------ Create vFabric (DCIP)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:34b8f61d-fec5-44c9-911d-a7a6ab3583c4"><CreateVirtualFabric xmlns="urn:kaloom:faas:fabrics"><Name>Altran</Name>

<AdminUserName>admin</AdminUserName>

<AdminUserPassword>\*\*\*\*\*\*</AdminUserPassword></CreateVirtualFabric></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:34b8f61d-fec5-44c9-911d-a7a6ab3583c4" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:fabrics="urn:kaloom:faas:fabrics">...</rpc-reply>

------ Extract Information of the newly create vFabric (DCIP)

<?xml version="1.0" encoding="UTF-8" standalone="no"?>

<rpc message-id="m-14" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">

<get>

<filter xmlns:ns0="urn:ietf:params:xml:ns:netconf:base:1.0" ns0:type="subtree">

<VirtualFabric xmlns="urn:kaloom:faas:fabrics">

<VFabricID>10</VFabricID>

</VirtualFabric>

</filter>

</get>

</rpc>

<rpc-reply message-id="m-14" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

------ Extract Management Interface allocated to vFabric (DCIP)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:fed5408d-cef0-42d5-839f-60d198a9b0bf"><get><filter type="subtree">

<top xmlns="urn:kaloom:faas:fabrics">

<VirtualFabric>

<VFabricID/>

<ManagementIPv4Address/>

<Name>Altran</Name>

</VirtualFabric>

</top>

</filter></get></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:fed5408d-cef0-42d5-839f-60d198a9b0bf" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

------ Extract Participating node-id in the Fabric (DCIP)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:fc74a3b5-4200-47a4-ac3b-8464ba101aca"><get><filter type="subtree">

<Fabric xmlns="urn:kaloom:faas:fabrics">

<FabricID>666</FabricID>

<Node>

<NodeID/>

<Name/>

</Node>

</Fabric>

</filter></get></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:fc74a3b5-4200-47a4-ac3b-8464ba101aca" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

------ Rename Termination point with a name that will be used in the vFabric (DCIP)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:3747fca1-cde6-4dbe-a94a-41d44cae398f"><edit-config><edit-config>

<config>

<Fabric xmlns="urn:kaloom:faas:fabrics">

<FabricID>666</FabricID>

<Node>

<NodeID>68522443-7015-46ea-b9dc-7193795376bc</NodeID>

<TerminationPoint nc:operation="replace">

<TpID>sw1p16s1</TpID>

<Name>N6</Name>

</TerminationPoint>

</Node>

</Fabric>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:3747fca1-cde6-4dbe-a94a-41d44cae398f" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:8a6017ed-c8a2-4d88-b382-0ae54e6b8cff"><edit-config><edit-config>

<config>

<Fabric xmlns="urn:kaloom:faas:fabrics">

<FabricID>666</FabricID>

<Node>

<NodeID>68522443-7015-46ea-b9dc-7193795376bc</NodeID>

<TerminationPoint nc:operation="replace">

<TpID>sw1p17s1</TpID>

<Name>N4-loop</Name>

</TerminationPoint>

</Node>

</Fabric>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:8a6017ed-c8a2-4d88-b382-0ae54e6b8cff" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:c08004b7-0fb0-4595-9597-f71ca51bf504"><edit-config><edit-config>

<config>

<Fabric xmlns="urn:kaloom:faas:fabrics">

<FabricID>666</FabricID>

<Node>

<NodeID>46576b03-b439-48c2-853f-4e96415f3f87</NodeID>

<TerminationPoint nc:operation="replace">

<TpID>sw1p16s1</TpID>

<Name>N3-loop</Name>

</TerminationPoint>

</Node>

</Fabric>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:c08004b7-0fb0-4595-9597-f71ca51bf504" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:cfafee08-149c-4256-9c4d-7c7a97e964c8"><edit-config><edit-config>

<config>

<Fabric xmlns="urn:kaloom:faas:fabrics">

<FabricID>666</FabricID>

<Node>

<NodeID>3a3c3603-f590-4219-9bee-17fe84a04eef</NodeID>

<TerminationPoint nc:operation="replace">

<TpID>sw1p11s1</TpID>

<Name>UPF-sw1p11s1-N3</Name>

</TerminationPoint>

</Node>

</Fabric>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:cfafee08-149c-4256-9c4d-7c7a97e964c8" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:f4c39f4f-2203-4c1f-af77-c1bafba90871"><edit-config><edit-config>

<config>

<Fabric xmlns="urn:kaloom:faas:fabrics">

<FabricID>666</FabricID>

<Node>

<NodeID>3a3c3603-f590-4219-9bee-17fe84a04eef</NodeID>

<TerminationPoint nc:operation="replace">

<TpID>sw1p27s1</TpID>

<Name>UPF-sw1p27s1-N6</Name>

</TerminationPoint>

</Node>

</Fabric>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:f4c39f4f-2203-4c1f-af77-c1bafba90871" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

------ Extract tp-id, which will be used to assign the Termination point to the vFabric (DCIP)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:0d1beacf-522c-4251-aaa1-650dbcc2dbfd"><get><filter type="subtree">

<Fabric xmlns="urn:kaloom:faas:fabrics">

<Slice>

<TpMapping>

<NodeRef>68522443-7015-46ea-b9dc-7193795376bc</NodeRef>

<TpRef>sw1p16s1</TpRef>

</TpMapping>

</Slice>

</Fabric>

</filter></get></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:0d1beacf-522c-4251-aaa1-650dbcc2dbfd" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:fba2058a-0081-48de-af77-76011265cde1"><get><filter type="subtree">

<Fabric xmlns="urn:kaloom:faas:fabrics">

<Slice>

<TpMapping>

<NodeRef>68522443-7015-46ea-b9dc-7193795376bc</NodeRef>

<TpRef>sw1p17s1</TpRef>

</TpMapping>

</Slice>

</Fabric>

</filter></get></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:fba2058a-0081-48de-af77-76011265cde1" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:da284355-44e6-446e-86c1-f85acac5d364"><get><filter type="subtree">

<Fabric xmlns="urn:kaloom:faas:fabrics">

<Slice>

<TpMapping>

<NodeRef>46576b03-b439-48c2-853f-4e96415f3f87</NodeRef>

<TpRef>sw1p16s1</TpRef>

</TpMapping>

</Slice>

</Fabric>

</filter></get></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:da284355-44e6-446e-86c1-f85acac5d364" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:97988134-39a5-4178-920c-9e4f93dd9b17"><get><filter type="subtree">

<Fabric xmlns="urn:kaloom:faas:fabrics">

<Slice>

<TpMapping>

<NodeRef>3a3c3603-f590-4219-9bee-17fe84a04eef</NodeRef>

<TpRef>sw1p11s1</TpRef>

</TpMapping>

</Slice>

</Fabric>

</filter></get></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:97988134-39a5-4178-920c-9e4f93dd9b17" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:b053bbd9-d3dc-4965-8388-206aba2d2958"><get><filter type="subtree">

<Fabric xmlns="urn:kaloom:faas:fabrics">

<Slice>

<TpMapping>

<NodeRef>3a3c3603-f590-4219-9bee-17fe84a04eef</NodeRef>

<TpRef>sw1p27s1</TpRef>

</TpMapping>

</Slice>

</Fabric>

</filter></get></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:b053bbd9-d3dc-4965-8388-206aba2d2958" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

------ Assign the Termination point to the vFabric (NodeID will be 0) (DCIP)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:7001f608-3de1-423a-9402-565030f7269c"><AssignTpToVirtualFabric xmlns="urn:kaloom:faas:fabrics"><FabricID>666</FabricID>

<NodeID>0</NodeID>

<TpID>9e170562-e27f-43bd-b0c7-500ad24c1dc0</TpID>

<ToVirtualFabric>10</ToVirtualFabric></AssignTpToVirtualFabric></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:7001f608-3de1-423a-9402-565030f7269c" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:da3c61e1-d824-4adf-be80-fe4208ed0b46"><AssignTpToVirtualFabric xmlns="urn:kaloom:faas:fabrics"><FabricID>666</FabricID>

<NodeID>0</NodeID>

<TpID>735359f0-29cc-4942-a044-708d062be9b7</TpID>

<ToVirtualFabric>10</ToVirtualFabric></AssignTpToVirtualFabric></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:da3c61e1-d824-4adf-be80-fe4208ed0b46" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:853f6271-fda4-4fe6-aea0-f20b62380e10"><AssignTpToVirtualFabric xmlns="urn:kaloom:faas:fabrics"><FabricID>666</FabricID>

<NodeID>0</NodeID>

<TpID>13a22056-ed4a-4e79-a6fd-9845d7024241</TpID>

<ToVirtualFabric>10</ToVirtualFabric></AssignTpToVirtualFabric></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:853f6271-fda4-4fe6-aea0-f20b62380e10" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:1e83ef41-74bc-446d-9766-ff52b55cf9e9"><AssignTpToVirtualFabric xmlns="urn:kaloom:faas:fabrics"><FabricID>666</FabricID>

<NodeID>0</NodeID>

<TpID>a17c9f0f-66c0-4069-a1c7-80426890c611</TpID>

<ToVirtualFabric>10</ToVirtualFabric></AssignTpToVirtualFabric></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:1e83ef41-74bc-446d-9766-ff52b55cf9e9" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Create vUPF

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:4b9550a3-da05-4365-ad9f-b6f99d7d35a4">

<create-vupf xmlns="urn:kaloom:faas:vfabric-upf">

<name>Default\_vUPF</name>

<description>vUPF to slice UPF functionality for integration with Altran</description>

</create-vupf>

</nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:4b9550a3-da05-4365-ad9f-b6f99d7d35a4" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:upf="urn:kaloom:faas:vfabric-upf">...</rpc-reply>

-------------- Configure PFCP

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:c2d5b40a-f387-4e71-8b19-23ed2e7dacfd"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<pfcp nc:operation="replace">

<node-id>new.domainname.com</node-id>

<supported-features>

<ftup>

<enable>True</enable>

</ftup>

</supported-features>

<ignore-unsupported-ie>True</ignore-unsupported-ie>

</pfcp>

</upf>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:c2d5b40a-f387-4e71-8b19-23ed2e7dacfd" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Define NRF

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:c9a00739-a6f4-4ab6-8eb7-0d69e544bfc6"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<nrf>

<destination-address nc:operation="replace">

<port>2290</port>

<destination>192.168.14.2</destination>

</destination-address>

</nrf>

</upf>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:c9a00739-a6f4-4ab6-8eb7-0d69e544bfc6" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:fab42d53-41a9-45f8-802e-73c0ce48eaed"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<nrf nc:operation="merge">

<heartbeat-timer>30</heartbeat-timer>

</nrf>

</upf>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:fab42d53-41a9-45f8-802e-73c0ce48eaed" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Define SNSSAI

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:f551a43e-2cf8-470a-ab94-96be6a8e01d6"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<snssai nc:operation="replace">

<sst>1</sst>

<description>ts11-slice1</description>

<sd>abbeff</sd>

</snssai>

</upf>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:f551a43e-2cf8-470a-ab94-96be6a8e01d6" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Define SMF Area

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:1253c425-7616-458b-a557-33d42bf19b57"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<smf nc:operation="replace">

<serving-area>slice-1</serving-area>

</smf>

</upf>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

-------------- Define ipv4 UE Range

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:1dcc420f-79be-4b62-9b13-4cd17444c9b7"><action xmlns="urn:ietf:params:xml:ns:yang:1"><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<network-instances>

<network-instance>

<network-instance-id>6b96f880-a272-40ae-a315-6e408eb32b3c</network-instance-id>

<interfaces-5g>

<interface-5g>

<interface-id>37fb920c-e51d-4ea0-8af4-2ce691bbebbc</interface-id>

<ue-ranges>

<ipv4-address-range nc:operation="replace">

<lower-address>60.0.0.1</lower-address>

<upper-address>60.0.255.254</upper-address>

</ipv4-address-range>

</ue-ranges>

</interface-5g>

</interfaces-5g>

</network-instance>

</network-instances>

</upf>

</node>

</network>

</networks>

</config>

</edit-config></action></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:1dcc420f-79be-4b62-9b13-4cd17444c9b7" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Define ipv6 UE Range

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:e5a84448-0c34-4afd-9cff-c1400f06917e"><action xmlns="urn:ietf:params:xml:ns:yang:1"><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<network-instances>

<network-instance>

<network-instance-id>6b96f880-a272-40ae-a315-6e408eb32b3c</network-instance-id>

<interfaces-5g>

<interface-5g>

<interface-id>37fb920c-e51d-4ea0-8af4-2ce691bbebbc</interface-id>

<ue-ranges>

<ipv6-prefix-range nc:operation="replace">

<lower-prefix>fc00::10:1:44:44/64</lower-prefix>

<upper-prefix>fc00::10:1:44:45/64</upper-prefix>

</ipv6-prefix-range>

</ue-ranges>

</interface-5g>

</interfaces-5g>

</network-instance>

</network-instances>

</upf>

</node>

</network>

</networks>

</config>

</edit-config></action></nc:rpc>

-------------- Define NRF Trust Chain

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:ee2a02d7-1357-44e0-98b6-28bd04e75f22"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<nrf>

<authentication>

<server-trust-chain-certs nc:operation="replace">

<description/>

<trust-chain-certs>

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bDEPMA0GA1UECgwGS2Fsb29tMRAwDgYDVQQDDAdjYTEuY29tMB4XDTIwMTEyNDIy

MDc0MloXDTMwMTEyMjIyMDc0MlowUDELMAkGA1UEBhMCQ0ExCzAJBgNVBAgMAlFD

MREwDwYDVQQHDAhNb250cmVhbDEPMA0GA1UECgwGS2Fsb29tMRAwDgYDVQQDDAdj

YTEuY29tMIIBIjANBgkqhkiG9w0BAQEFAAOCAQ8AMIIBCgKCAQEA2Fo9K2HxzPRu

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-----END CERTIFICATE-----

</trust-chain-certs>

</server-trust-chain-certs>

</authentication>

</nrf>

</upf>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:ee2a02d7-1357-44e0-98b6-28bd04e75f22" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:35ab0d1a-aa5a-4420-a5cc-1f54ba472200"><action xmlns="urn:ietf:params:xml:ns:yang:1"><networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<nrf>

<authentication>

<client-certificate>

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C+SadWDly8iPj04NeOTG8/EH9FANXtWDgNyHksLtG7ZrIOtSNtJRp/iXqETBdc30

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-----END CERTIFICATE-----

</certificate>

<private-key>

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VgGAI5az5LPBz0v4qwvJaChISbNmg6Wfu8odw9M9NbfFD7R5Vlp1GOCaQEMVwHnm

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Tg145Mbz8Qf0UA1e1YOA3IeSwu0btmsg61I20lGn+JeoRMF1zfQbmiIFl1ZxS2EC

QJBi6P2/G0do0/xOX0DOscoMvHpZqqoOJQQ7dzD/25La6gJKgDgcO2OtWC4ct/Ux

huOVbtPniB+T4LNtwhsFHqfRx70BhHa5cWzuqDT/6C68SganfO2j4eIolTNwCCy8

TwhNXVMVAgMBAAECggEAS0R/K3pgrdoDZJkUBumJWhpF0hfJbXG/sdBu7U3tuoMP

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C4Y6JLZ1r0VzBTKhj+spIK3Xd+zEpLjZGZ5Ql29pAoGBAN5whsFW757gD0X/XvjE

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IJUiZ/N3mE8c3G4QsXbZxfCh

-----END PRIVATE KEY-----

</private-key>

</upload-client-certificate>

</client-certificate>

</authentication>

</nrf>

</upf>

</node>

</network>

</networks></action></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:35ab0d1a-aa5a-4420-a5cc-1f54ba472200" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Creating L2 for external connectivity

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:02f98058-3f03-4c64-9a05-15a18ea4ab04"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>2</network-id>

<node nc:operation="create">

<node-id>L2:N4-Altran</node-id>

<vl2-mac xmlns="urn:kaloom:faas:vfabric-l2-topology">

<mac-address-table-aging-time>300</mac-address-table-aging-time>

<mac-address-table-aging-enable>true</mac-address-table-aging-enable>

</vl2-mac>

<vl2-neighbors xmlns="urn:kaloom:faas:vfabric-l2-topology">

<nd-table-aging-time>300</nd-table-aging-time>

<arp-table-aging-time>300</arp-table-aging-time>

<arp-suppression-enable>true</arp-suppression-enable>

<nd-suppression-enable>true</nd-suppression-enable>

</vl2-neighbors>

<l2-node-attributes xmlns="urn:ietf:params:xml:ns:yang:ietf-l2-topology">

<description>ext control L2</description>

<name>L2:N4-Altran</name>

</l2-node-attributes>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:02f98058-3f03-4c64-9a05-15a18ea4ab04" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:bca64edc-b2a8-4db5-ad7d-3372537a7680"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

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<node nc:operation="create">

<node-id>L2:N3-Altran</node-id>

<vl2-mac xmlns="urn:kaloom:faas:vfabric-l2-topology">

<mac-address-table-aging-time>300</mac-address-table-aging-time>

<mac-address-table-aging-enable>true</mac-address-table-aging-enable>

</vl2-mac>

<vl2-neighbors xmlns="urn:kaloom:faas:vfabric-l2-topology">

<nd-table-aging-time>300</nd-table-aging-time>

<arp-table-aging-time>300</arp-table-aging-time>

<arp-suppression-enable>true</arp-suppression-enable>

<nd-suppression-enable>true</nd-suppression-enable>

</vl2-neighbors>

<l2-node-attributes xmlns="urn:ietf:params:xml:ns:yang:ietf-l2-topology">

<description>ext access L2</description>

<name>L2:N3-Altran</name>

</l2-node-attributes>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:bca64edc-b2a8-4db5-ad7d-3372537a7680" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:2e0de37b-b282-4bb2-943e-2bbdb36ea175"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>2</network-id>

<node nc:operation="create">

<node-id>L2:N6-Altran</node-id>

<vl2-mac xmlns="urn:kaloom:faas:vfabric-l2-topology">

<mac-address-table-aging-time>300</mac-address-table-aging-time>

<mac-address-table-aging-enable>true</mac-address-table-aging-enable>

</vl2-mac>

<vl2-neighbors xmlns="urn:kaloom:faas:vfabric-l2-topology">

<nd-table-aging-time>300</nd-table-aging-time>

<arp-table-aging-time>300</arp-table-aging-time>

<arp-suppression-enable>true</arp-suppression-enable>

<nd-suppression-enable>true</nd-suppression-enable>

</vl2-neighbors>

<l2-node-attributes xmlns="urn:ietf:params:xml:ns:yang:ietf-l2-topology">

<description>ext data L2</description>

<name>L2:N6-Altran</name>

</l2-node-attributes>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:2e0de37b-b282-4bb2-943e-2bbdb36ea175" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Extract Available Termination Points to obtain tp-id

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:66c34f8a-8722-45b5-8cbb-f140683cd9f8"><get><filter type="subtree">

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>1</network-id>

<node/>

</network>

</networks>

</filter></get></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:66c34f8a-8722-45b5-8cbb-f140683cd9f8" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Attach termination point(tp-id) to L2

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:c458db36-7f40-4738-bcfb-4f8263f9cb77"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>2</network-id>

<node>

<node-id>L2:N4-Altran</node-id>

<termination-point xmlns="urn:ietf:params:xml:ns:yang:ietf-network-topology" nc:operation="create">

<tp-id>735359f0-29cc-4942-a044-708d062be9b7</tp-id>

<l2-termination-point-attributes xmlns="urn:ietf:params:xml:ns:yang:ietf-l2-topology">

<description>ext control L2</description>

<encapsulation-type xmlns="urn:kaloom:faas:vfabric-l2-topology">VLAN</encapsulation-type>

<vlan-id xmlns="urn:kaloom:faas:vfabric-l2-topology">30</vlan-id>

</l2-termination-point-attributes>

</termination-point>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:c458db36-7f40-4738-bcfb-4f8263f9cb77" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:4860edee-da52-4fb7-a499-74526f9d61fa"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>2</network-id>

<node>

<node-id>L2:N3-Altran</node-id>

<termination-point xmlns="urn:ietf:params:xml:ns:yang:ietf-network-topology" nc:operation="create">

<tp-id>13a22056-ed4a-4e79-a6fd-9845d7024241</tp-id>

<l2-termination-point-attributes xmlns="urn:ietf:params:xml:ns:yang:ietf-l2-topology">

<description>ext access L2</description>

<encapsulation-type xmlns="urn:kaloom:faas:vfabric-l2-topology">VLAN</encapsulation-type>

<vlan-id xmlns="urn:kaloom:faas:vfabric-l2-topology">1827</vlan-id>

</l2-termination-point-attributes>

</termination-point>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:4860edee-da52-4fb7-a499-74526f9d61fa" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:eb9f0580-5888-4266-a719-f8502d92fc7e"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>2</network-id>

<node>

<node-id>L2:N6-Altran</node-id>

<termination-point xmlns="urn:ietf:params:xml:ns:yang:ietf-network-topology" nc:operation="create">

<tp-id>9e170562-e27f-43bd-b0c7-500ad24c1dc0</tp-id>

<l2-termination-point-attributes xmlns="urn:ietf:params:xml:ns:yang:ietf-l2-topology">

<description>ext data L2</description>

<encapsulation-type xmlns="urn:kaloom:faas:vfabric-l2-topology">VLAN</encapsulation-type>

<vlan-id xmlns="urn:kaloom:faas:vfabric-l2-topology">1825</vlan-id>

</l2-termination-point-attributes>

</termination-point>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:eb9f0580-5888-4266-a719-f8502d92fc7e" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Create vRouter (L3)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:29f6b482-6666-40ab-942e-e2493dea6646"><create-router xmlns="urn:kaloom:faas:vfabric-l3-unicast-topology"><network-id>3</network-id>

<name>vupf-router</name>

<looking-glass-server>False</looking-glass-server></create-router></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:29f6b482-6666-40ab-942e-e2493dea6646" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:vl3t="urn:kaloom:faas:vfabric-l3-unicast-topology">...</rpc-reply>

-------------- Extract L2 information, used to attach L2 to L3

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:7c3efaf3-61eb-4e90-8481-0cc03635b186"><get><filter type="subtree">

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>2</network-id>

<node/>

</network>

</networks>

</filter></get></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:7c3efaf3-61eb-4e90-8481-0cc03635b186" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Attach L2 to L3

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:32959e96-1a26-4e3b-9c9b-b57087a7dc0e"><attach-l3node-to-l2node xmlns="urn:kaloom:faas:vfabric-l3-unicast-topology"><l3-network-id>3</l3-network-id>

<l3-node-id>99ee3e09-20c8-4a2a-b628-f788570a7f53</l3-node-id>

<l2-network-id>2</l2-network-id>

<l2-node-id>L2:N4-Altran</l2-node-id>

<mtu>1500</mtu></attach-l3node-to-l2node></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:32959e96-1a26-4e3b-9c9b-b57087a7dc0e" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:vl3t="urn:kaloom:faas:vfabric-l3-unicast-topology">...</rpc-reply>

-------------- Define ipv4 address to interface (L2 interface attached to L3)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:d469e5cc-dab8-4474-a416-d2be094c6ba4"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>99ee3e09-20c8-4a2a-b628-f788570a7f53</node-id>

<interfaces xmlns="urn:kaloom:faas:vfabric-interfaces">

<interface>

<name>net66ca2d3f8eea</name>

<ipv4 xmlns="urn:kaloom:faas:vfabric-ip">

<address nc:operation="create">

<ip>172.24.198.200</ip>

<prefix-length>24</prefix-length>

</address>

</ipv4>

</interface>

</interfaces>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:d469e5cc-dab8-4474-a416-d2be094c6ba4" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Define ipv6 address to interface (L2 interface attached to L3)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:4325bc57-0661-403b-86da-45b2515861af"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>99ee3e09-20c8-4a2a-b628-f788570a7f53</node-id>

<interfaces xmlns="urn:kaloom:faas:vfabric-interfaces">

<interface>

<name>net66ca2d3f8eea</name>

<ipv6 xmlns="urn:kaloom:faas:vfabric-ip">

<address nc:operation="create">

<ip>fd24:24:198::200</ip>

<prefix-length>120</prefix-length>

</address>

</ipv6>

</interface>

</interfaces>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:4325bc57-0661-403b-86da-45b2515861af" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Extract L2 information, used to attach L2 to L3

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:d2170c6b-bb3d-4184-850e-a1ba3ebc0df6"><get><filter type="subtree">

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>2</network-id>

<node/>

</network>

</networks>

</filter></get></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:d2170c6b-bb3d-4184-850e-a1ba3ebc0df6" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Attach L2 to L3

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:09269fb9-2b6b-45a5-9cf0-18a9f0e6645b"><attach-l3node-to-l2node xmlns="urn:kaloom:faas:vfabric-l3-unicast-topology"><l3-network-id>3</l3-network-id>

<l3-node-id>99ee3e09-20c8-4a2a-b628-f788570a7f53</l3-node-id>

<l2-network-id>2</l2-network-id>

<l2-node-id>L2:N3-Altran</l2-node-id>

<mtu>1500</mtu></attach-l3node-to-l2node></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:09269fb9-2b6b-45a5-9cf0-18a9f0e6645b" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:vl3t="urn:kaloom:faas:vfabric-l3-unicast-topology">...</rpc-reply>

-------------- Define ipv4 address to interface (L2 interface attached to L3)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:3dc443a7-afba-4d6f-8759-7dd827d4e3ea"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>99ee3e09-20c8-4a2a-b628-f788570a7f53</node-id>

<interfaces xmlns="urn:kaloom:faas:vfabric-interfaces">

<interface>

<name>netbdb61319aaea</name>

<ipv4 xmlns="urn:kaloom:faas:vfabric-ip">

<address nc:operation="create">

<ip>10.198.6.200</ip>

<prefix-length>24</prefix-length>

</address>

</ipv4>

</interface>

</interfaces>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:3dc443a7-afba-4d6f-8759-7dd827d4e3ea" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Define ipv6 address to interface (L2 interface attached to L3)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:f96b4a13-d414-463f-a546-2867ecc106db"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>99ee3e09-20c8-4a2a-b628-f788570a7f53</node-id>

<interfaces xmlns="urn:kaloom:faas:vfabric-interfaces">

<interface>

<name>netbdb61319aaea</name>

<ipv6 xmlns="urn:kaloom:faas:vfabric-ip">

<address nc:operation="create">

<ip>fd23:198:6::200</ip>

<prefix-length>120</prefix-length>

</address>

</ipv6>

</interface>

</interfaces>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:f96b4a13-d414-463f-a546-2867ecc106db" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Extract L2 information, used to attach L2 to L3

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:e1af7bbc-dd31-4a1b-b1a2-b000eac65167"><get><filter type="subtree">

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>2</network-id>

<node/>

</network>

</networks>

</filter></get></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:e1af7bbc-dd31-4a1b-b1a2-b000eac65167" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Attach L2 to L3

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:bb3214d3-061e-46bf-b2ba-8a1dcc2d7419"><attach-l3node-to-l2node xmlns="urn:kaloom:faas:vfabric-l3-unicast-topology"><l3-network-id>3</l3-network-id>

<l3-node-id>99ee3e09-20c8-4a2a-b628-f788570a7f53</l3-node-id>

<l2-network-id>2</l2-network-id>

<l2-node-id>L2:N6-Altran</l2-node-id>

<mtu>1500</mtu></attach-l3node-to-l2node></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:bb3214d3-061e-46bf-b2ba-8a1dcc2d7419" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:vl3t="urn:kaloom:faas:vfabric-l3-unicast-topology">...</rpc-reply>

-------------- Define ipv4 address to interface (L2 interface attached to L3)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:2a677840-cf4c-4097-bf52-1909e5abd9ff"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>99ee3e09-20c8-4a2a-b628-f788570a7f53</node-id>

<interfaces xmlns="urn:kaloom:faas:vfabric-interfaces">

<interface>

<name>net3eb663b393b8</name>

<ipv4 xmlns="urn:kaloom:faas:vfabric-ip">

<address nc:operation="create">

<ip>10.198.4.200</ip>

<prefix-length>24</prefix-length>

</address>

</ipv4>

</interface>

</interfaces>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:2a677840-cf4c-4097-bf52-1909e5abd9ff" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Define ipv6 address to interface (L2 interface attached to L3)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:fc1cc3d6-692a-4e86-b2d4-859f83a2d89a"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>99ee3e09-20c8-4a2a-b628-f788570a7f53</node-id>

<interfaces xmlns="urn:kaloom:faas:vfabric-interfaces">

<interface>

<name>net3eb663b393b8</name>

<ipv6 xmlns="urn:kaloom:faas:vfabric-ip">

<address nc:operation="create">

<ip>fd26:198:4::200</ip>

<prefix-length>120</prefix-length>

</address>

</ipv6>

</interface>

</interfaces>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:fc1cc3d6-692a-4e86-b2d4-859f83a2d89a" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Extract L3 Information

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:d0454ef6-ea33-4320-b2a8-4fab6b49c296"><get><filter type="subtree">

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node/>

</network>

</networks>

</filter></get></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:d0454ef6-ea33-4320-b2a8-4fab6b49c296" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Configure Default Network Instance (N4C)

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:2a731f2b-0df7-4a82-aad3-0ece7c92da39"><edit-config><edit-config>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<network-instances>

<network-instance>

<network-instance-id>889fdddf-eac7-43a9-8608-7a8295e1d861</network-instance-id>

<interfaces-5g>

<interface-5g nc:operation="replace">

<interface-id>487f3f51-6029-4d81-99a8-13cbaa48b7f8</interface-id>

<reference-point>n4c</reference-point>

<control-serving-ipv4-prefix>172.24.98.12/30</control-serving-ipv4-prefix>

<control-serving-ipv6-prefix>fd24:198:0::14/127</control-serving-ipv6-prefix>

<description>Default control 5g interface</description>

<name>default-control-interface</name>

</interface-5g>

</interfaces-5g>

</network-instance>

</network-instances>

</upf>

</node>

</network>

</networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:2a731f2b-0df7-4a82-aad3-0ece7c92da39" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Attach Network Instance to vRouter

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:07dc944b-da2f-443e-a4d2-8430ea43e259"><action xmlns="urn:ietf:params:xml:ns:yang:1"><networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<network-instances>

<network-instance>

<network-instance-id>889fdddf-eac7-43a9-8608-7a8295e1d861</network-instance-id>

<attach-router>

<l3-node-id>99ee3e09-20c8-4a2a-b628-f788570a7f53</l3-node-id>

</attach-router>

</network-instance>

</network-instances>

</upf>

</node>

</network>

</networks></action></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:07dc944b-da2f-443e-a4d2-8430ea43e259" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Add Network Instances

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:ea5b2b9b-f811-444c-90ec-82fb23bea842"><action xmlns="urn:ietf:params:xml:ns:yang:1"><networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<add-network-instance>

<name>internet</name>

<description>N6Interface</description>

</add-network-instance>

</upf>

</node>

</network>

</networks></action></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:ea5b2b9b-f811-444c-90ec-82fb23bea842" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:upf="urn:kaloom:faas:vfabric-upf">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:cf3f2d99-5b81-44b7-89f5-4c604f0b8b8d"><action xmlns="urn:ietf:params:xml:ns:yang:1"><networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<add-network-instance>

<name>an0.labs.kaloom.io</name>

<description>N3Interface-AN0</description>

</add-network-instance>

</upf>

</node>

</network>

</networks></action></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:cf3f2d99-5b81-44b7-89f5-4c604f0b8b8d" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:upf="urn:kaloom:faas:vfabric-upf">...</rpc-reply>

-------------- Attach Network Instances to vRouter

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:be8a95f2-0fc7-47a5-8588-cdbb90f79c54"><action xmlns="urn:ietf:params:xml:ns:yang:1"><networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<network-instances>

<network-instance>

<network-instance-id>6b96f880-a272-40ae-a315-6e408eb32b3c</network-instance-id>

<attach-router>

<l3-node-id>99ee3e09-20c8-4a2a-b628-f788570a7f53</l3-node-id>

</attach-router>

</network-instance>

</network-instances>

</upf>

</node>

</network>

</networks></action></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:be8a95f2-0fc7-47a5-8588-cdbb90f79c54" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:b322551d-d344-4113-afc2-eabc14ce6b2d"><action xmlns="urn:ietf:params:xml:ns:yang:1"><networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<network-instances>

<network-instance>

<network-instance-id>4eb5e89c-cfad-41ef-9097-d1e91361b0b1</network-instance-id>

<attach-router>

<l3-node-id>99ee3e09-20c8-4a2a-b628-f788570a7f53</l3-node-id>

</attach-router>

</network-instance>

</network-instances>

</upf>

</node>

</network>

</networks></action></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:b322551d-d344-4113-afc2-eabc14ce6b2d" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Add 5G Interfaces to Network Instance

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:6a5f2695-230d-47d8-a15c-bdcf06e42172"><action xmlns="urn:ietf:params:xml:ns:yang:1"><networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<network-instances>

<network-instance>

<network-instance-id>6b96f880-a272-40ae-a315-6e408eb32b3c</network-instance-id>

<add-5g-interface>

<name>N6Interface-DN0</name>

<description>N6Interface</description>

<reference-point>n6</reference-point>

<data-serving-address>172.26.98.2</data-serving-address>

<data-serving-address>fd26:98:0::2</data-serving-address>

</add-5g-interface>

</network-instance>

</network-instances>

</upf>

</node>

</network>

</networks></action></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:6a5f2695-230d-47d8-a15c-bdcf06e42172" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:upf="urn:kaloom:faas:vfabric-upf">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:b1112735-32db-4195-9419-3d47de6d3866"><action xmlns="urn:ietf:params:xml:ns:yang:1"><networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<network-instances>

<network-instance>

<network-instance-id>4eb5e89c-cfad-41ef-9097-d1e91361b0b1</network-instance-id>

<add-5g-interface>

<name>N3Interface-AN0</name>

<description>N3Interface-AN0</description>

<reference-point>n3</reference-point>

<data-serving-address>172.23.98.2</data-serving-address>

<data-serving-address>fd23:98:0::2</data-serving-address>

</add-5g-interface>

</network-instance>

</network-instances>

</upf>

</node>

</network>

</networks></action></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:b1112735-32db-4195-9419-3d47de6d3866" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:upf="urn:kaloom:faas:vfabric-upf">...</rpc-reply>

-------------- Extract L1 information, used to extract tp-id

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:f0bb443a-14dd-418d-b51f-0204447a81bc"><get><filter type="subtree">

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>1</network-id>

<node/>

</network>

</networks>

</filter></get></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:f0bb443a-14dd-418d-b51f-0204447a81bc" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

-------------- Attach SystemPort to 5G interface

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:1a503efc-35c6-4ecb-b4cc-d0535adbdfee"><action xmlns="urn:ietf:params:xml:ns:yang:1"><networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<network-instances>

<network-instance>

<network-instance-id>6b96f880-a272-40ae-a315-6e408eb32b3c</network-instance-id>

<interfaces-5g>

<interface-5g>

<interface-id>37fb920c-e51d-4ea0-8af4-2ce691bbebbc</interface-id>

<attach-sp>

<sp>

<sp-network-id>1</sp-network-id>

<sp-node-id>1</sp-node-id>

<sp-tp-id>f96d9d59-8181-40c6-ba8e-c603da4be0fe</sp-tp-id>

<private-ipv4-subnet-prefix>192.168.26.6/30</private-ipv4-subnet-prefix>

<mtu>1500</mtu>

</sp>

</attach-sp>

</interface-5g>

</interfaces-5g>

</network-instance>

</network-instances>

</upf>

</node>

</network>

</networks></action></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:1a503efc-35c6-4ecb-b4cc-d0535adbdfee" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:upf="urn:kaloom:faas:vfabric-upf">...</rpc-reply>

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:63ad01b6-a810-4e99-96a8-507b025c6927"><action xmlns="urn:ietf:params:xml:ns:yang:1"><networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>c655373a-f24b-446d-b71a-a086c1ee9f40</node-id>

<upf xmlns="urn:kaloom:faas:vfabric-upf">

<network-instances>

<network-instance>

<network-instance-id>4eb5e89c-cfad-41ef-9097-d1e91361b0b1</network-instance-id>

<interfaces-5g>

<interface-5g>

<interface-id>da92b4b7-03ba-45ef-b872-4667b4a78151</interface-id>

<attach-sp>

<sp>

<sp-network-id>1</sp-network-id>

<sp-node-id>1</sp-node-id>

<sp-tp-id>a17c9f0f-66c0-4069-a1c7-80426890c611</sp-tp-id>

<private-ipv4-subnet-prefix>192.168.23.2/30</private-ipv4-subnet-prefix>

<mtu>1500</mtu>

</sp>

</attach-sp>

</interface-5g>

</interfaces-5g>

</network-instance>

</network-instances>

</upf>

</node>

</network>

</networks></action></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:63ad01b6-a810-4e99-96a8-507b025c6927" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0" xmlns:upf="urn:kaloom:faas:vfabric-upf">...</rpc-reply>

-------------- Define Static Route of UE to be routed from N6 to N3

<?xml version="1.0" encoding="UTF-8"?><nc:rpc xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:2bafd39d-4f01-448d-832d-f86b7873f0de"><edit-config><edit-config>

<config xmlns:xc="urn:ietf:params:xml:ns:netconf:base:1.1" xmlns:nd="urn:ietf:params:xml:ns:yang:ietf-network" xmlns:vr="urn:kaloom:faas:vfabric-routing" xmlns:v4ur="urn:kaloom:faas:vfabric-ipv4-unicast-routing">

<nd:networks>

<nd:network>

<nd:network-id>3</nd:network-id>

<nd:node>

<nd:node-id>99ee3e09-20c8-4a2a-b628-f788570a7f53</nd:node-id>

<vr:routing>

<vr:control-plane-protocols>

<vr:control-plane-protocol>

<vr:type>static</vr:type>

<vr:name>static-routes</vr:name>

<vr:static-routes>

<v4ur:ipv4>

<v4ur:route xc:operation="create">

<v4ur:destination-prefix>22.22.0.0/14</v4ur:destination-prefix>

<v4ur:next-hop>

<v4ur:outgoing-interface>netfc846389eb80</v4ur:outgoing-interface>

<v4ur:next-hop-address>192.168.26.6</v4ur:next-hop-address>

</v4ur:next-hop>

</v4ur:route>

</v4ur:ipv4>

</vr:static-routes>

</vr:control-plane-protocol>

</vr:control-plane-protocols>

</vr:routing>

</nd:node>

</nd:network>

</nd:networks>

</config>

</edit-config></edit-config></nc:rpc>

<rpc-reply xmlns:nc="urn:ietf:params:xml:ns:netconf:base:1.0" message-id="urn:uuid:2bafd39d-4f01-448d-832d-f86b7873f0de" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">...</rpc-reply>

<rpc message-id="m-39" xmlns="urn:ietf:params:xml:ns:netconf:base:1.0">

<edit-config>

<target>

<running/>

</target>

<default-operation>none</default-operation>

<config>

<networks xmlns="urn:ietf:params:xml:ns:yang:ietf-network">

<network>

<network-id>3</network-id>

<node>

<node-id>4466b63b-fc28-47d8-babc-a4900fef3a87</node-id>

<routing xmlns="urn:kaloom:faas:vfabric-routing">

<control-plane-protocols>

<control-plane-protocol>

<type>static</type>

<name>static-routes</name>

<static-routes>

<ipv6 xmlns="urn:kaloom:faas:vfabric-ipv6-unicast-routing">

<route xmlns:op="urn:ietf:params:xml:ns:netconf:base:1.0" op:operation="create">

<destination-prefix>fc00:0000:0000:0000:0000:0000:0000:0000/6</destination-prefix>

<next-hop>

<outgoing-interface>net4ea1e2367f49</outgoing-interface>

<next-hop-address>fe80::82a2:35ff:fe2a:ea25</next-hop-address>

</next-hop>

<description/>

</route>

</ipv6>

</static-routes>

</control-plane-protocol>

</control-plane-protocols>

</routing>

</node>

</network>

</networks>

</config>

</edit-config>

</rpc>