

# CSCI 320: Networking and Distributed Computing

## Project 02 Timing

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After 9 runs of gRPC timing, I selected the run with the median total time. The following times are from that run and are divided into how long each function took to time (all times in seconds).

GetProductsByID: 0.1805684150000002  
GetProductsByName: 0.15384835100000016  
GetProductsByManufacturer: 0.12924276300000015  
GetOrdersByID: 0.07656160900000009  
GetOrdersByStatus: 0.15875302599999985  
GetProductsInStock: 0.11105593099999966  
UpdateProducts: 0.4868030550000002  
UpdateOrders: 0.3059147299999996  
AddProducts: 0.1334436910000001  
CreateOrders: 0.3591622100000009

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Total: 2.095353781000001

All functions interacting with products use 500 products, whether that means the function retrieves, adds, or updates them. Similarly, all functions interacting with orders use 50 orders, whether that means the function retrieves, adds, or updates them.

The choice of 500 products comes from the fact that gRPC has a 4 MB message size limit and using 750 or 1000 (or more) products exceeds this byte limit. In the future I could modify my program to use bidirectional streaming to overcome this limitation, with the caveat of increased complexity. Another way to handle large amounts of products and orders is to call the gRPC functions multiple times and only pass up to 500 products/orders at a time.

I modified my gRPC timing to run the timing back to back 10 times and then sum the times. Similar to running the timing once, after 9 runs of gRPC timing, I selected the run with the median total time to run and display the following times in seconds.

GetProductsByID: 1.8775839970000003  
GetProductsByName: 1.5515576980000172  
GetProductsByManufacturer: 1.2014333719999954  
GetOrdersByID: 0.6999692510000135  
GetOrdersByStatus: 1.7190775080000011  
GetProductsInStock: 1.2387777189999994  
UpdateProducts: 4.405793927999987  
UpdateOrders: 2.0425504680000035  
AddProducts: 1.4805720659999917  
CreateOrders: 2.3826795900000075

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Total: 18.59999559700001

According to groups that completed both gRPC and XML-RPC, gRPC seems to run in about half the time XML-RPC does. This makes sense since gRPC uses HTTP/2 whereas XML-RPC uses HTTP. So one would expect a gRPC server running the same function calls to complete them faster since it has less overhead.