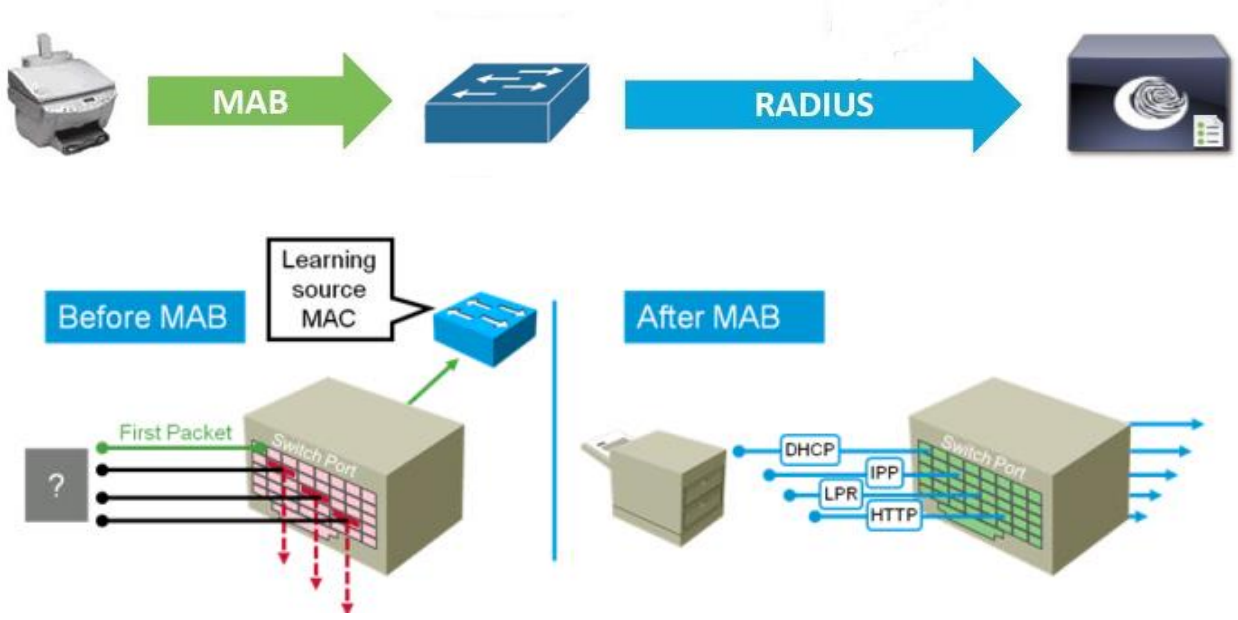
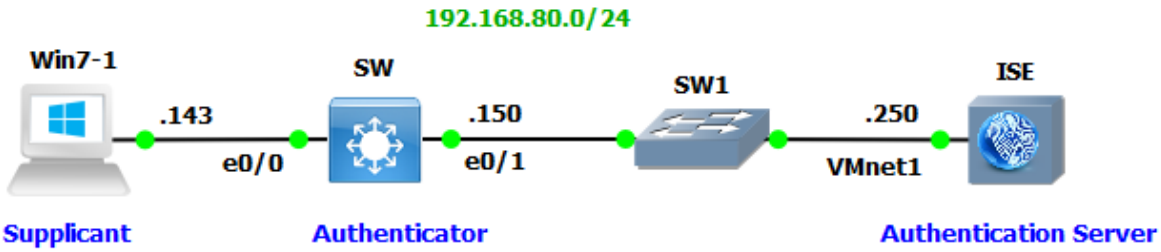
Implement MAB:

- MAB stands for Media Access Control Authentication Bypass.
- MAB allow controlling devices to access the Network at Layer 2.
- Authentication server performs authentication lookup using MAC address as a credential.
- MAC Authentication Bypass feature is a MAC-address-based authentication mechanism.
- MAB can be implemented over devices, which do not support 802.1x authentication.
- MAB is used to authenticate non-802.1x capable devices such as printers, IP phones.
- MAB is working over MAC address it is independent of Usernames and passwords.
- MAB can also be implemented over the 802.1x supported devices.
- MAB is not secure authentication method compared to other authentication methods.
- MAB is not a strong authentication process it can be overcome by MAC address spoofing.
- When enable MAB on switchport, switch drops all frames except first frame to learn MAC.
- Once the switch has learned the MAC address of the connected device.
- Switch contacts an authentication server to check if it permits the MAC address.
- ISE authenticate MAB devices either based on Calling Station ID or Username & Password.
- If Process Host Lookup is enabled, then Authentication is done based on Calling Station ID.
- If Process Host Lookup is disabled, then Authentication is done on username & password.
- By default, MAB only supports a single endpoint (device) per switchport.
- MAB also supports dynamic values from your RADIUS server such as ACL or VLAN.
- MAB can be deployed as standalone authentication.



Lab Topology:

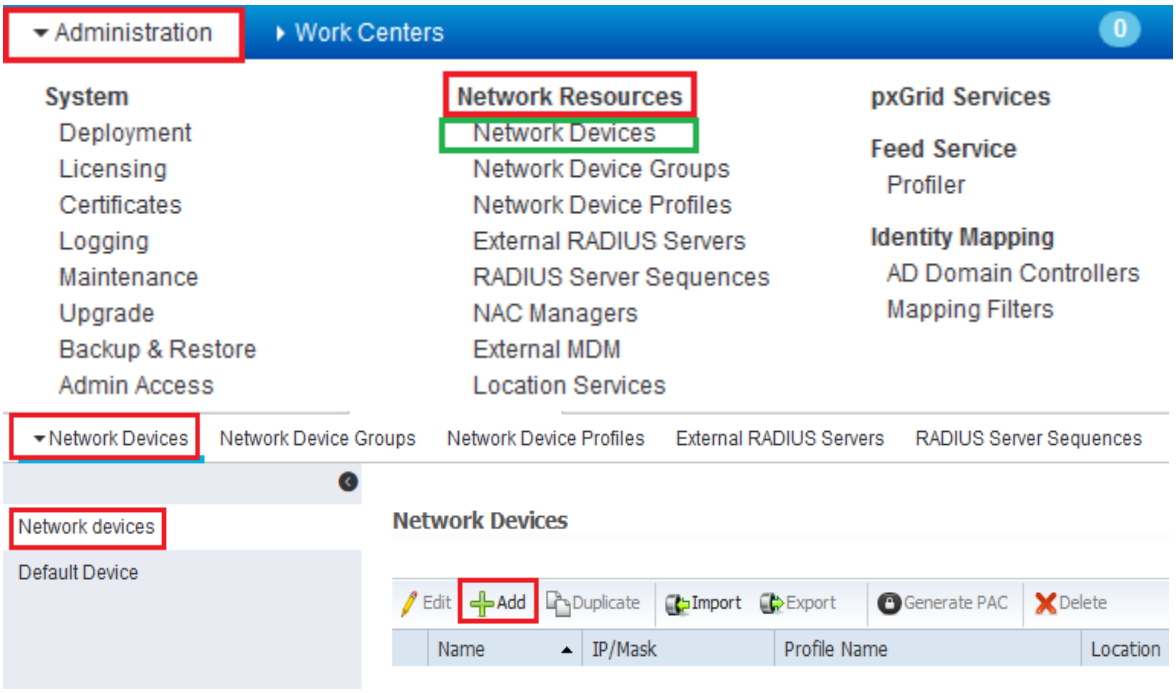


MAB Configuration:

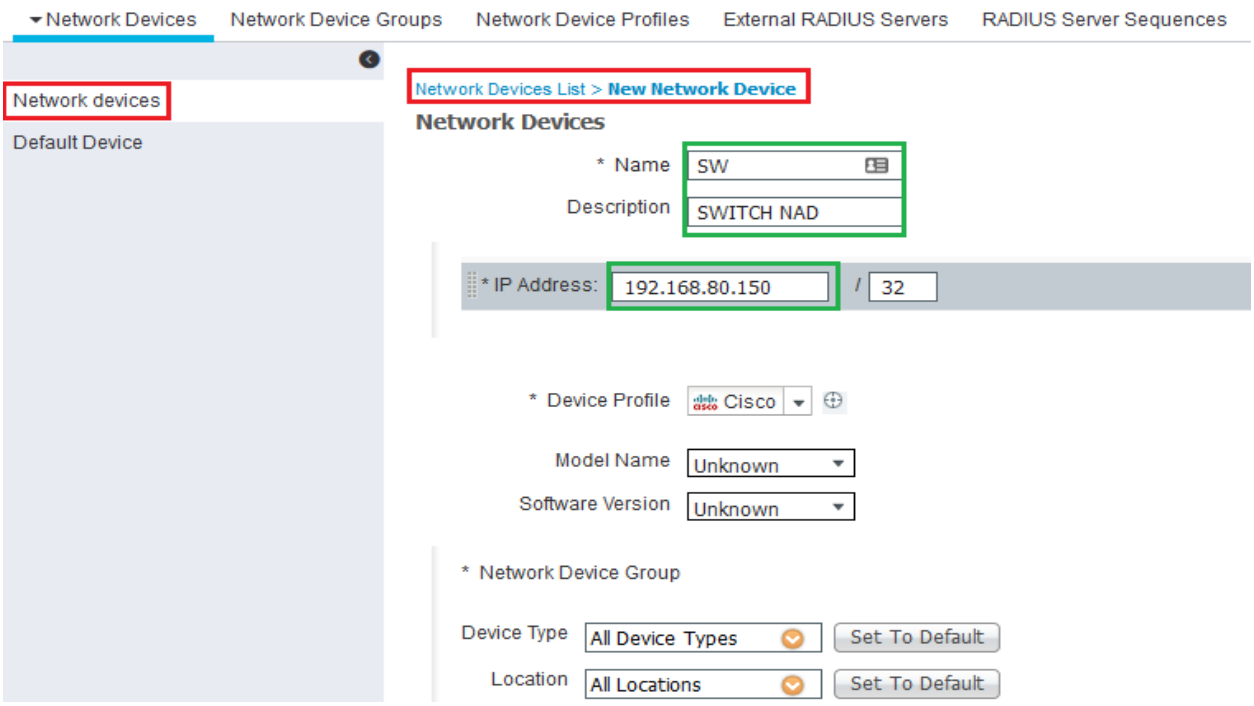
MAB Configuration on SW
SW(config)#interface vlan 1 SW(config-if)#ip address 192.168.80.150 255.255.255.0 SW(config-if)#no shutdown SW(config-if)#exit
SW(config)#aaa new-model
SW(config)#aaa authentication dot1x default group radius
SW(config)#radius server ISE SW(config-radius-server)#address ipv4 192.168.80.250 auth-port 1812 acct-port 1813 SW(config-radius-server)#key test123
SW(config)#interface ethernet 0/0 SW(config-if)#switchport host SW(config-if)#authentication port-control auto SW(config-if)#mab SW(config-if)#authentication order mab dot1x SW(config-if)#authentication priority dot1x mab
SW# debug radius authentication
SW# show mab all
SW# show authentication sessions interface ethernet 0/0
SW# show authentication sessions interface ethernet 0/0 details
SW# show authentication sessions

Add Network Device:

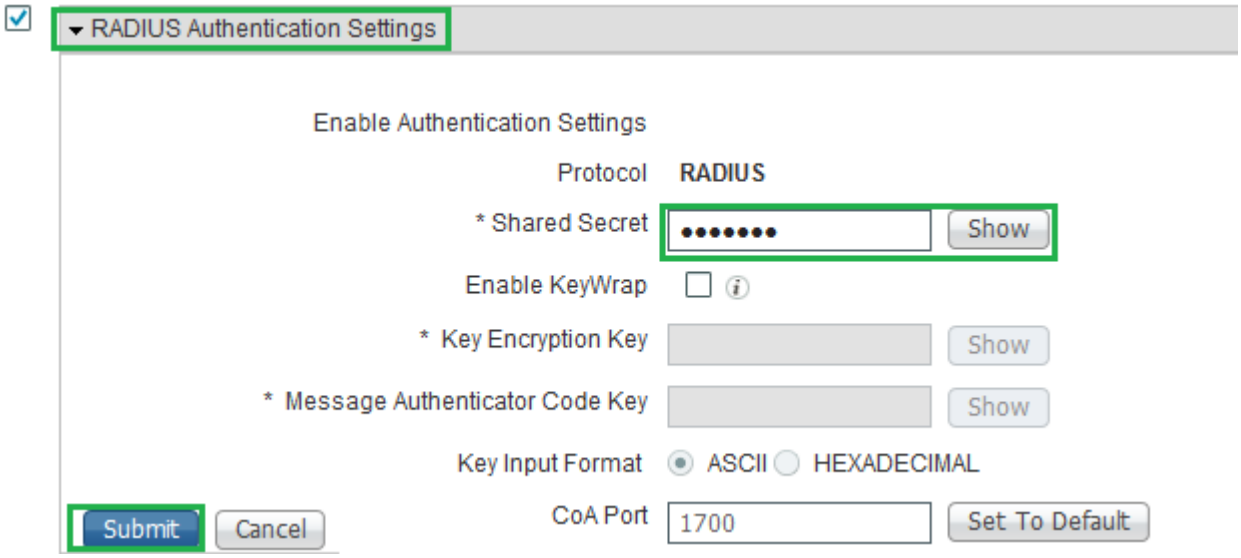
Go to **Administration > Network Resources > Network Devices** to add the Device (SW), which will request to authenticate Dot1x Client.



Click on Add button to add Device, Configure **Name** of the device, **IP address** configured.

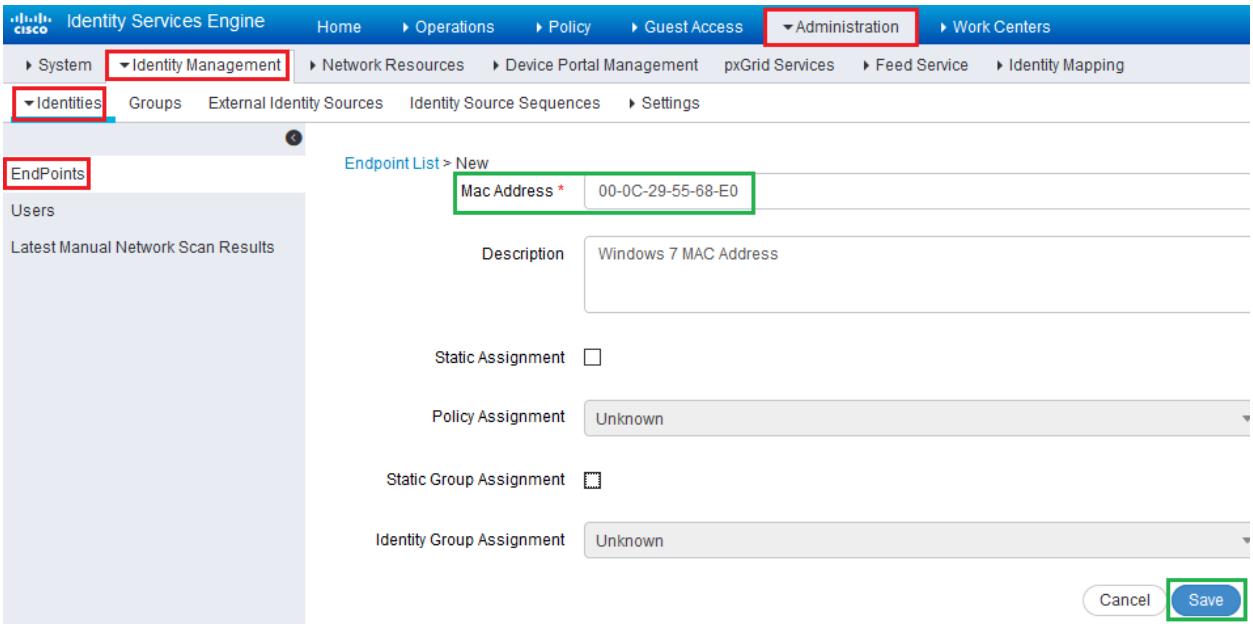


Scroll down to set Authentication settings. Set Password configured as Server key on Switch device “test123” and save settings.



Add MAC to Identity Store:

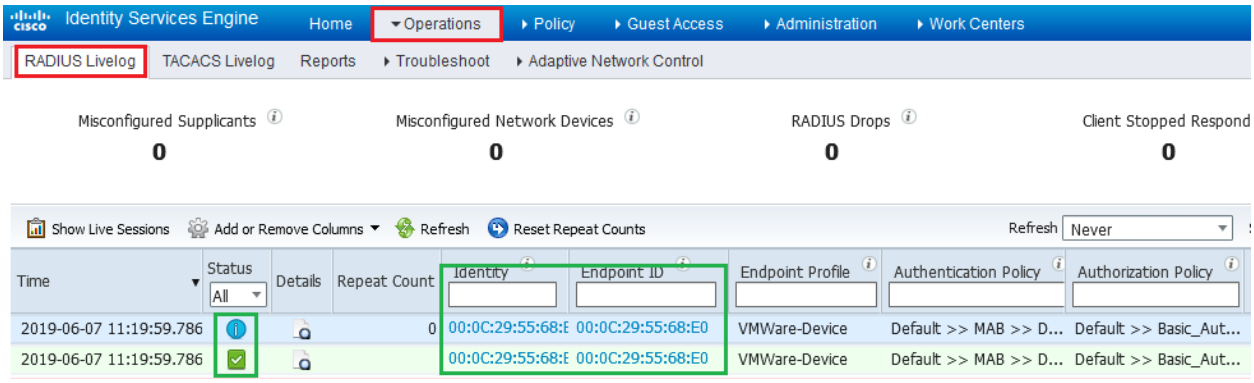
To add Windows 7 MAC address in ISE database, navigate to **Administration > Identities > End Points >** Add. Type Windows 7 MAC Address and click **"Save"** to save the setting.



Verify:

To verify navigate to **Operations > RADIUS Livelog.**

The live logs show the given MAC address has verified and allowed.



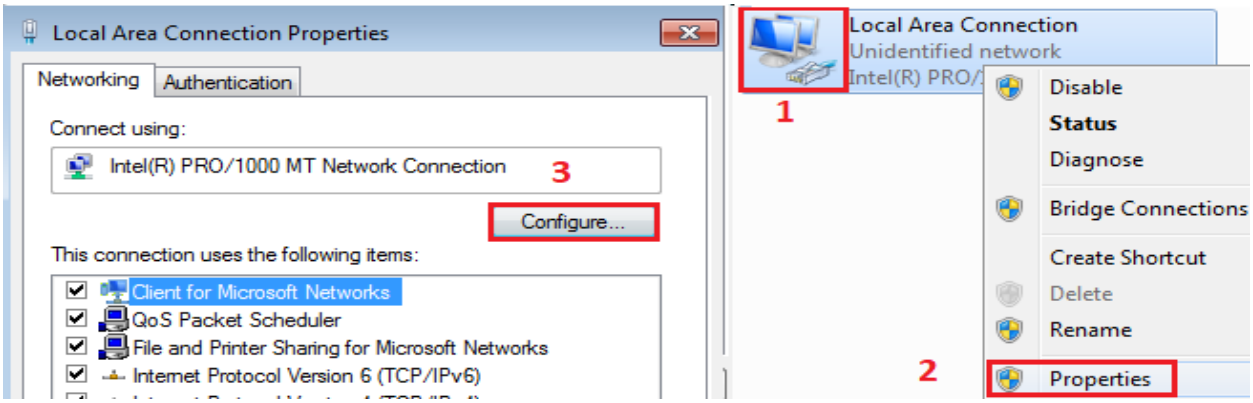
Verify on Switch it show the method is MAB and authenticated.

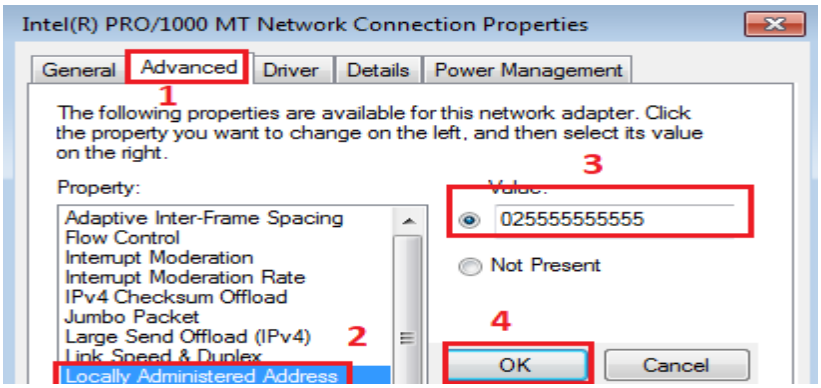
```
SW#show authentication sessions

Interface     Identifier      Method  Domain  Status Fg Session ID
Et0/0         000c.2955.68e0  mab     DATA    Auth      C0A850960000001000458959
```

Verify on Switch it show more details about MAB configured interface.

```
SW#show authentication sessions interface ethernet 0/0 details
            Interface:  Ethernet0/0
          MAC Address:  000c.2955.68e0
         IPv6 Address:  Unknown
         IPv4 Address:  192.168.80.143
            User-Name:  00-0C-29-55-68-E0
               Status:  Authorized
               Domain:  DATA
      Oper host mode:  single-host
    Oper control dir:  both
     Session timeout:  N/A
     Restart timeout:  N/A
Periodic Acct timeout:  N/A
      Session Uptime:  4526s
    Common Session ID:  C0A850960000001000458959
      Acct Session ID:  Unknown
               Handle:  0xAD000005
      Current Policy:  POLICY_Et0/0

Local Policies:
        Service Template: DEFAULT_LINKSEC_POLICY_SHOULD_SECURE (priority 150)
      Security Policy:  Should Secure
      Security Status:  Link Unsecure


Server Policies:

Method status list:
      Method            State

      mab                Authc Success
```

Let us change the MAC Address of Windows 7.





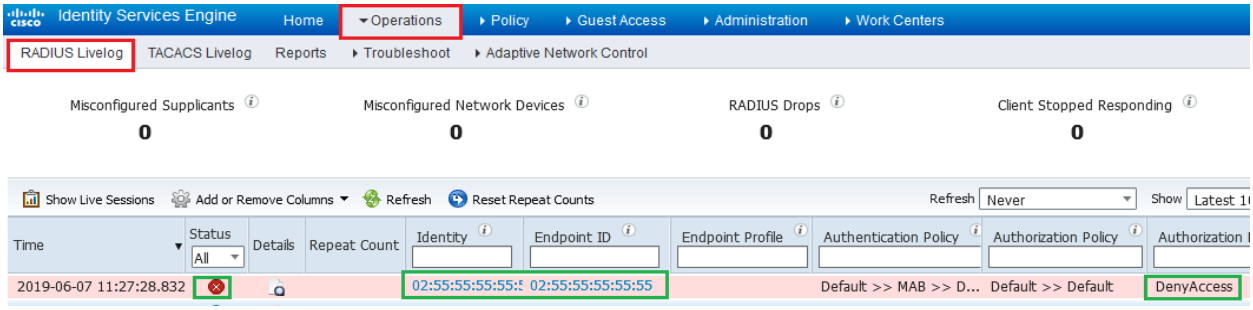
Switch deducted the security violation and shutdown the interface.

```
SW#
*Jun  7 11:25:57.862: %PM-4-ERR_DISABLE: security-violation error detected on Et
0/0, putting Et0/0 in err-disable state
SW#
*Jun  7 11:25:57.863: %AUTHMGR-5-SECURITY_VIOLATION: Security violation on the i
nterface Ethernet0/0, new MAC address (0255.5555.5555) is seen.AuditSessionID  U
nassigned
*Jun  7 11:25:58.862: %LINEPROTO-5-UPDOWN: Line protocol on Interface Ethernet0/
0, changed state to down
```

Let us bring up the interface of switch.

```
SW(config)#interface ethernet 0/0
SW(config-if)#shutdown
SW(config-if)#no shutdown
```

Let us verify again from **Operations > RADIUS Livelog**. The new MAC address is not in local database that why it has been denied by cisco ISE.



 Prepared By Ahmad Ali, Email: ahmadalimsc@gmail.com , Mobile# 0564303717