Content DElivery Network (CDN)

What is CDN

Definition:- A content delivery network or content distribution network (CDN) is a globally distributed network of proxy servers deployed in multiple data centers.

Goal:- The goal of a CDN is to serve content to end-users with high availability and high performance

CDNs serve a large fraction of the Internet content today, including web objects (text, graphics and scripts), downloadable objects (media files, software, documents), applications (e-commerce, portals), live streaming media, on-demand streaming media, and social networks.

Explanation

The rapid growth of streaming video traffic uses large capital expenditures by broadband providers in order to meet this demand and to retain subscribers by delivering a sufficiently good quality of experience.

To address this, telecommunications service providers (TSPs) have begun to launch their own content delivery networks as a means to lessen the demands on the network backbone and to reduce infrastructure investments.

Single Server Distribution Model
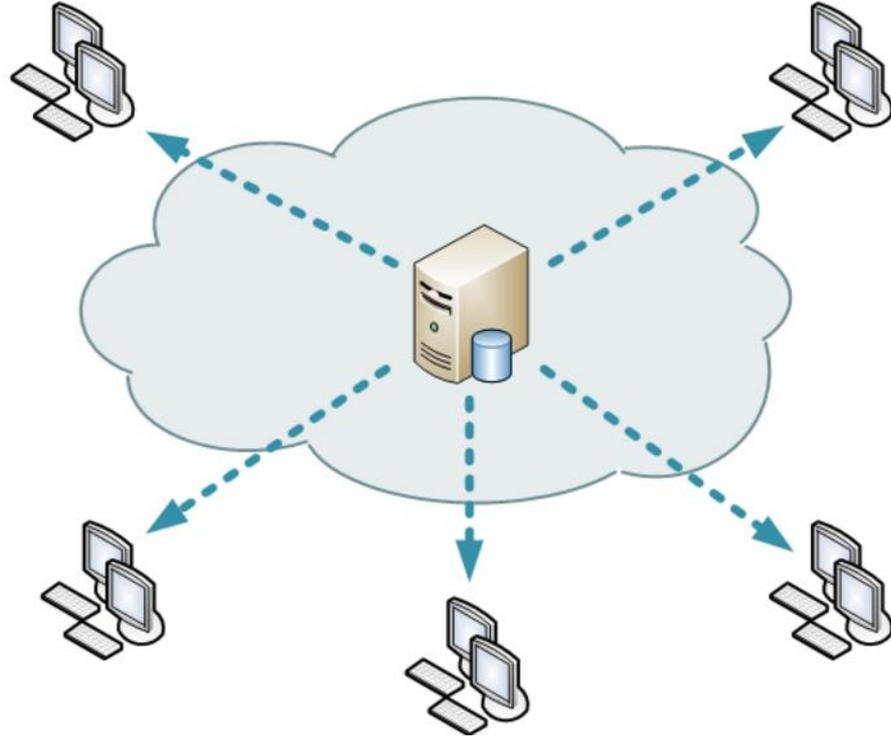
CDN SCHEME of DISTRIBUTION
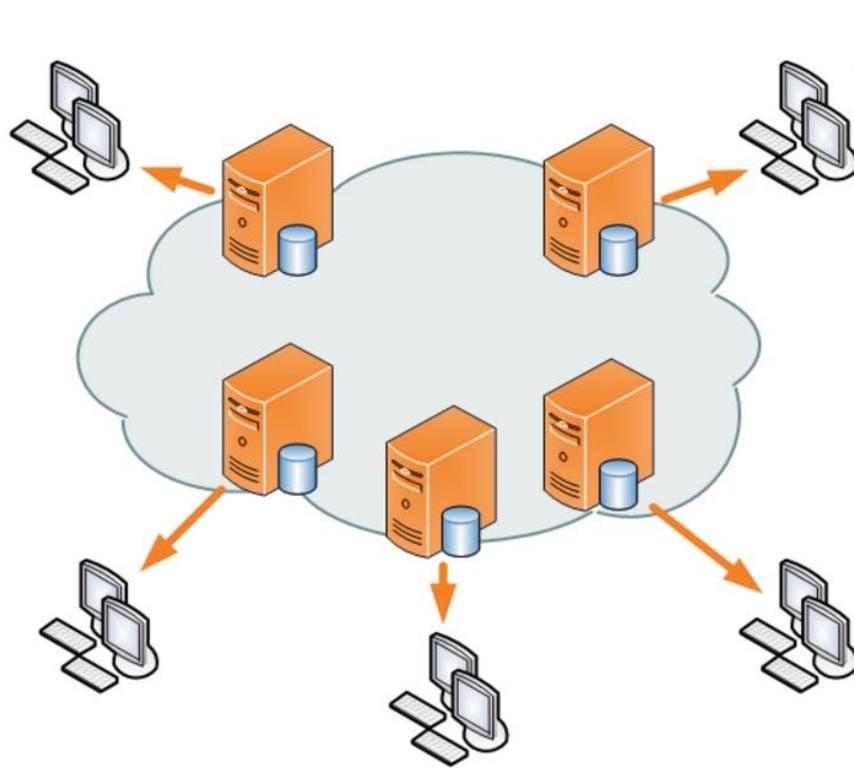
HOW A CDN WORKS?

To minimize the distance between the visitors and your website's server, a CDN stores a cached version of its content in multiple geographical locations (a.k.a., points of presence, or PoPs). Each PoP contains a number of caching servers responsible for content delivery to visitors within its proximity.
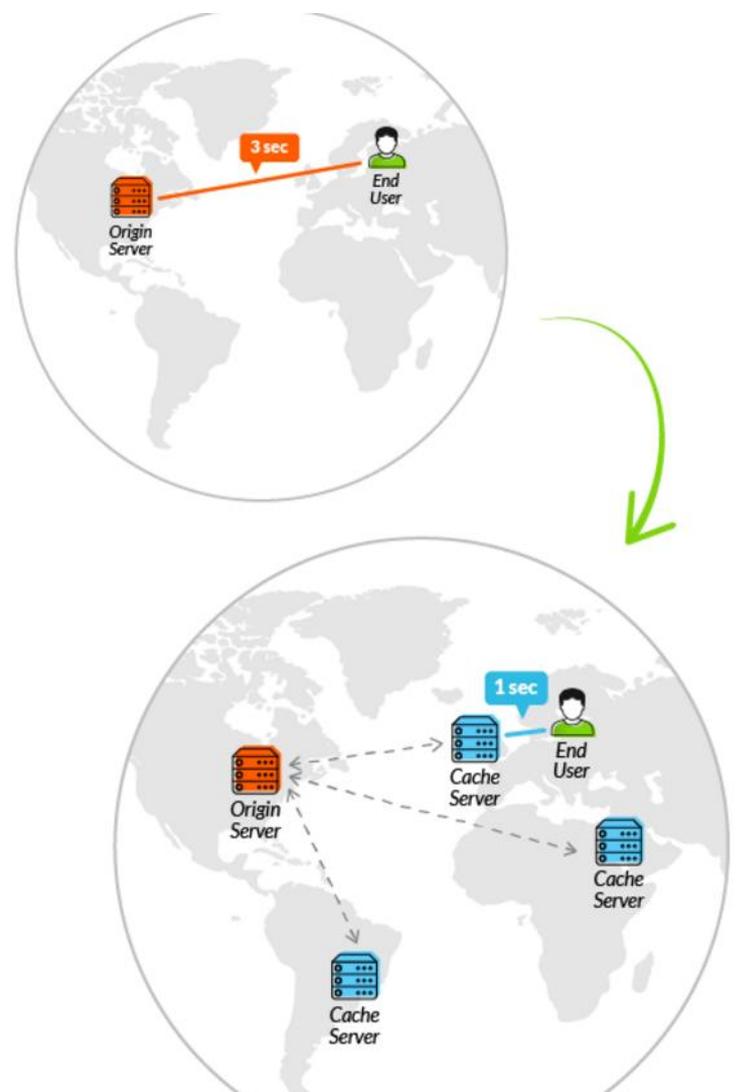
HOW A CDN WORKS (CONTD...)

In essence, CDN puts your content in many places at once, providing superior coverage to your users. For example, when someone in London accesses your US-hosted website, it is done through a local UK PoP. This is much quicker than having the visitor's requests, and your responses, travel the full width of the Atlantic and back.**This is how a CDN works in a nutshell**
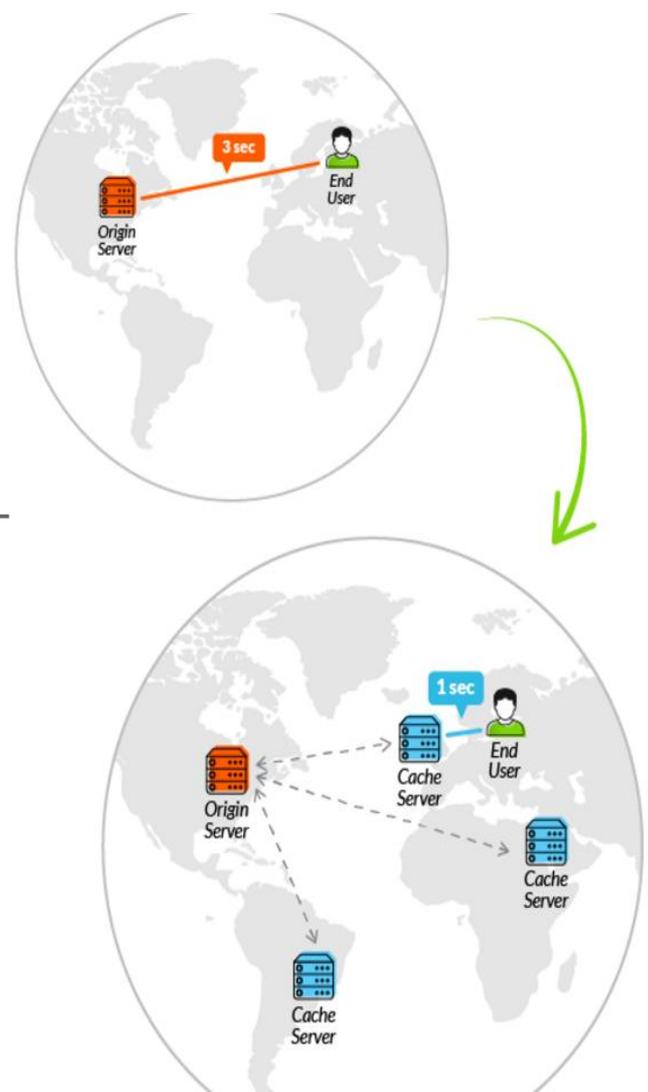
Who uses CDN

CDN usage a popular choice in the following sectors:

→ Advertising → Media and entertainment

→ Online gaming → E-commerce

→ Mobile → Healthcare

→ Education → Government

CDN BUILDING BLOCKS

PoPs
(Points of Presence)

CDN PoPs (Points of Presence) are strategically located data centers responsible for communicating with users in their geographic vicinity. Their main function is to reduce round trip time by bringing the content closer to the website's visitor. Each CDN PoP typically contains numerous caching servers.
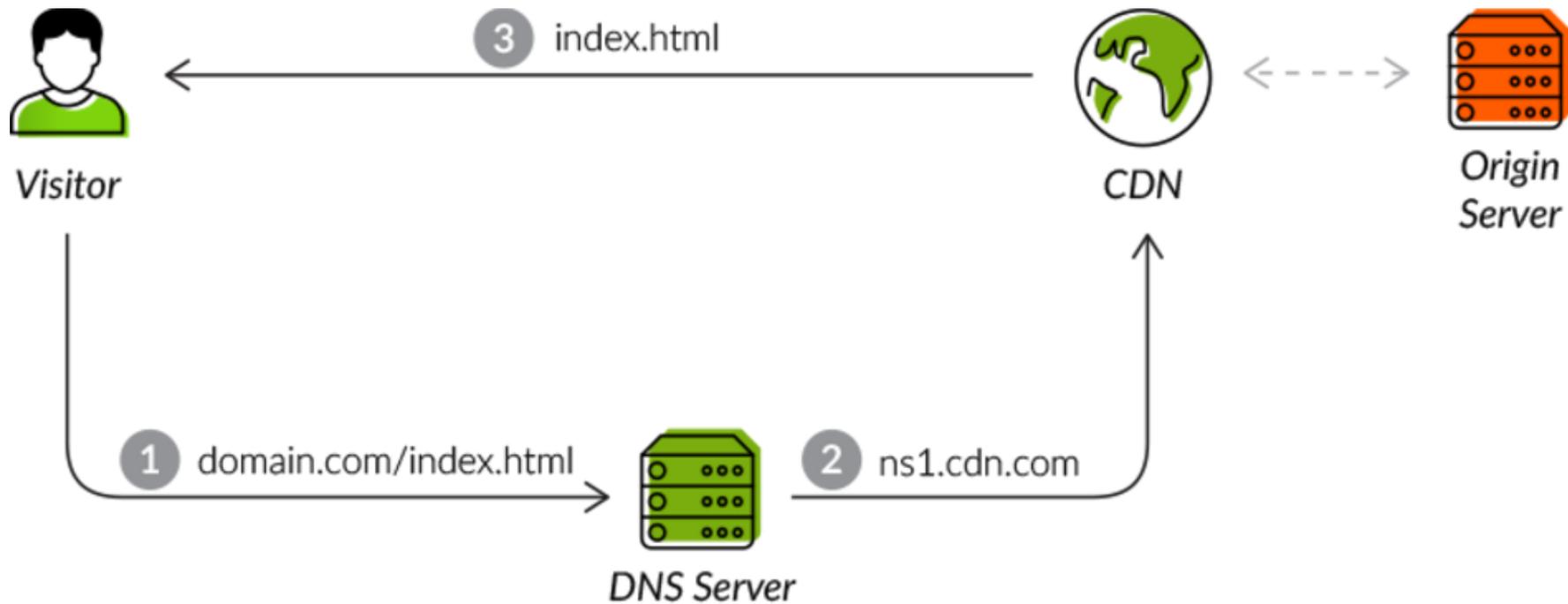
Caching Servers

Caching servers are responsible for the storage and delivery of cached files. Their main function is to accelerate website load times and reduce bandwidth consumption. Each CDN caching server typically holds multiple storage drives and high amounts of RAM resources.

SSD/HDD + RAM

Inside CDN caching servers, cached files are stored on solid-state and hard-disk drives (SSD and HDD) or in random-access memory (RAM), with the more commonly-used files hosted on the more speedy mediums. Being the fastest of the three, RAM is typically used to store the most frequently-accessed items.

Visitor

③ index.html

CDN

Origin Server

① domain.com/index.html

DNS Server

② ns1.cdn.com

EVOLUTION

| 1997 | 2001 | 2010 | 2015 |

1st Gen
Static CDN

2nd Gen
Dynamic CDN

3rd Gen
Multi-Purpose CDN

EVOLUTION (CONTD..)

1st Gen *Static CDN*	2nd Gen *Dynamic CDN*	3rd Gen *Multi-Purpose CDN*
Content served Static HTML and downloadable files	Content served Static and dynamic content, including rich media	Content served Static and dynamic content, including mobile and rich media
Caching method Origin push	Caching method Many are origin pull	Caching method Most are origin pull
Network topology Scattered	Network topology Consolidated	Network topology Highly consolidated
Agenda Performance	Agenda Performance and availability	Agenda Security, performance and availability