



Network Orchestration and Configuration Management through Camunda

Ajit Dani, BT Media and Broadcast





Network Orchestration & Configuration Automation through Camunda

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What to Media and broadcast do?



The backbone of all UK TV services, working with the BBC, ITV, Sky and all Freeview services



Linking the global production community, from Bollywood, to Soho, to Hollywood and beyond



Distribution of TV channels distribution for customers such as NBC Universal, Viacom, Fox, BBC World Service, Star TV, CNBC and more



Delivering 3,500 headline live events each year across sports, music and entertainment

BBC

itv

BT Sport

sky

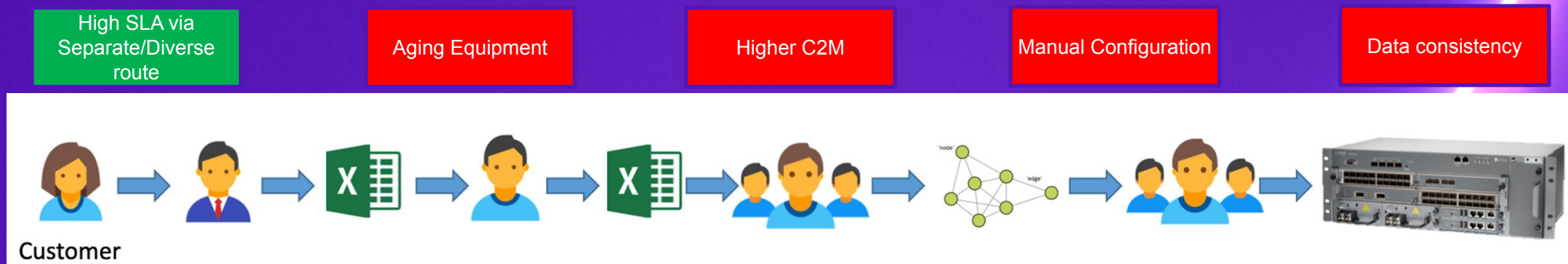
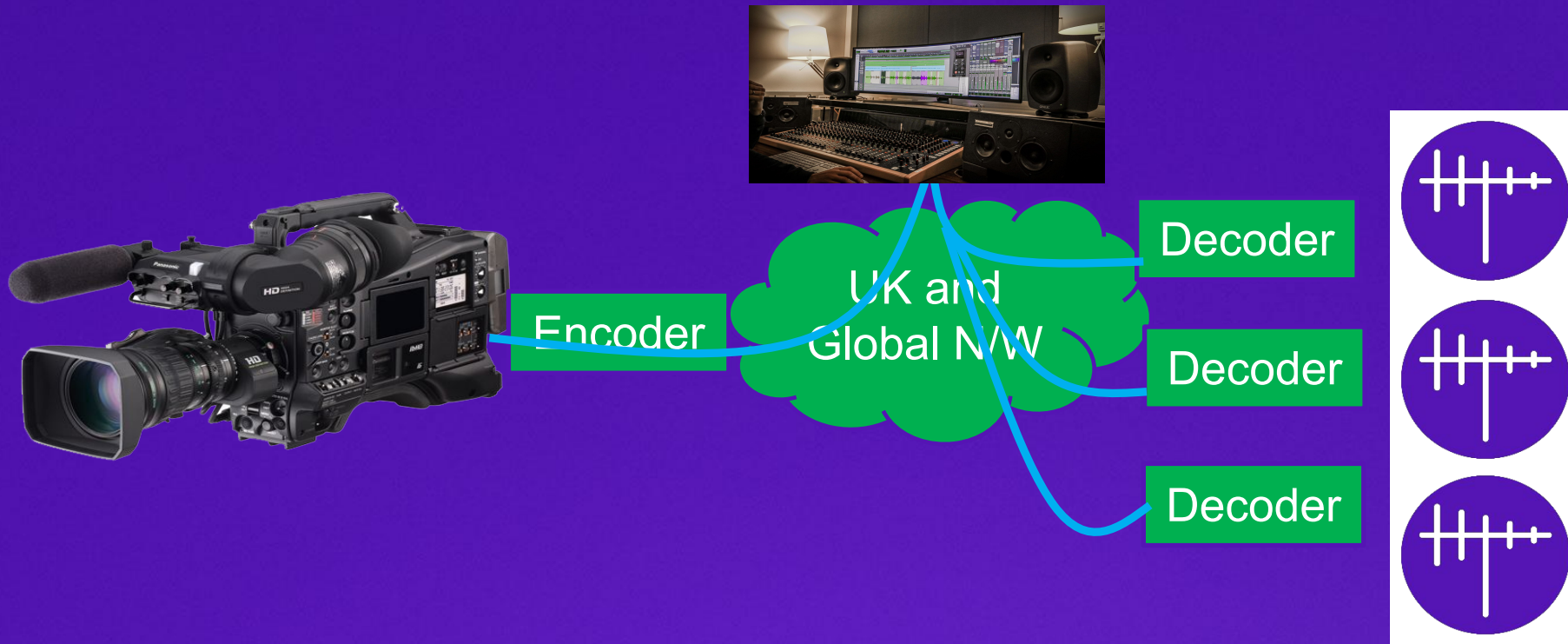
Freeview

viacom



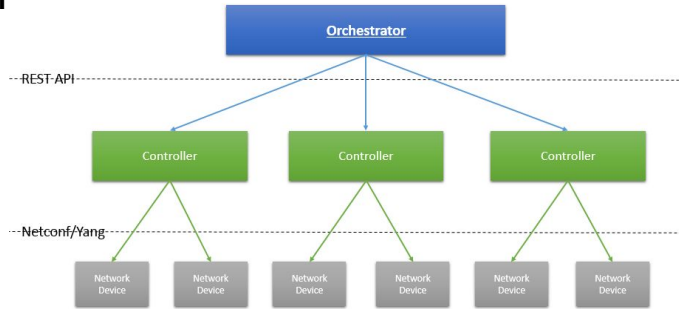
+500 others

What is the problem statement Vena is addressing

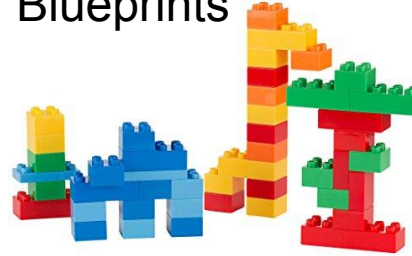


Technology Vision

Orchestration



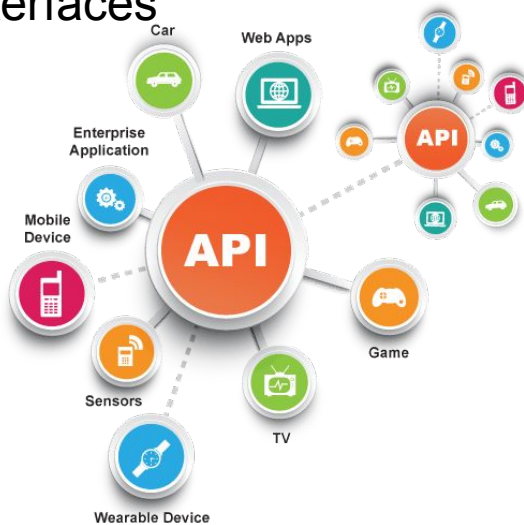
Service Blueprints



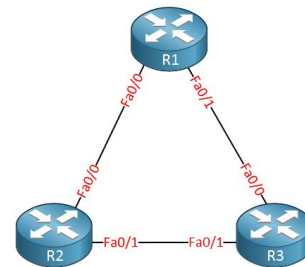
Build v.s. Buy



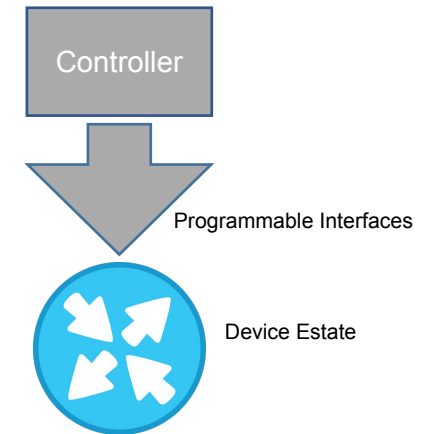
Standard Interfaces



Self Healing Network

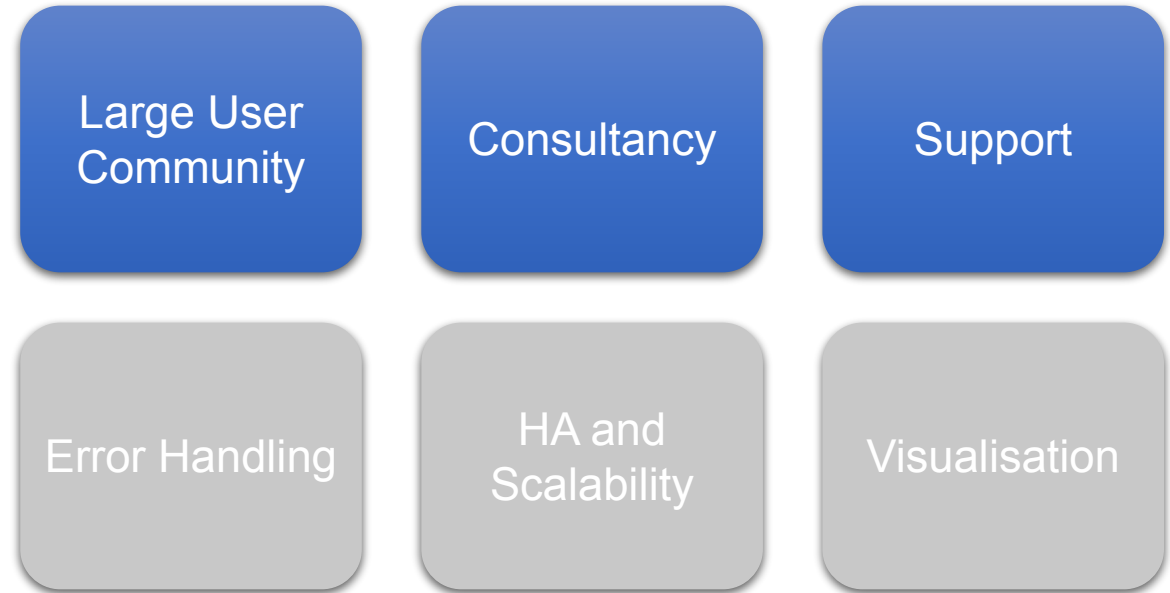


Programmable Network



Why we chose Camunda

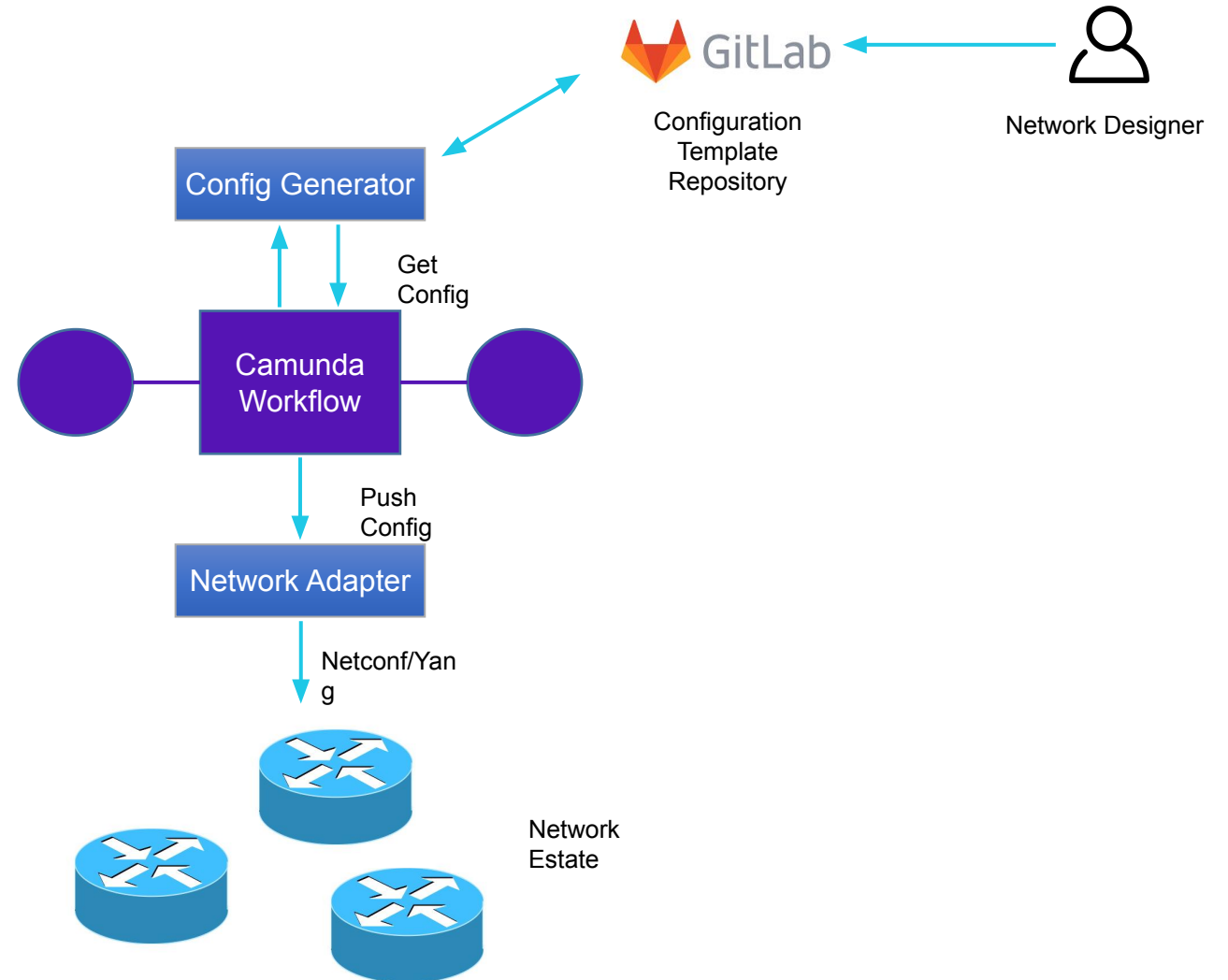
- Large user and developer community for Best Practices, online trainings, testing resources, tutorials, videos, and documentation
- Consultancy on Best Practices, workflow reviews, deployment advice, Optimizing Workflows
- 24/7 365 Support including priority hotfixes and patch releases for bugs and security fixes
- Error Handling and Rollback easier to build
- Performance and Scalability because of stateless nature of the workflow engine
- Visualisation of workflows for Design and Troubleshooting
- HA and Geo-Resilience depends entirely on HA and Resilience of the Data layer



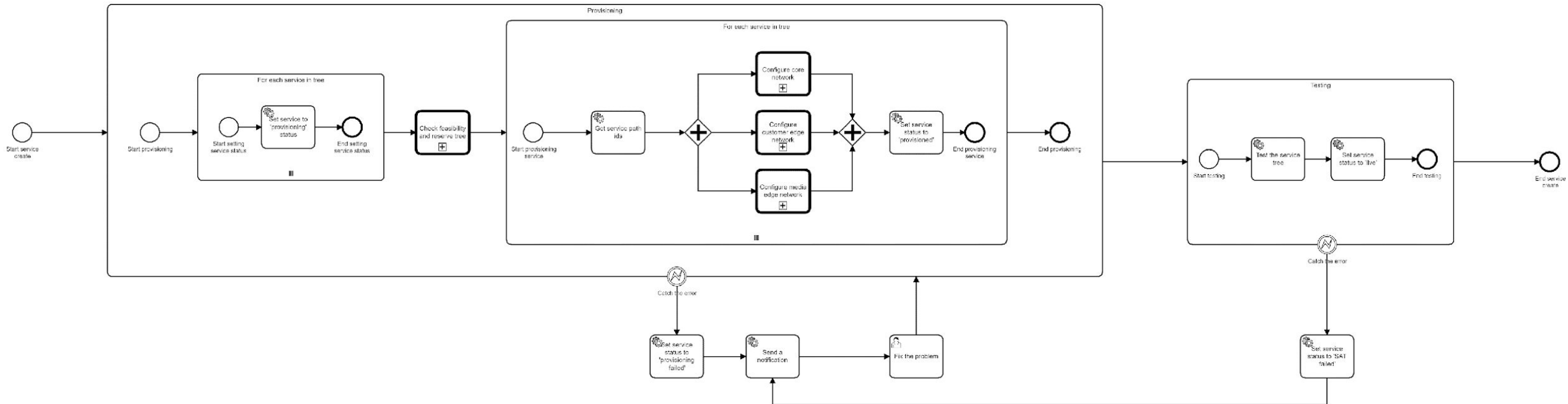
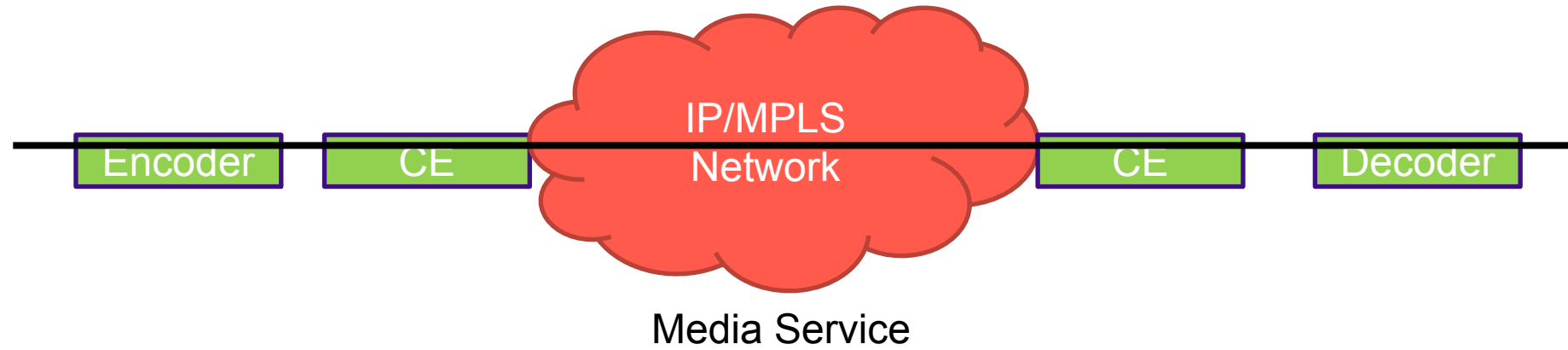
Design Pattern for Network Configuration Orchestration

- **Workflow** – sequences the series of config that needs to be pushed to the device in the right order.
- **Config Generator** – Generates config that needs to be pushed to a device. It pulls config template from GIT, fetches and populates necessary variables in the template and responds back to the requestor with the final payload
- **Network Adapter** – exposes an API and translates whatever is sent to it into Netconf/Yang RPC calls to the device estate

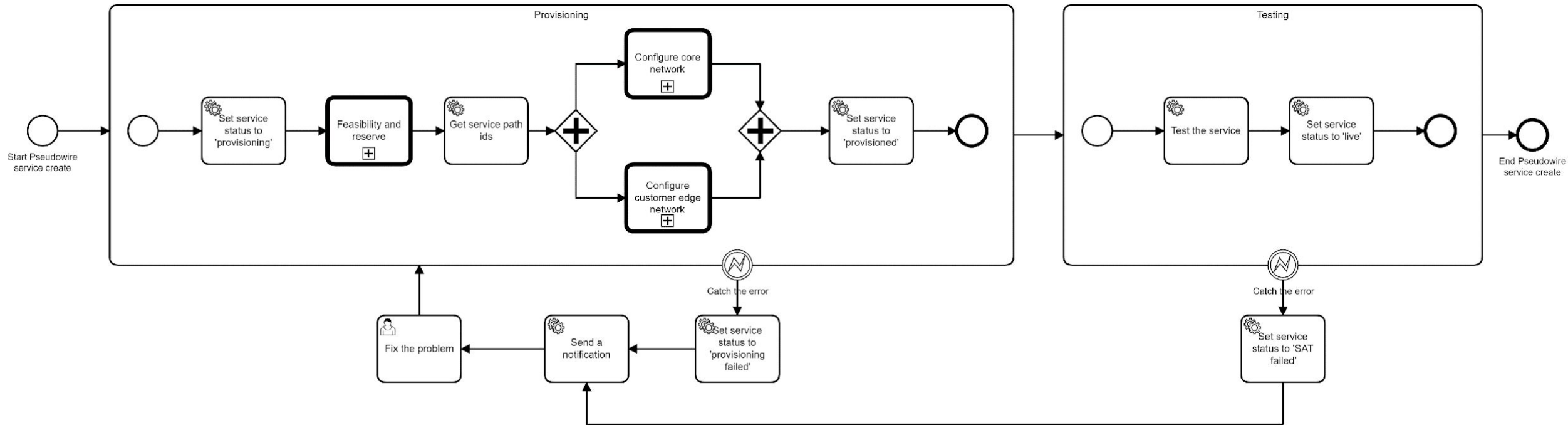
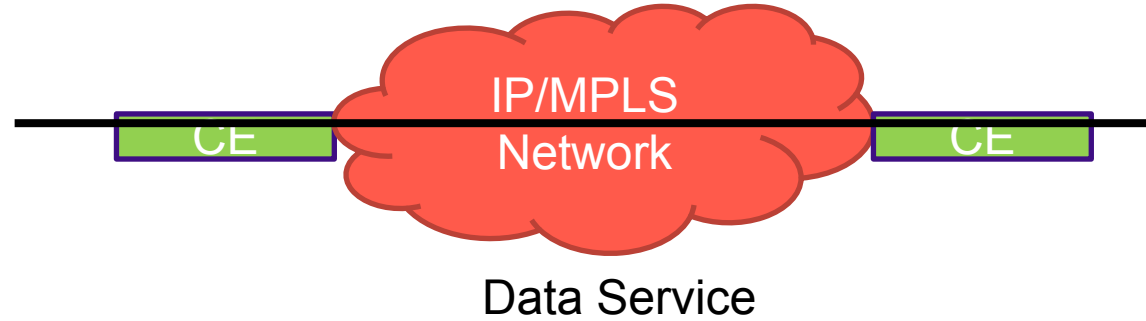
This architecture is used in building these devices and for lifecycle management of services



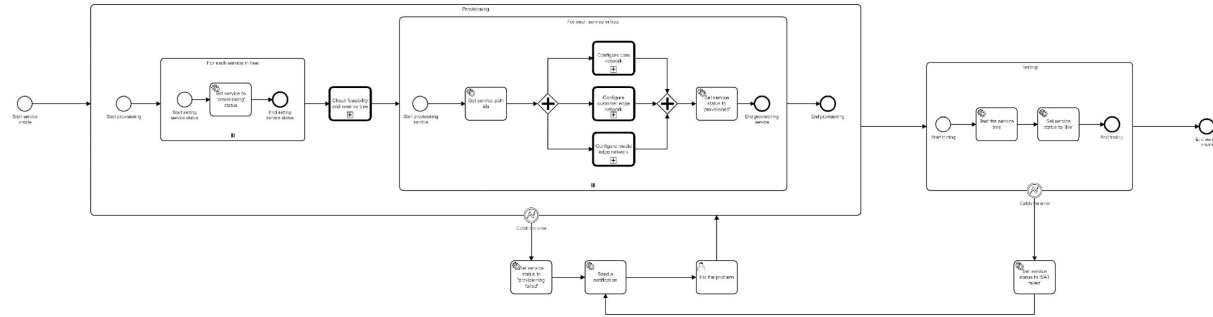
How we started



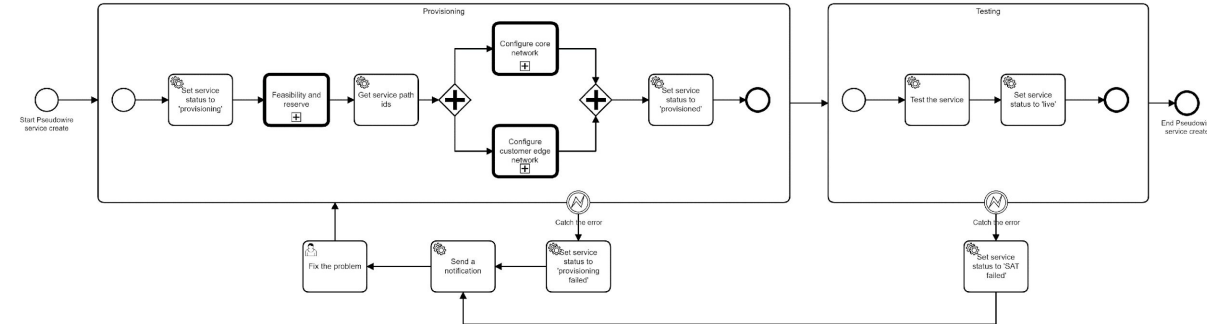
Build next service



Inspect and Learn

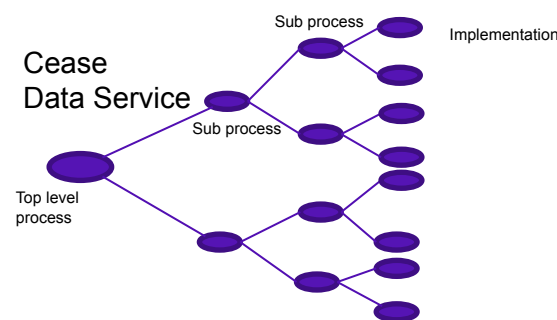
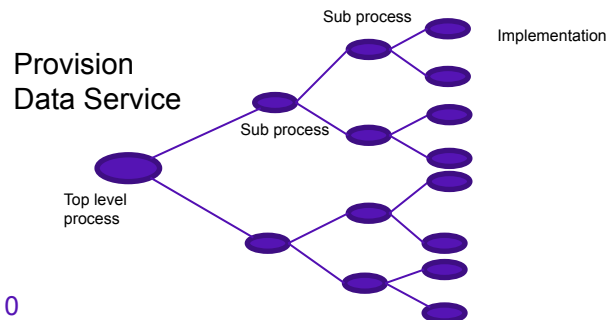
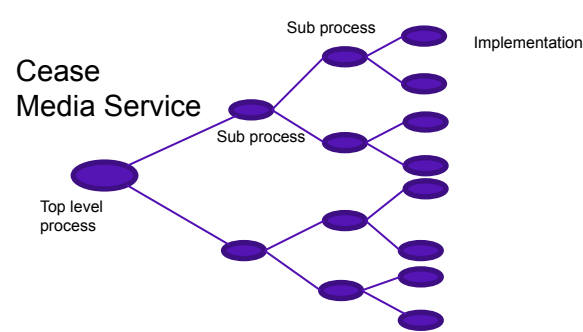
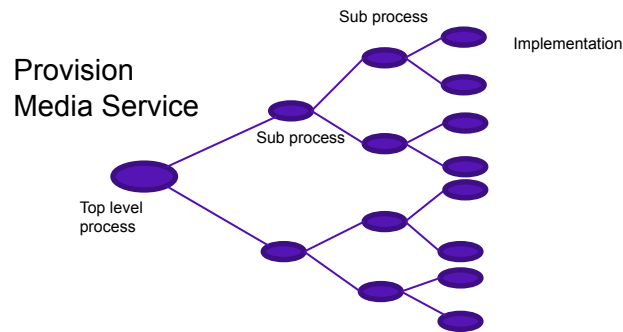


MEDIA SERVICE



DATA SERVICE






VS



- Each node has its own implemented.
- Many are duplicates or slight variations for each other.
- Complex decisions are in BPMN
- New services are difficult to accommodate without promoting duplication

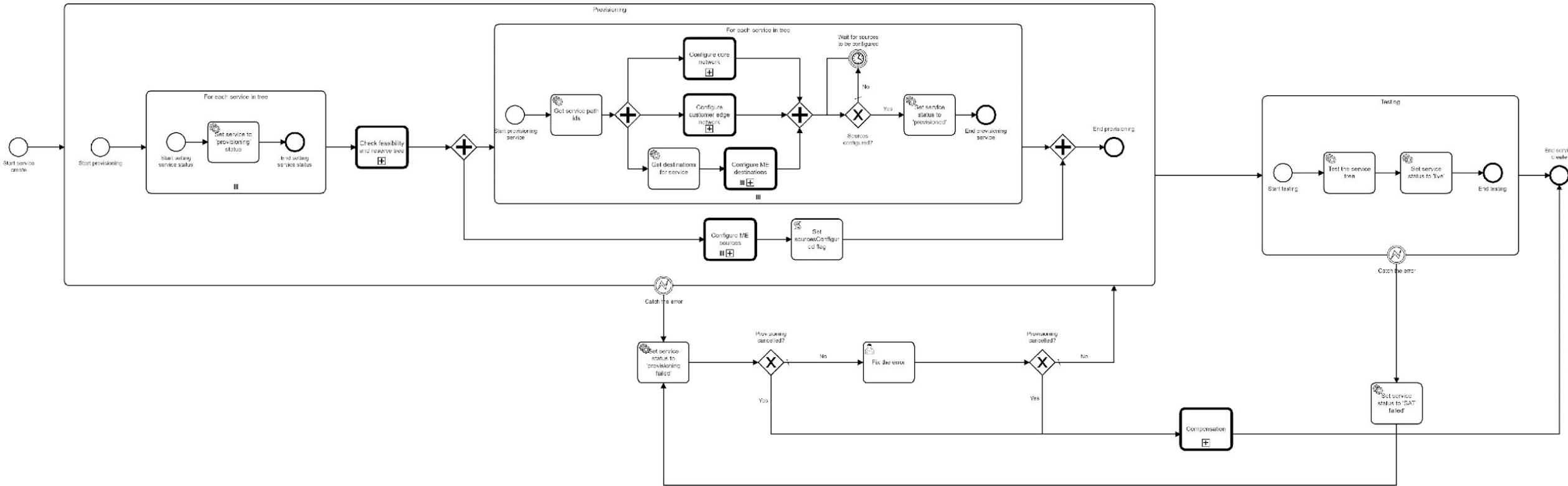
Decision model and notation (DMN) to rescue



-  PE Configuration Decisions
-  CE Configuration Decisions
-  ME Configuration Decision
-  Device Resource Activation Status
-  Is Last Media Service Destination

PE Configuration Decisions										
Hit Policy: Unique										
	When	And	And	And	Service Direction	Configuration Type	Configuration Sub-Type	Push Mode	Configuration Operati...	And
	Service Category	Operation	Direction	Is Last Destination						
	"MEDIA_SERVICE","DATA_SE...	"ACTIVATE","TERMINATE"	"SOURCE","DESTINATION"	boolean	"TX","RX"	"MEDIA_SERVICE","PSEUDO...	"SOURCESITE","DESTINATIONSIT...	"json","grpc","set"	"MERGE","DELETE"	
1	"MEDIA_SERVICE"	"ACTIVATE"	"SOURCE"	-	"TX"	"MEDIA_SERVICE"	"SOURCESITE"	"json"		sol
2	"MEDIA_SERVICE"	"TERMINATE"	"SOURCE"	true	"TX"	"MEDIA_SERVICE"	"SOURCESITE_DELETE"	"set"	"MERGE"	sol
3	"MEDIA_SERVICE"	"ACTIVATE"	"DESTINATION"	-	"TX"	"MEDIA_SERVICE"	"DESTINATIONSITE"	"json"		des
4	"MEDIA_SERVICE"	"TERMINATE"	"DESTINATION"	-	"TX"	"MEDIA_SERVICE"	"DESTINATIONSITE_DELETE"	"set"	"MERGE"	des
5	"DATA_SERVICE"	"ACTIVATE"	"SOURCE"	-		"PSEUDOWIRE"	"SOURCESITE"	"json"		sol
6	"DATA_SERVICE"	"TERMINATE"	"SOURCE"	-		"PSEUDOWIRE"	"SOURCESITE_DELETE"	"set"	"MERGE"	sol
7	"DATA_SERVICE"	"ACTIVATE"	"DESTINATION"	-		"PSEUDOWIRE"	"DESTINATIONSITE"	"json"		des
8	"DATA_SERVICE"	"TERMINATE"	"DESTINATION"	-		"PSEUDOWIRE"	"DESTINATIONSITE_DELETE"	"set"	"MERGE"	des
+	-	-	-	-						

Generic Workflow



Why?

- Takes **Hours instead of days** to roll out a service variants.
- **Eliminates duplication** of workflows.
- **Reduced complexity** as service variations are now new DMN rules.
- Provides a **self service capability**.
- Workflows allow us to **design** for a specific device type and **reuse** blocks where necessary for different device types

Quick

Consistent

Error Free

