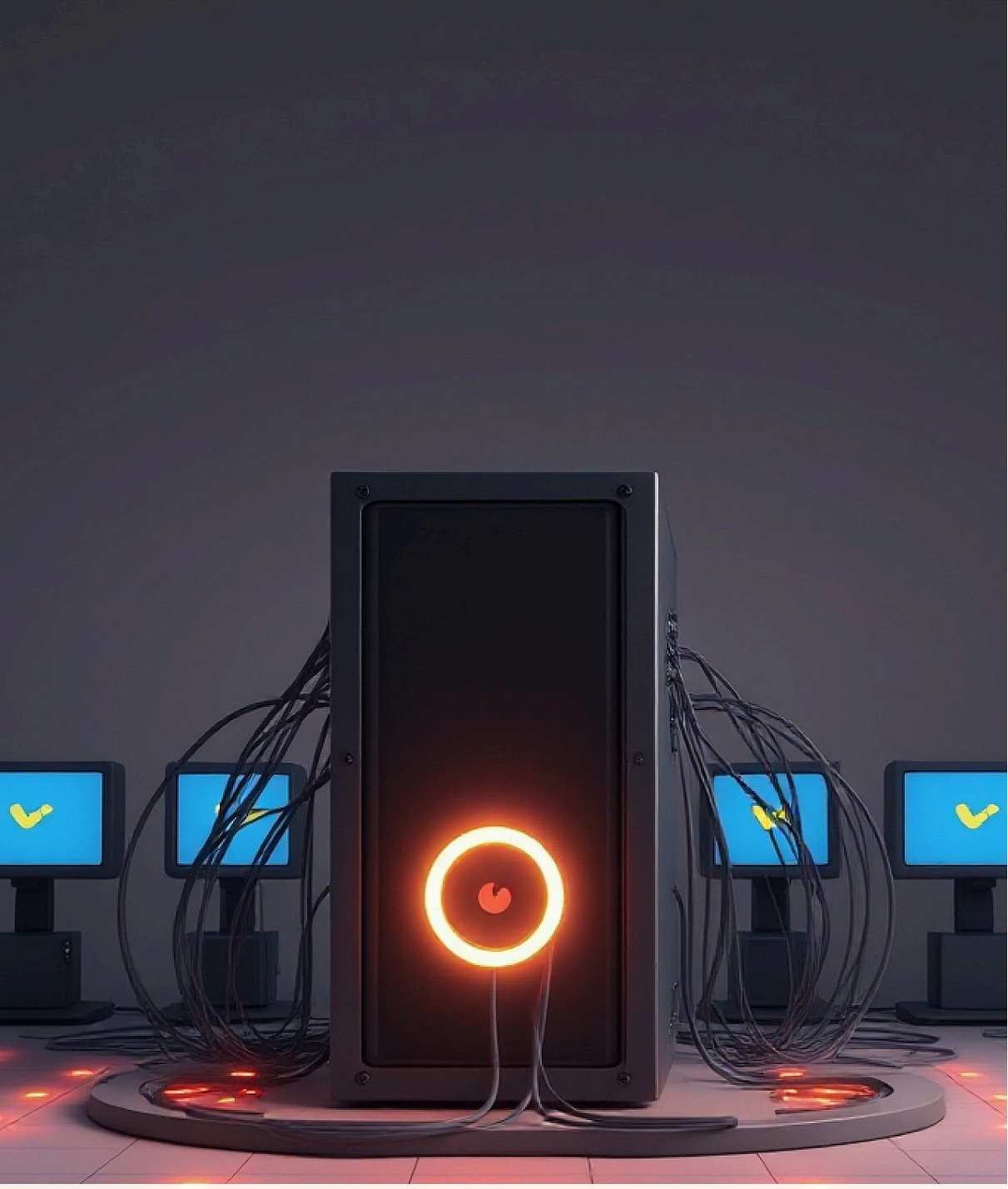

What is a content delivery network for?
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A content delivery network (CDN) is a system that keeps copies of files in many places and serves each user from a nearby one. The main purpose is to make websites faster and to reduce the load on the main server. For example, when you load a website with many images, a CDN can deliver those images from a location close to you.



Picture a website that stores all its files on one main server. This server holds the images, videos, and other content that make up the site. Every user who visits the site must connect to this one server, no matter where they are in the world. The server is the single source for all the website's files.



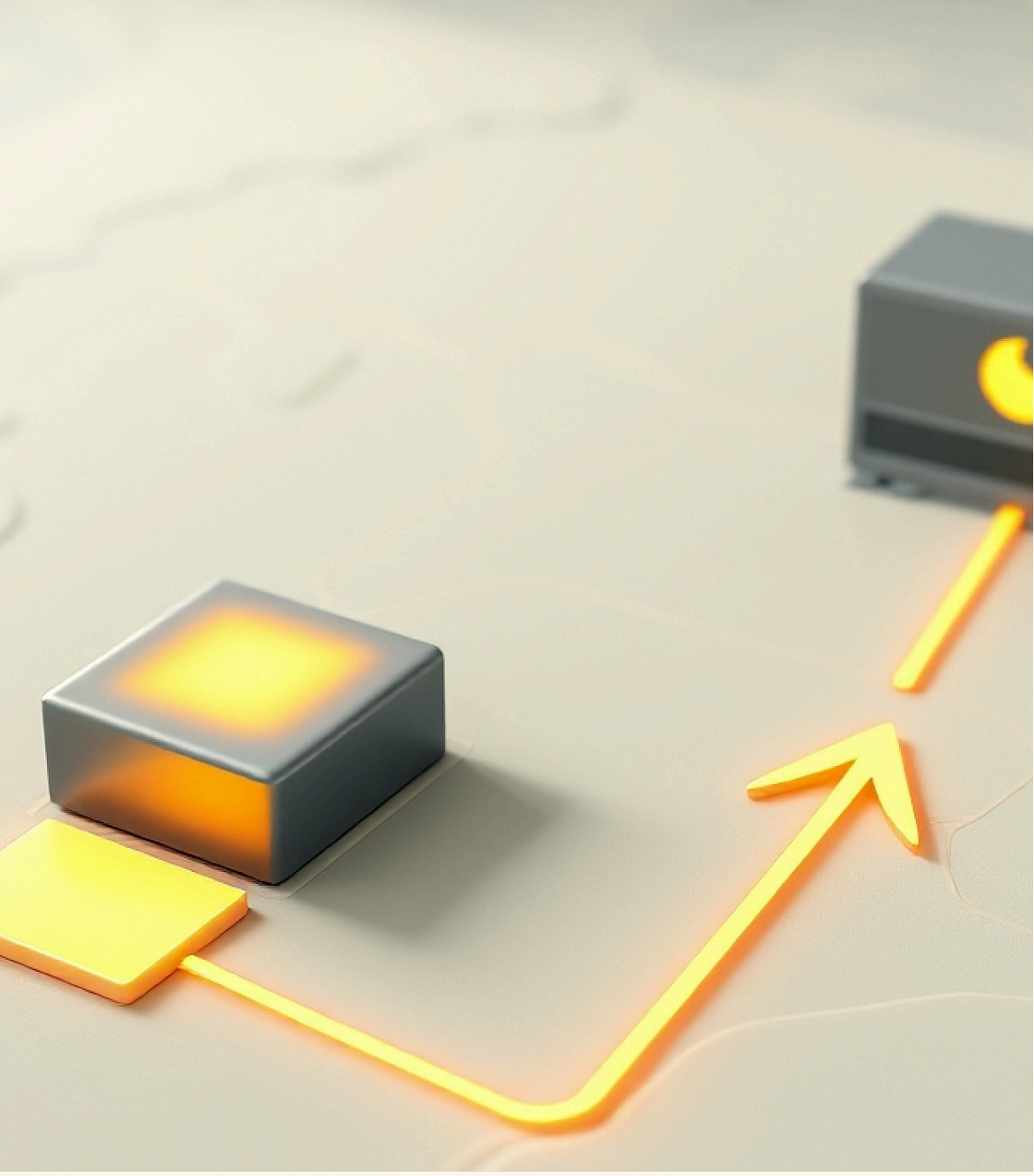
When a user is far from the main server, the data has to travel a long distance. This travel time creates a delay, which is called latency. The farther away you are, the longer each file takes to arrive. For example, a user in Australia accessing a server in the United States will experience more latency than a user in the same country.



If many users request files from the main server at the same time, the server can become overloaded. This load can slow down responses for everyone. The server has limited capacity to handle simultaneous requests. For instance, during a popular event, a website might receive thousands of requests per second, straining the single server.



A content delivery network solves these problems by placing copies of certain files at multiple geographic points. These points are often called edge servers. Each copy is stored closer to some users, so they don't have to travel to the main server. For example, a CDN might have copies of a website's images in Europe, Asia, and the Americas.



When you request a file, the CDN directs your request to the nearest copy. This means the file travels a shorter distance to reach you. Instead of going all the way to the main server, you get the file from a nearby edge server. For example, a user in Germany might get an image from a server in Frankfurt rather than one in New York.



Because the file comes from a nearby location, the latency is lower. You wait less time for the file to load. This makes websites feel faster and more responsive. For example, a video might start playing almost instantly instead of buffering for several seconds.



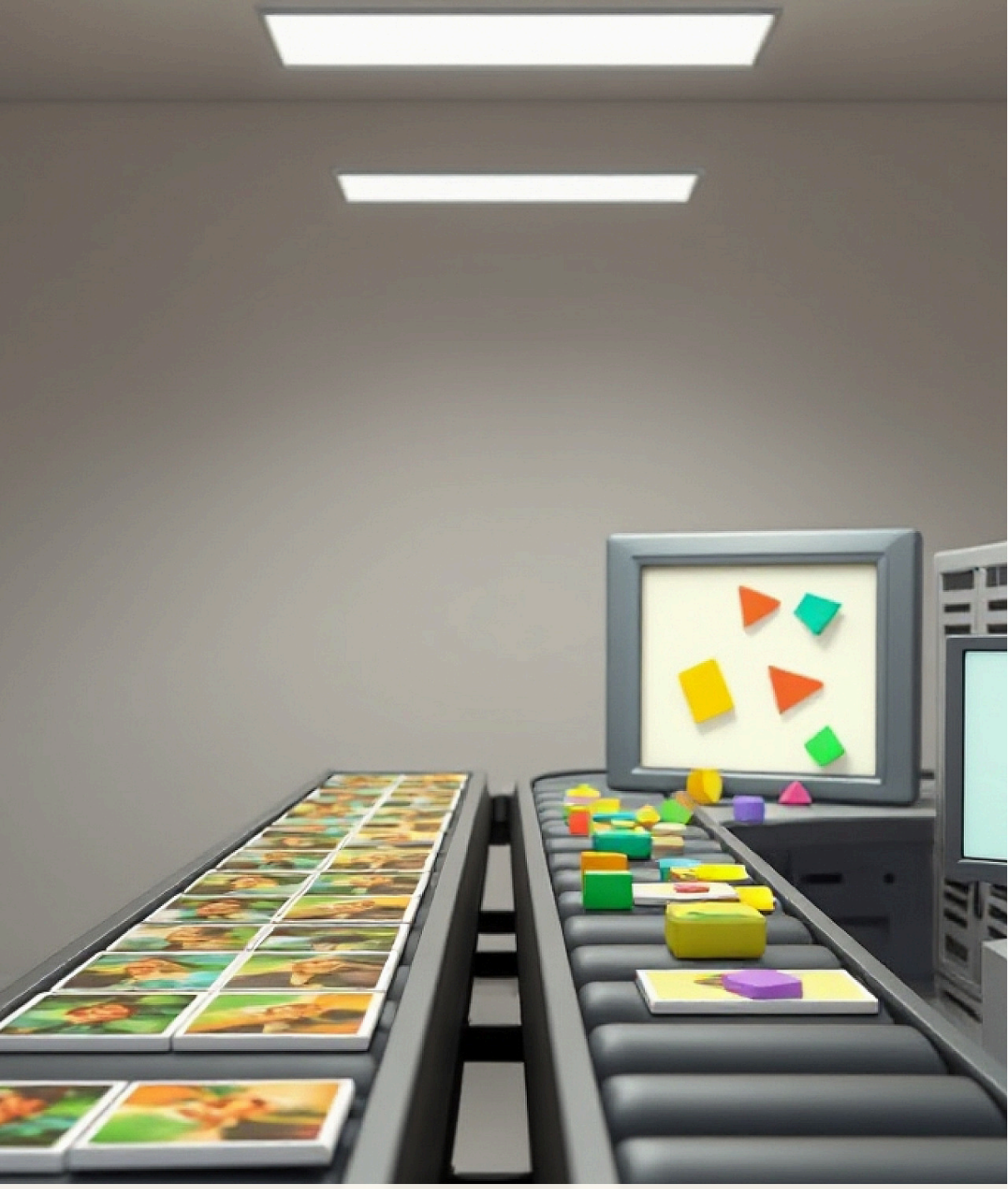
The main server no longer has to handle every request itself. Many requests are served by the copies, which reduces the load on the main server. This means the main server can run more efficiently and handle other tasks. For example, if a website has a surge in traffic, the CDN absorbs most of it, keeping the main server stable.



Consider a website that has many images. These images can be copied to servers in different countries. When you visit the site, the images are sent from a server in your country or a nearby one. For example, a user in Japan gets images from a server in Tokyo, while a user in Brazil gets them from a server in São Paulo.



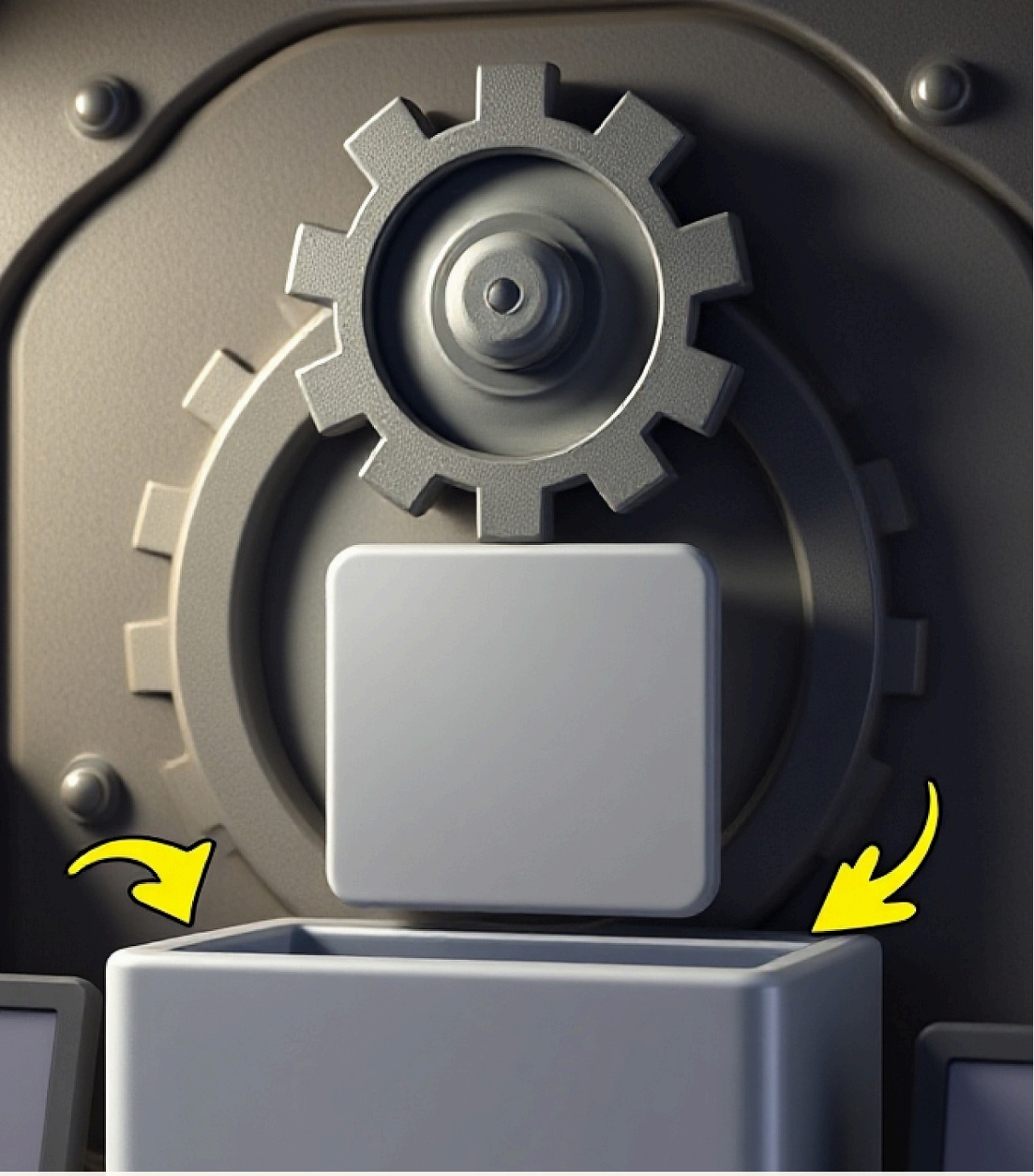
The CDN copies files that many users request, such as images, videos, and style sheets. These are static files that don't change often. They are good candidates for caching because they can be reused by many users. For example, a logo image is the same for all users, so it can be copied to many locations.



Not all content can be cached in the same way. Some content is dynamic and changes for each user. For example, a personalized homepage or a shopping cart cannot be stored as a static copy. These require different handling, often involving the main server.



Personal data, such as user profiles or messages, should not be copied to many locations. This could risk privacy and security. Extra rules are needed to ensure that personal data is handled securely and only served from appropriate servers. For example, a CDN might be configured to bypass caching for pages that contain personal information.



Frequently changing data, like live scores or stock prices, also needs special rules. If copies are stored, they can become out of date quickly. The CDN must know when to refresh the copies or avoid caching such data. For example, a news site might update its homepage every minute, so caching it for long would show stale content.



A common mistake is to think that a CDN copies all content in the same way. In reality, it treats different types of content differently. Static files are cached widely, while personal and fast-changing data require special handling. For example, you wouldn't want your bank account details to be stored on servers around the world.



Another mistake is to believe that a CDN replaces the main server. The main server still holds the original content and handles dynamic requests. The CDN only reduces latency and load by serving copies of static files. For example, when you log in, your request goes to the main server, not to a copy.



To sum up, a content delivery network serves copies of files from nearby points to reduce latency and the load on the main server. It works best for static content like images. Personal and frequently changing data need extra rules to ensure they are handled correctly. Remember that the CDN complements, but does not replace, the main server.