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# **Internet Access Service Level Agreement**

## Version 2.1



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## 1. Introduction

Internet Access has different service levels originally designed to fulfil common customer demands across the Nordic region. This means that Telenor is prepared to meet our customers' demands for excellent and flexible network services.

The purpose of this Service Level Agreement (SLA) is to define the Internet Access service undertaking from Telenor as well as the relevant service descriptions. In addition, the standard settings and basic service levels are described here. The document describes the proper use of terms and definitions, and is the SLA between the individual customer and Telenor concerning parameters such as availability, downtime, contact channels and fix time according to service level agreements with customers.

## 2. Terms and definitions

Table 2.1 presents the definitions of the terms used in Telenor's service agreement. All designations of time in the document refer to GMT + 1. The term "service description" in the table refers to the document that defines the design of the product.

Terms	Definitions
AVAILABILITY	The minimum availability a customer may expect from a service, expressed as a percentage of a maximum availability according to the service description. Availability is measured over a period of one month.
SERVICE TIME	The period, according to the SLA, in which Telenor offers fault handling and service (see Fault reporting time).
FAULT REPORTING TIME	The period, according to the SLA, in which Telenor receives fault reports.
START TIME	The maximum time between reporting of the fault and start of fault handling during the service time.
RESPONSE TIME	The time from the customer's first attempt to reach Telenor using a method described in the SLA and the time when Telenor responds or offers services during the fault handling time.
FIX TIME	The maximum time within the service time (excluding suspension time) it will take to repair an fault in the service after the customer's reporting of the fault and until it has been repaired.
SUSPENSION TIME	The time within the service time when the fix time will not continue to run due to the customer's obligation to arrange for fault analysis and handling.
INTERRUPTION TIME	The total time between the customer's reporting of the fault and the time when the fault has been repaired.
DOWNTIME	The accumulated time within the service time when there are faults in the service (excluding suspension time, service window and time to planned job).
ARRIVAL TIME	The time between Telenor's submission of a receipt for the fault report to the customer and until Telenor arrives personally at the customer's location (according to the SLA).
SERVICE WINDOW	The recurring period, as defined in the SLA, used by Telenor to maintain the service without affecting the calculation of availability.
PLANNED JOB	Specific time outside of the service window which Telenor or its subsuppliers may use to maintain the service without affecting the calculation of availability. A "Planned emergency job" is reported and completed

Terms	Definitions
	within 24 hours and will take less than 30 minutes.
FAULT IN SERVICE	Faults in service are defined as all deviations from a fully functional service and are classified in different categories, some of which are related to availability.
ACTUAL FAULT TIME	The time in which the service is effectively not available to the customer.
CONTACT METHODS	
MEASURING POINT	The technical inspection defined in the service description for the calculation of availability.
CONCLUSION OF CONTRACT	The time when the customer and Telenor sign the contract for delivery of the service.
START OF DELIVERY	The time when Telenor has received and accepted a complete order with all the required and correct information.
SERVICE DELIVERED	The time when the service has been delivered and tested at the customer's location. The customer will receive a delivery confirmation.
DELIVERY CONFIRMATION	A document (sent by email) showing that the service has been delivered.
DELIVERY TIME	The time from "start of delivery" and until "service delivered".
ACKNOWLEDGEMENT OF DELIVERY	Confirmation from the customer that the service has been delivered.
DELIVERY APPROVAL PERIOD	The period (10 days), designated by Telenor, during which the customer is entitled to complain of the service delivered.
DAYS	Days are defined as working days (Monday to Friday, not including public holidays).

Table 2.1 Terms and definitions - SLA

## 2.1 Example

### 2.1.1 Fault handling

This is an example of how the terms and definitions are used in a concrete fault case.

The customer discovers an *fault* at 8:30 AM and later reports it to Telenor. After a short *response time*, Telenor submits a trouble ticket with a case number as confirmation of the fault report. According to our definition, Telenor will immediately start fault handling, and the *downtime* calculation begins. In this example, since the fault is physical, Telenor will arrive at the customer's location after an *interruption time* as part of the fault handling procedure. When the *service time* ends at 5:00 PM, the fault handling procedure will stop, and the calculation of downtime will be suspended and will only begin when the next *service time* starts. During fault handling, the customer must restart one of its own routers. This is treated as *suspension time*, and the *downtime* calculation will be suspended. The fault is repaired before noon the next day, and the total *downtime* is calculated. This is reported to the customer and the case is closed. Later that same day, a short and previously announced *planned job* is performed, but this has no effect on the calculation of *downtime*.

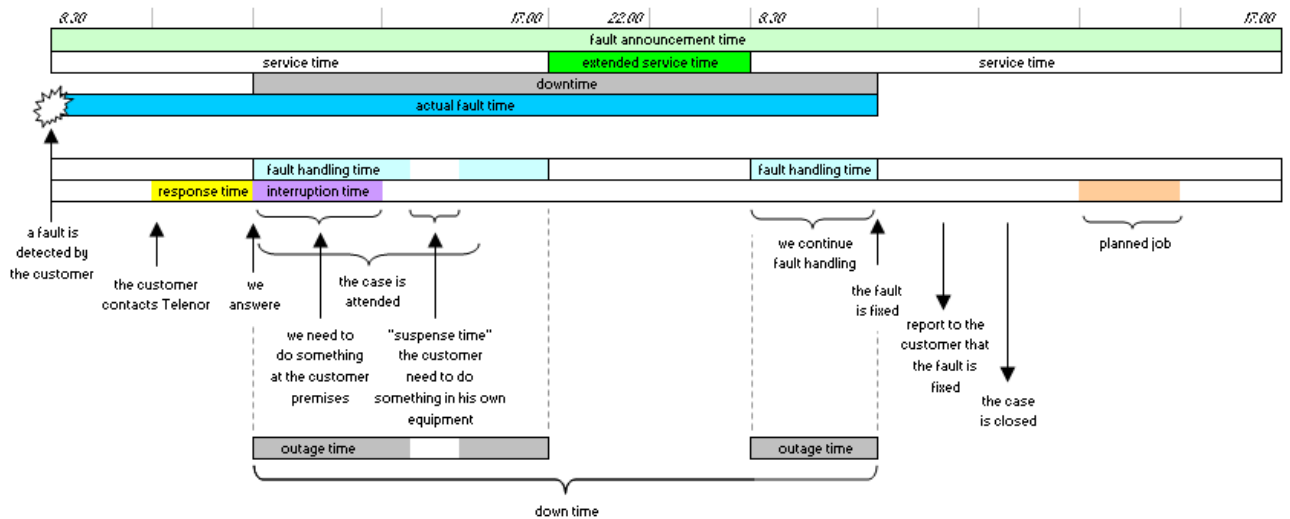


Figure 2.1 Terms and definitions used in fault handling and service support

### 3. Service levels

All Internet Access services offered and delivered by Telenor have a related standard service level. This is described in the service description. All extensions above the standard level are treated as add-on services.

In all service combinations defined in this Service Level Agreement, the lowest service level applies to the entire combined solution. For example, an add-on service for an access line cannot have a higher service level agreement than the actual access line.

#### 3.1 Service parameters

All service levels offered by Telenor are based on the parameters of service time, fix time and availability, cf. table 3.1. Please note that some of the service agreements are subject to special technical requirements for the implementation of the service.

#### 3.2 Proactive monitoring

For SLAs 4-6, proactive monitoring is included.



**3.3 Service level overview**

Service level	Service time	Physical fix time	Remote fix time (1)	Automatic fail-over	Availability per month	Technical requirements
LEVEL 4	Working days Mon-Fri 8 AM – 5 PM		< 4 h		99.60%	None
LEVEL 4,3	All days 24 hours	< 8 h	< 4 h		99.60%	none
LEVEL 5,3 (3)	All days, 24 hours	< 8 h (2)	< 4 h	< 3 min	99.80%	Partly or fully redundant connection (Type 2 or 4)
LEVEL 6 (3)(4)	All days, 24 hours	< 8 h (2)	< 4 h	< 3 min	99.99%	Fully redundant connection (type 4)

- 1) Remote terminal-based fault recovery, excluding the access line.
- 2) Restoration of primary connection, with traffic running on the redundant/secondary connection.
- 3) The above parameters only apply to own network, i.e. no availability target guarantees are made for DIX and other peering points or for the public Internet as a whole.
- 4) Requires the same bandwidth on the primary and the secondary connection.

*Table 3.1 Service level overview*

Applies to all levels:

<b>Fault reporting time</b>	<ul style="list-style-type: none"> <li>• 24 hours, all days</li> </ul>
<b>Response time</b>	<ul style="list-style-type: none"> <li>• &lt; 20 sec. for 80% (telephone)</li> <li>• &lt; 30 min. for 100% (fax, email)</li> </ul>

*Table 3.2 Fault reporting*

**4. Ordering and delivery**

The delivery times indicated are considered binding maximum times from Telenor. When placing an order, the requested delivery date must be stated. An order confirmation must be sent to the customer within five (5) working days from the time when a complete order was received from the customer. Notice of any faults or missing information in the order must be given within five (5) working days. This applies to connections up to and including 2 Mbit. The order confirmation from Telenor will, if possible, confirm the requested delivery date or indicate another date, if it is not possible to deliver by the requested date. Confirmation of the delivery date must be submitted within 15 days.

Delivery will always take place within normal working hours (Monday to Friday between the hours of 8:00 AM and 4:00 PM). All requests for delivery and implementation outside of this period, will be subject to additional fees. Such requests must be stated in the order and will only be granted if received in due time and accepted by Telenor. Changes in the configuration, access line or CPE may imply a downtime of between 0.5 and 4 hours.

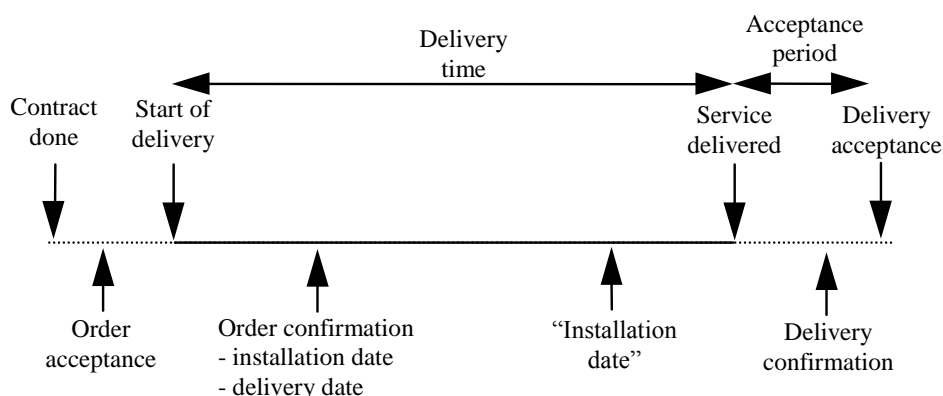


Figure 4.1 Visualisation of different milestones for ordering and delivery

#### 4.1 Delivery time

Internet Access		
Deliver type	Description	Value <sup>1)</sup>
New access <i>Only redundancy</i>	Leased line 2 Mbps	DK 50 days
New access <sup>2)</sup> <i>Internet Access</i>	Establishment of new radio link	50 days
Change of configuration	Change of service parameters within the existing service (not including change of bandwidth)	4 days
Change of bandwidth, software	No physical change required	7 days
Change of bandwidth, hardware	Requires a physical change	As new access
Termination	The period from receipt of a written termination from the end of the month after receipt of the termination	1 month

<sup>1)</sup> All days are working days. All times indicated in "days" are maximum times.

<sup>2)</sup> The delivery time applies to the standard product delivered via a radio link.

Table 4.1 Delivery time for Internet Access services

#### 4.2 Acknowledgement of delivery

When the router/switch at the customer's location has been physically installed, and Telenor has configured the service from the operations centre, the service is considered as delivered. When the service has been configured, measurement and reporting of the technical quality start immediately. From the time when notice of access to the port is given, the customer will have an approval period of 10 working days to test the functionality of the service. If the customer discovers any faults in the service delivered by Telenor, which faults considerably reduce the customer's possibility of testing the network, the parties may negotiate an extension of the approval period.

If the customer has not discovered any serious faults before the end of the approval period, the service delivered will be regarded as being in conformity with the contract. If the customer discovers any faults during the approval period, the customer must contact Telenor immediately via Helpdesk or its contact. If the fault occurs during the approval period, an amount will be credited to the customer on the first invoice.

### 4.3 Non-compliance

If Telenor discovers any non-compliance with the agreement in connection with the delivery, Telenor must notify the customer's contact at the place of installation and the customer's coordinator. If the customer discovers any non-compliance with the agreement in connection with delivery, the customer must notify the contact stated in the order confirmation. If otherwise agreed in specific projects, the guidelines agreed for the project must be followed.

### 4.4 Pre-delivery requirements

Telenor expects the customer to meet the following requirements for pre-installation preparations:

1. Telenor installs the systems at the customer's location. Space must be cleared for Telenor's equipment in a room of at least 1 x 1 x 1 metres. The room must be a normal office environment with regard to temperature, humidity and atmospheric dust/cleanliness. This means that the requirements for the installation room within the temperature range are 10 °C – 35 °C and with a relative humidity (non-condensing) of 20% - 80%.
2. Access to the installation room and equipment should be restricted to authorised staff. If radio access with antenna is used, the customer must accept and authorise installation of equipment before the installation starts.
3. Electricity and separate circuits etc.  
The rooms must be fitted with the required and correct electricity supply of 230 V, 50 Hz (with earth connection) close to the equipment. The electricity supply should preferably be on a separate circuit. The mains voltage may vary by +/- 10%. The frequency may vary by +/- 1%.  
The equipment will not be delivered with UPS.
4. Electrical noise and voltage peaks.  
Abnormally strong electrical interference is not allowed in the immediate vicinity of the room. Common transients (office environment) may have a duration of up to 0.2 milliseconds. Although variations as mentioned occur within the mentioned limits, it may not result in interruptions. The responsibility for avoiding damage to equipment due to voltage peaks, e.g. from lightning, lies with the customer.
5. Distribution network and cabling.  
Unless otherwise expressly agreed, all connections between implemented Telenor equipment and lines to other units may be created without a requirement for fixed cabling.
6. Other suppliers/contractors.  
If implementation of the delivery requires help from other suppliers, e.g. the suppliers that have already delivered equipment to the customer, the customer must ensure that they are available to Telenor without delay.
7. Availability at the time of installation.  
The contact must be available (on his or her mobile or the like) to Telenor at the agreed time and place of installation. The contact must have access to the rooms in which the equipment is to be installed, and must have keys and/or other equipment required to have access to the location and the place of installation.
8. Delivery knowledge and information.  
The contact at the place of installation must be in possession of the information and have the knowledge required by Telenor to perform the job to the satisfaction of both parties.
9. Before the system is installed, unless otherwise agreed, the customer must make the following preparations in the rooms: The customer must provide 230 V power supply with earth connection.

Otherwise, there are no specific requirements for the rooms other than the Danish Working Environment Service's requirements for office premises.

In accordance with good supplier practice, the supplier must check well in advance of the installation of the system that rooms and installations meet the requirements in the



appendices. The supplier must give the customer written notice of the result of this check in order for the customer to be able to remedy any defects.

#### 4.5 Physical access to the place of installation

Telenor must be given free access to communication with the service interface. Telenor must be authorised to make the necessary installations and line installations on and in all buildings at the installation address.

#### 4.6 Inconvenience caused by the installation

No compensation will be paid for inconvenience caused by the installation of access at the customer's location.

## 5. Status information and reporting

### 5.1 Information and fault reporting

Telenor constantly monitors all its services for production and performance faults. As a result, the customer may have access to a number of different forms of information and fault reports. The methods used are closely connected with the relevant product and the agreed service level and its related communication channel. The different status and information reports are shown in table 5.1.

Service level	Means of contact	Information	Frequency	Notice of planned job
4.0	Web/telephone /email	General performance information with specific fault descriptions	Every four hours or in case of status change, whichever occurs first <sup>1)</sup>	Email
4.3	Web/telephone /email	General performance information with specific fault descriptions	Every four hours or in case of status change, whichever occurs first <sup>1)</sup>	Email
5.3	Web/telephone/SM S /email	General performance information and specific fault descriptions with cause and estimated fix time	Every two hours or in case of status change, whichever occurs first <sup>1)</sup>	Email
6.0	Web/telephone/SM S /email	General performance information and specific fault descriptions with cause and estimated fix time	Every two hours or in case of status change, whichever occurs first <sup>1)</sup>	Email

Table 5.1 Overview – contact channels and information types

<sup>1)</sup> Or as agreed with the customer. When an fault affects a large number of customers (more than 20), fault handling will be given priority, and customers will be contacted as quickly as possible. In this situation, updating fault reports on the Internet will be given top priority.

## 5.2 Escalation

When service management is not performed as described in this document or the service description for the product in question, this escalation procedure may be used. Escalation takes place via Helpdesk.

1. Helpdesk, technician
2. Helpdesk, manager
3. Technical manager for the service
4. Operations manager for the service
5. Other persons responsible for the service

## 5.3 Case status reporting

Fault tracking, handling and reporting are reported to customers as follows:

The case status is reported in accordance with table 5.1. If the customer wishes to follow a specific case, he or she must use a unique case number which is allocated to the fault when it is reported.

A customer with level 4 service agreements are informed of the status of faults classified as major faults every four hours. Reports of all other types are updated as soon as status changes occur.

Customers with level 5 and 6 service agreements are informed of the status of faults classified as major faults every two hours and will also be notified by telephone or as agreed. Reports of all other types are updated as soon as status changes occur.

## 6. Availability

### 6.1 Calculation

Availability is measured from the time of delivery and is calculated monthly. All time during the period up to delivery is treated as if availability was 100 per cent.

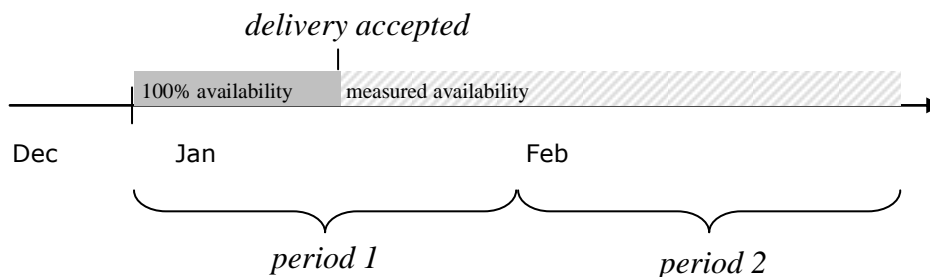


Figure 6.1 Calculation of availability for the first month

Availability is based on a measurement of the downtime, according to the above definition, during the period, including the total time during which the service is offered, excluding suspension time, service windows and planned work. The calculation formula is shown below.

$$\text{AVAILABILITY} = 1 - \left( \frac{\text{DOWNTIME}}{\text{MEASURINGPERIOD}} \right) * 100 (\%)$$

Figure 6.2 Availability calculation formula

#### 6.1.1 Downtime

Downtime is defined as the total period during the service time when an fault in service has been registered and classified as a major fault according to the definition in table 6.1, excluding suspension time, service window and planned job.

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If it is not possible to reach the customer through the agreed channels, or if Telenor's employees are not able to gain access to equipment at the customer's location with a view to fault tracking or handling, the time passed will be regarded as suspension time and will not be included in the calculation of downtime.

If an fault in service is due to circumstances outside of the control of Telenor or Telenor's subsuppliers, such as power failure at the customer's location, the time passed will be regarded as suspension time and will not influence the calculation of downtime.

#### 6.1.2 Measuring period

The period used in the availability calculation is defined as all time during a period of 30 days (24 hours x 30 days = 720 hours), excluding the time allocated to service windows and planned jobs.

#### 6.1.3 Faults in service

Faults in service are classified on two levels. Faults making it impossible to use the service are classified as major faults and will trigger the start of calculation of downtime. All other faults are treated as minor faults, meaning that the service may still be used, with reduced quality.

<b>Internet Access</b>		
<b>Classification</b>	<b>Perceived fault</b>	<b>Description</b>
Major fault	The customer is not able to use the service. The service is blocked, the response time exceeds IETF's guidelines (>10 s.).	It is not possible to use the service without fault tracking and recovery. The limits for accepted packet loss and delay are permanently exceeded according to the quality guidelines provided in the service description.
Minor fault	Reduced service functionality or capacity, but the service is not blocked.	The limits for accepted packet loss and delay are exceeded for a brief period of time according to the quality guidelines provided in the service description.
Irregular event	The customer does not perceive any functionality changes.	An event which currently has no effect on the customer, but which must be analysed.

*Table 6.1 Classification of faults for Managed and Partner services*

#### 6.1.4 Measuring point

As the service availability calculation is based on the registration of a trouble ticket, no specific measuring point is defined.

#### 6.1.5 Fault reporting

It is possible to report faults at any time, provided that the fault is reported through the means agreed and defined in the service description for the product (or possibly through a Telenor subsupplier/partner). This option is not subject to any requirements for the agreed service level. Telenor confirms the report by issuing a trouble ticket/case number as soon as an fault is registered.

#### 6.1.6 Service window

A service window is a periodically recurring time (Monday 1 AM – 6 AM) when Telenor is allowed to perform support on the services delivered without affecting the availability calculations.

Generally, all customers are informed of planned jobs on the Internet at least five (5) working days before the allocated time, and of the extent to which the time will be used.

The customer chooses the contact method via Weblines. Telenor is only allowed to spend 15 hours in 90 days for this type of service support. If a service window has not been reported correctly, it will be treated as downtime in the availability calculation.

#### 6.1.7 Planned job

A planned job comprises all forms of service support performed by Telenor or its subsuppliers, which affect customers outside of service windows. Customers who will be affected will be notified by email at least five (5) working days in advance. Planned jobs of which notice has not been given correctly will be treated as downtime in the availability calculation.

There is a special type of planned job designated as "urgent", which covers a brief and minor action which may affect the customer in some way. The planned urgent job will be announced via Weblines and performed within 24 hours with a maximum service interruption of 30 minutes.

## 6.2 Helpdesk

### 6.2.1 The purpose of Helpdesk

The purpose of Helpdesk is to provide one place to which the customer may direct all inquiries regarding the service after delivery. Helpdesk is responsible to the customers for fault recovery and coordination of activities necessary for operative units in Telenor and any other partners. In addition, Customer Service handles all general inquiries and inquiries concerning invoicing.

## 6.2.2 Service parameters

### Opening hours and telephone numbers

The Helpdesk is open 24 hours a day on weekdays. The Customer Service is open from 8 AM to 4 PM on working days. The Helpdesk and the Customer Service may be contacted by telephone (see below) or email (see below).

Inquiry	Telephone number
Fault reporting	+45 7212 1314
General	+45 7212 0000

Table 6.3 Telephone contact information

### Response time

At least 80% of all inquiries received by telephone will be answered within 20 seconds.

Inquiry	Email – Denmark
Fault reporting	network.service@telenor.dk
General	Kundeservice @Telenor.dk

Table 6.4 Email contact information

### Response time

100% of all fault reports submitted by email will be answered within 30 minutes.

## 6.2.3 Measurement

Response time, number of faults and fault recovery times will be measured by Telenor's fault registration system. This information will normally be used for internal control and as basis for improvements.