Internet Route Reflector LLD

Generated For: British Telecom Global

Project Name: 39346 BT GNV Global

Generated On: July 29, 24

Version: 0.2

Document Control

Authors : Jayanthan T, Maanas P M

Change Authority : Juniper Networks Professional Services

Change Forecast : Medium

Revision History:

|  |  |  |  |  |
| --- | --- | --- | --- | --- |
| Version | Date Issued | Status | Author | Reason for Change |
| 0.1 | 26/07/2024 | Draft | Jayanthan T | Draft of the HLD |
| 0.2 | 29/07/2024 | Draft | Jayanthan T | Updated after peer reviews |

Reviewers:

|  |  |  |
| --- | --- | --- |
| Department | Name | Approval Date |
| Juniper Professional Services | Kural O |  |
| Juniper Professional Services | Maanas P M | 29/07/2024 |
| Juniper Professional Services | Sachin Joshi |  |

Intellectual Property Rights

This document contains valuable trade secrets and confidential information of Juniper Networks and its affiliates, subsidiaries and suppliers, and shall not be disclosed to any person, organization, or entity unless such disclosure is subject to the provisions of a written non-disclosure and proprietary rights agreement, or intellectual property license agreement approved by Juniper Networks. The distribution of this document does not grant any license in or rights, in whole or in part, to the content, the product(s), technology, or intellectual property described herein.

Table of Contents

[1 Document Control 2](#_Toc172886081)

[2 Table of Contents 3](#_Toc172886082)

[3 List of Figures 4](#_Toc172886083)

[4 List of Tables 4](#_Toc172886084)

[5 Introduction 5](#_Toc172886085)

[5.1 Purpose 5](#_Toc172886086)

[5.2 Audience 5](#_Toc172886087)

[5.3 External References 5](#_Toc172886088)

[5.4 Alphabetical Index of Terms 5](#_Toc172886089)

[6 Summary 7](#_Toc172886090)

[7 Template Version Support 7](#_Toc172886091)

[8 Design Overview 8](#_Toc172886092)

[8.1 IRR Geographical Grouping 8](#_Toc172886093)

[8.1.1 Zone Maps 8](#_Toc172886094)

[8.1.2 City 8](#_Toc172886095)

[8.1.3 City BGP Community Mapping 8](#_Toc172886096)

[8.2 IRR BGP Communities 9](#_Toc172886097)

[8.2.1 BGP Community Types and Formats 9](#_Toc172886098)

[8.2.1 Generating BGP Communities 10](#_Toc172886099)

[8.3 Aggregate Footprint 11](#_Toc172886100)

[8.4 IRR iBGP Peer Configuration 11](#_Toc172886101)

[8.4.1 Peering with PE Devices 12](#_Toc172886102)

[8.4.1 Peering with other IRR Devices 12](#_Toc172886103)

[9 Configuration Samples 13](#_Toc172886104)

[9.1 IRR Yang Model Example 13](#_Toc172886105)

[9.2 IRR Device Context Example 13](#_Toc172886106)

[9.3 IRR Device Configuration Example 13](#_Toc172886107)

[10 Sign Off 14](#_Toc172886108)

List of Figures

*Figure 1 Netbox Zone Maps* 8

*Figure 2 Netbox City BGP Community Mappings* 9

*Figure 3 BGP Aggregates - Aggregate FootPrint* 11

List of Tables

*Table 1 Alphabetical Index of Terms* 6

*Table 2 Netbox Zone, Site and City Definition* 8

*Table 3 IRR BGP Community Types* 10

*Table 4 Basebuild Parameters BGP Community startic part definitions* 10

*Table 5 IRR iBGP Peering* 11

*Table 6 iBGP Peer - Peer and Transit Communities* 12

# Introduction

## Purpose

This document is a Low-Level Design Document outlining the Internet Route Reflector related Nas automation design components. The following design document was drafted utilizing best practices expertise and the experience of Juniper Professional Services based on reviewing of the British Telecom Global business and technical requirements.

## Audience

The primary audience for this design document is British Telecom network design and engineering team, network operations team and any other service personnel directly or indirectly involved in this project. Juniper Networks personnel such as Service Managers, JTAC engineers and other Professional Services consultants may also use this document as part of the service delivery process.

## External References

|  |  |  |  |
| --- | --- | --- | --- |
|  | External Reference | Version | Comment |
| 1 | System Integration HLD | latest | [System\_Integration\_HLD\_0.1.docx](https://btgroupcloud.sharepoint.com/:w:/r/teams/GNVNetworkDesignBTCISCO-JUNIPERPrivateChannel/Shared%20Documents/JUNIPER%20Private%20Channel/Juniper%20HLD%27s/System_Integration_HLD_0.1.docx?d=w64abd9e7208c41cc8c7770ca52600d43&csf=1&web=1&e=VjsZWk) |
| 2 | CFS and RFS specs | latest |  |

Table 2: External References

## Alphabetical Index of Terms

Following project specific terminology is used throughout this document to specify specific parts of the data network. These terminologies may also reflect the physical place and function of the equipment with respect to the overall project.

|  |  |
| --- | --- |
| Acronym | Description |
| BDD | Behaviour Driven Development |
| BT | British Telecom |
| CI | Continuous Integration |
| CD | Continuous Delivery or Deployment |
| HA | High Availability |
| HLD | High Level Design |
| HTTP | Hypertext Transfer Protocol. Method used to publish and receive information on the Web, such as text and graphic files. |
| HTTPS | Hypertext Transfer Protocol over Secure Sockets Layer. Similar to HTTP with an added encryption layer that encrypts and decrypts user page requests and pages that are returned by a Web server. Used for secure communication, such as payment transactions. |
| IAP | Identical Automation Platform |
| IAG | Itential Automation Gateway |
| MD | Markdown |
| MR | Merge Request |
| NC | Network Cloud |
| POC | Proof of Concept |
| PS | Professional Services |
| Syslog | System log. Method for sending and storing messages to a log file for troubleshooting or record-keeping. |
| IRR | Internet Route Reflector |

*Table 1 Alphabetical Index of Terms*

# Summary

This document captures the IRR specific NaaS implementations that are not covered by the generic NaaS high level design document.

Similar to other device types, IRR follows the standard base build device onboarding process. NaaS performs some IRR specific tasks when it compiles the IRR base build (day0/dayN) configurations.

Please refer to the section12 of the system integration HLD for the basic principle on NaaS TMF639 and device onboarding.

# Template Version Support

IRR design in this document supports the feature sets that are covered in the following Template and IRR design versions.

Template version: v5.0

IRR HLD version referred: v1.5

# Design Overview

## IRR Geographical Grouping

NaaS supports the following geographical scopes to support implementing the IRR network design requirements.

|  |  |  |
| --- | --- | --- |
| **IRR Design Definition** | **NaaS Netbox Elements** | **Community Definitions** |
| Policy Region / Zone | Zone | zone comm (3-digit id) |
| +--Sites | +--Site |  |
| +--City Zone | +--City | city comm (3-digit id) |

*Table 2 Netbox Zone, Site and City Definition*

### Zone Maps

All Sites must be associated with a Zone. The Site to Zone mapping is defined under resource pools ‘Zone Maps’ in Netbox.

A screenshot of a computer

Description automatically generated

*Figure 1 Netbox Zone Maps*

Zone maps are populated via Netbox user interface or API endpoint.

### City

A Site is also always associated to a city using the ‘Site Place’ attribute of the site. This is created as part of the standard TMF674 workflow.

### City BGP Community Mapping

Every city is assigned with a city-id that will be used to produce the peer and transit community values. The city-id is defined under ‘City BGP Community Mappings’ in BaseBuild Parameters in Netbox.

A screenshot of a computer

Description automatically generated

*Figure 2 Netbox City BGP Community Mappings*

Every city must be defined under the City BGP Community Mappings for IRRs to produce the city specific BGP peer and transit communities.

City BGP Community Mappings are populated via Netbox user interface or API endpoint.

## IRR BGP Communities

### BGP Community Types and Formats

|  |  |  |  |
| --- | --- | --- | --- |
| **PE Access BGP Connection Types** | **Connection Type Id** | **Community Value** | **Detail** |
| Customer Aggregate Routes | 31 | 5400:31<> | aggregates created for customer prefixes - for prefixes learned over customer connections |
| Customers (routes learned from customers) | 32 | 5400: <connection- type><region-id> 5400: <connection-type><city-id> | <region-id> and <city-id> where the path was learned by BT GNF |
| peers | 33 | 5400: 33<city-id> | <city-id> where the path was learned by BT GNF |
| 5400:30<region.region-id> | Used to control path propagation to other route reflectors within GNF  Identifies the policy regions to which a transit or peer learned path should be propagated, which could either be an entire geographical region or a subset of policy region(s) |
| transits | 34 | 5400: 34<city-id> | <city-id> where the path was learned by BT GNF |
| {% for region in peer.propogate.regions %} 5400:30<region.region-id> {% endfor %}  {% for city in peer.propogate.cities %} 5400:30<city.city-id> {% endfor %} | Used to control path propagation to other route reflectors within GNF  Identifies the policy regions to which a transit or peer learned path should be propagated, which could either be an entire geographical region or a subset of policy region(s) |

*Table 3 IRR BGP Community Types*

Note:

Currently NaaS supports template version 5.0 and do not support any of the propagation communities in the current release.

### Generating BGP Communities

Each BGP community is compiled using two parts in Netbox:

1. The static part of the community value based on the BGP AS number and the community type-id.
2. The region or city specific id that would dynamically derived based on the relevant region or city that is being associated.

Static BGP community part for each type of community is defined under the BaseBuild Parameters in Netbox.

|  |  |
| --- | --- |
| Key | Value |
| aggregateComm | 5400:31 |
| customerComm | 5400:32 |
| peerComm | 5400:33 |

*Table 4 Basebuild Parameters BGP Community static part definitions*

The city specific community is produced by appending the city-id that is defined under the ‘City BGP Community Mapping’ – refer Section 9.1.3.

## Aggregate Footprint

For aggregate static routes that are configured and originated from the PE routers, IRRs will be configured to match on the tag values set on the routes and attach the relevant BGP community values as detailed in the network design.

For NaaS to implement the aggregate footprint configurations, Netbox is populated with the BGP Aggregate footprint details in ‘BGP Aggregates’ under BaseBuild Variables.

A screenshot of a computer

Description automatically generated

*Figure 3 BGP Aggregates - Aggregate Footprint*

## IRR iBGP Peer Configuration

The TMF639 basebuild and MACD workflows are designed to configure the IRR router with all devices that are eligible to be configured as iBGP peer with the IRR.

All available PE and IRR devices in the network are processed to filter out and identify the list of PE and other IRR devices that are eligible to configured as an iBGP peer.

|  |  |  |  |
| --- | --- | --- | --- |
| **Local Device** | **Peering Device Type** | **iBGP peer type** | **Policy Region Constraint** |
| IRR | PE routes | RR client | Same policy region |
| IRRs | Standard (non-client) | Remote policy regions |

*Table 5 IRR iBGP Peering*

### Peering with PE Devices

IRR will iBGP peer with all PE routers that are in the same policy region as the source IRR itself.

Following the design principles, PE routers will in the policy region will peer with both IRRs, hence IRR will peer with all PE routers in the policy region.

### Peering with other IRR Devices

IRR will iBGP peer with all IRR routers that are not in the same policy region as the source IRR itself. IRRs in the same policy region will not peer with each other.

As part of identifying the valid IRR peer devices, NaaS will also compile and populate the BGP community details for the peer device’s region and cities as shown in the example below.

|  |  |
| --- | --- |
| **IRR Context Snippet** | **Comments** |
| bgp:{ |  |
| "neighbors":{ |  |
| "10.213.97.133":{ |  |
| "peerGroup":"INTERNET-NON-CLIENT-NEIGHBOR-GRP", |  |
| "description":"to irr1-test1-uk", |  |
| "region":"lab-zone-UK" | << peer device's policy region (example) |
| } |  |
| }, |  |
| "region":{ |  |
| "lab-zone-UK":{ | << community values for the peer's region (Example) |
| "transitComm":[ | Transit community values |
| "5400:34420", |  |
| "5400:34732", |  |
| "5400:34666" |  |
| ], |  |
| "peerComm":[ |  |
| "5400:33420", | Peer community values |
| "5400:33732", |  |
| "5400:33666" |  |
| ] |  |
| } |  |
| }, |  |
| } |  |

*Table 6 iBGP Peer - Peer and Transit Communities*

# Configuration Samples

## IRR Yang Model Example

Note: This is just an example from a test IRR device.

|  |
| --- |
| {    "fh-infrastructure-ntw:infrastructure-ntw":{       "network-nodes":{          "network-node":[             {                "bgp":{                   "groups":{                      "group":[                         {                            "name":"INTERNET-RR-CLIENT-NEIGHBOR-GRP",                            "neighbors":{                               "addresses":[                                  "10.213.97.79",                                  "10.213.97.72",                                  "10.213.97.77",                                  "10.213.97.75",                                  "10.213.97.76"                               ]                            },                            "address-family":[                               "ipv4-unicast"                            ],                            "naas-sm-basebuild-ext:password":"59555153466357585e63574d58606754524251634463445263464a626848605c5f"                         }                      ]                   },                   "naas-sm-basebuild-ext:regions":[                      {                         "peerComm":[                            "5400:33866",                            "5400:33394",                            "5400:3355",                            "5400:33420",                            "5400:33123"                         ],                         "region-name":"lab-zone-InternetRR",                         "transitComm":[                            "5400:34123",                            "5400:34420",                            "5400:3455",                            "5400:34866",                            "5400:34394"                         ]                      }                   ],                   "naas-sm-basebuild-ext:afi-safis":[                      {                         "enabled":true,                         "afi-safi":"ipv4-unicast",                         "export-policy":"EXPORT-ALL",                         "import-policy":"IMPORT-ALL"                      }                   ],                   "naas-sm-basebuild-ext:neighbors":[                      {                         "neighbor":"10.213.97.79",                         "description":"to edge1-atl8-us",                         "region-name":"None",                         "auth-password":"59555153466357585e63574d58606754524251634463445263464a626848605c5f",                         "prefix-length":31,                         "neighbor-group":"INTERNET-RR-CLIENT-NEIGHBOR-GRP"                      },                      {                         "neighbor":"10.213.97.72",                         "description":"to edge1-sin7-sg",                         "region-name":"None",                         "auth-password":"59555153466357585e63574d58606754524251634463445263464a626848605c5f",                         "prefix-length":31,                         "neighbor-group":"INTERNET-RR-CLIENT-NEIGHBOR-GRP"                      },                      {                         "neighbor":"10.213.97.77",                         "description":"to edge1-srk3-nl",                         "region-name":"None",                         "auth-password":"59555153466357585e63574d58606754524251634463445263464a626848605c5f",                         "prefix-length":31,                         "neighbor-group":"INTERNET-RR-CLIENT-NEIGHBOR-GRP"                      },                      {                         "neighbor":"10.213.97.75",                         "description":"to edge1-par38-fr",                         "region-name":"None",                         "auth-password":"59555153466357585e63574d58606754524251634463445263464a626848605c5f",                         "prefix-length":31,                         "neighbor-group":"INTERNET-RR-CLIENT-NEIGHBOR-GRP"                      },                      {                         "neighbor":"10.213.97.76",                         "description":"to edge2-par38-fr",                         "region-name":"None",                         "auth-password":"59555153466357585e63574d58606754524251634463445263464a626848605c5f",                         "prefix-length":31,                         "neighbor-group":"INTERNET-RR-CLIENT-NEIGHBOR-GRP"                      }                   ],                   "naas-sm-basebuild-ext:aggregates":{                      "footprints":[                         {                            "region-name":"APAC",                            "additionalInfraCommunity":[                               "5400:31053",                               "5400:31052",                               "5400:31051"                            ],                            "aggregateStaticFootprintTag":510                         },                         {                            "region-name":"Asia\_East\_WEst",                            "additionalInfraCommunity":[                               "5400:31052",                               "5400:31051"                            ],                            "aggregateStaticFootprintTag":511                         },                         {                            "region-name":"East\_Australia",                            "additionalInfraCommunity":[                               "5400:31053",                               "5400:31086",                               "5400:31088"                            ],                            "aggregateStaticFootprintTag":524                         },                         {                            "region-name":"EMEA",                            "additionalInfraCommunity":[                               "5400:31042",                               "5400:31011",                               "5400:31012",                               "5400:31013",                               "5400:31014",                               "5400:31015",                               "5400:31041"                            ],                            "aggregateStaticFootprintTag":535                         },                         {                            "region-name":"Europe",                            "additionalInfraCommunity":[                               "5400:31011",                               "5400:31012",                               "5400:31013",                               "5400:31014",                               "5400:31015"                            ],                            "aggregateStaticFootprintTag":536                         },                         {                            "region-name":"Europe\_exc\_Nordics\_SouthEast",                            "additionalInfraCommunity":[                               "5400:31011",                               "5400:31013",                               "5400:31014"                            ],                            "aggregateStaticFootprintTag":540                         },                         {                            "region-name":"Europe\_exc\_SouthEast",                            "additionalInfraCommunity":[                               "5400:31011",                               "5400:31012",                               "5400:31013",                               "5400:31014"                            ],                            "aggregateStaticFootprintTag":539                         },                         {                            "region-name":"global",                            "additionalInfraCommunity":[                               "5400:31021",                               "5400:31033",                               "5400:31042",                               "5400:31011",                               "5400:31012",                               "5400:31053",                               "5400:31052",                               "5400:31051",                               "5400:31022",                               "5400:31013",                               "5400:31014",                               "5400:31031",                               "5400:31015",                               "5400:31041",                               "5400:31032"                            ],                            "aggregateStaticFootprintTag":503                         },                         {                            "region-name":"Hong\_Kong",                            "additionalInfraCommunity":[                               "5400:31051",                               "5400:31065"                            ],                            "aggregateStaticFootprintTag":517                         },                         {                            "region-name":"Japan",                            "additionalInfraCommunity":[                               "5400:31051",                               "5400:31066"                            ],                            "aggregateStaticFootprintTag":518                         },                         {                            "region-name":"Singapore",                            "additionalInfraCommunity":[                               "5400:31051",                               "5400:31067"                            ],                            "aggregateStaticFootprintTag":519                         },                         {                            "region-name":"West\_Asia\_Oceania",                            "additionalInfraCommunity":[                               "5400:31053",                               "5400:31052"                            ],                            "aggregateStaticFootprintTag":513                         },                         {                            "region-name":"West\_Australia",                            "additionalInfraCommunity":[                               "5400:31053",                               "5400:31087"                            ],                            "aggregateStaticFootprintTag":523                         },                         {                            "region-name":"West\_Europe",                            "additionalInfraCommunity":[                               "5400:31011",                               "5400:31014"                            ],                            "aggregateStaticFootprintTag":537                         },                         {                            "region-name":"West\_Europe\_and\_Nordics",                            "additionalInfraCommunity":[                               "5400:31011",                               "5400:31012",                               "5400:31014"                            ],                            "aggregateStaticFootprintTag":538                         }                      ],                      "localRegionInfraCommunity":"5400:31123"                   },                   "naas-sm-basebuild-ext:rpkiServers":[                      {                         "tcp-port":1234,                         "server-id":"1.1.1.1",                         "refresh-time":300,                         "response-time":120,                         "source-interface":"Loopback0"                      }                   ],                   "naas-sm-basebuild-ext:neighbor-groups":[                      {                         "ao":{                            "key-chain-name":"BGP-KEY",                            "include-tcp-options":false                         },                         "timers":{                            "holdtime":90                         },                         "address-families":[                            {                               "af-name":"ipv4-unicast",                               "redistribute":[                                                                 ],                               "route-policy":{                                                                 },                               "trigger-delays":[                                                                 ],                               "additional-paths":[                                                                 ],                               "route-reflector-client":{                                                                 }                            },                            {                               "af-name":"ipv6-labeled-unicast",                               "redistribute":[                                                                 ],                               "route-policy":{                                                                 },                               "trigger-delays":[                                                                 ],                               "additional-paths":[                                                                 ],                               "route-reflector-client":{                                                                 }                            },                            {                               "af-name":"ipv4-flowspec",                               "redistribute":[                                                                 ],                               "route-policy":{                                  "in":"DROP-ALL",                                  "out":"PASS-ALL"                               },                               "trigger-delays":[                                                                 ],                               "additional-paths":[                                                                 ],                               "route-reflector-client":{                                                                 }                            },                            {                               "af-name":"ipv6-flowspec",                               "redistribute":[                                                                 ],                               "route-policy":{                                  "in":"DROP-ALL",                                  "out":"PASS-ALL"                               },                               "trigger-delays":[                                                                 ],                               "additional-paths":[                                                                 ],                               "route-reflector-client":{                                                                 }                            }                         ],                         "neighbor-group-name":"INTERNET-RR-CLIENT-NEIGHBOR-GRP"                      },                      {                         "ao":{                            "key-chain-name":"BGP-KEY",                            "include-tcp-options":false                         },                         "timers":{                            "holdtime":90                         },                         "address-families":[                            {                               "af-name":"ipv4-unicast",                               "redistribute":[                                                                 ],                               "route-policy":{                                                                 },                               "trigger-delays":[                                                                 ],                               "additional-paths":[                                                                 ],                               "route-reflector-client":{                                                                 }                            },                            {                               "af-name":"ipv6-labeled-unicast",                               "redistribute":[                                                                 ],                               "route-policy":{                                                                 },                               "trigger-delays":[                                                                 ],                               "additional-paths":[                                                                 ],                               "route-reflector-client":{                                                                 }                            },                            {                               "af-name":"ipv4-flowspec",                               "redistribute":[                                                                 ],                               "route-policy":{                                  "in":"PASS-ALL",                                  "out":"PASS-ALL"                               },                               "trigger-delays":[                                                                 ],                               "additional-paths":[                                                                 ],                               "route-reflector-client":{                                                                 }                            },                            {                               "af-name":"ipv6-flowspec",                               "redistribute":[                                                                 ],                               "route-policy":{                                  "in":"PASS-ALL",                                  "out":"PASS-ALL"                               },                               "trigger-delays":[                                                                 ],                               "additional-paths":[                                                                 ],                               "route-reflector-client":{                                                                 }                            }                         ],                         "neighbor-group-name":"INTERNET-NON-CLIENT-NEIGHBOR-GRP"                      },                      {                         "ao":{                            "include-tcp-options":false                         },                         "timers":{                            "holdtime":90                         },                         "address-families":[                            {                               "af-name":"ipv4-flowspec",                               "validation":false,                               "redistribute":[                                                                 ],                               "route-policy":{                                  "in":"PASS-ALL",                                  "out":"DROP-ALL"                               },                               "trigger-delays":[                                                                 ],                               "additional-paths":[                                                                 ],                               "route-reflector-client":{                                                                 }                            },                            {                               "af-name":"ipv6-flowspec",                               "validation":false,                               "redistribute":[                                                                 ],                               "route-policy":{                                  "in":"PASS-ALL",                                  "out":"DROP-ALL"                               },                               "trigger-delays":[                                                                 ],                               "additional-paths":[                                                                 ],                               "route-reflector-client":{                                                                 }                            }                         ],                         "neighbor-group-name":"RR-TRA-DDOS"                      }                   ],                   "naas-sm-basebuild-ext:address-families":[                      {                         "af-name":"ipv4-unicast",                         "redistribute":[                            {                               "protocol":"static",                               "route-policy":"RR-STATIC-TO-BGP-V4"                            }                         ],                         "route-policy":{                                                     },                         "table-policy":"DROP-ALL",                         "maximum-paths":8,                         "trigger-delays":[                            {                               "type":"critical",                               "delay-timer":1000                            },                            {                               "type":"non-critical",                               "delay-timer":2000                            }                         ],                         "additional-paths":[                            {                               "path":"receive",                               "route-policy":"BGP-Path-Selection"                            },                            {                               "path":"send",                               "route-policy":"BGP-Path-Selection"                            }                         ],                         "route-reflector-client":{                                                     }                      },                      {                         "af-name":"ipv6-unicast",                         "label-mode":"per-vrf",                         "redistribute":[                            {                               "protocol":"static",                               "route-policy":"RR-STATIC-TO-BGP-V6"                            }                         ],                         "route-policy":{                                                     },                         "table-policy":"DROP-ALL",                         "maximum-paths":8,                         "trigger-delays":[                            {                               "type":"critical",                               "delay-timer":1000                            },                            {                               "type":"non-critical",                               "delay-timer":2000                            }                         ],                         "additional-paths":[                            {                               "path":"receive",                               "route-policy":"BGP-Path-Selection"                            },                            {                               "path":"send",                               "route-policy":"BGP-Path-Selection"                            }                         ],                         "label-allocation":"all",                         "route-reflector-client":{                                                     }                      },                      {                         "af-name":"ipv4-flowspec",                         "redistribute":[                                                     ],                         "route-policy":{                                                     },                         "trigger-delays":[                                                     ],                         "additional-paths":[                                                     ],                         "route-reflector-client":{                                                     }                      },                      {                         "af-name":"ipv6-flowspec",                         "redistribute":[                                                     ],                         "route-policy":{                                                     },                         "trigger-delays":[                                                     ],                         "additional-paths":[                                                     ],                         "route-reflector-client":{                                                     }                      }                   ],                   "naas-sm-basebuild-ext:graceful-restart":{                      "enabled":true,                      "restart-time":120,                      "stale-routes-time":"360"                   },                   "naas-sm-basebuild-ext:use-multiple-paths":{                      "ebgp":32,                      "ibgp":32                   },                   "naas-sm-basebuild-ext:route-reflector-client":true,                   "naas-sm-basebuild-ext:route-selection-options":{                      "always-compare-med":true                   }                },                "name":"irr1-atl8-us",                "model":"Router\_XRV9000-APLN-ROUT\_10.0\_STD",                "users":{                   "user":[                      {                         "name":"btuser\_admin",                         "full-name":"btuser\_admin",                         "naas-sm-basebuild-ext:class":"root-lr",                         "naas-sm-basebuild-ext:password":"$6$UEl.OIAU41c/O...$LxHGqLlQ7KgoeBZYu1PyA/5BUXFiwgn2v9BokgkznkizZquhWm5x7Q.7DvAQv5HA89L8nnmST/4EWy1.eYZyQ/"                      },                      {                         "name":"gnmi\_rob",                         "full-name":"gnmi\_rob",                         "naas-sm-basebuild-ext:class":"root-lr",                         "naas-sm-basebuild-ext:password":"$6$4H54B0oVFXMo6B0.$M2NC3MojioYWjUr6ClfQ23pdyA9Fr4FcyFNWZO14dalsjeBLqFMEkd3xv069c/TSZV9bKbgkzlZb9Q7F4zpCh0"                      },                      {                         "name":"juniper\_gnmi\_rob",                         "full-name":"juniper\_gnmi\_rob",                         "naas-sm-basebuild-ext:class":"root-lr",                         "naas-sm-basebuild-ext:password":"$6$G9PX/mqMB4/.....$YU1XMOUjt6zwQnTa/zw.Cdrt3oUMI/kddEZpXXb8kO1jk/2Hfw0AYwCHE.QR7N4oiY/gg5rXlHVraXxgmjwbM/"                      }                   ]                },                "hostname":"irr1-atl8-us",                "location":"USATLA008",                "router-id":{                   "explicit":"10.213.97.105"                },                "accounting":{                   "destination":{                      "tacplus":{                         "server":[                            {                               "name":"10.2.116.237",                               "authentication-options":{                                  "port":49,                                  "secret":"4f655164455755414c5046435d545a444f53515e446154434244444f585c42605f654c594c5b62596358414142"                               },                               "naas-sm-basebuild-ext:timeout":5,                               "naas-sm-basebuild-ext:orderingIndex":1,                               "naas-sm-basebuild-ext:source-interface":"Loopback0"                            },                            {                               "name":"10.2.116.239",                               "authentication-options":{                                  "port":49,                                  "secret":"4f655164455755414c5046435d545a444f53515e446154434244444f585c42605f654c594c5b62596358414142"                               },                               "naas-sm-basebuild-ext:timeout":5,                               "naas-sm-basebuild-ext:orderingIndex":2,                               "naas-sm-basebuild-ext:source-interface":"Loopback0"                            }                         ]                      }                   }                },                "interfaces":{                   "interface":[                      {                         "isis":{                            "naas-sm-basebuild-ext:metric":{                               "ipv4":10,                               "ipv6":10                            },                            "naas-sm-basebuild-ext:password":"565c52414c444f4f4f4c6748485e6765684c5f674d4e4b594c64594a644c4a5346"                         },                         "name":"TenGigE0/0/0/0",                         "description":"core1-atl8-us Te0/0/0/1/1",                         "naas-sm-basebuild-ext:ipv4":{                            "explicit":"192.168.208.201/31"                         }                      },                      {                         "isis":{                            "naas-sm-basebuild-ext:metric":{                               "ipv4":10,                               "ipv6":10                            },                            "naas-sm-basebuild-ext:password":"565c52414c444f4f4f4c6748485e6765684c5f674d4e4b594c64594a644c4a5346"                         },                         "name":"Loopback0",                         "naas-sm-basebuild-ext:ipv4":{                            "explicit":"10.213.97.105/32"                         },                         "naas-sm-basebuild-ext:enabled":true                      }                   ]                },                "ipv4-loopback":{                   "explicit":"10.213.97.105"                },                "autonomous-system":5400,                "naas-sm-basebuild-ext:bfd":{                   "bfdInterfaces":[                                         ]                },                "naas-sm-basebuild-ext:ntp":{                   "ntpACL":"NTP\_ACL",                   "ntpKeys":[                      {                         "id":1,                         "ntp-password":"094F471A1A0A"                      }                   ],                   "ntpServers":[                      {                         "ntp-server-ip-address":"10.213.97.64"                      }                   ],                   "ntpSourceInt":"Loopback0"                },                "naas-sm-basebuild-ext:qos":{                   "interfaces":[                      {                         "interface":"TenGigE0/0/0/0",                         "egress-policy":"internetRR\_egress",                         "ingress-policy":"internetRR\_ingress"                      }                   ],                   "forwarding-groups":[                                         ]                },                "naas-sm-basebuild-ext:grpc":{                   "name":"Default",                   "port":57344,                   "enable":true                },                "naas-sm-basebuild-ext:isis":{                   "nsr":true,                   "levels":{                      "level-number":2,                      "traffic-engineering":true                   },                   "timers":{                      "spf":{                         "spf-hold-interval":1000,                         "spf-first-interval":200,                         "spf-second-interval":400                      },                      "lsp-generation":{                         "lsp-max-wait-interval":1000,                         "lsp-first-wait-interval":50,                         "lsp-second-wait-interval":50                      },                      "lsp-refresh-interval":10800,                      "lsp-lifetime-interval":65535                   },                   "area-id":"49.0001",                   "afi-safi":{                      "af":[                         {                            "afi-name":"openconfig-isis-types:IPV4",                            "safi-name":"openconfig-isis-types:UNICAST",                            "multi-topology":false                         },                         {                            "afi-name":"openconfig-isis-types:IPV6",                            "safi-name":"openconfig-isis-types:UNICAST",                            "multi-topology":true                         }                      ]                   },                   "password":"565c52414c444f4f4f4c6748485e6765684c5f674d4e4b594c64594a644c4a5346",                   "system-id":"0102.1309.7105",                   "interfaces":[                      {                         "delay":{                            "offset":0,                            "interval":255                         },                         "levels":[                                                     ],                         "enabled":true,                         "passive":false,                         "afi-safi":{                            "af":[                               {                                  "enabled":true,                                  "afi-name":"openconfig-isis-types:IPV4",                                  "safi-name":"openconfig-isis-types:UNICAST"                               },                               {                                  "enabled":true,                                  "afi-name":"openconfig-isis-types:IPV6",                                  "safi-name":"openconfig-isis-types:UNICAST"                               }                            ]                         },                         "circuit-type":"level-2-only",                         "hello-padding":"STRICT",                         "hello-password":"565c52414c444f4f4f4c6748485e6765684c5f674d4e4b594c64594a644c4a5346",                         "interface-name":"TenGigE0/0/0/0",                         "address-families":[                            {                               "af-name":"ipv4",                               "saf-name":"unicast",                               "default-metric":10                            },                            {                               "af-name":"ipv6",                               "saf-name":"unicast",                               "default-metric":10                            }                         ],                         "prefix-sid-algorithms":[                                                     ]                      },                      {                         "delay":{                            "offset":0,                            "interval":255                         },                         "levels":[                                                     ],                         "enabled":true,                         "passive":false,                         "afi-safi":{                            "af":[                               {                                  "enabled":true,                                  "afi-name":"openconfig-isis-types:IPV4",                                  "safi-name":"openconfig-isis-types:UNICAST"                               },                               {                                  "enabled":true,                                  "afi-name":"openconfig-isis-types:IPV6",                                  "safi-name":"openconfig-isis-types:UNICAST"                               }                            ]                         },                         "circuit-type":"level-2-only",                         "hello-padding":"STRICT",                         "hello-password":"565c52414c444f4f4f4c6748485e6765684c5f674d4e4b594c64594a644c4a5346",                         "interface-name":"Con0/RP0/CPU0",                         "address-families":[                            {                               "af-name":"ipv4",                               "saf-name":"unicast",                               "default-metric":10                            },                            {                               "af-name":"ipv6",                               "saf-name":"unicast",                               "default-metric":10                            }                         ],                         "prefix-sid-algorithms":[                                                     ]                      },                      {                         "delay":{                            "offset":0,                            "interval":255                         },                         "levels":[                                                     ],                         "enabled":true,                         "passive":false,                         "afi-safi":{                            "af":[                               {                                  "enabled":true,                                  "afi-name":"openconfig-isis-types:IPV4",                                  "safi-name":"openconfig-isis-types:UNICAST"                               },                               {                                  "enabled":true,                                  "afi-name":"openconfig-isis-types:IPV6",                                  "safi-name":"openconfig-isis-types:UNICAST"                               }                            ]                         },                         "circuit-type":"level-2-only",                         "hello-padding":"STRICT",                         "hello-password":"565c52414c444f4f4f4c6748485e6765684c5f674d4e4b594c64594a644c4a5346",                         "interface-name":"MgmtEth0/RP0/CPU0/0",                         "address-families":[                            {                               "af-name":"ipv4",                               "saf-name":"unicast",                               "default-metric":10                            },                            {                               "af-name":"ipv6",                               "saf-name":"unicast",                               "default-metric":10                            }                         ],                         "prefix-sid-algorithms":[                                                     ]                      },                      {                         "delay":{                            "offset":0,                            "interval":255                         },                         "levels":[                                                     ],                         "enabled":true,                         "passive":false,                         "afi-safi":{                            "af":[                               {                                  "enabled":true,                                  "afi-name":"openconfig-isis-types:IPV4",                                  "safi-name":"openconfig-isis-types:UNICAST"                               },                               {                                  "enabled":true,                                  "afi-name":"openconfig-isis-types:IPV6",                                  "safi-name":"openconfig-isis-types:UNICAST"                               }                            ]                         },                         "circuit-type":"level-2-only",                         "hello-padding":"STRICT",                         "hello-password":"565c52414c444f4f4f4c6748485e6765684c5f674d4e4b594c64594a644c4a5346",                         "interface-name":"CIMC 0",                         "address-families":[                            {                               "af-name":"ipv4",                               "saf-name":"unicast",                               "default-metric":10                            },                            {                               "af-name":"ipv6",                               "saf-name":"unicast",                               "default-metric":10                            }                         ],                         "prefix-sid-algorithms":[                                                     ]                      },                      {                         "levels":[                                                     ],                         "enabled":true,                         "passive":true,                         "afi-safi":{                            "af":[                               {                                  "enabled":true,                                  "afi-name":"openconfig-isis-types:IPV4",                                  "safi-name":"openconfig-isis-types:UNICAST"                               },                               {                                  "enabled":true,                                  "afi-name":"openconfig-isis-types:IPV6",                                  "safi-name":"openconfig-isis-types:UNICAST"                               }                            ]                         },                         "hello-padding":"STRICT",                         "interface-name":"Loopback0",                         "address-families":[                            {                               "af-name":"ipv6",                               "saf-name":"unicast"                            },                            {                               "af-name":"ipv4",                               "saf-name":"unicast"                            }                         ],                         "prefix-sid-algorithms":[                                                     ]                      }                   ],                   "lsp-password":"565c52414c444f4f4f4c6748485e6765684c5f674d4e4b594c64594a644c4a5346",                   "redistribute":[                                         ],                   "isis-overload":[                      {                         "level-id":"level-2",                         "time-to-advertise":120                      }                   ],                   "segment-routing":true,                   "address-families":[                      {                         "af-name":"ipv4",                         "saf-name":"unicast"                      },                      {                         "af-name":"ipv6",                         "saf-name":"unicast"                      }                   ],                   "graceful-restart":true                },                "naas-sm-basebuild-ext:role":"internetRR",                "naas-sm-basebuild-ext:vrfs":[                                   ],                "naas-sm-basebuild-ext:sflow":{                   "sampler-maps":[                                         ],                   "sflowCollectors":[                                         ]                },                "naas-sm-basebuild-ext:twamp":{                   "interfaces":[                      {                         "delay":3,                         "interface":"TenGigE0/0/0/0"                      },                      {                         "delay":3,                         "interface":"Con0/RP0/CPU0"                      },                      {                         "delay":3,                         "interface":"MgmtEth0/RP0/CPU0/0"                      },                      {                         "delay":3,                         "interface":"CIMC 0"                      },                      {                         "delay":3,                         "interface":"Loopback0"                      }                   ],                   "liveness-profile":{                      "multiplier":3,                      "tx-interval":2500000                   }                },                "naas-sm-basebuild-ext:syslog":{                   "syslogServers":[                      {                         "syslog-server-ip-address":"100.1.1.1"                      }                   ],                   "syslogSourceInt":"Loopback0"                },                "naas-sm-basebuild-ext:is\_day0":true,                "naas-sm-basebuild-ext:flowspec":{                   "interfaces":[                      {                         "status":"disable",                         "interface":"TenGigE0/0/0/0"                      },                      {                         "status":"disable",                         "interface":"Con0/RP0/CPU0"                      },                      {                         "status":"disable",                         "interface":"MgmtEth0/RP0/CPU0/0"                      },                      {                         "status":"disable",                         "interface":"CIMC 0"                      },                      {                         "status":"disable",                         "interface":"Loopback0"                      }                   ]                },                "naas-sm-basebuild-ext:timezone":"GMT",                "naas-sm-basebuild-ext:locations":[                                   ],                "naas-sm-basebuild-ext:region\_id":"",                "naas-sm-basebuild-ext:key-chains":{                   "key-chain":[                      {                         "keys":[                            {                               "key-id":1,                               "key-string":{                                  "key-string":"Embe1mpls"                               },                               "send-lifetime":{                                  "start-date":1,                                  "start-hour":0,                                  "start-year":2022,                                  "start-month":"jan",                                  "infinite-flag":true,                                  "start-minutes":0,                                  "start-seconds":0                               },                               "accept-lifetime":{                                  "start-date":1,                                  "start-hour":0,                                  "start-year":2022,                                  "start-month":"jan",                                  "infinite-flag":true,                                  "start-minutes":0,                                  "start-seconds":0                               },                               "cryptographic-algorithm":"alg-hmac-md5-16"                            }                         ],                         "name":"BGP-KEY"                      },                      {                         "keys":[                            {                               "key-id":2,                               "key-string":{                                  "key-string":""                               },                               "send-lifetime":{                                  "start-date":1,                                  "start-hour":1,                                  "start-year":2024,                                  "start-month":"jan",                                  "infinite-flag":true,                                  "start-minutes":1,                                  "start-seconds":1                               },                               "accept-lifetime":{                                  "start-date":1,                                  "start-hour":0,                                  "start-year":2022,                                  "start-month":"jan",                                  "infinite-flag":true,                                  "start-minutes":0,                                  "start-seconds":0                               },                               "cryptographic-algorithm":"alg-hmac-md5-16"                            }                         ],                         "name":"ISIS-KEY"                      }                   ]                },                "naas-sm-basebuild-ext:controllers":[                                   ],                "naas-sm-basebuild-ext:access-lists":{                   "access-list":[                      {                         "name":"NTP\_CLIENTS",                         "type":"ACL\_IPV4",                         "acl-entries":[                            {                               "sequence-id":1,                               "source-prefix":"10.2.80.0/20",                               "forwarding-action":"ACCEPT"                            },                            {                               "sequence-id":2,                               "source-prefix":"10.2.112.0/21",                               "forwarding-action":"ACCEPT"                            },                            {                               "sequence-id":3,                               "source-prefix":"10.2.120.0/21",                               "forwarding-action":"ACCEPT"                            },                            {                               "sequence-id":4,                               "source-prefix":"10.213.83.141/32",                               "forwarding-action":"ACCEPT"                            },                            {                               "sequence-id":5,                               "source-prefix":"10.213.93.207/32",                               "forwarding-action":"ACCEPT"                            },                            {                               "sequence-id":6,                               "source-prefix":"10.213.93.218/32",                               "forwarding-action":"ACCEPT"                            },                            {                               "sequence-id":7,                               "source-prefix":"10.213.93.219/32",                               "forwarding-action":"ACCEPT"                            },                            {                               "sequence-id":8,                               "source-prefix":"10.213.93.220/32",                               "forwarding-action":"ACCEPT"                            },                            {                               "sequence-id":9,                               "source-prefix":"10.213.95.220/32",                               "forwarding-action":"ACCEPT"                            }                         ]                      }                   ]                },                "naas-sm-basebuild-ext:manufacturer":"CISCO",                "naas-sm-basebuild-ext:static-routes":[                   {                      "tag":10,                      "prefix":"192.0.2.1/32",                      "next-hops":[                         {                            "index":"##DROP##",                            "next-hop":"openconfig-local-routing:DROP"                         }                      ],                      "description":"static-route-1"                   },                   {                      "tag":10,                      "prefix":"100::1/128",                      "next-hops":[                         {                            "index":"##DROP##",                            "next-hop":"openconfig-local-routing:DROP"                         }                      ],                      "description":"static-route-2"                   }                ],                "naas-sm-basebuild-ext:routing-policies":{                   "community-sets":[                      {                         "set-name":"infraCommunity",                         "rpl-community-set":"community-set infraCommunity\n  ios-regex '5400:31(...)'\nend-set"                      }                   ],                   "route-policies":[                      {                         "rpl-route-policy":"route-policy RP\_BGP\_PIC\_EDGE\n  set path-selection backup 1 install\nend-policy",                         "route-policy-name":"RP\_BGP\_PIC\_EDGE"                      }                   ],                   "maximum-lines-of-policy":131072,                   "maximum-number-of-policies":5000,                   "extended-community-opaque-sets":[                      {                         "set-name":"GREEN",                         "rpl-extended-community-opaque-set":"extcommunity-set opaque GREEN\n  100\nend-set"                      }                   ]                },                "naas-sm-basebuild-ext:control-plane-protection":{                   "ipv4":[                      {                         "name":"ipv4",                         "ipv4-address":"10.2.80.0",                         "prefix-length":20                      },                      {                         "name":"ipv4",                         "ipv4-address":"10.2.112.0",                         "prefix-length":21                      },                      {                         "name":"ipv4",                         "ipv4-address":"10.2.120.0",                         "prefix-length":21                      },                      {                         "name":"ipv4",                         "ipv4-address":"10.213.83.141",                         "prefix-length":32                      },                      {                         "name":"ipv4",                         "ipv4-address":"10.213.93.207",                         "prefix-length":32                      },                      {                         "name":"ipv4",                         "ipv4-address":"10.213.93.218",                         "prefix-length":32                      },                      {                         "name":"ipv4",                         "ipv4-address":"10.213.93.219",                         "prefix-length":32                      },                      {                         "name":"ipv4",                         "ipv4-address":"10.213.93.220",                         "prefix-length":32                      },                      {                         "name":"ipv4",                         "ipv4-address":"10.213.95.220",                         "prefix-length":32                      }                   ],                   "ipv6":[                                         ],                   "local-interface":"10.213.97.105"                }             }          ]       }    } } |

## IRR Device Context Example

Note: This is just an example from a test IRR device.

|  |
| --- |
| {  "status": "Success",  "context": {  "deviceType": "internetRR",  "manufacturer": "CISCO",  "site\_name": "USQASA005",  "is\_day0": true,  "aaa": {  "tacacsServer": {  "hosts": {  "host": {  "10.2.116.237": {  "key": {  "six": "*<truncated>*"  },  "orderingIndex": 1,  "port": 49,  "timeout": 5  },  "10.2.116.239": {  "key": {  "six": "*<truncated>*"  },  "orderingIndex": 2,  "port": 49,  "timeout": 5  }  }  }  }  },  "srte": {  "endpoints": {}  },  "mpp": {  "inband": {  "ipv4": {  "10.2.80.0": {  "length": 20  },  "10.2.112.0": {  "length": 21  },  "10.2.120.0": {  "length": 21  },  "10.213.93.207": {  "length": 32  },  "10.213.93.218": {  "length": 32  },  "10.213.93.219": {  "length": 32  },  "10.213.93.220": {  "length": 32  },  "10.213.95.220": {  "length": 32  }  },  "ipv6": {}  }  },  "snmp\_server": {  "users": {  "user": {  "mf": {  "auth": {  "encryption\_aes": "128"  },  "priv": {  "encryption\_aes": "128"  }  }  }  }  },  "sflow": {},  "call\_home": {  "profiles": {  "profile": {  "destination": {  "addresses": {  "address\_type": {  "destination\_address": "https://smart.bt.com"  }  }  }  }  }  },  "isis": {  "netIdPartial": "0102.1309.7058",  "key": {  "1": {  "password": "*<truncated>*",  "passwordEncrypted": true,  "start": {  "hour": 1,  "minutes": 1,  "seconds": 1,  "day": 1,  "month": "jan",  "year": 2024  }  }  }  },  "qos": {  "policy": {  "internetRR": {  "forwarding\_groups": {}  }  }  },  "system": {  "aaa": {  "authentication": {  "users": {  "btadmin": {  "password\_hashed": *<truncated>*",  "role": "root-lr"  },  "bt\_gnmi\_rob": {  "password\_hashed": *<truncated>*",  "role": "root-lr"  },  "gnmi\_rob": {  "password\_hashed": *<truncated>*",  "role": "root-lr"  }  }  }  },  "config": {  "hostname": "irr1-qas5-us"  },  "logging": {  "remoteServers": {  "100.1.1.1": "syslog-server-details"  }  },  "ntp": {  "ntpKey": [  {},  {  "password": "*<truncated>*"  }  ],  "servers": {  "10.213.97.56": "ntp-server-details"  }  }  },  "bgp": {  "neighbors": {  "10.213.97.33": {  "peerGroup": "INTERNET-RR-CLIENT-NEIGHBOR-GRP",  "description": "to edge1-lax6-us"  },  "10.213.97.35": {  "peerGroup": "INTERNET-RR-CLIENT-NEIGHBOR-GRP",  "description": "to edge1-qas5-us"  },  "10.213.97.36": {  "peerGroup": "INTERNET-RR-CLIENT-NEIGHBOR-GRP",  "description": "to edge2-qas5-us"  }  },  "key": {  "1": {  "password": "*<truncated>*",  "passwordEncrypted": true,  "start": {  "hour": 0,  "minutes": 0,  "seconds": 0,  "day": 1,  "month": "jan",  "year": 2022  }  }  },  "region": {  "lab-zone": {  "transitComm": [  "5400:34902",  "5400:34865"  ],  "peerComm": [  "5400:33902",  "5400:33865"  ]  }  },  "aggregates": {  "localRegionInfraCommunity": "5400:31865",  "footprint": {  "APAC": {  "additionalInfraCommunity": [  "5400:31053",  "5400:31052",  "5400:31051"  ],  "aggregateStaticFootprintTag": 510  },  "Asia\_East\_WEst": {  "additionalInfraCommunity": [  "5400:31052",  "5400:31051"  ],  "aggregateStaticFootprintTag": 511  },  "East\_Australia": {  "additionalInfraCommunity": [  "5400:31053",  "5400:31086",  "5400:31088"  ],  "aggregateStaticFootprintTag": 524  },  "EMEA": {  "additionalInfraCommunity": [  "5400:31042",  "5400:31011",  "5400:31012",  "5400:31013",  "5400:31014",  "5400:31015",  "5400:31041"  ],  "aggregateStaticFootprintTag": 535  },  "Europe": {  "additionalInfraCommunity": [  "5400:31011",  "5400:31012",  "5400:31013",  "5400:31014",  "5400:31015"  ],  "aggregateStaticFootprintTag": 536  },  "Europe\_exc\_Nordics\_SouthEast": {  "additionalInfraCommunity": [  "5400:31011",  "5400:31013",  "5400:31014"  ],  "aggregateStaticFootprintTag": 540  },  "Europe\_exc\_SouthEast": {  "additionalInfraCommunity": [  "5400:31011",  "5400:31012",  "5400:31013",  "5400:31014"  ],  "aggregateStaticFootprintTag": 539  },  "global": {  "additionalInfraCommunity": [  "5400:31021",  "5400:31033",  "5400:31042",  "5400:31011",  "5400:31012",  "5400:31053",  "5400:31052",  "5400:31051",  "5400:31022",  "5400:31013",  "5400:31014",  "5400:31031",  "5400:31015",  "5400:31041",  "5400:31032"  ],  "aggregateStaticFootprintTag": 503  },  "Hong\_Kong": {  "additionalInfraCommunity": [  "5400:31051",  "5400:31065"  ],  "aggregateStaticFootprintTag": 517  },  "Japan": {  "additionalInfraCommunity": [  "5400:31051",  "5400:31066"  ],  "aggregateStaticFootprintTag": 518  },  "Singapore": {  "additionalInfraCommunity": [  "5400:31051",  "5400:31067"  ],  "aggregateStaticFootprintTag": 519  },  "West\_Asia\_Oceania": {  "additionalInfraCommunity": [  "5400:31053",  "5400:31052"  ],  "aggregateStaticFootprintTag": 513  },  "West\_Australia": {  "additionalInfraCommunity": [  "5400:31053",  "5400:31087"  ],  "aggregateStaticFootprintTag": 523  },  "West\_Europe": {  "additionalInfraCommunity": [  "5400:31011",  "5400:31014"  ],  "aggregateStaticFootprintTag": 537  },  "West\_Europe\_and\_Nordics": {  "additionalInfraCommunity": [  "5400:31011",  "5400:31012",  "5400:31014"  ],  "aggregateStaticFootprintTag": 538  }  }  }  },  "device\_list": {},  "interfaces": {  "TenGigE0/0/0/0": {  "description": "",  "ipv4": {  "address": "192.168.80.20"  },  "isis": {  "metric": {  "ipv4": 10,  "ipv6": 10  }  },  "restrictMtu": true  },  "TenGigE0/0/0/4": {  "description": "",  "ipv4": {  "address": "192.168.80.23"  },  "isis": {  "metric": {  "ipv4": 10,  "ipv6": 10  }  },  "restrictMtu": true  },  "Loopback0": {  "enabled": true,  "ipv4": {  "address": "10.213.97.58"  },  "isis": {  "metric": {  "ipv4": 10,  "ipv6": 10  }  }  }  }  }  } |

## IRR Device Configuration Example

Note: This is just an example from a test IRR device.

|  |
| --- |
| {  "status": "Success",  "config": [  [  "openconfig-acl:acl",  {  "acl-sets": {  "acl-set": [  {  "name": "NTP\_ACL",  "type": "ACL\_IPV4",  "config": {  "name": "NTP\_ACL",  "type": "ACL\_IPV4"  },  "acl-entries": {  "acl-entry": [  {  "sequence-id": 10,  "config": {  "sequence-id": 10  },  "actions": {  "config": {  "forwarding-action": "ACCEPT"  }  },  "ipv4": {  "config": {  "source-address": "10.213.97.56/32"  }  }  }  ]  }  }  ]  }  }  ],  [  "Cisco-IOS-XR-um-lpts-pifib-cfg:lpts",  {  "pifib": {  "hardware": {  "police": {  "flow": {  "bgp": {  "known": {  "rate": 10000  },  "configured": {  "rate": 10000  }  }  }  }  }  }  }  ],  [  "openconfig-bfd:bfd",  {  "interfaces": {  "interface": [  {  "id": "TenGigE0/0/0/0",  "config": {  "id": "TenGigE0/0/0/0",  "detection-multiplier": 3,  "required-minimum-receive": 300000,  "desired-minimum-tx-interval": 300000  }  },  {  "id": "TenGigE0/0/0/4",  "config": {  "id": "TenGigE0/0/0/4",  "detection-multiplier": 3,  "required-minimum-receive": 300000,  "desired-minimum-tx-interval": 300000  }  }  ]  }  }  ],  [  "Cisco-IOS-XR-um-bfd-sbfd-cfg:bfd",  {  "dampening": {  "disable": {}  }  }  ],  [  "openconfig-network-instance:network-instances",  {  "network-instance": [  {  "name": "DEFAULT",  "protocols": {  "protocol": [  {  "identifier": "openconfig-policy-types:BGP",  "name": "default",  "config": {  "identifier": "openconfig-policy-types:BGP",  "name": "default"  },  "bgp": {  "global": {  "config": {  "as": 5400,  "router-id": "10.213.97.58"  },  "graceful-restart": {  "config": {  "restart-time": 120,  "stale-routes-time": 360,  "enabled": true  }  },  "route-selection-options": {  "config": {  "always-compare-med": true  }  },  "afi-safis": {  "afi-safi": [  {  "afi-safi-name": "openconfig-bgp-types:IPV4\_UNICAST",  "config": {  "afi-safi-name": "openconfig-bgp-types:IPV4\_UNICAST",  "enabled": true  }  },  {  "afi-safi-name": "openconfig-bgp-types:IPV6\_UNICAST",  "config": {  "afi-safi-name": "openconfig-bgp-types:IPV6\_UNICAST",  "enabled": true  }  }  ]  }  },  "peer-groups": {  "peer-group": [  {  "peer-group-name": "INTERNET-RR-CLIENT-NEIGHBOR-GRP",  "config": {  "peer-group-name": "INTERNET-RR-CLIENT-NEIGHBOR-GRP",  "peer-as": 5400  },  "timers": {  "config": {  "keepalive-interval": 30,  "hold-time": 90  }  },  "transport": {  "config": {  "local-address": "Loopback0"  }  },  "afi-safis": {  "afi-safi": [  {  "afi-safi-name": "openconfig-bgp-types:IPV4\_UNICAST",  "config": {  "afi-safi-name": "openconfig-bgp-types:IPV4\_UNICAST",  "enabled": true  },  "apply-policy": {  "config": {  "import-policy": [  "PASS-ALL"  ],  "export-policy": [  "bgpInternet\_RR-TO-PE"  ]  }  }  },  {  "afi-safi-name": "openconfig-bgp-types:IPV6\_LABELED\_UNICAST",  "config": {  "afi-safi-name": "openconfig-bgp-types:IPV6\_LABELED\_UNICAST",  "enabled": true  },  "apply-policy": {  "config": {  "import-policy": [  "PASS-ALL"  ],  "export-policy": [  "bgpInternet\_RR-TO-PE"  ]  }  }  }  ]  }  },  {  "peer-group-name": "INTERNET-NON-CLIENT-NEIGHBOR-GRP",  "config": {  "peer-group-name": "INTERNET-NON-CLIENT-NEIGHBOR-GRP",  "peer-as": 5400  },  "timers": {  "config": {  "keepalive-interval": 30,  "hold-time": 90  }  },  "transport": {  "config": {  "local-address": "Loopback0"  }  },  "afi-safis": {  "afi-safi": [  {  "afi-safi-name": "openconfig-bgp-types:IPV4\_UNICAST",  "config": {  "afi-safi-name": "openconfig-bgp-types:IPV4\_UNICAST",  "enabled": true  },  "apply-policy": {  "config": {  "import-policy": [  "PASS-ALL"  ]  }  }  },  {  "afi-safi-name": "openconfig-bgp-types:IPV6\_LABELED\_UNICAST",  "config": {  "afi-safi-name": "openconfig-bgp-types:IPV6\_LABELED\_UNICAST",  "enabled": true  },  "apply-policy": {  "config": {  "import-policy": [  "PASS-ALL"  ]  }  }  }  ]  }  },  {  "peer-group-name": "RR-TRA-DDOS",  "config": {  "peer-group-name": "RR-TRA-DDOS",  "peer-as": 5400  },  "timers": {  "config": {  "keepalive-interval": 30,  "hold-time": 90  }  },  "transport": {  "config": {  "local-address": "Loopback0"  }  },  "afi-safis": {  "afi-safi": [  {  "afi-safi-name": "openconfig-bgp-types:IPV4\_UNICAST",  "config": {  "afi-safi-name": "openconfig-bgp-types:IPV4\_UNICAST",  "enabled": true  },  "apply-policy": {  "config": {  "import-policy": [  "PASS-ALL"  ],  "export-policy": [  "DROP-ALL"  ]  }  }  },  {  "afi-safi-name": "openconfig-bgp-types:IPV6\_UNICAST",  "config": {  "afi-safi-name": "openconfig-bgp-types:IPV6\_UNICAST",  "enabled": true  },  "apply-policy": {  "config": {  "import-policy": [  "PASS-ALL"  ],  "export-policy": [  "DROP-ALL"  ]  }  }  }  ]  },  "route-reflector": {  "config": {  "route-reflector-client": true  }  }  }  ]  },  "neighbors": {  "neighbor": [  {  "neighbor-address": "10.213.97.33",  "config": {  "neighbor-address": "10.213.97.33",  "peer-group": "INTERNET-RR-CLIENT-NEIGHBOR-GRP",  "description": "to edge1-lax6-us"  }  },  {  "neighbor-address": "10.213.97.35",  "config": {  "neighbor-address": "10.213.97.35",  "peer-group": "INTERNET-RR-CLIENT-NEIGHBOR-GRP",  "description": "to edge1-qas5-us"  }  },  {  "neighbor-address": "10.213.97.36",  "config": {  "neighbor-address": "10.213.97.36",  "peer-group": "INTERNET-RR-CLIENT-NEIGHBOR-GRP",  "description": "to edge2-qas5-us"  }  }  ]  }  }  }  ]  }  }  ]  }  ],  [  "openconfig-network-instance:network-instances",  {  "network-instance": [  {  "name": "DEFAULT",  "protocols": {  "protocol": [  {  "identifier": "openconfig-policy-types:STATIC",  "name": "DEFAULT",  "config": {  "identifier": "openconfig-policy-types:STATIC",  "name": "DEFAULT"  },  "static-routes": {  "static": [  {  "prefix": "192.0.2.1/32",  "config": {  "prefix": "192.0.2.1/32",  "set-tag": 10  },  "next-hops": {  "next-hop": [  {  "index": "##DROP##",  "config": {  "index": "##DROP##",  "next-hop": "openconfig-local-routing:DROP"  }  }  ]  }  },  {  "prefix": "100::1/128",  "config": {  "prefix": "100::1/128",  "set-tag": 10  },  "next-hops": {  "next-hop": [  {  "index": "##DROP##",  "config": {  "index": "##DROP##",  "next-hop": "openconfig-local-routing:DROP"  }  }  ]  }  }  ]  }  }  ]  }  }  ]  }  ],  [  "openconfig-network-instance:network-instances",  {  "network-instance": [  {  "name": "DEFAULT",  "protocols": {  "protocol": [  {  "identifier": "openconfig-policy-types:ISIS",  "name": "1",  "config": {  "identifier": "openconfig-policy-types:ISIS",  "name": "1"  },  "isis": {  "global": {  "config": {  "level-capability": "LEVEL\_2",  "net": [  "49.0000.0102.1309.7058.00"  ]  },  "nsr": {  "config": {  "enabled": true  }  },  "graceful-restart": {  "config": {  "enabled": true  }  },  "timers": {  "lsp-generation": {  "config": {  "lsp-max-wait-interval": "1000",  "lsp-first-wait-interval": "50",  "lsp-second-wait-interval": "50"  }  },  "config": {  "lsp-refresh-interval": 10800,  "lsp-lifetime-interval": 65535  },  "spf": {  "config": {  "spf-hold-interval": "1000",  "spf-first-interval": "200",  "spf-second-interval": "400"  }  }  },  "transport": {  "config": {  "lsp-mtu-size": 8979  }  },  "afi-safi": {  "af": [  {  "afi-name": "openconfig-isis-types:IPV4",  "safi-name": "openconfig-isis-types:UNICAST",  "config": {  "afi-name": "openconfig-isis-types:IPV4",  "safi-name": "openconfig-isis-types:UNICAST"  }  },  {  "afi-name": "openconfig-isis-types:IPV6",  "safi-name": "openconfig-isis-types:UNICAST",  "config": {  "afi-name": "openconfig-isis-types:IPV6",  "safi-name": "openconfig-isis-types:UNICAST"  },  "multi-topology": {  "config": {  "afi-name": "openconfig-isis-types:IPV6",  "safi-name": "openconfig-isis-types:UNICAST"  }  }  }  ]  }  },  "levels": {  "level": [  {  "level-number": 2,  "config": {  "level-number": 2  }  }  ]  },  "interfaces": {  "interface": [  {  "interface-id": "Loopback0",  "config": {  "interface-id": "Loopback0",  "enabled": true,  "hello-padding": "STRICT",  "passive": true  },  "interface-ref": {  "config": {  "interface": "Loopback0"  }  },  "afi-safi": {  "af": [  {  "afi-name": "openconfig-isis-types:IPV4",  "safi-name": "openconfig-isis-types:UNICAST",  "config": {  "afi-name": "openconfig-isis-types:IPV4",  "safi-name": "openconfig-isis-types:UNICAST",  "enabled": true  }  },  {  "afi-name": "openconfig-isis-types:IPV6",  "safi-name": "openconfig-isis-types:UNICAST",  "config": {  "afi-name": "openconfig-isis-types:IPV6",  "safi-name": "openconfig-isis-types:UNICAST",  "enabled": true  }  }  ]  }  },  {  "interface-id": "TenGigE0/0/0/0",  "config": {  "interface-id": "TenGigE0/0/0/0",  "enabled": true,  "hello-padding": "STRICT",  "passive": false,  "circuit-type": "POINT\_TO\_POINT"  },  "interface-ref": {  "config": {  "interface": "TenGigE0/0/0/0"  }  },  "bfd": {  "config": {  "bfd-tlv": true  }  },  "timers": {  "config": {  "lsp-pacing-interval": "1"  }  },  "afi-safi": {  "af": [  {  "afi-name": "openconfig-isis-types:IPV4",  "safi-name": "openconfig-isis-types:UNICAST",  "config": {  "afi-name": "openconfig-isis-types:IPV4",  "safi-name": "openconfig-isis-types:UNICAST",  "enabled": true  }  },  {  "afi-name": "openconfig-isis-types:IPV6",  "safi-name": "openconfig-isis-types:UNICAST",  "config": {  "afi-name": "openconfig-isis-types:IPV6",  "safi-name": "openconfig-isis-types:UNICAST",  "enabled": true  }  }  ]  }  },  {  "interface-id": "TenGigE0/0/0/4",  "config": {  "interface-id": "TenGigE0/0/0/4",  "enabled": true,  "hello-padding": "STRICT",  "passive": false,  "circuit-type": "POINT\_TO\_POINT"  },  "interface-ref": {  "config": {  "interface": "TenGigE0/0/0/4"  }  },  "bfd": {  "config": {  "bfd-tlv": true  }  },  "timers": {  "config": {  "lsp-pacing-interval": "1"  }  },  "afi-safi": {  "af": [  {  "afi-name": "openconfig-isis-types:IPV4",  "safi-name": "openconfig-isis-types:UNICAST",  "config": {  "afi-name": "openconfig-isis-types:IPV4",  "safi-name": "openconfig-isis-types:UNICAST",  "enabled": true  }  },  {  "afi-name": "openconfig-isis-types:IPV6",  "safi-name": "openconfig-isis-types:UNICAST",  "config": {  "afi-name": "openconfig-isis-types:IPV6",  "safi-name": "openconfig-isis-types:UNICAST",  "enabled": true  }  }  ]  }  }  ]  }  }  }  ]  }  }  ]  }  ],  [  "Cisco-IOS-XR-um-router-bgp-cfg:router",  {  "bgp": {  "as": [  {  "as-number": 5400,  "nsr": {},  "address-families": {  "address-family": [  {  "af-name": "ipv4-unicast",  "table-policy": "DROP-ALL",  "additional-paths": {  "receive": {},  "send": {},  "selection": {  "route-policy": "BGP-Path-Selection"  }  },  "maximum-paths": {  "ibgp": {  "multipath": 8,  "unequal-cost": {}  }  },  "nexthop": {  "trigger-delay": {  "critical": 1000,  "non-critical": 20000  }  },  "redistribute": {  "static": {  "route-policy": "RR-STATIC-TO-BGP-V4"  }  }  },  {  "af-name": "ipv6-unicast",  "table-policy": "DROP-ALL",  "label": {  "mode": {  "per-vrf": {}  }  },  "additional-paths": {  "receive": {},  "send": {},  "selection": {  "route-policy": "BGP-Path-Selection"  }  },  "maximum-paths": {  "ibgp": {  "multipath": 8,  "unequal-cost": {}  }  },  "nexthop": {  "trigger-delay": {  "critical": 1000,  "non-critical": 20000  }  },  "redistribute": {  "static": {  "route-policy": "RR-STATIC-TO-BGP-V6"  }  },  "allocate-label": {  "all": {}  }  },  {  "af-name": "ipv4-flowspec"  },  {  "af-name": "ipv6-flowspec"  }  ]  },  "neighbor-groups": {  "neighbor-group": [  {  "neighbor-group-name": "INTERNET-RR-CLIENT-NEIGHBOR-GRP",  "ao": {  "key-chain-name": "BGP-KEY",  "include-tcp-options": {  "disable": {}  }  },  "address-families": {  "address-family": [  {  "af-name": "ipv4-unicast",  "route-reflector-client": {}  },  {  "af-name": "ipv6-labeled-unicast",  "route-reflector-client": {}  },  {  "af-name": "ipv4-flowspec",  "route-policy": {  "in": "DROP-ALL",  "out": "PASS-ALL"  },  "route-reflector-client": {}  },  {  "af-name": "ipv6-flowspec",  "route-policy": {  "in": "DROP-ALL",  "out": "PASS-ALL"  },  "route-reflector-client": {}  }  ]  }  },  {  "neighbor-group-name": "INTERNET-NON-CLIENT-NEIGHBOR-GRP",  "ao": {  "key-chain-name": "BGP-KEY",  "include-tcp-options": {  "disable": {}  }  },  "address-families": {  "address-family": [  {  "af-name": "ipv4-unicast"  },  {  "af-name": "ipv6-labeled-unicast"  },  {  "af-name": "ipv4-flowspec",  "route-policy": {  "in": "PASS-ALL",  "out": "PASS-ALL"  }  },  {  "af-name": "ipv6-flowspec",  "route-policy": {  "in": "PASS-ALL",  "out": "PASS-ALL"  }  }  ]  }  },  {  "neighbor-group-name": "RR-TRA-DDOS",  "address-families": {  "address-family": [  {  "af-name": "ipv4-flowspec",  "route-policy": {  "in": "PASS-ALL",  "out": "DROP-ALL"  },  "route-reflector-client": {},  "validation": {  "disable": {}  }  },  {  "af-name": "ipv6-flowspec",  "route-policy": {  "in": "PASS-ALL",  "out": "DROP-ALL"  },  "route-reflector-client": {},  "validation": {  "disable": {}  }  }  ]  }  }  ]  }  }  ]  }  }  ],  [  "Cisco-IOS-XR-um-http-client-cfg:http",  {  "client": {  "secure-verify-peer": {  "disable": {}  },  "source-interface": {  "ipv4": {  "interface": "Loopback0"  }  }  }  }  ],  [  "Cisco-IOS-XR-um-crypto-cfg:crypto",  {  "ca": {  "trustpoint": {  "trustpoints": {  "trustpoint": [  {  "trustpoint-name": "ssms",  "crl": {  "optional": {}  }  }  ]  }  }  }  }  ],  [  "Cisco-IOS-XR-um-call-home-cfg:call-home",  {  "service": {  "active": {}  },  "contact": {  "smart-licensing": {}  },  "source-interface": "Loopback0",  "profiles": {  "profile": [  {  "profile-name": "CiscoTAC-1",  "reporting": {  "smart-licensing-data": {  "disable": {}  }  }  },  {  "profile-name": "ssms",  "active": {},  "destination": {  "addresses": {  "address": [  {  "address-type": "http",  "destination-address": "https://smart.bt.com/Transportgateway/services/DeviceRequestHandler"  }  ]  },  "transport-method": {  "http": {}  }  },  "reporting": {  "smart-licensing-data": {}  }  }  ]  }  }  ],  [  "Cisco-IOS-XR-um-control-plane-cfg:control-plane",  {  "management-plane": {  "inband": {  "interfaces": {  "interface": [  {  "interface-name": "TenGigE0/0/0/0",  "allow": {  "ssh-peer": {  "address": {  "ipv4": {  "ipv4-addresses": {  "ipv4-address": [  {  "address": "10.213.93.207"  },  {  "address": "10.213.93.218"  },  {  "address": "10.213.93.219"  },  {  "address": "10.213.93.220"  },  {  "address": "10.213.95.220"  }  ]  },  "ipv4-address-prefixes": {  "ipv4-address-prefix": [  {  "address": "10.2.80.0",  "length": 20  },  {  "address": "10.2.112.0",  "length": 21  },  {  "address": "10.2.120.0",  "length": 21  }  ]  }  }  }  }  }  },  {  "interface-name": "TenGigE0/0/0/4",  "allow": {  "ssh-peer": {  "address": {  "ipv4": {  "ipv4-addresses": {  "ipv4-address": [  {  "address": "10.213.93.207"  },  {  "address": "10.213.93.218"  },  {  "address": "10.213.93.219"  },  {  "address": "10.213.93.220"  },  {  "address": "10.213.95.220"  }  ]  },  "ipv4-address-prefixes": {  "ipv4-address-prefix": [  {  "address": "10.2.80.0",  "length": 20  },  {  "address": "10.2.112.0",  "length": 21  },  {  "address": "10.2.120.0",  "length": 21  }  ]  }  }  }  }  }  }  ]  }  }  }  }  ],  [  "Cisco-IOS-XR-um-tpa-cfg:tpa",  {  "vrfs": {  "vrf": [  {  "vrf-name": "default",  "address-family": {  "ipv4": {  "protection": {  "allow": {  "protocols": {  "protocol": [  {  "protocol-name": "tcp",  "local-port": [  {  "port-number": 57344,  "local-address-remote-addresses": {  "local-address-remote-address": [  {  "local-address": "10.213.97.58",  "local-address-length": 32,  "remote-address": "10.2.80.0",  "remote-address-length": 20  },  {  "local-address": "10.213.97.58",  "local-address-length": 32,  "remote-address": "10.2.112.0",  "remote-address-length": 21  },  {  "local-address": "10.213.97.58",  "local-address-length": 32,  "remote-address": "10.2.120.0",  "remote-address-length": 21  },  {  "local-address": "10.213.97.58",  "local-address-length": 32,  "remote-address": "10.213.93.207",  "remote-address-length": 32  },  {  "local-address": "10.213.97.58",  "local-address-length": 32,  "remote-address": "10.213.93.218",  "remote-address-length": 32  },  {  "local-address": "10.213.97.58",  "local-address-length": 32,  "remote-address": "10.213.93.219",  "remote-address-length": 32  },  {  "local-address": "10.213.97.58",  "local-address-length": 32,  "remote-address": "10.213.93.220",  "remote-address-length": 32  },  {  "local-address": "10.213.97.58",  "local-address-length": 32,  "remote-address": "10.213.95.220",  "remote-address-length": 32  }  ]  }  }  ]  }  ]  }  }  }  }  }  }  ]  }  }  ],  [  "openconfig-interfaces:interfaces",  {  "interface": [  {  "name": "Loopback0",  "config": {  "type": "iana-if-type:softwareLoopback",  "enabled": true,  "name": "Loopback0"  },  "subinterfaces": {  "subinterface": [  {  "index": 0,  "openconfig-if-ip:ipv4": {  "addresses": {  "address": [  {  "ip": "10.213.97.58",  "config": {  "ip": "10.213.97.58",  "prefix-length": 32  }  }  ]  }  }  }  ]  }  },  {  "name": "TenGigE0/0/0/0",  "config": {  "type": "iana-if-type:ethernetCsmacd",  "mtu": 9216,  "enabled": true,  "name": "TenGigE0/0/0/0"  },  "openconfig-if-ethernet:ethernet": {  "config": {  "auto-negotiate": false  }  },  "hold-time": {  "config": {  "up": 5000,  "down": 0  }  },  "subinterfaces": {  "subinterface": [  {  "index": 0,  "openconfig-if-ip:ipv4": {  "addresses": {  "address": [  {  "ip": "192.168.80.20",  "config": {  "ip": "192.168.80.20",  "prefix-length": 31  }  }  ]  }  }  }  ]  }  },  {  "name": "TenGigE0/0/0/4",  "config": {  "type": "iana-if-type:ethernetCsmacd",  "mtu": 9216,  "enabled": true,  "name": "TenGigE0/0/0/4"  },  "openconfig-if-ethernet:ethernet": {  "config": {  "auto-negotiate": false  }  },  "hold-time": {  "config": {  "up": 5000,  "down": 0  }  },  "subinterfaces": {  "subinterface": [  {  "index": 0,  "openconfig-if-ip:ipv4": {  "addresses": {  "address": [  {  "ip": "192.168.80.23",  "config": {  "ip": "192.168.80.23",  "prefix-length": 31  }  }  ]  }  }  }  ]  }  }  ]  }  ],  [  "Cisco-IOS-XR-um-router-isis-cfg:router",  {  "isis": {  "processes": {  "process": [  {  "process-id": "1",  "set-overload-bit-levels": {  "level": [  {  "level-id": 2  }  ]  },  "log": {  "adjacency": {  "changes": {}  }  },  "lsp-password": {  "keychain": {  "keychain-name": "ISIS-KEY"  }  },  "address-families": {  "address-family": [  {  "af-name": "ipv4",  "saf-name": "unicast",  "metric-style": {  "wide": {}  },  "advertise": {  "passive-only": {}  },  "router-id": {  "interface-name": "Loopback0"  },  "spf": {  "prefix-priority": {  "prefix-priority": [  {  "priority": "critical",  "tag": 5400  }  ]  }  }  },  {  "af-name": "ipv6",  "saf-name": "unicast",  "metric-style": {  "wide": {}  },  "advertise": {  "passive-only": {}  },  "router-id": {  "interface-name": "Loopback0"  }  }  ]  },  "interfaces": {  "interface": [  {  "interface-name": "Loopback0",  "address-families": {  "address-family": [  {  "af-name": "ipv6",  "saf-name": "unicast",  "tag": {  "interface-tag": 10  }  },  {  "af-name": "ipv4",  "saf-name": "unicast",  "tag": {  "interface-tag": 5400  }  }  ]  }  },  {  "interface-name": "TenGigE0/0/0/0",  "circuit-type": "level-2-only",  "hello-password": {  "keychain": {  "keychain-name": "ISIS-KEY"  }  },  "delay": {  "normalize": {  "interval": 5000,  "offset": 0  }  },  "lsp": {  "fast-flood": {  "threshold": {  "levels": {  "level": [  {  "level-id": 2,  "number-of-lsps": 50  }  ]  }  }  }  },  "address-families": {  "address-family": [  {  "af-name": "ipv4",  "saf-name": "unicast",  "fast-reroute": {  "computation": {  "levels": {  "level": [  {  "level-id": 2,  "per-prefix-computation": {}  }  ]  }  }  },  "metric": {  "default-metric": 10  }  }  ]  }  },  {  "interface-name": "TenGigE0/0/0/4",  "circuit-type": "level-2-only",  "hello-password": {  "keychain": {  "keychain-name": "ISIS-KEY"  }  },  "delay": {  "normalize": {  "interval": 5000,  "offset": 0  }  },  "lsp": {  "fast-flood": {  "threshold": {  "levels": {  "level": [  {  "level-id": 2,  "number-of-lsps": 50  }  ]  }  }  }  },  "address-families": {  "address-family": [  {  "af-name": "ipv4",  "saf-name": "unicast",  "fast-reroute": {  "computation": {  "levels": {  "level": [  {  "level-id": 2,  "per-prefix-computation": {}  }  ]  }  }  },  "metric": {  "default-metric": 10  }  }  ]  }  }  ]  }  }  ]  }  }  }  ],  [  "Cisco-IOS-XR-um-ntp-cfg:ntp",  {  "authentication-keys": {  "authentication-key": [  {  "key-number": 1,  "md5": {  "encrypted": "*<truncated>*"  }  }  ]  },  "authenticate": {},  "trusted-keys": {  "trusted-key": [  {  "key-number": 1  }  ]  },  "peer-server": {  "ipv4": {  "ipv4-peer-server": [  {  "address": "10.213.97.56",  "type": "server",  "key": 1  }  ]  }  },  "access-group": {  "ipv4": {  "peer": "NTP\_ACL"  }  },  "source": {  "interface-name": "Loopback0"  }  }  ],  [  "openconfig-system:system",  {  "ntp": {  "ntp-keys": {  "ntp-key": [  {  "key-id": 1,  "config": {  "key-id": 1,  "key-value": "*<truncated>*"  }  }  ]  },  "servers": {  "server": [  {  "address": "10.213.97.56",  "config": {  "address": "10.213.97.56",  "association-type": "SERVER",  "prefer": false,  "iburst": false,  "version": 4  }  }  ]  }  }  }  ],  [  "openconfig-system:system",  {  "config": {  "hostname": "irr1-qas5-us",  "motd-banner": "#WARNING. You have accessed a BT PLC network device. You need to be authorised to\\naccess and use it and stick to the limits of your authorisation. If you are not\\nauthorised it could be an offence to use this network device, the system or\\nany of its data. And if you misuse this network device, the system, any of its\\ndata or share any data or other information from it without our permission, we\\ncould take legal action against you.#"  },  "clock": {  "config": {  "timezone-name": "UTC"  }  }  }  ],  [  "openconfig-system:system",  {  "ssh-server": {  "config": {  "timeout": 120,  "rate-limit": 60,  "session-limit": 10,  "enable": true,  "protocol-version": "V2"  }  }  }  ],  [  "openconfig-system:system",  {  "messages": {  "config": {  "severity": "NOTICE"  }  },  "logging": {  "remote-servers": {  "remote-server": [  {  "host": "100.1.1.1",  "config": {  "host": "100.1.1.1"  },  "selectors": {  "selector": [  {  "facility": "LOCAL7",  "severity": "NOTICE",  "config": {  "severity": "NOTICE"  }  }  ]  }  }  ]  }  }  }  ],  [  "openconfig-system:system",  {  "aaa": {  "authentication": {  "users": {  "user": [  {  "username": "btadmin",  "config": {  "username": "btadmin",  "role": "root-lr",  "password-hashed": *<truncated>*"  }  },  {  "username": "gnmi\_rob",  "config": {  "username": "gnmi\_rob",  "role": "root-lr",  "password-hashed": *<truncated>*"  }  },  {  "username": "bt\_gnmi\_rob",  "config": {  "username": "bt\_gnmi\_rob",  "role": "root-lr",  "password-hashed": *<truncated>*"  }  }  ]  },  "config": {  "authentication-method": [  "BTGNF",  "openconfig-aaa-types:LOCAL"  ]  }  },  "server-groups": {  "server-group": [  {  "name": "BTGNF",  "config": {  "name": "BTGNF",  "type": "openconfig-aaa:TACACS"  },  "servers": {  "server": [  {  "address": "10.2.116.237",  "config": {  "timeout": 5  },  "tacacs": {  "config": {  "port": 49  }  }  },  {  "address": "10.2.116.239",  "config": {  "timeout": 5  },  "tacacs": {  "config": {  "port": 49  }  }  }  ]  }  }  ]  },  "accounting": {  "config": {  "accounting-method": [  "BTGNF"  ]  },  "events": {  "event": [  {  "event-type": "openconfig-aaa-types:AAA\_ACCOUNTING\_EVENT\_LOGIN",  "config": {  "event-type": "openconfig-aaa-types:AAA\_ACCOUNTING\_EVENT\_LOGIN",  "record": "START\_STOP"  }  },  {  "event-type": "openconfig-aaa-types:AAA\_ACCOUNTING\_EVENT\_COMMAND",  "config": {  "event-type": "openconfig-aaa-types:AAA\_ACCOUNTING\_EVENT\_COMMAND",  "record": "START\_STOP"  }  }  ]  }  },  "authorization": {  "config": {  "authorization-method": [  "BTGNF",  "openconfig-aaa-types:LOCAL"  ]  },  "events": {  "event": [  {  "event-type": "openconfig-aaa-types:AAA\_AUTHORIZATION\_EVENT\_CONFIG",  "config": {  "event-type": "openconfig-aaa-types:AAA\_AUTHORIZATION\_EVENT\_CONFIG"  }  },  {  "event-type": "openconfig-aaa-types:AAA\_AUTHORIZATION\_EVENT\_COMMAND",  "config": {  "event-type": "openconfig-aaa-types:AAA\_AUTHORIZATION\_EVENT\_COMMAND"  }  }  ]  }  }  }  }  ],  [  "openconfig-routing-policy:routing-policy",  {  "defined-sets": {  "openconfig-bgp-policy:bgp-defined-sets": {  "community-sets": {  "community-set": [  {  "community-set-name": "bgpInternet\_lab-zone\_peerComm",  "config": {  "community-set-name": "bgpInternet\_lab-zone\_peerComm",  "community-member": [  "5400:33902",  "5400:33865"  ]  }  },  {  "community-set-name": "bgpInternet\_lab-zone\_transitComm",  "config": {  "community-set-name": "bgpInternet\_lab-zone\_transitComm",  "community-member": [  "5400:34902",  "5400:34865"  ]  }  },  {  "community-set-name": "aggregateLocalRegion",  "config": {  "community-set-name": "aggregateLocalRegion",  "community-member": [  "5400:31865"  ]  }  },  {  "community-set-name": "noExportAggregateLocalRegion",  "config": {  "community-set-name": "noExportAggregateLocalRegion",  "community-member": [  "5400:1051",  "5400:31865"  ]  }  },  {  "community-set-name": "aggregateApac",  "config": {  "community-set-name": "aggregateApac",  "community-member": [  "5400:31865",  "5400:31053",  "5400:31052",  "5400:31051"  ]  }  },  {  "community-set-name": "aggregateEmea",  "config": {  "community-set-name": "aggregateEmea",  "community-member": [  "5400:31865",  "5400:31042",  "5400:31011",  "5400:31012",  "5400:31013",  "5400:31014",  "5400:31015",  "5400:31041"  ]  }  },  {  "community-set-name": "aggregateJapan",  "config": {  "community-set-name": "aggregateJapan",  "community-member": [  "5400:31865",  "5400:31051",  "5400:31066"  ]  }  },  {  "community-set-name": "aggregateEurope",  "config": {  "community-set-name": "aggregateEurope",  "community-member": [  "5400:31865",  "5400:31011",  "5400:31012",  "5400:31013",  "5400:31014",  "5400:31015"  ]  }  },  {  "community-set-name": "aggregateGlobal",  "config": {  "community-set-name": "aggregateGlobal",  "community-member": [  "5400:31865",  "5400:31021",  "5400:31033",  "5400:31042",  "5400:31011",  "5400:31012",  "5400:31053",  "5400:31052",  "5400:31051",  "5400:31022",  "5400:31013",  "5400:31014",  "5400:31031",  "5400:31015",  "5400:31041",  "5400:31032"  ]  }  },  {  "community-set-name": "aggregateHong\_kong",  "config": {  "community-set-name": "aggregateHong\_kong",  "community-member": [  "5400:31865",  "5400:31051",  "5400:31065"  ]  }  },  {  "community-set-name": "aggregateSingapore",  "config": {  "community-set-name": "aggregateSingapore",  "community-member": [  "5400:31865",  "5400:31051",  "5400:31067"  ]  }  },  {  "community-set-name": "aggregateWest\_europe",  "config": {  "community-set-name": "aggregateWest\_europe",  "community-member": [  "5400:31865",  "5400:31011",  "5400:31014"  ]  }  },  {  "community-set-name": "aggregateAsia\_east\_west",  "config": {  "community-set-name": "aggregateAsia\_east\_west",  "community-member": [  "5400:31865",  "5400:31052",  "5400:31051"  ]  }  },  {  "community-set-name": "aggregateEast\_australia",  "config": {  "community-set-name": "aggregateEast\_australia",  "community-member": [  "5400:31865",  "5400:31053",  "5400:31086",  "5400:31088"  ]  }  },  {  "community-set-name": "aggregateWest\_australia",  "config": {  "community-set-name": "aggregateWest\_australia",  "community-member": [  "5400:31865",  "5400:31053",  "5400:31087"  ]  }  },  {  "community-set-name": "aggregateWest\_asia\_oceania",  "config": {  "community-set-name": "aggregateWest\_asia\_oceania",  "community-member": [  "5400:31865",  "5400:31053",  "5400:31052"  ]  }  },  {  "community-set-name": "aggregateEurope\_exc\_southeast",  "config": {  "community-set-name": "aggregateEurope\_exc\_southeast",  "community-member": [  "5400:31865",  "5400:31011",  "5400:31012",  "5400:31013",  "5400:31014"  ]  }  },  {  "community-set-name": "aggregateWest\_europe\_and\_nordics",  "config": {  "community-set-name": "aggregateWest\_europe\_and\_nordics",  "community-member": [  "5400:31865",  "5400:31011",  "5400:31012",  "5400:31014"  ]  }  },  {  "community-set-name": "aggregateEurope\_exc\_nordics\_southeast",  "config": {  "community-set-name": "aggregateEurope\_exc\_nordics\_southeast",  "community-member": [  "5400:31865",  "5400:31011",  "5400:31013",  "5400:31014"  ]  }  }  ]  }  }  },  "policy-definitions": {  "policy-definition": [  {  "config": {  "name": "PASS-ALL"  },  "name": "PASS-ALL",  "statements": {  "statement": [  {  "name": "id-1",  "config": {  "name": "id-1"  },  "actions": {  "config": {  "policy-result": "ACCEPT\_ROUTE"  }  }  }  ]  }  },  {  "config": {  "name": "DROP-ALL"  },  "name": "DROP-ALL",  "statements": {  "statement": [  {  "name": "id-1",  "config": {  "name": "id-1"  },  "actions": {  "config": {  "policy-result": "REJECT\_ROUTE"  }  }  }  ]  }  }  ]  }  }  ],  [  "Cisco-IOS-XR-um-route-policy-cfg:routing-policy",  {  "sets": {  "community-sets": {  "community-set": [  {  "set-name": "bgpInternet\_customerCommunity",  "rpl-community-set": "community-set bgpInternet\_customerCommunity\n ios-regex '5400:32(...)',\n ios-regex '5400:31(...)'\nend-set\n"  },  {  "set-name": "bgpInternet\_peerCommunity",  "rpl-community-set": "community-set bgpInternet\_peerCommunity\n ios-regex '5400:33(...)'\nend-set\n"  },  {  "set-name": "bgpInternet\_transitCommunity",  "rpl-community-set": "community-set bgpInternet\_transitCommunity\n ios-regex '5400:34(...)'\nend-set\n"  }  ]  }  },  "route-policies": {  "route-policy": [  {  "route-policy-name": "bgpInternet\_RR-TO-PE",  "rpl-route-policy": "route-policy bgpInternet\_RR-TO-PE\n if community in bgpInternet\_customerCommunity then\n done\n endif\n if community in bgpInternet\_peerCommunity and destination is-best-path then\n done\n endif\n if community in bgpInternet\_peerCommunity and destination is-multi-path then\n done\n endif\n if community in bgpInternet\_peerCommunity and destination is-multipath-protect then\n done\n endif\n if community in bgpInternet\_transitCommunity and destination is-best-path then\n done\n endif\n if community in bgpInternet\_transitCommunity and destination is-multi-path then\n done\n endif\n if community in bgpInternet\_transitCommunity and destination is-multipath-protect then\n done\n endif\nend-policy\n"  },  {  "route-policy-name": "BGP-Path-Selection",  "rpl-route-policy": "route-policy BGP-Path-Selection\n set path-selection multipath advertise\n set path-selection all advertise\n set path-selection multipath advertise multipath-protect multipath-protect-advertise\nend-policy\n"  },  {  "route-policy-name": "RR-STATIC-TO-BGP-V4",  "rpl-route-policy": "route-policy RR-STATIC-TO-BGP-V4\n # Propogate in Region - localNoExport\n if tag eq 501 then\n set community noExportAggregateLocalRegion\n set weight 0\n endif\n # Propogate in Region - local\n if tag eq 502 then\n set community aggregateLocalRegion\n set weight 0\n endif\n# Propogate in Region - APAC\n if tag eq 510 then\n set community aggregateApac\n set weight 0\n endif\n # Propogate in Region - EMEA\n if tag eq 535 then\n set community aggregateEmea\n set weight 0\n endif\n # Propogate in Region - Japan\n if tag eq 518 then\n set community aggregateJapan\n set weight 0\n endif\n # Propogate in Region - Europe\n if tag eq 536 then\n set community aggregateEurope\n set weight 0\n endif\n # Propogate in Region - global\n if tag eq 503 then\n set community aggregateGlobal\n set weight 0\n endif\n # Propogate in Region - Hong\_Kong\n if tag eq 517 then\n set community aggregateHong\_kong\n set weight 0\n endif\n # Propogate in Region - Singapore\n if tag eq 519 then\n set community aggregateSingapore\n set weight 0\n endif\n # Propogate in Region - West\_Europe\n if tag eq 537 then\n set community aggregateWest\_europe\n set weight 0\n endif\n # Propogate in Region - Asia\_East\_WEst\n if tag eq 511 then\n set community aggregateAsia\_east\_west\n set weight 0\n endif\n # Propogate in Region - East\_Australia\n if tag eq 524 then\n set community aggregateEast\_australia\n set weight 0\n endif\n # Propogate in Region - West\_Australia\n if tag eq 523 then\n set community aggregateWest\_australia\n set weight 0\n endif\n # Propogate in Region - West\_Asia\_Oceania\n if tag eq 513 then\n set community aggregateWest\_asia\_oceania\n set weight 0\n endif\n # Propogate in Region - Europe\_exc\_SouthEast\n if tag eq 539 then\n set community aggregateEurope\_exc\_southeast\n set weight 0\n endif\n # Propogate in Region - West\_Europe\_and\_Nordics\n if tag eq 538 then\n set community aggregateWest\_europe\_and\_nordics\n set weight 0\n endif\n # Propogate in Region - Europe\_exc\_Nordics\_SouthEast\n if tag eq 540 then\n set community aggregateEurope\_exc\_nordics\_southeast\n set weight 0\n endif\nend-policy\n"  },  {  "route-policy-name": "RR-STATIC-TO-BGP-V6",  "rpl-route-policy": "route-policy RR-STATIC-TO-BGP-V6\n # Propogate in Region - localNoExport\n if tag eq 501 then\n set community noExportAggregateLocalRegion\n set weight 0\n endif\n # Propogate in Region - local\n if tag eq 502 then\n set community aggregateLocalRegion\n set weight 0\n endif\n# Propogate in Region - APAC\n if tag eq 510 then\n set community aggregateApac\n set weight 0\n endif\n # Propogate in Region - EMEA\n if tag eq 535 then\n set community aggregateEmea\n set weight 0\n endif\n # Propogate in Region - Japan\n if tag eq 518 then\n set community aggregateJapan\n set weight 0\n endif\n # Propogate in Region - Europe\n if tag eq 536 then\n set community aggregateEurope\n set weight 0\n endif\n # Propogate in Region - global\n if tag eq 503 then\n set community aggregateGlobal\n set weight 0\n endif\n # Propogate in Region - Hong\_Kong\n if tag eq 517 then\n set community aggregateHong\_kong\n set weight 0\n endif\n # Propogate in Region - Singapore\n if tag eq 519 then\n set community aggregateSingapore\n set weight 0\n endif\n # Propogate in Region - West\_Europe\n if tag eq 537 then\n set community aggregateWest\_europe\n set weight 0\n endif\n # Propogate in Region - Asia\_East\_WEst\n if tag eq 511 then\n set community aggregateAsia\_east\_west\n set weight 0\n endif\n # Propogate in Region - East\_Australia\n if tag eq 524 then\n set community aggregateEast\_australia\n set weight 0\n endif\n # Propogate in Region - West\_Australia\n if tag eq 523 then\n set community aggregateWest\_australia\n set weight 0\n endif\n # Propogate in Region - West\_Asia\_Oceania\n if tag eq 513 then\n set community aggregateWest\_asia\_oceania\n set weight 0\n endif\n # Propogate in Region - Europe\_exc\_SouthEast\n if tag eq 539 then\n set community aggregateEurope\_exc\_southeast\n set weight 0\n endif\n # Propogate in Region - West\_Europe\_and\_Nordics\n if tag eq 538 then\n set community aggregateWest\_europe\_and\_nordics\n set weight 0\n endif\n # Propogate in Region - Europe\_exc\_Nordics\_SouthEast\n if tag eq 540 then\n set community aggregateEurope\_exc\_nordics\_southeast\n set weight 0\n endif\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-LOCAL-REGION",  "rpl-route-policy": "route-policy AGGREGATE-LOCAL-REGION\n set community aggregateLocalRegion\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-LOCAL-NOEXPORT",  "rpl-route-policy": "route-policy AGGREGATE-LOCAL-NOEXPORT\n set community noExportAggregate\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-APAC",  "rpl-route-policy": "route-policy AGGREGATE-APAC\n set community aggregateApac\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-EMEA",  "rpl-route-policy": "route-policy AGGREGATE-EMEA\n set community aggregateEmea\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-JAPAN",  "rpl-route-policy": "route-policy AGGREGATE-JAPAN\n set community aggregateJapan\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-EUROPE",  "rpl-route-policy": "route-policy AGGREGATE-EUROPE\n set community aggregateEurope\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-GLOBAL",  "rpl-route-policy": "route-policy AGGREGATE-GLOBAL\n set community aggregateGlobal\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-HONG\_KONG",  "rpl-route-policy": "route-policy AGGREGATE-HONG\_KONG\n set community aggregateHong\_kong\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-SINGAPORE",  "rpl-route-policy": "route-policy AGGREGATE-SINGAPORE\n set community aggregateSingapore\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-WEST\_EUROPE",  "rpl-route-policy": "route-policy AGGREGATE-WEST\_EUROPE\n set community aggregateWest\_europe\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-ASIA\_EAST\_WEST",  "rpl-route-policy": "route-policy AGGREGATE-ASIA\_EAST\_WEST\n set community aggregateAsia\_east\_west\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-EAST\_AUSTRALIA",  "rpl-route-policy": "route-policy AGGREGATE-EAST\_AUSTRALIA\n set community aggregateEast\_australia\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-WEST\_AUSTRALIA",  "rpl-route-policy": "route-policy AGGREGATE-WEST\_AUSTRALIA\n set community aggregateWest\_australia\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-WEST\_ASIA\_OCEANIA",  "rpl-route-policy": "route-policy AGGREGATE-WEST\_ASIA\_OCEANIA\n set community aggregateWest\_asia\_oceania\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-EUROPE\_EXC\_SOUTHEAST",  "rpl-route-policy": "route-policy AGGREGATE-EUROPE\_EXC\_SOUTHEAST\n set community aggregateEurope\_exc\_southeast\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-WEST\_EUROPE\_AND\_NORDICS",  "rpl-route-policy": "route-policy AGGREGATE-WEST\_EUROPE\_AND\_NORDICS\n set community aggregateWest\_europe\_and\_nordics\n set weight 0\nend-policy\n"  },  {  "route-policy-name": "AGGREGATE-EUROPE\_EXC\_NORDICS\_SOUTHEAST",  "rpl-route-policy": "route-policy AGGREGATE-EUROPE\_EXC\_NORDICS\_SOUTHEAST\n set community aggregateEurope\_exc\_nordics\_southeast\n set weight 0\nend-policy\n"  }  ]  }  }  ],  [  "Cisco-IOS-XR-um-logging-cfg:logging",  {  "console": "disable"  }  ],  [  "Cisco-IOS-XR-um-aaa-cfg:aaa",  {  "Cisco-IOS-XR-um-aaa-tacacs-server-cfg:tacacs": {  "source-interface": "Loopback0"  },  "accounting": {  "system": {  "accounting-list": [  {  "list-name": "default",  "start-stop": {},  "groups": {  "group-1": {  "server-group-name": "BTGNF"  }  }  },  {  "list-name": "network",  "start-stop": {},  "groups": {  "group-1": {  "server-group-name": "BTGNF"  }  }  }  ]  }  },  "Cisco-IOS-XR-um-aaa-task-user-cfg:display-login-failed-users": {}  }  ],  [  "Cisco-IOS-XR-um-aaa-cfg:aaa",  {  "Cisco-IOS-XR-um-aaa-task-user-cfg:taskgroups": {  "taskgroup": [  {  "taskgroup-name": "netct\_tg",  "task": {  "read": {  "fc": {},  "fr": {},  "li": {},  "atm": {},  "bfd": {},  "bgp": {},  "cdp": {},  "cef": {},  "cgn": {},  "eem": {},  "fti": {},  "nps": {},  "pbr": {},  "qos": {},  "rib": {},  "rip": {},  "sbc": {},  "ancp": {},  "bcdl": {},  "cpri": {},  "diag": {},  "hdlc": {},  "hsrp": {},  "isis": {},  "lisp": {},  "lldp": {},  "lpts": {},  "nacm": {},  "rcmd": {},  "vlan": {},  "vpdn": {},  "vrrp": {},  "eigrp": {},  "l2rib": {},  "l2vpn": {},  "bundle": {},  "crypto": {},  "dossier": {},  "drivers": {},  "monitor": {},  "netflow": {},  "pos-dpt": {},  "firewall": {},  "mpls-ldp": {},  "call-home": {},  "ext-access": {},  "mpls-static": {}  },  "write": {  "fc": {},  "fr": {},  "li": {},  "atm": {},  "bfd": {},  "bgp": {},  "cdp": {},  "cef": {},  "cgn": {},  "eem": {},  "fti": {},  "nps": {},  "pbr": {},  "qos": {},  "rib": {},  "rip": {},  "sbc": {},  "ancp": {},  "bcdl": {},  "cpri": {},  "diag": {},  "hdlc": {},  "hsrp": {},  "isis": {},  "lisp": {},  "lldp": {},  "lpts": {},  "nacm": {},  "rcmd": {},  "vlan": {},  "vpdn": {},  "vrrp": {},  "eigrp": {},  "l2rib": {},  "l2vpn": {},  "bundle": {},  "crypto": {},  "dossier": {},  "drivers": {},  "monitor": {},  "netflow": {},  "pos-dpt": {},  "firewall": {},  "mpls-ldp": {},  "call-home": {},  "ext-access": {},  "mpls-static": {}  },  "execute": {  "fc": {},  "fr": {},  "li": {},  "atm": {},  "bfd": {},  "bgp": {},  "cdp": {},  "cef": {},  "cgn": {},  "eem": {},  "fti": {},  "nps": {},  "pbr": {},  "qos": {},  "rib": {},  "rip": {},  "sbc": {},  "ancp": {},  "bcdl": {},  "cpri": {},  "diag": {},  "hdlc": {},  "hsrp": {},  "isis": {},  "lisp": {},  "lldp": {},  "lpts": {},  "nacm": {},  "rcmd": {},  "vlan": {},  "vpdn": {},  "vrrp": {},  "eigrp": {},  "l2rib": {},  "l2vpn": {},  "bundle": {},  "crypto": {},  "dossier": {},  "drivers": {},  "monitor": {},  "netflow": {},  "pos-dpt": {},  "firewall": {},  "mpls-ldp": {},  "call-home": {},  "ext-access": {},  "mpls-static": {}  }  },  "description": "Task group for netct users"  }  ]  },  "Cisco-IOS-XR-um-aaa-task-user-cfg:usergroups": {  "usergroup": [  {  "usergroup-name": "netct",  "taskgroup": {  "task-groups": {  "task-group": [  {  "task-group-name": "netct\_tg"  }  ]  },  "maintenance": {}  },  "description": "User group for netct users"  },  {  "usergroup-name": "bt-operator",  "taskgroup": {  "operator": {},  "read-only-tg": {}  },  "description": "User group for NCCA users"  }  ]  }  }  ],  [  "Cisco-IOS-XR-aaa-lib-cfg:aaa",  {  "Cisco-IOS-XR-aaa-locald-cfg:server-groups": {  "Cisco-IOS-XR-aaa-tacacs-cfg:tacacs-server-groups": {  "tacacs-server-group": [  {  "server-group-name": "BTGNF",  "private-servers": {  "private-server": [  {  "ordering-index": 1,  "ip-address": "10.2.116.237",  "port-number": 49,  "key": {  "encrypt-type": "type6",  "secret6": "*<truncated>*"  }  },  {  "ordering-index": 2,  "ip-address": "10.2.116.239",  "port-number": 49,  "key": {  "encrypt-type": "type6",  "secret6": "*<truncated>*"  }  }  ]  }  }  ]  }  }  }  ],  [  "Cisco-IOS-XR-um-password6-cfg:password6",  {  "encryption": {  "aes": {}  }  }  ],  [  "Cisco-IOS-XR-lib-keychain-cfg:keychains",  {  "keychain": [  {  "chain-name": "ISIS-KEY",  "keys": {  "key": [  {  "accept-lifetime": {  "infinite-flag": true,  "start-hour": 0,  "start-minutes": 0,  "start-seconds": 0,  "start-date": 1,  "start-month": "jan",  "start-year": 2022  },  "cryptographic-algorithm": "alg-hmac-md5-16",  "key-id": "1",  "key-string": {  "key-string": "*<truncated>*",  "encrypt-type": "type6"  },  "send-lifetime": {  "infinite-flag": true,  "start-hour": 1,  "start-minutes": 1,  "start-seconds": 1,  "start-date": 1,  "start-month": "jan",  "start-year": 2024  }  }  ]  }  },  {  "chain-name": "BGP-KEY",  "keys": {  "key": [  {  "accept-lifetime": {  "infinite-flag": true,  "start-hour": 0,  "start-minutes": 0,  "start-seconds": 0,  "start-date": 1,  "start-month": "jan",  "start-year": 2022  },  "cryptographic-algorithm": "alg-hmac-sha1-96",  "key-id": "1",  "key-string": {  "key-string": "*<truncated>*",  "encrypt-type": "type6"  },  "send-lifetime": {  "infinite-flag": true,  "start-hour": 0,  "start-minutes": 0,  "start-seconds": 0,  "start-date": 1,  "start-month": "jan",  "start-year": 2022  }  }  ]  }  }  ]  }  ],  [  "Cisco-IOS-XR-um-tcp-cfg:tcp",  {  "ao": {  "keychains": {  "keychain": [  {  "keychain-name": "BGP-KEY",  "keys": {  "key": [  {  "key-name": "1",  "send-id": 1,  "receive-id": 1  }  ]  }  }  ]  }  }  }  ],  [  "Cisco-IOS-XR-um-tcp-cfg:tcp",  {  "path-mtu-discovery": {},  "accept-rate": 100  }  ]  ]  } |

# Sign Off

(Optional – remove this section in case the sign off is by email or on another document)

This final sign off is based on the understanding that formal review meetings have been conducted to present, explain and discuss the Low-Level Design document created. As per the observations made during these meetings, we have incorporated BT Global input and feedback in this document.

|  |  |
| --- | --- |
| Juniper Networks Inc | Customer |
| Approved YES  NO | Approved YES  NO |
| Name | Name |
| Signature | Signature |
| Position | Position |
| Date | Date |