

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.

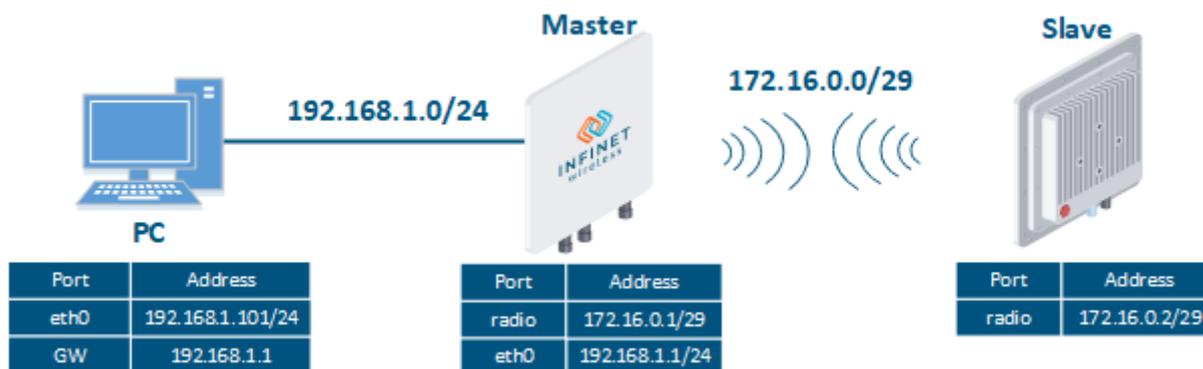


Figure 1 - Routing configuration for the management traffic using the InfiLINK 2x2, InfiMAN 2x2, InfiLINK Evolution, InfiMAN Evolution families of devices

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	<p>▼ Network Settings</p> <p>▶ eth0 <input type="text" value="192.168.1.1"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/> Mode: <input type="text" value="auto"/></p> <p>▶ rf5.0 <input type="text" value="172.16.0.1"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/></p> <p><input type="button" value="Create PRF"/> <input type="button" value="Create VLAN"/> <input type="button" value="Create LAG"/> <input type="button" value="Create SVI"/> <input type="button" value="Create Tunnel"/> <input type="button" value="Create Tap"/></p>
Slave	<p>▼ Network Settings</p> <p>▶ eth0 <input type="text" value="192.168.2.2"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/> Mode: <input type="text" value="auto"/></p> <p>▶ rf5.0 <input type="text" value="172.16.0.2"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/></p> <p><input type="button" value="Create PRF"/> <input type="button" value="Create VLAN"/> <input type="button" value="Create LAG"/> <input type="button" value="Create SVI"/> <input type="button" value="Create Tunnel"/> <input type="button" value="Create Tap"/></p>

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	<p>A static route must be added towards PC1's network:</p> <p>Routing Parameters</p> <p>Default Gateway</p> <p><input type="text" value=""/>.<input type="text" value=""/>.<input type="text" value=""/>.<input type="text" value=""/> <input type="button" value="X"/> <input type="button" value="+"/> <input type="button" value="OK"/></p> <p>Network Gateway</p> <p><input type="text" value="192"/>.<input type="text" value="168"/>.<input type="text" value="1"/>.<input type="text" value="0"/> / <input type="text" value="24"/> <input type="button" value="X"/> <input type="text" value="172"/>.<input type="text" value="16"/>.<input type="text" value="0"/>.<input type="text" value="1"/> <input type="button" value="X"/> <input type="button" value="+"/> <input type="button" value="OK"/></p>

Step 3a

Title

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	<p>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:</p> <p>Routing Parameters</p> 

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.
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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.

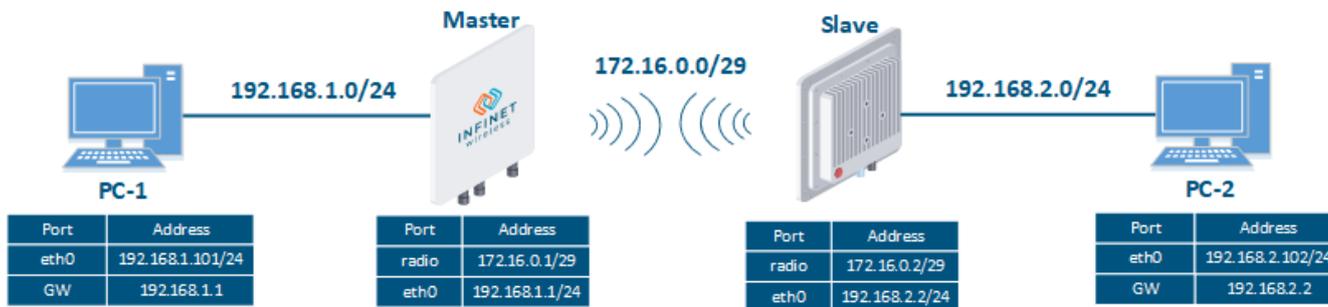


Figure 2 - Routing configuration for the data traffic using the InfiLINK 2x2, InfiMAN 2x2, InfiLINK Evolution, InfiMAN Evolution families of devices

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	<p>▼ Network Settings</p> <p>▶ eth0 <input type="text" value="192.168.1.1"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/> Mode: auto</p> <p>▶ rf5.0 <input type="text" value="172.16.0.1"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/></p> <p> <input type="button" value="Create PRF"/> <input type="button" value="Create VLAN"/> <input type="button" value="Create LAG"/> <input type="button" value="Create SVI"/> <input type="button" value="Create Tunnel"/> <input type="button" value="Create Tap"/> </p>

Title

Slave

Network Settings

eth0 Up: Description: DHCP: Mode: auto

rf5.0 Up: Description: DHCP:

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	<p>Add static routes for the connection between PC-1 and PC-2.</p> <p>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.</p>
Master	<p>Routing Parameters</p> <p>Default Gateway</p> <p>Network: 192.168.2.0 / 24 Gateway: 172.16.0.2</p>
Slave	<p>Routing Parameters</p> <p>Default Gateway</p> <p>Network: 192.168.1.0 / 24 Gateway: 172.16.0.1</p>

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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Title

Master	<p>Routing Parameters</p> <p>Default Gateway</p> <p>127 . 16 . 0 . 2 [X] +</p> <p>Network Gateway</p> <p>[] . [] . [] . [] / [] [X] [] . [] . [] . [] [X] +</p>
Slave	<p>Routing Parameters</p> <p>Default Gateway</p> <p>172 . 16 . 0 . 1 [X] +</p> <p>Network Gateway</p> <p>[] . [] . [] . [] / [] [X] [] . [] . [] . [] [X] +</p>

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.

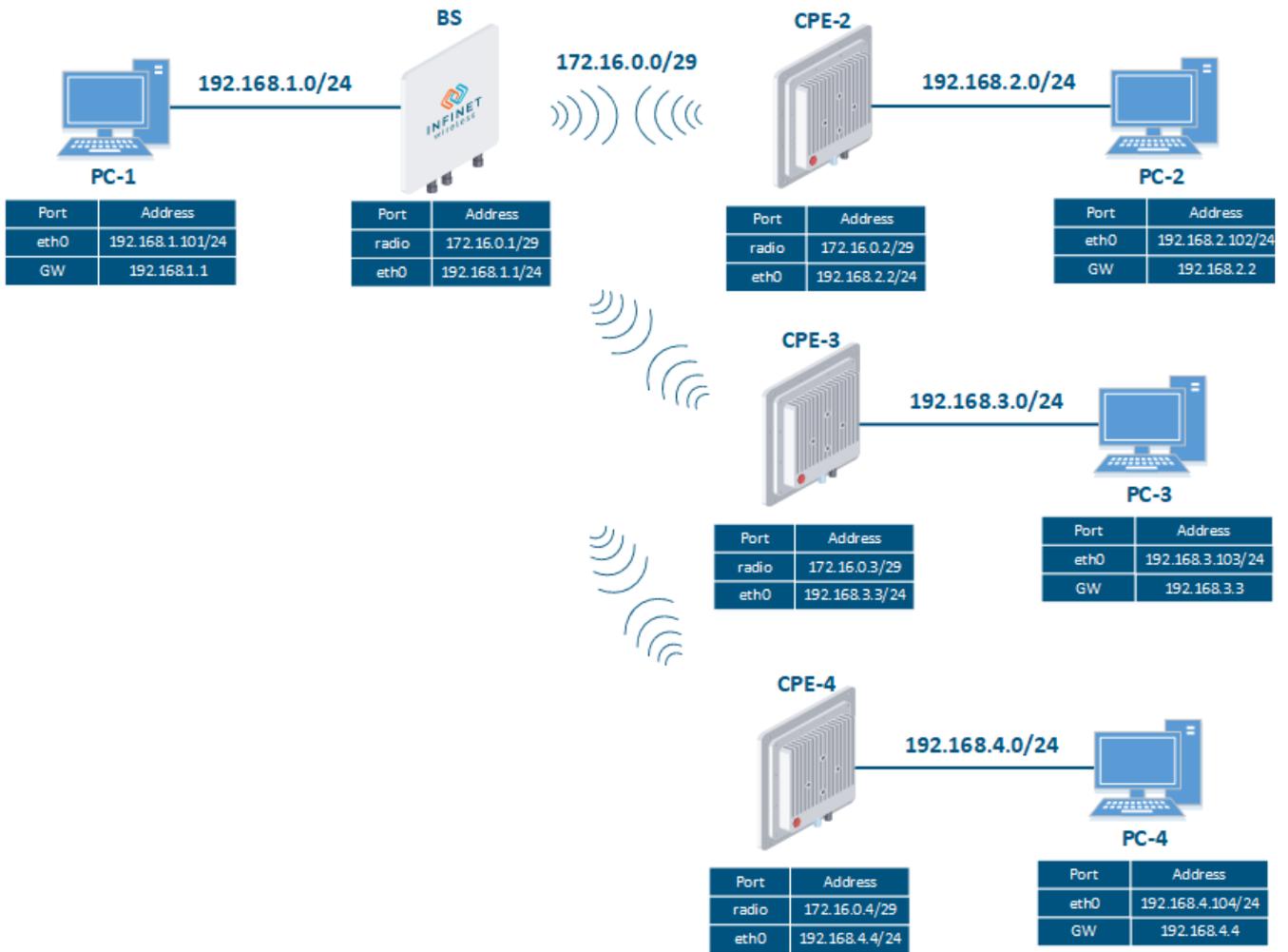


Figure 3 - Routing configuration for the data traffic using the InfIMAN 2x2, InfIMAN Evolution families of devices

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	<p>▼ Network Settings</p> <p>▶ eth0 <input type="text" value="192.168.1.1"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/> Mode: auto</p> <p>▶ rf5.0 <input type="text" value="172.16.0.1"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/></p> <p>Create PRF Create VLAN Create LAG Create SVI Create Tunnel Create Tap</p>
CPE2	<p>▼ Network Settings</p> <p>▶ eth0 <input type="text" value="192.168.2.2"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/> Mode: auto</p> <p>▶ rf5.0 <input type="text" value="172.16.0.2"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/></p> <p>Create PRF Create VLAN Create LAG Create SVI Create Tunnel Create Tap</p>

Title

CPE3	<p>▼ Network Settings</p> <p>▶ eth0 <input type="text" value="192.168.3.3"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/> Mode: <input type="text" value="auto"/></p> <p>▶ rf5.0 <input type="text" value="172.16.0.3"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/></p> <p><input type="button" value="Create PRF"/> <input type="button" value="Create VLAN"/> <input type="button" value="Create LAG"/> <input type="button" value="Create SVI"/> <input type="button" value="Create Tunnel"/> <input type="button" value="Create Tap"/></p>
CPE4	<p>▼ Network Settings</p> <p>▶ eth0 <input type="text" value="192.168.4.4"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/> Mode: <input type="text" value="auto"/></p> <p>▶ rf5.0 <input type="text" value="172.16.0.4"/> Up: <input checked="" type="checkbox"/> Description: <input type="text"/> DHCP: <input type="checkbox"/></p> <p><input type="button" value="Create PRF"/> <input type="button" value="Create VLAN"/> <input type="button" value="Create LAG"/> <input type="button" value="Create SVI"/> <input type="button" value="Create Tunnel"/> <input type="button" value="Create Tap"/></p>

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

<p>Description</p>	<p>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.</p>																																															
<p>BS</p>	<p>Routing Parameters</p> <p>Default Gateway</p> <p>[] . [] . [] . [] [X] +</p> <table border="1"> <thead> <tr> <th colspan="4">Network</th> <th colspan="4">Gateway</th> </tr> </thead> <tbody> <tr> <td>192</td><td>168</td><td>2</td><td>0</td> <td>/</td> <td>24</td> <td>X</td> <td>172</td><td>16</td><td>0</td><td>2</td> <td>X</td> <td>+</td> </tr> <tr> <td>192</td><td>168</td><td>3</td><td>0</td> <td>/</td> <td>24</td> <td>X</td> <td>172</td><td>16</td><td>0</td><td>3</td> <td>X</td> <td>+</td> </tr> <tr> <td>192</td><td>168</td><td>4</td><td>0</td> <td>/</td> <td>24</td> <td>X</td> <td>172</td><td>16</td><td>0</td><td>4</td> <td>X</td> <td>+</td> </tr> </tbody> </table>	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	+
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192	168	4	0	/	24	X	172	16	0	4	X	+																																				
<p>CPE2</p>	<p>Routing Parameters</p> <p>Default Gateway</p> <p>[] . [] . [] . [] [X] +</p> <table border="1"> <thead> <tr> <th colspan="4">Network</th> <th colspan="4">Gateway</th> </tr> </thead> <tbody> <tr> <td>192</td><td>168</td><td>1</td><td>0</td> <td>/</td> <td>24</td> <td>X</td> <td>172</td><td>16</td><td>0</td><td>1</td> <td>X</td> <td>+</td> </tr> <tr> <td>192</td><td>168</td><td>3</td><td>0</td> <td>/</td> <td>24</td> <td>X</td> <td>172</td><td>16</td><td>0</td><td>3</td> <td>X</td> <td>+</td> </tr> <tr> <td>192</td><td>168</td><td>4</td><td>0</td> <td>/</td> <td>24</td> <td>X</td> <td>172</td><td>16</td><td>0</td><td>4</td> <td>X</td> <td>+</td> </tr> </tbody> </table>	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	+
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Network				Gateway																																												
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192	168	2	0	/	24	X	172	16	0	2	X	+																																				
192	168	4	0	/	24	X	172	16	0	4	X	+																																				
<p>CPE4</p>	<p>Routing Parameters</p> <p>Default Gateway</p> <p>[] . [] . [] . [] [X] +</p> <table border="1"> <thead> <tr> <th colspan="4">Network</th> <th colspan="4">Gateway</th> </tr> </thead> <tbody> <tr> <td>192</td><td>168</td><td>1</td><td>0</td> <td>/</td> <td>24</td> <td>X</td> <td>172</td><td>16</td><td>0</td><td>1</td> <td>X</td> <td>+</td> </tr> <tr> <td>192</td><td>168</td><td>2</td><td>0</td> <td>/</td> <td>24</td> <td>X</td> <td>172</td><td>16</td><td>0</td><td>2</td> <td>X</td> <td>+</td> </tr> <tr> <td>192</td><td>168</td><td>3</td><td>0</td> <td>/</td> <td>24</td> <td>X</td> <td>172</td><td>16</td><td>0</td><td>3</td> <td>X</td> <td>+</td> </tr> </tbody> </table>	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	+
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

<p>Description</p>	<p>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.</p>
<p>BS</p>	<p>-</p>

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

Step 4

<p>Description</p>	<p>Analyze the routing table: three static entries (flag S) have been added to the routing table of each device.</p>
<p>BS</p>	<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>

<p>CPE2</p>	<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>
<p>CPE3</p>	<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>
<p>CPE4</p>	<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

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

<p>CPE2</p>	<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>
<p>CPE3</p>	<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>
<p>CPE4</p>	<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

<p>Description</p>	<p>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.</p>
---------------------------	---

**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.

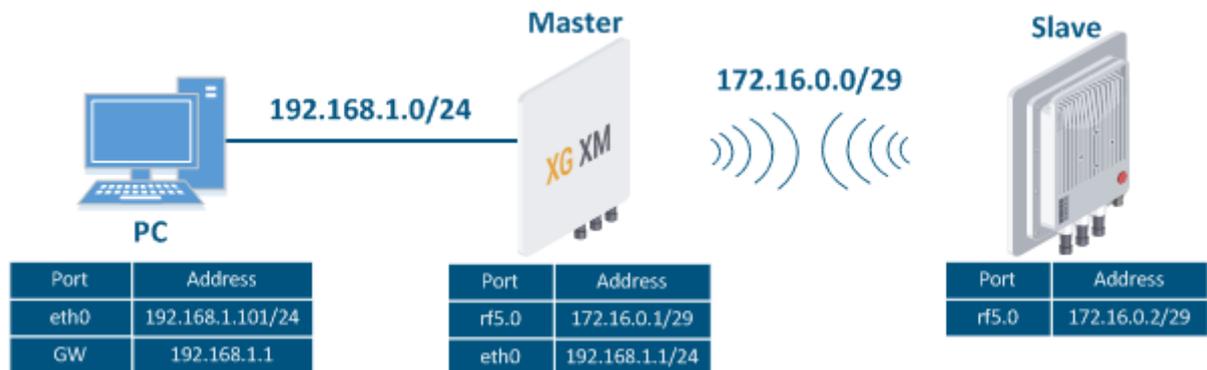


Figure 4 - Routing configuration for the management traffic using the InfiLINK XG / InfiLINK XG 1000 families of devices

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	<p>Network Settings</p> <p>IP Address: 192.168.1.1 / 24 (highlighted in orange)</p> <p>172.16.0.1 / 29 (highlighted in orange)</p> <p>Vlan: <input type="checkbox"/> Vlan ID: <input type="text"/> DHCP: <input type="checkbox"/></p>
Slave	<p>Network Settings</p> <p>IP Address: 10.10.1.1 / 24 (highlighted in orange)</p> <p>172.16.0.2 / 29 (highlighted in orange)</p> <p>Vlan: <input type="checkbox"/> Vlan ID: <input type="text"/> DHCP: <input type="checkbox"/></p>

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 connected networks (flag C).
--------------------	--

Title

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 UG 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 UG 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	<p>Configure a static route on the Slave device towards the PC's network:</p> <p>Static Routes</p> <p>Network: <input type="text" value="192"/> <input type="text" value="168"/> <input type="text" value="1"/> <input type="text" value="0"/> / <input type="text" value="24"/> <input type="text" value="x"/> Gateway: <input type="text" value="172"/> <input type="text" value="16"/> <input type="text" value="0"/> <input type="text" value="1"/> <input type="text" value="x"/> <input type="text" value="+"/> <input type="text" value="x"/></p>

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	<p>Routing Settings</p> <p>Default Gateway: <input type="text" value="172"/> <input type="text" value="16"/> <input type="text" value="0"/> <input type="text" value="1"/> <input type="text" value="x"/></p>

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

Title

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.

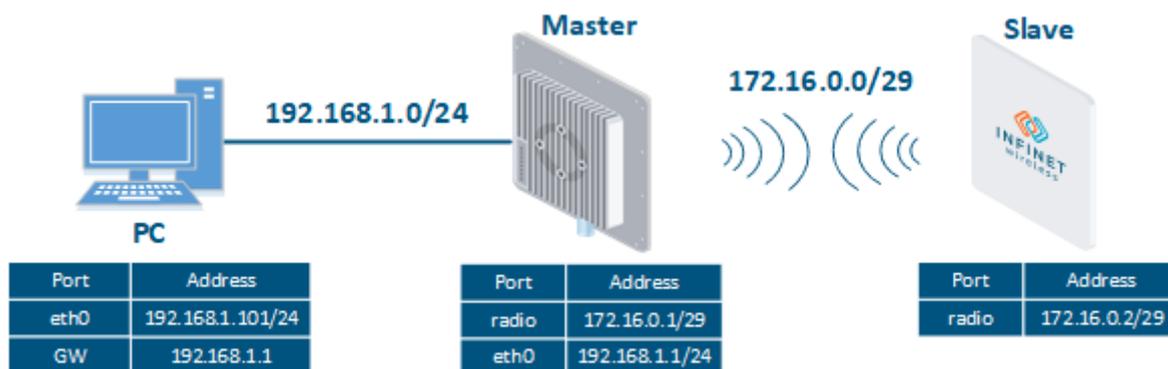


Figure 5 - Routing configuration for the management traffic using the Quanta 5, Quanta 6, Quanta 70 families of devices

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

Step 1

Description	<p>Add the IP addresses to the interfaces of the devices according to the scheme.</p> <p>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).</p>												
Master	<p>Network interface</p> <table border="1"> <thead> <tr> <th>IP address</th> <th>Subnet mask</th> <th>VLAN ID</th> <th>DHCP</th> </tr> </thead> <tbody> <tr> <td>172.16.0.1</td> <td>/ 29</td> <td>Disabled</td> <td>Disabled</td> </tr> <tr> <td>192.168.1.1</td> <td>/ 24</td> <td>Disabled</td> <td>Disabled</td> </tr> </tbody> </table> <p>+ Add IP address</p>	IP address	Subnet mask	VLAN ID	DHCP	172.16.0.1	/ 29	Disabled	Disabled	192.168.1.1	/ 24	Disabled	Disabled
IP address	Subnet mask	VLAN ID	DHCP										
172.16.0.1	/ 29	Disabled	Disabled										
192.168.1.1	/ 24	Disabled	Disabled										
Slave	<p>Network interface</p> <table border="1"> <thead> <tr> <th>IP address</th> <th>Subnet mask</th> <th>VLAN ID</th> <th>DHCP</th> </tr> </thead> <tbody> <tr> <td>10.10.10.2</td> <td>/ 24</td> <td>Disabled</td> <td>Disabled</td> </tr> <tr> <td>172.16.0.2</td> <td>/ 29</td> <td>Disabled</td> <td>Disabled</td> </tr> </tbody> </table> <p>+ Add IP address</p>	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 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 connected 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	<p>Add static routes for establishing the communication between the PC and Slave devices.</p> <p>The Quanta 5, Quanta 6 and the Quanta 70 families of devices allow to configure only the default route.</p>															
Master	<p>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.</p>															
Slave	<div style="border: 1px solid #ccc; padding: 10px;"> <p>Network interface</p> <table border="1" style="width: 100%; border-collapse: collapse;"> <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 style="text-align: right;">✎ ✕</td> </tr> <tr> <td>172.16.0.2</td> <td>/ 29</td> <td>Disabled</td> <td>Disabled</td> <td style="text-align: right;">✎ ✕</td> </tr> </tbody> </table> <p style="text-align: center; margin-top: 10px;">+ Add IP address</p> <div style="border: 1px solid #ccc; padding: 5px; margin-top: 10px; display: flex; align-items: center;"> Default gateway: <input style="border: 1px solid #ccc; padding: 2px 10px;" type="text" value="172.16.0.1"/> </div> </div>	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	<p>Analyze the routing table: a static entry (flag S) has been added to the Slave's routing table.</p>
Master	<p>See step 2</p>

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)