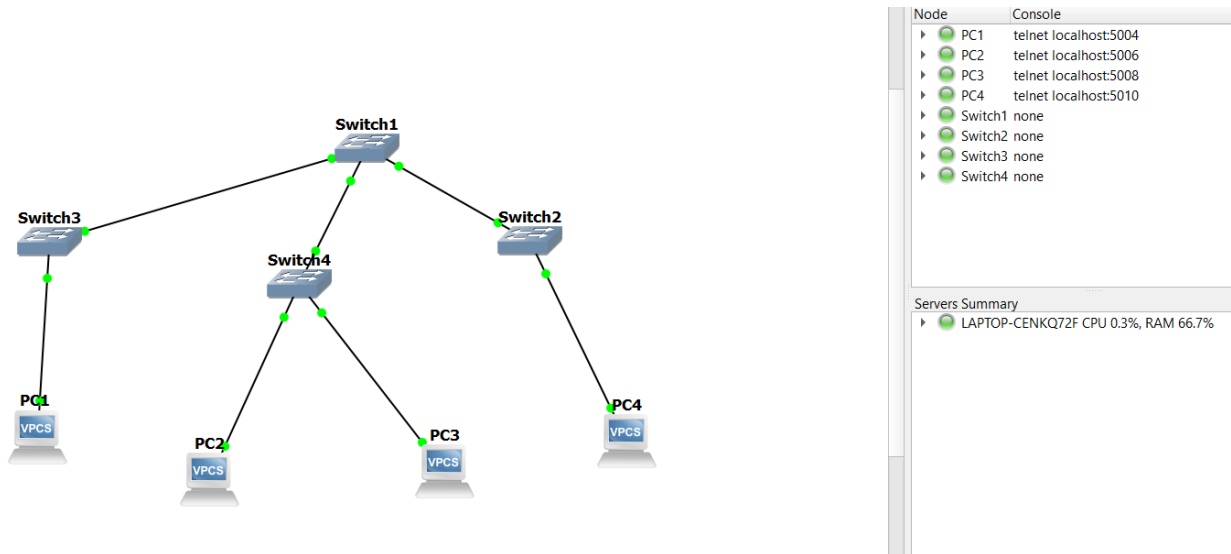


گزارش پروژه دوم شبکه

محمد علی قهاری ۸۱۰۱۰۰۲۰۱ - رضا عبدلی ۸۱۰۱۰۰۲۵۱

بخش (۱)

پس از راه اندازی شبکه و متصل کردن سویچ ها و کامپیوتر ها:



برای هر کامپیوتر ، آدرس IP و Subnet Mask را تنظیم میکنیم:

:PC1

```
PC1
Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
Copyright (c) 2007-2014, Paul Meng (mirnshi@gmail.com)
All rights reserved.

VPCS is free software, distributed under the terms of the "BSD" licence.
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

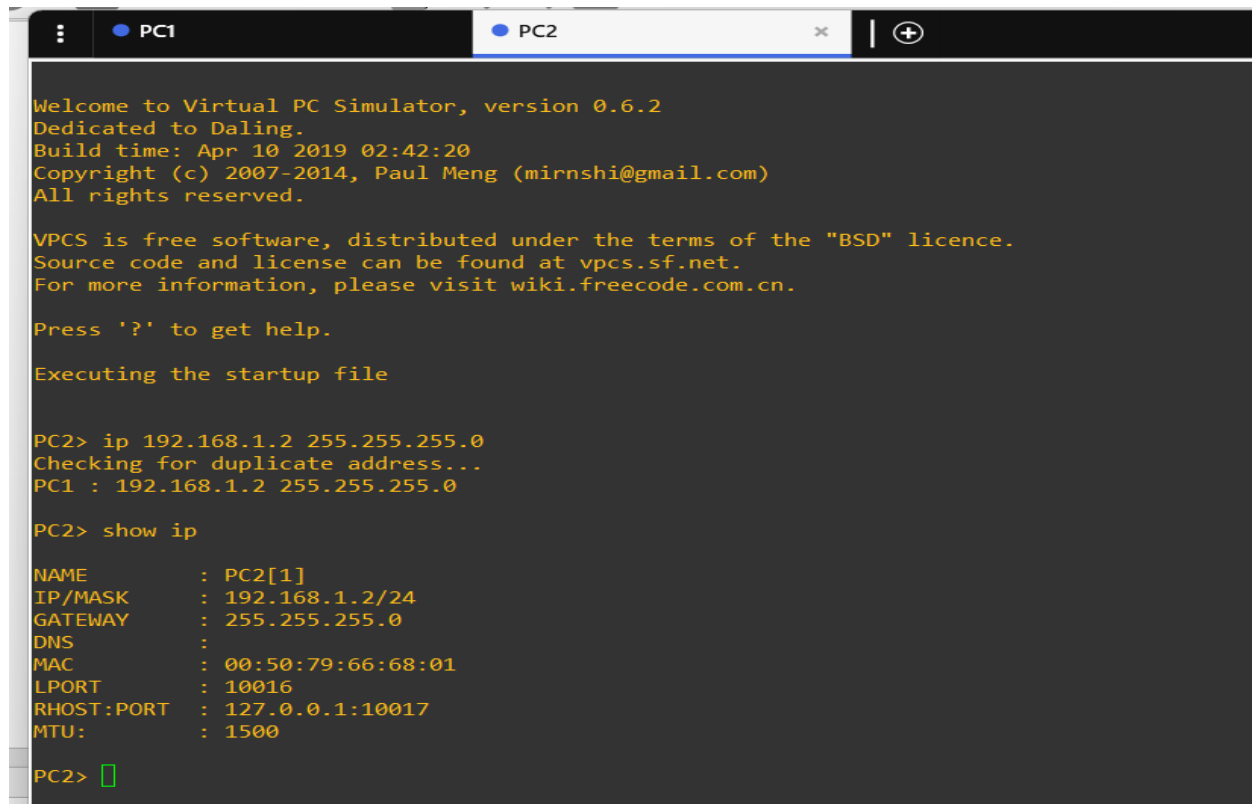
Press '?' to get help.

Executing the startup file

PC1> ip 192.168.1.1 255.255.255.0
Checking for duplicate address...
PC1 : 192.168.1.1 255.255.255.0

PC1> 
```

:PC2



The screenshot shows a window titled 'Virtual PC Simulator' with two tabs: 'PC1' and 'PC2'. The 'PC2' tab is active, displaying a command prompt with the following text:

```
Welcome to Virtual PC Simulator, version 0.6.2
Dedicated to Daling.
Build time: Apr 10 2019 02:42:20
Copyright (c) 2007-2014, Paul Meng (mirnshi@gmail.com)
All rights reserved.

VPCS is free software, distributed under the terms of the "BSD" licence.
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC2> ip 192.168.1.2 255.255.255.0
Checking for duplicate address...
PC1 : 192.168.1.2 255.255.255.0

PC2> show ip

NAME       : PC2[1]
IP/MASK     : 192.168.1.2/24
GATEWAY     : 255.255.255.0
DNS         :
MAC         : 00:50:79:66:68:01
LPORT      : 10016
RHOST:PORT  : 127.0.0.1:10017
MTU         : 1500

PC2> █
```

برای PC3 192.168.1.3 255.255.255.0 و برای PC4 192.168.1.4 255.255.255.0 به همین منوال.

برای تست ارتباط میان کامپیوترها، از دستور **ping** استفاده میکنیم.

مثلا از PC2 به PC3، روی PC2 دستور زیر را وارد میکنیم: *ping 192.168.1.3*

```
Build time: Apr 10 2019 02:42:20
Copyright (c) 2007-2014, Paul Meng (mirnshi@gmail.com)
All rights reserved.

VPCS is free software, distributed under the terms of the "BSD" licence.
Source code and license can be found at vpcs.sf.net.
For more information, please visit wiki.freecode.com.cn.

Press '?' to get help.

Executing the startup file

PC2> ip 192.168.1.2 255.255.255.0
Checking for duplicate address...
PC1 : 192.168.1.2 255.255.255.0

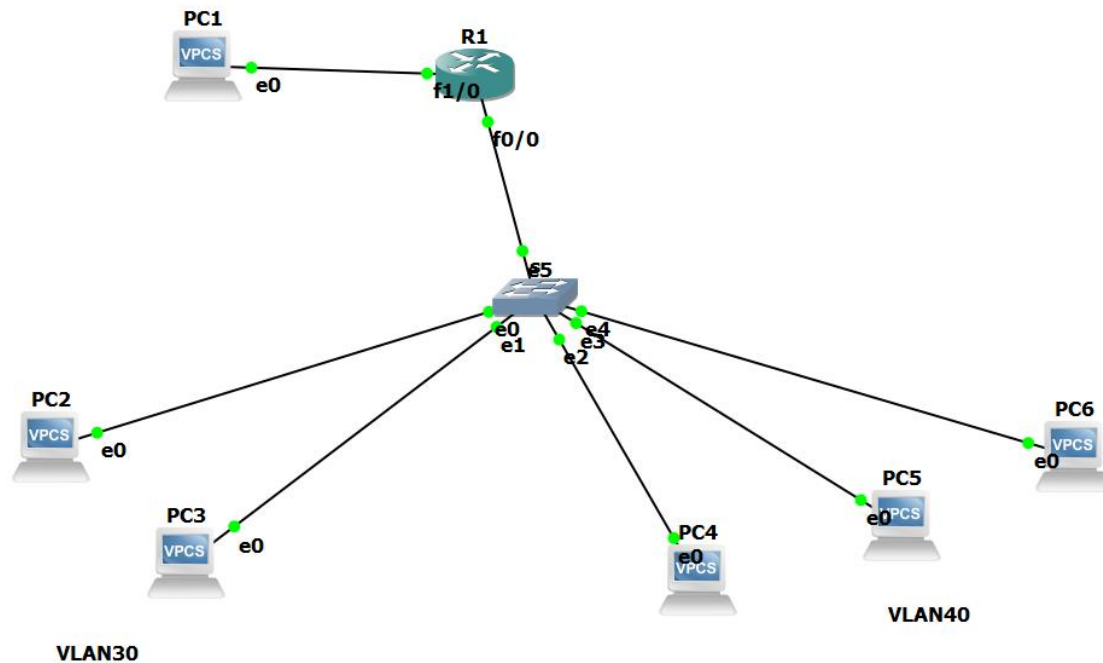
PC2> show ip
NAME       : PC2[1]
IP/MASK     : 192.168.1.2/24
GATEWAY     : 255.255.255.0
DNS         :
MAC         : 00:50:79:66:68:01
LPORT      : 10016
RHOST:PORT  : 127.0.0.1:10017
MTU         : 1500

PC2> ping 192.168.1.3
84 bytes from 192.168.1.3 icmp_seq=1 ttl=64 time=0.430 ms
84 bytes from 192.168.1.3 icmp_seq=2 ttl=64 time=0.463 ms
84 bytes from 192.168.1.3 icmp_seq=3 ttl=64 time=0.762 ms
84 bytes from 192.168.1.3 icmp_seq=4 ttl=64 time=0.819 ms
84 bytes from 192.168.1.3 icmp_seq=5 ttl=64 time=0.535 ms

PC2> █
```

این خروجی نشان می‌دهد که بسته‌ها به مقصد رسیده‌اند (یعنی ارتباط برقرار است).

بخش ۲:



این پینگ بین VLAN ۲ است:

Checking for duplicate address...

PC1 : 192.168.30.1 255.255.255.0 gateway 192.168.30.10

PC2> ping 192.168.40.1

84 bytes from 192.168.40.1 icmp_seq=1 ttl=63 time=60.892 ms

84 bytes from 192.168.40.1 icmp_seq=2 ttl=63 time=30.604 ms

84 bytes from 192.168.40.1 icmp_seq=3 ttl=63 time=30.479 ms

84 bytes from 192.168.40.1 icmp_seq=4 ttl=63 time=30.873 ms

84 bytes from 192.168.40.1 icmp_seq=5 ttl=63 time=30.539 ms

PC2> █

این هم گزارش لینکی است که بین روتر و سوئیچ قرار دارد:

No.	Time	Source	Destination	Protocol	Length	Info
2	9.981470	192.168.30.1	192.168.40.1	ICMP	102	Echo (ping) request id=0xf887, seq=1/256, ttl=64
3	9.996470	ca:01:10:a4:00:00	ca:01:10:a4:00:00	LOOP	60	Reply
4	9.996470	ca:01:10:a4:00:00	Broadcast	ARP	64	Who has 192.168.40.1? Tell 192.168.40.10
5	9.997469	Private_66:68:03	ca:01:10:a4:00:00	ARP	64	192.168.40.1 is at 00:50:79:66:68:03
6	10.011468	192.168.30.1	192.168.40.1	ICMP	102	Echo (ping) request id=0xf887, seq=1/256, ttl=63
7	10.011468	192.168.40.1	192.168.30.1	ICMP	102	Echo (ping) reply id=0xf887, seq=1/256, ttl=64
8	10.026468	ca:01:10:a4:00:00	Broadcast	ARP	64	Who has 192.168.30.1? Tell 192.168.30.10
9	10.026468	Private_66:68:01	ca:01:10:a4:00:00	ARP	64	192.168.30.1 is at 00:50:79:66:68:01
10	10.041468	192.168.40.1	192.168.30.1	ICMP	102	Echo (ping) reply id=0xf887, seq=1/256, ttl=63
11	11.063321	192.168.30.1	192.168.40.1	ICMP	102	Echo (ping) request id=0xf987, seq=2/512, ttl=64
12	11.078383	192.168.30.1	192.168.40.1	ICMP	102	Echo (ping) request id=0xf987, seq=2/512, ttl=63
13	11.078383	192.168.40.1	192.168.30.1	ICMP	102	Echo (ping) reply id=0xf987, seq=2/512, ttl=64
14	11.093392	192.168.40.1	192.168.30.1	ICMP	102	Echo (ping) reply id=0xf987, seq=2/512, ttl=63
15	12.115140	192.168.30.1	192.168.40.1	ICMP	102	Echo (ping) request id=0xfb87, seq=3/768, ttl=64
16	12.130140	192.168.30.1	192.168.40.1	ICMP	102	Echo (ping) request id=0xfb87, seq=3/768, ttl=63
17	12.130140	192.168.40.1	192.168.30.1	ICMP	102	Echo (ping) reply id=0xfb87, seq=3/768, ttl=64
18	12.145140	192.168.40.1	192.168.30.1	ICMP	102	Echo (ping) reply id=0xfb87, seq=3/768, ttl=63
19	13.167512	192.168.30.1	192.168.40.1	ICMP	102	Echo (ping) request id=0xfc87, seq=4/1024, ttl=64
20	13.182512	192.168.30.1	192.168.40.1	ICMP	102	Echo (ping) request id=0xfc87, seq=4/1024, ttl=63
21	13.183515	192.168.40.1	192.168.30.1	ICMP	102	Echo (ping) reply id=0xfc87, seq=4/1024, ttl=64
22	13.197514	192.168.40.1	192.168.30.1	ICMP	102	Echo (ping) reply id=0xfc87, seq=4/1024, ttl=63
23	14.219857	192.168.30.1	192.168.40.1	ICMP	102	Echo (ping) request id=0xfd87, seq=5/1280, ttl=64
24	14.234857	192.168.30.1	192.168.40.1	ICMP	102	Echo (ping) request id=0xfd87, seq=5/1280, ttl=63
25	14.235773	192.168.40.1	192.168.30.1	ICMP	102	Echo (ping) reply id=0xfd87, seq=5/1280, ttl=64
26	14.249847	192.168.40.1	192.168.30.1	ICMP	102	Echo (ping) reply id=0xfd87, seq=5/1280, ttl=63

که نشان میدهد از این لینک هر ریکوئست و ریپلای دو بار رد میشود چون روتر فقط آپی پکت رو عوض میکنه و دوباره از همون لینک برمیگردونه.(از seqNumber هم میشه فهمید.)

این هم یکی از پکت های ریکوئست هست که نشون میده هر لایه یک هدر به اون اضافه کرده و از پروتکل ICMP استفاده شده دارای checksum هست و sequence number اون ۱ هست:

```

▶ Frame 6: 102 bytes on wire (816 bits), 102 bytes captured (816 bits) on interface -, id 0
▼ Ethernet II, Src: ca:01:10:a4:00:00 (ca:01:10:a4:00:00), Dst: Private_66:68:03 (00:50:79:66:68:03)
  ▶ Destination: Private_66:68:03 (00:50:79:66:68:03)
  ▶ Source: ca:01:10:a4:00:00 (ca:01:10:a4:00:00)
  Type: 802.1Q Virtual LAN (0x8100)
  [Stream index: 3]
▶ 802.1Q Virtual LAN, PRI: 0, DEI: 0, ID: 40
▼ Internet Protocol Version 4, Src: 192.168.30.1, Dst: 192.168.40.1
  0100 .... = Version: 4
  .... 0101 = Header Length: 20 bytes (5)
  ▶ Differentiated Services Field: 0x00 (DSCP: CS0, ECN: Not-ECT)
  Total Length: 84
  Identification: 0x87f8 (34808)
  ▶ 000. .... = Flags: 0x0
  ...0 0000 0000 0000 = Fragment Offset: 0
  Time to Live: 63
  Protocol: ICMP (1)
  Header Checksum: 0x2c5e [validation disabled]
  [Header checksum status: Unverified]
  Source Address: 192.168.30.1
  Destination Address: 192.168.40.1
  [Stream index: 0]
▼ Internet Control Message Protocol
  Type: 8 (Echo (ping) request)
  Code: 0
  Checksum: 0x2783 [correct]
  [Checksum Status: Good]
  Identifier (BE): 63623 (0xf887)
  Identifier (LE): 34808 (0x87f8)
  Sequence Number (BE): 1 (0x0001)
  Sequence Number (LE): 256 (0x0100)
  [Response frame: 7]
  ▶ Data (56 bytes)

```

0000	00 50 79 66 68 03 ca 01 10 a4 00 00 81 00 00 28	Pyfh... ..(
0010	08 00 45 00 00 54 87 f8 00 00 3f 01 2c 5e c0 a8	..E..T...?.,^..
0020	1e 01 c0 a8 28 01 08 00 27 83 f8 87 00 01 08 09('.....
0030	0a 0b 0c 0d 0e 0f 10 11 12 13 14 15 16 17 18 19
0040	1a 1b 1c 1d 1e 1f 20 21 22 23 24 25 26 27 28 29 ! " # \$ % & ' ()
0050	2a 2b 2c 2d 2e 2f 30 31 32 33 34 35 36 37 38 39	*+,-./01 23456789
0060	3a 3b 3c 3d 3e 3f	;<=>?

این هم پینگ به اون کامپیوتر تکی:

```

PC2> ping 192.168.3.1
84 bytes from 192.168.3.1 icmp_seq=1 ttl=63 time=30.502 ms
84 bytes from 192.168.3.1 icmp_seq=2 ttl=63 time=30.904 ms
84 bytes from 192.168.3.1 icmp_seq=3 ttl=63 time=30.538 ms
84 bytes from 192.168.3.1 icmp_seq=4 ttl=63 time=30.769 ms
84 bytes from 192.168.3.1 icmp_seq=5 ttl=63 time=30.469 ms

```

و اینم وایر شارکش که از هر کدوم یکی هست و همه چیز عادیه:

134 809.993333	ca:01:10:a4:00:00	ca:01:10:a4:00:00	LOOP	60 Reply
135 813.210681	192.168.30.1	192.168.3.1	ICMP	102 Echo (ping) request id=0x1c8b, seq=1/256, ttl=64 (reply in 136)
136 813.240752	192.168.3.1	192.168.30.1	ICMP	102 Echo (ping) reply id=0x1c8b, seq=1/256, ttl=63 (request in 135)
137 814.262781	192.168.30.1	192.168.3.1	ICMP	102 Echo (ping) request id=0x1d8b, seq=2/512, ttl=64 (reply in 138)
138 814.293083	192.168.3.1	192.168.30.1	ICMP	102 Echo (ping) reply id=0x1d8b, seq=2/512, ttl=63 (request in 137)
139 815.313662	192.168.30.1	192.168.3.1	ICMP	102 Echo (ping) request id=0x1e8b, seq=3/768, ttl=64 (reply in 140)
140 815.343661	192.168.3.1	192.168.30.1	ICMP	102 Echo (ping) reply id=0x1e8b, seq=3/768, ttl=63 (request in 139)
141 816.364997	192.168.30.1	192.168.3.1	ICMP	102 Echo (ping) request id=0x1f8b, seq=4/1024, ttl=64 (reply in 142)
142 816.394997	192.168.3.1	192.168.30.1	ICMP	102 Echo (ping) reply id=0x1f8b, seq=4/1024, ttl=63 (request in 141)
143 817.414997	192.168.30.1	192.168.3.1	ICMP	102 Echo (ping) request id=0x208b, seq=5/1280, ttl=64 (reply in 144)
144 817.444997	192.168.3.1	192.168.30.1	ICMP	102 Echo (ping) reply id=0x208b, seq=5/1280, ttl=63 (request in 143)

بخش ۳:

از PC1 به تمام شبکه های دیگر پینگ زدم
این در حالی بود که لینکی قطع نبود

```
PC1 : 192.168.3.1 255.255.255.0 gateway 192.168.3.10

PC1> ping 192.168.1.1
84 bytes from 192.168.1.1 icmp_seq=1 ttl=62 time=90.268 ms

PC1> ping 192.168.2.1
84 bytes from 192.168.2.1 icmp_seq=1 ttl=61 time=90.297 ms

PC1> ping 192.168.3.1
192.168.3.1 icmp_seq=1 ttl=64 time=0.001 ms
192.168.3.1 icmp_seq=2 ttl=64 time=0.001 ms
192.168.3.1 icmp_seq=3 ttl=64 time=0.001 ms
192.168.3.1 icmp_seq=4 ttl=64 time=0.001 ms
192.168.3.1 icmp_seq=5 ttl=64 time=0.001 ms

PC1>
```

این هم جدول روتر که برای وقتی است که لینک متصل است.(R2) اگر لینک قطع شد از لینک دیگر استفاده کند که این اولویت را با یک عدد که به معنای فاصله هست قرار دادم(فاصله بیشتر اولویت کمتر)

Gateway of last resort is not set

```
10.0.0.0/8 is variably subnetted, 4 subnets, 2 masks
C    10.0.0.0/30 is directly connected, Serial2/1
L    10.0.0.1/32 is directly connected, Serial2/1
C    10.0.0.8/30 is directly connected, Serial2/0
L    10.0.0.9/32 is directly connected, Serial2/0
S    192.168.1.0/24 is directly connected, Serial2/1
S    192.168.2.0/24 is directly connected, Serial2/0
192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.3.0/24 is directly connected, FastEthernet0/0
L    192.168.3.10/32 is directly connected, FastEthernet0/0
R2#
```

این هم وقتی که لینک قطع است برای R2:

```
10.0.0.0/8 is variably subnetted, 2 subnets, 2 masks
C    10.0.0.0/30 is directly connected, Serial2/1
L    10.0.0.1/32 is directly connected, Serial2/1
S    192.168.1.0/24 is directly connected, Serial2/1
S    192.168.2.0/24 is directly connected, Serial2/1
192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.3.0/24 is directly connected, FastEthernet0/0
L    192.168.3.10/32 is directly connected, FastEthernet0/0
R2#
```

برای وقتی که لینک قطع نیست، پینگ از شبکه روتر ۲ به شبکه روتر ۳:

Capturing from Standard input [R2 Serial2/0 to R3 Serial2/0]

	Time	Source	Destination	Protocol	Length	Info
1	0.000000	N/A	N/A	SLARP	24	Line keepalive, outg
2	0.101999	N/A	N/A	SLARP	24	Line keepalive, outg
3	9.992899	N/A	N/A	SLARP	24	Line keepalive, outg
4	10.082901	N/A	N/A	SLARP	24	Line keepalive, outg
5	19.992097	N/A	N/A	SLARP	24	Line keepalive, outg
6	20.097097	N/A	N/A	SLARP	24	Line keepalive, outg
7	27.718021	192.168.3.1	192.168.2.1	ICMP	88	Echo (ping) request
8	27.793019	192.168.2.1	192.168.3.1	ICMP	88	Echo (ping) reply
9	28.891019	192.168.3.1	192.168.2.1	ICMP	88	Echo (ping) request
10	28.921018	192.168.2.1	192.168.3.1	ICMP	88	Echo (ping) reply
11	29.967209	192.168.3.1	192.168.2.1	ICMP	88	Echo (ping) request
12	29.997207	192.168.2.1	192.168.3.1	ICMP	88	Echo (ping) reply
13	29.997207	N/A	N/A	SLARP	24	Line keepalive, outg
14	30.087743	N/A	N/A	SLARP	24	Line keepalive, outg
15	31.032748	192.168.3.1	192.168.2.1	ICMP	88	Echo (ping) request
16	31.062743	192.168.2.1	192.168.3.1	ICMP	88	Echo (ping) reply
17	31.723742	N/A	N/A	CDP	334	Device ID: R2 Port :
18	32.099084	192.168.3.1	192.168.2.1	ICMP	88	Echo (ping) request
19	32.129086	192.168.2.1	192.168.3.1	ICMP	88	Echo (ping) reply
20	34.395236	N/A	N/A	CDP	334	Device ID: R3 Port :

این هم وقتی که اینترفیس ها قطع شدند:

Capturing from Standard input [R1 Serial2/1 to R2 Serial2/1]

No.	Time	Source	Destination	Protocol	Length	Info
44	180.333080	N/A	N/A	SLARP	24	Line keepalive, outgoing
45	184.461100	N/A	N/A	CDP	334	Device ID: R1 Port ID:
46	189.984658	N/A	N/A	SLARP	24	Line keepalive, outgoing
47	190.344671	N/A	N/A	SLARP	24	Line keepalive, outgoing
48	194.784637	N/A	N/A	CDP	329	Device ID: R2 Port ID:
49	199.993114	N/A	N/A	SLARP	24	Line keepalive, outgoing
50	200.338114	N/A	N/A	SLARP	24	Line keepalive, outgoing
51	209.988339	N/A	N/A	SLARP	24	Line keepalive, outgoing
52	210.333339	N/A	N/A	SLARP	24	Line keepalive, outgoing
53	214.524187	192.168.3.1	192.168.2.1	ICMP	88	Echo (ping) request id=
54	216.534407	192.168.3.1	192.168.2.1	ICMP	88	Echo (ping) request id=
55	217.599896	192.168.2.1	192.168.3.1	ICMP	88	Echo (ping) reply id=
56	217.599896	192.168.2.1	192.168.3.1	ICMP	88	Echo (ping) reply id=
57	218.544897	192.168.3.1	192.168.2.1	ICMP	88	Echo (ping) request id=
58	218.604898	192.168.2.1	192.168.3.1	ICMP	88	Echo (ping) reply id=
59	219.655828	192.168.3.1	192.168.2.1	ICMP	88	Echo (ping) request id=
60	219.715827	192.168.2.1	192.168.3.1	ICMP	88	Echo (ping) reply id=
61	219.985828	N/A	N/A	SLARP	24	Line keepalive, outgoing
62	220.345827	N/A	N/A	SLARP	24	Line keepalive, outgoing
63	220.765828	192.168.3.1	192.168.2.1	ICMP	88	Echo (ping) request id=
64	220.825827	192.168.2.1	192.168.3.1	ICMP	88	Echo (ping) reply id=
65	220.980646	N/A	N/A	SLARP	24	Line keepalive, outgoing

بخش ۴:

ابتدا OSPF را با آیدی ۱ روی تمام روتر ها بالا آوردیم و هر روتر تمام اینترفیس های خودش رو در این پروتکل به اصطلاح advertise میکند. که من همه رو در area 0 تبلیغ کردم.

PC1> ping 192.168.2.1	22 32.750540	192.168.2.1	192.168.3.1	ICMP	88 Echo (ping) reply
84 bytes from 192.168.2.1 icmp_seq=1 ttl=62 time=75.255 ms	23 33.806519	192.168.3.1	192.168.2.1	ICMP	88 Echo (ping) request
84 bytes from 192.168.2.1 icmp_seq=2 ttl=62 time=60.353 ms	24 33.836521	192.168.2.1	192.168.3.1	ICMP	88 Echo (ping) reply
84 bytes from 192.168.2.1 icmp_seq=3 ttl=62 time=60.240 ms	25 34.886521	192.168.3.1	192.168.2.1	ICMP	88 Echo (ping) request
84 bytes from 192.168.2.1 icmp_seq=4 ttl=62 time=60.201 ms	26 34.916531	192.168.2.1	192.168.3.1	ICMP	88 Echo (ping) reply
84 bytes from 192.168.2.1 icmp_seq=5 ttl=62 time=60.289 ms	27 35.966521	192.168.3.1	192.168.2.1	ICMP	88 Echo (ping) request
PC1>	28 35.996521	192.168.2.1	192.168.3.1	ICMP	88 Echo (ping) reply
	29 39.011744	10.0.0.9	224.0.0.5	OSPF	84 Hello Packet
	30 39.401744	10.0.0.10	224.0.0.5	OSPF	84 Hello Packet
	31 39.986824	N/A	N/A	SLARP	24 Line keepalive, outgo
	32 40.031741	N/A	N/A	SLARP	24 Line keepalive, outgo
	33 48.437893	10.0.0.9	224.0.0.5	OSPF	84 Hello Packet
	34 48.875358	10.0.0.10	224.0.0.5	OSPF	84 Hello Packet

اما وقتی ۱۹۲/۱۶۸/۱/۱ را پینگ گرفتم دیگر خبری از پکت های پینگ داخل لینک بین ۱۹۲/۱۶۸/۳/۰ و ۱۹۲/۱۶۸/۲/۰ نبود

PC1> ping 192.168.1.1	73 132.995122	10.0.0.9	224.0.0.5	OSPF	84 Hello Packet
84 bytes from 192.168.1.1 icmp_seq=1 ttl=62 time=75.615 ms	74 136.197060	10.0.0.10	224.0.0.5	OSPF	84 Hello Packet
84 bytes from 192.168.1.1 icmp_seq=2 ttl=62 time=60.692 ms	75 139.983678	N/A	N/A	SLARP	24 Line keepalive, outgo
84 bytes from 192.168.1.1 icmp_seq=3 ttl=62 time=60.301 ms	76 140.029296	N/A	N/A	SLARP	24 Line keepalive, outgo
84 bytes from 192.168.1.1 icmp_seq=4 ttl=62 time=60.995 ms	77 142.896202	10.0.0.9	224.0.0.5	OSPF	84 Hello Packet
84 bytes from 192.168.1.1 icmp_seq=5 ttl=62 time=60.267 ms	78 146.076418	10.0.0.10	224.0.0.5	OSPF	84 Hello Packet

در تصویر زیر همانطور که میبینیم ۲ رکورد برای دو روتر دیگر در روتر ۱ ذخیره شده که میگوید از کدام اینترفیس آن خارج شود

```

10.0.0.0/8 is variably subnetted, 5 subnets, 2 masks
C    10.0.0.0/30 is directly connected, Serial2/0
L    10.0.0.1/32 is directly connected, Serial2/0
C    10.0.0.8/30 is directly connected, Serial2/1
L    10.0.0.9/32 is directly connected, Serial2/1
O    10.0.0.16/30 [110/128] via 10.0.0.10, 00:09:36, Serial2/1
      [110/128] via 10.0.0.2, 00:09:36, Serial2/0
O    192.168.1.0/24 [110/65] via 10.0.0.2, 00:09:36, Serial2/0
O    192.168.2.0/24 [110/65] via 10.0.0.10, 00:09:36, Serial2/1
      192.168.3.0/24 is variably subnetted, 2 subnets, 2 masks
C    192.168.3.0/24 is directly connected, FastEthernet0/0
L    192.168.3.10/32 is directly connected, FastEthernet0/0

```

توضیحات دستورات فایل ها:

`sh ip int br`: نمایش وضعیت و آدرس IP اینترفیس‌های روتر.

`sh ip rou`: نمایش جدول مسیریابی روتر.

`conf t`: ورود به حالت پیکربندی.

`Int fa 0/0`: ورود به اینترفیس `FastEthernet0/0` برای پیکربندی.

`ip add 192.168.1.1 255.255.255.0`: تنظیم آدرس IP و Subnet Mask برای اینترفیس.

`router os 1`: فعال‌سازی پروتکل OSPF با شناسه فرآیند ۱.

`ip route`: اضافه کردن یک مسیر استاتیک به جدول مسیریابی.

`netw 192.168.1.10 0.0.0.255 ar 0`: اضافه کردن شبکه `192.168.1.0/24` به OSPF در `Area 0`.

`wr`: ذخیره پیکربندی جاری در حافظه `NVRAM`

`save`: ذخیره پیکربندی.

`no shut`: فعال کردن اینترفیس.

`shut`: غیرفعال کردن اینترفیس.

`int fa0/0.30`: ورود به Sub-Interface مربوط به `VLAN 30`

`Encapsulation DotQ1 30`: تنظیم Sub-Interface برای `VLAN 30`