# ปฏิบัติการที่ X VoIP Analysis SIP

## Protocol

ດ <b>ບໍ</b> ່	~ .		
ต่ดตั้ง	ี่ไป	รแกรม	Phoner

## ดาวโหลดและติดตั้งโปรแกรม

1. ดาวโหลดโปรแกรมที่เว็บไซต์ http://phoner.de/download\_de.htm

Phoner download X	
← → C ③ www.phoner.de/download_en.htm	\$ ☆ :
Softphone for VoIP, CAPI und TAPI	*
Index <u>Screenshots</u> <u>Download</u> <u>Contact</u>	
Download	
file     version     size       PhonerSetup.exe     3.12     4.80 MB       Phoner.zip     3.12     5.27 MB       PhonerBeta.zip     3.13beta	
Add-Ons	
COM control, samples           Delphi           Misual Basic 1           Visual Basic 2           C++	

2. เมื่อดาวโหลดเสร็จให้ไปที่เก็บไฟล์ และดับเบิลคลิก

						x
Coo 🔍 📜 « Local	l Disk	(C:) ▶ Users ▶ Master ▶ Downloads	<b>▼ 4</b> 9	Search Downloads		٩
Organize 🔻 Inclue	de in l	library ▼ Share with ▼ New folder				?
☆ Favorites	^	Name	Date modified	Туре	Size	
Desktop		🕞 PhonerSetup	25/11/2559 19:06	Application	4,922 K	В
Recent Places						
Eibraries						
J Music						
Pictures	=					
Videos						
輚 Homegroup						
💻 Computer						
🚢 Local Disk (C:)						
🥳 CD Drive (D:) Virt	t					
📬 Network						
👰 PC1						
PC1	-					
1 item						

3.	เลือกภาษาอังกฤษ และคลิกปุ่ม 🦲 🛛 🗰
Select Set	tup Language
12	Select the language to use during the installation:
	English 💌
	OK Cancel

คลิกเลือก I accept the agreement
 จากนั้นคลิกปุ่ม Next >

Setup - Phoner	x
License Agreement Please read the following important information before continuing.	
Please read the following License Agreement. You must accept the terms of this agreement before continuing with the installation.	
Phoner License	<u>^</u>
Except where otherwise noted, all of the documentation and software included in the Phoner package is copyrighted by Heiko Sommerfeldt.	-
Copyright (C) 2016 Heiko Sommerfeldt. All rights reserved.	
This software is provided "as-is", without any express or implied warranty. In no event shall the author be held liable for any damages arising from the use of this software.	Ŧ
I accept the agreement	
I do not accept the agreement	
Mext > C	ancel



B Setup - Phoner
Select Destination Location Where should Phoner be installed?
Setup will install Phoner into the following folder.
To continue, click Next. If you would like to select a different folder, click Browse.
C: \Program Files \Phoner Browse
At least 17.7 MB of free disk space is required.
< Back Next > Cancel

6.	คลิกปุ่ม	Next >	
I Setup -	Dhoner		

13 Setup - Phoner	
Select Start Menu Folder Where should Setup place the program's shortcuts?	
Setup will create the program's shortcuts in the following Start	Menu folder.
To continue, click Next. If you would like to select a different folder, click	Browse.
Phoner	Browse
🕅 Don't create a Start Menu folder	
< Back Next >	Cancel

7. ใส่เครื่องหมายถูก 📝 Create a desktop shortcut และคลิกปุ่ม 🔍 Next >
j Setup - Phoner
Select Additional Tasks Which additional tasks should be performed?
Select the additional tasks you would like Setup to perform while installing Phoner, then dick Next.
Additional shortcuts:
Create a desktop shortcut
Create a Quick Launch shortcut
< Back Next > Cancel

<ol> <li>คลิกปุ่ม Install</li> </ol>	
Setup - Phoner	
Ready to Install Setup is now ready to	begin installing Phoner on your computer.
Click Install to continue change any settings.	e with the installation, or click Back if you want to review or
Destination location: C:\Program Files\	Phoner
Start Menu folder: Phoner	
Additional tasks: Additional shortc Create a deskt	uts: op shortcut
٠	
	< Back Install Cancel
9.         คลิกปุ่ม         Finish           #I Satura - Phones	
	Completing the Phoner Setup Wizard
	Setup has finished installing Phoner on your computer. The application may be launched by selecting the installed shortcuts.
$\mathbf{}$	Click Finish to exit Setup.
Phoner	✓ Launch Phoner
	Finish

Phoner (sip:SIPPER@10.0.2.4)	_ 0	×
Connection Options Window Language Help		
🦿 🖚 📖 - 🛍 📖 🕦	)	
Destination number		<b>(</b> )»
1 2 3 def 4 5 6 jkl mno		
pqrs tuv wxyz * 0 #		
Phoner   Transmit own number		
	D	D
Solution of the second		.4

เมื่อติดตั้งเรียบร้อยจะแสดงหน้าต่างของโปรแกรม

### ที่คอมพิวเตอร์เครื่องที่ 2 ติดตั้งขั้นตอนเดียวกับข้างตัน

Phoner (sip:SIPPER@10.0.2.5)		x
Connection Options Window Language	Help	
6 🖚 🖼 - 🕅 📟 🗊	🔍 P 🔴 🕮 🔶 -	
Destination number Dial buttons 1 2 3 def 4 5 6 7 8 9 pqrs tuv wxyz * 0 # Free Own number Phoner V Transmit own number		
isconnected	0.00	

## ทดลองใช้งานและวิเคราะห์ข้อมูลเครือข่าย

1.	ที่ PC เครื่องที่ 2 เปิดโปรแกรม Wireshark และจับ Pac	ket

1	Capturin	g from L	local A	rea Co	nnect	tion																		- (		x
File	Edit	View	Go	Capti	ure	Anal	yze	Stati	stics	Tel	epho	ony	Wirel	ess T	Fools	Help	,									
		•	010	X	6	२ 🤇			Ŷ	4			€ €													
	Apply a d	isplay filt	ter <(	Ctrl-/>																		-	- E	Express	sion	+
No.		Time		So	urce					Destin	ation				Protoco	l Le	ngth	Info					_			
	1	0.0000	00	fe	80::	4c48	3:90	9c:c2	2a	fe80	::98	31:6	ff3:0	516	SSDP		453	HTTP/	/1.1	200	OK					
	2	1.1998	19	fe	80::	4c48	3:90	9 <b>c</b> :c2	2a	ff02	::c			2	SSDP		208	M-SEA	ARCH	* H	TTP/:	1.1				
	3	1.2024	16	fe	80::	4c48	3:90	9c:c2	2a	fe80	::98	31:6	ff3:	516	PNRP		158	PNRP	SOLI	ICIT	Mes	sage				
	4	1.2034	20	fe	80::	9831	:6f	f3:61	.6	fe80	::4c	48:9	09c:	c2a	PNRP		182	PNRP	ADVE	ERTI	SE M	essag	e			
	5	1.2054	26	fe	80::	4c48	3:90	9c:c2	2a	fe80	::98	31:6	ff3:0	516	PNRP		170	PNRP	REQU	UEST	Mes	sage				
	6	1.2064	81	fe	80::	9831	:6f	f3:61	.6	fe80	::4c	48:9	09c:	c2a	PNRP		82	PNRP	ACK	Mes	sage					
	7	1.2064	84	fe	80::	9831	L:6f	f3:61	.6	fe80	::4c	48:9	09c:	c2a	PNRP		190	PNRP	FLOO	OD M	essa	ge				
	8	1.2065	92	fe	::08	9831	1:6f	f3:61	.6	fe80	::4c	48:9	09c:	c2a	PNRP		190	PNRP	FLOO	OD M	essa	ge				
	9	2.8738	98	fe	80::	9831	1:6f	f3:61	.6	fe80	::4c	48:9	09c:	c2a	SSDP		453	HTTP/	1.1	200	OK					
	<pre></pre>									4																
	User D	atagra	m Prot	tocol	, Sr	c Po	rt:	1900	, D:	st Po	ort:	596	37													_
	Simpie	Servio	ce D1	scove	ry P	roto	001																			
00	00 08	00 27	d3 68	3 99	08 0	0 2	7 18	54	b1 8	86 dd	60	00	'	.h	. '.т.	`.										*
00	10 00	00 01	8f 11	L 80	fe 8	0 0	0 00	00	00 0	00 00	4c	48			• • • •	LH										
00	20 90	9C 0C	2a ta	a e2	TE 8	0 0	0 00 8 fc	00	00 ( 8f (	90 00 54 44	98	51		····		1 µT										
00.	10 54	50 2f	31 24	= 31	20 3	23	0 30	20	01 5 4f 4	1h 0d	46	53	U	1.1	00 0	DK										
00	50 54	3a 75	72 66	a 3a	4d 6	9 6	3 72	6f	73 6	5f 66	74	20	T:u	irn:M:	L cros	soft										-
0	2 L	ocal Area	a Conne	ction:	<live c<="" td=""><td>aptur</td><td>e in p</td><td>rogres</td><td>s&gt;</td><td></td><td></td><td></td><td></td><td></td><td></td><td>   P</td><td>ackets</td><td>s: 9 · Dis</td><td>splaye</td><td>ed: 9</td><td>(100.0</td><td>1%)</td><td></td><td>Profile</td><td>: Defau</td><td>ult 🔡</td></live>	aptur	e in p	rogres	s>							P	ackets	s: 9 · Dis	splaye	ed: 9	(100.0	1%)		Profile	: Defau	ult 🔡

2. ที่ PC เครื่องที่ 1 ที่ช่อง Destination number ให้ใส่หมายเลขของ IP เครื่องที่ 2 คือ

sip:SIPPER@10.0.2.5 จากนั้นคลิก 🦨

Phoner (sip:SIPPER@10.0.2.4)		- • ×
Connection Options Window Language Help		
<b>6 19 - 1</b> 2 📟 🗊	9. P 🗨	₿
Destination number sip:SIPPER@10.0.2.5 ▼		
Dial buttons 1 2 3 def 4 5 6 mno 7 8 9 pqrs tuv wxyz * 0 #		
Own <u>n</u> umber Phoner  Transmit own number		٥٫٥
Contracted 0.00		

3. ที่ PC เครื่องที่ 2 จะมีหน้าต่างสายเข้า ให้คลิกปุ่ม 💷 🍋	🔜 เพื่อรับสาย
Phoner (sip:SIPPER@10.0.2.5)	
Connection Options Window Language Help	
<b>/</b>	🔍 P 🌒 🕿🔶
Destination number       Image: Sipper Sipper Internation Internation         Dial buttons       Image: Sipper Internation Internation         1       2       3         4       5       6         9       Image: Sipper Internation Internation       New call         0       Image: Sipper Internation Internation       New call         0       Image: Sipper Internation Internation       Sipper Internation         Image: Internation Internation Internation Internation       Image: Internation Internation       Image: Internation Internation         9       Image: Internation Internation       Image: Internation Internation       Image: Internation Internation         9       Image: Internation Internation       Image: Internation Internation       Image: Internation Internation         9       Image: Internation Internation       Image: Internation Internation       Image: Internation Internation         9       Image: Internation Internation       Image: Internation Internation       Image: Internation Internation         0       Image: Internation Internation       Image: Internation Internation       Image: Internation Internation         0       Image: Internation Internation       Image: Internation Internation       Image: Internation Internation         0       Image: Internating Internating       Image: Internating Intern	
(a) (a) (a) (b) (c) (c) (c) (c) (c) (c) (c) (c) (c) (c	



🚄 *Local Area Connection	- 0 X
File Edit View Go Capture Analyze Statistics Telephony Wireless Tools Help	
∡ ■ ∅ ⊛ ▶ № № © ९ ⇔ ⇔ ≌ 7 ₺ ⊒ 🗐 ९ ९ ९ ‼	
Apply a display filter <ctrl-></ctrl->	Expression +
No. Time Source Destination Protocol Length Info	-
1 0.000000 fe80::4c48:909c:c2a fe80::9831:6ff3:616 SSDP 453 HTTP/1.1 200 OK	
2 1.199819 fe80::4c48:909c:c2a ff02::c SSDP 208 M-SEARCH * HTTP/1.1	
3 1.202416 fe80::4c48:909c:c2a fe80::9831:6ff3:616 PNRP 158 PNRP SOLICIT Message	
4 1.203420 fe80::9831:6ff3:616 fe80::4c48:909c:c2a PNRP 182 PNRP ADVERTISE Messa	ge
5 1.205426 fe80::4c48:909c:c2a fe80::9831:6ff3:616 PNRP 170 PNRP REQUEST Message	
6 1.206481	
71.206484 TE80::9831:6TT3:616TE80::4648:909C:C28PNRP 190 PNRP FLOOD MESSAge	
01.200392 TE00::901:0115:010. TE00::4440:009C:C24 PNRP 190 PNRP FLOUD MESSAGE	
5 2.673050 1000.5051.015.010.10001000405.0051.124530F 453 11117/1.1 200 0K	
11 3 786724 688-9831-6ff3-616 ff0c SSDP 28 M-SEARCH HTTP/11	
12 3.787370 fe88:1961161161161162116211621162116211621162	-
<	۱. E
Frame 1: 453 bytes on wire (3624 bits), 453 bytes captured (3624 bits) on interface 0	
Ethernet II, Src: PcsSyste_18:54:b1 (08:00:27:18:54:b1), Dst: PcsSyste_d3:68:99 (08:00:27:d3:68:9	99)
Internet Protocol Version 6, Src: fe80::4c48:909c:c2a:fae2, Dst: fe80::9831:6ff3:616:851d	
User Datagram Protocol, Src Port: 1900, Dst Port: 59637	
Simple Service Discovery Protocol	
0000 08 00 27 d3 68 99 08 00 27 18 54 b1 86 dd 60 00'.h '.T`.	<u>^</u>
0010 00 00 10 11 00 TE 80 00 00 00 00 00 00 4C 48LH	
0030 6f f3 06 16 85 1d 07 6c e8 f5 01 8f 9d df 48 54 o1HT	
0040 54 50 2f 31 2e 31 20 32 30 30 20 4f 4b 0d 0a 53 TP/1.1 2 00 OKS	
0050 54 3a 75 72 6e 3a 4d 69 63 72 6f 73 6f 66 74 20 T:urn:Mi crosoft	+
🔘 🍸 wireshark_62EAA0F6-3FF8-4877-868A-2A5457D666D9_20161125192508_a01024 🛛 🛛 Packets: 4472 • Displayed: 4472 (100.09	6) Profile: Default

#### 7. ไปที่เมนู Telephony เลือก VoIP Calls

*Local Area Connection	
File Edit View Go Capture Analyze Statistics	Telephony Wireless Tools Help
∡ ■ ∅ ⊛ 🐌 🚠 🗙 😋 🔍 ⇔ ⇔ 🕾 🖗	VoIP Calls
Apply a display filter <ctrl-></ctrl->	ANSI   Expression +
No.         Time         Source         D           10.00000         fe80::4c48:909c:c2a         f           21.199819         fe80::4c48:909c:c2a         f           31.202416         fe80::4c48:909c:c2a         f           41.203420         fe80::4c48:909c:c2a         f           51.205426         fe80::4c48:909c:c2a         f           61.206481         fe80::9831:6ff3:616         f           71.206484         fe80::9831:6ff3:616         f           92.873898         fe80::9831:6ff3:616         f           103.373782         10.0.2.5         2           113.786874         fe80::9831:6ff3:616         f           123.787370         fe80::9831:6ff3:616         f	GSM       + ength Info         IAX2 Stream Analysis       453 HTTP/1.1 200 OK         ISUP Messages       208 M-SEARCH * HTTP/1.1         LTE       158 PNRP SOLICIT Message         MTP3       + 170 PNRP REQUEST Message         RTP       + 82 PNRP ACK Message         RTSP       + 190 PNRP FLOOD Message         SCTP       + 453 HTTP/1.1 200 OK         SMPP Operations       215 M-SEARCH * HTTP/1.1         UCP Messages       + 188 PNRP SOLICIT Message         H.225       + MTP/1.1
<ul> <li>Frame 1: 453 bytes on wire (3624 bits), 45</li> <li>Ethernet II, Src: PcsSyste_18:54:b1 (08:00</li> </ul>	SIP Statistics d3:68:99 (08:00:27:d3:68:99)
<ul> <li>Internet Protocol Version 6, Src: fe80::4c</li> <li>User Datagram Protocol, Src Port: 1900, Dsc</li> </ul>	WAP-WSP Packet Counter 9831:6ff3:616:851d
Simple Service Discovery Protocol	
0000 08 00 27 d3 68 99 08 00 27 18 54 b1 86 0010 00 00 01 8f 11 80 fe 80 00 00 00 00 00 0020 90 9c 0c 2a fa e2 fe 80 00 00 00 00 00	i dd 60 00'.h '.T`. 00 4c 48LH 00 98 31*1
0030         6f         f3         06         16         85         1d         07         6c         e8         f5         01         8f         9d           0040         54         50         2f         31         2e         31         20         32         30         30         20         4f         4b           0050         54         3a         75         72         6e         3a         4d         69         63         72         6f         73         6f	df 48 54 olHT 0 dd 0a 53 TP/1.1 2 00 0KS 66 74 20 T:urn:Mi crosoft
wireshark_62EAA0F6-3FF8-4B77-868A-2A5457D666D	9_20161125192508_a01024 Packets: 4472 · Displayed: 4472 (100.0%) Profile: Default

8. จะแสดงหน้าต่าง ให้เลือก Packet และคลิกปุ่ม Flow Sequence

🚄 Wireshark	· VoIP Calls ·	wireshark_62EA	A0F6-3FF8-4B77-868A	-2A5457D666D9_2016	112519250	08_a01024		
Start Time	Stop Time	Initial Speaker	From	То	Protocol	Packets	State	Comments
47.102577	106.294708	10.0.2.4	<sip:sipper@10.0.2.4< th=""><th><sip:sipper@10.0.2.5< th=""><th>SIP</th><th>7</th><th>COMPLETED</th><th>D INVITE 200</th></sip:sipper@10.0.2.5<></th></sip:sipper@10.0.2.4<>	<sip:sipper@10.0.2.5< th=""><th>SIP</th><th>7</th><th>COMPLETED</th><th>D INVITE 200</th></sip:sipper@10.0.2.5<>	SIP	7	COMPLETED	D INVITE 200
					ОК	Cano	el Prepar	are Filter Flow Sequence Play Streams Copy  Help

- 9. จะแสงหน้าต่าง Flow Sequence ซึ่งมีสถานะ
  - 100 Trying คือกำลังเรียก -
  - 180 Ringing คือมีเสียงเรียกเข้า -
  - 200 OK คือรับสาย และเริ่มการสนทนา -

เมื่อกดวางสาย จะส่ง Message BYE คือ สิ้นสุดการสนทนา คลิกปุ่ม Close

📕 Wireshark ·	Call Flow · wires	hark_62EAA0F6-3FF8-4B77-868A-2	A5457D666D9_20161125192508_a01024		x
Time	10.0	0.2.4	.2.5	Comment	*
47. 102577 47. 104953 47. 123243 65.981778 66.003857 66.007504 66.013408 106.294245 106.294708	5060 5060 5060 5062 5062 5062 5060 5060	INVITE SDP (g711A g711U g721 G5M L 100 Trying 180 Ringing 200 CK SDP (g711A g711U g721 G5M L RTP (g711A) RTP (g711A) ACK BYE 200 OK	5060 5060 5060 5062 5062 5062 5060 5060	SIP INVITE From: <sip:sipper@10.0.2.4 to:<si<br="">SIP Status 100 Trying SIP Status 180 Ringing SIP Status 200 CK RTP, 1994 packets. Duration: 4294901.293s SSRC RTP, 2015 packets. Duration: 4294901.289s SSRC SIP Request INVITE ACK 200 CSeq:1 SIP Request BYE CSeq:1 SIP Status 200 OK</sip:sipper@10.0.2.4>	
∢ 2 node(s), 9 item	(5)			Save As Close Help	-

10. ให้เลือก Packet และคลิกปุ่ม 🕨 Play Streams

t Time	Stop Time	Initial Speaker	From	То	Protocol	Packets	State	Comments
02577	106.294708	10.0.2.4	<sip:sipper@10.0.2.4< td=""><td><sip:sipper@10.0.2.5< td=""><td>SIP</td><td>7</td><td>COMPLETED</td><td>INVITE 200</td></sip:sipper@10.0.2.5<></td></sip:sipper@10.0.2.4<>	<sip:sipper@10.0.2.5< td=""><td>SIP</td><td>7</td><td>COMPLETED</td><td>INVITE 200</td></sip:sipper@10.0.2.5<>	SIP	7	COMPLETED	INVITE 200



**12.** กลับมาที่ Wireshark เลือก Telephony > RTP > Steam Analysis

*Local Area Connection		
File Edit View Go Capture Analyze Statistics	Telephony Wireless Tools Help	
File       Edit       View       Go       Capture       Analyze       Statistics <ul> <li>Image: Statistic of the statis</li></ul>	Telephony     Wireless     Tools     Help       VoIP Calls     ANSI     -       ANSI     -     -       GSM     -     -       I IAX2 Stream Analysis     214 PT=ITU-T G.711 PCMA,       I SUP Messages     214 PT=ITU-T G.711 PCMA,       LTE     -       MTP3     -       RTP     RTP Stream Analysis       RTSP     -       SCTP     -       SMPP Operations     214 PT=ITU-T G.711 PCMA,       214 PT=ITU-T G.711 PCMA,     -       214 PT=ITU-T G.711 PCMA,     -	
620 69.502848 10.0.2.4 1 621 69.511471 10.0.2.5 1 622 69.522814 10.0.2.4 1 ←	1       SMPP Operations       214 PT=TTU-T G.711 PCMA,         1       UCP Messages       214 PT=TTU-T G.711 PCMA,         1       UCP Messages       214 PT=TTU-T G.711 PCMA,         1       H.225       SIP Flows         3       SIP Statistics         WAP-WSP Packet Counter       18:54:b1 (08:00:27:18:54:	SSRC=0x599 SSRC=0x985 SSRC=0x599 ↓ b1)
0000         08         00         27         18         54         b1         08         00         27         d3         68         99         02           0010         00         c8         1f         be         40         00         80         11         c1         be         00         00         00         00         00         11         c1         be         00	18       00       45       a0        T.T       '. hE.         12       04       0a       00        I.T       '. hE.         11       10       00        Q       I.T       '. hE.         15       11       10       00        Q       I.T       '. hE.         15       15       05       05         I.T       '. h         15       05       05       05         D <td< td=""><td>%) Profile: Default</td></td<>	%) Profile: Default



#### 13. จะแสดงหน้าต่าง ซึ่งจะแสดงค่าต่างๆของการส่งข้อมูล