

WE  
CAN DO  
SO MUCH  
TOGETHER

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# Cloud Computing in the 5G era

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# Motivation and current context

Creating a #DigitalSingleMarket

## DIGITISING EU INDUSTRY

EU CLOUD



Digital public services



Standards



European Commission #DigitiseEU

July 7th 2016

activity infrastructure, (health, digital factories) whilst ICT sectors, and bringing all the vertical sectors services.

Industry for advanced ICT

subsequent backing of

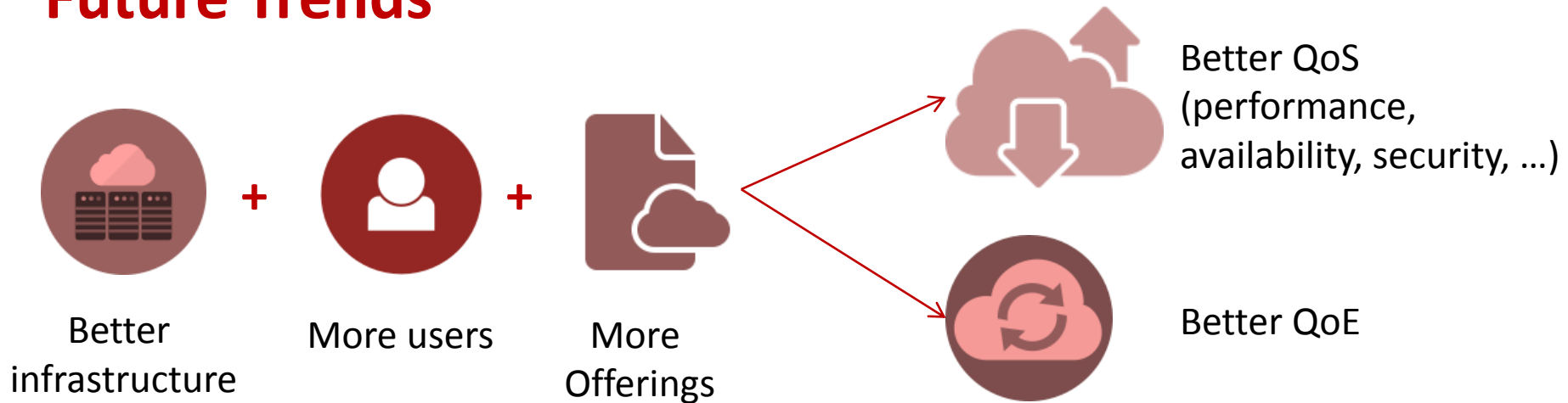
[Bernd-Lauterbach-welcomes-5g-manifesto](#)

ough interoperability services sectors. 5G for personal, public communication solution

[5g-manifesto-2016-07-07-fm?action=display&doc\\_id=16579](#)

Source: <https://ec.europa.eu/digital-single-market/en/digitising-european-industry>

## Future Trends



Users will expect that Cloud – native applications **scale, react** and are **adaptive** to a new set of **Non-Functional Requirements**

## Future Trends

- **Why** multi-cloud?
  - avoidance of vendor lock-in,
  - increase reliability
  - improve other QoS concerns such as increasing performance or security,
  - reduce costs,
  - Ensure compliance of the CSPs to the agreed SLAs,
- **Which** applications would **benefit** the most?
  - critical to the business
  - need to respond efficiently to the user's needs in terms of performance, reliability and security
  - specific needs and requirements such as compliance to regulations.

# Challenges in SDLC and SOLC of multi-cloud apps



No standardised **architectural, optimization and deployment patterns**



No **standard APIs or connectors that ensure interoperability** of platforms and providers, security parameters, cost models, etc.



Lack of methods, algorithms and tools that simulate, **prior to the application deployment, the most adequate deployment topology**



Lack of approaches for the (semi-) automatic **self-healing / adaptiveness of a multi-cloud application**



Management of heterogeneous infrastructures, CSPs and CSBs from a **single point of access**.

## Needs



“**Continuous architecting**” + continuous development, **optimization** and deployment, **covering SDLC and SOLC**



**Simulation** techniques and tools **prior to the deployment** of a multi-cloud application in order to select the most adequate topology, considering NFRs



(semi-) automatic **dynamic reconfiguration** and **self-healing**



Automatic **data migration** and data portability



Mechanisms and tools to deal with **extended cloud resources** in heterogeneous ecosystems

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