De presentaties van NFO Special 'In-huis communicatie'

Ministerie EZ, dinsdag 28 januari 2014 's middags, Den Haag

Het Programma was:

1 - Introductie en marktontwikkeling, Peter Anker, ministerie EZ (vanaf p2)

2 - De marktvraag vanuit vastgoed.

- Mobiliteit en het nieuwe werken, De facilitaire wensen van huurders en gebruikers van gebouwen; de vraagstelling vanuit de huurder. Spreker: Gerton de Goeij, NUON Vattenfall. (vanaf p 7)
- De wensen van een grote openbare vastgoed gebruiker, de plannen voor een eigen indoor voorziening op Schiphol, de specifieke gebruikerswensen tav autonomie en netwerktoegang. Spreker: Robert Lee, Schiphol Terminal Real Estate (vanaf P 25)

3 - De wensen en oplossingen vanuit een mobiele operator.
Sprekers: T-Mobile, Fred Herrebout, Richard Marijs.

- de stringente eisen aan indoor voorzieningen, de indoor voorzieningen die een operator treft, de afstemming tussen mobiele operators (vanaf p29)

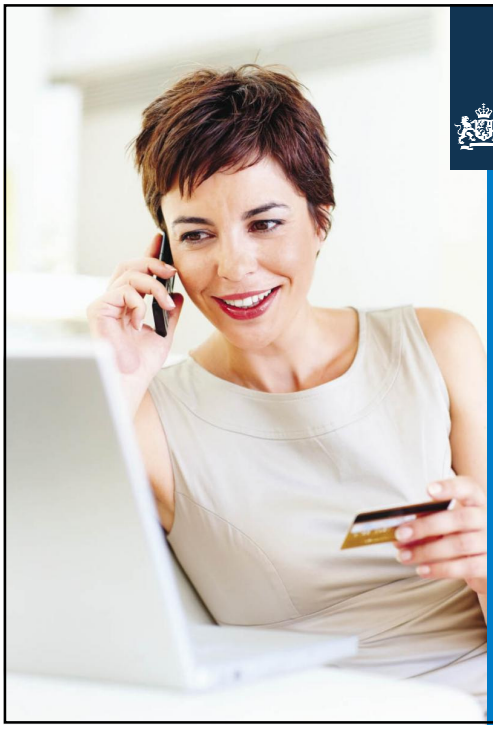
4 - Het innoverend effect van Private GSM en vrij spectrum. Spreker: John van Nijnatten, MCS:

- de groei van Private GSM, de gebruikers, het innovatievermogen van licentievrij spectrum Presentatie via: http://prezi.com/cajjr8xchumo/nfo-private-gsm-presentation/?utm_campaign=share&utm_medium=copy

5 - Oplossingen voor indoor systematiek, samenwerking en marktversnelling in de UK. Spreker: Ken Ng, CAM consult:

- De ontstaansgeschiedenis en beweegredenen achter de Engelse Joint Operator Technical Specification (JOTS); de scope van en praktijkervaringen met de Joint Operator Specification; de gebruiksvoorbeelden. (vanaf p 40).

- o -



Ministerie van Economische Zaken

NFO Special
in-huis communicatie

Welkom

Peter Anker

Programma

14.00 Welkom, introductie EZ.
Peter Anker, Ministerie van Economische Zaken

14.20 Marktvraag vanuit de gebruiker
Gerton de Goeij, NUON Vattenfall
Robert Lee, Schiphol Terminal Real Estate

15.10 De wensen en oplossingen vanuit een mobiele operator
Richard Marijs, T-Mobile

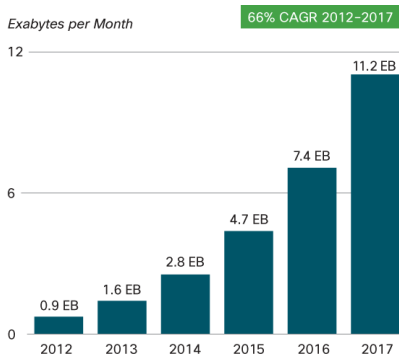
15.35 Het innoverend effect van Private GSM en vrij spectrum
John van Nijnatten, MCS

16.00 de Joint Operator Spec: samenwerking en marktversnelling in de UK
Ken Ng, ex T_Mobile en thans CAM consult

16.30 Discussie

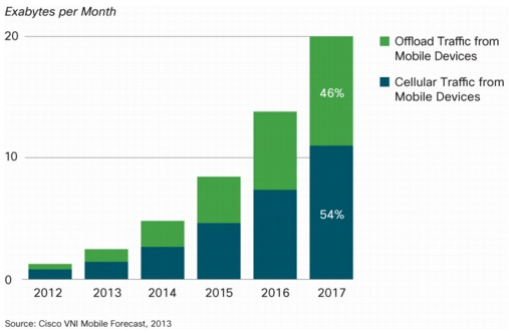
17.00 Borrel

Mobiele datagebruik groeit hard



Source: Cisco VNI Mobile Forecast, 2013

Niet al het verkeer gaat over het mobiele net



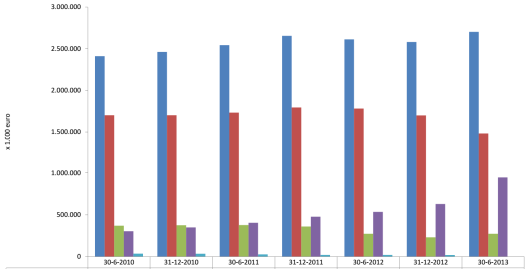
Source: Cisco VNI Mobile Forecast, 2013

Gebruik van mobiele communicatie in NL

Autoriteit Consument & Markt

ACM Openbaar

Mobiel: Omzet retail per half jaar

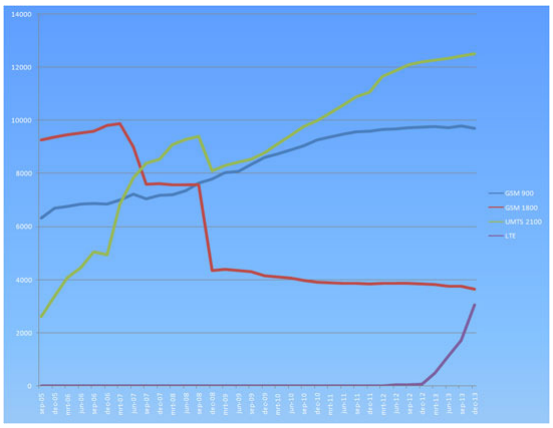


	30-6-2010	31-12-2010	30-6-2011	31-12-2011	30-6-2012	31-12-2012	30-6-2013
Omzet totaal	2.411.120	2.462.398	2.544.132	2.655.136	2.612.985	2.580.758	2.703.192
Omzet spraakdiensten	1.702.218	1.702.277	1.733.362	1.796.569	1.782.147	1.700.682	1.483.859
Omzet SMS-diensten	369.265	376.087	378.393	359.758	273.954	231.299	273.376
Omzet data-diensten	304.057	349.056	404.949	477.411	535.616	628.728	945.957
Omzet overige diensten	35.580	34.977	27.428	21.398	21.268	20.049	

Top 10 Technologie Trends 2014 van Gartner

1. Mobile Device Diversity en Management
2. Mobile apps en applicaties
3. The internet of everything
4. Hybride cloud en IT als service broker
5. Cloud/client architectuur
6. Het tijdperk van de personal cloud
7. Software defined anything
8. Web-scale IT
9. Smart machines
10. 3-D printing

Uitrol LTE komt op gang



© GSMhelpdesk.nl

	Totaal	ΔDec 2013
GSM900	9.707	-76
GSM1800	3.635	-96
UMTS	12.511	+91
LTE	3.063	+511

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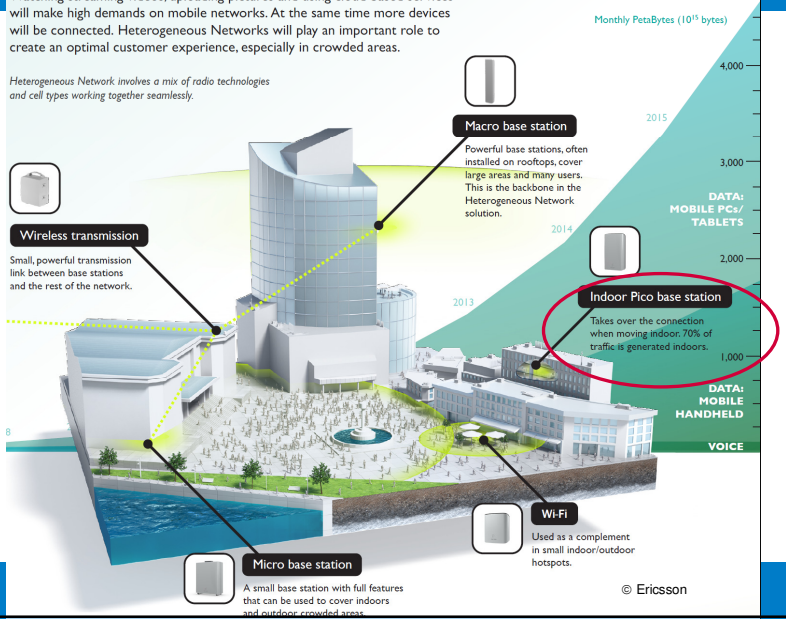
Heterogeneous Network (Hetnet)

Servicing data hungry smartphones

Watching streaming videos, uploading pictures and using cloud-based services will make high demands on mobile networks. At the same time more devices will be connected. Heterogeneous Networks will play an important role to create an optimal customer experience, especially in crowded areas.

Heterogeneous Network involves a mix of radio technologies and cell types working together seamlessly.



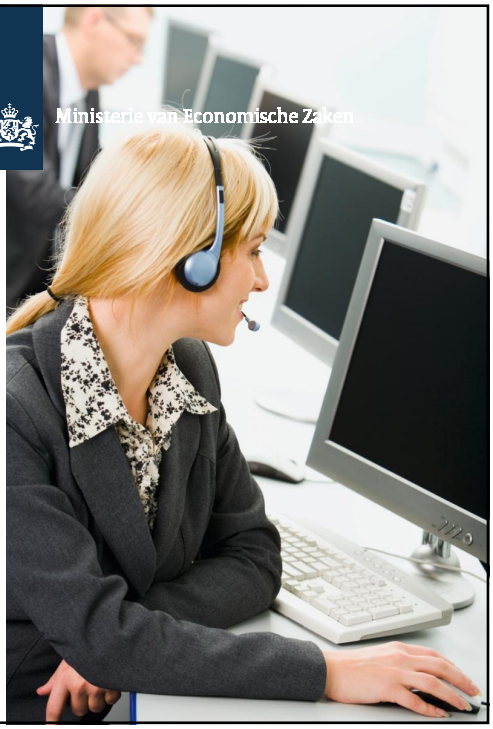
© Ericsson

Buiten

- "GSM"
  - 900 MHz band
  - 1800 MHz band
- "UMTS/HSPA"
  - 2 GHz band
- "LTE"
  - 2,6 GHz band
  - 800 MHz band
- 700 MHz band
- (3.400 – 3.800 MHz)
- …

In-door

- "DECT guard band"
  - 5MHz @ 1800 MHz
- Wi-Fi
  - 2,4 GHz band
  - 5 GHz band
  - (uitbreiding 5 GHz?)
  - Indoor pico-, femtocellen
  - Distributed Antenna Systems



Indoor coverage voor een energiebedrijf

Gerton de Goeij
28 januari 2014

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Experience the commitment®

Even voorstellen…

- Gerton de Goeij
- Werkzaam in telecom sinds 1996
- Sinds 2001 via CGI
- Zowel telecombedrijven als grootzakelijke bedrijven
- Innovatie, kostenbesparing
- Technisch projectmanager, adviseur, contractmanager
- Sinds 2009 bij het energiebedrijf, op dit moment als technisch manager
  - vervanging telefonie powerplants
  - Vervanging avaya door genesys call center
  - Telecommunicatie voorzieningen nieuwe pand

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Energiebedrijf – part of europees energiebedrijf

Energiebedrijf

- Levert elektriciteit, gas, warmte en koude
- 2,2 miljoen consumenten
- 7 energie centrales, meest op gas
- 5.200 medewerkers
- Oude bedrijf gesplitst in PLB en NB (2008)
- Overname PLB door europees energiebedrijf (2009)

Europees energiebedrijf

- Een van de grootste europese energie bedrijven
- Kernlanden: Zweden, Duitsland, Nederland
- Levert elektriciteit, warmte en gas
- ~7 miljoen klanten
- 32.800 medewerkers

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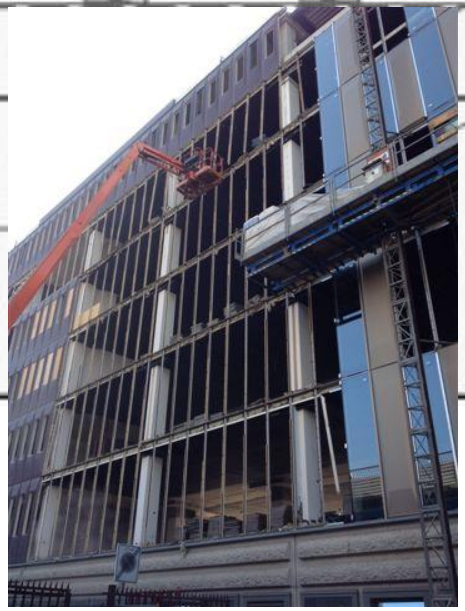
Mobiel bij Energiebedrijf

- Volledig outsourced
- Voornamelijk kantoortoepassingen
  - Mobiel tenzij
  - Smartphones (>50%)
- Voor een klein deel ook business applicaties
  - SAP applicatie voor incasso
  - M2M voor heat/wind modems

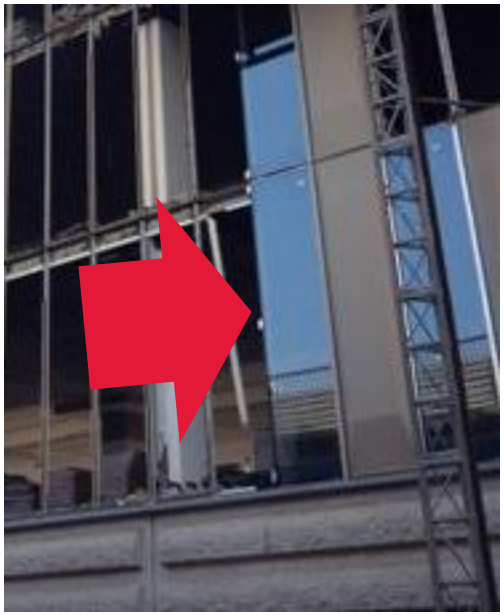
Aanleiding 1

Aanleiding 2

Uitdaging 1

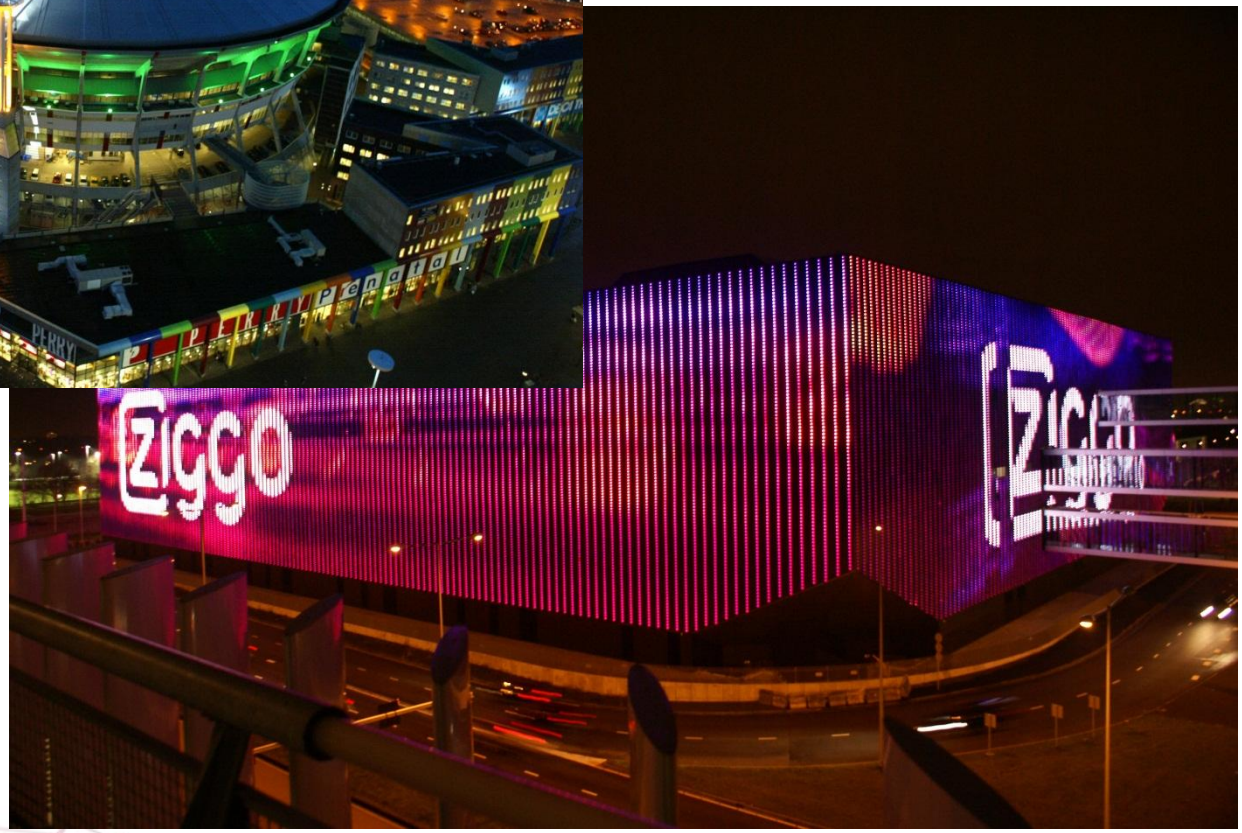


Uitdaging 2



Uitdaging 3

Uitdaging 4



Overwogen oplossingen

- Mobiele operator
- DAS
- Private GSM
- WLAN
- Picocellen

Welke leverancier?

Vodafone

+ Alles in 1 hand onder bestaand contract

- Sterke afhankelijkheid van Vodafone (wisselen?)

Onafhankelijke partij

+ meerdere operators aangesloten

+ bestaande contacten met kabelleverancier

- Mogelijke inkoppelproblemen

Designkeuzes

Actief of passief

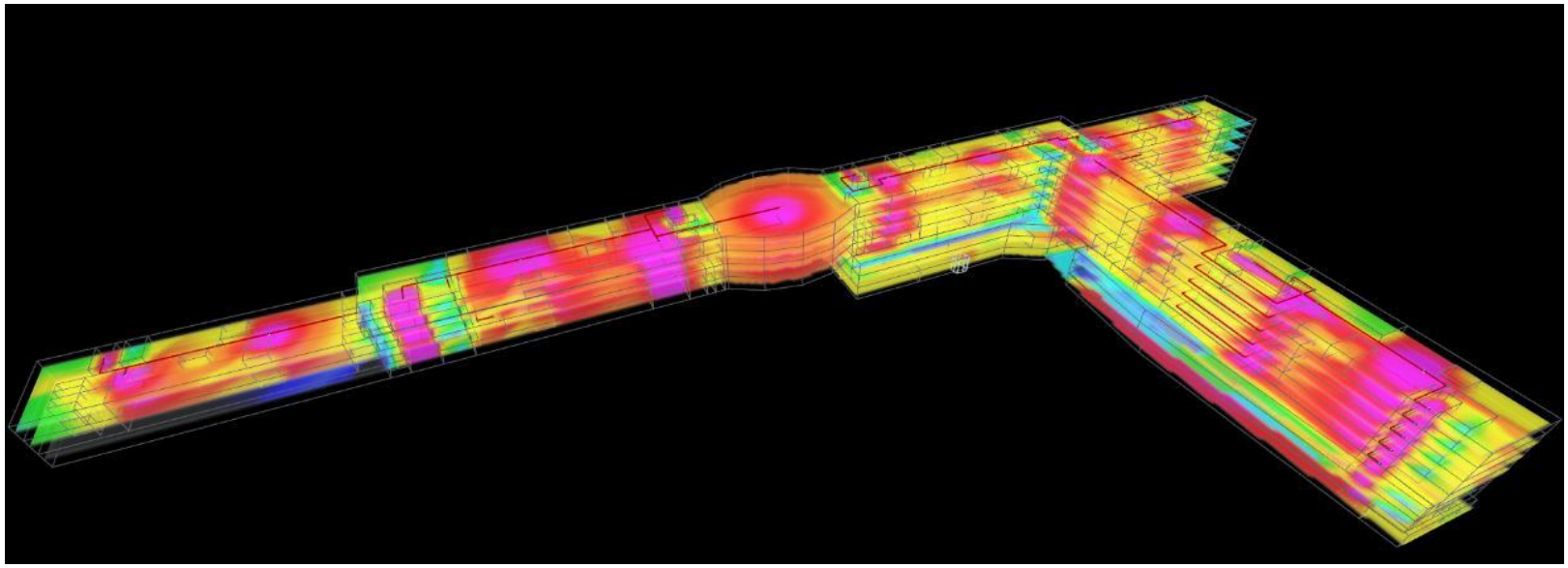
Actief:

+ Schaalbaar
+ kan BTS buiten het gebouw aansluiten
- Duurder
- Lastige acceptatie door operators (geen standaard)
- Hogere stroomkosten

Passief

+ wordt makkelijk geaccepteerd door operators
+ goedkoper
- Minder schaalbaar

Design



Tijdslijnen DAS

Maart 2012	Tekenen contract
Nov 2012	Dekkingsmeting CBRE uitgevoerd door Vodafone
Nov-april	Leveranciersselectie, highlevel design
Maart 2013	pre-engineering, site survey, offerte
April 2013	Contract Spie
April-Sep	Implementatie das

Tijdslijnen inkoppeling in 2013

Juli	verzoek inkoppeling vodafone
Augustus	bevestiging inkoppeling mogelijk
September	Ontwerp, Offerte Vodafone
Oktober	Order Bevestiging energiebedrijf
22 November	Inkoppeling

Verhuizing: 25 november 2013

Lessons learned

- Hou rekening met mobiele dekking en capaciteit in aanbestedingen
  - **Dekkingseis** opnemen in de eisen van het pand
  - Beding een **DAS** bij de verhuurder (probleem: afwezigheid standaard)
  - Neem een DAS op in de tender voor de **kabelleverancier**
- Door het toegenomen gebruik van **smartphones** voor spraak aan de ene kant, en **UMTS** aan de operator kant, worden de dekkings en capaciteitsproblemen de komende tijd alleen maar groter.
- Maak 1 leverancier van de technische oplossing verantwoordelijk voor de levering van het mobiele signaal van de operator, **coördinatie** uitbesteden.
- Indien niet afhankelijk willen zijn van een operator kies voor een **passieve oplossing** die door alle operators worden ondersteund.
- Zoek in een vroeg stadium contact met de operator in verband met **lange doorlooptijden** van de levering van het mobiele signaal door mogelijk gebruik van leased lines van derden.

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Vragen‘

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Waarom een DAS op Schiphol…

Robbert Lee
NFO
28 januari 2014

In deze presentatie

Aanleiding

Onze passagiers veranderen… onze airports veranderen

Verdieping en haalbaarheid

NU is het moment: OneXS

Draadloze mobiele communicatie:

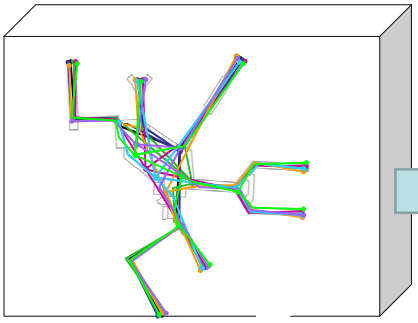
Publiek
2G: GSM
3G: UMTS
4G: LTE (vanaf nu)

Besloten/zakelijk
Tetra DTRS (portofoon)
C2000 (portfoon)

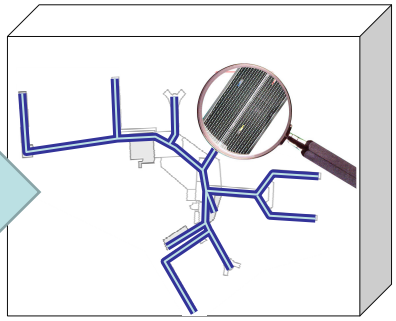
Vrije frequenties
Wifi
Private GSM/private LTE

Het concept DAS* op Schiphol

Terminal Nu: 6-7 aparte netwerken

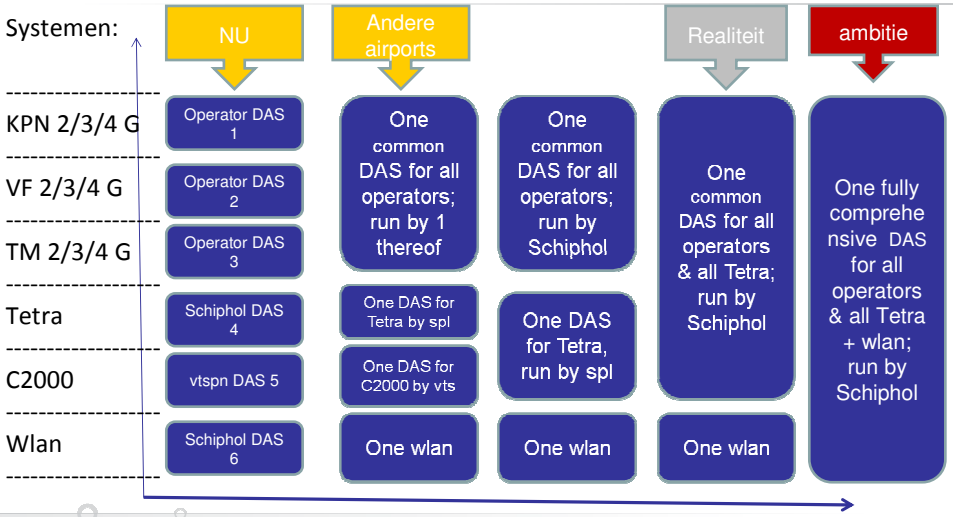


Terminal straks: geïntegreerd mobiel communicatienetwerk



*In verleden ook Gemeenschappelijk Operator Netwerk (GON) genoemd, in de markt ook bekend als Distributed Antenna System (DAS). Binnen Schiphol is projectnaam: Common Use Wireless Infrastructure

Integratie draadloze communicatiesystemen



Verdieping en haalbaarheid DAS 2011

Conclusies:

- ✓ Een DAS is efficiënter
  - Overall investeringskosten lager
  - Exploitatiekosten lager
  - Efficiënter beheer
  - Groter aanpassingsvermogen
  - Duurzame oplossing
- ✓ Technisch haalbaar
- ✓ Juridisch, organisatorisch, economisch haalbaar (mits…)
- ✓ De “wil” is er bij alle stakeholders

Advies:

- ✓ Start met ontwikkelen van een blauwdruk/architectuur DAS voor Schiphol
- ✓ Hanteer Blauwdruk DAS op Schiphol bij grote nieuw-/verbouw projecten

Dus… waarom wil Schiphol een DAS?

- ✓Omdat het kan (techniek)
- ✓Omdat het NU moet (One-XS)
- ✓Omdat onze klanten het willen
- ✓Omdat het eenvoudiger is…
- ✓en daarmee beter beheersbaar is en dus veiliger
- ✓en daarmee een meer duurzame oplossing biedt
- ✓en daarmee minder kosten met zich meebrengt…

T-Mobile and indoorcoverage

Discussion document

How far do we go?

Fred Herrebout, Richard Marijs

T · ·Mobile·

LIFE IS FOR SHARING.

Nationaal Frequentie Overleg Special indoordekking 28 Jan 2014

Facts and Figures.

Facts and figures T-Mobile Nederland

- 4,7 million mobile customers
- Revenues (2012): € 1,664 million
- Net Profit (2012): € 246 million
- EBITDA (2012): € 525 million
- ARPU (2012): € 24 euro per month
- 110 own T-Mobile shops
- Employees: 1659 FTE (incl Online*)

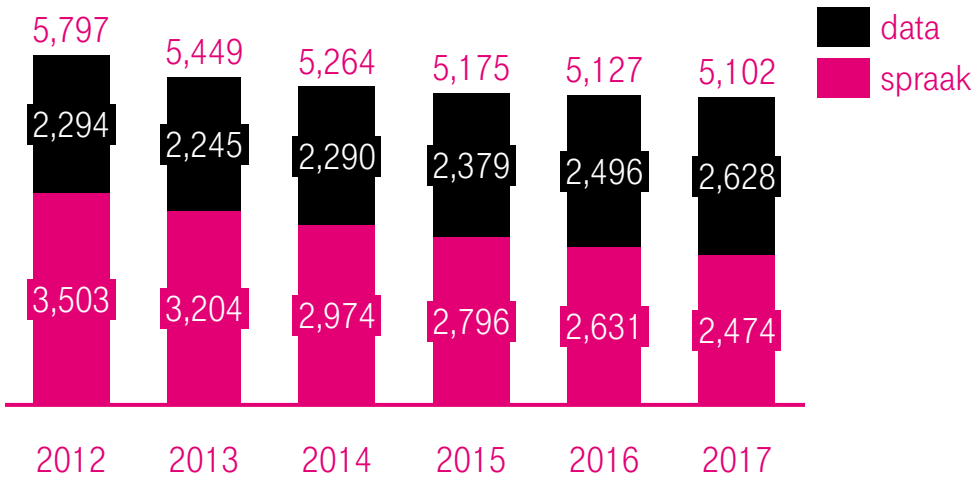
* Sold to M7 January 2014

T-MOBILE NETHERLANDS MARKET POSITION

- T-Mobile number 3 in market share and service revenues.
- Strong competition from new entrants (Tele2) and cable operators, creating 5-player market, in declining market
- On top, competition from many MVNOs, due to vibrant wholesale market.

The Dutch mobile telecommunications market is very dynamic.

Service revenues (€ mio)



Source: telecom.paper Q3-13

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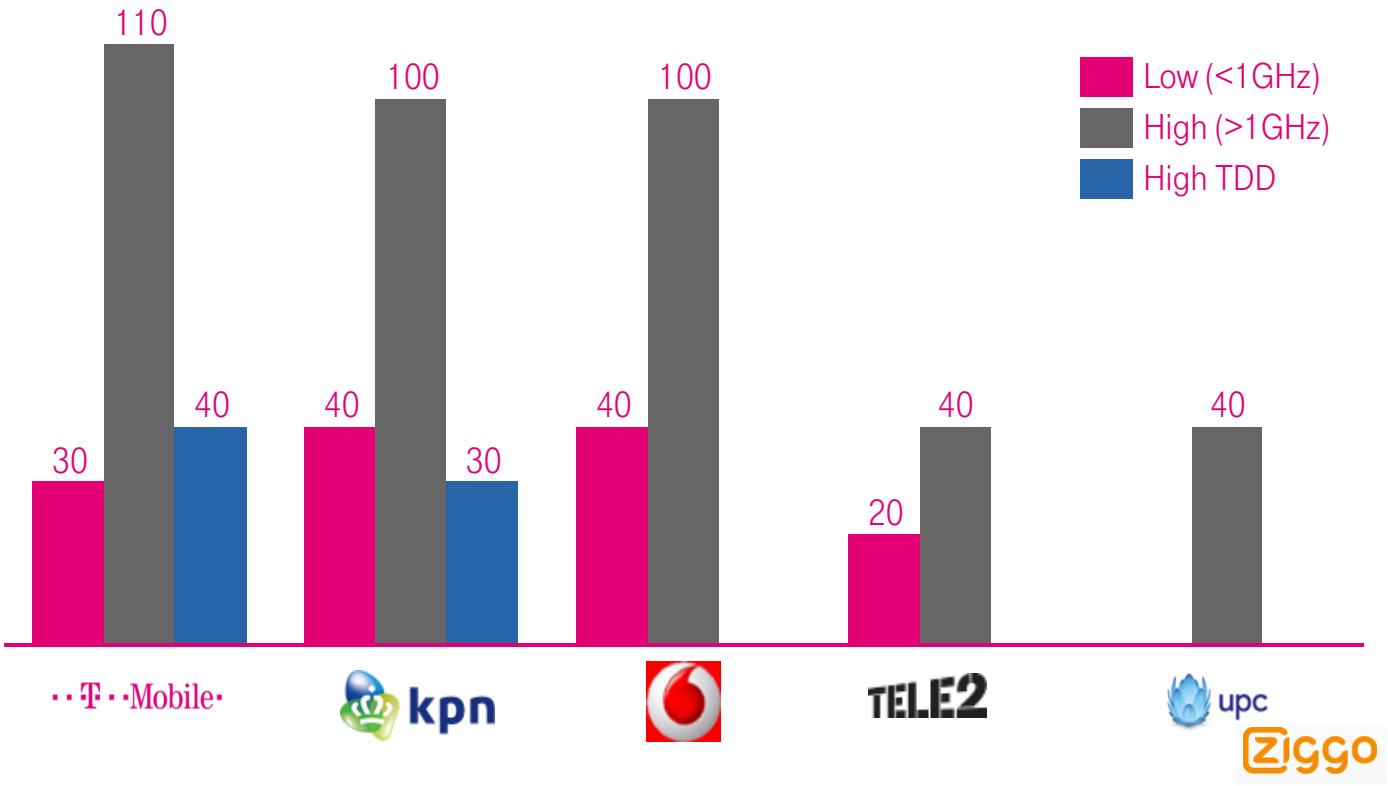
SPECTRUM POSITION AFTER THE RECENT MULTIBAND AUCTION 2012



Amount of spectrum in MHz

T-Mobile

LIFE IS FOR SHARING.

NETWERK MODERNISATION

- T-Mobile Netherlands network grid is designed for 1800/2100MHz.
- Excellent grid for network on high frequency (>1 GHz) bands, but great for low frequency (< 1GHz) bands (for coverage and capacity) .
- A boost in indoor coverage will be achieved when the low frequency bands will be used on this network-grid.
- But is this enough to provide indoor coverage everywhere now?
- A what about the future with improved building insulation policies?

Where is the limit?

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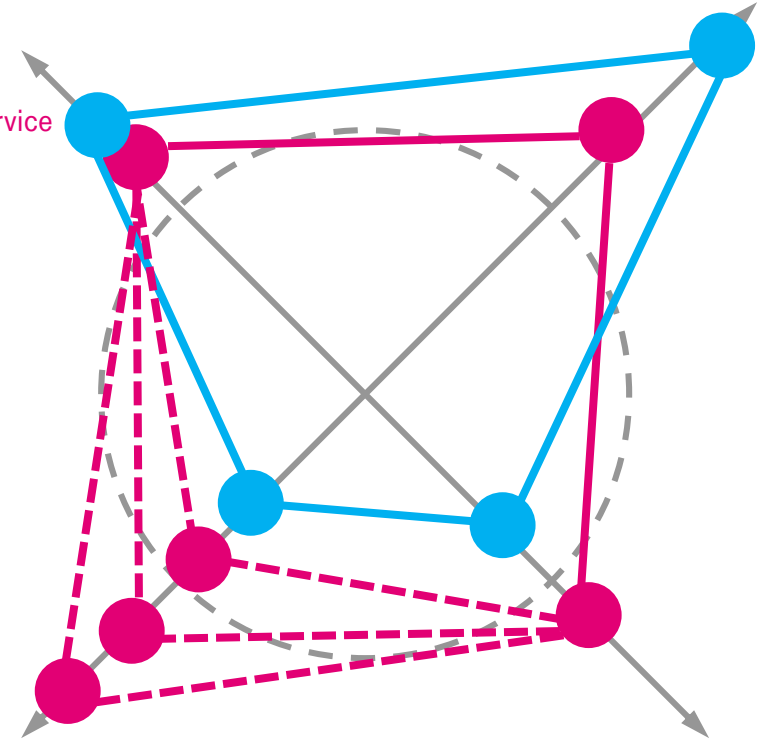
CHALLENGES IN THE (MOBILE) MARKET

MORE THAN COVERAGE/CAPACITY

Proposition
- Pricing
- Transparency
- Ease of use
- Handset (subsidy)
-

Brand
- Image
- Customer Service



Network
- Coverage
- Capacity
- Service quality

(Distribution) Channel
- Shops
- Online
- Retailers

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Picture is pure for illustrations purposes of this presentation

SOLUTION FOR NETWORK IMPROVEMENTS

Small Cell example

Macro solutions for network improvements

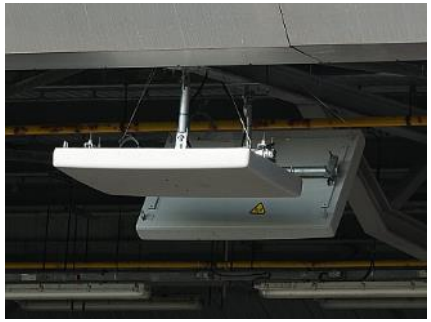
- Increase in macro capacity increases coverage; (lower noise level → less interference)
- Increase in macro coverage increases capacity; (less (uplink) power used, less interference)
- Future network Features improves indoor coverage

  → More spectrum, beam forming, interference cancellation & coordinated multiple point transmission to improve cell edge performance;

Options to increase coverage/capacity & densify current network beyond macro solutions:

- Small cells; (micro/pico)
- Indoor solutions
  - Femto
  - Small cell
  - DAS
  - Relay & repeaters
  - Special directive antenna solutions

Special Antennas in Stadiums



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PROS AND CONS AND TARGETS OF INDOOR SOLUTIONS

Solution	Target	Remarks
Femto	Small business or consumer	Not used within T-Mobile, due to complexity when deployed large scale (network quality degradation)
Small cells (pico / micro)	Event halls, indoor shopping malls, train-stations, business costumers etc.	Business case driven
Relay & repeaters + DAS	Dedicated solution, low capacity → e.g. Tunnels	Must have for mobility; shared investments/cost with OLO's
Special directive antenna solutions	(permanent) mass events, stadiums;	Very expensive, therefore business case driven; often shared investments/cost with OLOs
Dedicated DAS for indoor	Indoor, e.g. apartment buildings, large commercial buildings	Expensive, therefore business case driven; Incidentally shared investments/cost with OLO's

ISSUES FOR INDOOR (DAS) SOLUTION FOR COMMON BUILDINGS*

- MNOs have to make a profit, so business case needed. Factors considered:
  - Pay-back period sufficient? Investing in a indoor solutions adds to revenues, but for limited period, i.e. contract duration.
  - Risk of cannibalization of other services over DAS e.g. WIFI.

- Business case drives investments:

- ➢ Indoor design (mitigation of interference outdoor) ✓
- ➢ Initial built cost – backhaul, telecom equipment and maintenance ✓
- ➢ *Long contract duration* ✓

T-Mobile willing to invest

- ➢ Initial cost – DAS – Distributed Antenna System design/built
- ➢ Need to pay Rental/Concession fee from building owner

T-Mobile not willing to invest

Investment/cost should come from building owner

*Common building: Multiple tenants building, no targeted T-Mobile) business client

DISCUSSION STATEMENT

- Mobile voice and data is perceived as a commodity;
  Just like electricity and internet.
  It will be delivered wherever possible to all households and (in) buildings, as long as doing so is profitable/sustainable.

- If mobile service will blocked by better (highly) insulated buildings, we maintain to bring the service to the “frontdoor”.
  The building owner should provide the internal plumping!
  Like with water, gas and electricity;

Quid pro quo

JOTS

Joint Operators Technical Specification

Netherlands NFO – Indoor Wireless

Ken Ng 28/1/2014

CELLULAR
ASSET MANAGEMENT

CELLULAR
ASSET MANAGEMENT

Agenda

- Introduction
- JOTS Development History
- JOTS Users
- High level processes
- JOTS Examples
- JOTS Overview
- Other Co-operations
- Summary

CELLULAR
ASSET MANAGEMENT

Introduction

- Not a technical review of the UK JOTS
- More on the UK experience of JOTS
- Advantages and disadvantages

JOTS Development History

- Bluewater Shopping Centre
  - First joint operator project
  - Opened March 1999

JOTS Development History

- Principles
  - Fairness
    - Coverage – GSM1800 is 2dB higher than GSM900
  - Unanimity
    - Agreed by all operators and compromise where necessary
  - Only technical, no commercial
- 2G JOTS – May 1999
- 3G JOTS – January 2003
- 2G, 3G & 4G JOTS – March 2013

CELLULAR ASSET MANAGEMENT

JOTS Users

- Neutral Host (NH), such as Arquiva, WIG
  - 3rd party infrastructure owner
  - Lease agreement with property owner
  - Build distribution systems to JOTS specification
  - Offer tailored to operators' CAPEX / OPEX preference
  - Business model adjustments
  - Maintenance concerns
- Lead Operator
  - Open book and equal share of cost
  - More cost effective
  - Exclusivity for limited period, Transparency concerns
  - Financial risk – not all operators join the scheme unless popular buildings

CELLULAR
ASSET MANAGEMENT

JOTS Users

- Property Owners
  - Services to their customers
  - Revenue stream, in particular “monopolised” buildings
  - Poor system maintenance, outsource service contract
  - Mobile utility appreciation increasing
    - Incorporating mobile signal distribution system at the early stage of development and construction
- Large Corporations
  - Mainly laws and finance sectors whose customers are of different mobile service providers
  - Public and corporate DAS
  - Free connection to the operators
- Government agency

JOTS High Level Processes

- NH & Lead Operator (including corporation)
  - More commercial sensitive due to agreement with site owner
  - Proposal
    - Existing coverage and High level design
    - Footfall and facilities information for potential revenue estimate
    - Commercial proposal including sponsor operator and benefit
  - Operator express interest, Detailed design and comments from participating operators
  - Build, commissioning and acceptance
- Others
  - More open, transparent and mutli-operator discussion from the beginning
  - Take longer time to complete the project

JOTS Examples – Shopping Centres

- Mostly Neutral Host
- Bluewater – NH/Arquiva for 2G, & Lead Operator/Vodafone for 3G
- Trafford Park – NH/WIG
- Westfield – Building Owner
- About 60 shopping centres mostly built for 2G

JOTS Examples – Transport

- Heathrow going through major redevelopment
  - T1 & T3 – each operator has their own system
  - T5 & T2 – JOTS DAS owned by BAA, the owner
- Heathrow Express – rail link between Paddington train station and Heathrow
  - Tunnel coverage
  - Old HEX tunnel – non-JOTS
  - HEX extension to T5 – JOTS
- Eurotunnel – Reference to the UK JOTS for the design as the French operators do not have a common specification – owned by Eurotunnel
- Railways Station – mostly individual operator owned system
- St. Pancreas – Train station for UK rails and Eurostar, and is also a shopping centre
  - Struggled to build a DAS for non-technical reason

JOTS Examples – Sports

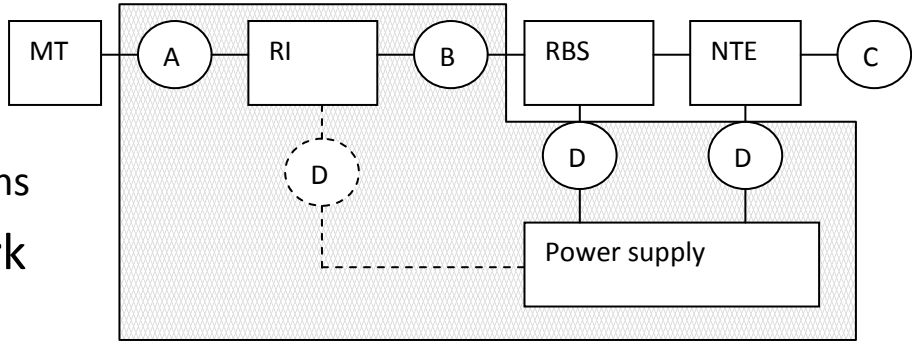
- Mostly operators led system
  - Twickenham Ruby Stadium – O2
  - Arsenal Emirate Stadium -- Vodafone
  - O2 Arena – O2 …..
- Wembley Stadium -- EE
  - 24 sectors for the bowl and the corporate boxes
  - Dedicate indoor DAS for indoors such as changing rooms, underground corridors
  - Blue print for Olympic Stadium

JOTS Examples – Others

- Conference and exhibition centres
  - Excel Centre – NH/Arquiva
- Parliament
  - Porticullis House -- EE
- Buildings
  - Shard – Vodafone
  - Clifford Chance in Canary Wharf – EE
- Hotels
  - NH, Operators, and hotel owners
  - Many customers demand mobile coverage as a condition for hiring
  - Hotel owners are offering to install DAS in their hotel with free connection for operators
    - Operator may not participate depending on the potential traffic due to CAPEX and OPEX considerations

JOTS Overview

- Requirements classification
  - Mandatory For regulations conformance
  - Requirements
  - Information – clarification and assumptions
- Area of responsibility & Scope of work



- Technical requirements
  - Coverage including sectorisation and overlap between sectors
  - Co-existence with other technology
  - Leakage into external environment
  - Overloading and intermodulation
  - Health and safety – radiation hazard
  - DAS elements performance & Interface between DAS and base station equipment
  - Supervisory
  - Reliability – 99.95%
- Documentation
- Testing
- Appendix -- Operators frequency bands, coverage testing methodology and concession template

Other Co-operations

- Other mobile operator technical forums based on JOTS principle and spirit
- JOOG – Joint Operators Olympic Group
  - Probably the most high profile group in delivery mobile coverage and capacity to the 2012 London Olympics venues
  - Participated by all mobile operators, PMR and the London Olympic Delivery body
  - The operators share responsibility of building the system
    - EE – Stadium
    - MBNL – Broadcasting centre
    - Vodafone – Velodrom, sailing and temporary cells
    - O2 – Aquatic centre,and other indoor venues in the Olympic Park
- Operator Antenna Forum
  - Define site share requirements to minimise interference and overloading
  - Exchange antenna data for accurate interference and loading estimates
- Radiation Hazard Group under MOA
  - Agree calculation methodology for exposure calculations
  - Co-ordinates responses to EU regulations

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Summary

- Although coverage is essential in delivery mobile services, it is not the primary factor affecting customer satisfaction. Quality of Service is the key
- Customers demand is driving closer technical co-operation among mobile operators despite fierce commercial and service competition, leading to more cost effective solution for coverage delivery
- A common technical specification makes this co-operation more effective and efficient
- JOTS is not a “Bible” or a Standard, it is a reference and a framework for the delivery of a signal distribution system. Compromises are not uncommon for the seek of cost effectiveness and project speed.
- Impress the Regulator that the Mobile Operators are working together for the benefits of themselves, the customers and the environment

Thanks for the

Attention

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