ONSEN YANG2API

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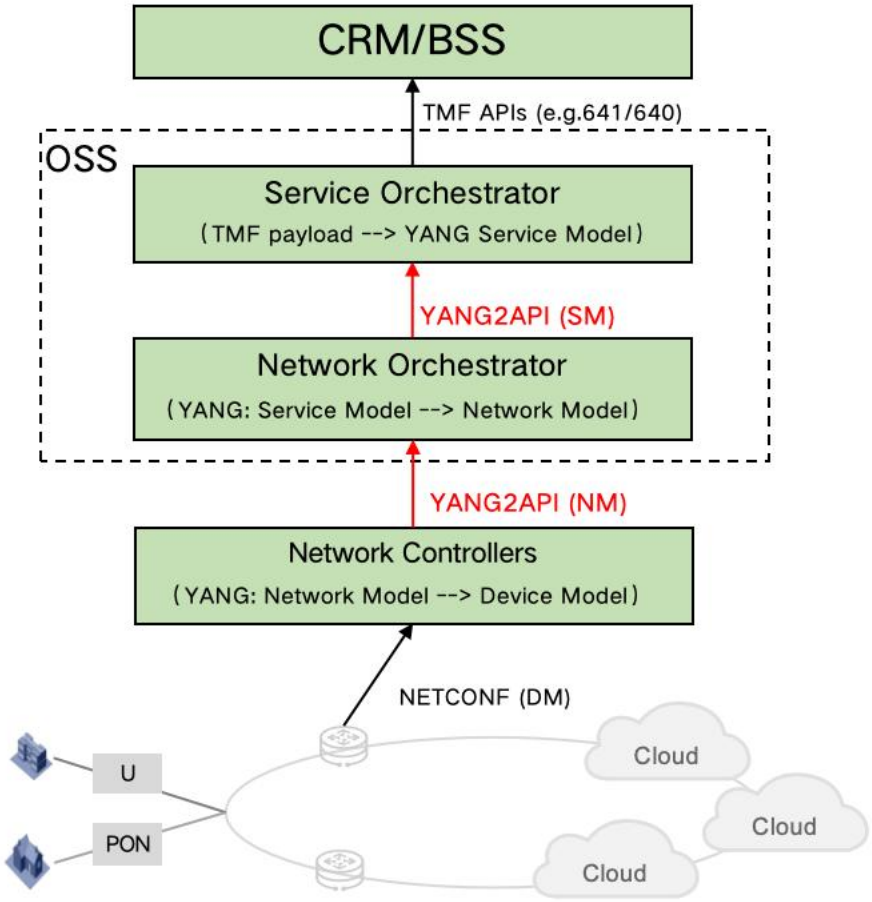
ONSEN (Operationalizing Network & SErvice abstractioNs) BOF

- Type: Working Group Forming- BOF
- Previous name: **ONIONS**
- Goal:
  - The ONSEN WG aims to make IETF service and network abstractions easier to implement and use, improving automation, operational efficiency, and interoperability.
- Time：9:00~11:00, March 17(Tuesday)
- Location：Grand Ballroom 1

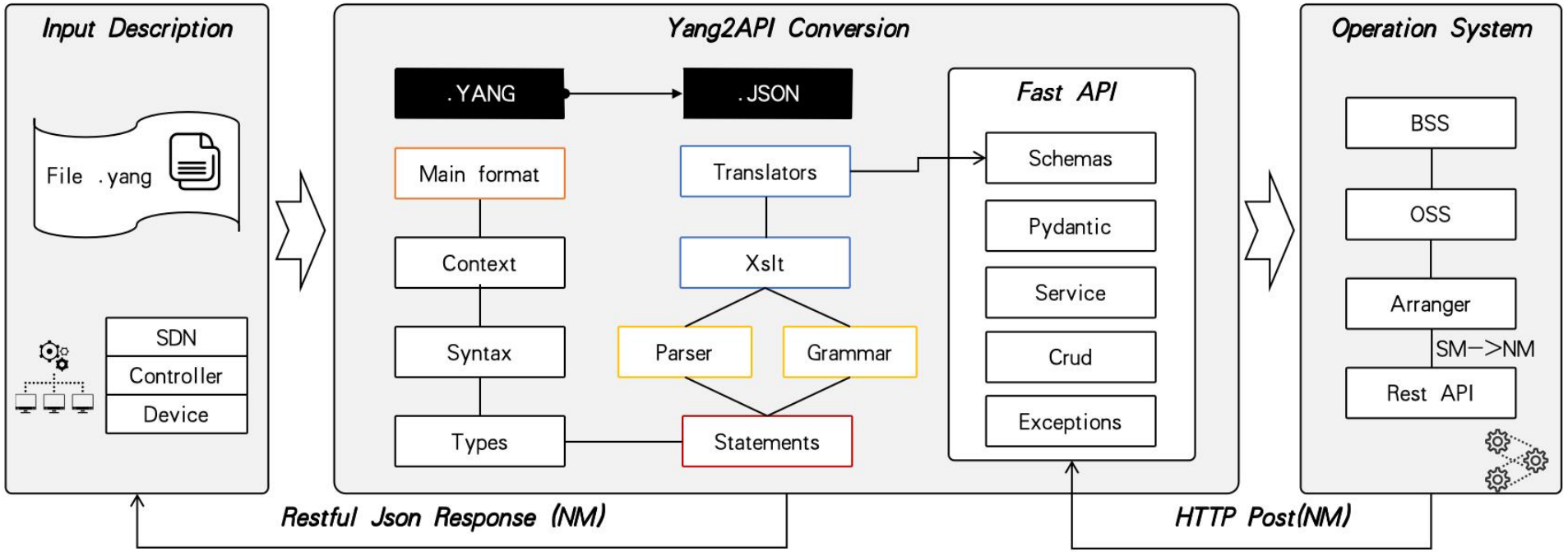
ONSEN YANG2API

YANG2API is a technical methodology for the automatic generation of API interfaces based on the YANG data models.

Its primary function is to transform the data structures, fields, constraints and relationships defined within YANG modules into JSON Schema and RESTful API that can be directly invoked by upper-layer systems.



Functional Architecture



- Model Parsing: Utilize tools such as pyang to perform deep parsing of .yang files compliant with IETF specifications.
- Model Mapping and Standardization: Generates core API parameter JSON Schemas based on the fields and constraints derived from the parsed YANG models. Simultaneously, maps the various constraint rules defined in the YANG models directly to API validation rules to ensure data legitimacy.
- Service Interface Generation: Leverages technologies such as FastAPI, integrated with actual network service logic, to generate RESTful API interfaces that are aligned with the Container and List hierarchy levels of the YANG models.

Implementation Steps

Step 1： YANG Model Parsing and Structured Presentation

Step 2： Automatic Conversion from Model to JSON Schema

Step 3： Generation of Standardized RESTful API Interfaces

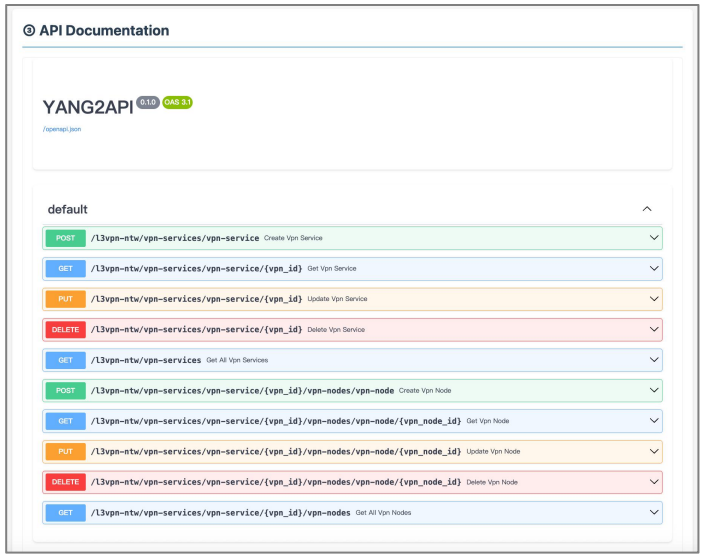
① YANG Tree Structure

```
module: ietf-l3vpn-ntw
  +--rw l3vpn-ntw
     +--rw vpn-profiles
     |  +--rw valid-provider-identifiers
     |     +--rw external-connectivity-identifier* [id] {external-
connectivity}?
     |     |  +--rw id    string
     |     +--rw encryption-profile-identifier* [id]
     |     |  +--rw id    string
     |     +--rw qos-profile-identifier* [id]
     |     |  +--rw id    string
     |     +--rw bfd-profile-identifier* [id]
     |     |  +--rw id    string
     |     +--rw forwarding-profile-identifier* [id]
     |     |  +--rw id    string
     |     +--rw routing-profile-identifier* [id]
     |        +--rw id    string
     +--rw vpn-services
        +--rw vpn-service* [vpn-id]
           +--rw vpn-id                    vpn-common:vpn-id
           +--rw vpn-name?                 string
           +--rw vpn-description?          string
```

② JSON Schema

```
{
  "type": "array",
  "items": {
    "type": "object",
    "properties": {
      "vpn-id": {
        "type": "string"
      },
      "vpn-name": {
        "type": "string"
      },
      "vpn-description": {
        "type": "string"
      },
      "customer-name": {
        "type": "string"
      },
      "parent-service-id": {
        "type": "string"
      },
      "vpn-type": {
        "type": "string",
```

③ API Documentation



Warmly welcome all of you to our ONSEN BOF at Grand Ballroom 1 from 9:00 to 11:00 next Tuesday morning.

Thank You