Micro operator driven 5G ecosystem for local service delivery

IEEE 5G-IoT Summit
18th September 2017, Helsinki, Finland.

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Introduction
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• Policy makers have recognized the importance of widespread deployment and timely take-up of very high capacity networks as the key enabler for digitalization.

• 5G will revolutionize the traditional mobile business ecosystem to serve vertical sectors’ specific needs connecting billions of devices.

• This development is based on local dense small cell network deployments in specific high demand areas, which will open the mobile market for new players.
### Today:
- Small number of big mobile network operators (MNOs) dominate the mobile market with equal service offerings
- Spectrum licenses are auctioned for tens of years with nation-wide coverage obligations
- Market entry for new players is high due to high investment barrier

### Future:
- Local service demand grows in digitalization of different verticals especially in indoors
- There is growing need for local indoor small cell networks and spectrum licenses
- Sharing economy allows cost-efficient network scaling according to demand "Network as a Service"

### Challenges:
- Existing regulation does not support local operator business
- Building of dense indoor networks by all MNOs is expensive => Who pays, what are the incentives?
- There is a need for a new mobile business ecosystem with local players to speed up digitalization
Trends of change in network deployments

- From outdoor macro cell deployments
- From a small number of nation-wide long-term spectrum licenses
- From owning infrastructure
- From a small number of dominant MNOs

- To local indoor small cell networks
- To a larger number of sharing-based local spectrum licenses
- To buying required infrastructure as a service
- To emergence of a large number of local micro operators
Micro operators enter mobile market

- Micro operators deploy and operate local small cell communication infrastructure in specific areas and offer local context related services and content to complement existing MNOs’ offerings.
- Micro operators can serve MNOs’ customers (neutral host), own restricted set of customers, or both.

Spectrum sharing solutions
Regulators have approved spectrum sharing

- Spectrum sharing solutions are critical in making new spectrum available for mobile communications while protecting incumbents’ rights in the long term.
- The US regulator FCC: has introduced a three-tier model in 3.55-3.70 GHz that enables market entry for new players with local access rights.
- In Europe the Licensed Shared Access (LSA) concept was standardized and trialed in 2.3-2.4 GHz band to enable local mobile network deployments and is extended to 3.4-4.2 GHz bands.
5G spectrum authorization models
Spectrum authorization in 5G

- Spectrum authorization decisions determining who is allowed to use 5G bands including rights and obligations will shape the entire future mobile market.
- Serving of vertical sectors’ tailored needs in specific high demand areas is based on local small cell network deployments in the higher frequency bands.

- Who is allowed to deploy and operate 5G radio access networks?
- All this in a fair and transparent way to promote competition and innovation.
Micro licensing for granting local access rights

- Micro licensing can open the mobile market for new entrants to deploy and operate local 5G networks in a specific areas.
- Micro licensing exploits horizontal spectrum sharing by protecting micro licensees from harmful interference in their license area. Vertical spectrum sharing protects the potential incumbents.

Exclusive licensing:
Small number of license holders, long-term availability, high price, wide coverage
=> Free from harmful interference

Micro licensing:
Local access rights for a large number of new entrants
Coordination with other licensees
=> Free from harmful interference
=> Efficient protection of incumbents which makes spectrum available

License-exempt:
Anyone can access, no fee, potentially a large and varying number of users
=> No protection from interference

Micro licensing model

Interference coordination between local micro licensees’ and incumbents’ deployments becomes easier when going to higher frequency bands.

Conclusion

• Spectrum authorization decisions shape the 5G mobile business ecosystem where traditional stakeholder roles are changing.

• New local micro licensing models are needed to allow entrant micro operators to deploy local small cell networks to serve vertical sectors’ needs and promote competition and innovation in the market.
References


