

# Dynamic Port Breakout

## Restriction

- [202111.0] known issue:
  - [SONIC-4681] Switch failed to break out interface if eth0 has static IP address  
The issue is fixed on 202111.3
  - [SONIC-4331] If there had been ACL that without IP\_Type binding on some ports, once other ports try to do the dynamic port breakout, they will face an error.
- Before breakout, please make sure the port restore to default configuration. In 202012 branch, "advertised-speed" command is supported. If you have advertised-speed configuration, please remember to remove the configuration. (Refer to this [restored guide](#) for config restore. )
- Admin status of interfaces is down by default after applying Dynamic Port Breakout setting.
- AS5835-54X(T), it could only set the port breakout on Ethernet48 and Ethernet60.
- On the version "[Edgecore-SONiC\\_20210209\\_051110\\_ec202006\\_134](#)", AS9716-32D support more breakout mode "[2x50G\(4\)](#), [4x25G\[10G\]\(4\)](#)".
- AS7816-64X, due to the logical port limitation by ASIC, breakout is realized only in row1 (Ethernet0,8,16,24,32,40,48,56,64,72,80,88,96,104,112,120 as the yellow block) in current design.

Ethernet0	Ethernet8	Ethernet16	Ethernet24	Ethernet32	Ethernet40	Ethernet48	Ethernet56	Ethernet64	Ethernet72	Ethernet80	Ethernet88	Ethernet96	Ethernet104	Ethernet112	Ethernet120
Ethernet4	Ethernet12	Ethernet20	Ethernet28	Ethernet36	Ethernet44	Ethernet52	Ethernet60	Ethernet68	Ethernet76	Ethernet84	Ethernet92	Ethernet100	Ethernet108	Ethernet116	Ethernet124
Ethernet128	Ethernet136	Ethernet144	Ethernet152	Ethernet160	Ethernet168	Ethernet176	Ethernet184	Ethernet192	Ethernet200	Ethernet208	Ethernet216	Ethernet224	Ethernet232	Ethernet240	Ethernet248
Ethernet132	Ethernet140	Ethernet148	Ethernet156	Ethernet164	Ethernet172	Ethernet180	Ethernet188	Ethernet196	Ethernet204	Ethernet212	Ethernet220	Ethernet228	Ethernet236	Ethernet244	Ethernet252

- For the mode '[4x25\[10G\]\(4\)](#)' of AS9716-32D, the default breakout is 4x25G. If you need 4x10G, you need to break out first and then use the down-speed command as following.

```
admin@sonic:~$ sudo config interface breakout Ethernet24 '4x25G[10G](4)'
```

```
Do you want to Breakout the port, continue? [y/N]: y
```

Running Breakout Mode : 1x400G

Target Breakout Mode : [4x25G\[10G\]\(4\)](#)

Ports to be deleted :

```
{  
"Ethernet24": "400000"
```

```
}  
Ports to be added :  
{  
"Ethernet25": "25000",  
"Ethernet24": "25000",  
"Ethernet27": "25000",  
"Ethernet26": "25000"  
}
```

After running Logic to limit the impact

Final list of ports to be deleted :

```
{  
"Ethernet24": "400000"  
}
```

Final list of ports to be added :

```
{  
"Ethernet25": "25000",  
"Ethernet24": "25000",  
"Ethernet27": "25000",  
"Ethernet26": "25000"  
}
```

Loaded below Yang Models

```
['sonic-acl', 'sonic-extension', 'sonic-interface', 'sonic-loopback-interface', 'sonic-port', 'sonic-portchannel', 'sonic-types',  
'sonic-vlan']
```

Note: Below table(s) have no YANG models:

CONTAINER\_FEATURE, VERSIONS, DEVICE\_METADATA, TELEMETRY, FEATURE, FLEX\_COUNTER\_TABLE,  
BREAKOUT\_CFG, MGMT\_INTERFACE, CRM,

Breakout process got successfully completed.

Please note loaded setting will be lost after system reboot. To preserve setting, run `config save`.

admin@sonic:~\$ [sudo config interface speed Ethernet24 10000](#)

## Dynamic Port Breakout

### Tested model & firmware version:

- Switch model name:  
DCS203 (AS7326-56X)
- Edgecore SONiC version:  
202006.4  
202012.0 ~ 202012.4  
202111.0 ~ 202111.8

### Procedure:

Step 1. We should remove the ip interface/ VLAN member and portchannel member on ports which we want to run the DPB.

Assume if we want to run DPB on "Ethernet48", we need to remove the ip interface on the port.

```
admin@sonic:~$ show ip interfaces
```

Interface	Master	IPv4 address/mask	Admin/Oper	BGP Neighbor	Neighbor IP
ge-0/0/0		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/1		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/2		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/3		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/4		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/5		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/6		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/7		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/8		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/9		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/10		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/11		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/12		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/13		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/14		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/15		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/16		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/17		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/18		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/19		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/20		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/21		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/22		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/23		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/24		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/25		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/26		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/27		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/28		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/29		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/30		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2
ge-0/0/31		10.0.0.1/24	up/up	10.0.0.2	10.0.0.2

Ethernet48	192.168.1.1/24	up/up	N/A	N/A
docker0	240.127.1.1/24	up/down	N/A	N/A
eth0	188.188.9.3/16	up/up	N/A	N/A
lo	127.0.0.1/16	up/up	N/A	N/A

```
admin@sonic:~$ sudo config interface ip remove Ethernet48 192.168.1.1/24
```

Assume if we want to run DPB on "Ethernet52", we should remove it from the VLAN member of VLAN100.

```
admin@sonic:~$ show vlan brief
```

VLAN ID	IP Address	Ports	Port	Proxy	DHCP Helper	DHCP Relay Configuration
		Tagging	ARP	Address		
100	192.168.2.2/24	Ethernet52	untagged	disabled		Source Interface:
					Link Selection:	
					Server Vrf:	
					Server ID Override:	

```
admin@sonic:~$ sudo config vlan member del 100 Ethernet52
```

Assume if we want to run the DPB on "Ethernet0", we should remove it from portchannel member of PortChannel01.

```
admin@sonic:~$ show interfaces portchannel
```

Flags: A - active, I - inactive, Up - up, Dw - Down, N/A - not available,

S - selected, D - deselected, \* - not synced,

M - mixed speed

No.	Team Dev	Protocol	Ports	Oper Key	Admin Key	Fast Rate
-----	----------	----------	-------	----------	-----------	-----------

```
01 PortChannel01 LACP(A)(Dw) Ethernet0(D) 101 auto false
```

```
admin@sonic:~$ sudo config portchannel member del PortChannel01 Ethernet0
```

Step 2. Check breakout option availability and current breakout mode on Ethernet48.

```
admin@sonic:~$ show interfaces breakout
```

```
...omitted...
```

```
"Ethernet48": {
  "index": "13,13,13,13",
  "lanes": "49,50,51,52",
  "breakout_modes": {
    "1x100G[40G]": [
      "Eth13(Port13)"
    ],
    "2x50G": [
      "Eth13/1(Port13)",
      "Eth13/2(Port13)"
    ],
    "4x25G": [
      "Eth13/1(Port13)",
      "Eth13/2(Port13)",
      "Eth13/3(Port13)",
      "Eth13/4(Port13)"
    ],
    "4x10G": [
      "Eth13/1(Port13)",
      "Eth13/2(Port13)",
      "Eth13/3(Port13)",
      "Eth13/4(Port13)"
    ]
  },
  "default_brkout_mode": "1x100G[40G]",
  "autoneg": "off",
  "Current Breakout Mode": "1x100G[40G]",
  "child ports": "Ethernet48",
  "child port speeds": "100G"
},
```

```
...omitted...
```

```
admin@sonic:~$ show interfaces breakout current-mode Ethernet48
```

```
+-----+-----+
```

Interface	Current Breakout Mode
Ethernet48	1x100G[40G]

Step 3. Configure dynamic port breakout

```
admin@sonic:~$ sudo config interface breakout Ethernet48 '4x25G' -y
```

Running Breakout Mode : 1x100G[40G]

Target Breakout Mode : 4x25G

Ports to be deleted :

```
{
  "Ethernet48": "100000"
}
```

Ports to be added :

```
{
  "Ethernet48": "25000",
  "Ethernet49": "25000",
  "Ethernet50": "25000",
  "Ethernet51": "25000"
}
```

After running Logic to limit the impact

Final list of ports to be deleted :

```
{
  "Ethernet48": "100000"
}
```

Final list of ports to be added :

```
{
  "Ethernet48": "25000",
  "Ethernet49": "25000",
  "Ethernet50": "25000",
  "Ethernet51": "25000"
}
```

sonic\_yang(6):Note: Below table(s) have no YANG models: REST\_SERVER, SNMP, SNMP\_COMMUNITY, XCVRD\_LOG

Breakout process got successfully completed.

Please note loaded setting will be lost after system reboot. To preserve setting, run `config save`.

Caution: Be careful, please use include the mode setting with ' '.

Step 4. Show breakout current mode status and interface status

```
admin@sonic:~$ show interfaces breakout current-mode Ethernet48
```

```
+-----+-----+
| Interface | Current Breakout Mode |
+=====+=====+
| Ethernet48 | 4x25G                |
+-----+-----+
```

```
admin@sonic:~$ show interfaces status Ethernet48-51
```

Interface	Lanes	Speed	MTU	FEC	Alias	Vlan	Oper	Admin	Type	Asym	PFC
Ethernet48	77	25G	9100	none	Eth49/1(Port49)	routed	down	down	down	QSFP+ or later	N/A
Ethernet49	78	25G	9100	none	Eth49/2(Port49)	routed	down	down	down	N/A	N/A
Ethernet50	79	25G	9100	none	Eth49/3(Port49)	routed	down	down	down	N/A	N/A
Ethernet51	80	25G	9100	none	Eth49/4(Port49)	routed	down	down	down	N/A	N/A

Step 5. Set the admin status of interface to startup

```
admin@sonic:~$ sudo config interface startup Ethernet48-51
```

```
admin@sonic:~$ show interfaces status Ethernet48-51
```

Interface	Lanes	Speed	MTU	FEC	Alias	Vlan	Oper	Admin	Type	Asym	PFC
Ethernet48	77	25G	9100	none	Eth49/1(Port49)	routed	up	up	up	QSFP+ or later	N/A
Ethernet49	78	25G	9100	none	Eth49/2(Port49)	routed	up	up	up	N/A	N/A
Ethernet50	79	25G	9100	none	Eth49/3(Port49)	routed	up	up	up	N/A	N/A
Ethernet51	80	25G	9100	none	Eth49/4(Port49)	routed	up	up	up	N/A	N/A

Step 6. Save configuration to startup configuration.

```
admin@sonic:~$ sudo config save -y
```

```
Running command: /usr/local/bin/sonic-cfggen -d --print-data > /etc/sonic/config_db.json
```