Customer Internet access – requirements and verification methods for Network Extender 3G Femtocell
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Introduction

The main purpose of this document is to identify the pre-requirements for your Internet access so that the Femtocell (Network Extender 3G) can connect to the ORANGE network.

This document covers the technical pre-requisites and provides a way to verify each of them on your Internet access.

If all results are positive, we should be able to install and connect the Femtocell on this Internet line. Keep in mind, however, that if any of these parameters change after your test (for example, bandwidth availability if your Internet line is shared with other activities, or changes to your firewall), this can affect the Femtocell connection.
Technical requirements for Internet access

Your Internet access solution must allow the Femtocell to get an IP address from a DHCP server and access the Internet, and then allow the communication with Orange equipment (SeGW and NTP) using the different protocols and ports.

You can find the detailed list of requirements for your Internet access below:

1. The DHCP and DNS servers must be active See § 3.1 to know how to test this
   Note: The Femtocell can receive a fixed IP address but the address must be assigned by the DHCP server (MAC address of the Femtocell must be configured in the DHCP server)

2. Your Internet access must have an always-available bandwidth of at least 1 Mbps upload and 1 Mbps download. See § 3.2 to know how to test this
   Note: if you want to use the 3G network provided by the Femtocell to run data sessions, you might need more throughput on your Internet access than 1 Mbps

3. If a firewall exists between the Femtocell and Internet, it must allow traffic on the following protocols and ports between the Femtocell and the Orange network. (See § 3.3 to know how to test this)

<table>
<thead>
<tr>
<th>Port/Protocol</th>
<th>Service</th>
<th>State</th>
</tr>
</thead>
<tbody>
<tr>
<td>123/udp</td>
<td>Ntp</td>
<td>Open</td>
</tr>
<tr>
<td>500/udp</td>
<td>Isakmp</td>
<td>Open</td>
</tr>
<tr>
<td>4500/udp</td>
<td>nat-t-ike</td>
<td>Open</td>
</tr>
<tr>
<td>33434-33445/udp</td>
<td>bandwidth estimation</td>
<td>Open</td>
</tr>
</tbody>
</table>

4. The Femtocell can be connected behind a NAT firewall, but not behind a proxy.

Note: The electrical power for the Femtocell can be provided via a standard 220 V power socket. If no power socket is available, the installer will install a PoE (Power over Ethernet) device to send the needed power via the Ethernet cable.
How to verify the requirements

IMPORTANT:
For all the tests below, connect the PC or laptop to the Internet via the cable (RJ-45) on the port that will be used to connect the Femtocell.

Please run the tests described here anyway to ensure that the Femtocell will be able to connect without problems.

Test of DNS and DHCP server

Method:
1. First, make sure your PC is connected to the Internet via a cable (RJ-45) on the port that will be used to connect the Femtocell
2. Click on the Windows button (start menu) -> in the search bar, type “cmd.exe” then press “ENTER”
3. In the black window type “ipconfig /all” then press “ENTER”

Expected result:

You need to verify the CMD output window, to check for the existence of DNS server and DHCP server lines, whose addresses must be different from 0.0.0.0 (see yellow arrows here below)
Speed test

Method:

1. First, make sure your PC is connected to the Internet via the cable (RJ-45) on the port that will be used to connect the Femtocell.
2. Go to the URL: http://Orange.speedtest.net/
3. Just click on “begin test (recommended server)”
4. Run the bandwidth test at least 3 times, preferably at different moments of the same day to get an average

Expected results:

Both “upload speed” and “download speed” should be above 1 Mbps
Testing the ports

There are different methods and tools to test the ports. Here are 2 methods to do so.

Method 1: Automatic port check

Method:

1. First, make sure your PC is connected to the Internet via a cable (RJ-45) on the port that will be used to connect the Femtocell
2. Go to https://business.orange.be/sites/default/files/femto.zip
3. Download the zipfile and install it on your pc
4. Run the “Porttest” application
5. Open result folder and open the text file

Successful result:

You must see is “ok” for all listed ports
Unsuccessful result:

Any other results indicate that you will need to modify your firewall/Internet connection settings in order to open that specific port.

![Unsuccessful test result]

Please re-run the test afterwards to verify that the results are correct.

Method 2: NMAP tool (for Microsoft Windows PC)

Note: you will need administrator privileges on your PC in order to perform the installation and the required steps for this method

Method:

1. Install the freeware NMAP Tool (network analyser) on your Windows-based PC from this URL [https://nmap.org/dist/nmap-6.47-setup.exe](https://nmap.org/dist/nmap-6.47-setup.exe)
2. Install Winpcap if necessary (this installation is included in the NMAP setup file)
3. Make sure your PC is connected to the Internet via a cable (RJ-45) on the port that will be used to connect the Femtocell
4. Once NMAP is installed, click on the Windows button (start menu) -> in the search bar, type “cmd.exe” then press “ENTER”
4. In the black window copy and paste the following text:

```
start /W /B nmap -sU -PN -p 500,4500,33434,33435,33436,33437,33438,33439,33440,33441,33442,33443,33444,33445
212.224.131.24 212.224.131.25 212.224.131.41 212.224.131.7
```

```
start /W /B nmap -sU -PN -p 123.212.224.131.26 212.224.131.27
pause
```

**Successful result:**

After executing the script, you need to check the CMD output window and verify that the “STATE” for each port is “open|filtered” or “open” (see yellow arrows in the image below)
Unsuccessful result:

Any other results indicate that you will need to modify the settings of your firewall/internet connection in order to open this specific port. Please re-run the test afterwards to verify that the result is correct.

```
C:\Program Files (x86)\Nmap
Starting Nmap 6.49 ( http://nmap.org ) at 2018-01-03 15:55 Romance Standard Time
Nmap scan report for initial-ipsecrouter.net.mobistar.be (212.224.131.24)
Host is up (0.00s latency).
PORT      STATE     SERVICE
500/udp    filtered isakmp
4500/udp    filtered nat-ike
33434/udp    filtered unknown
33435/udp    filtered unknown
33436/udp    filtered unknown
33437/udp    filtered unknown
33438/udp    filtered unknown
33439/udp    filtered unknown
33440/udp    filtered unknown
33441/udp    filtered unknown
33442/udp    filtered unknown
33443/udp    filtered unknown
33444/udp    filtered unknown
33445/udp    filtered unknown

Nmap scan report for ptr-212-224-131-25.dyn.mobistar.be (212.224.131.25)
Host is up (0.00s latency).
PORT      STATE     SERVICE
500/udp    filtered isakmp
4500/udp    filtered nat-ike
33434/udp    filtered unknown
33435/udp    filtered unknown
33436/udp    filtered unknown
33437/udp    filtered unknown
33438/udp    filtered unknown
33439/udp    filtered unknown
33440/udp    filtered unknown
33441/udp    filtered unknown
33442/udp    filtered unknown
33443/udp    filtered unknown
33444/udp    filtered unknown
33445/udp    filtered unknown
```
<table>
<thead>
<tr>
<th>PORT</th>
<th>STATE</th>
<th>SERVICE</th>
</tr>
</thead>
<tbody>
<tr>
<td>5000/udp</td>
<td>filtered</td>
<td>isakmp</td>
</tr>
<tr>
<td>1337/udp</td>
<td>filtered</td>
<td>nat-t-ike</td>
</tr>
<tr>
<td>5000/udp</td>
<td>filtered</td>
<td>unknown</td>
</tr>
<tr>
<td>33435/udp</td>
<td>filtered</td>
<td>unknown</td>
</tr>
<tr>
<td>3346/udp</td>
<td>filtered</td>
<td>unknown</td>
</tr>
<tr>
<td>3347/udp</td>
<td>filtered</td>
<td>unknown</td>
</tr>
<tr>
<td>3348/udp</td>
<td>filtered</td>
<td>unknown</td>
</tr>
<tr>
<td>3345/udp</td>
<td>filtered</td>
<td>unknown</td>
</tr>
<tr>
<td>3342/udp</td>
<td>filtered</td>
<td>unknown</td>
</tr>
<tr>
<td>3344/udp</td>
<td>filtered</td>
<td>unknown</td>
</tr>
<tr>
<td>3345/udp</td>
<td>filtered</td>
<td>unknown</td>
</tr>
</tbody>
</table>

Map scan report for ptr-212-224-131-41.dyn.mobistar.be (212.224.131.41)
Host is up (0.000s latency).
PORT   STATE SERVICE
5000/udp filtered isakmp
4500/udp filtered nat-t-ike
33434/udp filtered unknown
33435/udp filtered unknown
33436/udp filtered unknown
33437/udp filtered unknown
33438/udp filtered unknown
3344/udp filtered unknown
33441/udp filtered unknown
33442/udp filtered unknown
33443/udp filtered unknown
33444/udp filtered unknown
33445/udp filtered unknown