

CONTENTS LOCALIZATION INITIATIVES TO GET BETTER USER EXPERIENCE



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Acknowledgement

I have made this presentation with the help of different source like (website, presentation slide).

How Users are Connected to the Internet?

Interconnection:

- Is the mutual exchange of traffic across separate networks by contractual agreement between different Internet service providers (ISPs).

Hierarchy of Interconnection

- **Transit**

- Is a default path for any traffic that comes and goes from outside of the network.

- **Peering**

- Peering is the direct interconnection between One network and another network to support the exchange of traffic.

- Types of Peering:

- **Private Peering:**

- Private peering allows a network to connect directly with Google over a dedicated physical link known as a private network interconnect (PNI)

- **Public Peering**

- Public peering allows a network to connect with Google and other networks over a shared fabric known as an internet exchange (IX)

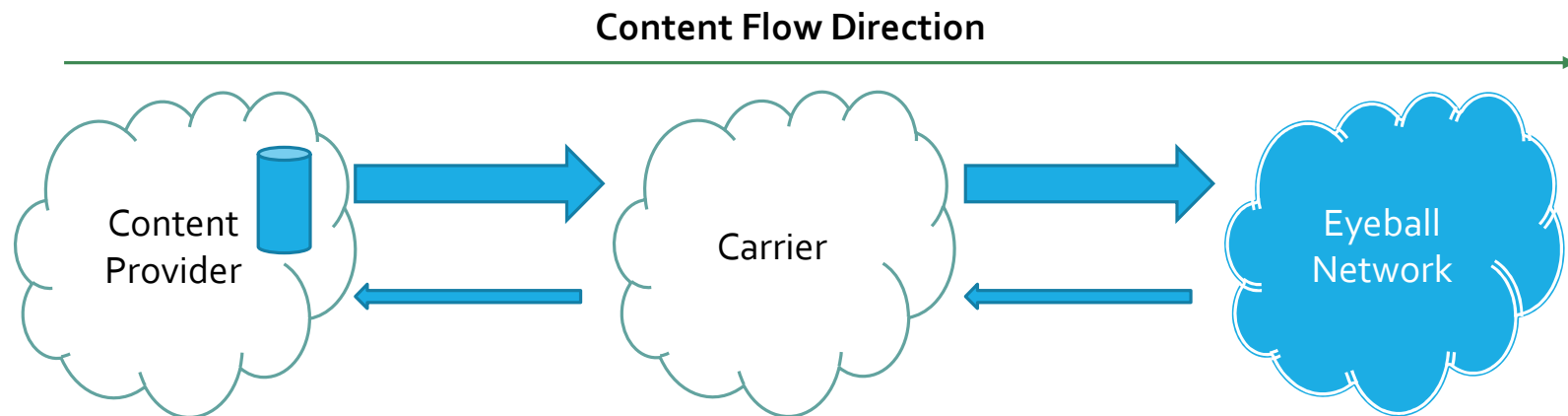
Different Types of Networks

Networks come in all shapes and sizes, and they all have different purposes.

- Eyeball Networks
- Content Networks
- Carrier Networks

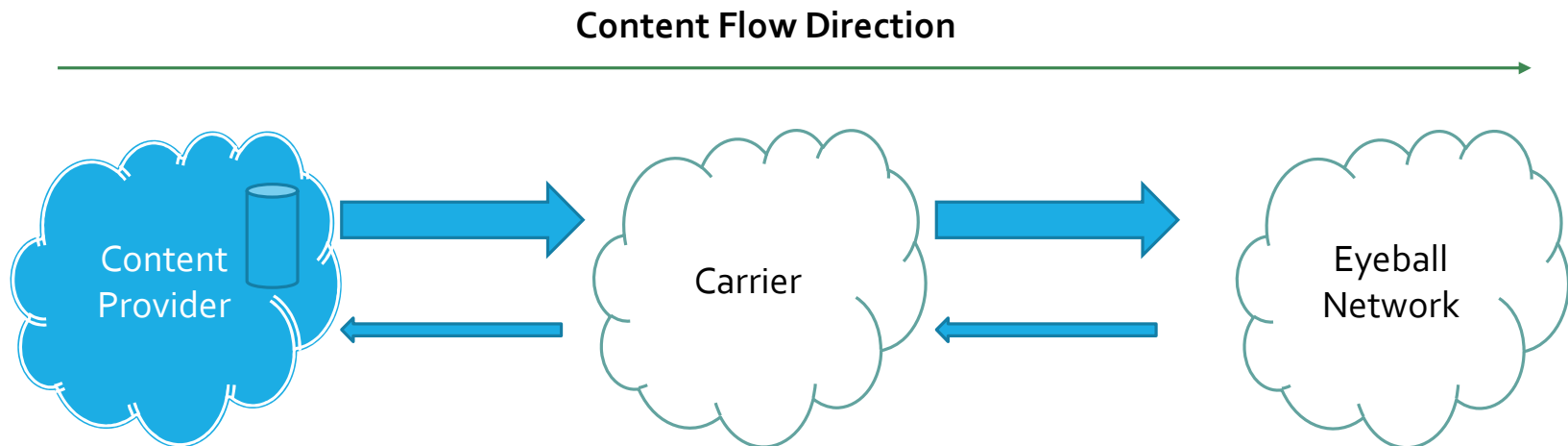
Eyeball Networks

- ISP that provides internet connectivity to end-users – The ISP may peer with Google (which is a content provider) where the end users consume content serviced/provided by Google, in this case the ISP is just an “eyeball network” providing a means for the end user to reach Google provided actual content.
- However, it is to be noted that **not** all ISPs are eyeball networks, they can be pure transit providers. With Tier 2 networks and lower, they can serve as both an eyeball network and a transit provider, depending on their business model.



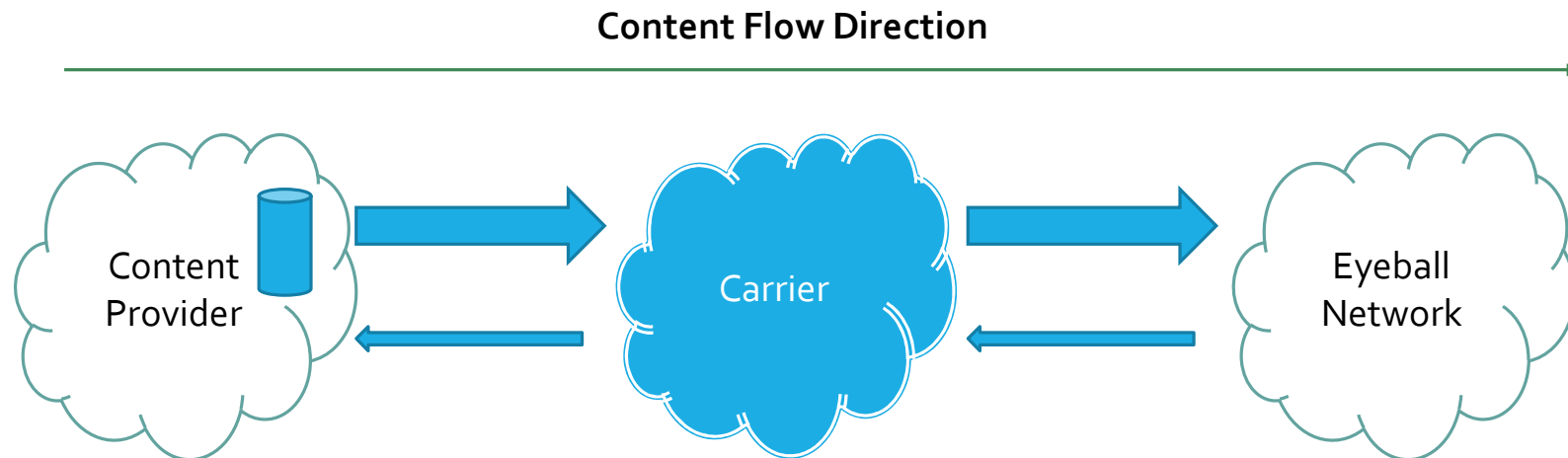
Content Networks

Content networks are the reverse of the eyeball networks: these networks originate the majority of traffic, destined to be consumed by end-users.



Carrier Networks

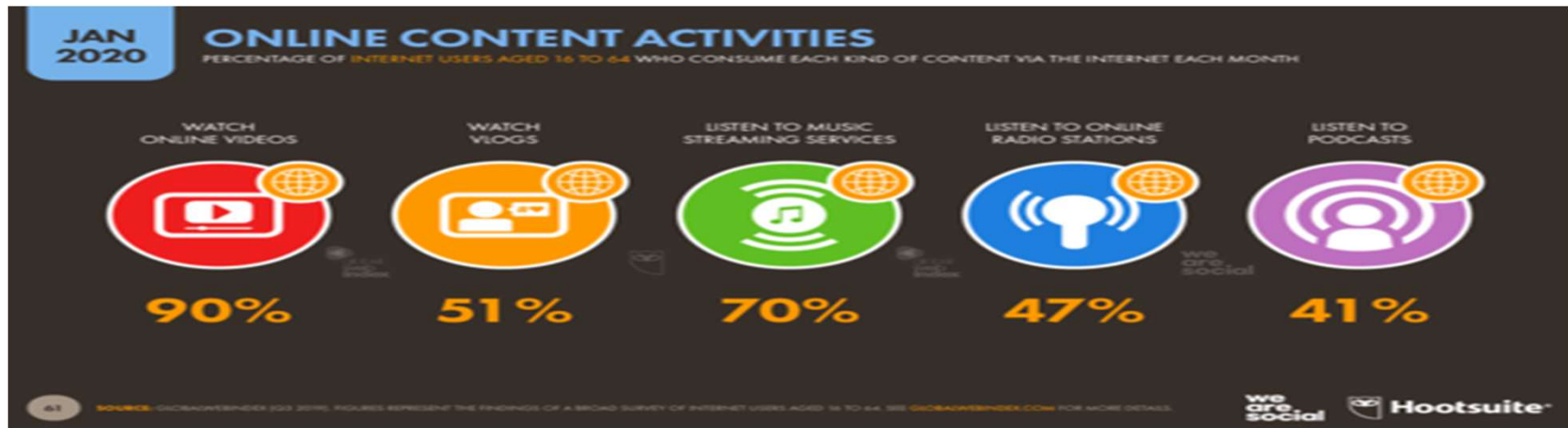
These networks are the providers of all the other networks: in essence, they transport packets from content networks to eyeball networks across the globe and are “the backbone of the internet.”



Why Do People Access the Internet?

- To Access The Internet Contents
- To Communicate Each Other
- To Socialize
- For Entertainment
- Web Transactions

What is contents? in internet



Internet Content refers to the information that you find on the internet. It can be anything from a picture, video, or even text.

There are many other kinds of content such as audio, live streams, games, software, and more.

Where Contents are Available?

- Contents are available in different location all over the world.
- So, all contents sources are not same.
- And Contents Path may vary as per their origin and delivering location.

How Contents are Serving to the Users

By using the following:

- Global Internet
- Private Network Interconnection (PNI)
- Content Delivery Network (CDN) Edge Server.
- Local Cache on Premises.

What Dimensions Matter? For Better User Experience

The three well-known dimensions:

- **Cost:**
 - Generally, a transit interconnect is more expensive than peering on a cost per Mbps basis.
- **Performance:**
 - Performance relies among others on the number of hops to reach a specific destination.
 - A direct peering connection allows for content to go directly from the content provider to the subscriber
- **Reliability:**
 - As a rule of thumb, the more available paths to choose from between a source and a destination, the more reliable the eventual service rendered between the two.
 - For example, if the primary path fails, a backup path is immediately available.

Best Practices for Contents Serving

Implement **Content Localization** to Delivery the Contents to the End User.

Contents Localization



Content Localization is the process or mechanism that optimizes the way in which data or content is accessed and delivered from the closest servers, data centers, and clouds to the requesting endpoint server.

This helps in optimizing the time taken and improving overall speed and performance.

Benefits of Contents Localization

- Contents Load within Short Possible Time.
- Improve Application Performance
- Reduce Database Cost
- Reduce the Load on the Backend
- Predictable Performance
- Eliminate Database Hotspots
- Increase Read Throughput (IOPS)

Initiatives for Content Localization

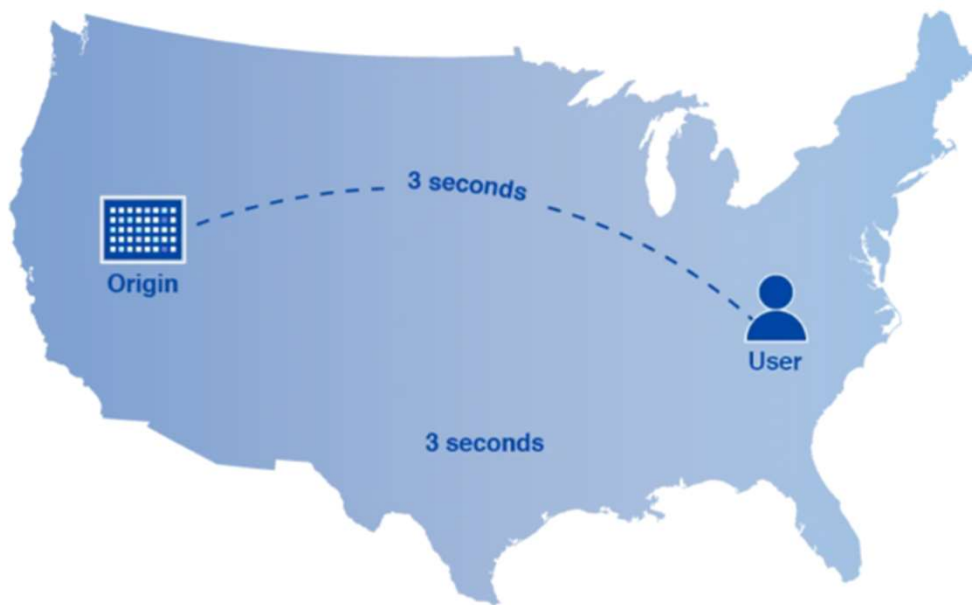


- Content Delivery Network (CDN) Caching
- Implement Cache Server into Own Premises.

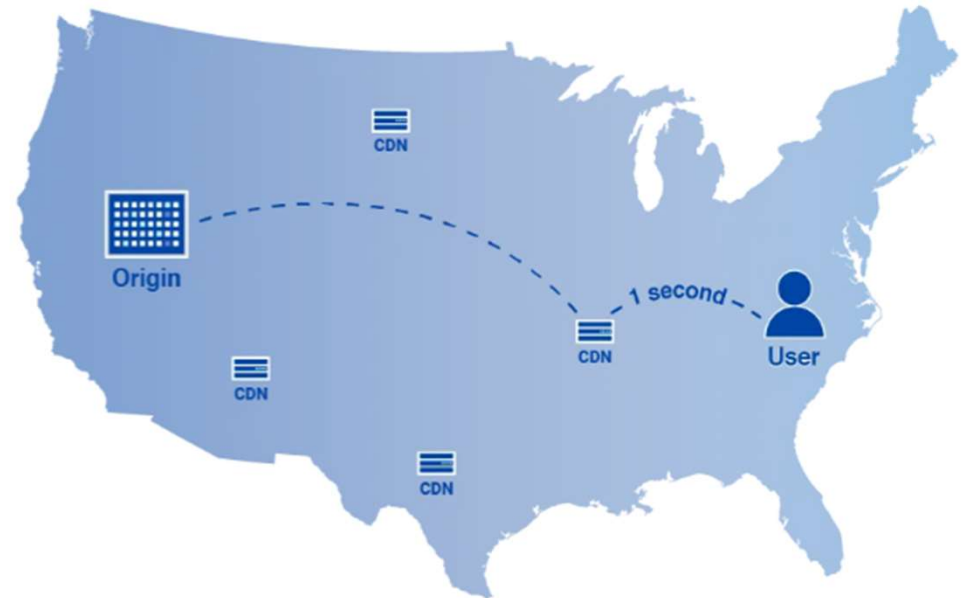
CDN, the latest in edge delivery

- A Content Delivery Network (CDN) refers to a geographically distributed group of servers which work together to provide fast delivery of Internet content.
- A CDN allows for the quick transfer of assets needed for loading Internet content including HTML pages, images and videos.
- The popularity of CDN services continues to grow, and today the majority of web traffic is served through CDNs, including traffic from major sites like Facebook, Netflix, and Amazon.

Contents Loading Procedure



Resources are downloaded from the origin server



Resources are downloaded from the nearest CDN edge

CDN Origin Server and Edge Server

CDNs place Data Centers at strategic locations across the globe, enhance security, and are designed to survive various types of failures and Internet congestion.

CDN Origin Server:

An origin server can take on all the responsibility of serving up the content for an internet property such as a website, provided that the traffic does not extend beyond what the server is capable of processing and latency is not a primary concern.

CDN Edge Server:

A CDN edge server is to store content as close as possible to a requesting client machine, thereby reducing latency and improving page load times.

CDN, How is it beneficial to you?

- Static content will be served from the nearest server, your bandwidth requirements will be certainly decreased.
- Content delivery network provide faster page loads and performance with redundancy.
- CDN copies your static contents to geographically dispersed servers, hence your website load is divided among them. Ultimately, your website is highly available to your visitors.
- CDN service is probably primary step to improve your SEO strategies and lift Google page rankings. Because, poor and slow loading websites will face more challenges to rank good in search engines.

Major Challenges For CDN

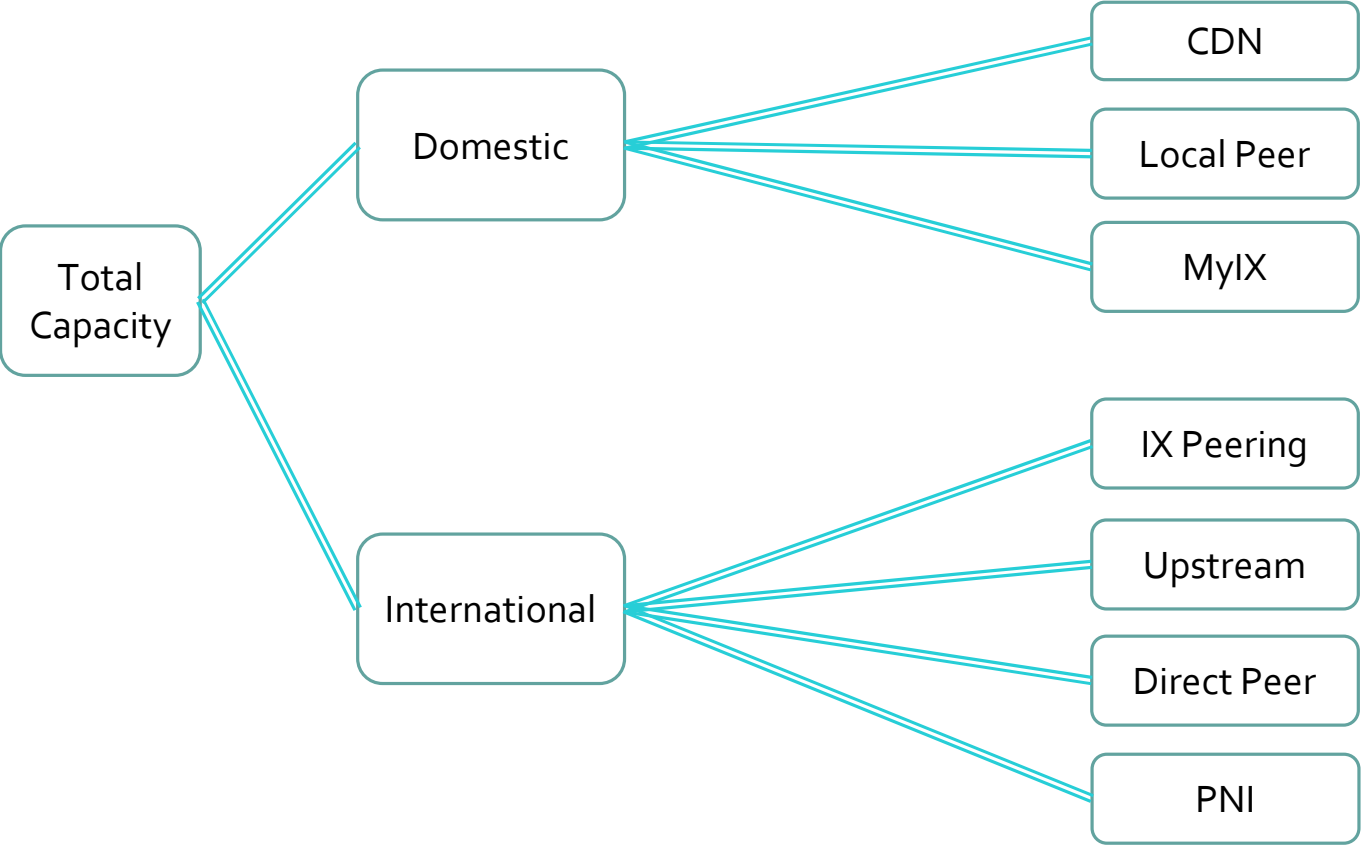
- Technical Understanding (Proper tricks)
- Proper Planning for Contents Delivery.
- Fulfill the CDN Providers requirements.
- Financial Capabilities New Hardware Cost and Maintenance Cost.

Considerations while choosing a CDN

While choosing a CDN, you will compare the services offered by several different content delivery network companies.

- How many PoPs does the **CDN provider** own and what is the strength of their overall infrastructure?
- Can the content delivery network handle all types of content and is it capable of meeting your specific requirements?
- Does the CDN technology offer advanced network security without hampering the speed? Is there a seamless integration between the two?
- How do the CDN pricing and customer support work?
- Does the CDN provider give you network statistics and analytics to understand speed, performance, and real-time network latency?

Peering Category (at a glance)

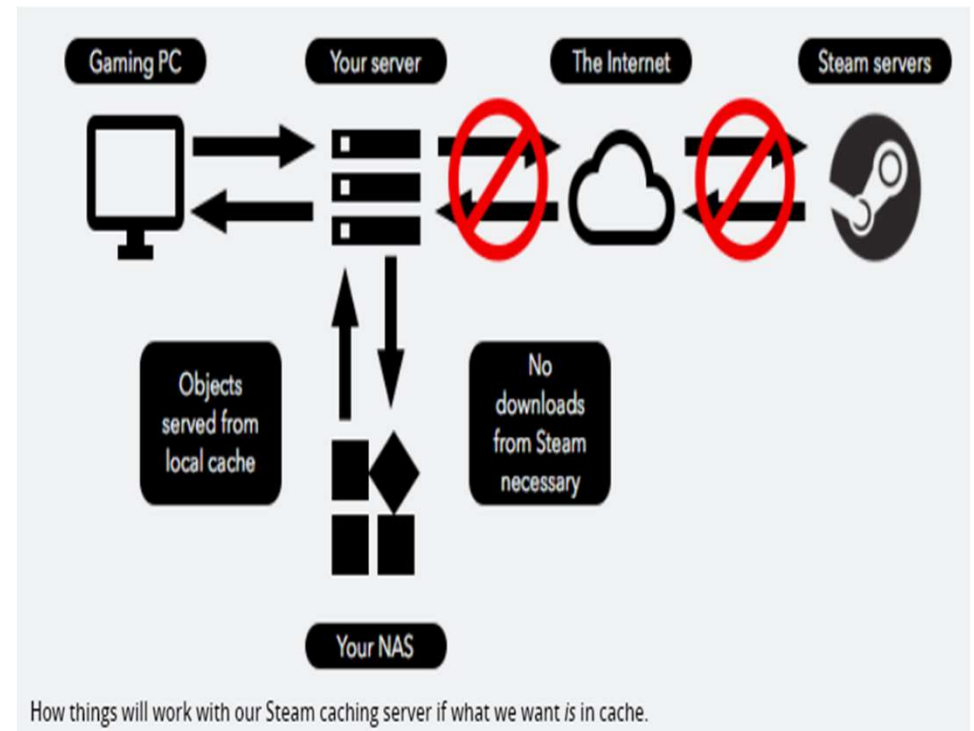
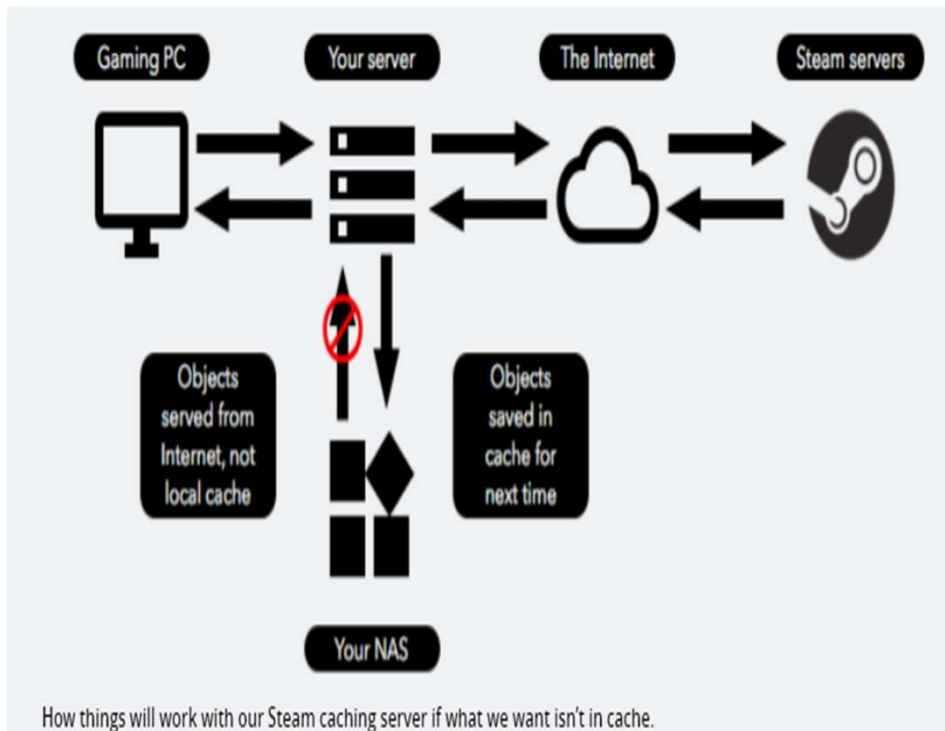


On Premises Cache Server Implementation

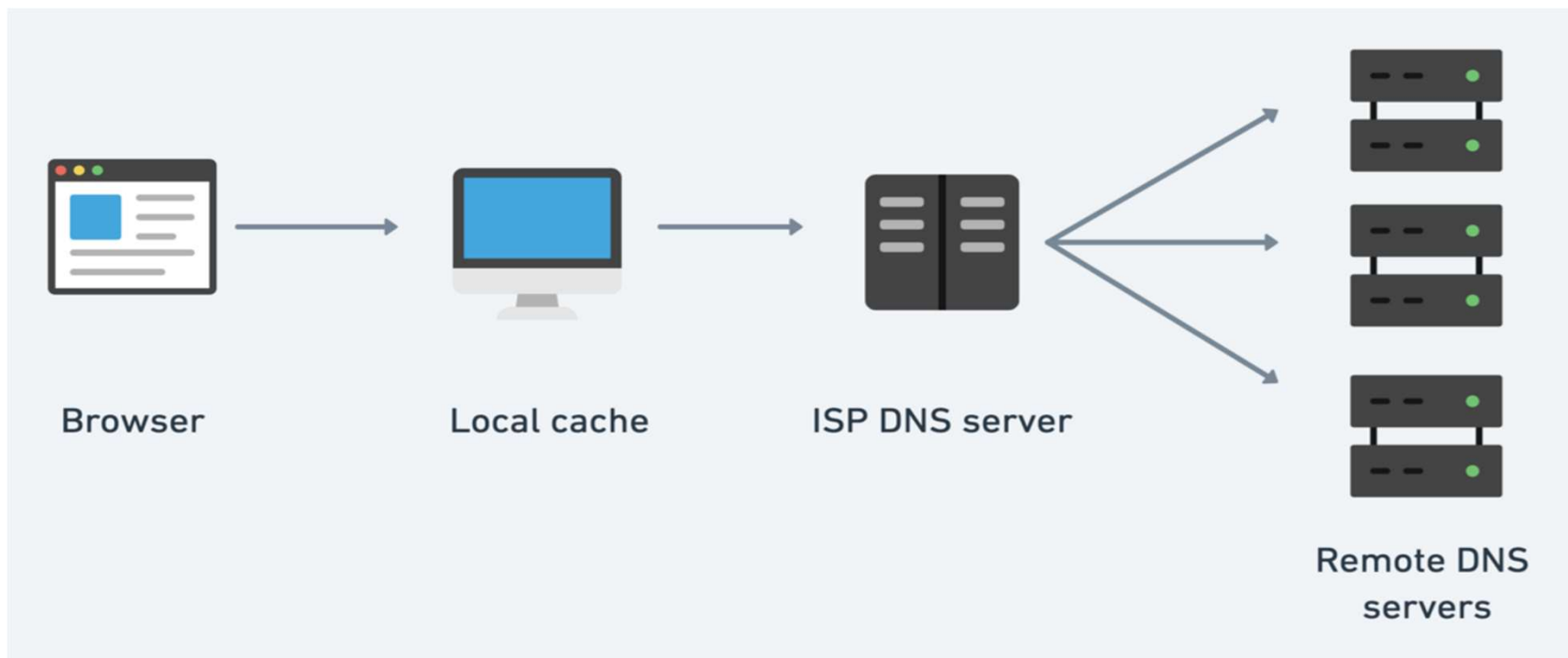
Various Use Cases

- Game Caching
- Web Caching
- General Cache
- Integrated Cache
- Database Caching
- Session Management
- Domain Name System (DNS) Caching
- Application Programming Interfaces (APIs)
- Caching for Hybrid Environments

local Steam caching server: How this works



DNS Caching and How It Makes Your Internet Better



Guidelines and Best Practices

- Caching is a long and complex topic, but the following rules are a good start:
 - Keep DNS resolution on-premises
 - Configure Access Control Lists (ACLs)
 - Deploy Anycast DNS Server
 - Build a local Stream Caching Server

Recommendation for Content Localization

Performance optimization is an ongoing exercise. Customers are becoming more demanding, the internet is becoming more complex, and delivery platforms are becoming increasingly specialized.

So, we can make the focus on **Contents Localization** as soon as possible to get the better

Questions are welcome & encouraged

- This is for you, be sure you get the most out of it

