מטלה 4 רשתות תקשורת 213934599_319096251

<u>מה זה Ping?</u>

פינג הוא יישום השולח חבילת נתונים בפרוטוקול ICMP ממקור מסוים ליעד מסוים ברשת לפי כתובתו. המטרה העיקרית לה היא משמשת היא בחינת תקינות התקשורת בין נקודת המקור לנקודת היעד.

אפשר להשתמש בפינג לאתר אינטרנט ידוע על מנת למצוא האם יש תקשורת לרשת האינטרנט, למשל הפקודה (כמעט בכל מערכת הפעלה בת זמננו)

יכולה לשמש לבדיקת התקשורת לאינטרנט מהמחשב האישי. חיסרון של שיטה זו הוא שאתר עלול לא להיות זמין עקב עומס או תקלה טכנית, או שהוא חוסם את אפשרות משלוח הפינג אליו.

ההודעה שהמחשב שולח נקראות ECHO REQUEST ומכונה פינג, והתשובה שהוא מקבל נקראת ECHO RESPONSE ומכונה פונג (pong).

המונח "פינג" הפך לביטוי המייצג בסלנג המחשבי את הקשר ברשת, גם אם לא מדובר בקישור רשת פשוט (למשל דרך חומת אש שכלל איננה מאפשרת משלוח פינג דרכה).

IPv4 Datagram

3								
23–16 ביטים 24–23		ביטים 8–15	7–0 ביטים					
Ler	ngth	Type of service	Version/IHL					
<i>flags</i> ar	nd <i>offset</i>	Identif	ication					
Header C	Checksum	Protocol	Time To Live (TTL)	Header (בתים 20				
	Source IF	P address						
	Destination	IP address						
Chec	ksum	Code	Type of message	ICMP Header				
	Heade	er Data		(8 בתים)				
	Payloa	id Data		ICMP Payload (אופציונאלי)				

(Wikipedia)

<u>איך להריץ את התוכנית:</u>

```
• achiya@achiya-Latitude-7490:~/Desktop/matala4$ make
```

make מגיעים בטרמינל למיקום בו התקייה עם הקוד נמצאת ועושים

```
achiya@achiya-Latitude-7490:~/Desktop/matala4$ make
gcc ping.c -o parta
gcc new_ping.c -o partb
achiya@achiya-Latitude-7490:~/Desktop/matala4$ sudo ./parta 8.8.8.8
```

כותבים את השורה הבאה עם האייפי אשר רוצים לעשות לו פינג והחלק שרוצים להריץ: parta או parta.

לאחר מכן מכניסים את הסיסמה של המנהל והתוכנית תתחיל לרוץ.

חלק א

הדפסות בטרמינל

לאחר שליחת ping ECHO REQUEST אנו מקבלים מה-Host (במקרה הזה(8.8.8.8) את ה-ECHO RESPONSE ומדפיסים את ה-IP source של הפאקטה, מספר ה-ping ברצף ומשך זמן שליחת ה ping- עד לקבלת ה pong-. הפעולה חוזרת על עצמה כל שנייה.

```
• achiya@achiya-Latitude-7490:~/Desktop/matala4$ make
gcc ping.c -o parta
gcc new_ping.c -o partb
achiya@achiya-Latitude-7490:~/Desktop/matala4$ sudo ./parta 8.8.8.8
[sudo] password for achiya:
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 1 , Time that the ping took: 5981 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 2 , Time that the ping took: 5358 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 3 , Time that the ping took: 5582 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 4 , Time that the ping took: 5365 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 5 , Time that the ping took: 5252 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 6 , Time that the ping took: 5256 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 7 , Time that the ping took: 5256 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 7 , Time that the ping took: 5476 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 9 , Time that the ping took: 5891 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 10 , Time that the ping took: 5519 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 10 , Time that the ping took: 5519 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 11 , Time that the ping took: 5399 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 12 , Time that the ping took: 5399 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 12 , Time that the ping took: 5399 microseconds
Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 13 , Time that the ping took: 5399 microseconds
```

אדפסות ב-Wireshark

2 0.014576409 8.8.8.8 10.0.2.15 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 1) 31.015579128 10.0.2.15 8.8.8.8 1CMP 63 Etch (ping) request id=0x1200, seq=0/6, ttl=31 (request in 3) 52.028528663 10.0.2.15 8.8.8.8 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 3) 52.028528663 10.0.2.15 8.8.8.8 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 3) 62.041164966 8.8.8.8 10.0.2.15 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 5) 73.041722595 10.0.2.15 8.8.8.8 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 5) 83.053902733 8.8.8.8 10.0.2.15 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 7) 94.054714214 10.0.2.15 8.8.8.8 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 7) 115.060532011 8.8.8.8 10.0.2.15 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 7) 125.079613870 8.8.8.8 10.0.2.15 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 1) 136.09057474 10.0.2.15 8.8.8.8 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 11) 146.105370873 8.8.8.8 10.0.2.15 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 11) 146.105370873 8.8.8.8 10.0.2.15 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 13) 157.105067590 10.0.2.15 8.8.8.8 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 13) 157.105067590 10.0.2.15 8.8.8.8 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 13) 167.10547239 8.8.8.8 10.0.2.15 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 13) 167.105472493 8.8.8.8 10.0.2.15 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 15) 167.119241293 8.8.8.8 10.0.2.15 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 15) 167.119241293 8.8.8.8 10.0.2.15 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 15) 167.119241293 8.8.8.8 10.0.2.15 1CMP 63 Etch (ping) reply id=0x1200, seq=0/6, ttl=31 (request in 17) 199.149087774 10.0.2.15 8.8.8.8 1CMP 63 Etc	No.	Time	Source	Destination	Protocol	Length Info					
3 1.015579128	→	1 0.000000000	10.0.2.15	8.8.8.8					id=0x1200,	seq=0/0,	ttl=64 (reply in 2)
4 1.028151015 8.8.8.8 10.0.2.15 1CMP 63 Echo (ping) reply id=0x1200, seq=0/0, ttl=116 (request in 3) 5 2.0281528603 10.0.2.15 1S.8.8.8 1CMP 63 Echo (ping) reply id=0x1200, seq=0/0, ttl=116 (request in 5) 7 3.04172595 10.0.2.15 1S.8.8.8 1D.0.2.15 1CMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=116 (request in 5) 8 3.053962733 8.8.8.8 10.0.2.15 1CMP 63 Echo (ping) reply id=0x1200, seq=0/0, ttl=116 (request in 7) 9 4.054714214 10.0.2.15 1S.8.8.8 1D.0.2.15 1CMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=116 (request in 7) 9 4.054714214 10.0.2.15 1S.8.8.8 1D.0.2.15 1CMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=116 (request in 7) 15.066851047 10.0.2.15 1S.8.8.8 1D.0.2.15 1CMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=116 (request in 9) 15.066851047 10.0.2.15 1S.8.8.8 1D.0.2.15 1CMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=116 (request in 1) 12.0.0.2.15 1D.0.0.2.15 1D.0.0.2.1	-	2 0.014570400	8.8.8.8	10.0.2.15	ICMP	63 Echo	(ping)	reply	id=0x1200,	seq=0/0,	ttl=116 (request in 1)
5 2.028528663		3 1.015579128	10.0.2.15	8.8.8.8		63 Echo	(ping)	request			
6 2.041164966 8.8.8.8 10.0.2.15 8.8.8.8 ICMP 63 Echo (ping) reply id=0x1200, seq=0/0, ttl=116 (request in 5) 8 3.053062733 8.8.8.8.8 IO.0.2.15 8.8.8.8 ICMP 63 Echo (ping) reply id=0x1200, seq=0/0, ttl=164 (reply in 8) 9 4.054714214 10.0.2.15 8.8.8.8 ICMP 63 Echo (ping) reply id=0x1200, seq=0/0, ttl=164 (reply in 10) 14.066532211 8.8.8.8 IO.0.2.15 ICMP 63 Echo (ping) reply id=0x1200, seq=0/0, ttl=164 (reply in 10) 15.066851047 10.0.2.15 8.8.8.8 IO.0.2.15 ICMP 63 Echo (ping) reply id=0x1200, seq=0/0, ttl=164 (reply in 12) 12.0.2 12.0.0.0.2 12.0.0.0.0 12.0. 12.0.0 12.0.0 12.0.0 12.0.0 12.0.0 12.		4 1.028151015	8.8.8.8	10.0.2.15	ICMP	63 Echo	(ping)	reply	id=0x1200,	seq=0/0,	ttl=116 (request in 3)
8 3.0539062733 8.8.8.8 10.0.2.15 10.0.2 15 10		5 2.028528663	10.0.2.15	8.8.8.8	ICMP	63 Echo	(ping)	request	id=0x1200,	seq=0/0,	ttl=64 (reply in 6)
8 3.653962733 8 8.8.8 10.0.2.15 ICMP 63 Echo (ping) reply id=0x1209, seq=0/0, ttl=116 (request in 7) 9 4.06532211 8 8.8.8 10.0.2.15 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=16 (request in 9) 11 5.066851047 10.0.2.15 8 8.8.8 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=16 (request in 1) 13 6.089257474 10.0.2.15 8 8.8.8 ICMP 63 Echo (ping) reply id=0x1209, seq=0/0, ttl=16 (request in 11) 13 6.089257474 10.0.2.15 8 8.8.8 ICMP 63 Echo (ping) reply id=0x1209, seq=0/0, ttl=16 (request in 11) 13 6.089257474 10.0.2.15 8 8.8.8 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=16 (request in 11) 13 6.089257474 10.0.2.15 8 8.8.8 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=16 (request in 11) 13 6.089257474 10.0.2.15 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=16 (request in 13) 15 7.109567596 10.0.2.15 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=16 (request in 13) 15 7.109567596 10.0.2.15 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=16 (request in 15) 17 8.125134222 10.0.2.15 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=16 (request in 15) 18 8.8.8 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=16 (request in 15) 18 9.149907774 10.0.2.15 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=16 (request in 17) 19 9.149907774 10.0.2.15 8.8.8 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=164 (reply in 20) 12 10.155191068 10.0.2.15 8.8.8 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=164 (reply in 20) 12 11.194797969 8.8.8 8 10.0.2.15 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=164 (reply in 20) 12 11.195431109 10.0.2.15 8.8.8 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=164 (reply in 20) 12 11.195431109 10.0.2.15 8.8.8 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=164 (reply in 20) 12 11.195431109 10.0.2.15 8.8.8 ICMP 63 Echo (ping) request id=0x1209, seq=0/0, ttl=164 (reply in 20) 12 11.195431109 10.0.2.15 8.8.8 ICMP 63 Echo (ping) reply id=0x1209, seq=0/0, ttl=164 (reply in 20) 12 11.19541109 10.0.2.15 8.8.8 ICMP 63 Echo (ping) reply		6 2.041164966	8.8.8.8	10.0.2.15	ICMP						
9 4.954714214 19.0.2.15 8.8.8.8 ICMP 63 Echo (ping) requést id=0x1200, seq=0/0, ttl=64 (reply in 19) 115.066851047 10.0.2.15 8.8.8.8 ICMP 63 Echo (ping) reply id=0x1200, seq=0/0, ttl=164 (reply in 12) 125.0795013870 8.8.8.8.8 19.0.2.15 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=64 (reply in 12) 136.0806257474 10.0.2.15 8.8.8.8 19.0.2.15 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=64 (reply in 14) 146.105370873 8.8.8.8 19.0.2.15 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=64 (reply in 14) 157.105667590 19.0.2.15 8.8.8.8 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=64 (reply in 16) 167.119241293 8.8.8.8 19.0.2.15 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=64 (reply in 16) 178.125134222 19.0.2.15 8.8.8.8 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=164 (request in 15) 178.125134222 19.0.2.15 8.8.8.8 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=164 (reply in 18) 188.138638718 8.8.8.8 19.0.2.15 ICMP 63 Echo (ping) reply id=0x1200, seq=0/0, ttl=64 (reply in 18) 188.138638718 8.8.8.8 19.0.2.15 ICMP 63 Echo (ping) reply id=0x1200, seq=0/0, ttl=64 (reply in 18) 189.149997774 10.0.2.15 8.8.8.8 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=64 (reply in 18) 19.149997774 10.0.2.15 8.8.8.8 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=164 (reply in 20) 19.149937774 10.0.2.15 8.8.8.8 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=164 (reply in 20) 19.14993784 19.0.2.15 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=164 (reply in 20) 19.14993784 19.0.2.15 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=164 (reply in 20) 19.14993784 19.0.2.15 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=164 (reply in 20) 19.14993784 19.0.2.15 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=164 (reply in 20) 19.14993784 19.0.2.15 8.8.8.8 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=164 (reply in 20) 19.14993784 19.0.2.15 8.8.8.8 ICMP 63 Echo (ping) request id=0x1200, seq=0/0, ttl=164 (reply in 20) 19.149937934 19.0.2.15 8.8.8.8 ICMP 63 Echo (ping)		7 3.041722595	10.0.2.15	8.8.8.8	ICMP				id=0x1200,	seq=0/0,	ttl=64 (reply in 8)
10 4.966532211 8.8.8.8 10.0.2.15 ICMP 63 ECho (ping) reply id=0x1200, seq=0/0, ttl=16 (request in 9) 115.066851047 10.0.2.15 8.8.8.8 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=64 (reply in 12) 12 5.079613870 8.8.8.8 10.0.2.15 ICMP 63 ECho (ping) reply id=0x1200, seq=0/0, ttl=64 (reply in 14) 13 6.080257474 10.0.2.15 8.8.8.8 ICMP 63 ECho (ping) reply id=0x1200, seq=0/0, ttl=16 (request in 11) 13 6.080257474 10.0.2.15 8.8.8.8 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=16 (request in 13) 15 7.195607596 10.0.2.15 8.8.8.8 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=16 (request in 13) 15 7.195401293 8.8.8.8 10.0.2.15 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=16 (request in 15) 17 8.125134222 10.0.2.15 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=16 (request in 15) 18 8.8.8.8 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=16 (request in 17) 19 9.140907774 10.0.2.15 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=16 (request in 17) 19 9.140907774 10.0.2.15 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=16 (request in 19) 12 110.155191088 10.0.2.15 8.8.8.8 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=16 (request in 19) 12 110.155191088 10.0.2.15 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=16 (request in 19) 12 11.19379900 8.8.8.8 10.0.2.15 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=16 (request in 19) 12 11.19379900 8.8.8.8 10.0.2.15 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=16 (request in 19) 12 11.19379900 8.8.8.8 10.0.2.15 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=64 (reply in 24) 12 11.19379900 8.8.8.8 10.0.2.15 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=164 (reply in 26) 12 11.19379900 8.8.8.8 10.0.2.15 ICMP 63 ECho (ping) request id=0x1200, seq=0/0, ttl=164 (request in 25) 12 11.193541100 10.0.2.15 8.8.8.8 ICMP 63 ECho (ping) reply id=0x1200, seq=0/0, ttl=164 (reply in 26) 12 11.19361400 10.0.2.15 ICMP 63 ECho (ping) reply id=0x1200, seq=0/0, ttl=164 (reply in 36) 13 13.31170317 10.0.2.15 8.8.8.8 ICMP 63 EC		8 3.053962733	8.8.8.8	10.0.2.15	ICMP	63 Echo	(ping)	reply	id=0x1200,	seq=0/0,	ttl=116 (request in 7)
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37 18 381034464 10 0 2 15 8 8 8 8 TCMP 63 Echo (ping) request id=0v1200 seg=0/0 ttl=64 (reply in 39)											
				8.8.8	ICMP						
38 18.392390330 8.8.8.8 10.0.2.15 ICMP 63 Echo (ping) reply id=0x1200, seq=0/0, ttl=116 (request in 37)											
20 10 200722025 10 0 2 15 0 0 0 0 TCMD 62 Each (ning) request id=0v1200 cog=0/0 +t1=6/ (reply in A0)								roquest	14-041200	COG=0/0	++1-64 (roply in 40)
Frame 1: 63 bytes on wire (504 bits), 63 bytes captured (504 bits) on interface any, id 0			•	us), os bytes captured (504	DIES) OU :	Incertace any,	10 0				

ניתן לראות את ה request וה replay בין שולח הפינג לבין מחזיר הפונג.במקרה זה מי ששולח פינג זה השרת מהמחשב שלנו שהוא 10.0.2.15 והשרת שמחזיר פונג הוא במקרה הזה 8.8.8.8

Internet Protocol Version 4, Src: 10.0.2.15, Dst: 8.8.8.8

Internet Control Message Protocol

חלק ב

הדפסות בטרמינל

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• achiya@achiya-Latitude-7490:~/Desktop/matala4$ make gcc ping.c -o parta gcc new_ping.c -o partb

• achiya@achiya-Latitude-7490:~/Desktop/matala4$ sudo ./partb 8.8.8.8 [sudo] password for achiya:

Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 1 , Time that the ping took: 5607 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 2 , Time that the ping took: 6018 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 3 , Time that the ping took: 7968 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 4 , Time that the ping took: 5886 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 5 , Time that the ping took: 5509 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 6 , Time that the ping took: 5509 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 7 , Time that the ping took: 5539 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 8 , Time that the ping took: 6063 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 9 , Time that the ping took: 5608 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 10 , Time that the ping took: 5600 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 11 , Time that the ping took: 5600 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 12 , Time that the ping took: 5186 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 12 , Time that the ping took: 5186 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 12 , Time that the ping took: 5186 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 12 , Time that the ping took: 5186 microseconds Successfuly received one packet: IP: 8.8.8.8, Packet seq number: 12 , Time that the ping took: 5186 microseconds Successfuly received one packet: IP: 8.8.8.8, Pac
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פה ההרצה כמעט זהה להרצה של החלק הראשון רק שבהרצה הזו נכתוב partb במקום

Wireshark ב-

).	Time	Source	Destination	Protocol	Length Info
	1 0.000000000	127.0.0.1	127.0.0.1	TCP	76 53672 → 3000 [SYN] Seq=0 Win=65495 Len=0 MSS=65495 SACK_PERM=1 TSval=1766458064 TSecr=0 WS=128
	2 0.000017749	127.0.0.1	127.0.0.1	TCP	76 3000 - 53672 [SYN, ACK] Seq=0 Ack=1 Win=65483 Len=0 MSS=65495 SACK_PERM=1 TSval=1766458064 TSecr=1766458064 WS=128
	3 0.000032219	127.0.0.1	127.0.0.1	TCP	68 53672 → 3000 [ACK] Seq=1 Ack=1 Win=65536 Len=0 TSval=1766458064 TSecr=1766458064
	4 0.000120170	10.0.2.15	8.8.8.8	ICMP	63 Echo (ping) request id=0x1200, seq=0/0, ttl=64 (reply in 5)
	5 0.013756091	8.8.8.8	10.0.2.15	ICMP	63 Echo (ping) reply id=0x1200, seq=0/0, ttl=116 (request in 4)
	6 0.015765121	127.0.0.1	127.0.0.1	TCP	81 53672 - 3000 [PSH, ACK] Seq=1 Ack=1 Win=65536 Len=13 TSval=1766458079 TSecr=1766458064
	7 0.015783356	127.0.0.1	127.0.0.1	TCP	68 3000 → 53672 [ACK] Seq=1 Ack=14 Win=65536 Len=0 TSval=1766458079 TSecr=1766458079
	8 0.015834749	127.0.0.1	127.0.0.1	TCP	71 3000 → 53672 [PSH, ACK] Seq=1 Ack=14 Win=65536 Len=3 TSval=1766458080 TSecr=1766458079
	9 0.015839663	127.0.0.1	127.0.0.1	TCP	68 53672 → 3000 [ACK] Seq=14 Ack=4 Win=65536 Len=0 TSval=1766458080 TSecr=1766458080
	10 1.018678153	127.0.0.1	127.0.0.1	TCP	71 3000 → 53672 [PSH, ACK] Seq=4 Ack=14 Win=65536 Len=3 TSval=1766459082 TSecr=1766458080
	11 1.018736102	127.0.0.1	127.0.0.1	TCP	68 53672 - 3000 [ACK] Seq=14 Ack=7 Win=65536 Len=0 TSval=1766459082 TSecr=1766459082
	12 2.019529945	127.0.0.1	127.0.0.1	TCP	71 3000 → 53672 [PSH, ACK] Seq=7 Ack=14 Win=65536 Len=3 TSval=1766460083 TSecr=1766459082
	13 2.019536798	127.0.0.1	127.0.0.1	TCP	68 53672 → 3000 [ACK] Seq=14 Ack=10 Win=65536 Len=0 TSval=1766460083 TSecr=1766460083
	14 2.020518047	10.0.2.15	8.8.8.8	ICMP	63 Echo (ping) request id=0x1200, seq=0/0, ttl=64 (reply in 15)
	15 2.033759280	8.8.8.8	10.0.2.15	ICMP	63 Echo (ping) reply id=0x1200, seq=0/0, ttl=116 (request in 14)
	16 2.033851411	127.0.0.1	127.0.0.1	TCP	81 53672 → 3000 [PSH, ACK] Seq=14 Ack=10 Win=65536 Len=13 TSval=1766460098 TSecr=1766460083
	17 2.081155994	127.0.0.1	127.0.0.1	TCP	68 3000 → 53672 [ACK] Seq=10 Ack=27 Win=65536 Len=0 TSval=1766460145 TSecr=1766460098
	18 3.022471989	127.0.0.1	127.0.0.1	TCP	71 3000 → 53672 [PSH, ACK] Seq=10 Ack=27 Win=65536 Len=3 TSval=1766461086 TSecr=1766460098
	19 3.064067325	127.0.0.1	127.0.0.1	TCP	68 53672 → 3000 [ACK] Seq=27 Ack=13 Win=65536 Len=0 TSval=1766461128 TSecr=1766461086
	20 4.023918270	10.0.2.15	8.8.8.8	ICMP	63 Echo (ping) request id=0x1200, seq=0/0, ttl=64 (reply in 23)
	21 4.023987469	127.0.0.1	127.0.0.1	TCP	71 3000 - 53672 [PSH, ACK] Seq=13 Ack=27 Win=65536 Len=3 TSval=1766462088 TSecr=1766461128
	22 4.023997787	127.0.0.1	127.0.0.1	TCP	68 53672 → 3000 [ACK] Seq=27 Ack=16 Win=65536 Len=0 TSval=1766462088 TSecr=1766462088
	23 4.039143177	8.8.8.8	10.0.2.15	ICMP	63 Echo (ping) reply id=0x1200, seq=0/0, ttl=116 (request in 20)
	24 4.039304914	127.0.0.1	127.0.0.1	TCP	81 53672 → 3000 [PSH, ACK] Seq=27 Ack=16 Win=65536 Len=13 TSval=1766462103 TSecr=1766462088
	25 4.039314198	127.0.0.1	127.0.0.1	TCP	68 3000 → 53672 [ACK] Seq=16 Ack=40 Win=65536 Len=0 TSval=1766462103 TSecr=1766462103
	26 5.034407708	127.0.0.1	127.0.0.1	TCP	71 3000 → 53672 [PSH, ACK] Seq=16 Ack=40 Win=65536 Len=3 TSval=1766463098 TSecr=1766462103
	27 5.075209429	127.0.0.1	127.0.0.1	TCP	68 53672 → 3000 [ACK] Seq=40 Ack=19 Win=65536 Len=0 TSval=1766463139 TSecr=1766463098
	28 6.047970771	127.0.0.1	127.0.0.1	TCP	71 3000 → 53672 [PSH, ACK] Seq=19 Ack=40 Win=65536 Len=3 TSval=1766464112 TSecr=1766463139
	29 6.048028180	10.0.2.15	8.8.8.8	ICMP	63 Echo (ping) request id=0x1200, seq=0/0, ttl=64 (reply in 31)
	30 6.048057117	127.0.0.1	127.0.0.1	TCP	68 53672 - 3000 [ACK] Seq=40 Ack=22 Win=65536 Len=0 TSval=1766464112 TSecr=1766464112
	31 6.061110925	8.8.8.8	10.0.2.15	ICMP	63 Echo (ping) reply id=0x1200, seq=0/0, ttl=116 (request in 29)
	32 6.061374894	127.0.0.1	127.0.0.1	TCP	81 53672 - 3000 [PSH, ACK] Seq=40 Ack=22 Win=65536 Len=13 TSval=1766464125 TSecr=1766464112

בהתחלה אנו יוצרים חיבור עם Watchdog שמתחיל לספור זמן:

Source	Destination	Protocol	Length	Info		
127.0.0.1	127.0.0.1	TCP	76	53672 → 3000	[SYN]	Seq=0 Win=65495 Len=0 N
127.0.0.1	127.0.0.1	TCP	76	3000 → 53672	[SYN,	ACK] Seq=0 Ack=1 Win=65
127.0.0.1	127.0.0.1	TCP	68	53672 → 3000	[ACK]	Seq=1 Ack=1 Win=65536 L

לאחר מכן שלחנו ping ל-host וקיבלנו תגובה חזרה:

10.0.2.15	8.8.8.8	ICMP	63 Echo (ping)) request	id=0x1200,	seq=0/0,	ttl=64 (reply in 5)
8.8.8.8	10.0.2.15	ICMP	63 Echo (ping) reply	id=0x1200,	seq=0/0,	ttl=116	(request in 4)

ואחרי זה אנו מעדכנים את ה-watchdog שקיבלנו תגובה ושיעצור את הספירה. אם לא עברו 10 שניות הוא ישלח הודעת "ok" ויספור מחדש עבור ה-סוחם הבא:

				. 0
127.0.0.1	127.0.0.1	TCP	81 53672 → 3000	[PSH, ACK] Seq=1 Ack=1
127.0.0.1	127.0.0.1	TCP	68 3000 → 53672	[ACK] Seq=1 Ack=14 Win=
127.0.0.1	127.0.0.1	TCP	71 3000 - 53672	[PSH, ACK] Seq=1 Ack=14
127.0.0.1	127.0.0.1	TCP	68 53672 → 3000	[ACK] Seq=14 Ack=4 Win=
127.0.0.1	127.0.0.1	TCP	71 3000 - 53672	[PSH, ACK] Seq=4 Ack=14
127.0.0.1	127.0.0.1	TCP	68 53672 → 3000	[ACK] Seq=14 Ack=7 Win=
127.0.0.1	127.0.0.1	TCP	71 3000 - 53672	[PSH, ACK] Seg=7 Ack=14
127 0 0 1	127 0 0 1	TCP	68 53672 . 3000	[ACK] Seg=14 Ack=10 Wir

:אם ה watchdog מגלה שהטיימר עבר את ה 10 שניות

No.	Time	Source	Destination	Protocol Leng	pth Info
	1 0.000000000	127.0.0.1	127.0.0.1	TCP	74 35300 - 3000 [SYN] Seq=0 Win=65495 Len=0 MSS=65495 SACK_PERM=1 TSval=3458797215 TSecr=0 WS=128
	2 0.000010031	127.0.0.1	127.0.0.1	TCP	74 3000 - 35300 [SYN, ACK] Seq=0 Ack=1 Win=65483 Len=0 MSS=65495 SACK_PERM=1 TSval=3458797215 TSecr=3458797215 WS=128
	3 0.000018922	127.0.0.1	127.0.0.1	TCP	66 35300 → 3000 [ACK] Seq=1 Ack=1 Win=65536 Len=0 TSval=3458797215 TSecr=3458797215
	4 0.000037339	127.0.0.1	127.0.0.1	TCP	74 35300 → 3000 [PSH, ACK] Seq=1 Ack=1 Win=65536 Len=8 TSval=3458797215 TSecr=3458797215
	5 0.000040572	127.0.0.1	127.0.0.1	TCP	66 3000 → 35300 [ACK] Seq=1 Ack=9 Win=65536 Len=0 TSval=3458797215 TSecr=3458797215
	6 0.005307771	127.0.0.1	127.0.0.1	TCP	79 35300 → 3000 [PSH, ACK] Seq=9 Ack=1 Win=65536 Len=13 TSval=3458797220 TSecr=3458797215
	7 0.005314186	127.0.0.1	127.0.0.1	TCP	66 3000 → 35300 [ACK] Seq=1 Ack=22 Win=65536 Len=0 TSval=3458797220 TSecr=3458797220
	8 10.000485039	127.0.0.1	127.0.0.1	TCP	69 3000 → 35300 [PSH, ACK] Seq=1 Ack=22 Win=65536 Len=3 TSval=3458807215 TSecr=3458797220
	9 10.000515111	127.0.0.1	127.0.0.1	TCP	66 35300 → 3000 [ACK] Seq=22 Ack=4 Win=65536 Len=0 TSval=3458807215 TSecr=3458807215
	10 11.000752694	127.0.0.1	127.0.0.1	TCP	74 3000 - 35300 [PSH, ACK] Seq=4 Ack=22 Win=65536 Len=8 TSval=3458808216 TSecr=3458807215
	11 11.000771845	127.0.0.1	127.0.0.1	TCP	66 35300 → 3000 [ACK] Seq=22 Ack=12 Win=65536 Len=0 TSval=3458808216 TSecr=3458808216
L	12 11.001002951	127.0.0.1	127.0.0.1	TCP	66 3000 - 35300 [RST, ACK] Seg=12 Ack=22 Win=65536 Len=0 TSval=3458808216 TSecr=3458808216

אז רואים שבהודעה 10 הוא שולח timeout בהודעה 10 באורך 8 ואז רואים שבהודעה מפסיקה.

בטרמינל התוכנית תראה כך אחרי שה watchdog יעבוד:

```
    achiya@achiya-Latitude-7490:~/Desktop/matala4$ make gcc ping.c -o parta gcc watchdog.c -o watchdog gcc new_ping.c -o partb
    achiya@achiya-Latitude-7490:~/Desktop/matala4$ sudo ./partb 8.8.8.8 [sudo] password for achiya: Server cannot be reached. 10 sec passed.
    achiya@achiya-Latitude-7490:~/Desktop/matala4$ []
```

הצלחנו להפעיל את ה watchdog כך ששמנו טיימר של 10 שניות בתוך התוכנית וכך הטיימר עבר את ה 10 שניות וה watchdog הופעל.