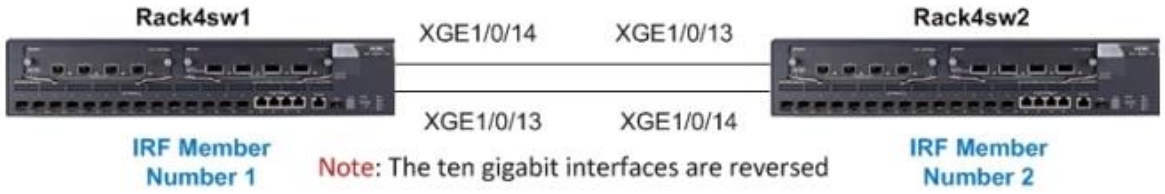
Intelligent Resilient Framework (IRF)

IRF; bir software virtulization teknolojisidir. IRF portlar sayesinde birçok network cihazı fiziksel olarak birbirine bağlanarak tek bir control plane üzerinden yönetilebilir. Bu teknolojinin diğer üreticilerde karşılığı "stack" şeklindedir.

Birden fazla fiziksel switch; IRF teknolojisi ile birlikte tek bir çatı altında toplanarak tek bir yerden yönetilir, tek bir management IP adresi olur. Böylece IP kazancı da sağlanmış olur.

Aşağıdaki örnekte iki adet switch 10G portlar yardımıyla IRF yapılandırmasına dahil edilecektir. Sw1 master, sw2 ise slave/secondary cihaz olarak seçilecektir.



Bu protokol uygulanmadan önce mevcut konfig backup'larınızı almayı unutmayınız.

1. **Adım:** Rack4sw2 cihazının IRF altına dahil edilmeden önce switch number değeri değiştirilmelidir. Bu cihaz yapı içerisinde 2 numaralı cihaz olacağı için port numaraları XGE2/0/1…..XGE2/0/14 şeklinde ayarlanmalıdır. (Default değer XGE1/0/1…. Şeklindedir.)

```
[Rack4sw2]irf member 1 renumber 2 // Burada switch number 1' den 2 olmuştur

Warning: Renumbering the switch number may result in configuration change o
r loss. Continue?[Y/N]y

<Rack4sw2>reboot // Switch numarası değiştikten sonra cihaz restart edilir

Start to check configuration with next startup configuration file, please w
ait.........DONE!
 This command will reboot the device. Continue? [Y/N]:y
```

2. **Adım:** IRF altına dahil edilecek olan fiziksel portlar kapalı duruma getirilir.

```
[Rack4sw2]interface Ten-GigabitEthernet 1/0/13
[Rack4sw2-Ten-GigabitEthernet1/0/13]shut
[Rack4sw2-Ten-GigabitEthernet1/0/13]quit

[Rack4sw2]interface Ten-GigabitEthernet 1/0/14
[Rack4sw2-Ten-GigabitEthernet1/0/14]shut
[Rack4sw2-Ten-GigabitEthernet1/0/14]quit

[Rack4sw1]interface Ten-GigabitEthernet 2/0/13
[Rack4sw1-Ten-GigabitEthernet1/0/13]shut
[Rack4sw1-Ten-GigabitEthernet1/0/13]quit

[Rack4sw1]interface Ten-GigabitEthernet 2/0/14
[Rack4sw1-Ten-GigabitEthernet1/0/14]shut
[Rack4sw1-Ten-GigabitEthernet1/0/14]quit
```

Her iki switch' de tüm portlar shut duruma getirilmiştir.

3. **Adım:** IRF interface' ler konfigüre edilir.

```
[Rack4sw1]irf-port 1/1
[Rack4sw1-irf-port1/1]port group interface Ten-GigabitEthernet1/0/13
 Info: You are recommended to save the configuration after completing your
IRF configuration; otherwise, it may be lost after system reboot.
[Rack4sw1-irf-port1/1]quit

[Rack4sw1]irf-port 1/2
[Rack4sw1-irf-port1/2]port group interface Ten-GigabitEthernet1/0/14
 Info: You are recommended to save the configuration after completing your
IRF configuration; otherwise, it may be lost after system reboot.
[Rack4sw1-irf-port1/2]quit

[Rack4sw2]irf-port 2/1
[Rack4sw2-irf-port2/1]port group interface Ten-GigabitEthernet2/0/13
 Info: You are recommended to save the configuration after completing your
IRF configuration; otherwise, it may be lost after system reboot.
[Rack4sw2-irf-port2/1]quit

[Rack4sw2]irf-port 2/2
[Rack4sw2-irf-port2/2]port group interface Ten-GigabitEthernet2/0/14
 Info: You are recommended to save the configuration after completing your
IRF configuration; otherwise, it may be lost after system reboot.
[Rack4sw2-irf-port2/2]quit
```

IRF sanal portlarının içerisine girilerek ilgili fiziksel interface' ler, bu sanal portların altına dahil edilir.

4. **Adım:** Daha önce kapalı konuma getirilen fiziksel portlar aktif edilir.

```
[Rack4sw1]interface Ten-GigabitEthernet 1/0/13
[Rack4sw1-Ten-GigabitEthernet1/0/13]undo shut
[Rack4sw1-Ten-GigabitEthernet1/0/13]quit

[Rack4sw1]interface Ten-GigabitEthernet 1/0/14
[Rack4sw1-Ten-GigabitEthernet1/0/14]undo shut
[Rack4sw1-Ten-GigabitEthernet1/0/14]quit

[Rack4sw2]interface Ten-GigabitEthernet 2/0/13
[Rack4sw2-Ten-GigabitEthernet2/0/13]undo shut
[Rack4sw2-Ten-GigabitEthernet2/0/13]quit

[Rack4sw2]interface Ten-GigabitEthernet 2/0/14
[Rack4sw2-Ten-GigabitEthernet2/0/14]undo shut
[Rack4sw2-Ten-GigabitEthernet2/0/14]quit


Note: In steps 5-8 the configuration is activated and saved.
On the master switch (Rack4sw1) the configuration is saved after the
configuration is activated.
On the slave switch (Rack4sw2) the configuration is saved before the
configuration is activated.
```

5. **Adım:** IRF port konfigürasyonu SW-1 altında aktif edilir.

```
[Rack4sw1]irf-port-configuration active
```

6. **Adım:** Sw-1' in konfigürasyonunu kaydedelim.

```
[Rack4sw1]save force
 Saved the current configuration to mainboard device successfully.
 Configuration is saved to device successfully.
```

7. **Adım:** Sw-2' nin konfigürasyonunu kaydedelim.

```
[Rack4sw2]save force
 Saved the current configuration to mainboard device successfully.
 Configuration is saved to device successfully.
```

8. **Adım:** IRF port konfigürasyonunu Sw-2 altında aktif edelim.

```
[Rack4sw2]irf-port-configuration active

Note: After activation of the irf ports, switch Rack4sw2 will reboot.
```

8.adım uygulandıktan sonra Sw-2 kendini reboot edip yeniden açılında Sw-1' e dahil olmuş olacak şekilde tek control plane üzerinden yönetilebilir şekilde açılmış olur.

9. **Adım:** Kontrollerin Yapılması

```
<Rack4sw1>display irf // burada switchlerin irf statülerini görürüz

Switch  Role    Priority  CPU-Mac         Description
 *+1    Master  1         3822-d66b-e253  -----
  2     Slave   1         3822-d6b7-27d9  -----
-------------------------------------------------

 * indicates the device is the master.
 + indicates the device through which the user logs in.

 The Bridge MAC of the IRF is: 3822-d66b-e252
 Auto upgrade                : yes
 Mac persistent              : 6 min
 Domain ID                   : 0

<Rack4sw1>display irf configuration

 MemberID NewID    IRF-Port1                     IRF-Port2
  1       1        Ten-GigabitEthernet1/0/13     Ten-GigabitEthernet1/0/14
  2       2        Ten-GigabitEthernet2/0/13     Ten-GigabitEthernet2/0/14

<Rack4sw1>display irf topology

                          Topology Info
 ------------------------------------------------------------------------
              IRF-Port1                IRF-Port2
 Switch    Link       neighbor      Link       neighbor    Belong To
 1         UP         2             UP         2           3822-d66b-e253
 2         UP         1             UP         1           3822-d66b-e253

<Rack4sw1>display device

 Slot 1
```

```
SubSNo PortNum PCBVer  FPGAVer CPLDVer BootRomVer AddrLM Type       State
0      18      Ver.B   NULL    003 003 215        IVL    MAIN       Normal
 Slot 2
SubSNo PortNum PCBVer  FPGAVer CPLDVer BootRomVer AddrLM Type       State
0      18      Ver.B   NULL    003 003 215        IVL    MAIN       Normal

<Rack4sw1>display interface brief

The brief information of interface(s) under route mode:
Link: ADM - administratively down; Stby - standby
Protocol: (s) - spoofing
Interface            Link Protocol Main IP         Description
NULL0                UP   UP(s)    --
Vlan1                UP   UP       --

The brief information of interface(s) under bridge mode:
Link: ADM - administratively down; Stby - standby
Speed or Duplex: (a)/A - auto; H - half; F - full
Type: A - access; T - trunk; H - hybrid
Interface            Link Speed   Duplex Type PVID Description
GE1/0/15             DOWN auto    A      A    1
GE1/0/16             DOWN auto    A      A    1
GE1/0/17             DOWN auto    A      A    1
GE1/0/18             DOWN auto    A      A    1
GE2/0/15             DOWN auto    A      A    1
GE2/0/16             DOWN auto    A      A    1
GE2/0/17             DOWN auto    A      A    1
GE2/0/18             DOWN auto    A      A    1
XGE1/0/1             ADM  auto    A      A    1
XGE1/0/2             ADM  auto    A      A    1
XGE1/0/3             DOWN auto    A      A    1
XGE1/0/4             DOWN auto    A      A    1
XGE1/0/5             DOWN auto    A      A    1
XGE1/0/6             DOWN auto    A      A    1
XGE1/0/7             DOWN auto    A      A    1
XGE1/0/8             DOWN auto    A      A    1
XGE1/0/9             DOWN auto    A      A    1
XGE1/0/10            DOWN auto    A      A    1
XGE1/0/11            ADM  auto    A      A    1
XGE1/0/12            DOWN auto    A      A    1
XGE1/0/13            UP   --      --     --   --
XGE1/0/14            UP   --      --     --   --
XGE2/0/1             UP   1G(a)   F(a)   A    1
XGE2/0/2             UP   1G(a)   F(a)   A    1
XGE2/0/3             DOWN auto    A      A    1
XGE2/0/4             DOWN auto    A      A    1
XGE2/0/5             DOWN auto    A      A    1
XGE2/0/6             DOWN auto    A      A    1
XGE2/0/7             DOWN auto    A      A    1
XGE2/0/8             DOWN auto    A      A    1
XGE2/0/9             DOWN auto    A      A    1
XGE2/0/10            DOWN auto    A      A    1
XGE2/0/11            UP   1G(a)   F(a)   A    1
XGE2/0/12            DOWN auto    A      A    1
XGE2/0/13            UP   --      --     --   --
XGE2/0/14            UP   --      --     --   --
```

***** Physical interconnect *****

```
<Rack4sw1>display lldp neighbor-information list

System Name          Local Interface Chassis ID      Port ID
Rack4sw2             XGE1/0/13       3822-d6b7-27d8  Ten-
GigabitEthernet1/0/14
Rack4sw2             XGE1/0/14       3822-d6b7-27d8  Ten-
GigabitEthernet1/0/13

<Rack4sw2>display lldp neighbor-information list

System Name          Local Interface Chassis ID      Port ID
Rack4sw1             XGE1/0/13       3822-d66b-e252  Ten-
GigabitEthernet1/0/14
Rack4sw1             XGE1/0/14       3822-d66b-e252  Ten-
GigabitEthernet1/0/13
```