



In-band Management User Guide

Version 23.8.1.2, 06 November 2023

Registered Address	Support	Sales
26, Kingston Terrace, Princeton, New Jersey 08540, United States		
		+91 80 4850 5445
http://www.rtbrick.com	support@rtbrick.com	sales@rtbrick.com

©Copyright 2023 RtBrick, Inc. All rights reserved. The information contained herein is subject to change without notice. The trademarks, logos and service marks ("Marks") displayed in this documentation are the property of RtBrick in the United States and other countries. Use of the Marks are subject to RtBrick's Term of Use Policy, available at <https://www.rtbrick.com/privacy>. Use of marks belonging to other parties is for informational purposes only.

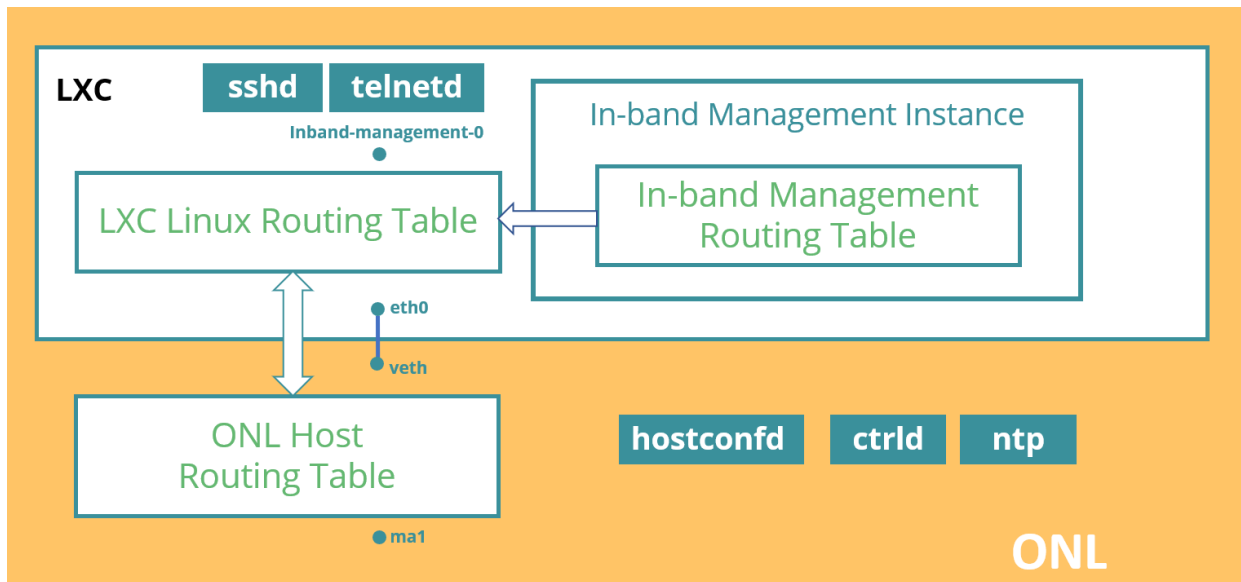
Table of Contents

1. Overview of RBFS In-band Management	3
1.1. Supported Platforms	3
2. Configuring In-band Management	4
2.1. Enabling In-band Management in an Instance	4
2.2. Enabling In-band Management Services	4
2.2.1. Enabling SSH service	5
2.2.2. Enabling Telnet Service	5
2.2.3. Enabling CTRLD Service	6
2.2.4. Enabling NTP service	7
2.2.5. Enabling API Gateway (APIGW) Service	7
2.2.6. Enabling TACACS Service	8
2.2.7. Enabling All Service	8
2.2.8. Enabling In-band Management for a Specific Source	9
3. In-Band Management Operational Commands	11
3.1. Verifying In-band Management on LXC Container	11
3.2. Verifying In-band Management on ONL	11

1. Overview of RBFS In-band Management

RBFS is mostly deployed on an ONL host as a Linux container. The ONL host is only reachable through the out-of-band management interface. In order to use services like NTP, and TACACS, which are run on ONL, you must use an out-of-band management connection. Services such as ssh, telnet that run on LXC containers cannot be accessed via out of band management. In-band management provides a way to access these services which are running in ONL and LXC containers via physical ports.

The RBFS creates a Linux kernel interface named `inband-mgmt-0` when in-band management is enabled on an instance. The loopback IPs of the in-band instance are then assigned to this Linux interface, and the routes of this instance are downloaded to the LXC container, then to ONL. Trap rules are installed in the hardware depending on the in-band service enabled.



1.1. 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. Configuring In-band Management

2.1. Enabling In-band Management in an Instance

Syntax:

set inband management instance <instance-name>

Attribute	Description
<instance-name>	Routing instance name in which in-band management has to be enabled. All the IFLs in this instance will be enabled with in-band management service after executing this command

Example: In-band Management in an Instance

```
"rtbrick-config:inband-management": {
  "instance": [
    {
      "name": "management",
    }
  ]
}
```

2.2. Enabling In-band Management Services

Syntax:

set inband management instance <instance-name> <service> <true/false>

Attribute	Description
<instance-name>	routing instance name in which in-band management has to be enabled. All the IFLs in this instance will be enabled with in-band management service after executing this command
<service>	Specifies the service to be enabled (ssh ,telnet, ctrld, ntp, tacacs, all)
<true false>	A true value enables the service. A false value disables the service.

Example: Enabling In-band Management Services

```
"rtbrick-config:inband-management": {
  "instance": [
    {
      "name": "management",
      "ssh": "true",
      "ctrld": "true"
    }
  ]
}
```

2.2.1. Enabling SSH service

To access the ssh service running in the LXC container hosting RBFS, ssh service has to be enabled.

By configuring this, the hosts are reachable in in-band instance via the physical interface can access this service

Syntax:

set inband management instance <instance-name> **ssh** <true/false>

Attribute	Description
<instance-name>	routing instance name in which in-band management has to be enabled.
<true false>	A true value enables the ssh service. A false value disables the ssh service.

Example: Enabling SSH In-band Management Services

```
"rtbrick-config:inband-management": {
  "instance": [
    {
      "name": "management",
      "ssh": "true",
    }
  ]
}
```

2.2.2. Enabling Telnet Service

To access the telnet service running in the LXC container hosting RBFS, telnet service has to be enabled.

By configuring this, the hosts are reachable in in-band instance via the physical interface can access this service

Syntax:

set inband management instance <instance-name> **telnet** <true/false>

Attribute	Description
<instance-name>	routing instance name in which in-band management has to be enabled.
<true false>	A true value enables the telnet service. A false value disables the telnet service.

Example: Enabling Telnet In-band Management Services

```
"rtbrick-config:inband-management": {
  "instance": [
    {
      "name": "management",
      "telnet": "true",
    }
  ]
}
```

2.2.3. Enabling CTRLD Service

To access the CTRLD service running in the ONL, the CTRLD service has to be enabled in in-band management.

By configuring this, the hosts are reachable via the physical interface in the inband instance can access this service.

Syntax:

set inband management instance <instance-name> **ctrlld** <true/false>

Attribute	Description
<instance-name>	routing instance name in which in-band management has to be enabled.
<true false>	A true value enables the CTRLD service. A false value disables the CTRLD service.

Example: Enabling CTRLD In-band Management Services

```
"rtbrick-config:inband-management": {
  "instance": [
    {
      "name": "management",
      "ctrlld": "true",
    }
  ]
}
```

2.2.4. Enabling NTP service

To access the NTP service running in the ONL, this service has to be enabled in in-band management.

By configuring this, the hosts are reachable in in-band instance via the physical interface can access this service

Syntax:

set inband management instance <instance-name> **ntp** <true/false>

Attribute	Description
<instance-name>	routing instance name in which in-band management has to be enabled.
<true false>	A true value enables the ntp service. A false value disables the ntp service.

Example: Enabling NTP In-band Management Services

```
"rtbrick-config:inband-management": {
  "instance": [
    {
      "name": "management",
      "ntp": "true",
    }
  ]
}
```

2.2.5. Enabling API Gateway (APIGW) Service

To access the APIGW service running in the ONL, this service has to be enabled in in-band management.

By configuring this, the hosts are reachable in in-band instance via the physical interface can access this service

Syntax:

set inband management instance <instance-name> **apigw** <true/false>

Attribute	Description
<instance-name>	routing instance name in which in-band management has to be enabled.
<true false>	A true value enables the APIGW service. A false value disables the APIGW service.

Example: Enabling APIGW In-band Management Services

```
"rtbrick-config:inband-management": {
  "instance": [
    {
      "name": "management",
      "apigw": "true",
    }
  ]
}
```

2.2.6. Enabling TACACS Service

To access the TACACS service running in the ONL, this service has to be enabled in in-band management.

By configuring this, the hosts are reachable in in-band instance via the physical interface can access this service

Syntax:

set inband management instance <instance-name> **tacacs** <true/false>

Attribute	Description
<instance-name>	routing instance name in which in-band management has to be enabled.
<true false>	A true value enables the TACACS service. A false value disables the TACACS service.

Example: Enabling TACACS In-band Management Services

```
"rtbrick-config:inband-management": {
  "instance": [
    {
      "name": "management",
      "tacacs": "true",
    }
  ]
}
```

2.2.7. Enabling All Service

Enabling this service will allow access to all service running in LXC/ONL.

Once this service is enabled, packets that don't hit any of the other acls/services in RBFS are redirected to LXC/ONL.

Syntax:

set inband management instance <instance-name> **all** <true/false>

Attribute	Description
<instance-name>	routing instance name in which in-band management has to be enabled.
<true false>	A true value enables all services. A false value disables all services.

Example: Enabling all In-band Management Services

```
"rtbrick-config:inband-management": {
  "instance": [
    {
      "name": "management",
      "all": "true",
    }
  ]
}
```

2.2.8. Enabling In-band Management for a Specific Source

Enabling any of the in-band services as mentioned in previous section will expose this service to all the sources which are reachable via in-band service.

To restrict this to specific source prefixes, source-prefix-list has to be enabled using the following command.

By configuring this, the hosts having IPs in the mentioned source-prefix-list only can access this service.

Syntax:

set inband management instance <instance-name> **source-prefix-list** <source-prefix-list-name>

Attribute	Description
<instance-name>	routing instance name in which in-band management has to be enabled.
<source-prefix-list-name>	Specifies the name of the source prefix list which is configured in 'set forwarding-options prefix-list' command.

Example: Enabling source prefix list in In-band Management Services

```
"rtbrick-config:inband-management": {  
  "instance": [  
    {  
      "name": "management",  
      "source-prefix-list": "source-prefix1"  
    }  
  ]  
}
```

3. In-Band Management Operational Commands

The In-band Management show commands provide detailed information about the In-band Management operations.

3.1. Verifying In-band Management on LXC Container

In the LXC container, there will be a new interface named `inband-mgmt-0` on enabling in-band management. All the loopback address as well as route in in-band instance should be assigned to this interface.

The example below shows how to verify if `inband-mgmt-0` interface is created and if the routing for management traffic is pointing to it.

```
supervisor@rtbrick:~$ ip link show
<...>
5: inband-mgmt-0: <POINTOPOINT,UP,LOWER_UP> mtu 1492 qdisc pfifo_fast state
UNKNOWN mode DEFAULT group default qlen 500
    link/none

supervisor@rtbrick:~$ ip route show
198.51.100.1/24 dev inband-mgmt-0 proto rtb_fibd scope link
<...>
```

3.2. Verifying In-band Management on ONL

The example below shows how to verify Linux routing tables on ONL host and LXC container.

```
root@bl2-pod1:~# ip route show
default via 198.51.100.202 dev mal proto rtb_routesync metric 4294966272
default via 198.51.100.10 dev lxcbr0 proto rtb_routesync scope rtb_umd metric 128
198.51.100.81/24 via 198.51.100.10 dev lxcbr0 proto rtb_routesync scope rtb_umd
metric 128
198.51.100.30/24 dev lxcbr0 proto kernel scope link src 198.51.100.31
198.51.100.55 via 198.51.100.10 dev lxcbr0 proto rtb_routesync scope rtb_umd
metric 128
198.51.100.119/23 dev mal proto kernel scope link src 198.51.100.112

supervisor@rtbrick:~$ ip route show
default via 198.51.100.31 dev eth0 proto rtb_routesync scope rtb_umd metric
4294966400
default dev inband-mgmt-0 proto rtb_fibd scope link
198.51.100.81/24 dev inband-mgmt-0 proto rtb_fibd scope link
198.51.100.30/24 dev eth0 proto kernel scope link src 198.51.100.10
198.51.100.55 dev inband-mgmt-0 proto rtb_fibd scope link
198.51.100.119/23 via 198.51.100.31 dev eth0 proto rtb_routesync scope rtb_umd
metric 128
198.51.100.112 via 198.51.100.31 dev eth0 proto rtb_routesync scope rtb_umd metric
128
```