Net Neutrality and Quality of Access

1. New provisions

New provisions relating to **net neutrality** have been adopted in Europe, according to which:

- The internet is a **fundamental right**
- **Transparency** is established as a key principle: our customers must be clearly informed of the traffic management practices put in place by internet access providers.

Our customers must therefore be informed about:

- Restrictions put in place in terms of access and/or use of application services.
- The traffic management techniques implemented and their impact on service quality.

2. Orange mobile networks

Orange offers mobile services and provides **optimum quality** to all its customers. Orange puts procedures in place to measure traffic and prevent any saturation or overload of a connection to the Orange network.

Orange has put a range procedures and dashboards in place to monitor the quality and capacity of its network to ensure **optimal customer experience and optimal quality** of voice and data communications. Technical experts monitor the network 24 hours a

day, seven days a week. Proactive procedures have been established to anticipate or avoid the slightest incident and to prevent any network congestion.

Most of the networked technical devices send performance measurements. This allows thresholds to be defined that trigger proactive actions to improve or increase the network's capacity. The aim is to intervene quickly before any deterioration in quality.

As regards capacity for voice and data communications:

- **sizing calculations** are carried out each month on the basis of the traffic over the network and the expected increase in that traffic. Orange's RCE (Radio Capacity Extension) platform examines the traffic data and trends, analyses congestion and determines the actions to be taken. For example, it is possible to increase the radio capacity by adding a radio device or to increase the bandwidth of our transmission lines;
- **capacity is monitored daily**. If the threshold is repeatedly exceeded, action is taken to increase the capacity of a cell, of a number of cells or of a network node.

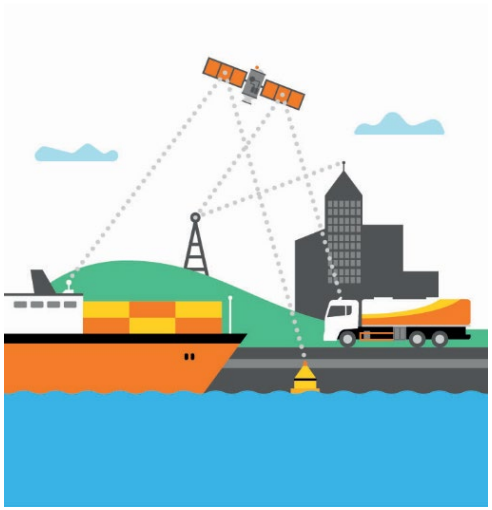
If an incident occurs on the network despite this pre-emptive work, teams are ready to act **24 hours a day, seven days a week** to restore the service and increase the network's capacity.

The main priority of our operational experts is to resolve each incident as quickly as possible in order to minimise the impact on the services provided to our customers (such as voice communications, internet connection or mailboxes).

3. Data rates of internet access services.

There are 2 types of data rate:

- The **download data rate** concerns the flow of data the customer receives on their mobile device. It determines the speed with which the customer can access the internet and download files.
- The **upload data rate** concerns the flow of data the client sends from their mobile device to the internet. It determines the speed with which the customer can send emails or share files.



Mobile network

The maximum download and upload data rates of the Orange network's mobile internet access services, in January 2017, are (Mbps=Megabit per second):

Technologie	Download	Upload
3G	42 Mbps	5.44 Mbps
4G	100 Mbps	50 Mbps
4G+	225 Mbps	50 Mbps
5G	1.5Gbps	500 Mbps

The data rates indicated are the estimated maximum data rates (technical limits) the Orange mobile network can achieve in **ideal conditions.**

The estimated maximum data rate on the 3G/4G, 4G advanced (or 4G+) and 5G networks varies according to the capacities and status of the networks (the number of users connected to the array antenna at the same time), the specific technical features of the customer's mobile device, the user's geographical location when connected to the mobile network, whether the user is stationary or mobile, any obstacles between the mobile network and the mobile device, the number of services/applications being used concurrently on the mobile device and the capacity of the website visited.

To ensure its customers benefit from **optimum network service quality**, Orange may restrict the maximum data rate if a reasonable usage threshold, defined in the relevant offer or option, is exceeded, in accordance with the conditions set out in the information sheet for the mobile offer. As a result, the maximum data rate observed by the customer may differ from the advertised theoretical maximum data rate.

Example of temporary measures we may take:

where the mobile internet (Skype, streaming music, watching videos and films, etc.) requires a high capacity, Orange may first restrict/block access to the mobile internet in order to maintain sufficient capacity for calls to emergency services and sending text messages.

Population/geographical coverage

	2023		End of 2024	
	Population	Territory	Population	Territory
Couverture 2G	99,9%	96,2%	99,9%	96,3%
Couverture 3G	99,1%	89,3%	99,1%	89,3%
Couverture 4G	99,8%	99,5%	99,8%	99,5%
Couverture 5G	18%	12%	93%	90%

Fixed network

The **maximum download and upload data rates** of the Orange network's mobile internet access services, in January 2017, are (Mbits/s=megabits per second or Kbits/s = kilobits per second):

Offre	Technologie	Debit annoncé/ Débit maximal		Débit Maximal		Debit normalement disponible	
		Download	upload	Download	upload	Download	upload
Livebox fibre	Fibre	500 Mbits/s	250 Mbits/s	500 Mbits/s	250 Mbits/s	Heures pleines, au moins 70% du débit maximal Heures creuses, au moins 90% du débit maximal	
Option boost	Fibre	1GB	500Mb/s	1GB	500Mb/s		
Option boost	Fibre	2GB	500Mb/s	2GB	700Mb/s		

- The **normally available data rate** is the data rate the customer can expect to achieve during peak hours (between 8pm and 10pm each day). The normally available data rate cannot be lower than the minimum data rate.
- The **minimum data rate** is the minimum transmission speed that ORANGE undertakes to provide to the customer.
- The **advertised data rate** is the data rate used in sales communications.

Data rates depend on a number of factors, and particularly:

- the characteristics of the Customer's installation, including the infrastructure available at the customer's address, in particular whether fibre optic or copper,
- the compatibility of the device used by the Customer,
- the network load,
- the time of day.

For infrastructure on copper wire, all the data rates (except the minimum data rate) are subject to eligibility.
The **higher the data rate**, the better the Internet Access Service **performs**.

For example, a 100 MB file can be downloaded in less than 45 seconds with a downstream data rate of 20 Mbit/s and in less than 10 seconds with a data rate of 100 Mbit/s.

Other technical parameters (independent of ORANGE) influence the performance of the Internet Access Service:

- **latency**: the time that elapses between the request for information (e.g. opening a web page) and receipt of that information. The shorter this time is, the quicker the Internet Access Service,
- **jitter**: the variation in latency. The lower the jitter, the smoother the Internet Access Service,
- **packet loss**: in computing, a piece of information is made up of several data packets in order to improve transmission over the network. However, some packets may not be transmitted (as a result of network congestion, for example) and must be re-sent. A low packet loss rate means the information requested is received more quickly and the Internet Access Service is faster.

4. Service quality parameters.

In the context of net neutrality, the performance of the services/applications used by our customers is of paramount importance.
The table below (source: BEREC, BoR (14) 117 of 25 September 2014) shows the **different qualities** that may help our customers to **choose the offer best suited** to how they use the mobile internet.

The following criteria were defined:

- Browse (text)
- Browse (media)
- Download file
- Transactions
- Streaming media
- VoIP
- Gaming

Relevance ranges from "-" to "+++", where "-" means the criterion is less relevant for proper and optimum use of the service/application. In effect, popular services/applications impose different requirements on internet access providers.

Application	Data transmission speed		Delay	Delay variation	Packet loss	Packet error
	Downstream	Upstream				
Browse (text)	++	-	++	-	+++	+++
Browse (media)	+++	-	++	+	+++	+++
Download file	+++	-	+	-	+++	+++
Transactions	-	-	++	-	+++	+++
Streaming media	+++	-	+	-	+	+
VoIP	+	+	+++	+++	+	+
Gaming	+	+	+++	++	+++	+++

Examples :

Browse (text): I am browsing a web page.

Browse (media): I am browsing text, images and videos on the internet.

Download file: I am downloading the attachment to an email. A high transmission speed is important to me.

Transactions: I am making a bank transfer from my mobile banking app.

Streaming media: I am watching a video online.

VOIP: I am making a call via an app.

Gaming: I am playing a game on my smartphone.

5. Who to contact if you have any questions or complaints

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If you have **any questions** or complaints about this document or if your data rate drops significantly, you can **contact Orange** at the following address:

Orange Communications Luxembourg
Service Clients
8 rue des Mérovingiens
L-8070 Bertrange

or

by calling our technical centre on 800 61 606. The technical centre is open from 8am to 8pm Monday to Friday and from 10am to 6pm on Saturday.

If you are unhappy with the response provided by Orange or if you do not receive a response, you can write to the Service de Médiation [Mediation Service] of the ILR (Institut Luxembourgeois de Régulation [Luxembourg Institute of Regulation]) at 17, rue du Fossé L-2922 Luxembourg, or complete the online form provided (http://www.ilr.public.lu/mediation/index.html).