

Paikalliset 5G-verkot

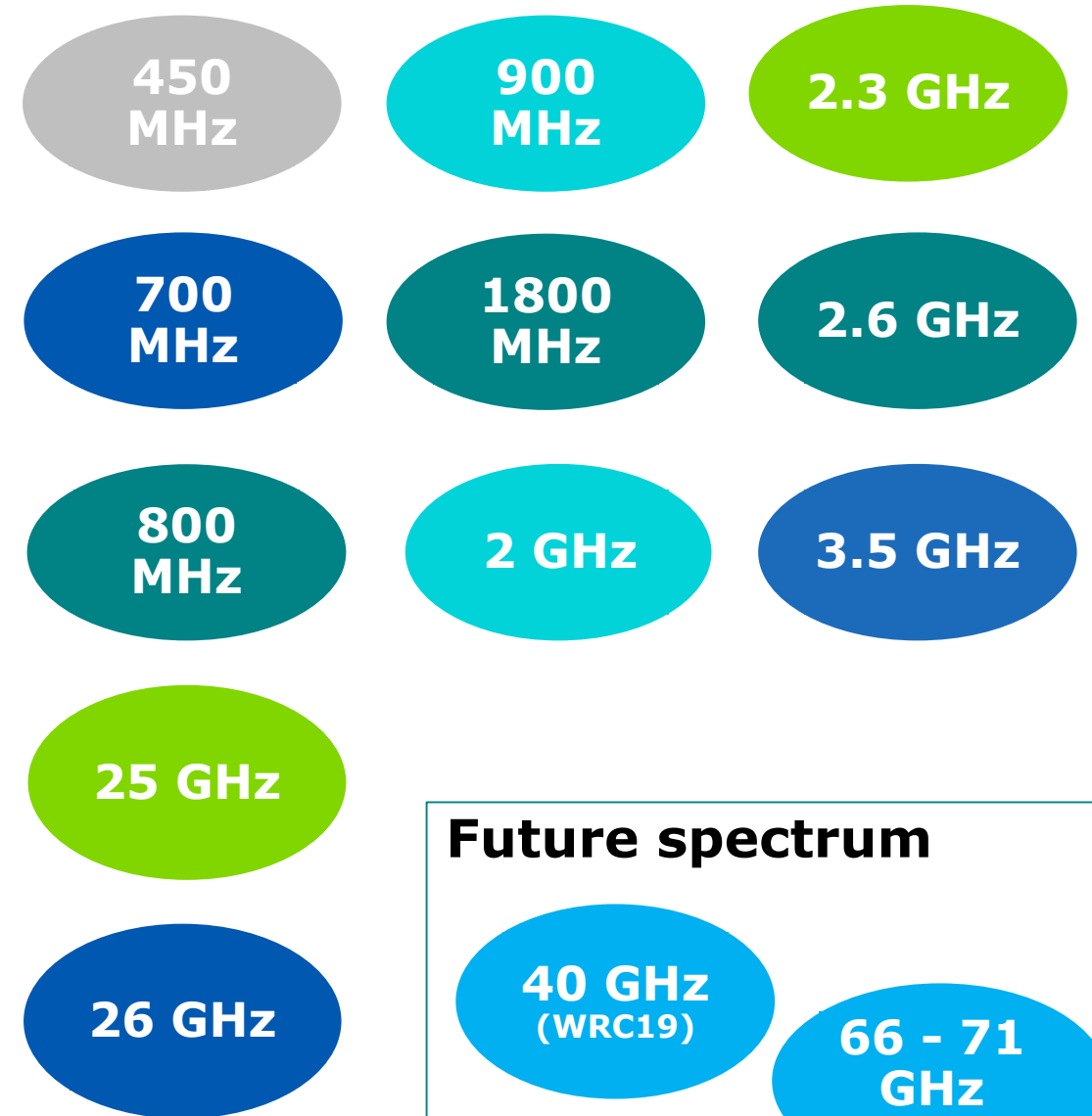
5G Momentum webinaari
'Kaupunkien ja kuntien 5G-verkot'

Heidi Himmanen
5.11.2020

Spectrum for mobile broadband in Finland

- ▶ Three operators with nationwide coverage
 - ▶ > 99 % population with 2G & 4G
 - ▶ New spectrum quickly into use without fiscal goals: cheaper to build, easier to plan, less congestion, more capacity
 - ▶ Unlimited data, inexpensive prices, developed networks, good coverage
- ▶ Dedicated spectrum for private and local networks
 - ▶ 2300 – 2320 MHz (20 MHz)
 - ▶ 24.25 – 25.1 GHz (850 MHz) in 2021

Current spectrum



MNO's support verticals

Valtra & Elisa Team Up On Remote-Controlled Tractor



Valtra and Elisa have been working on a remote-controlled tractor that allows one to operate the machine from as far as 100 kilometres away via 5G network signals. (Photo courtesy of Valtra)



Viisi vinkkiä rakennustyömaan digitalisointiin

DNA Business | 29.4.2020 14:00



A GLOBAL PHARMA COMPANY IS INCREASING YIELD

A multinational healthcare company, manufacturing pharmaceutical products and services

The challenges

- Low yield
- High operational costs
- Slow ability to detect outliers in production

The Solution

- Anomaly detection to understand which anomalies affected the success of the batch
- Yield level prediction for the ongoing batch runs

The Benefits

- Optimization of the bioreactor process to maximize yield
- Resource savings in process monitoring and detection of more complex anomalies



World's first industrial application utilizing 5G and AI adopted at ABB drives factory in Helsinki



assurance, low latency 5G connection, machine vision analytics running in datacenter

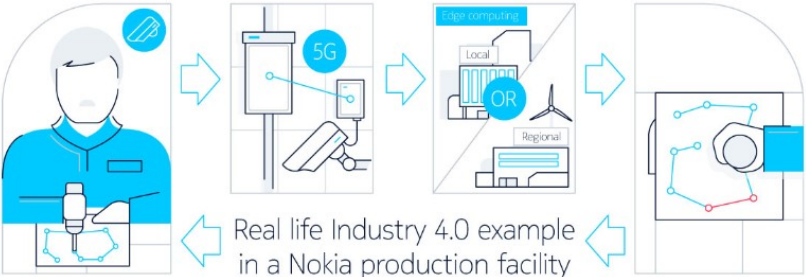
NEWSROOM / NEWS ARTICLES / 2018

TELIA COMPANY AND STORA ENSO BRING 5G AND AR TO THE FOREST INDUSTRY

2018-09-12

Telia Company together with Stora Enso tested the augmented reality and 5G technology use cases in the forest industry. The solutions were tested at Stora Enso's Oulu mill in Finland where real-time information is being used in mill maintenance.

Advanced quality assurance with 5G enabled video analytics



Real life Industry 4.0 example in a Nokia production facility

Solution is scalable to wide industry usage leveraging the true 5G promise

1. Video camera monitors the assembly work
Line operator makes deliberate and random assembly mistakes to test the solution
2. Live video is streamed over 5G to Nokia base station
The trial utilized the Intel® 5G Mobile Trial Platform as the end-user device
3. Video analytics are performed remotely in a Telia datacenter
Finwe video analytics can also be run locally on Nokia MEC platform powered by Intel
4. Quality control is enforced in real-time and by machine learning
Visual alarms help the line operator to avoid inconsistencies in the process



DNA Business | 22.4.2020 18:00

5G on jo täällä – miten sinun yrityksesi voi hyötyä nopeista yhteyksistä

Sharing / leasing access to spectrum

- ▶ Sharing and leasing allowed in all auctioned network licenses (700 MHz, 800 MHz, 2.6 GHz, 3.5 GHz, 26 GHz)
- ▶ Competitional aspects – plans need to be approved by authorities
- ▶ Network and radio licenses define rules for each part of spectrum. Everyone operates according to and responsible of their own license.
- ▶ "Lain 20 §:n mukaan toimiluvanhaltija voi valtioneuvoston suostumuksella vuokrata käyttöoikeuden toimiluvassa tarkoitettuihin taajuuksiin toiselle toimijalle."

Example: Company focusing on edge connectivity



EDGE CONNECTIVITY

Seamlessly connecting assets in the most challenging environments to enable continuous operations and to accelerate digitalisation



Edge Connectivity solutions provider
trusted by world-class enterprises

FINAVIA



[Click logos for case studies](#)

Example: Campus owner serve as micro-operator



PORT OULU
Smarter.

**PORT AREA DIGITAL
INFRASTRUCTURE**

Connectivity
- Privat LTE

**MICRO
OPERATOR**

Data sources
Data platform
Data sharing

Example: Private network with own spectrum

New leaf turns in the history of telecommunications - Fortum's Loviisa Power Plant gets its own mobile network

Published 07.07.2020 16:45

The Finnish Transport and Communications Agency Traficom responds to the changing needs of digitalised society by granting the first ever licence to local mobile networks. These radio networks for a limited user group implemented by mobile communications technology are intended to be used locally in, for example, factories, ports, airports, power plants and mines for their own operations. The first, and thus historical, radio licence for frequency band 2300-2320 Mhz was granted to Fortum's Loviisa Power Plant.

25 GHz spectrum for local use

- ▶ The lower part of the 26 GHz frequency spectrum, **24.25 – 25.1 GHz or 850 MHz**, was excluded from the 26 GHz auction. The spectrum was reserved for the construction of local networks.
- ▶ Traficom will grant radio licenses from beginning of 2021
 - ▶ Private networks with restricted user group could be even city wide (depending on the final regulation)
 - ▶ The extent of local public use is still open but will probably not be city wide at least in large cities
 - ▶ Public telecommunications means the provision of communications services to a set of users that is not subject to any prior restriction. Public networks require network licence from the Government. There is a draft government proposal concerning overall Act on Electronic Communication Services reform, including provisions about license requirements and enabling new operator models.
- ▶ In a local Neutral Host network as a joint deployment with MNOs different spectrum bands (local – national) can have different license conditions.

Regulatory aspects on infrastructure sharing

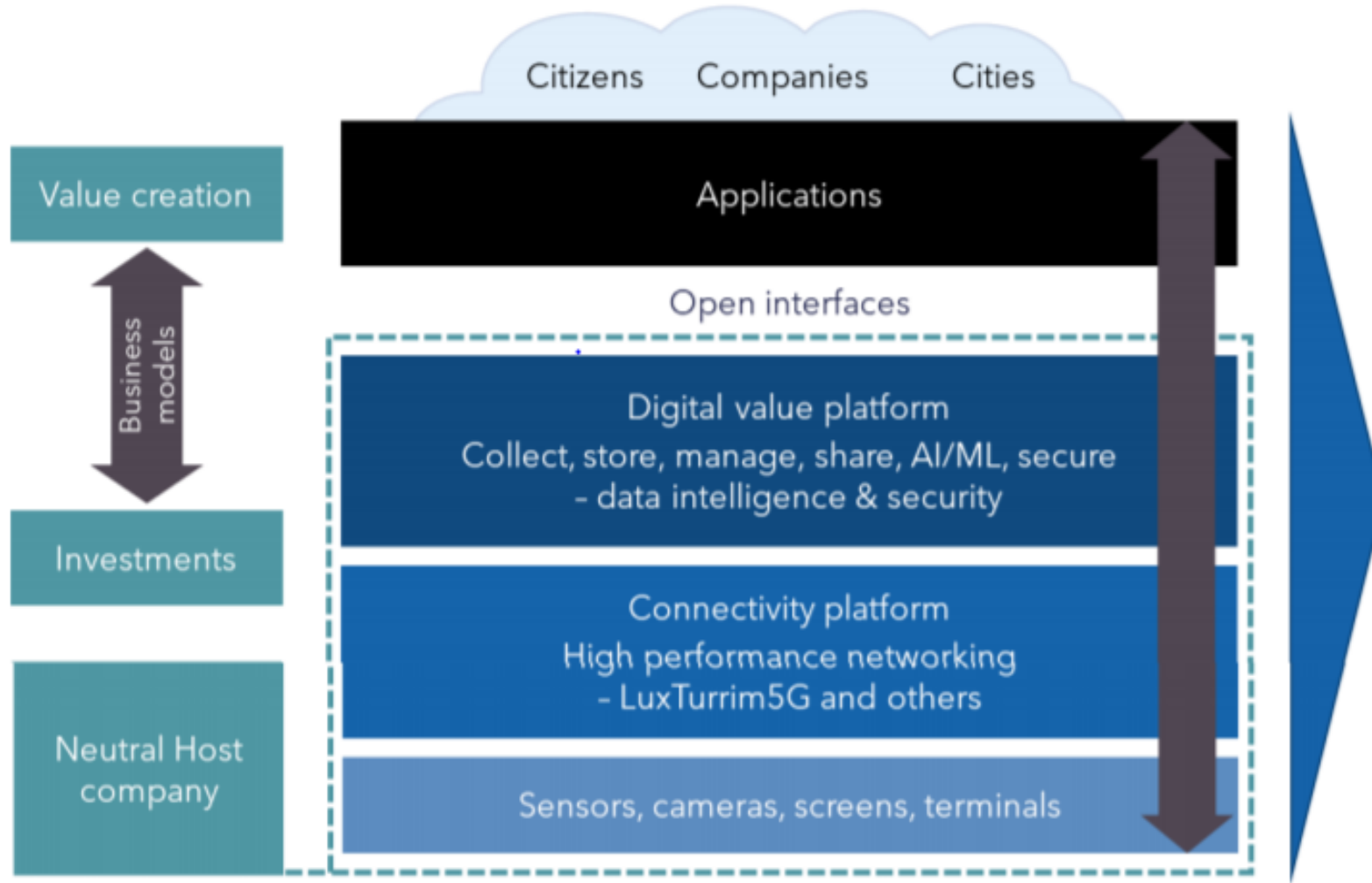
▶ Commercially driven

- ▶ National roaming agreements are made on commercial basis - No regulatory obligations apply to MNOs or local operators
- ▶ Mobile virtual network operator (MVNO) agreements are made on commercial basis
- ▶ Joint deployment agreements between operators are commercially driven
 - ▶ In relevant cases Competition Authority might initiate proceedings based on competition law

▶ Regulated

- ▶ Access to passive elements of network infrastructure is regulated
 - ▶ According to the Joint Construction Act every network owner is obliged to provide access to their physical passive infrastructure (e.g. ducts, masts, antennas, co-location facilities) to other network owners on fair and reasonable terms and conditions

Layered approach



Source: LuxTurrin5G / Neutral Host Pilot

Public procurement for smart city services and infrastructure

- ▶ Do cities have enough knowledge and understanding of smart city services, infrastructure and equipment, e.g. the technical quality and interoperability requirements?
- ▶ Neutral host: Public procurement rules raise two particular questions ^[1]:
 1. whether Neutral Host is required to arrange competitive tendering of its procurements
 - ▶ This mainly comes into question if a public entity (e.g. city) occupies a central role in Neutral Host activities.
 2. whether another entity that purchases goods or services from Neutral Host has to arrange competitive tendering and what implications this has for Neutral Host.

[1] Personal Data Protection, Frequency Regulation and Competition Law in the Context of Smart City Infrastructure
Anette Alén-Savikko – Shakila Bu-Pasha – Heidi Himmanen – Päivi Korpisaari – Sara Lehtilä – Juha Vesala, Oikeuksia, vapauksia ja rajoituksia – Viestintäoikeuden vuosikirja 2019 s. 159, Alkuperäinen julkaisupäivä: 29.6.2020

Thanks!

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5G Momentum ecosystem, Digital connections

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