



Nokia SRL OS Napalm Driver Summary of Methods

Mapping Document

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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
<code>ping(destination, source="", ttl=128, timeout=2, size=100, count=5, vrf="")</code>	"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/neighbor/link-layer-address and srl_nokiainterface/subinterface/ipv6/neighbor/link-layer-address
	ip – String	srl_nokiainterface/subinterface/ipv4/arp/neighbor/ipv4-address and srl_nokiainterface/subinterface/ipv6/neighbor/ipv6-address
	age – float	srl_nokiainterface/subinterface/ipv4/arp/timeout and srl_nokiainterface/subinterface/ipv6/neighbor/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/description
	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/transport/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
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	export_policy – String list	/srl_nokia-network-instance/protocols/bgp/group/exportpolicy
	remove_private_as – Boolean	Not supported yet.
	prefix_limit – dict	<p>"limit": srl_nokia-networkinstance/protocols/bgp/group/ipv4unicast/prefix-limit/max-receivedroutes and srl_nokia-networkinstance/protocols/bgp/group/ipv6unicast/prefix-limit/max-receivedroutes.</p> <p>"threshold": srl_nokia-networkinstance/protocols/bgp/group/ipv4unicast/prefix-limit/warning-thresholdpct and srl_nokia-networkinstance/protocols/bgp/group/ipv6unicast/prefix-limit/warning-thresholdpct</p> <p>"timeout": Not Supported yet</p>
	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/import-policy

	export_policy – String list	srl_nokia-networkinstance/protocols/bgp/neighbor/export-policy
	local_address – String	srl_nokia-networkinstance/protocols/bgp/neighbor/transport/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/authentication/keychain
	prefix_limit – dict	<p>"limit": srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/prefix-limit/max-receivedroutes and srl_nokia-networkinstance/protocols/bgp/neighbor/ipv6unicast/prefix-limit/max-receivedroutes</p> <p>"threshold": srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/prefix-limit/warning-thresholdpct and srl_nokia-networkinstance/protocols/bgp/neighbor/ipv6unicast/prefix-limit/warning-thresholdpct.</p>
	route_reflector_client – Boolean	srl_nokia-networkinstance/protocols/bgp/neighbor/route-reflector/client

	nhs – Boolean	srl_nokia-networkinstance/protocols/bgp/neighbor/next-hop-self
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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/session-state == "established"
	is_enabled – Boolean	srl_nokia-networkinstance/protocols/bgp/neighbor/admin-state
	description – String	srl_nokia-networkinstance/protocols/bgp/neighbor/description
	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/received-routes and srl_nokia-networkinstance/protocols/bgp/neighbor/ipv6unicast/received-routes

	sent_prefixes – int	srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/s routes and srl_nokianetworkinstance/protocols/bgp/neighbor/ipv6unicast/s routes
	accepted_prefixes – int	srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/a routes and srl_nokianetworkinstance/protocols/bgp/neighbor/ipv6unicast/a 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_detail(neighbor_address="")	vrf – String	

peer_as: [{	srl_nokia-networkinstance/protocols/bgp/neighbor/peer -as
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up – Boolean	if srl_nokia-networkinstance/protocols/bgp/neighbor/session-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/transport/local-address
routing_table – String	srl_nokia-netinst:networkinstance/srl_nokianetinst:protocols/srl_nokiabgp:bgp/srl_nokiabgp:neighbor/srl_nokia-bgp:peer-group
local_address_configured – Boolean	True if srl_nokia-networkinstance/protocols/bgp/neighbor/transport/local-address == "" else False
local_port – int	srl_nokia-networkinstance/protocols/bgp/neighbor/transport/local-port
remote_address – String	srl_nokia-networkinstance/protocols/bgp/neighbor/peer-address

remote_port – int	srl_nokia-networkinstance/protocols/bgp/neighbor/transport/remote-port
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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/import-policy
export_policy – String list	srl_nokia-networkinstance/protocols/bgp/neighbor/export-policy
input_messages – int	srl_nokia-networkinstance/protocols/bgp/neighbor/received-messages/total-messages
output_messages – int	srl_nokia-networkinstance/protocols/bgp/neighbor/sentmessages/total-messages
input_updates – int	srl_nokia-networkinstance/protocols/bgp/neighbor/received-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/session-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/timers/hold-time
configured_holdtime – int	srl_nokia-networkinstance/protocols/bgp/neighbor/timers/negotiatedhold-time
keepalive – int	srl_nokia-networkinstance/protocols/bgp/neighbor/timers/keepalive-interval

configured_keepalive – int	srl_nokia-networkinstance/protocols/bgp/neighbor/timers/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/received-routes and srl_nokianetworkinstance/protocols/bgp/neighbor/ipv6unicast/received-routes
accepted_prefix_count – int	srl_nokia-networkinstance/protocols/bgp/neighbor/ipv4unicast/active-routes and srl_nokia-
	networkinstance/protocols/bgp/neighbor/ipv6unicast/active-routes
suppressed_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 (default) or JSON RPC "info flat" (running_format='cli')

- This method returns the running configuration from the SRL OS device.
- Parameters are retrieved for this method via gNMI Get method (default) or via JSON RPC (if optional_args 'running_format' parameter is set to 'cli' during driver initialization)
- Limitations:
 - o Only 'running' or 'all' values for 'retrieve' are supported, other values return an empty response
 - 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

- 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/name

	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/portdescription
	remote_chassis_id – String	srl_nokiasystem/lldp/interface/neighbor/chassis-id
	remote_system_name - String	srl_nokiasystem/lldp/interface/neighbor/system-name
	remote_system_description –String	srl_nokiasystem/lldp/interface/neighbor/system-description

	remote_system_capab – String list	srl_nokiasystem/lldp/interface/neighbor/capability/name
	remote_system_enabled_capab – String list	srl_nokiasystem/lldp/interface/neighbor/capability/enabled

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
	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": [
	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_nokiabgp:neighbor/srl_nokia-bgp:peer-as

peer_id – String	srl_nokia-netinst:networkinstance/srl_nokianetinst:protocols/srl_nokiabgp:bgp/srl_nokiabgp:neighbor/srl_nokia-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_nokia-rib-bgp-routes:segment/srl_nokia-rib-bgp-routes: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-bgp-routes:communities/srl_nokia-rib-bgp-routes: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:instance/srl_nokiaisis: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
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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 a JSON RPC 'date' command is executed successfully on the SRL OS device.

Method Name	Output Parameters with Datatype	SRL OS Path
is_alive()		Returns True if JSON RPC 'date' command is successful

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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