

CS490-004 Network Programming

Fall 2026

Exercise Questions on September 24, 2026 (PART I)

EXERCISE

Global Positioning System (GPS) is a U.S.-owned satellite navigation network that provides exact location, velocity, and time data anywhere on Earth. Although GPS heavily depends on its hardware infrastructure, its software components also play important roles.

The main software used by GPS is actually a special client-server network application, where GPS satellites are the server-side process that broadcast beacon signals (without requests from clients) and users' mobile devices are the client-side process that receives beacon signals from GPS satellites. Note that each beacon signal from a GPS satellite contains: a satellite current location, the timestamp of the beacon signal, the distance from a GPS satellite to a client-side device, and more.



Question: Which type of the network application models of the thin-client and the fat-client do you think GPS navigation system is based on? Select either thin-client or fat client. Then, justify your choice.

Hints: the major factors for consideration (there can be other critical factors):

- (a) The server-side workload
- (b) Network delay
- (c) Responsiveness at each client-side terminal device