



## EDGE COMPUTING 2021

**Abstract:** Predictions on the future evolution of Edge Cloud deployment for enterprise applications in multiple vertical markets, including Oil & Gas, Industrial, Manufacturing, Retail, Gaming, and Media. Technical background and ROI modeling were investigated thoroughly to accurately predict the proper business model in each vertical market. The five-year forecast for deployment includes expectations for data centers, servers, and CPU/GPU cores as well as revenue from software and Edge Cloud services.



# MOBILE EXPERTS

## MEXP-EDGE-21

Entire contents © 2021 Mobile Experts, Inc. Reproduction of this publication in any form without prior written permission is strictly forbidden and will be prosecuted to the fully extent of US and International laws. The transfer of this publication in either paper or electronic form to unlicensed third parties is strictly forbidden. The opinions expressed herein are subject to change without notice.

# TABLE OF CONTENTS

<b>EXECUTIVE SUMMARY .....</b>	<b>7</b>
<b>TECHNOLOGY AND DEFINITIONS .....</b>	<b>9</b>
Definition of Edge Computing .....	9
Technical Background .....	10
Segmentation of MEC: Access Edge, Regional Edge, On-Prem.....	10
<b>MARKET DRIVERS AND CHALLENGES .....</b>	<b>13</b>
Driver: Data Control.....	13
Driver: Real Time Computing .....	14
Driver: Poor Connectivity .....	16
Driver: Cost of Bandwidth.....	17
Challenge: App Development is still slow .....	18
Challenge: Business Model Uncertainty.....	20
<b>EDGE COMPUTING SERVICES OUTLOOK.....</b>	<b>23</b>
Forecast for MW of Edge Computing Power.....	23
Edge Computing Revenue Outlook.....	23
Connected MEC Service Revenue Breakdown by Function.....	26
Data Center Installed Base.....	30
Data Center Deployment Breakdowns by type, region, etc .....	31
<b>EDGE COMPUTING EQUIPMENT AND SPENDING .....</b>	<b>33</b>
Edge Server Shipments .....	33
Number of Cores Shipped for Edge Servers .....	33
<b>COMPANY PROFILES .....</b>	<b>38</b>
ADLINK:.....	38
Akamai:.....	38
Alibaba: .....	38
Amazon Web Services (AWS):.....	38
AT&T:.....	39
Baidu:.....	39
BaseLayer:.....	39
China Mobile: .....	39
Cisco: .....	39
CloudFlare:.....	40
DartPoints: .....	40
Dell / EMC: .....	41
Digital Bridge: .....	41
EdgeConneX: .....	41
EdgeMicro:.....	41
EdgePresence: .....	41
Equinix:.....	42
Ericsson: .....	42
Fastly: .....	42
Google:.....	43

Huawei Technologies: .....	43
IBM: .....	43
Intel: .....	43
Korea Telecom (KT):.....	44
Limelight: .....	44
Microsoft (Azure): .....	44
MobiledgeX:.....	44
Nokia: .....	45
NTT Docomo: .....	45
Oracle: .....	45
Orange:.....	45
Ori: .....	45
Packet (Equinix):.....	46
Quanta Cloud Technology (QCT):.....	46
Rafay Systems:.....	46
Rakuten:.....	46
Saguna Networks: .....	47
Samsung:.....	47
SK Telecom (SKT): .....	47
StackPath:.....	47
Telefonica:.....	48
Vapor IO: .....	48
Verizon: .....	48
WiWynn:.....	48
Skyvera (ZephyrTel, Vasona Networks):.....	49
ZTE:.....	49
<b>ACRONYMS .....</b>	<b>50</b>
<b>METHODOLOGY.....</b>	<b>54</b>

## CHARTS

Chart 1: <i>Forecasted Edge Computing power, by data center location thru 2026</i> .....	7
Chart 2: <i>Forecasted Connected Edge Computing service revenue, 2020-2026</i> .....	8
Chart 3: <i>Forecasted Edge Computing Power (MW), by location</i> .....	23
Chart 4: <i>Forecasted Public Cloud Computing Revenue (2020-2026)</i> .....	24
Chart 5: <i>Forecasted Edge Computing Revenue (2020-2026)</i> .....	24
Chart 6: <i>Forecasted Connected Edge Cloud Computing Service Revenue (2019-2025)</i>	25
Chart 7: <i>MEC share of Public Cloud Service revenue (2019-2025)</i> .....	26
Chart 8: <i>Edge Computing service revenue, by function (Connectivity, Compute, Site) (2020-2026)</i> .....	27
Chart 9: <i>Edge Computing service revenue, by participant group (Cloud, Telco, NH)</i> ..	28
Chart 10: <i>MEC Computing service revenue, by participant group (Cloud, Telco, NH)</i> .	28
Chart 11: <i>MEC Connectivity service revenue, by participant group (Cloud, Telco, NH)</i>	29
Chart 12: <i>MEC Physical Infrastructure service revenue, by participant group (Cloud, Telco, NH)</i> .....	29
Chart 13: <i>Installed Base of Edge Data Centers, global (2020-2026)</i> .....	30
Chart 14: <i>Deployment of Edge Data Centers, Regional Edge, Access Edge, and On-Prem (2020-2026)</i> .....	31
Chart 15: <i>Deployment of Edge Data Centers, by world region (2020-2026)</i> .....	32
Chart 16: <i>Deployment of Edge Data Centers, by site host type (Enterprise, Telco, NH, Cloud)</i> .....	32
Chart 17: <i>Deployment of Edge Computing servers, worldwide (2020-2026)</i> .....	33
Chart 18: <i>Deployment of CPU/GPU cores for Edge Computing (2020-2026)</i> .....	34
Chart 19: <i>Spending on MEC hardware and software (2020-2026)</i> .....	35
Chart 20: <i>Spending on MEC hardware and software, Near Edge vs Far Edge vs On-Prem (2020-2026)</i> .....	36
Chart 21: <i>Spending on MEC hardware and software, by world region (2020-2026)</i> .....	37

## FIGURES

Figure 1. <i>Edge Computing Concept Diagram</i> .....	10
Figure 2. <i>Edge Computing Continuum</i> .....	11
Figure 3 <i>Decision Latency for On-Prem, Access Edge, and Regional Edge</i> .....	15
Figure 4. <i>Map of Edge Applications and Latency/Throughput Requirements</i> .....	16
Figure 5. <i>An Example of On-Prem Edge Computing driven by poor connectivity</i> .....	17
Figure 6. <i>ROI associated with Edge Computing in a video streaming service</i> .....	18
<b>Figure 7. <i>Migration from Customized MEC to Common MEC Platforms over time</i></b> .....	20
<b>Figure 8. <i>Prime Examples of Edge Cloud Business Models</i></b> .....	20
<b>Figure 9. <i>A Neutral Hosted Edge Node</i></b> .....	22
Figure 10. <i>Public Cloud Service Definitions</i> .....	54
Figure 11. <i>Edge Use Case Definitions</i> .....	54

Figure 12. Edge Data Center (Location) Definitions ..... 55  
Figure 13. Edge Cost Element Definitions ..... 55  
Figure 14. Geographic Regions ..... 55