PEER ENABLED DISTRIBUTED WEB

PEDWEB

CURRENT WEB

- Clusters of Web Servers host web pages which clients connect to
- The only way to scale is to get bigger, faster, or more servers
- This lack of easy scalability is becoming an increasingly large problem as more and more devices become internet enabled
- Growing businesses are required to spend a lot of money upgrading their web capabilities as they grow

HOW CAN WE FIX THIS?

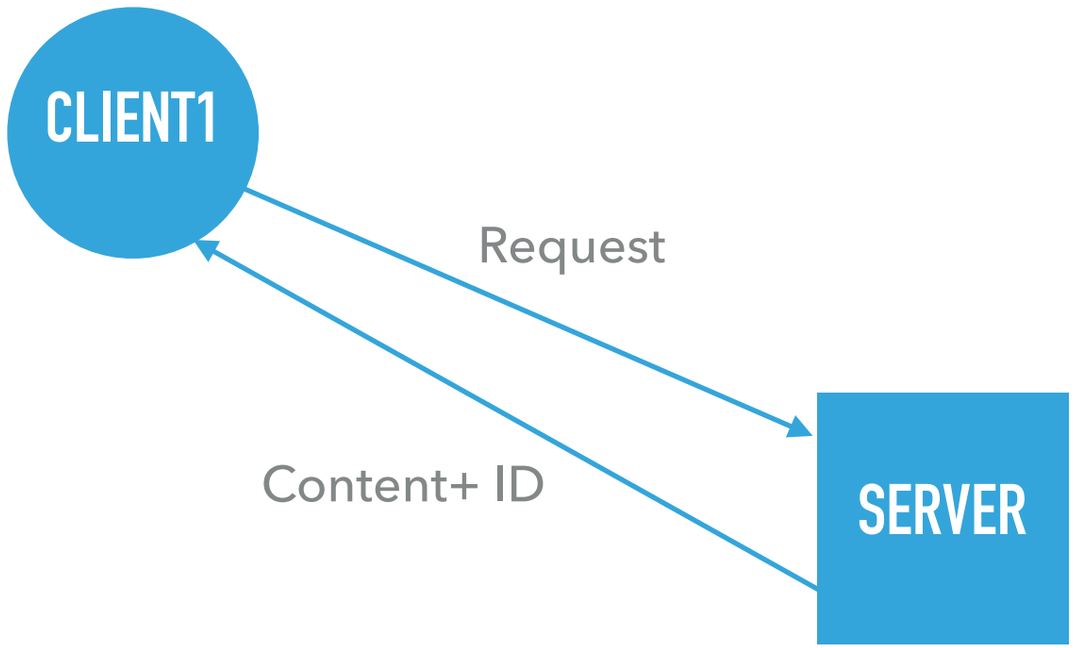
TEXT

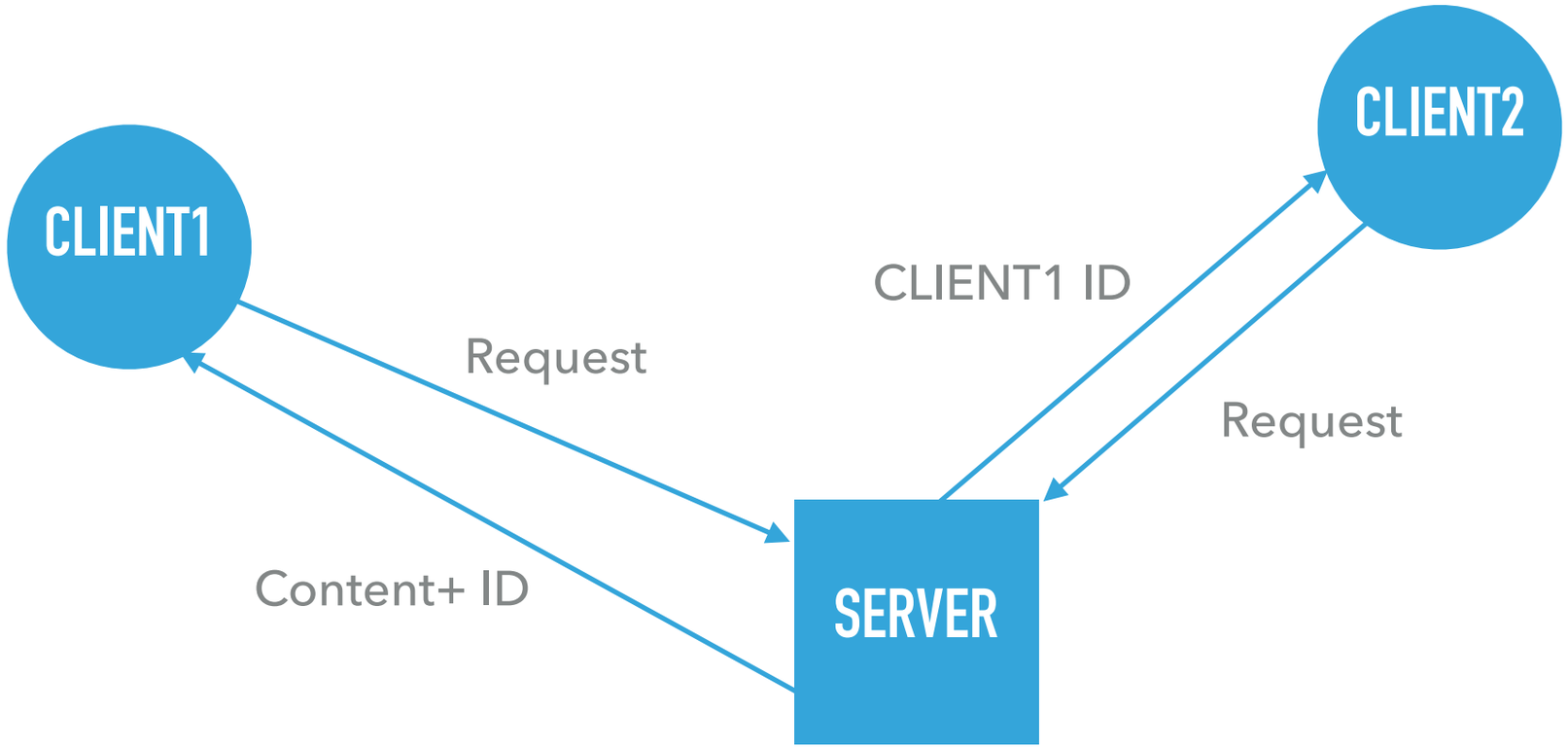
INTRODUCING PEDWEB

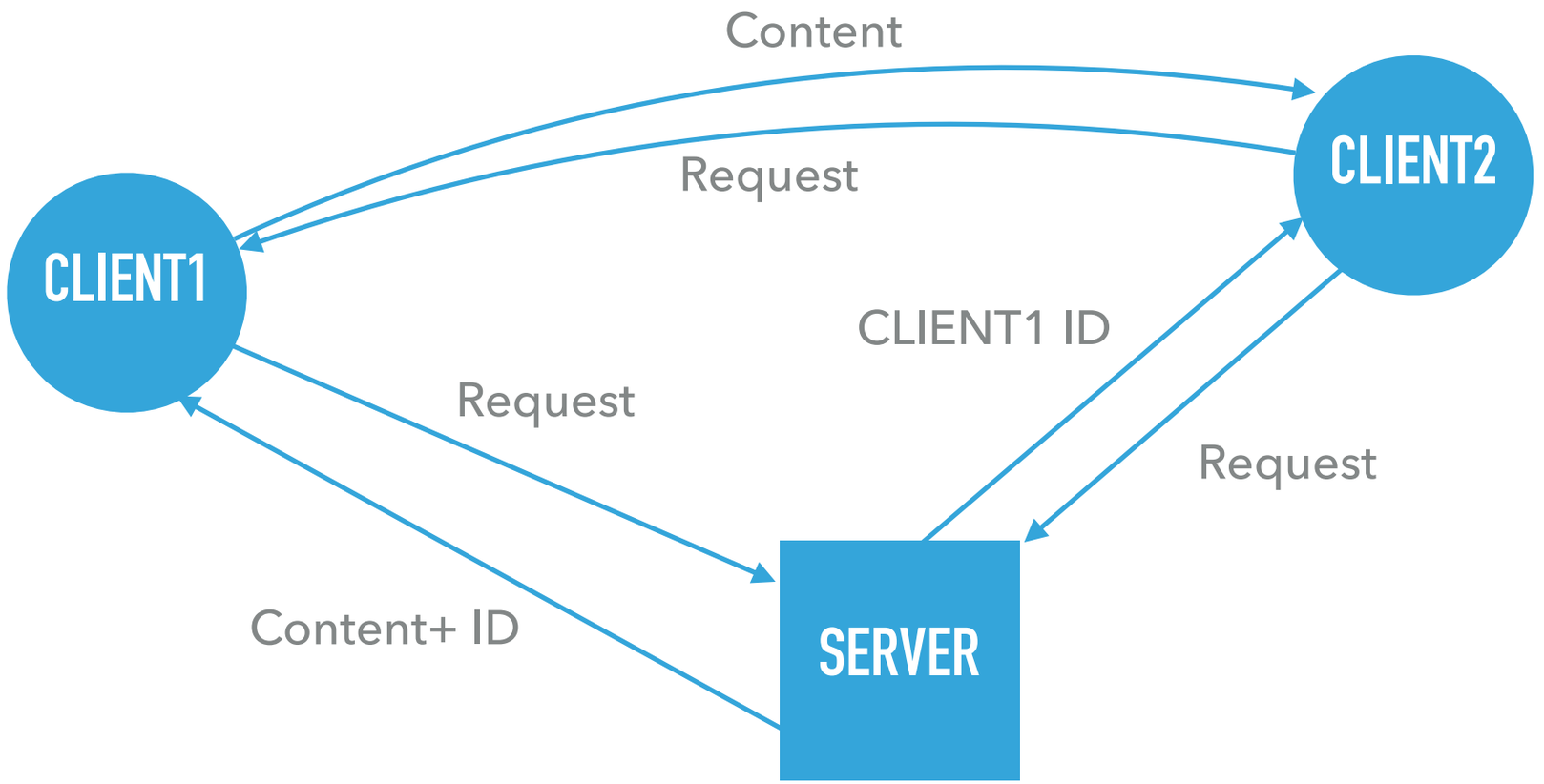
- PEDWeb, or Peer Enabled Distributed Web, is our solution to make web scale more efficient
- Instead of only a few computers serving pages, every computer effectively becomes a web server
- The load of web traffic is split among all users to ensure connection speeds are not affected
- One central server keeps track of the ongoing connections, but since it doesn't need to serve data, it can be much smaller than a typical web server

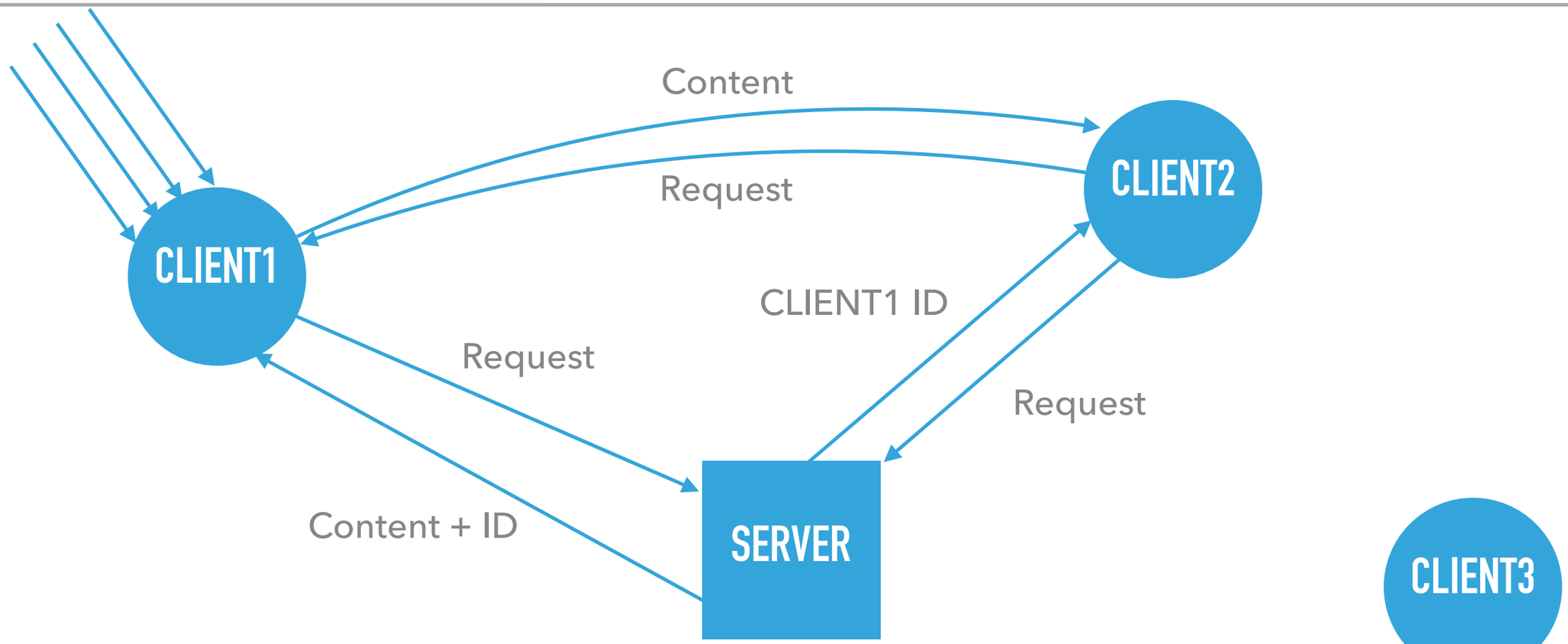
PICTURES

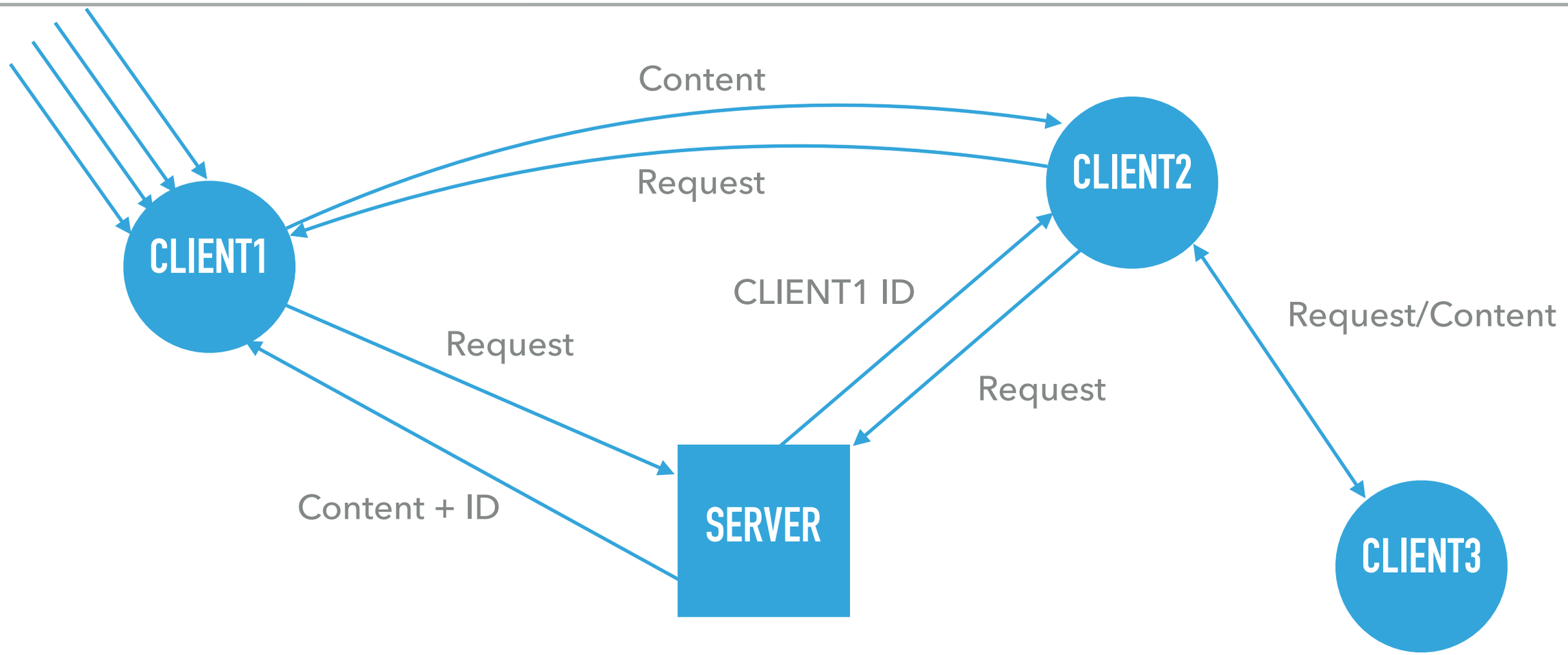
SERVER

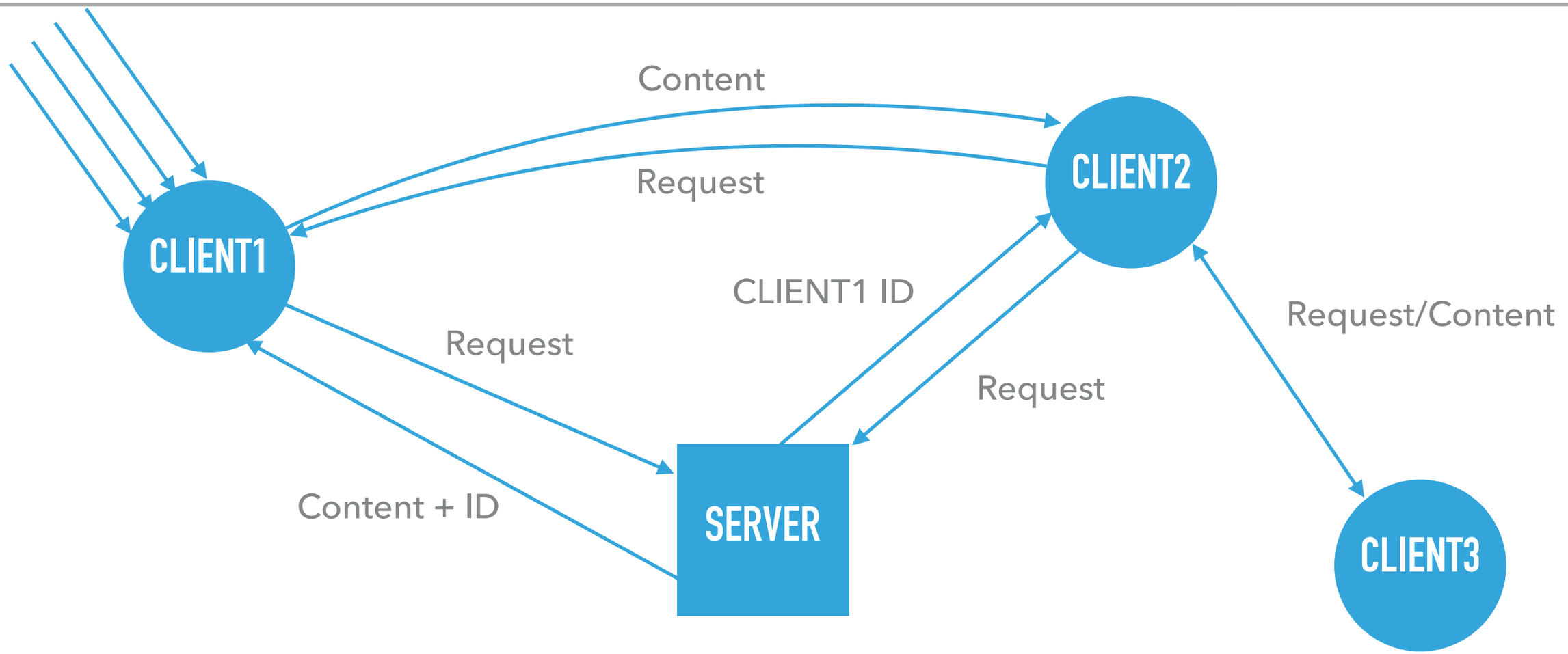

CLIENT1
Request
Content+ ID
SERVER


CLIENT1
CLIENT2
SERVER
Request
CLIENT1 ID
Request
Content+ ID


Content
CLIENT2
Request
CLIENT1
CLIENT1 ID
Request
Request
Content+ ID
SERVER


Content
Request
CLIENT1
CLIENT2
CLIENT1 ID
Request
Request
Content + ID
SERVER
CLIENT3


Content
Request
CLIENT1
CLIENT2
CLIENT1 ID
Request
Request
Request/Content
Content + ID
SERVER
CLIENT3


Content
Request
CLIENT1
CLIENT2
CLIENT1 ID
Request
Request
Request/Content
Content + ID
SERVER
CLIENT3

AND REPEAT!

SECURITY

- All pages on the server are fed into a sha256 hash function
- When server receives a request, the hash is returned along with the client ID to connect to
- Once you receive the file from your “client-server,” another hash is computed from the file you received
- If said hash doesn't match the one provided by the server, your browser will alert the server, dropping that client and connecting you with another
- This prevents anyone from changing files on their local machine to be propagated through the network
- OpenSSL for secure communication between clients

BENEFITS

- The central server rarely has to transfer large data files, allowing it to run more efficiently and use less bandwidth
- Small-medium sized sites don't need to spend a bunch of money on web servers and web hosting. Their clients host for them!
- There are more potential points of access for a file, it is probable that someone nearby will be “hosting” the site you want, reducing network latency*
- Loads are spread out over the entire world wide web, starvation and resource stalls become a non-issue*

*In Theory