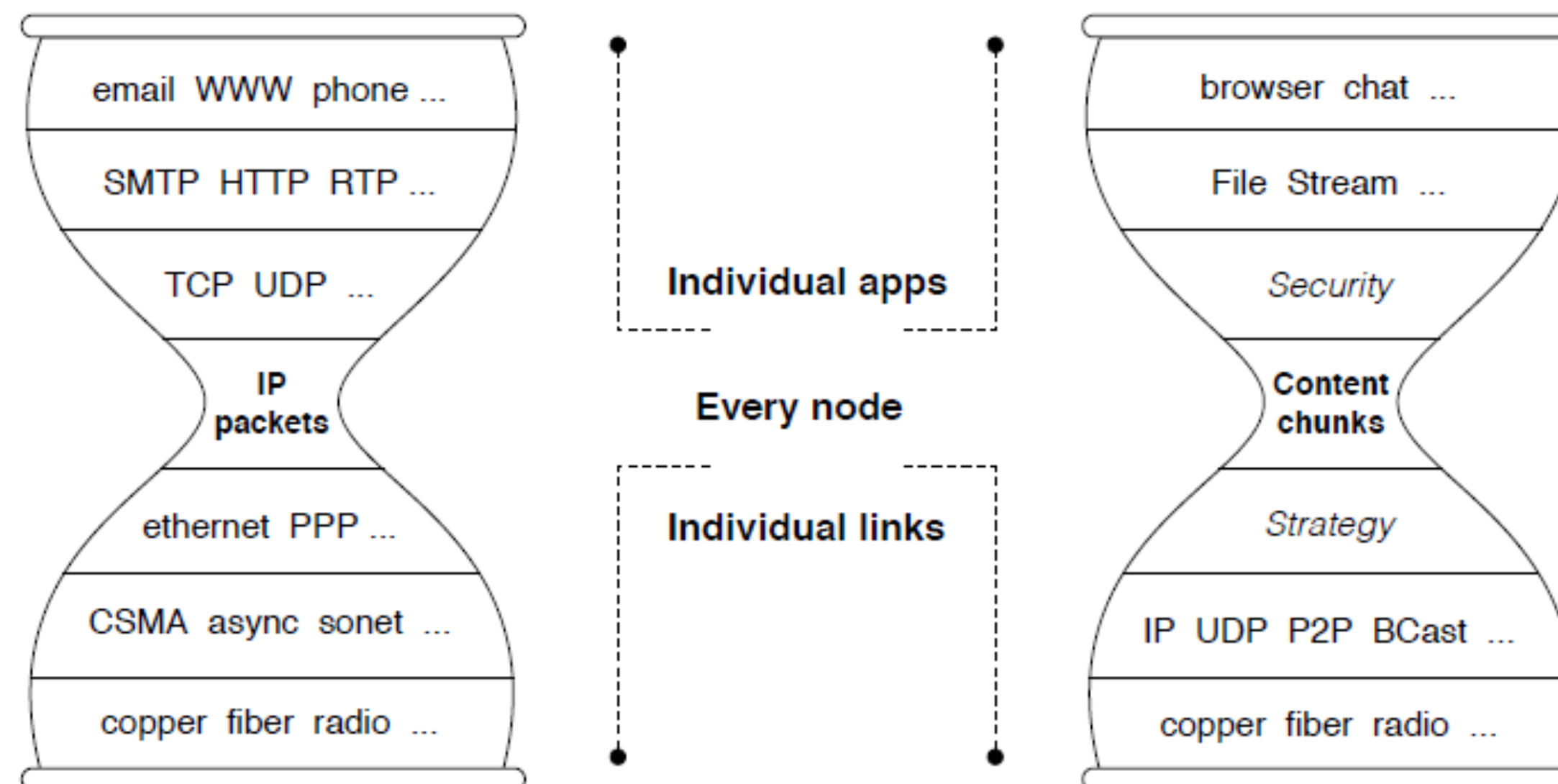
- ▶ Many solutions exist to reduce protocol latency, however, they cannot solve all problems, the **inherent propagation latency** of the network will always be an issue.
- ▶ In order to address this issue, we must **reduce the distance** between the server providing the information and the client requesting it.
- ▶ **Approach:** move the server closer to the client

Information Centric ~~Content Delivery~~ Networks

- ▶ Many solutions exist to reduce protocol latency, however, they cannot solve all problems, the **inherent propagation latency** of the network will always be an issue.
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Information Centric Networks

- ▶ One idea, many names:
 - **ICN** Information Centric Networks (IRTF ICNRRG)
 - **CCN** Content-Centric Networking (PARC)
 - **NDN** Named Data Networking
 - ...



Information Centric Networks

- ▶ The concept of a CDN can be further developed to a system where the **content identifier**, rather than its location (URL), **is used to retrieve it**.
- ▶ Separating content from its location allows so called **Information Centric Networks** (ICNs) to make demand-driven decisions on:
 - **creating copies** of the content, and
 - the **locations** of the copies that minimize the access latency for the users