



Virtualized, Disaggregated 3GPP 5G RAN and Small Cells

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Cyient Inc

About Cyient

A Global Network Planning & Design Engineering services company for Communication Service Providers, both for Fixed Line and Mobile Networks. We work on a Plan, Build and Operate Model. We offer a unique blend of GIS, RF, IT and Systems, knowledge. Some of our North American clients include AT&T, Verizon, Century Link, SaskTel, TBayTel, Shaw and Rogers.



Program Manager with over 15 years of Engineering, Sales and Operations experience in the wireless Industry. Prior, I was associated with multiple carriers and OEM's in USA.

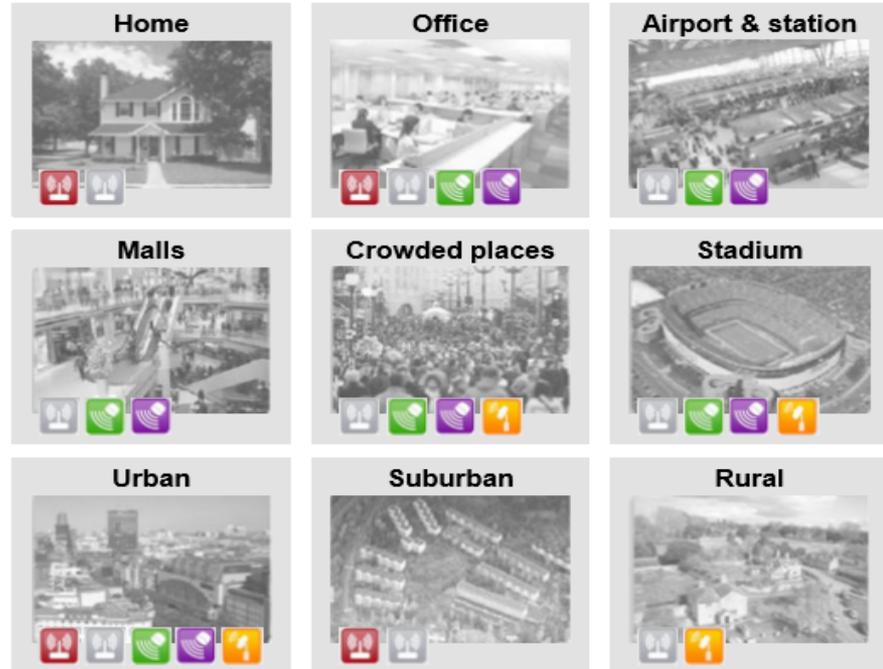
My team manages 4G/5G communications projects and Customer relationships. In-sync with sales and delivery, we are responsible for solutions architecture and presales.

Holds MBA from University Of Maryland and MS in Electrical Engineering from University of Texas at Arlington.

Small Cell's:: Key Ingredient for UDN

| | | |
|-----------------------------------------------------------------------------------|----------------------------------------------------------------------------------------------------|---------------------------------------|
|  | <ul style="list-style-type: none"> Indoor Outdoor Coverage radius | 10-100 mW 0.2-1 W 10s of meters |
|  | <ul style="list-style-type: none"> Indoor Outdoor Coverage radius | 20-100 mW 0.2-1 W 10s of meters |
|  | <ul style="list-style-type: none"> Indoor Outdoor | >10 W >10 W |
|  | <ul style="list-style-type: none"> Indoor Outdoor Coverage radius | 100-250 mW 1-5 W 10s of meters |
|  | <ul style="list-style-type: none"> Indoor Outdoor | 5-10 W 100S of meters |
|  | <ul style="list-style-type: none"> Indoor Outdoor | >10 W kilometer(s) |

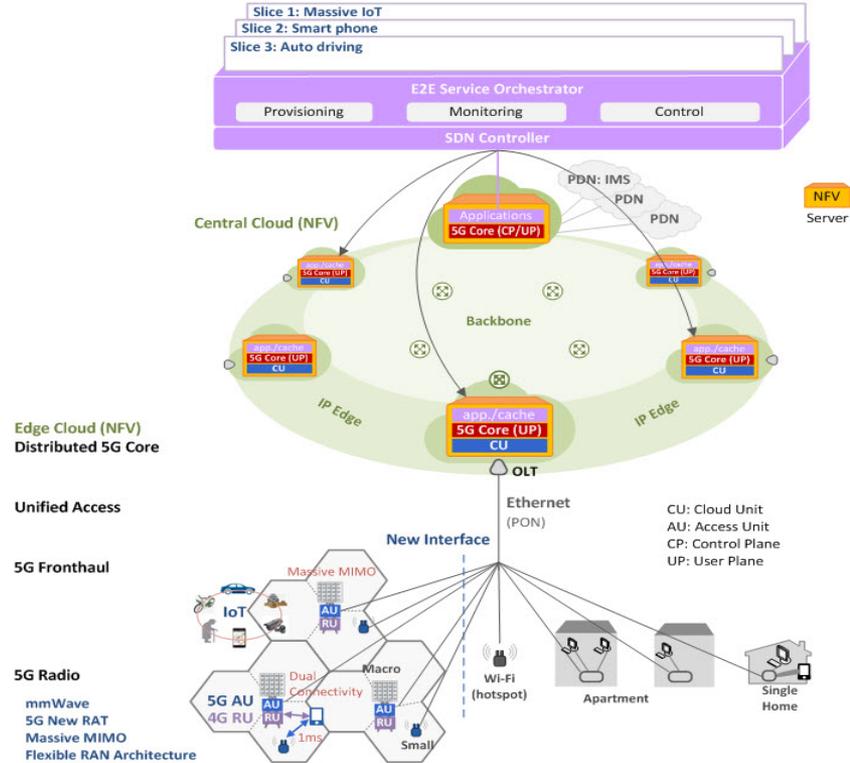
Small Cell Network Deployment Models



- Thruput per square mile increases to the 3rd power frequency while number of sites increases to the frequency squared.
- Everything else being equal your capital cost per bit decreases by a factor of 10

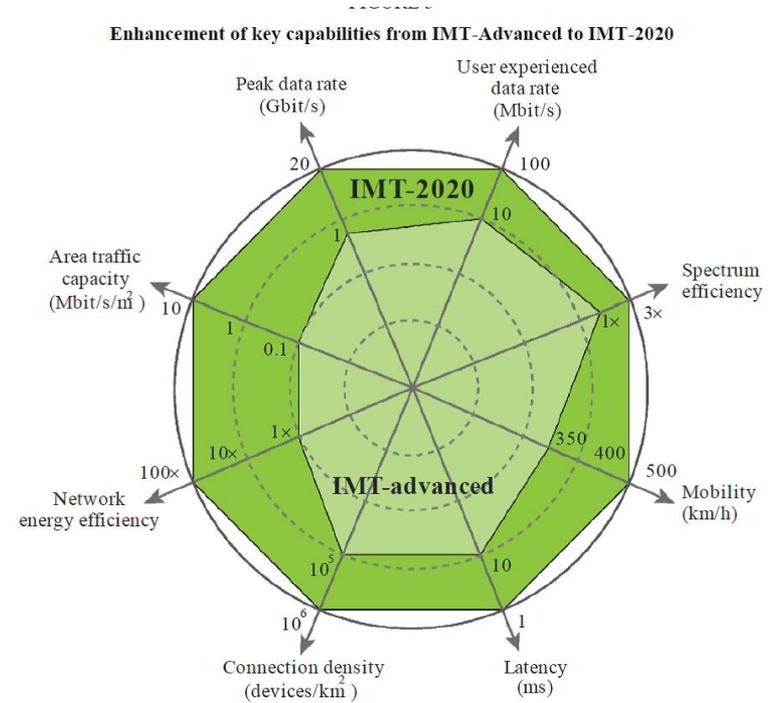
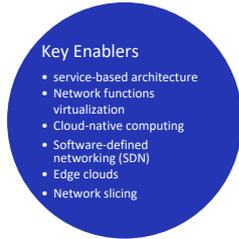
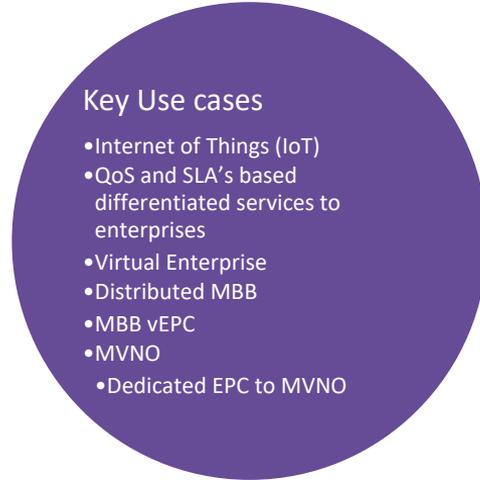
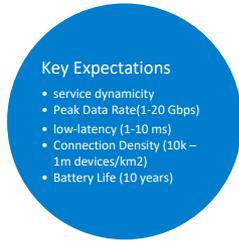
5G components and architecture

| | |
|-------------------------------------------|-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| New spectrum | high frequency spectrum above 6 Ghz and new spectrum between 3.4 and 6 Ghz. Spectrum convergence : mmWave spectrum to be used for fixed wireless, mobile access and transport |
| Flexible and programmable networks | SDN, NFV and slicing will enable flexibility, scalability and configurability of networks |
| Multi-connectivity | 5G to work with LTE, other RAT |
| Virtualized/cloud RAN and core | LTE RAN, 5G RAN and core will be virtualized/cloudified, with a combination of centralized and distributed cloud |
| Massive MIMO and beamforming | applied to enhance capacity and coverage, reduce interference |
| HetNet and densification | More nodes and more small cells in 5G than in previous generations |



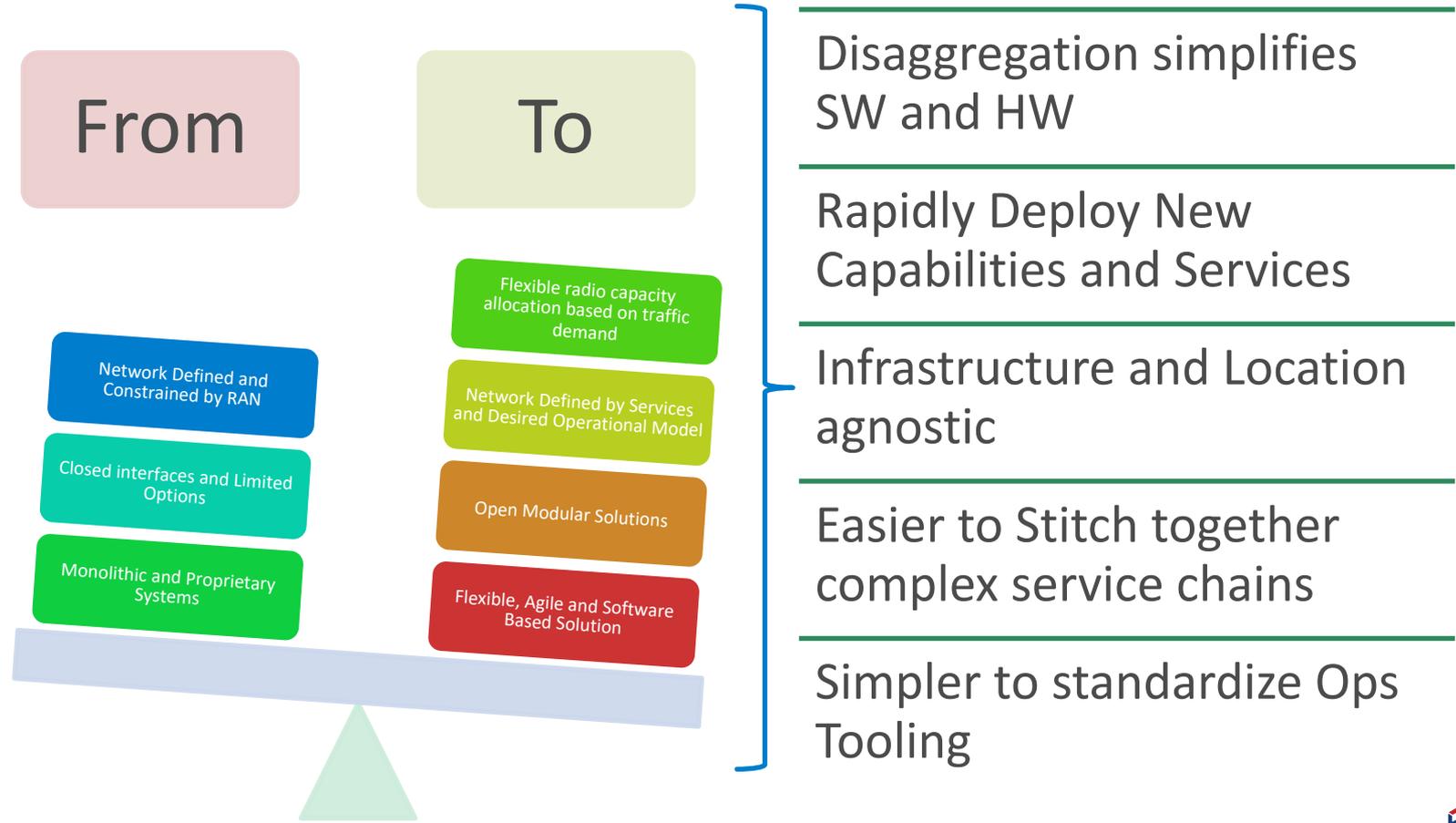
[Source : Netmanias, KT]

5G promise



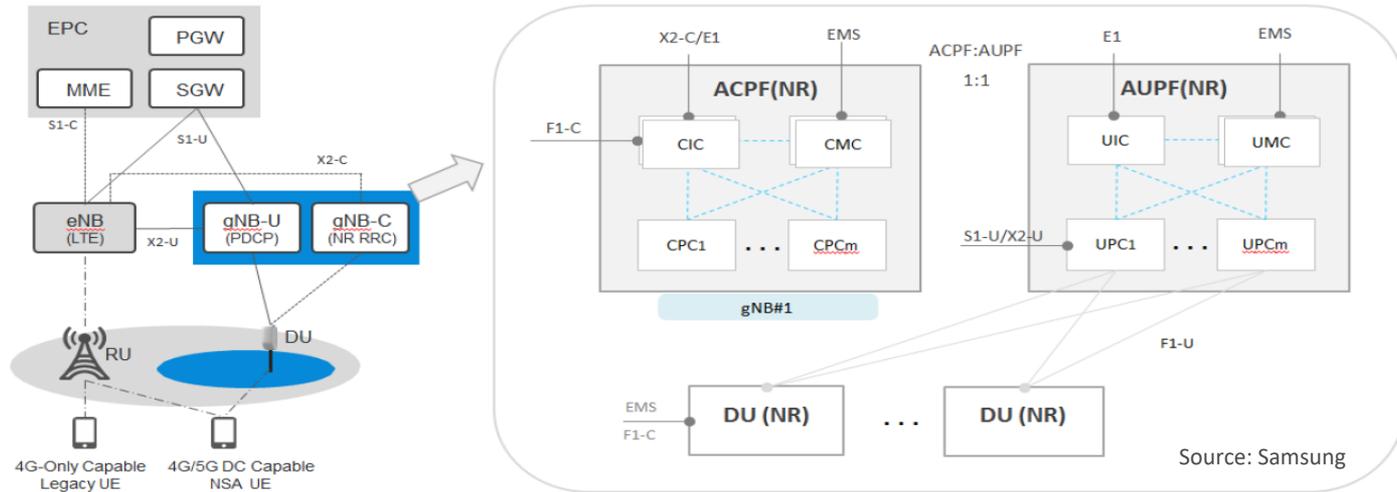
5G promises to support diverse industry use cases with varying demands such as service agility, QoS and latency requirements

Software Defined Mobile Networks



5G vRAN Architecture-NSA (Non Stand Alone) Option

Figure 1. 5G vRAN Architecture – NSA (Non-StandAlone) option



The vRAN is deployed in VCP edge as a VNF. CPC and UPC are scalable independently.



Thank You

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