

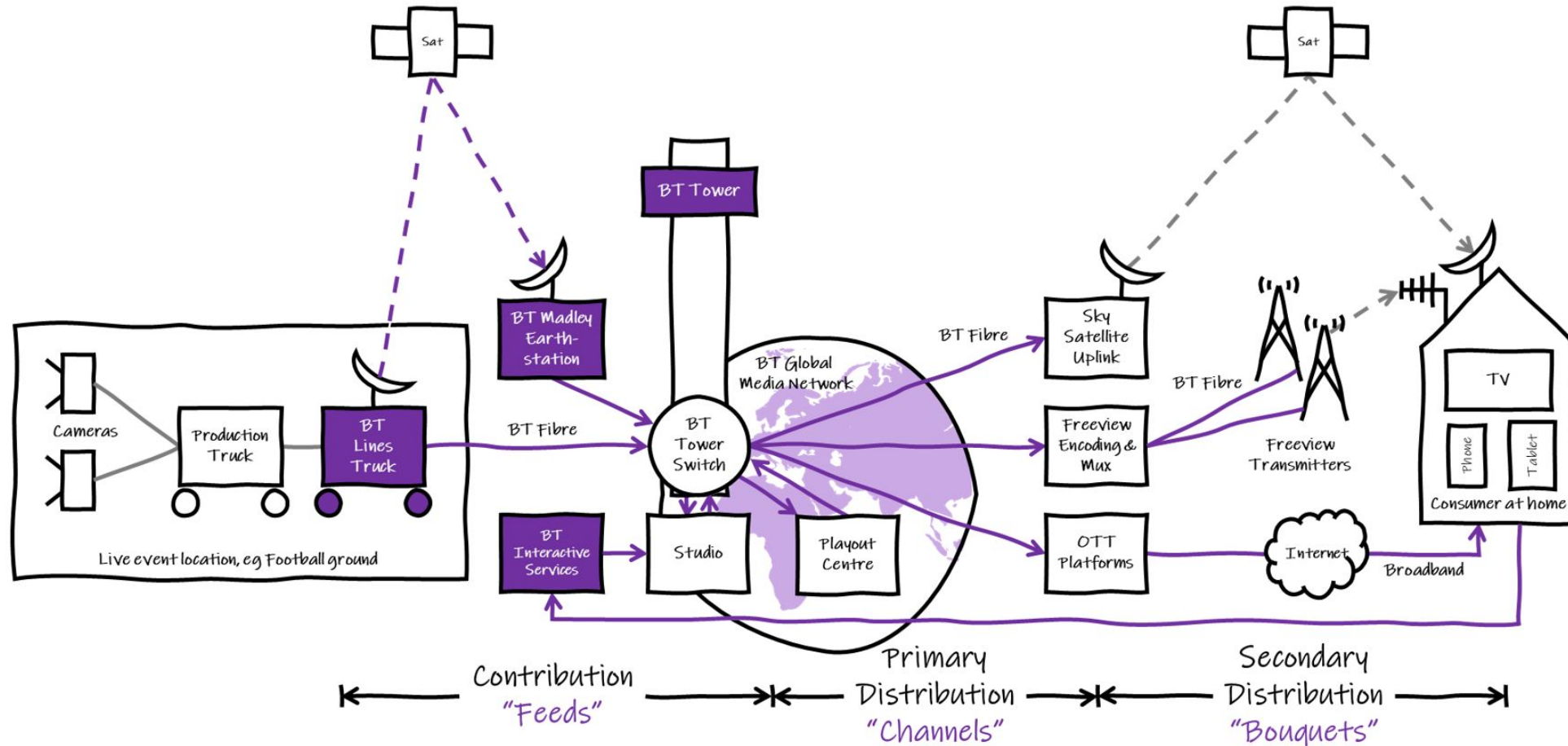
Vena: How BTs next-generation broadcast network relies on Camunda

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Media & Broadcast



The backbone of all
UK TV

Linking the global
production
community from
Bollywood to Soho

Distribution of TV
Channels

Delivering 3500
headline events
every year

Challenges

- Aging equipment
- Manual Configuration
- Slow for customers
- Consistency



Opportunity – Renewal of obsolescent infrastructure and management systems

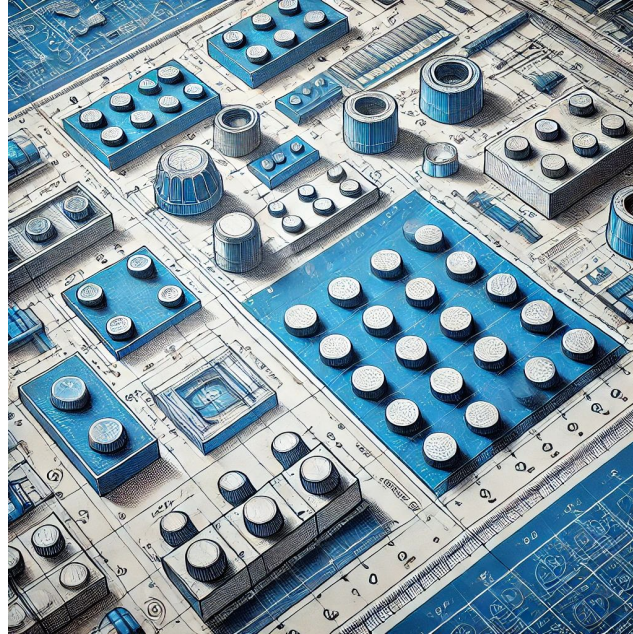
Leverage this transformation to fulfil BT M&B key business objectives in terms of competitiveness, operational effectiveness and data integrity

Area	Opportunity	IT System requirements	KPIs
Increased competitiveness and Customer Experience 	- Decreased time to market by automated service life cycle management - Deploy a platform capable of supporting the creation of innovative and competitive service bundles for broadcaster - Provide customers with simplified self serve service ordering	- Modular functional architecture for vertical and horizontal scaling. - Adoption Microservices - Model/Intent-driven network services.	- Service delivery times - Market Share & Revenue - Number of new services launched - Number of new service bundles launched
Operational Effectiveness and Data Integrity 	- Decrease operational cost by minimizing human intervention from service fulfilment to assurance - Data model structure to ensure real time resource status - Guarantee end to end view of services	- Closed loop automation - E2E topology view - Central Dynamic inventory - Service, resources, live data correlation for service management decisions	- Number of repair calls completed - Cost reduction related to inventory changes.

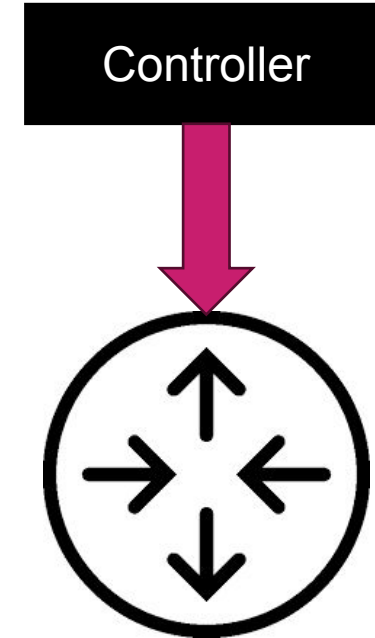
Architectural Vision



Orchestration and
Standard Interfaces



Blueprints



Programmable
Network

VENA – More than just a network

Built for broadcast, VENA is our new smart media platform set to transform the broadcast industry by intelligently connecting media supply chains.

Software Defined
Network

100+ PoP
locations in UK

Up to 99.999%
Reliability

Resilient service
type options

Live service
reporting

Self-service
provisioning

Path
Computation
Engine (PCE)

Automate
workflows with
APIs

High bandwidth
Video & Data
services

Integrated Media
processing

Global, Cloud &
OTT delivery

Multiple Handoff
types



Why ?

- 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
- Visualization of workflows for Design and Troubleshooting
- HA and Geo-Resilience depends entirely on HA and Resilience of the Data layer

Large User
Community

Consultancy

Support

Error Handling

HA and
Scalability

Visualization



Our journey

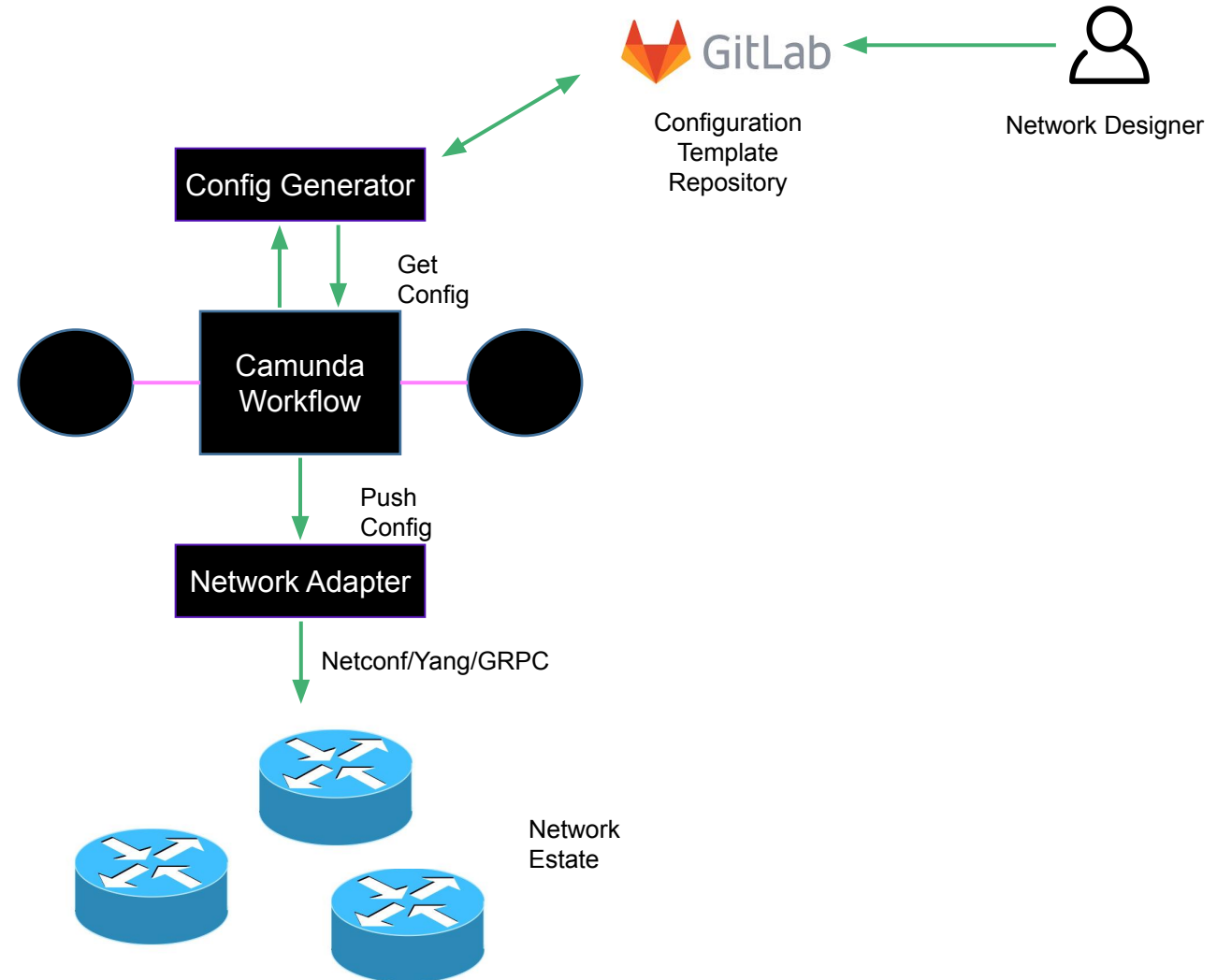


Design Pattern for Network Configuration Orchestration

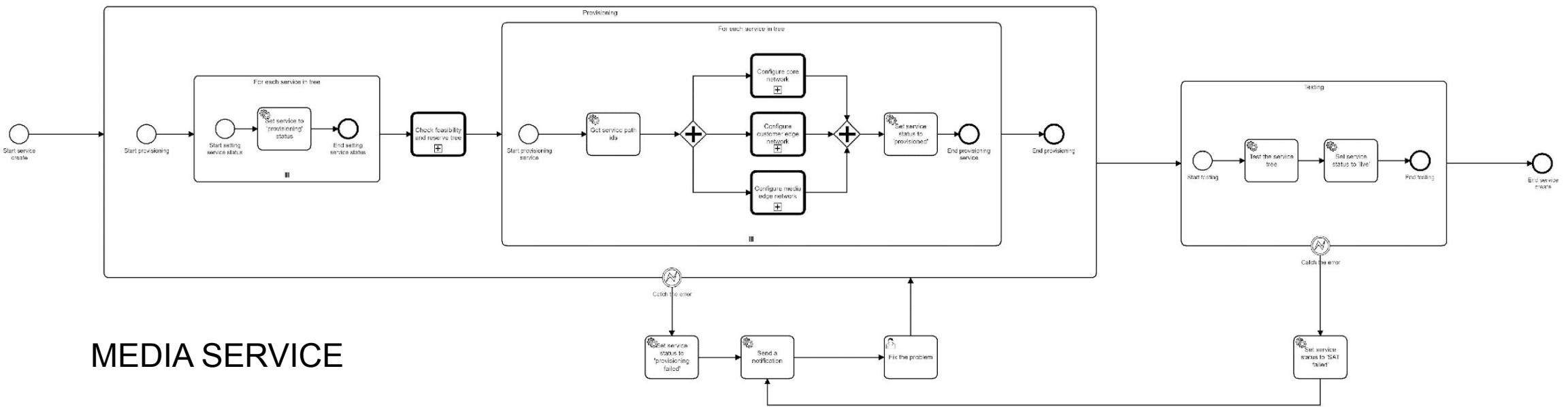
Workflow – sequences the series of config that needs to be pushed to the device in the right order.

Config Generator – Generates config that needs to be pushed to a device. It pulls the config template from GIT, fetches and populates necessary variables in the template and responds back to the requestor with the final payload

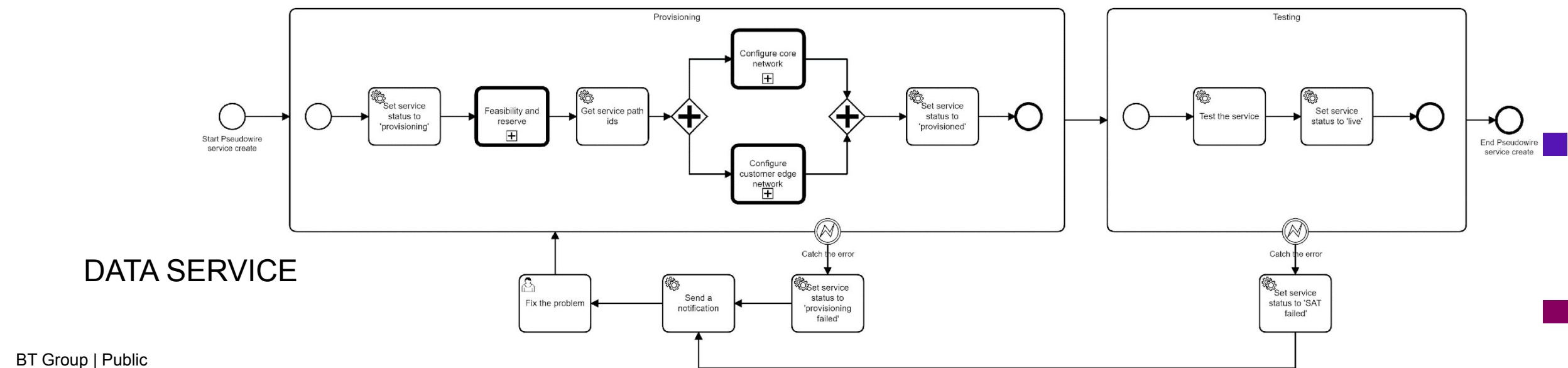
Network Adapter – exposes an API and translates whatever is sent to it into Netconf RPC calls to the device estate



How it started



VS



Decision model and notation (DMN) to rescue



PE Configuration Decisions



CE Configuration Decisions



ME Configuration Decision



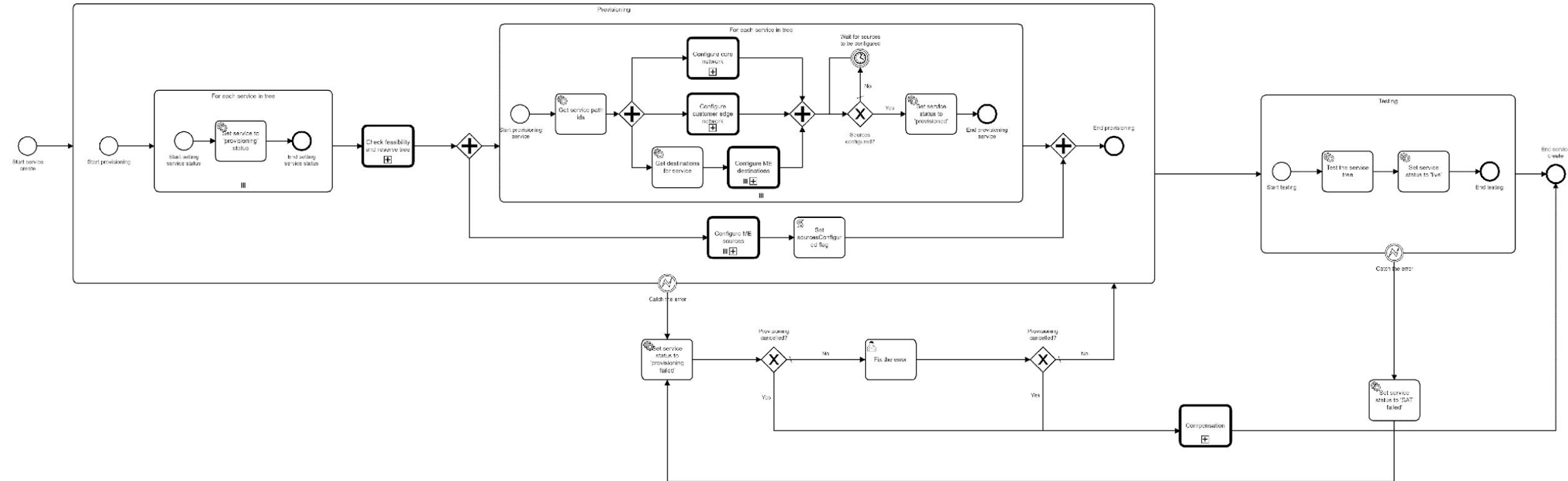
Device Resource Activation Status



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...	
	Service Category	Operation	Direction	Is Last Destination	"TX", "RX"	"MEDIA_SERVICE", "PSEUDO...	"SOURCESITE", "DESTINATIONSIT...	"json", "grpc", "set"	"MERGE", "DELETE"	
	"MEDIA_SERVICE", "DATA_SE...	"ACTIVATE", "TERMINATE"	"SOURCE", "DESTINATION"	boolean						
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
+	-	-	-	-						

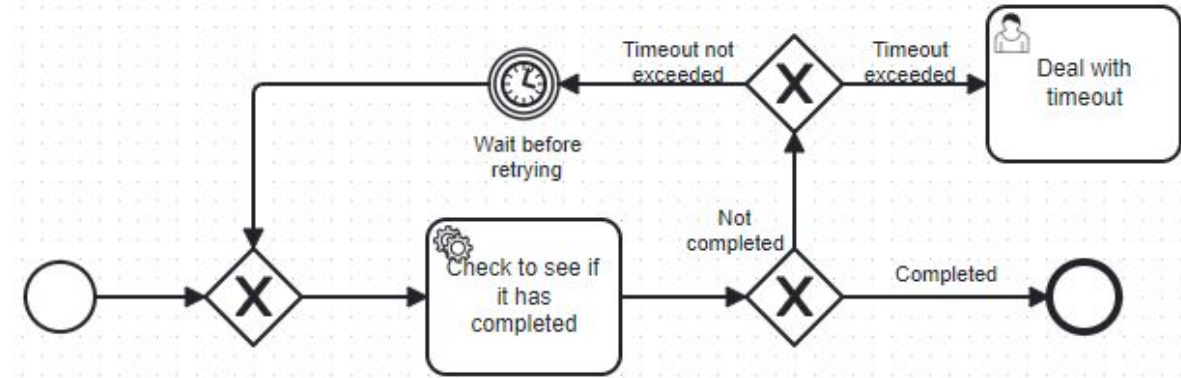
Generic workflow + DMN



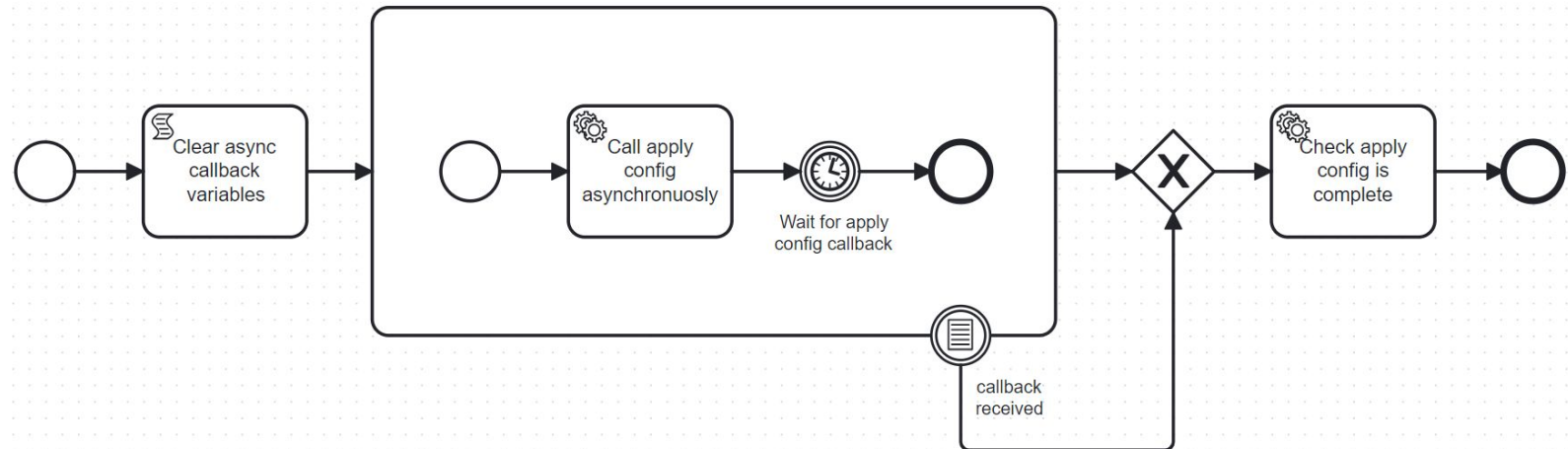
- **Eliminates duplication** of workflows.
- **Reduced complexity** as service variations are now new DMN rules.
- Workflows allow us to **design** for a specific device type and **reuse** blocks where necessary for different device types

DB sizing

- ~100 orders /day, 30-day history
- ~100 GB 🤯
- Turns out “polling” is the culprit



- Replace with event based gateway



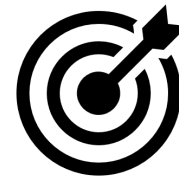
DMN can grow quickly

Our case – 130+ decisions and 17+ conditions

ME Configuration Decision															Hit policy: Rule rule	
When	And		And	And	And	And	And	And	And	And	And	And	And	Then	And	
Service Category	Service Type		Operation	Direction	Stage	Is Last Destination	Is Protector Path	Is Compressed	Is IP Input	Is IP Output	Compute Paths Action	Transform Action	Transform Sub Actions	Configuration Call Type	Configuration Service Type	
"MEDIA_SERVICE"	"SDI","ASI","H264","JXS","H265"		"ACTIVATE","TERMINATE"	"SOURCE","DESTINATION"	"INITIALISE","CONFIGURE"	boolean	boolean	boolean	boolean	boolean	"COMPUTE_PATHS"	"CORE_ROUTE","MODIFY_BANDWIDTH","NONE","MCCIP","SERV...			string	"service_ip3022encoderpool",s...
1	"MEDIA_SERVICE"	"SDI"	"ACTIVATE"	"SOURCE"					false		"COMPUTE_PATHS"	"NONE"		"mediaServiceSdiPort"		
2	"MEDIA_SERVICE"	"JXS"	"ACTIVATE"	"SOURCE"					false		"COMPUTE_PATHS"	"NONE"		"mediaServiceJxsPort"		
3	"MEDIA_SERVICE"	"ASI"	"ACTIVATE"	"SOURCE"					false		"COMPUTE_PATHS"	"NONE"		"mediaServiceAsiPort"		
4	"MEDIA_SERVICE"	"ASI"	"ACTIVATE"	"SOURCE"					false		"COMPUTE_PATHS"	"NONE"		"mediaServiceAsiInput"		
5	"MEDIA_SERVICE"	"SDI","ASI","JXS"	"ACTIVATE"	"SOURCE"					true		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputPort"		
6	"MEDIA_SERVICE"	"SUL","ASI","JXS"	"ACTIVATE"	"SOURCE"					true		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputL1"		
7	"MEDIA_SERVICE"	"SDI","ASI","JXS"	"ACTIVATE"	"SOURCE"					true		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputL2"		
8	"MEDIA_SERVICE"	"ASI","SDI","JXS"	"ACTIVATE"	"SOURCE"					true		"COMPUTE_PATHS"	"NONE"		"logicalInterfaceActivationStatus"		
9	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				fa se	true		"COMPUTE_PATHS"	"NONE"		"mediaServiceIpPort"		
10	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				true	true		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputL1"		
11	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				true	true		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputL2"		
12	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				true	true		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputPort"		
13	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				true	true		"COMPUTE_PATHS"	"NONE"		"logicalInterfaceActivationStatus"		
14	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				false	true		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputL1"		
15	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				false	true		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputL2"		
16	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				false	true		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputPort"		
17	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				false	false		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputL1"		
18	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				false	true		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputL2"		
19	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				false	false		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputPort"		
20	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				false	true		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputL1"		
21	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				false	false		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputL2"		
22	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				false	true		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputPort"		
23	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				false	false		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputL1"		
24	"MEDIA_SERVICE"	"H264","H265"	"ACTIVATE"	"SOURCE"				false	true		"COMPUTE_PATHS"	"NONE"		"mediaServiceCustomerIpInputL2"		

- Try to split them based on journeys, types
 - Our case we would be splitting these up
- E.g. instead of one for media-service, we have one each for
- media-service provide
 - media-service cease
 - media-service-modify

Business Value Delivered



Accelerated delivery

- Development cycle reduced from 3 sprint to 1 sprint with DMN approach
- 10+ new service types delivered
- Over 36K orders processed

Operational efficiency's

- Automated configuration
- Reduces human errors
- Fast and scalable
- Consistent



Thank you &
Questions?

