



THE  
INSIGHT  
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# How's vRAN Doing These Days?

Insight Research Corporation

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## Table of Contents

<b>1.</b>	<b>Executive Summary .....</b>	<b>1</b>
1.1	What about Open RAN? .....	4
1.2	Has vRAN changed form? .....	4
1.2.1	VM-based vRAN.....	5
1.2.2	Container-based vRAN .....	5
1.3	Market Overview .....	6
<b>2.</b>	<b>Virtualization of Network Functions .....</b>	<b>8</b>
2.1	Introduction.....	8
2.2	VM-based Approach; a.k.a. NFV Earlier .....	8
2.2.1	VNFi/NFVi .....	9
2.2.2	MANO.....	10
2.2.2.1	Virtualized Infrastructure Manager (VIM) .....	10
2.2.2.2	VNF Manager (VNFM).....	10
2.2.2.3	NFV Orchestrator (NFVO) .....	11
2.2.3	VNF .....	11
2.3	Container-based Approach; a.k.a. CNF Earlier .....	11
2.3.1	What are Containers? .....	12
2.3.2	Microservices .....	12
2.3.3	Container Morphology.....	13
2.3.3.1	Provisioning and Run-time Management Block .....	14
2.3.3.1.1	Docker Engine .....	14
2.3.3.2	Orchestration Block.....	15
2.3.3.2.1	Kubernetes.....	15
2.3.3.3	Application Deployment Block .....	15
2.3.4	CNCF .....	16

Tables of Contents

2.4	Contrasting VMs and Containers .....	17
<b>3.</b>	<b>Virtualization of the RAN.....</b>	<b>19</b>
3.1	The RAN and its Evolution .....	19
3.1.1	Closer Look at E-UTRAN .....	20
3.1.2	5G- NR, NSA and SA .....	21
3.1.3	MEC .....	22
3.2	The Progression of the RAN to the vRAN .....	23
3.3	How VM-based and Container-based vRANs Compare? .....	24
3.3.1	The Need for Containers .....	24
3.3.1.1	Advantage Containers.....	25
3.3.1.2	Challenges Confronting Containers .....	27
3.3.2	The Rigid CPRI.....	28
3.4	RAN Virtualization – A Story of Alliances .....	29
3.4.1	O-RAN Alliance .....	29
3.4.1.1	Architecture and Approach to RAN Layer Split .....	30
3.4.2	Open vRAN (O-vRAN) .....	32
3.4.2.1	Architecture and Approach to RAN Layer Split .....	33
3.4.3	Telecom Infra Project (TIP) OpenRAN .....	34
3.4.3.1	Architecture and Approach to RAN Layer Split .....	35
<b>4.</b>	<b>Telco Profiles .....</b>	<b>37</b>
4.1	Telco profiles .....	37
4.2	Airtel .....	37
4.2.1	VM and Container-based vRAN Initiatives .....	37
4.3	AT&T .....	38
4.3.1	VM and Container-based vRAN Initiatives .....	39
4.4	BT .....	40
4.4.1	VM and Container-based vRAN Initiatives .....	40

**Tables of Contents**

---

4.5	China Mobile .....	41
4.5.1	VM and Container-based vRAN Initiatives .....	41
4.6	China Telecom .....	42
4.6.1	VM and Container-based vRAN Initiatives .....	43
4.7	China Unicom .....	43
4.7.1	VM and Container-based vRAN Initiatives .....	43
4.8	Deutsche Telekom.....	44
4.8.1	VM and Container-based vRAN Initiatives .....	44
4.9	Etisalat.....	45
4.9.1	VM and Container-based vRAN Initiatives .....	45
4.10	Jio .....	46
4.10.1	VM and Container-based vRAN Initiatives .....	46
4.11	KDDI.....	47
4.11.1	VM and Container-based vRAN Initiatives .....	48
4.12	KT .....	49
4.12.1	VM and Container-based vRAN Initiatives .....	49
4.13	LG Uplus.....	49
4.13.1	VM and Container-based vRAN Initiatives .....	49
4.14	M1 Singapore.....	50
4.14.1	VM and Container-based vRAN Initiatives .....	50
4.15	NTT DoCoMo .....	51
4.15.1	VM and Container-based vRAN Initiatives .....	51
4.16	Ooredoo.....	52
4.16.1	VM and Container-based vRAN Initiatives .....	52
4.17	Optus (Singtel Optus) .....	53
4.17.1	VM and Container-based vRAN Initiatives .....	53
4.18	Orange .....	53

**Tables of Contents**

---

4.18.1	VM and Container-based vRAN Initiatives .....	54
4.19	Rakuten .....	55
4.19.1	VM and Container-based vRAN Initiatives .....	55
4.20	Saudi Telecom (STC) .....	56
4.20.1	VM and Container-based vRAN Initiatives .....	56
4.21	Singtel .....	57
4.21.1	VM and Container-based vRAN Initiatives .....	57
4.22	SK Telecom .....	58
4.22.1	VM and Container-based vRAN Initiatives .....	58
4.23	Softbank .....	59
4.23.1	VM and Container-based vRAN Initiatives .....	59
4.24	Swisscom .....	60
4.24.1	VM and Container-based vRAN Initiatives .....	60
4.25	T-Mobile .....	61
4.25.1	VM and Container-based vRAN Initiatives .....	61
4.26	TIM/Telecom Italia .....	62
4.26.1	VM and Container-based vRAN Initiatives .....	62
4.27	Telenor .....	63
4.27.1	VM and Container-based vRAN Initiatives .....	63
4.28	Telefonica .....	64
4.28.1	VM and Container-based vRAN Initiatives .....	64
4.29	Telia .....	66
4.29.1	VM and Container-based vRAN Initiatives .....	66
4.30	Telkom Indonesia .....	66
4.30.1	VM and Container-based vRAN Initiatives .....	67
4.31	Telstra .....	67
4.31.1	VM and Container-based vRAN Initiatives .....	67

**Tables of Contents**

4.32	Turk Telecom .....	68
4.32.1	VM and Container-based vRAN Initiatives .....	68
4.33	Turkcell .....	69
4.33.1	VM and Container-based vRAN Initiatives .....	69
4.34	Veon VimpelCom .....	69
4.34.1	VM and Container-based vRAN Initiatives .....	70
4.35	Verizon .....	70
4.35.1	VM and Container-based vRAN Initiatives .....	70
4.36	Vodafone .....	72
4.36.1	VM and Container-based vRAN Initiatives .....	72
<b>5.</b>	<b>Solution Provider Profiles.....</b>	<b>75</b>
5.1	Containers and the Vendors .....	75
5.2	Organization Categories .....	76
5.2.1	Telecommunications Domain Experts .....	77
5.2.2	DAS Specialists.....	77
5.2.3	Equipment Vendors .....	77
5.2.4	Independent Software Vendors (ISV) .....	77
5.2.5	Semiconductor Specialists .....	77
5.2.6	Hardware, OS and Firmware Specialists .....	78
5.2.7	Niche Solution Developers.....	78
5.3	Company Profiles .....	78
5.4	6WIND .....	78
5.4.1	VM and Container-based vRAN Initiatives .....	79
5.4.1.1	6WINDGate .....	79
5.4.1.2	Other Developments .....	79
5.5	Accelleran.....	80
5.5.1	VM and Container-based vRAN Initiatives .....	80

**Tables of Contents**

5.5.1.1	dRAX .....	80
5.5.1.2	Other Developments .....	80
5.6	Airspan.....	81
5.6.1	VM and Container-based vRAN Initiatives .....	81
5.6.1.1	Air5G OpenRange .....	81
5.6.1.1.1	OpenRANGE Software, .....	81
5.6.1.2	AirSymphony .....	82
5.6.1.3	Other Developments .....	82
5.7	Altiostar .....	83
5.7.1	VM and Container-based vRAN Initiatives .....	83
5.7.1.1	Altiostar - vRAN .....	83
5.7.1.1.1	Open vRAN software .....	84
5.7.1.1.2	vBBU .....	84
5.7.1.1.3	Radio .....	84
5.7.1.2	Other Developments .....	85
5.8	Amarisoft .....	86
5.8.1	VM and Container-based vRAN Initiatives .....	87
5.8.1.1	LTE and 5G NR software .....	87
5.8.1.2	Other Developments .....	88
5.9	ASOCS .....	88
5.9.1	VM and Container-based vRAN Initiatives .....	88
5.9.1.1	Cyrus 4.0 .....	88
5.9.1.2	Other Developments .....	89
5.10	Cisco Systems.....	89
5.10.1	VM and Container-based vRAN Initiatives .....	89
5.10.2	Open vRAN.....	90
5.10.2.1	Other Developments .....	90



**Tables of Contents**

5.11	Commscope.....	90
5.11.1	VM and Container-based vRAN Initiatives.....	90
5.11.1.1	OneCell Controller.....	90
5.11.1.2	Other Developments.....	91
5.12	Dali Wireless.....	91
5.12.1	VM and Container-based vRAN Initiatives.....	91
5.12.1.1	Dali - Matrix vFI.....	92
5.12.1.2	Other Developments.....	92
5.13	Dell EMC.....	93
5.13.1	VM and Container-based vRAN Initiatives.....	93
5.13.1.1	Open Networking Switches.....	93
5.13.1.2	Virtual Edge Platform.....	94
5.13.1.3	Other Developments.....	94
5.14	Ericsson.....	95
5.14.1	VM and Container-based vRAN Initiatives.....	95
5.14.1.1	Cloud Native Application (CNA).....	95
5.14.1.2	vRAN.....	96
5.14.1.3	Cloud-native NFVi.....	96
5.14.1.4	Cloud RAN.....	97
5.14.1.5	Other Developments.....	98
5.15	Huawei.....	99
5.15.1	VM and Container-based vRAN Initiatives.....	99
5.15.1.1	5G RAN Gear.....	99
5.15.1.2	Other Initiatives.....	100
5.16	Intel.....	101
5.16.1	VM and Container-based vRAN Initiatives.....	101
5.16.1.1	RAN.....	101

**Tables of Contents**

---

5.16.1.2	Silicon Photonics .....	101
5.16.1.3	Other Developments .....	101
5.17	JMA Wireless.....	103
5.17.1	VM and Container-based vRAN Initiatives .....	103
5.17.1.1	XRAN Adaptive Baseband Software .....	103
5.17.1.2	Other Developments .....	103
5.18	Mavenir.....	104
5.18.1	VM and Container-based vRAN Initiatives .....	104
5.18.1.1	4G/5G OpenRAN .....	104
5.18.1.2	vRAN .....	105
5.18.1.3	Open vRAN .....	105
5.18.1.4	Other Developments .....	105
5.19	NEC/Netcracker .....	107
5.19.1	VM and Container-based vRAN Initiatives .....	107
5.19.1.1	Open vRAN .....	107
5.19.1.2	Radio Units (RU).....	107
5.19.1.3	Other Developments .....	108
5.20	Nokia.....	109
5.20.1	VM and Container-based vRAN Initiatives .....	109
5.20.1.1	Nokia - AirScale .....	109
5.20.1.2	Other Developments .....	110
5.21	Parallel Wireless.....	112
5.21.1	VM and Container-based vRAN Initiatives .....	112
5.21.1.1	OpenRAN .....	112
5.21.1.2	Other Developments .....	112
5.22	Phluido .....	113
5.22.1	VM and Container-based vRAN Initiatives .....	113

**Tables of Contents**

---

5.22.1.1 Phluido – vRAN Layer-1 .....	114
5.22.1.2 Radio-as-a-Service (RaaS) .....	114
5.22.1.3 Other Developments .....	114
5.23 Platform9 .....	115
5.23.1 VM and Container-based vRAN Initiatives .....	115
5.23.1.1 Open-Source SaaS Managed Solution .....	115
5.23.1.2 Other Developments .....	116
5.24 Radisys .....	116
5.24.1 VM and Container-based vRAN Initiatives .....	116
5.24.1.1 MobilityEngine.....	116
5.24.1.2 Open RAN .....	116
5.24.1.3 Other Developments .....	117
5.25 Red Hat.....	118
5.25.1 VM and Container-based vRAN Initiatives .....	118
5.25.1.1 OpenShift Container Platform .....	118
5.25.1.2 Ansible .....	119
5.25.1.3 Other Developments .....	119
5.26 Robin.io.....	121
5.26.1 VM and Container-based vRAN Initiatives .....	121
5.26.1.1 Other Developments .....	121
5.27 Samsung.....	122
5.27.1 VM and Container-based vRAN Initiatives .....	122
5.27.1.1 vRAN .....	123
5.27.1.2 Other Developments .....	123
5.28 VMware .....	124
5.28.1 VM and Container-based vRAN Initiatives .....	124
5.28.1.1 NSX .....	124

**Tables of Contents**

5.28.1.2	X-Factor .....	125
5.28.1.3	Telco Cloud Platform RAN.....	125
5.28.1.4	Other Developments .....	126
5.29	Wind River.....	126
5.29.1	VM and Container-based vRAN Initiatives.....	126
5.29.1.1	Titanium Cloud Product Portfolio.....	126
5.29.1.2	Kubernetes .....	127
5.29.1.3	Wind River Studio .....	127
5.29.1.4	Other Developments .....	127
5.30	ZTE.....	128
5.30.1	VM and Container-based vRAN Initiatives.....	128
5.30.1.1	TECS.....	128
5.30.1.2	Other Developments .....	129
<b>6.</b>	<b>Quantitative Forecasts.....</b>	<b>130</b>
6.1	Report Taxonomy .....	130
6.2	Research Methodology.....	131
6.3	Foreword .....	132
6.3.1	Container Morphology.....	132
6.3.2	Deployment Methodology.....	132
6.3.3	Geographical Regions .....	133
6.4	Global Markets .....	136
6.4.1	End Users .....	137
6.4.2	RAN Morphology.....	139
6.4.3	Hosting Modes.....	141
6.4.4	Geographical Regions.....	143
6.5	VM-based vRAN Market.....	145
6.5.1	NFV Component.....	145

**Tables of Contents**

---

6.5.2	End-user.....	147
6.5.3	RAN Morphology.....	149
6.5.4	Hosting Mode .....	151
6.5.5	Geographical Regions.....	153
6.6	Container-based vRAN Market .....	155
6.6.1	Container Morphology.....	155
6.6.2	End-user.....	157
6.6.3	RAN Morphology.....	159
6.6.4	Hosting Mode .....	161
6.6.5	Deployment Methodology .....	163
6.6.6	Geographical Regions.....	165

## List of Tables and Figures

Figure 1-1: Global Market for VM and Container-based vRAN 2021-2026 (\$ million) .....	6
Table 1-1: Global Market for VM and Container-based vRAN 2021-2026 (\$ million) .....	6
Figure 1-2: Market Share for VM and Container-based vRAN 2021-2026 .....	7
Figure 2-1: Interactive Cloud Native Technology Developer Landscape from CNCF .....	16
Figure 2-2: VNF versus CNF Stacks .....	17
Figure 3-1: VNF versus CNF Stacks .....	24
Figure 3-1: O-RAN High-Level Architecture .....	30
Figure 3-1: O-RAN Reference Architecture .....	31
Figure 3-2: Architecture of vRAN Base Station as Visualized by TIP .....	35
Figure 5-2: Cloud Infrastructure Requirements as Visualized by Ericsson .....	95
Figure 5-3: NFVI Evolution .....	96
Figure 6-1: Taxonomy of the VM-based vRAN Market .....	130
Figure 6-2: Taxonomy of the Container-based vRAN Market .....	131
Figure 6-3: Global Market for VM and Container-based vRAN; by End-User 2021-2026 (\$ million) .....	137
Table 6-1: Global Market for VM and Container-based vRAN; by End-User 2021-2026 (\$ million) .....	137
Figure 6-4: Market Share for VM and Container-based vRAN; by End-User 2021-2026 .....	138
Figure 6-5: Global Market for VM and Container-based vRAN; by RAN Morphology 2021-2026 (\$ million) .....	139
Table 6-2: Global Market for VM and Container-based vRAN; by RAN Morphology 2021-2026 (\$ million) .....	139
Figure 6-6: Market Share for VM and Container-based vRAN; by RAN Morphology 2021-2026 .....	140
Figure 6-7: Global Market for VM and Container-based vRAN; by Hosting Mode 2021-2026 (\$ million) .....	141

**Executive Summary**

---

Table 6-3: Global Market for VM and Container-based vRAN; by Hosting Mode 2021-2026 (\$ million).....	141
Figure 6-8: Market Share for VM and Container-based vRAN; by Hosting Mode 2021-2026	142
Figure 6-9: Global Market for VM and Container-based vRAN; by Region 2021-2026 (\$ million) .....	143
Table 6-4: Global Market for VM and Container-based vRAN; by Region 2021-2026 (\$ million) .....	143
Figure 6-10: Market Share for VM and Container-based vRAN; by Region 2021-2026.....	144
Figure 6-11: Global Market for VM-based vRAN; by NFV Component 2021-2026 (\$ million)	145
Table 6-5: Global Market for VM-based vRAN; by NFV Component 2021-2026 (\$ million)	145
Figure 6-12: Market Share for VM-based vRAN; by NFV Component 2021-2026 .....	146
Figure 6-13: Global Market for VM-based vRAN; by End-User 2021-2026 (\$ million) .....	147
Table 6-6: Global Market for VM-based vRAN; by End-User 2021-2026 (\$ million) .....	147
Figure 6-14: Market Share for VM-based vRAN; by End-User 2021-2026.....	148
Figure 6-15: Global Market for VM-based vRAN; by RAN Morphology 2021-2026 (\$ million)	149
Table 6-7: Global Market for VM-based vRAN; by RAN Morphology 2021-2026 (\$ million)	149
Figure 6-16: Market Share for VM-based vRAN; by RAN Morphology 2021-2026.....	150
Figure 6-17: Global Market for VM-based vRAN; by Hosting Mode 2021-2026 (\$ million)	151
Table 6-8: Global Market for VM-based vRAN; by Hosting Mode 2021-2026 (\$ million) ...	151
Figure 6-18: Market Share for VM-based vRAN; by Hosting Mode 2021-2026 .....	152
Figure 6-19: Global Market for VM-based vRAN; by Region 2021-2026 (\$ million) .....	153
Table 6-9: Global Market for VM-based vRAN; by Region 2021-2026 (\$ million) .....	153
Figure 6-20: Market Share for VM-based vRAN; by Region 2021-2026 .....	154

**Executive Summary**

---

Figure 6-21: Global Market for Container-based vRAN, by CNF Morphology 2021-2026 (\$ million) .....	155
Table 6-10: Global Market for Container-based vRAN, by CNF Morphology 2021-2026 (\$ million) .....	155
Figure 6-22: Market Share for Container-based vRAN, by CNF Morphology 2021-2026 ..	156
Figure 6-23: Global Market for Container-based vRAN; by End-User 2021-2026 (\$ million) 157	157
Table 6-11: Global Market for Container-based vRAN; by End-User 2021-2026 (\$ million) 157	157
Figure 6-24: Market Share for Container-based vRAN; by End-User 2021-2026 .....	158
Figure 6-25: Global Market for Container-based vRAN; by RAN Morphology 2021-2026 (\$ million) .....	159
Table 6-12: Global Market for Container-based vRAN; by RAN Morphology 2021-2026 (\$ million) .....	159
Figure 6-26: Market Share for Container-based vRAN; by RAN Morphology 2021-2026 ..	160
Figure 6-27: Global Market for Container-based vRAN; by Hosting Mode 2021-2026 (\$ million) .....	161
Table 6-13: Global Market for Container-based vRAN; by Hosting Mode 2021-2026 (\$ million) .....	161
Figure 6-28: Market Share for Container-based vRAN; by Hosting Mode 2021-2026.....	162
Figure 6-29: Global Market for Container-based vRAN, by Deployment Methodology 2021-2026 (\$ million).....	163
Table 6-14: Global Market for Container-based vRAN, by Deployment Methodology 2021-2026 (\$ million).....	163
Figure 6-30: Market Share for Container-based vRAN, by Deployment Methodology 2021-2026	164
Figure 6-31: Global Market for Container-based vRAN, by Region 2021-2026 (\$ million)	165
Table 6-15: Global Market for Container-based vRAN, by Region 2021-2026 (\$ million) .	165
Figure 6-32: Market Share for Container-based vRAN, by Region 2021-2026.....	166



## 1. EXECUTIVE SUMMARY

This chapter presents the key discernible trends in the virtual RAN market along with a high-level view of the market size.

Let us get a few key questions out of the way before we dive into the subject.

### 1.1 WHAT ABOUT OPEN RAN?

Why are we talking about virtual RAN (vRAN) when the whole world is talking about Open RAN?

Isn't vRAN the same as Open RAN?

vRAN is outdated, aren't companies moving towards container-based RANs?

Let us answer these questions for you, although not necessarily in the same order.

Open RAN has different connotations - depending on whom you ask. We will make it simple for you. Open RAN is essentially disaggregated RAN; wherein the BBU interface with the CU (backhaul); the CU interface with the DU (midhaul) and the DU interface with the RU (fronthaul) are open. Virtual RAN and Open RAN are not necessarily the same. They however work well together. Virtualization of the BBU, CU and DU (the RU is not virtualized) lends flexibility to their respective architecture, helping them utilize most of the open interfaces. Open interfaces, on the other hand, provide considerable options for virtualized network functions to have multidimensional interfaces with each other. Practically all the vendors covered in this report, with the notable exception of Huawei, support open interfaces.

That brings us to the major geopolitical challenge in quantifying the market for Open RAN. Today, the world appears to be divided among supporters or opponents of Open RAN, not on the basis of technology, but on the basis of geopolitics. As we have evidenced in the past, geopolitics is a fluid entity. The foes of today can be friends tomorrow and vice-versa. We will not hazard to forecast where geopolitics will take us. We will stick to market forecasting of technology-driven trends.

In the absence of the backing of Huawei in particular, the term Open RAN does not appear to be interchangeable with virtual RAN. Virtual RAN, or vRAN is a more universal concept that draws its inheritance from the NFV and includes in its ambit container/microservice technologies as well.

### 1.2 HAS vRAN CHANGED FORM?

In the past, we have sought to distinguish the VM-based vRAN markets as VNFs and container-based vRAN markets as CNFs. Considering that containers do

## Executive Summary

technically qualify as VNFs, and most VNF vendors have containerization of network functions on their radars anyway, we had to relook at the earlier characterizations.

This report concentrates on the market for vRAN.

The report now considers two types of vRANs:

- Virtual machine (VM)-based vRANs, whose predecessors in the earlier report were VNFs
- Container-based vRANs, whose predecessors in the earlier report were CNFs

### 1.2.1 VM-based vRAN

NFV can be defined in the following manner:

*“The migration from physical networking hardware to virtualized network functions is termed as Network Functions Virtualization.”*

While NFV technically includes virtualization in general, its prevalent connotation since inception has been restricted to the usage of virtual machines (VM) in the network function architecture. With the advent of container-based network functions, NFV stakeholders increasingly include this approach as well under their fold. To make the definition explicit, Insight Research refers to the original NFV-based network functions as “VM-based”.

### 1.2.2 Container-based vRAN

*CNF is a network function on that employs container-based environment for its realization.*

According to the Cloud Native Computing Foundation, *“Cloud native computing uses an open-source software stack to deploy applications as microservices, packaging each part into its own container, and dynamically orchestrating those containers to optimize resource utilization.”*

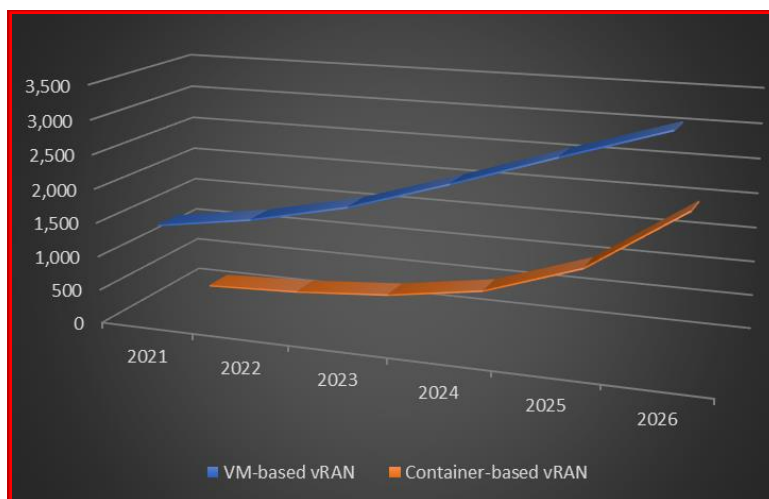
Docker, considered as the creator of containers, defines containers as *“a standard unit of software that packages up code and all its dependencies, so the application runs quickly and reliably from one computing environment to another”*.

### 1.3 MARKET OVERVIEW

The movement towards virtualization of network functions has a universal endorsement, as evidenced in the healthy growth rates.

The following figure presents the global market for VM and container-based vRAN.

**Figure 1-1: Global Market for VM and Container-based vRAN 2021-2026 (\$ million)**



Source: Insight Research

The following table presents the global market for VM and container-based vRAN.

**Table 1-1: Global Market for VM and Container-based vRAN 2021-2026 (\$ million)**

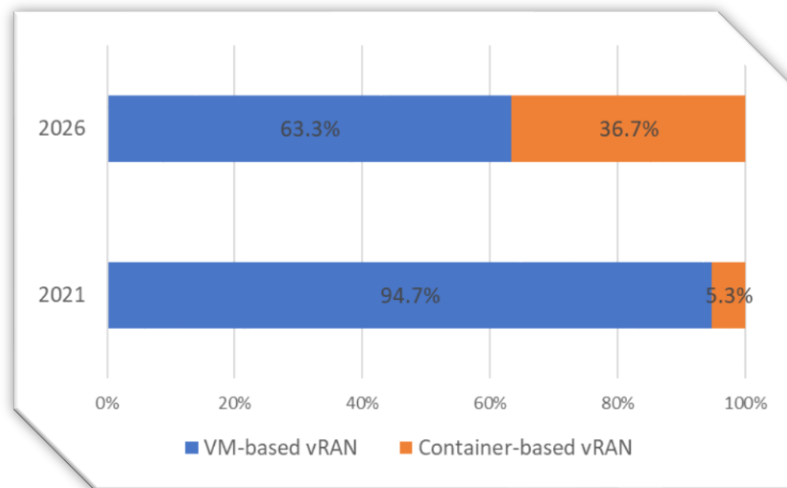
	2021	2022	2023	2024	2025	2026	CAGR 2021-2026
VM-based vRAN	1,419	1,632	1,942	2,389	2,866	3,325	18.6%
Container-based vRAN	79	137	246	467	958	1,925	89.4%
<b>Total</b>	<b>1,498</b>	<b>1,769</b>	<b>2,188</b>	<b>2,856</b>	<b>3,824</b>	<b>5,250</b>	<b>28.5%</b>

Source: Insight Research

Executive Summary

The following figure presents the market share for VM and container-based vRAN.

**Figure 1-2: Market Share for VM and Container-based vRAN 2021-2026**



Source: Insight Research

The progression towards containerization will happen faster than anticipated. Practically every vendor covered in this report has begun or is planning to offer container-based vRAN.

The absence of the hypervisor reduces overheads in terms of computing, storage and memory resources. Containers are therefore lighter than VMs. Containers facilitate the packaging of an application with its dependencies by which the package can be ported like a single entity. The 5G-PPP terms microservices as loosely coupled, but highly cohesive. The cohesiveness helps in quickly establishing connections with other microservices, while the loose coupling allows for independence and autonomy in the development cycles of individual microservices. Containers can elegantly address the vexing issue of VNF orchestration. The underlying simplicity in directly accessing the kernel of the host OS and fewer design overheads as compared to hypervisor based VMs helps in quicker container orchestration.

And then, there is Kubernetes, which is a clear winner in the battle of orchestrators! The availability of an effective and versatile orchestrator in form of Kubernetes is the game-changer for container-based vRANs.

Container-based vRAN will rapidly gain market share in the battle of virtualization technologies. The advantages that containers and microservices bring to the table as compared to VMs have been amply demonstrated and explained in the report.