cSRX validation on SUSE Rancher: RKE2

v1.3

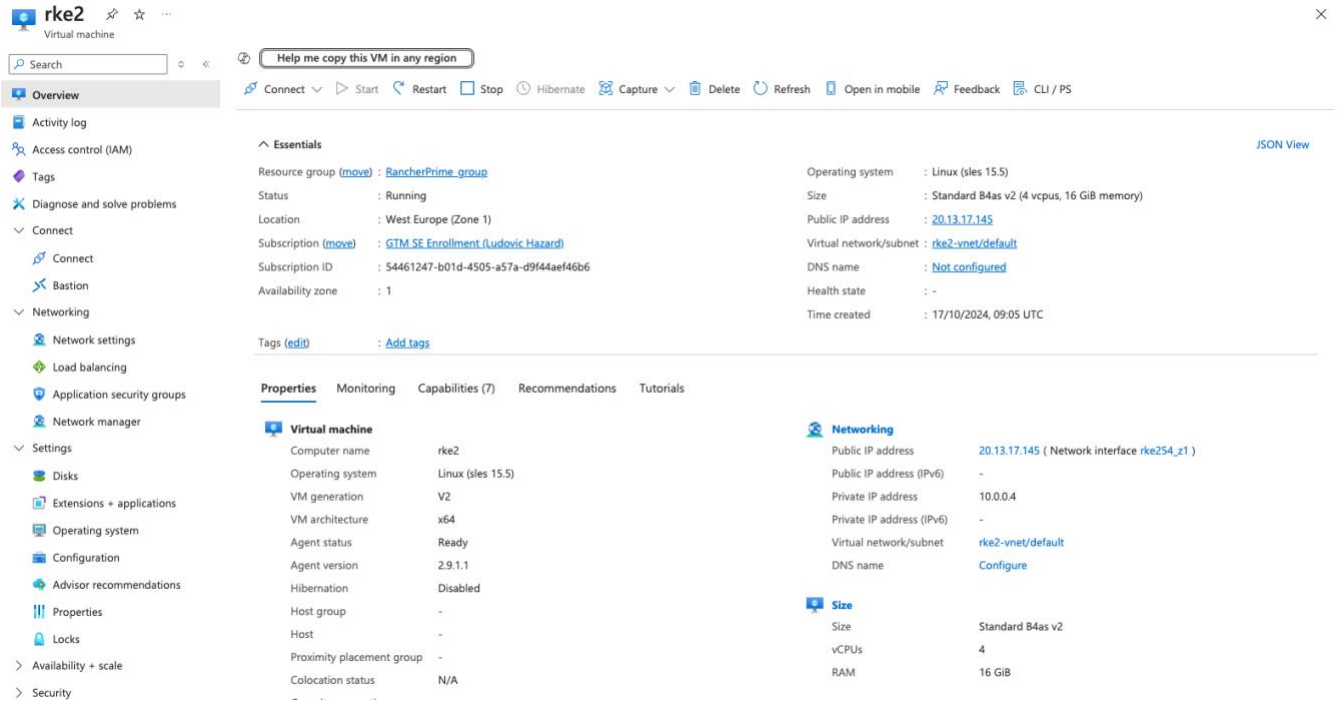
Content

Introduction

This document details the validation activities performed with cSRX (junos versions 21.1R3.11 and 24.2R1.17) on SUSE Rancher: RKE2 (v1.30.5+rke2r1).

The objectives of this validation is to confirm the expected behavior of basic NGFW features delivered by the Juniper cSRX VNF on SUSE Rancher: KE2. The L3/L4 Firewall rules are configured on the cSRX that acts as the default gateway for 2 ubuntu pods located on different vnets (network-attachment-definition used macvlan in the scenario).

The single node SUSE Rancher: RKE2 used durign the validation activities is hosted on Azure:



The details about the SUSE Rancher: RKE2 version used for the validation activities are listed below:

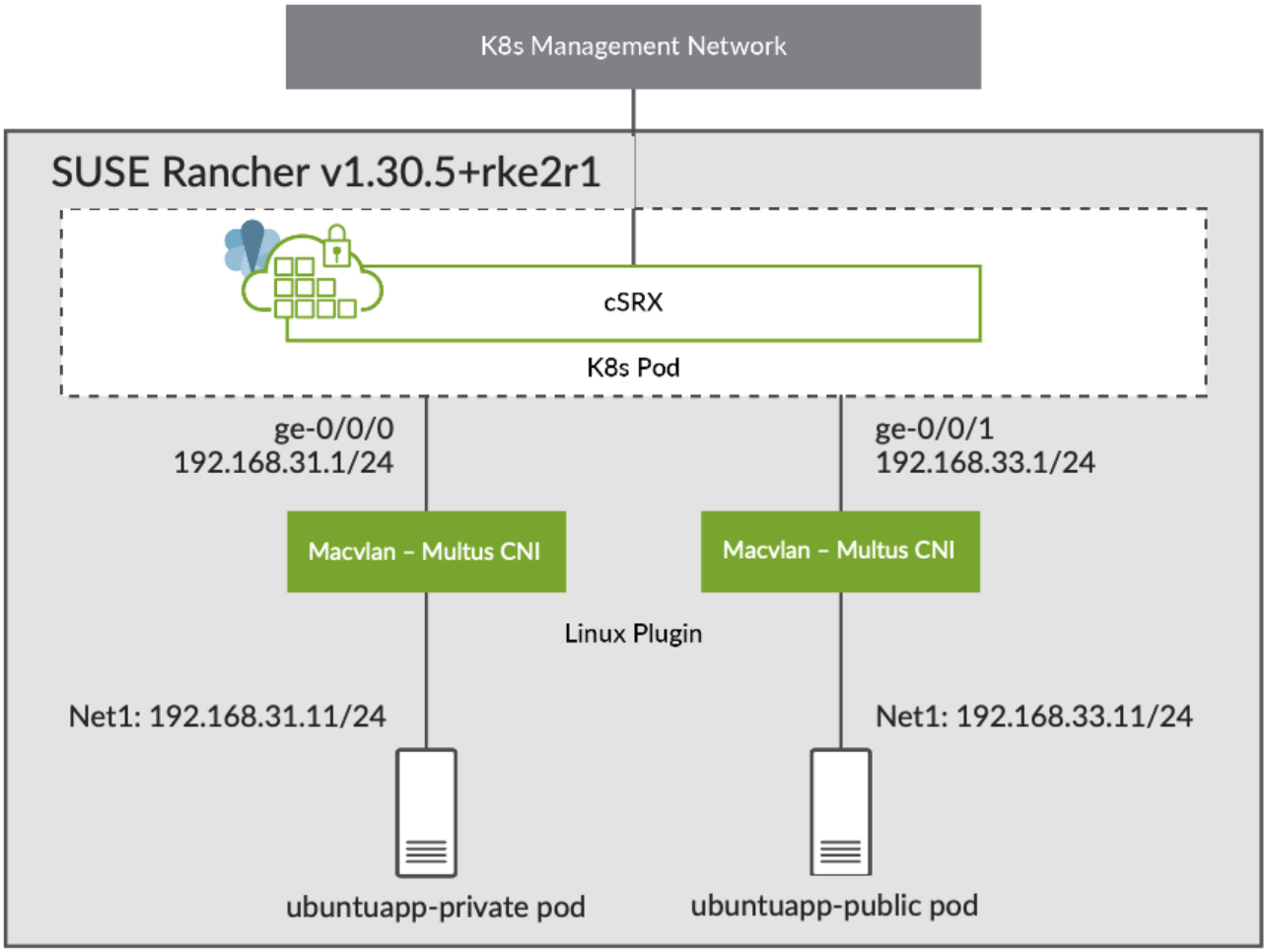
```
azureuser@rke2:~/validation> kubectl version
Client Version: v1.30.5+rke2r1
Kustomize Version: v5.0.4-0.20230601165947-6ce0bf390ce3
Server Version: v1.30.5+rke2r1
azureuser@rke2:~/validation>
```

Validation Scenario

The “k8s internal networks” scenario (described on the documentation available thru the link below) has been used for the validation activities:

https://www.juniper.net/documentation/us/en/software/csrx/csrx-consolidated-deployment-guide/csrx-kubernetes-deployment/topics/task/connecting-csrx-internal-network-k8s.html

This figure details the validation architecture inside the SUSE Rancher: RKE2 single node cluster:

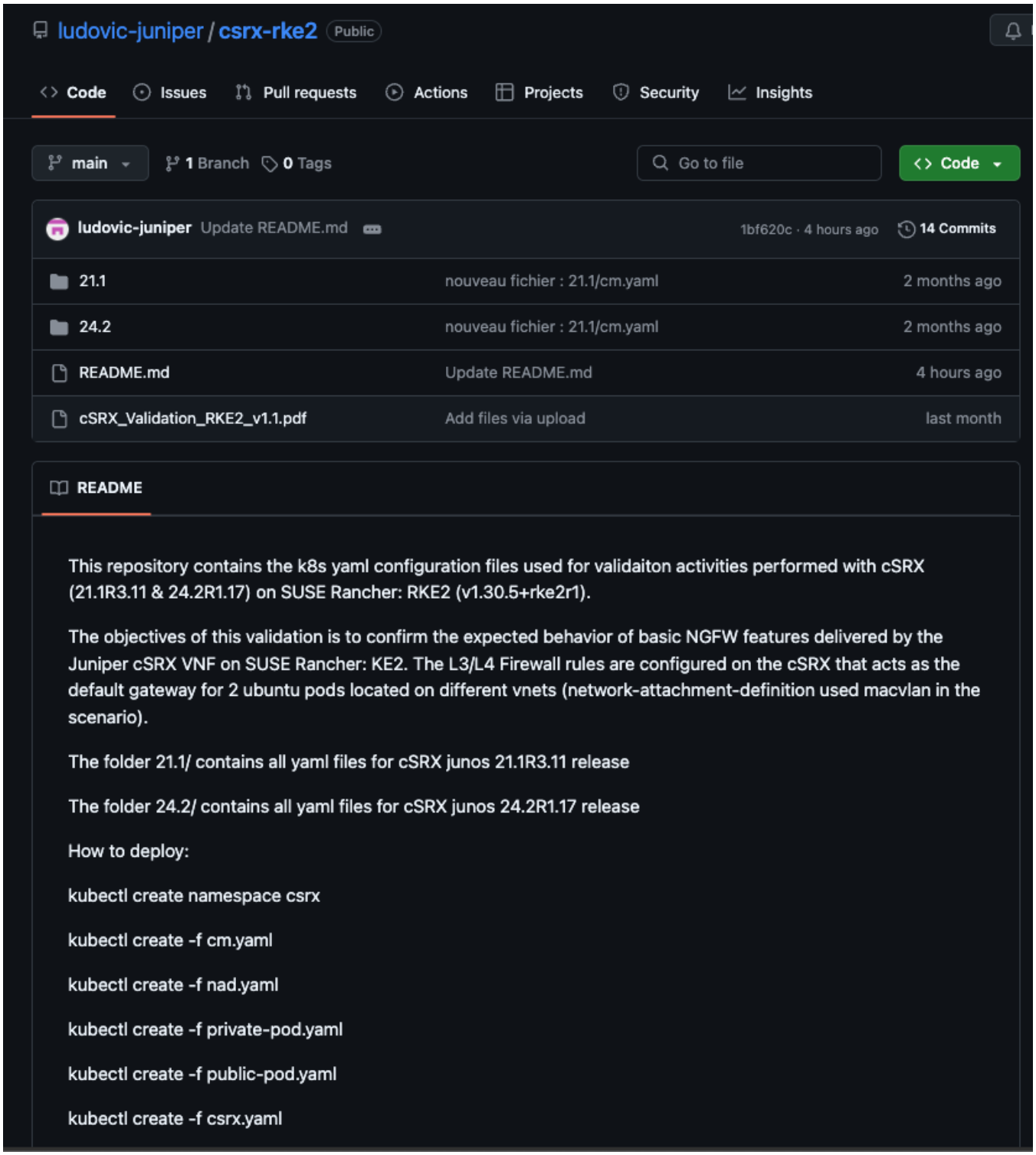


The same validation scenario has been used for cSRX validation on RedHat OpenShift:
Juniper cSRX validation on RedHat OpenShift

For more information about Juniper CNFs validation on RedHat OpenShift:
https://catalog.redhat.com/search?gs&q=juniper&searchType=software

Environment details

The configuration files used for the validation are available at:
https://github.com/ludovic-juniper/csrx-rke2



The k8s namespace cSRX contains 3 pods and 2 network-attachment-definitions using macvlan to connect cSRX with ubuntu pods as detailled in the diagram above:

CSRX 21.1R3.11

```
azureuser@rke2:~> kubectl get pods -n csrx -o wide
NAME                READY   STATUS    RESTARTS      AGE   IP           NODE   NOMINATED NODE   READINESS
GATES
csrx                1/1     Running   1 (12m ago)   39d   10.42.0.22   rke2   <none>           <none>
ubuntuapp-private   1/1     Running   1 (12m ago)   39d   10.42.0.25   rke2   <none>           <none>
ubuntuapp-public    1/1     Running   2 (10m ago)   39d   10.42.0.24   rke2   <none>           <none>
azureuser@rke2:~>
```

```
azureuser@rke2:~/validation> kubectl describe pods -n csrx
Name:             csrx
Namespace:        csrx
Priority:         0
Service Account:  default
Node:             rke2/10.0.0.4
Start Time:       Thu, 17 Oct 2024 09:21:40 +0000
Labels:           <none>
Annotations:      cni.projectcalico.org/containerID:
aa9c220dfaa3903f98ba4873b6d116b3d28f330487ac6647e22859a36d39688d
                  cni.projectcalico.org/podIP: 10.42.0.22/32
                  cni.projectcalico.org/podIPs: 10.42.0.22/32
                  k8s.v1.cni.cncf.io/network-status:
                    [{
                        "name": "csrx/network-conf-1",
                        "interface": "net1",
                        "ips": [
                            "192.168.31.0"
                        ],
                        "mac": "a6:71:9c:ac:18:2a",
                        "dns": {},
                        "gateway": [
                            "\u003cnil\u003e"
                        ]
                    },{
                        "name": "csrx/network-conf-2",
                        "interface": "net2",
                        "ips": [
                            "192.168.33.0"
                        ],
                        "mac": "c2:00:9c:40:2f:2d",
                        "dns": {},
                        "gateway": [
                            "\u003cnil\u003e"
                        ]
                    }]
                  k8s.v1.cni.cncf.io/networks: [ { "name": "network-conf-1" }, { "name": "network-conf-
2" } ]
Status:           Running
IP:               10.42.0.22
IPs:
  IP:  10.42.0.22
Containers:
  csrx:
    Container ID:   containerd://61da5a52fa8613720c658fe1fd8b1a7b810ca1ef61aeca4e48bef6bc2d20d853
    Image:          quay.io/juniper-128t/csrx:21.1R3.11
```

```
    Image ID:       quay.io/juniper-
128t/csrx@sha256:34fb717a2ee84fd853790273967f966cf2028fb3889afc820cc80607e1c23f55
    Port:           <none>
    Host Port:      <none>
    State:          Running
      Started:      Mon, 25 Nov 2024 10:48:12 +0000
    Last State:     Terminated
      Reason:       Unknown
      Exit Code:    255
      Started:      Thu, 17 Oct 2024 09:22:02 +0000
      Finished:     Mon, 25 Nov 2024 10:47:26 +0000
    Ready:          True
    Restart Count:  1
    Environment:
      CSRX_ROOT_PASSWORD:   lab123
      CSRX_SIZE:            large
      CSRX_HUGEPAGES:       no
      CSRX_PACKET_DRIVER:   interrupt
      CSRX_AUTO_ASSIGN_IP:  yes
      CSRX_FORWARD_MODE:    routing
      CSRX_LICENSE_FILE:    /var/jail/.csrx_license
      CSRX_JUNOS_CONFIG:    var/jail/csrx_config
    Mounts:
      /var/jail from config (rw)
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-fqgzn (ro)
Conditions:
  Type                        Status
  PodReadyToStartContainers   True
  Initialized                 True
  Ready                       True
  ContainersReady             True
  PodScheduled                True
Volumes:
  config:
    Type:      ConfigMap (a volume populated by a ConfigMap)
    Name:      csrx-config-map
    Optional:  false
  kube-api-access-fqgzn:
    Type:                     Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:   3607
    ConfigMapName:            kube-root-ca.crt
    ConfigMapOptional:        <nil>
    DownwardAPI:              true
QoS Class:                    BestEffort
Node-Selectors:               <none>
Tolerations:                  node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                              node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:                       <none>


Name:             ubuntuapp-private
Namespace:        csrx
Priority:         0
Service Account:  default
Node:             rke2/10.0.0.4
Start Time:       Thu, 17 Oct 2024 09:20:44 +0000
Labels:           app=ubuntuapp
                  zone=private
Annotations:      cni.projectcalico.org/containerID:
75507222a89e7dc70d8c3d62a41cd6664b73d2502d401550c0addfcd1f80c537
                  cni.projectcalico.org/podIP: 10.42.0.25/32
                  cni.projectcalico.org/podIPs: 10.42.0.25/32
                  k8s.v1.cni.cncf.io/network-status:
                    [{
                        "name": "csrx/network-conf-1",
                        "interface": "net1",
                        "ips": [
                            "192.168.31.0"
                        ],
                        "mac": "16:3d:4e:14:0d:a0",
                        "dns": {},
```

```
                        "gateway": [
                            "\u003cnil\u003e"
                        ]
                    }]
                  k8s.v1.cni.cncf.io/networks: [{ "name": "network-conf-1" }]
                  k8s.v1.cni.cncf.io/networks-status:
                    [{
                        "name": "network-conf-1",
                        "interface": "net1",
                        "ips": [
                            "192.168.31.11"
                        ],
                        "mac": "22:2f:60:a5:ff:01",
                        "dns": {}
                    }]
Status:           Running
IP:               10.42.0.25
IPs:
  IP:  10.42.0.25
Containers:
  ubuntuapp:
    Container ID:  containerd://f37563adf91322bc2a4ae4b9e3868156fe9912fd3a37b0d6184edfe6a68e8877
    Image:         ubuntu-upstart
    Image ID:      sha256:caf860ff39ff6acbecc1e01d86d0a22e6a59b5fb10dc624e2c638161fc7dfa37
    Port:          <none>
    Host Port:     <none>
    Command:
      sh
      -c
      ifconfig net1 192.168.31.11/24;route add -net 192.168.33.0/24 gw 192.168.31.1;mount
/sys/fs/selinux -o remount,ro; apt install iperf; apt install ethtool; ethtool -K net1 tx off; sleep 40;
iperf -c 192.168.33.11 -t 300;sleep 100d
    State:          Running
      Started:      Mon, 25 Nov 2024 10:48:14 +0000
    Last State:     Terminated
      Reason:       Unknown
      Exit Code:    255
      Started:      Thu, 17 Oct 2024 09:20:52 +0000
      Finished:     Mon, 25 Nov 2024 10:47:26 +0000
    Ready:          True
    Restart Count:  1
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-qsnj2 (ro)
Conditions:
  Type                        Status
  PodReadyToStartContainers   True
  Initialized                 True
  Ready                       True
  ContainersReady             True
  PodScheduled                True
Volumes:
  kube-api-access-qsnj2:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
QoS Class:                   BestEffort
Node-Selectors:              <none>
Tolerations:                 node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                             node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:                      <none>


Name:             ubuntuapp-public
Namespace:        csrx
Priority:         0
Service Account:  default
Node:             rke2/10.0.0.4
Start Time:       Thu, 17 Oct 2024 09:20:49 +0000
```

```
Labels:           app=ubuntuapp
                  zone=private
Annotations:      cni.projectcalico.org/containerID:
a9c2ffe4dcd06ab3f1d79c0a3536abaa2b2faad19b1569103d94dcbc2364bacc
                  cni.projectcalico.org/podIP: 10.42.0.24/32
                  cni.projectcalico.org/podIPs: 10.42.0.24/32
                  k8s.v1.cni.cncf.io/network-status:
                    [{
                        "name": "csrx/network-conf-2",
                        "interface": "net1",
                        "ips": [
                            "192.168.33.0"
                        ],
                        "mac": "ca:55:47:78:6f:8f",
                        "dns": {},
                        "gateway": [
                            "\u003cnil\u003e"
                        ]
                    }]
                  k8s.v1.cni.cncf.io/networks: [{ "name": "network-conf-2" }]
                  k8s.v1.cni.cncf.io/networks-status:
                    [{
                        "name": "network-conf-2",
                        "interface": "net1",
                        "ips": [
                            "192.168.33.11"
                        ],
                        "mac": "22:2f:60:a5:ff:02",
                        "dns": {}
                    }]
Status:           Running
IP:               10.42.0.24
IPs:
  IP:  10.42.0.24
Containers:
  ubuntuapp:
    Container ID:  containerd://00364a3940cf5f4c1010d831d130c047c95b9646da5d399e9e70628162b89240
    Image:         ubuntu-upstart
    Image ID:      sha256:caf860ff39ff6acbecc1e01d86d0a22e6a59b5fb10dc624e2c638161fc7dfa37
    Port:          <none>
    Host Port:     <none>
    Command:
      sh
      -c
      ifconfig net1 192.168.33.11/24;route add -net 192.168.31.0/24 gw 192.168.33.1;mount
/sys/fs/selinux -o remount,ro; apt install iperf; apt install ethtool; ethtool -K net1 tx off;iperf -s
    State:          Running
      Started:      Mon, 25 Nov 2024 11:25:05 +0000
    Last State:     Terminated
      Reason:       Error
      Exit Code:    137
      Started:      Mon, 25 Nov 2024 10:48:52 +0000
      Finished:     Mon, 25 Nov 2024 11:25:03 +0000
    Ready:          True
    Restart Count:  3
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-cbl2b (ro)
Conditions:
  Type                        Status
  PodReadyToStartContainers   True
  Initialized                 True
  Ready                       True
  ContainersReady             True
  PodScheduled                True
Volumes:
  kube-api-access-cbl2b:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
```

```
    DownwardAPI:             true
QoS Class:                   BestEffort
Node-Selectors:              <none>
Tolerations:                 node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                             node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:                      <none>
azureuser@rke2:~/validation>
```

```
azureuser@rke2:~/validation> kubectl get network-attachment-definition -n csrx
NAME             AGE
network-conf-1   39d
network-conf-2   39d
azureuser@rke2:~/validation>
```

```
azureuser@rke2:~/validation> kubectl describe network-attachment-definition -n csrx
Name:         network-conf-1
Namespace:    csrx
Labels:       <none>
Annotations:  <none>
API Version:  k8s.cni.cncf.io/v1
Kind:         NetworkAttachmentDefinition
Metadata:
  Creation Timestamp:  2024-10-17T09:20:39Z
  Generation:          1
  Resource Version:    2727
  UID:                 9809b0f6-fc6f-4ce9-bd3a-8b931a30f408
Spec:
  Config:  { "cniVersion": "0.3.0", "type": "bridge", "master": "eno2", "promiscMode": true, "ipam": {
"type": "static", "addresses": [ { "address": "192.168.31.0/24", "gateway": "192.168.31.1" } ],
"routes": [ { "dst": "0.0.0.0/0" } ] } }
Events:    <none>


Name:         network-conf-2
Namespace:    csrx
Labels:       <none>
Annotations:  <none>
API Version:  k8s.cni.cncf.io/v1
Kind:         NetworkAttachmentDefinition
Metadata:
  Creation Timestamp:  2024-10-17T09:20:39Z
  Generation:          1
  Resource Version:    2728
  UID:                 d4f2ad8d-8d65-4507-80f2-03ad6d49e91a
Spec:
  Config:  { "cniVersion": "0.3.0", "type": "bridge", "master": "eno3", "promiscMode": true, "ipam": {
"type": "static", "addresses": [ { "address": "192.168.33.0/24", "gateway": "192.168.33.1" } ],
"routes": [ { "dst": "0.0.0.0/0" } ] } }
Events:    <none>
azureuser@rke2:~/validation>
```

cSRX Configuration :

```
root@csrx> show configuration | display set
set version 20211201.145818_builder.r1226460
set interfaces ge-0/0/0 unit 0 family inet address 192.168.31.1/24
set interfaces ge-0/0/1 unit 0 family inet address 192.168.33.1/24
set security policies from-zone trust to-zone untrust policy permit-ping-iperf match source-address any
set security policies from-zone trust to-zone untrust policy permit-ping-iperf match destination-address
any
set security policies from-zone trust to-zone untrust policy permit-ping-iperf match application junos-
ping
set security policies from-zone trust to-zone untrust policy permit-ping-iperf match application iperf
set security policies from-zone trust to-zone untrust policy permit-ping-iperf then permit
set security zones security-zone trust host-inbound-traffic system-services all
set security zones security-zone trust host-inbound-traffic protocols all
set security zones security-zone trust interfaces ge-0/0/0.0
set security zones security-zone untrust host-inbound-traffic system-services all
set security zones security-zone untrust host-inbound-traffic protocols all
set security zones security-zone untrust interfaces ge-0/0/1.0
set applications application iperf protocol tcp
set applications application iperf destination-port 5001

root@csrx>
```

cSRX license:

```
root@csrx> show system license
License usage:
                                Licenses     Licenses    Licenses    Expiry
  Feature name                       used    installed      needed
  anti_spam_key_sbl                     0            1           0    2025-10-14 00:00:00 UTC
  idp-sig                               0            1           0    2025-10-14 00:00:00 UTC
  appid-sig                             0            1           0    2025-10-14 00:00:00 UTC
  av_key_sophos_engine                  0            1           0    2025-10-14 00:00:00 UTC
  wf_key_websense_ewf                   0            1           0    2025-10-14 00:00:00 UTC
  cSRX                                  1            1           0    2025-10-14 00:00:00 UTC

Licenses installed:
  License identifier: f410a3dc-f128-4aad-8868-e62e8ddbf341
  License SKU: (NCKT)S-CSRX-A2_DEMOLAB
  License version: 1
  Order Type: demo
  Software Serial Number: 307102022020-rGYuC
  Customer ID: Juniper Internal
  License count: 1
  Features:
    anti_spam_key_sbl - Anti-Spam
      date-based, 2024-10-14 00:00:00 UTC - 2025-10-14 00:00:00 UTC
    cSRX              - Containerized Firewall
      date-based, 2024-10-14 00:00:00 UTC - 2025-10-14 00:00:00 UTC
    idp-sig           - IDP Signature
      date-based, 2024-10-14 00:00:00 UTC - 2025-10-14 00:00:00 UTC
    appid-sig         - APPID Signature
      date-based, 2024-10-14 00:00:00 UTC - 2025-10-14 00:00:00 UTC
    wf_key_websense_ewf - Web Filtering EWF
      date-based, 2024-10-14 00:00:00 UTC - 2025-10-14 00:00:00 UTC
    av_key_sophos_engine - Anti Virus with Sophos Engine
      date-based, 2024-10-14 00:00:00 UTC - 2025-10-14 00:00:00 UTC

root@csrx>
```

CSRX 24.2R1.17

cSRX version:

```
root@csrx> show version
Hostname: csrx
Model: csrx
Junos: 24.2R1.17
```

cSRX Configuration :

```
root@csrx> show configuration | display set
set version 20211201.145818_builder.r1226460
set interfaces ge-0/0/0 unit 0 family inet address 192.168.31.1/24
set interfaces ge-0/0/1 unit 0 family inet address 192.168.33.1/24
set security policies from-zone trust to-zone untrust policy permit-ping-iperf match source-address any
set security policies from-zone trust to-zone untrust policy permit-ping-iperf match destination-address
any
set security policies from-zone trust to-zone untrust policy permit-ping-iperf match application junos-
ping
set security policies from-zone trust to-zone untrust policy permit-ping-iperf match application iperf
set security policies from-zone trust to-zone untrust policy permit-ping-iperf then permit
set security zones security-zone trust host-inbound-traffic system-services all
set security zones security-zone trust host-inbound-traffic protocols all
set security zones security-zone trust interfaces ge-0/0/0.0
set security zones security-zone untrust host-inbound-traffic system-services all
set security zones security-zone untrust host-inbound-traffic protocols all
set security zones security-zone untrust interfaces ge-0/0/1.0
set applications application iperf protocol tcp
set applications application iperf destination-port 5001

root@csrx>
```

cSRX license:

```
root@csrx> show system license
License usage:
                                Licensed     Licensed    Licensed
                                 Feature      Feature     Feature
  Feature name                      used    installed      needed    Expiry
  Anti-Spam                            0            1           0    2025-10-15 00:00:00 UTC
  IDP-SIG                              0            1           0    2025-10-15 00:00:00 UTC
  APPID Signature                      0            1           0    2025-10-15 00:00:00 UTC
  Sophos AV                            0            1           0    2025-10-15 00:00:00 UTC
  Web Filtering EWF                    0            1           0    2025-10-15 00:00:00 UTC
  cSRX                                 1            1           0    2025-10-15 00:00:00 UTC

Licenses installed:

  License identifier: DemoLabJUNOS520607852
  License version: 4
  Order Type: demo
  Software Serial Number: 307102022020-iW4br
  Customer ID: Juniper Internal
  Features:
    Anti-Spam        - Anti-Spam
      date-based, 2024-10-14 00:00:00 UTC - 2025-10-15 00:00:00 UTC
    cSRX             - Containerized SRX Firewall
      date-based, 2024-10-14 00:00:00 UTC - 2025-10-15 00:00:00 UTC
    Sophos AV        - Anti Virus with Sophos Engine
      date-based, 2024-10-14 00:00:00 UTC - 2025-10-15 00:00:00 UTC
    Web Filtering EWF - Web Filtering EWF
      date-based, 2024-10-14 00:00:00 UTC - 2025-10-15 00:00:00 UTC
```

```
    APPID Signature  - APPID Signature
      date-based, 2024-10-14 00:00:00 UTC - 2025-10-15 00:00:00 UTC
    IDP-SIG          - IDP Signature
      date-based, 2024-10-14 00:00:00 UTC - 2025-10-15 00:00:00 UTC

  License identifier: E20210503001
  License version: 4
  Order Type: trial
  Software Serial Number: 050320210001
  Customer ID: CSRX-JUNIPEREVAL
  Features:
    cSRX             - Containerized SRX Firewall
      date-based, 2024-11-27 14:46:37 UTC - 2025-01-26 14:46:37 UTC

root@csrx>
```

```
azureuser@rke2:~/validation/csrx-rke2> kubectl get pods -n csrx -o wide

NAME                READY   STATUS    RESTARTS   AGE     IP           NODE   NOMINATED NODE   READINESS
GATES

csrx                1/1     Running   0          5d18h   10.42.0.44   rke2   <none>           <none>

ubuntuapp-private   1/1     Running   0          6d23h   10.42.0.30   rke2   <none>           <none>

ubuntuapp-public    1/1     Running   0          6d23h   10.42.0.32   rke2   <none>           <none>

azureuser@rke2:~/validation/csrx-rke2> kubectl describe pods -n csrx

Name:             csrx

Namespace:        csrx

Priority:         0

Service Account:  default

Node:             rke2/10.0.0.4

Start Time:       Wed, 27 Nov 2024 14:46:30 +0000

Labels:           <none>

Annotations:      cni.projectcalico.org/containerID:
1f81c0315e6dd4c6ae92b3e81bb24ddb6856dd1e8290cb4198ca4176a462f1e9

                  cni.projectcalico.org/podIP: 10.42.0.44/32

                  cni.projectcalico.org/podIPs: 10.42.0.44/32

                  k8s.v1.cni.cncf.io/network-status:

                    [{

                        "name": "csrx/network-conf-1",

                        "interface": "eth1",

                        "mac": "fa:39:9a:a4:41:26",

                        "dns": {}

                    },{

                        "name": "csrx/network-conf-2",
```

```
                        "interface": "eth2",
                        "mac": "92:bf:69:30:12:ed",
                        "dns": {}
                    }]
                  k8s.v1.cni.cncf.io/networks: network-conf-1@eth1, network-conf-2@eth2
Status:           Running
IP:               10.42.0.44
IPs:
  IP:  10.42.0.44
Containers:
  csrx:
    Container ID:   containerd://c9c7e0d853318d38eb10b49ea82ad42e689433b3d80af61436f00b9c260872d5
    Image:          quay.io/juniper-128t/csrx:24.2R1.17
    Image ID:       quay.io/juniper-
128t/csrx@sha256:ef23e8b4d9b669bd635ea0fc2e56d32a0e238336722e3efb6b7f03aca26640af
    Port:           <none>
    Host Port:      <none>
    State:          Running
      Started:      Wed, 27 Nov 2024 14:46:32 +0000
    Ready:          True
    Restart Count:  0
    Limits:
      cpu:     4
      memory:  6000Mi
    Requests:
      cpu:     2
      memory:  4000Mi
    Environment:
      CSRX_ROOT_PASSWORD:  lab123
      CSRX_SIZE:           large
      CSRX_HUGEPAGES:      no
      CSRX_PACKET_DRIVER:  interrupt
      CSRX_FORWARD_MODE:   routing
      CSRX_LICENSE_FILE:   /var/jail/.csrx_license
      CSRX_JUNOS_CONFIG:   var/jail/csrx_config
```

```
      CSRX_LICENSE_FILE:   yes
      CSRX_CONFIG_FILE:    yes
      CSRX_PORT_NUM:       3
    Mounts:
      /var/jail from config (rw)
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-n7lrg (ro)
Conditions:
  Type                        Status
  PodReadyToStartContainers   True
  Initialized                 True
  Ready                       True
  ContainersReady             True
  PodScheduled                True
Volumes:
  config:
    Type:      ConfigMap (a volume populated by a ConfigMap)
    Name:      csrx-config-map
    Optional:  false
  kube-api-access-n7lrg:
    Type:                     Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:   3607
    ConfigMapName:            kube-root-ca.crt
    ConfigMapOptional:        <nil>
    DownwardAPI:              true
QoS Class:                    Burstable
Node-Selectors:               <none>
Tolerations:                  node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                              node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:                       <none>



Name:             ubuntuapp-private
Namespace:        csrx
Priority:         0
```

```
Service Account:  default
Node:             rke2/10.0.0.4
Start Time:       Tue, 26 Nov 2024 10:29:12 +0000
Labels:           app=ubuntuapp
                  zone=private
Annotations:      cni.projectcalico.org/containerID:
d1c772dcb1590e2ca522afd6be2fc12d35332e9f9522c9a396a859e3426a3795
                  cni.projectcalico.org/podIP: 10.42.0.30/32
                  cni.projectcalico.org/podIPs: 10.42.0.30/32
                  k8s.v1.cni.cncf.io/network-status:
                    [{
                        "name": "csrx/network-conf-1",
                        "interface": "net1",
                        "mac": "d6:bb:2d:eb:75:ae",
                        "dns": {}
                    }]
                  k8s.v1.cni.cncf.io/networks: [{ "name": "network-conf-1" }]
                  k8s.v1.cni.cncf.io/networks-status:
                    [{
                        "name": "network-conf-1",
                        "interface": "net1",
                        "ips": [
                            "192.168.31.11"
                        ],
                        "mac": "22:2f:60:a5:ff:01",
                        "dns": {}
                    }]
Status:           Running
IP:               10.42.0.30
IPs:
  IP:  10.42.0.30
Containers:
  ubuntuapp:
    Container ID:  containerd://987640ddb26e9155251b210844babe9de7344e000a2782a1c370d4f6c3b59386
    Image:         ubuntu-upstart
```

```
    Image ID:      sha256:caf860ff39ff6acbecc1e01d86d0a22e6a59b5fb10dc624e2c638161fc7dfa37
    Port:          <none>
    Host Port:     <none>
    Command:
      sh
      -c
      ifconfig net1 192.168.31.11/24;route add -net 192.168.33.0/24 gw 192.168.31.1;mount
/sys/fs/selinux -o remount,ro; apt install iperf; apt install ethtool; ethtool -K net1 tx off; sleep 40;
iperf -c 192.168.33.11 -t 300;sleep 100d
    State:          Running
      Started:      Tue, 26 Nov 2024 10:29:14 +0000
    Ready:          True
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-dmgxv (ro)
Conditions:
  Type                        Status
  PodReadyToStartContainers   True
  Initialized                 True
  Ready                       True
  ContainersReady             True
  PodScheduled                True
Volumes:
  kube-api-access-dmgxv:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
QoS Class:                   BestEffort
Node-Selectors:              <none>
Tolerations:                 node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                             node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:                      <none>
```

```
Name:             ubuntuapp-public
Namespace:        csrx
Priority:         0
Service Account:  default
Node:             rke2/10.0.0.4
Start Time:       Tue, 26 Nov 2024 10:30:02 +0000
Labels:           app=ubuntuapp
                  zone=public
Annotations:      cni.projectcalico.org/containerID:
bf86b900ed80848e2f562c3d9aab77667df5764f9d3818ae535f281a3a26dc47
                  cni.projectcalico.org/podIP: 10.42.0.32/32
                  cni.projectcalico.org/podIPs: 10.42.0.32/32
                  k8s.v1.cni.cncf.io/network-status:
                    [{
                        "name": "csrx/network-conf-2",
                        "interface": "net1",
                        "mac": "ae:01:32:4d:a8:e9",
                        "dns": {}
                    }]
                  k8s.v1.cni.cncf.io/networks: [{ "name": "network-conf-2" }]
                  k8s.v1.cni.cncf.io/networks-status:
                    [{
                        "name": "network-conf-2",
                        "interface": "net1",
                        "ips": [
                            "192.168.33.11"
                        ],
                        "mac": "22:2f:60:a5:ff:02",
                        "dns": {}
                    }]
Status:           Running
IP:               10.42.0.32
IPs:
```

```
  IP:  10.42.0.32
Containers:
  ubuntuapp:
    Container ID:  containerd://849f4f7dd00d64a01af69c99bf9f4bd951c63ec8168e87e9f0991c45188bc2c4
    Image:         ubuntu-upstart
    Image ID:      sha256:caf860ff39ff6acbecc1e01d86d0a22e6a59b5fb10dc624e2c638161fc7dfa37
    Port:          <none>
    Host Port:     <none>
    Command:
      sh
      -c
      ifconfig net1 192.168.33.11/24;route add -net 192.168.31.0/24 gw 192.168.33.1;mount
/sys/fs/selinux -o remount,ro; apt install iperf; apt install ethtool; ethtool -K net1 tx off;iperf -s
    State:          Running
      Started:      Tue, 26 Nov 2024 10:30:04 +0000
    Ready:          True
    Restart Count:  0
    Environment:    <none>
    Mounts:
      /var/run/secrets/kubernetes.io/serviceaccount from kube-api-access-tqztd (ro)
Conditions:
  Type                        Status
  PodReadyToStartContainers   True
  Initialized                 True
  Ready                       True
  ContainersReady             True
  PodScheduled                True
Volumes:
  kube-api-access-tqztd:
    Type:                    Projected (a volume that contains injected data from multiple sources)
    TokenExpirationSeconds:  3607
    ConfigMapName:           kube-root-ca.crt
    ConfigMapOptional:       <nil>
    DownwardAPI:             true
QoS Class:                   BestEffort
```

```
Node-Selectors:              <none>
Tolerations:                 node.kubernetes.io/not-ready:NoExecute op=Exists for 300s
                             node.kubernetes.io/unreachable:NoExecute op=Exists for 300s
Events:                      <none>
```

```
azureuser@rke2:~/validation/csrx-rke2> kubectl get network-attachment-definition -n csrx
NAME             AGE
network-conf-1   6d23h
network-conf-2   6d23h
```

```
azureuser@rke2:~/validation/csrx-rke2> kubectl describe network-attachment-definition -n csrx
Name:         network-conf-1
Namespace:    csrx
Labels:       <none>
Annotations:  <none>
API Version:  k8s.cni.cncf.io/v1
Kind:         NetworkAttachmentDefinition
Metadata:
  Creation Timestamp:  2024-11-26T10:29:03Z
  Generation:          1
  Resource Version:    828372
  UID:                 b02923d2-9158-4ac2-aac1-a09a4197388d
Spec:
  Config:  { "cniVersion": "0.3.0", "type": "bridge", "master": "eno2", "promiscMode": true }
Events:    <none>



Name:         network-conf-2
Namespace:    csrx
Labels:       <none>
Annotations:  <none>
API Version:  k8s.cni.cncf.io/v1
Kind:         NetworkAttachmentDefinition
Metadata:
```

```
  Creation Timestamp:  2024-11-26T10:29:03Z
  Generation:          1
  Resource Version:    828373
  UID:                 c82dd883-e61e-4487-971a-9d9fbc3b0dbd
Spec:
  Config:  { "cniVersion": "0.3.0", "type": "bridge", "master": "eno3", "promiscMode": true }
Events:    <none>
azureuser@rke2:~/validation/csrx-rke2>
```

Validation tests

IPERF TRAFFIC IS ALLOWED FROM ZONE TRUST (PRIVATE) TO ZONE UNTRUST (PUBLIC)

cSRX 21.1R3.11

```
root@csrx> show security flow session extensive
Session ID: 222, Status: Normal, State: Stand-alone
Flags: 0x40/0x0/0x2/0x8003
Policy name: permit-ping-iperf/4
Source NAT pool: Null
Dynamic application: junos:UNKNOWN,
Encryption:  Unknown
Url-category:  Unknown
Application traffic control rule-set: INVALID, Rule: INVALID
Maximum timeout: 1800, Current timeout: 1800
Session State: Valid
Start time: 2348, Duration: 14
   In: 192.168.31.11/53866 --> 192.168.33.11/5001;tcp,
  Conn Tag: 0x0, Interface: ge-0/0/0.0,
    Session token: 0xa, Flag: 0x1021
    Route: 0x90010, Gateway: 192.168.31.11, Tunnel ID: 0, Tunnel type: None
    Port sequence: 0, FIN sequence: 0,
    FIN state: 0,
    Pkts: 523562, Bytes: 785338688
   Out: 192.168.33.11/5001 --> 192.168.31.11/53866;tcp,
  Conn Tag: 0x0, Interface: ge-0/0/1.0,
    Session token: 0x14, Flag: 0x1020
    Route: 0xa0010, Gateway: 192.168.33.11, Tunnel ID: 0, Tunnel type: None
    Port sequence: 0, FIN sequence: 0,
    FIN state: 0,
    Pkts: 260258, Bytes: 13546792
Total sessions: 1

root@csrx> show security flow session
Session ID: 222, Policy name: permit-ping-iperf/4, State: Stand-alone, Timeout: 1800, Valid
  In: 192.168.31.11/53866 --> 192.168.33.11/5001;tcp, Conn Tag: 0x0, If: ge-0/0/0.0, Pkts: 5182650,
Bytes: 7773970688,
  Out: 192.168.33.11/5001 --> 192.168.31.11/53866;tcp, Conn Tag: 0x0, If: ge-0/0/1.0, Pkts: 2572593,
Bytes: 133842372,
Total sessions: 1

root@csrx>
```

```
root@ubuntuapp-private:/# iperf -c 192.168.33.11 -t 300
------------------------------------------------------------
Client connecting to 192.168.33.11, TCP port 5001
TCP window size: 85.0 KByte (default)
------------------------------------------------------------
[  3] local 192.168.31.11 port 53866 connected with 192.168.33.11 port 5001
[ ID] Interval       Transfer     Bandwidth
[  3]  0.0-300.0 sec  15.0 GBytes   429 Mbits/sec
root@ubuntuapp-private:/#
```

cSRX 24.2R1.17

```
root@csrx> show security flow session extensive
Session ID: 50, Status: Normal
Flags: 0x40/0x0/0x2/0x8003
Policy name: default-policy-logical-system-00/2
Source NAT pool: Null
Dynamic application: junos:UNKNOWN,
Encryption:  Unknown
Url-category:  Unknown
Application traffic control rule-set: INVALID, Rule: INVALID
Maximum timeout: 1800, Current timeout: 1800
Session State: Valid
Start time: 1733219595, Duration: 15
   In: 192.168.31.11/35074 --> 192.168.33.11/5001;tcp,
  Conn Tag: 0x0, Attachment Id: 0, GW Endpoint Id: 0, Flow Cookie: 0, Interface: ge-0/0/0.0,
    Session token: 0x8, Flag: 0x201021,
    Power-Mode Active: False
    Route: 0x50010, Gateway: 192.168.31.11, Tunnel ID: 0, Tunnel type: None,
    Port sequence: 0, FIN sequence: 0,
    FIN state: 0,
    Pkts: 481126, Bytes: 721684688
   Out: 192.168.33.11/5001 --> 192.168.31.11/35074;tcp,
  Conn Tag: 0x0, Interface: ge-0/0/1.0,
    Session token: 0x9, Flag: 0x201020,
    Power-Mode Active: False
    Route: 0x40010, Gateway: 192.168.33.11, Tunnel ID: 0, Tunnel type: None,
    Port sequence: 0, FIN sequence: 0,
    FIN state: 0,
    Pkts: 236025, Bytes: 12282092
Total sessions: 1

root@csrx> show security flow session
Session ID: 50, Policy name: default-policy-logical-system-00/2, Timeout: 1800, Session State: Valid
  In: 192.168.31.11/35074 --> 192.168.33.11/5001;tcp, Conn Tag: 0x0, If: ge-0/0/0.0, Pkts: 748618,
Bytes: 1122922688,
  Out: 192.168.33.11/5001 --> 192.168.31.11/35074;tcp, Conn Tag: 0x0, If: ge-0/0/1.0, Pkts: 367452,
Bytes: 19119608,
Total sessions: 1

root@csrx>
```

```
root@ubuntuapp-private:/# iperf -c 192.168.33.11 -t 300
------------------------------------------------------------
Client connecting to 192.168.33.11, TCP port 5001
TCP window size: 85.0 KByte (default)
------------------------------------------------------------
[  3] local 192.168.31.11 port 35074 connected with 192.168.33.11 port 5001
[ ID] Interval       Transfer     Bandwidth
[  3]  0.0-300.0 sec  14.1 GBytes   405 Mbits/sec
root@ubuntuapp-private:/#
```

TCP IPERF IS ALLOWED BUT UDP IPERF IS DENIED BY CSRX SECURITY POLICIES:

cSRX 21.1R3.11

```
root@ubuntuapp-private:/# iperf -c 192.168.33.11 -t 10
------------------------------------------------------------
Client connecting to 192.168.33.11, TCP port 5001
TCP window size: 85.0 KByte (default)
------------------------------------------------------------
[  3] local 192.168.31.11 port 41642 connected with 192.168.33.11 port 5001
[ ID] Interval       Transfer     Bandwidth
[  3]  0.0-10.0 sec   506 MBytes   423 Mbits/sec
root@ubuntuapp-private:/# iperf -c 192.168.33.11 -t 10 -u
------------------------------------------------------------
Client connecting to 192.168.33.11, UDP port 5001
Sending 1470 byte datagrams
UDP buffer size:  208 KByte (default)
------------------------------------------------------------
[  3] local 192.168.31.11 port 46124 connected with 192.168.33.11 port 5001
[ ID] Interval       Transfer     Bandwidth
[  3]  0.0-10.0 sec  1.25 MBytes  1.05 Mbits/sec
[  3] Sent 893 datagrams
[  3] WARNING: did not receive ack of last datagram after 10 tries.
root@ubuntuapp-private:/#
```

cSRX 24.2R1.17

```
root@ubuntuapp-private:/# iperf -c 192.168.33.11 -t 10
------------------------------------------------------------
Client connecting to 192.168.33.11, TCP port 5001
TCP window size: 85.0 KByte (default)
------------------------------------------------------------
[  3] local 192.168.31.11 port 44922 connected with 192.168.33.11 port 5001
[ ID] Interval       Transfer     Bandwidth
[  3]  0.0-10.0 sec   464 MBytes   389 Mbits/sec
root@ubuntuapp-private:/# iperf -c 192.168.33.11 -t 10 -u
------------------------------------------------------------
Client connecting to 192.168.33.11, UDP port 5001
Sending 1470 byte datagrams
UDP buffer size:  208 KByte (default)
------------------------------------------------------------
[  3] local 192.168.31.11 port 51201 connected with 192.168.33.11 port 5001
[ ID] Interval       Transfer     Bandwidth
[  3]  0.0-10.0 sec  1.23 MBytes  1.03 Mbits/sec
[  3] Sent 893 datagrams
read failed: Connection refused
[  3] WARNING: did not receive ack of last datagram after 5 tries.
root@ubuntuapp-private:/#
```

ICMP PING TRAFFIC IS ALLOWED ONLY FROM TRUST ZONE TO UNTRUST ZONE

Same outputs with cSRX 21.1R3.11 and cSRX 24.2R1.17

```
root@ubuntuapp-private:/# ping 192.168.33.11
PING 192.168.33.11 (192.168.33.11) 56(84) bytes of data.
64 bytes from 192.168.33.11: icmp_seq=1 ttl=63 time=0.243 ms
64 bytes from 192.168.33.11: icmp_seq=2 ttl=63 time=0.173 ms
64 bytes from 192.168.33.11: icmp_seq=3 ttl=63 time=0.169 ms
64 bytes from 192.168.33.11: icmp_seq=4 ttl=63 time=0.195 ms
64 bytes from 192.168.33.11: icmp_seq=5 ttl=63 time=0.193 ms
64 bytes from 192.168.33.11: icmp_seq=6 ttl=63 time=0.173 ms
64 bytes from 192.168.33.11: icmp_seq=7 ttl=63 time=0.169 ms
64 bytes from 192.168.33.11: icmp_seq=8 ttl=63 time=0.172 ms
64 bytes from 192.168.33.11: icmp_seq=9 ttl=63 time=0.174 ms
^C
--- 192.168.33.11 ping statistics ---
9 packets transmitted, 9 received, 0% packet loss, time 8181ms
rtt min/avg/max/mdev = 0.169/0.184/0.243/0.026 ms
root@ubuntuapp-private:/#
```

```
root@csrx> show security flow session
Session ID: 1130, Policy name: permit-ping-iperf/4, State: Stand-alone, Timeout: 2, Valid
  In: 192.168.31.11/155 --> 192.168.33.11/3;icmp, Conn Tag: 0x0, If: ge-0/0/0.0, Pkts: 1, Bytes: 84,
  Out: 192.168.33.11/3 --> 192.168.31.11/155;icmp, Conn Tag: 0x0, If: ge-0/0/1.0, Pkts: 1, Bytes: 84,

Session ID: 1131, Policy name: permit-ping-iperf/4, State: Stand-alone, Timeout: 2, Valid
  In: 192.168.31.11/155 --> 192.168.33.11/4;icmp, Conn Tag: 0x0, If: ge-0/0/0.0, Pkts: 1, Bytes: 84,
  Out: 192.168.33.11/4 --> 192.168.31.11/155;icmp, Conn Tag: 0x0, If: ge-0/0/1.0, Pkts: 1, Bytes: 84,

Session ID: 1132, Policy name: permit-ping-iperf/4, State: Stand-alone, Timeout: 4, Valid
  In: 192.168.31.11/155 --> 192.168.33.11/5;icmp, Conn Tag: 0x0, If: ge-0/0/0.0, Pkts: 1, Bytes: 84,
  Out: 192.168.33.11/5 --> 192.168.31.11/155;icmp, Conn Tag: 0x0, If: ge-0/0/1.0, Pkts: 1, Bytes: 84,

Session ID: 1133, Policy name: permit-ping-iperf/4, State: Stand-alone, Timeout: 4, Valid
  In: 192.168.31.11/155 --> 192.168.33.11/6;icmp, Conn Tag: 0x0, If: ge-0/0/0.0, Pkts: 1, Bytes: 84,
  Out: 192.168.33.11/6 --> 192.168.31.11/155;icmp, Conn Tag: 0x0, If: ge-0/0/1.0, Pkts: 1, Bytes: 84,
Total sessions: 4

root@csrx>
```

```
root@ubuntuapp-public:/# ping 192.168.31.11
PING 192.168.31.11 (192.168.31.11) 56(84) bytes of data.
^C
--- 192.168.31.11 ping statistics ---
19 packets transmitted, 0 received, 100% packet loss, time 18423ms

root@ubuntuapp-public:/#
```

```
root@csrx> show security flow session
Total sessions: 0

root@csrx>
```

OTHER TRAFFIC THAN IPERF (TCP PORT 5001) AND ICMP PING ARE REJECTED:

Same outputs with cSRX 21.1R3.11 and cSRX 24.2R1.17

```
root@csrx> show security flow statistics
    Current sessions: 0
    Packets received: 18193307
    Packets transmitted: 18192373
    Packets forwarded/queued: 0
    Packets copied: 0
    Packets dropped: 934
    Services-offload packets processed: 0
    Fragment packets: 0
    Pre fragments generated: 0
    Post fragments generated: 0

root@csrx>
```

```
root@ubuntuapp-private:/# ssh 192.168.33.11
…
…
```

```
root@ubuntuapp-public:/# tcpdump -i net1 port 22
tcpdump: verbose output suppressed, use -v or -vv for full protocol decode
listening on net1, link-type EN10MB (Ethernet), capture size 262144 bytes
^C
0 packets captured
0 packets received by filter
0 packets dropped by kernel
root@ubuntuapp-public:/#
```

```
root@csrx> show security flow statistics
    Current sessions: 0
    Packets received: 18193317
    Packets transmitted: 18192373
    Packets forwarded/queued: 0
    Packets copied: 0
    Packets dropped: 944
    Services-offload packets processed: 0
    Fragment packets: 0
    Pre fragments generated: 0
    Post fragments generated: 0

root@csrx>
```

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