



MASTERING THE ROUTE TO DISAGGREGATION

OPERATING MODEL #1: SINGLE VENDOR LED

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OPERATING MODEL #1: SINGLE VENDOR LED

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Project Lead
Carlos Fernandes, Deutsche Telekom
Lennart Olaivar, Smart

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TABLE OF CONTENTS

- 00 FOR AN OVERALL INTRODUCTION TO THE OPERATING MODELS, REFER TO THE SEPARATE DOCUMENT #0 TITLED "OPERATING MODELS – AN INTRODUCTION #0". [CLICK HERE](#) FOR THE DOCUMENT.

- 01 EXECUTIVE SUMMARY 4
- 02 INTRODUCTION 6
- 03 OPERATING MODEL: SINGLE VENDOR LED 7
- 04 IMPLICATIONS OF SINGLE VENDOR LED 8
 - 4.1. Target Organisation to Support Operating Model 8
 - 4.1.1. Process Changes 8
 - 4.1.2. People (Skills) Changes 8
- 05 CONCLUSIONS..... 9
- 06 REFERENCES..... 11
- 07 FIGURES 12

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All operator and vendor examples mentioned in this publication are provided solely for illustrative purposes, serving to clarify the model through concrete examples. References to specific brands or company names are not intended as endorsements or recommendations. NGMN neither endorses nor promotes any particular operator or vendor and has no intention of doing so.

01 EXECUTIVE SUMMARY

In recent years, there has been a significant increase in operators worldwide testing and deploying disaggregated networks which are characterised by architectures featuring separation software from hardware (so-called 'vertical' disaggregation) and more granular network functions (so-called 'horizontal disaggregation'). Thus far, only a limited number of operating models have been adopted.

This publication outlines the "Single Vendor Led" model. The model is described, and its pros and cons are discussed vis-a-vis the three other operating models identified by NGMN in related publications. No recommendation should be inferred from these publications - they are simply to provide the industry with an overview of operating models and the impact on mobile operators. NGMN further notes that the list of models identified in this, and related publications is non-exhaustive. Other approaches may be possible.

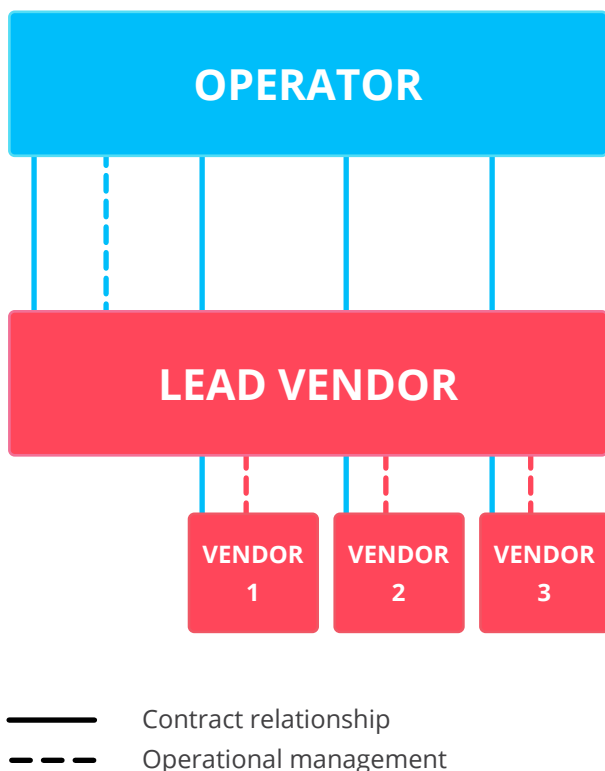


Figure 1: Single Lead Vendor

The model (figure 1) involves engaging a single lead vendor responsible for both systems integration and operational management of all network components. This approach offers the operator several benefits:

- 1. Simplified Management:**
Streamlined communication and management by dealing with a lead vendor.
- 2. Clear Accountability:**
A single point of responsibility ensures issues are addressed efficiently.
- 3. Ease of Integration:**
Reduced interoperability issues as the lead vendor handles the systems integration of all components.

However, it also presents notable disadvantages:

- 1. Lock-in Risk:**
If the selected solution requires the operator to rely on proprietary technologies or to outsource specific activities, then in the longer term, this could make it more challenging to switch solutions. Dependence on a lead vendor (and its selected partners and their products and solutions) might limit flexibility and can make switching solutions challenging.
- 2. Limited Access to others' Products and Services:**
Restricted access to technologies from suppliers who are not partners of the selected lead vendor could impact the ability of the operator to develop services which rely on features that are not available within the lead vendor's present ecosystem.
- 3. Cost Implications:**
This model could lead to potentially reduced negotiation power and potentially higher costs if only a few firms offer such 'lead vendor' type solutions.

Implications for Organisations:

Adopting the “Single Vendor Led” model requires less organisational changes, making it suitable for operators reluctant to disrupt existing processes. However, it may also lead to over-dependence on the vendor and reduced autonomy in network design and optimisation. Operators must balance these factors against the benefits of simplified management and integration.

Strategic Considerations:

It may be possible for operators to consider a phased approach:

Initial Phase:

The “Single Vendor Led” model could lay the foundation for disaggregated networking while minimising disruption.

Future Phases:

It could follow a gradual transition to more complex models that enable the operator to potentially have greater control over the complete solution and may leverage the full anticipated benefits of disaggregation, including cost optimisation, increased flexibility, and enhanced efficiency. Such benefits - the investment required and their actual impact on costs, efficiency, and flexibility - will only become clearer if and when large scale deployments take place.

Conclusion:

The “Single Vendor Led” model offers a convenient path to disaggregation. On the other hand, it does not fully exploit the potential operator perceived benefits of disaggregation.

A potential way forward for operators could be:

Leverage Initial Simplicity:

Start with this model to ease into disaggregation and build a robust foundation.

Plan for Gradual Transition:

Aim to transition to broader multi-vendor strategies to enable the operator to have greater control over the solution and solution roadmap.

Foster Alliances:

Form strategic alliances with multiple vendors to enable the graduation transition leveraging flexibility and freedom in choosing the right solution and approach.

Alliances such as **NGMN** are crucial for driving industry transformation. By collaborating with a diverse range of partners, operators can navigate through the complexities of disaggregation.

02 INTRODUCTION

For the past three or four years, the number of operators across the world testing disaggregated solutions and networks has been gradually increasing. However, only a handful of operating models are available and are used by operators who are rolling out such technology and architecture.

Currently the number of potential operating models observed across the industry has crystallised into four which are seen as most common practice. Each of them has their own advantages and disadvantages. Operators may categorise themselves as using one of these or they may opt to adopt them based on their current network and financial situation, as well as technology and organisational readiness.

Several operators are leading the adoption and deployments and have planned to start roll-out in 2024. Others are still testing and contemplating as they are unsure which model to follow or take. Both kinds of operators will benefit from this short publication that outlines one possible option to take, which is potentially the easiest and most straightforward that is currently available to deploy disaggregated networks; other solutions are outlined in similar publications.

In a previous NGMN publication [1], technical, organisational, processual, procurement and other requirements were identified, indicating which are needed in order to be ready for disaggregation implementation. The level of implementation of these requirements will act as proxy for readiness of a given operator to deploy or adopt disaggregation, depending on the scale.

03 OPERATING MODEL: SINGLE VENDOR LED

This publication outlines the "Single Vendor Led" model, a straightforward approach whereby the operator contracts with a single/lead vendor to deploy the disaggregated network with the lead vendor acting as System Integrator (SI) and using its own products and/or those of partners to provide a complete solution. This operating model is simple and straightforward since it is very similar to the current operating model of network roll outs today.

This operating model is most likely chosen by operators who chose to leverage the benefits of disaggregated networks but are still opting to use existing methods to deploy and operate their network building on existing people, processes and relationships.

This model is similar to the one seen in previous network roll outs where an operator engages with just one or few major vendors, usually hardware and software vendor, to roll out mobile technologies (e.g. 5G). This model is currently utilised by operators such as AT&T [2] recently and Vodafone back in 2022 [3] where they tapped only one vendor to do the complete Open RAN rollout. This vendor is then responsible for all components – hardware, software, RU as well as integration. It has the option to use its own products or tap into other vendor's products.

From a disaggregation perspective, this model appears to be counter intuitive, as it defeats the purpose of fully breaking down technology silos and separating the different layers of the stack, potentially limiting the options of operators in terms of the solution.

The advantage of this model is that it is the closest to today's deployment of networks where there is typically a single responsible entity, therefore making the engagements easier and simpler. Operators who are starting disaggregation may choose this model for its simplicity since it is similar to what they are familiar with for many years.

The unified responsibility of a single lead vendor enhances overall management and integration, ensuring compatibility among components and reducing overall complexity. Additionally, this model typically facilitates quicker delivery, as all technologies and equipment originate from the same vendor (but may also be supplied by others), streamlining coordination and integration processes. But with all responsibilities concentrated on a single vendor, any issues with the supplier pose a risk to the entire deployment plan, increasing the likelihood of risk concentration.

04 IMPLICATIONS OF SINGLE VENDOR LED

4.1 TARGET ORGANISATION TO SUPPORT OPERATING MODEL

This model most likely fits those organisations or operators that do not want to have a huge impact on the way they do things and operate when they adopt disaggregation. When adopting disaggregation there are many facets of the organisation that need to change such, as organisational format, procurement processes, integration process, planning, dimensioning, optimisation and operations. These needed changes are some of the reasons why many of the operators are not yet ready for disaggregation and are still hesitant to go ahead with it. With this model, the needed changes are minimised, so it will better encourage operators to go ahead with disaggregation adoption, since the methodology will be similar to what they are familiar with.

4.1.1 Process Changes

One of the advantages of this model is that it will entail fewer process changes since it adopts most of what the operators are doing in their existing network roll outs, since these also typically are led by a single lead vendor.

There might be some changes on how the network is planned, designed, dimensioned, optimised and operated due to architectural changes disaggregation brings. For example, in RAN, instead of dimensioning only the BBUs and RRUs, now operators need to dimension CU, DU and RU separately. Also, software would be dimensioned separately from hardware. So, there are still several adjustments that need to be made and challenges to overcome.

4.1.2 People (Skills) Changes

The people (skills) changes required by the operator when adopting the single vendor led model are

minimal. During the life cycle of the network (planning/design, build, operate, maintain) the single lead vendor is responsible for integration and operational management. However, the operator will still need to maintain oversight of the project, day to day operations and maintenance, as well as be able to plan for future upgrades to this and any new or related infrastructures.

For these reasons, it is important for the operator to have people skilled in engineering disaggregated networks who are able to clearly communicate high-level requirements, as well as be able to understand and, where appropriate, challenge responses from vendors.

05 CONCLUSIONS

Despite the advantages of adopting this model, there are also known potential disadvantages to this model. Operators relying on a single lead vendor may lead to over-dependence, posing risks to network operations if the vendor encounters issues. Additionally, choosing the lead single vendor model may reduce the operator's autonomy in network design and optimisation, making it difficult to customise and adjust according to customer needs, especially when new functions and features are needed. Operators may be limited to what their chosen suppliers can do and sometimes need to wait for a major software release in order to effect changes and use new functionalities and features. So, the target organisation needs to be fully aware of this.

In light of the foregoing, each operator needs to decide whether a multi-vendor strategy would make sense to potentially mitigate risks and enhance market competition. In addition, operators need to make up their mind on whether to retain a degree of technological autonomy by using standardised hardware and software at critical nodes.

The pros and cons depend on the intention of the operator in adopting disaggregation as well as its long-term plan.

Model 1 Pros:

- 1. Simplified Management:**
Streamlined communication and management by dealing with a lead vendor.
- 2. Clear Accountability:**
A single point of responsibility ensures issues are addressed efficiently.
- 3. Ease of Integration:**
Reduced interoperability issues as the lead vendor handles all systems integration.

This model is clearly the easiest to do when adopting disaggregation – few changes are needed, less adjustments in the organisation and processes are needed. This could be a solution to operators who are wanting to leverage on the benefits of disaggregation, but are hesitant due to the vast changes needed to adopt it.

Model 1 Cons:

- 1. Lock-in Risk:**
If the selected solution requires the operator to rely on proprietary technologies or to outsource specific activities, then in the longer term this could make it more challenging to switch solutions. Dependence on a lead vendor (and its selected partners) might limit flexibility and can make switching solutions challenging.
- 2. Limited Access to others' Products and Services:**
Restricted access to technologies from suppliers who are not partners of the selected lead vendor. This could impact the ability of the operator to develop services which rely on features that are not available within the lead vendor's present ecosystem.
- 3. Cost Implications:**
Potentially reduced negotiation power and potentially higher costs if only a few firms offer such 'lead vendor' type solutions.

If there is hesitance in doing full disaggregation, it could be an option that operators adopt this in their phase 0 or phase 1 or on their initial disaggregation roll out just so they could already lay the foundations for the future full disaggregation journey and end state - which will eventually reap the operator perceived advantages and benefits of disaggregation on cost optimisation, efficiency and flexibility. Then, the operator does have the option to gradually move to other models that leverage the full potential of disaggregation that effects maximum efficiencies

in Capex and Opex and maximum flexibility in the solution.

Adopting the “Single Vendor Led” model requires less organisational changes, making it suitable for operators reluctant to disrupt existing processes. However, it may also lead to over-dependence on the vendor and reduced autonomy in network design and optimisation. Operators must balance these factors against the benefits of simplified management and integration.

While the “Single Vendor Led” model offers a convenient path to disaggregation, it does not fully exploit the potential operator perceived benefits of disaggregation.

A potential way forward for operators could be:

1. Leverage Initial Simplicity:

Operator could start with this model to ease into disaggregation and build a robust foundation.

2. Plan for Gradual Transition:

A transition to broader multi-vendor strategies could follow to enable the operator to have greater control over the solution and solution roadmap.

3. Foster Alliances:

Form strategic alliances with multiple vendors to enable the gradual transition leveraging flexibility and freedom in choosing the right solution and approach.

Alliances such as NGMN are crucial for driving industry transformation. By collaborating with a diverse range of partners, operators can navigate the complexities of disaggregation.

06 REFERENCES

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07 FIGURES

Figure 1:
Single Lead Vendor..... 4

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 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.