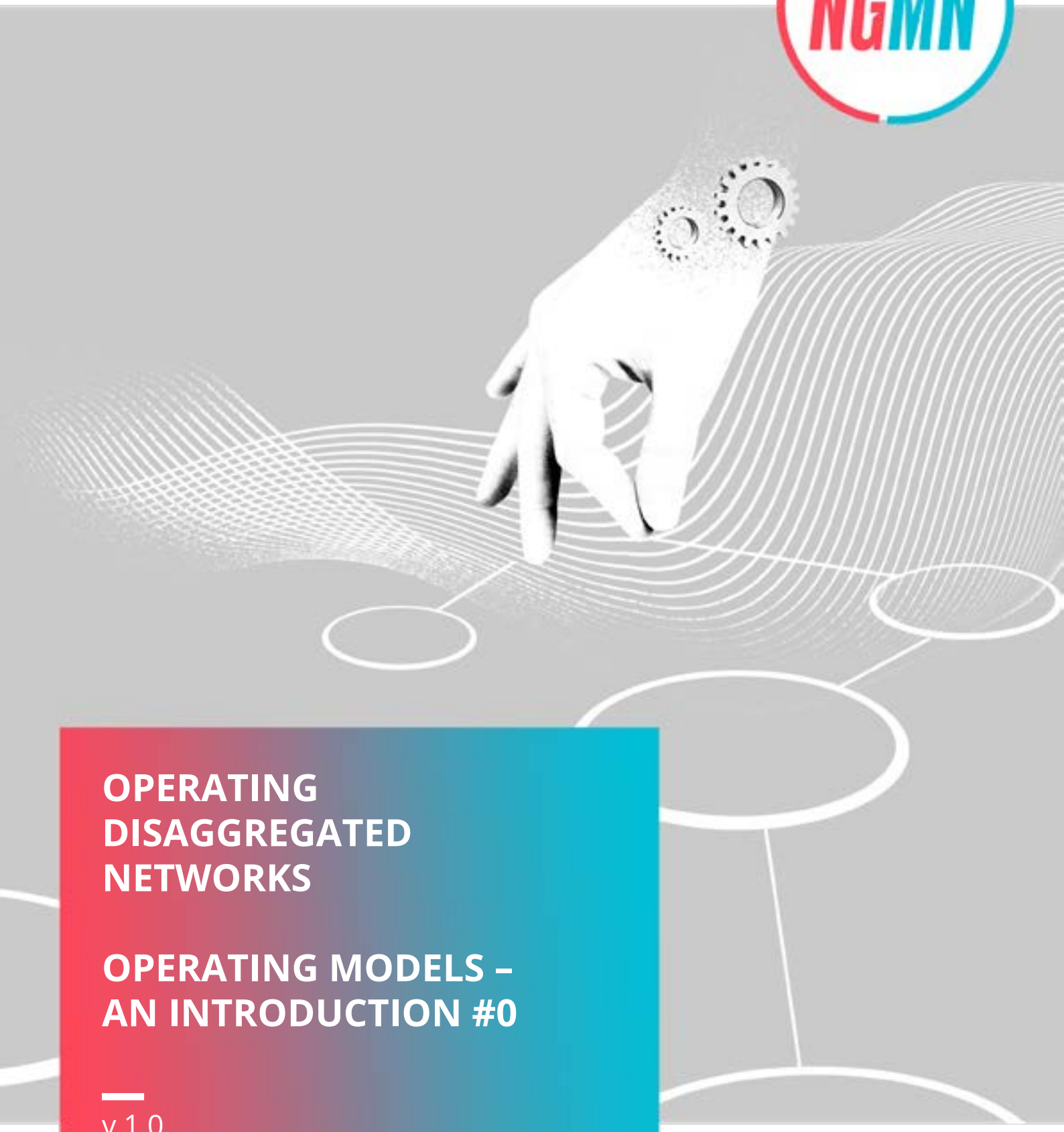

OPERATING DISAGGREGATED NETWORKS

OPERATING MODELS – AN INTRODUCTION #0

v 1.0

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OPERATING DISAGGREGATED NETWORKS:

OPERATING MODELS – AN INTRODUCTION #0

by NGMN Alliance

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ABSTRACT

This short publication provides an overview of the four Operating Models for Disaggregated Networks identified by NGMN Alliance. Each operating model is further outlined in a separate publication.

The Operating Models are outlined to provide technical and organisational guidance only and no market recommendation or market preference should be inferred from these publications. Other Operating Models may be possible.

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01 INTRODUCTION

In recent years, there has been a significant increase in operators worldwide testing and deploying disaggregated networks which are characterised by architectures which feature separation of hardware and software (so-called 'vertical' disaggregation) and more granular network functions (so-called 'horizontal disaggregation').

NGMN has just released four short publications on disaggregation models with the following objectives:

1. **Define models for the most relevant and widely used deployment and operating scenarios in the industry** by the operators today who are rolling out disaggregated architecture in their networks.

2. **Provide short publications that will give high level guidance for CTO's and decision makers** on what each model is, what are its advantages and disadvantages and how operators and vendors perceive each model to be helping operators. These publications would hopefully help them decide which model to adopt in their network, and possibly also do combinations.

Network disaggregation will often require a new operating model compared to the models operators have adopted over the years. The most appropriate model for each operator will be influenced by many parameters such as their organisational structure, culture, skills or risk appetite, to name a few.

02 OPERATING MODELS

2.1 MODEL 1: SINGLE VENDOR LED

The "Single Vendor Led" model [1], a straightforward approach whereby the operator contracts with a single/lead vendor to deploy the disaggregated network with the lead vendor acting as Systems Integrator (SI) and using its own products and/or those of partners to provide a complete solution. The operator in this model has a major contract relationship with the Lead Vendor and has contracts with other vendors (hardware, software, etc.). All operational management will be via the Lead Vendor.

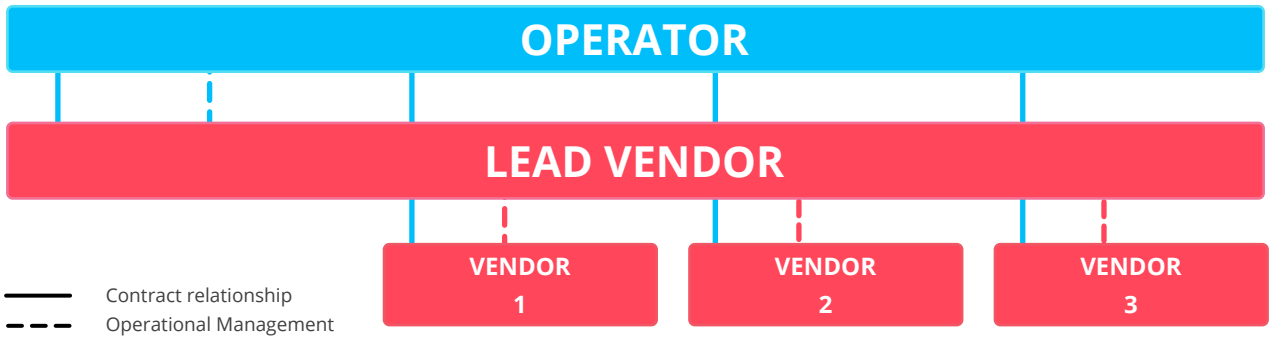

Figure 1: Single Lead Vendor

2.2 MODEL 2: SYSTEMS INTEGRATOR (SI) LED

This model [2] utilises a Systems Integrator (SI) who is not the main supplier of a solution, albeit may deliver some elements. Their main role is to implement the solution on behalf of the operator by integrating various vendor offerings. The model fully relies on other hardware and software vendors for the supply. This is both an advantage and a challenge: an advantage because it empowers the operator to create a solution with more choice yet discharge the complexity to the SI without having a significant impact on the organisation; a challenge in that the integration may become complex and perhaps take longer without a lead vendor owning the integration effort. In this model, the operator deploying the disaggregated network has the main contract relationship with the SI and in most instances the SI will be responsible for the operational management towards all the vendors.

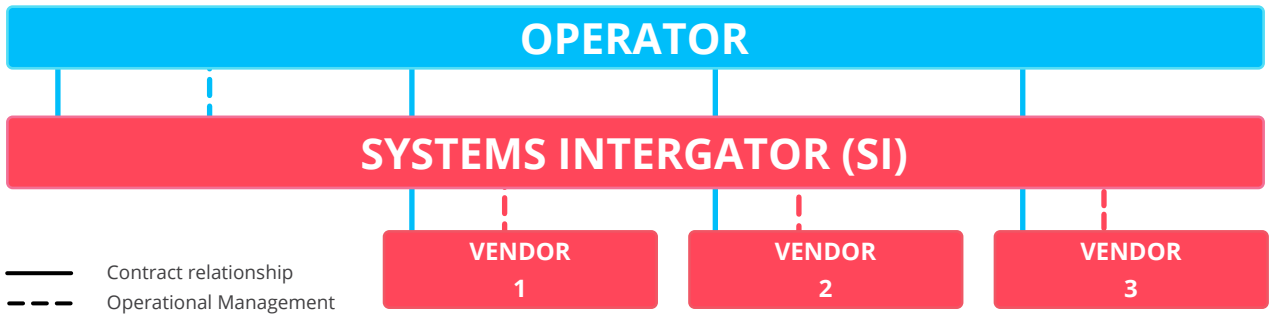

Figure 2: Systems Integrator (SI) Led

NOTE: Figure 2 shows the 'Turnkey' solution sub-model. Other sub-models are possible (e.g. Build-Operate-Transfer, Consultancy, Hybrid) and can be used at different stages of a project or for different types of projects. Please see the publication for full details.

2.3 MODEL 3: OPERATOR PLATFORM FOR OWN USE

This is a unique model [3] and could be an option for a selected number of operators as it requires an investment in the organisation to develop and build the platform. However, the model is beneficial because it gives the operator all the flexibilities possible since it has full control over the ongoing solution roadmap.

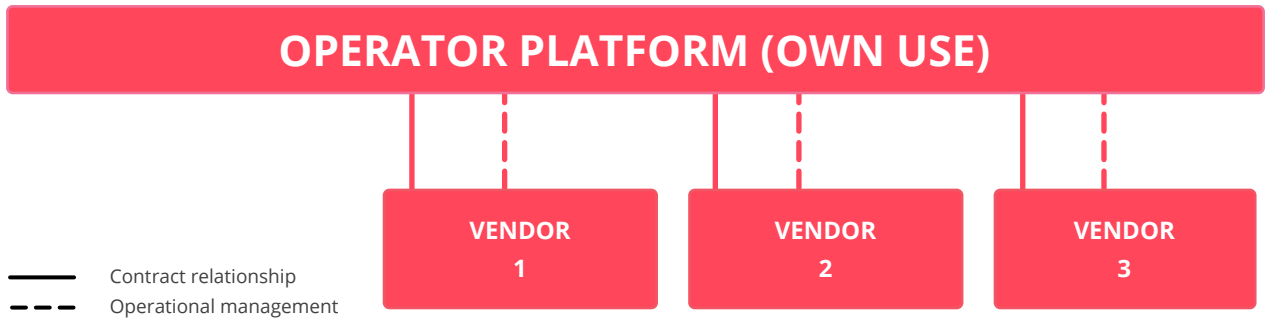

Figure 3: Operator Platform for own use

2.4 MODEL 4: OPERATOR PLATFORM COMMERCIALLY OFFERED TO OTHERS

This model [4] is very similar to model 2 and model 3 as the operator acts as a SI (to another operator customers) but the operator is also developing its own solutions, or at least integrating hardware and software as pre-integrated solutions that allows operator-customers to not worry about compatibility and interoperation and facilitate a faster deployment by having proven solutions that are tested in similar networks.

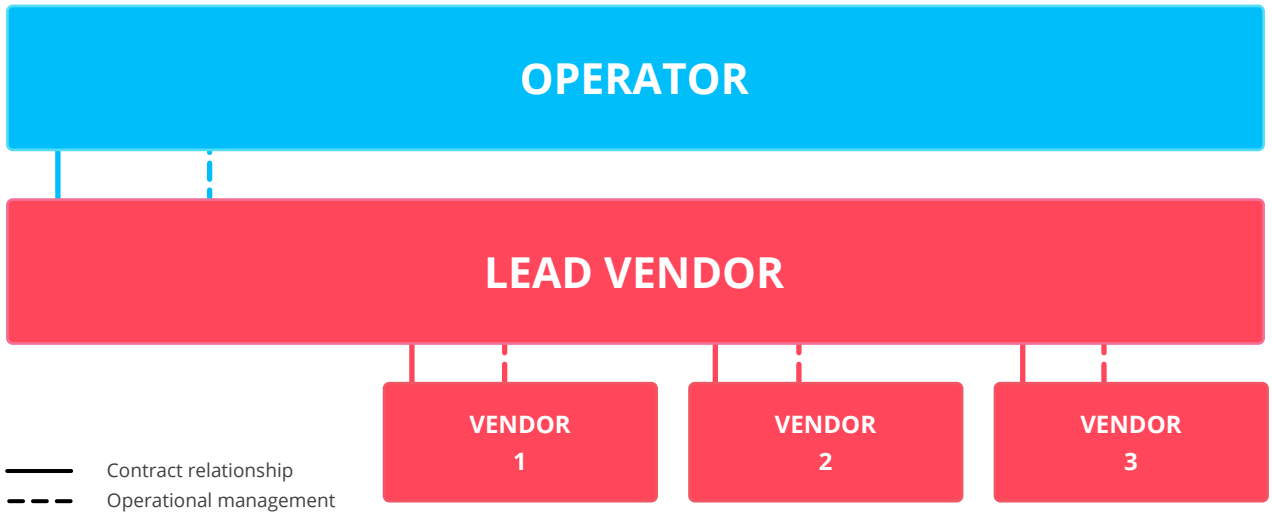

Figure 4: Operator Platform commercially offered to others

03 CONCLUSIONS

During development of the four models, there are key items identified that are present:

Vendor
All models are dependent on the support and products (HW/SW) of vendors - however this does not preclude operators developing their own custom SW tools as part of the overall disaggregated networks solution.

Systems Integration
In each model, there is always system integration, which is the heart of disaggregation.

Role	Model 1	Model 2	Model 3	Model 4
Operator	x	x	*x*	*x*
Vendor (HW/SW)	x	*x*	*x*	*x*
Systems Integrator (SI)	x	*x*	*x*	*x*
Operator (as platform vendor)				*x*

Table 1: Operating Models and Roles

From an operator perspective each model attempts to simplify solution management and Systems integration except for Model 3 'Operator Platform for own use'. Model 4 'Operator Platform offered to others' puts the burden of SI to the operator platform vendor. All models encourage multi-vendor deployment, which is consistent to the essence of disaggregation.

Metric (Operator perspective)	Model 1	Model 2	Model 3	Model 4
Solution Management	Simplified	Simplified	Complex	Simplified
Solution Management	Single PoC (Operations) / Multiple PoC (contracts)	Single PoC	N/A / Internal	Single PoC
Integration	Simplified	Simplified	Complex	Simplified
Multi-vendor	Yes	Yes	Yes	Yes

DISCLAIMER: NGMN does not recommend one model v another but leaves this to each operator to decide.

Table 2: Comparison of Models

04 REFERENCES

[1] NGMN Alliance, "Mastering the Route to Disaggregation: Operating Model #1: Single Vendor Led," NGMN Alliance, 10 Dec 2024. [Online]. Available: https://www.ngmn.org/wp-content/uploads/241216_Operating-Model-1-Single-Vendor-Led_v1.0.pdf. [Accessed 10 Dec 2024].

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05 FIGURES AND TABLES

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NEXT GENERATION MOBILE NETWORKS ALLIANCE

NGMN is a forum established in 2006 by world-leading Mobile Network Operators. NGMN is a global operator-led alliance comprising nearly 70 companies and organizations, including operators, vendors and academia.

Its objective is to ensure that next generation network infrastructure, service platforms, and devices meet the requirements of operators and address the demands and expectations of end users.

VISION

The vision of NGMN is to provide impactful industry guidance to achieve innovative, sustainable and affordable mobile telecommunication services for the end user with a particular focus on Mastering the Route to Disaggregation, Green Future Networks and 6G, whilst continuing to support 5G's full implementation.

MISSION

The mission of NGMN is:

- To evaluate and drive technology evolution towards the three **Strategic Focus Topics:**
  - **Mastering to the Route to Disaggregation:**

    Leading in the development of open, disaggregated, virtualised and cloud native solutions with a focus on the E2E Operating Model
  - **Green Future Networks:**

    Developing sustainable and environmentally conscious solutions
  - **6G:**

    Anticipating the emergence of 6G by highlighting key technological trends and societal requirements, as well as outlining use cases, requirements, and design considerations to address them.
- To define precise functional and non-functional requirements for the next generation of mobile networks
- To provide guidance to equipment developers, standardisation bodies, and collaborative partners, leading to the implementation of a cost-effective network evolution
- To serve as a platform for information exchange within the industry, addressing urgent concerns, sharing experiences, and learning from technological challenges
- To identify and eliminate obstacles hindering the successful implementation of appealing mobile services.