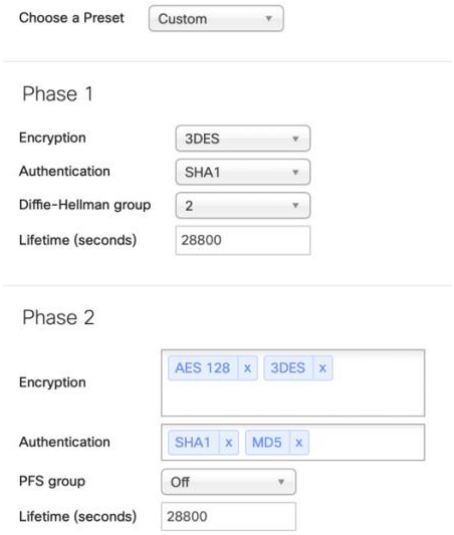
Meraki site to site VPN to Cisco IOS CSR1000v

1. Topology

2. Configuration the Meraki MX80 Site to Site VPN

There are not a lot of IPsec options within the Dashboard for this, this is the IKEv1 configuration I used:



The other settings to allow internal networks 10.0.250.0/24, 10.0.251.0/24 and 10.0.252.0/24 towards 10.10.10.0/24 on the remote site, are:

VERY ANNOYING on OsX: auto-password generation can alter your VPN password in the web-GUI!

3. Configuration on IOS

ISAKMP / IKE:

```
crypto isakmp policy 10
 encr 3des
```

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```
 authentication pre-share
 group 2
 lifetime 28800
crypto isakmp key test123 address 192.168.100.114
```

IPset / Phase 2:

```
crypto ipsec transform-set MYSET esp-3des esp-sha-hmac
 mode tunnel
!
!
!
crypto map to-mx 1 ipsec-isakmp
 set peer 192.168.100.114
 set transform-set MYSET
 match address 110
```

The ACL 110:

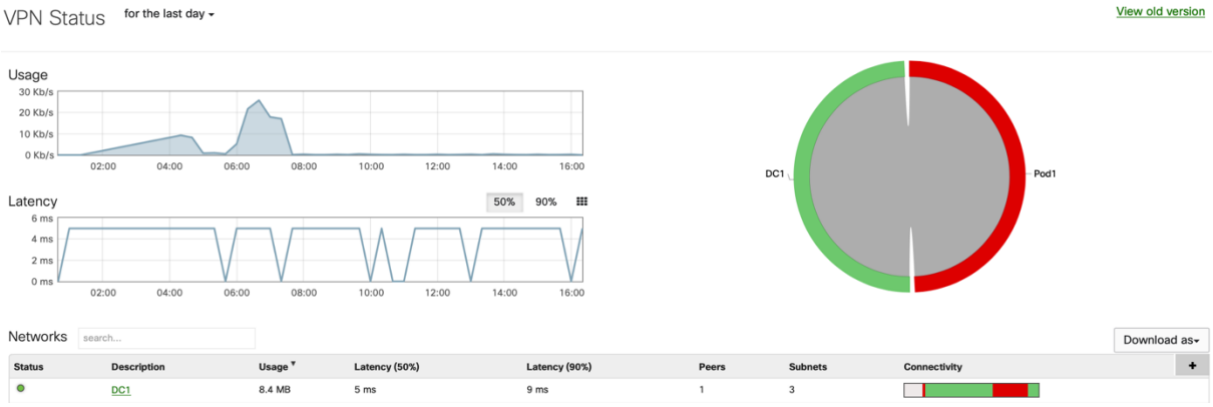
```
access-list 110 permit ip 10.10.10.0 0.0.0.255 10.0.250.0 0.0.0.255
access-list 110 permit ip 10.10.10.0 0.0.0.255 10.0.251.0 0.0.0.255
access-list 110 permit ip 10.10.10.0 0.0.0.255 10.0.252.0 0.0.0.255
```

And the application to the interface:

```
interface GigabitEthernet1
 ip address 192.168.3.71 255.255.255.0
 crypto map to-mx
```

4. Verification and monitoring

The dashboard could do with some more monitoring facilities. Under ORGANIZATION → MONITOR → VPN status, you can see this:



The red VPN "Pod1" was unavailable at the time, the DC1 is the one that is "up".

Your best bet for troubleshooting is the event – log:

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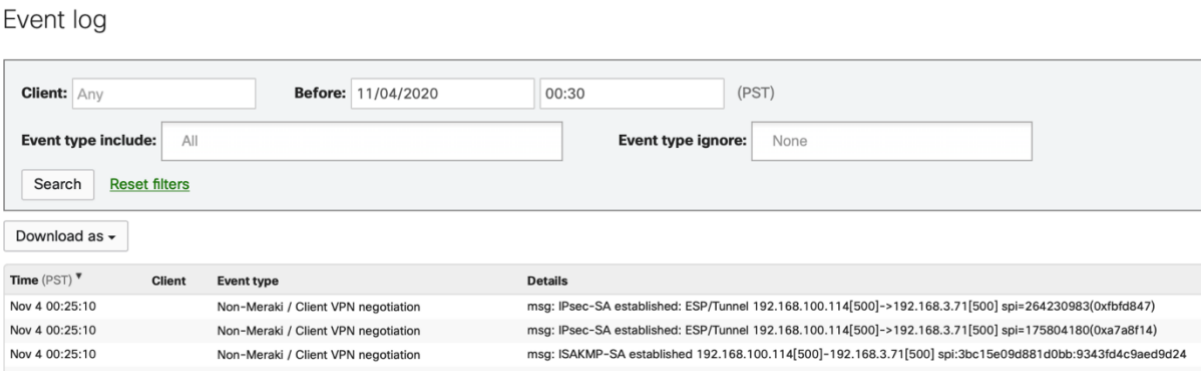

On the IOS side, of course there a more facilities:

```
csr1000v1# show crypto isakmp sa
IPv4 Crypto ISAKMP SA
dst             src             state          conn-id status
192.168.100.114 192.168.3.71    QM_IDLE           1024 ACTIVE

csr1000v1# show crypto ipsec sa

interface: GigabitEthernet1
    Crypto map tag: to-mx, local addr 192.168.3.71
[…]
  local  ident (addr/mask/prot/port): (10.10.10.0/255.255.255.0/0/0)
   remote ident (addr/mask/prot/port): (10.0.252.0/255.255.255.0/0/0)
   current_peer 192.168.100.114 port 500
     PERMIT, flags={origin_is_acl,}
    #pkts encaps: 169, #pkts encrypt: 169, #pkts digest: 169
    #pkts decaps: 200, #pkts decrypt: 200, #pkts verify: 200
```

And then there is "**debug crypto isakmp**" for the not so faint at heard, as it seems to be designed NOT too help you with any usable information.

And of course the proof is in the pudding:

```
csr1000v1# ping 10.0.251.11 source 10.10.10.10
Packet sent with a source address of 10.10.10.10
!!!!!
```

5. Important notes

-This configuration was done using IKEv1, which is not available through NAT. ☹
The two devices here were simply routed. Be aware..
You are likely to need IKEv2.

-Using 3DES was of course not advisable for production environments, once you get the VPN to work you can increase the security on it.

-Was this a headache to setup?.. well.. IPsec usually is and despite that I got it to work before hanging myself, IPsec is NEVER cooperative. But it worked never the less.

-I did not get IKEv2 working yet from the MX to IOS. That could very well be my ignorance, but… since the Dashboard says that IKEv2 is in "Beta" (!), I think this is pretty strange. IKEv2 has been around for ages and is THE requirement to get IPsec working in a NAT environment. Strange. ☹

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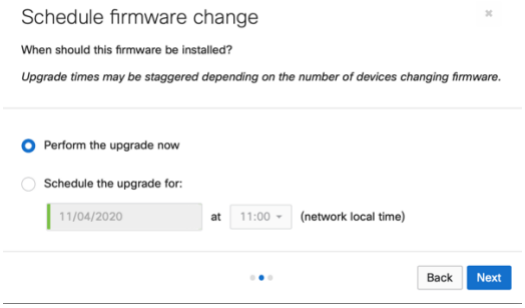
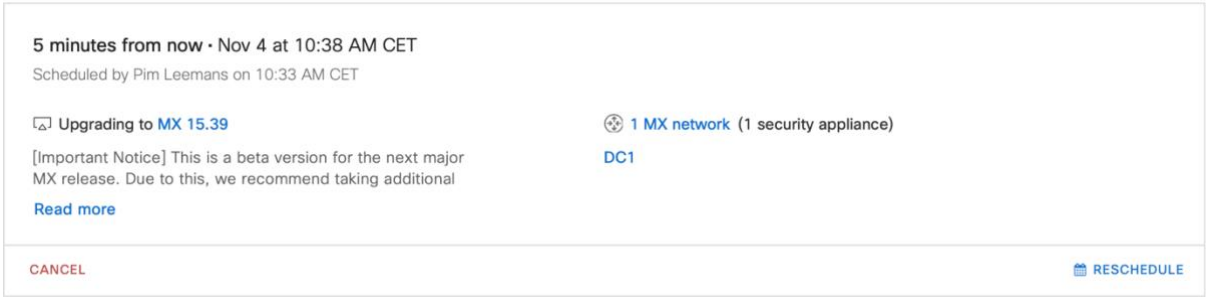
The event-log displayed: msg: invalid flag 0x08, which apparently is indicative that there is an IKE version mismatch..

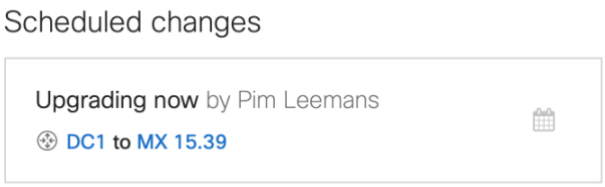
IKEv2 supported on MX appliances running firmware 15.12 or higher, so I did an upgrade to a Beta vesion on the MX.. ☹ ☹.



→ the upgrade will be scheduled "5 minutes from now", in case you change your mind.



And after a few minutes:



Note that DES is no longer supported in 15.x. ☹ ☹ ☹ That may sound "safer".. but if you have to connect via an IPsec via to legacy endpoints, you are SCREWED!

Note: "*The latest beta firmware is fully supported by our Support and Engineering teams. Older betas are supported with best effort; an upgrade to the latest beta will ensure full support.*"

As I was waiting for the upgrade.. the message appeared: "Restricted from versions 15.0 and higher".

This very crypted message apparently means that the MX80 can NOT run version 15.0+. Hmm.. strange as the "Upgrading now" window still appears. Then that windows disappeared after a while as well.

So the end of the story is: Firmware <15.x which is still in Beta does NOT support IKEv2. And it seems.. like my MX80 never will. Boy this sucks.