Workshop Integrating OSS and BSS

Peter Boers

5th of June, 2023

Agenda

- 9:00 – 9:30 Introduction
- 9:30 – 10:00 Bootstrapping of the development environment
- 10:00 – 10:30 Details of the Orchestrator core models
- 10:30 – 11:00 Coffee 
- 11:00 – 12:30 Development of your first Orchestrator workflow
- 12:30 – 14:00 Lunch (Rogner Hotel) 
- **14:00 – 15:30 Integration of OSS and BSS to your workflow**
- 15:30 – 16:00 Coffee 
- 16:00 – 17:30 Tailoring the Orchestrator to your needs (Discussion)

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A quick recap

- Products describe the logical set of resources that together form a service
- Products contain product blocks and resource types that are populated during workflows, they are different per subscription
- Fixed inputs are like resource types, but are attributes that cannot change during the lifecycle of a subscription
- Workflows are run to create, update, delete and validate subscriptions.
- Subscriptions are a logical set of resources that together describe a valid service for a specific customer
- Domain models describe what a subscription to a product must contain for each lifecycle state and how it can be validated.

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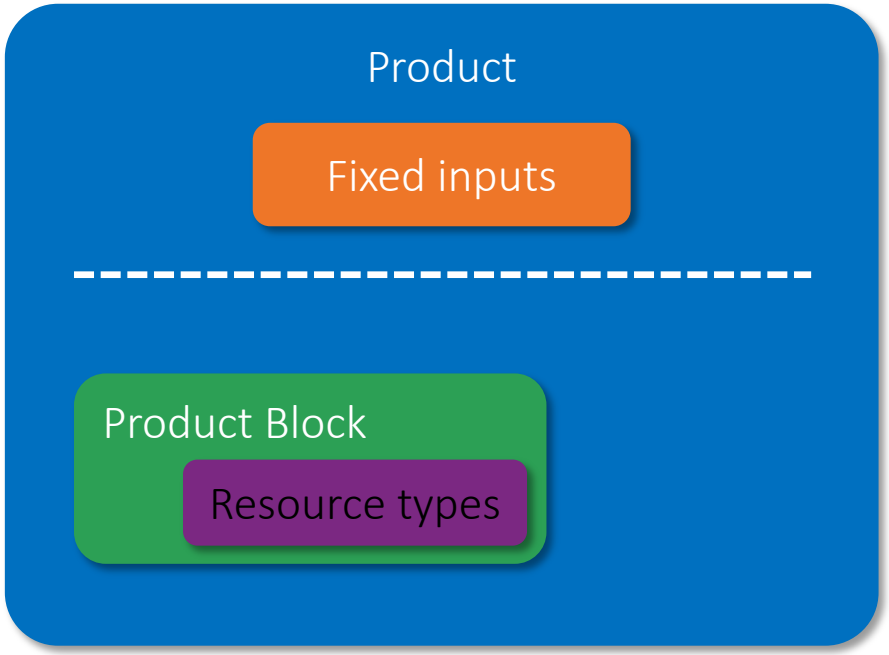
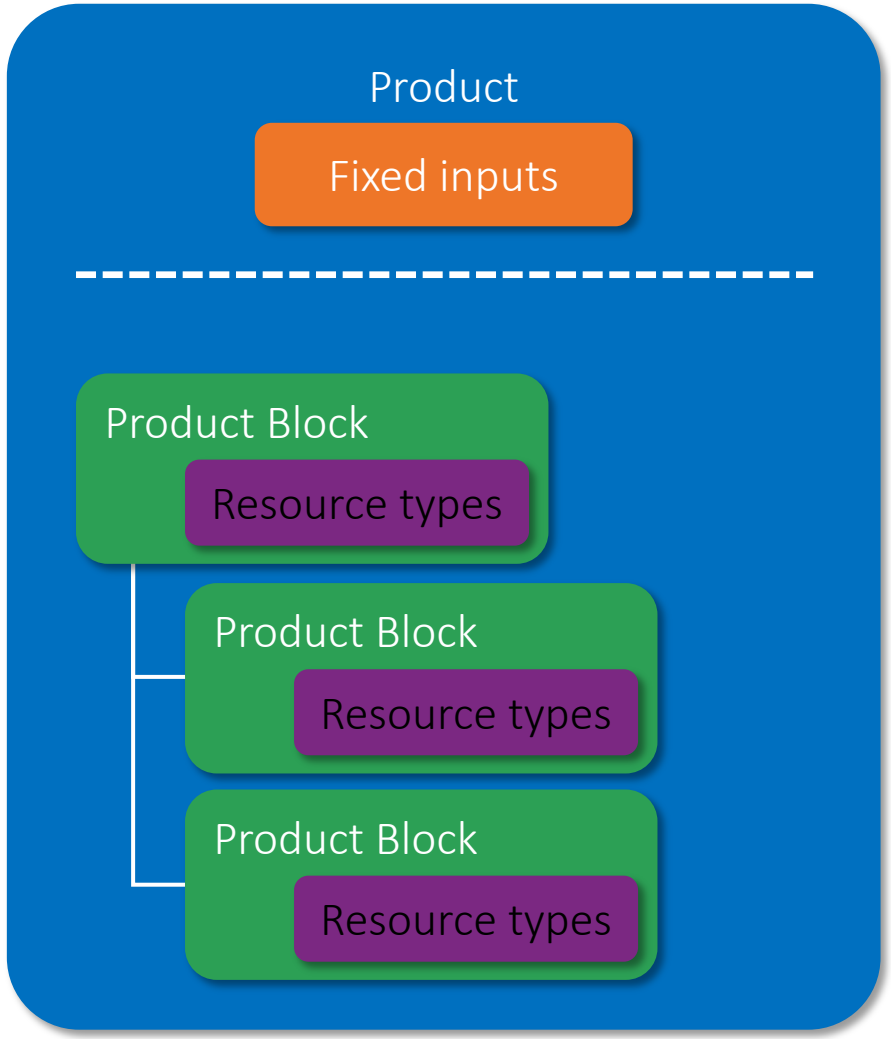
Product Model



Fixed inputs describes immutable parameters of the product

Product blocks are containers for resource types (key/value pairs) and (optional) other product blocks

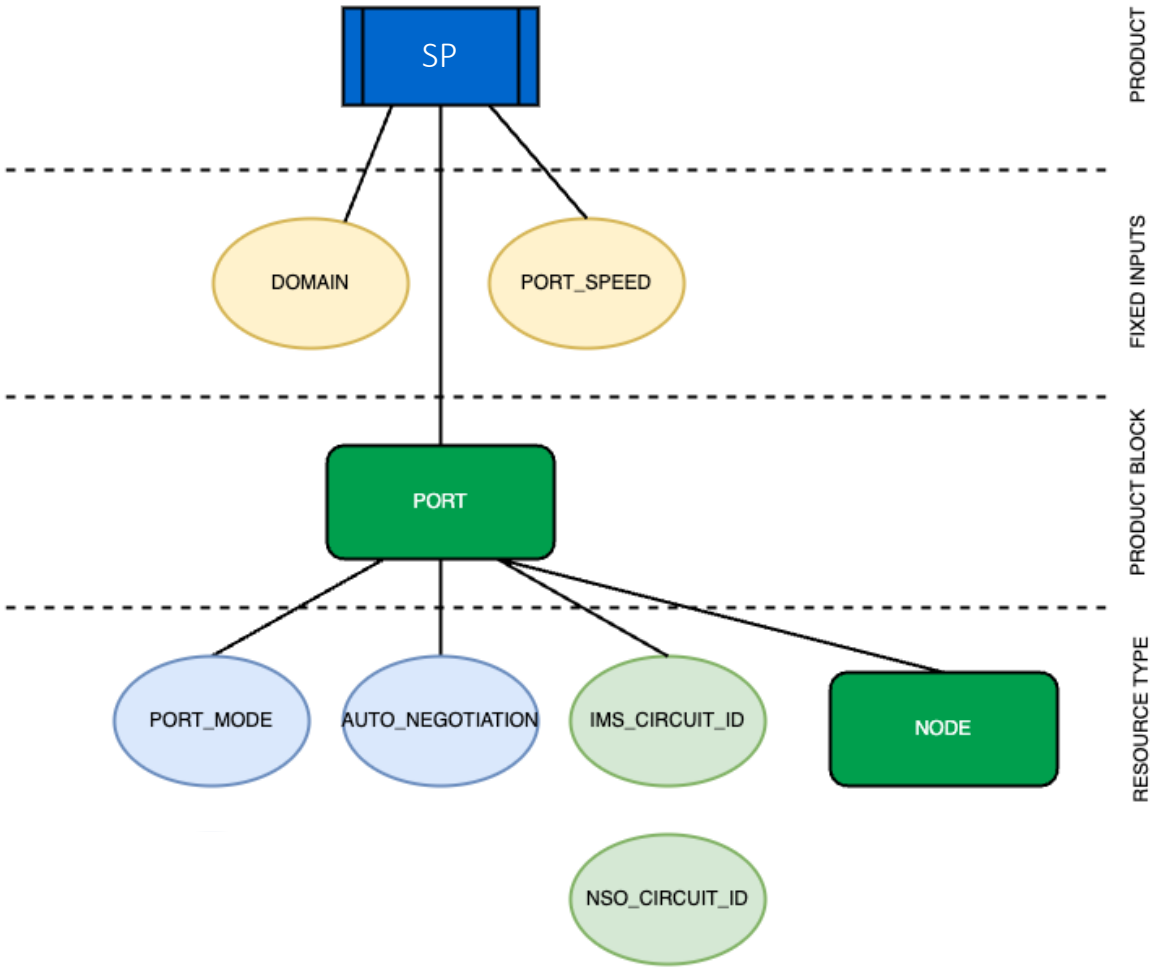
Product Model – little bit more complex

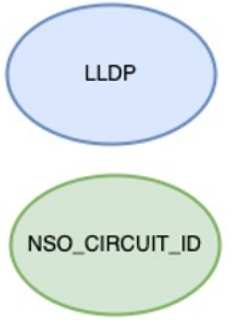


Fixed inputs describes immutable parameters of the product

Product blocks forms building block of resource types (key value pairs)

Simple Port product:

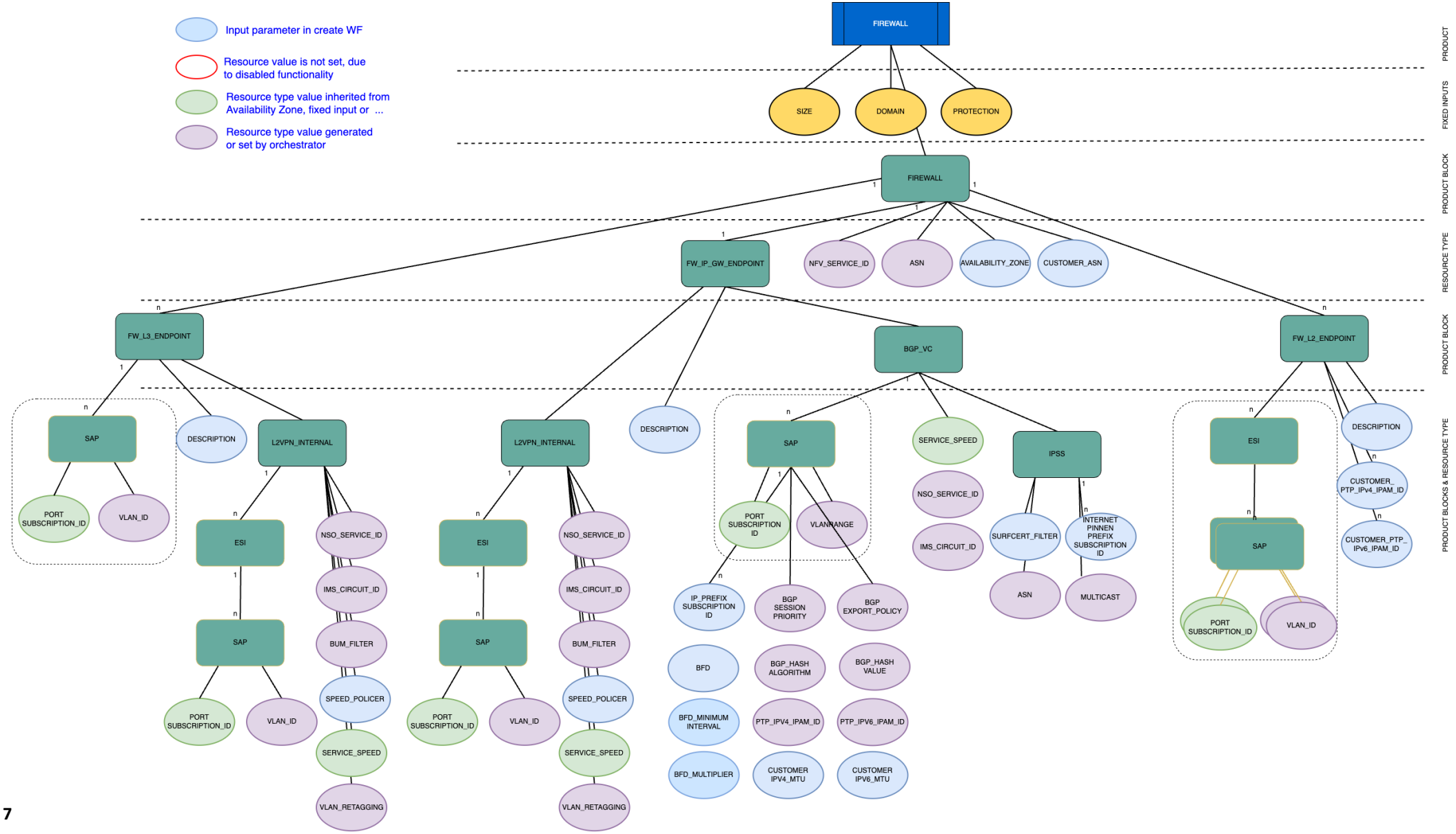




Customer facing parameter - to be filled in by USER

Pointer to OSS/BSS, autogenerated by orchestrator or OSS/BSS

Complex FW product model:



Questions so far?

Integration of OSS and BSS to your workflow

- Exercise in creating an automated service delivery
- Methods of integrating OSS and BSS
- How do you keep your data sane?
- Walk through of the example code
- Write some code:
- Implement the OSS/BSS integration in the create workflow
- Write the modify and terminate workflow
- Quickstarting your workflow writing experience

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What methods can you use to integrate sources of truth to achieve automated service delivery?

Are there NRENS in the room who are willing to share some experiences?

- What method(s) have you chosen?
- What success have you had?
- What challenges did you have?
- Where did you define sources of truth?

Two methods: centralised and decentralised

Centralised

A single point of data entry. A user will enter data at a single point and that will be distributed across all other systems. Most or all validation logic is centralised

Pros: Very reliable, easy to trust and debug, single pane view

Cons: Rigid, time consuming to implement, paradigm shift in processes and data management

Decentralised

Multiple data entry points. A user will enter data in the CMDB, CRM and/or IPAM. Validation logic is handled very close or at the source of truth.

Pros: Flexible, less of a change in processes, easy to start, less data migration

Cons: More checks and balances, difficult to control, consistency not guaranteed

Exercise: Create a layer3 circuit for ACME corp. at NREN Wile E. Coyote

In a group of 3 – 4 people, do the following exercise:

- Design an automated process (workflow) through which you could deliver a layer3 circuit for customer ACME corp.
- Include as much of the process as you can: i.e how you can gather requirements for the service, what the automation flow looks like, what resources you need to configure the service (nodes, interfaces, VRF ids etc)?
- Define where your sources of truth live and how they interact to create working network configuration.
- Describe each step in as much detail as possible
- How do you know when the process is finished?
- When do humans interact with the automated process?

Take 30 minutes to discuss this and prepare a short pitch about what this would look like.

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Centralised: The orchestrator first mentality

Integrating OSS and BSS

- The orchestrator is designed to be in control of all data
- The system works best when all data entry is done whilst running workflows, the benefits include:
- Defining your validations once
- It uses repeatable workflows to translate the data into valid OSS/BSS objects
- It eliminates data entry errors
- **This process only allows sane data to enter the system**

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Mitigating the centralised architecture risk i,e closing the loop

The greatest risk to the centralised approach is someone going outside orchestration and making a change in an external system.

- Writing validation tasks that crosscheck all data
- Is the inventory in-sync with the network and vice versa
- Do all service parameters correlate with inventory and subscription intent
- Closing the loop makes sure you detect inconsistencies as soon as possible
- Closing the loop makes changes reliable as they enable you to block changes to services if they do not comply to business rules.

How can you enforce data consistency of a subscription

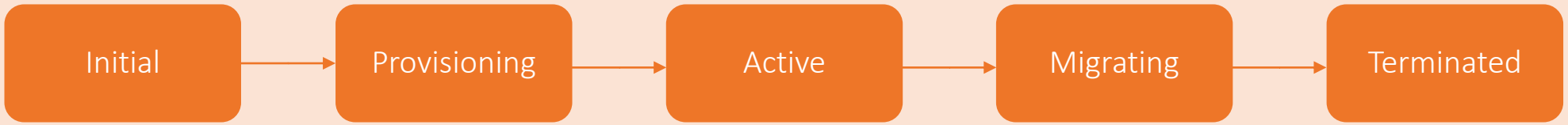
A subscription has two means of “locking” to guarantee “safety”

- Subscription Lifecycle
- The orchestrator gives you five states initially: Initial, Provisioning, Migrating, Active and Terminated
- An insync Boolean:
- This controls if the subscription is insync with all subsystems or not.

Subscription Lifecycle

Subscription lifecycle helps define what a subscription should look like a certain point in it's existence

- E.g At state *provisioning*, a subscription might not have access to all workflows and it may not be filled in completely. Some properties may not be known.
- At state *terminated* all external id's may be removed except for a reference to telemetry.
- When writing validation workflows, subscription lifecycle helps the system to decide what to check, and when you check it, what it should look like



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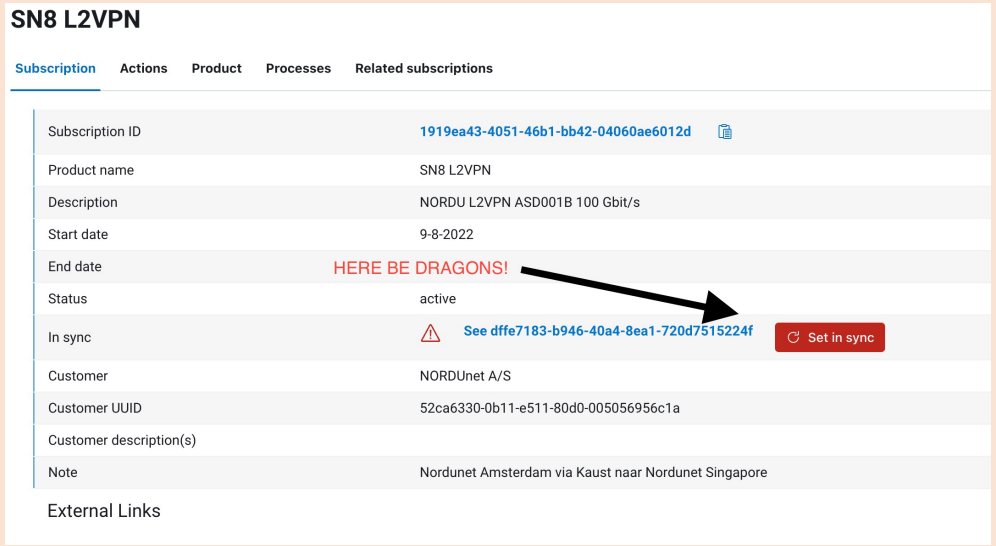
Insync boolean

Subscription insync helps the system understand if it is safe to run a workflow on a subscription or not.

- Only one workflow may run on a subscription at any given time.
- If a validation workflow is ”failed” the subscription remains out of sync.
- This can be overruled….



Mitigating the centralised architecture risk.

Check everything!

Gamify keeping data sane!

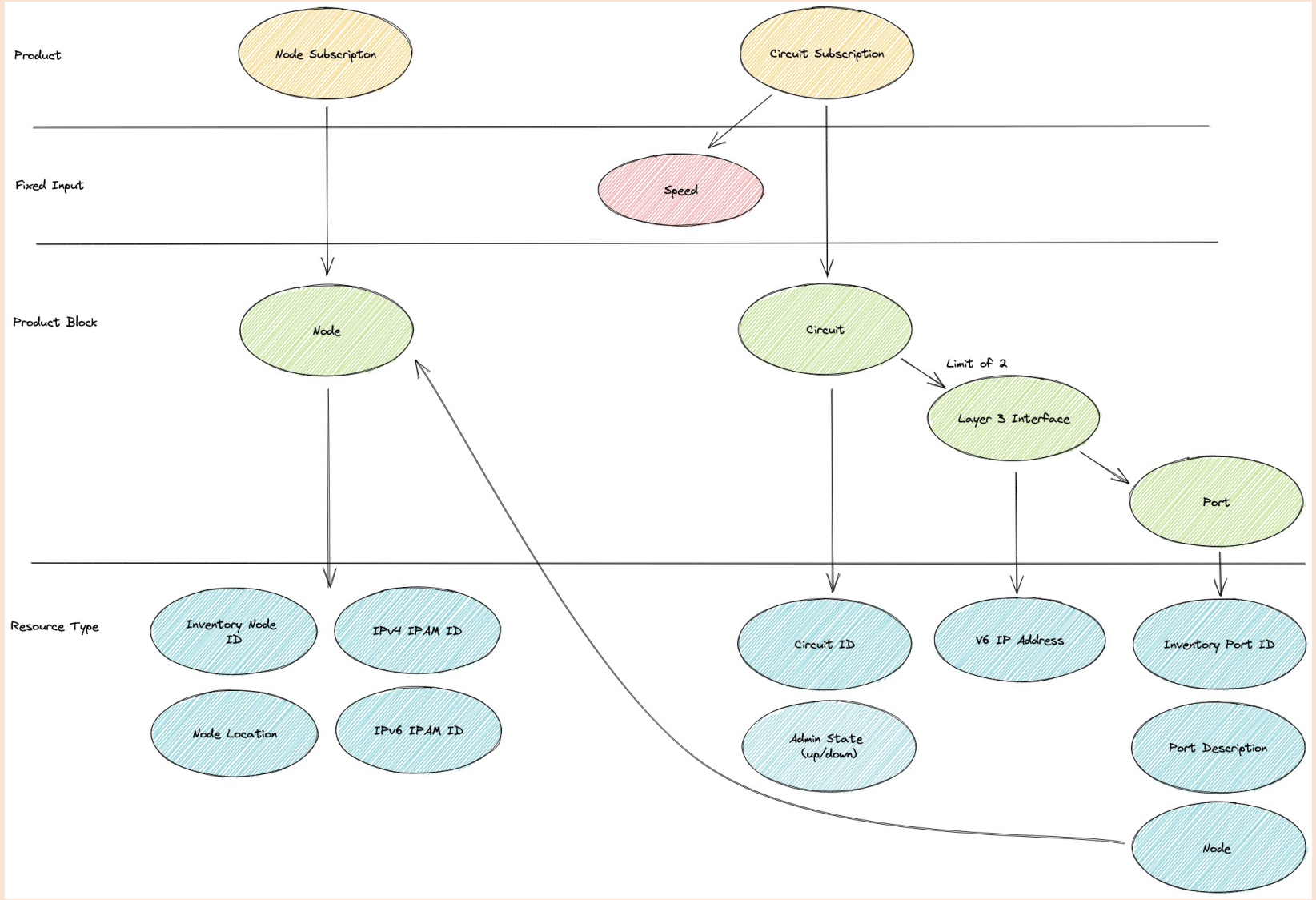
Do it from day one!

Questions so far?

Circuit product workflows (coding)

- Create a circuit between two nodes.
- Use only active nodes that are ready to accept traffic (according to the business rules)
- Use two available interfaces on each node and create the circuit
- Administer the circuit in Netbox (coding)
- Write the modify and or terminate workflows

Domain models



Architecture

- Input steps vs steps
- Workflow targets
- Testing

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