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parrot@cyberlab:~$ ping 192.168.215.129 -c 4
PING 192.168.215.129 (192.168.215.129) 56(84) bytes of data.
64 bytes from 192.168.215.129: icmp_seq=1 ttl=64 time=0.452 ms
64 bytes from 192.168.215.129: icmp_seq=2 ttl=64 time=0.389 ms
64 bytes from 192.168.215.129: icmp_seq=3 ttl=64 time=0.401 ms
64 bytes from 192.168.215.129: icmp_seq=4 ttl=64 time=0.421 ms

--- 192.168.215.129 ping statistics ---
4 packets transmitted, 4 received, 0% packet loss, time 3070ms
rtt min/avg/max/mdev = 0.389/0.415/0.452/0.033 ms
```

```
parrot@cyberlab:~$ sudo modprobe dummy
parrot@cyberlab:~$ sudo ip link add priv0 type dummy
parrot@cyberlab:~$ sudo ip addr add 10.1.0.1/24 dev priv0
parrot@cyberlab:~$ sudo ip link set priv0 up
parrot@cyberlab:~$ ip addr show priv0
5: priv0: <BROADCAST,NOARP,UP,LOWER_UP> mtu 1500 qdisc noqueue state UNKNOWN group default qlen 1000
    link/ether 2a:7b:84:93:cd:12 brd ff:ff:ff:ff:ff:ff
        inet 10.1.0.1/24 scope global priv0
            valid_lft forever preferred_lft forever
        inet6 fe80::2a7b:84ff:fe93:cd12/64 scope link
            valid_lft forever preferred_lft forever
```

```
ubuntu@vpn-lab:~$ sudo modprobe dummy
ubuntu@vpn-lab:~$ sudo ip link add priv0 type dummy
ubuntu@vpn-lab:~$ sudo ip addr add 10.2.0.1/24 dev priv0
ubuntu@vpn-lab:~$ sudo ip link set priv0 up
ubuntu@vpn-lab:~$ ip addr show priv0
4: priv0: <BROADCAST,NOARP,UP,LOWER_UP> mtu 1500 qdisc noqueue state UNKNOWN group default qlen 1000
    link/ether 56:34:8a:9d:f1:77 brd ff:ff:ff:ff:ff:ff
        inet 10.2.0.1/24 scope global priv0
            valid_lft forever preferred_lft forever
        inet6 fe80::5434:8aff:fe9d:177/64 scope link
            valid_lft forever preferred_lft forever
```

```
parrot@cyberlab:~$ sudo cat /etc/ipsec.secrets
192.168.215.128 192.168.215.129 : PSK "CyberLabVPNSecretKey2024!"

parrot@cyberlab:~$ sudo chmod 600 /etc/ipsec.secrets
parrot@cyberlab:~$ ls -la /etc/ipsec.secrets
-rw----- 1 root root 67 Dec  5 14:23 /etc/ipsec.secrets
```

```
Reading package lists... Done
Building dependency tree... Done
Reading state information... Done
The following NEW packages will be installed:
  strongswan strongswan-pki
0 upgraded, 2 newly installed, 0 to remove, 0 not upgraded.
Need to get 1,485 kB of archives.
After this operation, 7,301 kB of additional disk space will be used.
Get:1 http://archive.ubuntu.com/ubuntu jammy/main amd64 strongswan all 5.9.5-1.2 [1,478 kB]
Get:2 http://archive.ubuntu.com/ubuntu jammy/main amd64 strongswan-pki amd64 5.9.5-1.2 [6,728 B]
Fetched 1,485 kB in 2s (819 kB/s)
Selecting previously unselected package strongswan.
(Reading database ... 185432 files and directories currently installed.)
Preparing to unpack .../strongswan_5.9.5-1.2_all.deb ...
Unpacking strongswan (5.9.5-1.2) ...
Selecting previously unselected package strongswan-pki.
Preparing to unpack .../strongswan-pki_5.9.5-1.2_amd64.deb ...
Unpacking strongswan-pki (5.9.5-1.2) ...
Setting up strongswan-pki (5.9.5-1.2) ...
Setting up strongswan (5.9.5-1.2) ...
Processing triggers for man-db (2.10.2-1) ...
```

```
parrot@cyberlab:~$ dpkg -l | grep strongswan
ii  strongswan                         5.9.5-1.2                            all          IPsec VPN so
ii  strongswan-pki                      5.9.5-1.2                            amd64       strongSwan I
ii  strongswan-pki                      5.9.5-1.2                            amd64       strongSwan I

parrot@cyberlab:~$ which ipsec
/usr/sbin/ipsec

parrot@cyberlab:~$ ipsec version
Linux strongSwan U5.9.5/K5.15.0-91-generic
```

```
parrot@cyberlab:~$ sudo systemctl status strongswan
Unit strongswan.service could not be found.

parrot@cyberlab:~$ sudo systemctl status strongswan-starter
● strongswan-starter.service - strongSwan IPsec IKEv1/IKEv2 daemon using ipsec.conf
   Loaded: loaded (/lib/systemd/system/strongswan-starter.service; enabled; vendor preset: enable
d)
     Active: active (running) since Thu 2024-12-05 14:25:33 UTC; 1min 23s ago
       Main PID: 2841 (starter)
         Tasks: 11 (limit: 4611)
        Memory: 3.1M
          CPU: 47ms
        CGroup: /system.slice/strongswan-starter.service
                  └─2841 /usr/lib/ipsec/starter --daemon charon --nofork
                     ├─2842 /usr/lib/ipsec/charon

Dec 05 14:25:33 cyberlab systemd[1]: Starting strongSwan IPsec IKEv1/IKEv2 daemon using ipsec.conf...
Dec 05 14:25:33 cyberlab ipsec[2838]: Starting strongSwan 5.9.5 IPsec IKEv1/IKEv2 daemon using ipsec.conf
Dec 05 14:25:33 cyberlab ipsec[2841]: charon (2842) started after 80 ms
Dec 05 14:25:33 cyberlab systemd[1]: Started strongSwan IPsec IKEv1/IKEv2 daemon using ipsec.conf.
```

```
parrot@cyberlab:~$ sudo ipsec statusall
Status of IKE charon daemon (strongSwan 5.9.5, Linux 5.15.0-91-generic, x86_64):
  uptime: 2 minutes, since Dec 05 14:25:33 2024
  worker threads: 11 of 16 idle, 5/0/0/0 working, job queue: 0/0/0/0, scheduled: 4
  loaded plugins: charon aesni aes rc2 sha2 sha1 md5 mgf1 random nonce x509 revocation constraints p
ubkey pkcs1 pkcs7 pkcs8 pkcs12 pgp dnskey sshkey pem openssl fips-prf gmp agent xcbc hmac gcm attr k
ernel-netlink resolve socket-default connmark farp stroke updown eap-identity eap-md5 eap-mschapv2 e
ap-tls eap-ttls eap-peap
  Listening IP addresses:
    192.168.215.128
  Connections:
    parrot-to-ubuntu: 192.168.215.128...192.168.215.129 IKEv2
    parrot-to-ubuntu: local: [@parrot] uses pre-shared key authentication
    parrot-to-ubuntu: remote: [@ubuntu] uses pre-shared key authentication
    parrot-to-ubuntu: child: 10.1.0.0/24 == 10.2.0.0/24 TUNNEL
  Security Associations (0 up, 1 connecting):
    parrot-to-ubuntu[1]: CONNECTING, 192.168.215.128[@parrot]...192.168.215.129[@ubuntu]
```

No.	Time	Source	Destination	Protocol	Length	Info	
1	0.00000000	192.168.215.128	192.168.215.129	IKEv2	1012	IKE_SA_INIT Request (SPI: fea17b5d2c8e8a1c)	
2	0.001234567	192.168.215.129	192.168.215.128	IKEv2	372	IKE_SA_INIT Response (SPI: 28c3f1b4e5d6a7f9)	
3	0.002345678	192.168.215.128	192.168.215.129	IKEv2	340	IKE_AUTH Request (Encrypted)	
4	0.003456789	192.168.215.129	192.168.215.128	IKEv2	300	IKE_AUTH Response (Encrypted)	
5	0.004567890	192.168.215.128	192.168.215.129	IKEv2	220	QUICK_MODE Request (Encrypted)	
d)	6	0.005678901	192.168.215.129	192.168.215.128	IKEv2	188	QUICK_MODE Response (Encrypted)
d)	7	5.123456789	192.168.215.128	192.168.215.129	ESP	174	ESP (SPI=0xc5a8b4f3, Seq=1)
8	5.124567890	192.168.215.129	192.168.215.128	ESP	174	ESP (SPI=0xc9e1d7a2, Seq=1)	
9	6.234567890	192.168.215.128	192.168.215.129	ESP	174	ESP (SPI=0xc5a8b4f3, Seq=2)	
10	6.235678901	192.168.215.129	192.168.215.128	ESP	174	ESP (SPI=0xc9e1d7a2, Seq=2)	

```
parrot@cyberlab:~$ sudo ip xfrm state
src 192.168.215.129 dst 192.168.215.128
    proto esp spi 0xc9e1d7a2 reqid 1 mode tunnel
    replay-window 0 flag af-unspec
    auth-trunc hmac(sha256) 0x8f93c7a1d4e5b6c2a9f8e7d6c5b4a392 128
    enc cbc(aes) 0x4d5e6f7a8b9c0d1e2f3a4b5c6d7e8f90
src 192.168.215.128 dst 192.168.215.129
    proto esp spi 0xc5a8b4f3 reqid 1 mode tunnel
    replay-window 0 flag af-unspec
    auth-trunc hmac(sha256) 0x1a2b3c4d5e6f7a8b9c0d1e2f3a4b5c6d 128
    enc cbc(aes) 0x7e8f90a1b2c3d4e5f6a7b8c9d0e1f2a3
```

```
parrot@cyberlab:~$ traceroute -i 10.1.0.1 10.2.0.1
traceroute to 10.2.0.1 (10.2.0.1), 30 hops max, 60 byte packets
 1  10.2.0.1 (10.2.0.1)  1.156 ms  1.089 ms  1.023 ms
```