5G Verticals Session
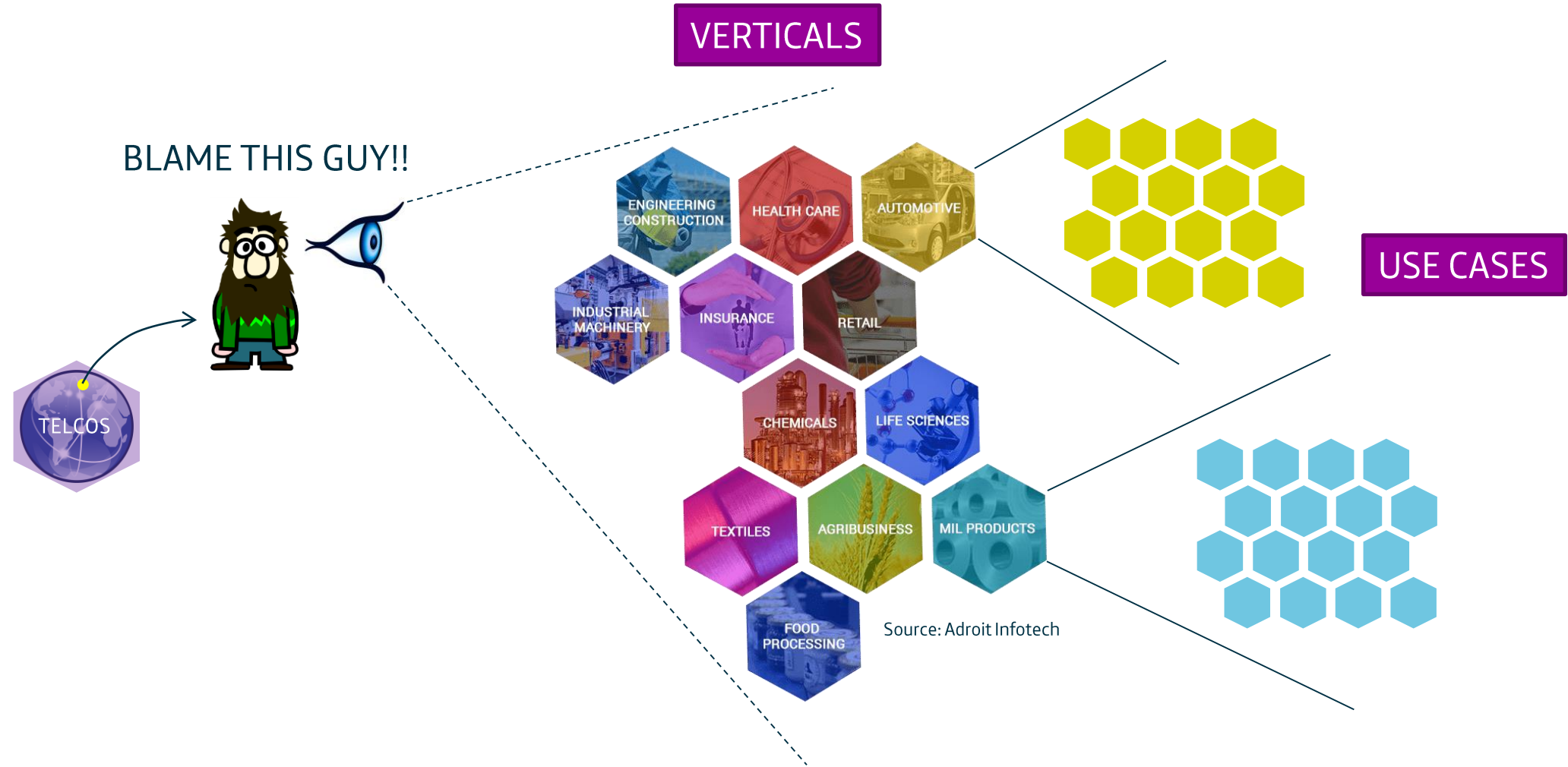
How can OSM accelerate 5G Vertical Services?

Juan Rodriguez Martinez

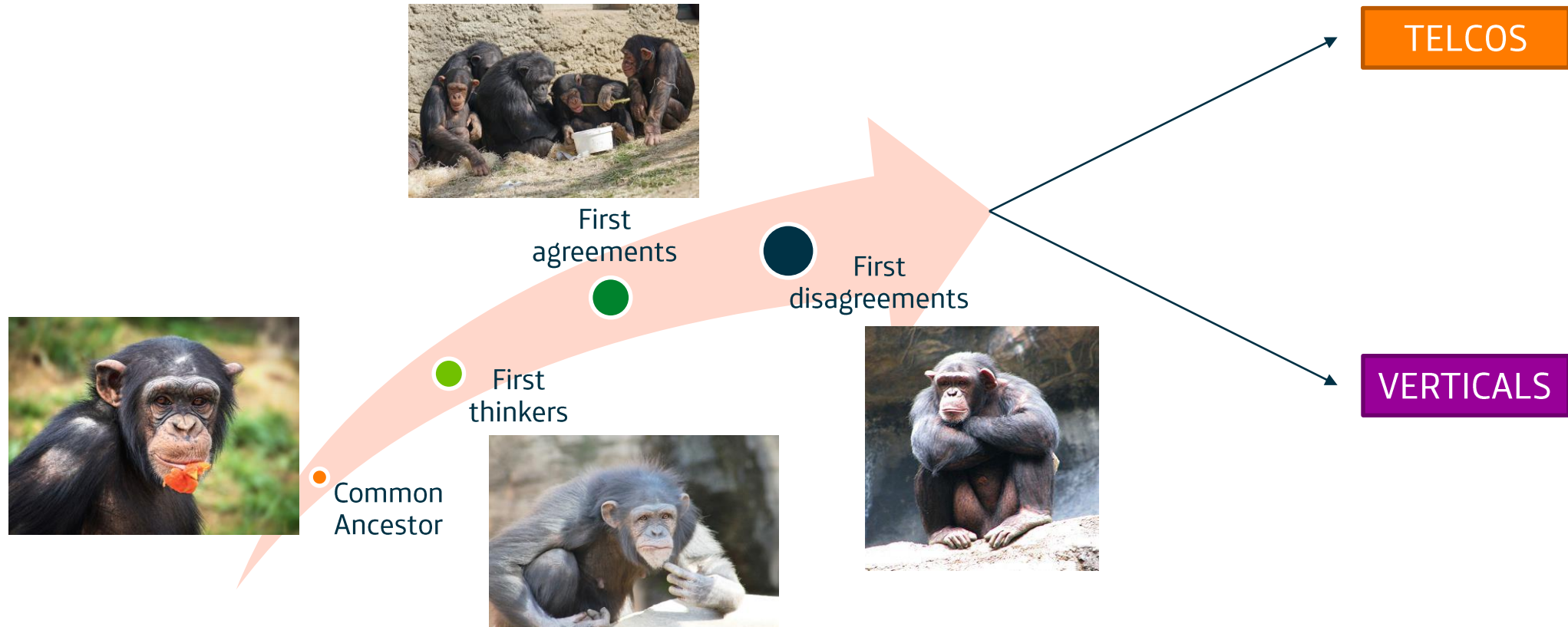juan.rodriguezmartinez@telefonica.com

Telefonica

Open Source MANO Hackfest
Patras, Greece 9-13 September 2019

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5G 5GINFIRE

Disclaimer!

VERTICALS

USE CASES

BLAME THIS GUY!!

TELCOS

ENGINEERING CONSTRUCTION

HEALTH CARE

AUTOMOTIVE

INDUSTRIAL MACHINERY

INSURANCE

RETAIL

CHEMICALS

LIFE SCIENCES

TEXTILES

AGRIBUSINESS

MIL PRODUCTS

FOOD PROCESSING

Source: Adroit Infotech

Telcos & Verticals have evolved differently...

… and language is a key divergence

Telcos	Verticals
• Reference Architecture	• What do I have to install?
• Network Topology	• How do I connect things?
• 5G frequencies	• As long as it is not Wi-Fi…
• Network KPIs	• Application KPIs
• Revenue	• Zero evaluation cost

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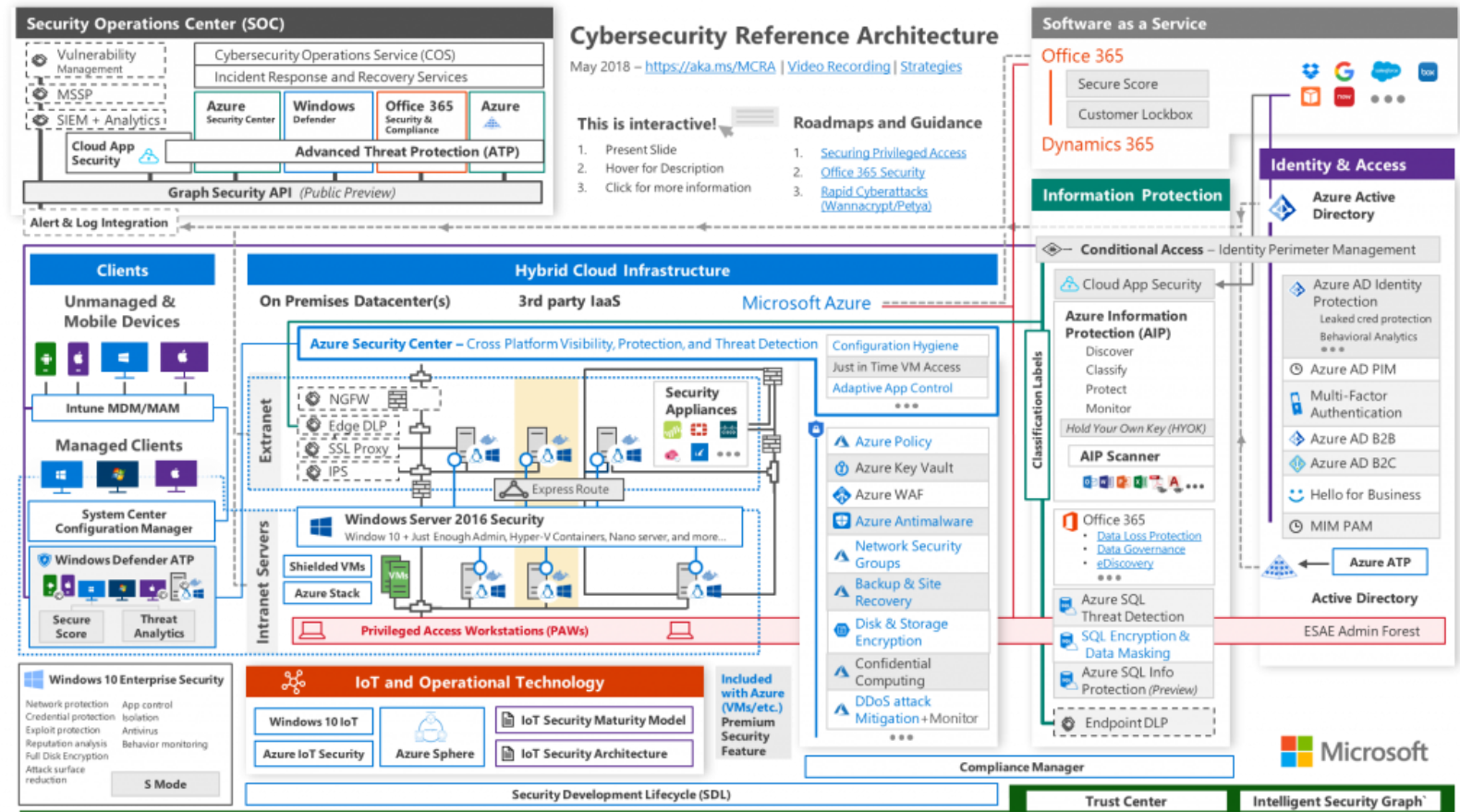# About Reference Architectures: quick poll

How many of you work for a Vertical?

Please, take a look at the Figure
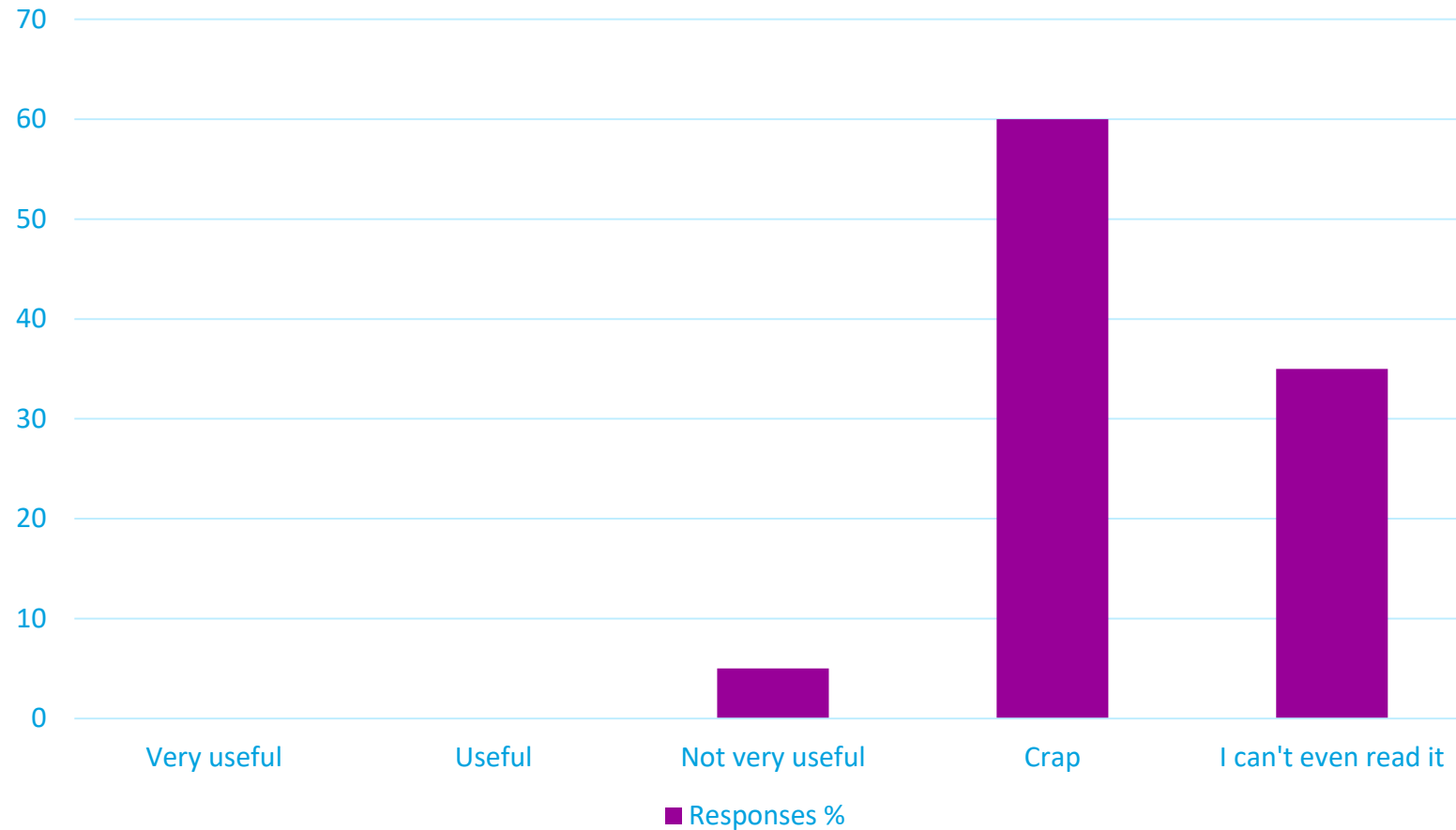
With the mindset of a Vertical…

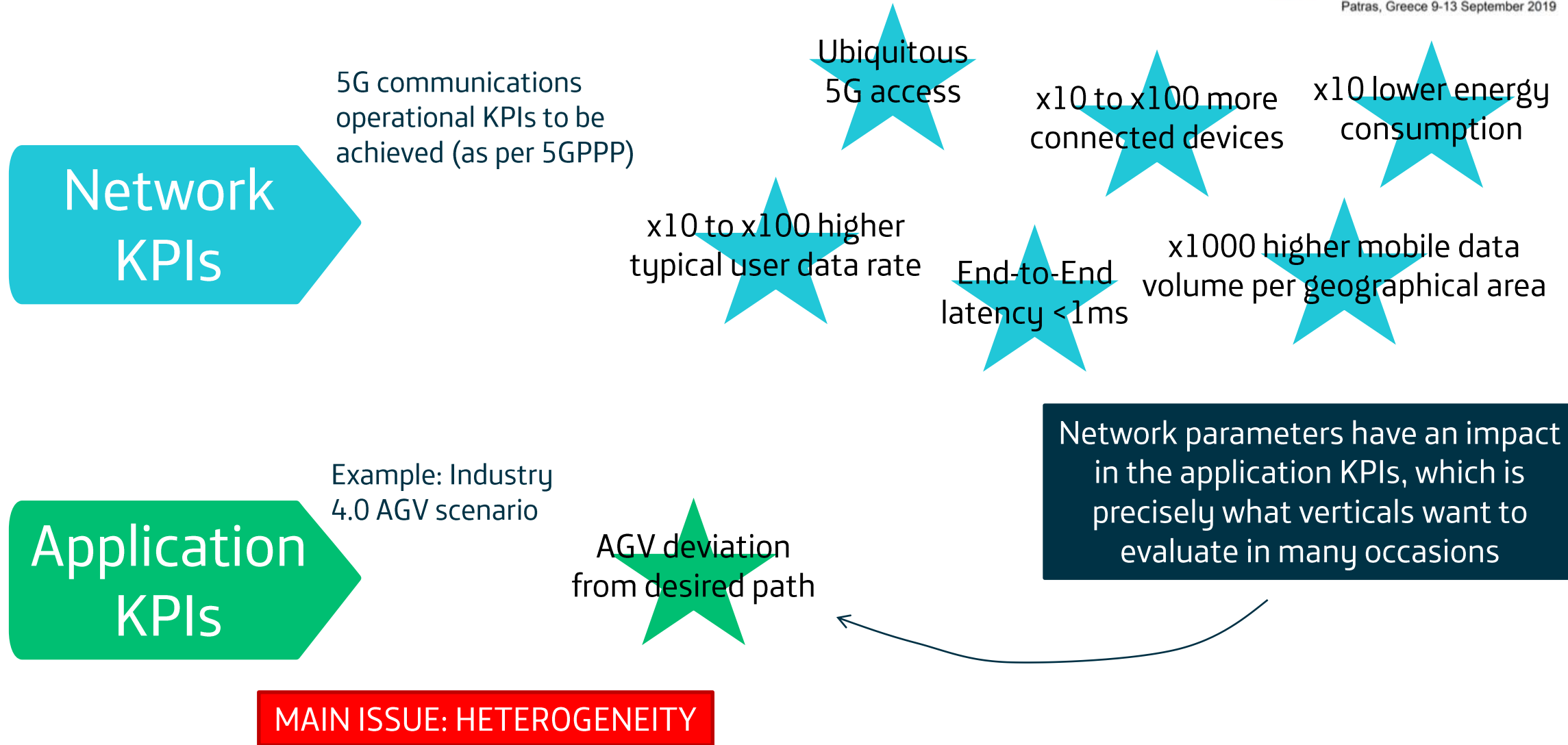**How many of you find this Reference Architecture useful for your business?**

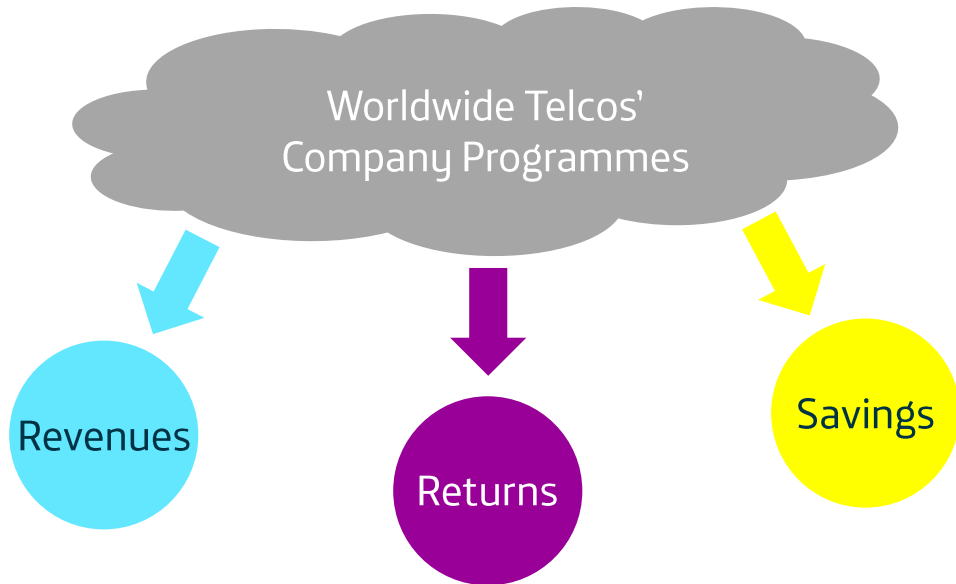Source: Microsoft Cybersecurity Reference Architecture

Predicted results*

* No offense intended to owner of Reference Architecture; this invented exercise is just for concept illustration purposes
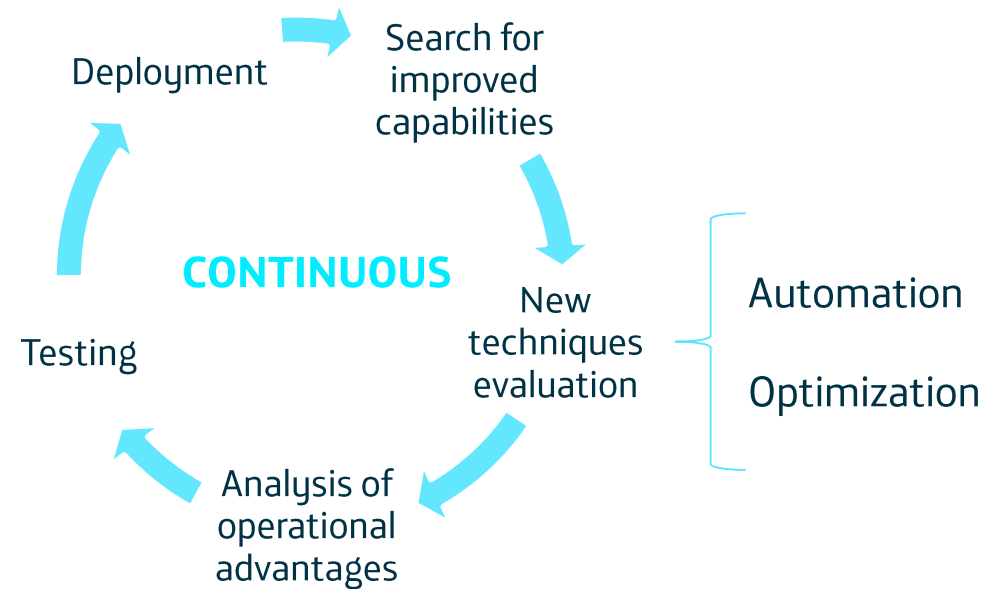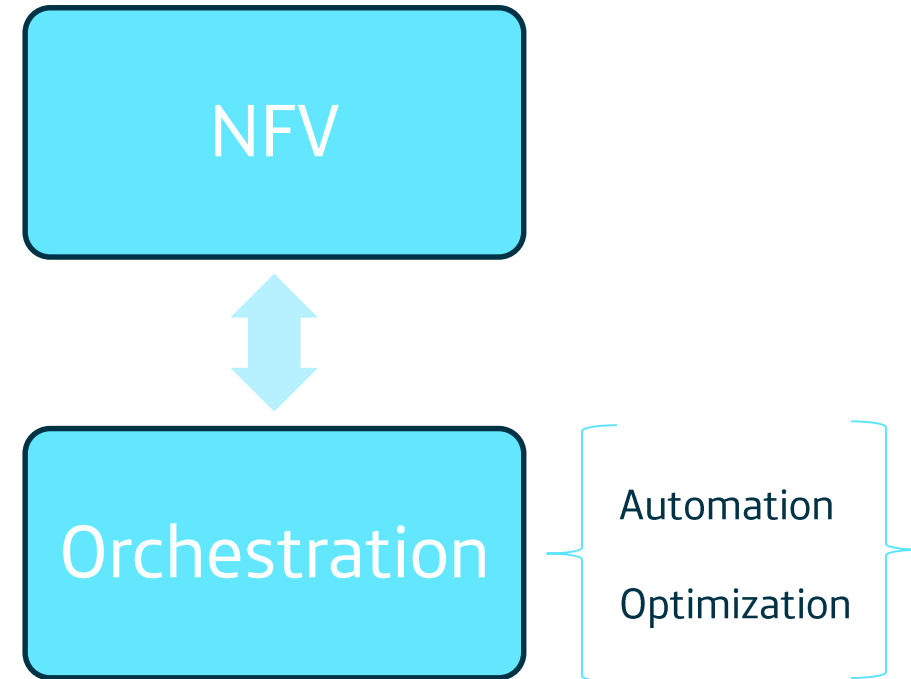
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About 5G KPIs

Network KPIs

5G communications operational KPIs to be achieved (as per 5GPPP)

Ubiquitous 5G access

x10 to x100 more connected devices

x10 lower energy consumption

x10 to x100 higher typical user data rate

End-to-End latency <1ms

x1000 higher mobile data volume per geographical area

Application KPIs

Example: Industry 4.0 AGV scenario

AGV deviation from desired path

Network parameters have an impact in the application KPIs, which is precisely what verticals want to evaluate in many occasions

MAIN ISSUE: HETEROGENEITY

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OSM and telco operators

Some of these can be derived from
IMPROVED SERVICE DEPLOYMENT
CAPABILITIES

Worldwide Telcos'
Company Programmes

Revenues

Returns

Savings

Deployment

Search for improved capabilities

CONTINUOUS

Testing

New techniques evaluation

Automation

Optimization

Analysis of operational advantages

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OSM and telco operators (cont.)

NFV

Worldwide Telcos' Networks

NFV

Orchestration

Automation

Optimization
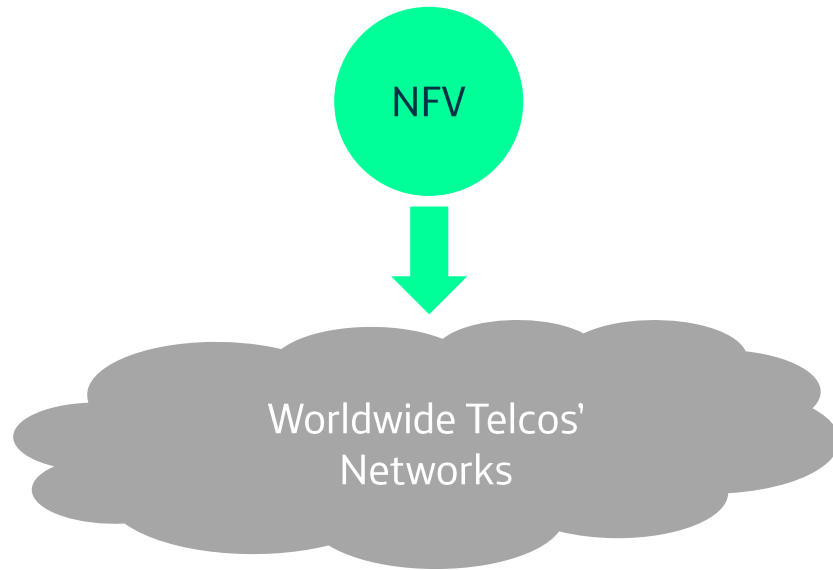
INTEREST BY OPERATORS IN MANO IMPLEMENTATIONS, **LIKE OSM**

What about Verticals?

AUTOMOTIVE INDUSTRY

Main trends

5G

Edge Computing

NEW SERVICE!

How can OSM accelerate 5G Vertical Services?

AUTOMOTIVE INDUSTRY

IDEA

5G

NEW SERVICE!

Main phases

Development

Testing

Deployment

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Complexity of testing by Verticals
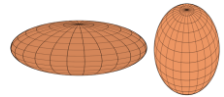
Experiments Heterogeneity

- Each Vertical its own Use Cases
- Reusable VNFs? Fake VNFs?
- No lab fits all

Vertical/Facility Interaction

- Do they speak the same language?
- What testing services are offered?
- How do I use them?

CHALLENGES

5G Testing Scenarios

- Very specialized (equipment cost)
- Regionally distributed
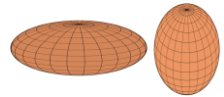- Very occupied

Testing Methodology

- Is it secure?
- Does it have an impact in the rest of the infrastructure?
- Is it standard?

Validation of results

- Can I measure the required KPIs?
- Assurance of appropriate conditions (i.e. close to production conditions)
- Can I replicate my tests?

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Few comments on few topics…

Experiments Heterogeneity

- Each Vertical its own Use Cases
- Reusable VNFs? Fake VNFs?
- No lab fits all

Vertical/Facility Interaction

- Do they speak the same language?
- What testbeds are offered?
- How to use them?

DESCRIPTORS

5G Testing Scenarios

- Very specialized (equipment cost)
- Regionally distributed
- Very occupied

Testing Methodology

- Is it secure?
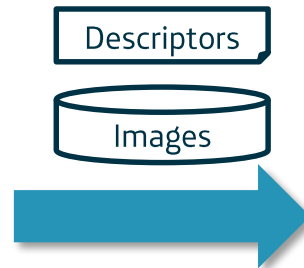- Does it have access to the rest of the infrastructure?
- Is it valid?

SLICES

Validation of results

- Can I measure the required KPIs?
- Assurance of appropriate conditions (i.e. close to production conditions)
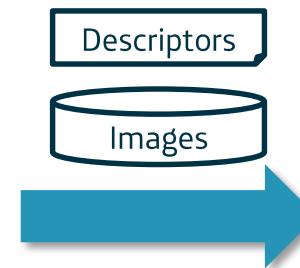- Can I replicate my tests?

Open Source MANO

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The OSM example

LOCAL DEVELOPMENT & TESTING

Descriptors

Images

TEST POOL FOR DEVELOPERS

Descriptors

Images

SERVICE PROVIDER

- ✓ Open development environment
- ✓ Functional testing
- ✓ Low cost
- ✓ Integration from the beginning

- ✓ Real servers and switches
- ✓ Performance tests (EPA can be enforced)
- ✓ Cost effective shared infrastructure
- ✓ Move the value to VNF services

- ✓ Production/pre-production environment
- ✓ Real network scenarios
- ✓ Final service configuration
- ✓ Fast deployment
- ✓ Low final integration cost

SAME **IMAGES** AND **VNF PACKAGE** ACROSS ALL THE CHAIN!
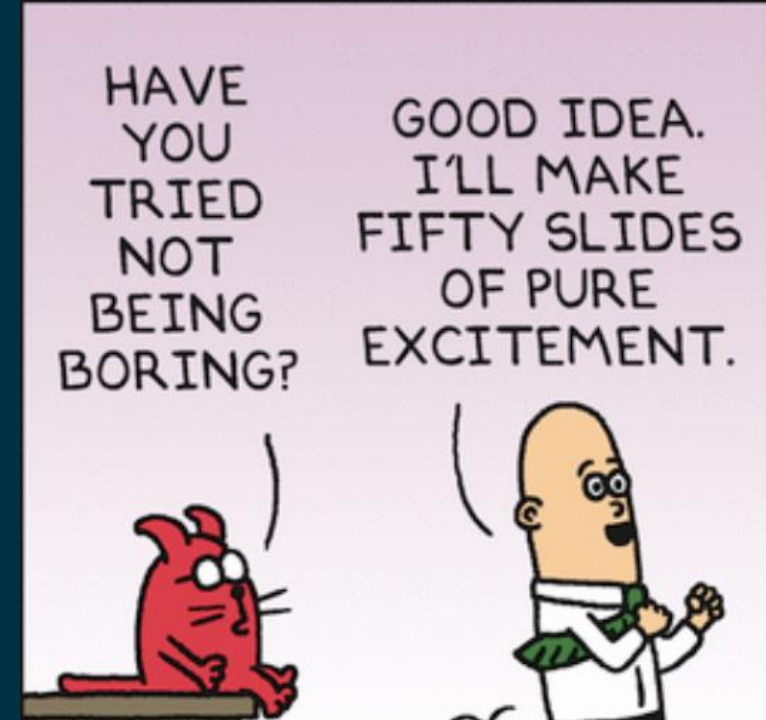
REPLICATION OF TESTS

REPLICATION OF OSM?

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OPEN DISCUSSION:
PLEASE, ASK
AND CONTRIBUTE

HAVE YOU TRIED NOT BEING BORING?

GOOD IDEA. I'LL MAKE FIFTY SLIDES OF PURE EXCITEMENT.

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