

Homework 1

601.419/619 Cloud Computing

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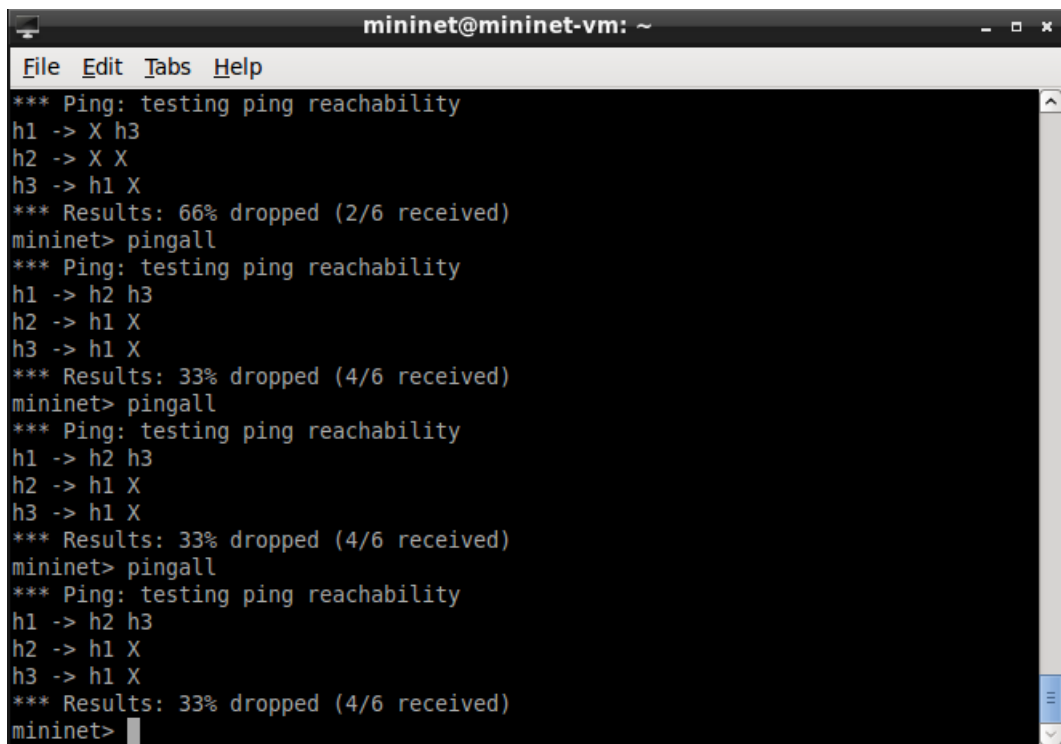
- A.1.1 What will happen if you ping a non-existent host that doesn't reply ICMP requests? For example, do the following command in the xterm for h3: `ping -c1 10.0.0.9`.

Answer:

H3 will initially broadcast ARP requests for the desired IP address in hopes of getting a reply containing the associated MAC address. In the case that we try to ping 10.0.0.9, h3 will broadcast an ARP request for 10.0.0.9 that none of the other hosts will respond to. Ping has a default ARP retry of 3 times, which is set at a default time out of 1 second. Thus after not receiving any reply after 3 retries, Ping discards the queued ICMP packets and returns Destination Host Unreachable.

- A.1.2 Modify the firewall (firewall.py) to block trac with source MAC address 00:00:00:00:00:02 and destination MAC address 00:00:00:00:00:03. To show the result, you can use the command `pingall` and copy the output to your report. (Hint 1: this only takes a few lines of code. Hint 2: if you did not specify any action in a OpenFlow message, then matching packets will be dropped.)

Answer:



```
mininet@mininet-vm: ~
File Edit Tabs Help
*** Ping: testing ping reachability
h1 -> X h3
h2 -> X X
h3 -> h1 X
*** Results: 66% dropped (2/6 received)
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 h3
h2 -> h1 X
h3 -> h1 X
*** Results: 33% dropped (4/6 received)
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 h3
h2 -> h1 X
h3 -> h1 X
*** Results: 33% dropped (4/6 received)
mininet> pingall
*** Ping: testing ping reachability
h1 -> h2 h3
h2 -> h1 X
h3 -> h1 X
*** Results: 33% dropped (4/6 received)
mininet>
```

- A.2.1 On how many occasions did companies violate the Do Not Call Registry?

Accuray Incorporated	5	
Akebia Therapeutics, Inc.	4	
American River Bankshares	7	
Antares Pharma, Inc.	2	
Aquestive Therapeutics, Inc.	2	
Arch Capital Group Ltd.	3	
Arotech Corporation	4	
Aspen Group Inc.	3	
Attis Industries Inc.	1	
Aware, Inc.	1	
Barclays PLC	1	
BioCryst Pharmaceuticals, Inc.	2	
Bridgewater Bancshares, Inc.	1	
Brighthouse Financial, Inc.	7	
B. Riley Financial, Inc.	8	
Bruker Corporation	3	
Cadiz, Inc.	2	
Capital Bancorp, Inc.	1	
CareTrust REIT, Inc.	1	
CASI Pharmaceuticals, Inc.	1	
Celcuity Inc.	3	
Cellectar Biosciences, Inc.	3	
ClearBridge All Cap Growth ETF	2	
Clearfield, Inc.	2	
CM Seven Star Acquisition Corporation	2	
Corcept Therapeutics Incorporated	1	
CPI Card Group Inc.	2	
CryoPort, Inc.	4	
CSI Compressco LP	1	
CUI Global, Inc.	2	
DarioHealth Corp.	1	
Davis Select International ETF	2	
Deciphera Pharmaceuticals, Inc.	4	
DiamondPeak Holdings Corp.	3	
Discovery, Inc.	6	
eGain Corporation	5	
Ekso Bionics Holdings, Inc.	1	
Enphase Energy, Inc.	3	
Entera Bio Ltd.	1	
Evoform Biosciences, Inc.	1	
First Midwest Bancorp, Inc.	3	
Five Star Senior Living Inc.	4	
FlexShopper, Inc.	1	
Fortress Biotech, Inc.	1	
FSB Bancorp, Inc.	1	
Gilead Sciences, Inc.	8	
Gladstone Commercial Corporation	1	
Golar LNG Partners LP	2	
Gordon Pointe Acquisition Corp.	4	
Greenland Acquisition Corporation	1	
HD Supply Holdings, Inc.	1	
HMS Holdings Corp	1	
HopFed Bancorp, Inc.	3	
Huntington Bancshares Incorporated	4	
InterDigital, Inc.	1	
Invesco DWA Momentum ETF	2	
IRIDEX Corporation	4	
iShares Russell 1000 Pure U.S. Revenue ETF	1	

Kala Pharmaceuticals, Inc.	1	
Longevity Acquisition Corporation		1
Luminex Corporation	1	
Minerva Neurosciences, Inc	1	
Monocle Acquisition Corporation	1	
MTBC, Inc.	1	
NantKwest, Inc.	1	
Newell Brands Inc.	3	
Patterson Companies, Inc.	8	
PennantPark Floating Rate Capital Ltd.	3	
Perceptron, Inc.	5	
PetIQ, Inc.	5	
Phunware, Inc.	3	
Profire Energy, Inc.	1	
Restoration Robotics, Inc.	1	
Retrophin, Inc.	2	
RF Industries, Ltd.	8	
RigNet, Inc.	1	
Schultze Special Purpose Acquisition Corp.		1
Senior Housing Properties Trust	1	
ServisFirst Bancshares, Inc.	1	
SigmaTron International, Inc.	4	
Simulations Plus, Inc.	1	
Soliton, Inc.	2	
Sotherly Hotels LP	1	
Sunrun Inc.	1	
The Trade Desk, Inc.	7	
TiVo Corporation	1	
TravelCenters of America LLC	4	
Travelzoo	1	
Tribune Publishing Company	1	
United Bancshares, Inc.	4	
United Natural Foods, Inc.	4	
Universal Logistics Holdings, Inc.	5	
Vanda Pharmaceuticals Inc.	9	
Vertex Pharmaceuticals Incorporated	3	
Viacom Inc.	5	
VictoryShares Emerging Market High Div Volatility Wtd ETF		1

A.2.2 How many numbers should be blocked / marked as spam to reduce the number of unwanted calls?

Accuray Incorporated	118	
Akebia Therapeutics, Inc.	68	
American River Bankshares	121	
Antares Pharma, Inc.	49	
Aquestive Therapeutics, Inc.	113	
Arch Capital Group Ltd.	105	
Arotech Corporation	120	
Aspen Group Inc.	120	
Attis Industries Inc.	42	
Aware, Inc.	93	
Barclays PLC	68	
BioCryst Pharmaceuticals, Inc.	94	
Bridgewater Bancshares, Inc.	60	
Brighthouse Financial, Inc.	71	
B. Riley Financial, Inc.	16	
Bruker Corporation	85	
Cadiz, Inc.	17	

Capital Bancorp, Inc.	61	
CareTrust REIT, Inc.	103	
CASI Pharmaceuticals, Inc.	107	
Celcuity Inc.	136	
Cellectar Biosciences, Inc.	63	
ClearBridge All Cap Growth ETF	44	
Clearfield, Inc.	171	
CM Seven Star Acquisition Corporation	139	
Corcept Therapeutics Incorporated	39	
CPI Card Group Inc.	135	
CryoPort, Inc.	36	
CSI Compressco LP	119	
CUI Global, Inc.	58	
DarioHealth Corp.	98	
Davis Select International ETF	60	
Deciphera Pharmaceuticals, Inc.	42	
DiamondPeak Holdings Corp.	144	
Discovery, Inc.	118	
eGain Corporation	143	
Ekso Bionics Holdings, Inc.	11	
Enphase Energy, Inc.	125	
Entera Bio Ltd.	158	
Evoform Biosciences, Inc.	74	
First Midwest Bancorp, Inc.	75	
Five Star Senior Living Inc.	126	
FlexShopper, Inc.	36	
Fortress Biotech, Inc.	130	
FSB Bancorp, Inc.	41	
Gilead Sciences, Inc.	41	
Gladstone Commercial Corporation	62	
Golar LNG Partners LP	42	
Gordon Pointe Acquisition Corp.	21	
Greenland Acquisition Corporation	35	
HD Supply Holdings, Inc.	22	
HMS Holdings Corp	52	
HopFed Bancorp, Inc.	154	
Huntington Bancshares Incorporated	115	
InterDigital, Inc.	29	
Invesco DWA Momentum ETF	123	
IRIDEX Corporation	124	
iShares Russell 1000 Pure U.S. Revenue ETF	21	
Kala Pharmaceuticals, Inc.	70	
Longevity Acquisition Corporation	54	
Luminex Corporation	12	
Minerva Neurosciences, Inc	12	
Monocle Acquisition Corporation	115	
MTBC, Inc.	19	
NantKwest, Inc.	88	
Newell Brands Inc.	14	
Patterson Companies, Inc.	150	
PennantPark Floating Rate Capital Ltd.	91	
Perceptron, Inc.	55	
PetIQ, Inc.	131	
Phunware, Inc.	29	
Profire Energy, Inc.	86	
Restoration Robotics, Inc.	99	
Retrophin, Inc.	141	
RF Industries, Ltd.	148	

RigNet, Inc.	38	
Schultze Special Purpose Acquisition Corp.		81
Senior Housing Properties Trust	57	
ServisFirst Bancshares, Inc.	103	
SigmaTron International, Inc.	50	
Simulations Plus, Inc.	19	
Soliton, Inc.	134	
Sotherly Hotels LP	141	
Sunrun Inc.	19	
The Trade Desk, Inc.	15	
TiVo Corporation	34	
TravelCenters of America LLC	139	
Travelzoo	104	
Tribune Publishing Company	121	
United Bancshares, Inc.	175	
United Natural Foods, Inc.	105	
Universal Logistics Holdings, Inc.		83
Vanda Pharmaceuticals Inc.	149	
Vertex Pharmaceuticals Incorporated		161
Viacom Inc.	30	
VictoryShares Emerging Market High Div Volatility Wtd ETF		16

A.2.3 Which telephone numbers received the most spam calls?

(404)–934–5110 77
(216)–684–9356 72
(410)–516–8171 69

A.2.4 Which telephone numbers are responsible for the most spam calls?

(396)–073–8185 1261
(871)–758–4694 1116
(376)–303–1515 791

A.2.5 Which hours of the day are spam calls most likely?

1 PM 20754
2 PM 12212
12 PM 12191