Intraway

Symphonica 5G

What is Symphonica?

Service Orchestration & Activation Platform

Activate any service from any **vendor** across any **network technology** from a single solution

Cloud native

Implemented in Top Tier 1s in the Americas

Modern Architecture
(Scalable / Microservices / Open APIs)

Developed under TM Forum standards and AWS Well Architected Framework **(Perfect Score Certification)**

Service Packages & Connectors Library Available **(90+ Southbound Connectors / 15+ Northbound Integrations)**

Out of the Box NaaS support: **3GPP, ETSI**, MEF

AWS
Well-Architected

tmforum
FRAMEWORX 14
CONFORMANCE
CERTIFIEDPRODUCT

Design Principles

Standards-based **BPM engine** and **multiprotocol connectors**

No-Code platform to enable Self-Service.

Web interface with **order input**, **real-time flows execution and centralized logs**

Single screen infrastructure and business monitoring and alarm system

An Amazon Web Services (AWS) Select Technology Partner

Aligned with **TM Forum Entities and Open APIs**

Event-driven architecture **with Apache Kafka** as main broker and **RESTful APIs**

Cloud-native scalable solution with **micro-services** components over Kubernetes/Docker

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Scaling Up

Symphonica Multi-Country Wireless Activation

3G/4G/VoLTE

3G, 4G and VOLTE Services

Multiple Network Vendors

Ericsson
Huawei
HP
Converge
Others

Multiple NB Systems

Siebel
In-house Systems
Qvantel
Others

9 Countries

Panamá, El Salvador, Nicaragua, Bolivia, Paraguay, Honduras, Colombia, Guatemala and Costa Rica

ALL MARKETS

B2B, B2C, Prepaid, Postpaid, Hybrid, etc.

+40M Subscribers

More than 40M Subscribers

Intraway

Select the solution everyone can agree on

CMO
Drive competitors crazy with your delivery speed
- Prepackaged products and solutions
- Studio to rapidly customize and deploy
- Product catalog integration or foundation
- Enable consistency or autonomy across segments / markets / product lines

COO
Designed to withstand production demands
- Tool and solutions consistently celebrated
- Scalability, Reliability, & Intelligence
- Field, Customer, and Technical Operations optimized

CIO
Who says you can't have your cake and eat it too?
- Many deployment and engagement options
- Industry certified interfaces
- Business enablement within governance framework
- Seamless enterprise integration or cornerstone system

CSO
Processes and data managed by the very best
- AWS Well Architected Certified
- Native Access Controls and Data Protection
- Designed for Compliance, Change, & Release Mgmt

CTO
A platform engineered for rapid innovation
- >100 "out of the box" integrations
- Quick Launch Packages
- D.I.Y. / Turn Key / Everything in between

CFO
Our record withstands skepticism and diligence
- Success based growth since inception
- ROI in 12 months or less
- Drive Revenue, EBITDA, and OpEx efficiencies
- Models constantly aligned with your business

100%
Deployment Success

>90
NPS trailing 3 yrs

>50%
Time to Market & Revenue

>40%
Cost Reductions

0%
Symphonica Churn

Driving mobile & fixed innovation

Services
- Mobile (+1.5MM) | Internet (+500K) | TV (+15K) | Fixed Telephony (+600K)

Network Technologies
- GSM | LTE | xDSL | GPON | DTH | IPTV | POTS | IMS

Integration with Platforms
- +25 Platforms | +45 Connectors
- HLR | HSS | OCS | OLM | OTA | PCRF | SMSC | MMSC | VM | VPN | DSLAM | BRAS | AAA | OLT | CAS | IMS

Integration with BSS/OSS Systems
- +10 Systems
- CRM | Billing | Product Catalog | Order Manager | Activator | Inventory | Tickets

Main Use Cases
- Activation | Customer Service | Assurance | Planning | Sales

Volume of Transactions per Hour
- Consumers: 65k | Providers (On-Demand): 50k | Data Collection (Bulk): 750K

Intraway

Driving mobile & fixed innovation

Services
- Mobile (+1.5MM) | Internet (+500K) | TV (+15K) | Fixed Telephony (+600K)

Network Techn...
- GSM | LTE...

Integration wit...
- +25 Platfo...
- HLR | HSS...

Integration wit...
- +10 Syste...
- CRM | Bil...

Main Use Cas...
- Activation...

Volume of Transactions per Hour
- Consumers: 65k | Providers (On-Demand): 50k | Data Collection (Bulk): 750K

Result Summary

- Implemented in 6-9 months

- 80% reduction in provisioning errors

- 20% reduction in service calls

- 50% reduction in repeat calls

- Time to Market average of 1 month (down from 6)

- In-store activation guaranteed vs prior commit of 24hr SLA
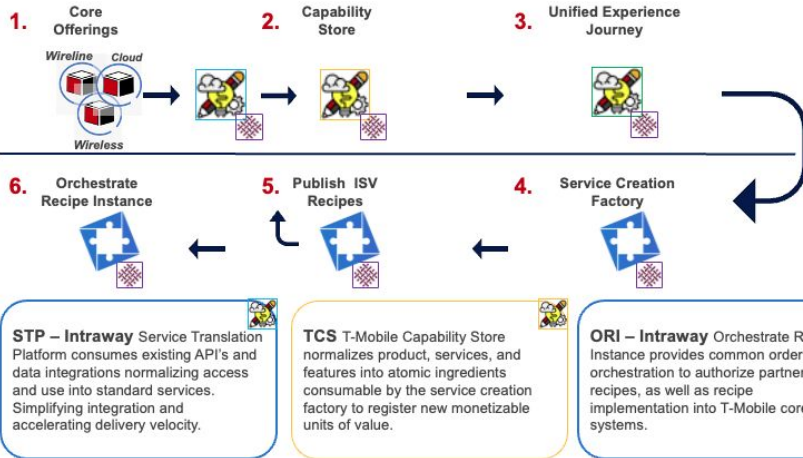
Intraway

Clients trust us with their business

Slice Service Offerings
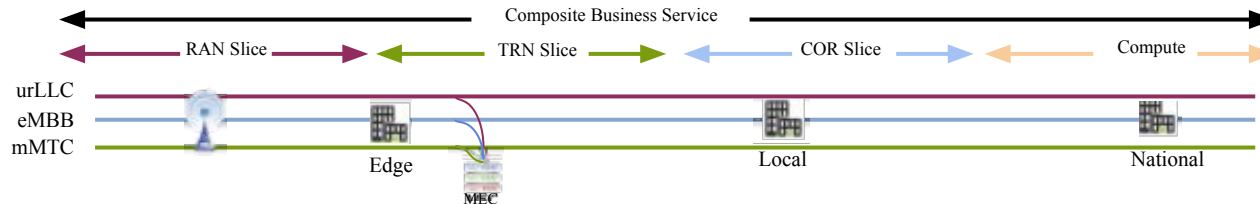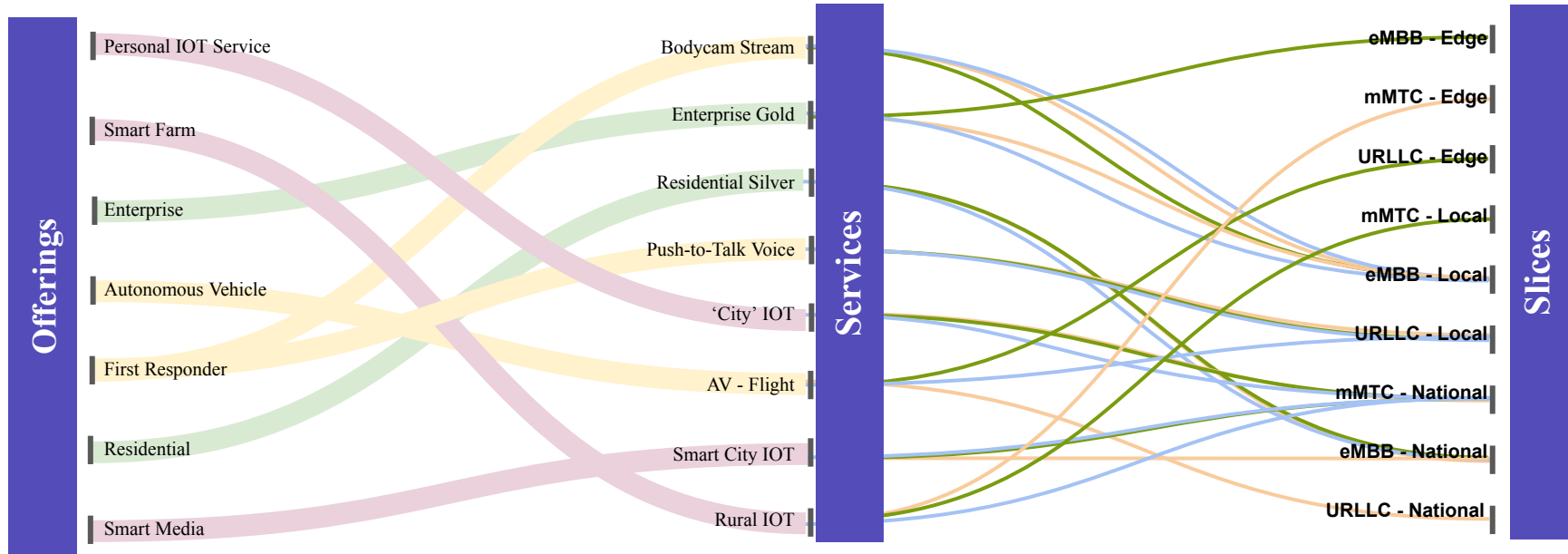
5G Content Marketplace

Platform/Ecosystem Functional Objectives

MAXIMIZE TECHNOLOGY REUSE + **NORMALIZED CAPABILITY** = **COHESIVE EXPERIENCE**

1. Core Offerings — Wireline, Cloud, Wireless
2. Capability Store
3. Unified Experience Journey
4. Service Creation Factory
5. Publish ISV Recipes
6. Orchestrate Recipe Instance

STP – Intraway Service Translation Platform consumes existing API's and data integrations normalizing access and use into standard services. Simplifying integration and accelerating delivery velocity.

TCS T-Mobile Capability Store normalizes product, services, and features into atomic ingredients consumable by the service creation factory to register new monetizable units of value.

ORI – Intraway Orchestrate Recipe Instance provides common order orchestration to authorize partner recipes, as well as recipe implementation into T-Mobile core systems.

UCX Unified customer experience abstracts existing platform flavors into a seamless journey to Optimize creation, consumption, and subscription of T-Mobile wide products services.

SCF – Intraway Service Creation Factory facilitates the curation, promotion, monetization, and use of offerings utilizing pre-integrated capabilities with their own IP.

TDT T-Mobile Digital Twin enables actionable intelligence across all eco-system actors. By mining data at throughout the process journey at sources of production, and consumption to facilitate the most efficient action.

1. Bring Innovators together create and consume applications on T-Mobile's network.

2. Common Persona framework with custom role journey. (Customer, Partner, Developer)

3. Simplify exposure and use of Network Slices to facilitate adoption.

4. Safely orchestrate compute, connectivity, and application capabilities in test and local, regional, or national launches.
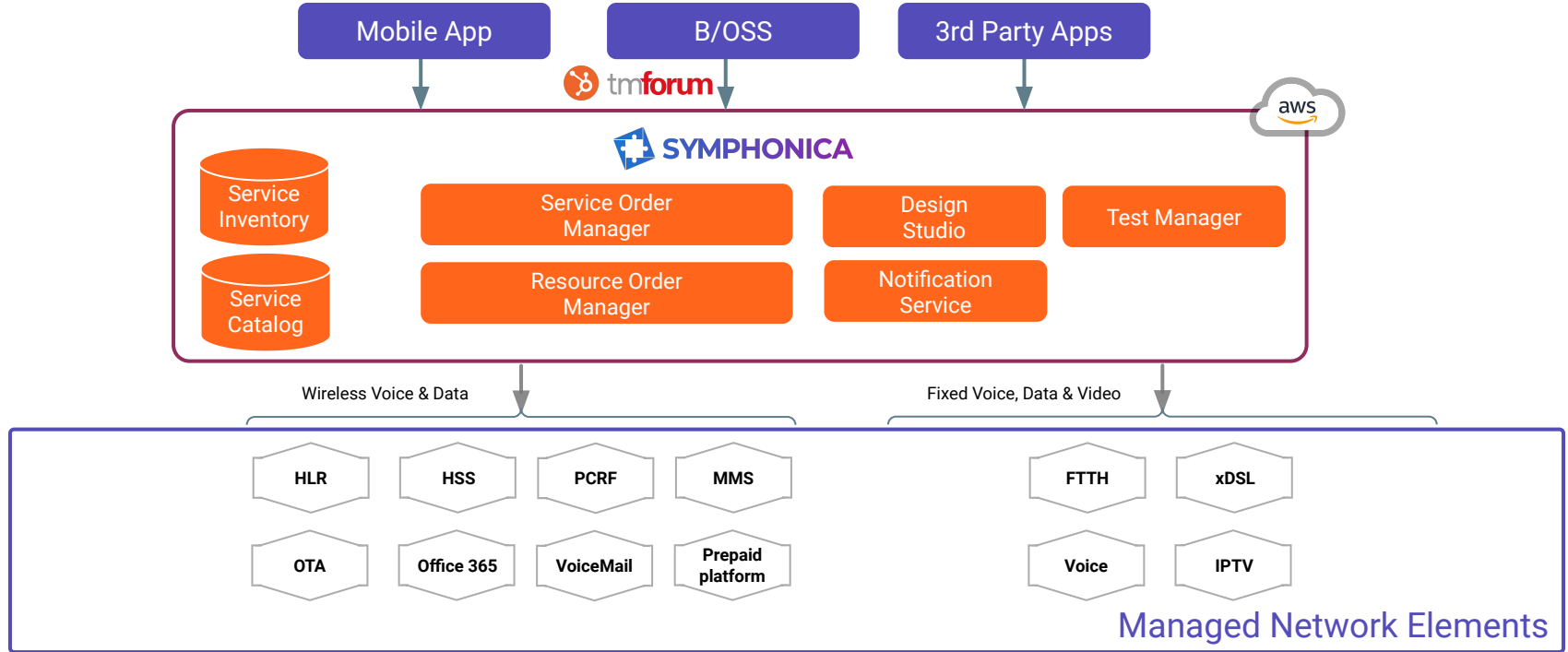
Integration Overview
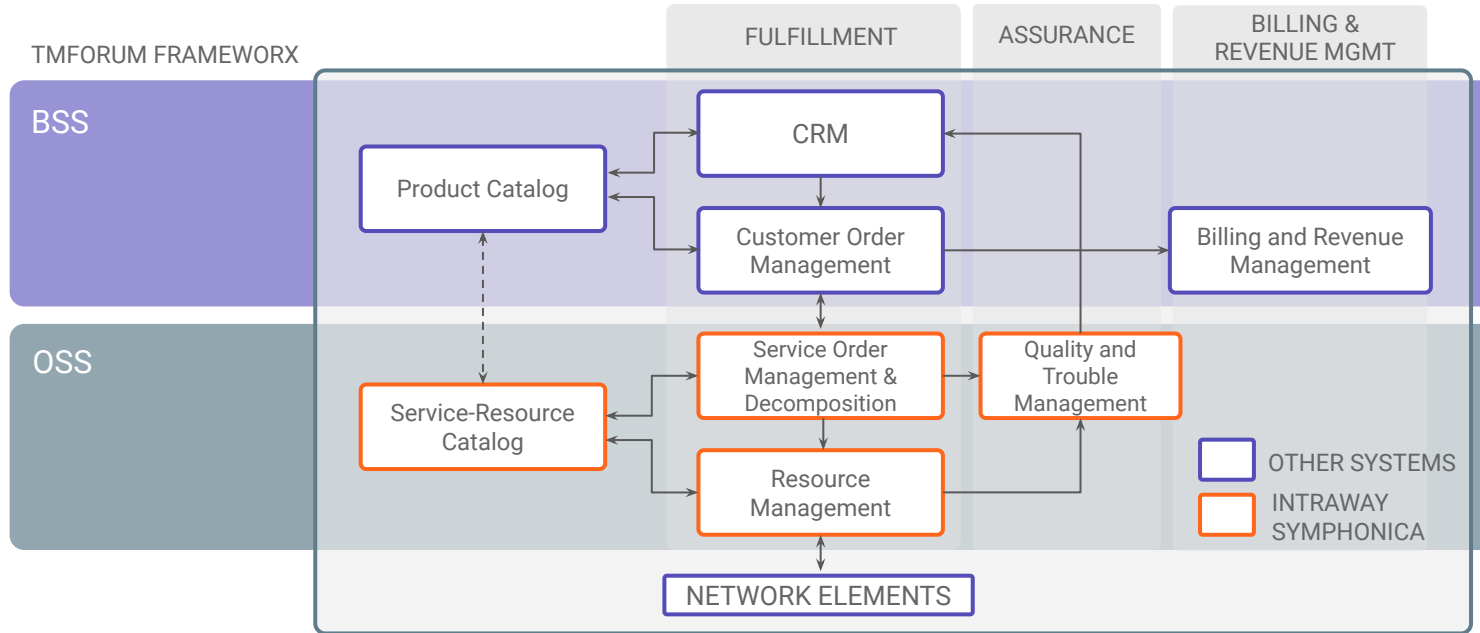
- **Managing** Product/**Service**/**Resource Orders** synchronized with a **Centralized Catalog**.
- **Aligned** to **TMForum** Frameworx (Architecture, datamodel, APIs)
- **No-code, multi-technology** and **multi-vendor** platform.

Example: Fixed/Mobile Convergence

Integration Inventory (select sampling)

NORTHBOUND

Vendor	Product	Type
AMDOCS	SIF v430	BSS
	ACTIVATION MANAGER	OSS
	SWITCH CONTROL	OSS
Appian	In-house Order Management	OM
AS/400 Based CRMs	IN-HOUSE SYSTEMS	BSS
CALIPSO		BSS
COMARCH	TYTAN	BSS
CSGI	CSGI	BSS
ERICSSON	OM	OSS
IN-HOUSE OSS	IN-HOUSE SYSTEMS	OSS
Netbox	Open-source Inventory	INVENTORY
NETCRACKER	CONVERGYS	BSS
OPEN		BSS
ORACLE	M6/METASOLV	OSS
	SIEBEL	BSS
	SOA / SERVICE BUS	OSS
PeopleSoft		INVENTORY
SALESFORCE		BSS
SAP	ERP, INVENTORY	BSS/OSS
TOA		WFM

CHARGING

Vendor	Type	Model	Provisioning	Support OP	Interface
Ericsson	OCS		✅	✅	HTTP
Sixbell	OCS	Nekotec	✅	✅	HTTP
Tecnotree	OCS		✅	✅	HTTP

EXTERNAL INVENTORY

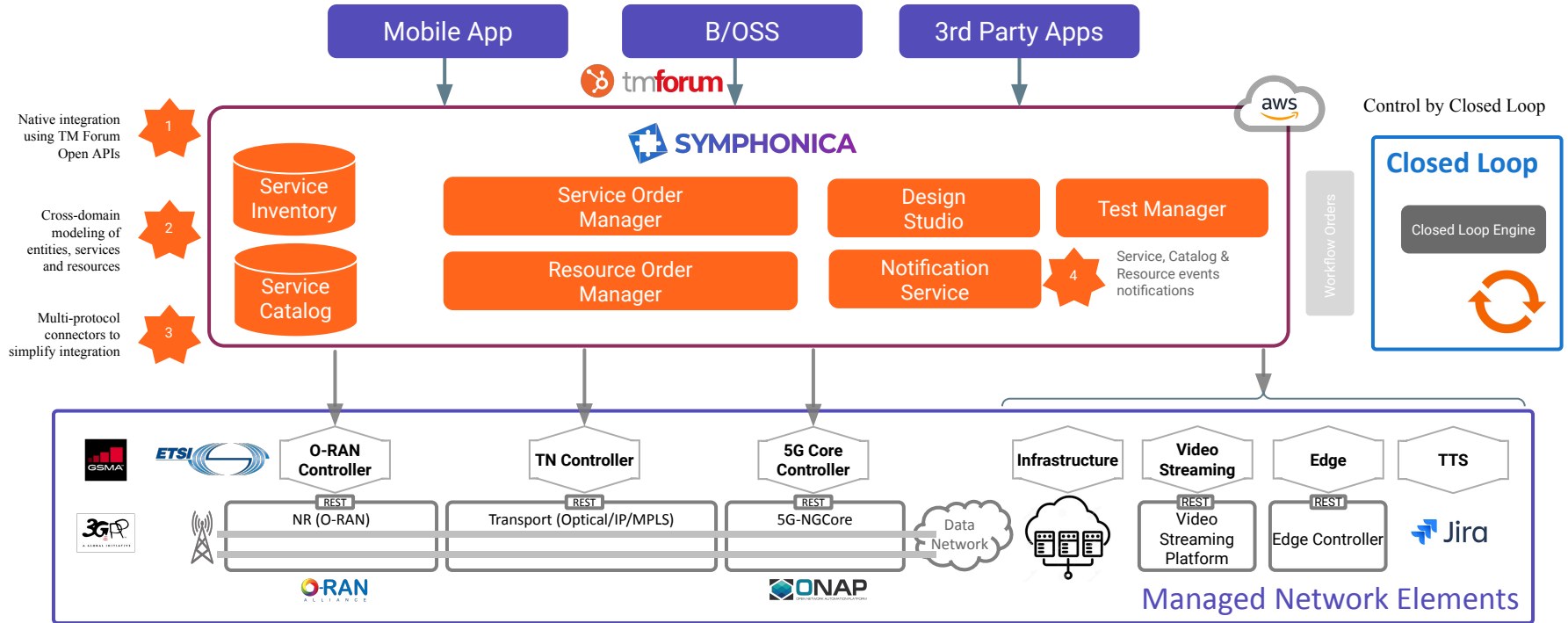| Vendor	Type	Model	Provisioning	Support OP	Interface
Netbox	Inventory		✅	✅	HTTP
NCP	Inventory		✅	✅	HTTP
Sunvizion	Inventory		✅		HTTP

Integration Summary (distinct platforms and solutions)

- **90+ Southbound Connectors**
- **15+ Northbound Integrations**
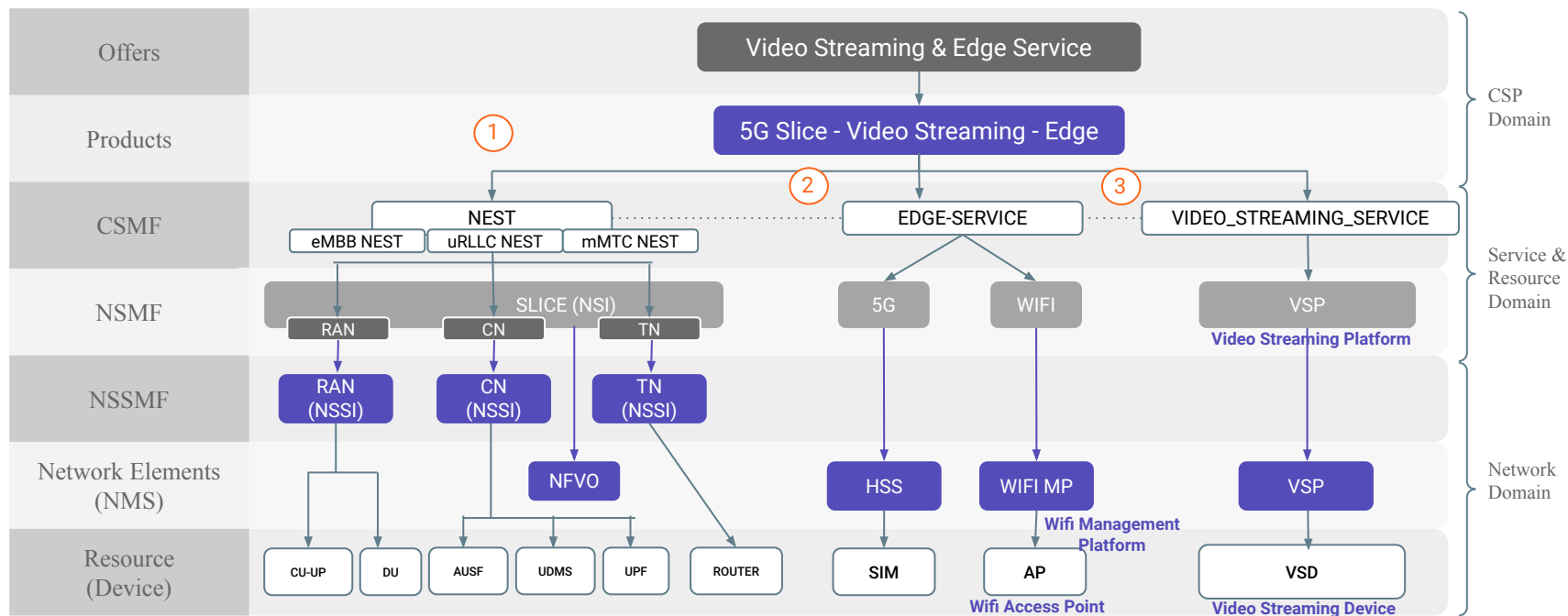- **20+ Quick Launch Packages**

* Full list of integrations in "Intraway-Symphonica-Connectors-Catalog-and-Integrations" Symphonica online documentation

Intraway

5G Slicing, Video Streaming, Edge Service

5G Slicing - Video Streaming

BSS

SYMPHONICA

Offers	Video Streaming & Edge Service
Products	5G Slice - Video Streaming - Edge
CSMF	NEST / eMBB NEST / uRLLC NEST / mMTC NEST / EDGE-SERVICE / VIDEO_STREAMING_SERVICE
NSMF	SLICE (NSI) / RAN / CN / TN / 5G / WIFI / VSP — Video Streaming Platform
NSSMF	RAN (NSSI) / CN (NSSI) / TN (NSSI)
Network Elements (NMS)	NFVO / HSS / WIFI MP — Wifi Management Platform / VSP
Resource (Device)	CU-UP / DU / AUSF / UDMS / UPF / ROUTER / SIM / AP — Wifi Access Point / VSD — Video Streaming Device

CSP Domain

Service & Resource Domain

Network Domain

① Allocate & Activate Slice ② Activate Edge Service ③ Activate Video Streaming Service ④ Enable & Monitor Video Assurance Service (by notification)

Slice and Services - Symphonica View

Updated Inventory

NEST

- **NEST-EMBB-VIDEOSTREAMING (NEST-EMBB_VIDEOSTREAMING_INSIDE_VENUE_5G)**
 - RAN3 (RAN_NSSIID-IW_6661959-3931648)
    - CU-UP (CU-UP_NSSIID-IW_6661959-3931648)
    - DU (DU_NSSIID-IW_6661959-3931648)
  - CN3 (CN_NSSI-C-JYV-HDBNJ-NSSMF-01-A-ZX)
    - UPF (UPF_NSSI-C-JYV-HDBNJ-NSSMF-01-A-ZX)
  - TN2 (TN_NSSIID-IW_8979191-3437177)
    - ROUTER (ROUTER_NSSIID-IW_8979191-3437177)

Video Streaming

- VIDEO_STREAMING_SERVICE (VSP_VIDEOSTREAMING_AND_NEST_5G)
  - NEST-EMBB-VIDEOSTREAMING (NEST-EMBB_VIDEOSTREAMING_INSIDE_VENUE_5G)
  - VIDEO_STREAMING_PLATFORM
    - VIDEO_STREAMING_DEVICE (VIDEO_STREAMING_DEVICE)

Edge Service

- EDGE-SERVICE (EDGE-SERVICE_NS_87654321_5G)
  - NEST-EMBB-VIDEOSTREAMING (NEST-EMBB_VIDEOSTREAMING_INSIDE_VENUE_5G)
  - 5G
    - imsi_NS_87654321 (imsi_NS_87654321)
  - WIFI
    - wifi_ssid (wifi_ssid)

- delayTolerance: supported
- ueMobilityLevel: 5
- availability: 999900
- countries: Portugal
- regions: Lisboa
- zones: Zone1
- sliceType: EMBB
- userEquipmentMaxDevices: 700
- downlinkThroughputSlice: 3500
- downlinkThroughputUE: 10000
- uplinkThroughputUE: 10000
- sampleFrequency: 234
- deviceVelocity: 10
- positioningAccuracy: 1
- positioningFrequency: 30
- radioSpectrum: 5GNR_n01
- SLA5QI: 1
- V2XCommunicationMode: NO
- packetErrorRate: Premmium
- maxPacketLossRate: Premmium
- downlinkThroughputMaxSlice: 100000
- uplinkThroughputMaxSlice: 100
- maxPacketSize: 1500
- latencyFromUFPToApplicationServer: 1
- missionCritical: No
- userEquipmentDeviceDensity: 12
- PDUSessionsMax: 123

Cloud Architecture - Symphonica
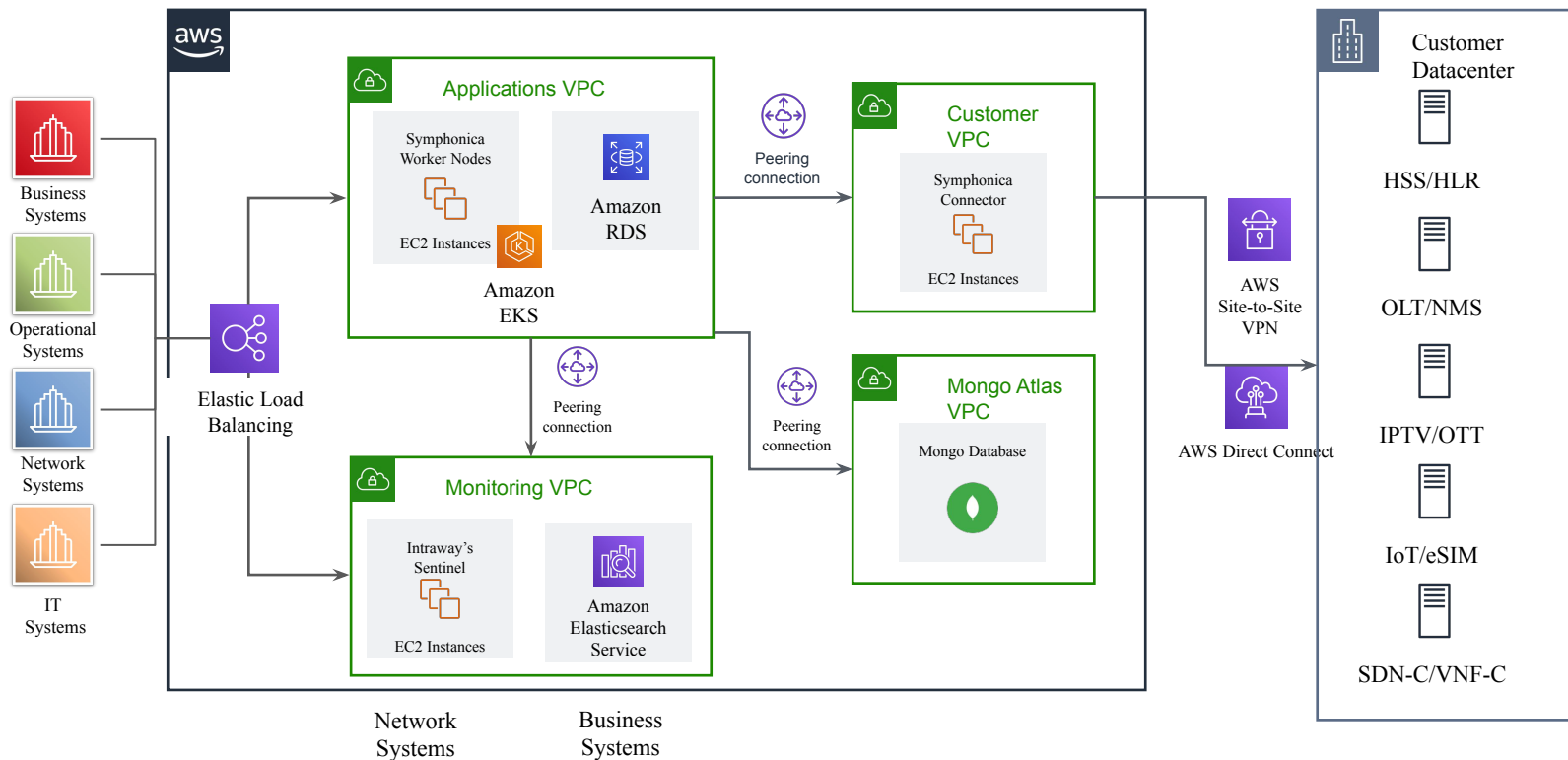
Cloud Scalability

Mobile use case example - 100M

100M SERVICES

200 MAX TPS

20 AVERAGE TPS

IW Component	AWS Service	Compute		Storage	
		Instance Type	Count	Storage Size (GB)	Backup (24hs)
Applications	Amazon Elastic Kubernetes Service	m5.xlarge	15 ⬆	200 ⬆	-
Databases	Amazon RDS	db.m5.12xlarge ⬆	2	1500 ⬆	1
	MongoDB (EC2)	m5.4xlarge ⬆	3	430 ⬆	1
Logging / Indexing	Amazon Elasticsearch Service	r5.12xlarge.elasticsearch ⬆	9	13900 ⬆	-
Monitoring	Amazon EC2	r5.2xlarge	1	150	-

Other: AWS Site-to-Site VPN, AWS Direct Connect, Elastic Load Balancing, GuardDuty, CloudWatch, Route53

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Symphonica Scaling Mechanisms

IW Component	Scaling Mechanism	Scaling Trigger	Reference
Applications	**Microservices** Supported by Amazon Elastic Kubernetes Service. Scales automatically.	Kubernetes Pods requirements (CPU, Memory) configuration and worker nodes Autoscaling group configuration	EKS Autoscaling
Databases	**MySQL RDS**. Supported by Amazon RDS. DB Storage autoscales automatically. CPU/Memory scales vertically with manual confirmation.	Alert from RDS performance monitoring. Requires manual confirmation to scale RDS instance type.	Vertical and Horizontal RDS Scaling
	MongoDB Supported by Mongo Atlas Cluster Auto-Scaling feature. Automatically scales CPU/Memory and storage.	Average CPU Utilization has exceeded 75% for the past hour, or Memory Utilization has exceeded 75% for the past hour.	Mongo Atlas Autoscaling
Logging / Indexing	**Elasticsearch** Supported Amazon Elasticsearch Service. CPU/Memory scales vertically with manual confirmation.	Alert from performance monitoring tool. Requires manual confirmation to scale Elasticsearch instance type.	Amazon Elasticsearch Scaling
Monitoring	**TIG Stack** Supported by Amazon EC2 Autoscaling Groups.	CPU, Memory utilization.	AWS EC2 Autoscaling

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