Optimize AnyConnect Split Tunnel for Microsoft Office 365/Webex

Contents

Introduction

This document describes how to configure an ASA with settings to exclude traffic destined to Microsoft Office 365 (Microsoft Teams) and Cisco Webex from VPN connection.

Background Information

Configuring Adaptive Security Appliance (ASA) also incorporates network address exclusions and dynamic fully qualified domain name (FQDN) based exclusions for AnyConnect clients that support it.

Split Tunneling

The ASA needs to be configured to exclude the specified list of IPv4 and IPv6 destinations to be excluded from the tunnel. Unfortunately, the list of addresses is dynamic and could potentially change. See the Configuration section for a python script, and a link to an online python readâ€“evalâ€“print loop (REPL) that can be used to retrieve the list and generate a sample configuration.

Dynamic Split Tunneling

In addition to the split exclude network address list, dynamic split tunneling was added in AnyConnect 4.6 for Windows and Mac. Dynamic split tunneling uses the FQDN in order to determine whether or not the connection can go over the tunnel. The python script also determines the FQDNs of the endpoints to add to the custom AnyConnect attributes.

Configuration

Either run this script in a Python 3 REPL, or run it in a public REPL environment such as [AnyConnectO365DynamicExclude](#)

```
import urllib.request
import uuid
import json
import re
```

```
def print_acl_lines(acl_name, ips, section_comment):
    slash_to_mask = (
        "0.0.0.0",
        "192.0.2.1",
        "192.0.2.1",
        "10.224.0.0",
        "10.240.0.0",
        "10.248.0.0",
        "10.252.0.0",
        "10.254.0.0",
        "10.255.0.0",
        "10.255.128.0",
        "10.255.192.0",
        "10.255.224.0",
        "10.255.240.0",
        "10.255.248.0",
        "10.255.252.0",
        "10.255.254.0",
        "10.255.255.0",
        "10.255.255.128",
        "10.255.255.192",
        "10.255.255.224",
        "10.255.255.240",
        "10.255.255.248",
        "10.255.255.252",
        "10.255.255.254",
        "10.255.255.255",
        "10.255.255.255",
        "10.255.255.255",
        "10.255.255.255",
        "10.255.255.240",
        "10.255.255.248",
        "10.255.255.252",
        "10.255.255.254",
        "10.255.255.255",
    )
    print(
        "access-list {acl_name} remark {comment}".format(
            acl_name=acl_name, comment=section_comment
        )
    )
    for ip in sorted(ips):
        if ":" in ip:
            # IPv6 address
            print(
                "access-list {acl_name} extended permit ip {ip} any6".format(
                    acl_name=acl_name, ip=ip
                )
            )
        else:
            # IPv4 address.  Convert to a mask
            addr, slash = ip.split("/")
            slash_mask = slash_to_mask[int(slash)]
            print(
                "access-list {acl_name} extended permit ip {addr} {mask} any4".format(
                    acl_name=acl_name, addr=addr, mask=slash_mask
                )
            )


# Fetch the current endpoints for O365
http_res = urllib.request.urlopen(
```

```
    url="https://endpoints.office.com/endpoints/worldwide?clientrequestid={}".format(
        uuid.uuid4()
    )
)
res = json.loads(http_res.read())
o365_ips = set()
o365_fqdns = set()
for service in res:
    if service["category"] == "Optimize":
        for ip in service.get("ips", []):
            o365_ips.add(ip)
        for fqdn in service.get("urls", []):
            o365_fqdns.add(fqdn)

# Generate an acl for split excluding For instance
print("##### Step 1: Create an access-list to include the split-exclude networks\n")
acl_name = "ExcludeSass"
# O365 networks
print_acl_lines(
    acl_name=acl_name,
    ips=o365_ips,
    section_comment="v4 and v6 networks for Microsoft Office 365",
)
# Microsoft Teams
# https://docs.microsoft.com/en-us/office365/enterprise/office-365-vpn-implement-split-tunnel#configurin
print_acl_lines(
  acl_name=acl_name,
  ips=["10.107.60.1/32"],
  section_comment="v4 address for Microsoft Teams"
)
# Cisco Webex - Per https://help.webex.com/en-us/WBX000028782/Network-Requirements-for-Webex-Teams-Servi
webex_ips = [
    "10.68.96.1/19",
    "10.114.160.1/20",
    "10.163.32.1/19",
    "192.0.2.1/18",
    "192.0.2.2/19",
    "198.51.100.1/20",
    "203.0.113.1/19",
    "203.0.113.254/19",
    "203.0.113.2/19",
    "172.29.192.1/19",
    "203.0.113.1/20",
    "10.26.176.1/20",
    "10.109.192.1/18",
    "10.26.160.1/19",
]
print_acl_lines(
    acl_name=acl_name,
    ips=webex_ips,
    section_comment="IPv4 and IPv6 destinations for Cisco Webex",
)

# Edited. April 1st 2020
# Per advice from Microsoft they do NOT advise using dynamic split tunneling for their properties relate
#
print(
    "\n\n##### Step 2: Create an Anyconnect custom attribute for dynamic split excludes\n"
)
print("SKIP.  Per Microsoft as of April 2020 they advise not to dynamically split fqdn related to Office
#print(
#    """
```

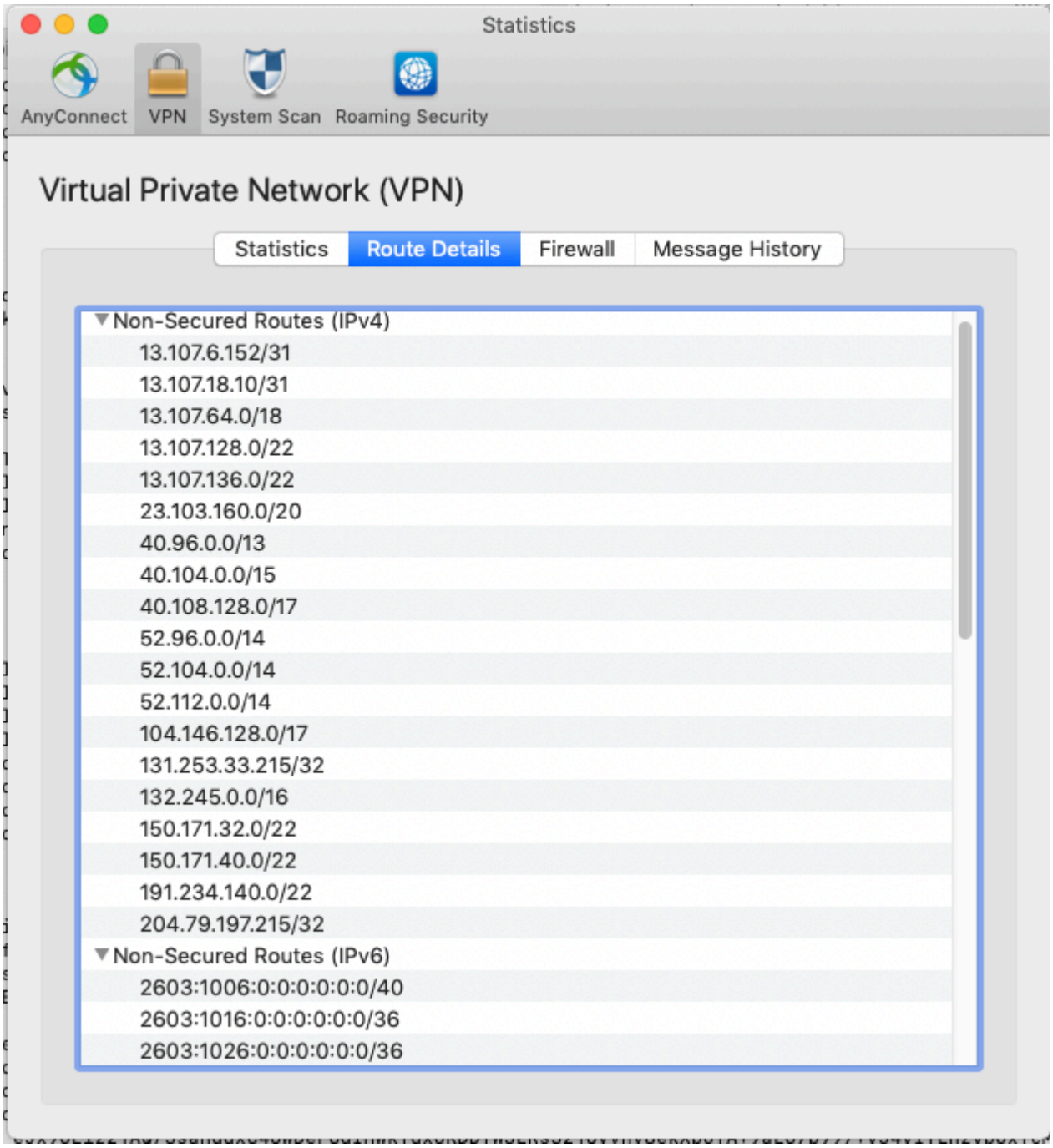
```
#webvpn
#  anyconnect-custom-attr dynamic-split-exclude-domains description dynamic-split-exclude-domains
#
#anyconnect-custom-data dynamic-split-exclude-domains saas {}
#""".format(
#        ",".join([re.sub(r"^\*\.", "", f) for f in o365_fqdns])
#    )
#)
#
print("\n##### Step 3: Configure the split exclude in the group-policy\n")
print(
    """
group-policy GP1 attributes
 split-tunnel-policy excludespecified
 ipv6-split-tunnel-policy excludespecified
 split-tunnel-network-list value {acl_name}
""".format(
        acl_name=acl_name
    )
)
```

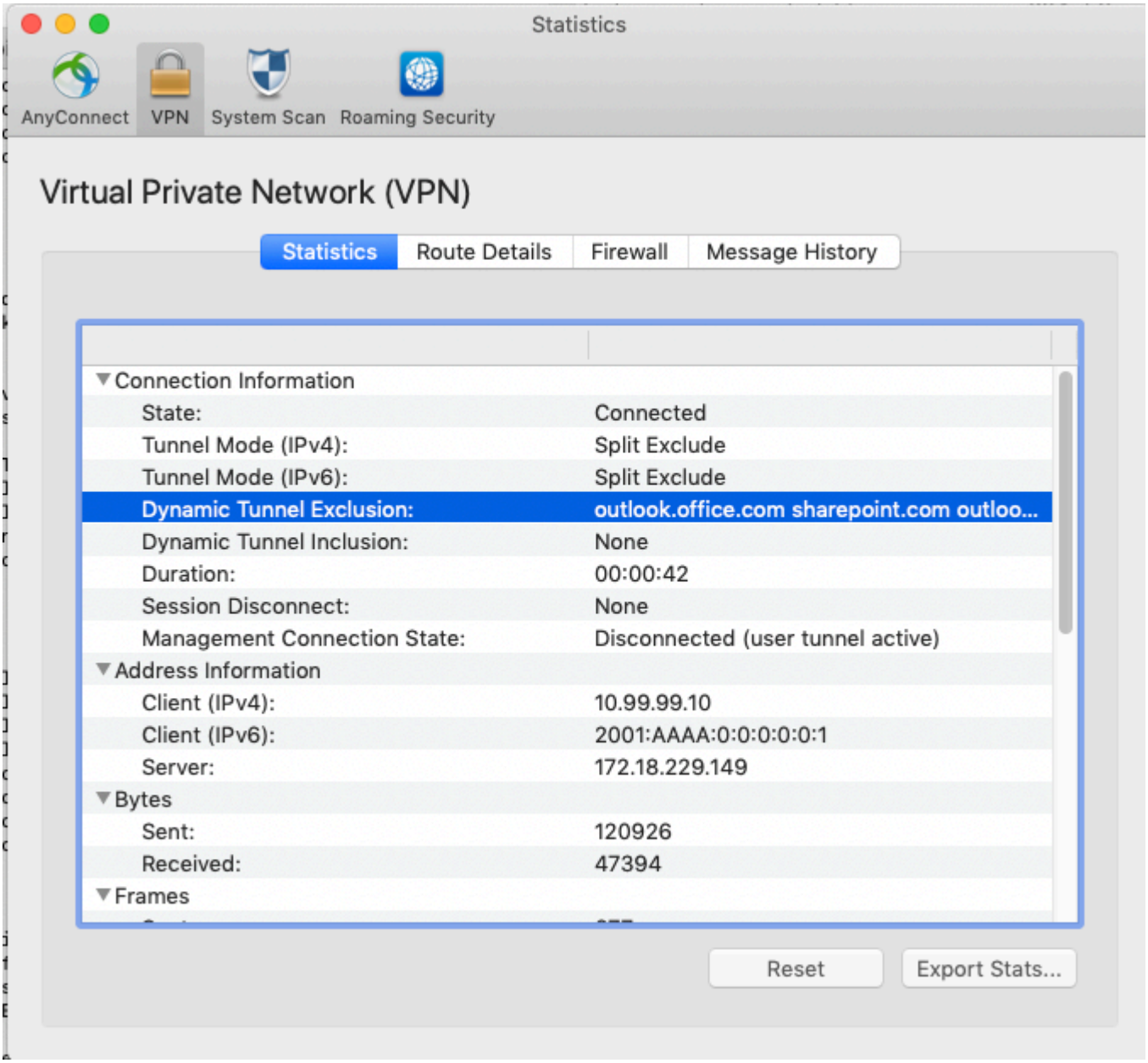
> **Note**: Microsoft recommends to exclude traffic destined to key Office 365 services from the scope of VPN connection by configuring split tunneling using published IPv4 and IPv6 address ranges. For the best performance and most efficient use of VPN capacity, traffic to these dedicated IP address ranges associated with Office 365 Exchange Online, SharePoint Online, and Microsoft Teams (referred to as Optimize category in Microsoft documentation) can be routed directly, outside of the VPN tunnel. Refer to Optimize Office 365 connectivity for remote users using VPN split tunnelling for more detailed information about this recommendation.

> **Note**: As of early April 2020, Microsoft Teams has a dependency that the IP range 10.107.60.1/32 must be excluded from the tunnel. See Configuring and securing Teams media traffic for more information.

Verification

Once a user is connected, you see the Non-Secured Routes populated with the addresses provided in the ACL as well as the Dynamic Tunnel Exclusion list.


Statistics
AnyConnect
VPN
System Scan
Roaming Security
Virtual Private Network (VPN)
Statistics
Route Details
Firewall
Message History
Non-Secured Routes (IPv4)
13.107.6.152/31
13.107.18.10/31
13.107.64.0/18
13.107.128.0/22
13.107.136.0/22
23.103.160.0/20
40.96.0.0/13
40.104.0.0/15
40.108.128.0/17
52.96.0.0/14
52.104.0.0/14
52.112.0.0/14
104.146.128.0/17
131.253.33.215/32
132.245.0.0/16
150.171.32.0/22
150.171.40.0/22
191.234.140.0/22
204.79.197.215/32
Non-Secured Routes (IPv6)
2603:1006:0:0:0:0:0:0/40
2603:1016:0:0:0:0:0:0/36
2603:1026:0:0:0:0:0:0/36


Statistics
AnyConnect
VPN
System Scan
Roaming Security
Virtual Private Network (VPN)
Statistics
Route Details
Firewall
Message History
Connection Information
State: Connected
Tunnel Mode (IPv4): Split Exclude
Tunnel Mode (IPv6): Split Exclude
Dynamic Tunnel Exclusion: outlook.office.com sharepoint.com outloo...
Dynamic Tunnel Inclusion: None
Duration: 00:00:42
Session Disconnect: None
Management Connection State: Disconnected (user tunnel active)
Address Information
Client (IPv4): 10.99.99.10
Client (IPv6): 2001:AAAA:0:0:0:0:0:1
Server: 172.18.229.149
Bytes
Sent: 120926
Received: 47394
Frames
Reset
Export Stats...