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Terminating bgp with apipa blocks on firewalls - Avoid at all times -

The problem

[Day 1]

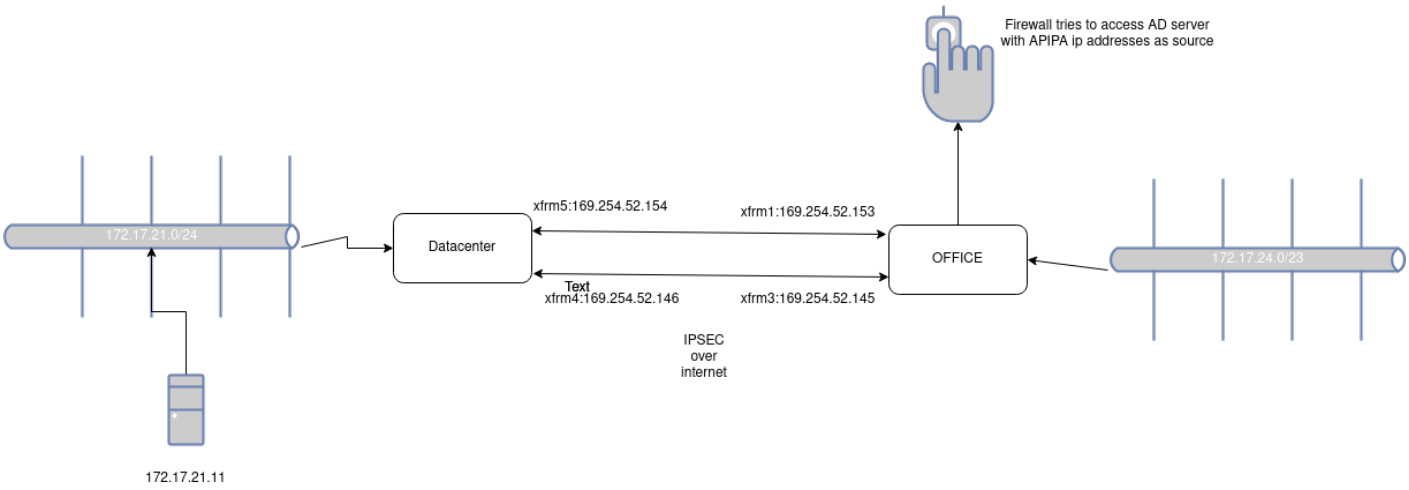
Today i got lost in sophos firewalls internal routing and nat labyrinths, what i was trying to do was a simple LDAP integration to a server ath the end of a vpn tunnel. For interoperability reasons with AWS networks, we did used the famous "APIPA" block ip addresses on our bgp neigborship design.

But, there is catch !

There is always a catch and sometimes *a group of catches*. Windows server machines won't route or process apipa address ranges. Блять right ? Anyway my options were clear

1. Change the addressing on ipsec links
2. Snat the connections getting out of the firewall

Here is the topology i was dealing with.



i got close

I thought that amazon must have a sound reason to use these blocks on their integrations. I am sure they never thought the apipa addresses were going to be used as source addresses on production links, or the CPE's might have limitations too.

I know that Fortigates have the option to specify source addresses for control plane operations however sophos doesn't have them. _insert sad emoji here _

there is one

Ok, i can always use the snat option right ? So i went with option 2 on my list.

And after two hours mangling with it i gave up and created a case, **which got the required attention immediately** from sophos, since the traffic is generated from firewall itself, a special snat entry was not going to be processed as i expect.

Apparently Postrouting operations weren't processed on **control plane chains**, and i really don't wanted to go with option 2 so a very capable and gentle guy from sophos tried helped me however we couldn't got the golden ticket today !

I did spent 3 hours working on this case learned many things about how kernel processes encrypted packets and found out good documents about how packets traverse when they are using xfrm framework. i am going to add the things i read at #further reading section below.

And will update this page on next update i get.

Further Reading

Beautiful explanation of xfrm

How to use snat with xfrm if had a vyos

This image from the post above displays the packet flow mech on linux.



Strongswan xfrm implementation

The solution

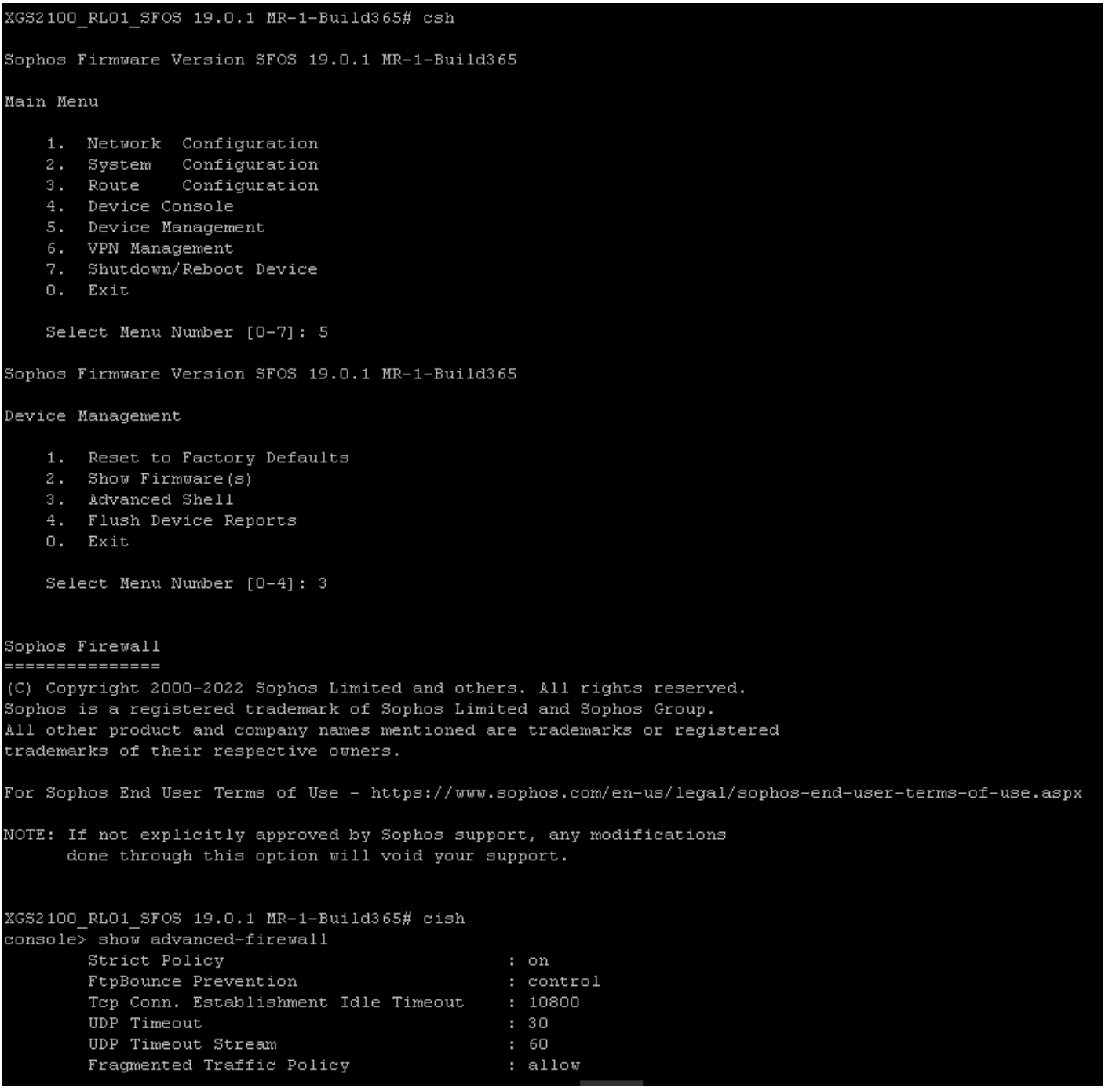
[day 5]

Apparently, there is a special section to add nat entries for "System Generated Traffic", and it is only accessible to command line interface. To do that you have to access the firewall through

console using ssh and go to advanced menu as shown below.

Then you will have to type

```
cish
```



then you'll have to add a nat entry as shown below

```
set advanced-firewall sys-traffic-nat add destination 172.17.21.11 netmask 255.255.255.255
snatip 172.17.24.1
```

[

```
console> set advanced-firewall sys-traffic-nat add destination 172.17.21.11 netmask 255.255.255.255 snatip 172.17.24.1
console> show advanced-firewall
        Strict Policy                           : on
        FtpBounce Prevention                    : control
        Tcp Conn. Establishment Idle Timeout    : 10800
        UDP Timeout                             : 30
        UDP Timeout Stream                      : 60
        Fragmented Traffic Policy               : allow
        Midstream Connection Pickup             : off
        TCP Seq Checking                        : on
        TCP Window Scaling                      : on
        TCP Appropriate Byte Count              : off
        TCP Selective Acknowledgements          : on
        TCP Forward RTO-Recovery[F-RTO]         : off
        TCP TIMESTAMPS                          : off
        Strict ICMP Tracking                    : off
        ICMP Error Message                      : allow
        Caching for route lookups               : on
        IPv6 Unknown Extension Header           : deny


        Bypass Stateful Firewall
        ------------------------
         Source              Genmask            Destination         Genmask


        NAT policy for system originated traffic
        ---------------------
        Destination Network     Destination Netmask     Interface       SNAT IP
        172.17.21.11            255.255.255.255                         172.17.24.1

console> ping 172.17.21.11172
ping: bad address '172.17.21.11172'
console> ^C
console> ping 172.17.21.11
PING 172.17.21.11 (172.17.21.11): 56 data bytes
64 bytes from 172.17.21.11: seq=0 ttl=127 time=6.115 ms
64 bytes from 172.17.21.11: seq=1 ttl=127 time=5.872 ms
64 bytes from 172.17.21.11: seq=2 ttl=127 time=5.662 ms
64 bytes from 172.17.21.11: seq=3 ttl=127 time=6.849 ms
64 bytes from 172.17.21.11: seq=4 ttl=127 time=6.032 ms
```

](https://books.netdev.com.tr/uploads/images/gallery/2022-12/image-1672316296662.png)

After you ping the destination or check the firewall you will see that the traffic is natted.

Wazuh Cheat Sheet

install linux agent on SLES or Opensuse

To install

```
WAZUH_MANAGER='172.21.21.165' WAZUH_AGENT_GROUP='Linux_Servers' zypper --no-gpg-checks install
https://packages.wazuh.com/4.x/yum/wazuh-agent-4.3.10-1.x86_64.rpm
```

to check

```
systemctl status wazuh-agent.service
```

output



Gns3 as a daemon on 22.04

Kullan?c? ekliyoruz

sudo adduser gns3

Gerekli python libraryler

sudo apt install python3-setuptools python3-aiohttp python3-psutil python3-jsonschema git -y

Tutundurma süreci



Toplant? öncesi bitmesi gerekenler

1. Sözleşmeler gönderilir (Hizmet ve Gizlilik Sözleşmesi)
2. Tüm çalışanlarının mail adresleri alınıp ‘’Bilgilendirme’’ maili atılır (OKAN)
3. Sistem sorumlusu ve Şirket sahibi/Genel müdür bilgileri öğrenilir.
4. Envanter için personel gönderilir ve detaylı envanter çıkarılır. Envanter alınırken sistem analizi ön çalışması yapılır.
5. Mutlaka Android telefon ile PHING kaydı alınır. Kritik önemdeki şifreler random pass yöntemi ile hemen değiştirilir.

Tan??ma toplant?s?

6. Sistem sorumlusu ve veya Genel Müdür seviyesinde randevu talep edilir ve aşağıdaki konular görüşülür.

```
 1.1 Değerleme/analiz çalışması için ikinci ziyaret yapılır. (Müşteri ilişkileri
yöneticisi)
 1.2 İş Kritik saat ve günler öğrenilir - En yoğun günleriniz hangileridir -
 1.3 İş Kritik sistemlerin duruşa - Asla durmaması gereken sistemleriniz nelerdir -
 1.4 Tek nokta problem analizi yapılır - sadece 1 adet sunucumu var ? firewall sadece
1 tane mi ?-
 1.5 Dışarıdan erişim politikaları öğrenilir -SSL vpn kullanıyormusunuz ?-
 1.6.En sık yaşanılan sıkıntılar konusunda bilgi talep edilir -En sık yaşadığınız
problem nedir-
 1.7 Sık yaşanan konular için akla gelen çözümler var ise basitçe sıralanır, case
olarak üretmek üzere toplantı sonrası adımlarında kullanılır
 1.8 Şirketimizin geçmişinden sayılarla örnekler verilir

     a. Kısa tarihçe anlatılır - şu kadar yıldır varız, şu kadar kişiyiz -
     b. Haftalık case ve çözülen iş sayısı söylenir
     c. 2.000 problem çözdük, 1800 işi tam zamamnında 150 işi yarı gecikmeli yaptık
şeklinde istatistik verilir
```

7. Müşteri den Yesis yetkilisi ataması yapılması istenir.

```
 6.1 Şirket bilgisayarından mutlaka Yesis login olduğu görülür
 6.2 Yesis konusunda kısaca bilgilendirilir.
```

Toplant? sonras? yap?lmas? gerekenler

8. Müşteriye, yesiscrm.net/mustericm paneli açılır

```
 6.3 İlk case oluşturması sağlanır. bu adında sık yaşanan problemler aşamasında
alınan notlar kullanılır
 6.4 Önceden haber verilen ekibin case'e hızlı dönmesi sağlanır
 6.5 Bu konuda teşvik edici sözler söylenir -Ekran üzerinden yapılan işlemler hızlı
dönüş sürecini başlatır-
```

9. Teknik personellerin zabbix kayıt işlemleri kontrol edilir.
10. Tespit edilen noksanlıklar raporlanır;
11. Alınması gereken tedbirler ve çözümler oluşturulur.
12. Gerekirse tedbir veya çözümlerin üretilmesi için teklifler oluşturulur.
13. Sistem analizi ve diagram ile birlikte müşteri sunuma gidilip eksikleri ve son durumu iletilir.

14. Sunum toplantısından sonra risk analiz raporunda tespit edilen acil durum çözümleri için teklif iletilmesi sağlanır(satış personeli)
15. 2 ayda 1 Periyodik memnuniyet ziyareti takvimi oluşturulur (Müşteri ilişkileri Yöneticisi)

tutundurma.xmind

SDS

1. Bölüm

Storage Nedir

Diskler, cdler, usb stickler, floppy veri yazdığımız her media bir storage dır. bunları birşekilde birleştirip kocaman veri ambarları yapıyoruz, bunlara da depolama çözümü deniyor yani storage solution. Bunların donanım şeklinde çalışanı var yazılım şeklinde çalışanı var. Fiyat/performans hesabına göre trendyol gibi bir skalada donanımsal çözümün hem finansal hemde politik bazı kötü sonuçları oluyor bu sebeple yazılım tabanlı depolama çözümleri kullanmak daha doğru oluyor.

Software defined storage nedir

Yazılım tanımlı depolama, depolama yazılımını donanım platformundan ayırarak depolama kaynaklarını soyutlayan bir depolama mimarisidir. Bu sayede daha büyük esneklik, verimlilik ve ölçeklenebilirlik elde edilir. openstack in support ettikleri:

- ceph
- iscsi
- local
- Prorprietary, üreticilerin geliştirdikleri diğer lisanslı çözümler.

Bizim openstack teki hangisidir ?

Block storage için Ceph'in mimic versiyonu kullanıyoruz. Ana storage seçimimiz bu.

Biraz rakam verelim ?u andaki büyüklü?ü vs vs

- 66 adet disklerle dolu sunucudan oluşuyor, sata platform üzerin ssd diskler kullanıyoruz
- xx petabbytetır salona sunucu ekleyebildiğimiz sürece büyür.

Bunlar? neden anlat?yoruz ?

B ir sonraki slayta io konuştuktan sonra bağlayacağız

2. Bölüm

IO nedir

Yazma ve okuma isteklerinin tamamına denir, en önemli parametresi gecikme takip eden parametre ise süratidir ve iops değeri ile ifade edilir.

Bizim ceph üzerinden verdi?imiz io rate nedir ve neden böyledir

Excel üzerinden gösterelim

Ba?layal?m

- database / nosql gibi IO bağımlı uygulamalarda kullanmak sorun olabiliyor.

3. Bölüm

Sorun dan bahsettik, cevab?m?z "Ephemeral" nedir ?

Sözlük anlamı geçiçi geçici çünkü hostu yada diski kaybedersek buna cevabımız bazen biraz beklemek, bazen de yeni makina vermek olabiliyor.

Ne zaman kullanmalıyız ?

- io intensive işler için
- bir cluster sayesinde datanın applikasyon üzerinden yedeklendiği durumlarda
- ephemeral ve ceph arasındaki farkın fio ile gösterimi

4. Production daki etkisi

- Can soysal ile yaptığımız 2. testteki çıktı
- iki farklı makinadaki fio çıktısı
- iki farklı makinadaki pgbench çıktısı
- Fark chartı gösterelim
- limitler
- Prod da kullandığımızda nelere dikkat edilmelidir

5. Bölüm

- Soru cevap

Nopasswd the user



On ubuntu 22.04

to add your current user to passwordless sudo

```
echo "useradmin ALL=(ALL) NOPASSWD: ALL" > /etc/sudoers.d/useradmin
```

Freeradius 2fa with ldap and google

root@zabbix:/usr/local/etc/raddb/sites-enabled# more my_server

```
server my_server {
listen {
        type = auth
        ipaddr = *
        port = 1812
}
authorize {
        filter_uuid
        filter_google_otp
        ldap
        if (ok || updated)  {
        update control {
        Auth-Type := LDAP
        }
        }
}
authenticate {
        Auth-Type LDAP {
                ldap
        }
}
}
```

ldap conf

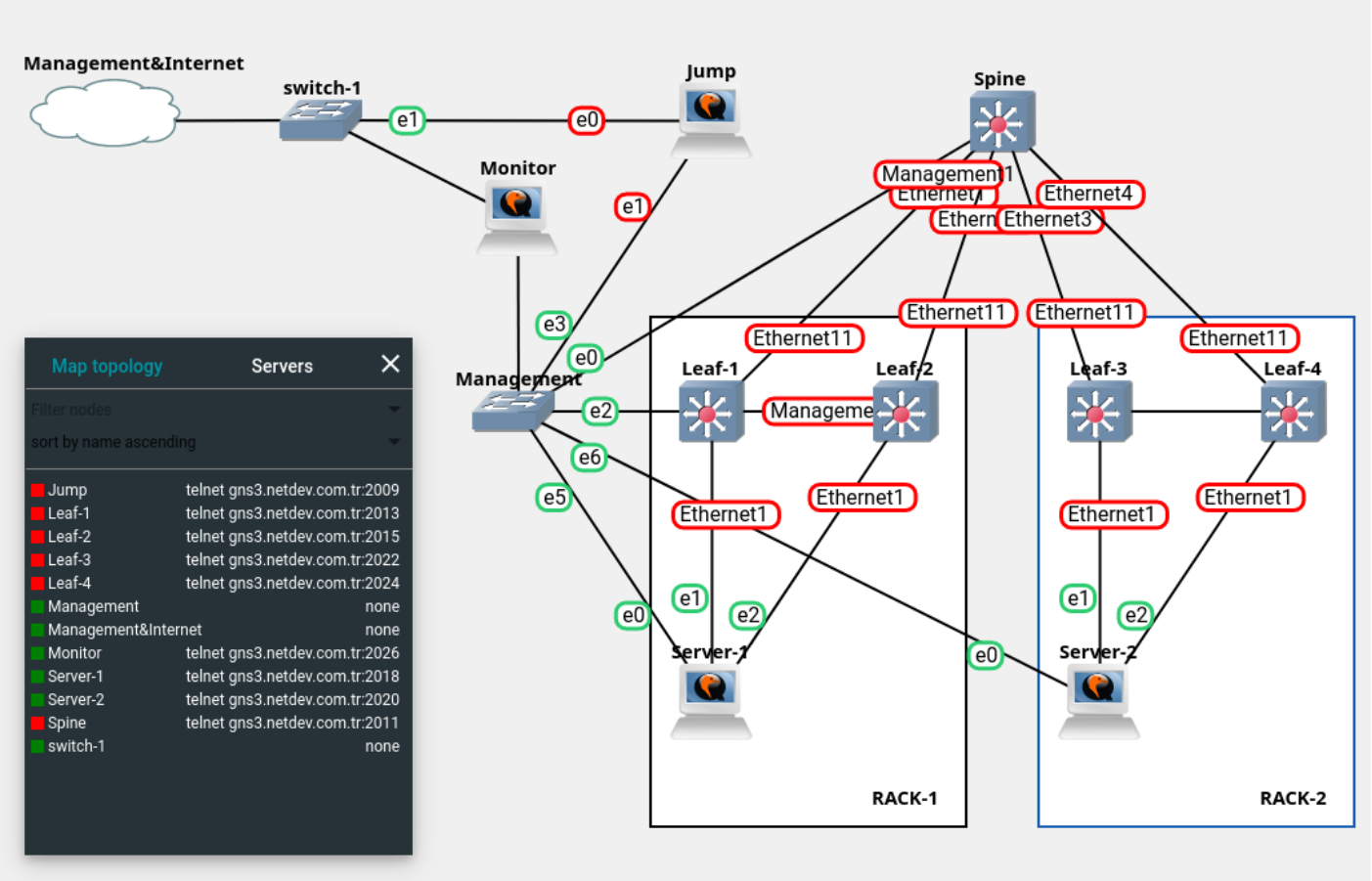
```
ldap {

    identity = 'CN=freeradius_svc,OU=Service_accounts,DC=migrosonline,DC=com'
    password = 'Cumartesi2023.'



    base_dn = 'OU=ADoutVPNusers,DC=migrosonline,DC=com'
```

```
  user {
        base_dn = 'OU=ADoutVPNusers,DC=migrosonline,DC=com'
        filter = "(sAMAccountName=%{%{Stripped-User-Name}:-%{User-Name}})"
        control:My_Group = 'memberOf'
        }



}
```

Bgp Evpn vxlan Case Documentation

This is a lab to test your bgp/evpn/vxlan skills, You have 15 business days to finish this.

The case will be reviewed at a remote meeting session upon your declaration about golden tickets. No manual config is allowed, everything should be deployed using ansible-playbooks



You can access the lab at:

```
http://gns3.eclit.cloud:3080
```

You have to inform Eclit network team using e-mail opr-network@eclit.com before you start working, lab will be ready approximately 30 minuters after receving a confirmation e-mail from eclit.

There are other labs available, you will use the one with the name **"your_name_network_case_eclit"**

Facts

- Accessing the jump and monitor,
  Warning !!! Internet facing instances, please do not forget to change password of ubuntu user

```
Jump server:
  ssh: gns3.eclit.cloud:2222 user pass ubuntu:ubuntu
  https: gns3.eclit.cloud:2443
  http: gns3.eclit.cloud:2080
Monitor :
  ssh: gns3.eclit.cloud:3222 user pass ubuntu:ubuntu
  https: gns3.eclit.cloud:3443
  http: gns3.eclit.cloud:3080
  Monitor management ip address : 192.168.10.250
```

- All ports except the managements ones are shut, be carefull, you can loop and loose the lab access
- Network devices addressing

```
- Spine management address : 192.168.10.11
- Leaf-1 management address : 192.168.10.21
- Leaf-2 management address : 192.168.10.22
- Leaf-3 management address : 192.168.10.23
- Leaf-4 management address : 192.168.10.24
```

- Leaf pairs are paired with dual links
- switch username, password : admin:admin
- Lab switches are Model Arista 4.26.0F vm instances
- Ansible galaxy collection for arista documentation
  https://galaxy.ansible.com/ui/repo/published/arista/eos/
- installation ansible-galaxy collection install arista.eos

Scenario

You will need to deliver the requirements listed below

- Create a public github repository and by using branches develop the following task entries/features
- Create a README.MD file with your details and some explanation about this lab
- Push

Using ansible playbooks:

- branch clos: Define a bgp/evpn clos topology
  you are free to chose between unnumbered/static addressing
- branch mlag: Define MLAG/ESI.
  you are free to chose static or dynamic configuration and opting between ESI/MLAG
- branch vlan: Define a vlan
- branch userports: set ethernet1 ports as access members of defined vlan
- branch telemetry: set monitoring details, credentials, descriptions

Monitoring:

- Create a monitoring solution for this structure on jump server. Snmp is good, other solutions are preferred.

Golden tickets:

1. vcs machines should be able to ping each other on same vlan between racks.
2. A monitoring solution, it must update the operator about thresolds and outages. These updates must happen less than a minute when any sensor triggers.
3. A solution brief, one pager.

100 kb over 20ms delayed link with smbv3

SMBv3 is a more complex protocol than a simple TCP file transfer, with additional overhead for headers, encryption, and other features like window scaling, pipelining, and multi-channel transfers. To adjust our calculations for SMBv3, we need to factor in this overhead. Let's break this down:

1. Overhead for SMBv3

SMBv3 adds protocol headers to each packet. The typical overhead for SMBv3 can range from 60 to 100 bytes per packet depending on the specific implementation, encryption, and other factors. We'll use a conservative estimate of 100 bytes of overhead per packet (this includes SMBv3, TCP, and IP headers).

Thus, the effective payload size of each packet will be reduced from the MTU size of 1470 bytes: Effective Payload=1470 bytes−100 bytes=1370 bytes Effective Payload=1470bytes−100bytes=1370bytes 2. Number of Packets Required (with Overhead)

Now we calculate how many packets are needed to transfer the 100 KB file using this reduced payload size: Number of Packets=File SizeEffective Payload=102,400 bytes1370 bytes/packet≈74.82 packets Number of Packets=Effective PayloadFile Size=1370bytes/packet102,400bytes≈74.82packets

Rounding up, we need 75 packets. 3. SMBv3 Overhead on Transfer Efficiency

SMBv3 also uses pipelining and window scaling to improve efficiency, reducing the need for an RTT for every packet. Let's assume a window size of 10 packets (which is typical for SMBv3 with good pipelining).

For every window, we send 10 packets and wait for 1 RTT for acknowledgment. 4. Total Number of RTTs

Now calculate the number of RTTs based on the window size: Total RTTs=Total PacketsWindow Size=7510=7.5 RTTs Total RTTs=Window SizeTotal Packets=1075=7.5RTTs

Since we can't have a fraction of an RTT, we round up to 8 RTTs. 5. Round-Trip Time (RTT)

We already know the RTT for this link is 40 ms or 0.04 seconds. 6. Total Transmission Time with SMBv3 Overhead

The total transmission time will be: Total Transmission Time=Total RTTs×RTT=8×0.04 seconds=0.32 seconds Total Transmission Time=Total RTTs×RTT=8×0.04seconds=0.32seconds 7.

Additional Overhead and Processing Time

We’ll assume 10% additional time for other processing overheads in SMBv3 (e.g., encryption, decryption, and internal protocol processing).

Thus, the final expected time becomes: Final Expected Time=0.32 seconds×1.10=0.352 seconds Final Expected Time=0.32seconds×1.10=0.352seconds 8. Conclusion

The expected copy duration for a 100 KB file over a 1470-byte MTU, 20 ms delay link, using SMBv3 (with typical overhead) is approximately 0.352 seconds or 352 milliseconds.

This takes into account SMBv3 protocol overhead, pipelining, and processing time.

ETL as a service

- Olabilir
- daha kolay çıkar

Workflow as a service

- me too sorunu
- çok adam / gün
- Olmayan birşey mi
- sürdürülebilir
- yıkıcı mı ?
- çok kanal ve coder çıkıyor.
- https://www.jobrouter.com/en/

Citrix Automated Reporting

Code to create automated citrix acceptance reports

```
import requests
import json
from requests.auth import HTTPBasicAuth

# Citrix VPX credentials and Nitro API endpoint
citrix_vpx_url = 'https://<citrix-vpx-ip>/nitro/v1/config/'
username = '<your-username>'
password = '<your-password>'
auth = HTTPBasicAuth(username, password)

# Disable SSL warnings for self-signed certificates
requests.packages.urllib3.disable_warnings()

# Function to get data from the Nitro API
def get_data_from_vpx(endpoint):
    url = citrix_vpx_url + endpoint
    response = requests.get(url, auth=auth, verify=False)
    if response.status_code == 200:
        return response.json()
    else:
        print(f"Failed to fetch {endpoint}: {response.status_code}")
        return None

# Fetch system-level details
def get_system_report():
    system_info = get_data_from_vpx('nsconfig')
    if system_info:
        ns_ip_address = system_info['nsconfig'][0].get('IPAddress', 'N/A')
        hostname = system_info['nsconfig'][0].get('hostname', 'N/A')
        ha_status = system_info['nsconfig'][0].get('hacurstatus', 'N/A')
        print(f"System IP Address: {ns_ip_address}")
        print(f"Hostname: {hostname}")
        print(f"HA Status: {ha_status}\n")
```

```
# Fetch and classify backend health status for virtual servers, also calculate health score
def get_load_balancer_report():
    lb_vservers = get_data_from_vpx('lbvserver')
    if lb_vservers:
        print(f"Load Balancing Virtual Servers:\n{'-'*30}")

        # Separate servers by health status
        perfect_servers = []
        degraded_servers = []
        down_servers = []

        # Counters for health score calculation
        total_servers = 0
        perfect_count = 0
        degraded_count = 0

        for vserver in lb_vservers['lbvserver']:
            name = vserver.get('name', 'N/A')
            ip = vserver.get('ipv46', 'N/A')
            state = vserver.get('curstate', 'N/A')
            total_servers += 1

            # Fetch backend service health status
            services_bound = get_data_from_vpx(f'lbvserver_service_binding/{name}')
            if services_bound:
                backend_health = {'perfect': True, 'degraded': False}
                for service in services_bound.get('lbvserver_service_binding', []):
                    service_name = service.get('servicename', 'N/A')
                    service_health = get_data_from_vpx(f'service/{service_name}')
                    if service_health:
                        health_status = service_health['service'][0].get('svrstate', 'N/A')
                        if health_status == 'DOWN':
                            backend_health['perfect'] = False
                            backend_health['degraded'] = True
                        elif health_status != 'UP':
                            backend_health['perfect'] = False

                if backend_health['perfect']:
                    perfect_servers.append(f"Name: {name} | IP: {ip} | State: {state}")
                    perfect_count += 1
                elif backend_health['degraded']:
```

```
                    degraded_servers.append(f"Name: {name} | IP: {ip} | State: {state}")
                    degraded_count += 1
                else:
                    down_servers.append(f"Name: {name} | IP: {ip} | State: {state}")
            else:
                down_servers.append(f"Name: {name} | IP: {ip} | State: {state}")

        # Print out categorized servers
        print("Perfect (Green) Servers:\n" + "-" * 30)
        for server in perfect_servers:
            print(server)
        print("\nDegraded (Yellow) Servers:\n" + "-" * 30)
        for server in degraded_servers:
            print(server)
        print("\nDown (Red) Servers:\n" + "-" * 30)
        for server in down_servers:
            print(server)
        print('\n')

        # Calculate overall health score
        total_degraded = degraded_count * 0.5
        total_health_contrib = perfect_count + total_degraded
        overall_health_score = (total_health_contrib / total_servers) * 100 if total_servers >
0 else 0

        print(f"Overall Health Score: {overall_health_score:.2f}%\n")

# Fetch SSL certificate details, including expiration dates
def get_ssl_report():
    ssl_certificates = get_data_from_vpx('sslcertkey')
    if ssl_certificates:
        print(f"SSL Certificates:\n{'-'*30}")
        for cert in ssl_certificates['sslcertkey']:
            cert_name = cert.get('certkey', 'N/A')
            cert_alias = cert.get('cert', 'N/A')
            exp_date = cert.get('expirymonitor', 'N/A')  # This field might vary depending on
your Citrix version
            print(f"Cert Name: {cert_name} | Alias: {cert_alias} | Expiry Date: {exp_date}")
        print('\n')

# Fetch high availability details
```

```
def get_ha_report():
    ha_status = get_data_from_vpx('hanode')
    if ha_status:
        print(f"High Availability Details:\n{'-'*30}")
        for node in ha_status['hanode']:
            node_id = node.get('id', 'N/A')
            node_state = node.get('state', 'N/A')
            print(f"Node ID: {node_id} | State: {node_state}")
        print('\n')

# Main function to generate the report
def generate_report():
    print("Citrix VPX High-Level Report\n")
    get_system_report()
    get_load_balancer_report()
    get_ssl_report()
    get_ha_report()

if __name__ == '__main__':
    generate_report()
```

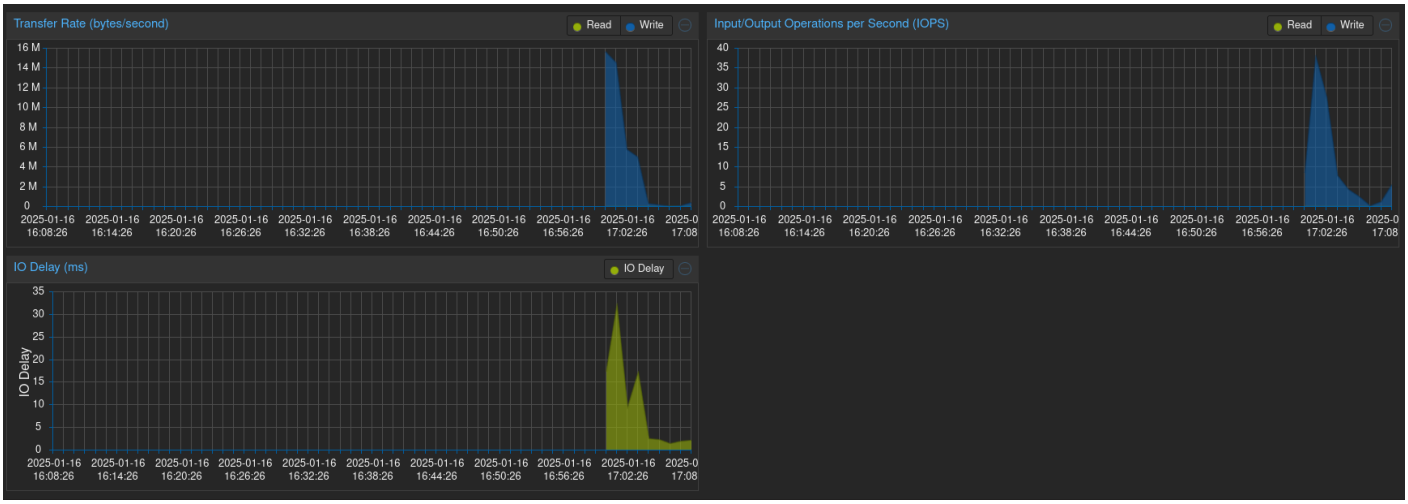
PBS Tests

Baseline

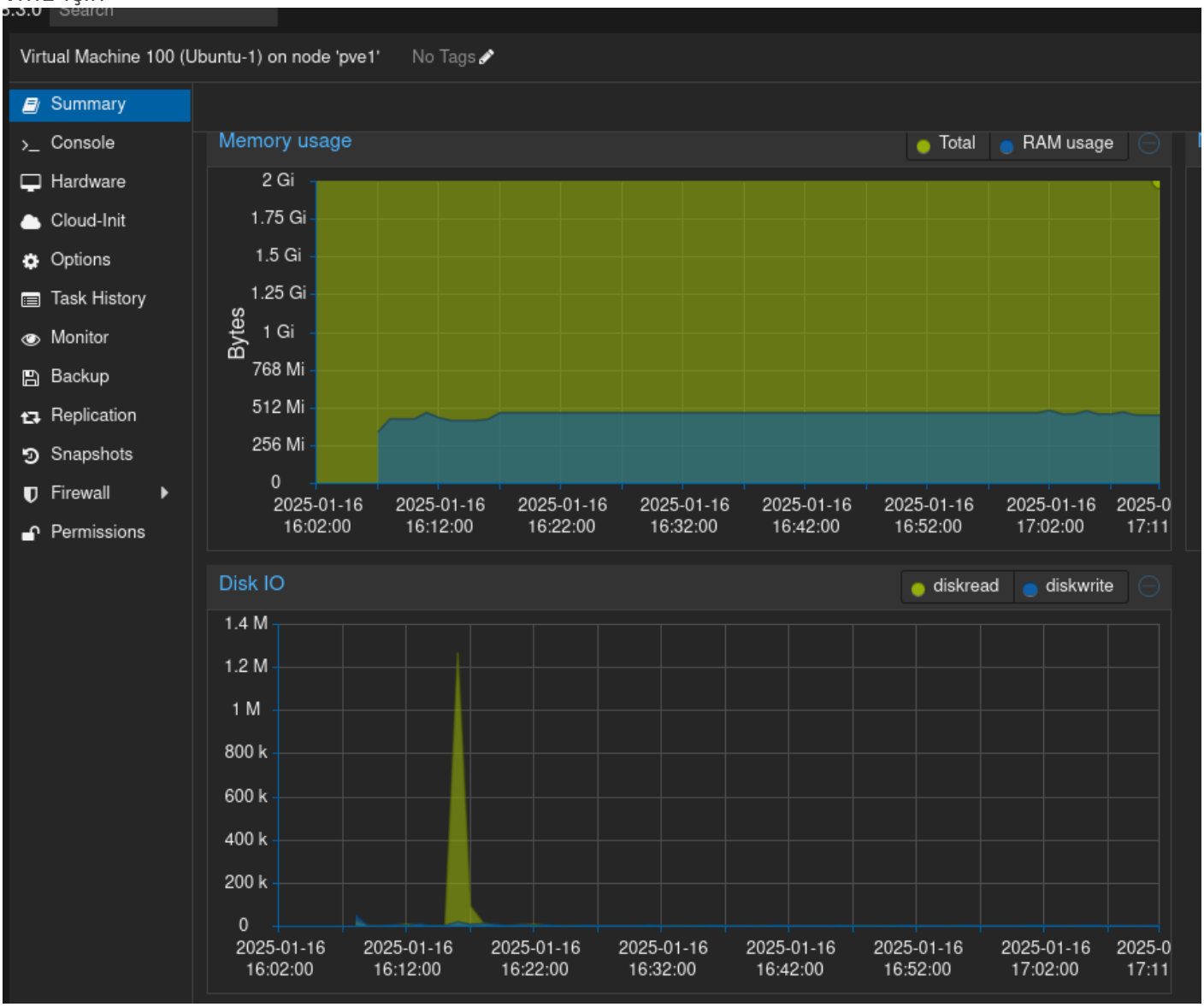
- PBS vm olarak ikinci hostta tek başına
- 300G backup lun PBS'e /backups foldera ext4 olarak mount
- pve1 den 3 adet 50g ubuntu aldık
- 3 test yaptık
- son iki testte storage cache olduğunu tahmin ettiğimiz için ilk hiti göremedik.

Delay

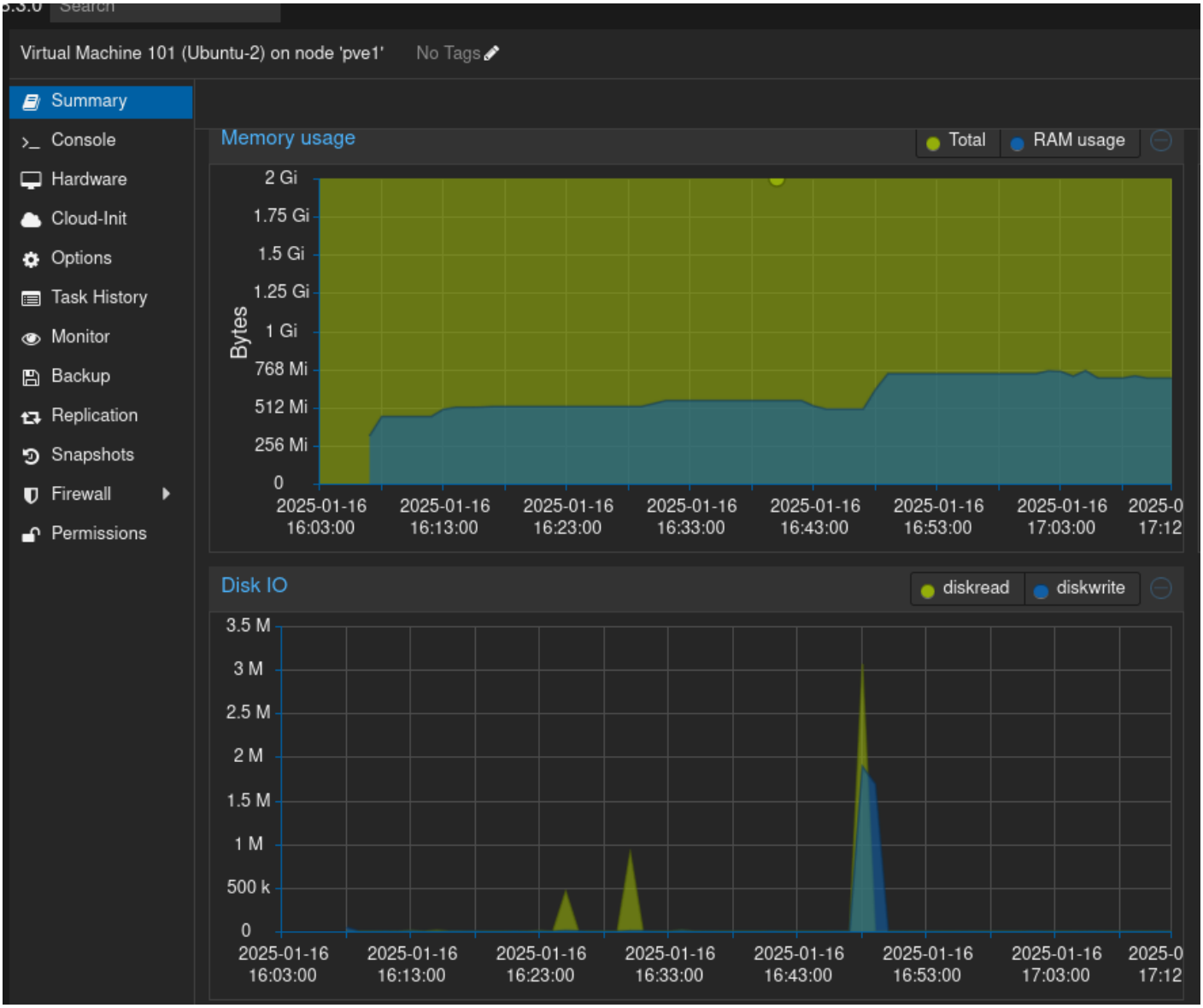
Data aşağıkdaki gibi



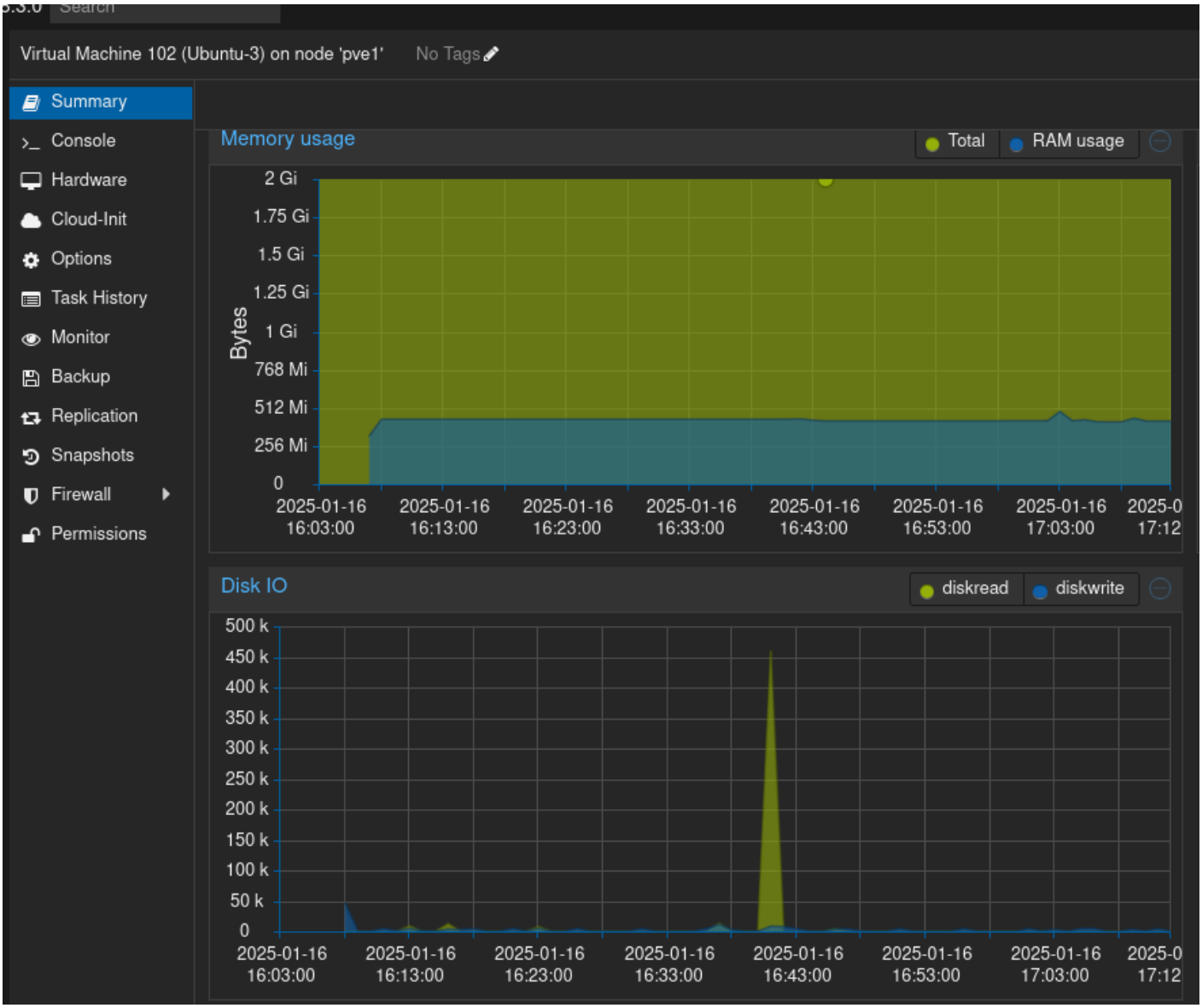
vm1 için



vm2 için


Virtual Machine 101 (Ubuntu-2) on node 'pve1'
No Tags
Summary
Console
Hardware
Cloud-Init
Options
Task History
Monitor
Backup
Replication
Snapshots
Firewall
Permissions
Memory usage
Total
RAM usage
2 Gi
1.75 Gi
1.5 Gi
1.25 Gi
1 Gi
768 Mi
512 Mi
256 Mi
0
Bytes
2025-01-16 16:03:00
2025-01-16 16:13:00
2025-01-16 16:23:00
2025-01-16 16:33:00
2025-01-16 16:43:00
2025-01-16 16:53:00
2025-01-16 17:03:00
Disk IO
diskread
diskwrite
3.5 M
3 M
2.5 M
2 M
1.5 M
1 M
500 k
0

vm3 için



Hammerdb çal???rken

NE assesement

Layer	Question	Best Answer	Explanation
1 - Physical	What are the differences between single-mode and multi-mode fiber in terms of distance and bandwidth?	**Single-mode fiber (SMF)** supports longer distances (up to 40 km) using a small core and a laser light source, while **multi-mode fiber (MMF)** is limited to shorter distances (typically up to 550m) using an LED light source.	SMF is preferred for long-haul and metro networks, whereas MMF is used in short-range applications like data centers.
1 - Physical	How does signal attenuation affect network performance, and how can you mitigate it in fiber and copper cabling?	Signal attenuation weakens signals over distance. In **copper**, use repeaters or shorter cables. In **fiber**, use higher-quality optics and proper splicing.	Attenuation leads to packet loss and slower speeds; fiber is less prone to interference than copper.
2 - Data Link	What is the difference between VLANs and VXLANs, and how do they impact network segmentation?	VLANs segment Layer 2 traffic within a local network, while VXLANs extend Layer 2 segments over Layer 3 using encapsulation (UDP port 4789).	VXLANs allow scalability beyond traditional VLANs (4094 limit) and support multi-tenant cloud environments.
2 - Data Link	Explain how Spanning Tree Protocol (STP) prevents network loops and describe one alternative protocol that can replace STP.	STP detects and disables redundant links to prevent loops, using a root bridge election. **Alternative: RSTP (Rapid STP)** provides faster convergence, or **TRILL/SPB** eliminates the need for STP by using shortest-path forwarding.	Without STP, broadcast storms can cripple networks. Modern alternatives improve convergence and efficiency.
3 - Network	How does BGP determine the best route to a destination, and what factors can influence its decision?	BGP selects the best path using attributes like AS-Path (shortest route wins), Local Preference (higher is better), MED (lower is preferred), and Next-Hop reachability.	BGP is a path-vector protocol used for inter-domain routing and is critical for internet and ISP-level routing.

Layer	Question	Best Answer	Explanation
3 - Network	Explain the difference between NAT, PAT, and how they impact IPv4 addressing in a corporate environment.	**NAT (Network Address Translation)** maps private IPs to a public IP; **PAT (Port Address Translation)** allows multiple private IPs to share one public IP using port numbers.	PAT is widely used in enterprises to conserve public IPs, enabling many devices to access the internet using a single IP.
4 - Transport	Compare and contrast TCP and UDP. In what scenarios would you choose one over the other?	**TCP** is reliable (error checking, retransmissions) and used for HTTP, SSH, etc. **UDP** is faster but unreliable, used for VoIP, DNS, and video streaming.	TCP is preferred for critical applications, while UDP is used when low latency is required.
4 - Transport	Explain the significance of the TCP three-way handshake and how it impacts security vulnerabilities such as SYN floods.	The handshake (SYN → SYN-ACK → ACK) establishes a connection. **SYN flood attacks** exploit this by sending repeated SYNs without completing the handshake.	Firewalls and SYN cookies can help mitigate SYN flood attacks by preventing resource exhaustion.
5 - Session	How does SSL/TLS establish a secure session between a client and a server?	It uses asymmetric encryption for key exchange (handshake) and symmetric encryption for data transfer (AES, ChaCha20).	TLS ensures confidentiality, integrity, and authentication using certificates (X.509).
5 - Session	What is the role of session persistence (sticky sessions) in load balancing, and how does it affect performance?	It ensures requests from the same client go to the same backend server, improving user experience.	While helpful for stateful applications, it can cause uneven load distribution if not managed properly.
6 - Presentation	How do encryption and compression impact network performance at the presentation layer?	Encryption secures data but increases CPU usage. Compression reduces data size, improving transmission speeds.	Balancing security (encryption) and efficiency (compression) is key in optimizing network performance.
6 - Presentation	Explain the difference between Base64 encoding and actual encryption. In what scenarios would you use each?	**Base64** encodes data for safe transport but is reversible. **Encryption (AES, RSA, etc.)** secures data by making it unreadable without a key.	Use Base64 for data encoding (e.g., email attachments). Use encryption for security (e.g., passwords, confidential data).
7 - Application	What are the differences between HTTP/1.1, HTTP/2, and HTTP/3 in terms of performance and security?	HTTP/1.1 uses sequential requests; HTTP/2 introduces multiplexing and header compression; HTTP/3 uses QUIC for lower latency and better security.	HTTP/3 improves web performance by reducing round-trip delays and mitigating TCP head-of-line blocking.

Layer	Question	Best Answer	Explanation
7 - Application	How does DNS caching work, and what are the security risks associated with DNS cache poisoning?	DNS caching stores query results locally to speed up lookups. **Cache poisoning** injects malicious IP mappings into caches, redirecting users to fraudulent sites.	Mitigations include **DNSSEC** (signing records) and validating responses to prevent tampering.
7 - Application	What is the role of an API gateway in modern cloud networking, and how does it impact microservices architectures?	It manages API traffic, enforcing authentication, rate limiting, and load balancing for microservices.	API gateways help decouple services, improve security, and enable scalable architectures.

System Requirements Specification (SRS)

Project: Layer 2 Data Center Extender (L2 DCE)

Version: 1.0
Date: 29/04/2025
Author: Mesut Bayrak

---

1. Introduction

1.1 Purpose

Describe the purpose of the L2 DCE system (e.g., extend VLANs across data centers with low latency).

1.2 Scope

Define what the L2 DCE will and will not do.

1.3 Definitions, Acronyms, and Abbreviations

- **L2 DCE** – Layer 2 Data Center Extender
- **VXLAN** – Virtual Extensible LAN
- **DC** – Data Center
- **BGP EVPN** – Border Gateway Protocol Ethernet VPN
- **MAC** – Media Access Control

1.4 References

List applicable RFCs, whitepapers, standards.

1.5 Overview

Brief description of document structure.

---

2. Overall Description

Main purpose of the device is to provide a transparent Layer-2 connectivity between two separate sites.

2.1 Product Perspective

Device can have two distinct operational units to be located in two sites. One central unit (an aggragator), and one (or more) remote site unit(s).

Central unit is intended to be located in a data-center facility with proper power and cooling.

Remote side units are intended to be located inside out-of-reach facilities, via some rental or sale agreement.

Describe how L2 DCE fits into the current system (optional: diagram).

2.2 Product Functions

Function Definition:

- Device will be Ethernet (802.3) based only.
- Extend Layer 2 VLANs transparently between two sites which has only IPv4 connectivity in between.
- The data transfer in between the two sites must be encrypted.
- Device will have two deterministic functional zones: WAN side (where the connection between sites are) and LAN side (where the VLANs to be carried over will be defined).
- Device will not learn and/or filter any Ethernet MAC addresses on either side.
- Device will not interfere, or contribute to any loop prevention algorithms (like spanning tree, SLPP, etc) so that it will not require any extra configuration on any connected devices. Any measures of loop prevention will be handled outside of the device context.
- Device must provide a mechanism for high availability. HA of ports on each side, HA of particular hardware conponents like power supplies, HA of the device itself will be described further as addendum
- Device must be able to perform VLAN number translation, at least on the central site.
- Device will have no OSI Layer-3 interaction with the transferred VLANs (example: Device will have no ip addresses and will not need an IP address on the transferred VLANs).
- If WAN side has Jumbo frames available, system should allow for higher MTU on LAN side. For regular (1500bytes) MTU on WAN side, LAN side will be restricted with …. bytes MTU

size (will be decided based on encap method selected)

Operational Definition:

- Deivce must have a Lights-Out Management facility in case it loses all configuration, or not able to boot.
- Configuration of Central unit can be done using a menu based script or GUI
- Basic connectivity configuration (ip address, subnet mask, defgw, dns server) of remote site unit can be done by a menu based script (startup/and or runnable bash script).
- Main configuration of remote site will be downloaded from central site once connectivity is established.
- Remote site device must be able to be altered in configuration, and able to be rebooted from the central side.

2.3 User Characteristics

- Two types of users: System administrators and consumers.
- Sys Admins are network engineers familiar with Layer 2/3 concepts.
- Consumer has no access to the device, or maybe max read-only

2.4 Constraints

- Jumbo frame support required.
- Latency and failover constraints.

2.5 Assumptions and Dependencies

- MPLS/IP backbone in place.
- Network hardware supports VXLAN, EVPN, ECMP.

---

3. Specific Requirements

3.1 Functional Requirements

ID	Requirement	Description
FR-1	VLAN Extension	Extend VLANs 1–4094.
FR-3	Control Plane	Use BGP EVPN or similar.
FR-4	Failover	To be defined in future
FR-5	MTU Handling	Minimum MTU 9100 bytes.

3.2 Non-Functional Requirements

ID	Requirement	Description
NFR-1	Availability	99.99% uptime.
NFR-3	Performance	Latency increase < 2ms one-way.

---

4. Interface Requirements

4.1 Hardware Interfaces

- Ethernet interfaces (1G, 10G, 25G, 40G, 100G).
- VXLAN Tunnel Endpoints (VTEPs).

4.2 Software Interfaces

- Standard Linux network stack compatibility.

4.3 Communication Interfaces

- VXLAN over UDP.

---

5. Performance Requirements

- Max bandwidth: [e.g., 40 Gbps per VTEP].
- Max link utilization: 80%.

---

6. Security Requirements

- Optional IPsec/MACsec encryption.

---

7. Other Requirements

- Appliance power limits (e.g., <300W).

---

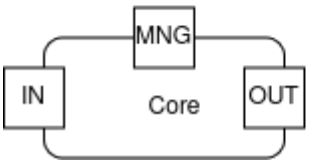
8. Appendix

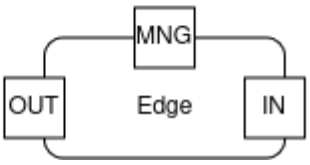
- Network diagrams.
- Failover flowcharts.
- Supported hardware/software matrix.

extender Daemon



Device properties





Reset usb and enable bluetooth

on a sudo shel

```
#sudo -i
#echo -n "0000:00:14.0" | sudo tee /sys/bus/pci/drivers/xhci_hcd/unbind
#sleep 2
#echo -n "0000:00:14.0" | sudo tee /sys/bus/pci/drivers/xhci_hcd/bind
```

it will reset usb hub and the usb bluetooth device will be re-enabled

Cisco Router Automation with Ansible

This repository contains Ansible playbooks and roles for automating VPN tunnel and direct link configurations on Cisco IOS routers across multiple datacenters (EQX, KKB) and AWS connections.

? Table of Contents

- Architecture Overview
- Prerequisites
- Quick Start
- Deployment Commands
- Network Topology
- Configuration Structure
- Troubleshooting

?? Architecture Overview

Datacenter Infrastructure

- **EQX Datacenter**: 2 routers (master/slave) running BGP AS 65401/65402
- **KKB Datacenter**: 2 routers (master/slave) running BGP AS 65501/65502
- **AWS Integration**: Direct Connect and IPsec VPN connections
- **Fortigate Firewalls**: Local firewalls at each datacenter for traffic filtering

Link Types

1. **IPsec VPN Tunnels**: Encrypted tunnels between datacenters and to AWS
2. **DWDM Direct Links**: High-speed fiber optic connections between EQX and KKB
3. **AWS Direct Connect**: Dedicated connections to AWS via IST and FR POPs
4. **Fortigate Links**: BGP peering with local firewalls

? Prerequisites

```
# Python environment (recommended: pyenv + virtualenv)
pyenv virtualenv 3.x routers
pyenv activate routers

# Install Ansible
pip install ansible

# Install required collections (if any)
ansible-galaxy collection install ansible.netcommon
```

? Quick Start

1. Clone and Setup

```
cd /path/to/cisco-automation-ansible
pyenv activate routers  # or your Python environment
```

2. Verify Inventory

```
# List all routers
ansible -i hosts.ini all_routers --list-hosts

# Test connectivity (dry-run)
ansible -i hosts.ini all_routers -m debug -a 'var=links' --connection=local
```

3. Deploy a Link

```
# Deploy specific link to a router
ansible-playbook -i hosts.ini deploy_tunnel.yml \
  --limit eqx-master \
  --extra-vars "link_name=TO-KKB-IPSEC-1"
```

? Deployment Commands by Router

? eqx-master (EQX Master - AS 65401)

```
# Inter-Datacenter Links
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-master --extra-vars "link_name=TO-KKB-IPSEC-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-master --extra-vars "link_name=TO-KKB-DWDM-1"

# Local Firewall
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-master --extra-vars "link_name=TO-FW-FORTI-1"

# AWS Links
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-master --extra-vars "link_name=TO-AWS-PROD-IPSEC-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-master --extra-vars "link_name=TO-AWS-PROD-IPSEC-2"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-master --extra-vars "link_name=TO-AWS-PROD-IST-DCON-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-master --extra-vars "link_name=TO-AWS-PROD-FR-DCON-2"
```

View as table

Link Name	Type	Destination	Description
TO-KKB-IPSEC-1	IPsec VPN	KKB Datacenter	Primary backup tunnel to KKB (prepend 2)
TO-KKB-DWDM-1	Direct/DWDM	KKB Datacenter	High-speed fiber to KKB (primary)
TO-FW-FORTI-1	Direct/BGP	Local Firewall	AS 65001, receives KKB+AWS, distributes EQX
TO-AWS-PROD-IPSEC-1	IPsec VPN	AWS	Primary backup to AWS (prepend 3)
TO-AWS-PROD-IPSEC-2	IPsec VPN	AWS	Secondary backup to AWS (prepend 4)
TO-AWS-PROD-IST-DCON-1	Direct Connect	AWS Istanbul	Direct Connect via Istanbul POP (prepend 1)
TO-AWS-PROD-FR-DCON-2	Direct Connect	AWS Frankfurt	Direct Connect via Frankfurt POP (prepend 2)

? eqx-slave (EQX Slave - AS 65402)

```
# Inter-Datacenter Links
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-slave --extra-vars "link_name=TO-KKB-IPSEC-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-slave --extra-vars "link_name=TO-KKB-DWDM-1"

# Local Firewall
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-slave --extra-vars "link_name=TO-FW-FORTI-1"

# AWS Links
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-slave --extra-vars "link_name=TO-AWS-PROD-IPSEC-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-slave --extra-vars "link_name=TO-AWS-PROD-IPSEC-2"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-slave --extra-vars "link_name=TO-AWS-PROD-IST-DCON-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-slave --extra-vars "link_name=TO-AWS-PROD-FR-DCON-2"
```

View as table

Link Name	Type	Destination	Description
TO-KKB-IPSEC-1	IPsec VPN	KKB Datacenter	Backup tunnel to KKB (prepend 3)
TO-KKB-DWDM-1	Direct/DWDM	KKB Datacenter	High-speed fiber to KKB (primary)
TO-FW-FORTI-1	Direct/BGP	Local Firewall	AS 65001, receives KKB+AWS, distributes EQX
TO-AWS-PROD-IPSEC-1	IPsec VPN	AWS	Primary backup to AWS (prepend 3)
TO-AWS-PROD-IPSEC-2	IPsec VPN	AWS	Secondary backup to AWS (prepend 4)
TO-AWS-PROD-IST-DCON-1	Direct Connect	AWS Istanbul	Direct Connect via Istanbul POP (prepend 1)
TO-AWS-PROD-FR-DCON-2	Direct Connect	AWS Frankfurt	Direct Connect via Frankfurt POP (prepend 2)

? kkb-master (KKB Master - AS 65501)

```
# Inter-Datacenter Links
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-master --extra-vars "link_name=TO-EQX-IPSEC-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-master --extra-vars "link_name=TO-EQX-DWDM-1"

# Local Firewall
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-master --extra-vars "link_name=TO-FW-FORTI-1"

# AWS Links
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-master --extra-vars "link_name=TO-AWS-PROD-IPSEC-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-master --extra-vars "link_name=TO-AWS-PROD-IPSEC-2"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-master --extra-vars "link_name=TO-AWS-PROD-IST-DCON-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-master --extra-vars "link_name=TO-AWS-PROD-FR-DCON-2"
```

View as table

Link Name	Type	Destination	Description
TO-EQX-IPSEC-1	IPsec VPN	EQX Datacenter	Primary backup tunnel to EQX (prepend 2)
TO-EQX-DWDM-1	Direct/DWDM	EQX Datacenter	High-speed fiber to EQX (primary)
TO-FW-FORTI-1	Direct/BGP	Local Firewall	AS 65000, receives EQX+AWS, distributes KKB
TO-AWS-PROD-IPSEC-1	IPsec VPN	AWS	Primary backup to AWS (prepend 3)
TO-AWS-PROD-IPSEC-2	IPsec VPN	AWS	Secondary backup to AWS (prepend 4)
TO-AWS-PROD-IST-DCON-1	Direct Connect	AWS Istanbul	Direct Connect via Istanbul POP (prepend 1)
TO-AWS-PROD-FR-DCON-2	Direct Connect	AWS Frankfurt	Direct Connect via Frankfurt POP (prepend 2)

? kkb-slave (KKB Slave - AS 65502)

```
# Inter-Datacenter Links
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-slave --extra-vars "link_name=TO-EQX-IPSEC-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-slave --extra-vars "link_name=TO-EQX-DWDM-1"

# Local Firewall
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-slave --extra-vars "link_name=TO-FW-FORTI-1"

# AWS Links
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-slave --extra-vars "link_name=TO-AWS-PROD-IPSEC-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-slave --extra-vars "link_name=TO-AWS-PROD-IPSEC-2"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-slave --extra-vars "link_name=TO-AWS-PROD-IST-DCON-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit kkb-slave --extra-vars "link_name=TO-AWS-PROD-FR-DCON-2"
```

View as table

Link Name	Type	Destination	Description
TO-EQX-IPSEC-1	IPsec VPN	EQX Datacenter	Backup tunnel to EQX (prepend 3)
TO-EQX-DWDM-1	Direct/DWDM	EQX Datacenter	High-speed fiber to EQX (primary)
TO-FW-FORTI-1	Direct/BGP	Local Firewall	AS 65000, receives EQX+AWS, distributes KKB
TO-AWS-PROD-IPSEC-1	IPsec VPN	AWS	Primary backup to AWS (prepend 3)
TO-AWS-PROD-IPSEC-2	IPsec VPN	AWS	Secondary backup to AWS (prepend 4)
TO-AWS-PROD-IST-DCON-1	Direct Connect	AWS Istanbul	Direct Connect via Istanbul POP (prepend 1)
TO-AWS-PROD-FR-DCON-2	Direct Connect	AWS Frankfurt	Direct Connect via Frankfurt POP (prepend 2)

? Development Routers

dev-eqx-master

```
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit dev-eqx-master --extra-vars
"link_name=TO-KKB-IPSEC-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit dev-eqx-master --extra-vars
"link_name=TO-KKB-DWDM-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit dev-eqx-master --extra-vars
"link_name=TO-FW-FORTI-1"
```

dev-eqx-slave

```
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit dev-eqx-slave --extra-vars
"link_name=TO-KKB-IPSEC-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit dev-eqx-slave --extra-vars
"link_name=TO-KKB-DWDM-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit dev-eqx-slave --extra-vars
"link_name=TO-FW-FORTI-1"
```

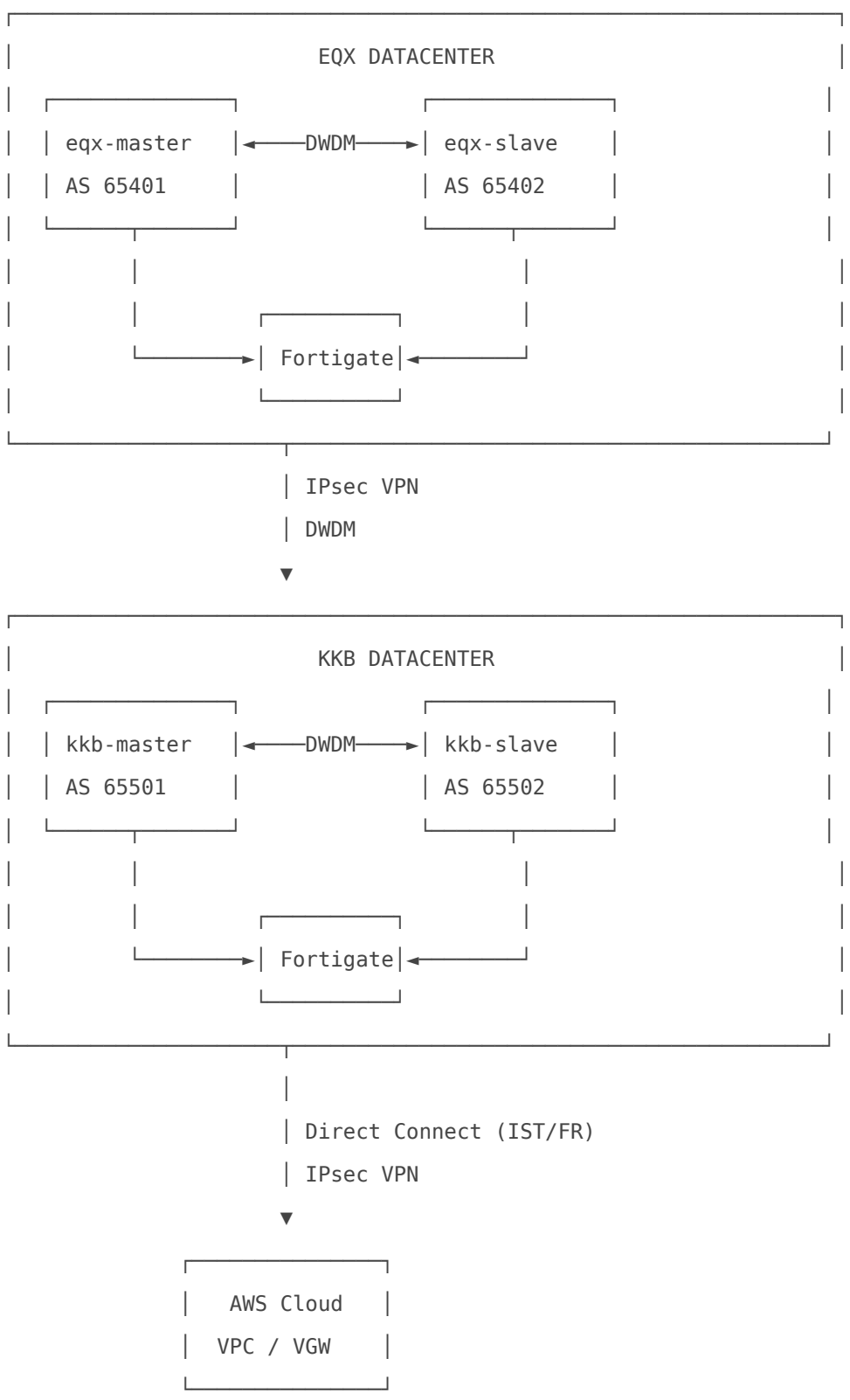
dev-kkb-master

```
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit dev-kkb-master --extra-vars
"link_name=TO-EQX-IPSEC-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit dev-kkb-master --extra-vars
"link_name=TO-EQX-DWDM-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit dev-kkb-master --extra-vars
"link_name=TO-FW-FORTI-1"
```

dev-kkb-slave

```
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit dev-kkb-slave --extra-vars
"link_name=TO-EQX-IPSEC-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit dev-kkb-slave --extra-vars
"link_name=TO-EQX-DWDM-1"
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit dev-kkb-slave --extra-vars
"link_name=TO-FW-FORTI-1"
```

? Network Topology



? Configuration Structure

```
cisco-automation-ansible/
├── ansible.cfg                # Ansible configuration
├── hosts.ini                  # Inventory file with all routers
```

```
├── deploy_tunnel.yml           # Main playbook
├── group_vars/
│   ├── all.yml                # Shared network lists (centralized)
│   ├── eqx_masters.yml        # EQX master router link configs
│   ├── eqx_slaves.yml         # EQX slave router link configs
│   ├── kkb_masters.yml        # KKB master router link configs
│   └── kkb_slaves.yml         # KKB slave router link configs
├── host_vars/
│   ├── eqx-master.yml         # Per-host variables (prod)
│   ├── eqx-slave.yml
│   ├── kkb-master.yml
│   ├── kkb-slave.yml
│   ├── dev-eqx-master.yml     # Per-host variables (dev)
│   ├── dev-eqx-slave.yml
│   ├── dev-kkb-master.yml
│   └── dev-kkb-slave.yml
└── roles/
    └── vpn_tunnel/
        └── tasks/
            ├── main.yml       # Entry point with link selection
            ├── ipsec.yml      # IPsec tunnel configuration
            ├── bgp.yml        # BGP neighbor & routing config
            └── interface.yml  # Interface configuration
```

Centralized Network Configuration

All network prefixes are defined once in `group_vars/all.yml`:

- **eqx_receive_networks / eqx_distribute_networks**: 18 EQX datacenter networks
- **kkb_distribute_networks**: 13 KKB datacenter networks
- **aws_receive_networks**: AWS VPC networks (172.16.110.0/24)
- **aws_distribute_networks**: Networks announced to AWS
- **forti_receive_in_eqx / forti_distribute_in_eqx**: Combined networks for EQX Fortigate
- **forti_receive_in_kkb / forti_distribute_in_kkb**: Combined networks for KKB Fortigate

This DRY (Don't Repeat Yourself) approach ensures consistency and easier maintenance.

? Advanced Usage

Deploy Multiple Links

```
# Deploy all links on a router (use with caution!)
ansible-playbook -i hosts.ini deploy_tunnel.yml --limit eqx-master
```

Deploy to Multiple Routers

```
# Deploy same link to all EQX routers
ansible-playbook -i hosts.ini deploy_tunnel.yml \
  --limit eqx_masters \
  --extra-vars "link_name=TO-KKB-IPSEC-1"

# Deploy to both datacenters
ansible-playbook -i hosts.ini deploy_tunnel.yml \
  --limit "eqx-master,kkb-master" \
  --extra-vars "link_name=TO-FW-FORTI-1"
```

Dry-Run / Check Mode

```
# Test without making changes
ansible-playbook -i hosts.ini deploy_tunnel.yml \
  --limit eqx-master \
  --extra-vars "link_name=TO-KKB-IPSEC-1" \
  --check
```

Selective Configuration

Links support per-component deployment flags:

```
configure:
  bgp: true        # Deploy BGP configuration
  ipsec: true      # Deploy IPsec configuration
  interface: true  # Deploy interface configuration
```

To skip specific components, set them to `false` in the link definition.

? Troubleshooting

Common Issues

Issue: "link_name is not defined"

```
# Solution: Always specify link_name
ansible-playbook -i hosts.ini deploy_tunnel.yml \
  --limit eqx-master \
  --extra-vars "link_name=TO-KKB-IPSEC-1"
```

Issue: "Unable to connect to router"

```
# Check SSH connectivity
ansible -i hosts.ini eqx-master -m ping

# Verify credentials in group_vars/all.yml
ansible_user: admin
ansible_password: admin
```

Issue: "Jinja2 template error"

```
# Validate configuration syntax
ansible -i hosts.ini eqx-master -m debug -a 'var=links' --connection=local
```

Debug Commands

```
# List all configured links for a router
ansible -i hosts.ini eqx-master -m debug -a 'var=links' --connection=local

# Check specific link configuration
ansible -i hosts.ini eqx-master -m debug \
  -a 'var=links[0]' \
  --connection=local

# Verify network lists
ansible -i hosts.ini eqx-master -m debug \
  -a 'var=eqx_receive_networks' \
  --connection=local
```

Validation

```
# Validate all routers can render their configurations
ansible -i hosts.ini all_routers -m debug \
  -a 'var=links[0].name' \
  --connection=local | grep SUCCESS
```

? Best Practices

1. **Always test in dev environment first**: Use dev routers before deploying to production
2. **Deploy one link at a time**: Easier to troubleshoot and rollback
3. **Use version control**: Commit changes before deploying to production
4. **Document changes**: Update this README when adding new links or routers
5. **Backup configurations**: Save router configs before making changes
6. **Monitor BGP sessions**: Verify BGP neighbors come up after deployment

? Security Notes

- Credentials are stored in `group_vars/all.yml` - ensure proper file permissions (600)
- Consider using Ansible Vault for sensitive data:

  ```
  ansible-vault encrypt group_vars/all.yml
  ```

- IPsec pre-shared keys should be rotated regularly
- Limit SSH access to Ansible control node only

? BGP AS Numbers

Router	AS Number	Role
eqx-master	65401	EQX Primary
eqx-slave	65402	EQX Secondary
kkb-master	65501	KKB Primary
kkb-slave	65502	KKB Secondary
Fortigate (EQX)	65001	EQX Firewall
Fortigate (KKB)	65000	KKB Firewall

? Additional Resources

- Ansible Network Automation Guide
- Cisco IOS Configuration Guide
- BGP Best Practices

? License

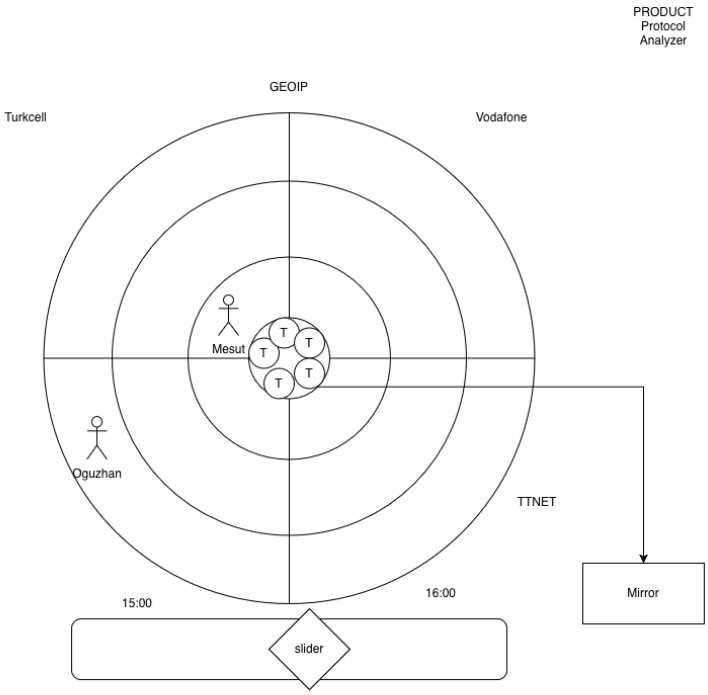
Internal use only - Proprietary

? Support

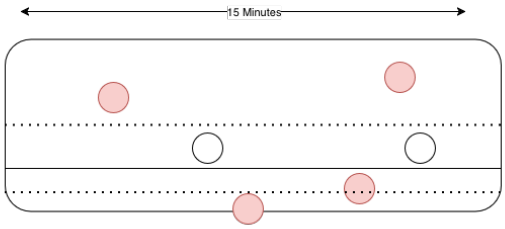
For issues or questions, contact the Network Operations team.

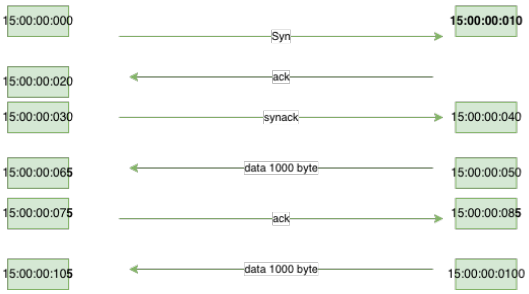
Last Updated: October 2025

Proto Analyzer



flow mesut : ortalama ack = 10ms, 10 dk ac ortalama 1000 ms, 5 dk ack ortalama 4000 ms
flow oguzhane :15:00 ortalama ack = 5ms, 10 dk ac ortalama 250 ms, 5 dk ack ortalama 4000 ms
15:01 ortalama ack = 7ms, 10 dk ac ortalama 350 ms, 5 dk ack ortalama 1000 ms



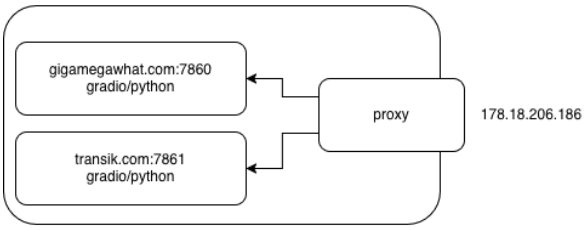


pipes

#	Pipe (Growth Channel)	Market Demand	Profitability	Ease of Execution	Strategic Value	Score (/10)	Why It Matters
1	**Cybersecurity-as-a-Service (MDR, SOC-lite, ZTNA, EDR)**	10	9	6	10	**8.8**	Exploding demand due to KVKK, cyber insurance, ransomware; Turkish SMBs lack in-house security.
2	**Cloud Migration & CloudOps (AWS, GCP, Azure, Turkcell/DC providers)**	9	8	7	9	**8.5**	High cloud adoption wave; companies need hybrid/multi-cloud.
3	**Network Modernization & NaaS (SD-WAN, Wi-Fi 6/6E, SASE)**	9	8	6	9	**8.2**	SD-WAN & secure access demand increasing with remote work + branch connectivity.
4	**Managed Compliance + Audit-readiness (KVKK, ISO 27001, PCI DSS)**	8	9	7	8	**8.0**	SMEs need compliance but lack expertise; high-margin advisory + recurring managed security.

#	Pipe (Growth Channel)	Market Demand	Profitability	Ease of Execution	Strategic Value	Score (/10)	Why It Matters
5	**Automation & AI Ops (RPA, Infra Automation, AIOps for SMEs)**	7	9	6	9	**7.9**	Turkey’s labor costs rising; automation reduces OPEX, big appeal for mid-market.
6	**Managed IT + Helpdesk (Enterprise-grade for SME market)**	8	7	8	7	**7.8**	Core MSP offering; still in demand; differentiates on SLAs & automation.
7	**Backup/DRaaS (Cross-datacenter, Azure/Turkcell/Vodafone DR)**	8	8	7	6	**7.6**	Earthquake risk & new regulations increase DR demand.
8	**Industry-Specific Solutions (Health, Retail, Manufacturing verticals)**	7	8	6	8	**7.4**	Tailored MSP bundles sell well in Turkish vertical markets.
9	**IoT & Edge Management (Factories, energy, logistics)**	6	8	5	9	**7.2**	Slow growth but high ROI in industrial zones; strong fit for advanced MSPs.
10	**MSP Co-managed IT (augment internal IT teams)**	6	7	9	7	**7.1**	Turkish enterprises keep small IT teams; co-managed fills skill gaps.

Mercan?n projeleri






```
# /etc/nginx/sites-available/gigamegawhat.com
server {
    listen 80;
    server_name gigamegawhat.com www.gigamegawhat.com;

    # Redirect all HTTP requests to HTTPS
    return 301 https://$host$request_uri;
}

server {
    listen 443 ssl http2;
    server_name gigamegawhat.com www.gigamegawhat.com;

    # SSL configuration
    ssl_certificate /etc/letsencrypt/live/gigamegawhat.com/fullchain.pem;
    ssl_certificate_key /etc/letsencrypt/live/gigamegawhat.com/privkey.pem;
    ssl_protocols TLSv1.2 TLSv1.3;
    ssl_ciphers HIGH:!aNULL:!MD5;

    # Proxy settings
    location / {
        proxy_pass http://127.0.0.1:7860;
        proxy_set_header Host $host;
        proxy_set_header X-Real-IP $remote_addr;
        proxy_set_header X-Forwarded-For $proxy_add_x_forwarded_for;
        proxy_set_header X-Forwarded-Proto $scheme;

        # Optional WebSocket support
        proxy_http_version 1.1;
        proxy_set_header Upgrade $http_upgrade;
        proxy_set_header Connection $http_connection;
    }

    # Optional: increase buffer sizes for larger responses
    proxy_buffers 16 16k;
    proxy_buffer_size 32k;
}
```