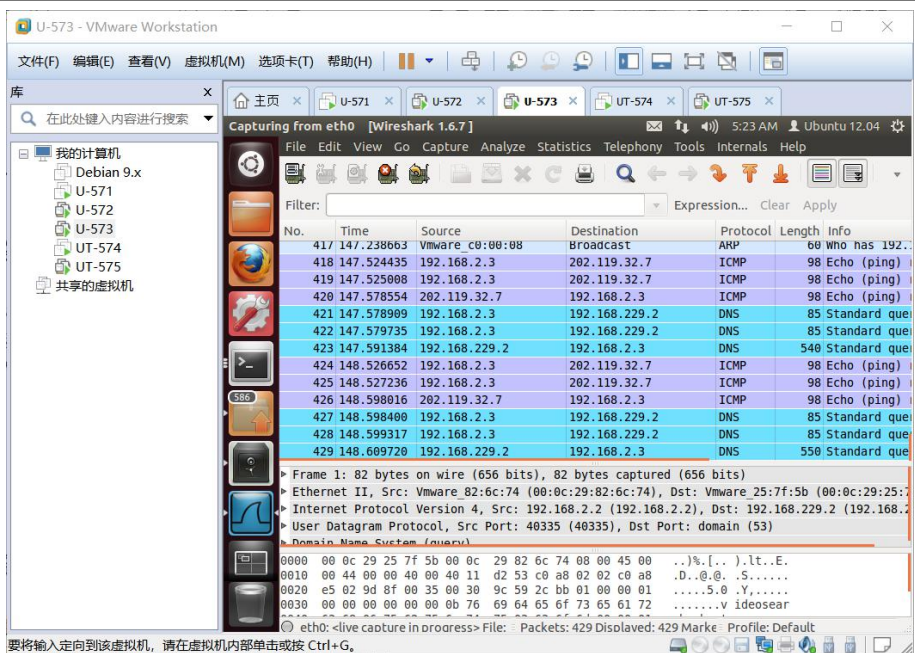


Lab1

171830635 俞星凯

实验目的	<div>1. 学习利用 VMWare 搭建一个由虚拟机组成的随机拓扑网络</div> <div>2. 学习利用 Wireshark 观测 PDU</div> <div>3. 理解 IP 地址、网卡、网关、路由规则等概念</div>																																																																																											
网络拓扑配置	见附表及附图																																																																																											
路由规则配置	<div>Router0:sudo ip route add 192.168.2.0/24 via 192.168.2.1</div> <div>Router1:sudo ip route add 192.168.3.0/24 via 192.168.3.1</div>																																																																																											
数据包截图																																																																																												
协议报文分析	<div>在列表框中不难发现数据报具有周期性，图中橙框即为一个完整的周期：</div> <table><thead><tr><th>No.</th><th>Time</th><th>Source</th><th>Destination</th><th>Protocol</th><th>Length</th><th>Info</th></tr></thead><tbody><tr><td>1378</td><td>228.708376</td><td>192.168.2.3</td><td>192.168.229.2</td><td>DNS</td><td>85</td><td>Standard que</td></tr><tr><td>1380</td><td>228.709047</td><td>192.168.2.3</td><td>192.168.229.2</td><td>DNS</td><td>85</td><td>Standard que</td></tr><tr><td>1381</td><td>228.826701</td><td>192.168.229.2</td><td>192.168.2.3</td><td>DNS</td><td>538</td><td>Standard que</td></tr><tr><td>1382</td><td>229.515564</td><td>192.168.2.3</td><td>202.119.32.7</td><td>ICMP</td><td>98</td><td>Echo (ping)</td></tr><tr><td>1383</td><td>229.516205</td><td>192.168.2.3</td><td>202.119.32.7</td><td>ICMP</td><td>98</td><td>Echo (ping)</td></tr><tr><td>1384</td><td>229.684762</td><td>202.119.32.7</td><td>192.168.2.3</td><td>ICMP</td><td>98</td><td>Echo (ping)</td></tr><tr><td>1385</td><td>229.685627</td><td>192.168.2.3</td><td>192.168.229.2</td><td>DNS</td><td>85</td><td>Standard que</td></tr><tr><td>1386</td><td>229.686075</td><td>192.168.2.3</td><td>192.168.229.2</td><td>DNS</td><td>85</td><td>Standard que</td></tr><tr><td>1387</td><td>229.802646</td><td>192.168.229.2</td><td>192.168.2.3</td><td>DNS</td><td>539</td><td>Standard que</td></tr><tr><td>1388</td><td>230.516369</td><td>192.168.2.3</td><td>202.119.32.7</td><td>ICMP</td><td>98</td><td>Echo (ping)</td></tr><tr><td>1389</td><td>230.517324</td><td>192.168.2.3</td><td>202.119.32.7</td><td>ICMP</td><td>98</td><td>Echo (ping)</td></tr><tr><td>1390</td><td>230.648436</td><td>202.119.32.7</td><td>192.168.2.3</td><td>ICMP</td><td>98</td><td>Echo (ping)</td></tr></tbody></table> <div>原始框中给出了数据报的 16 进制数据信息和 ASCII 表示的信息：</div> <div><div>0000 00 0c 29 25 7f 5b 00 0c 29 1f 86 54 08 00 45 00 ..).[...).T..E.</div><div>0010 00 47 00 00 40 00 40 11 d2 4f c0 a8 02 03 c0 a8 .G..@..0.....</div><div>0020 e5 02 ad b9 00 35 00 33 61 e6 36 76 01 00 00 015.3 a.6v....</div><div>0030 00 00 00 00 00 00 01 37 02 33 32 03 31 31 39 037 .32.119.</div><div>0040 32 30 32 07 69 6e 2d 61 64 64 72 04 61 72 70 61 202.in-a ddr.arpa</div><div>0050 00 00 0c 00 01</div></div> <div>而在协议框中点击某个协议，则可以看到其对应的字段信息和每个字段的</div>	No.	Time	Source	Destination	Protocol	Length	Info	1378	228.708376	192.168.2.3	192.168.229.2	DNS	85	Standard que	1380	228.709047	192.168.2.3	192.168.229.2	DNS	85	Standard que	1381	228.826701	192.168.229.2	192.168.2.3	DNS	538	Standard que	1382	229.515564	192.168.2.3	202.119.32.7	ICMP	98	Echo (ping)	1383	229.516205	192.168.2.3	202.119.32.7	ICMP	98	Echo (ping)	1384	229.684762	202.119.32.7	192.168.2.3	ICMP	98	Echo (ping)	1385	229.685627	192.168.2.3	192.168.229.2	DNS	85	Standard que	1386	229.686075	192.168.2.3	192.168.229.2	DNS	85	Standard que	1387	229.802646	192.168.229.2	192.168.2.3	DNS	539	Standard que	1388	230.516369	192.168.2.3	202.119.32.7	ICMP	98	Echo (ping)	1389	230.517324	192.168.2.3	202.119.32.7	ICMP	98	Echo (ping)	1390	230.648436	202.119.32.7	192.168.2.3	ICMP	98	Echo (ping)
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	<p>含义：</p> <div><div>▶ Frame 1382: 98 bytes on wire (784 bits), 98 bytes captured (784 bits)</div><div>▶ Ethernet II, Src: Vmware_1f:86:54 (00:0c:29:1f:86:54), Dst: Vmware_25:7f:5b (00:0c:29:25:7f:5b)</div><div>▶ Destination: Vmware_25:7f:5b (00:0c:29:25:7f:5b)</div><div>▶ Source: Vmware_1f:86:54 (00:0c:29:1f:86:54)</div><div>Type: IP (0x0800)</div><div>▶ Internet Protocol Version 4, Src: 192.168.2.3 (192.168.2.3), Dst: 202.119.32.7 (202.119.32.7)</div><div>▶ Internet Control Message Protocol</div></div> <div><div>0000 00 0c 29 25 7f 5b 00 0c 29 1f 86 54 08 00 45 00 ..)%.[..].T..E.</div><div>0010 00 54 00 00 40 00 40 01 8d 7f c0 a8 02 03 ca 77 .T..@.@:W</div><div>0020 20 07 08 00 9d 01 0a ac 00 c6 20 be 97 5b 9f 6f[.0</div><div>0030 0d 00 08 09 0a 0b 0c 0d 0e 0f 10 11 12 13 14 15[.0</div></div> <p>可以发现以太网协议是数据报的第一部分，IP 是第二部分，对于 1379~1381 的数据报，UDP 是第三部分，DNS 是第四部分，而对于 1382~1384 的数据报，它的第三部分为 ICMP，没有第四部分。简而言之，数据报是按照自下向上的方式表示信息的。</p>
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附表：

节点名	虚拟设备名	ip	netmask
Router0	U-571	eth0:192.168.229.131	255.255.255.0
		eth1:192.168.2.1	255.255.255.0
Router1	UT-574	eth0:192.168.229.135	255.255.255.0
		eth1:192.168.3.1	255.255.255.0
PC1	U-572	eth0:192.168.2.2	255.255.255.0
PC2	U-573	eth0:192.168.2.3	255.255.255.0
PC3	UT-575	eth0:192.168.3.2	255.255.255.0

附图：

