

SDF & NIPC hackathon report

ASDF working group meeting

The ASDF hackathon team

Dublin 07/09/2024

The ASDF hackathon team

- Ari Keränen
- Bart Brinckman
- Braeden Sandford (remote)
- Carsten Bormann
- Eliot Lear
- Michael Richardson
- Niklas Meyer (remote)
- Rohit Mohan (remote)
- Sriram Sekar (remote)

Thank you for participating!!!

Hackathon Plan

Work on 2 classes of problems

- Converting models between eco-systems: SDF & Matter
- Using SDF in networking environments (NIPC & SCIM):
 - ASDF describes interaction of Things
 - SCIM for devices provides device onboarding
 - NIPC is an Application Gateway for Non-IP Protocols-> How can they interoperate?

IETF DRAFTS:

- [draft-ietf-asdf-sdf](#)
- [draft-ietf-asdf-nipc](#)
- [draft-ietf-scim-device-model](#)

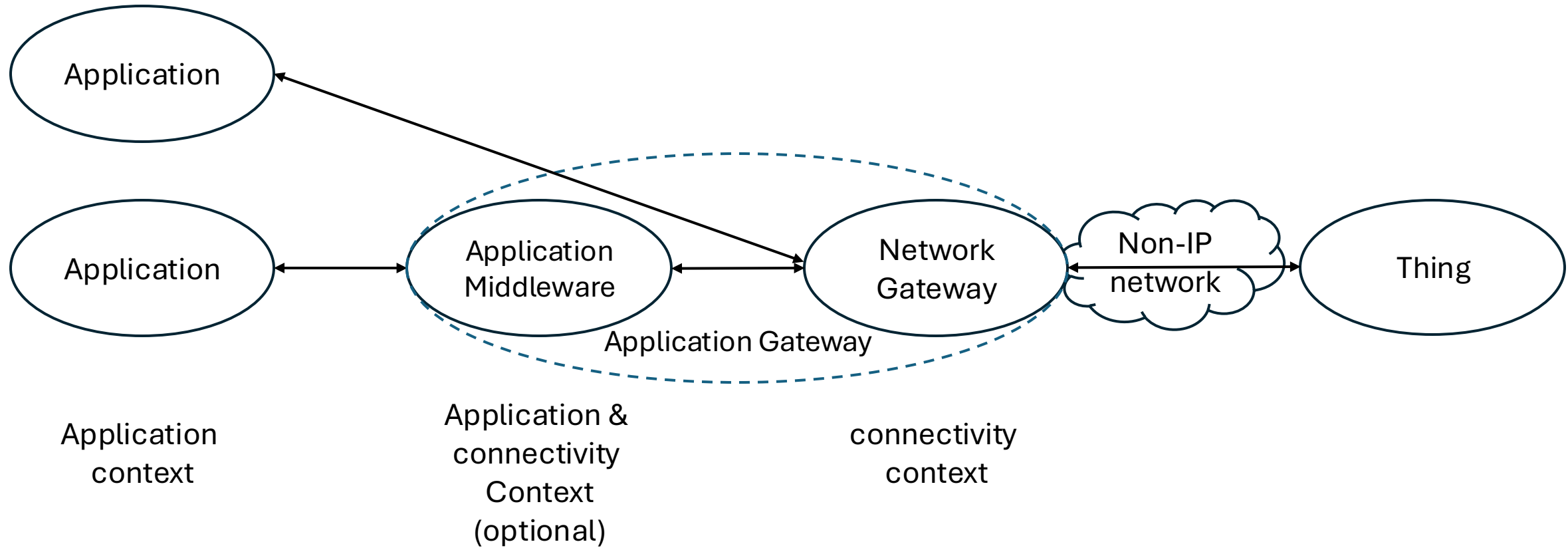
Matter ↔ SDF

Matter ↔ SDF

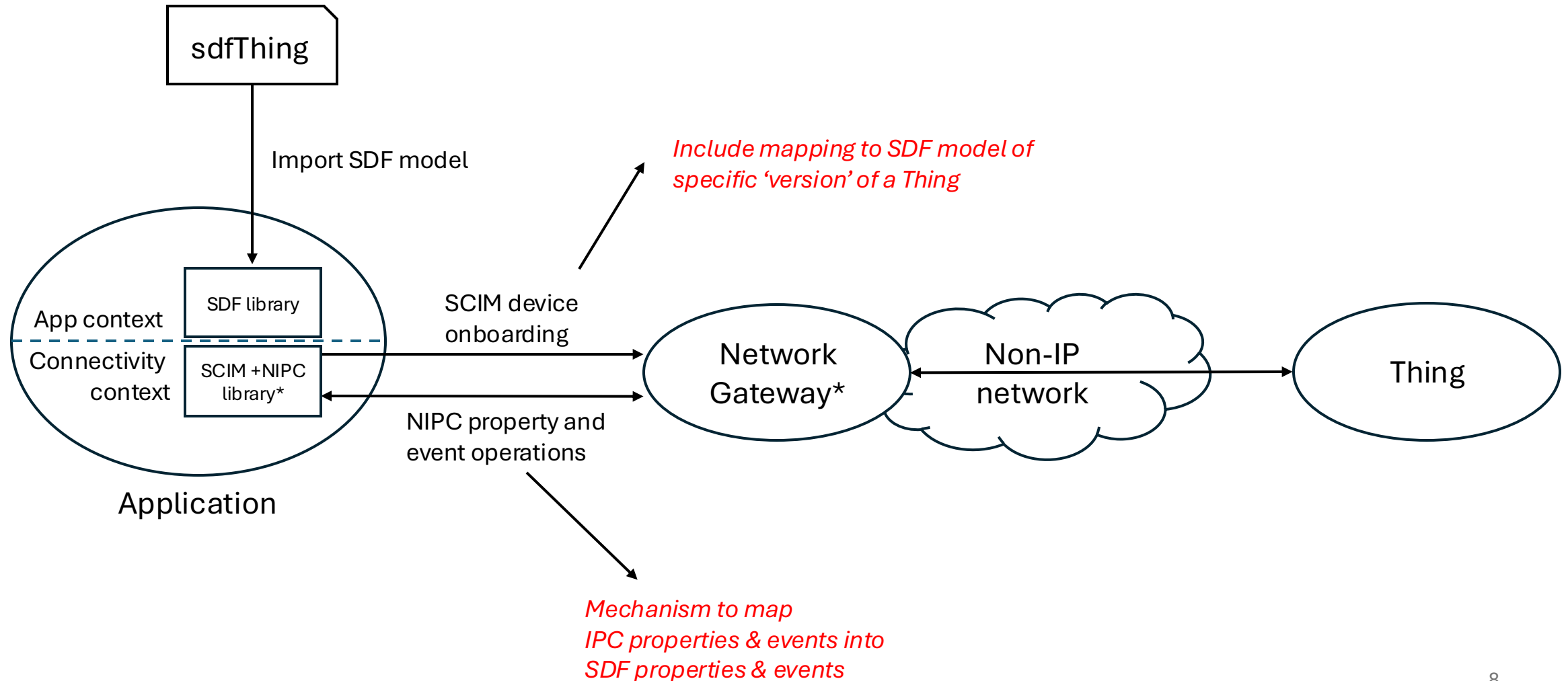
- Converter written by Niklas Meyer
- Achievements:
 - Verified: [converter](#) can be used by other ASDF people
 - [Docker container](#) for the conversion tool
- Work in Progress:
 - Ongoing: Document demo setup with physical Matter and non-Matter devices
(Validating interoperation between LwM2M/IPSO and Matter via SDF)

NIPC in SDF

NIPC in SDF: Roles



Deployment model 1: Network Gateway



* SCIM Server + NIPC Gateway

Mapping NIPC properties and events to SDF properties & events

NIPC currently supports 'registration' APIs that map a NIPC property or event to a protocol-specific property

- **Example: POST /registration/property:**

```
{ "property": "temperature",  
  "ble":  
    { "serviceID": "12345678-1234-5678-1234-56789abcdef4",  
      "characteristicID": "12345678-1234-5678-1234-56789abcdef4",  
    }  
}
```

- **Example: POST /registration/event:**

```
{ "event": "enterprise/hospital/pulse_oximeter",  
  "property": "heartrate",  
  "id": "12345678-1234-5678-1234-56789abcdef4",  
  "ble":  
    { "type": "gatt",  
      "serviceID": "12345678-1234-5678-1234-56789abcdef0",  
      "characteristicID": "12345678-1234-5678-1234-56789abcdef1"  
    }  
}
```

Mapping NIPC properties and events to SDF properties & events

Replacing individual registration APIs with single SDF model registration maps directly to SDF model and simplifies registration.

- a new NIPC quality with a NIPC protocol mapping for sdfProperties and sdfEvents in SDF
- NIPC gateway only needs to be able to interpret NIPC quality
- NIPC registration API registers an SDF model on a NIPC Gateway
- Application can send a subset of the model, e.g. only the required properties/events to perform NIPC operations
- In case the properties carry confidential information (e.g. patient heartrate), application can modify SDF model to obfuscate property or event names.

NIPC quality in sdfProperty

```
"sdfObject": {  
  "healthsensor": {  
    "sdfProperty": {  
      "heartrate": {  
        "description": "The current measured heart rate",  
        "type": "number",  
        "unit": "beat/min",  
        "observable": true,  
        "writable": false,  
        "nipc": {  
          "ble": {  
            "serviceID": "12345678-1234-5678-1234-56789abcdef4",  
            "characteristicID": "12345678-1234-5678-1234-56789abcdef4"  
          }  
        }  
      }  
    }  
  }  
}
```

NIPC quality in sdfEvent

```
"sdfObject": {  
  "healthsensor": {  
    "sdfEvent": {  
      "fallDetected": {  
        "sdfOutputData": {  
          "type": "boolean",  
          "nipc": {  
            "ble": {  
              "type": "gatt",  
              "serviceID": "12345678-1234-5678-1234-56789abcdef1",  
              "characteristicID": "12345678-1234-5678-1234-56789abcdef1"  
            }  
          }  
        }  
      }  
    }  
  },  
}
```

Mapping SDF model to a thing?

- Mapping device firmware/software version to an SDF model
- Retrieve appropriate SDF model based on that version
- Break it down into architectural building blocks
- There might be additional keys: firmware version, hardware version, app version,...

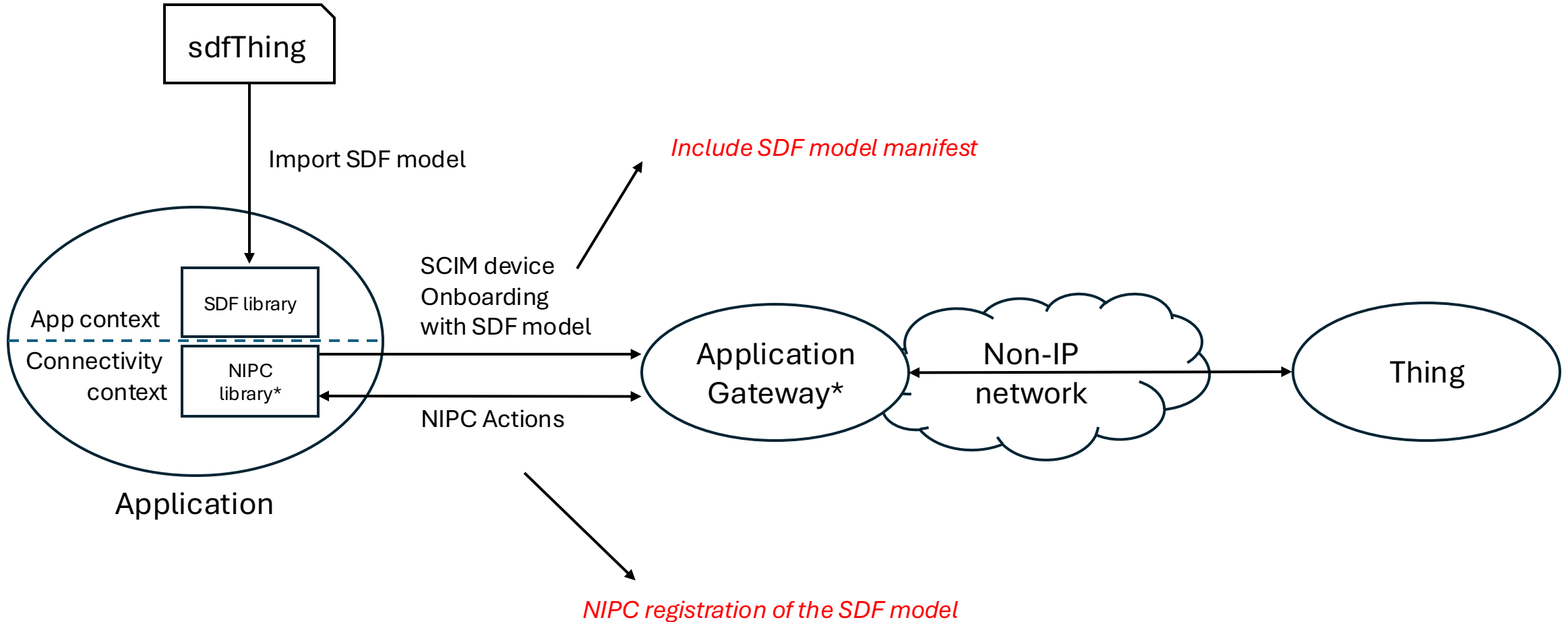
- Inclusion in SCIM
- Reference via MUD
- Direct import



Manifest

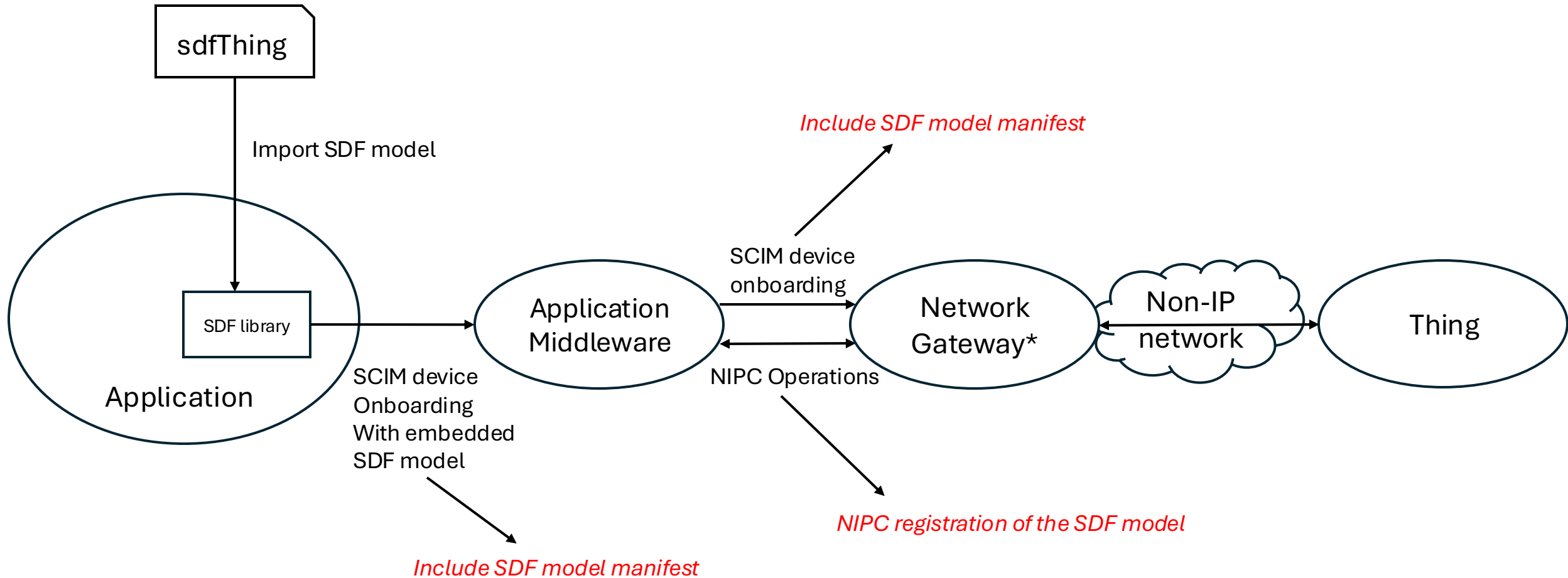
```
{
  manifest-version: 1,
  { firmware-version : 1.2,
    sdf-file : url1} ,
  {firmware-version: 1.3,
    sdf-file: url2}
}
```

Deployment model 2: Application Gateway



* SCIM Server + NIPC Gateway

Deployment model 3: Leveraging middleware



* SCIM Server + NIPC Gateway

Discussion