# Nokia SRL OS Napalm Driver Summary of Methods

Mapping Document

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|---|---|
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Nokia Internal Use

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# 1    Introduction

This document details all the napalm methods supported by the Nokia SRL OS driver. We've provided details of which arguments, options and response parameter mapping to SRL OS Yang data model objects are supported for each method.

We've also included any known considerations or limitations per method. If SRL OS does not support an expected response parameter, we've returned the following:

- String = ""

- Boolean = false

- Integer = -1

- Float = -1.0

We welcome suggestions and contributions to the driver. Please contact the Nokia owners of this repository on how to contribute.

# 2    Configuration Methods

## 2.1    cli(commands):
Method: JSON-RPC-CLI

- CLI commands provided as input to this method must be in Nokia SRL OS format and will  be executed on the target SRL OS as written, and any response or errors will be returned.

- Considerations – use of this method opens a single JSON-RPC session to the SRL OS device.

If a configuration command is used, it is recommended to do so in "exclusive" mode to lock the candidate config from changes by other users. If this mode is used though, the user will need to "commit" the changes within the same session to avoid all changes to the exclusive candidate config being lost once the session is closed.

## 2.2    commit_config(message="",revert_in=None):
Method: JSON-RPC-CLI (CLI format) or gNMI( gNMI format )

- This command performs a checkpoint and then executes a commit on the target SRL OS in the context of which type of candidate config the user is replacing/merging. Any response or errors will be returned.

- Both "CLI format" (lines of CLI commands) and "JSON gNMI format" (JSON config with 'updates', 'replaces', 'deletes') are supported

- Limitations:

    o    revert_in parameter is not supported

## 2.3    compare_config(message=""):
Method: JSON-RPC-CLI

- This command executes a compare on the target SRL OS in the context of the candidate config, versus the running config. Any response or errors will be returned.

Limitations:

  o This method performs on-box comparisons of config for CLI-style configs. gNMI-style candidate configs are not supported (will not return a meaningful diff result)

## 2.4    discard_config(message=""):
Method: JSON-RPC-CLI

- This command executes a discard on the target SRL OS in the context of the candidate config context of the session. Any response or errors will be returned.

## 2.5    load_merge_candidate(filename=None, config=None):
Method: JSON-RPC-CLI (CLI format) or prepare temp file (JSON formats) – see page 41

- This method adds the provided configuration to candidate datastore. This method accepts CLI formatted config (including 'delete' commands), SRL JSON config format or gNMI JSON formatted config (JSON with 'updates','replaces','deletes'). Any response or errors will be returned.

- For CLI formatted config, this method under the hood uses JSON-RPC CLI method to load the candidate config into the node. This requires that the JSON-RPC Server is configured at SRL Node and the associated port is open in ACLs.

- Explicit commit_config(message="",revert_in=None): is needed to apply the candidate config and merge it with the running config

## 2.6    load_replace_candidate(filename=None, config=None):
Method: JSON-RPC-CLI (CLI format) or prepare temp file (JSON formats) ) – see page 41

- This method prepares the provided candidate config to replace the running config. This method accepts CLI formatted config (including 'delete' commands), a full SRL JSON config file or gNMI JSON formatted config (JSON with only 'replaces'). Any response or errors will be returned.

    Caveats: This replaces the entire configuration, including mgmt network-instance and any certificates. The connection to the device may be lost in case of errors in these elements.

- Explicit commit_config(message="",revert_in=None): is needed to apply the candidate config and replace the running config

## 2.7 ping(destination, source="", ttl=128, timeout=2, size=100, count=5, vrf="" ):

Method: JSON-RPC-CLI

- This method executes a ping command from the base routing or VPN context on the device via JSON RPC-CLI

Limitations:

o Input parameter ttl – Should be in the range of 1...128

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| ping(destination, source="", ttl=128, timeout=2, size=100, count=5, vrf="" ) | "success": { | |
| | probes_sent – int | NA |
| | packet_loss – int | NA |
| | rtt_min – float | NA |
| | rtt_max – float | NA |
| | rtt_avg – float | NA |
| | rtt_stddev – float | NA |
| | results – list [ | |
| | ip_address – String | NA |
| | rtt – float ] } | NA |
| | "error" | "Unknown host {destination}" |

## 2.8 rollback():

Method: JSON-RPC-CLI

- Load_merge and Load_replace will create the checkpoint id 0 before merging or replacing, roll back will revert running configuration back to the checkpoint id 0.

## 2.9 traceroute(destination, source="", ttl=255, timeout=10, vrf=""):

Method: JSON-RPC-CLI

- This method executes a traceroute command from the base routing or VPN context on the device via JSON-RPC CLI.

- Limitation:

o The Nokia SRL OS napalm driver currently ignores the "timeout" and source optional arguments.

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| traceroute(destination, source="", ttl=255, timeout=10, vrf="") | "success": { | |
| | rtt – float | NA |
| | ip_address – String | NA |
| | host_name – String } | NA |
| | "error" | |

# 3 Get Methods

## 3.1 get_arp_table(vrf=""):

Method: gNMI GET

- This method returns the arp table in the context of the vrf passed in the method.

- All parameters are retrieved for this method via the SRL OS Yang models from the running config.

- Limitations

o        Retrieval is only for IPv4 entries in the current driver

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_arp_table(vrf="") | interface – String | srl_nokia-interface/subinterface/name |
| | mac – String | srl_nokiainterface/subinterface/ipv4/arp/neighb or/link-layer-address and srl_nokiainterface/subinterface/ipv6/neighbordiscovery/neighbor/link-layer-address |
| | ip – String | srl_nokiainterface/subinterface/ipv4/arp/neighb or/ipv4-address and srl_nokiainterface/subinterface/ipv6/neighbordiscovery/neighbor/ipv6-address |
| | age – float | srl_nokiainterface/subinterface/ipv4/arp/timeo ut and srl_nokiainterface/subinterface/ipv6/neighbordiscovery/reachable-time |

## 3.2   get_bgp_config(group="", neighbor=""):
Method: gNMI GET

- This method returns the bgp config in the context of the group and neighbor passed in the method for both base and VRFs.

- All parameters are retrieved for this method via the SRL OS Yang models for the running config.

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_bgp_config(group ="" , neighbor="") | type – String | if local_as == remote_as then internal else external |
| | description – String | /srl_nokia-network-instance/protocols/bgp/group/descript ion |
| | apply_groups – String list | Not supported yet |
| | multihop_ttl – int | Not supported yet |
| | multipath – Boolean | srl_nokia-networkinstance/protocols/bgp/ipv4unicast/multipath/allow-multiple-as |
| | local_address – String | srl_nokia-networkinstance/protocols/bgp/group/transpo rt/local-address |
| | local_as – int | srl_nokia-network-instance/protocols/bgp/group/local-as |
| | remote_as – int | /srl_nokia-network-instance/protocols/bgp/group/peer-as |

| | import_policy – String list | /srl_nokia-network-instance/protocols/bgp/group/importpolicy |
|---|---|---|

| | | |
|---|---|---|
| | export_policy – String list | /srl_nokia-network-instance/protocols/bgp/group/exportpolicy |
| | remove_private_as – Boolean | Not supported yet. |
| | prefix_limit – dict | "limit": srl_nokia-networkinstance/protocols/bgp/group/ipv4unicast/prefix-limit/max-receivedroutes and srl_nokia-networkinstance/protocols/bgp/group/ipv6unicast/prefix-limit/max-receivedroutes.<br><br>"threshold": srl_nokia-networkinstance/protocols/bgp/group/ipv4unicast/prefix-limit/warning-thresholdpct and srl_nokia-networkinstance/protocols/bgp/group/ipv6unicast/prefix-limit/warning-thresholdpct<br><br>"timeout": Not Supported yet |
| | neighbors: { | srl_nokia-networkinstance/protocols/bgp/neighbor/peer -group |
| | description – String | srl_nokia-networkinstance/protocols/bgp/neighbor/description |
| | import_policy – Sting list | srl_nokia-networkinstance/protocols/bgp/neighbor/impo rt-policy |

| | | |
|---|---|---|
| | export_policy – String list | srl_nokia-networkinstance/protocols/bgp/neighbor/expo rt-policy |
| | local_address – String | srl_nokia-networkinstance/protocols/bgp/neighbor/trans port/local-address |
| | local_as – int | /srl_nokia-networkinstance/protocols/bgp/neighbor/localas/as-number |
| | remote_as – int | srl_nokia-networkinstance/protocols/bgp/neighbor/peer -as |
| | authentication_key – String | srl_nokia-networkinstance/protocols/bgp/neighbor/auth entication/keychain |
| | prefix_limit – dict | "limit": srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/prefix-limit/max-receivedroutes and srl_nokia-networkinstance/protocols/bgp/neighbor/ipv6unicast/prefix-limit/max-receivedroutes "threshold": srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/prefix-limit/warning-thresholdpct and srl_nokia-networkinstance/protocols/bgp/neighbor/ipv6unicast/prefix-limit/warning-thresholdpct. |
| | route_reflector_client – Boolean | srl_nokia-networkinstance/protocols/bgp/neighbor/rout e-reflector/client |

| | nhs – Boolean | srl_nokia-networkinstance/protocols/bgp/neighbor/next -hop-self |
|---|---|---|

## 3.3    get_bgp_neighbors():

Method: gNMI GET

- This method returns the bgp neighbors' information from the SRL OS config and state Yang datastores for the running config for base routing and all VRFs.

- All parameters are retrieved for this method via the SRL OS Yang models.

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_bgp_neighbors() | router_id – String | srl_nokia-network-instance/router-id |
| | "peers" : { | |
| | ip-address : { | srl_nokia-networkinstance/protocols/bgp/neighbor/peer -address |
| | local_as – int | /srl_nokia-network-instance/protocols/bgp/neighbor/localas/as-number |
| | remote_as – int | srl_nokia-networkinstance/protocols/bgp/neighbor/peer -as |

| | | |
|---|---|---|
| | remote_id – String | srl_nokia-networkinstance/protocols/bgp/neighbor/peer -address |
| | is_up – Boolean | if srl_nokia-networkinstance/protocols/bgp/neighbor/sessi on-sta "established" |
| | is_enabled – Boolean | srl_nokia-networkinstance/protocols/bgp/neighbor/admi n-state |
| | description – String | srl_nokia-networkinstance/protocols/bgp/neighbor/descr iption |
| | uptime – int | srl_nokia-system/information/currentdatetime -- srl_nokia-networkinstance/protocols/bgp/neighbor/lastestablished |
| | "address_family": { | |
| | ipv4/ipv6 : { | |
| | received_prefixes – int | srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/recieved-re and srl_nokianetworkinstance/protocols/bgp/neighbor/ipv6unicast/re routes |

| | | |
|---|---|---|
| | sent_prefixes – int | srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/s routes and srl_nokianetworkinstance/protocols/bgp/neighbor/ipv6unicast/se routes |
| | accepted_prefixes – int | srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/a routes and srl_nokianetworkinstance/protocols/bgp/neighbor/ipv6unicast/ac routes |

## 3.4    get_bgp_neighbors_detail(neighbor_address=""):

Method: gNMI GET

This method returns the bgp neighbor information details from the SRL OS config and state Yang data stores for the running config for the provided neighbor address in base routing or VRFs.

•       Parameters are retrieved for this method via the SRL OS Yang models.

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_bgp_neighbors_detai l (neighbor_address="") | vrf – String | |

| | | |
|---|---|---|
| peer_as: [ { | | srl_nokia-networkinstance/protocols/bgp/neighbor/peer -as |

| | |
|---|---|
| up – Boolean | if srl_nokia-networkinstance/protocols/bgp/neighbor/sessi on-state == "established" |
| local_as – int | /srl_nokia-network-instance/protocols/bgp/neighbor/localas/as-number |
| remote_as – int | srl_nokia-networkinstance/protocols/bgp/neighbor/peer -as |
| router_id – String | srl_nokia-network-instance/router-id |
| local_address – String | srl_nokia-networkinstance/protocols/bgp/neighbor/trans port/local-address |
| routing_table – String | srl_nokia-netinst:networkinstance/srl_nokianetinst:protocols/srl_nokiabgp:bgp/srl_nokia-bgp:neighbor/srl_nokia-bgp:peer-group |
| local_address_configured – Boolean | True if srl_nokia-networkinstance/protocols/bgp/neighbor/trans port/local-address == "" else False |
| local_port – int | srl_nokia-networkinstance/protocols/bgp/neighbor/trans port/local-port |
| remote_address – String | srl_nokia-networkinstance/protocols/bgp/neighbor/peer -address |

| remote_port – int | srl_nokia-networkinstance/protocols/bgp/neighbor/trans port/remote-port |
|---|---|

| multihop – Boolean | Not supported yet |
|---|---|
| multipath – Boolean | Not supported yet |
| remove_private_as – Boolean | Not supported yet |
| import_policy – String list | srl_nokia-networkinstance/protocols/bgp/neighbor/impo rt-policy |
| export_policy – String list | srl_nokia-networkinstance/protocols/bgp/neighbor/expo rt-policy |
| input_messages – int | srl_nokia-networkinstance/protocols/bgp/neighbor/recei ved-messages/total-messages |
| output_messages – int | srl_nokia-networkinstance/protocols/bgp/neighbor/sentmessages/total-messages |
| input_updates – int | srl_nokia-networkinstance/protocols/bgp/neighbor/recei ved-messages/total-updates |
| output_updates – int | srl_nokia-networkinstance/protocols/bgp/neighbor/sentmessages/total-updates |

| | |
|---|---|
| messages_queued_out – int | srl_nokia-networkinstance/protocols/bgp/neighbor/sentmessages/queue-depth |
| connection_state – String | srl_nokia-networkinstance/protocols/bgp/neighbor/sessi on-state |
| previous_connection_state – String | srl_nokia-networkinstance/protocols/bgp/neighbor/laststate |

| | |
|---|---|
| last_event – String | srl_nokia-networkinstance/protocols/bgp/neighbor/lastevent |
| suppress_4byte_as – Boolean | Not supported yet |
| local_as_prepend – Boolean | /srl_nokia-network-instance/protocols/bgp/neighbor/localas/prepend-local-as |
| holdtime – int | srl_nokia-networkinstance/protocols/bgp/neighbor/timer s/hold-time |
| configured_holdtime – int | srl_nokia-networkinstance/protocols/bgp/neighbor/timer s/negotiatedhold-time |
| keepalive – int | srl_nokia-networkinstance/protocols/bgp/neighbor/timer s/keepalive-interval |

| | |
|---|---|
| configured_keepalive – int | srl_nokia-networkinstance/protocols/bgp/neighbor/timer s/negotiated-keepalive-interval |
| active_prefix_count – int | srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/active-routes and srl_nokianetworkinstance/protocols/bgp/neighbor/ipv6unicast/active-routes |
| received_prefix_count – int | srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/recieved-routes and srl_nokianetworkinstance/protocols/bgp/neighbor/ipv6unicast/recieved-routes |
| accepted_prefix_count – int | srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/active-routes and srl_nokia- |
| | networkinstance/protocols/bgp/neighbor/ipv6unicast/active-routes |
| supressed_prefix_count – int | srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/rejected-routes and srl_nokianetworkinstance/protocols/bgp/neighbor/ipv6unicast/rejected-routes |

| advertised_prefix_count – int | srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/sent-routes and srl_nokianetworkinstance/protocols/bgp/neighbor/ipv6unicast/sent-routes |
|---|---|
| flap_count – int | Not supported yet |

## 3.3   get_config(retrieve="all", full=False, sanitized=False):
Method: gNMI GET

•       This method returns the running configuration from the SRL OS device.

•       Parameters are retrieved for this method via gNMI Get method.

•       Limitations:

o       The Nokia SRL OS napalm driver currently ignores the "full" optional argument and will always return the full config.

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_config(retrieve="all", full=False, sanitized=False) | running – String | --type config get --path / |
| | candidate – String | Not supported yet |
| | startup – String | Not supported yet |

## 3.4   get_environment():
Method: gNMI GET

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- This method returns the environment information details from the SRL OS config and state Yang data stores for the running config.

- Limitations: o  If the device is virtual, limited information will be available.

| Method Name | Output Parameters with Datatype | SRL OS Path |
| --- | --- | --- |
| get_environment() | "fans": { | |
| | location– String { | srl_nokia-platform/fan-tray/id |
| | status – Boolean } | True if srl_nokia-platform/fantray/oper-state == "UP" |
| | "temperature": { | |
| | Location –String :{ | srl_nokia-platform/control/slot |
| | temperature – float | srl_nokia-platform/control/temperature/instant |
| | is_alert – Boolean | srl_nokiaplatform/control/temperature/alarmstatus |
| | is_critical – Boolean } | Not supported yet |
| | "power": { | |
| | PSUid - String:{ | srl_nokia-platform/power-supply/id |
| | status – Boolean | True if srl_nokia-platform/powersupply/oper-state == "UP" |

| | | |
|---|---|---|
| | capacity – float | srl_nokia-platform/powersupply/capacity |
| | output – float } | Not supported yet |
| | "cpu" : { | |
| | Id:{ - String | srl_nokia-platform/control/cpu/index |
| | %usage – float | srl_nokia-platform/control/cpu/total/instant |
| | "memory" : { | |
| | available_ram – int | srl_nokia-platform/control/memory/physical |
| | used_ram – int | srl_nokiaplatform/control/memory/physical - srl_nokia-platform/control/memory/free |

## 3.5   get_facts():

Method: gNMI GET

- This method returns the basic facts from the SRL OS config Yang data store for the running config     of the device.

- Consideration – this method will always return "Nokia" as the vendor string

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|

| get facts | uptime – float | srl_nokia-system/system/srl_nokiasystem-info:information/srl_nokiasystem-info:uptime |
|---|---|---|
| | vendor – String | Nokia |
| | model – String | srl_nokia-platform/platform/srl_nokiaplatform-chassis:chassis/srl_nokiaplatform-chassis:type |
| | hostname – String | srl_nokia-system/system/srl_nokiasystem-name:name/srl_nokia-systemname:host-name |
| | fqdn – String | srl_nokia-system/system/srl_nokiasystem-name:name/srl_nokia-systemname:host-name |
| | serial_number-String | srl_nokia-platform/platform/srl_nokiaplatform-chassis:chassis/srl_nokiaplatform-chassis:serial-number |
| | os_version-String | srl_nokia-system/system/srl_nokiasystem-info:information/srl_nokiasystem-info:version |
| | interface_list – List | srl_nokia-interfaces/interface/name |

## 3.6   get_interfaces():
Method: gNMI GET

- This method returns the physical port/interface (layer 2) AND logical interface (layer 3) information from the SRL OS config and state Yang data stores for the running config of the device.

| Method Name | Output Parameters with Datatype | SRL OS Path |
| --- | --- | --- |
| get_interfaces | is_up – Boolean | srl_nokiainterfaces/interface/oper_state == "up" |
| | is_enabled – Boolean | srl_nokiainterfaces/interface/admin_state == "enable" |
| | description – String | srl_nokia-interfaces/interface/description |
| | last_flapped – float | srl_nokia-interfaces/interface/lastchange |
| | speed – float | srl_nokia-interface/ethernet/portspeed |
| | MTU – Bytes | srl_nokia-interfaces/interface/mtu |
| | mac_address – String | srl_nokiainterfaces/interface/ethernet/hw-macaddress |

## 3.7  get_ interfaces_counters():
Method: gNMI GET

- This method returns the physical port/interface (layer 2) AND logical interface (layer 3) stats from the SRL OS state Yang datastore for the device

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_interfaces_counters | tx_errors – int | srl_nokiainterfaces/interface/subinterface/statistics/out-error-packets |
| | rx_errors – int | srl_nokiainterfaces/interface/subinterface/statistics/in-error-packets |
| | tx_discards – int | srl_nokiainterfaces/interface/subinterface/statistics/in-discarded-packets |
| | rx_discards – int | srl_nokiainterfaces/interface/subinterface/statistics/in-discarded-packets |
| | tx_octets – int | srl_nokiainterfaces/interface/subinterface/statistics/out-octets |
| | rx_octets – int | srl_nokiainterfaces/interface/subinterface/statistics/in-octets |
| | tx_unicast_packets – int | srl_nokiainterfaces/interface/statistics/outunicast-packets |
| | rx_unicast_packets – int | srl_nokiainterfaces/interface/statistics/inunicast-packets |

| | tx_multicast_packets – int | srl_nokiainterfaces/interface/statistics/outmulticast-packets |
| --- | --- | --- |
| | rx_multicast_packets – int | srl_nokiainterfaces/interface/statistics/inmulticast-packets |
| | tx_broadcast_packets – int | srl_nokiainterfaces/interface/statistics/outbroadcast-packets |
| | rx_broadcast_packets – int | srl_nokiainterfaces/interface/statistics/inbroadcast-packets |

## 3.8   get_interfaces_ip():

Method: gNMI GET

• This method returns the logical IP4 and IPv6 interface details from the SRL OS config and state  Yang data store of the base routing context and all configured L3 VPNs of the device.

| Method Name | Output Parameters with Datatype | SRL OS Path |
| --- | --- | --- |

| | | |
|---|---|---|
| get_interfaces_ip() | interface_name – String { | srl_nokiainterfaces/interface/subinterface/name |
| | "ipv4/ipv6" : { | |
| | ip_address – String { | srl_nokiainterfaces/interface/subinterface/ipv4/ address/ip-prefix and srl_nokiainterfaces/interface/subinterface/ipv6/ address/ip-prefix |
| | prefix_length – int | srl_nokiainterfaces/interface/subinterface/ipv4/ address/ip-prefix and srl_nokiainterfaces/interface/subinterface/ipv6/ address/ip-prefix |

## 3.9  get_ ipv6_neighbors_table():

Method: gNMI GET

- This method returns the IPv6 neighbor details from the SRL OS for the base routing context and all configured VPNs of the device.

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_ipv6_neighbors_table() | interface – String | srl_nokiainterfaces/interface/subinterface/nam e |
| | mac – String | srl_nokiainterface/subinterface/ipv6/neighbordiscovery/neighbor/li layer-address |

| | ip – String | srl_nokiainterface/subinterface/ipv6/neighbordiscovery/neighbor/ip address |
|---|---|---|
| | age – float | srl_nokiainterface/subinterface/ipv6/neighbordiscovery/neighbor/n state-time |
| | state – String | srl_nokiainterface/subinterface/ipv6/neighbordiscovery/neighbor/c state |

## 3.10 get_lldp_neighbors():
Method: gNMI GET

• This method returns a list of lldp neighbors from the SRL OS Yang state datastores for the device

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_lldp_neighbors() | Local_port_name – String: { | srl_nokia-system/lldp/interface/name |
| | hostname – String | srl_nokiasystem/lldp/interface/neighbor/system -name |
| | port – String | srl_nokia-system/lldp/interface/neighbor/port-id |

### 3.11 get_lldp_neighbors_detail():

Method: gNMI GET

• This method returns lldp neighbor details from the SRL OS Yang state datastores for the device

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_lldp_neighbors_detail(interface="") | interface – String: [ { | srl_nokia-system/lldp/interface/name |
| | parent_interface – String | srl_nokia-system/lldp/interface/name |
| | remote_port – String | srl_nokia-system/lldp/interface/neighbor/port-id |
| | remote_port_description – String | srl_nokiasystem/lldp/interface/neighbor/portdescri |
| | remote_chassis_id – String | srl_nokiasystem/lldp/interface/neighbor/chassis-id |
| | remote_system_name - String | srl_nokiasystem/lldp/interface/neighbor/system -n |
| | remote_system_description –String | srl_nokiasystem/lldp/interface/neighbor/system -description |
| | remote_system_capab – String list | srl_nokiasystem/lldp/interface/neighbor/capability/name |

| | | srl_nokiasystem/lldp/interface/neighbor/capability/enabled |
|---|---|---|
| | remote_system_enabled_capab – String list | |

## 3.12 get_mac_address_table():

Method: gNMI GET

• This method returns a list of learnt MACs from the SRL OS device via retrieval by Get Method.

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_mac_address_table() | mac – String | srl_nokiainterface/subinterface/bridgetable/mac-table/mac |
| | interface – String | srl_nokia-interface/subinterface/name |
| | vlan – int | srl_nokiainterface/subinterface/vlan/encap/single-tagged/vlan-id |
| | active – Boolean | Not supported yet |
| | static – Boolean | srl_nokiainterface/subinterface/bridgetable/mac-table/mac/type |
| | moves – int | Not supported yet |
| | last_move – float | Not supported yet |

## 3.13 get_network_instances(name=""):

Method: gNMI GET

- This method returns a list of all L2 (vpls) and L3 (vprn) network instances (including base and mgmt) for the SRL OS device from the Yang configuration and state datastores

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_network_instances(name=" ") | name – String { | srl_nokia-network-instance/networkinstance/name |
| | name – String | srl_nokia-network-instance/networkinstance/name |
| | type – String | srl_nokia-network-instance/networkinstance/type |
| | "state" { | |
| | route-distinguisher – String | Not supported yet |
| | "interfaces" { | |
| | "interface" { | |
| | interface-name – String}}} | srl_nokia-network-instance/networkinstance/interface/name |

## 3.14 get_ntp_peers():

Method: gNMI GET

- This method returns a list of all ntp peers for the SRL OS device from the Yang state data stores

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_ntp_peers() | ip-address – String | srl_nokia-system/system/ntp/server/address |

## 3.15 get_ntp_servers():

Method: gNMI GET

- This method returns a list of all ntp servers for the SRL OS device from the Yang state data stores

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_ntp_servers() | ip-address – String | Not supported yet |

## 3.16 get_ntp_stats():

Method: gNMI GET

- This method returns all ntp stats for the SRL OS device from the Yang config and state data stores and via Get method.

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_ntp_stats() | remote – String | srl_nokia-system/system/ntp/server/address |
| | referenceid – String | Not supported yet |
| | synchronized – Boolean | srl_nokia-system/ntp/synchronized |

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| | | |
|---|---|---|
| | stratum – int | srl_nokia-system/ntp/server/stratum |
| | type – String | Not supported yet |
| | when – String | Not supported yet |
| | hostpoll – int | srl_nokia-system/ntp/server/pollinterval |
| | reachability – int | Not supported yet |
| | delay – float | Not supported yet |
| | offset – float | srl_nokia-system/ntp/server/offset |
| | jitter – float | srl_nokia-system/ntp/server/jitter |

## 3.17 get_optics():

Method: gNMI GET

• This method returns all optics state and stats for the SRL OS device from the Yang config and state datastores.

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_optics() | intf_name – String { | srl_nokia-interface/name |
| | "physical_channels" | |
| | "channels": [ | |

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| | index - int | srl_nokia-interface/transceiver/channel/index |
|---|---|---|
| | "state" { | |
| | "input_power" { | |
| | "instant" – float | srl_nokiainterface/transceiver/channel/inputpower/latest_value |
| | "avg" – float | Not supported yet |
| | "min" – float | Not supported yet |
| | "max" – float } | Not supported yet |
| | "output_power" { | |
| | "instant" – float | srl_nokiainterface/transceiver/channel/outputpower/latest_value |
| | "avg" – float | Not supported yet |
| | "min" – float | Not supported yet |
| | "max" – float } | Not supported yet |
| | "laser_bias_current" { | |
| | "instant" – float | srl_nokiainterface/transceiver/channel/laserbias-current/latest_value |

| | “avg” – float | Not supported yet |
|---|---|---|
| | “min” – float | Not supported yet |
| | “max” – float } | Not supported yet |

## 3.18  get_probes_config():
Not currently available


## 3.19  get_probes_results():
Not currently available


## 3.20  get_route_to(destination=””, protocol=””, longer=False):
Method: gNMI GET

- This method returns the get_route_to results based on the provided inputs, for the SRL OS device  from the Yang config and state datastores and Get method.

- Limitations: o  The Nokia SRL OS napalm driver currently not supporting the “longer” optional argument.


| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_route_to(destination =””, protocol=””, longer=False) | destination – String { | |
| | protocol – String | srl_nokia-network-instance/routetable/ipv4-unicast/route/owner |

| | current_active – Boolean | srl_nokia-network-instance/routetable/ipv4-unicast/route/active |
|---|---|---|

| | | |
|---|---|---|
| last_active – Boolean | Not supported yet | |
| age – int | srl_nokia-system/information/currentdatetime - srl_nokia-networkinstance/route-table/ipv4unicast/route/last-app-update | |
| next_hop – String | srl_nokia-netinst:networkinstance/srl_nokia-netinst:routetable/srl_nokia-ip-route-tables:nexthop/srl_nokia-ip-route-tables:ipaddress | |
| outgoing_interface – String | srl_nokia-netinst:networkinstance/srl_nokia-netinst:routetable/srl_nokia-ip-route-tables:nexthop/srl_nokia-ip-routetables:subinterface | |
| selected_next_hop – Boolean | if next hop then true else false | |
| preference – int | srl_nokia-network-instance/routetable/ipv4-unicast/route/preference | |
| inactive_reason – String | Not supported yet | |
| routing_table – String | srl_nokia-network-instance/name | |
| "protocol_attributes": { | | |
| If BGP: | | |
| local_as – int | | |

| remote_as – int | |
|---|---|
| | srl_nokia-netinst:networkinstance/srl_nokianetinst:protocols/srl_nokiabgp:bgp/srl_nokia-bgp:neighbor/srl_nokia-bgp:peer-as |

| peer_id – String | |
|---|---|
| | srl_nokia-netinst:networkinstance/srl_nokianetinst:protocols/srl_nokiabgp:bgp/srl_nokiabgp:neig bgp:peeraddress |
| as_path – String | srl_nokia-netinst:networkinstance/srl_nokia-rib-bgp-routes:bgprib/srl_nokia-rib-bgp-routes:attrsets/srl_nokia-rib-bgp-routes:attrset/srl_nokia-rib-bgp-routes:aspath/srl_no bgproutes:segment/srl_nokia-rib-bgproutes:member |
| communities – String list | srl_nokia-netinst:networkinstance/srl_nokia-rib-bgp-routes:bgprib/srl_nokia-rib-bgp-routes:attrsets/srl_nokia-rib-bgp-routes:attrset/srl_nokia-rib-bgproutes:communities/s bgproutes:community |
| local_preference – int | srl_nokia-netinst:networkinstance/srl_nokia-rib-bgp-routes:bgprib/srl_nokia-rib-bgp-routes:attrsets/srl_nokia-rib-bgp-routes:attrset/srl_nokia-rib-bgp-routes:local-pref |

| | preference2 – int | Not Supported yet |
|---|---|---|
| | metric – int | srl_nokia-netinst:networkinstance/srl_nokia-netinst:routetable/srl_nokia-ip-route-tables:ipv4unicast/srl_nokia-ip-routetables:route/srl_nokia-ip-routetables:metric |
| | metric2 – int | Not Supported yet |
| | If ISIS: | |
| | level – int | srl_nokia-netinst:networkinstance/srl_nokianetinst:protocols/srl_nokiaisis:isis/srl_nokiaisis:instan isis:levelcapability |

### 3.21 get_snmp_information():

Method: gNMI GET

- This method returns the snmp configuration for the SRL OS device from the Yang config datastore.

- Consideration – the community acl parameter will be returned as a hashed value

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_snmp_information() | chassis_id – String | Not supported yet |
| | "community": { | Not Supported yet |
| | acl – String | Not Supported yet |

| | mode – String | Ro |
|---|---|---|
| | contact – String | srl_nokia-system/information/contact |
| | location – String | srl_nokia-system/information/location |

## 3.22 get_users():

Method: gNMI GET

- This method returns the configured users for the SRL OS device from the Yang config datastore.

- Considerations:

o SRL OS does not support the "level" parameter but does support users being members of groups inheriting the same user privileges. A mapping table is provided in the SRL OS napalm driver for operators to map the privilege group names they configure in SRL OS at /configure/system/security/aaa/local-profiles/profile to 0-15 integer levels. The default is 0.

o The method maps the level parameter based on parsing the profile name, looking for an integer value between 0-15 and maps this integer accordingly. eg Profile name Level-7 maps to 7 o The password will always be returned in hashed form for security purposes.

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| get_users() | username – String { | srl_nokia-system:system/srlaaa:aaa/srl-aaa:authentication/srlaaa:admin-user/srl-aaa:username |
| | level – int | Not supported Yet |
| | password – String | srl_nokia-system:system/srlaaa:aaa/srl-aaa:authentication/srlaaa:admin-user/srl-aaa:password |
| | sshkeys – String list | Not supported Yet |

### 3.23  is_alive():

is_alive()

Method: gNMI GET

• This method returns True if NETCONF connection is open or SSH connection is open for the SRL OS device.

| Method Name | Output Parameters with Datatype | SRL OS Path |
|---|---|---|
| is_alive() | | Returns True if NETCONF connection is open as well as SSH connection is open |

### 3.24  Outbox_diff tool:

Method: Customer python libraries with JSON lib

• A diff tool is attached, as private function to the driver. This tool will return the difference between new configuration file and old configuration file.

 Usage:

o        _diff(newconfiguration_file_path,oldconfiguration_file_path)

All the args of the driver can optionally be given as none when using diff function alone.

# 4 Examples of usage

## 4.1 Sample formats for load_replace_candidate and load_merge_candidate methods

In this updated version of the driver, the load_replace_candidate and load_merge_candidate methods are updated to support 3 flavors of input:

1.  SR Linux CLI commands separated by newlines (default when no valid JSON is parsed)
    Example:
    */system name host-name "a new name"*
    */interface ethernet-1/1 admin-status disable*

    An explicit 'delete /' is prepended in case of load_replace_candidate

2.  SR Linux JSON YAML format
    Example (fragment for load_merge_candidate):
    *{ "system": { "name": { "host-name" : "json-style name update" } } }*

    Alternatively, a full saved config file can be used as input

3.  gNMI style JSON format listing 'updates','replaces' and 'deletes'
    Example:
    *{ "updates": [ { "path": "/system/name/host-name", "value": "json gnmi-style name" }] }*

    Note that load_replace_candidate only supports a single 'replaces' entry with a path of "/".
    Also note that 'compare_config' is not supported for this format

This concludes the documentation of the Nokia SRL OS napalm methods.

Any questions or concerns can be directed to the owners of the repository and we will do our best to respond quickly.

Thanks for your support, from the Nokia NI team.

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