

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Based on information presently available, Advanced Coding Technologies LLC (“ACT”) contends that Defendant Google LLC (“Defendant” or “Google”) infringe Claims 1-5 and 7 (the “Asserted Claims”) of U.S. Patent No. 8,230,101 (the “’101 Patent”) through the Accused Products which are manufactured, sold, offered for sale, and/or used by Google.

Representativeness: Each Accused Product that performs network content delivery, including Defendant’s’ Google Cloud Content Delivery Network, and any Google device that utilizes Google Cloud Content Delivery Network is representative of other Accused Products for the purposes of infringement of the ’101 Patent. Based on publicly available information, ACT believes each Accused Product shares substantially the same structure and functionality with respect to the components which are relevant to infringement given that, among other things, the listed products all purport to support Google Cloud Content Delivery Network.

Google directly infringes each of the Asserted Claims by using, importing, testing, selling, and/or offering for sale the Accused Products in violation of 35 U.S.C. § 271(a).

Google indirectly infringes the Asserted Claims in violation of 35 U.S.C. § 271(b) by inducing third parties, including its users and/or customers, to directly infringe through their operation and use of the Accused Products. Google has knowingly and intentionally induced this direct infringement by, *inter alia*, (i) selling, importing, or otherwise providing the Accused Products to third parties with the intent that the Accused Products will be operated and used in a manner that practices the Asserted Claim; and (ii) marketing and advertising the Accused Products. Google’s marketing and promotional materials for the Accused Products are found, for example, on Google’s website, and in App stores of operating systems for which the Accused Products are made available. For example, Google’s website offers customers instructions and/or manuals for the Accused Products that instruct customers to, among other things, use the accused functionality in the Accused Products. Google’s website also offers support to customers, including instruction to, among other things, use the Accused Products. On information and belief, Google knows that its actions will result in infringement of the Asserted Claims, or subjectively believes that there is a high probability that its actions will result in infringement of the Asserted Claims but has taken deliberate actions to avoid learning these facts.

Plaintiff contends that the Accused Products perform each step of the claimed methods. Plaintiff contends that use, testing, and qualification of the Accused Products by Google itself, as well as use by customers and end-users of the Accused Products, perform each step of the claimed methods. On information and belief, backend servers, under the direction and control of the Accused Products, may perform certain steps of the claimed methods. Google, its customers, and users of the Accused Products derive benefits from their infringement.

On information and belief, the charted version of Google’s products is representative of all versions of the Accused Products, including all variants of the Accused Products made, sold, offered for sale, or used on any operating system.

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

ACT does not concede that any claims of the '101 Patent that are not listed below are not infringed by the identified Accused Products. Moreover, the citations to certain documents and other information below are intended to be exemplary only and in no way foreclose ACT from citing or relying on additional documents, information, source code, and/or testimony at a later time. These contentions are preliminary in nature, and an analysis of Google's products, internal documentation, source code, and/or testimony from relevant witnesses may more fully and accurately describe the infringing features of its Accused Products. Accordingly, ACT reserves the right to supplement, correct, modify, and/or amend these contentions once such additional information is made available to ACT. Furthermore, ACT reserves the right to supplement, correct, modify, and/or amend these contentions as discovery in this case progresses; in view of the Court's claim construction order(s); in view of any positions taken by Google including, but not limited to, positions on claim construction, invalidity, and/or non-infringement; and in connection with the preparation and exchange of expert reports.

The contents of every below claim cell on which another claim cell depends are expressly incorporated by reference in that dependent cell, as if set forth in their entirety therein.

Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendants require additional information in accordance with P.R. 3-1 and for any other reasons.

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google's Accused Products
[1P] A server device for media, the server device for media comprising:	<p>The Google Accused Products are each: A server device for media, the server device for media. Google directly infringes by using, importing, testing, selling, and/or offering for sale devices having the Google Accused Products.</p> <p>For example, Google Cloud CDN includes a server device for the streaming/delivery of digital content (i.e., a server device for media) such as videos, images, etc.</p>

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Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
	<p align="center">What is Cloud CDN?</p> <p>Cloud CDN is a content delivery network that accelerates your web and video content delivery by using Google's global edge network to bring content as close to your users as possible. As a result latency, cost, and load on your backend servers is reduced, making it easier to scale to millions of users. Global anycast IP provides a single IP for global reach. It enables Google Cloud to route users to the nearest edge cache automatically and avoid DNS propagation delays that can impact availability. It supports HTTP/2 end-to-end and the QUIC protocol from client to cache. QUIC is a multiplexed stream transport over UDP, which reduces latency and makes it ideal for lossy mobile networks.</p> <p align="center">Source: https://cloud.google.com/learn/what-is-cloud-storage?hl=en</p> <p align="center">Content delivery</p> <p>With the ability to save copies of media data, such as large audio and video files, on servers dispersed across the globe, media and entertainment companies can serve their audience low-latency, always available content from wherever they reside.</p> <p align="center">Source: https://cloud.google.com/learn/what-is-cloud-storage?hl=en</p>

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Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
	<p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendants require additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[1A] an internal storage device for storing digital contents, wherein the server device for media responds to a data transmission request from a network player by stream-delivering corresponding data in corresponding digital contents from the internal storage device to the network player during connection to a network;</p>	<p>The Google Accused Products comprise: an internal storage device for storing digital contents, wherein the server device for media responds to a data transmission request from a network player by stream-delivering corresponding data in corresponding digital contents from the internal storage device to the network player during connection to a network.</p> <p>For example, Google Cloud CDN includes a server device for the streaming/delivery of digital content (i.e., A server device for media) such as videos, images, etc., stored at Google’s Cloud Server (i.e., server device for media) to user devices via APIs (i.e., Network Player). The digital content that is delivered is stored at Google’s cloud storage servers deployed across the globe. These cloud servers include cloud storage (i.e., an internal storage device) to save digital content such as videos, images, etc.</p> <p align="center">What is Cloud CDN?</p> <p>Cloud CDN is a content delivery network that accelerates your web and video content delivery by using Google's global edge network to bring content as close to your users as possible. As a result latency, cost, and load on your backend servers is reduced, making it easier to scale to millions of users. Global anycast IP provides a single IP for global reach. It enables Google Cloud to route users to the nearest edge cache automatically and avoid DNS propagation delays that can impact availability. It supports HTTP/2 end-to-end and the QUIC protocol from client to cache. QUIC is a multiplexed stream transport over UDP, which reduces latency and makes it ideal for lossy mobile networks.</p> <p align="center">Source: https://cloud.google.com/learn/what-is-cloud-storage?hl=en</p>

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Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
	<p align="center">Content delivery</p> <p>With the ability to save copies of media data, such as large audio and video files, on servers dispersed across the globe, media and entertainment companies can serve their audience low-latency, always available content from wherever they reside.</p> <p align="center">Source: https://cloud.google.com/learn/what-is-cloud-storage?hl=en</p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

<p>Claim – 8,230,101</p>	<p align="center">Exemplary Supporting Evidence Regarding Google’s Accused Products</p>
	<p>Source: https://cloud.google.com/blog/topics/developers-practitioners/what-cloud-cdn-and-how-does-it-work</p>

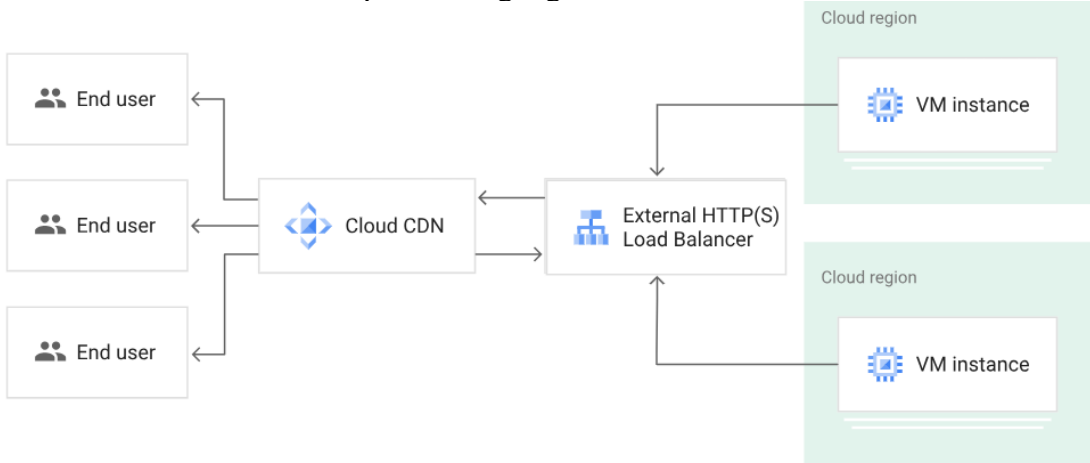
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Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
	<div data-bbox="667 250 1732 695" data-label="Diagram"> <pre> graph LR subgraph EndUsers [End users] E1[End user] E2[End user] E3[End user] end subgraph CloudCDN [Cloud CDN] C[Cloud CDN] end subgraph LoadBalancer [External HTTP(S) Load Balancer] LB[External HTTP(S) Load Balancer] end subgraph CloudRegion1 [Cloud region] VM1[VM instance] end subgraph CloudRegion2 [Cloud region] VM2[VM instance] end E1 --> C E2 --> C E3 --> C C <--> LB LB --> VM1 LB --> VM2 </pre> </div> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p> <h3>How does Cloud Storage work?</h3> <p>Cloud Storage uses remote servers to save data, such as files, business data, videos, or images. Users upload data to servers via an internet connection, where it is saved on a virtual machine on a physical server. To maintain availability and provide redundancy, cloud providers will often spread data to multiple virtual machines in data centers located across the world. If storage needs increase, the cloud provider will spin up more virtual machines to handle the load. Users can access data in Cloud Storage through an internet connection and software such as web portal, browser, or mobile app via an application programming interface (API).</p> <p>Cloud Storage is available in four different models:</p> <p align="center">Source: https://cloud.google.com/learn/what-is-cloud-storage?hl=en</p> <p>For example, when Google Cloud CDN receives a request for digital content via APIs and browsers, the request is handled by frontend APIs. In response to the request for accessing the digital content from the user device, the Google Cloud Storage servers (i.e., server devices for media) deliver the contents by first</p>

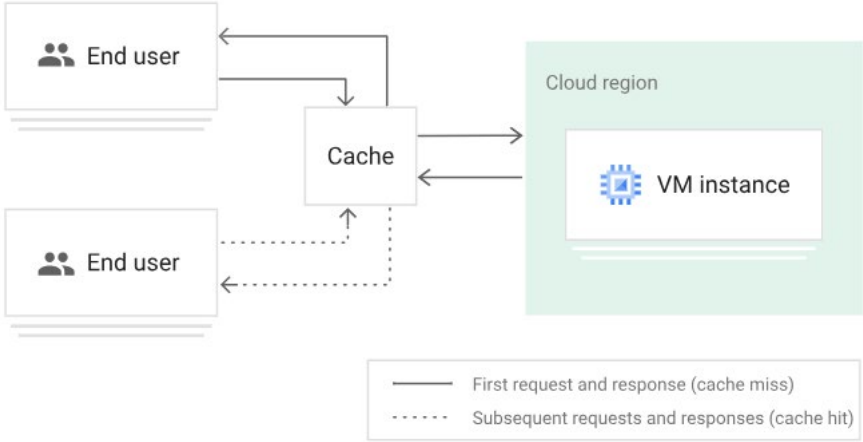
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	<p>transferring the requested data from server storage to the CDN cache (i.e., network device storage). The cache storage of the CDN network streams this data via various APIs and browsers (i.e., Network Player).</p> <p align="center">How Cloud CDN works</p> <p>When a user requests content from an external Application Load Balancer, the request arrives at a GFE that is at the edge of Google's network as close as possible to the user.</p> <p>If the load balancer's URL map routes traffic to a backend service or backend bucket that has Cloud CDN configured, the GFE uses Cloud CDN.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p> <p align="center">Source: https://cloud.google.com/blog/topics/developers-practitioners/what-cloud-cdn-and-how-does-it-work</p>

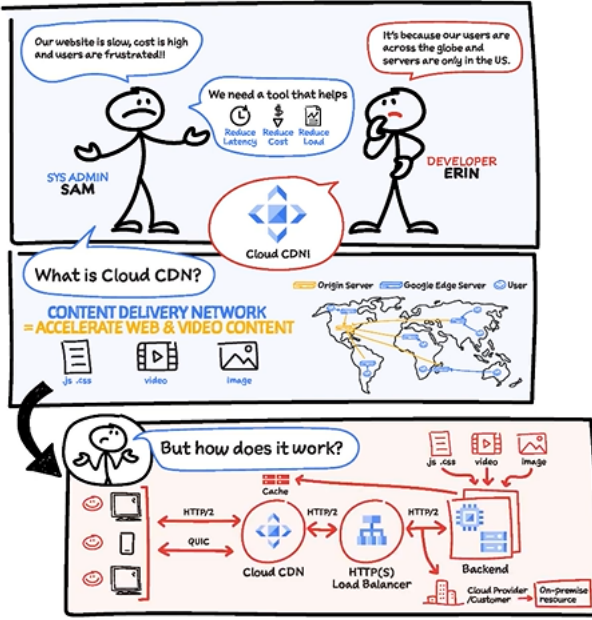
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	<p>Cloud CDN works with the global external Application Load Balancer or the classic Application Load Balancer to deliver content to your users. The external Application Load Balancer provides the frontend IP addresses and ports that receive requests and the backends that respond to the requests.</p> <p>Source: https://cloud.google.com/cdn/docs/overview Cloud CDN content can be sourced from various types of backends.</p> <p>In Cloud CDN, these backends are also called <i>origin servers</i>. Figure 1 illustrates how responses from origin servers that run on virtual machine (VM) instances flow through an external Application Load Balancer before being delivered by Cloud CDN. In this situation, the Google Front End (GFE) comprises Cloud CDN and the external Application Load Balancer.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p>  <pre> graph LR subgraph EndUsers [End users] direction TB E1[End user] E2[End user] E3[End user] end subgraph CloudRegions [Cloud regions] direction TB subgraph CR1 [Cloud region] VM1[VM instance] end subgraph CR2 [Cloud region] VM2[VM instance] end end E1 --> CloudCDN[Cloud CDN] E2 --> CloudCDN E3 --> CloudCDN CloudCDN <--> LoadBalancer[External HTTP(S) Load Balancer] VM1 --> LoadBalancer VM2 --> LoadBalancer </pre> <p>The diagram illustrates the traffic flow in a Google Cloud environment. On the left, three boxes labeled 'End user' have arrows pointing to a central box labeled 'Cloud CDN'. To the right of 'Cloud CDN' is a box labeled 'External HTTP(S) Load Balancer', connected to 'Cloud CDN' by a double-headed arrow. Further to the right are two 'Cloud region' boxes, each containing a 'VM instance'. Arrows point from each 'VM instance' to the 'External HTTP(S) Load Balancer'.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p>

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	 <p>Source: https://cloud.google.com/cdn/docs/overview</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendants require additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[1B] a transfer control unit adapted to transfer and store part of held digital contents in the internal storage device to a network storage device, wherein the network storage device is connected to the network and is capable of storing data, and wherein said transfer control unit does not transfer, from the internal storage device to the network storage device, the digital contents that cannot be recovered if a network failure occurs during the transferring of the digital contents from the internal storage device to the network storage device.</p>	<p>The Google Accused Products comprise: a transfer control unit adapted to transfer and store part of held digital contents in the internal storage device to a network storage device, wherein the network storage device is connected to the network and is capable of storing data, and wherein said transfer control unit does not transfer, from the internal storage device to the network storage device, the digital contents that cannot be recovered if a network failure occurs during the transferring of the digital contents from the internal storage device to the network storage device.</p> <p>For example, when Google Cloud CDN receives a request for data, the Google Cloud storage servers first cache (i.e., transfer and store) the data from cloud storage (i.e., internal storage) to Cloud CDN storage (i.e., network storage). While delivering the data from cloud server to various APIs, the data is only cached to the cloud CDN storage if it is cacheable (i.e., wherein the digital contents that cannot be recovered if a network</p>

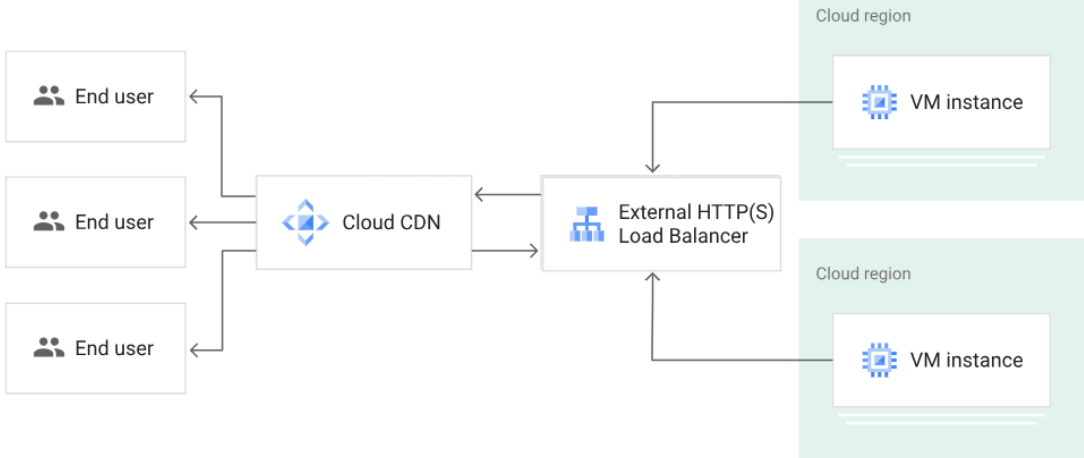
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<p>capable of storing data, and wherein said transfer control unit does not transfer, from the internal storage device to the network storage device, the digital contents that cannot be recovered if a network failure occurs during the transferring of the digital contents from the internal storage device to the network storage device;</p>	<p>failure occurs during the transferring of the digital contents are not transferred from the internal storage device to the network storage device”)</p> <p align="center">How Cloud CDN works</p> <p>When a user requests content from an external Application Load Balancer, the request arrives at a GFE that is at the edge of Google's network as close as possible to the user.</p> <p>If the load balancer's URL map routes traffic to a backend service or backend bucket that has Cloud CDN configured, the GFE uses Cloud CDN.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p> 

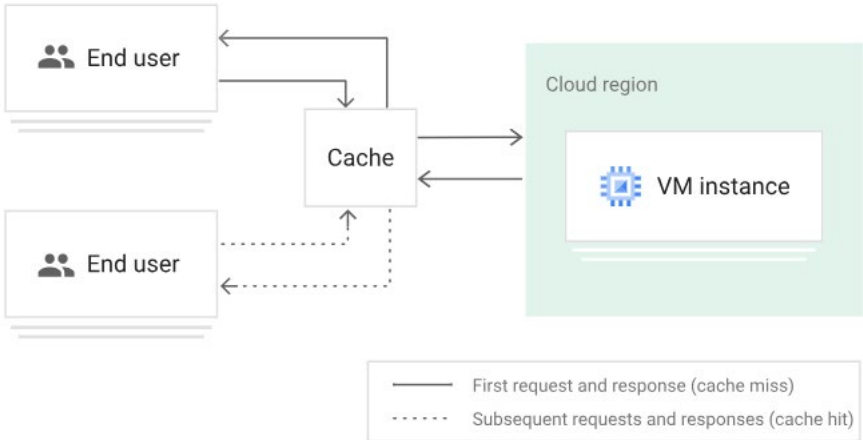
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	<p>Source: https://cloud.google.com/blog/topics/developers-practitioners/what-cloud-cdn-and-how-does-it-work</p> <div data-bbox="655 321 1759 378" style="border: 1px solid #ccc; padding: 10px; margin: 10px 0;"> <h2 style="margin: 0;">Cloud CDN overview 🔖</h2> <p style="text-align: right;">Send feedback</p> </div> <p>Cloud CDN (Content Delivery Network) uses Google's global edge network to serve content closer to users, which accelerates your websites and applications.</p> <p>Cloud CDN works with the global external Application Load Balancer or the classic Application Load Balancer to deliver content to your users. The external Application Load Balancer provides the frontend IP addresses and ports that receive requests and the backends that respond to the requests.</p> <p>Cloud CDN content can be sourced from various types of backends.</p> <p>In Cloud CDN, these backends are also called <i>origin servers</i>. Figure 1 illustrates how responses from origin servers that run on virtual machine (VM) instances flow through an external Application Load Balancer before being delivered by Cloud CDN. In this situation, the Google Front End (GFE) comprises Cloud CDN and the external Application Load Balancer.</p> <p align="right">Source: https://cloud.google.com/cdn/docs/overview</p>

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Source: <https://cloud.google.com/cdn/docs/overview>



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	<p>How Cloud CDN works</p> <p>When a user requests content from an external Application Load Balancer, the request arrives at a GFE that is at the edge of Google's network as close as possible to the user.</p> <p>If the load balancer's URL map routes traffic to a backend service or backend bucket that has Cloud CDN configured, the GFE uses Cloud CDN.</p> <p>Cache hits and cache misses</p> <p>A cache is a group of servers that stores and manages content so that future requests for that content can be served faster. The cached content is a copy of cacheable content that is stored on origin servers.</p> <p>If the GFE looks in the Cloud CDN cache and finds a cached response to the user's request, the GFE sends the cached response to the user. This is called a <i>cache hit</i>. When a cache hit occurs, the GFE looks up the content by its cache key and responds directly to the user, shortening the round-trip time and saving the origin server from having to process the request.</p> <p>A <i>partial hit</i> occurs when a request is served partially from cache and partially from a backend. This can happen if only part of the requested content is stored in a Cloud CDN cache, as described in Support for byte range requests.</p> <p>Source: https://cloud.google.com/cdn/docs/overview</p>
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	<p>The first time that a piece of content is requested, the GFE determines that it can't fulfill the request from the cache. This is called a <i>cache miss</i>. When a cache miss occurs, the GFE forwards the request to the external Application Load Balancer. The load balancer then forwards the request to one of your origin servers. When the cache receives the content, the GFE forwards the content to the user.</p> <p>If the origin server's response to this request is cacheable, Cloud CDN stores the response in the Cloud CDN cache for future requests. Data transfer from a cache to a client is called <i>cache egress</i>. Data transfer to a cache is called <i>cache fill</i>.</p> <p>Figure 2 shows a cache hit and a cache miss:</p> <ol style="list-style-type: none">1. Origin servers running on VM instances send HTTP(S) responses.2. The external Application Load Balancer distributes the responses to Cloud CDN.3. Cloud CDN delivers the responses to end users. <p>Source: https://cloud.google.com/cdn/docs/overview</p> <p>Cache hit ratio</p> <p>The <i>cache hit ratio</i> is the percentage of times that a requested object is served from the cache. If the cache hit ratio is 60%, it means that the requested object is served from the cache 60% of the time and must be retrieved from the origin 40% of the time.</p> <p>For information about how cache keys can affect the cache hit ratio, see Using cache keys. For troubleshooting information, see Cache hit ratio is low.</p>
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	<p align="center">Source: https://cloud.google.com/cdn/docs/overview</p> <p>Inserting content into the cache</p> <p>Caching is reactive in that an object is stored in a particular cache if a request goes through that cache and if the response is cacheable. An object stored in one cache does not automatically replicate into other caches; cache fill happens only in response to a client-initiated request. You cannot preload caches except by causing the individual caches to respond to requests.</p> <p>When the origin server supports byte range requests, Cloud CDN can initiate multiple cache fill requests in reaction to a single client request.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p> <p>Serving content from a cache ⇔</p> <p>After you enable Cloud CDN, caching happens automatically for all cacheable content. Your origin server uses HTTP headers to indicate which responses are cached. You can also control cacheability by using cache modes.</p> <p>When you use a backend bucket, the origin server is Cloud Storage. When you use VM instances, the origin server is the web server software that you run on those instances.</p> <p>Cloud CDN uses caches in numerous locations around the world. Because of the nature of caches, it is impossible to predict whether a particular request is served out of a cache. You can, however, expect that popular requests for cacheable content are served from a cache most of the time, yielding significantly reduced latencies, reduced cost, and reduced load on your origin servers.</p> <p>For more information about what Cloud CDN caches and for how long, see the Caching overview.</p> <p>To see what Cloud CDN is serving from a cache, you can view logs.</p> <p>Source: https://cloud.google.com/cdn/docs/overview</p>

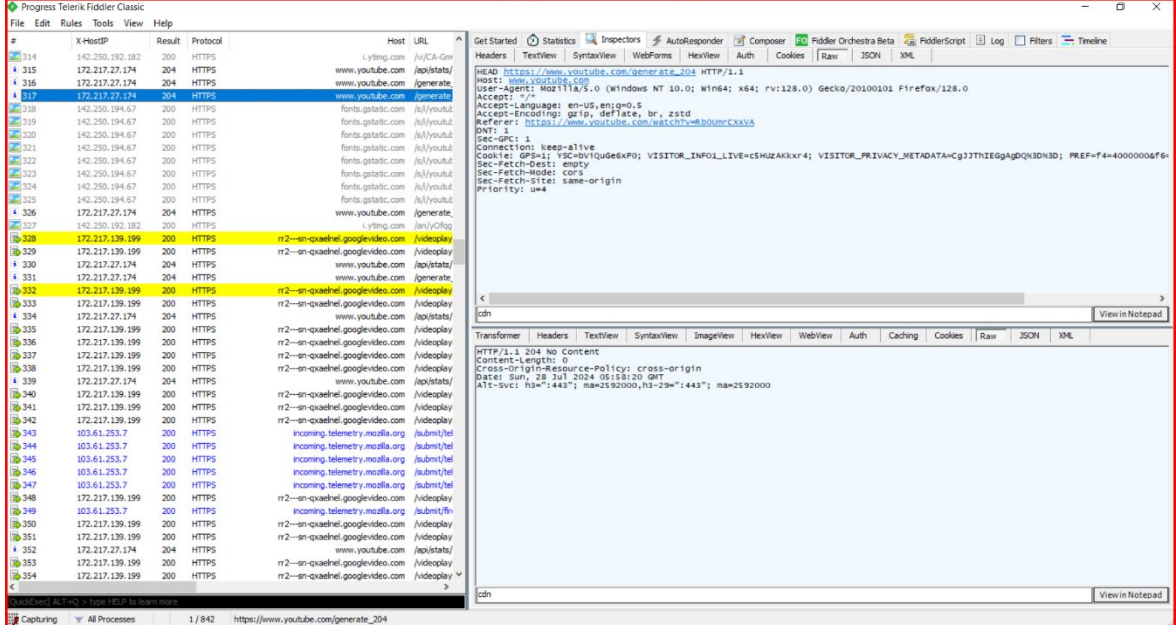
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	<p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendants require additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[1C] a list information transmission unit adapted to respond to a list presentation request for the held digital contents of the server device for media from the network player by transmitting list information to the network player, wherein the list information lists the digital contents left in the internal storage device and the digital contents transferred from the internal storage device to the network storage device and stored in the network storage device, and wherein the list information maintains a tree structure of the</p>	<p>The Google Accused Products comprise: a list information transmission unit adapted to respond to a list presentation request for the held digital contents of the server device for media from the network player by transmitting list information to the network player, wherein the list information lists the digital contents left in the internal storage device and the digital contents transferred from the internal storage device to the network storage device and stored in the network storage device, and wherein the list information maintains a tree structure of the digital contents in the internal storage device before transferring the digital contents to the network storage device.</p> <p>For example, when Google Cloud CDN receives a request to access a playlist of the content via APIs (e.g., requesting a YouTube playlist), in responding to that request, the user API (i.e., Network Player such as YouTube) is presented with a list of digital content. The list shows (i.e., list information lists) the digital content stored at the Google Cloud storage (i.e., content left in an internal storage device) and the digital content stored at the Google Cloud CDN (i.e., Network Storage). Since the information packets are retrieved and structured in the form of a user playlist, the present information is in the form of a tree structure. For example, the packet capture images below depict that when a user requested a digital content via the user interface, the response presented a list of packets that came from two distinct locations. Packet number 622, which is directed from a url _cloud-netblocks .googleusercontent.com, according to a conversation by the Google support platform this URL, represents the content delivery network, whereas packet 317 is received from the YouTube backend server. Therefore the the list presents the content from both the server storage device as well as the network storage device.</p>

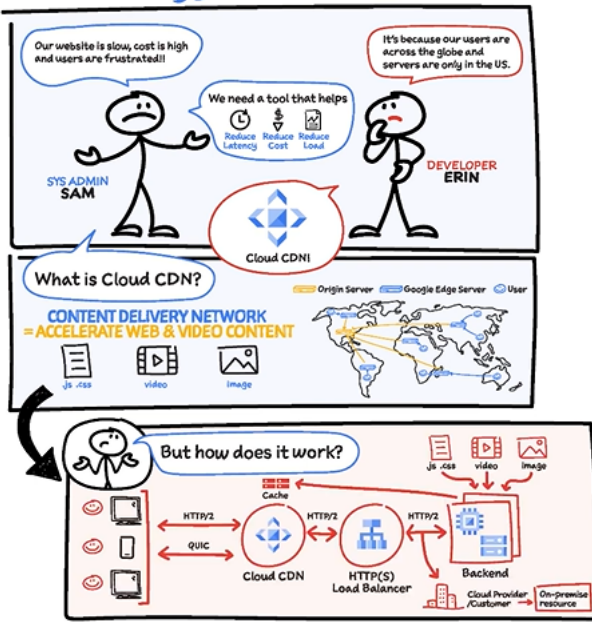
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<p>digital contents in the internal storage device before transferring the digital contents to the network storage device;</p>	<div data-bbox="653 248 1772 781"> <p>Stevo Novkovski to gce-discussion Jun 15, 2016, 6:44:02 AM</p> <p>Hello,</p> <p>How we can white-list google CDN in our backend? There is no ip-range list.</p> <hr/> <p>George (Google Cloud Support) to gce-discussion Jun 15, 2016, 8:12:13 PM</p> <p>Hello Stevo,</p> <p>Google Cloud Platform uses a large range of IP addresses, which change over time. For historical reasons, Google Cloud Platform publishes its list of public IP addresses in an SPF record for _cloud-netblocks.googleusercontent.com.</p> <p>When you need the literal IP addresses for Google Cloud Platform, use one of the common DNS lookup commands (<code>nslookup</code>, <code>dig</code>, <code>host</code>) to retrieve the TXT records for the domain _cloud-netblocks.googleusercontent.com:</p> <pre>\$ nslookup -q=TXT _cloud-netblocks.googleusercontent.com 8.8.8.8</pre> <p>This returns a list of the domains included in Google's SPF record, such as:</p> </div> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p>

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<p>Claim – 8,230,101</p>	<p align="center">Exemplary Supporting Evidence Regarding Google’s Accused Products</p>
	 <p align="center">Source: You Tube Packet Capture for Accessing a user playlist</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendants require additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[1D] a search unit adapted to respond to a data transmission request for the held digital contents from the network player by searching for a</p>	<p>The Google Accused Products comprise: a search unit adapted to respond to a data transmission request for the held digital contents from the network player by searching for a location where the held digital contents are currently stored.</p> <p>For example, when Google Cloud CDN receives a request to access the digital content via APIs, in responding to that request from the user API (i.e., Network Player), the content is first searched across the CDN cache. If the search in cache results in a “cache miss,” the content is searched at the original Google server storage. For example, Packet 622, highlighted below, is received in response to the content access request, whereas packet</p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
<p>location where the held digital contents are currently stored; and</p>	<p>317, highlighted in the figure below that one, is received from the Google Cloud CDN. This indicates that when a request to access content via APIs is made, the content is searched across both the backend servers and the CDN, and then retrieved from its location.</p> <p align="center">How Cloud CDN works</p> <p>When a user requests content from an external Application Load Balancer, the request arrives at a GFE that is at the edge of Google's network as close as possible to the user.</p> <p>If the load balancer's URL map routes traffic to a backend service or backend bucket that has Cloud CDN configured, the GFE uses Cloud CDN.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p>  <p align="center">Source: https://www.youtube.com/watch?v=EumuFAfTWJY</p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

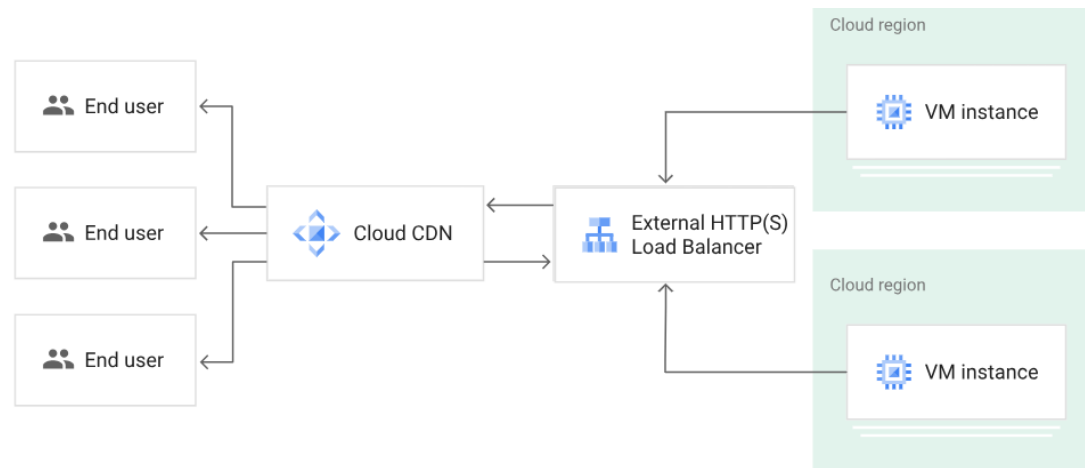
Cloud CDN works with the [global external Application Load Balancer](#) or the [classic Application Load Balancer](#) to deliver content to your users. The external Application Load Balancer provides the frontend IP addresses and ports that receive requests and the backends that respond to the requests.

Source: <https://cloud.google.com/cdn/docs/overview>

Cloud CDN content can be sourced from [various types of backends](#).

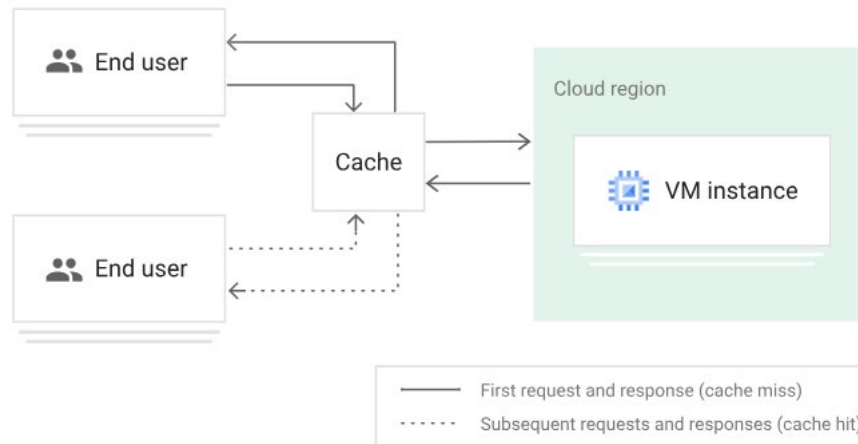
In Cloud CDN, these backends are also called *origin servers*. Figure 1 illustrates how responses from origin servers that run on virtual machine (VM) instances flow through an external Application Load Balancer before being delivered by Cloud CDN. In this situation, the [Google Front End \(GFE\)](#) comprises Cloud CDN and the external Application Load Balancer.

Source: <https://cloud.google.com/cdn/docs/overview>



Source: <https://cloud.google.com/cdn/docs/overview>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN



Source: <https://cloud.google.com/cdn/docs/overview>

The first time that a piece of content is requested, the GFE determines that it can't fulfill the request from the cache. This is called a *cache miss*. When a cache miss occurs, the GFE forwards the request to the external Application Load Balancer. The load balancer then forwards the request to one of your origin servers. When the cache receives the content, the GFE forwards the content to the user.

If the origin server's response to this request is *cacheable*, Cloud CDN stores the response in the Cloud CDN cache for future requests. Data transfer from a cache to a client is called *cache egress*. Data transfer to a cache is called *cache fill*.

Figure 2 shows a cache hit and a cache miss:



1. Origin servers running on VM instances send HTTP(S) responses.
2. The external Application Load Balancer distributes the responses to Cloud CDN.
3. Cloud CDN delivers the responses to end users.

Source: <https://cloud.google.com/cdn/docs/overview>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
	<p>Cache hit ratio</p> <p>The <i>cache hit ratio</i> is the percentage of times that a requested object is served from the cache. If the cache hit ratio is 60%, it means that the requested object is served from the cache 60% of the time and must be retrieved from the origin 40% of the time.</p> <p>For information about how cache keys can affect the cache hit ratio, see Using cache keys. For troubleshooting information, see Cache hit ratio is low.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p> <p>Serving content from a cache ⇄</p> <p>After you enable Cloud CDN, caching happens automatically for all cacheable content. Your origin server uses HTTP headers to indicate which responses are cached. You can also control cacheability by using cache modes.</p> <p>When you use a backend bucket, the origin server is Cloud Storage. When you use VM instances, the origin server is the web server software that you run on those instances.</p> <p>Cloud CDN uses caches in numerous locations around the world. Because of the nature of caches, it is impossible to predict whether a particular request is served out of a cache. You can, however, expect that popular requests for cacheable content are served from a cache most of the time, yielding significantly reduced latencies, reduced cost, and reduced load on your origin servers.</p> <p>For more information about what Cloud CDN caches and for how long, see the Caching overview.</p> <p>To see what Cloud CDN is serving from a cache, you can view logs.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

	<p> Stevo Novkovski to gce-discussion Jun 15, 2016, 6:44:02 AM ☆ ↶ ⋮</p> <p>Hello,</p> <p>How we can white-list google CDN in our backend? There is no ip-range list.</p> <hr/> <p> George (Google Cloud Support) to gce-discussion Jun 15, 2016, 8:12:13 PM ☆ ↶ ⋮</p> <p>Hello Stevo,</p> <p>Google Cloud Platform uses a large range of IP addresses, which change over time. For historical reasons, Google Cloud Platform publishes its list of public IP addresses in an SPF record for _cloud-netblocks.googleusercontent.com.</p> <p>When you need the literal IP addresses for Google Cloud Platform, use one of the common DNS lookup commands (<code>nslookup</code>, <code>dig</code>, <code>host</code>) to retrieve the TXT records for the domain _cloud-netblocks.googleusercontent.com:</p> <pre>\$ nslookup -q=TXT _cloud-netblocks.googleusercontent.com 8.8.8.8</pre> <p>This returns a list of the domains included in Google's SPF record, such as:</p> <p>Source: https://groups.google.com/g/gce-discussion/c/V2n9Ri-T5qg</p>
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Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

The screenshot displays the Progress Telerik Fiddler Classic interface. The main window shows a list of captured HTTP requests. The selected request is a 404 Not Found response from a CDN. The detailed view on the right shows the response headers and body.

#	X-HostIP	Result	Protocol	Host	URL
602	142.250.77.227	200	HTTPS	www.gstatic.com	/_jms/bo
603	142.250.77.227	200	HTTPS	www.gstatic.com	/_jms/bo
604	142.250.77.227	200	HTTPS	www.gstatic.com	/_jms/bo
605	142.250.77.227	200	HTTP	Tunnel to	www.gsta
606	142.250.77.227	200	HTTPS	www.gstatic.com	/_jms/bo
607	142.250.77.227	200	HTTPS	www.gstatic.com	/_jms/bo
608	142.250.77.227	200	HTTPS	www.gstatic.com	/_jms/bo
609	142.250.77.227	200	HTTPS	www.gstatic.com	/_jms/bo
610	142.250.77.227	200	HTTPS	www.gstatic.com	/_jms/bo
611	142.250.77.227	200	HTTPS	www.gstatic.com	/_jms/bo
612	216.239.38.177	200	HTTPS	groups.google.com	/_jGroup
613	216.239.38.177	200	HTTP	Tunnel to	groups.go
614	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
615	142.250.77.227	200	HTTPS	www.gstatic.com	/_jms/bo
616	216.239.38.177	200	HTTPS	groups.google.com	/_jGroup
617	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
618	172.217.27.174	204	HTTPS	www.youtube.com	/api/stats/
619	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
620	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
621	142.250.192.193	200	HTTP	Tunnel to	cloud-netb
622	142.250.192.193	404	HTTP	cloud-netblocks.googleusercontent.com	/
623	142.250.192.193	404	HTTP	cloud-netblocks.googleusercontent.com	/
624	142.250.194.196	200	HTTP	www.google.com	/images/er
625	142.250.192.193	404	HTTP	cloud-netblocks.googleusercontent.com	/favicon.ic
626	142.250.194.196	200	HTTP	www.google.com	/images/br
627	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
628	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
629	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
630	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
631	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
632	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
633	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
634	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
635	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
636	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
637	172.217.27.174	204	HTTPS	www.youtube.com	/api/stats/
638	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
639	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
640	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
641	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay
642	172.217.139.199	200	HTTPS	r2--sn-qaehel.googlevideo.com	/videoplay

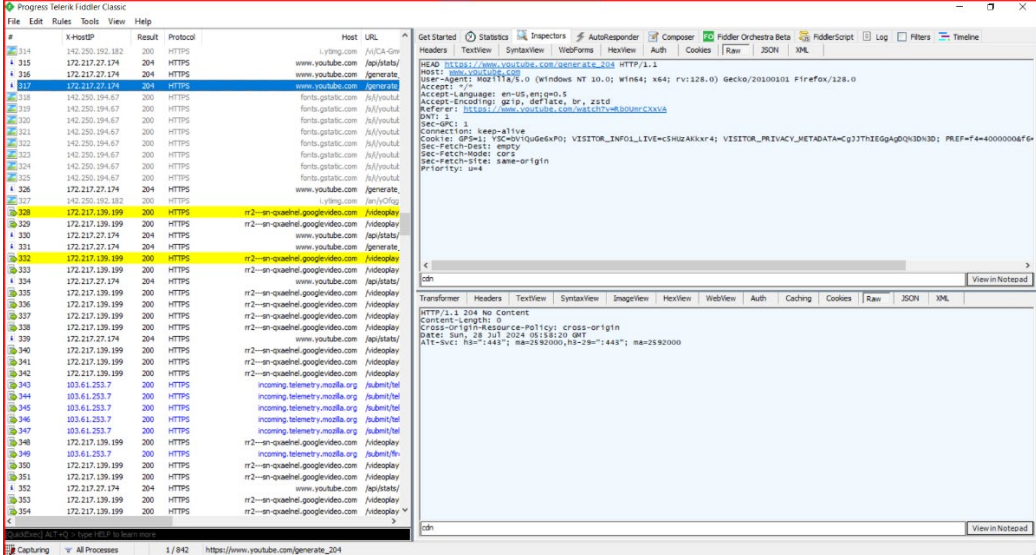
```
GET https://cloud-netblocks.googleusercontent.com/ HTTP/1.1
Host: cloud-netblocks.googleusercontent.com
User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:128.0) Gecko/20100101 Firefox/128.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,image/avif,image/webp,image/png,image/svg+xml,*/*;q=0.8
Accept-Language: en-US,en;q=0.6
Accept-Encoding: gzip, deflate, br, zstd
Referer: https://groups.google.com/
DNT: 1
Sec-IPC: 1
Upgrade-Insecure-Requests: 1
Connection: keep-alive
Sec-Fetch-Dest: document
Sec-Fetch-Mode: navigate
Sec-Fetch-Site: cross-site
Sec-Fetch-User: ?1
Priority: u=0, i
```

```
HTTP/1.1 404 Not Found
Cross-Origin-Resource-Policy: cross-origin
Content-Type: text/html; charset=utf-8
X-Content-Type-Options: nosniff
Date: Sun, 28 Jul 2024 06:01:49 GMT
Server: sffe
Content-Length: 1561
X-SS-Protection: 0
Alt-Svc: h3="443"; ma=2592000,h3-29="443"; ma=2592000

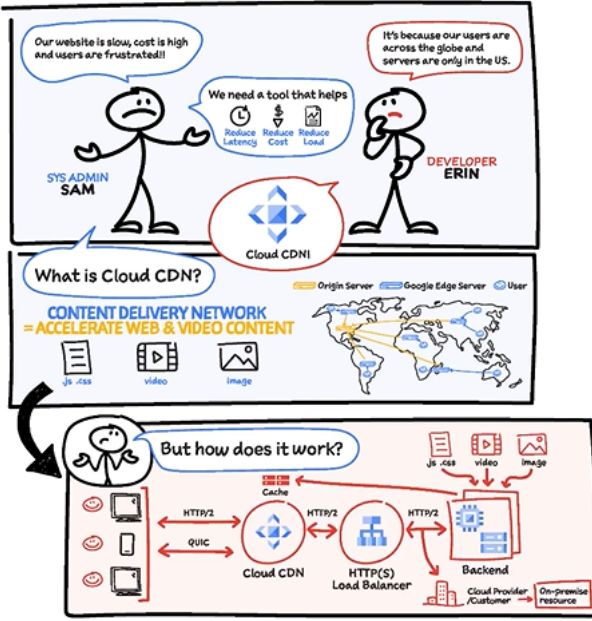
<!DOCTYPE html>
<html lang=en>
<meta charset=utf-8>
<meta name=viewport content="initial-scale=1, minimum-scale=1, width=device-width">
<title>Error 404 (Not Found) | sffe | title>
<style>
  @margin:0;padding:0;html{code{font:15px/22px arial,sans-serif}html{background:#fff;color:#222;padding:15px}body{margin:7% auto 0;max-width:390px;min-height:180px;padding:30px 0 15px} > .body{background:url(/www.google.com/images/errors/robot.png) 100% 100% no-repeat;float:right;clear:both}img{border:0}a{color:#222;text-decoration:none}a img{border:0}@media screen and (max-width:720px){body{background:none;margin-top:0;max-width:none;padding-right:0}}@logo{background:url(/www.google.com/images/branding/googlelogo/2x/googlelogo_color_110x48dp.png) no-repeat;margin-left:-5px}@media only screen and (min-resolution:193dpi){
  @logo{background:url(/www.google.com/images/branding/googlelogo/2x/googlelogo_color_110x48dp.png) no-repeat;margin-top:-9px}@media only screen and (-webkit-min-device-pixel-ratio:2){@logo{background:url(/www.google.com/images/branding/googlelogo/2x/googlelogo_color_110x48dp.png) no-repeat;webkit-background-size:100% 100%}}@logo{display:inline-block;height:48px;width:150px}}
```

Source: You Tube Packet Capture for Accessing a user playlist

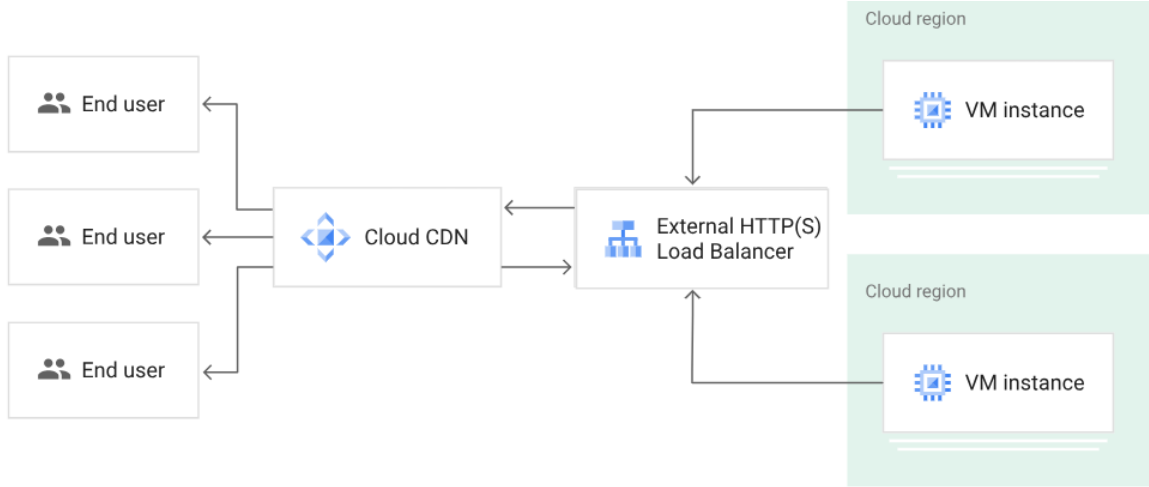
Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

<p>Claim – 8,230,101</p>	<p align="center">Exemplary Supporting Evidence Regarding Google’s Accused Products</p>
	 <p>Source: You Tube Packet Capture for Accessing a User Playlist</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contents pursuant to production of such source code and to the extent Defendants require additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[1E] a digital contents data transmission processing unit adapted to allow the corresponding data in held digital contents to be stream-delivered from the network storage device to the</p>	<p>The Google Accused Products comprise: a digital contents data transmission processing unit adapted to allow the corresponding data in held digital contents to be stream-delivered from the network storage device to the network player, if the result of search shows the network storage device.</p> <p>For example, when digital content is requested from Google Cloud CDN via APIs (i.e., Network Player) that digital content is present at Google Cloud CDN, that results in a “cache hit.” In this case, the user API (i.e., Network Player) accesses and delivers the digital content directly from Google Cloud CDN (i.e., Network Storage).</p>

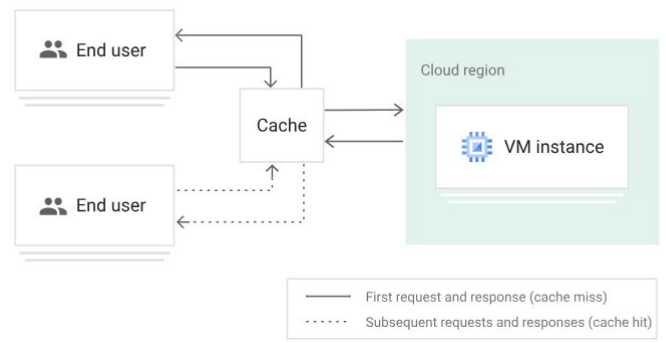
Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
<p>network player, if the result of search shows the network storage device,</p>	<p align="center">How Cloud CDN works</p> <p>When a user requests content from an external Application Load Balancer, the request arrives at a GFE that is at the edge of Google’s network as close as possible to the user.</p> <p>If the load balancer’s URL map routes traffic to a backend service or backend bucket that has Cloud CDN configured, the GFE uses Cloud CDN.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p>  <p align="center">Source: https://cloud.google.com/blog/topics/developers-practitioners/what-cloud-cdn-and-how-does-it-work</p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
	<p>Cloud CDN works with the global external Application Load Balancer or the classic Application Load Balancer to deliver content to your users. The external Application Load Balancer provides the frontend IP addresses and ports that receive requests and the backends that respond to the requests.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p> <p>Cloud CDN content can be sourced from various types of backends.</p> <p>In Cloud CDN, these backends are also called <i>origin servers</i>. Figure 1 illustrates how responses from origin servers that run on virtual machine (VM) instances flow through an external Application Load Balancer before being delivered by Cloud CDN. In this situation, the Google Front End (GFE) comprises Cloud CDN and the external Application Load Balancer.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p>  <pre> graph LR subgraph EndUsers [End users] direction TB E1[End user] E2[End user] E3[End user] end subgraph CloudRegions [Cloud regions] direction TB subgraph CR1 [Cloud region] VM1[VM instance] end subgraph CR2 [Cloud region] VM2[VM instance] end end E1 --> CDN[Cloud CDN] E2 --> CDN E3 --> CDN CDN <--> ALB[External HTTP(S) Load Balancer] ALB --> VM1 ALB --> VM2 </pre> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN



Source: <https://cloud.google.com/cdn/docs/overview>

The first time that a piece of content is requested, the GFE determines that it can't fulfill the request from the cache. This is called a *cache miss*. When a cache miss occurs, the GFE forwards the request to the external Application Load Balancer. The load balancer then forwards the request to one of your origin servers. When the cache receives the content, the GFE forwards the content to the user.

If the origin server's response to this request is *cacheable*, Cloud CDN stores the response in the Cloud CDN cache for future requests. Data transfer from a cache to a client is called *cache egress*. Data transfer to a cache is called *cache fill*.

Figure 2 shows a cache hit and a cache miss:

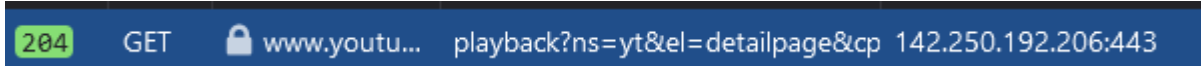
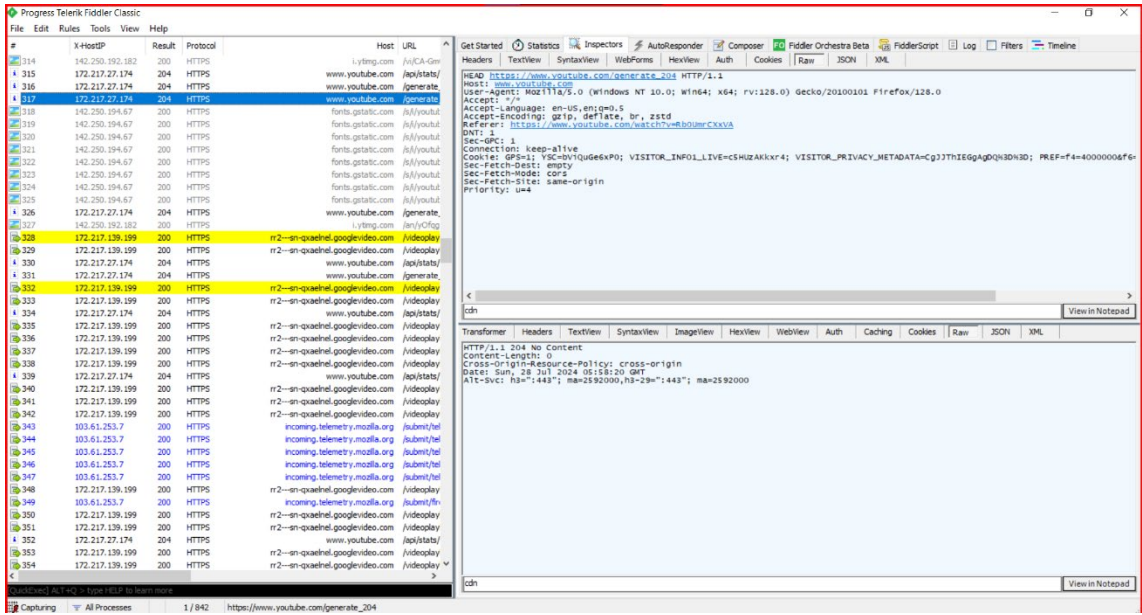
1. Origin servers running on VM instances send HTTP(S) responses.
2. The external Application Load Balancer distributes the responses to Cloud CDN.
3. Cloud CDN delivers the responses to end users.

Source: <https://cloud.google.com/cdn/docs/overview>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
	<p>Cache hit ratio</p> <p>The <i>cache hit ratio</i> is the percentage of times that a requested object is served from the cache. If the cache hit ratio is 60%, it means that the requested object is served from the cache 60% of the time and must be retrieved from the origin 40% of the time.</p> <p>For information about how cache keys can affect the cache hit ratio, see Using cache keys. For troubleshooting information, see Cache hit ratio is low.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p> <p>Serving content from a cache ⇄</p> <p>After you enable Cloud CDN, caching happens automatically for all cacheable content. Your origin server uses HTTP headers to indicate which responses are cached. You can also control cacheability by using cache modes.</p> <p>When you use a backend bucket, the origin server is Cloud Storage. When you use VM instances, the origin server is the web server software that you run on those instances.</p> <p>Cloud CDN uses caches in numerous locations around the world. Because of the nature of caches, it is impossible to predict whether a particular request is served out of a cache. You can, however, expect that popular requests for cacheable content are served from a cache most of the time, yielding significantly reduced latencies, reduced cost, and reduced load on your origin servers.</p> <p>For more information about what Cloud CDN caches and for how long, see the Caching overview.</p> <p>To see what Cloud CDN is serving from a cache, you can view logs.</p> <p>Source: https://cloud.google.com/cdn/docs/overview</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendants require additional information in accordance with P.R. 3-1 and for any other reasons.</p>
[1F] wherein the server device for	The Google Accused Products comprise: wherein the server device for media is a media player.

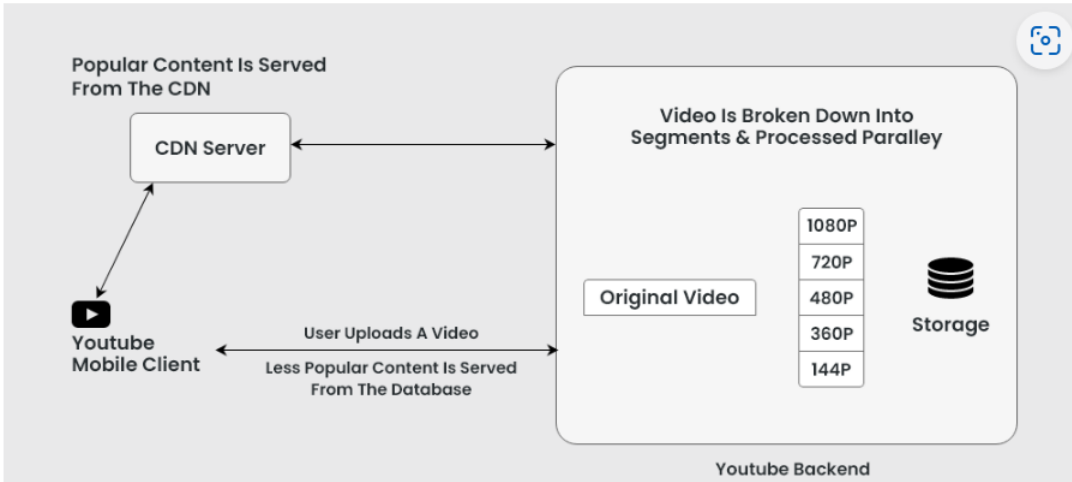
Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
<p>media is a media player.</p>	<p>For example, Google Cloud CDN servers act as media players by hosting and streaming content via services like YouTube. They handle storage, transcoding, and real-time delivery of media. Google Cloud's infrastructure supports efficient content distribution and playback across various devices and platforms. Therefore, the Google Cloud servers with integration to its services like YouTube act as a media player. For example, the following packet capture images show that, when a request to access the content from YouTube API is placed, the packets corresponding to the streamed content are observed from Google Servers (e.g., Packet 317). It shows the content stored on Google servers can be streamed/played via API requests, and hence the Google Cloud with integration to its services like YouTube acts as a media player.</p> <div style="text-align: center; margin: 10px 0;">  <p>Source: Packet Capture corresponding to accessing content via YouTube</p> </div> <div style="text-align: center; margin: 10px 0;">  <p>Source: You Tube Packet Capture for Accessing a user playlist</p> </div>

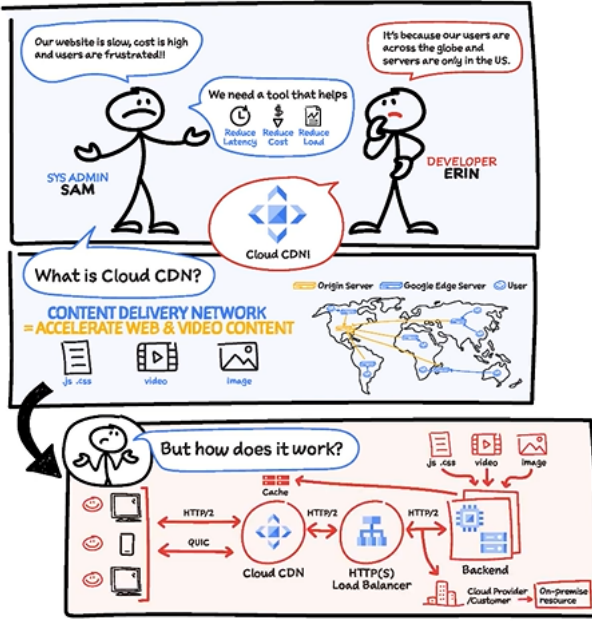
Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
	<div data-bbox="735 284 1669 682" data-label="Diagram"> <p>The diagram illustrates a multi-region architecture. On the left, three 'End user' boxes represent clients. Arrows from these users point to a central 'Cloud CDN' box. From the 'Cloud CDN', arrows point to an 'External HTTP(S) Load Balancer' box. This load balancer then distributes traffic to two 'Cloud region' boxes, each containing a 'VM instance'.</p> </div> <p data-bbox="871 730 1543 763">Source: https://cloud.google.com/cdn/docs/overview</p> <div data-bbox="787 803 1543 1193" data-label="Diagram"> <p>This diagram shows a 'Cache' box positioned between two 'End user' boxes and a 'Cloud region' box containing a 'VM instance'. Solid arrows indicate a 'cache miss' scenario: an end user requests content from the cache, the cache requests it from the VM instance, and the VM instance returns it to the cache, which then serves it to the user. Dashed arrows indicate a 'cache hit' scenario: an end user requests content directly from the cache, and the cache serves it immediately without contacting the VM instance.</p> <div data-bbox="1102 1128 1543 1193" data-label="Text"> <p>— First request and response (cache miss) - - - Subsequent requests and responses (cache hit)</p> </div> </div> <p data-bbox="871 1226 1543 1258">Source: https://cloud.google.com/cdn/docs/overview</p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
	 <p>The diagram illustrates the YouTube architecture. On the left, a 'Youtube Mobile Client' sends data to a 'CDN Server'. Above the CDN server, it is noted that 'Popular Content Is Served From The CDN'. On the right, the 'Youtube Backend' contains 'Storage' and a 'Video Is Broken Down Into Segments & Processed Parallely' unit. This unit lists video resolutions: 1080P, 720P, 480P, 360P, and 144P. An 'Original Video' is also shown. Arrows indicate that 'User Uploads A Video' from the mobile client to the backend, and 'Less Popular Content Is Served From The Database' from the backend to the CDN server. A double-headed arrow connects the CDN server and the backend processing unit.</p> <p>Source: https://www.geeksforgeeks.org/system-design-of-youtube-a-complete-architecture/</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendants require additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[2] The server device for media according to claim 1, wherein said digital contents data transmission processing unit causes the network storage device to transmit the corresponding data</p>	<p>The Google Accused Products comprise: The server device for media according to claim 1, wherein said digital contents data transmission processing unit causes the network storage device to transmit the corresponding data to the server device for media, and then transmits the corresponding data received from the network storage device from the server device for media to the network player.</p> <p><i>See Claim [1E].</i> As shown below, the digital contents data transmission processing unit causes the network cache such as Google CDN to transmit the data to a server media for the GFE (Google Front End) (server device for media) for the ultimate transmission to the client device for playing.</p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
<p>to the server device for media, and then transmits the corresponding data received from the network storage device from the server device for media to the network player.</p>	<p align="center">How Cloud CDN works</p> <p>When a user requests content from an external Application Load Balancer, the request arrives at a GFE that is at the edge of Google’s network as close as possible to the user.</p> <p>If the load balancer’s URL map routes traffic to a backend service or backend bucket that has Cloud CDN configured, the GFE uses Cloud CDN.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p>  <p align="center">Source: https://cloud.google.com/blog/topics/developers-practitioners/what-cloud-cdn-and-how-does-it-work</p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
	<p>Cloud CDN works with the global external Application Load Balancer or the classic Application Load Balancer to deliver content to your users. The external Application Load Balancer provides the frontend IP addresses and ports that receive requests and the backends that respond to the requests.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p> <p>Cloud CDN content can be sourced from various types of backends.</p> <p>In Cloud CDN, these backends are also called <i>origin servers</i>. Figure 1 illustrates how responses from origin servers that run on virtual machine (VM) instances flow through an external Application Load Balancer before being delivered by Cloud CDN. In this situation, the Google Front End (GFE) comprises Cloud CDN and the external Application Load Balancer.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendants require additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[3] The server device for media according to claim 1, wherein said digital contents data transmission processing unit transmits the corresponding data and information for identifying the network storage</p>	<p>The Google Accused Products comprise: The server device for media according to claim 1, wherein said digital contents data transmission processing unit transmits the corresponding data and information for identifying the network storage device to the network player, and causes the network storage device to directly transmit the corresponding data to the network player.</p> <p><i>See Claim [1E]. As shown below, the digital contents data transmission processing unit transmits corresponding data and information for identification of the network storage device to the network player such as “the frontend IP address and ports that receive the requests and the backends that respond to the requests.”</i></p>

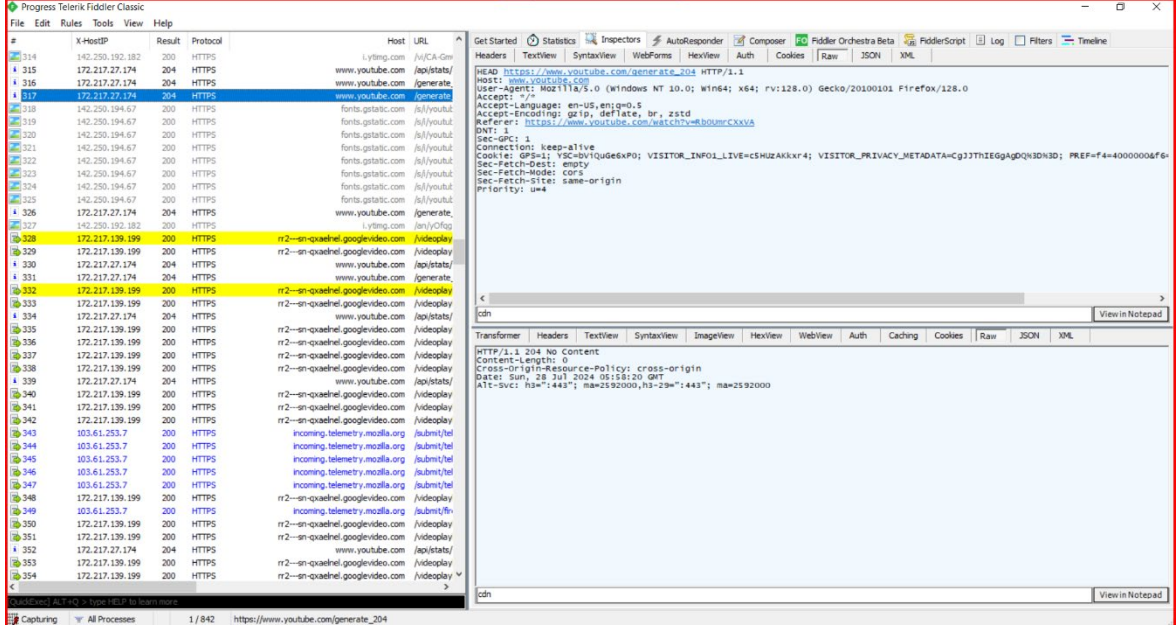
Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
<p>device to the network player, and causes the network storage device to directly transmit the corresponding data to the network player.</p>	<p>Cloud CDN works with the global external Application Load Balancer or the classic Application Load Balancer to deliver content to your users. The external Application Load Balancer provides the frontend IP addresses and ports that receive requests and the backends that respond to the requests.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendants require additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[4] The server device for media according to claim 1, further comprising a return control unit adapted to cause the digital contents corresponding to a predetermined condition among the digital contents which have been transferred to the network storage device to be returned from the network storage device to the internal storage device.</p>	<p>The Google Accused Products comprise: The server device for media according to claim 1, further comprising a return control unit adapted to cause the digital contents corresponding to a predetermined condition among the digital contents which have been transferred to the network storage device to be returned from the network storage device to the internal storage device.</p> <p>For example, digital contents that meet a certain predetermined condition, such as “when a user requests content from an external Application Load Balancer,” may be returned from the network storage device to the internal storage device (e.g., GFE) since a local network shares data much faster than the Internet (the network storage device) since it is “at the edge of Google’s network as close as possible to the user.”</p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
	<p align="center">How Cloud CDN works</p> <p>When a user requests content from an external Application Load Balancer, the request arrives at a GFE that is at the edge of Google's network as close as possible to the user.</p> <p>If the load balancer's URL map routes traffic to a backend service or backend bucket that has Cloud CDN configured, the GFE uses Cloud CDN.</p> <p align="center">Source: https://cloud.google.com/cdn/docs/overview</p> <p>Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendants require additional information in accordance with P.R. 3-1 and for any other reasons.</p>
<p>[5] The server device for media according to claim 1, wherein said list information transmission unit makes the list information to be transmitted to the network player include information for identifying whether each digital content is currently stored in the internal storage device or the network storage device in the display</p>	<p>The Google Accused Products comprise: The server device for media according to claim 1, wherein said list information transmission unit makes the list information to be transmitted to the network player include information for identifying whether each digital content is currently stored in the internal storage device or the network storage device in the display list of the network player.</p> <p>For example, as shown below, the list information transmission unit lists information identifying the source of the digital content (e.g., “host,” “URL,” etc.) that can correspond to the internal storage device or network storage device.</p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

<p>Claim – 8,230,101</p>	<p align="center">Exemplary Supporting Evidence Regarding Google’s Accused Products</p>
	 <p>The screenshot shows a network traffic capture tool with a list of requests on the left and a detailed view of a selected request on the right. The list includes requests to various domains like lyftmg.com, www.youtube.com, fonts.gstatic.com, and rr2-sq-qaehel.googlevideo.com. The detailed view shows an HTTP 204 No Content response with headers including Date, Expires, and Cache-Control.</p>
<p>[7P] A method for controlling a server device for media which is equipped with an internal storage device for storing digital contents, the method</p>	<p>Users of the Google Accused Products perform a method for controlling a server device for media which is equipped with an internal storage device for storing digital contents. Google directly infringes and induces infringement by causing a user to perform the claimed method on the Google Accused Products. Google induces infringement by users by supplying the Google Accused Products and instructing and encouraging users to use the Google Accused Products in an infringing manner.</p> <p><i>See Claim [1P].</i></p>

Source: You Tube Packet Capture for Accessing a user playlist

Further, to the extent this element is performed at least in part by software source code, ACT reserves the right to supplement these contentions pursuant to production of such source code and to the extent Defendants require additional information in accordance with P.R. 3-1 and for any other reasons.

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
comprising the steps of:	
[7A] responding to a data transmission request from a network player by stream-delivering corresponding data in corresponding digital contents from the internal storage device to the network player during connection to a network;	<p>Users of the Google Accused Products perform responding to a data transmission request from a network player by stream-delivering corresponding data in corresponding digital contents from the internal storage device to the network player during connection to a network.</p> <p><i>See Claim [1A].</i></p>
[7B] transferring and storing part of held digital contents in the internal storage device to a network storage device, wherein the network storage device is connected to the network and is capable of storing data, and wherein the digital contents that cannot be recovered if a network failure occurs during the	<p>Users of the Google Accused Products perform transferring and storing part of held digital contents in the internal storage device to a network storage device, wherein the network storage device is connected to the network and is capable of storing data, and wherein the digital contents that cannot be recovered if a network failure occurs during the transferring of the digital contents are not transferred from the internal storage device to the network storage device.</p> <p><i>See Claim [1B].</i></p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
<p>transferring of the digital contents are not transferred from the internal storage device to the network storage device;</p>	
<p>[7C] responding to a list presentation request for the held digital contents of the server device for media from the network player by transmitting list information to the network player, wherein the list information lists the digital contents left in the internal storage device and the digital contents transferred from the internal storage device to the network storage device and stored in the network storage device, and wherein the list information maintains a tree</p>	<p>Users of the Google Accused Products perform responding to a list presentation request for the held digital contents of the server device for media from the network player by transmitting list information to the network player, wherein the list information lists the digital contents left in the internal storage device and the digital contents transferred from the internal storage device to the network storage device and stored in the network storage device, and wherein the list information maintains a tree structure of the digital contents in the internal storage device before transferring the digital contents to the network storage device.</p> <p><i>See Claim [1C].</i></p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
structure of the digital contents in the internal storage device before transferring the digital contents to the network storage device;	
[7D] responding to a data transmission request for the held digital contents from the network player by searching for a location where the held digital contents are currently stored; and	<p>Users of the Google Accused Products perform responding to a data transmission request for the held digital contents from the network player by searching for a location where the held digital contents are currently stored.</p> <p><i>See Claim [1D].</i></p>
[7E] allowing the corresponding data in held digital contents to be stream-delivered from the network storage device to the network player, if the result of search shows the network storage device,	<p>Users of the Google Accused Products perform allowing the corresponding data in held digital contents to be stream-delivered from the network storage device to the network player, if the result of search shows the network storage device.</p> <p><i>See Claim [1E].</i></p>
[7F] wherein the service device for	<p>Users of the Google Accused Products perform the claimed method wherein the service device for media is a media player.</p>

Appendix E-1 - Claim Chart for U.S. Patent No. 8,230,101 Against Google Cloud Content Delivery Network (CDN) and Google Products Utilizing CDN

Claim – 8,230,101	Exemplary Supporting Evidence Regarding Google’s Accused Products
media is a media player.	<i>See Claim [1F].</i>