# TERMINAL INTEGRATION & VALIDATION

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# WHAT'S ON TODAY:

- Who we are

- Natcos in Europe

- Testing programme

- Attractions

- Demonstration

- Discussion

# WHO WE ARE

Deutsche Telekom Group Shared Service Center with extensive and unique terminal expertise in fixed and mobile devices and networks

## Terminal Shared Service Center (SSC)

- The DT unique competence center for fixed and mobile terminal expertise

- A virtual team of highly qualified experts experienced in the state-of-the-art terminal/network technologies in multiple locations

- Serves to 13 national companies

- Provides excellent mobile & fixed terminal integration & validation services

- Unique terminal knowhow & expertise and end-to-end network experience

- Drives the best terminals for the best networks

CTO-TIV

**Terminal Services to DT Customers**
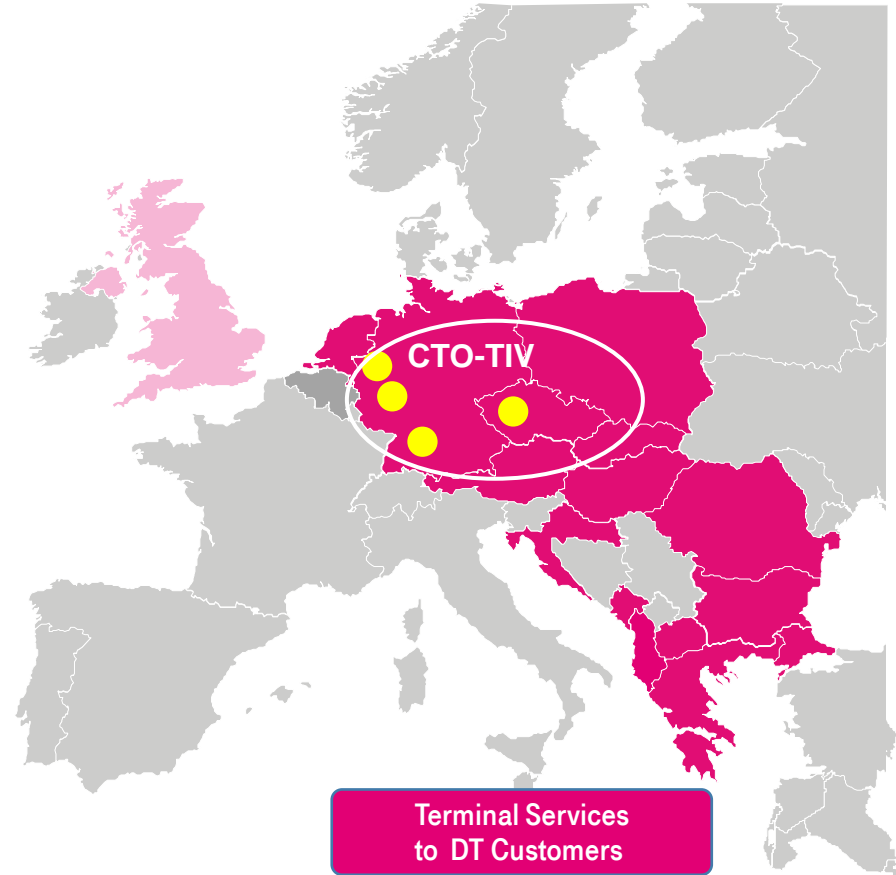
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# WHO WE ARE

Terminal Shared Service Center provides multiple, distinct service packages

- Terminal Shared Service Center
- Terminal knowhow & expertise
- End-to-end network experience

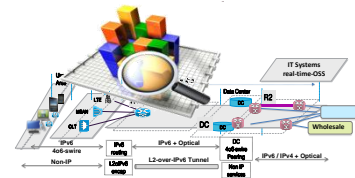| Terminal Portfolio Mobile | Terminal Portfolio Fixed-Line | Technology/Service Integration | Terminal Expert Business Support |
|---|---|---|---|
| certifies the DT portfolio smartphones, tablets, M2M modules, data sticks etc. | certifies the DT portfolio home gateways, speedphones adapters, bridges | key technologies, corporate priority services | e.g. LTE introduction, voice quality analyses, iPhone launches |

# NATCOS IN EUROPE

European DT Group with presence in 13 countries

- Serves about 62 million mobile customers*
- Produces approx. €14.4 billion of mobile revenue*
- About 16 million of terminal products (per annum)
- And delivers the iPhone to all European markets*

(* DT Company Presentation 2013)

## Terminal SSC integrated and validated products in 2013

New terminal products:

- "Superphone" smartphones
- "Ordinary" smartphones
- Tablets
- Voice phones
- Data products
- OEM/M2M modules

Lifecycle software releases for products in the field

Services

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# TESTING PROGRAMME

Several hundreds of products approved every year

## New terminal products:

- "Superphone" smartphones
- "Ordinary" smartphones
- Tablets
- Voice phones
- Data products
- OEM/M2M modules
- Lifecycle major software releases

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# TESTING PROGRAMME

## We drive new technologies

- We drove a test equipment vendor R&S to develop an LTE system simulator ensuring that the capabilities meet DT's requirements.

- As a result, we are able to test and certify early LTE device samples of our competitors and deliver first to market products to their customers.

- The first test package for performance and protocol tests released and launched in December 2012.

## MyWallet Portfolio enabled for several countries

# TESTING PROGRAMME

How do we manage?



## Access
- Test RAN environment
- Live net environment
- Local Natco environment

## Client
- Applications
- Services
- UI
- Dashboard for MBB

## Innovation projects
- Joyn (RCSe)
- mWallet
- VoLTE
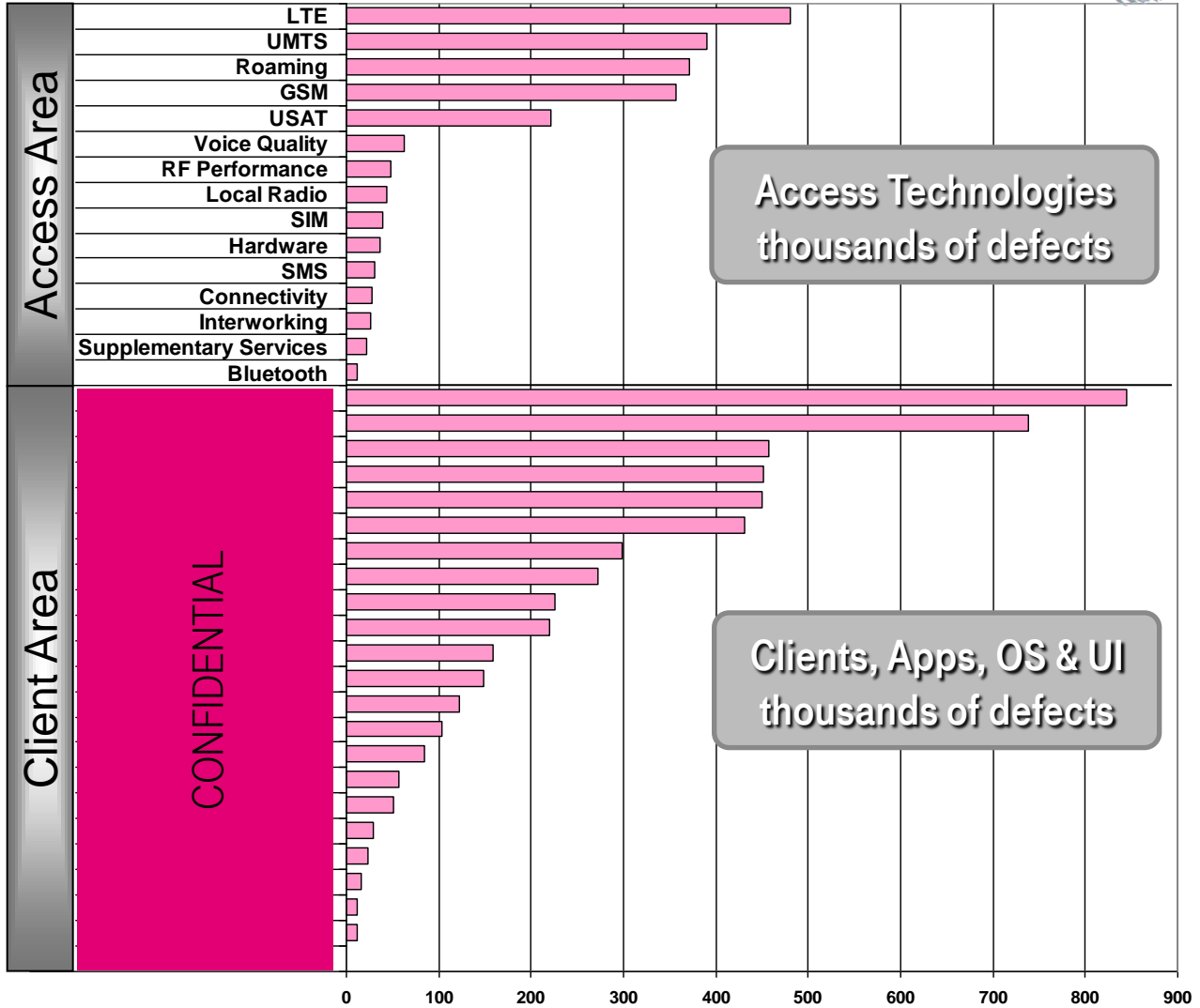- Hybrid Access
- Vectoring
- Carrier Aggregation

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# TESTING PROGRAMME



Focus on Quality

**Thousands**

defects identified and addressed!

Access Area: LTE, UMTS, Roaming, GSM, USAT, Voice Quality, RF Performance, Local Radio, SIM, Hardware, SMS, Connectivity, Interworking, Supplementary Services, Bluetooth
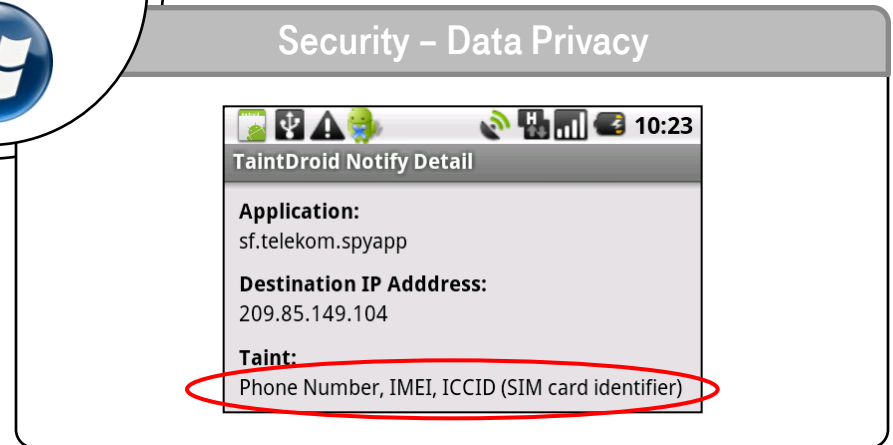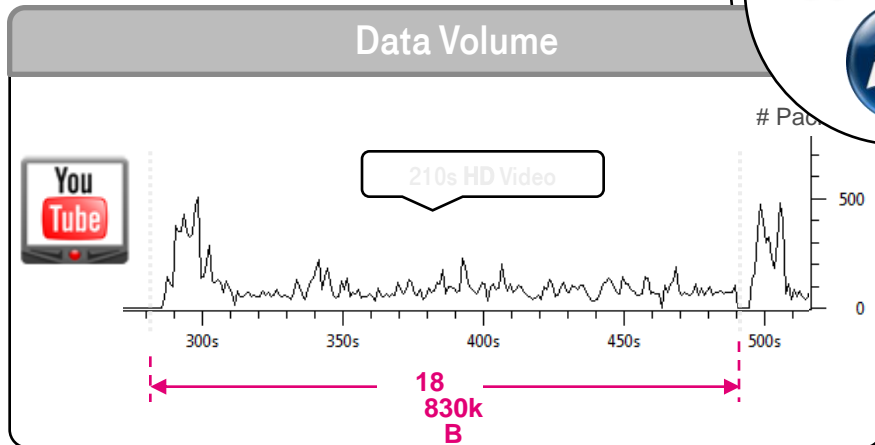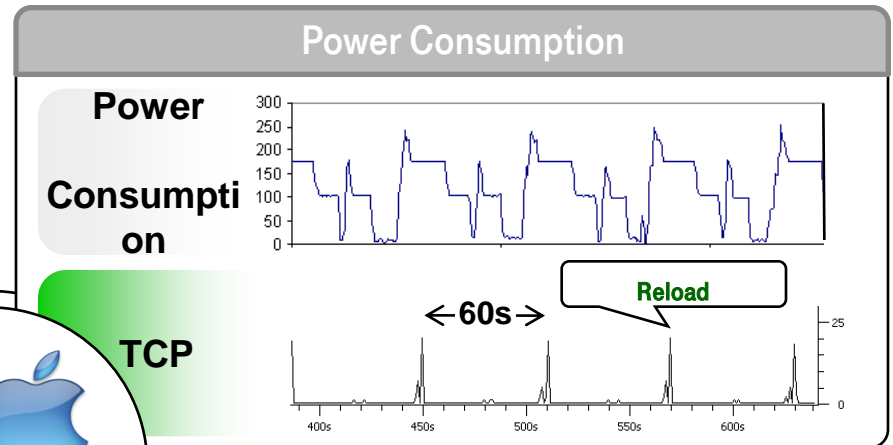
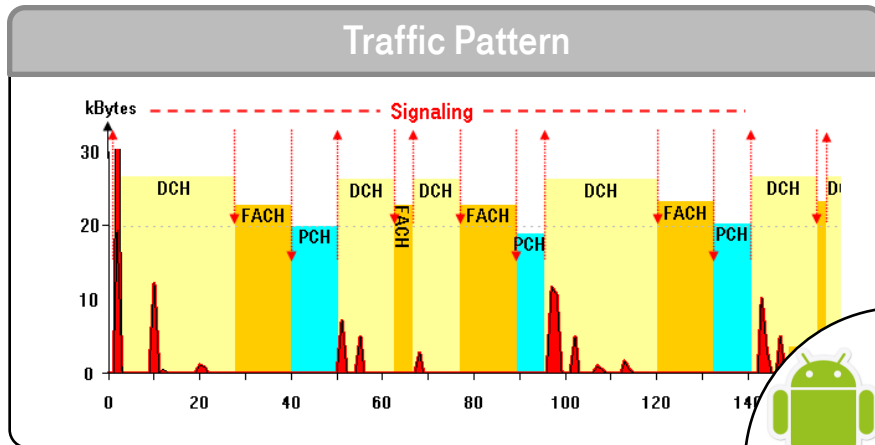Client Area: CONFIDENTIAL

**Access Technologies thousands of defects**

**Clients, Apps, OS & UI thousands of defects**

# TESTING PROGRAMME

In 2013, more than 50 apps were analysed and improved for markets in PL, NL and CZ



## Traffic Pattern

## Power Consumption

Power Consumption

TCP

## Data Volume

## Security – Data Privacy

# TESTING PROGRAMME

- Benefits of DT's Terminal Validation Program
- Overview of SW quality OEMs delivered to DT for validation (Entry Quality) vs. SW quality released to customers (Released Quality) after DT validation

**Software Quality all Vendors** [ranked by Entry Quality]

**12 Month**

Example Quality Increase

Legend: ■ Entry Quality  ■ Released Quality  ♦ Avg. Complexity

| Vendor | Entry Quality | Released Quality | Avg. Complexity |
|--------|---------------|------------------|-----------------|
| Vendor A | 1,93 | 0,84 | [5] |
| Vendor B | 2,22 | 0,96 | [8] |
| Vendor C | 2,34 | 0,78 | [6] |
| Vendor D | 2,53 | 2,02 | [7] |
| Vendor E | 2,73 | 1,75 | [6] |
| Vendor F | 3,16 | 0,98 | [10] |
| Vendor G | 3,61 | 0,89 | [7] |
| Vendor H | 3,83 | 0,67 | [8] |
| Vendor I | 6,56 | 1,78 | [8] |
| Vendor J | 6,63 | 1,18 | [9] |

Quality Increase

WORSE

AVG

BETTER

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# ATTRACTIONS
## HERO DEVICES 2014

# DEMONSTRATION
## LIVE DEMO

Apps analysis presented by:

- **Leonid Varlamov**, Senior Expert, Terminal Integration & Validation

- **Tomáš Nikodým**, Senior Expert, Terminal Integration & Validation

DT Optimized versus Non-optimized Terminals presented by:

- **Michal Tripes**, Senior Expert, Terminal Integration & Validation

Fire Phone sample preview

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# THANK YOU FOR YOUR ATTENTION!