Content Distribution

Client Distance

International RTT
circa 11/2011
Content Distribution Network (CDN)

Proxy Server

Ask Bob what the current time is.

What is the current time.

Bob says the time is 7pm.

The time is 7pm.
CHAPTER 7. CONSISTENCY AND REPLICATION

contains the host name of the origin server for reasons we explain next. The modified URL is resolved as follows, as is also shown in Figure 7.35.

Figure 7.35: The principal working of the Akamai CDN.

The name of the virtual ghost includes a DNS name such as ghosting.com, which is resolved by the regular DNS naming system to a CDN DNS server (the result of step 3). Each such DNS server keeps track of servers close to the client. To this end, any of the proximity metrics we have discussed previously could be used. In effect, the CDN DNS servers redirect the client to a replica server best for that client (step 4), which could mean the closest one, the least-loaded one, or a combination of several such metrics (the actual redirection policy is proprietary).

Finally, the client forwards the request for the embedded document to the selected CDN server. If this server does not yet have the document, it fetches it from the original Web server (shown as step 6), caches it locally, and subsequently passes it to the client. If the document was already in the CDN server's cache, it can be returned forthwith. Note that in order to fetch the embedded document, the replica server must be able to send a request to the origin server, for which reason its host name is also contained in the embedded document's URL.

An interesting aspect of this scheme is the simplicity by which consistency of documents can be enforced. Clearly, whenever a main document is changed, a client will always be able to fetch it from the origin server. In the case of embedded documents, a different approach needs to be followed as these documents are, in principle, fetched from a nearby replica server. To this end, a URL for an embedded document not only refers to a special host name that eventually leads to a CDN DNS server, but also contains a unique identifier that is changed every time the embedded document changes. In effect, this identifier changes the name of the embedded document. As a consequence, DS 3.02 downloaded by SBARKER@BOWDOIN.EDU