

A Few Thoughts on How to Build a Competitive 5G Ecosystem in Taiwan



A Look into the History and Then Our Crystal Ball

- **2G (GSM)**
 - To meet the basic need for mobile telephony
 - First published standard in 1990; first deployment in 1991, GPRS in 2000, EDGE in 2003
- **3G (UMTS)**
 - Triggered by IS-95; to provide a better solution for data transmission; to avoid Qualcomm's IPR
 - First published standard in 1999; first deployment in 2001
- **4G (LTE)**
 - Triggered by Wimax and UMB; to provide higher data rate; to avoid Qualcomm's IPR
 - First published standard in 2008; first deployment in 2010
- **When will 5G occur and what is the motivation behind?**

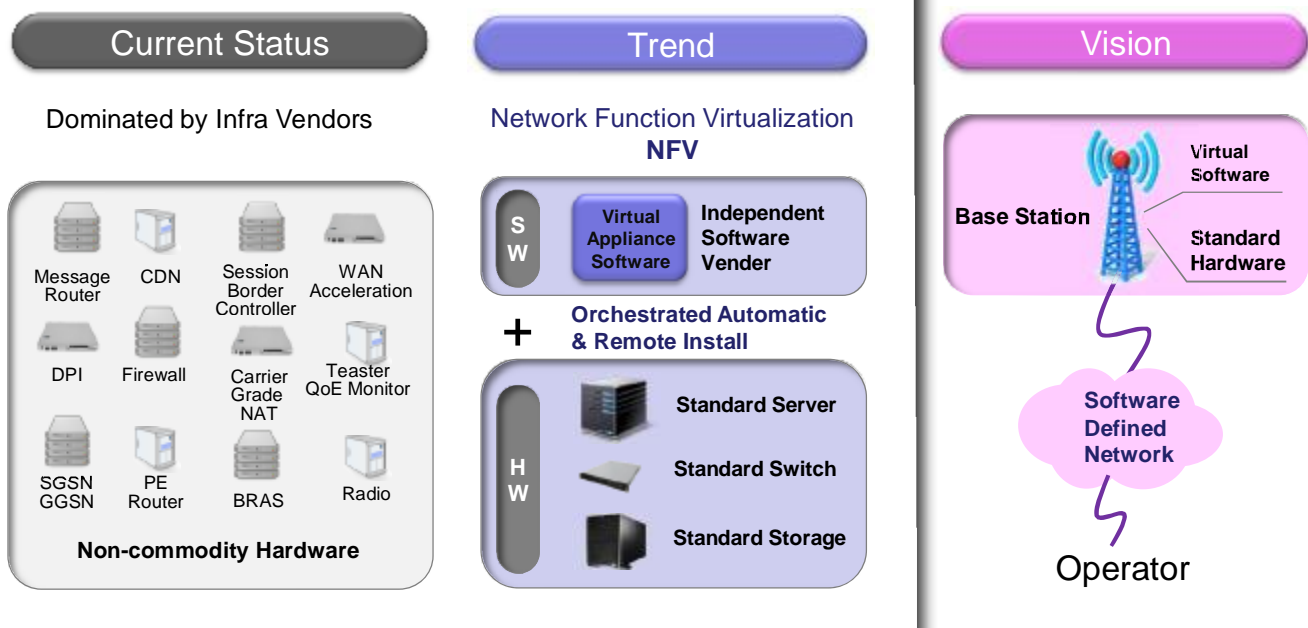
Taiwan's Wireless Ecosystem

- Operators
- Infrastructure vendors (lack of)
- Device vendors
- Component suppliers
- Universities and research institutes
- Government

- How can we all collaborate more to help each other?

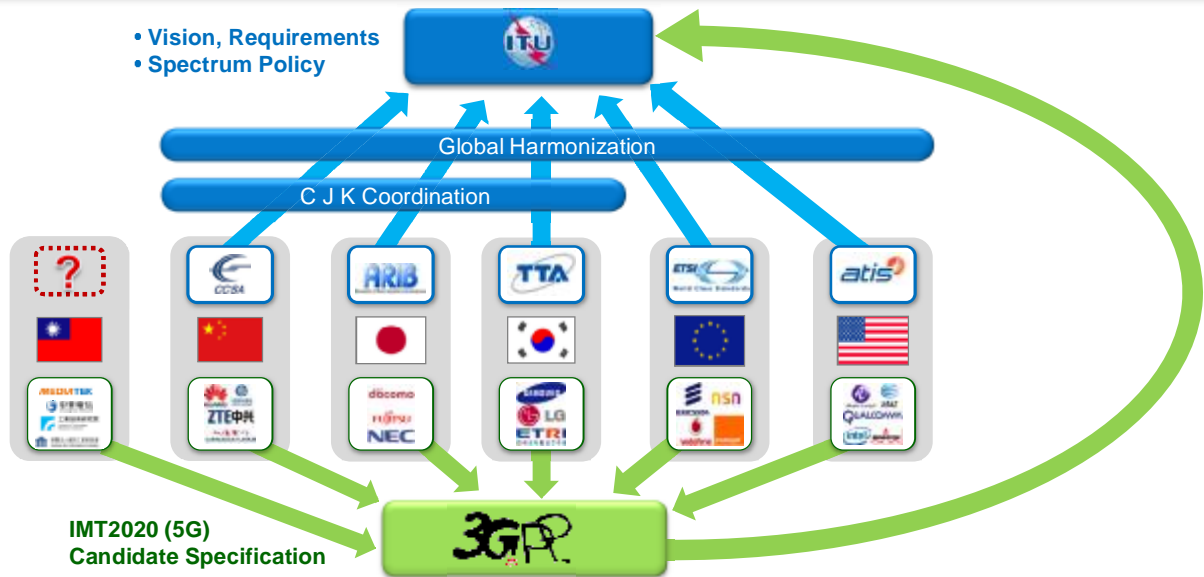
Innovative Network Architecture

- ❖ Create a new network architecture that allows participation from non-traditional infrastructure vendors



Joint Force on 5G Research and Standardization

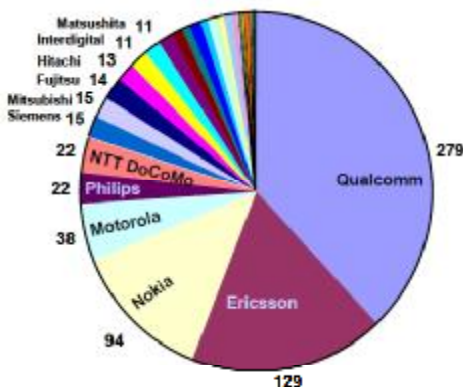
- ❖ Avoid duplication of work
- ❖ Better coverage of topics and information gathering
- ❖ More influence in international standard bodies



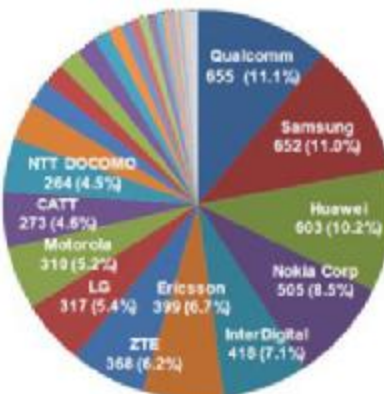
IPR Pool

- ❖ An joint IPR pool from selected companies
 - ❖ Every good IPR created should be used to strengthen our competitive position
 - ❖ Selected members to prevent dilution

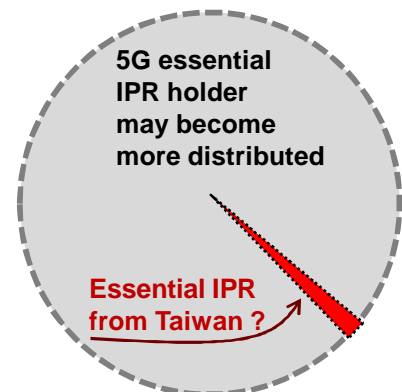
3G Essential IPR



4G (LTE) Essential IPR



5G (IMT2020) Essential IPR



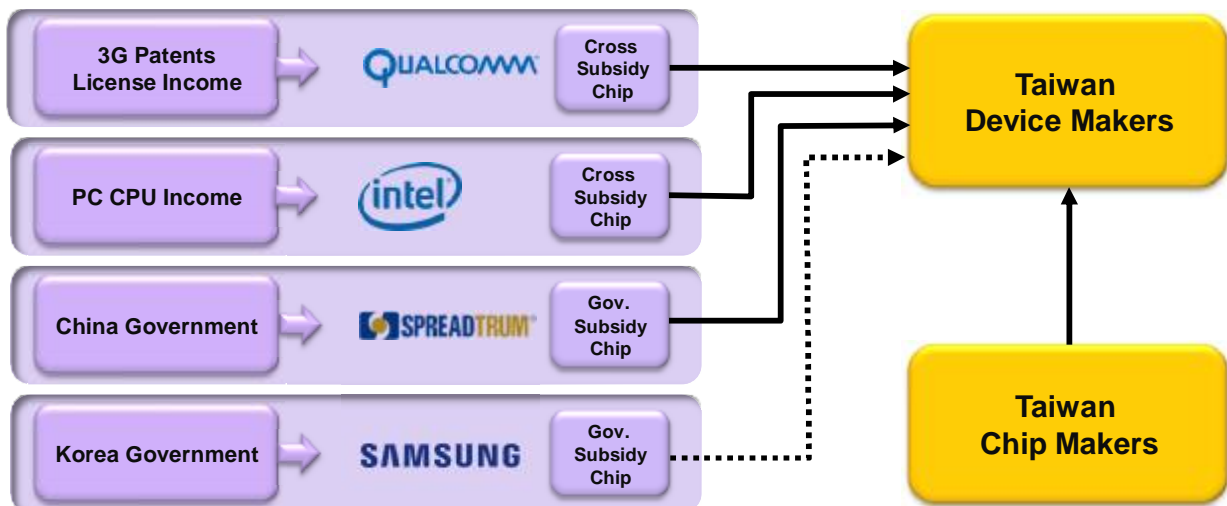
Aligned University Curricula and Research

- ❖ Our universities must produce sufficient high-quality talents to meet industry's needs
- ❖ University researches must be aligned to industry's interests



Focused Government Aids

- ❖ We need help to compete internationally with industry behemoth
- ❖ Government's help should be focused on companies/projects with good ROI



Concluding Remarks

- **LTE is in the early stage of its life cycle, it still has a very long way to go**
 - It is much easier to improve an existing standard (evolution) than to create a totally new one (revolution)
 - A strong presence in 4G will lay a solid foundation for 5G
- **5G is full of uncertainty (schedule, requirements, new technologies, market acceptance, etc.)**
 - Unlike 4G, there is no clear and immediate threat to incumbent technology as a catalyst
 - The exploration phase could take a long time --- treat it as a marathon instead of a 100-meter dash
- **Efforts should be focused on fundamental research now**
 - Value realization comes from actual products
 - Innovations in computing, graphics, multimedia, and circuit technologies are applicable to products regardless of they are 4G or 5G
- **Instead of staying at identifying issues (e.g., IPR royalty), start working on feasible solutions**

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