

**NAME**

nmcli-examples – usage examples of nmcli

**SYNOPSIS**

**nmcli** [OPTIONS...]

**DESCRIPTION**

*nmcli* is a command-line client for NetworkManager. It allows controlling NetworkManager and reporting its status. For more information please refer to **nmcli**(1) manual page.

The purpose of this manual page is to provide you with various examples and usage scenarios of *nmcli*.

**EXAMPLES****Example 1. Listing available Wi-Fi APs**

**\$ nmcli device wifi list**

```
* SSID      MODE  CHAN  RATE   SIGNAL  BARS  SECURITY
netdatacomm_local Infra 6   54 Mbit/s 37   __  WEP
* F1        Infra 11  54 Mbit/s 98    ____ WPA1
LoremCorp   Infra 1   54 Mbit/s 62    _  WPA2 802.1X
Internet    Infra 6   54 Mbit/s 29    ____ WPA1
HPB110a.F2672A Ad-Hoc 6   54 Mbit/s 22    ____ --
Jozinet     Infra 1   54 Mbit/s 19    ____ WEP
VOIP        Infra 1   54 Mbit/s 20    ____ WEP
MARTINA     Infra 4   54 Mbit/s 32    __  WPA2
N24PU1      Infra 7   11 Mbit/s 22    ____ --
alfa        Infra 1   54 Mbit/s 67    _  WPA2
bertnet     Infra 5   54 Mbit/s 20    ____ WPA1 WPA2
```

This command shows how to list available Wi-Fi networks (APs). You can also use `--fields` option for displaying different columns. **nmcli -f all dev wifi list** will show all of them.

**Example 2. Connect to a password-protected wifi network**

**\$ nmcli device wifi connect "\$SSID" password "\$PASSWORD"**

**\$ nmcli --ask device wifi connect "\$SSID"**

**Example 3. Showing general information and properties for a Wi-Fi interface**

**\$ nmcli -p -f general,wifi-properties device show wlan0**

```
=====
Device details (wlan0)
=====
GENERAL.DEVICE:      wlan0
GENERAL.TYPE:        wifi
GENERAL.VENDOR:      Intel Corporation
GENERAL.PRODUCT:      PRO/Wireless 5100 AGN [Shiloh] Network Connection
GENERAL.DRIVER:      iwlwifi
GENERAL.DRIVER-VERSION: 3.8.13-100.fc17.x86_64
GENERAL.FIRMWARE-VERSION: 8.83.5.1 build 33692
GENERAL.HWADDR:      00:1E:65:37:A1:D3
GENERAL.MTU:          1500
GENERAL.STATE:        100 (connected)
GENERAL.REASON:        0 (No reason given)
GENERAL.UDI:          /sys/devices/pci0000:00/0000:00:1c.1/net/wlan0
GENERAL.IP-IFACE:      wlan0
GENERAL.IS-SOFTWARE:   no
GENERAL.NM-MANAGED:    yes
```

```

GENERAL.AUTOCONNECT:  yes
GENERAL.FIRMWARE-MISSING: no
GENERAL.CONNECTION:   My Alfa WiFi
GENERAL.CON-UUID:      85194f4c-d496-4eec-bae0-d880b4cbcf26
GENERAL.CON-PATH:      /org/freedesktop/NetworkManager/ActiveConnection/
10

```

---

```

WIFI-PROPERTIES.WEP:  yes
WIFI-PROPERTIES.WPA:  yes
WIFI-PROPERTIES.WPA2: yes
WIFI-PROPERTIES.TKIP: yes
WIFI-PROPERTIES.CCMP: yes
WIFI-PROPERTIES.AP:   no
WIFI-PROPERTIES.ADHOC: yes

```

---

This command shows information about a Wi-Fi device.

#### Example 4. Listing NetworkManager polkit permissions

##### \$ nmcli general permissions

PERMISSION	VALUE
org.freedesktop.NetworkManager.enable-disable-network	yes
org.freedesktop.NetworkManager.enable-disable-wifi	yes
org.freedesktop.NetworkManager.enable-disable-wwan	yes
org.freedesktop.NetworkManager.enable-disable-wimax	yes
org.freedesktop.NetworkManager.sleep-wake	no
org.freedesktop.NetworkManager.network-control	yes
org.freedesktop.NetworkManager.wifi.share.protected	yes
org.freedesktop.NetworkManager.wifi.share.open	yes
org.freedesktop.NetworkManager.settings.modify.system	yes
org.freedesktop.NetworkManager.settings.modify.own	yes
org.freedesktop.NetworkManager.settings.modify.hostname	auth
org.freedesktop.NetworkManager.settings.modify.global-dns	auth
org.freedesktop.NetworkManager.reload	auth

This command shows configured polkit permissions for various NetworkManager operations. These permissions or actions (using polkit language) are configured by a system administrator and are not meant to be changed by users. The usual place for the polkit configuration is `/usr/share/polkit-1/actions/org.freedesktop.NetworkManager.policy`. *pkaction* command can display description for polkit actions.

**pkaction --action-id org.freedesktop.NetworkManager.network-control --verbose**

More information about polkit can be found at <http://www.freedesktop.org/wiki/Software/polkit>.

#### Example 5. Listing NetworkManager log level and domains

##### \$ nmcli general logging

```

LEVEL  DOMAINS
INFO   PLATFORM,RFKILL,ETHER,WIFI,BT,MB,DHCP4,DHCP6,PPP,WIFI_SCAN,IP4,IP6,A
      UTOIP4,DNS,VPN,SHARING,SUPPLICANT,AGENTS,SETTINGS,SUSPEND,CORE,DEVICE,OLPC,
      WIMAX,INFINIBAND,FIREWALL,ADSL,BOND,VLAN,BRIDGE,DBUS_PROPS,TEAM,CONCHECK,DC
      B,DISPATCH

```

This command shows current NetworkManager logging status.

**Example 6. Changing NetworkManager logging**

```
$ nmcli g log level DEBUG domains CORE,ETHER,IP
$ nmcli g log level INFO domains DEFAULT
```

The first command makes NetworkManager log in DEBUG level, and only for CORE, ETHER and IP domains. The second command restores the default logging state. Please refer to the [NetworkManager.conf\(5\)](#) manual page for available logging levels and domains.

**Example 7. Activating a VPN connection profile requiring interactive password input**

```
$ nmcli --ask con up my-vpn-con
```

This command activates a VPN connection profile enabling nmcli to interact with the user ('--ask'): this will allow nmcli to prompt for the VPN password on the command line when the *password-flags* are set to '0x02' ('always ask', see [nm-settings\(5\)](#)). This is particularly useful for OTP based VPNs, as the user needs to be prompted for the password each time the connection is activated.

**Example 8. Adding a bonding master and two slave connection profiles**

```
$ nmcli con add type bond ifname mybond0 mode active-backup
$ nmcli con add type ethernet ifname eth1 master mybond0
$ nmcli con add type ethernet ifname eth2 master mybond0
```

This example demonstrates adding a bond master connection and two slaves. The first command adds a master bond connection, naming the bonding interface *mybond0* and using *active-backup* mode. The next two commands add slaves connections, both enslaved to *mybond0*. The first slave will be bound to *eth1* interface, the second to *eth2*.

**Example 9. Adding a team master and two slave connection profiles**

```
$ nmcli con add type team con-name Team1 ifname Team1 config team1-master-json.conf
$ nmcli con add type ethernet con-name Team1-slave1 ifname em1 master Team1
$ nmcli con add type ethernet con-name Team1-slave2 ifname em2 master Team1
```

This example demonstrates adding a team master connection profile and two slaves. It is very similar to the bonding example. The first command adds a master team profile, naming the team interface and the profile *Team1*. The team configuration for the master is read from *team1-master-json.conf* file. Later, you can change the configuration with *modify* command (**`nmcli con modify Team1 team.config team1-master-another-json.conf`**). The last two commands add slaves profiles, both enslaved to *Team1*. The first slave will be bound to the *em1* interface, the second to *em2*. The slaves don't specify *config* and thus *teamd* will use its default configuration. You will activate the whole setup by activating both slaves:

```
$ nmcli con up Team1-slave1
$ nmcli con up Team1-slave2
```

By default, the created profiles are marked for auto-activation. But if another connection has been activated on the device, the new profile won't activate automatically and you need to activate it manually.

**Example 10. Adding a bridge and two slave profiles**

```
$ nmcli con add type bridge con-name TowerBridge ifname TowerBridge
$ nmcli con add type ethernet con-name br-slave-1 ifname ens3 master TowerBridge
$ nmcli con add type ethernet con-name br-slave-2 ifname ens4 master TowerBridge
$ nmcli con modify TowerBridge bridge.stp no
```

This example demonstrates adding a bridge master connection and two slaves. The first command adds a master bridge connection, naming the bridge interface and the profile as *TowerBridge*. The next two commands add slaves profiles, both will be enslaved to *TowerBridge*. The first slave will be tied to *ens3* interface, the second to *ens4*. The last command will disable 802.1D STP for the *TowerBridge* profile.

**Example 11. Adding an ethernet connection profile with manual IP configuration**

```
$ nmcli con add con-name my-con-em1 ifname em1 type ethernet \
  ip4 192.168.100.100/24 gw4 192.168.100.1 ip4 1.2.3.4 ip6 abbe::cafe
$ nmcli con mod my-con-em1 ipv4.dns "8.8.8.8 8.8.4.4"
$ nmcli con mod my-con-em1 +ipv4.dns 1.2.3.4
$ nmcli con mod my-con-em1 ipv6.dns "2001:4860:4860::8888 2001:4860:4860::8844"
$ nmcli -p con show my-con-em1
```

The first command adds an Ethernet connection profile named *my-con-em1* that is bound to interface name *em1*. The profile is configured with static IP addresses. Three addresses are added, two IPv4 addresses and one IPv6. The first IP 192.168.100.100 has a prefix of 24 (netmask equivalent of 255.255.255.0). Gateway entry will become the default route if this profile is activated on *em1* interface (and there is no connection with higher priority). The next two addresses do not specify a prefix, so a default prefix will be used, i.e. 32 for IPv4 and 128 for IPv6. The second, third and fourth commands modify DNS parameters of the new connection profile. The last *con show* command displays the profile so that all parameters can be reviewed.

**Example 12. Convenient field values retrieval for scripting**

```
$ nmcli -g ip4.address connection show my-con-eth0
192.168.1.12/24

$ nmcli -g ip4.address,ip4.dns connection show my-con-eth0
192.168.1.12/24
192.168.1.1

$ nmcli -g ip4 connection show my-con-eth0
IP4:192.168.1.12/24;192.168.1.1::192.168.1.1::
```

This example shows retrieval of ip4 connection field values via the `--get-values` option. Multiple comma separated fields can be provided: they will be printed one per line. If a whole section is provided instead of a single field, the name of the section will be printed followed by all the related field values on the same line. See also `--terse`, `--mode`, `--fields` and `--escape` options in **nmcli(1)** manual page for more customized output.

**Example 13. Adding an Ethernet connection and configuring SR-IOV VFs**

```
$ nmcli con add type ethernet con-name EthernetPF ifname em1
$ nmcli con modify EthernetPF sriov.total-vfs 3 sriov.autoprobe-drivers false
$ nmcli con modify EthernetPF sriov.vfs '0 mac=00:11:22:33:44:55 vlans=10, 1 trust=true spoof-check=false'
$ nmcli con modify EthernetPF +sriov.vfs '2 max-tx-rate=20'
```

This example demonstrates adding an Ethernet connection for physical function (PF) *ens4* and configuring 3 SR-IOV virtual functions (VFs) on it. The first VF is configured with MAC address 00:11:22:33:44:55 and VLAN 10, the second one has the *trust* and *spoof-check* features respectively enabled and disabled. VF number 2 has a maximum transmission rate of 20Mbps. The kernel is instructed to not automatically instantiate a network interface for the VFs.

**Example 14. Escaping colon characters in tabular mode**

```
$ nmcli -t -f general -e yes -m tab dev show eth0
GENERAL:eth0:ethernet:Intel Corporation:82567LM Gigabit Network Connection:
e1000e:2.1.4-k:1.8-3:00\;22\;68\;15\;29\;21:1500:100 (connected):0 (No reas
on given):/sys/devices/pci0000\;00\;0000\;00\;19.0/net/eth0:eth0:yes:yes:no:
ethernet-13:89cbbc6-dc85-456c-9c8b-bd828fee3917:/org/freedesktop/NetworkMa
nager/ActiveConnection/9
```

This example shows escaping colon characters in tabular mode. It may be useful for script processing,

because ':' is used as a field separator.

**Example 15. nmcli usage in a NetworkManager dispatcher script to make Ethernet and Wi-Fi mutually exclusive**

```
#!/bin/bash
export LC_ALL=C

enable_disable_wifi ()
{
    result=$(nmcli dev | grep "ethernet" | grep -w "connected")
    if [ -n "$result" ]; then
        nmcli radio wifi off
    else
        nmcli radio wifi on
    fi
}

if [ "$2" = "up" ]; then
    enable_disable_wifi
fi

if [ "$2" = "down" ]; then
    enable_disable_wifi
fi
```

This dispatcher script makes Wi-Fi mutually exclusive with wired networking. When a wired interface is connected, Wi-Fi will be set to airplane mode (rfkilled). When the wired interface is disconnected, Wi-Fi will be turned back on. Name this script e.g. 70-wifi-wired-exclusive.sh and put it into /etc/NetworkManager/dispatcher.d/ directory. See **NetworkManager**(8) manual page for more information about NetworkManager dispatcher scripts.

**Example sessions of interactive connection editor**

**Example 16. Adding an ethernet connection profile in interactive editor (a)**

**\$ nmcli connection edit type ethernet**

===| nmcli interactive connection editor |===

Adding a new '802-3-ethernet' connection

Type 'help' or '?' for available commands.

Type 'describe [<setting>.<prop>]' for detailed property description.

You may edit the following settings: connection, 802-3-ethernet (ethernet), 802-1x, ipv4, ipv6, dcb

nmcli> **print**

```
=====
                        Connection details
=====
connection.id:          ethernet-4
connection.uuid:        de89cdeb-a3e1-4d53-8fa0-c22546c775f4
connection.interface-name:  --
connection.type:        802-3-ethernet
connection.autoconnect:  yes
```

```

connection.autoconnect-priority: 0
connection.timestamp: 0
connection.read-only: no
connection.permissions:
connection.zone: ---
connection.master: ---
connection.slave-type: ---
connection.secondaries:
connection.gateway-ping-timeout: 0

```

---

```

802-3-ethernet.port: ---
802-3-ethernet.speed: 0
802-3-ethernet.duplex: ---
802-3-ethernet.auto-negotiate: yes
802-3-ethernet.mac-address: ---
802-3-ethernet.cloned-mac-address: ---
802-3-ethernet.mac-address-blacklist:
802-3-ethernet.mtu: auto
802-3-ethernet.s390-subchannels:
802-3-ethernet.s390-nettype: ---
802-3-ethernet.s390-options:

```

---

```

ipv4.method: auto
ipv4.dns:
ipv4.dns-search:
ipv4.addresses:
ipv4.gateway: ---
ipv4.routes:
ipv4.route-metric: -1
ipv4.ignore-auto-routes: no
ipv4.ignore-auto-dns: no
ipv4.dhcp-client-id: ---
ipv4.dhcp-send-hostname: yes
ipv4.dhcp-hostname: ---
ipv4.never-default: no
ipv4.may-fail: yes

```

---

```

ipv6.method: auto
ipv6.dns:
ipv6.dns-search:
ipv6.addresses:
ipv6.gateway: ---
ipv6.routes:
ipv6.route-metric: -1
ipv6.ignore-auto-routes: no
ipv6.ignore-auto-dns: no
ipv6.never-default: no
ipv6.may-fail: yes
ipv6.ip6-privacy: -1 (unknown)
ipv6.dhcp-hostname: ---

```

---

**nmcli> goto ethernet**

You may edit the following properties: port, speed, duplex, auto-negotiate, mac-address, cloned-mac-address, mac-address-blacklist, mtu, s390-subchann

```
els, s390-nettype, s390-options
nmcli 802-3-ethernet> set mtu 1492
nmcli 802-3-ethernet> b
nmcli> goto ipv4.addresses
nmcli ipv4.addresses> desc
```

```
=== [addresses] ===
```

```
[NM property description]
```

```
Array of IP addresses.
```

```
[nmcli specific description]
```

```
Enter a list of IPv4 addresses formatted as:
```

```
ip[/prefix], ip[/prefix],...
```

```
Missing prefix is regarded as prefix of 32.
```

```
Example: 192.168.1.5/24, 10.0.0.11/24
```

```
nmcli ipv4.addresses> set 192.168.1.100/24
```

```
Do you also want to set 'ipv4.method' to 'manual'? [yes]: yes
```

```
nmcli ipv4.addresses>
```

```
nmcli ipv4.addresses> print
```

```
addresses: 192.168.1.100/24
```

```
nmcli ipv4.addresses> back
```

```
nmcli ipv4> b
```

```
nmcli> set ipv4.gateway 192.168.1.1
```

```
nmcli> verify
```

```
Verify connection: OK
```

```
nmcli> print
```

```
=====
Connection details
=====
```

```
connection.id:          ethernet-4
connection.uuid:        de89cdeb-a3e1-4d53-8fa0-c22546c775f4
connection.interface-name:  --
connection.type:         802-3-ethernet
connection.autoconnect:   yes
connection.autoconnect-priority:  0
connection.timestamp:     0
connection.read-only:     no
connection.permissions:
connection.zone:          --
connection.master:        --
connection.slave-type:    --
connection.secondaries:
connection.gateway-ping-timeout:  0
```

```
802-3-ethernet.port:     --
802-3-ethernet.speed:     0
802-3-ethernet.duplex:    --
802-3-ethernet.auto-negotiate:  yes
802-3-ethernet.mac-address:  --
802-3-ethernet.cloned-mac-address:  --
802-3-ethernet.mac-address-blacklist:
802-3-ethernet.mtu:       1492
```

```
802-3-ethernet.s390-subchannels:
802-3-ethernet.s390-nettype:    --
802-3-ethernet.s390-options:
```

```
-----
ipv4.method:                manual
ipv4.dns:
ipv4.dns-search:
ipv4.addresses:              192.168.1.100/24
ipv4.gateway:                192.168.1.1
ipv4.routes:
ipv4.route-metric:           -1
ipv4.ignore-auto-routes:     no
ipv4.ignore-auto-dns:        no
ipv4.dhcp-client-id:         --
ipv4.dhcp-send-hostname:     yes
ipv4.dhcp-hostname:          --
ipv4.never-default:          no
ipv4.may-fail:               yes
-----
```

```
-----
ipv6.method:                auto
ipv6.dns:
ipv6.dns-search:
ipv6.addresses:
ipv6.routes:
ipv6.route-metric:           -1
ipv6.ignore-auto-routes:     no
ipv6.ignore-auto-dns:        no
ipv6.never-default:          no
ipv6.may-fail:               yes
ipv6.ip6-privacy:            -1 (unknown)
ipv6.dhcp-hostname:          --
-----
```

```
nmcli> set ipv4.dns 8.8.8.8 8.8.4.4
nmcli> print
```

```
=====
                        Connection details
=====
```

```
-----
connection.id:               ethernet-4
connection.uuid:              de89cdeb-a3e1-4d53-8fa0-c22546c775f4
connection.interface-name:    --
connection.type:              802-3-ethernet
connection.autoconnect:       yes
connection.autoconnect-priority: 0
connection.timestamp:         0
connection.read-only:         no
connection.permissions:
connection.zone:              --
connection.master:            --
connection.slave-type:        --
connection.secondaries:
connection.gateway-ping-timeout: 0
-----
```

```
802-3-ethernet.port:         --
802-3-ethernet.speed:         0
```



```

802-3-ethernet.duplex:      --
802-3-ethernet.auto-negotiate:  yes
802-3-ethernet.mac-address:    --
802-3-ethernet.cloned-mac-address: --
802-3-ethernet.mac-address-blacklist:
802-3-ethernet.mtu:          1492
802-3-ethernet.s390-subchannels:
802-3-ethernet.s390-nettype:  --
802-3-ethernet.s390-options:

```

---

```

ipv4.method:                manual
ipv4.dns:                    8.8.8.8,8.8.4.4
ipv4.dns-search:
ipv4.addresses:              192.168.1.100/24
ipv4.gateway:                192.168.1.1
ipv4.routes:
ipv4.route-metric:           -1
ipv4.ignore-auto-routes:     no
ipv4.ignore-auto-dns:        no
ipv4.dhcp-client-id:         --
ipv4.dhcp-send-hostname:     yes
ipv4.dhcp-hostname:          --
ipv4.never-default:          no
ipv4.may-fail:               yes

```

---

```

ipv6.method:                auto
ipv6.dns:
ipv6.dns-search:
ipv6.addresses:
ipv6.gateway:               --
ipv6.routes:
ipv6.route-metric:          -1
ipv6.ignore-auto-routes:    no
ipv6.ignore-auto-dns:       no
ipv6.never-default:         no
ipv6.may-fail:              yes
ipv6.ip6-privacy:            -1 (unknown)
ipv6.dhcp-hostname:          --

```

---

nmcli> **verify**

Verify connection: OK

nmcli> **save**

Connection 'ethernet-4' (de89cdeb-a3e1-4d53-8fa0-c22546c775f4) successfully saved.

nmcli> **quit**

Example session in the nmcli interactive connection editor. The scenario creates an Ethernet connection profile with static addressing (IPs and DNS).

### Example 17. Bluetooth connection profiles

NetworkManager supports both connecting to NAP and DUN devices as a client. It also supports sharing the network via a NAP server.

For NAP client connections, NetworkManager automatically creates a suitable in-memory profile for paired devices if none is available. You may use that generated profile directly, but you may also modify and persist it, which will prevent to automatically re-create it. You may also create a profile from scratch.

For example, the following uses DHCP and IPv6 autoconf for address configuration:

```
$ nmcli connection add type bluetooth con-name "Profile for My Bluetooth Device (NAP)" autoconnect no bluetoot
```

For DUN connections, the user needs to configure modem settings and hence no profile gets created automatically. The modem settings depend on your device and you either need a "gsm" or a "csma" section. For example,

```
$ nmcli connection add type bluetooth con-name "Profile for My Bluetooth Device (DUN)" autoconnect no bluetoot
```

Finally, you can create a bluetooth hotspot. BlueZ implements those as a bridge device, so such profiles also have a bridge section. Also, you probably want to set IP methods as "shared", so that clients get automatic IP addressing. Note that the "shared" IPv4 method requires dnsmasq to be available.

```
$ nmcli connection add type bluetooth con-name "My Bluetooth Hotspot" autoconnect no ifname btnap0 bluetoot
```

#### SEE ALSO

**nmcli**(1), **NetworkManager**(8), **NetworkManager.conf**(5), **nm-settings**(5), **nm-online**(1), **nm-applet**(1), **nm-connection-editor**(1)