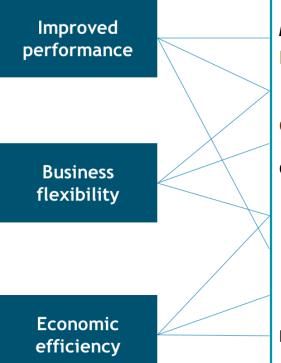


#### The Future Now



#### Massive MIMO SDN

High frequency bands

New waveforms

Interference alignment

**Carrier Aggregation** 

Advanced receivers

Cognitive Management

**NFV** 

Fog computing

**Device to Device** 

Full Duplex

Non Orthogonal Multiple Access

Fixed Mobile Convergence

Ultra Dense Networks

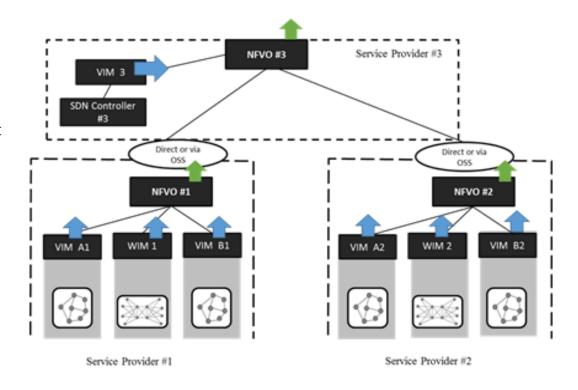
- 5G goes well beyond new radio interfaces and spectrum allocation
  - The very definition of 5G
    networks is aligned to what
    Software Networks are intended
    since they were conceived
- The goals of 5G require Software Networks as a key enabler
  - The Software Networks concepts have to evolve to satisfy these goals





### Software Networks in 5G

- The targets
  - Heterogeneous services on a regular infrastructure
    - Sustainability and adaptation
  - Support for dynamic, independent management of tenant virtual networks
    - And personalization
    - Through the slice concept
  - Optimal function placement
    - Elastic capacity, follow the users
- Address the challenges of the transition period
  - And even transform them into opportunities

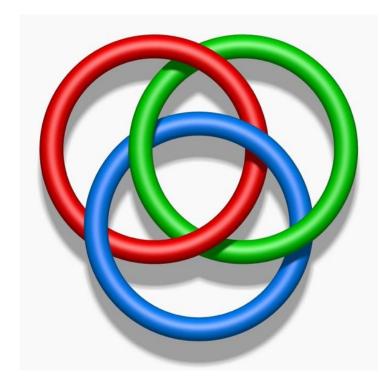






## The Virtuous Circle(s)

- A changing network landscape
  - Not only "pure 5G"
  - Network stack evolution
  - Pervasive encryption
- More agile processes in SDOs
  - Limit architecture to frameworks
  - Focus on models and interfaces
  - Leave room for differentiation
- More freedom of choice in open-source communities
  - Diversity is not fragmentation
  - Focus on models and interfaces
  - Leave room for differentiation
- The ETSI NFV community is trying to build these virtuous circles





# Telefonica

