



elisa

Building **New** capabilities through
technology and people

Tomi Tilander & Terhi Kiiski



**NEARLY ONE
MILLION**

DOWNLOADED ELECTRONIC
BOOKS BRING JOY TO OUR
CUSTOMERS EVERY YEAR



EVERY YEAR OUR COR-
PORATE CUSTOMERS SEE
THEIR STAKEHOLDERS
10 MILLION
TIMES BY VIDEO
CONNECTION



**2.5
MILLION**

ELISA CUSTOMERS COM-
MUNICATE WITH PEOPLE
CLOSE TO THEM EVERY
YEAR



OVER 1,000
CHILDREN HAVE
LEARNT PROGRAMMING
AT ELISA'S DIGITAL
SCHOOLS



**OVER A
MILLION**
FILM RENTALS FROM
ELISA VIIHDE EVERY
YEAR



EVERY YEAR PEOPLE
WATCH
**NEARLY 200
MILLION**
ELISA VIIHDE
RECORDINGS

ELISA IS PART OF
EVERYDAY LIFE
IN FINLAND

elisa

Elisa key figures



€1.79 billion (1.64)
revenue 2017



€1.86 (1.66)
comparable earnings per share (EPS) 2017



4,68 million (4.69)
mobile subscriptions, Finland and Estonia 2017



692,300 (594,900)
fixed broadband subscriptions 2017 (incl. Starman)



#1 Finland #2 Estonia
market position



2,8 million
customers, Finland and Estonia



21.1
customer satisfaction (NPS) 2017



Approx. **190 000**
shareholders



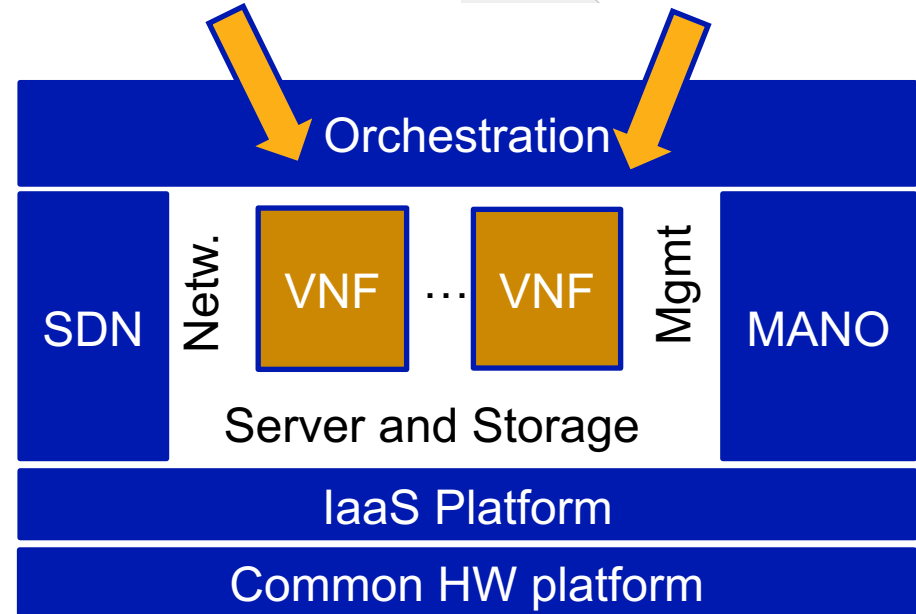
4,700 (4,300)
Elisa employees



€240 million (226)
capital expenditure investments 2017

What is a Telco Cloud?

- Cloud IaaS Platform to enable:
 - Network functions virtualization
 - SW defined Networking
 - VNF management and Orchestration
 - Common operational model
- Increased automation and flexibility:
 - Application management, deployment and configuration
 - Application Lifecycle management
 - Verification, acceptance
- Single Cloud for all NFV's:
 - Multivendor VFNs and Multitenancy
 - 99.999 => Always-on services

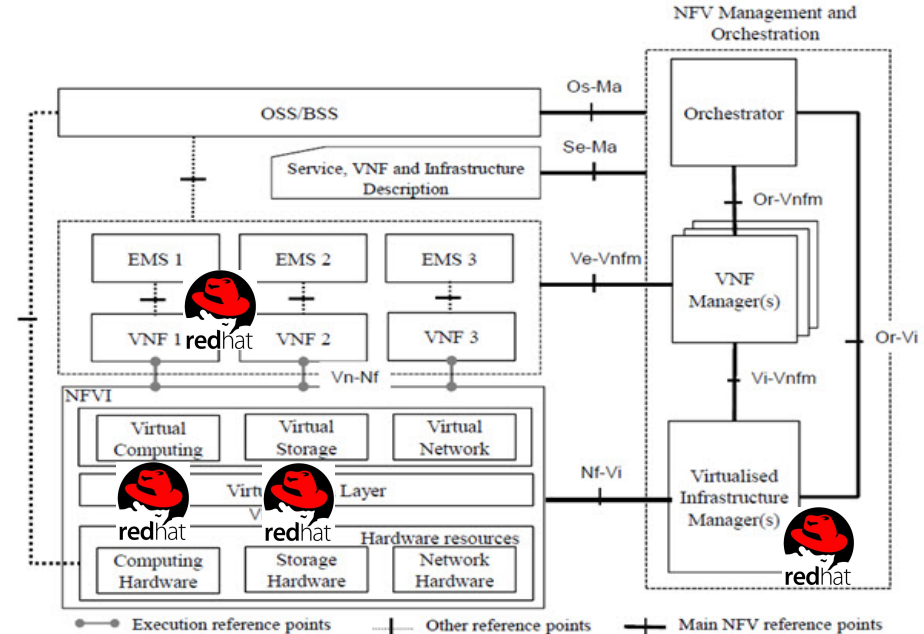


”Carrier Grade” with Cloud

- Telco ”Carrier Grade” applications require high availability for the infra
 - To avoid unnecessary downtime and suboptimal network performance
 - Support for Less Cloud Native applications
 - To Implement HA Network functions
- High SLA in operations
 - 24/7 Monitoring
 - Support
- Extra HW functions
 - Redundant networks
 - DC power with battery pack-up
- Safety and security
 - Compliance and Regulatory requirements

Ecosystem and Open Source

- Network Functions Virtualization
 - ETSI Industry Specification Group, 2012
 - Enables Multivendor Clouds with Tech. Framework
 - Drives SW based Networking for Telcos
- Open Source based solution
 - Openness, free availability for NFV vendors
 - No/Less Vendor lock-in
 - Open API's
- Eco-system
 - Interoperability of VIM infra and VNFs

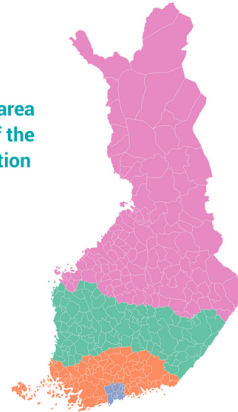


Ref: <http://www.etsi.org/technologies-clusters/technologies/nfv>

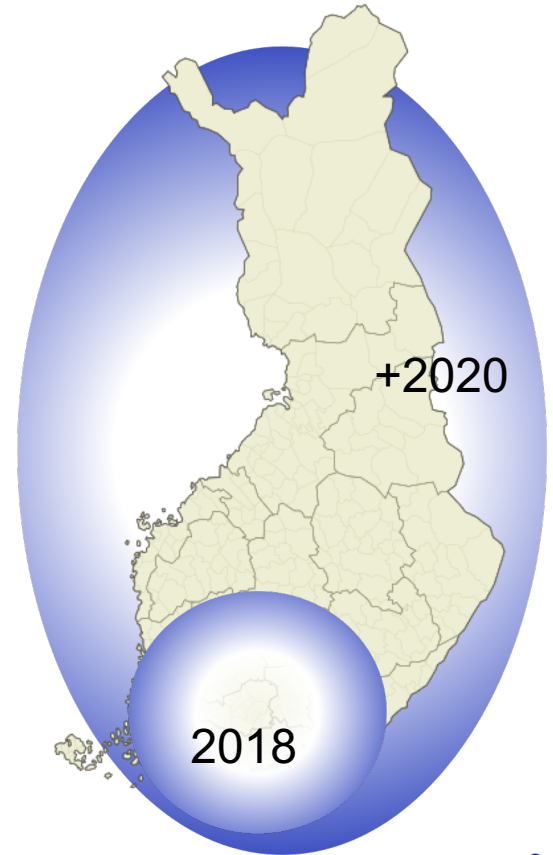
Elisa Telco Cloud - NFVi

- Multitenant, multi-vendor, geographically distributed
- Currently 4 production sites
- Preparing for 5G
- For latency critical applications or traffic optimisation

Each coloured area contains 1/4 of the Finnish population (2017)



Source: Statistics Finland
@NaytaData

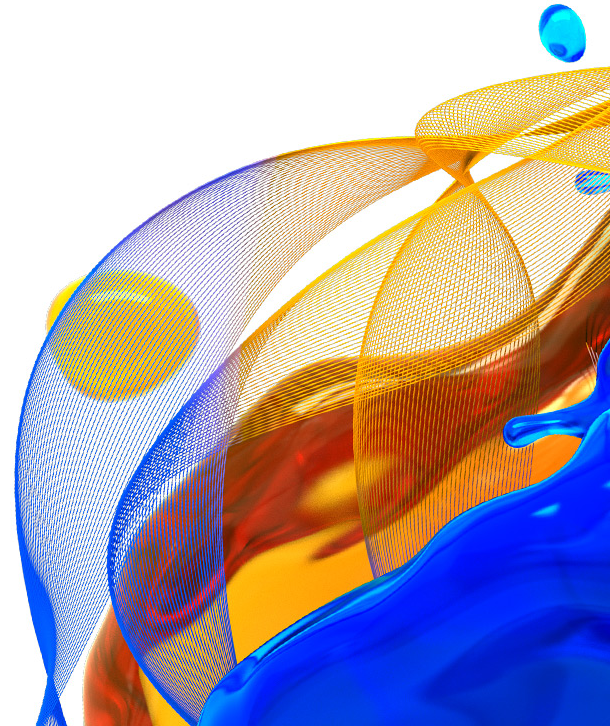


Future focus areas

- Regional sites
- Distributed clouds
- Low latency edge computing, RT
- Orchestration
- Automation
- More and more Cloud Native VNF's

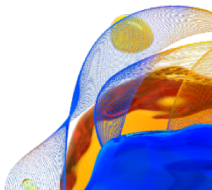
Telco Cloud introduces an organisation change – to implement Telco Cloud datacenters and Virtualized Mobile Core Network Functions

To make this all happen, we
need competent and
enthusiastic ***PEOPLE*** to
help us with our journey



The journey started with a challenge...

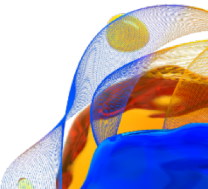
- Training people in Elisa has been the most important action to take
- Strong investments on new technology demand strong competences
→ more people were needed
- Recruiting market is going strong for Openstack professionals, difficult to find people through normal recruiting process



A new approach was needed

- Elisa and Red Hat decided to tackle the problem together
- We decided to start a different kind of recruiting and learning process in co-operation
- The target was set:

Hire Juniors with the right kind of attitude and enthusiasm and train them to become telco cloud professionals by the end of year





00 001000000 011000101 0

001 01101111 01110010 011

0 01110011 01110101 01101

00 01101001 01100010 0

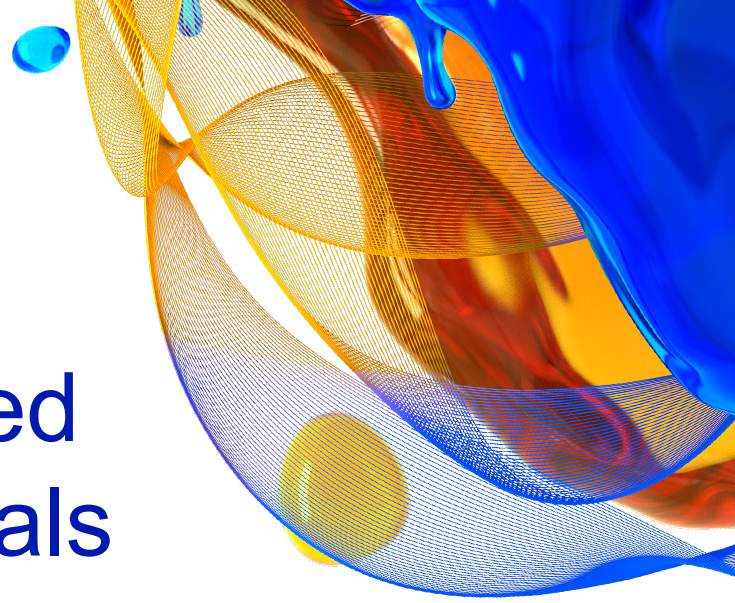
0100 01110010 01100001



What happens next

- The Juniors begin their training by attending several Red Hat Openstack courses
 - After the courses, they will start "an internship" in Red Hat premises in Czech Republic for 6 weeks: support and engineering
 - After the internship, some more courses are done
- The actual work as Junior Telco Cloud professional starts in the beginning of 2019

We expect to have engaged
and competent professionals
to turn our visions on Telco
cloud into reality





We are happy to answer
your questions!

Thank you