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Section: 2
Lab #2 – Application Layer

1. Problem 1
   a. Request Capture

```
No.     Time            Source              Destination         Protocol Length Info
    661 13:48:00.085958   10.0.1.6            13.225.231.96       OCSP      487    Request
Frame 661: 487 bytes on wire (3896 bits), 487 bytes captured (3896 bits) on interface \Device\NPF_{83311EA2-BF29-408D-B244-2ED780897B0B},
id 0
Ethernet II, Src: IntelCor_d0:cc:58 (34:2e:b7:d0:cc:58), Dst: Apple_f1:b2:86 (a4:e9:75:f1:b2:86)
Internet Protocol Version 4, Src: 10.0.1.6, Dst: 13.225.231.96
Transmission Control Protocol, Src Port: 57118, Dst Port: 80, Seq: 1, Ack: 1, Len: 433
Hypertext Transfer Protocol
    POST / HTTP/1.1\r\n
        [Expert Info (Chat/Sequence): POST / HTTP/1.1\r\n]
        Request Method: POST
        Request URI: /
        Request Version: HTTP/1.1
    Host: ocsp.sca1b.amazontrust.com\r\n
    User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:92.0) Gecko/20100101 Firefox/92.0\r\n
    Accept: */*\r\n
    Accept-Language: en-US,en;q=0.5\r\n
    Accept-Encoding: gzip, deflate\r\n
    Content-Type: application/ocsp-request\r\n
    Content-Length: 83\r\n
    Connection: keep-alive\r\n
    Pragma: no-cache\r\n
    Cache-Control: no-cache\r\n
    \r\n
    [Full request URI: http://ocsp.sca1b.amazontrust.com/]
    [HTTP request 1/7]
    [Response in frame: 758]
    [Next request in frame: 3365]
    File Data: 83 bytes
Online Certificate Status Protocol
```

   b. Response Capture

```
No.     Time            Source              Destination         Protocol Length Info
    758 13:48:00.110869   13.225.231.96       10.0.1.6            OCSP      1060   Response
Frame 758: 1060 bytes on wire (8480 bits), 1060 bytes captured (8480 bits) on interface \Device\NPF_{83311EA2-BF29-408D-B244-2ED780897B0B},
id 0
Ethernet II, Src: Apple_f1:b2:86 (a4:e9:75:f1:b2:86), Dst: IntelCor_d0:cc:58 (34:2e:b7:d0:cc:58)
Internet Protocol Version 4, Src: 13.225.231.96, Dst: 10.0.1.6
Transmission Control Protocol, Src Port: 80, Dst Port: 57118, Seq: 1, Ack: 434, Len: 1006
Hypertext Transfer Protocol
    HTTP/1.1 200 OK\r\n
        [Expert Info (Chat/Sequence): HTTP/1.1 200 OK\r\n]
        Response Version: HTTP/1.1
        Status Code: 200
        [Status Code Description: OK]
        Response Phrase: OK
    Content-Type: application/ocsp-response\r\n
    Content-Length: 471\r\n
    Connection: keep-alive\r\n
    Accept-Ranges: bytes\r\n
    Cache-Control: max-age=120871\r\n
    Date: Sun, 19 Sep 2021 17:47:58 GMT\r\n
    Etag: "61469b2c-1d7"\r\n
    Expires: Tue, 21 Sep 2021 03:22:29 GMT\r\n
    Last-Modified: Sun, 19 Sep 2021 02:06:36 GMT\r\n
    Server: ECS (nyb/1D21)\r\n
    X-Cache: Miss from cloudfront\r\n
    Via: 1.1 f800b68f44c427976fe7546b255b6206.cloudfront.net (CloudFront)\r\n
    X-Amz-Cf-Pop: JFK51-C1\r\n
    X-Amz-Cf-Id: k5HpSVvMC20KiTuqoRosAarVMJWj8X5s2wOyhe2tquNg0bM81ezl6A==\r\n
    Age: 4553\r\n
    \r\n
    [HTTP response 1/7]
    [Time since request: 0.024911000 seconds]
    [Request in frame: 661]
    [Next request in frame: 3365]
    [Next response in frame: 3424]
    [Request URI: http://ocsp.sca1b.amazontrust.com/]
    File Data: 471 bytes
Online Certificate Status Protocol
```

b. Request http://ocsp.sca1b.amazontrust.com
Response http://ocsp.sca1b.amazontrust.com

c. HTTP has a persistent connection function that allows the channel to remain open rather than be closed after a requested exchange of data. Persistent connections added for HTTP 1.0 used an extra header to request the client keep the connection alive.

d. The web browser is Mozilla as we can see in the user-agent in the figure the request. It is required because servers need to know which browser request for the service(web-page) so that it can serve according to that browser format requirements.

e.In the figure response in the section of content-type is **application/ocsp-response\r\n**

f. Request Get

```
Hypertext Transfer Protocol
  > GET /canonical.html HTTP/1.1\r\n
    Host: detectportal.firefox.com\r\n
    User-Agent: Mozilla/5.0 (Windows NT 10.0; Win64; x64; rv:92.0) Gecko/20100101 Firefox/92.0\r\n
    Accept: */*\r\n
    Accept-Language: en-US,en;q=0.5\r\n
    Accept-Encoding: gzip, deflate\r\n
    Cache-Control: no-cache\r\n
    Pragma: no-cache\r\n
    Connection: keep-alive\r\n
    \r\n
    [Full request URI: http://detectportal.firefox.com/canonical.html]
    [HTTP request 1/1]
    [Response in frame: 3172]
```

Response

```
>  Transmission Control Protocol, Src Port: 80, Dst Port: 62111, Seq: 1, Ack: 302, Len: 302
v  Hypertext Transfer Protocol
   >  HTTP/1.1 200 OK\r\n
      Server: nginx\r\n
      Date: Wed, 29 Sep 2021 16:42:04 GMT\r\n
      Content-Type: text/html\r\n
   >  Content-Length: 90\r\n
      Via: 1.1 google\r\n
      Age: 84941\r\n
      Cache-Control: public, must-revalidate, max-age=0, s-maxage=86400\r\n
      \r\n
      [HTTP response 1/1]
      [Time since request: 0.024570000 seconds]
      [Request in frame: 3169]
      [Request URI: http://detectportal.firefox.com/canonical.html]
      File Data: 90 bytes
>  Line-based text data: text/html (1 lines)
```

In this experiment, it is a different method than the first example, the method GET is the method used by the browser to ask the server to send back a given resource.

2. Problem 2

Docker hub
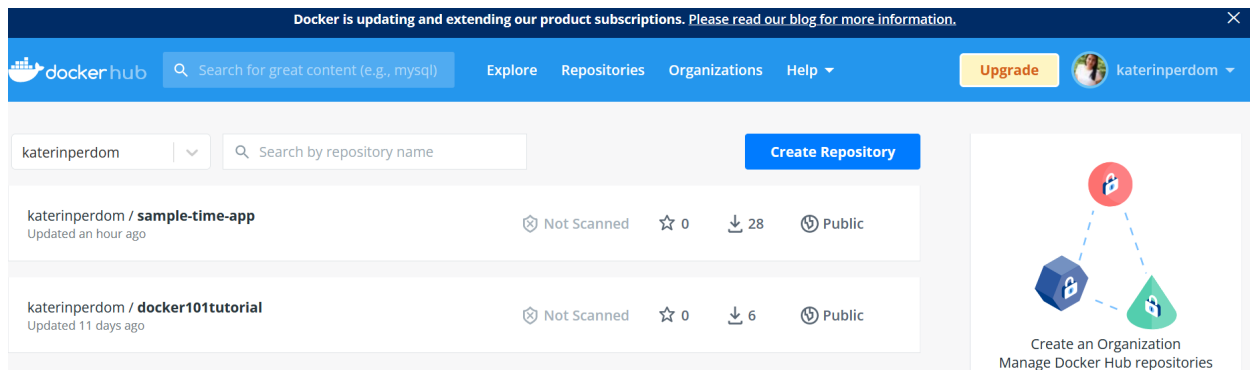
In Ibmcloud workload
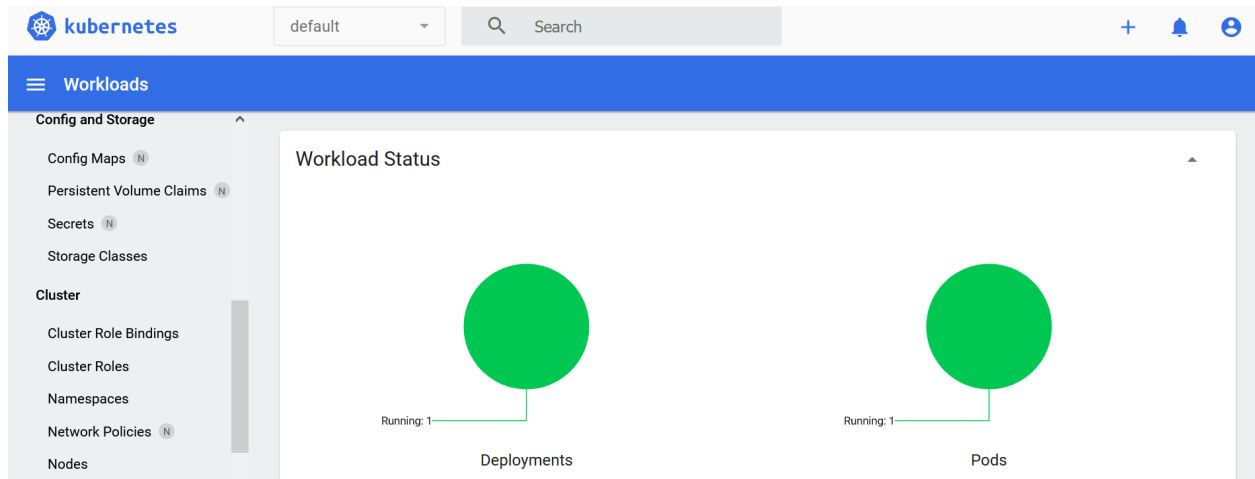
Deployments

Name	Namespace	Images	Labels
● sample-time-app	default	Show all	Show all

Kubectl services after the deployment sample-time-app

```
(env) PS C:\Users\Katerin Perdom\OneDrive\Documents\Semester2\DataCommunication\Project1\nyu-cs2262-001-fa20\sample_time_app> kubectl get services
NAME              TYPE        CLUSTER-IP     EXTERNAL-IP    PORT(S)          AGE
kubernetes        ClusterIP   172.21.0.1     <none>         443/TCP          7d20h
sample-time-app   NodePort    172.21.79.62   <none>         8080:31432/TCP   7d19h
sample-time-app2  NodePort    172.21.60.137  <none>         8080:30120/TCP   137m
(env) PS C:\Users\Katerin Perdom\OneDrive\Documents\Semester2\DataCommunication\Project1\nyu-cs2262-001-fa20\sample_time_app> []
```

Verification of website

Hello Katerine :D!

Page /: greeting

09/30/2021, 09:40:03

Page /time

Repository in Github

Affirmation of my Independent Effort: