



**Software Documentation
Level-0 Registered Device Service**

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ABBREVIATIONS

API	Application Interface
FAE	Field Application Engineer
HTTPS	Secure Hypertext Transfer Protocol
L0	(Registered Device) Level-0
RD	Registered Device
RDSID	Registered Device Service Identification
SSL	Secure Socket Layer
UID	Unique Identity Data
UIDAI	Unique Identification Authority of India

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REFERENCES

Table 1: References

Document Name	Description	Location
Registered Devices Technical Specification – Version 2.0.2 (Revision 1) – July 2017	Registered Devices Technical Specification	https://uidai.gov.in/images/resource/aadhaar_registered_devices_2_0_09112016.pdf
Aadhaar Authentication API Specification – Version 2.5 – March 2018	Aadhaar Authentication API Specification	https://uidai.gov.in/images/resource/aadhaar_authentication_api_2_5.pdf

1 INTRODUCTION

1.1 About This Document

This document contains information on NEXT Biometrics Registered Device (RD) service. Intended audience are all users of NEXT Biometrics Level-0 Registered Devices. The document assumes that the audience is familiar with Aadhaar.

1.2 About NEXT Registered Device Service

NEXT Biometrics Registered Device (RD) service is a host operating system service / application. It serves as an interface between NEXT Biometrics Level-0 Registered Device fingerprint readers and modules and customer applications.

NEXT RD service complies with the requirements per UIDAI Registered Device Technical Specification, Version 2. (Revision 1) and Aadhaar Authentication API Specification – Version 2.5 for Level-0 Registered Devices

1.3 Registered Device Service Properties

Table 2 lists NEXT Registered Device service properties.

Table 2: Registered Device Service Properties

Property	Value
Supported modality	Fingerprint
Level of compliance	Level-0 (L0)
Supported device models	NEXT Biometrics NB-3023-U-UID USB fingerprint reader ¹ (MI NB-3023-U-UID) NEXT Biometrics NB-2023-U-UID USB fingerprint module (MI NB-3023-U-UID) NEXT Biometrics NB-2023-S-UID SPI fingerprint module (MI NB-2023-S-UID) (planned Q1/2019).
Supported sensor models	NEXT Biometrics NB-0510-S
Connectivity	USB 2.0 (MI NB-3023-U-UID) SPI (MI NB-2023-S-UID)
Supported Operating Systems	Windows 7, 8.1, 10 (32 and 64 bit) Android from version 5.0 (API 21)
Extractor	Innovatrics ANSI_ISO_SDK v2.0.3, MINEX 3 certified
RD Service ID (RDSID)	Windows: NEXTL0.WIN.001 Android: NEXTL0.AND.001 (SafetyNet) Android: NEXTL0.AND.201 (Managed OS)
RD Service Version	1.0.0
DP ID	NEXTBIOMETRICS.AQT

¹ At the host, NB-3023-U-UID USB is recognised as NB-2023-U-UID

2 INSTALLATION

2.1 Supported Platforms

Windows 7, 8, 8.1, 10 (32 or 64 bit)

Android from version 5.0 or higher

USB 2.0 or higher.

2.2 Supported Products

NEXT Biometrics NB-3023-U-UID USB fingerprint reader

NEXT Biometrics NB-2023-U-UID USB fingerprint module

2.3 Download Links

<https://www.nextbiometrics.com/rd>

<https://nextbiometrics.com/rd>

<https://support.nextbiometrics.com>

[RDService L0 Setup](#)

2.4 Network Connectivity

Host must be connected to the Internet. Secure http (https) connection must be available. Internet connection is also supported via proxy server.

2.5 Installation Instructions

Plug-in the NB-3023-U-UID reader to the host.



Figure 1: NB-3023-U-UID “Scallop” reader

L0 RD Service package is available at Support Portal, link [here](#). The installer package will install both USB device driver and L0 RD Service.



Figure 2: RD Service installation

Once the installation is done RD service will be launched and listening at port 11100 - 11120 at IP address 127.0.0. If needed, NEXT Biometrics L0 RD Service can be manually stopped or started from [Services](#) application.

NEXT Biometrics NB-AD00-U device driver will be installed during RD Service installation.

Current driver version: 1.0.1.0 dated 15.8.2017.

IMPORTANT

After the installation, RD service is configured for “production” environment. **Until production environment is not available, staging environment shall be used.** It is necessary to configure the service to staging mode. Follow instructions in section 4.3.3.

2.6 De-Installation Instructions

Run Uninstall.exe located in the directory where RD Service is installed. RD Service can be also uninstalled by Windows Add or Remove programs tool.

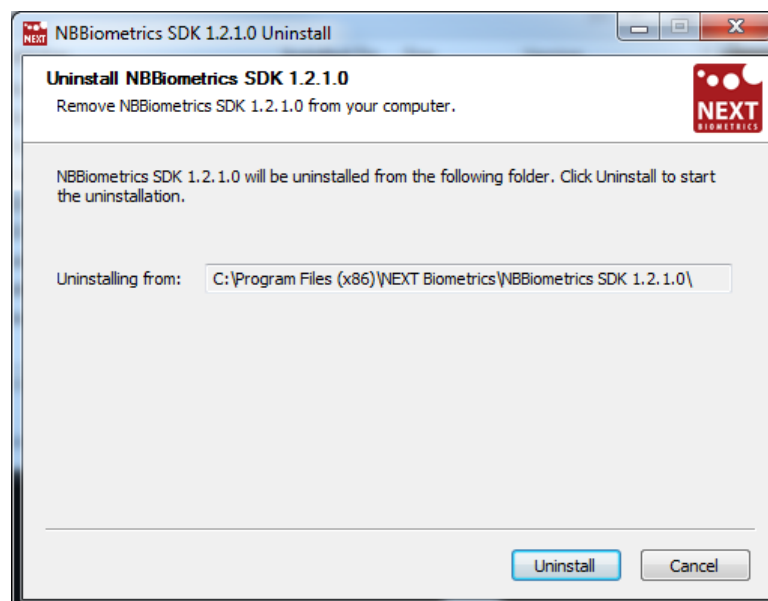


Figure 3: RD Service de-installation

3 RDSERVICE CONFIGURATION

3.1 RDSERVICE Setup

RDSERVICE setup is intended for smooth installation of both RDSERVICE service, required libraries and configuration as well as drivers for NEXT Biometrics NB-3023-U-UID device (or module NB-2023-U-UID). In case RDSERVICE is already installed, RDSERVICE will ask the user to confirm if current installed version should be removed. If NO is selected, RDSERVICE installation exits. RDSERVICE setup does not check versions (meaning it is possible to install previous version over newer RDSERVICE version).

RDSERVICE setup has following OPTIONAL command options:

- 1) /S – execute setup in silent mode (no UI). All USER questions (like USER confirmation mentioned above) are automatically selected as YES.
- 2) /PRESERVE=1 (or /PRESERVE=0) – depending on 1 or 0 will preserve configuration files (RDSERVICE.exe.config, RDSERVICETray.exe.config) during uninstallation of previous version and installation of newer version.

If no optional command is entered, the application will ask user questions and replace existing configuration files.

3.2 RDSERVICE.exe.config configuration

Standard C# setting file format is used (<https://docs.microsoft.com/en-us/dotnet/framework/configure-apps/index>). Only main settings will be specified below, system settings:

- 1) Log4net – log4net is used for specifying logging of the service, more on configuration options for log4net: <https://csharp.today/log4net-tutorial-great-library-for-logging/>
- 2) System.net – system.net allows to configure proxy: <https://docs.microsoft.com/en-us/dotnet/framework/configure-apps/file-schema/network/system-net-element-network-settings>
- 3) appSettings – custom settings that are described below. Each new setting is specified in following format: `<add key="%key%" value="%value%" />` - where key is name of setting and value is value that is to be assigned.

3.2.1 Environment

To select working environment add / modify the following line in <appSettings> section in RDSERVICE.exe.config and restart the service.

```
<add key="Environment" value="Staging" />
```

Available values are: Staging, PreProduction, Production (default).

3.2.2 Pre-flight mode

To enable pre-flight mode, add the following lines to <appSettings> section in RDSERVICE.exe.config and restart the service.

```
<add key="AllowOptionsHeader" value="true" />
<add key="AllowOrigin" value="*" />
```

4 TROUBLESHOOTING

4.1 RD Service log

RD L0 Service has implemented logging system. All important events and messages are tracked and stored to text log file. In case any problem occurs, the log file is the best place to check what happened.

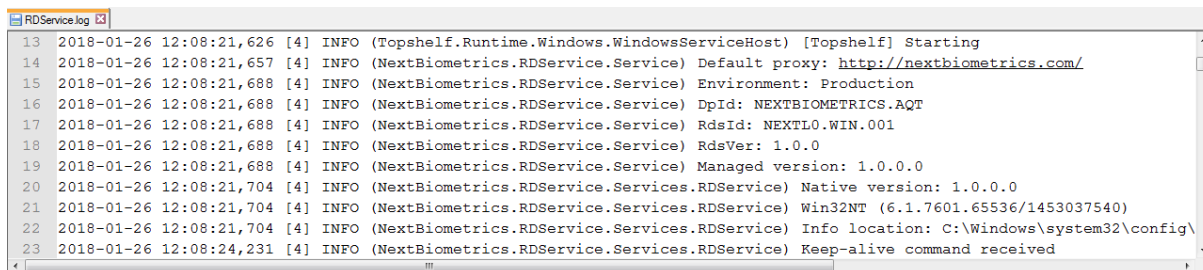


Figure 4: RD Service messages

RD Service log file is located under \Logs directory in the directory where RD Service is installed. The default RD Service installation path is "c:\Program Files (x86)\NEXT Biometrics\RDService L0\".

4.2 RD Service is not running

If service state is "not running" then check if the service is not stopped. It can be done by Services GUI or from Windows command prompt.

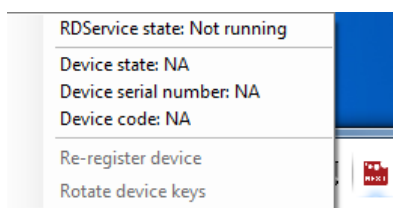


Figure 5: RD Service state: Not running

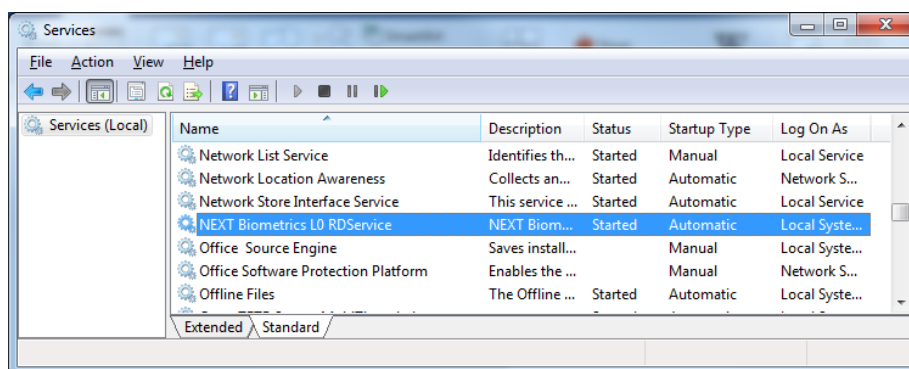


Figure 6: Windows Services GUI

4.2.1 Command line approach

- 1) Check if RD service is not stopped

sc query "NEXT Biometrics L0 RDService"

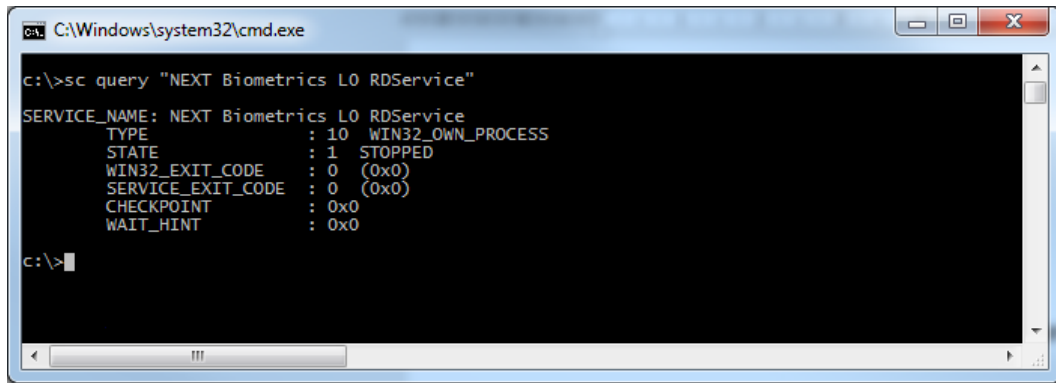


Figure 7: RD Service control via Windows command prompt

- 2) If RD service is stopped then open Windows command prompt as administrator (Right click on command prompt -> Run as administrator) and start the service.

sc start "NEXT Biometrics L0 RDSERVICE"

Ensure that the service will start automatically next time by running following command:

sc config "NEXT Biometrics L0 RDSERVICE" start= auto

4.3 RD Service is not ready

There can be several reasons for RD Service “Not ready” state.

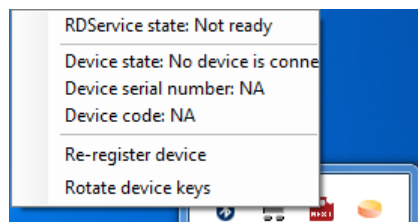


Figure 8: RD Service state: Not ready

4.3.1 No device is connected

- 1) If the reader is not connected “Device state” under RD Service tray shows “No device is connected” as in Figure 8.
- 2) Make sure the reader is properly connected to USB port. If the reader is connected, then re-plug the reader.
- 3) If the reader is connected to the host via external USB hub, connect the reader directly to PC USB port.
- 4) Check if the reader is listed in Device Manager. The correct driver name is “NEXT Biometrics NB-AD00-U” and can be found under Universal Serial Bus Devices.

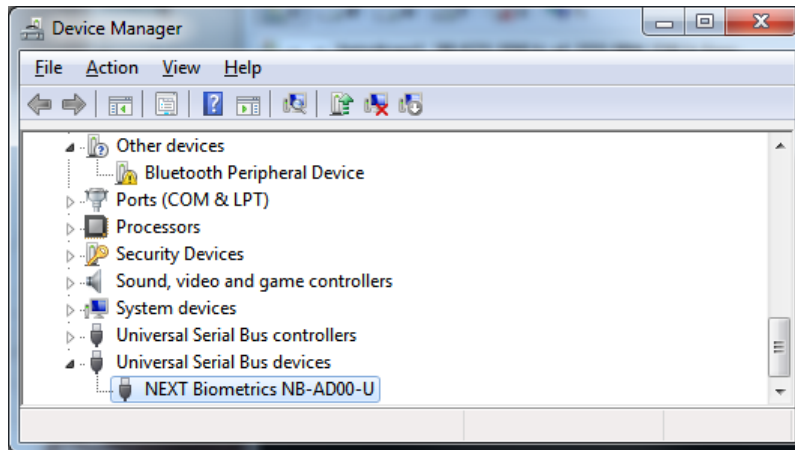


Figure 9: NB-AD00-U device driver

- 5) If the reader is enumerated but the driver has not been installed install the driver manually. The driver can be found under \Drivers directory in the directory where RD Service is installed. The default RD Service installation path is “c:\Program Files (x86)\NEXT Biometrics\RDService L0\”.

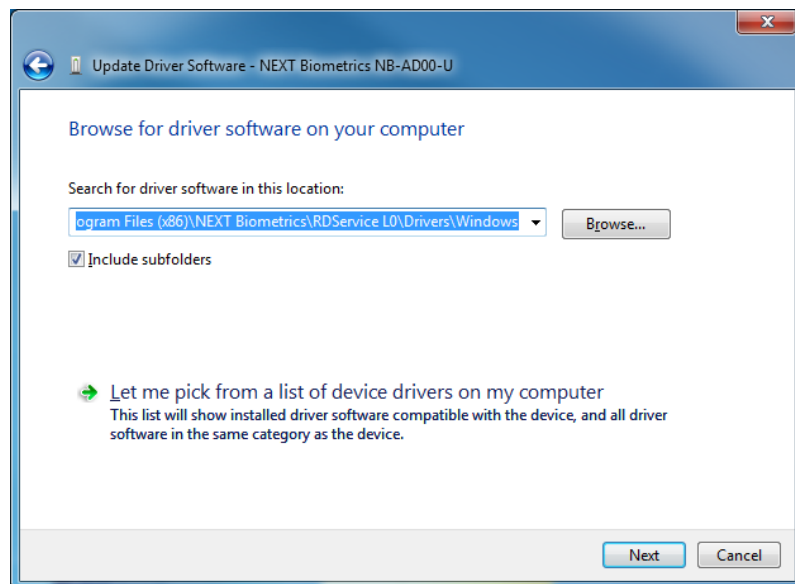


Figure 10: Manual driver installation

- 6) If UID reader is connected and the driver installed the serial number will be listed in RD Service tray as shown at Figure 11.

4.3.2 Device has no key

Try to rotate device keys. Open RD Service tray and click on “Rotate device keys”

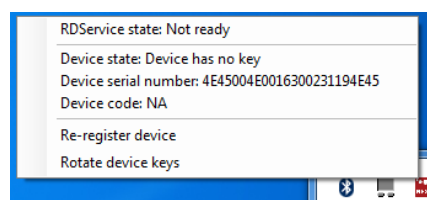


Figure 11: Device has no key

If the rotation failed continue by reading section 6.3.3.

4.3.3 Device registration / key rotation failed

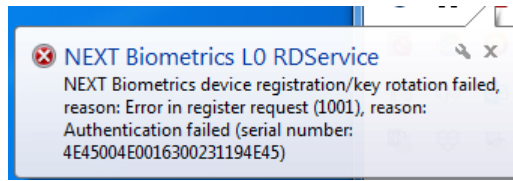


Figure 12: Device registration / key rotation failed

The reason of failure, especially after first RD Service installation or in case the service has been reinstalled (e.g. by a new version) might be bad environment settings.

By default, the service is configured for “production” environment. Until production environment is not available, staging environment shall be used.

To set staging environment, edit RDService.exe.config file and add

```
<add key="Environment" value="Staging" />
```

into appSettings section as shown in Figure 13.



Figure 13: Configuring RD Service for Staging environment

More details about RD Service settings can be found in section 4.2.1.

NOTE: the RD Service log file is located under \Logs directory in the directory where RD Service is installed. The default RD Service installation path is “c:\Program Files (x86)\NEXT Biometrics\RDService L0”.

Restart (Stop -> Start) the service now. Refer to section 4.2 on how to do that. Restarting service will automatically initiate device key rotation. Once the process is finished, RD Service notification message pops-up.

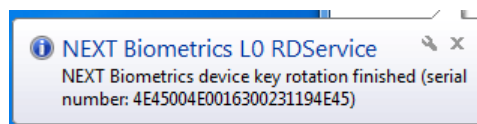


Figure 14: Key rotation

If the key rotation /device registration fails again, the device is likely not whitelisted at management server. In that case, contact us at <https://www.nextbiometrics.com/company/contact/>

5 UIDAI SERVER ERRORS

Refer to [Aadhaar Authentication API Specification](#)

6 TEST RIG

This section describes how to configure the system and make authentic attempt with NB-3023-U-UID reader against Aadhaar Server.

6.1 UIDAI Authentication Client Installation

- 1) Download Test_RIG_pack zip file from Support Portal, link [here](#).
- 2) Follow instructions in attached test-rig-installation-guide.docx

6.2 L0 RD Service installation

Follow steps in section 2.5 to install RD Service on your PC.

Make sure that the service is configured to use **staging server**. Refer to section 4.3.3 on how to do that.

6.3 UIDAI Authentication Client

Once UIDAI Authentication client is installed and launched (section 6.1), open <http://localhost:8091/> in a web browser. The page shown at Figure 15 should appear.

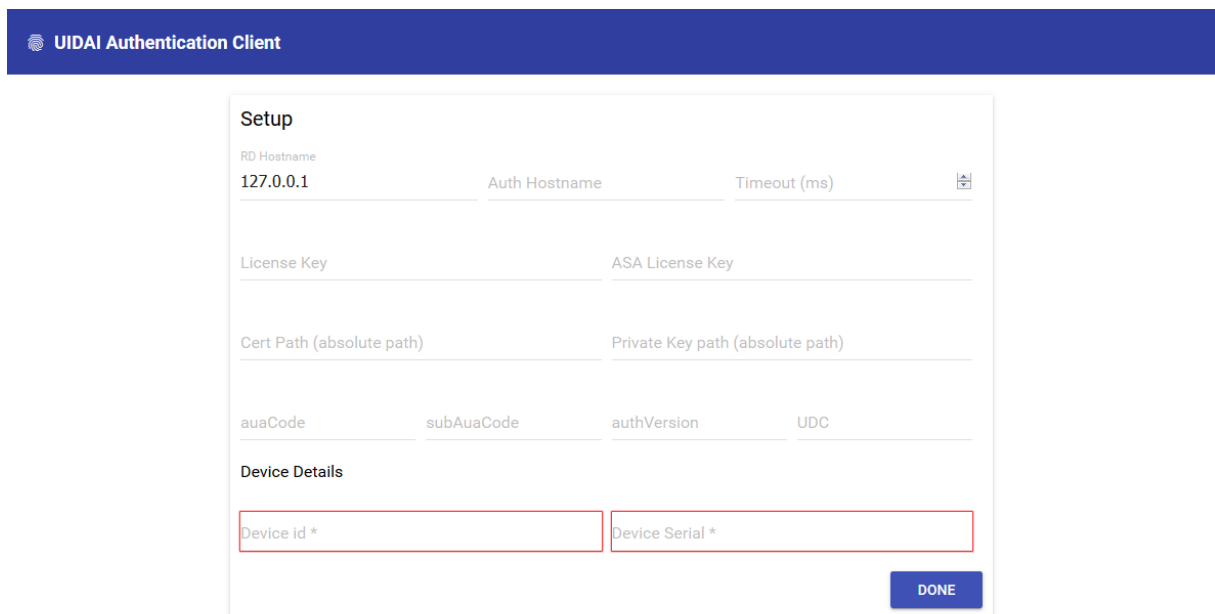


Figure 15: UIDAI Authentication Client

There is no need to fill anything in Setup. Click DONE. UIDAI Authentication Client appears.

You should see device status “READY”. If the device is not ready, check if RD Service is running and the device is registered. (see section 4)

6.3.1 Capture test

- 1) Fill in parameters to PID Options block in as shown in Figure 16:
 fCount = 1
 fType = **FMR**
 format = **XML**
 pidVer = **2.0**

- 2) Click Capture. Blue LED on the reader will start flashing. If not specified, operation timeout is 10 seconds. Timeout value can be set under PID options.
- 3) Put your finger on the sensor. The device will capture fingerprint and return SUCCESS.

The screenshot displays the UIDAI Authentication Client interface. The top navigation bar includes 'Adhoc', 'Batch', and 'Rapid' tabs. The main interface is divided into three panels:

- Pid Options:** Shows device status (Port:11100 Status:READY), fCount (1), iCount, pCount, fType (FMR), iType, pType, format (XML), pidVer (2.0), OTP, wadh, posh, and timeout. It includes 'CAPTURE' and 'INFO' buttons.
- Personal Information (Pi):** Includes fields for Name, Match%, localName, Match%, Match Strategy, gender, DOBT, Email address, Phone, Date of Birth, and age. It also has an 'OTP' section with a 'channel' dropdown and a 'GENERATE' button.
- Authentication Results:** Shows a 'SUCCESS' status with a green checkmark. Below it, a JSON response is displayed:


```

{
  "root": {
    "rdParams": {
      "Demo": {
        "Opts": {
          "fCount": "1",
          "fType": "0",
          "format": "0",
          "pidVer": "2.0"
        }
      }
    },
    "authParams": {
      "host": "127.0.0.1",
      "lk": "",
      "ac": "",
      "sa": "",
      "ver": ""
    }
  }
}
```

 An 'EXPORT JSON' button is also present.

Figure 16: UIDAI Authentication Client – Capture test

6.3.2 Authentication test

- 1) Fill in parameters to PID Options block in as shown in Figure 17:

fCount = 1

fType = FMR

format = XML

pidVer = 2.0

- 2) Enter AADHAAR number and click Authenticate. Blue LED on the reader will start flashing. If not specified, operation timeout is 10 seconds. Timeout value can be set under PID options.
- 3) Put your finger on the sensor. The device will authenticate you against AADHAAR server.

UIDAI Authentication Client
Adhoc Batch Rapid

Pid Options

Devices

Port: 11100 Status: READY

fCount
1

iCount pCount

fType
FMR

iType pType

format pidVer
XML 2.0

OTP

wadh posh timeout

Custom Options

CAPTURE
INFO

Personal Information (Pi)

Name Match%

localName Match%

Match Strategy gender DOBT

Email address
 Phone

Date of Birth age

OTP

channel

GENERATE

Aadhaar Number

999999990019

AUTHENTICATE

❌ 300_N
EXPORT JSON

```

root: {} 10 keys
└─ rdParams: {} 2 keys
   └─ Demo: {} 0 keys
      └─ Opts: {} 4 keys
         fCount: "1"
         fType: 0
         format: 0
         pidVer: "2.0"
      └─ authParams: {} 7 keys
         host: "127.0.0.1"
         lk: ""
         ac: ""
         sa: ""
         ver: ""
          
```

Figure 17: UIDAI Authentication Client - Authentication test