

# **Digital Catapult: 5G Testbed Use Policy**

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### 1 Scope

This document describes the Use Policy for any of Digital Catapult's 5G Testbeds and applies to all authorised users e.g. to test their 5G-enabled and 5G-capable solutions. The purpose of this Policy document is to set out the rules and expectations when accessing the testbed.

### 2 Introduction

The purpose of the Digital Catapult 5G Testbeds is to demonstrate the power of 5G to deliver innovation and growth and to help both industry and innovators in understanding the value of 5G and building offerings on the network.

The Digital Catapult 5G Testbeds are indoor Testbeds and the Testbed Use Policy is applicable to all Digital Catapult testbeds as well as to those users accessing the Testbed remotely.

Digital Catapult 5G Testbeds participants refer to all users of the 5G testbed - companies and individuals - that will be allowed access to the 5G Testbed for the purposes of testing new applications and services.

The policy sets out a framework to allow the Digital Catapult 5G Testbeds participants to perform and realise their full potential, while adhering to appropriate standards of professional and ethical practice.

### 3 Testbed features and services

This section describes the key capabilities of the Testbed for the participants to get an idea as to what features are supported and how they can be leveraged to support their use cases and solutions. This also tells the users how they can interact with the Testbed and about the devices attached to the Testbed.

#### 3.1 Digital Catapult Testbed Core Network

The Digital Catapult 5G Testbeds are served by the Testbed Cores. These Cores serve an NSA-(Non-StandAlone) implementation and the SA-(StandAlone) implementation.

While an NSA implementation comprises 4G Core (EPC) supporting both 4G (LTE) and 5G (NR) radio access networks, where LTE is used as an anchor, an SA implementation comprises 5G Core (5GC) again supporting both 4G (LTE) and 5G (NR) radio access networks, but without having to rely on LTE as an anchor.

The applicants are not able to modify the physical or software configuration of the 5G network, however they might be able to perform the following activities,

- Leverage relevant 5G technologies to define solutions and integrate them into the 5G network.
- Service slice creation and management using OSM orchestration of VNFs.

- The development of AI-centric VNFs to enable intelligent networks, and their deployment on both Kubernetes and OpenStack.

The key features of the Digital Catapult Testbeds are as follows:

- 4G LTE and 5G NR radio access networks will operate in licensed spectrum using a non-operational licence granted by Ofcom, band 40 (LTE)/band N78 (5G NR) respectively, as well as band B20 for NB-IoT connectivity
- Commercial-grade 4G/5G Core with following capabilities:
  - Network Slicing
  - Edge Computing
  - LTE-M/NB-IoT
- Connectivity between the sites
- Dedicated Firewalled 1 Gbps Internet access
- Latest 5G devices as well 5G-enabled user devices such as laptops, tablets etc.
- Highly capable 5G technical support team for 5G solutions integration and configuration

### 3.2 Digital Catapult Testbeds Access Network

The Digital Catapult Testbeds covers sites in Brighton and London resulting in two Access Networks. These Access Networks consist of 4G/5G base stations (eNBs/gNBs) as well as WiFi Access Points.

All the Digital Catapult Access Networks are connected and served by the 5G Testbed Cores.

### 3.3 User Devices

Users will have the opportunity to have access to the latest 5G devices, such as 5G phones with 5G native capabilities, as well as other devices such as tablets and laptops that are either 5G-capable or 5G-enabled through 5G modem/routers.

These devices will be connected to the 5G Testbed using pre-configured 5G Testbed SIMs provisioned by the testbed support team. These devices can also be connected to the WiFi network through their WiFi connection capabilities also provisioned by the Testbed facilities.

Users may be allowed to connect their own devices in the 5G Testbed, subject to permission by the Testbed Manager. Users must not attempt to connect their own devices without such permission.

Testbed SIMs and WiFi access credentials for WiFi, and other systems, will be provided during the on-boarding stage.

## 4 Testbed On-boarding

The process of engaging with the testbed consists of an innovation programme and the technical engagement.

The innovation programme aims to accelerate innovation through leveraging the testbed resources while the technical engagement takes place after the innovation programme and includes:

- Identifying the technical requirements for deploying the user applications
- Provisioning a slice of the network resources tailored to the user needs
- Supporting the deployment and the experimentation with the allocated testbed resources

Applicants who intend to on-board and make use of the 5G Testbed will agree and document with the Testbed Manager the following, before they can have access to the testbed:

- A description of the intended experiment, data to be generated and used etc.
- Support requirements from the 5G team
  - To identify the technical requirements for 5G technical support, e.g. support with solution integration with 5G network, 5G network and device configuration, use-case setup etc.
- Technical requirements in terms of network and compute resources and capabilities
  - Required equipment to support the use case/experiment, i.e. mobile devices, CPE, modem, SIMs etc.
  - Compute resources, i.e. virtual server, virtual machines, CPU, RAM, Storage etc.
  - Network resources and services, i.e. WiFi access in addition to 4G/5G connectivity, VPN for remote access etc.
  - Estimation of performance expectations from the system, such as bandwidth, latency, stability, etc.
- An official request for an access account

As part of the Testbed on-boarding process, users will be informed about the available resources to them, i.e. ultra-fast Internet access using smartphones or other network-enabled devices, access to 4G/5G and also access to Testbed switch ports via Ethernet connectivity. In addition, users will also be informed about other available resources, such as compute resources including individual VMs for easy deployment of classical image-based applications, containers (Docker) for lightweight applications and physical server space, e.g. GPU, for applications with specific requirements.

Available benefits and support will be incorporated in the relevant contractual agreements between you and Digital Catapult (to the extent applicable).

## 5 Remote Access to the 5G Testbed

- Remote access to the 5G Testbed may be provided under the following conditions:
  - When the intended experiment is deliverable remotely, including technical resource availability for supporting remote operations
  - Limited physical presence possible at the 5G Testbed due to a prolonged emergency situation (e.g. the Covid-19 situation)
  - Logistical challenges, e.g. where involved equipment is too costly or difficult to transport

- Maximum number of users per site is reached
- Limiting access only to the participant's allocated VMs and Containers as defined and set by the Testbed Manager

## **6 BYOD- Bring Your Own Device**

- At the discretion of the Testbed Manager, participants may be allowed to bring their own devices onsite to access the Testbed, e.g. mobile phones, laptops, tablets etc., or use those devices for remote access to the Testbed, providing participants meet the following criteria identified during the Testbed on-boarding process:
  - They made an official request to the Testbed Manager and the Testbed Manager agrees in writing
  - They register those devices with the Testbed Manager
  - They abide by the terms of the Acceptable Usage Policy in the use of their devices whilst accessing the testbed resources, onsite or remotely
- Participants should notify the Testbed Manager in advance if they have any radio equipment to be attached to the Testbed to avoid any potential interference with other radio equipment within the Testbed

## **7 Rules of Use**

Rules of the 5G Testbed use are described in the context of general rules and principles, individual Testbed components and in the context of the whole Testbed system.

### **7.1 General Rules**

- 5G Testbed shall not be used for any illegal activity
- 5G Testbed should not be used for any activity other than those defined as being within the scope of the project, i.e. to support the use cases and experiments identified under contract
- Any proposed changes to the agreed scope of an experiment must be re-agreed and documented with the 5G team and approved by the Testbed Manager before being implemented (contractual updates may be required)
- Access rights given to the participants for the access to the 5G Testbed cannot be transferred to other parties/entities that are not part of the programme.
- No personal data may be used, transferred or generated on the Testbed, unless it is suitably anonymised, the detail of which is agreed by the Testbed Manager on-boarding.
- Access rights to the 5G Testbed at any of the sites doesn't give access to other 5G Testbeds outside the project
- 5G Testbed participant present at the sites must comply at all times with the visitor's policies and procedures including those related to security and health and safety
- 5G Testbed participant present at Testbed sites must treat the equipment and facilities with all reasonable care, leaving them in a safe and tidy state

- 5G Testbed participant present at Testbed sites shall respect staff and other Testbed users and those on the programme
- 5G Testbed participants should attend regular technical meetings, at the site or remotely to ensure the technology is developed in a timely manner
- 5G Testbed participants may not receive technical support if they miss two or more booked technical meetings

## **7.2 Usage Rules for 5G Testbed Individual Components**

- Participants should use the specific security mechanisms, e.g. SSH, OpenVPN tunnels to access the Testbed as agreed with the Testbed Manager during the on-boarding
- Testbed participants should not share the Testbed access credentials to the other users or participants, inside or outside the programme
- Participants shall not try to hack the security mechanism to the Testbed for any purpose, including the purpose of testing its strength or for overloading the Testbed
- Participants should only have limited access to the 5G Testbed to ensure they are subject to monitoring mechanisms
- Testbed users should not change the configuration or setup of provided equipment (phone, modem, laptops etc.) to be connected to the Testbed without a permission from the 5G Testbed Manager

## **7.3 Usage Rules for using/borrowing 5G Testbed Equipment/ Devices**

- Participants should be able to borrow Testbed equipment, e.g. 5G devices, sensors etc., for their specific use cases and their solutions needs based on the prior written agreement with the Testbed Manager
- Participants should take extra care when borrowing the Testbed equipment and are liable for any damage or loss of those equipment. Any damaged or lost equipment should be replaced or paid for
- Participants shall return all the borrowed equipment within a week from the completion or termination of the programme

## **7.4 5G Testbed system Rules**

- The 5G Testbed account should not be used for accessing any 5G Testbed resource that the user is not supposed to or has not applied for, as agreed at on-boarding. If the participant becomes aware of such access they should inform the Testbed Manager
- Participants shall not use tools and techniques that seek to exploit or affect the use of the testbed by other participants (for example port scanning, address spoofing or generate more traffic than agreed with the Testbed Manager)
- Participants should consult and agree with the Testbed Manager beforehand for any large data, more than 1 GB, transfer through the Testbed
- Participants should agree in advance with the Testbed Manager if they have any software or application to be controlled remotely

## 8 Consequences

A violation of the Acceptable Use Policy by any participant may, depending on severity and frequency, result in any of the following:

- Limiting access to the Testbed, e.g. supervised/monitored access
- Temporary suspension of the service
- Suspending from the programme and declining further access to the Testbed, including removing access credentials

Any such violation should be reported to the Testbed Manager.

## 9 Disputes

- 5G Testbed service is provided on a fair reasonable-effort mode. This means that the 5G Testbed technical team will treat all participants equally and fairly
- 5G Testbed participants may raise with the Testbed Manager about any misbehaving service caused or triggered by any compute resources-hungry experiment
- If the service received by a participant appears to be below what the agreed parameters were at the time of the participant on-boarding the participant should discuss with the 5G Testbed Manager the situation and seek an explanation
- In case of unresolved issues whereby the expected testing work cannot be carried out then a participant can raise the issue with the Programme Manager, or the relevant person mentioned under contract.

## 10 Guarantees

- 5G Testbed service is provided on fair reasonable-effort mode. This means that the 5G Testbed technical team will treat all participants equally and fairly in allocating all resources, technical and human, that support the operation of the 5G Testbed
- Whilst reasonable effort will be made to operate the testbed service in a stable way, with any maintenance work planned to not affect testbed usage, it is not possible to guarantee uninterrupted service in a testbed environment.
- Digital Catapult is not responsible for any loss of data, and participants should make every attempt to avoid losing data or work due to unexpected service interruptions

## 11 Data Protection and Privacy

- 5G Testbed will provide a protected space for each participant, through their individual user profile, to operate their service
- 5G Testbed does not provide privacy guarantees to the participants with regard to access to Internet over 5G Testbed
- Digital Catapult shall keep the contact details of the participants for a period of five years after the project end date for use with its applications on both sides
- It is Testbed participant's responsibility to ensure that no personal information, information about the experiment/application and/or any other sensitive information is shown during a public presentation or an event



- It is the Testbed participant's responsibility to ensure that any stored data, i.e. data about the testing, application, experiment or any use case-related data, is backed up before the end or the termination of the programme
- All the data about a participant's experiment/application and/or any other related data shall be deleted from the Testbed upon the completion or termination of the programme unless an agreement between Digital Catapult and Testbed participant is reached to keep the data for further tests beyond the programme

### **12 Testing/Experimenting Results**

- Testing should take place according to the contract, and any Test Plans as agreed during the on-boarding with the Testbed Manager and 5G support team
- The participant and 5G Testbed support team should mutually agree to provide a detailed report on testing activities and demonstration

### **13 5G Testbed Use Completion/Termination**

- Participants's access to the Testbed shall be stopped upon the completion/termination of the programme
- In the case of early termination of the programme, Testbed participants should inform the Testbed Manager and agree on the steps to complete this termination
- Following the completion/termination, Testbed Manager shall remove the access credentials from the system to prevent any access attempt

### **14 Access Policy Reviews**

- Digital Catapult In coordination with the Testbed Manager reserves the right to modify this Testbed Use Policy at any time by providing written notice to the Testbed users/participants