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## Show Commands

### open-flow

<b>Syntax</b>	<b>open-flow</b>
<b>Context</b>	show
<b>Description</b>	Displays OpenFlow switch hybrid information.

### of-switch

<b>Syntax</b>	<b>of-switch</b> <b>of-switch</b> <i>ofs-name</i> <b>controller</b> <i>ip-address:port</i> <b>detail</b> <b>of-switch</b> <i>ofs-name</i> <b>status controller</b> [ <i>ip-address:port</i> ] <b>of-switch</b> <i>ofs-name</i> <b>controller</b> <b>of-switch</b> <i>ofs-name</i> <b>flowtable</b> <b>of-switch</b> <i>ofs-name</i> <b>status</b> <b>of-switch</b> <i>ofs-name</i> <b>port</b>						
<b>Context</b>	show>open-flow						
<b>Description</b>	This command displays information related to H-OFS configuration and operations as per parameters specified.						
<b>Parameters</b>	<p>none — Displays a summary for H-OFS instances configured.</p> <p><i>ofs-name</i> — Specifies the name of the configured H-OFS instance, up to 32 characters.</p> <p><b>controller</b> <i>ip-address:port</i> — Displays information on the controller for the specified H-OFS instance.</p> <table> <tr> <td><b>Values</b></td> <td>ip-address:</td> <td>a.b.c.d</td> </tr> <tr> <td></td> <td>port:</td> <td>1—65535</td> </tr> </table> <p><b>detail</b> — Displays detailed information.</p> <p><b>status</b> — Displays status information for the specified H-OFS switch or its controller.</p> <p><b>flowtable</b> — Displays information about flowtables for the specified H-OFS instance.</p> <p><b>port</b> — Displays information about the logical OpenFlow ports registered with the specified H-OFS instance.</p>	<b>Values</b>	ip-address:	a.b.c.d		port:	1—65535
<b>Values</b>	ip-address:	a.b.c.d					
	port:	1—65535					

#### Sample Output

```
*A:Dut-A# show open-flow of-switch "s1" status
```

```
=====
Open Flow Switch Information
```

## Show Commands

```
=====
Switch Name      : s1
Data Path ID    : 0
Echo Interval   : 10 seconds
Logical Port Type : all
Buffer Size     : 256
Description     : test-sw1
Capabilities Supp. : flow-stats table-stats port-stats
=====

*A:Dut-A# show open-flow of-switch "s1" controller

=====
Open Flow Controller Summary
=====
IP Address      Port
-----
10.20.1.2      6633
10.20.1.3      6633
-----
Number of Controllers : 2
=====

*A:Dut-A# show open-flow of-switch "s1" controller 10.20.1.2:6633 detail

=====
Open Flow Controller Information
=====
IP Address      : 10.20.1.2      Port      : 6633
Role           : equal          Generation ID : 0
-----

Open Flow Channel Information
-----
Channel ID      : 1          Version      : 4
Connection Type : primary      Operational Status: Up
Operational Flags : socketStateEstablished helloReceived helloTransmitted
                    handshake
Async Fltr Packet In
  (Master or Equal) : tableMiss applyAction
  (Slave)           : (Not Specified)
Async Fltr Port Status
  (Master or Equal) : portAdd portDelete portModify
  (Slave)           : portAdd portDelete portModify
Async Fltr Flow Rem
  (Master or Equal) : idleTimeOut hardTimeOut flowModDelete groupDelete
  (Slave)           : (Not Specified)

Echo Time Expiry : 0d 00:00:10      Hold Time Expiry : 0d 00:00:30
Conn. Uptime     : 0d 00:00:00      Conn. Retry       : 0d 00:00:00
-----

Open Flow Channel Stats - Channel ID(1)
-----
Packet Type      Transmitted Packets  Received Packets      Error Packets
-----
Hello           1                    1                      0
Error           0                    0                      0
-----
```

```

Echo Request      0          70          0
Echo Reply        70          0          0
Experimenter      0          0          0
Feat. Request     0          1          0
Feat. Reply       1          0          0
Get Cfg Request   0          1          0
Get Cfg Reply     1          0          0
Set Config        0          1          0
Packet In         0          0          0
Flow Removed      0          0          0
Port Status       0          0          6
Packet Out        0          0          0
Flow Modify       0          0          0
Group Modify      0          0          0
Port Modify       0          0          0
Table Modify      0          0          0
Multipart Req    0          0          0
Multipart Reply  0          0          0
Barrier Request   0          0          0
Barrier Reply     0          0          0
Get Q Cfg Req     0          0          0
Get Q Cfg Reply   0          0          0
Role Request      0          0          0
Role Reply        0          0          0
Get Async Req     0          0          0
Get Async Reply   0          0          0
Set Async         0          0          0
Meter Modify      0          0          0

```

```

-----
-----
=====
*A:Dut-A# show open-flow of-switch "s1" flowtable

```

```

=====
Flow Table Information
=====
Flow Table ID      : 0          Max-Size          : 1000
No-Match Action    : fall-through  Curr Num. of Entries : 1
Max. Num. of Entries : 54
=====

```

```

*A:Dut-A# show open-flow of-switch "s1" port

```

```

=====
Open Flow Port Stats
=====
Port ID      Port Name          Transmitted Packets  Transmitted Bytes
-----
1073741825  to_B              0                   0
1073741826  to_C              0                   0
1073741827  to_D              0                   0
1073741828  to_E              0                   0
1073741829  to_F              0                   0
1073742824  1                 0                   0
=====

```

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## Debug Commands

### open-flow

<b>Syntax</b>	<b>open-flow</b>
<b>Context</b>	tools>dump
<b>Description</b>	This command enables dumping of the open-flow information.

### of-switch

	<b>Syntax</b>	<b>of-switch</b> <i>ofs-name</i> [ <b>flowtable</b> <i>of-table-id</i> ] [ <b>grt</b>   <b>system</b>   <b>service-id</b> <i>service-id</i> ] [ <b>cookie</b> <i>hex-string</i> ] [ <b>priority</b> <i>priority</i> ]
		<b>of-switch</b> <i>ofs-name</i> [ <b>flowtable</b> <i>of-table-id</i> ] <b>service-id</b> <i>service-id</i> <b>sap</b> <i>sap-id</i> [ <b>cookie</b> <i>hex-string</i> ] [ <b>priority</b> <i>priority</i> ]
		<b>of-switch</b> <i>ofs-name</i> [ <b>flowtable</b> <i>of-table-id</i> ] <b>summary</b>
	<b>Context</b>	tools>dump>open-flow
	<b>Description</b>	<p>This command can be used to dump information for a given open-flow switch or its flowtable. Priority and cookie filters are provided no focus on part of a flow table.</p> <p>Usage examples:</p> <p>a. <b>tools&gt;dump&gt;open-flow&gt;of-switch ofs-test</b> — This command displays detailed flow information for a given OpenFlow switch. If the switch has <b>switch-defined-cookie</b> enabled, the flows with all cookie-types are displayed.</p> <p>b. <b>tools&gt;dump&gt;open-flow&gt;of-switch ofs summary</b> — This command displays a summary of each cookie context and the number of flows in it for the switch that has <b>switch-defined-cookie</b> enabled. If <b>switch-defined-cookie</b> is disabled, then the total number of entries is displayed (single context).</p> <p>c. Options like <b>grt</b>, <b>system</b>, <b>service-id</b>, <b>sap-id</b>, <b>cookie</b>, and <b>priority</b> can be used to limit display entries to the specified options.</p>
	<b>Parameters</b>	<p><i>ofs-name</i> — Specifies the name of the OFS instance, up to 32 characters.</p> <p><i>of-table-id</i> — Specifies the identifier for the OpenFlow table.</p> <p><b>Values</b>      0</p> <p><i>hex-string</i> — Specifies the identifier for the OpenFlow cookies.</p> <p><b>Values</b>      0x0 — 0xFFFFFFFFFFFFFFFF</p> <p><i>priority</i> — Specifies the priority for the OpenFlow switch.</p> <p><b>Values</b>      0 — 65535</p>

*service-id* — Specifies the identifier for the service.

**Values** 1 — 2148007978 | *svc-name*: 64 characters max

*sap-id* — Specifies the identifier for the Ethernet SAP.

<b>Values</b>	<i>sap-id</i>	null port-id bundle-id bpgrp-id lag-id aps-id> dot1q port-id bundle-id bpgrp-id lag-id aps-id pw-id>:qtag1 qinq port-id bundle-id bpgrp-id lag-id pw-id>:qtag1.qtag2 atm <port-id aps-id>[:vpi/vci vpi vpi1.vpi2 cp.conn-prof- id]
		cp keyword conn-prof-id 1..8000 frame port-id aps-id:dldci cisco-hdlc slot/mda/port.channel cem slot/mda/port.channel ima-grp bundle-id>[:vpi/vci vpi vpi1.vpi2 cp.conn-prof-id] cp keyword conn-prof-id 1..8000 port-id slot/mda/port[.channel] bundle-id bundle-<type>-slot/mda. <i>bundle-num</i> bundle keyword type ima, fr, ppp bundle-num 1..336 bpgrp-id bpgrp-<type>-<bpgrp-num> bpgrp keyword type ima, ppp bpgrp-num 1..2000 aps-id aps-<group-id>[.channel] aps keyword group-id 1..64 ccag-id <i>ccag-id.path-id[cc-type]&lt;cc-id</i> ccag keyword id 1..8 path-id a, b cc-type .sap-net, .net-sap cc-id 0..4094 eth-tunnel eth-tunnel-id[:eth-tun-sap-id] id 1..1024 eth-tun-sap-id 0..4094 lag-id lag-id lag keyword id 1..800 pw-id pw- <i>id</i> pw keyword id 1..10239 qtag1 *, 0..4094 qtag2 * 0..4094 vpi 0..4095 (NNI) 0..255 (UNI) vci 1, 2, 5..65535

```

dlci      16..1022
tunnel-id tunnel-id,private|public:tag
tunnel    keyword
id        1..16
tag       0..4094
    
```

**summary** — Keyword to summarize output.

*ip-address:port* — *ip-address*: a.b.c.d  
*port*: 1 to 65535

**Sample Output**

```

=====
Switch: ofs
=====
Table      : 0                               Flow Pri   : 0
Cookie     : 0x0000000000000000             CookieType: grt
Controller: :::0
Filter Hnd: 0xC30000010000FFFF
Filter     : _tmnx_ofs_ofs:1 entry 65535

In Port    : *
VID        : *                               Outer VID  : *
EthType    : *
Src IP     : *
Dst IP     : *
IP Proto   : *                               DSCP      : *
Src Port   : *                               Dst Port  : *
ICMP Type  : *                               ICMP Code : *
Label     : *
IPv6ExtHdr: (Not Specified)

Action     : Fall-through

Flow Flags: IPv4/6 [!E] [RO] [DEF]
Up Time    : 0d 00:03:51                     Add TS    : 680828
Mod TS     : 0                               Stats TS  : 703820
#Packets   : 0                               #Bytes    : 0
-----
Table      : 0                               Flow Pri   : 16
Cookie     : 0x0000000000000000             CookieType: grt
Controller: 1.3.8.8:6633
Filter Hnd: 0x830000010000FFEF
Filter     : _tmnx_ofs_ofs:1 entry 65519

In Port    : *
VID        : *                               Outer VID  : *
EthType    : 0x0800
Src IP     : *
Dst IP     : 22.22.22.1/32
IP Proto   : *                               DSCP      : *
Src Port   : *                               Dst Port  : *
ICMP Type  : *                               ICMP Code : *
Label     : *

Action     : Forward On Svc 99
    
```

```

Flow Flags: IPv4
Up Time   : 0d 00:01:15           Add TS    : 696581
Mod TS    : 0                     Stats TS  : 703820
#Packets  : 0                     #Bytes   : 0
-----
Table     : 0                     Flow Pri  : 17
Cookie    : 0xC000006300000000   CookieType: service 99
Controller: 1.3.8.8:6633
Filter Hnd: 0x8300000D0000FFEE
Filter    : _tmnx_ofs_ofs:13 entry 65518

In Port   : *
VID       : *                     Outer VID : *
EthType   : 0x0800
Src IP    : *
Dst IP    : 22.22.22.2/32
IP Proto  : *                     DSCP      : *
Src Port  : *                     Dst Port  : *
ICMP Type : *                     ICMP Code : *
Label     : *

Action    : Forward On GRT

Flow Flags: IPv4
Up Time   : 0d 00:01:10           Add TS    : 697095
Mod TS    : 0                     Stats TS  : 703820
#Packets  : 0                     #Bytes   : 0
-----
Table     : 0                     Flow Pri  : 4
Cookie    : 0xC000007E200000000   CookieType: service 2018
Controller: 1.3.8.8:6633
Filter Hnd: 0x830000050000FFFB
Filter    : _tmnx_ofs_ofs:5 entry 65531
SAP       : 1/1/3:0

In Port   : 0x2218000
VID       : 0x1000                 Outer VID : *
EthType   : 0x0800
Src IP    : *
Dst IP    : *
IP Proto  : *                     DSCP      : *
Src Port  : *                     Dst Port  : *
ICMP Type : *                     ICMP Code : *
Label     : *

Action    : Forward On Sap
           Sap 1/1/3:0

Flow Flags: IPv4
Up Time   : 0d 00:02:13           Add TS    : 690788
Mod TS    : 0                     Stats TS  : 703820
#Packets  : 0                     #Bytes   : 0
-----
Table     : 0                     Flow Pri  : 3
Cookie    : 0xC000007E200000000   CookieType: service 2018
Controller: 1.3.8.8:6633
Filter Hnd: 0x830000040000FFFC
Filter    : _tmnx_ofs_ofs:4 entry 65532

```

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```
SAP      : 1/1/3:4094

In Port  : 0x2218000
VID      : 0x1ffe                               Outer VID : *
EthType  : 0x0800
Src IP   : *
Dst IP   : *
IP Proto : *                                   DSCP      : *
Src Port : *                                   Dst Port  : *
ICMP Type : *                                ICMP Code : *
Label    : *

Action   : Forward On Sap
          Sap 1/1/3:4094

Flow Flags: IPv4
Up Time  : 0d 00:02:18                         Add TS    : 690274
Mod TS   : 0                                    Stats TS  : 703820
#Packets : 0                                    #Bytes    : 0
-----
Table    : 0                                    Flow Pri  : 5
Cookie   : 0xC00007E200000000                 CookieType: service 2018
Controller: 1.3.8.8:6633
Filter Hnd: 0x830000060000FFFA
Filter   : _tmnx_ofs_ofs:6 entry 65530
SAP      : lag-800:4094

In Port  : 0x50000320
VID      : 0x1ffe                               Outer VID : *
EthType  : 0x0800
Src IP   : *
Dst IP   : *
IP Proto : *                                   DSCP      : *
Src Port : *                                   Dst Port  : *
ICMP Type : *                                ICMP Code : *
Label    : *

Action   : Forward On Sap
          Sap lag-800:4094

Flow Flags: IPv4
Up Time  : 0d 00:02:09                         Add TS    : 691201
Mod TS   : 0                                    Stats TS  : 703821
#Packets : 0                                    #Bytes    : 0
-----
Table    : 0                                    Flow Pri  : 8
Cookie   : 0xC00007E300000000                 CookieType: service 2019
Controller: 1.3.8.8:6633
Filter Hnd: 0x830000090000FFF7
Filter   : _tmnx_ofs_ofs:9 entry 65527
SAP      : 2/1/3:1.0

In Port  : 0x4218000
VID      : 0x1000                               Outer VID : 0x1001
EthType  : 0x0800
Src IP   : *
Dst IP   : *
IP Proto : *                                   DSCP      : *
Src Port : *                                   Dst Port  : *
```



```

ICMP Type : *
Label      : *
Action     : Forward On Sap
            Sap 2/1/3:1.0

Flow Flags: IPv4
Up Time    : 0d 00:01:56
Mod TS     : 0
#Packets   : 0
Add TS     : 692448
Stats TS   : 703821
#Bytes     : 0
-----
Table      : 0
Cookie     : 0xC00007E300000000
Controller: 1.3.8.8:6633
Filter Hnd: 0x830000080000FFF8
Filter     : _tmnx_ofs_ofs:8 entry 65528
SAP        : 2/1/3:4094.4094
Flow Pri   : 7
CookieType: service 2019

In Port    : 0x4218000
VID        : 0x1ffe
EthType    : 0x0800
Src IP     : *
Dst IP     : *
IP Proto   : *
Src Port   : *
ICMP Type  : *
Label      : *
DSCP       : *
Dst Port   : *
ICMP Code  : *

Action     : Forward On Sap
            Sap 2/1/3:4094.4094

Flow Flags: IPv4
Up Time    : 0d 00:02:01
Mod TS     : 0
#Packets   : 0
Add TS     : 692032
Stats TS   : 703821
#Bytes     : 0
-----
Table      : 0
Cookie     : 0xC00007E300000000
Controller: 1.3.8.8:6633
Filter Hnd: 0x8300000B0000FFF5
Filter     : _tmnx_ofs_ofs:11 entry 65525
SAP        : lag-799:4094.4094
Flow Pri   : 10
CookieType: service 2019

In Port    : 0x5000031f
VID        : 0x1ffe
EthType    : 0x0800
Src IP     : *
Dst IP     : *
IP Proto   : *
Src Port   : *
ICMP Type  : *
Label      : *
DSCP       : *
Dst Port   : *
ICMP Code  : *

Action     : Forward On Sap
            Sap lag-799:4094.4094

Flow Flags: IPv4
Up Time    : 0d 00:01:46
Mod TS     : 0
Add TS     : 693483
Stats TS   : 703821

```

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```
#Packets : 0                               #Bytes : 0
-----
Table : 0                                  Flow Pri : 1
Cookie : 0xC00007E400000000             CookieType: service 2020
Controller: 1.3.8.8:6633
Filter Hnd: 0x830000020000FFFE
Filter : _tmnx_ofs_ofs:2 entry 65534
SAP : 2/1/4

In Port : 0x4220000
VID : 0x0                                  Outer VID : *
EthType : 0x0800
Src IP : *
Dst IP : *
IP Proto : *                               DSCP : *
Src Port : *                               Dst Port : *
ICMP Type : *                             ICMP Code : *
Label : *

Action : Forward On Sap
        Sap 2/1/4

Flow Flags: IPv4
Up Time : 0d 00:02:27                     Add TS : 689443
Mod TS : 0                                 Stats TS : 703821
#Packets : 0                               #Bytes : 0
-----
Table : 0                                  Flow Pri : 12
Cookie : 0xC00007E400000000             CookieType: service 2020
Controller: 1.3.8.8:6633
Filter Hnd: 0x830000020000FFF3
Filter : _tmnx_ofs_ofs:2 entry 65523
SAP : 2/1/4

In Port : 0x4220000
VID : 0x0                                  Outer VID : *
EthType : 0x0800
Src IP : *
Dst IP : *
IP Proto : *                               DSCP : *
Src Port : *                               Dst Port : *
ICMP Type : *                             ICMP Code : *
Label : *

Action : Forward Sdp 12:4294967295

Flow Flags: IPv4
Up Time : 0d 00:01:36                     Add TS : 694524
Mod TS : 0                                 Stats TS : 703821
#Packets : 0                               #Bytes : 0
-----
Table : 0                                  Flow Pri : 13
Cookie : 0xC00007E400000000             CookieType: service 2020
Controller: 1.3.8.8:6633
Filter Hnd: 0x830000020000FFF2
Filter : _tmnx_ofs_ofs:2 entry 65522
SAP : 2/1/4

In Port : 0x4220000
```

```

VID : 0x0 Outer VID : *
EthType : 0x0800
Src IP : *
Dst IP : *
IP Proto : * DSCP : *
Src Port : * Dst Port : *
ICMP Type : * ICMP Code : *
Label : *

```

```

Action : Forward On Nhop(Indirect)
        Nhop: 200.180.200.180

```

```

Flow Flags: IPv4
Up Time : 0d 00:01:31 Add TS : 695037
Mod TS : 0 Stats TS : 703821
#Packets : 0 #Bytes : 0

```

```

-----
Table : 0 Flow Pri : 15
Cookie : 0xC00007E400000000 CookieType: service 2020
Controller: 1.3.8.8:6633
Filter Hnd: 0x830000020000FFF0
Filter : _tmnx_ofs_ofs:2 entry 65520
SAP : 2/1/4

```

```

In Port : 0x4220000
VID : 0x0 Outer VID : *
EthType : 0x0800
Src IP : *
Dst IP : *
IP Proto : * DSCP : *
Src Port : * Dst Port : *
ICMP Type : * ICMP Code : *
Label : *

```

```

Action : Forward LspId 1
        Lsp lsp1

```

```

Flow Flags: IPv4
Up Time : 0d 00:01:21 Add TS : 696067
Mod TS : 0 Stats TS : 703822
#Packets : 0 #Bytes : 0

```

```

-----
Table : 0 Flow Pri : 14
Cookie : 0xC00007E400000000 CookieType: service 2020
Controller: 1.3.8.8:6633
Filter Hnd: 0x430000020000FFF1
Filter : _tmnx_ofs_ofs:2 entry 65521
SAP : 2/1/4

```

```

In Port : 0x4220000
VID : 0x0 Outer VID : *
EthType : 0x86dd
Src IP : *
Dst IP : *
IP Proto : * DSCP : *
Src Port : * Dst Port : *
ICMP Type : * ICMP Code : *
Label : *
IPv6ExtHdr: (Not Specified)

```

## Show Commands

```
Action      : Forward On Nhop(Indirect)
              Nhop: 3ffe:1111:1111:2222:2222:3333:3333:4444

Flow Flags: IPv6
Up Time    : 0d 00:01:26                Add TS     : 695551
Mod TS     : 0                          Stats TS   : 703822
#Packets   : 0                          #Bytes     : 0
-----

Table      : 0                          Flow Pri   : 2
Cookie     : 0xC00007E400000000         CookieType: service 2020
Controller: 1.3.8.8:6633
Filter Hnd: 0x830000030000FFFD
Filter     : _tmnx_ofs_ofs:3 entry 65533
SAP        : lag-798

In Port    : 0x5000031e
VID        : 0x0                        Outer VID  : *
EthType    : 0x0800
Src IP     : *
Dst IP     : *
IP Proto   : *                          DSCP      : *
Src Port   : *                          Dst Port  : *
ICMP Type  : *                          ICMP Code  : *
Label     : *

Action      : Forward On Sap
              Sap lag-798

Flow Flags: IPv4
Up Time    : 0d 00:02:23                Add TS     : 689857
Mod TS     : 0                          Stats TS   : 703822
#Packets   : 0                          #Bytes     : 0
-----

Table      : 0                          Flow Pri   : 19
Cookie     : 0x8000000000000000         CookieType: system
Controller: 1.3.8.8:6633
Filter Hnd: 0x4300000E0000FFEC
Filter     : _tmnx_ofs_ofs:14 entry 65516

In Port    : *
VID        : *                          Outer VID  : *
EthType    : 0x86dd
Src IP     : *
Dst IP     : 3ffe::1616:1601/128
IP Proto   : *                          DSCP      : *
Src Port   : *                          Dst Port  : *
ICMP Type  : *                          ICMP Code  : *
Label     : *
IPv6ExtHdr: (Not Specified)

Action      : Forward On Nhop(Indirect)
              Nhop: 3ffe:1111:1111:2222:2222:3333:3333:4444

Flow Flags: IPv6
Up Time    : 0d 00:01:01                Add TS     : 698121
Mod TS     : 0                          Stats TS   : 703822
#Packets   : 0                          #Bytes     : 0
-----
```

```

Table      : 0                               Flow Pri   : 18
Cookie     : 0x8000000000000000             CookieType: system
Controller: 1.3.8.8:6633
Filter Hnd: 0x8300000E0000FFED
Filter     : _tmnx_ofs_ofs:14 entry 65517
    
```

```

In Port    : *
VID        : *                               Outer VID  : *
EthType    : 0x0800
Src IP     : *
Dst IP     : 22.22.22.1/32
IP Proto   : *                               DSCP      : *
Src Port   : *                               Dst Port  : *
ICMP Type  : *                               ICMP Code : *
Label      : *
    
```

```

Action     : Forward On Nhop(Indirect)
            Nhop: 200.180.200.180
    
```

```

Flow Flags: IPv4
Up Time    : 0d 00:01:06                     Add TS    : 697608
Mod TS     : 0                               Stats TS  : 703822
#Packets   : 0                               #Bytes   : 0
    
```

-----  
Number of flows: 17  
=====

\*A:Dut-C#

Show Commands