Wireshark

Wireshark??
?GNU??

- ????
- Learning
- tcpdump

????

????

?????

```
==
!=
>
<
>=
<=
in
```

?????

```
&&  # AND
||     # OR
!      # NOT
```

?????

- type: host, port
- dir: src, dst
- proto: tcp, udp, ftp, http

SIP ??

tcpdump

```
timeout 6m tcpdump -i eth0 host <sip-trunk-ip> -n -s 0 -vvvv  -w carrier.pcap
```

Wireshark

- ??? sip ??? filter ???https://www.wireshark.org/docs/dfref/s/sip.html

??? REGISTER ??Filter: `sip.CSeq.method == REGISTER`

??

??????

```
ssh root@192.168.0.1 tcpdump -n -i any -w- 'not \( port 22 and host 192.168.0.1 \)' |etherape -r-
```

Filter ???

Wireshark Display Filter Cheat Sheet

www.cellstream.com www.netscionline.com

Operators and Logic

eq or ==	lt or <	and or && Logical AND	not or ! Logical NOT
ne or !=	ge or >=	or or || Logical OR	[n] [_] Substring operator
gt or >	le or <=	xor or ^^ Logical XOR	

LAYER 1

frame	frame.ignored	frame.number	frame.time_delta
frame.cap_len	frame.len	frame.p2p_dir	frame.time_delta_displayed
frame.coloring_rule.name	frame.link_nr	frame.protocols	frame.time_epoch
frame.coloring_rule.string	frame.marked	frame.ref_time	frame.time_invalid
frame.file_off	frame.md5_hash	frame.time	frame.time_relative

LAYER 2

Ethernet

eth.addr	eth.multicast		
eth.dst	eth.src		
eth.ig	eth.trailer		
eth.len	eth.type		
eth.lg			

ARP

arp.dst.hw_mac	arp.proto.size		
arp.dst.proto_ipv4	arp.proto.type		
arp.hw.size	arp.src.hw_mac		
arp.hw.type	arp.src.proto_ipv4		
arp.opcode			

802.1Q VLAN

vlan.cfi	vlan.len		
vlan.etype	vlan.priority		
vlan.id	vlan.trailer		

PPP

ppp.address	ppp.direction		
ppp.control	ppp.protocol		

VLAN Trunking Protocol

vtp.code	vtp.version		
vtp.conf_rev_num	vtp.vlan_info.802_10_index		
vtp.followers	vtp.vlan_info.isl_vlan_id		
vtp.md	vtp.vlan_info.len		
vtp.md5_digest	vtp.vlan_info.mtu_size		
vtp.md_len	vtp.vlan_info.status.vlan_susp		
vtp.neighbor	vtp.vlan_info.tlv_len		
vtp.seq_num	vtp.vlan_info.tlv_type		
vtp.start_value	vtp.vlan_info.vlan_name		
vtp.upd_id	vtp.vlan_info.vlan_name_len		
vtp.upd_ts	vtp.vlan_info.vlan_type		

DTP

dtp.neighbor	dtp.tlv_type		
dtp.tlv_len	dtp.version		

MPLS

mpls.bottom	mpls.oam.defect_location		
mpls.cw.control	mpls.oam.defect_type		
mpls.cw.res	mpls.oam.frequency		
mpls.exp	mpls.oam.function_type		
mpls.label	mpls.oam.ttsi		
mpla.aom.bip16	mpls.ttl		

Frame Relay

fr.becn	fr.control.p	fr.dlci	fr.snap.oui
fr.chdlctype	fr.control.s_ftype	fr.dlcore_control	fr.snap.pid
fr.control	fr.control.u_modifier_cmd	fr.ea	fr.snaptype
fr.control_f	fr.control.u_modifier_resp	fr.fecn	fr.third_dlci
fr.control.ftype	fr.cr	fr.lower_dlci	fr.upper_dlci
fr.control.n_r	fr.dc	fr.nlpid	
fr.control.n_s	fr.de	fr.second_dlci	

LAYER 3

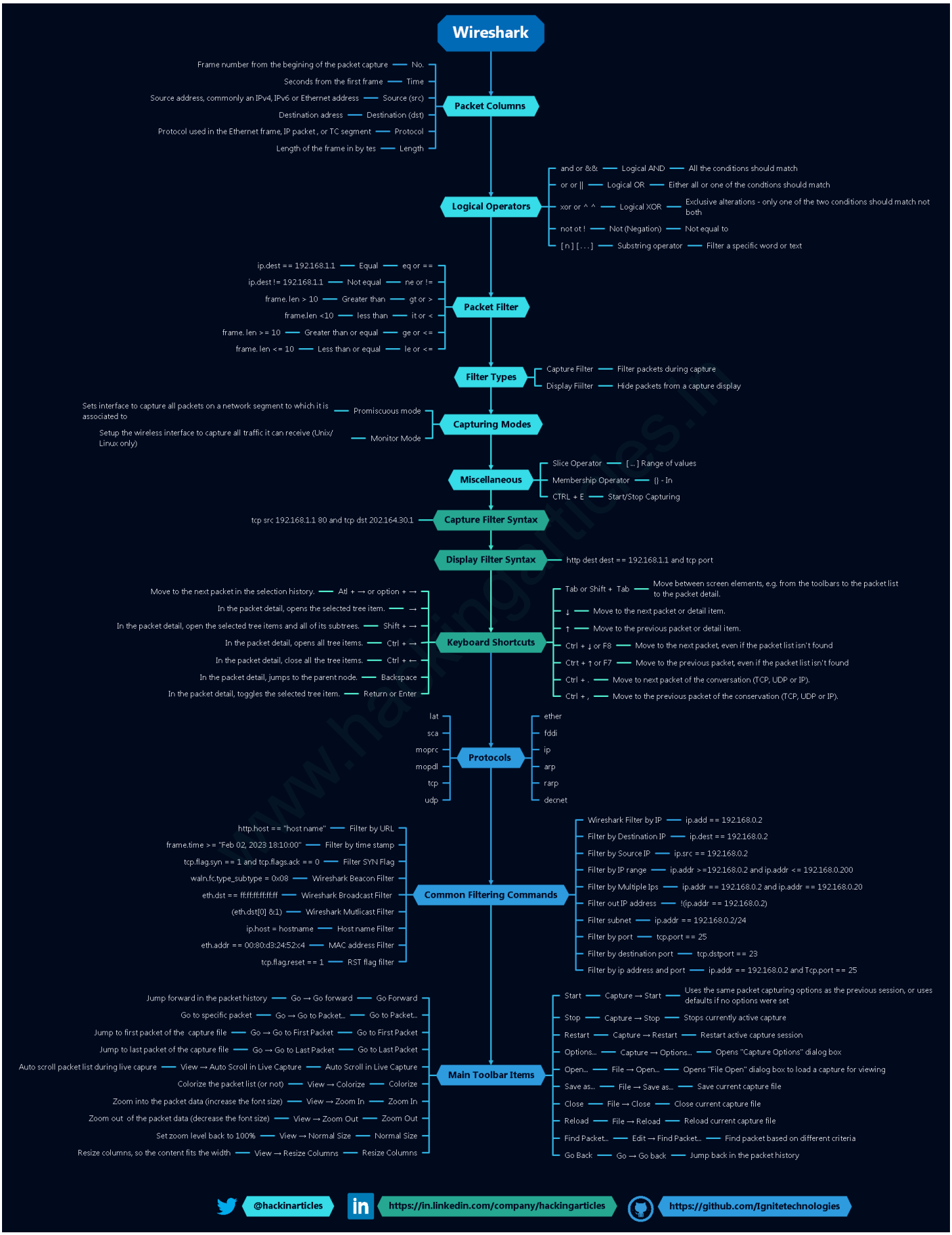
IP v4

ip.addr	ip.fragment.overlap.conflict		
ip.checksum	ip.fragments		
ip.checksum_bad	ip.fragment.toolongfragment		
ip.checksum_good	ip.hdr_len		
ip.dsfield	ip.host		

IP v6

ipv6.addr	ipv6.hop_opt		
ipv6.class	ipv6.host		
ipv6.dst	ipv6.mipv6_home_address		
ipv6.dst_host	ipv6.mipv6_length		
ipv6.dst_opt	ipv6.mipv6_type		

(c)1998-2021 CellStream, Inc.


Wireshark
Packet Columns
Frame number from the begining of the packet capture — No.
Seconds from the first frame — Time
Source address, commonly an IPv4, IPv6 or Ethernet address — Source (src)
Destination adress — Destination (dst)
Protocol used in the Ethernet frame, IP packet , or TC segment — Protocol
Length of the frame in by tes — Length
Logical Operators
and or && — Logical AND — All the conditions should match
or or || — Logical OR — Either all or one of the condtions should match
xor or ^ ^ — Logical XOR — Exclusive alterations - only one of the two conditions should match not both
not ot ! — Not (Negation) — Not equal to
[n] [. . .] — Substring operator — Filter a specific word or text
Packet Filter
ip.dest == 192.168.1.1 — Equal — eq or ==
ip.dest != 192.168.1.1 — Not equal — ne or !=
frame. len > 10 — Greater than — gt or >
frame.len <10 — less than — it or <
frame. len >= 10 — Greater than or equal — ge or <=
frame. len <= 10 — Less than or equal — le or <=
Filter Types
Capture Filter — Filter packets during capture
Display Fiilter — Hide packets from a capture display
Capturing Modes
Sets interface to capture all packets on a network segment to which it is associated to — Promiscuous mode
Setup the wireless interface to capture all traffic it can receive (Unix/ Linux only) — Monitor Mode
Miscellaneous
Slice Operator — [..] Range of values
Membership Operator — {} - In
CTRL + E — Start/Stop Capturing
Capture Filter Syntax
tcp src 192.168.1.1 80 and tcp dst 202.164.30.1
Display Filter Syntax
http dest dest == 192.168.1.1 and tcp port
Keyboard Shortcuts
Move to the next packet in the selection history. — Atl + → or option + →
In the packet detail, opens the selected tree item. — →
In the packet detail, open the selected tree items and all of its subtrees. — Shift + →
In the packet detail, opens all tree items. — Ctrl + →
In the packet detail, close all the tree items. — Ctrl + ←
In the packet detail, jumps to the parent node. — Backspace
In the packet detail, toggles the selected tree item. — Return or Enter
Tab or Shift + Tab — Move between screen elements, e.g. from the toolbars to the packet list to the packet detail.
↓ — Move to the next packet or detail item.
↑ — Move to the previous packet or detail item.
Ctrl + ↓ or F8 — Move to the next packet, even if the packet list isn't found
Ctrt + ↑ or F7 — Move to the previous packet, even if the packet list isn't found
Ctrl + . — Move to next packet of the conversation (TCP, UDP or IP).
Ctrl + , — Move to the previous packet of the conservation (TCP, UDP or IP).
Protocols
lat
sca
moprc
mopdl
tcp
udp
ether
fddi
ip
arp
rarp
decnet
Common Filtering Commands
http.host == "host name" — Filter by URL
frame.time >= "Feb 02, 2023 18:10:00" — Filter by time stamp
tcp.flag.syn == 1 and tcp.flags.ack == 0 — Filter SYN Flag
waln.fc.type_subtype = 0x08 — Wireshark Beacon Filter
eth.dst == ff:ff:ff:ff:ff:ff — Wireshark Broadcast Filter
(eth.dst[0] &1) — Wireshark Mutlicast Filter
ip.host = hostname — Host name Filter
eth.addr == 00:80:d3:24:52:c4 — MAC address Filter
tcp.flag.reset == 1 — RST flag filter
Wireshark Filter by IP — ip.add == 192.168.0.2
Filter by Destination IP — ip.dest == 192.168.0.2
Filter by Source IP — ip.src == 192.168.0.2
Filter by IP range — ip.addr >=192.168.0.2 and ip.addr <= 192.168.0.200
Filter by Multiple Ips — ip.addr == 192.168.0.2 and ip.addr == 192.168.0.20
Filter out IP address — !(ip.addr == 192.168.0.2)
Filter subnet — ip.addr == 192.168.0.2/24
Filter by port — tcp.port == 25
Filter by destination port — tcp.dstport == 23
Filter by ip address and port — ip.addr == 192.168.0.2 and Tcp.port == 25
Main Toolbar Items
Jump forward in the packet history — Go → Go forward — Go Forward
Go to specific packet — Go → Go to Packet... — Go to Packet...
Jump to first packet of the capture file — Go → Go to First Packet — Go to First Packet
Jump to last packet of the capture file — Go → Go to Last Packet — Go to Last Packet
Auto scroll packet list during live capure — View → Auto Scroll in Live Capture — Auto Scroll in Live Capture
Colorize the packet list (or not) — View → Colorize — Colorize
Zoom into the packet data (increase the font size) — View → Zoom In — Zoom In
Zoom out of the packet data (decrease the font size) — View → Zoom Out — Zoom Out
Set zoom level back to 100% — View → Normal Size — Normal Size
Resize columns, so the content fits the width — View → Resize Columns — Resize Columns
Start — Capture → Start — Uses the same packet capturing options as the previous session, or uses defaults if no options were set
Stop — Capture → Stop — Stops currently active capture
Restart — Capture → Restart — Restart active capture session
Options... — Capture → Options... — Opens "Capture Options" dialog box
Open... — File → Open... — Opens "File Open" dialog box to load a capture for viewing
Save as... — File → Save as... — Save current capture file
Close — File → Close — Close current capture file
Reload — File → Reload — Reload current capture file
Find Packet... — Edit → Find Packet... — Find packet based on different criteria
Go Back — Go → Go back — Jump back in the packet history
@hackinarticles
https://in.linkedin.com/company/hackingarticles
https://github.com/Ignitetechnologies

Learning

- Network Forensics, Wireshark Basics, Part 1

tcpdump

Capture All traffic

```
tcpdump -i eth0
tcpdump -i wlan0
```

To a File

```
tcpdump -i eth0 -w capture.pcap

# Set Timeout
timeout 6m tcpdump -i eth0 -w capture.pcap
```

Read a file (.pcap)

```
tcpdump -r capture.pcap
```

Filter

```
# Filter by Source IP
tcpdump src 192.168.0.1

# Filter by Destination IP
tcpdump dst 192.168.0.1

# Filter by Port
tcpdump port 80

# Filter by Protocol
tcpdump icmp

# Protocol and Port
tcpdump tcp port 443

# Source and Destination
tcpdump src 192.168.0.1 and dst 192.168.0.2
```

Display in ASCII

```
# Dispaly in ASCII
tcpdump -A

# Display in Hexadecimal
tcpdump -X
```

Specific Number of Packets

```
tcpdump -c 100
```

Display

```
# Capture and Display IPv6 Traffic
tcpdump -6

# Capture and Display Traffic in Timestamp Format
tcpdump -tttt
```

SSH Connections

```
# -l: real-time
# -e: including ethernet headers
tcpdump -i eth0 'tcp port 22' -l -e
```

HTTP Request and Response

```
tcpdump -i eth0 -s 0 -A -n 'tcp dst port 80'
```

IP Range and Protocol

```
tcpdump -i eth0 'net 192.168.0.0/24 and (tcp port 22 or icmp)'
```

DNS Traffic

```
tcpdump -i eth0 'udp port 53' -nnvvv
```

FTP Traffic

```
tcpdump -i eth0 -s 0 'tcp port 21'
```

?? DDos ?????????

```
interface=ens1
dumpdir=/home/user/automatic-tcp-dump/
while /bin/true; do
  pkt_old=`grep $interface: /proc/net/dev | cut -d :  -f2 | awk '{ print $2 }'`
  sleep 1
  pkt_new=`grep $interface: /proc/net/dev | cut -d :  -f2 | awk '{ print $2 }'`
  pkt=$(( $pkt_new - $pkt_old ))
  echo -ne "\r$pkt packets/s\033[0K"
  if [ $pkt -gt 30000 ]; then
    echo -e "\n`date` Under Attack. Capturing Packets..."
    sudo  tcpdump -n -i $interface -s0 -c 20000 -w $dumpdir/dump.`date +"%Y%m%d-%H%M%S"`.pcap
    echo "`date` Packets Captured."
    sleep 300  && pkill -HUP -f /usr/sbin/tcpdump
  else
    sleep 1
  fi
done
```