IoT in the machine economy: Achieving trust between business partners.

Gianni Rüegg & Dumeni Vincenz, 8th March 2019

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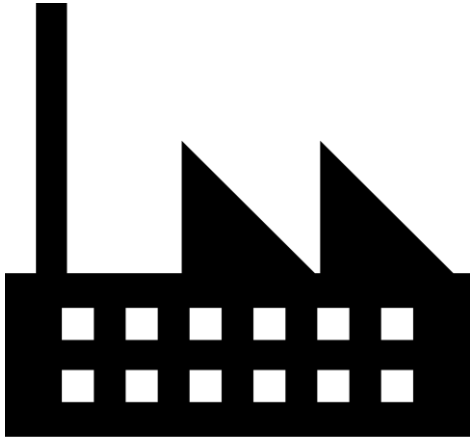
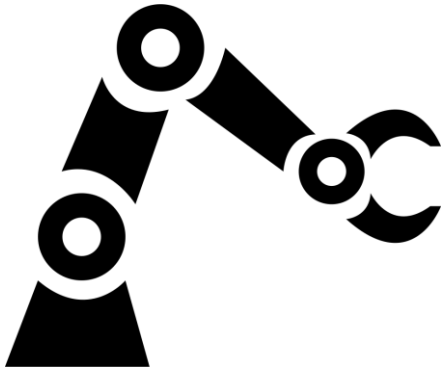
Starting position

- Manufacturer of high-end precision industry machines
- The manufactuer sells globally, to different countries with different law systems
- To buy a machine, the customer has to pay the full price in advance





The Challenge

Create a technological solution which **builds trust:**

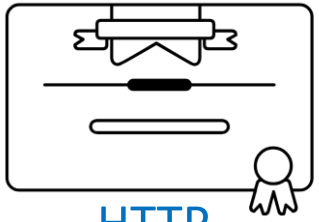
- **Manufacturer should be able to reach more customers (e.g with new business models):**
  1. e.g. Pay As You Go (PAYG)
  2. e.g. Rent model
- **Customers should be able to get a more affordable loan**
  1. The lower the risk of the investment, the cheaper the loan
  2. Various financing options possible (e.g. private investors)
- **Risk should be minimized for all parties**
  1. Automated contracts
  2. Establish trust between the parties
  3. Exclude human errors

API – IoT Device Mockup

* = provided by us

* = developed by you

IoT device mock

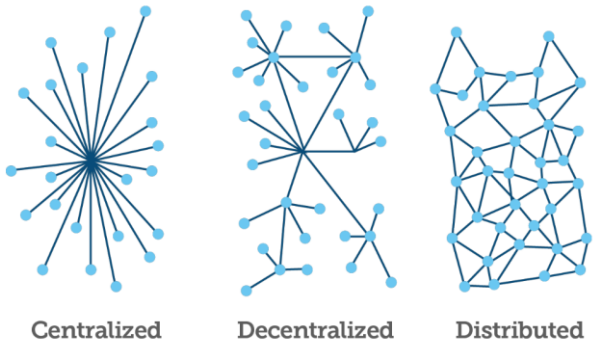


Token with signed message for verification

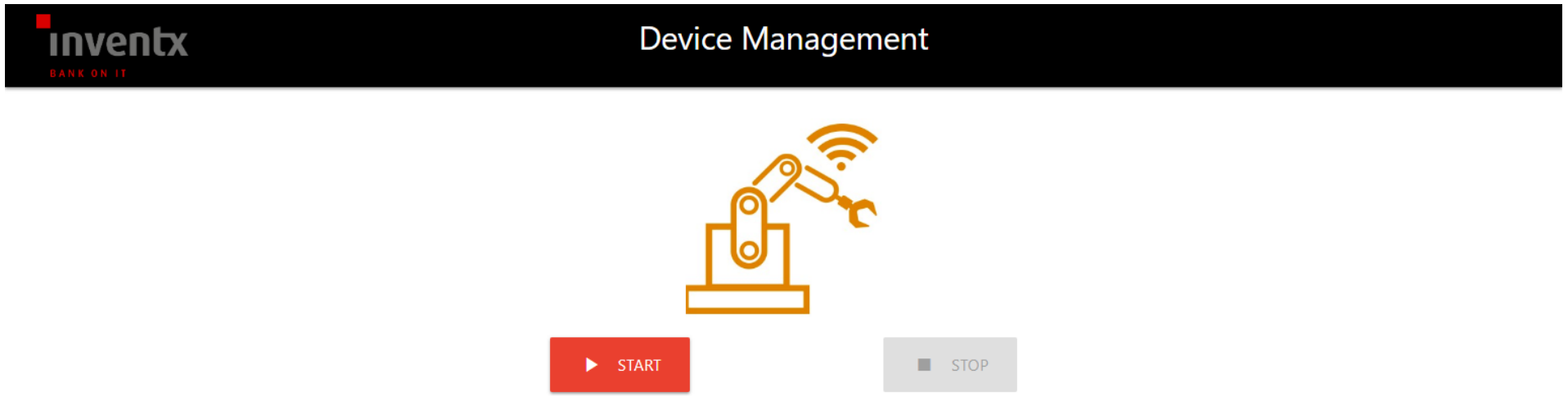
This token is needed to start the device and contains the amount of work the machine is allowed to do.

Contracts

Ledger



GUI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Device Management
START
STOP
Device information
Select Device
Inventx-DeviceModel
Serial Number
328439797
Name
Inventx-DeviceModel
Work Counter
0
Credit
0
Is Working
No
Last Service
08.03.2019
Next Service
16.06.2019

Device Mock

Device

- GET /api/devices→ gets list of all machines including details
- GET /api/devices/{serialNumber}→ gets details for specific device including available amount of work
- GET /api/devices/{serialNumber}/tokens→ returns tokens already being submitted for this device
- POST /api/devices/{serialNumber}/tokens→ post a new token to a device
- PUT /api/devices/{serialNumber}/start → start the device
- PUT /api/devices/{serialNumber}/stop → stop the device

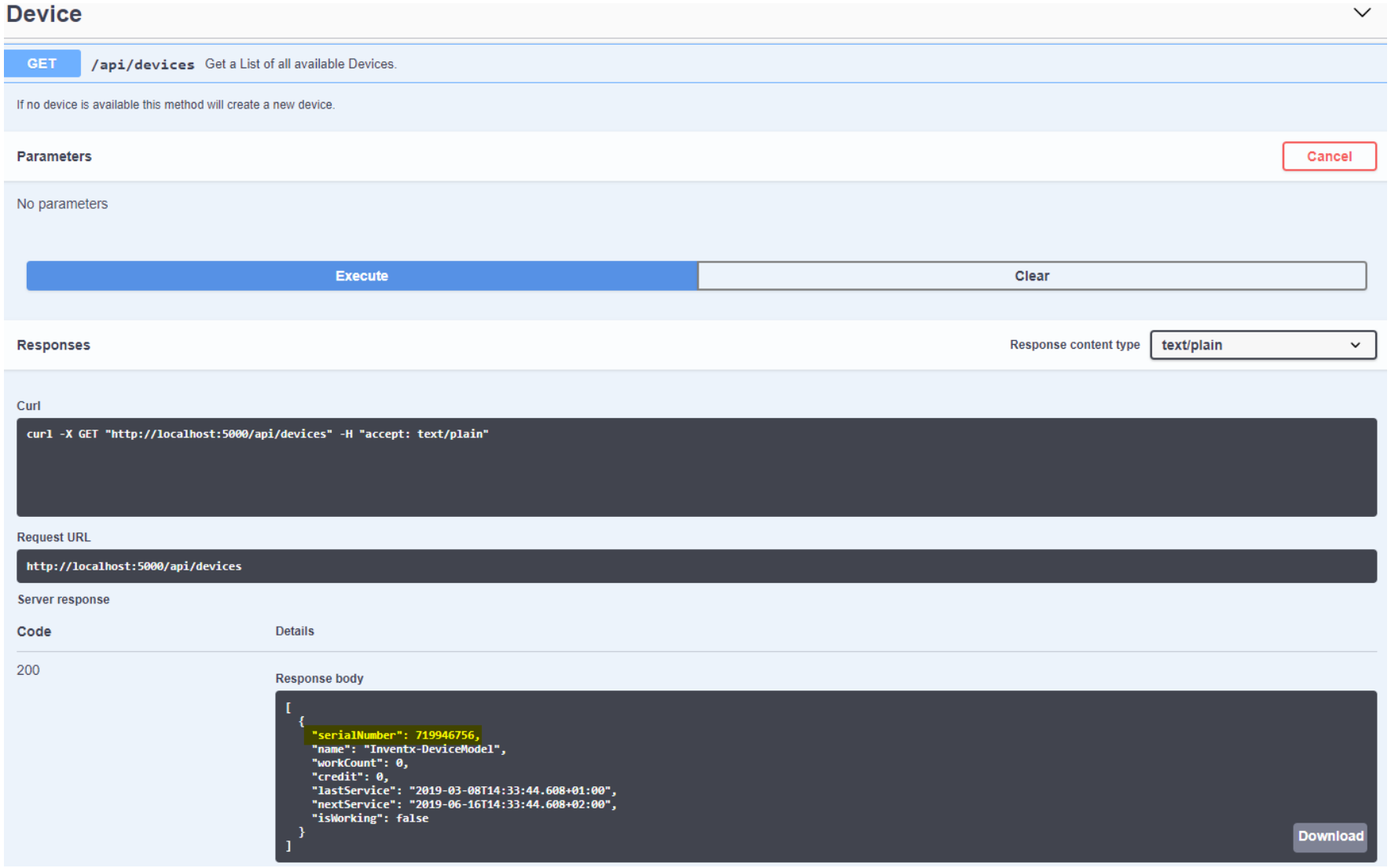
Token

- POST /api/tokens → generate new token for device with available work amount

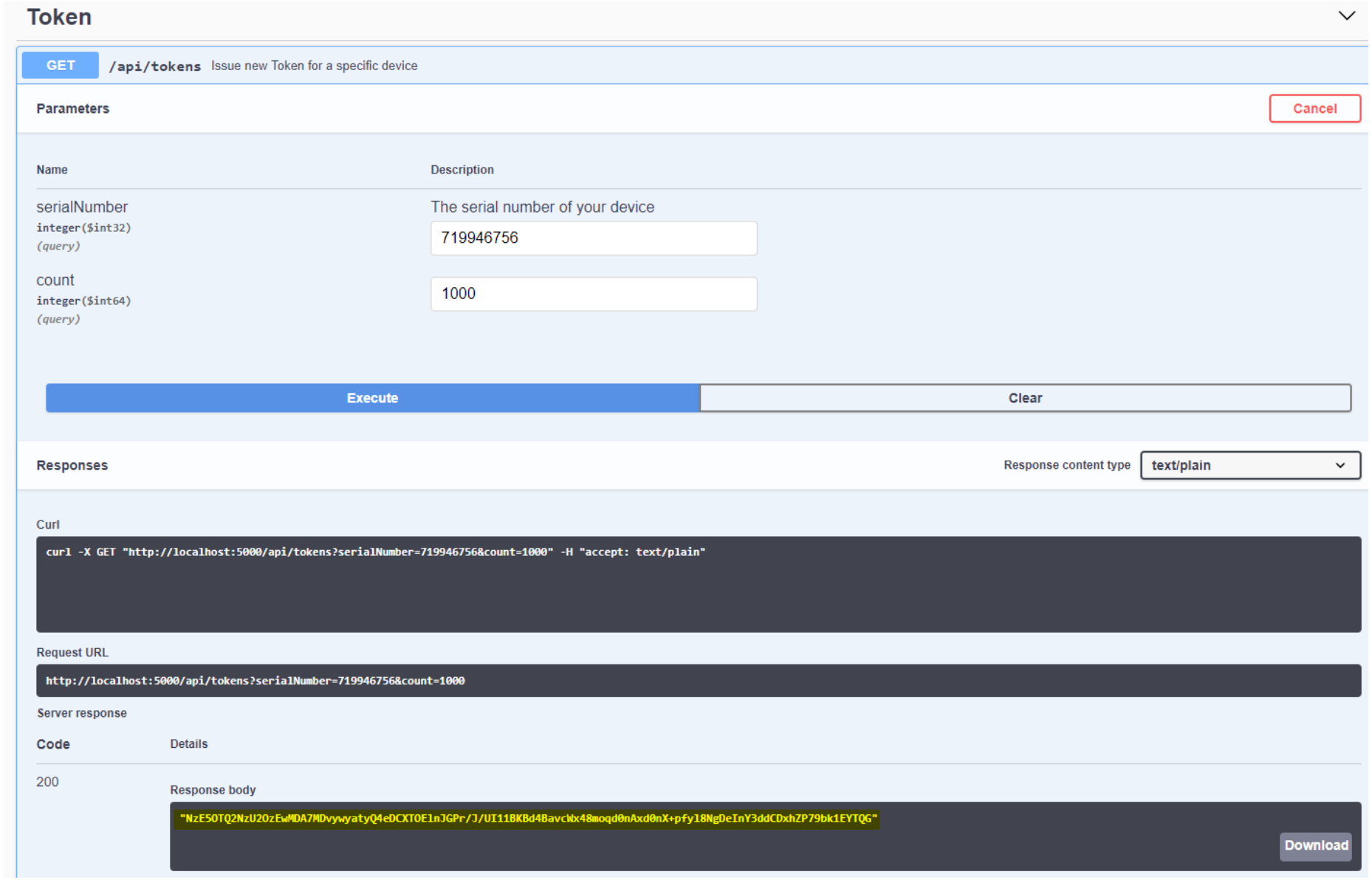
Maintenance

- DELETE /api/maintenance → will reset the database and delete all tokens and devices
- POST /api/maintenance/add → Use to add new device if you need more than one device

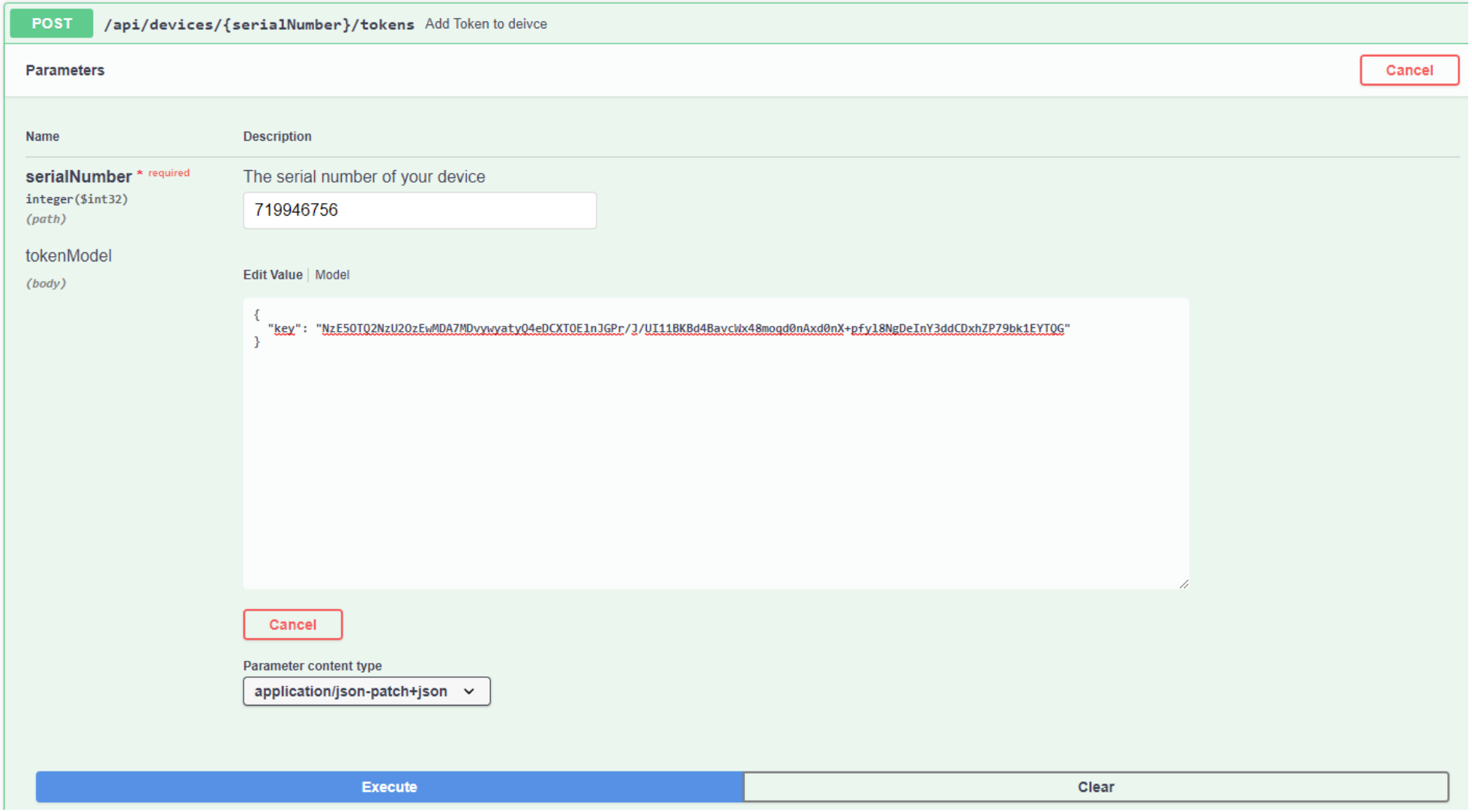
Demo – Issue new token to a device



Demo – Generate a new token



Demo – Assign the token to the machine



Demo – Check GUI and start the machine

START STOP

Select Device

Inventx-DeviceModel

Device information

Serial Number	719946756
Name	Inventx-DeviceModel
Work Counter	320
Credit	680
Is Working	Yes...
Last Service	08.03.2019
Next Service	16.06.2019

Mock disclaimer

- Our mock can be adjusted to your needs.
- Found errors in the mock do not contribute to the solution.

Access to the API

Facts

- Built with .NET Core 2.1 (Link)
- We provide you the source code and the compiled .dll
- Download both here: https://github.com/inventxHackathon/mock

API

- http://localhost:5000/

Documentation

- http://localhost:5000/swagger

GUI

- http://localhost:5000/gui/index.html
  Displays a web based GUI to interact with the machine.
  This GUI can be used to start and stop the machine.

Requirements

- Scalable solution, which works globally and can be adapted for other industries
- New business models can be achieved with this solution
- Protected from unauthorized interaction
- Business transaction costs should become cheaper
- Operating costs should be low, compared to current markets solutions
- Nearly impossible to cheat or is not financially worthwhile to do so
- Easy to handle in daily business

A possible solution could involve a distributed ledger technology, but is not mandatory.

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Questions?

For more information

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