



5G: A Different Beast

INTRODUCTION

5G: A Different Beast: 5G is “not just another G” or a mere evolution of what has gone before. It is a revolution in technology that is cloud-based by definition. It is an enabler of an expansive range of new services and yet provides greater options in terms of ease of service setup, evolution and granularity of control that were unimagined in previous generations. While it needs to acknowledge what has gone before, it is a significant shift that Openet has been anticipating for some time. We cannot wait for the better enablement of incredible services that 5G will facilitate!



1G and 2G ‘Green Field’

TDMA and Message-enabling
Mobile Communications.

Monolithic, large Applications.
Annual (or longer) Releases.



3G and 4G ‘Reaching for the Sky’

Optimizing the pipe for mobile broadband data.
Virtualization for early adopters.

(Still) Large Applications... but with Agile
processes and more frequent releases.



5G and Beyond ‘The Next Step’

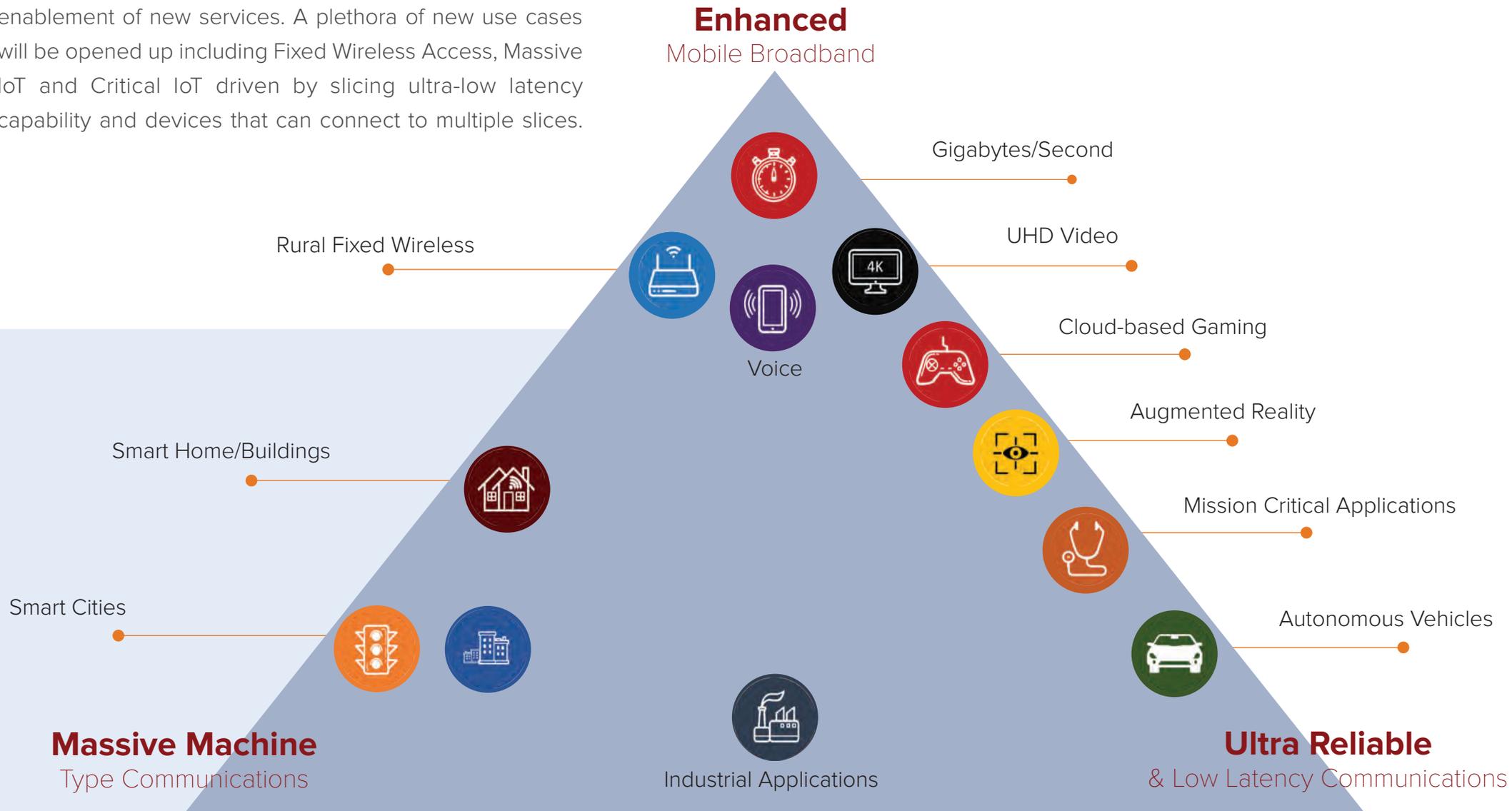
Realizing a Micro Services based Cloud Native
architecture for both Network and IT.

DevOps and Micro Services ring the introduction
of a continuous evolution model allowing for
innovation, collaboration and swifter deployment.

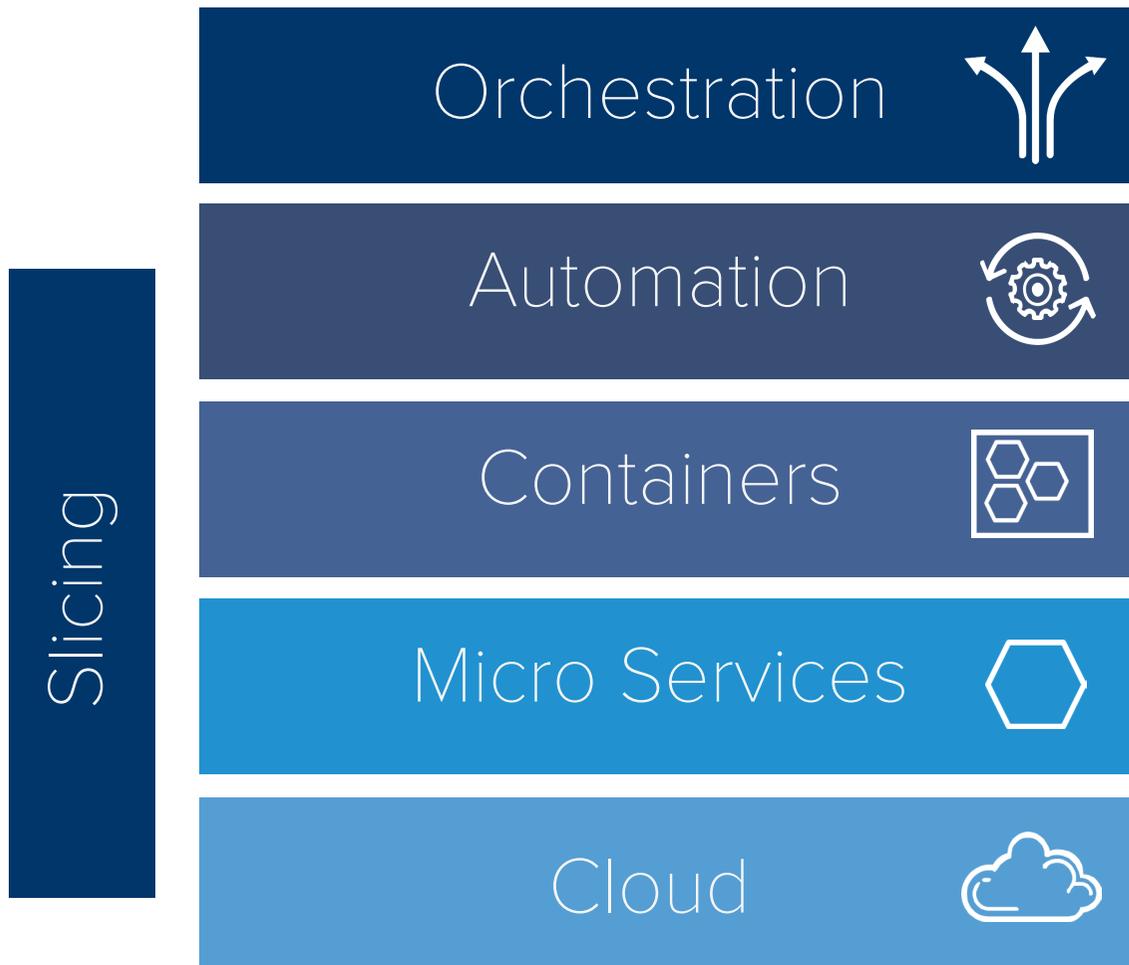


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True flexibility and controllability combined with web-style interfaces and API's will ensure the rapid enablement of new services. A plethora of new use cases will be opened up including Fixed Wireless Access, Massive IoT and Critical IoT driven by slicing ultra-low latency capability and devices that can connect to multiple slices.



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Depending on the use cases and range of devices enabled, processing power can move back to a more reliable network. Distributed, cloud technology enables a more optimal deployment across both centralized and edge-based data centers depending on requirements. A more adaptive network will facilitate a wider range of use cases. Dynamic automation and orchestration provide cost-effective and simplified control of network slices as well as scaling up and down in combination with lifecycle management.



5G: A DIFFERENT BEAST

5G is a different beast because of the way the components interact. This is going to allow new and evolved business models. The need with 5G isn't just to manage data efficiently but to expose that data in new ways that allow ecosystems of collaborative players, whether made up of applications within a telecom environment, or applications that are outside of that environment, or some combination of both those environments. That involves IoT and other edge-based systems but also allows new services, new devices and new concepts that make use of this fabric to monetize in new ways where telecoms operators have previously been challenged. Being vendor agnostic is a key principle of 5G which is enabling open-source and multiple vendors to work in such a way that well defined Micro Services can interwork with one another effectively.

New, Evolving Business Models

New Devices, Services & Concepts

Cloudified Networking

Edge Computing & Slicing

Open APIs

Vendor Agnostic

5G: A DIFFERENT BEAST

Containerization

Loosely Coupled Micro Services

Stateless Processing & Services

RESTful APIs

CI:CD & Dev(Sec)Ops

Collaboration

5G necessitates capabilities that Openet has embraced for some time:

Openet has adopted continuous integration and continuous development, DevOps and essential collaboration between development, security and operations in order to enable the rapid deployment of services. Openet has embraced automation of functions that are required in order to drive elastic scaling as well as new business functions. Ultimately, collaboration is absolutely critical, as is embracing a new environment that encompasses both open source and a variety of vendors in order to derive a true cloud-native environment.

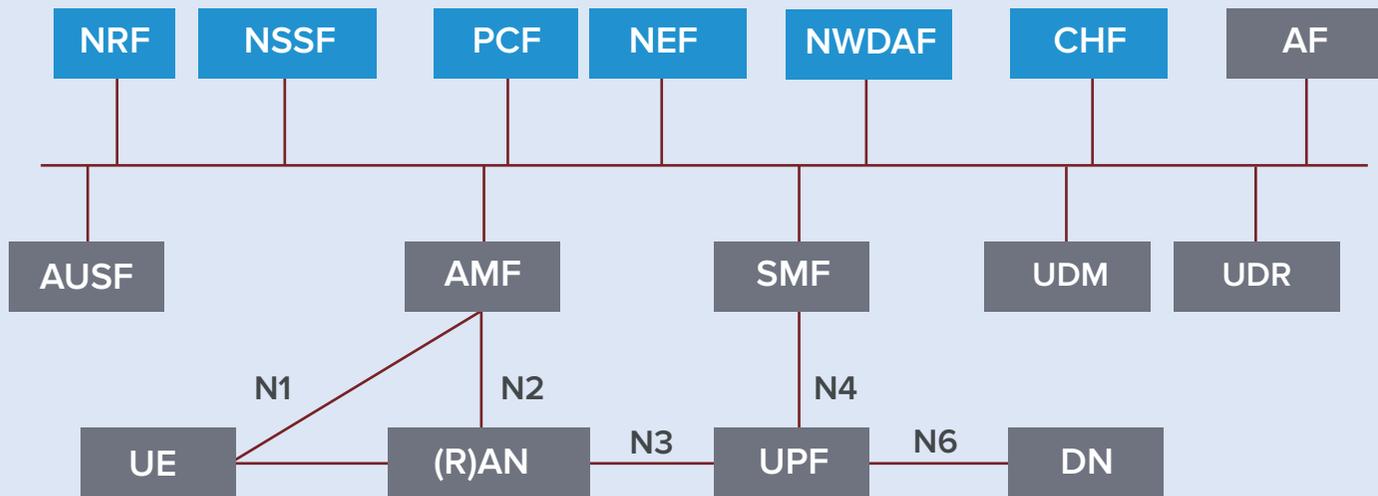
*Openet is the most credible and proven vendor focused on combinational **4G/5G** real-time Policy and Charging Controls*



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Network



Openet Focus

23.501
System Architecture for the 5G System

23.502
Procedures for the 5G System

23.503
Policy and Charging Control Framework
for the 5G System

Core Network Advances

- Separation of CP/UP ('CUPS')
- Access Independent Architecture
- Service Based Architecture
- Increased Centralization of State
- Harmonized Protocols
- Flow-based QoS

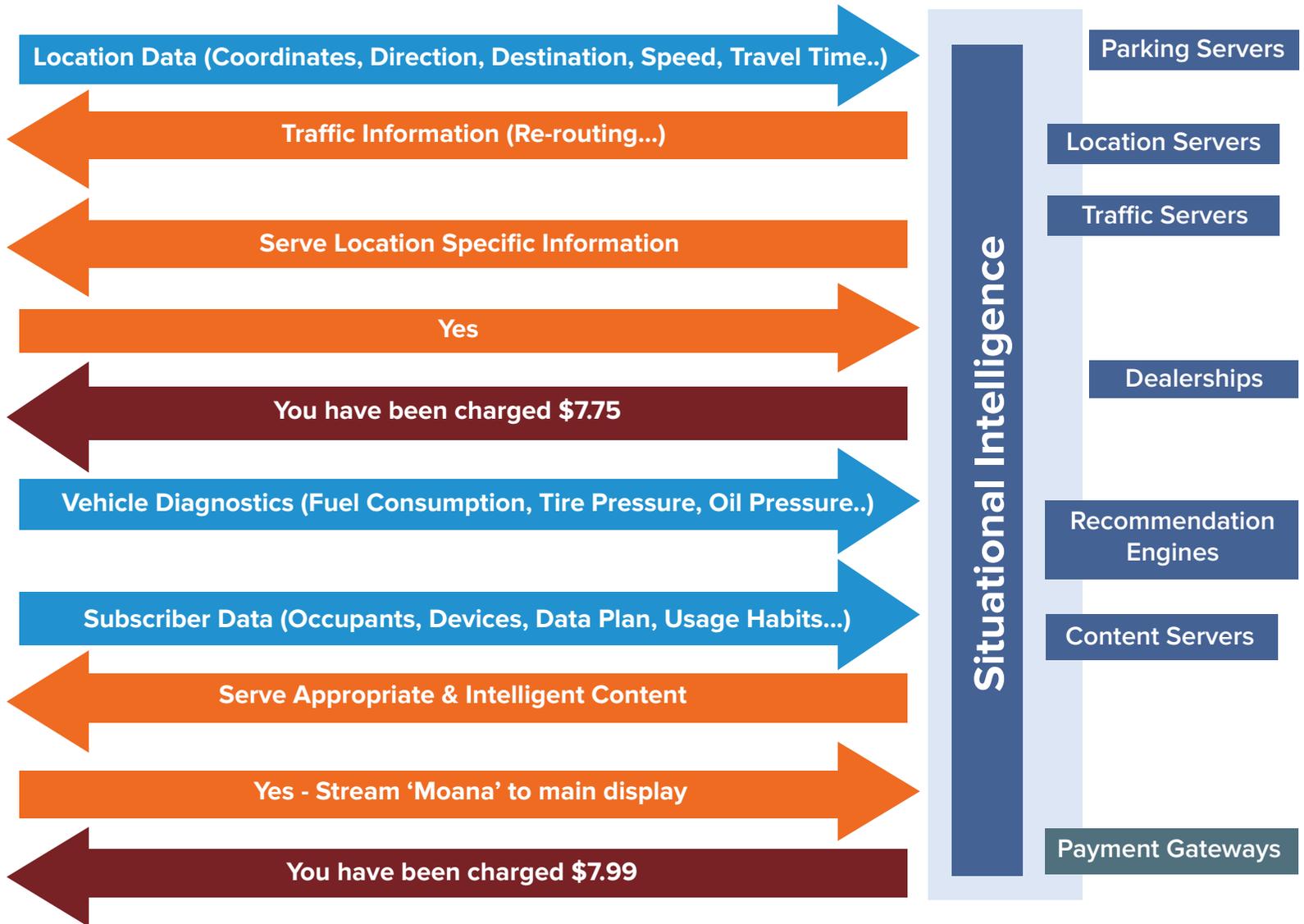
But functions are not enough: 5G traffic will be growing explosively by 2020. We know that functional deployment will not be enough and that just as important will be the enablement of more advanced approaches described here, especially Micro Services and DevOps. These will be better enabled by 5G but Openet is aiming to be the best in the business. These enablers and capabilities are in our DNA already as a software company. 5G is designed for flexibility and is a "perfect beast" for Openet.

5G: A DIFFERENT BEAST | SAMPLE OPENET USE CASE: **Autonomous Vehicles**

You are 1 mile from the Golden Gate Bridge.
Pay toll via PayPal?– Yes/No

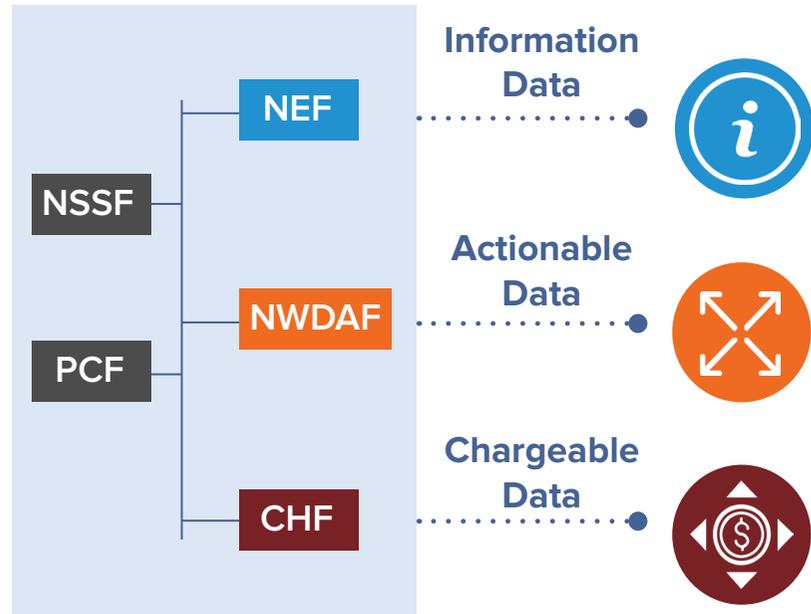


You have 2 hours left until you reach your destination - just enough time to watch 'Moana' – Yes/No



5G: A DIFFERENT BEAST

5G involves more sophisticated Policy and Charging decisions driven by enriched contextual input through interactions with Network Data Analytics and Network Exposure.



Network Exposure Function

- Bi-directional feed
- Provides unprecedented control
- Data provided via myriad APIs

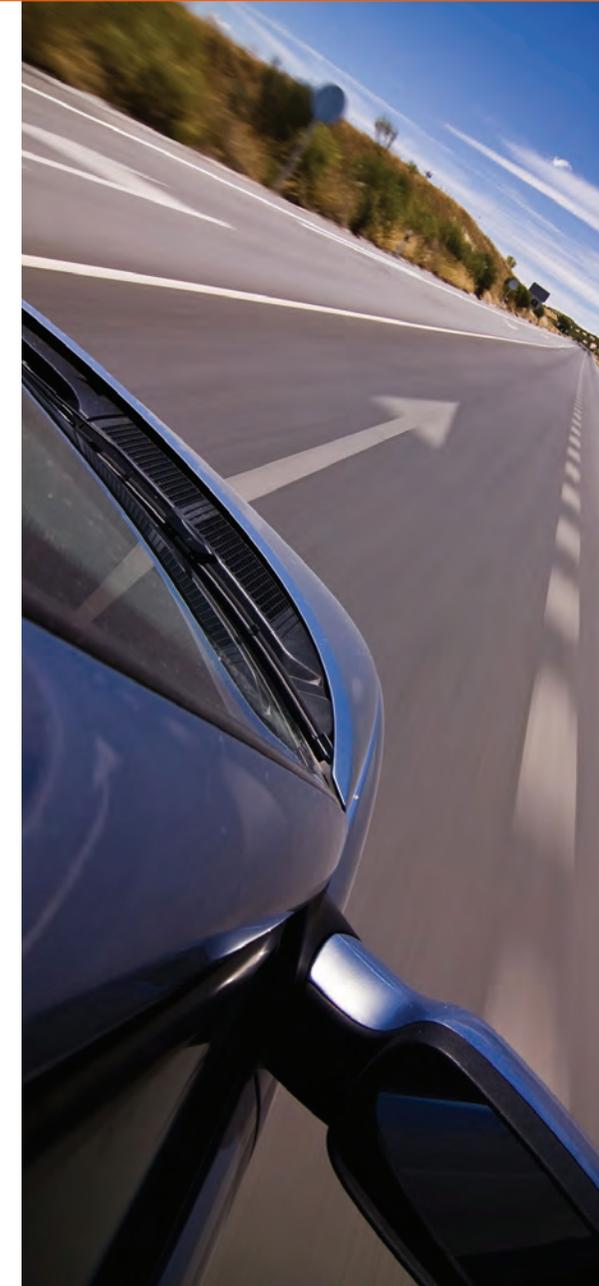
Network Data Analytics Function

- Bi-directional feed
- Access to real-time network analytics
- Able to drive in-session decisions

Charging Function

- Dedicated instances
- Can be edge-enabled
- Real-time focus

New uses of data (informational, actionable, chargeable) to drive future value



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We can't wait for 5G:

5G brings Cloud-native functions to telecom

- Elastic scaling of functions
- Network slicing for isolation of services
- Distribution of network functions closer to the edge to support low latency services
- RESTful APIs supporting open and seamless integration with applications and devices

5G Data is shared to drive new business value and automation

- User data and analytics shared across different network functions
- Exposed to Enterprise and IT applications to drive future value.



5G: A DIFFERENT BEAST

5G means a reinvention of the telecom network.

Benefits will be realized as business models are changed and new systems are developed to interwork in ways that incorporate these changes.

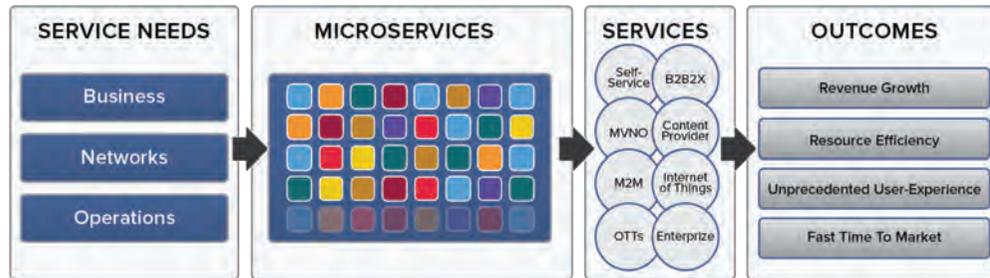
Openet is uniquely positioned due to its early embrace of flexible deployment methods, its vendor-agnostic approach that is now integral to 5G and its application of new-generation business models that are reflective of new service differentiators...

We can't wait!



ABOUT OPENET FORGE

Openet Forge is a platform embracing cloud technology and micro-services to provide the dynamism, flexibility, and agility to enable communications service providers position beyond their traditional core business. It enables them to develop an ecosystem of new capabilities and services that will grow revenue and deliver long-term opportunity by linking service needs to business outcomes.



ABOUT OPENET

Openet provides the solutions and consulting services to enable service providers to fast track their digital journeys. Our real-time solutions provide the digital platform for service providers to be more agile and innovative. This improves how they engage with their customers to drive new revenues and increase their share of their customers' digital spend.

We are all for open solutions that deliver value and benefits to our customers. We are against vendor lock-in and the vendor first, second and third approach that has been endemic in telecoms. We work with our customers to deliver innovative solutions that drive value and enable change.

We passionately believe that the most adaptable businesses are those that prosper best. We help our customers transform their businesses and access new revenues and profits by using the latest technologies and methods—in ways ranging from augmenting existing architectures or replacement with more agile and cost-effective end to end platforms.

Since its foundation in 1999, Openet has been at the forefront of telecoms software development and innovation. Our success is personified by the many long-term relationships it has fostered with the largest, most progressive, and demanding operators across the globe.

For more information visit www.openet.com

VOLTDDB

Openet's real-time solutions for digital and 5G are powered by the VoltDB in-memory database.

VoltDB helps their customers monetize and capitalise on their 5G investment; VoltDB is the only in-memory operational database suitable for real-time software solutions and services to enable service providers to create new revenues from digital services and improve customer engagement.

