



# L2X User Guide

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# 1. Overview

Layer 2 Cross-Connect (L2X) is a data plane feature that connects two physical ports (IFPs) using Layer 2 switching. L2X can switch the traffic between two IFPs to provide the trunk service for an Ethernet switch.

## 1.1. Local and Remote L2X

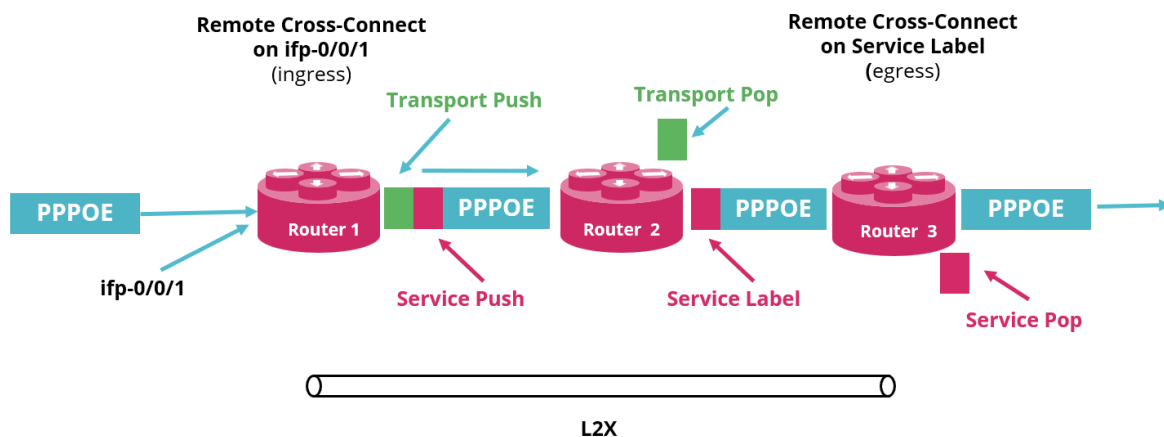
Local L2X refers to an L2 connection between two ports or VLANs on the same device. In a local L2X, both interfaces are on the same router. The L2X can switch Layer 2 (frame) traffic between the ports. Based on the configuration, these cross connects can be uni-directional as well as bi-directional.

Remote L2X refers to L2 connection between two ports located on two different devices. In a remote L2X, the interfaces are located on two different routers and it requires an MPLS tunnel to transport the traffic between the two routers.

**Local L2X:** The following figure shows the Local L2X scenario.



**Remote L2X:** The following figure shows the remote L2X scenario.



## 1.2. Unidirectional and Bidirectional L2X

Unidirectional refers to data either sent or received in one direction and Bidirectional implies the flow of traffic between two routers in both directions.

The bidirectional cross connect feature helps you to establish cross connection between two local ports with an L2X configuration. Bi-directional attribute is applicable only to local cross connect. Bidirectional connectivity requires a pair of unidirectional L2X or a single bidirectional L2X.



The VLAN operations are not supported for bi-directional local cross connect.

## 1.3. Ingress and Egress in L2X

In L2X, ingress traffic is incoming traffic that enters the boundary of a network and egress traffic implies outgoing traffic that exits an entity or a network boundary.

## 1.4. Port and VLAN Cross-connects

Both port and VLAN cross-connects switches Layer 2 traffic from input interface to output interface. A port cross-connect switches all Layer 2 traffic arriving at an input interface, but a VLAN cross-connect only switches the Layer 2 traffic associated with a specific VLAN. A port-based L2X indicates a port-only configuration, so there are no VLANs involved.

Both single-tag and double-tagged (inner and outer VLAN tags) are supported. The port and VLAN L2X support both local and remote L2X configurations. In remote L2X connections, the VLAN cross-connects are typically configured on the MPLS tunnel ingress router.

Untagged traffic on L2X interfaces is also supported. However, there is no way to select only untagged traffic for cross-connecting. Therefore, only port cross connects are supported for untagged traffic.

## 1.5. L2X 802.1ad Ethertype Support

RBFS supports VLAN operations such as VLAN add, VLAN swap, and VLAN delete on egress interface. RBFS supports similar functionality at the ingress side as well. That is, RBFS supports the following VLAN operations:

- Single-VLAN-Add with an option to configure encapsulation (that is, 802.1q or 802.1ad)
- Single-VLAN-Delete
- Swap-Outer-VLAN

By default the encapsulation method is 802.1q. If an encapsulation method is not specified, 802.1q is the default mode.

In addition to setting the Ethertype for a VLAN operation, the 802.1ad support includes that ingress traffic for all tagged match options will match on both Ethertype 0x8100 (802.1q) and 0x88a8 (802.1ad) by default.

## 1.6. VLAN Operations

RBFS supports VLAN operations such as **VLAN add**, **VLAN swap** and **VLAN delete** on Ingress and Egress interfaces.

The current functionality has been extended to all the existing CLIs to accept ingress and egress VLAN operations and Ingress and Egress VLAN encapsulation values.

Both 802.1q and 802.1ad encapsulations are supported. The default encapsulation is 802.1q.

Traffic will be matched at ingress direction based on the match criterion. RtBrick Full Stack (RBFS) supports the following match parameters.

On a physical interface, there are five different match types. Traffic can be matched based on the following:

1. (ifp)
2. (ifp, outer\_vlan)
3. (ifp, outer\_vlan, inner\_vlan)
4. (ifp, outer\_vlan, any inner\_vlan)
5. (ifp, any vlan)

Some of the match types are mutually exclusive. For example, (ifp, outer\_vlan, inner\_vlan) and (ifp, outer\_vlan, any inner\_vlan) configuration on the same interface throws errors.

If **ifp, any vlan** match type is configured with any other match type, it will create conflicts.



The **match-type** attribute is mandatory for **match-untagged**, **match-any** and **match-inner-any** match criterion.

## 1.7. Supported Match Type Validations

The following table shows the supported match type validations.



The asterisk \* indicates *any* or *no* vlan tags.

Cases	Configuration A	Configuration B	Support
<b>Case 1 : IFP A, *</b>	IFP A,*	IFP A, ov 10	No
	IFP A,*	IFP A, ov 10, iv 20	No
	IFP A,*	IFP A, ov 10, *	No
	IFP A,*	IFP A, untagged	No
<b>Case 2: IFP A, untagged</b>	IFP A, untagged	IFP A, *	No
	IFP A, untagged	IFP A, ov 10	Yes
	IFP A, untagged	IFP A, ov 30, iv 20	Yes
	IFP A, untagged	IFP A, ov 20, *	Yes
<b>Case 3: IFP A, outer_vlan:</b>	IFP A, ov 10	IFP A, *	No
	IFP A, ov 10	IFP A, ov 10, *	No
	IFP A, ov 10	IFP A, ov 20	Yes
	IFP A, ov 10	IFP A, ov 10 , iv 20	No
	IFP A, ov 10	IFP A, ov 40 , iv 7	Yes
	IFP A, ov 10	IFP A, ov 30, *	Yes
	IFP A, ov 10	IFP A, untagged	Yes
<b>Case 4: IFP A, outer_vlan, inner_vlan:</b>	IFP A, ov 10, iv 20	IFP A, *	No
	IFP A, ov 10, iv 20	IFP A, ov 10, *	No
	IFP A, ov 10, iv 20	IFP A, ov 10	No
	IFP A, ov 10, iv 20	IFP A, ov 30	Yes
	IFP A, ov 10, iv 20	IFP A, ov 20 , *	Yes
	IFP A, ov 10, iv 20	IFP A, untagged	Yes
	IFP A, ov 10, iv 20	IFP A, ov 10, iv 30	Yes
<b>Case 5: IFP A, outer_vlan, *</b>	IFP A, ov 10, *	IFP A, *	No
	IFP A, ov 10, *	IFP A, ov 10	No
	IFP A, ov 10, *	IFP A, ov 10, iv 20	No
	IFP A, ov 10, *	IFP A, ov 20, iv 7	Yes
	IFP A, ov 10, *	IFP A, ov 30	Yes
	IFP A, ov 10, *	IFP A, untagged	Yes
	IFP A, ov 10, *	IFP A, ov 40, *	Yes

## 1.8. Supported Platforms

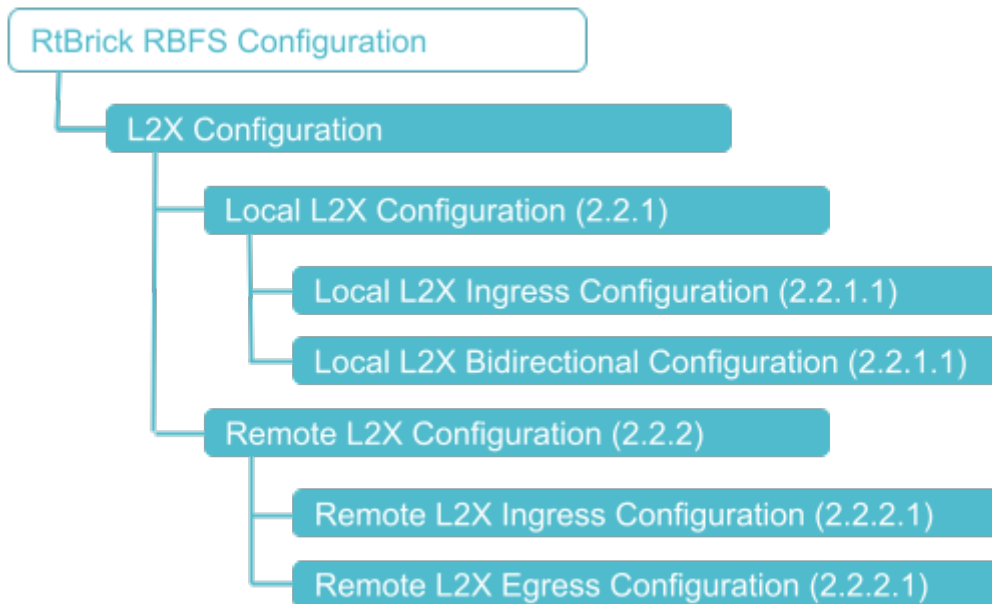
Not all features are necessarily supported on each hardware platform. Refer to the *Platform Guide* for the features and the sub-features that are or are not supported by each platform.



## 2. L2X Configuration

### 2.1. Configuration Hierarchy

The diagram illustrates the L2X configuration hierarchy.



### 2.2. Configuration Syntax and Commands

The following sections describe the L2X configuration syntax and commands.

#### 2.2.1. Local L2X Configuration

The following sections describe the Local L2X unidirectional and bidirectional configurations.

##### 2.2.1.1. Local L2X Ingress Configuration

This configuration enables local unidirectional L2X (Local Cross-Connect) on the same device.

#### Syntax:

```
set l2x name <l2x-name> ingress <attribute> <value>
```

Attribute	Description
<l2x-name>	Name of L2X
description <description>	(Optional) L2X description

Attribute	Description
egress-vlan-encapsulation <encapsulation>	(Optional) Egress VLAN encapsulation value
egress-vlan-operation <vlan-action>	(Optional) Outgoing VLAN operation
incoming-inner-vlan <vlan-id>	(Optional) Incoming inner VLAN
incoming-interface <incoming-interface>	(Mandatory) Incoming physical interface name
incoming-outer-vlan <vlan-id>	(Optional) Incoming outer VLAN
ingress-outer-vlan <vlan-id>	(Optional) Outer VLAN at ingress side
ingress-vlan-encapsulation <encapsulation>	(Optional) Ingress VLAN encapsulation value
ingress-vlan-operation <vlan-action>	(Optional) VLAN operation on ingress side outer VLAN
match-type <match-type>	(Mandatory) L2X match type
outgoing-interface <outgoing-interface>	(Mandatory) Outgoing physical interface name
outgoing-outer-vlan <vlan-id>	(Optional) Outgoing outer VLAN

### Example 1: Local L2X Ingress Configuration with Port Match

```
{
  "rtbrick-config:l2x": {
    "name": [
      {
        "name": "test1",
        "direction": "ingress",
        "incoming-interface": "ifp-0/1/64",
        "outgoing-interface": "ifp-0/1/66",
        "match-type": "match-any"
      }
    ]
  }
}
```

### Example 2: Local L2X Ingress Configuration with VLAN Match

```

{
  "rtbrick-config:l2x": {
    "name": [
      {
        "name": "test4",
        "direction": "ingress",
        "incoming-interface": "ifp-0/1/12",
        "incoming-outer-vlan": 200,
        "outgoing-interface": "ifp-0/1/13",
        "match-type": "match-outer"
      }
    ]
  }
}

```

### Example 3: Local L2X Ingress VLAN Operations

```

{
  "rtbrick-config:l2x": {
    "name": [
      {
        "name": "test4",
        "direction": "ingress",
        "incoming-interface": "ifp-0/1/12",
        "incoming-outer-vlan": 200,
        "outgoing-interface": "ifp-0/1/13",
        "match-type": "match-outer",
        "ingress-vlan-operation": "single-vlan-add",
        "ingress-outer-vlan": 400
      }
    ]
  }
}

```

#### 2.2.1.2. Local L2X Bidirectional Configuration

This configuration enables redirecting traffic incoming (ingress) on a particular interface to another interface and vice versa on the same hardware device.

#### Syntax:

**set l2x name** <l2x-name> **bi-directional** <attribute> <value>

Attribute	Description
match-type <match-type>	(Mandatory) Match types with which traffic can be matched.
incoming-interface <incoming-interface>	(Mandatory) Incoming interface is where the traffic originates from.

Attribute	Description
outgoing-interface <outgoing-interface>	(Mandatory) Outgoing interface where the traffic is going to.
description <description>	(Optional) L2X description
egress-vlan-encapsulation <encapsulation>	(Optional) Egress VLAN encapsulation
incoming-inner-vlan <vlan-id>	(Optional) Incoming inner VLAN
incoming-outer-vlan <vlan-id>	(Optional) Incoming outer VLAN
ingress-outer-vlan <vlan-id>	(Optional) Outer VLAN at ingress side
ingress-vlan-encapsulation <encapsulation>	(Optional) Ingress VLAN encapsulation
outgoing-outer-vlan <vlan-id>	(Optional) Outgoing outer VLAN

### Example 1: Local L2X Bidirectional Configuration

```
{
  "rtbrick-config:l2x": {
    "name": [
      {
        "name": "test2",
        "direction": "bi-directional",
        "incoming-interface": "ifp-0/1/64",
        "outgoing-interface": "ifp-0/1/66",
        "match-type": "match-untagged"
      }
    ]
  }
}
```

## 2.2.2. Remote L2X Configuration

The following sections describe the remote L2X configurations.

### 2.2.2.1. Remote L2X Ingress Configuration

This configuration enables the remote L2X ingress side.

#### Syntax:

**set l2x name** <l2x-name> **ingress** <attribute> <value>

Attribute	Description
match-type <match-type>	(Mandatory) Match types with which traffic can be matched.
incoming-interface <incoming-interface>	(Mandatory) Incoming interface is where the traffic originates from.
ingress-vlan-operation <ingress-vlan-action>	(Optional) VLAN operation on ingress side outer VLAN
ingress-outer-vlan <vlan-id>	(Optional) Outer VLAN at ingress side
ingress-vlan-encapsulation <encapsulation>	(Optional) Ingress VLAN encapsulation value
nexthop4/nexthop6 <nexthop>	(Mandatory) Next-Hop address
lookup-instance <lookup-instance>	(Optional) Instance name
lookup-afi <lookup-afi>	(Optional) AFI value: ipv4 or ipv6
lookup-safi <lookup-safi>	(Optional) SAFI value: safi values are unicast, labeled-unicast
service-label <service_label>	(Mandatory) Service label value. NOTE: Supported MPLS label values are 0 - 1048575. The reserved MPLS label range is 0 - 15. In RBFS, BGP uses the label range 20000 - 100000. It is recommended to assign label values outside of these reserved ranges to avoid conflicts.

### Example 1: Remote L2X Ingress Configuration with Port Match

```
{
  "rtbrick-config:l2x": {
    "name": [
      {
        "name": "test8",
        "direction": "ingress",
        "incoming-interface": "ifp-0/1/64",
        "nexthop4": "4.4.4.4",
        "lookup-instance": "default",
        "lookup-afi": "ipv4",
        "lookup-safi": "labeled-unicast",
        "service-label": 10000,
        "match-type": "match-any"
      }
    ]
  }
}
```

## Example 2: Remote L2X Ingress Configuration with VLAN match

```
{
  "rtbrick-config:l2x": {
    "name": [
      {
        "name": "test4",
        "direction": "ingress",
        "incoming-interface": "ifp-0/1/12",
        "incoming-outer-vlan": 100,
        "incoming-inner-vlan": 200,
        "nexthop4": "4.4.4.4",
        "lookup-instance": "default",
        "lookup-afi": "ipv4",
        "lookup-safi": "labeled-unicast",
        "service-label": 8000,
        "match-type": "match-outer-inner"
      }
    ]
  }
}
```

## Example 3: Remote L2X Ingress VLAN operations

```
{
  "rtbrick-config:l2x": {
    "name": [
      {
        "name": "test4",
        "direction": "ingress",
        "incoming-interface": "ifp-0/1/12",
        "incoming-outer-vlan": 100,
        "incoming-inner-vlan": 200,
        "nexthop4": "4.4.4.4",
        "lookup-instance": "default",
        "lookup-afi": "ipv4",
        "lookup-safi": "labeled-unicast",
        "service-label": 10000,
        "match-type": "match-outer-inner",
        "ingress-vlan-operation": "Single-Vlan-Delete"
      }
    ]
  }
}
```

### 2.2.2.2. Remote L2X Egress Configuration

This configuration enables the remote L2X egress side.

#### Syntax:

**set l2x name** <l2x-name> **egress** <attribute> <value>

Attribute	Description
service-label <service_label>	(Mandatory) Service label value. NOTE: Supported MPLS label values are 0 - 1048575. The reserved MPLS label range is 0 - 15. In RBFS, BGP uses the label range between 20000 - 100000. It is recommended to assign a label value outside of these reserved ranges to avoid conflicts.
outgoing-interface <outgoing-interface>	(Mandatory) Interface where traffic is going to.
egress-vlan-operation <vlan-action>	(Optional) Outgoing VLAN operation
outgoing-outer-vlan <vlan-id>	(Optional) Outgoing outer VLAN

### Example 1: Local L2X Egress Configuration

```
{
  "rtbrick-config:l2x": {
    "name": [
      {
        "name": "test4",
        "direction": "egress",
        "service-label": 10000,
        "outgoing-interface": "ifp-0/1/66"
      }
    ]
  }
}
```

### Example 2: Local L2X Egress Configuration with VLAN Operation

```
{
  "rtbrick-config:l2x": {
    "name": [
      {
        "name": "test4",
        "direction": "egress",
        "service-label": 10000,
        "outgoing-interface": "ifp-0/1/12",
        "egress-vlan-operation": "single-vlan-add",
        "outgoing-outer-vlan": 400
      }
    ]
  }
}
```

## 3. L2X Operational Commands

The L2X show commands provide detailed information about the L2X operations.

### 3.1. L2X Show Commands

The L2X show commands display data from FIB local table. Therefore, local L2X with down ports or remote l2x with unresolved nexthop address are not displayed.

#### 3.1.1. L2X Summary

The summary commands display L2X information in a tabular format. Key information is displayed in the summary output.



The L2X name is truncated after certain length as space is less to display summary output. In such cases, you can use detail command output where full name is displayed.

#### Syntax:

**show l2x** <options>

Option	Description
-	Without any option, the commands displays all L2X information such as ingress L2X and egress L2X.
l2x-name <l2x-name>	Displays information for a specific L2X.
detail	Displays detailed L2X information for a specific L2X.
direction <direction>	Displays L2X information for a specified direction, where direction can be ingress, egress, or bi-directional.
local-interface <interface-name>	Displays L2X information for a specific LAG interface.
nexthop4 <nexthop>	Displays L2X information for the remote IPv4 address.
nexthop6 <nexthop>	Displays L2X information for the remote IPv6 address.
service-label <service_label>	Displays the L2X information for a specific service label.
type <type>	Displays detailed L2X information for a specific type and L2X.
statistics	Displays statistics for a specific L2X.

Example 1: Summary view of L2X information



```

supervisor@rtbrick: op> show l2x
Name
Intf/Next Hop      Outer VLAN      Direction  Incoming Intf      Outgoing
                   Inner VLAN      Service label
12bsa-0/1/27/281479271677953 ingress         ifp-0/1/27      fd00:a4::31
64                  Any             110011
12bsa-0/1/27/281479271677953 egress         -                ifp-0/1/27
-                   -               120011
12bsa-0/1/27/281479271677954 ingress         ifp-0/1/27      fd00:a4::31
65                  Any             110012
12bsa-0/1/27/281479271677954 egress         -                ifp-0/1/27
-                   -               120012
12bsa-0/1/27/281479271677955 ingress         ifp-0/1/27      fd00:a4::31
66                  Any             110013
12bsa-0/1/27/281479271677955 egress         -                ifp-0/1/27
-                   -               120013
12bsa-0/1/27/281479271677956 ingress         ifp-0/1/27      fd00:a4::31
67                  Any             110014
12bsa-0/1/27/281479271677956 egress         -                ifp-0/1/27
-                   -               120014

```

### Example 2: Summary view of a specific L2X

```

supervisor@rtbrick: op> show l2x 12bsa-0/1/27/281479271677953
Name
Intf/Next Hop      Outer VLAN      Direction  Incoming Intf      Outgoing
                   Inner VLAN      Service label
12bsa-0/1/27/281479271677953 ingress         ifp-0/1/27      fd00:a4::31
64                  Any             110011
12bsa-0/1/27/281479271677953 egress         -                ifp-0/1/27
-                   -               120011

```

### Example 3: Summary view of a remote L2X

```

supervisor@rtbrick: op> show l2x type remote
Name
Intf/Next Hop      Outer VLAN      Direction  Incoming Intf      Outgoing
                   Inner VLAN      Service label
l2bsa_lag-1_11    11              ingress    lag-1               fd00:a4::21
-                  Any             120011
l2bsa_lag-1_11    -              egress     -                   lag-1
-                  -              110011
l2bsa_lag-1_12    12              ingress    lag-1               fd00:a4::21
-                  Any             120012
l2bsa_lag-1_12    -              egress     -                   lag-1
-                  -              110012
l2bsa_lag-1_13    13              ingress    lag-1               fd00:a4::21
-                  Any             120013
l2bsa_lag-1_13    -              egress     -                   lag-1
-                  -              110013
l2bsa_lag-1_14    14              ingress    lag-1               fd00:a4::21
-                  Any             120014
l2bsa_lag-1_14    -              egress     -                   lag-1
-                  -              110014
l2bsa_lag-1_15    15              ingress    lag-1               fd00:a4::21
-                  Any             120015
l2bsa_lag-1_15    -              egress     -                   lag-1
-                  -              110015
l2bsa_lag-1_16    16              ingress    lag-1               fd00:a4::21
-                  Any             120016

```

#### Example 4: Summary view of L2X for a specific service label

```

supervisor@rtbrick: op> show l2x service-label 120011
Name
Intf/Next Hop      Outer VLAN      Direction  Incoming Intf      Outgoing
                   Inner VLAN      Service label
l2bsa_lag-1_11    11              ingress    lag-1               fd00:a4::21
-                  Any             120011
supervisor@rtbrick: op>

```

Example 5: Summary view of the L2X information for a specified direction, where direction can be ingress, egress, or bi-directional.

```
supervisor@rtbrick: op> show l2x direction ingress
Name
Intf/Next Hop      Outer VLAN      Direction      Inner VLAN      Incoming Intf      Outgoing
Service label
l2bsa_lag-1_11    11              ingress        120011          lag-1              fd00:a4::21
Any
l2bsa_lag-1_12    12              ingress        120012          lag-1              fd00:a4::21
Any
l2bsa_lag-1_13    13              ingress        120013          lag-1              fd00:a4::21
Any
l2bsa_lag-1_14    14              ingress        120014          lag-1              fd00:a4::21
Any
l2bsa_lag-1_15    15              ingress        120015          lag-1              fd00:a4::21
Any
l2bsa_lag-1_16    16              ingress        120016          lag-1              fd00:a4::21
Any
l2bsa_lag-1_17    17              ingress        120017          lag-1              fd00:a4::21
Any
l2bsa_lag-1_18    18              ingress        120018          lag-1              fd00:a4::21
Any
l2bsa_lag-1_19    19              ingress        120019          lag-1              fd00:a4::21
Any
l2bsa_lag-1_20    20              ingress        120020          lag-1              fd00:a4::21
Any
l2bsa_lag-1_21    21              ingress        120021          lag-1              fd00:a4::21
Any
l2bsa_lag-1_22    22              ingress        120022          lag-1              fd00:a4::21
Any
l2bsa_lag-1_23    23              ingress        120023          lag-1              fd00:a4::21
Any
l2bsa_lag-1_24    24              ingress        120024          lag-1              fd00:a4::21
Any
l2bsa_lag-1_25    25              ingress        120025          lag-1              fd00:a4::21
Any
l2bsa_lag-1_26    26              ingress        120026          lag-1              fd00:a4::21
Any
l2bsa_lag-1_27    27              ingress        120027          lag-1              fd00:a4::21
Any
```

Example 6: Summary view of L2X information for a specific LAG interface

```

supervisor@rtbrick: op> show l2x local-interface lag-1
Name
Intf/Next Hop      Outer VLAN      Direction      Incoming Intf      Outgoing
                   Inner VLAN      Service label
l2bsa_lag-1_11    11              ingress        lag-1              fd00:a4::21
                   Any             120011
l2bsa_lag-1_12    12              ingress        lag-1              fd00:a4::21
                   Any             120012
l2bsa_lag-1_13    13              ingress        lag-1              fd00:a4::21
                   Any             120013
l2bsa_lag-1_14    14              ingress        lag-1              fd00:a4::21
                   Any             120014
l2bsa_lag-1_15    15              ingress        lag-1              fd00:a4::21
                   Any             120015
l2bsa_lag-1_16    16              ingress        lag-1              fd00:a4::21
                   Any             120016
l2bsa_lag-1_17    17              ingress        lag-1              fd00:a4::21
                   Any             120017
l2bsa_lag-1_18    18              ingress        lag-1              fd00:a4::21
                   Any             120018
l2bsa_lag-1_19    19              ingress        lag-1              fd00:a4::21
                   Any             120019
l2bsa_lag-1_20    20              ingress        lag-1              fd00:a4::21
                   Any             120020

```

#### Example 7: Summary view of L2X information for a remote egress router

```

supervisor@rtbrick: op> show l2x nexthop4 192.1.0.3
Name
Intf/Next Hop      Outer VLAN      Direction      Incoming Intf      Outgoing
                   Inner VLAN      Service label
l2bsa_lag-1_11    11              ingress        lag-1              192.1.0.3
                   Any             120011
l2bsa_lag-1_12    12              ingress        lag-1              192.1.0.3
                   Any             120012
l2bsa_lag-1_13    13              ingress        lag-1              192.1.0.3
                   Any             120013
l2bsa_lag-1_14    14              ingress        lag-1              192.1.0.3
                   Any             120014
l2bsa_lag-1_15    15              ingress        lag-1              192.1.0.3
                   Any             120015
l2bsa_lag-1_16    16              ingress        lag-1              192.1.0.3
                   Any             120016

```

#### Example 8: Summary view of L2X information for a remote egress router

```

supervisor@rtbrick: op> show l2x nexthop6 fd00:a4::21
Name
Intf/Next Hop      Outer VLAN      Direction  Incoming Intf      Outgoing
                   Inner VLAN      Service label
l2bsa_lag-1_11     11              ingress    lag-1               fd00:a4::21
11                 Any             120011
l2bsa_lag-1_12     12              ingress    lag-1               fd00:a4::21
12                 Any             120012
l2bsa_lag-1_13     13              ingress    lag-1               fd00:a4::21
13                 Any             120013
l2bsa_lag-1_14     14              ingress    lag-1               fd00:a4::21
14                 Any             120014
l2bsa_lag-1_15     15              ingress    lag-1               fd00:a4::21
15                 Any             120015
l2bsa_lag-1_16     16              ingress    lag-1               fd00:a4::21
16                 Any             120016
l2bsa_lag-1_17     17              ingress    lag-1               fd00:a4::21
17                 Any             120017
l2bsa_lag-1_18     18              ingress    lag-1               fd00:a4::21
18                 Any             120018
l2bsa_lag-1_19     19              ingress    lag-1               fd00:a4::21
19                 Any             120019
l2bsa_lag-1_20     20              ingress    lag-1               fd00:a4::21
20                 Any             120020
l2bsa_lag-1_21     21              ingress    lag-1               fd00:a4::21
21                 Any             120021

```

### Example 9: L2X information in detailed format

```

supervisor@rtbrick: op> show l2x detail
L2X name: l2bsa_lag-1_11
  Direction: ingress
  Incoming interface: lag-1
  Service label: 120011
  Subtype: Incoming Port - Outer Vlan - Any Inner Vlan Match
  Incoming outer VLAN: 11
  Incoming inner VLAN: Any
  Ingress vlan operation:
    Vlan operation: Swap-Outer-Vlan
    Outer vlan: 64
  NextHop:
    NextHop IP: fd00:a4::21
    Lookup instance: default
    Lookup AFI: ipv6
    Lookup SAFI: labeled-unicast
    NextHop type: Remote ingress cross connect
    NextHop action: mpls label push
  Egress vlan operation:

```

### Example 10: Detailed L2X information for a specific L2X

```
supervisor@rtbrick: op> show l2x test1 detail
L2X name: test1
  Direction: ingress
  Incoming interface: ifp-0/0/4
  Outgoing interface: ifp-0/0/10
  Subtype: Incoming Port - Any Vlan Match
  Incoming outer VLAN: Any
  Incoming inner VLAN: Any
  Ingress vlan operation:
  NextHop:
    NextHop type: Local egress cross connect
    NextHop action: No vlan manipulation - l2 forward
  Egress vlan operation:
```

### Example 11: Detailed L2X information for a specific type and L2X

```
supervisor@rtbrick: op> show l2x type local test1 detail
L2X name: test1
  Direction: ingress
  Incoming interface: ifp-0/0/4
  Outgoing interface: ifp-0/0/10
  Subtype: Incoming Port - Any Vlan Match
  Incoming outer VLAN: Any
  Incoming inner VLAN: Any
  Ingress vlan operation:
  NextHop:
    NextHop type: Local egress cross connect
    NextHop action: No vlan manipulation - l2 forward
  Egress vlan operation:
```

### Example 12: Detailed L2X information for a specific direction and L2X

```
supervisor@rtbrick: op> show l2x direction egress test2 detail
L2X name: test2
  Direction: egress
  Outgoing interface: ifp-0/0/4
  Service label: 1234
  Subtype: Service Label Match
  Incoming outer VLAN: -
  Incoming inner VLAN: -
  Ingress vlan operation:
  NextHop:
    NextHop type: Remote egress cross connect
    NextHop action: No vlan manipulation - l2 forward
  Egress vlan operation:
```

### Example 13: Statistics for all installed L2X

```

supervisor@rtbrick: op> show l2x statistics

L2X Name: l2x-test1/0
Physical Interface Name: ifp-0/0/4
Logical Interface Type: L2x ingress vlan interface
Port-Mapping-Core: 0
Vlan-Port-ID: 1149251592
MPLS-Port-ID: N/A
Counters:
  In-Forward-Packets: 57
  In-Forward-Bytes: 5700
  In-Drop-Packets: 0
  In-Drop-Bytes: 0
  Out-Forward-Packets: 0
  Out-Forward-Bytes: 0
  Out-Drop-Packets: 0
  Out-Drop-Bytes: 0
L2X Name: l2x-d3b529d74770f91fb2acf5e38da70eb9213473dd7e996c6a
Physical Interface Name: ifp-0/0/10
Logical Interface Type: L2x egress vlan interface
Port-Mapping-Core: 0
Vlan-Port-ID: 1149251591
MPLS-Port-ID: N/A
Counters:
  In-Forward-Packets: 0
  In-Forward-Bytes: 0
  In-Drop-Packets: 0
  In-Drop-Bytes: 0
  Out-Forward-Packets: 0
  Out-Forward-Bytes: 0
  Out-Drop-Packets: 0
  Out-Drop-Bytes: 0

```

## 3.2. L2X Clear Commands

Clear commands allow to reset operational states.

### 3.2.1. L2X Statistics

This commands resets L2X statistics.

Syntax:

**clear l2x statistics** <l2x-name>

Attribute	Description
-	Without any option, the command clears all L2X statistics.
<l2x-name>	L2X name.

## Example

```
supervisor@rtbrick: op> clear l2x statistics l2x-test1/0
```