



5G-Infrastructure PPP Information Day

28th April 2014, Paris

View point: 5G Networks are

- **High / ever higher performant connectivity environments (i.e. ‘everything is connected’ paradigm)**
- **Significant reduction in management complexity and in costs of operations (i.e. OPEX)**
- **Service execution environments & programmable infrastructures (i.e. enable networks to support a new range of applications - ‘computation for everybody’ paradigm)**



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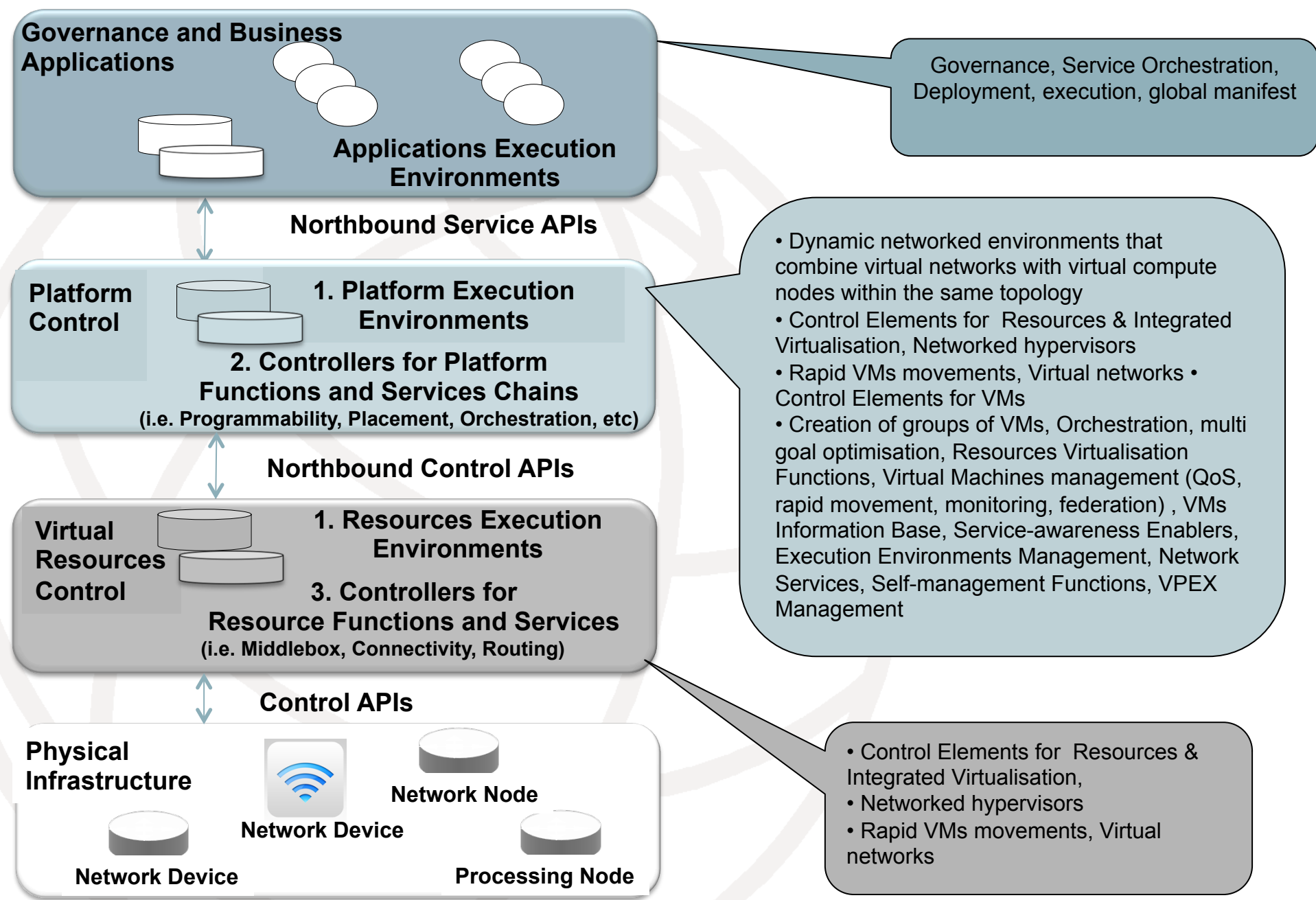
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Some Competences and Interests

UCL is ranked fourth in the world's top universities by the QS World University Rankings (2013) and number 21 in the Shanghai Ranking of World Universities.

<ul style="list-style-type: none">• New potential transmission standards based on Spectrally Efficient Frequency Division Multiplexing (SEFDM) where up to 40% bandwidth saving (relative to OFDM) may be achieved at the expense of receiver complexity (→P2)• Spectral sensing systems for wireless energy and bandwidth efficiency (→P2)• Massive MIMO and MIMO systems (→P2)• Radio over Fibre systems (RoF) operating in the mm-wave region; system, sub-system and circuit level design (→P4)• Software defined optical networks for flexible back-hauling →P7	↔	5G-PPP Radio network architecture & technologies
<ul style="list-style-type: none">• Functional Migration & Control methods for relocating network functions→P9• Network functions orchestrations (control, conflicts, integrity) → P9• Multi tenant network-based clouds and management→P10• Network hypervisors → P10	↔	5G-PPP Convergence beyond last mile
<ul style="list-style-type: none">• Information & monitoring systems for Virtual Networks (knowledge, SLAs)→P11, P12• Unified Service & Network functions orchestration→P11, P12• Service manifests and APIs →P12• Autonomic management & control loops for SDN → P14, P11	↔	5G-PPP Network Management
<ul style="list-style-type: none">• A New Virtual Networking Environment (integrated networking and computation resources) & New Network Hypervisor → P14• Execution environments & management for applications that define the software components and network functions of a network service together with their configuration parameters →P15, P14• Full lifecycle of the application related virtual machines and virtual routers in the network and the allocation of the applications running on the virtual nodes →P15• Programmability in networks and services →P14, P15	↔	5G-PPP Network Virtualisation and Software Networks

Service Defined 5G Networks Model (S/W stack model → P8)



Concluding Remarks

5G Networks are both a higher performant connectivity and service execution environments with programmable capabilities – ‘every things are connected and computation for all’ paradigm.

Softwarization and in particular (Self) Management and Control would represent nearly 99% of the new 5G Networks & Services functionality !!!