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**Detecon, Thailand**

**Policy and Regulatory Issues on 5G and Next Generation Services**

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# Policy and Regulatory Issues on 5G and Next Generation Services



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Deutsche Telekom Group



Consulting  
**DETECON**



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- 1. Detecon – Who we are?**
2. 5G Background and Selected Regulatory Issues
3. 5G and Services





## Partner and Head of Delivery Detecon Asia Pacific: Dr. Werner Knoben



**Dr. Werner Knoben**  
Partner

### Area of studies

- PhD in Mathematics: RWTH Aachen University, Aachen

### Professional Experience

- T-Com / Deutsche Telecom / Detecon – Partner: Bidding and Auction Strategies; War gaming; Regulatory strategies; Due Diligence; Scenario Analysis

### Key Qualifications

- Regulatory and wholesale strategy, market liberalization, competition law, regulatory costing and accounting separation
- Auction Design, Auction Strategies, Game Theory, War gaming, Communication Strategy, Bid Strategy
- Consumer and B2B strategy, Business Cases, Scenario Analysis

### Selected Project Experience

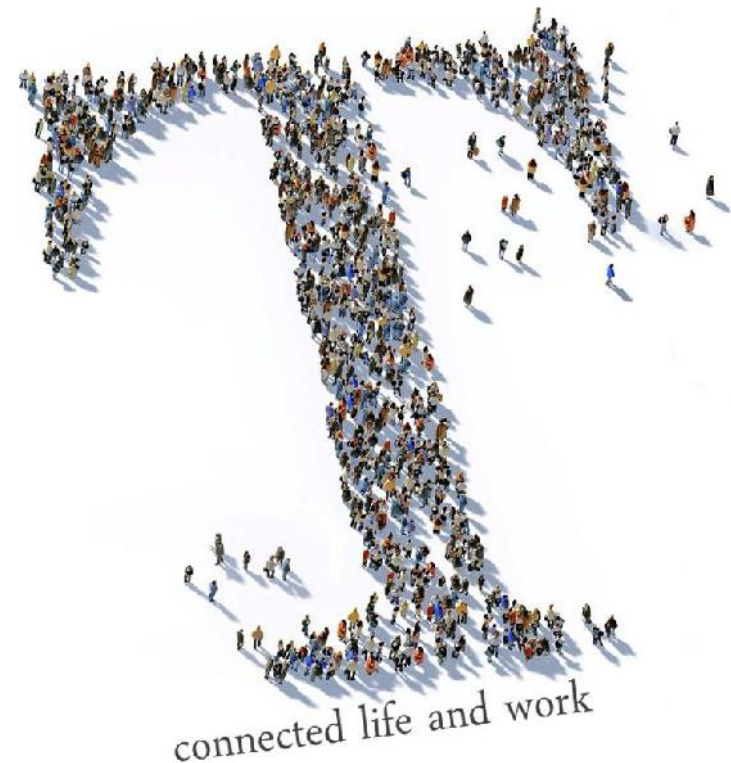
- TRA Oman: Setup of a 4G spectrum auction
- NCC Nigeria: Setup of SMS and Data Interconnection Regulation
- NBTC Thailand: Development of an Accounting Separation Framework
- SingTel, Singapore: Auction and bid strategy and 4G license valuation
- TMMK/MKT, Macedonia: Regulatory Costing
- Advisor for Deutsche Telekom subsidiaries in Croatia, Hungary and Slovakia for regulatory strategies



**We are part of Deutsche Telekom Group, the number one ICT provider in Europe. Our goal is to leverage the strengths of the group in international markets.**

### Key Facts Deutsche Telekom Group

- USD 75 billion net revenue
- 239,000 FTE employees
- 1,500 headcount in group innovation and partnerships
- 50.5 million fixed network lines
- 123 million mobile customers
- Number one ICT provider in Europe
- Number one cloud provider outside US
- Strong international footprint
- Group vision:  
*The customers' first choice for connected life and work*



Telekom subsidiaries provide integrated products and services for business and residential



T-Mobile offers mobile solutions and is the key co-brand for OTT partnerships



T-Systems delivers ICT solutions for corporate customers and public sector organizations



Detecon is the management consulting unit of DT Group, serving to the group and other customers



**Detecon's global presence ensures that clients get access to the knowledge and know-how of telecommunications experts worldwide.**

### Key Facts Detecon International GmbH

- Foundation:  
1954 – Diebold  
1977 – DETECON
- Restructuring:  
2002 – Detecon International GmbH
- Shareholder:  
T-Systems International GmbH
- Employees:  
More than 1,000 worldwide
- Turnover 2012:  
EUR 168 million
- Locations Germany:  
Cologne (head office),  
Dresden, Eschborn, Munich
- International Locations:  
Abu Dhabi, Almaty, Ankara, Bangkok,  
Beijing, Jakarta, Johannesburg,  
Moscow, Riyadh, San Francisco,  
Vienna, Zurich
- Webpage: [www.detecon.com/en/](http://www.detecon.com/en/)

### Worldwide Presence

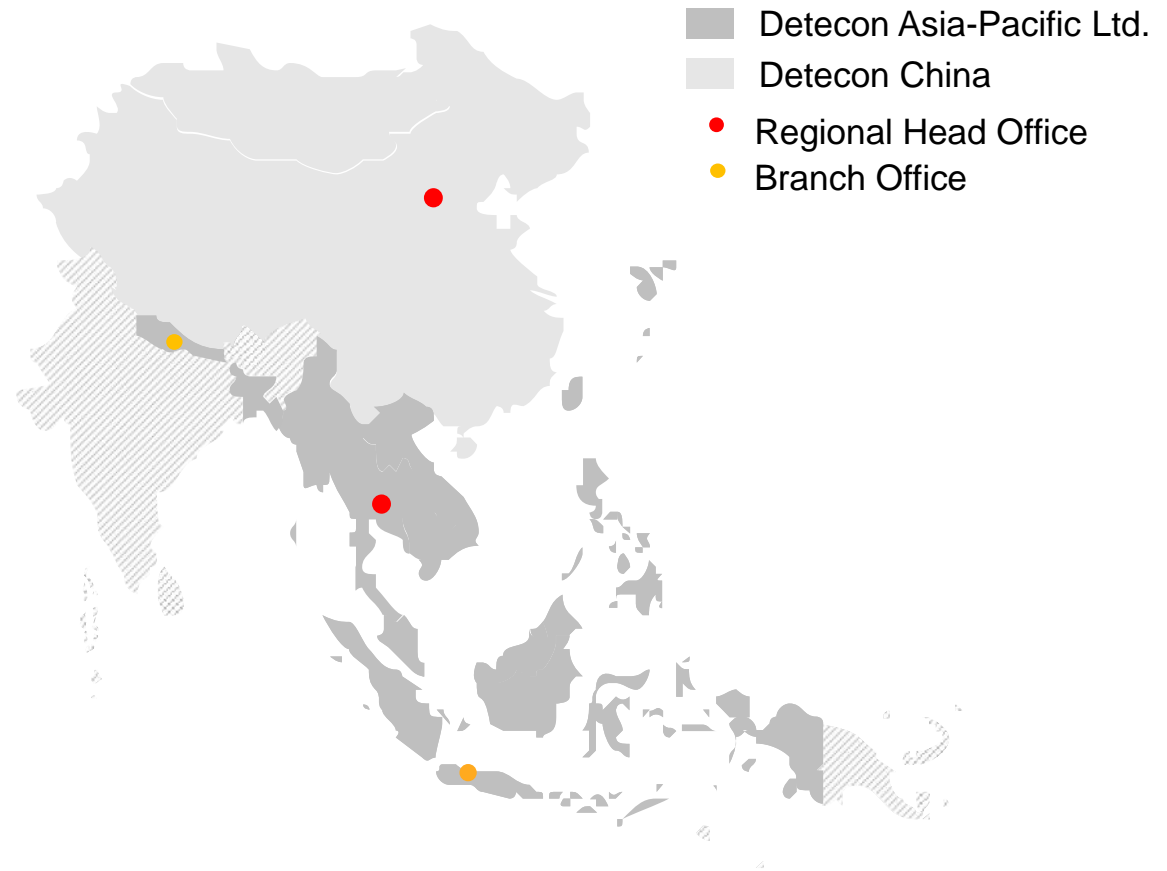


**Detecon Asia-Pacific Ltd. is focusing on wider South East Asian markets. We can build on successful client relationships that have developed over 25 years.**

### Key Facts Detecon Asia-Pacific Ltd.

- Business Activities in Asia:  
Since 1985
- Foundation of Detecon Asia-Pacific Ltd.:  
2005
- Major Shareholder:  
Detecon International GmbH (99%)
- Employees:  
45
- Turnover 2012:  
EUR 7 million
- Regional Headquarters:  
Bangkok
- Regional Branch Offices:  
Jakarta, Kathmandu
- Webpage:  
[www.detecon-asia-pacific.com](http://www.detecon-asia-pacific.com)

### Presence in Asia





## We combine a rich service portfolio with a unique approach to consulting and in-depth knowledge of the industry.

Strategy and Marketing	Technology Management	Organization and Processes
<ul style="list-style-type: none"><li>■ Startup and Launch Support</li><li>■ Marketing and Sales Strategies</li><li>■ Wholesale Strategy and Implementation</li><li>■ Regulatory Advisory (Regulation Frameworks, Licensing, Lobbying)</li><li>■ Corporate Strategy</li><li>■ Corporate Finance</li><li>■ Cost Optimization</li><li>■ Business Planning</li><li>■ Business Development</li><li>■ Innovation Management</li><li>■ Big Data Strategy</li><li>■ Due Diligence and Investment Appraisal</li><li>■ Corporate Social Responsibility</li></ul>	<ul style="list-style-type: none"><li>■ Network Rollout / Launch Support</li><li>■ Technology Strategy</li><li>■ Outsourcing, Managed Services</li><li>■ Vendor Selection</li><li>■ Network Performance Management</li><li>■ Network Operations Efficiency</li><li>■ Tool Based Network Planning, Design and Rollout</li><li>■ ICT Strategy Organization</li><li>■ Technology Innovation Management</li><li>■ Green Technologies</li><li>■ ICT Transformation Management</li><li>■ Next Generation Data Centre</li><li>■ Enterprise Architecture Strategy and Management</li><li>■ Enterprise Service Management</li></ul>	<ul style="list-style-type: none"><li>■ Business Process Management (Business Process Audits, Business Process Engineering including eTOM and ITIL), Process Optimization</li><li>■ TOGAF Training and Certification</li><li>■ Enterprise Transformation Management</li><li>■ Reorganization and Merger Integration</li><li>■ Human Resources Management</li><li>■ Procurement and Supply Chain Management</li><li>■ Financial, Risk and Compliance Management</li></ul>

Program Management, Project Management, Interim Management



**We support regulatory authorities and operators since 1977 with our deep regulatory and sector reform knowledge and experience worldwide.**

Sector Reform and Legislation	Regulatory Policies / Procedures	New Regulatory Challenges
<p><b>Sector Reform Strategy</b></p> <ul style="list-style-type: none"> <li>■ Review of given market situation</li> <li>■ Analysis and benchmarking of liberalization experience in other countries</li> <li>■ Examination of political, legal and economic implications</li> <li>■ Elaboration of guidelines and policies for sector reform</li> </ul> <p><b>Communication and Competition Legislation</b></p> <ul style="list-style-type: none"> <li>■ Analysis of existing legal situation</li> <li>■ Primary and secondary legislation</li> <li>■ Regulations and calculation models (price squeeze, margin squeeze, predatory pricing)</li> <li>■ Anti-competitive conduct (ex-ante and ex-post)</li> </ul>	<ul style="list-style-type: none"> <li>■ Regulatory market definition and analysis</li> <li>■ Competition policy, SMP designation and remedies</li> <li>■ Licensing and Authorization</li> <li>■ Universal service policy</li> <li>■ Tariff policy and tariff regulation</li> <li>■ Interconnection and Access Regulation</li> <li>■ Numbering</li> <li>■ Dispute resolution</li> <li>■ Market Monitoring and enforcement regulation</li> <li>■ Consumer, Data and Privacy Protection</li> <li>■ Frequency spectrum allocation and management</li> <li>■ Standardization and type approval</li> </ul>	<ul style="list-style-type: none"> <li>■ Fix-mobile convergence regulation (e.g. pricing of mobile termination, national and international roaming, MNP, SMP evaluation, digital dividend, spectrum trading, re-farming, auctioning, ...)</li> <li>■ Legal framework for eCommerce, eHealth and eGovernment</li> <li>■ Media, IT, telecom convergence regulation (e.g. for content and applications, IPTV, PPV, ...)</li> <li>■ Technical and economic regulation in an NGN environment, e.g.                         <ul style="list-style-type: none"> <li>■ VoIP regulation,</li> <li>■ Net neutrality and QoS,</li> <li>■ NGA industrial policies,</li> <li>■ Next Generation Data Centre,</li> <li>■ Network Resilience and QoS,</li> <li>■ OTT</li> </ul> </li> </ul>

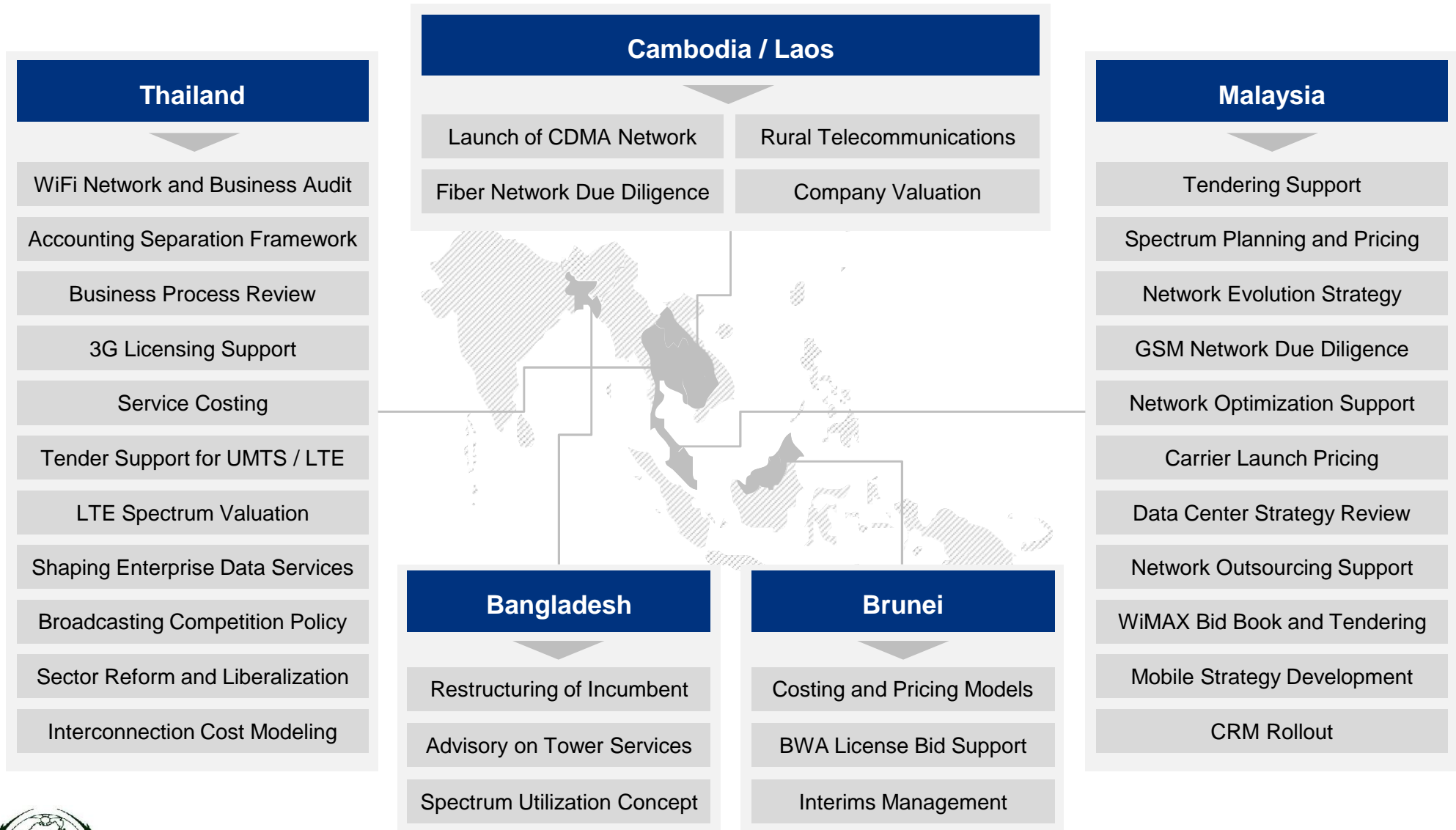
**Regulatory Strategy and Telecommunication / Broadcast / Spectrum Master Plans**



**Our Asian client base includes donor institutions, regulatory bodies, industry suppliers and telecommunications carriers across the whole region.**



**A country view on completed projects proves that we are industry experts capable of dealing with strategic challenges as well as detailed implementation tasks.**



**A country view on completed projects proves that we are industry experts capable of dealing with strategic challenges as well as detailed implementation tasks.**



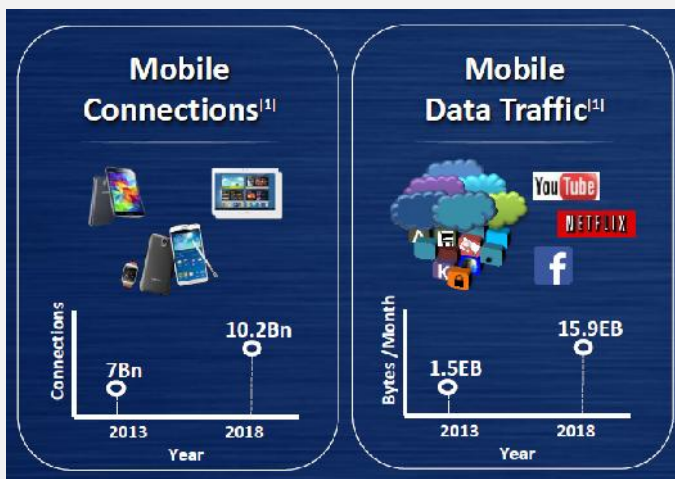


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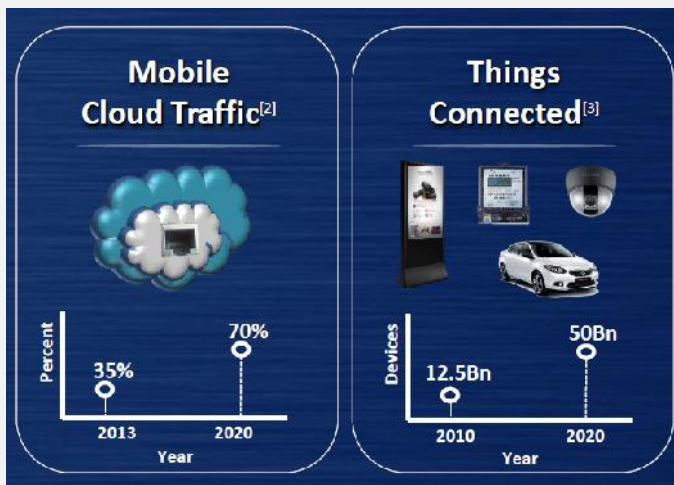


## Drivers leading to 5G are based on the experience in today's cellular mobile networks and a projection of the needs in the future.

### Mobile Trend



Source:  
VNI Global Mobile  
Data Traffic Forecast  
2013 – 2018  
Cisco, 2014



Source:  
• The Mobile Economy, GSMA, 2014  
• Internet of Things, 2013

### 5G – Overall Drivers

According to public sources, the following evolutions characterize the mobile trend until 2020, when 5G is supposed to get commercially launched:

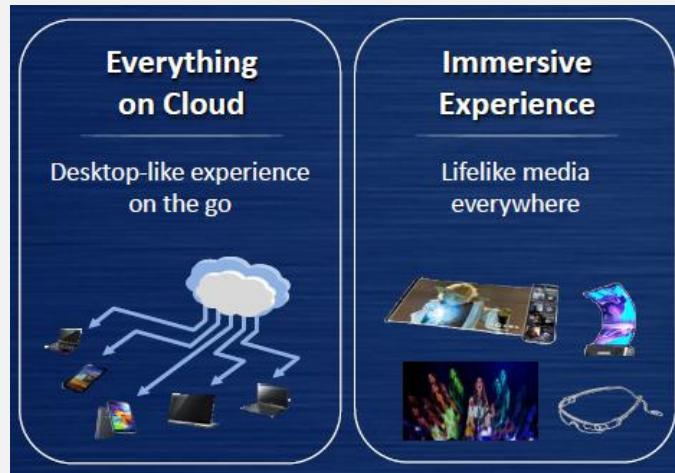
- **The number of mobile connections** grows between 2013 and 2018 from 7 billions to 10.2 billions.
- **The mobile data traffic** grows between 2013 and 2018 from 1.5 exaBytes to 15.9 exaBytes; 1 exaByte = 1 Mio teraBytes.
- **The mobile cloud traffic** share shall grow between 2013 and 2020 from 35% to 70% of the mobile data traffic.
- **The number of things connected** grows between 2010 and 2020 from 12.5 billions devices to 50 billions devices.

The above increasing demand leads to a three-fold requirement to 5G:

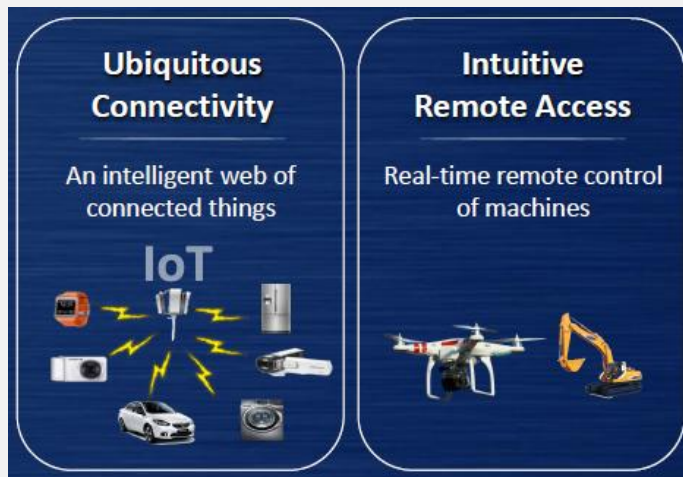
- **A better end-to-end performance**
- **A better support of non-traditional applications**
- **A reduced energy consumption to enable the IoT (Internet of Things)**

The vision about 5G, even though expressed differently by technology influencers as vendors, OpCos and their R&D partners, can be summarized in few keywords.

## 5G – Application domains



Source:  
Samsung DMC R&D  
Communications  
Research Team,  
2014



Source:  
Samsung DMC R&D  
Communications  
Research Team,  
2014

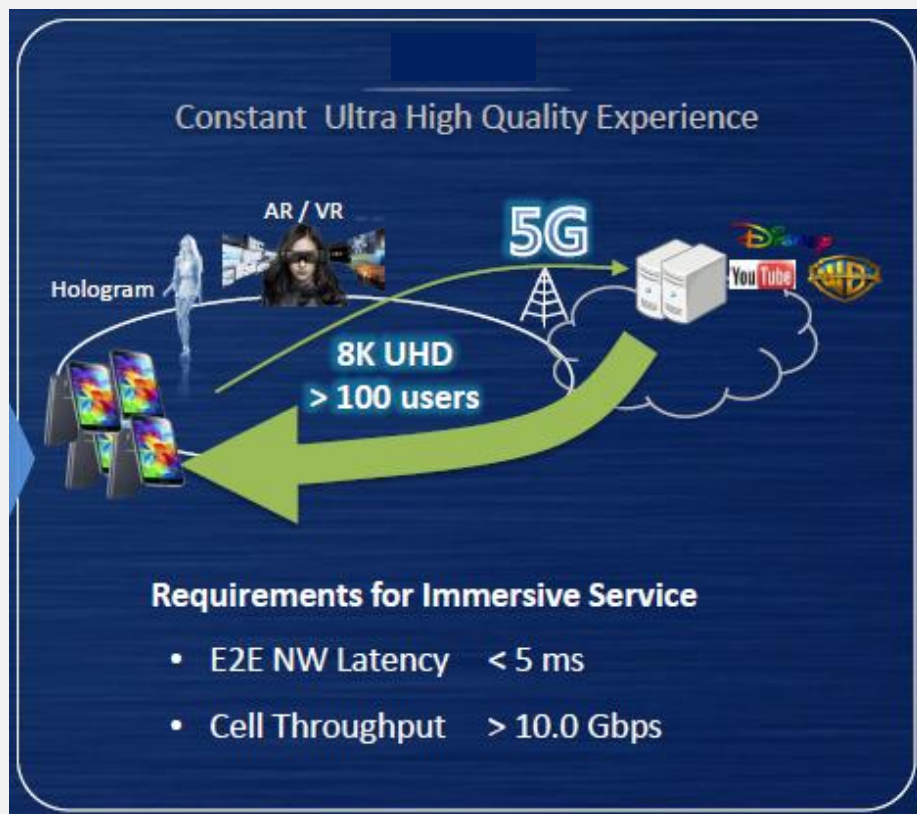
## 5G – Overall vision

The vision from different mobile cellular technology vendors, OpCos and their R&D partners about 5G use cases can be summarized as follows:

- **Everything on cloud:** in future, applications, computing power, memory and storage shall be made available in the cloud, enabling desktop-like experience on the go. A necessary condition for cloud architectures is a fast network technology with low latency like a technology of the 5<sup>th</sup> Generation.
- **Immersive experience:** 5G shall make more bandwidth available than 4G can do, enabling augmented reality applications and life-like media everywhere.
- **Ubiquitous connectivity:** with increasing number of connected things, information exchange can be made more efficient when devices communicate in an ad hoc mode. This leads to an intelligent web of connected things.
- **Intuitive remote access:** real-time remote control of machines

**Spectrum availability/efficiency is of highest relevance to meet throughput requirements. Considering requirements of 5G in spectrum decision/policies has to start today.**

### Immersive Experience



### Requirement Spectrum

- Cell throughput up to 10Gbps requires beside new innovative technologies and small cell solutions also
  - more spectrum available
  - higher spectrum efficiency
  - spectrum interference management

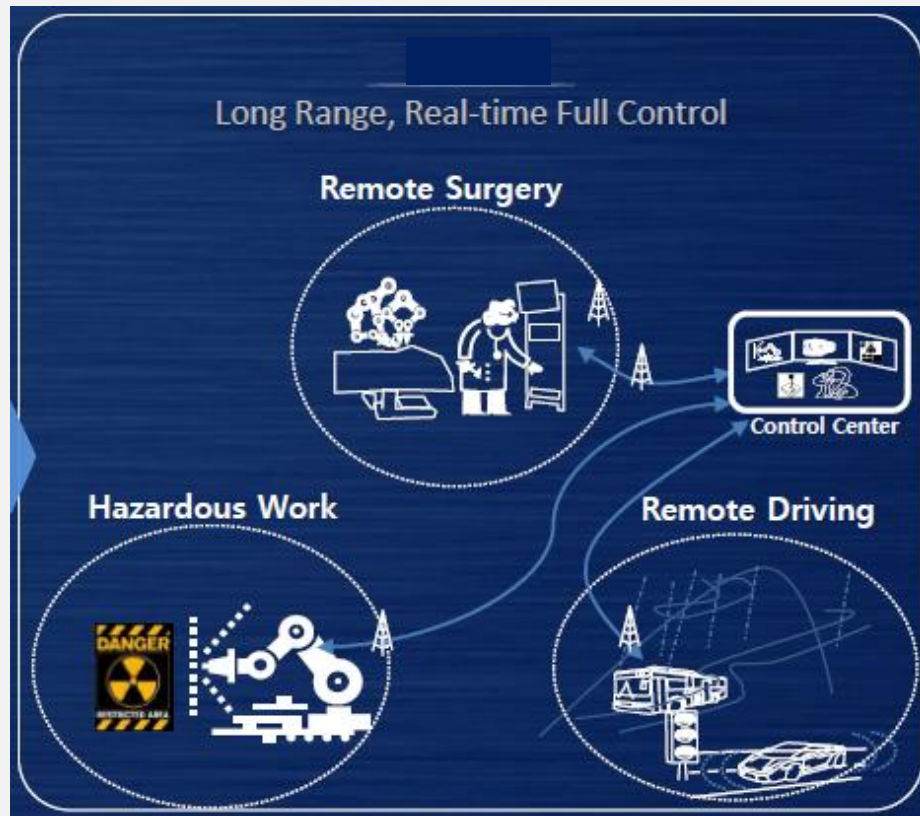
### Regulatory Areas

- New spectrum bands allocated to mobile and related re-farming activities
- Redesign of spectrum trading and sharing policies
- Step 1: Increasing efficiency of spectrum allocation policies (reconsideration of set-aside spectrum policies, rigid spectrum caps, ...)
- Step 2: Introduction of innovative spectrum allocation mechanisms (spectrum spot markets)



**Making a high user throughput and a low end-to-end latency available, 5G shall enable long range remote control and augment the remote control experience.**

### Intuitive Remote Access



### Requirement Latency

- 5G shall provide a superior network performance with an end-to-end network latency of around 5 ms corresponding to an air latency of 1 ms
- Latency requirements requires decentralization of services which define high latency requirement

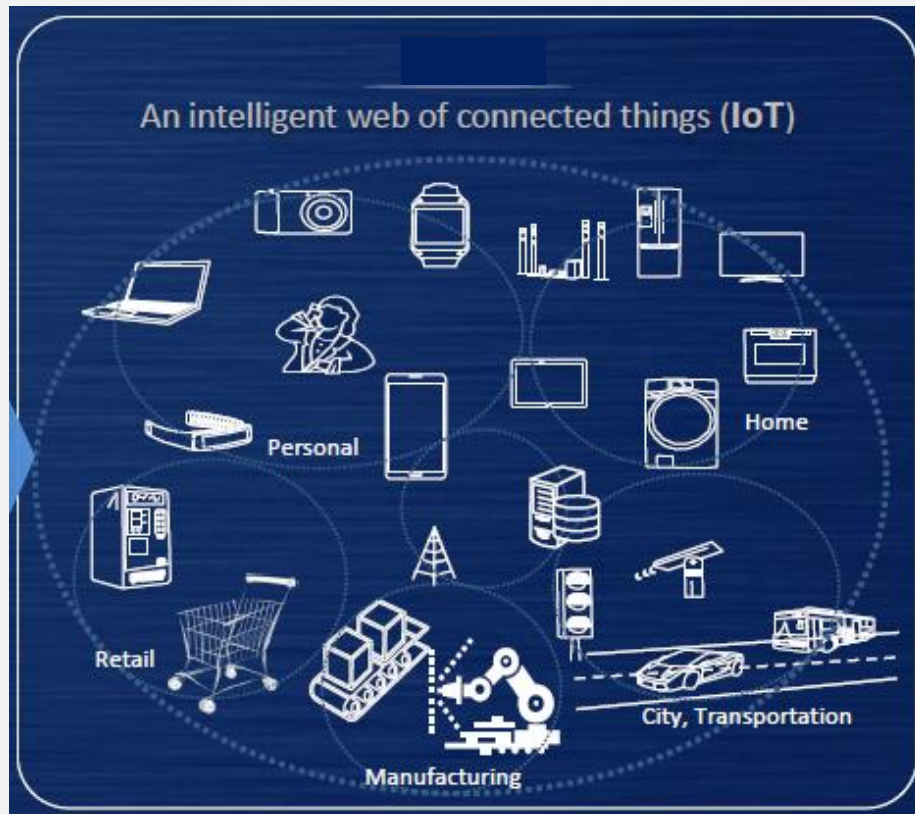
### Regulatory Areas

- Backhaul might become the new bottleneck (also due to throughput requirements) which might require regulatory attention in terms of sharing and RAN virtualization
- Additional decentralized infrastructure likely coming with higher CAPEX/OPEX and access issues (one network for all?)



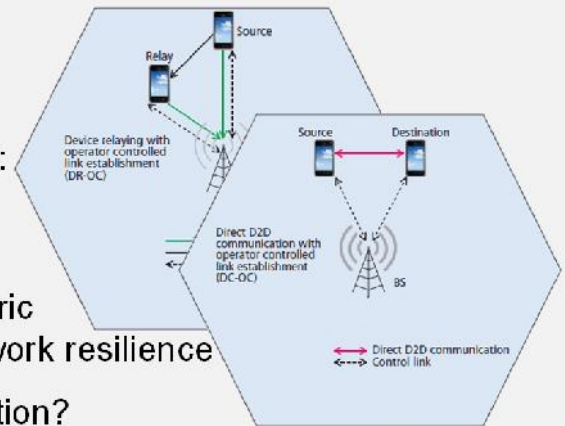
The discussion around network coverage and service interconnectivity are getting a new push with 5G. But also considerations around public safety are necessary.

### Ubiquitous connectivity



### Requirement Public Safety, Coverage & Interconnection

- New technologies might impact public safety guidelines (example: device to device communication)
- More customer centric network impact network resilience
- Service interconnection?

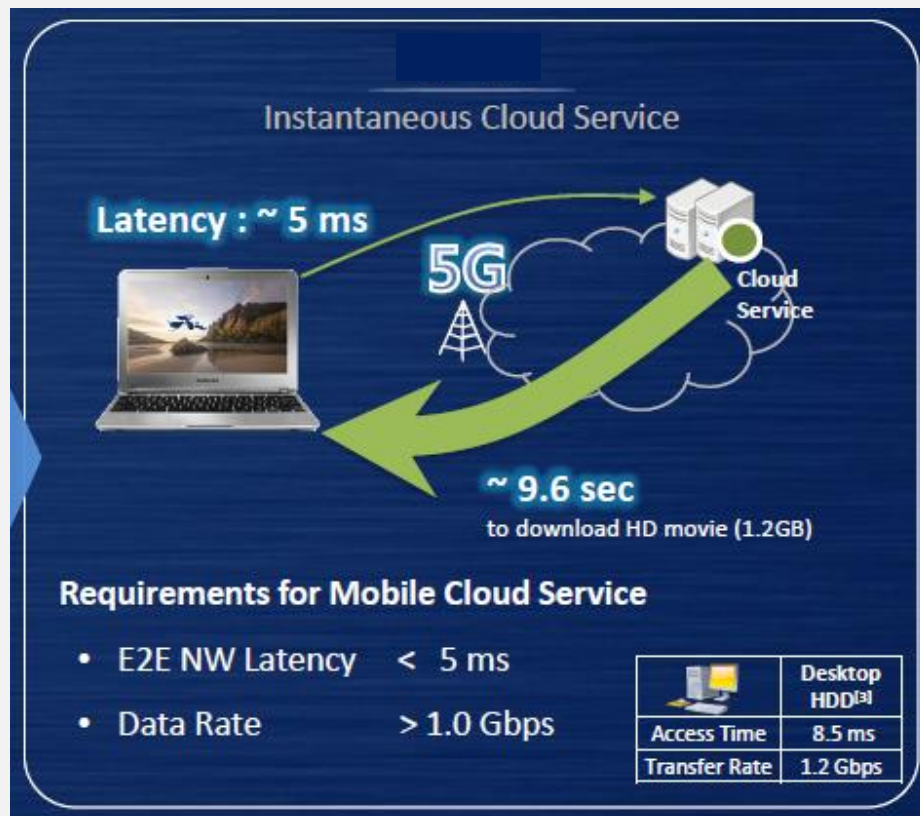


### Regulatory Areas

- Redesign of public safety requirements necessary to reflect new technical capabilities (Example: Blackberry 2010) with clear guidance for the industry
- Decentralization necessary to fulfill latency requirements requires reconsideration of network resilience codes and disaster recovery practices
- Network coverage (USO?) and service interconnectivity must be discussed

## Increasing trend of cloud services require globally effective data protection mechanisms to increase consumer trust in 5G services.

### Everything on the cloud



### Requirement Data Protection

- Personal data are stored globally in data center but also in locations closer to customer reflecting latency requirements
- Data exchange between different organization / instances over borders of increasing importance

### Regulatory Areas

- Global data protection standards in terms of
  - Right to be forgotten
  - Privacy by default
  - Data portability
- Consistent mechanisms, same rules for all providers and globally effective enforcement power

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# The current apparent imbalance regarding market and market entry conditions between licensed operators and OTT players needs solutions to pave the way for 5G.

The (un)-Level Playing Field		
Regulation	Licensed Network Operators	OTT Players
Licensing	<ul style="list-style-type: none"> <li>Subject to license and license fee</li> </ul>	<ul style="list-style-type: none"> <li>No license required</li> </ul>
Quality of Service	<ul style="list-style-type: none"> <li>SLAs included in the license</li> </ul>	<ul style="list-style-type: none"> <li>No quality requirements</li> </ul>
Interconnection	<ul style="list-style-type: none"> <li>Interconnection mandated</li> </ul>	<ul style="list-style-type: none"> <li>No interconnect requirements</li> </ul>
Universal Service	<ul style="list-style-type: none"> <li>Usually subject to universal service obligation</li> </ul>	<ul style="list-style-type: none"> <li>Not subject to universal service regime</li> </ul>
Consumer protection	<ul style="list-style-type: none"> <li>Subject to (enforceable) consumer protection policy</li> </ul>	<ul style="list-style-type: none"> <li>No or little enforcement power</li> </ul>
Legal interception	<ul style="list-style-type: none"> <li>Usually license condition</li> </ul>	<ul style="list-style-type: none"> <li>Country dependent</li> </ul>
Taxation	<ul style="list-style-type: none"> <li>Subject to national tax regime</li> </ul>	<ul style="list-style-type: none"> <li>Service dependent</li> </ul>

**Comparison of market conditions**

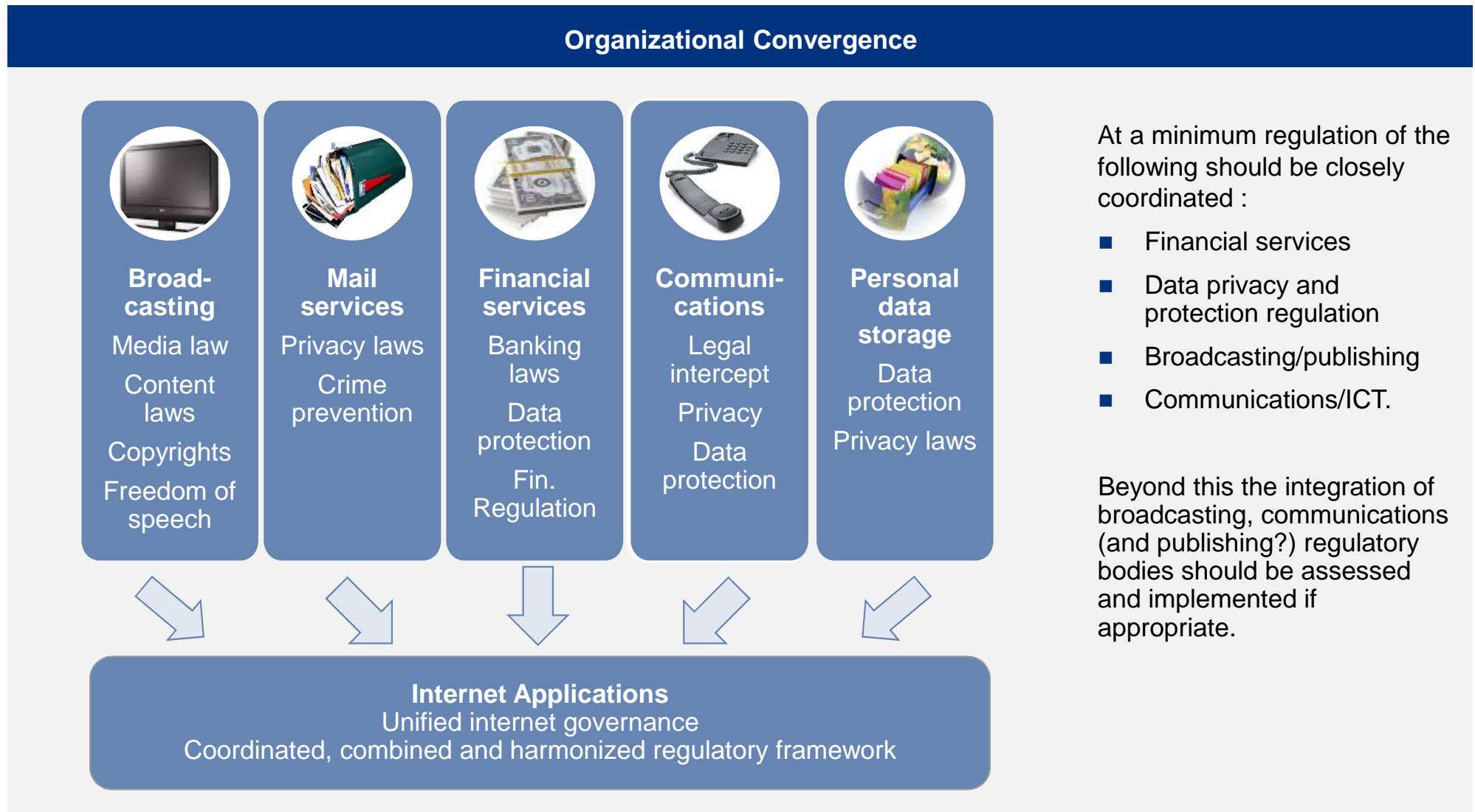
- Network operator's **business model** is determined by **regulatory requirements**
- OTT Players** are usually **free** of such **limitations**
- Current market setups have **not yet adapted** to the new competitive situation

➔

- Competition is **dysfunctional**
- Regulators **punish** network operators that invest in local **infrastructure**, are an important source for local **employment** and are local **tax payers**



**5G is leading to the convergence not only of services and business areas, but also of regulations and laws. The coordination of previously separate bodies is vital.**



At a minimum regulation of the following should be closely coordinated :

- Financial services
- Data privacy and protection regulation
- Broadcasting/publishing
- Communications/ICT.

Beyond this the integration of broadcasting, communications (and publishing?) regulatory bodies should be assessed and implemented if appropriate.





Thanks for your attention

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