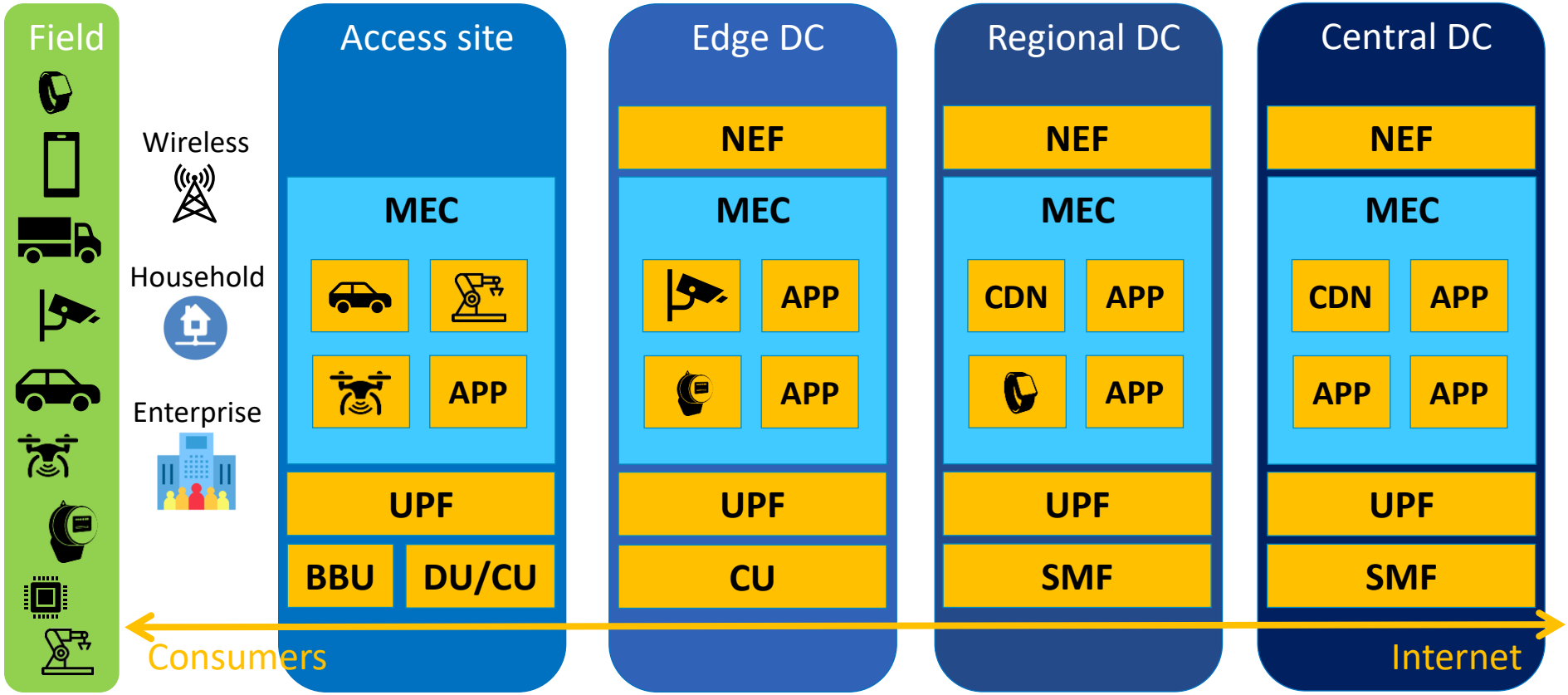
Edge Cloud for Telecom

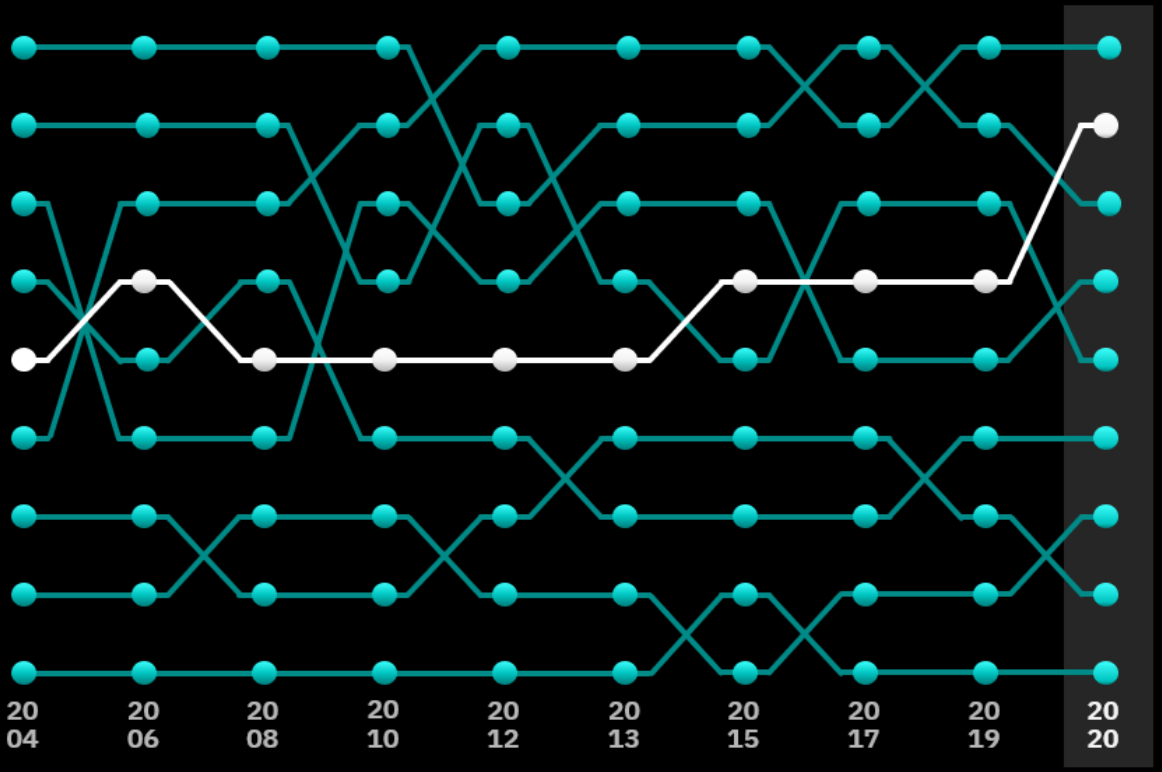
by Anton Palagin 18/03/2021
IBM Automation / Offering Management
anton.palagin@ie.ibm.com

What is MEC?




CHALLENGES AWAITING TELECOM

Regulatory concerns have emerged as a top factor CEOs see impacting their organizations



57%	Technological factors
50%	**Regulatory concerns**
50%	Market factors
44%	Macro-economic factors
44%	People skills
27%	Globalization
22%	Environmental factors
15%	Socio-economic factors
13%	Geopolitical factors

Q2. What are the most important external forces that will impact your enterprise over the next 2–3 years?

Technical

CHALLENGES

- Carrier-grade performance and security in virtualized functions
- Maturity of solutions
- Managing multi-vendor solutions, XNFs and environments
- Interoperability, integration, single pane of glass for multiple solutions
- Architecture differences

Operational

CHALLENGES

- Reflect new flexibility and time to market in existing business processes
- Adapt existing operations & maintenance processes for virtualized network
- Transform existing OSS/BSS
- Deal with hybrid environment where PNFs work together with VNFs and ready for future CNFs

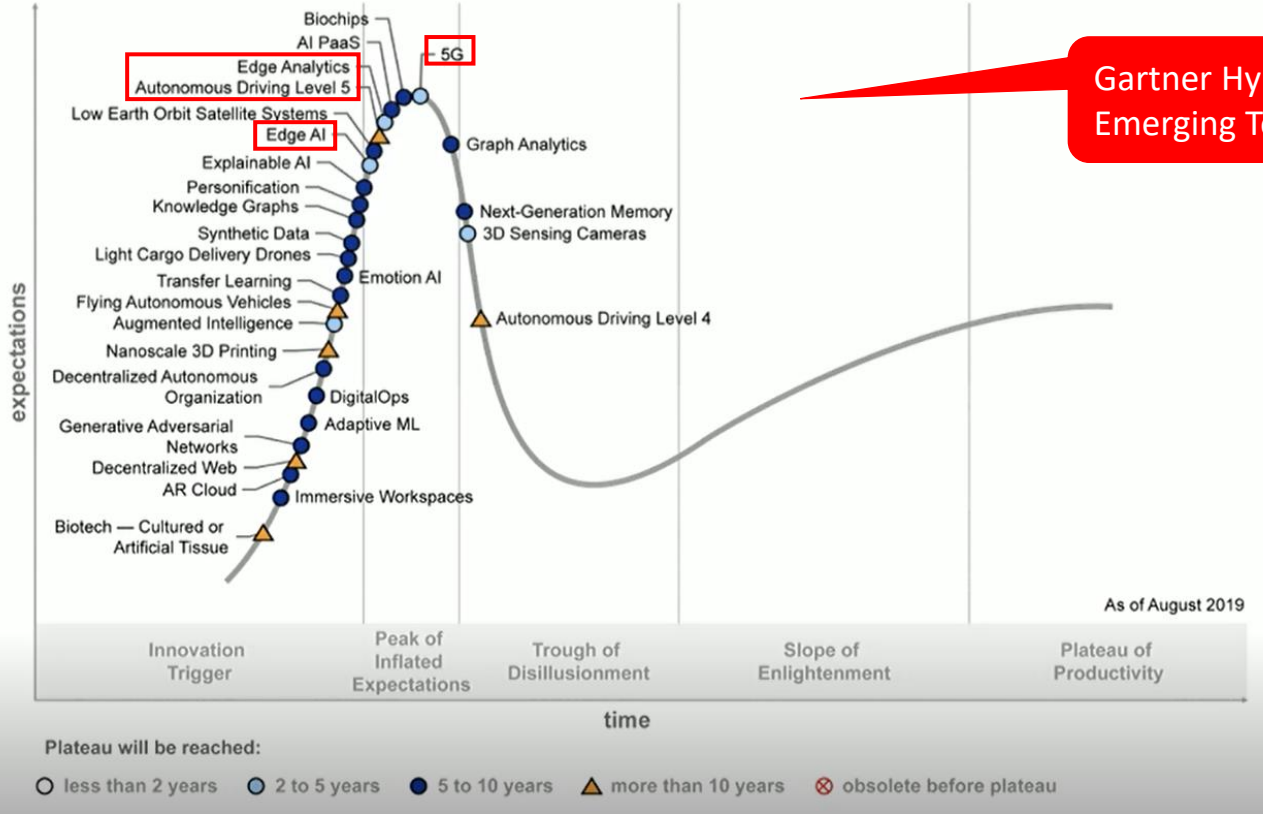
Organizational

CHALLENGES

- Transforming organizational structure of networking teams
- Developing new skills and new roles
- Competition for workforce against hyperscalers and enterprises
- New engagement models with vendors and suppliers
- Cultural shift from appliances and network management to software, DevOps, Agile, CI/CD and SRE


BUSINESS PERSPECTIVE

Hype Cycle for Emerging Technologies, 2019

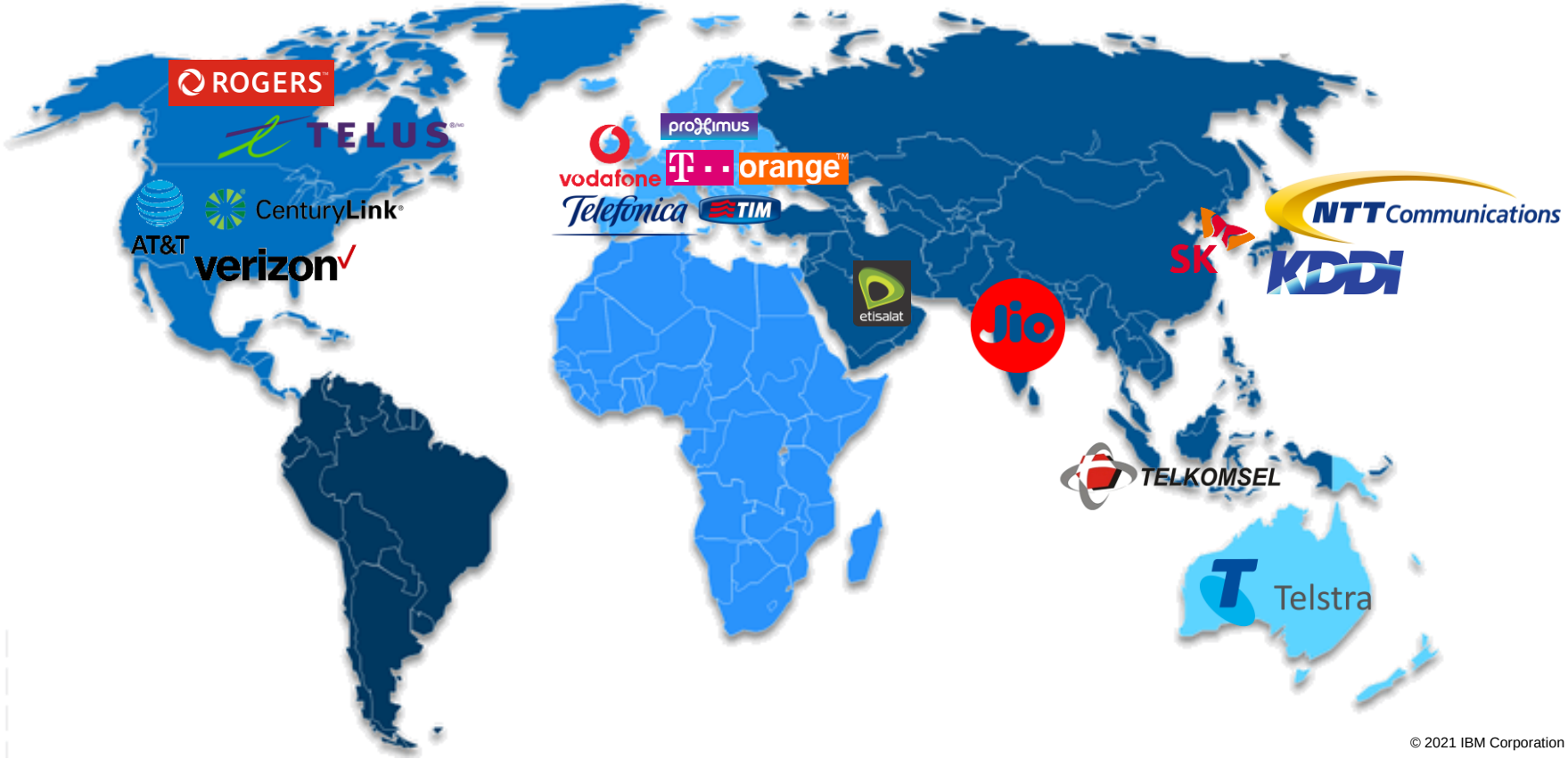


Gartner Hype Cycle for Emerging Technologies, 2019

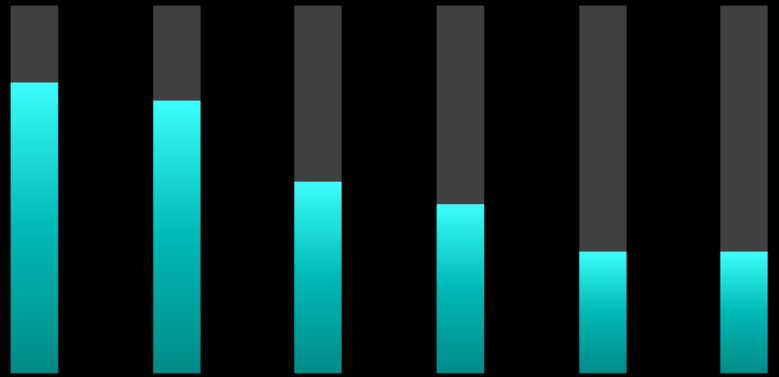
75%

of enterprise-generated data will be created and processed at the edge by 2025 (Gartner)

Early edge computing adopters



Across all respondents, IoT, Cloud, and AI are expected to help deliver results



Q16. Which of the following technologies will most help you deliver the results you need over the next 2–3 years?

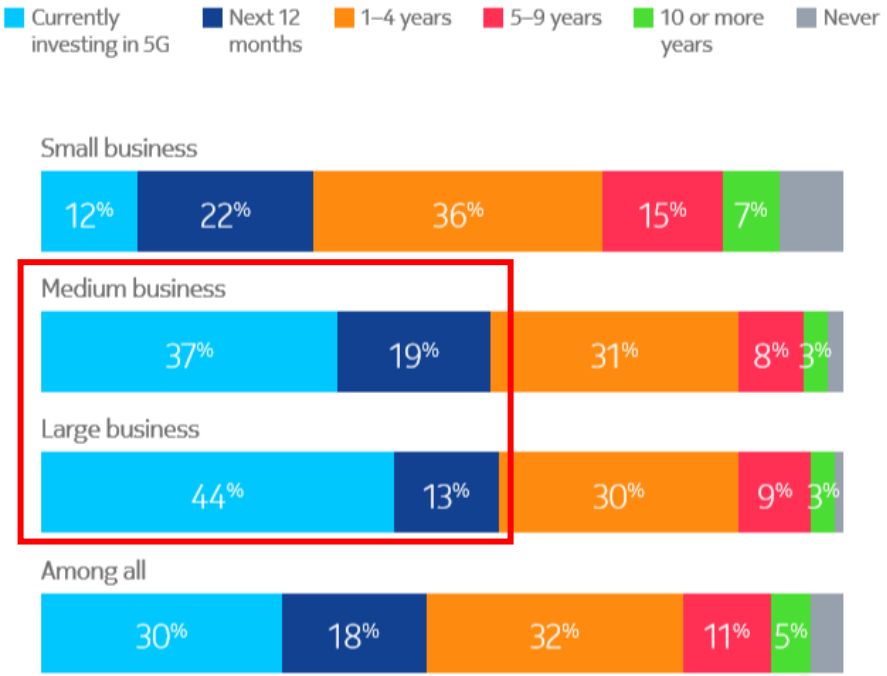
Across all respondents, at least

52%

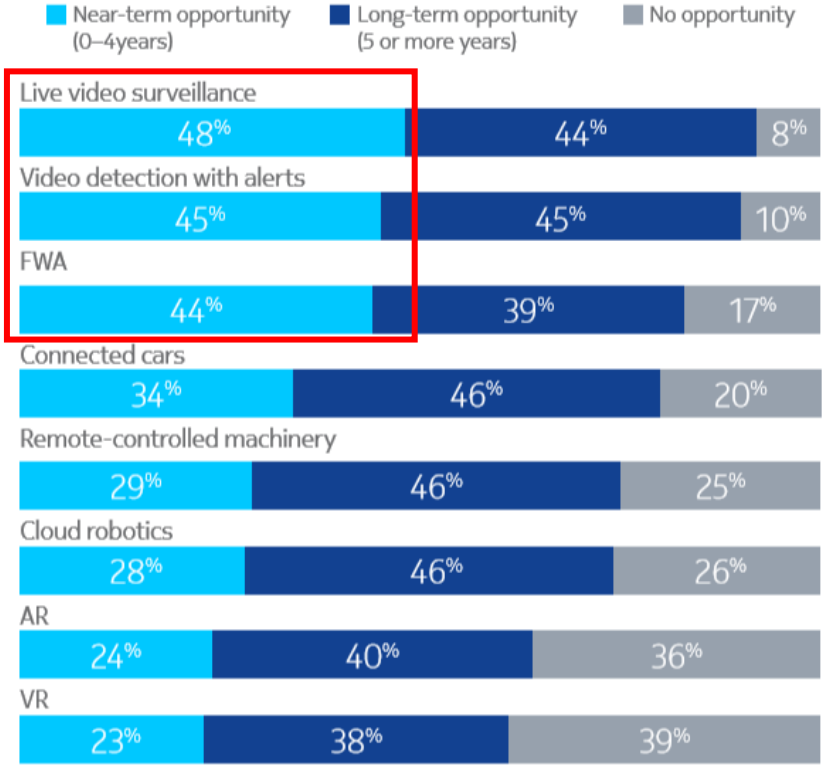
Expect IoT, Cloud, and AI to become core technologies over the next 2–3 years

Nokia research – Mapping the enterprise 5G opportunity

5G investment time frame by company size



Time frame for 5G use case deployment



The reality

Speaking at the UBS Global TMT Virtual Conference, Verizon CEO Hans Vestberg reiterated that the company expects to start seeing meaningful revenue from 5G MEC in 2022 – Fierce wireless

After reporting the cost and operating profit of Google Cloud for the first time on Tuesday, Google Cloud's revenue grew 47% year-over-year to $3.84 billion. Google Cloud, which is comprised of Google Cloud Platform and Google Workspace, posted operating losses of $1.24 billion in the fourth quarter compared to losses of $1.19 billion in the same quarter a year ago. Google's cloud segment had revenues of $13.06 billion last year and an operating loss of $5.61 billion. – Fierce wireless

Survey – what is your expectation for meaningful results of MEC?

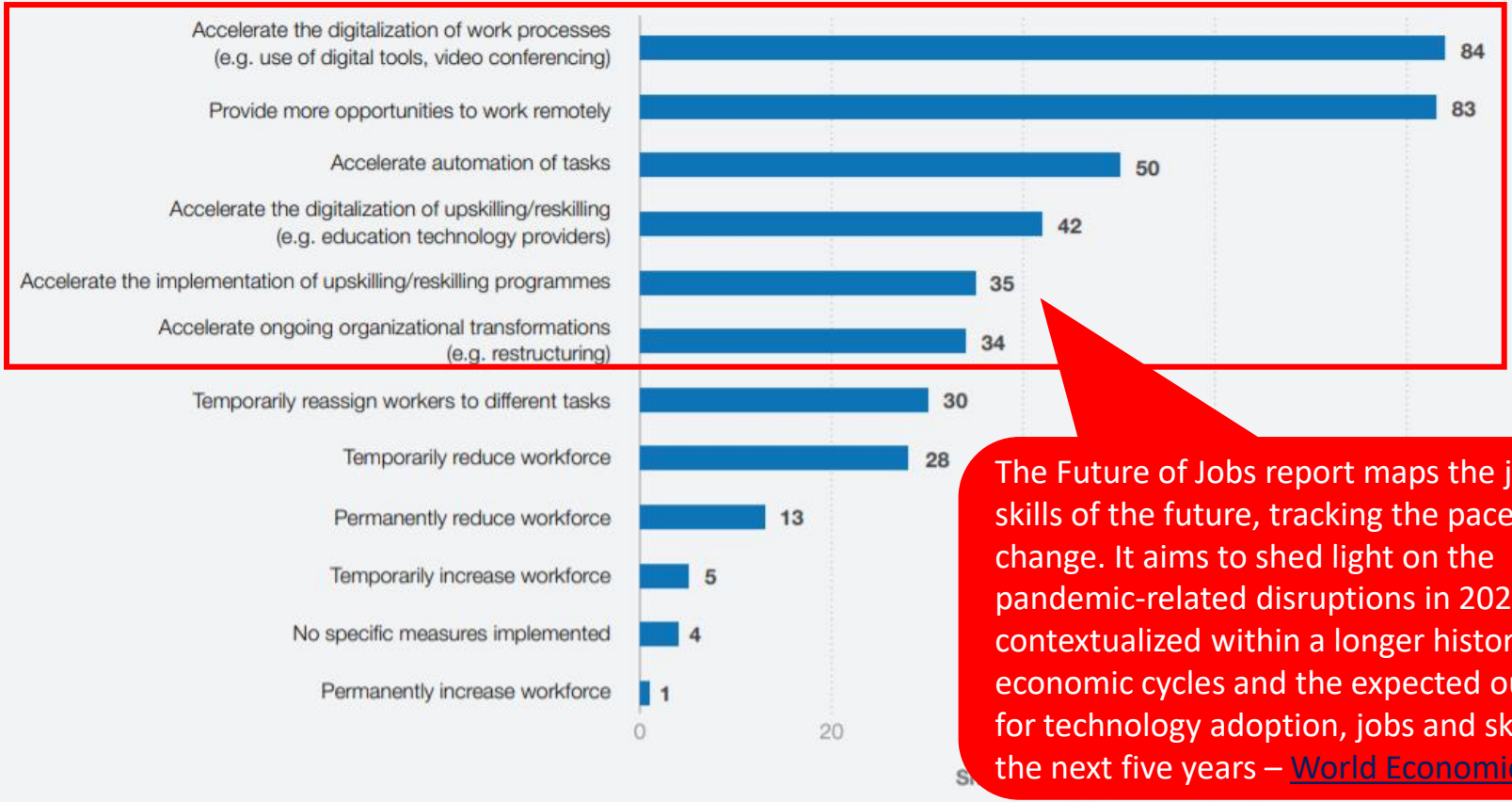
- Expect meaningful results in next 12 months
- Expect meaningful results in next 2-3 years
- Expect meaningful results in between 2023-2025
- Don’t expect any meaningful results in foreseeable future

Parallels and conclusions

- The expectations are high
- We should not expect immediate results
- Near-term we should not expect profitability
- To make this business profitable we need to achieve scale
- However, looks like rollout strategy will be on-demand basis
- Enrich our solutions with vertical software
- Scale probably can only be achieved with critical mass of MEC applications
- Huge opportunity on the cross-road between telco and hyperscalers clouds
- Private 5G and enterprises could be another beacon
- Business transformation is needed
- Follow cloud-first paradigm
- Become a system integrator for enterprises and partner with verticals


WORKFORCE PERSPECTIVE

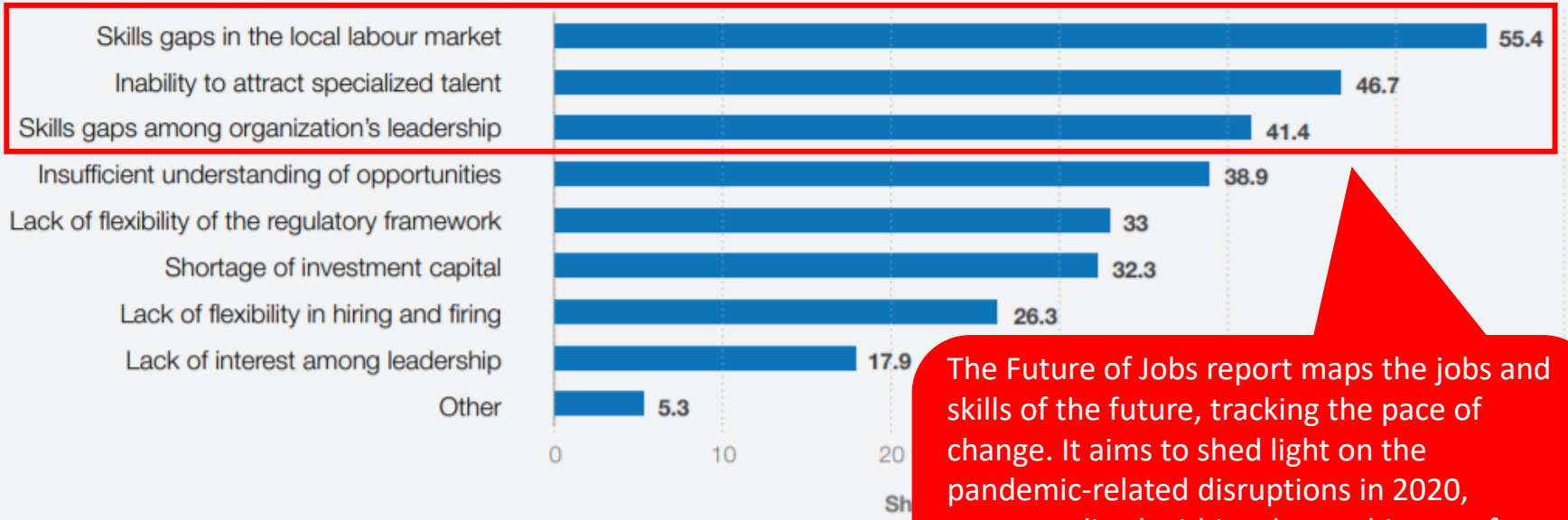
FIGURE 5 | Planned business adaptation in response to COVID-19



The Future of Jobs report maps the jobs and skills of the future, tracking the pace of change. It aims to shed light on the pandemic-related disruptions in 2020, contextualized within a longer history of economic cycles and the expected outlook for technology adoption, jobs and skills in the next five years – World Economic Forum

FIGURE 26

Perceived barriers to the adoption of new technologies



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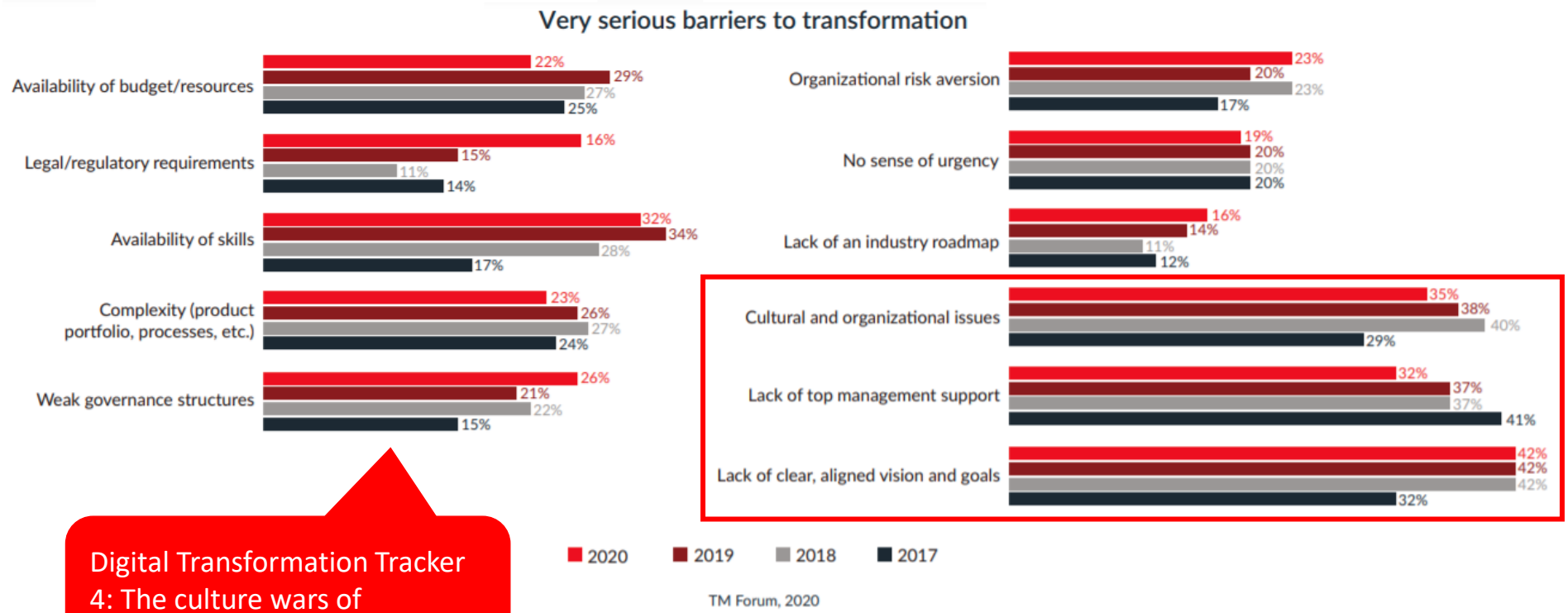
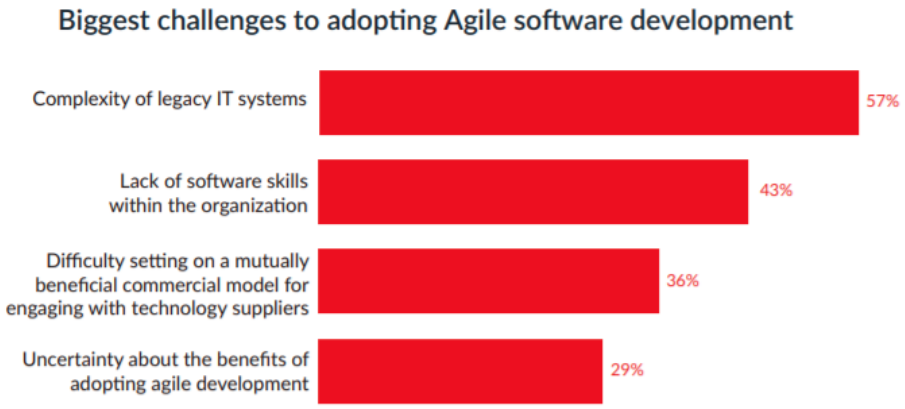
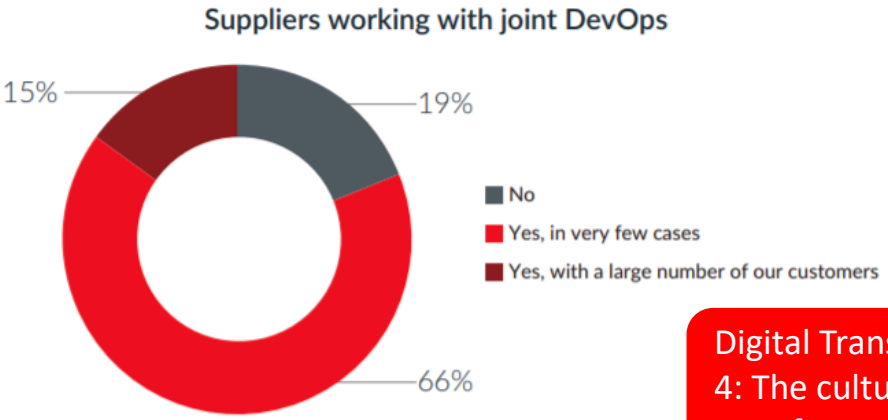
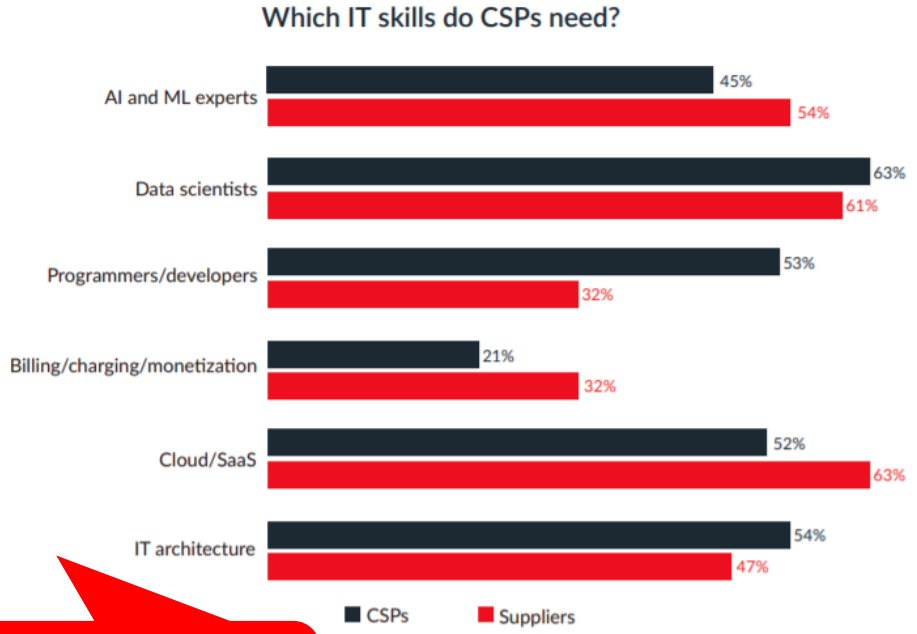


Digital Transformation Tracker 4: The culture wars of transformation – TM Forum







Digital Transformation Tracker 4: The culture wars of transformation – TM Forum

Few examples

More than 3,000 cloud architects and experts work for T-Systems. The IT service provider plans to equip 5,000 additional employees with deep cloud capabilities – Deutsche Telecom

AT&T and Verizon retraining programs to obtain future ready skills

It’s a constant challenge to hire right people because you’re not just competing with telcos; you’re competing with big tech companies as well. – Vodafone

Survey – what do you think about CSPs workforce transformation?

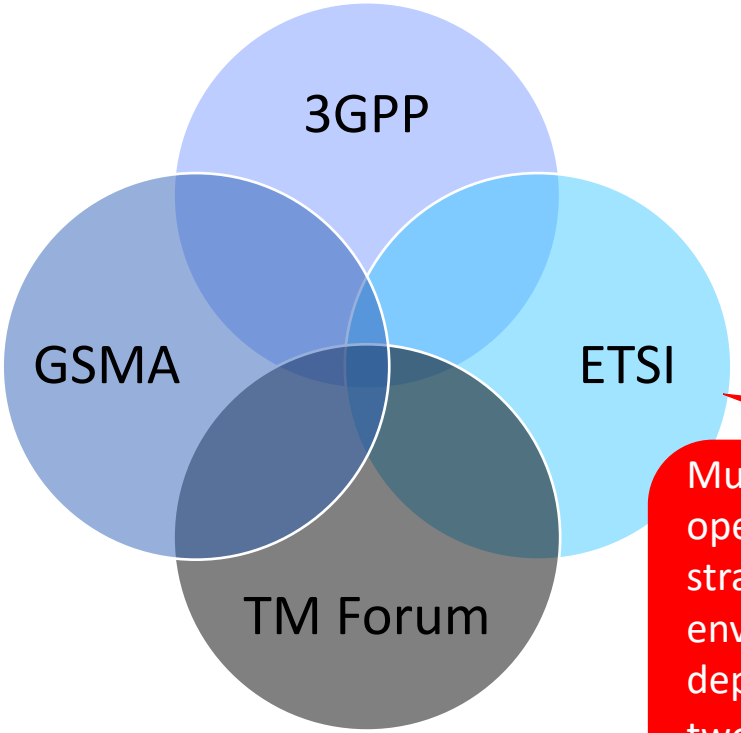
- Nothing is going to be changed, business as usual
- CSPs will outsource this problem to vendors and hyperscalers
- Sporadic OSS/BSS transformation with some cloud native practices
- Expect soft transitioning to cloud native solutions
- Expect rapid transitioning and massive workforce transformation

Parallels and conclusions

- Competition for workforce
- Retraining seems like a good strategy
- New skills set required to have hybrid engineers with telecom and cloud skills
- More collaboration in joint DevOps teams is essential
- Organizational and operational transformation is needed
- Adopt cloud culture such as DevOps, SRE, CI/CD and automation


TECHNICAL PERSPECTIVE

Standardization challenges



- Overall architecture
- Lack of end-to-end angle
- User experience
- APIs harmonization
- Security concerns
- Certification of devices
- Operational challenges

Multiple scenarios for deployments are possible, depending on operators' preferences for their networks and their migration strategy, e.g., fully virtualized environments or mixed environments, with MEC being deployed first, or NFV being deployed first, with different levels of integration between the two technologies, taking into account **secondary aspects such as multi-tenancy**, etc. - ETSI GS MEC 003

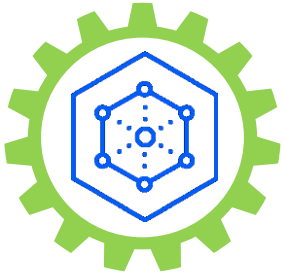
What is the edge cloud?

1

Edge cloud is just an extension of existing cloud to on-prem and closer to the consumer

2

Having multicloud we need to manage clouds as well as seamlessly move workloads between them



3

Use industry standard platforms to run and manage workloads across nodes and clusters

4

In addition to ability to run their apps in the edge customers need all cloud stuff as a service

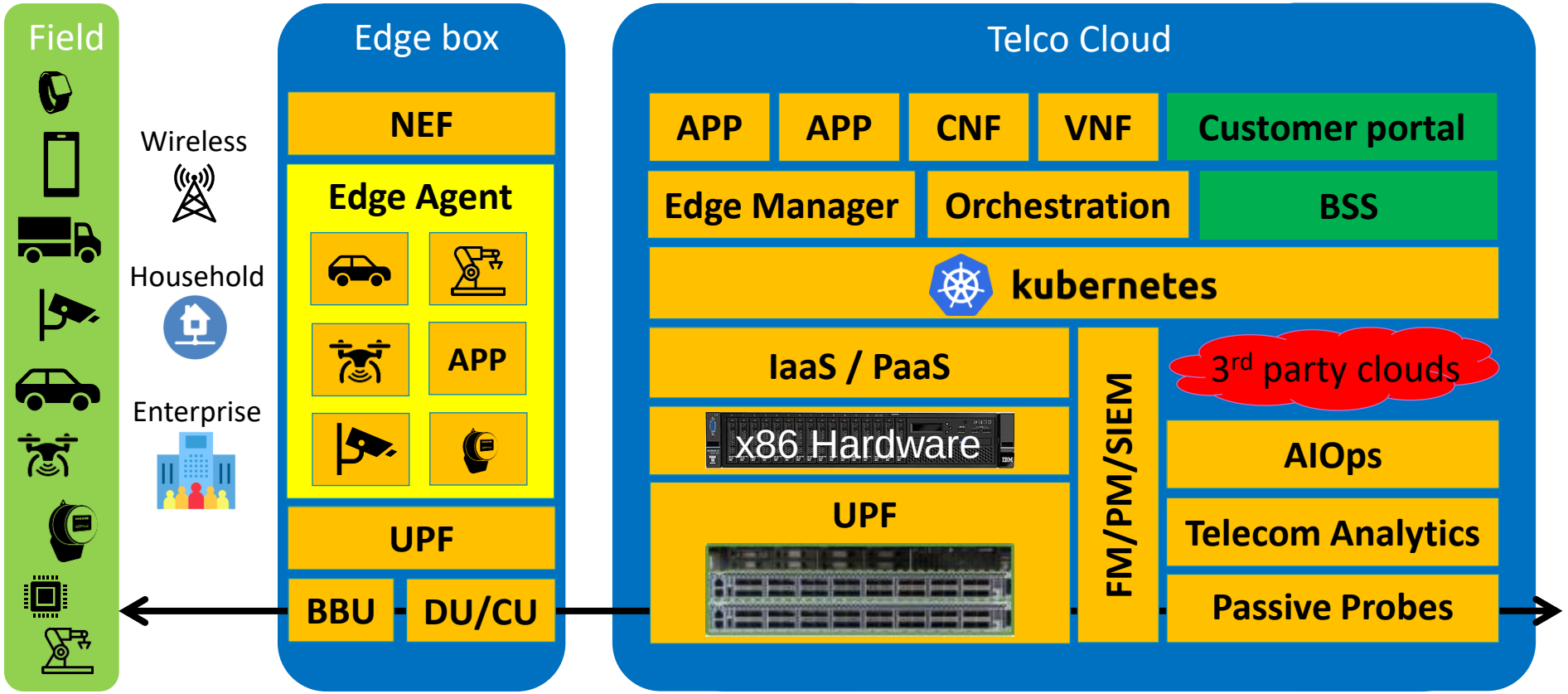
5

Enterprise organizations build their own tailored solutions

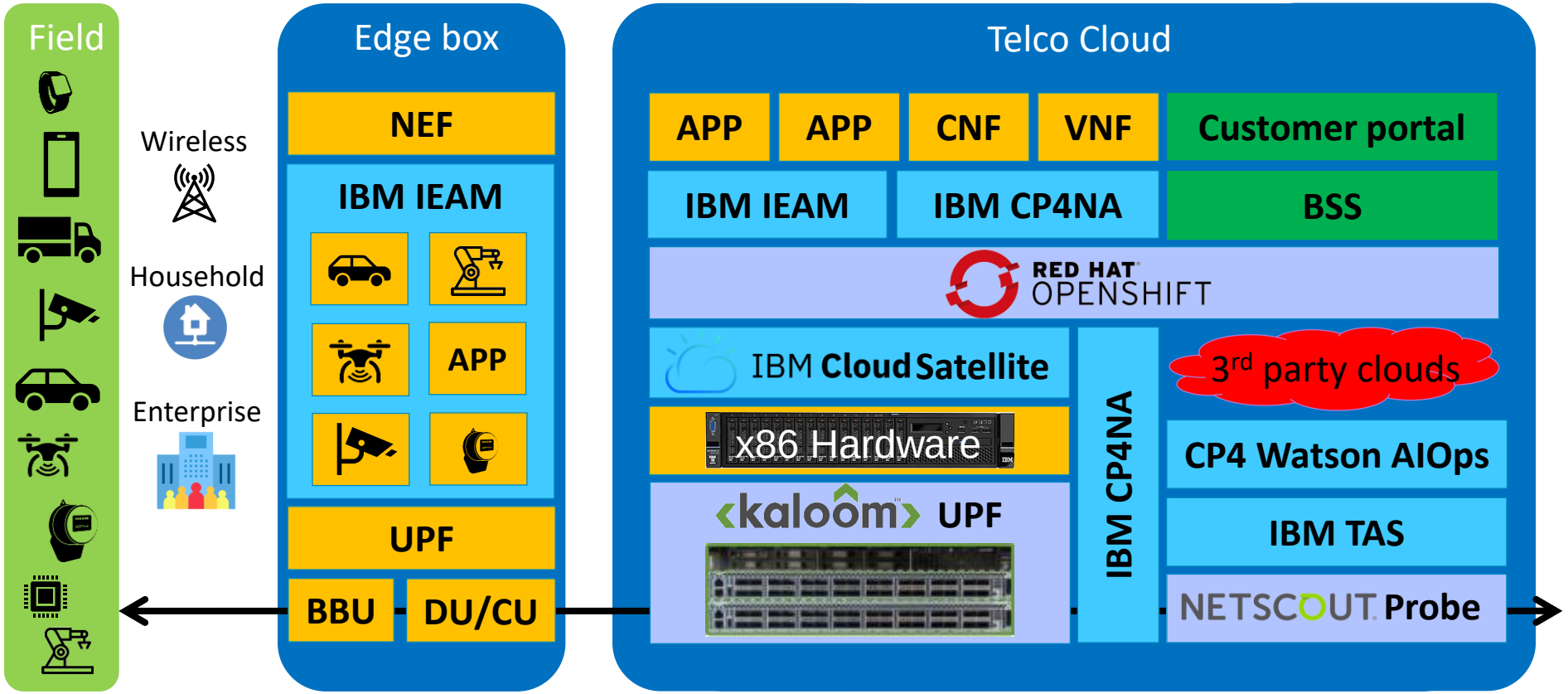
6

Telcos are trying to leverage their presence and convert their networks into distributed clouds

IBM Telco Edge cloud reference architecture

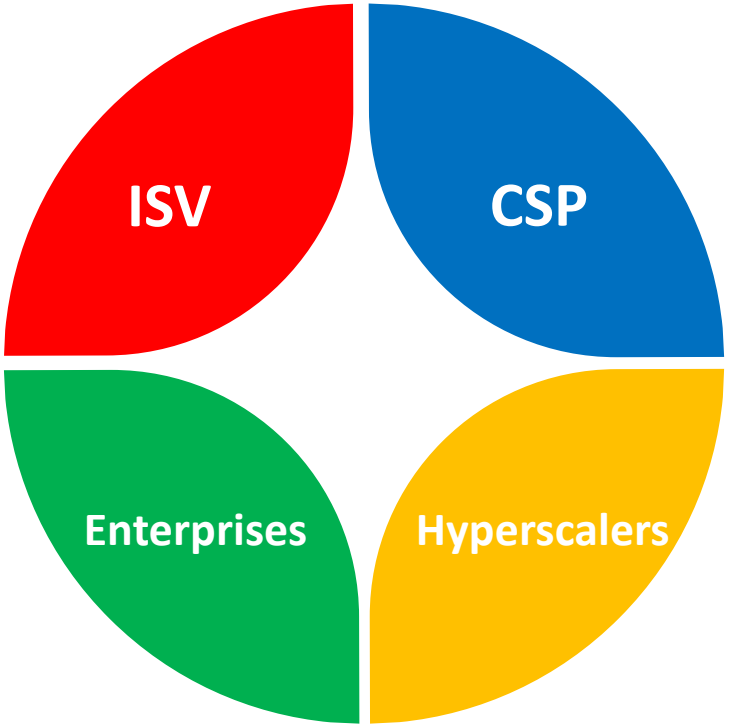


IBM Telco Edge cloud reference architecture



Player's perspectives

New use cases and options to run sw in distributed cloud with unique connectivity



Adopt cloud native technologies, power 5G rollout and digital transformation

Digital transformation, good compromise between on-prem vs cloud, OOB bundeled solutions

Cloud penetration everywhere, manage billions of new devices, customers insights and intelligence

Parallels and conclusions

- Standardization bodies need to accelerate work on MEC
- End-to-end and cloud native nature must be in focus
- Harmonization of standards with 5G and cloud native approaches is required
- Bridges between clouds and technologies are essential
- Service continuity is impossible without multi-vendor, multi-cloud and multi-technology and multi-connectivity solutions


THANK YOU