

Static routing

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This part of the article contains routing configuration scenarios for various tasks. In order to focus on the static routing topic, let's make the following assumptions, which are valid for all scenarios:

- the radio links are established between the wireless devices;
- at the endpoint devices (the PCs), the IP addresses of the wireless devices to which they are directly connected are set as gateway. After specifying the gateway, each endpoint device adds a default route to its routing table;
- switching is off on the devices of the InfiLINK 2x2, InfiMAN 2x2, InfiLINK Evolution, InfiMAN Evolution families;
- in the examples for the InfiLINK 2x2, InfiMAN 2x2, InfiLINK Evolution, InfiMAN Evolution families of devices, the IP addresses are assigned to the physical interfaces, however, virtual interfaces can be used instead, for example, vlan interfaces.

InfiLINK 2x2, InfiMAN 2x2, InfiLINK Evolution, InfiMAN Evolution families of devices

Routing configuration for the management traffic

Let's look at the task concerning the routing configuration for the management traffic (Figure 1). For this task, the Slave's device management interface must be accessible to the engineer working at the PC. Since the PC and the Slave devices belong to different subnets, routing must be used.

 **NOTE**
An configuration example is given for the InfiLINK 2x2, InfiMAN 2x2 families devices, pay attention to the name of the radio interface on your devices during the scheme implementation.

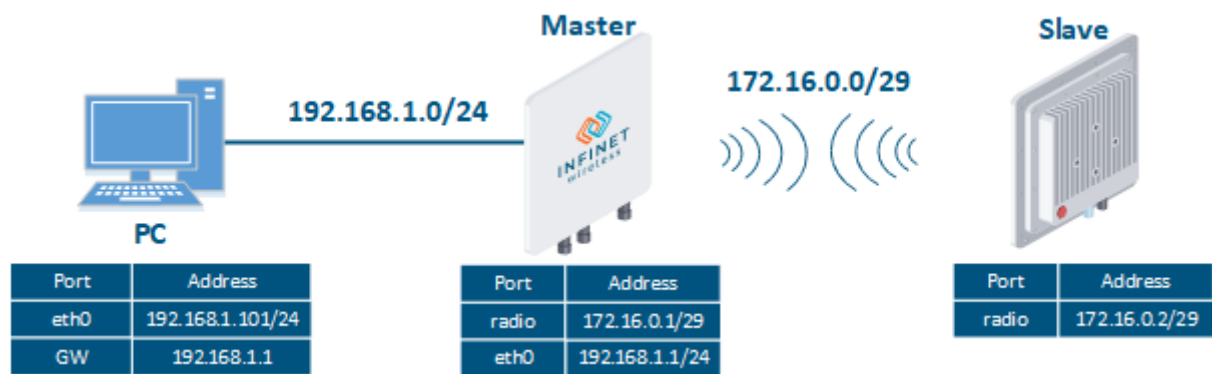


Figure 1 - Routing configuration for the management traffic using the InfiLINK 2x2, InfiMAN 2x2, InfiLINK Evolution, InfiMAN Evolution families of devices

Let's perform a step by step configuration for the Master and the Slave devices using the Web interface:

Step 1

Description	Add the IP addresses to the interfaces of the devices according to the scheme.
-------------	--

Title

Master	▼ Network Settings eth0 192.168.1.1 Up: ☒ Description: DHCP: ☐ Mode: auto rf5.0 172.16.0.1 Up: ☒ Description: DHCP: ☐ Create PRF Create VLAN Create LAG Create SVI Create Tunnel Create Tap
Slave	▼ Network Settings eth0 192.168.2.2 Up: ☒ Description: DHCP: ☐ Mode: auto rf5.0 172.16.0.2 Up: ☒ Description: DHCP: ☐ Create PRF Create VLAN Create LAG Create SVI Create Tunnel Create Tap

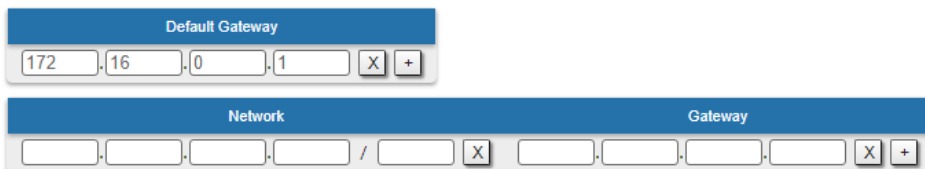
Step 2

Description	Analyze the routing table: after adding the IP addresses to the device's interfaces, the routing table was filled up with entries for every new connection (marked as C).
Master	<pre>Master#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 192.168.1.0/24 link#2 UC 0 0 eth0 192.168.1.101 00:0c:29:40:72:d0 UHL 1 974 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>
Slave	<pre>Slave#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 192.168.2.0/24 link#2 UC 0 0 eth0 192.168.2.102 00:0c:29:6c:b8:ad UHL 1 1244 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>

Step 3

Description	Add static routes for the connection between the PC and the Slave.
Master	The Master device is intermediate on the path of the packets between the PC and the Slave. Routes towards the PC and towards the Slave have been added to the Master's device routing table based on the configuration in the previous steps (see step 2), so there is no need to add static entries at the Master device.
Slave	A static route must be added towards PC1's network: Routing Parameters Default Gateway X + Network Gateway 192 . 168 . 1 . 0 / 24 X 172 . 16 . 0 . 1 X +

Step 3a

Description	A default route can be configured on the Slave device instead of a static route towards the PC's network.
Master	No changes required.
Slave	Add the IP address of the Master's rf interface as default gateway, so that all the packets will be sent to it by default, if no other specific route is present: Routing Parameters 

Step 4

Description	Analyze the routing table: a static entry (marked as S) has been added to the Slave's routing table.
Master	see step 2
Slave	<pre>Slave#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 172.16.0.1 link#3 UHL 1 0 rf5.0 192.168.1.0/24 172.16.0.1 UGS 0 0 rf5.0 192.168.2.0/24 link#2 UC 0 0 eth0 192.168.2.102 00:0c:29:6c:b8:ad UHL 0 1266 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>

Step 4a

Description	If a default route has been added as in step 3a, a corresponding entry (marked as S) will be added to the routing table.
Master	see step 2
Slave	<pre>Slave#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface default 172.16.0.1 UGS 0 0 rf5.0 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 172.16.0.1 link#3 UHL 1 0 rf5.0 192.168.2.0/24 link#2 UC 0 0 eth0 192.168.2.102 00:0c:29:6c:b8:ad UHL 0 18 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>

Step 5

Description	Task accomplished: an engineer working on the PC has access to the management interface of the Slave device.
--------------------	--



How to perform the same task using CLI commands

Master's device configuration:

Step 1

```
ifc eth0 192.168.1.1/24
```

```
ifc rf5.0 172.16.0.1/29
```

Step 2

```
netstat -r
```

Step 4

```
netstat -r
```

Slave's device configuration:

Step 1

```
ifc rf5.0 172.16.0.2/29
```

Step 2

```
netstat -r
```

Step 3

```
route add 192.168.1.0/24 172.16.0.1
```

Step 3a

```
route add default 172.16.0.1
```

Step 4

```
netstat -r
```

Step 4a

```
netstat -r
```

Routing configuration for the data traffic using a point-to-point scheme

Let's look at the task of performing the routing configuration for the data traffic using a PtP scheme (Figure 2). For this task, the connectivity between the PC-1 and the PC-2 devices should be established using routing, as PC-1 and PC-2 belong to different subnets.

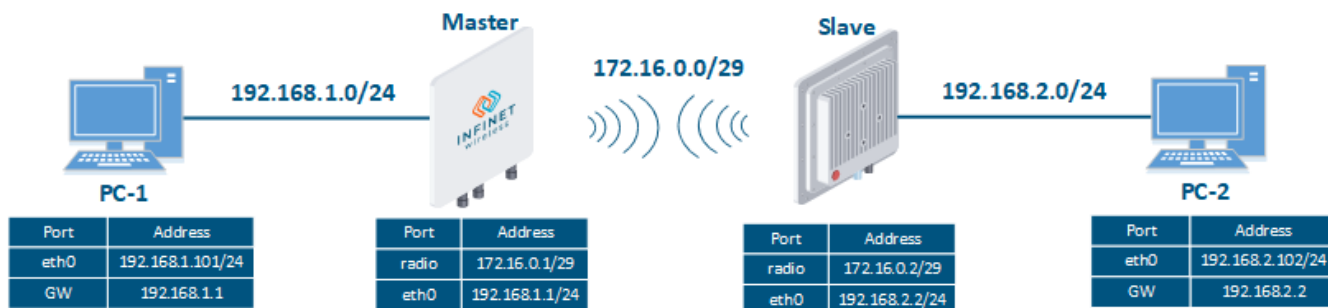


Figure 2 - Routing configuration for the data traffic using the InfiLINK 2x2, InfiMAN 2x2, InfiLINK Evolution, InfiMAN Evolution families of devices

Let's look at the step-by-step configuration of the Master and Slave devices using the Web interface:

Step 1

Description	Add the IP addresses to the interfaces of the devices according to the scheme.
Master	Network Settings eth0 192.168.1.1 Up: ☒ Description: DHCP: ☐ Mode: auto rf5.0 172.16.0.1 Up: ☒ Description: DHCP: ☐ Create PRF Create VLAN Create LAG Create SVI Create Tunnel Create Tap

Title

Slave	Network Settings	
	eth0 192.168.2.2 Up: ☒ Description: DHCP: ☐ Mode: auto rf5.0 172.16.0.2 Up: ☒ Description: DHCP: ☐	
	Create PRF Create VLAN Create LAG Create SVI Create Tunnel Create Tap	

Step 2

Description	Analyze the routing table: after adding IP addresses to the devices' interfaces, the routing tables were filled up with entries specifying the directly networks (marked as C).
Master	<pre>Master#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 192.168.1.0/24 link#2 UC 0 0 eth0 192.168.1.101 00:0c:29:40:72:d0 UHL 1 974 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>
Slave	<pre>Slave#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 192.168.2.0/24 link#2 UC 0 0 eth0 192.168.2.102 00:0c:29:6c:b8:ad UHL 5 1125 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>

Step 3

Description	Add static routes for the connection between PC-1 and PC-2. There is no route towards the PC-2's subnet on the Master device, and no route towards the PC-1's subnet on the Slave. Let's add these routes.
Master	Routing Parameters Default Gateway Network: 192.168.2.0 / 24 Gateway: 172.16.0.2
Slave	Routing Parameters Default Gateway Network: 192.168.1.0 / 24 Gateway: 172.16.0.1

Step 3a

Description	A default route can be configured on the Master and on the Slave devices instead of routes towards the networks of the PCs.
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Master	Routing Parameters Default Gateway 127 16 0 2 X + Network Gateway / X X +
Slave	Routing Parameters Default Gateway 172 16 0 1 X + Network Gateway / X X +

Step 4

Description	Analyze the routing table: a static entry (marked as S) has been added to the routing tables of the Master and Slave devices.
Master	<pre>Master#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 172.16.0.2 link#3 UHL 1 0 rf5.0 192.168.1.0/24 link#2 UC 0 0 eth0 192.168.1.101 00:0c:29:40:72:d0 UHL 1 40 eth0 192.168.2.0/24 172.16.0.2 UGS 0 0 rf5.0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>
Slave	<pre>Slave#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 172.16.0.1 00:04:35:13:72:4f UHL 1 0 rf5.0 192.168.1.0/24 172.16.0.1 UGS 0 2 rf5.0 192.168.2.0/24 link#2 UC 0 0 eth0 192.168.2.102 00:0c:29:6c:b8:ad UHL 6 1097 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>

Step 4a

Description	If a default route has been added in step 3a, a corresponding entry (marked as S) will be added to the routing tables.
Master	<pre>Master#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface default 172.16.0.2 UGS 1 13 rf5.0 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 172.16.0.2 00:04:35:10:a2:89 UHL 1 0 rf5.0 192.168.1.0/24 link#2 UC 0 0 eth0 192.168.1.101 00:0c:29:40:72:d0 UHL 0 35 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>

Slave	<pre>Slave#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface default 172.16.0.1 UGS 0 0 rf5.0 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 172.16.0.1 link#3 UHL 1 0 rf5.0 192.168.2.0/24 link#2 UC 0 0 eth0 192.168.2.102 00:0c:29:6c:b8:ad UHL 0 6 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>					
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Step 5

Description	The task has been solved: the connectivity between PC-1 and PC-2 was successfully established. Note that along with the data traffic routing, the management traffic routing was also configured.
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How to solve the same task using CLI commands

Master's device configuration:

Step 1

```
ifc eth0 192.168.1.1/24
```

```
ifc rf5.0 172.16.0.1/29
```

Step 2

```
netstat -r
```

Step 3

```
route add 192.168.2.0/24 172.16.0.2
```

Step 3a

```
route add default 172.16.0.2
```

Step 4

```
netstat -r
```

Step 4a

```
netstat -r
```

Slave's device configuration:

Step 1

```
ifc eth0 192.168.2.2/24
```

```
ifc rf5.0 172.16.0.2/29
```

Step 2

```
netstat -r
```

Step 3

```
route add 192.168.1.0/24 172.16.0.1
```

Step 3a

```
route add default 172.16.0.1
```

Step 4

```
netstat -r
```

Step 4a

```
netstat -r
```

Routing configuration for the data traffic using a Point-to-Multipoint scheme

Let's look at the task of performing the routing configuration for the data traffic using a PtMP scheme (Figure 3). The connectivity between PC-1, PC-2, PC-3 and PC-4 should be established using routing, since all the PCs belong to different subnets.

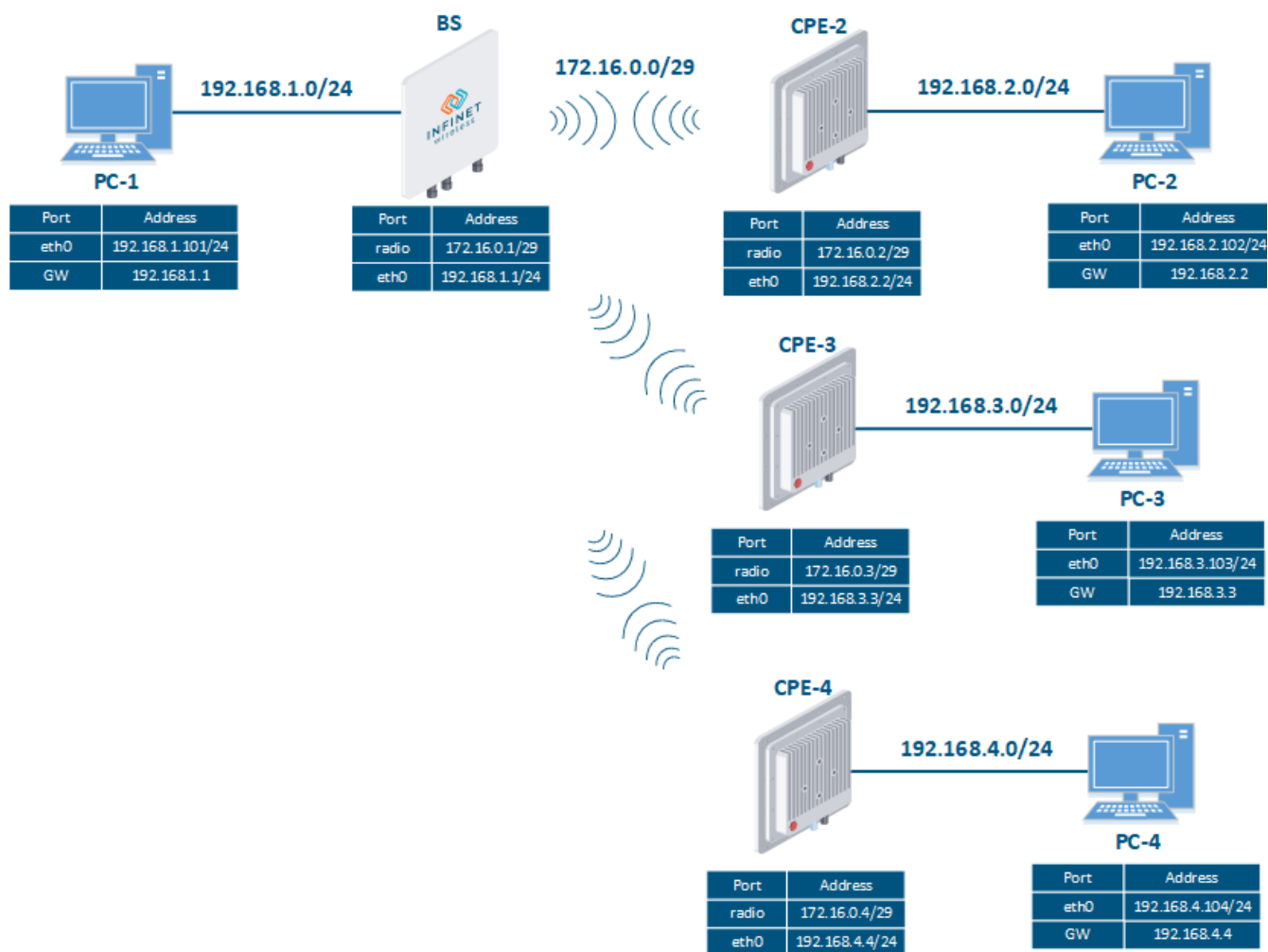


Figure 3 - Routing configuration for the data traffic using the InfIMAN 2x2, InfIMAN Evolution families of devices

Let's look at the step-by-step configuration of the wireless devices using the Web interface:

Step 1

Description	Add the IP addresses to the interfaces of the devices according to the scheme.
BS	▼ Network Settings eth0 192.168.1.1 Up: ☒ Description: DHCP: ☐ Mode: auto rf5.0 172.16.0.1 Up: ☒ Description: DHCP: ☐ Create PRF Create VLAN Create LAG Create SVI Create Tunnel Create Tap
CPE2	▼ Network Settings eth0 192.168.2.2 Up: ☒ Description: DHCP: ☐ Mode: auto rf5.0 172.16.0.2 Up: ☒ Description: DHCP: ☐ Create PRF Create VLAN Create LAG Create SVI Create Tunnel Create Tap

CPE3	▼ Network Settings	
	eth0 192.168.3.3 Up: ☒ Description: DHCP: ☐ Mode: auto rf5.0 172.16.0.3 Up: ☒ Description: DHCP: ☐ Create PRF Create VLAN Create LAG Create SVI Create Tunnel Create Tap	
CPE4	▼ Network Settings	
	eth0 192.168.4.4 Up: ☒ Description: DHCP: ☐ Mode: auto rf5.0 172.16.0.4 Up: ☒ Description: DHCP: ☐ Create PRF Create VLAN Create LAG Create SVI Create Tunnel Create Tap	

Step 2

Description	Analyze the routing table: after adding the IP addresses to the devices' interfaces, the routing tables were filled up with entries specifying the directly connected networks (marked as C).
BS	<pre> Master#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 192.168.1.0/24 link#2 UC 0 0 eth0 192.168.1.101 00:0c:29:40:72:d0 UHL 1 974 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0 </pre>
CPE2	<pre> Slave#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 192.168.2.0/24 link#2 UC 0 0 eth0 192.168.2.102 00:0c:29:6c:b8:ad UHL 5 1125 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0 </pre>
CPE3	<pre> Slave 3#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 1 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 192.168.3.0/24 link#2 UC 0 0 eth0 192.168.3.103 00:0c:29:15:29:b7 UHL 2 1169 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0 </pre>
CPE4	<pre> Slave 4#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 1 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 192.168.4.0/24 link#2 UC 0 0 eth0 192.168.4.104 00:0c:29:29:4b:b9 UHL 2 1900 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0 </pre>

Step 3

Description	Add static routes for the connectivity between the PCs. Three static routes should be added on each wireless device, for the other 3 PCs that are not directly connected.
BS	Routing Parameters Default Gateway X + Network Gateway 192 168 2 0 / 24 X 172 16 0 2 X + 192 168 3 0 / 24 X 172 16 0 3 X + 192 168 4 0 / 24 X 172 16 0 4 X +
CPE2	Routing Parameters Default Gateway X + Network Gateway 192 168 1 0 / 24 X 172 16 0 1 X + 192 168 3 0 / 24 X 172 16 0 3 X + 192 168 4 0 / 24 X 172 16 0 4 X +
CPE3	Routing Parameters Default Gateway X + Network Gateway 192 168 1 0 / 24 X 172 16 0 1 X + 192 168 2 0 / 24 X 172 16 0 2 X + 192 168 4 0 / 24 X 172 16 0 4 X +
CPE4	Routing Parameters Default Gateway X + Network Gateway 192 168 1 0 / 24 X 172 16 0 1 X + 192 168 2 0 / 24 X 172 16 0 2 X + 192 168 3 0 / 24 X 172 16 0 3 X +

Step 3a

Description	Since the data from any CPE to the BS or to another CPE goes through the BS, the routing tables of the CPEs can be optimized. Instead of three static entries, one default route can be added. The routing table of the BS cannot be optimized, as the BS has separate connections with each subscriber, having no common point.
BS	-

CPE2	Routing Parameters Default Gateway 172 . 16 . 0 . 1 [X] + Network Gateway [] . [] . [] . [] / [] [X] [] . [] . [] . [] [X] +
CPE3	Routing Parameters Default Gateway 172 . 16 . 0 . 1 [X] + Network Gateway [] . [] . [] . [] / [] [X] [] . [] . [] . [] [X] +
CPE4	Routing Parameters Default Gateway 172 . 16 . 0 . 1 [X] + Network Gateway [] . [] . [] . [] / [] [X] [] . [] . [] . [] [X] +

Step 4

Description	Analyze the routing table: three static entries (flag S) have been added to the routing table of each device.
BS	<pre> BS#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 172.16.0.2 link#3 UHL 1 0 rf5.0 172.16.0.3 link#3 UHL 1 0 rf5.0 172.16.0.4 link#3 UHL 1 0 rf5.0 192.168.1.0/24 link#2 UC 0 0 eth0 192.168.1.101 00:0c:29:40:72:d0 UHL 1 62 eth0 192.168.2.0/24 172.16.0.2 UGS 0 0 rf5.0 192.168.3.0/24 172.16.0.3 UGS 0 0 rf5.0 192.168.4.0/24 172.16.0.4 UGS 0 0 rf5.0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0 </pre>

CPE2	<pre> CPE_2#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 172.16.0.1 link#3 UHL 1 0 rf5.0 172.16.0.3 link#3 UHL 1 0 rf5.0 172.16.0.4 link#3 UHL 1 0 rf5.0 192.168.1.0/24 172.16.0.1 UGS 0 0 rf5.0 192.168.2.0/24 link#2 UC 0 0 eth0 192.168.2.102 00:0c:29:6c:b8:ad UHL 1 92 eth0 192.168.3.0/24 172.16.0.3 UGS 0 0 rf5.0 192.168.4.0/24 172.16.0.4 UGS 0 0 rf5.0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0 </pre>
CPE3	<pre> CPE_3#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 1 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 172.16.0.1 link#3 UHL 1 0 rf5.0 172.16.0.2 link#3 UHL 1 0 rf5.0 172.16.0.4 link#3 UHL 1 0 rf5.0 192.168.1.0/24 172.16.0.1 UGS 0 0 rf5.0 192.168.2.0/24 172.16.0.2 UGS 0 0 rf5.0 192.168.3.0/24 link#2 UC 0 0 eth0 192.168.3.103 00:0c:29:15:29:b7 UHL 1 89 eth0 192.168.4.0/24 172.16.0.4 UGS 0 0 rf5.0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0 </pre>
CPE4	<pre> CPE_4#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 1 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 172.16.0.1 link#3 UHL 1 0 rf5.0 172.16.0.2 link#3 UHL 1 0 rf5.0 172.16.0.3 link#3 UHL 1 0 rf5.0 192.168.1.0/24 172.16.0.1 UGS 0 0 rf5.0 192.168.2.0/24 172.16.0.2 UGS 0 0 rf5.0 192.168.3.0/24 172.16.0.3 UGS 0 0 rf5.0 192.168.4.0/24 link#2 UC 0 0 eth0 192.168.4.104 00:0c:29:29:4b:b9 UHL 1 62 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0 </pre>

Step 4a

Description	If a default route was added in step 3a, a corresponding entry (flag S) will be added to the routing table.
BS	Changes are not required on the BS.

CPE2	<pre> CPE_2#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface default 172.16.0.1 UGS 1 327 rf5.0 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 172.16.0.1 00:04:35:13:72:4f UHL 1 0 rf5.0 192.168.2.0/24 link#2 UC 0 0 eth0 192.168.2.102 00:0c:29:6c:b8:ad UHL 0 644 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0 </pre>
CPE3	<pre> CPE_3#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface default 172.16.0.1 UGS 1 7 rf5.0 127.0.0.1 127.0.0.1 UH 1 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 172.16.0.1 00:04:35:13:72:4f UHL 1 0 rf5.0 192.168.3.0/24 link#2 UC 0 0 eth0 192.168.3.103 00:0c:29:15:29:b7 UHL 0 568 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0 </pre>
CPE4	<pre> CPE_4#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface default 172.16.0.1 UGS 0 11 rf5.0 127.0.0.1 127.0.0.1 UH 1 0 lo0 172.16.0.0/29 link#3 UC 0 0 rf5.0 172.16.0.1 00:04:35:13:72:4f UHL 1 0 rf5.0 192.168.4.0/24 link#2 UC 0 0 eth0 192.168.4.104 00:0c:29:29:4b:b9 UHL 1 81 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0 </pre>

Step 5

Description	The task has been solved: the connectivity between PC-1, PC-2, PC-3 and PC-4 was successfully established. Note that along with the data traffic routing, the routing for the management traffic was also established.
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How to solve the same task using CLI commands

BS's device configuration:

Step 1

```
ifc eth0 192.168.1.1/24
```

```
ifc rf5.0 172.16.0.1/29
```

Step 2

```
netstat -r
```

Step 3

```
route add 192.168.2.0/24 172.16.0.2
```

```
route add 192.168.3.0/24 172.16.0.3
```

```
route add 192.168.4.0/24 172.16.0.4
```

Step 4

```
netstat -r
```

CPE-2's device configuration:

Step 1

```
ifc eth0 192.168.2.2/24
```

```
ifc rf5.0 172.16.0.2/29
```

Step 2

```
netstat -r
```

Step 3

```
route add 192.168.1.0/24 172.16.0.1
```

```
route add 192.168.3.0/24 172.16.0.3
```

```
route add 192.168.4.0/24 172.16.0.4
```

Step 3a

```
route add default 172.16.0.1
```

Step 4

```
netstat -r
```

Step 4a

```
netstat -r
```

CPE-3's device configuration:

Step 1

```
ifc eth0 192.168.3.3/24
```

```
ifc rf5.0 172.16.0.3/29
```

Step 2

```
netstat -r
```

Step 3

```
route add 192.168.1.0/24 172.16.0.1
```

```
route add 192.168.2.0/24 172.16.0.2
```

```
route add 192.168.4.0/24 172.16.0.4
```

Step 3a

```
route add default 172.16.0.1
```

Step 4

```
netstat -r
```

Step 4a

```
netstat -r
```

CPE-4 device configuration

Step 1

```
ifc eth0 192.168.4.4/24
```

```
ifc rf5.0 172.16.0.4/29
```

Step 2

```
netstat -r
```

Step 3

```
route add 192.168.1.0/24 172.16.0.1
```

```
route add 192.168.2.0/24 172.16.0.2
```

```
route add 192.168.3.0/24 172.16.0.3
```

Step 3a

```
route add default 172.16.0.1
```

Step 4

```
netstat -r
```

Step 4a

```
netstat -r
```

InfiLINK XG, InfiLINK XG 1000 families of devices

Routing configuration for the management traffic

Let's look at the task of performing the routing configuration for the management traffic (Figure 4). The Slave's device management interface should be accessible to the engineer working at the PC. Since the PC and the Slave devices belong to different subnets routing must be used.

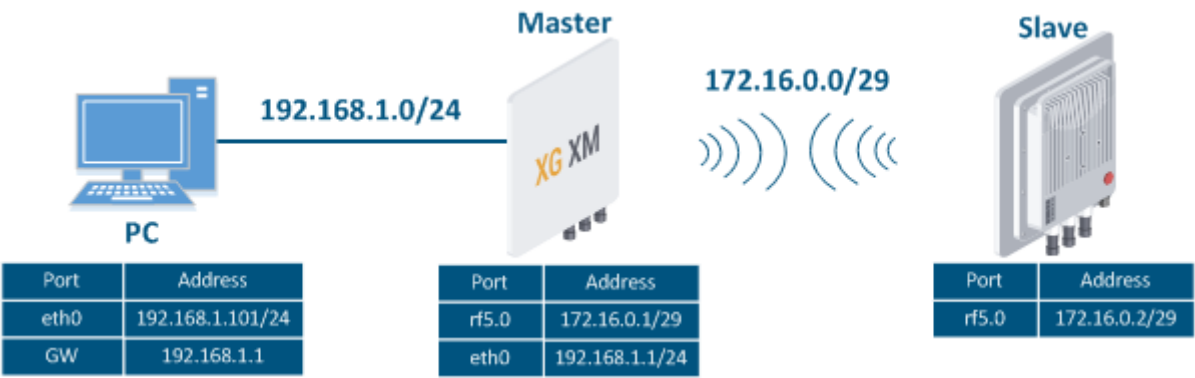


Figure 4 - Routing configuration for the management traffic using the InfiLINK XG / InfiLINK XG 1000 families of devices

Let's perform a step by step configuration for the Master and Slave devices using the Web interface:

Step 1

Description	Add the IP addresses to the interfaces of the devices according to the scheme. Unlike the devices of the InfiLINK 2x2 / InfiMAN 2x2 families, the IP address is not assigned to the physical interfaces, but to the virtual management interface (see the Switch section).
Master	Network Settings IP Address 192 168 1 1 / 24 ✕ + 172 16 0 1 / 29 ✕ + Vlan ☐ Vlan ID DHCP ☐ ☐ ☐
Slave	Network Settings IP Address 10 10 1 1 / 24 ✕ + 172 16 0 2 / 29 ✕ + Vlan ☐ Vlan ID DHCP ☐ ☐ ☐

Step 2

Description	Analyze the routing table: after adding IP addresses to the device's interfaces, the routing table was filled up with entries specifying the directly co networks (flag C).
-------------	---

Master	<pre>#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#2 UC 0 0 mgmt 192.168.1.0/24 link#2 UC 0 0 mgmt 192.168.1.101 00:0c:29:40:72:d0 UHL 7 3196 mgmt 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>
Slave	<pre>#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 10.10.10.0/24 link#2 UC 0 0 mgmt 10.10.10.102 00:0c:29:6c:b8:ad UHL 1 3637 mgmt 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#2 UC 0 0 mgmt 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>

Step 3

Description	Add static routes for establishing the communication between the PC and the Slave devices.
Master	The Master device is intermediate on the path of the packets between the PC and the Slave. Routes towards the PC and towards the Slave have been added to the Master's device routing table during the previous steps using the directly connected networks (see step 2), so there is no need to add static entries.
Slave	Configure a static route on the Slave device towards the PC's network: Static Routes Network: 192.168.1.0 / 24 Gateway: 172.16.0.1

Step 3a

Description	A default route can be configured on the slave device instead of a route towards the PC's network.
Master	Changes are not required.
Slave	Routing Settings Default Gateway: 172.16.0.1

Step 4

Description	Analyze the routing table: a static entry (flag S) has been added to the Slave's routing table.
Master	See step 2

Slave	<pre>#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 10.10.10.0/24 link#2 UC 0 0 mgmt 10.10.10.102 00:0c:29:6c:b8:ad UHL 7 4279 mgmt 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#2 UC 0 0 mgmt 172.16.0.1 00:04:35:07:a8:3a UHL 1 4 mgmt 192.168.1.0/24 172.16.0.1 UGS 0 115 mgmt 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>					
-------	--	--	--	--	--	--

Step 4a

Description	If a default route has been added in step 3a, a corresponding entry (flag S) will be added to the routing table.
Master	See step 2
Slave	<pre>#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface default 172.16.0.1 UGS 0 88 mgmt 10.10.10.0/24 link#2 UC 0 0 mgmt 10.10.10.102 00:0c:29:6c:b8:ad UHL 1 4603 mgmt 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#2 UC 0 0 mgmt 172.16.0.1 00:04:35:07:a8:3a UHL 1 4 mgmt 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>

Step 5

Description	The task has been solved: an engineer working on the PC has access to the Slave's device management interface.
-------------	--



How to solve the same task using CLI commands

Master's device configuration:

Step 1

```
ifc mgmt 192.168.1.1/24
```

```
ifc mgmt 172.16.0.1/29
```

Step 2

```
netstat -r
```

Step 4

```
netstat -r
```

Slave's device configuration:

Step 1

```
ifc mgmt 192.168.2.2/24
```

```
ifc mgmt 172.16.0.2/29
```

Step 2

```
netstat -r
```

Step 3

```
route add 192.168.1.0/24 172.16.0.1
```

Step 3a

```
route add default 172.16.0.1
```

Step 4

```
netstat -r
```

Step 4a

```
netstat -r
```

Quanta 5, Quanta 6, Quanta 70 families of devices

Routing configuration for the management traffic

Let's look at the task of performing the routing configuration for the management traffic (Figure 5). The Slave's device management interface should be accessible to the engineer working at the PC. Since the PC and the Slave devices belong to different subnets routing will be used.

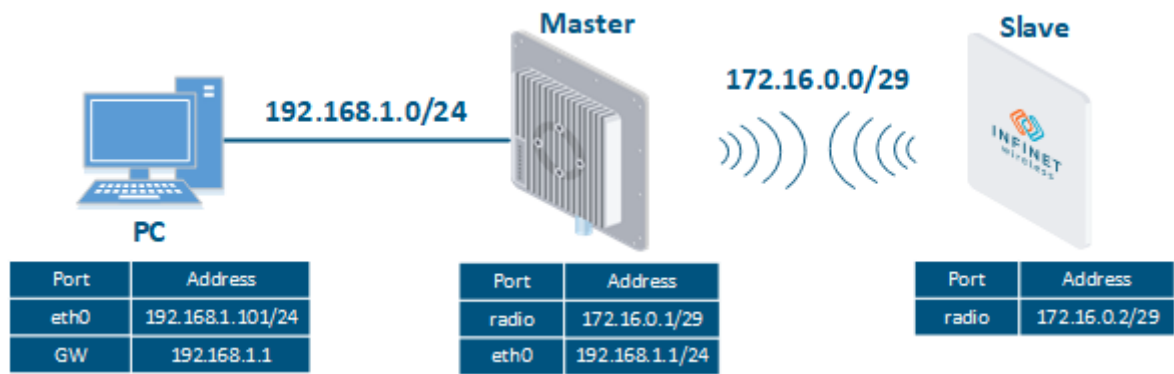


Figure 5 - Routing configuration for the management traffic using the Quanta 5, Quanta 6, Quanta 70 families of devices

Let's perform the step by step configuration of the Master and Slave devices using the Web interface:

Step 1

Description	Add the IP addresses to the interfaces of the devices according to the scheme. Unlike the devices of the InfiLINK 2x2 / InfiMAN 2x2 families, the IP address is not assigned to the physical interfaces, but to the virtual management interface (see "Switch settings" section).																				
Master	Network interface <table><thead><tr><th>IP address</th><th>Subnet mask</th><th>VLAN ID</th><th>DHCP</th><th></th></tr></thead><tbody><tr><td>172.16.0.1</td><td>/ 29</td><td>Disabled</td><td>Disabled</td><td> </td></tr><tr><td>192.168.1.1</td><td>/ 24</td><td>Disabled</td><td>Disabled</td><td> </td></tr><tr><td colspan="5"> + Add IP address </td></tr></tbody></table>	IP address	Subnet mask	VLAN ID	DHCP		172.16.0.1	/ 29	Disabled	Disabled		192.168.1.1	/ 24	Disabled	Disabled		+ Add IP address				
IP address	Subnet mask	VLAN ID	DHCP																		
172.16.0.1	/ 29	Disabled	Disabled																		
192.168.1.1	/ 24	Disabled	Disabled																		
+ Add IP address																					
Slave	Network interface <table><thead><tr><th>IP address</th><th>Subnet mask</th><th>VLAN ID</th><th>DHCP</th><th></th></tr></thead><tbody><tr><td>10.10.10.2</td><td>/ 24</td><td>Disabled</td><td>Disabled</td><td> </td></tr><tr><td>172.16.0.2</td><td>/ 29</td><td>Disabled</td><td>Disabled</td><td> </td></tr><tr><td colspan="5"> + Add IP address </td></tr></tbody></table>	IP address	Subnet mask	VLAN ID	DHCP		10.10.10.2	/ 24	Disabled	Disabled		172.16.0.2	/ 29	Disabled	Disabled		+ Add IP address				
IP address	Subnet mask	VLAN ID	DHCP																		
10.10.10.2	/ 24	Disabled	Disabled																		
172.16.0.2	/ 29	Disabled	Disabled																		
+ Add IP address																					

Step 2

Description	Analyze the routing table: after adding IP addresses to the device's interfaces, the routing table was filled up with entries specifying the directly co networks (marked as C).
-------------	---

Master	<pre>#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#2 UC 0 0 eth0 192.168.1.0/24 link#2 UC 0 0 eth0 192.168.1.101 00:0c:29:40:72:d0 UHL 13 6705 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>
Slave	<pre>#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface default 172.16.0.1 UGS 0 0 eth0 10.10.10.0/24 link#2 UC 0 0 eth0 10.10.10.101 00:0c:29:40:72:d0 UHL 10 10752 eth0 10.10.10.102 00:0c:29:6c:b8:ad UHL 5 9876 eth0 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#2 UC 0 0 eth0 172.16.0.1 00:04:35:0a:b1:67 UHL 1 0 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>

Step 3

Description	Add static routes for establishing the communication between the PC and Slave devices. The Quanta 5, Quanta 6 and the Quanta 70 families of devices allow to configure only the default route.															
Master	The Master device is intermediate on the path of the packets between the PC and the Slave. Routes towards the PC and towards the Slave have been added to the Master's device routing table (see step 2), so there is no need to add static entries.															
Slave	Network interface <table><thead><tr><th>IP address</th><th>Subnet mask</th><th>VLAN ID</th><th>DHCP</th><th></th></tr></thead><tbody><tr><td>10.10.10.2</td><td>/ 24</td><td>Disabled</td><td>Disabled</td><td> </td></tr><tr><td>172.16.0.2</td><td>/ 29</td><td>Disabled</td><td>Disabled</td><td> </td></tr></tbody></table> + Add IP address Default gateway: 172.16.0.1	IP address	Subnet mask	VLAN ID	DHCP		10.10.10.2	/ 24	Disabled	Disabled	 	172.16.0.2	/ 29	Disabled	Disabled	 
IP address	Subnet mask	VLAN ID	DHCP													
10.10.10.2	/ 24	Disabled	Disabled	 												
172.16.0.2	/ 29	Disabled	Disabled	 												

Step 4

Description	Analyze the routing table: a static entry (flag S) has been added to the Slave's routing table.
Master	See step 2

Slave	<pre>#1> netstat -r Routing tables Destination Gateway Flags Refs Use Interface default 172.16.0.1 UGS 0 56 eth0 10.10.10.0/24 link#2 UC 0 0 eth0 10.10.10.101 00:0c:29:40:72:d0 UHL 7 13277 eth0 10.10.10.102 00:0c:29:6c:b8:ad UHL 8 12871 eth0 127.0.0.1 127.0.0.1 UH 0 0 lo0 172.16.0.0/29 link#2 UC 0 0 eth0 172.16.0.1 00:04:35:0a:b1:67 UHL 1 1 eth0 224.0.0.0/8 127.0.0.1 UGS 0 0 lo0</pre>					
-------	--	--	--	--	--	--

Step 5

Description	The task has been solved: an engineer working on the PC has access to the Slave's device management interface.
-------------	--

How to solve the same task using CLI commands

```
Master's device configuration:
Step 1
ifc eth0 192.168.1.1/24
ifc eth0 172.16.0.1/29
Step 2
netstat -r
Step 4
netstat -r
Slave's device configuration:
Step 1
ifc eth0 172.16.0.2/29
Step 2
netstat -r
Step 3
route add default 172.16.0.1
Step 4
netstat -r
```

See also

The article continues with: [Dynamic routing](#).

Additional materials

Online courses

- 1. [Quanta 5 / Quanta 6: Installation and Configuration](#).
- 2. [InfiLINK XG Family Product](#).
- 3. [InfiLINK 2x2 / InfiMAN 2x2: Initial Link Configuration and Installation](#).

Webinars

- 1. [Typical scenario of routing setting using Infinet Wireless devices. Part I.](#)

Other

- 1. [Quanta 5 / Quanta 6 device configuration](#).
- 2. [InfiLINK XG, InfiLINK XG 1000 devices configuration](#).
- 3. [Network configuration via Web interface for InfiLINK 2x2, InfiMAN 2x2 families devices](#).
- 4. [Network configuration via Web interface for InfiLINK Evolution, InfiMAN Evolution families devices](#).

Title

5. `ifconfig` command (interfaces configuration)
6. `route` command (static routes configuration)