

Computer Networks (COL)

Assignment 1

Question 4

4.)

a. CalenderAgent, helpd, SystemUIServer.

b.

(i) Server for which DNS query was launched : 10.10.2.2

(ii) Number of http request generated : 162

(iii) Number of TCP connection opened : 970

(iv) Total time taken for download : 2.009770496 seconds

(v) TCP losses : 1

TCP retransmits : 0

DNS Packets:

7	3.883699182	192.168.0.100	10.10.2.2	DNS	74 Standard query 0x7f65 A www.iitd.ac.in
8	3.884363076	192.168.0.100	10.10.1.2	DNS	74 Standard query 0x7f65 A www.iitd.ac.in
9	3.884401249	192.168.0.100	10.10.2.2	DNS	74 Standard query 0x2788 AAAA www.iitd.ac.in
10	3.886611076	10.10.1.2	192.168.0.100	DNS	199 Standard query response 0x7f65 A www.iitd.ac.in A 10.7.174.1
11	3.889646436	10.10.2.2	192.168.0.100	DNS	199 Standard query response 0x7f65 A www.iitd.ac.in A 10.7.174.1
12	3.889671227	10.10.2.2	192.168.0.100	DNS	127 Standard query response 0x2788 AAAA www.iitd.ac.in SOA intdr

IP headers:

1.)

```
▼ Internet Protocol Version 4, Src: 192.168.0.100, Dst: 10.7.174.111
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  ▶ Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 52
    Identification: 0x9a36 (39478)
  ▶ Flags: 0x02 (Don't Fragment)
    Fragment offset: 0
    Time to live: 64
    Protocol: TCP (6)
    Header checksum: 0x270b [validation disabled]
    [Header checksum status: Unverified]
    Source: 192.168.0.100
    Destination: 10.7.174.111
    [Source GeoIP: Unknown]
    [Destination GeoIP: Unknown]
```

2.)

```
▼ Internet Protocol Version 4, Src: 192.168.0.100, Dst: 10.7.174.111
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  ▶ Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 52
    Identification: 0x9a3a (39482)
  ▶ Flags: 0x02 (Don't Fragment)
    Fragment offset: 0
    Time to live: 64
    Protocol: TCP (6)
    Header checksum: 0x2707 [validation disabled]
    [Header checksum status: Unverified]
    Source: 192.168.0.100
    Destination: 10.7.174.111
    [Source GeoIP: Unknown]
    [Destination GeoIP: Unknown]
```

3.)

```
▼ Internet Protocol Version 4, Src: 10.7.174.111, Dst: 192.168.0.100
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  ▶ Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
    Total Length: 1500
    Identification: 0xe364 (58212)
  ▶ Flags: 0x02 (Don't Fragment)
    Fragment offset: 0
    Time to live: 59
    Protocol: TCP (6)
    Header checksum: 0xdd34 [validation disabled]
    [Header checksum status: Unverified]
    Source: 10.7.174.111
    Destination: 192.168.0.100
    [Source GeoIP: Unknown]
    [Destination GeoIP: Unknown]
```

TCP headers:

1.)

```
▼ Transmission Control Protocol, Src Port: 57666, Dst Port: 80, Seq: 1, Ack: 1, Len: 0
  Source Port: 57666
  Destination Port: 80
  [Stream index: 3]
  [TCP Segment Len: 0]
  Sequence number: 1      (relative sequence number)
  Acknowledgment number: 1  (relative ack number)
  Header Length: 32 bytes
  ▶ Flags: 0x010 (ACK)
  Window size value: 229
  [Calculated window size: 29312]
  [Window size scaling factor: 128]
  Checksum: 0x6068 [unverified]
  [Checksum Status: Unverified]
  Urgent pointer: 0
  ▶ Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
  ▶ [SEQ/ACK analysis]
```

2.)

```
▼ Transmission Control Protocol, Src Port: 57666, Dst Port: 80, Seq: 1, Ack: 1, Len:
  Source Port: 57666
  Destination Port: 80
  [Stream index: 3]
  [TCP Segment Len: 386]
  Sequence number: 1      (relative sequence number)
  [Next sequence number: 387  (relative sequence number)]
  Acknowledgment number: 1  (relative ack number)
  Header Length: 32 bytes
  ▶ Flags: 0x018 (PSH, ACK)
  Window size value: 229
  [Calculated window size: 29312]
  [Window size scaling factor: 128]
  Checksum: 0x7509 [unverified]
  [Checksum Status: Unverified]
  Urgent pointer: 0
  ▶ Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
  ▶ [SEQ/ACK analysis]
```

3.)

```
▼ Transmission Control Protocol, Src Port: 80, Dst Port: 57670, Seq: 7654, Ack: 1592, Len: 1448
  Source Port: 80
  Destination Port: 57670
  [Stream index: 5]
  [TCP Segment Len: 1448]
  Sequence number: 7654    (relative sequence number)
  [Next sequence number: 9102  (relative sequence number)]
  Acknowledgment number: 1592  (relative ack number)
  Header Length: 32 bytes
  ▶ Flags: 0x010 (ACK)
  Window size value: 147
  [Calculated window size: 18816]
  [Window size scaling factor: 128]
  Checksum: 0x08d2 [unverified]
  [Checksum Status: Unverified]
  Urgent pointer: 0
  ▶ Options: (12 bytes), No-Operation (NOP), No-Operation (NOP), Timestamps
  ▶ [SEQ/ACK analysis]
  \[Reassembled PDU in frame: 187\]
  TCP segment data (1448 bytes)
```


HTTP requests:

1.)

```
GET / HTTP/1.1
Host: www.iitd.ac.in
User-Agent: Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:54.0) Gecko/20100101 Firefox/54.0
Accept: text/html,application/xhtml+xml,application/xml;q=0.9,*/*;q=0.8
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Cookie: SESS1f002926bf876664ed5383994cb4c1de=5jgd1h4itgncftrro94mv5e6d7
Connection: keep-alive
Upgrade-Insecure-Requests: 1
```

```
HTTP/1.1 200 OK
Date: Sun, 20 Aug 2017 05:51:01 GMT
Server: Apache/2.2.22 (Ubuntu) mod_fcgid/2.3.6 proxy_html/3.0.1 mod_ssl/2.2.22 OpenSSL/1.0.1
X-Powered-By: PHP/5.3.10-1ubuntu3.19
Expires: Sun, 19 Nov 1978 05:00:00 GMT
Cache-Control: store, no-cache, must-revalidate, post-check=0, pre-check=0
Last-Modified: Sun, 20 Aug 2017 05:51:01 GMT
Vary: Accept-Encoding
Content-Encoding: gzip
Content-Length: 9559
Keep-Alive: timeout=15, max=100
Connection: Keep-Alive
Content-Type: text/html; charset=utf-8
```

```
.....}k...r.wU...{+.j..}J..1.a.V..+.8....IH..<v.....H....r..y`f0C.....lQ$.@7...../n...".....
1...._t.....^%....G.7.n..].t.Q...v.....X...E.=+.g.^ $...
05..._x!..u.M..i.....{..0jA)..(J..k..N;...172n.>..S.:D.k.J.#...!N.hf.tH....!...l.Z..d...;...f.....\2{._u%,..
.W6w.....p....G.C..Y.lv...<ba.b3..Q7Z0..~R.0...x.....a=.....V.C.....u.f
T2[d.a'A..-m....:a.....f..f.yv.ut.....A.pr.....~..h....[l.....648..#^.....j..2...61.E.....18...Ky..p..Vj-JQ...
6s-.d.&.ds...).$. " .W7....%.|...;e.....1.=?.S].>7..T.jp..5f.r/....
v)@.j. .A.....qf[...b...Y..w<..VB....]...!;...e3...s...9w..M.^.....3={.F.F.U..Er %#.I...!.....%W..S
.{.L.....6...|.j.;?
..QQ.j2@3.#.1vKM..fq.=7.gbz...(.zt.P.7.....\.....0..p...>A_g... ..$..$#I2v,y%,...;.A..]....P.oo
.. ..[.#.Qo0./Q..0~.32."'.<.-.3...)*N1...../.Q....r. .Q.Y.
;b...G....p....H....J.gzGej...Yk...>.).....R....g..g...2h...[...]+.)...*x...E....9..7.
[...]&JYZ{6.B.a."....0i.vR1.L.N...k/..IO`.^p.E.9.J.61F8...S.S.n.A.r.Y9..Y@...L.s...6.+H;.....<.=.....t#..>&.....(.E4%[...`t.
3.j1..|6m.|.d.)..`/.....3L|...EK....o...
Y.qw.>'.J:|oh...$.n.9.d..R..uh...L.....,/B .a.?...._.....*V;..z...1.X...;... m..f..HU..~.8...!~u.Cq8aV...
.....Q.3.....Wf33...b.o.....5...0...<...1..f3@..e..|.t...c9j.h).._!..[...=.D.Y.q..uDj.Z..v'B...
2#.id.c.o...&8.z.H.@..).m0..q...Y#...p...<...E6.J..zqdp.!e.t.jR.9..
...6KMdV1
vQ...L....L.
)..@g9.....h.$...s.e...
X.h'.....n]h .....#.....8.Yp2P.."d/.o .....z .SY.$N,.....pKv.....@vu.." {l..... p..`n1.."..Hp.``.....%
%o..d...du....w.3....T@q8..$.._9...!...M.....'b.(.0.G.\.R0...T...N....CVJ~#. &.7.@.H.J.."v..RQ9...s>..B|a...*.
(()..A."Ou..S{h.Q.d*..#.3=.;..^`oh..zf.._X.....;t.&4....Xx...k.]..l...o..{..*....K..t...g....$.:..2P...VC
..!M...3..!.."..sf..%...@.....4.....[c.x.F.J.*.H
f....A... F.@pQ.@s.....F.#.P,~'I...e.G.....P...$ .../.g..N....Nw.i.h.l..$.5d..8..B...*.B.....
..y> ...D4...VN..tY(##%/k..+.f.....7.I...:J..dm7az.5E..3..4m..3..Sl...0..~@Vs1..#....X.,]f..W.....+..).`..'B.!+...
$DwFM.z..t..v.8.u...M...B y...X.,..SjM.|.|...{Xt..{..f.^.=..[ .9+%4..?
R..S...rr.....wi.".....v.@S.?.....P.3...[A.u.G.~J.b#8...:Lr.E.sVI.G78....q.p.....yy.e.d..{.....n.^.....2.|1...@.
<q.....!Au ...L.'U...1]/.*.wc.L*U.L.1.....^.....(1...P...)U.9..4.s.k..."..C!s=.
```

2.)

```
GET /modules/system/defaults.css?Y HTTP/1.1
Host: www.iitd.ac.in
User-Agent: Mozilla/5.0 (X11; Ubuntu; Linux x86_64; rv:54.0) Gecko/20100101 Firefox/54.0
Accept: text/css,*/*;q=0.1
Accept-Language: en-US,en;q=0.5
Accept-Encoding: gzip, deflate
Referer: http://www.iitd.ac.in/
Cookie: SESS1f002926bf876664ed5383994cb4c1de=5jgd1h4itgncftrro94mv5e6d7
Connection: keep-alive

HTTP/1.1 200 OK
Date: Sun, 20 Aug 2017 05:51:02 GMT
Server: Apache/2.2.22 (Ubuntu) mod_fcgid/2.3.6 proxy_html/3.0.1 mod_ssl/2.2.22 OpenSSL/1.0.1
Last-Modified: Tue, 02 Oct 2007 12:10:40 GMT
ETag: "1a2be5-2f5-43b817107d000"
Accept-Ranges: bytes
Content-Length: 757
Keep-Alive: timeout=15, max=100
Connection: Keep-Alive
Content-Type: text/css

/* $Id: defaults.css,v 1.5 2007/10/02 12:10:40 dries Exp $ */

/*
** HTML elements
*/
fieldset {
    margin-bottom: 1em;
    padding: .5em;
}
form {
    margin: 0;
    padding: 0;
}
hr {
    height: 1px;
    border: 1px solid gray;
}
img {
    border: 0;
}
table {
    border-collapse: collapse;
}
th {
    text-align: left; /* LTR */
    padding-right: 1em; /* LTR */
    border-bottom: 3px solid #ccc;
}

/*
```