WiMax to LTE transition

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WiMax History

- Institutional Television Fixed Services (ITFS) first introduced as a line of sight service that made up to 4 microwave channels available to degree granting institutions.
- Late 1980s, FCC allows leasing of spectrum providing 5% of "services" are retained by the license holder.
- 1998 FCC authorizes digital transmission over ITFS channels making two-way data communications possible.
- In 2001 the FCC stated their intention to keep the spectrum in the hands of the educational entities. At the same time Non- Line-of-sight (NLOS) services emerged (i.e. WiMax)
- 2008 – Clearwire and Sprint announce WiMax based metropolitan Wireless Internet Service Provider (WISP) offering
- 2014 – Clearwire announces transition to LTE

FCC migrates ITFS to EBS

- 2005 FCC begins planning for transition from ITFS to EBS

- April 2006 FCC Docket is released with formal plan (FCC 06-46)

- Plan offers transition planning.

Frequency Mapping

WiMax vs. LTE

- WiMax
  - IEEE Spec
  - 802.16 C&D
  - ASNGW controller
    - ASN
    - GW
    - AAA
  - No future development
  - Sprint until 2014

- LTE (4G)
  - 3GPP
  - R10 –R15 defined
  - Future 5G transition
  - Enhance Packet Core
    - HSS – Authentication
    - MME – Mobility control
    - PGW/SGW – Gateways
  - RAN
    - eNodeB
  - Sprint after 2015
  - Verizon, AT&T, T-Mobile, Movistar, TelCel etc
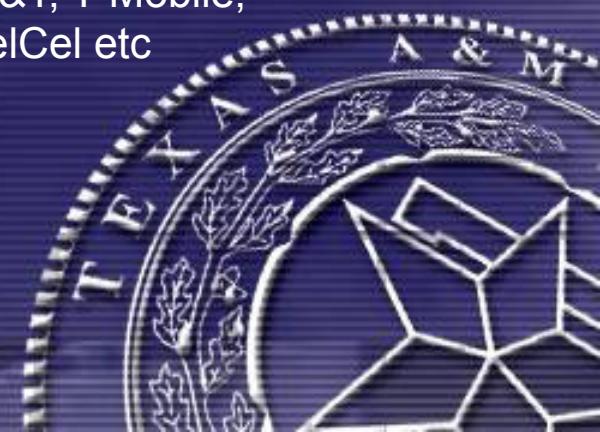
LTE at ITEC

- Support for Public Safety
  - Agreements with DHS and Commerce in U.S
  - Agreement with DR-DC in Canada

Reimaginar Comunicación inalámbrica

Reimagine Wireless Communication

1) fácil y rentable como Wi-Fi
2) el despliegue a la velocidad de envío.

Making LTE as easy and cost-effective as Wi-Fi.

Deploying at the speed of dispatch.

Nuestra Misión
Our Mission

→
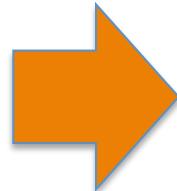
Haciendo redes celulares a nivel de operador tan fácil y rentable como Wi-Fi de la empresa
Making carrier-grade cellular networks as easy and cost-effective as enterprise WiFi

Nuestra Solucion
Our Solution

→
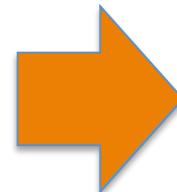
Automatización y simplificación a través HetNet Gateway y Converged Wireless System
Automation and Simplification via
HetNet Gateway and
Converged Wireless System

Vs.
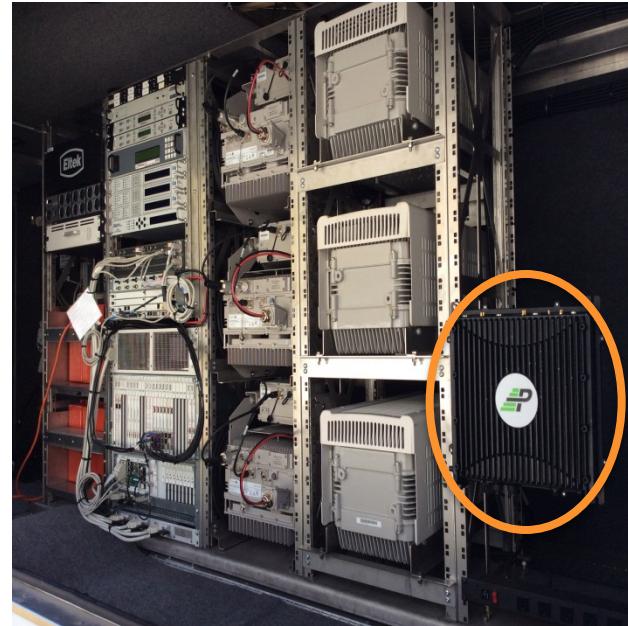
Parallel Wireless LTE – Mundo Real en Pruebas Real World Tested

Demonstrated to US DoD and DHS and at JIFX military exercise. Satellite/ LTE at 45 MPH!

Demonstrate interop and resilience between Canada and US at CAUSE II Sheriff installs RAN on flagpole - 15 min.

Part of the public safety LTE ecosystem for US FirstNet

Demonstrated as an integral component of Cisco's Public Safety LTE architecture @ APCO 2015

Deployed at MACC base to demonstrate interop, ease of deployment, and rural / in-building / mobile coverage

LTE North America Awards nominee

LTE NORTH AMERICA AWARDS 2015 SHORTLISTED

Demonstrated in Disaster City and Winter Institute exercises and outside US territorial waters.

Trialed and selected by public safety network in Europe

Demonstrated to Indian Military at DEFCOM: Delhi 2015

Live public safety LTE Band 14 network at Super Bowl 50 20 days from invitation to coverage

FBI: *Can Parallel build Super Bowl network?*

- NFL pidió radios en paneles de resultados, se desplazó a la SuperBowl City
- Los transportistas públicos para SB-50 requiere un año de planificación
- Despliegue: 20 días, 14 días: FCC, Barco de 3 días, Instalación de 20 min.
- Backhaul al condado de Harris (TX) EPC (EPC locales también).
- Necesidad de energía e Internet ... o simplemente alimentación del vehículo
- Software de hilos en Parallel Wireless corta diseño y campo de tiempo neto
- Interoperable entre las agencias

- NFL requested radios in scoreboards, shifted to SuperBowl City
- The public carriers for SB-50 required a year of planning
- Deploy: 20 days, FCC: 14 days, Ship 3 days, Install **20 min.**
- Backhaul to Harris County (TX) EPC (local EPC too).
- Need power and Internet…or just vehicle power
- Software from Parallel Wireless cuts net design and field time
- Interoperable between agencies
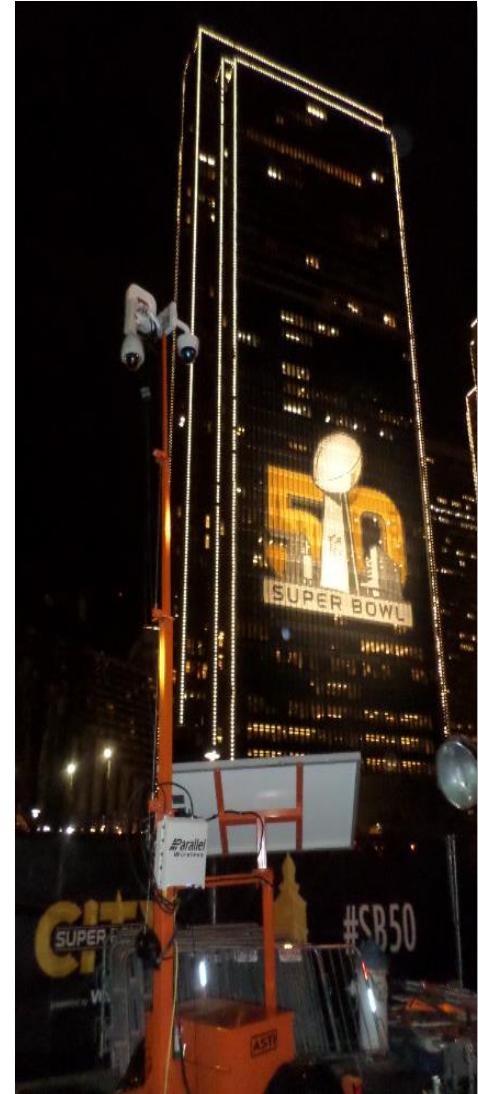
Nuevo Diseño eNB - Todo-en-uno Estación Base - CWS
New eNB Design – All-in-one Base Station - CWS

Disminuye el costo de implementación
Lowers Deployment Cost

Wireless mesh module

Ethernet Cable

CWS

LTE

3G

2G

Edge Router
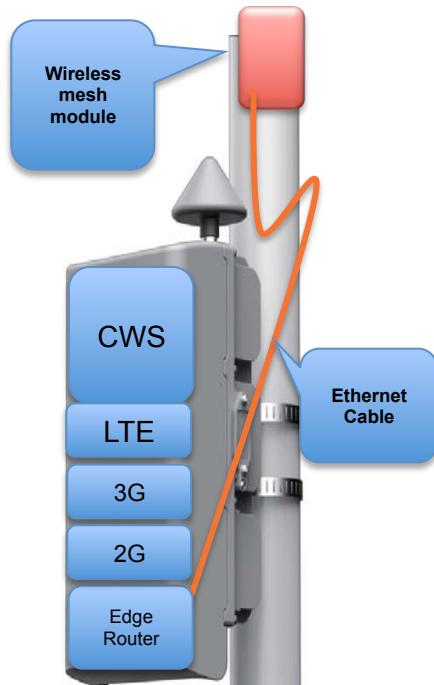
- Todo-en-una (CWS) integra el acceso y backhaul
- capacidades de backhaul CWS pueden ser mejorados con malla inalámbrica con sólo conectar el módulo de malla.
- HetNet puerta de enlace gestionará malla de red de retorno / enrutamiento dinámico
- HetNet puerta de enlace organiza diversas tecnologías de radio

- All-in-one base station (CWS) integrates access and backhaul
- CWS backhaul capabilities can be enhanced with wireless mesh by simply connect mesh module.
- HetNet Gateway will manage backhaul mesh/dynamic routing
- HetNet Gateway orchestrates various radio technologies

3G / 4G y la cubierta exterior Arquitectura de la Solución……..
3G/4G Outdoor and Indoor Solution Architecture

Outdoor CWS: 3G/4G/Wi-Fi

2X40W   2X20W   2X5W

Indoor Enterprise and residential Femto "white box"

Vertical Markets

Other Vendors

X2 for SON

HetNet Gateway

NFV + SDN

Uni-Manage

NetConf/ XML

Operator Core

3GPP Core Interface

Internet

3GPP Core Interface
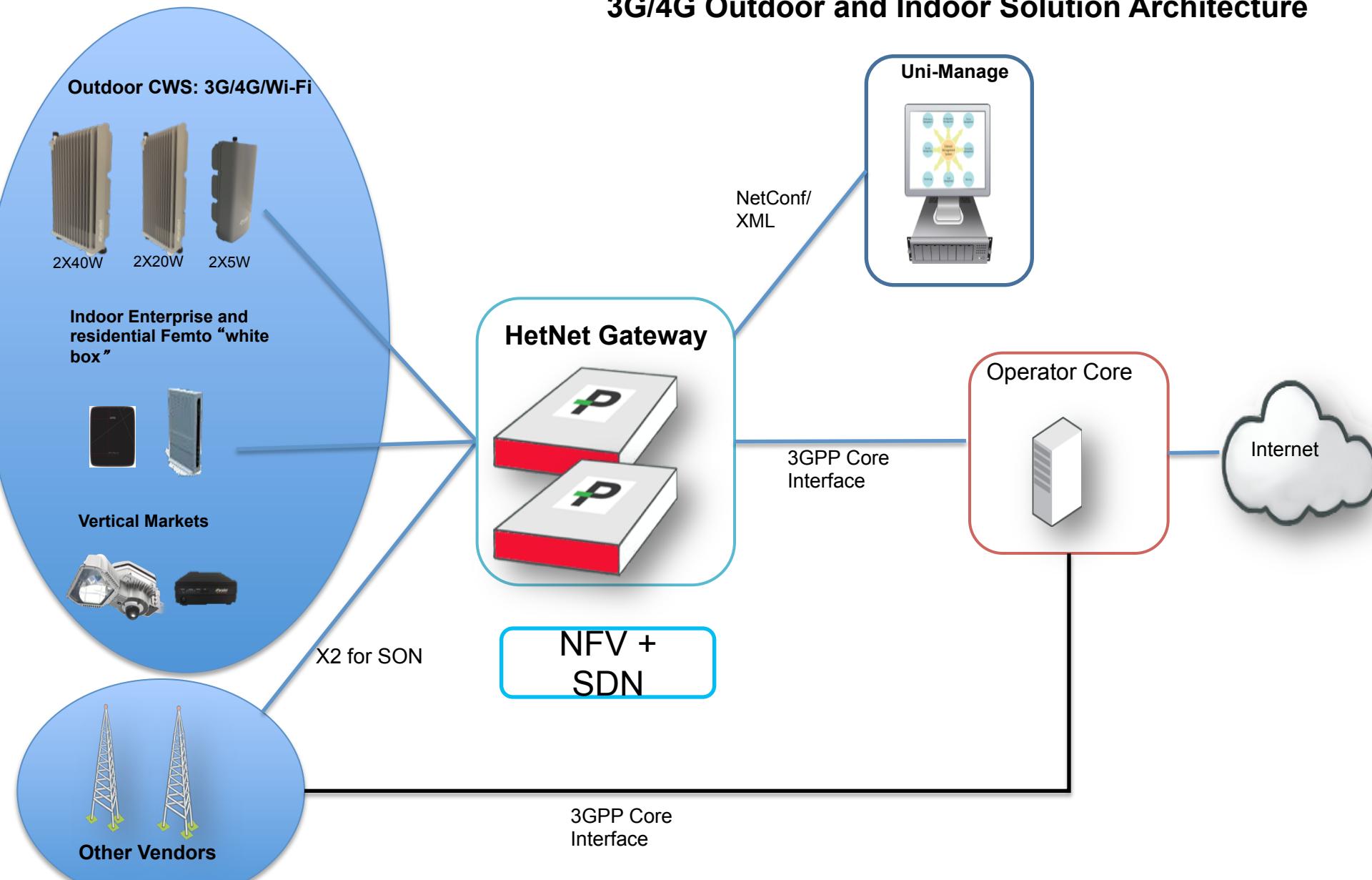
La simplificación de la red

Network Simplification

ALL IP

2G Access
2G devices
CWS BTS/BSC

3G Access (UTRAN)
3G devices
CWS NB

4G Access (E-RAN)
4G devices
eNodeB

Wi-Fi Access
CWS Wi-Fi AP

HetNet GW

NFV + SDN

3G Packet Core
3G SGSN, GGSN

3G Circuit Core
3G MSC/VLR

4G Packet Core
EPC

SCP

SMSC

HLR/HSS

IMS

PCRF

AAA

Iuh

Iuh

S1

SWu

IuPS

IuCS

S1-AP/S1-U

S2a, s2b

SWm

Gx

CAP

MAP

S6

Gm

Interoperability

EPC	HUAWEI · Aricent · GD · radisys · ERICSSON · Expeto · CISCO · affirmed · Atheo INGENIERIE | HUMAN INSIDE · ZTE中兴
3G Core	HUAWEI · ERICSSON · NOKIA · ZTE中兴 · PMN PRIVATE MOBILE NETWORKS
eNodeB	FUJITSU · GD · node H · ip|access · Accelleran Small Cells, Done Right · QUCELL · AIRVANA Small Cells from CommScope · sistelbanda
Macro	HUAWEI · GD
Satellite backhaul	AQYR Tactical SATCOM Solutions · HUGHES · ip access international · Gilat Gilat Satellite Networks
MEC	PeerApp · Saguna

CWS: 2X40W

- ✓ **Multi-mode** (incl Wi-Fi), multi-band

- ✓ **Most compact and light weight high performance high power macro**: radio, filter, baseband, edge router, integrated backhaul -- just add antenna, power supply/back up and IP

- ✓ Various outdoor installations

- ✓ **LOW OPEX AND CAPEX**

- ✓ **Self-configuring and self-optimizing** via HNG

- ✓ ~315 Watts input

- ✓ Much lower cost

- ✓ **Self-configuring and self-optimizing** via HNG

15" / 37 cm

6" / 15 cm

9" / 22 cm

![Parallel Wireless logo]
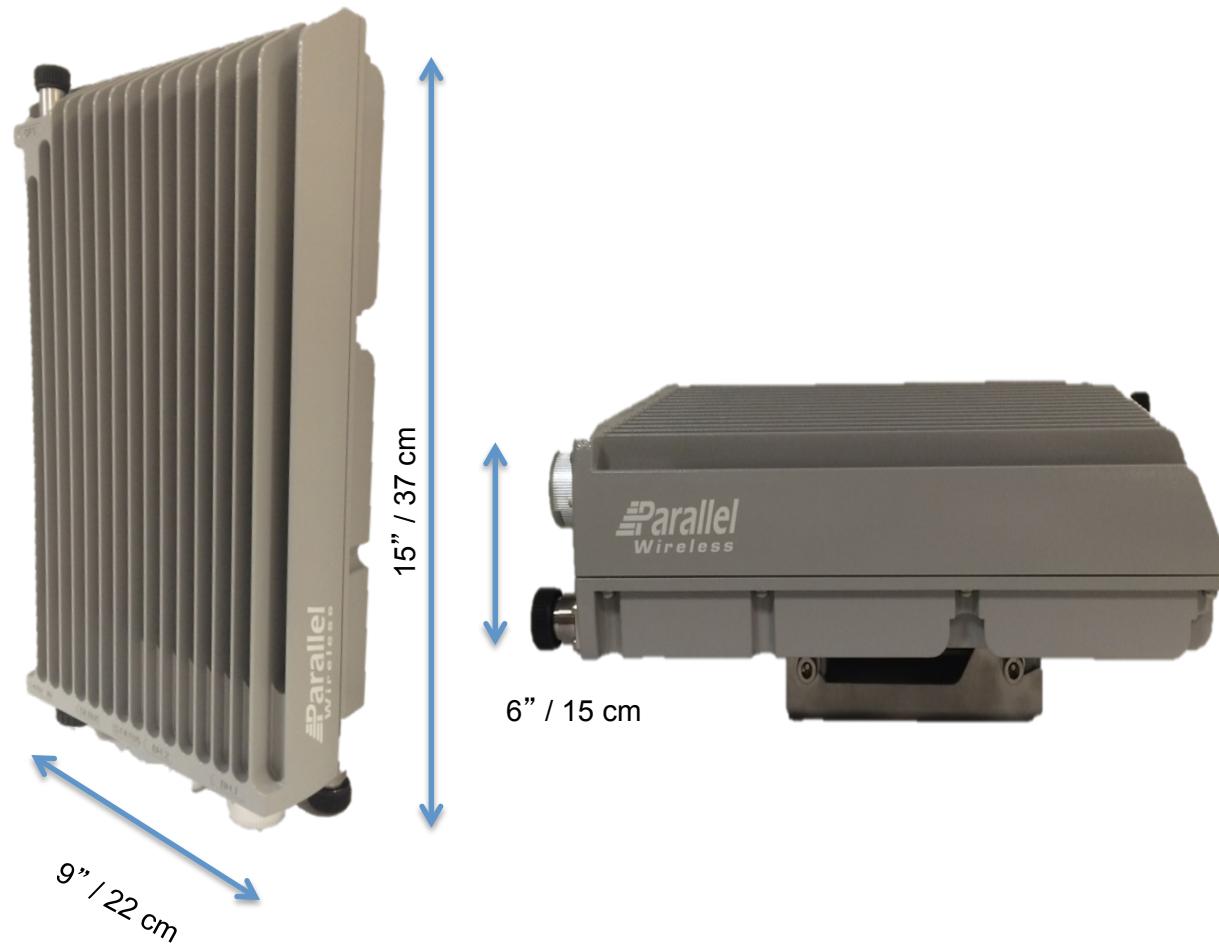
Fácil y rentable como Wi-Fi

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