Service Description

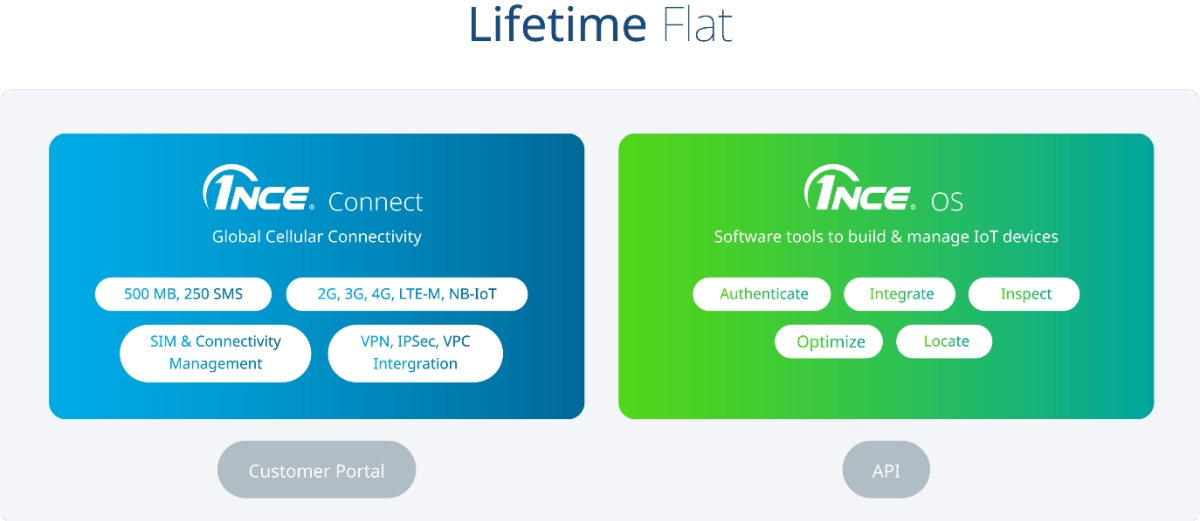
VERSION APRIL 2023

1NCE
Cologne – Miami – Singapore – Tokyo

Contents

1 Introduction – Lifetime Flat

1NCE provides connectivity and software services for business customers to develop and operate globally connected IoT devices.



1NCE Services can be purchased with the *Lifetime Flat* tariff.

1NCE Services consist of two products: 1NCE Connect and 1NCE OS. 1NCE Connect offers global cellular connectivity, data, and SMS via 2G, 3G, 4G, LTE-M and Narrowband-IoT, IoT SIMs, connectivity management functionality, and network integration options (via OpenVPN, IPSec and VPC). 1NCE OS consists of software tools to build and manage IoT devices. 1NCE OS simplifies the authentication, integration, inspection and localization of IOT devices.

Customers can access 1NCE Services through a graphical web interface (the Customer Portal), or an Application Programming Interface (API) for a more direct, data-based integration.

This Service Description is only applicable if there is at least one active IoT SIM (see Terms & Conditions) associated with a customer account or one of its sub-accounts (see section 4.1).

Definitions made in the Terms & Conditions are also valid in the context of this document.

2 1NCE Connect

1NCE Connect provides global cellular connectivity via roaming partnerships with local operators. It offers IoT SIMs in different form factors utilized in a wide range of IoT devices. The management of 1NCE Connect is done via Customer Portal (see section 4) or API (see section 5).

2.1 Data and SMS Volumes

2.1.1 Included Data Volume

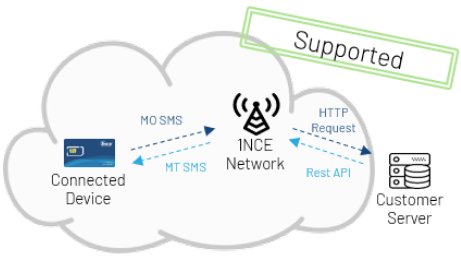
Included data volume for each IoT SIM is 500 MB (Megabytes). Consumption is measured in Bytes. After the data volume has been consumed, no further device communication is possible. Additional volume can be purchased as per section 2.4.

Unused data volume expires at the end of the Lifetime.

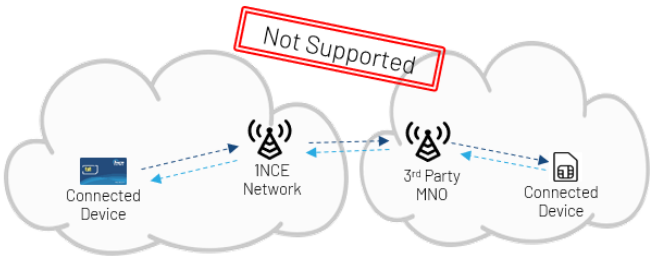
2.1.2 Included SMS

Included amount of SMS is 250. After the SMS have been consumed, no further SMS communication is possible. Additional SMS can be purchased as per section 2.4.

1NCE offers both Mobile-Originated (MO) and Mobile-Terminated (MT) SMS delivery. Device-to-device SMS is not supported:



- Example shows MO and MT SMS usage which both will be supported.



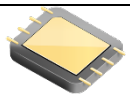
- Device-to-device SMS is not supported.

Unused SMS expire at the end of the Lifetime (see section 1).

2.2 IoT SIMs

2.2.1 Form Factors

1NCE offers IoT SIMs for IoT devices to connect to and use the 1NCE network (see section 2.3). IoT SIMs can be used with compatible IoT devices. We define three different IoT SIM classes by their physical attributes:

	IoT SIM Card Business	IoT SIM Card Industrial	IoT SIM Chip Industrial
Picture			
Ruggedized Form Factors	2FF, 3FF, 4FF	2FF	MFF2, QFN8
Temperature Range	-25°C - +85°C	-40°C - +105°C	
Operating Voltage	Class A, B, C (1.8 – 5V, +-10%)		
Data Retention	10 years		
Read / Write Cycles	500,000		
Standard Compliance	Global Platform 2.3 ETSI TS 101 220 ETSI TS 102 221 3GPP TS 31.101 3GPP TS 31.111 3GPP TR 31.900 3GPP TR 31.919		

The IoT SIM Card Business and IoT SIM Chip Industrial classes are part of the standard offer. All other classes are available on request.

1NCE offers additional sub-classes of IoT SIMs which have differing features. The prefix of each sub-class indicates its physical attributes as described in the table above.

- **IoT SIM Card Business China+**: Unlocks NB-IoT coverage in China, Hong Kong, Macao and Taiwan (see section 2.3.1) via Multi-IMSI capabilities. Currently only available in the IoT SIM Card Business class.
- **IoT SIM Card Business Unbranded**: Does not include the 1NCE logo. Currently only available in the IoT SIM Card Business class.
- **IoT SIM Chip Industrial eUICC**: Capable of remotely switching profiles as per GSMA standards *RSP SGP 01+02+16* and *eUICC Profile Package Interoperable Format Technical Specifications.* Currently only available in the IoT SIM Chip Industrial class.

2.3 Network

2.3.1 Country Coverage & Bearers

1NCE IoT SIMs support the following bearers / Radio Access Types (RATs):

- 2G (*GSM*)

- 3G (UMTS)
- 4G (*LTE*)
- Narrowband-IoT / NB-IoT (*CAT-NB1*)
- LTE-M (*CAT-M1*)

The availability of above-mentioned bearers in each supported country can be found on the 1NCE coverage website: https://1nce.com/en-eu/1nce-connect/coverage

2.3.2 Network Speed

The 1NCE network is optimized for IoT devices. Data-bound connectivity services are provided at a maximum transmission speed of 1Mbit/s for both uplink and downlink.

2.3.3 Local Breakouts

1NCE provides local Internet breakouts to reduce data latency depending on the geographical position of IoT devices in the following regions:

- Frankfurt, Germany
- California, USA
- Virginia, USA

IoT SIMs can either automatically select the nearest geographic breakout, or a fixed breakout can be configured.

2.3.4 APN

1NCE Access Point Names (APNs) allow IoT devices to connect to the 1NCE network when transmitting packet-oriented data. 1NCE provides a private APN *iot.1nce.net*.

2.3.5 IP Addresses

1NCE allocates 256 private IP addresses in an /24 address space per account (see section 4.2). An additional /24 address space will be automatically allocated when the previous space has been used up.

2.4 Connectivity Management

1NCE Connect offers a variety of connectivity management features, which can be accessed either via Customer Portal (section 4) or API (section 5):

2.4.1 Consumption Monitoring

- View IoT SIM status and consumption: Get current activation status and consumption of data and SMS per IoT SIM.
- View Network Events: Provides network-related events for all IoT SIMs in a customer account (see section 4.1).

2.4.2 IoT SIM Management

- View IoT SIM Details: Get ICCID, IMEI, IMSI, IP address, labels, usage and other attributes per IoT SIM.
- IoT SIM Export: Export and download the details of all IoT SIMs in a customer account.

- Set IoT SIM activation status: Allow or disallow IoT SIMs to use the 1NCE network.
- Reset an active network connection: Disconnects an IoT SIM from the 1NCE network.
- Monthly Limits: Set monthly limits for data and/or SMS MO/MT volume (see section 2.1) for all IoT SIMs in a customer account (see section 4.1).
- IMEI Lock: Locks the IMEI of an IoT device to the IoT SIM. Provides access to the 1NCE network only with this combination of IMEI and IoT SIM. Bars all other combinations from the 1NCE network. Can be setup for all IoT SIMs in a customer account (see section 4.1).
- SIM Transfer: Change ownership of a particular IoT SIM to a sub-account (see section 4.1).

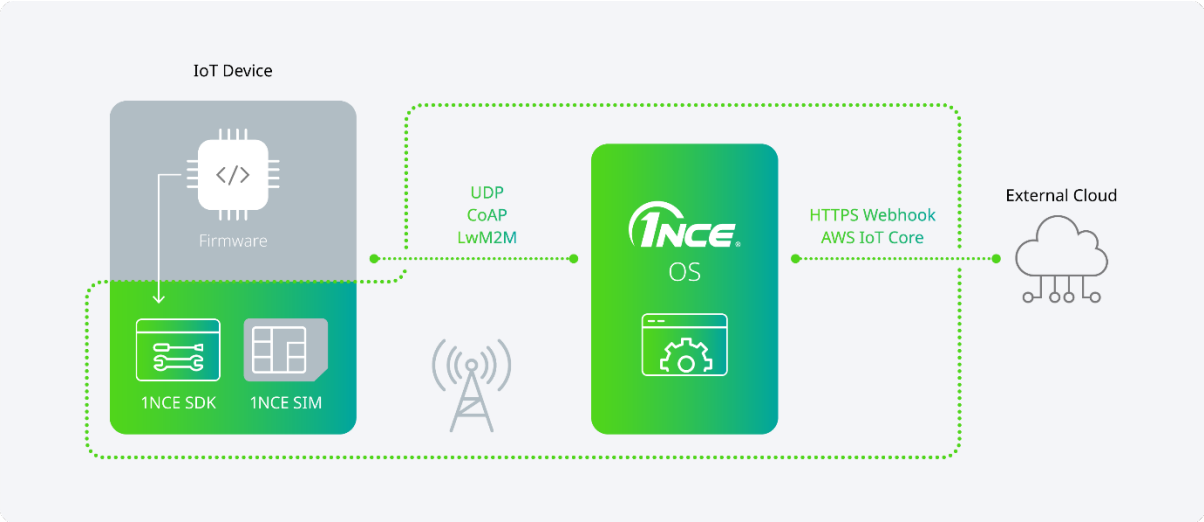
2.4.3 Order Management

- Purchase IoT SIMs: Order additional IoT SIMs.
- Top-Up: Purchase additional data and/or SMS volume for a specific IoT SIM.
- Auto Top-Up: Automatically purchase additional data and/or SMS volume once an IoT SIM has less than 20% of data and/or SMS volume available. Configurable for all IoT SIMs in a customer account (see section 4.1). Not available for AWS customers.
- Lifetime Extension: Extend the Lifetime per IoT SIM (see section 1).

2.4.4 Integration Options

- Open Internet: IoT devices can access the public Internet for M2M services.
- OpenVPN: IoT devices can communicate within an external OpenVPN-based Virtual Private Network.
- IPSec: IoT devices can communicate within an external IPsec-based Virtual Private Network. Not included in the standard offering.
- VPC Peering: IoT devices can communicate within a VPC peering in an external AWS environment. Not included in the standard offering.
- Data Streamer: Integrate selected Connectivity Management functions into external cloud services. This includes network-related events (IoT SIM activation status, network connection status, used local operator, bearer, data consumption usage, country of use). Pushes events in near real-time via Webhooks, AWS Kinesis, DataDog and Keen.io.
- SMS Management: Send SMS towards IoT devices or receive SMS from IoT devices and forward them via Webhook.
    - SMS Receiving: *Mobile Terminated* SMS can be triggered via API (see section 5) or Customer Portal (see section 4).
    - SMS Forwarding: *Mobile Originated* SMS can be integrated via Webhook.

3 1NCE OS



1NCE OS provides software tools to develop and manage IoT devices. These tools support in integrating the application layer on top of the network layer, which is provided by 1NCE Connect (see section 2).

1NCE OS consists of:

- Integration tools to authenticate and integrate IoT devices with external cloud services and make their telemetry data accessible.
- Optimization tools to improve the efficiency and security of IoT devices.
- Localization tool for determing the position of IoT devices, when GPS-reception is not available.
- Open-Source IoT Device functionality and examples

More information and a detailed description of 1NCE OS features can be found in the 1NCE OS Developer Documentation in the Developer Hub: https://help.1nce.com/dev-hub/docs/1nce-os-services-overview .

1NCE OS can only be used with 1NCE Connect. 1NCE OS can only be used with the local breakout in Frankfurt, Germany.

3.1 Device Authenticator

Authenticates IoT devices against external cloud systems based on the identity of the used IoT SIM. An IoT SIM in any form factor is placed into the IoT device and acts as an authenticating element by relying on the same network authentication mechanisms as 1NCE Connect. It replaces provisioning processes which include secret flashing during the manufacture and creation of secure device twins in external cloud services.

Informs integrated cloud services about the addition of new IoT SIMs to the customer account (see section 4.1).

3.2 IoT Integrator

Integrates IoT devices into cloud services by translating data protocols.

- **Device Integrator**: Provides an integration endpoint for telemetry data of IoT devices. Supports UDP, CoAP and Lightweight-M2M (LwM2M). CoAP and LwM2M connections can be encrypted using DTLS.
- **Cloud Integrator**: Provides an integration endpoint to push the enriched data stream into external cloud services. Supports AWS IoT Core and HTTPS Webhook integration. Both integration targets are TLS encrypted.

3.3 Device Inspector

Stores data streams for up to 7 days in 1NCE OS so that it can be retrieved and inspected within that time for e. g. debugging purposes or as a backup for other integration mechanisms. Data can be requested via API (see section 5) or viewed within the Customer Portal (see section 4).

3.4 Device Locator

Provides a rough position of IoT devices when connected via 2G based on the location of the cell tower they are connected to. Sends alert when IoT devices leave a configured geographical area (geo-fence). Data can be requested via API (see section 5) or viewed within the Customer Portal (see section 4)..

3.5 Energy Saver

Optimizes energy consumption of IoT devices by reducing data payload. Telemetry data is compressed on the IoT Device using *Binary Conversion Language* (BCL), before it gets sent to the *Device Integrator*, effectively reducing radio airtime and therefore energy. The telemetry data is decompressed by Energy Saver before it's made available via *Cloud Integrator* or *Device Inspector*.

3.6 1NCE SDK & Blueprints

The 1NCE SDK is an open-source, MIT-licensed, C SDK which can be integrated into the customer IoT devices firmware. It contains functions to authenticate against the 1NCE OS managed cloud service and to compress data for use with Energy Saver (see section 3.5).

The 1NCE SDK can be downloaded at: https://github.com/1NCE-GmbH/1nce-iot-c-sdk

Blueprints are open-source, MIT-licensed code repositories for embedded platforms. They contain complete examples for FreeRTOS and Zepyhr on how to use the 1NCE SDK, 1NCE Connect and 1NCE OS on the IoT device.

The blueprints can be downloaded at: https://github.com/1NCE-GmbH/blueprint-freertos (FreeRTOS) or https://github.com/1NCE-GmbH/blueprint-zephyr (Zephyr)

4 Customer Portal

1NCE provides a web interface called the *Customer Portal*. It allows customers to autonomously manage 1NCE Connect (see section 2.4) and 1NCE OS (see section 3). It can further be used to manage customer accounts, organizations, and to purchase additional IoT SIMs.

The Customer Portal can be found at https://portal.1nce.com/.

By default, the customer uses their email address and secret password to log into the Customer Portal and manage their customer account and its associated IoT SIMs. A menu is present on every page which allows navigation through the functionality of the provided services:

- Dashboard: Provides general status information about all customer IoT SIMs, e.g. data volume usage, SMS usage and order status.
- My SIMs: Overview of all customer IoT SIMs and IoT SIM Management functionality (see section 2.4.2)
- Configuration: Manage Network (see section 2.3) and Integration Options (see 2.4.4)
- 1NCE OS: Manage 1NCE OS (see section 3) functionality
- Account: Manage customer account (see section 4.1)
- Orders: Manage all previous orders and order new IoT SIMs
- Users: Manage users and their roles (see section 4.2)
- Organization: Manage sub-accounts (see section 4.1)
- Performance: Provides real-time status information about the network and attached services
- Support: Manage Service Requests (see section 7).

4.1 Account & Organization Management

Each customer has one account. Each customer account has billing and shipping addresses attached to it. Shipping addresses can be added and modified by the customer for future orders. The addresses are stored and will be used each time the user orders additional SIMs.

The customer account allows the customer to manage an IoT SIM fleet. An IoT SIM fleet refers to either one or multiple IoT SIMs associated with a customer account. By default, all IoT SIMs belong to the customer account which performed the initial purchase.

It is possible to create and delete sub-accounts (referenced as *sub-orgs* in the Customer Portal) below this customer account to group separate IoT SIM fleets. This structure is called *Organization* in the Customer Portal. IoT SIM fleets can be transferred within the Organization between a sub-account and the initial customer account or vice versa. The Customer Portal does not allow transferring IoT SIM fleets between different Organizations or sub-accounts.

4.2 User Management, Roles & Permissions

By default, the customer who performed the initial purchase is the sole user in the customer account. This user has the role *Owner*. It is possible to manage further users in this customer account and associate one of the following roles:

- Owner: Enables the use of all management and purchasing functions. Enables role assigning of all roles.

- **Admin**: Enables the use of all management and purchasing functions. Enables role assigning of the role *User*.
- **User**: Enables the use of all management functions.
- **API**: Enables the use of the API (see section 5)

5 API

1NCE provides a management API. It allows web services to programmatically manage 1NCE Connect (see section 2.4) and 1NCE OS (see section 3).

The API documentation can be found at https://help.1nce.com/dev-hub/reference/api-welcome.

Communication with the API is possible via HTTP(S) requests with JSON body content of content type *application/json* and authorization type OAuth2 (OAuth2, application), which are required for each API call. The applied encryption protocol is TLS 1.2.

6 Developer Hub

1NCE provides more detailed information about the previously described services, user manuals, AT commands and usage examples in the Developer Hub.

The Developer Hub can be found at https://help.1nce.com/dev-hub/docs.

7 Service Level Agreement

The quality of service is determined by 1NCE's standard SLA (Service Level Agreement).

7.1 Service Hours & Service Numbers

1NCE provides support services by telephone and by contact form (via e-mail to a ticket system), which can be reached via the Customer Portal (see section 4). The support is available to the named contact persons of the customer as well as to any other user of the Customer Portal (see section 4.1 and 4.2).

English telephone support is available 24 hours a day, Monday through Friday (24x5). Telephone support in local languages (other than English) is available during standard service hours between 8am and 6pm local time in the respective region.

The 1st level support speaks the following languages in the respective regions:

Region	Language(s)
Americas	English
APAC	English, Japanese
EMEA	English, German

The service numbers can be found in the Customer Portal.

7.2 Operations & Maintenance

All servers, services and system components required to operate the previously described services are operated in a technically and organizationally secure environment.