

# آزمایش اول

ابزارهای مدیریت شبکه

روژینا کاشفی-۹۸۳۱۱۱۸

## • استفاده از برنامه های خط فرمان

دستور ping یک پکت داده برای یک آدرس مشخص می فرستد و نشان میدهد چقدر طول کشیده تا بسته برسد و یک ابزار مناسب برای تست شبکه و مشکل زدایی است و دستور -l اندازه بافر ارسالی را مشخص میکند و با استفاده از آن میتوانیم دیفالت ۳۲ بایت را تغییر دهیم.

## سوال یک

```
C:\Users\K>ping/?

Usage: ping [-t] [-a] [-n count] [-l size] [-f] [-i TTL] [-v TOS]
           [-r count] [-s count] [[-j host-list] | [-k host-list]]
           [-w timeout] [-R] [-S srcaddr] [-c compartment] [-p]
           [-4] [-6] target_name

Options:
  -t             Ping the specified host until stopped.
                  To see statistics and continue - type Control-Break;
                  To stop - type Control-C.
  -a             Resolve addresses to hostnames.
  -n count       Number of echo requests to send.
  -l size        Send buffer size.
  -f             Set Don't Fragment flag in packet (IPv4-only).
  -i TTL         Time To Live.
  -v TOS         Type Of Service (IPv4-only. This setting has been deprecated
                  and has no effect on the type of service field in the IP
                  Header).
  -r count       Record route for count hops (IPv4-only).
  -s count       Timestamp for count hops (IPv4-only).
  -j host-list   Loose source route along host-list (IPv4-only).
  -k host-list   Strict source route along host-list (IPv4-only).
  -w timeout     Timeout in milliseconds to wait for each reply.
  -R            Use routing header to test reverse route also (IPv4-only).
                  Per RFC 5095 the use of this routing header has been
                  deprecated. Some systems may drop echo requests if
                  this header is used.
  -S srcaddr     Source address to use.
  -c compartment Routing compartment identifier.
  -p            Ping a Hyper-V Network Virtualization provider address.
  -4            Force using IPv4.
  -6            Force using IPv6.

C:\Users\K>ping google.com

Pinging google.com [216.58.209.142] with 32 bytes of data:
Reply from 216.58.209.142: bytes=32 time=308ms TTL=104
Reply from 216.58.209.142: bytes=32 time=207ms TTL=104
Reply from 216.58.209.142: bytes=32 time=308ms TTL=104
Reply from 216.58.209.142: bytes=32 time=304ms TTL=104

Ping statistics for 216.58.209.142:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 207ms, Maximum = 308ms, Average = 279ms

C:\Users\K>ping -l 100 google.com

Pinging google.com [216.58.209.142] with 100 bytes of data:
Reply from 216.58.209.142: bytes=68 (sent 100) time=151ms TTL=104
Reply from 216.58.209.142: bytes=68 (sent 100) time=497ms TTL=104
Reply from 216.58.209.142: bytes=68 (sent 100) time=181ms TTL=104
Reply from 216.58.209.142: bytes=68 (sent 100) time=196ms TTL=104

Ping statistics for 216.58.209.142:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 151ms, Maximum = 497ms, Average = 258ms
```

- ارزیابی ارتباط با سیستم های دیگر با استفاده از ابزار ping و tracer

## سوال دو

همانطور که مشاهده میکنید میانگین سامانه aut.ac.ir کمتر است زیرا سرورهای آن درون ایران قرار دارند و مسافت طی شده کمتر است. در واقع مسافت در تعداد hopهای پیمایش شده اثر می گذارد و هر چه آنها بیشتر باشند به آن معناست که تاخیر نیز بیشتر میشود.

و برای برای سایت dolat.ir احتمالاً چون بسته های icmp که عملیات ping باهاش انجام میشه بلاک شده است و تمام بسته های ارسالی ناموفق هستند.

دلایل متعددی برای request time out وجود دارد از جمله مسدود بودن مسیر توسط firewall و تنظیمات اشتباه آن روی کامپیوتر مد نظر و یا در دسترس نبود سرور مورد نظر و وجود نداشتن مسیر برگشت برای سرور.

```
C:\Users\K>ping aut.ac.ir

Pinging aut.ac.ir [185.211.88.131] with 32 bytes of data:
Reply from 185.211.88.131: bytes=32 time=27ms TTL=56
Reply from 185.211.88.131: bytes=32 time=31ms TTL=56
Reply from 185.211.88.131: bytes=32 time=42ms TTL=56
Reply from 185.211.88.131: bytes=32 time=31ms TTL=56

Ping statistics for 185.211.88.131:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 27ms, Maximum = 42ms, Average = 32ms

C:\Users\K>ping google.com

Pinging google.com [142.250.185.46] with 32 bytes of data:
Reply from 142.250.185.46: bytes=32 time=72ms TTL=105
Reply from 142.250.185.46: bytes=32 time=84ms TTL=105
Reply from 142.250.185.46: bytes=32 time=92ms TTL=105
Reply from 142.250.185.46: bytes=32 time=87ms TTL=105

Ping statistics for 142.250.185.46:
    Packets: Sent = 4, Received = 4, Lost = 0 (0% loss),
    Approximate round trip times in milli-seconds:
        Minimum = 72ms, Maximum = 92ms, Average = 83ms

C:\Users\K>ping dolat.ir

Pinging dolat.ir [194.225.148.177] with 32 bytes of data:
Request timed out.
Request timed out.
Request timed out.
Request timed out.

Ping statistics for 194.225.148.177:
    Packets: Sent = 4, Received = 0, Lost = 4 (100% loss),
```

## سوال سوم

برای مشاهده تمامی بسته های ارسالی از دستور t- استفاده می کنیم و بدون وقفه ادامه داد و با Ctrl+C میتوانیم خارج شویم و با استفاده از دستور ping[hostname]-l [count] میتوانیم تعداد دفعات ارسال درخواست را به طور دلخواه و به تعداد دفعات count تنظیم کرد.

```
C:\Users\K>ping -t google.com

Pinging google.com [216.58.209.142] with 32 bytes of data:
Reply from 216.58.209.142: bytes=32 time=153ms TTL=104
Reply from 216.58.209.142: bytes=32 time=143ms TTL=104
Reply from 216.58.209.142: bytes=32 time=140ms TTL=104
Reply from 216.58.209.142: bytes=32 time=147ms TTL=104
Reply from 216.58.209.142: bytes=32 time=145ms TTL=104
Reply from 216.58.209.142: bytes=32 time=320ms TTL=104
Reply from 216.58.209.142: bytes=32 time=142ms TTL=104
Reply from 216.58.209.142: bytes=32 time=324ms TTL=104
Reply from 216.58.209.142: bytes=32 time=141ms TTL=104
Reply from 216.58.209.142: bytes=32 time=146ms TTL=104
Reply from 216.58.209.142: bytes=32 time=138ms TTL=104
Reply from 216.58.209.142: bytes=32 time=140ms TTL=104
Reply from 216.58.209.142: bytes=32 time=139ms TTL=104
Reply from 216.58.209.142: bytes=32 time=140ms TTL=104
Reply from 216.58.209.142: bytes=32 time=162ms TTL=104
Reply from 216.58.209.142: bytes=32 time=138ms TTL=104
Reply from 216.58.209.142: bytes=32 time=138ms TTL=104
Reply from 216.58.209.142: bytes=32 time=141ms TTL=104

Ping statistics for 216.58.209.142:
    Packets: Sent = 18, Received = 18, Lost = 0 (0% loss),
Approximate round trip times in milli-seconds:
    Minimum = 138ms, Maximum = 324ms, Average = 163ms
Control-C
^C
```

## سوال چهارم

آخرین ادرس ip مشاهده شده همان ادرسی است که برای trace مشخص کردیم اما در facebook آخرین ادرس با ادرس ورودی متفاوت است و آخرین ادرس صفحه پیوند است که فیلترینگ انجام شده و برای رفع این مشکل میتوانیم از فیلترشکل استفاده کنیم.

```
C:\Users\K>tracert aut.ac.ir

Tracing route to aut.ac.ir [185.211.88.131]
over a maximum of 30 hops:

  0  3 ms    3 ms    3 ms  router.asus.com [192.168.1.1]
  1  36 ms   32 ms   35 ms  85.15.21.82
  2  *        *        *      Request timed out.
  3  *        *        *      Request timed out.
  4  *        *        *      Request timed out.
  5  *        *        *      Request timed out.
  6  *        *        *      Request timed out.
  7  30 ms   28 ms   36 ms  85.15.4.98
  8  30 ms   30 ms   27 ms  212.16.72.66
  9  34 ms   32 ms   29 ms  185.211.88.131

Trace complete.
```

```
C:\Users\K>tracert google.com

Tracing route to google.com [142.250.185.46]
over a maximum of 30 hops:

  0  2 ms     2 ms     4 ms  router.asus.com [192.168.1.1]
  1  596 ms   486 ms   199 ms  85.15.21.82
  2  *        *        *      Request timed out.
  3  *        *        *      Request timed out.
  4  *        *        *      Request timed out.
  5  *        *        *      Request timed out.
  6  *        *        *      Request timed out.
  7  *        *        *      Request timed out.
  8  *        *        *      Request timed out.
  9  *        *        *      Request timed out.
 10 183 ms    202 ms    215 ms  10.10.53.225
 11 216 ms    202 ms    201 ms  10.21.212.10
 12 309 ms    34 ms     39 ms  10.21.21.10
 13 118 ms    *        198 ms  134.0.220.186
 14 *        *        *      Request timed out.
 15 *        *        *      Request timed out.
 16 78 ms     59 ms     *      134.0.217.233
 17 *        *        282 ms  213.202.4.171
 18 138 ms    99 ms     98 ms  216.239.41.109
 19 142 ms    98 ms     99 ms  172.253.79.255
 20 162 ms    98 ms     99 ms  142.250.185.46

Trace complete.
```

مشاهده میکنیم با ادرس ورودی متفاوت است.

```
C:\Users\K>tracert Facebook.com
Tracing route to facebook.com [10.10.34.35]
over a maximum of 30 hops:
  0  4 ms  7 ms  10 ms  router.asus.com [192.168.1.1]
  1  241 ms  306 ms  482 ms  85.15.21.82
  2  *  *  *  Request timed out.
  3  *  *  *  Request timed out.
  4  *  *  *  Request timed out.
  5  *  *  *  Request timed out.
  6  *  *  *  Request timed out.
  7  *  *  *  Request timed out.
  8  *  *  *  Request timed out.
  9  228 ms  207 ms  263 ms  10.10.53.217
 10  331 ms  29 ms  30 ms  10.21.212.10
 11  334 ms  305 ms  173 ms  10.202.4.76
 12  39 ms  32 ms  27 ms  10.201.146.3
 13  *  *  *  Request timed out.
 14  *  *  *  Request timed out.
 15  *  *  *  Request timed out.
 16  *  *  *  Request timed out.
 17  *  *  *  Request timed out.
 18  *  *  *  Request timed out.
 19  *  *  *  Request timed out.
 20  *  *  *  Request timed out.
 21  *  *  *  Request timed out.
 22  *  *  *  Request timed out.
 23  *  *  *  Request timed out.
 24  *  *  *  Request timed out.
 25  *  *  *  Request timed out.
 26  *  *  *  Request timed out.
 27  *  *  *  Request timed out.
 28  *  *  *  Request timed out.
 29  *  *  *  Request timed out.
 30  *  *  *  Request timed out.

Trace complete.
```

• استفاده از ابزار ping plotter

## سوال پنجم

ابتدا با استفاده از روش گفته شده اتصالات موجود در شبکه محلی و دروازه شبکه پیدا میکنیم و سپس با استفاده از دستور ipconfig ادرس فیزیکی دروازه را میابیم.

The screenshot shows the PingPlotter Pro interface. The 'Discovery Methods' section is expanded, showing 'Subnet Scan', 'UDP / SSDP', 'mDNS / Bonjour / Zeroconf', and 'Address Resolution Protocol'. The 'Machine' dropdown is set to 'Local Machine'. The 'Scan' button is visible. Below the table, the 'Command Prompt' window is open, showing the output of the 'ipconfig' command. The 'IPv4 Address' for the 'Wireless LAN adapter Local Area Connection\* 3:' is highlighted in red.

IP	MAC Address	MAC Vendor	Hostname	Ping	Protocol	Description
192.168.1.1	08:00:cd:00:00:00	ASUSTeK ASUS	ROUTER ASUS	1	ICMP/ARP	192.168.1.1
192.168.1.3	00:04:14:00:00:00			33	ICMP/ARP	
192.168.1.11	08:00:27:00:00:00		DESKTOP-60Y7ED	9.24	ICMP	
192.168.1.12	08:00:27:00:00:00		MACBOOKPRO-S080	86	ICMP/ARP/mDNS	Rojakashoff's MacBook Pro
192.168.1.33	00:04:14:00:00:00			1000	ICMP/ARP	
192.168.1.8	00:04:14:00:00:00				ARP	
192.168.1.17	00:04:14:00:00:00				ARP	

```
Command Prompt
Wireless LAN adapter Local Area Connection* 3:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :

Ethernet adapter Ethernet 4:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :

Wireless LAN adapter Wi-Fi:
Connection-specific DNS Suffix . :
Link-local IPv6 Address . . . . . : fe80::3a:cd:7a:77b3:7b33
IPv4 Address. . . . . : 192.168.1.11
Subnet Mask . . . . . : 255.255.255.0
Default Gateway . . . . . : 192.168.1.1

Ethernet adapter Bluetooth Network Connection 2:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :

Ethernet adapter Ethernet 6:
Media State . . . . . : Media disconnected
Connection-specific DNS Suffix . :
```