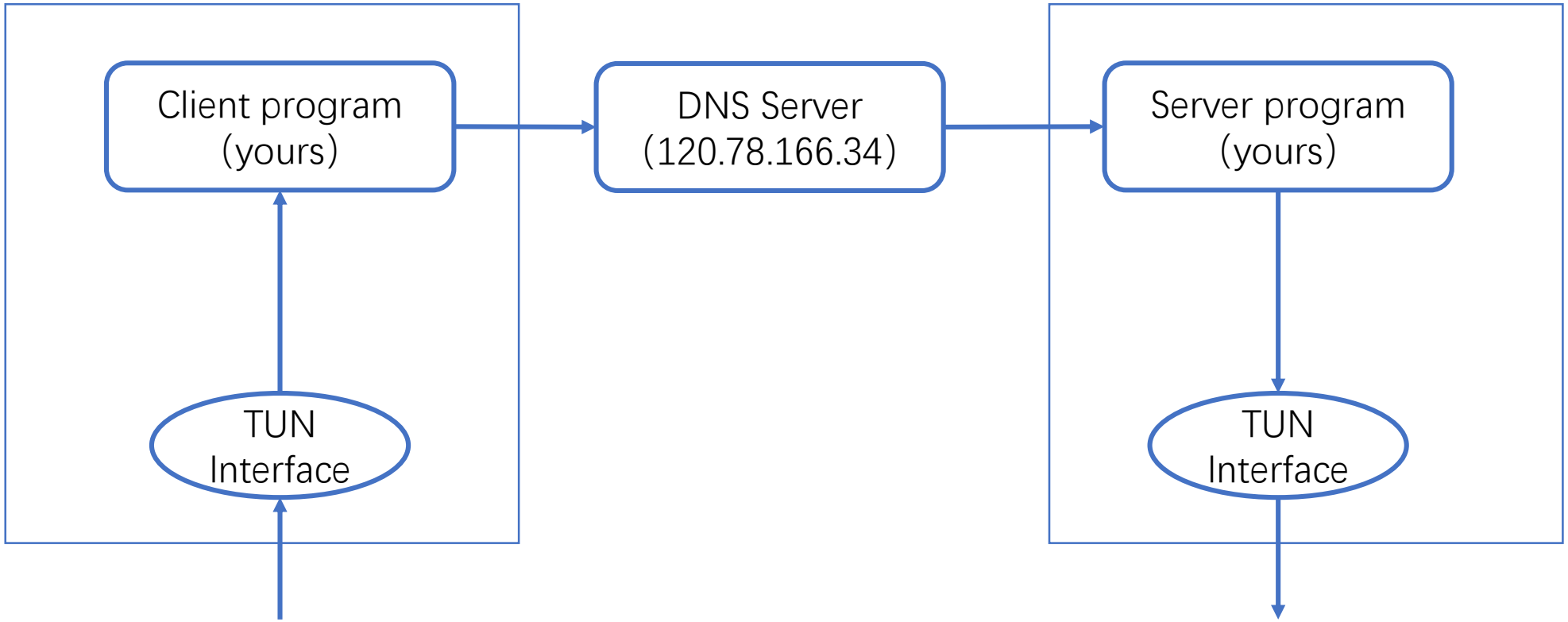
Project Architecture



AWS instance

- We provide each group an AWS instance for running your server program. Your program should listening on port 53. The identity file will be send to your by email later.
- Here is the documentation for how to connect to the instance. https://docs.aws.amazon.com/AWSEC2/latest/UserGuide/AccessingInstances.html?icmpid=docs_ec2_console

DNS Server

- The DNS server of to resolve cs305.fun is 120.78.166.34 （with recursion query on).
- Your server program will be running on an AWS instance, which we have configured as the name server for a subdomain of cs305.fun, such as group1.cs168.fun. Any query that you send to a subdomain of group1.cs168.fun will be forwarded to your DNS server. We will provide the actual names and addresses of your virtual machine and domain later.

DNS Server

- To check the DNS server (120.78.166.34) is working, use dig tool send a DNS query for test.cs305.fun, result should be like:

```
; <<>> DiG 9.11.3-1ubuntu1.1-Ubuntu <<>> @120.78.166.34 test.cs305.fun
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 64281
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 2

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;test.cs305.fun.                        IN      A

;; ANSWER SECTION:
test.cs305.fun.         600     IN      A       1.2.3.4

;; AUTHORITY SECTION:
cs305.fun.              600     IN      NS      ns.cs305.fun.

;; ADDITIONAL SECTION:
ns.cs305.fun.           600     IN      A       120.78.166.34
```

- Before getting started, make sure NS record of your domain name is correct. Use *dig @120.78.166.34* ***ns-****group1.cs305.fun*

```
; <<>> DiG 9.11.3-1ubuntu1.1-Ubuntu <<>> @120.78.166.34 ns-group1.cs305.fun
; (1 server found)
;; global options: +cmd
;; Got answer:
;; ->>HEADER<<- opcode: QUERY, status: NOERROR, id: 7413
;; flags: qr aa rd ra; QUERY: 1, ANSWER: 1, AUTHORITY: 1, ADDITIONAL: 2

;; OPT PSEUDOSECTION:
; EDNS: version: 0, flags:; udp: 4096
;; QUESTION SECTION:
;ns-group1.cs305.fun.           IN      A

;; ANSWER SECTION:
ns-group1.cs305.fun.    600     IN      A       52.[redacted]94

;; AUTHORITY SECTION:
cs305.fun.              600     IN      NS      ns.cs305.fun.

;; ADDITIONAL SECTION:
ns.cs305.fun.           600     IN      A       120.78.166.34
```

If this IP is not the server of yours, contact TA to change configuration

Set up TUN interface

- For server side we provide an AWS instance with ubuntu 16.04. For client, your should use an Linux machine which you have sudo privilege.
- *ip tuntap* command can be used to create an TUN interface. After TUN interface are created, you use *ifconfig* command to configure it.
- To read or write data from TUN interface in a program, you need call a system call to get the file descriptor. Please refer the documentation of Linux kernel. https://www.kernel.org/doc/Documentation/networking/tuntap.txt
- Here is a tutorial to use TUN API in C. https://backreference.org/2010/03/26/tuntap-interface-tutorial/
- For Python user, these projects may be helpful. https://github.com/gonewind73/pytuntap https://github.com/montag451/pytun