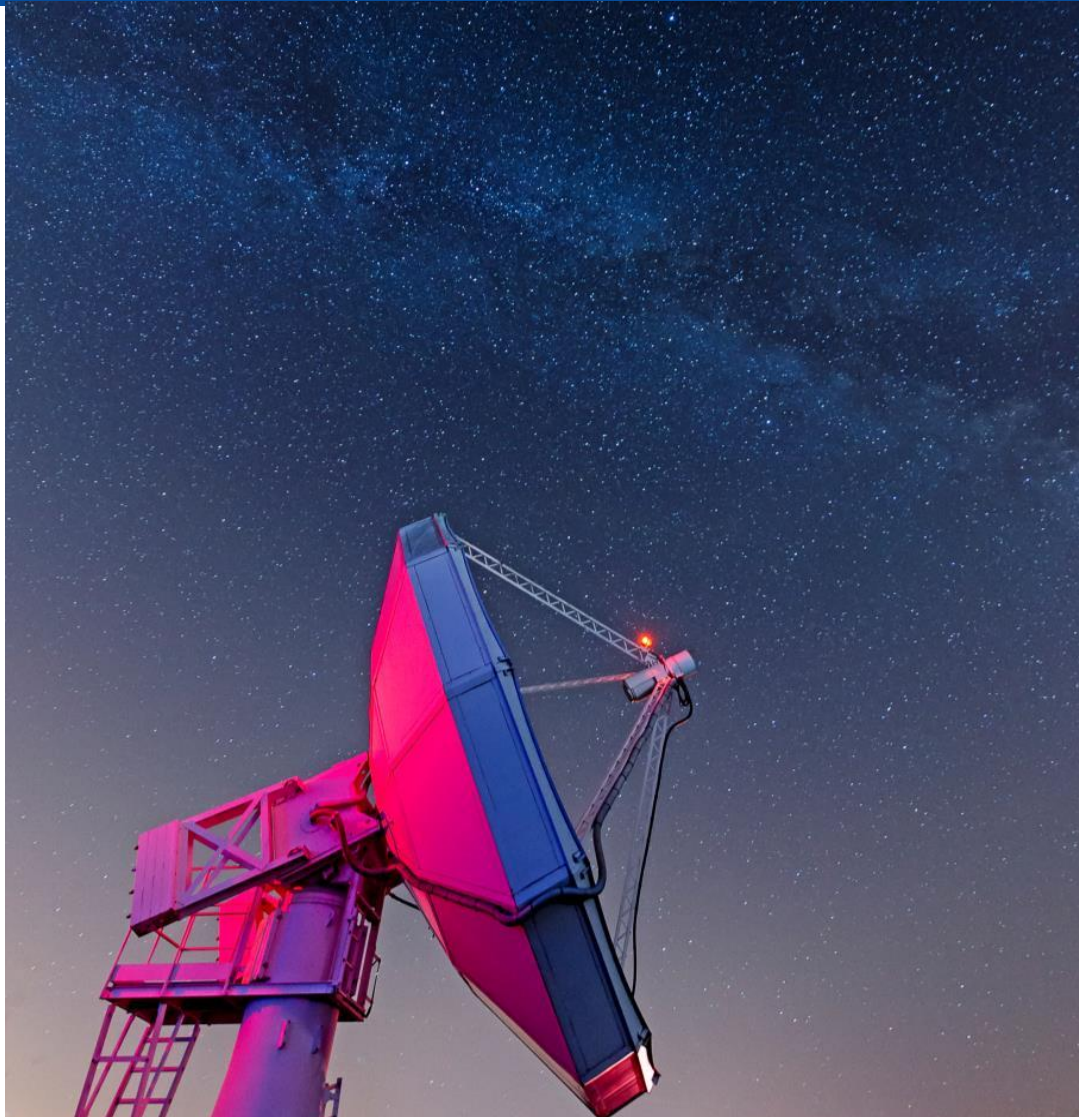


# **SATELLITE INTERNET**

*Eutelsat - Future Ready?*

*29<sup>th</sup> November 2016*

# EUTELSAT, A KEY PLAYER IN THE SATCOM BUSINESS



Pioneer in space

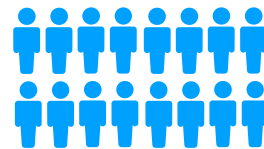
over **30** years of experience

**38**

Satellites  
for global coverage



6,300 TV channels & 1,250 Radio stations



**1000**

Industry  
experts

**37**

nationalities





# EUTELSAT BROADBAND

- ✓ Located in Turin, Eutelsat Broadband is a fully-owned subsidiary of Eutelsat, one of the world's three leading satellite operators
- ✓ Eutelsat Broadband supplies broadband services in Europe, Middle East, North Africa, the Americas for users located beyond range of terrestrial networks on land, at sea, in-flight
- ✓ Eutelsat Broadband also provides a full suite of services for regular and ad hoc broadcasting
- ✓ Eutelsat Broadband teleport, SkyPark, located in Turin, Piedmont, is among the largest platforms in the world for fully satellite-based value-added services



# **KA-SAT: the biggest European High Throughput Satellite**

# KA-SAT: THE BIGGEST EUROPEAN HTS

## About KA-SAT

### ■ Satellite main figures

#### → Power

- Spacecraft Power <14kW
- Payload DC power 11kW
- Solar Array Power up to 16kW

#### → Mass

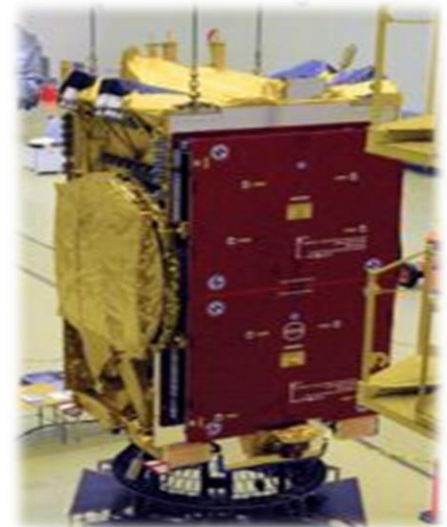
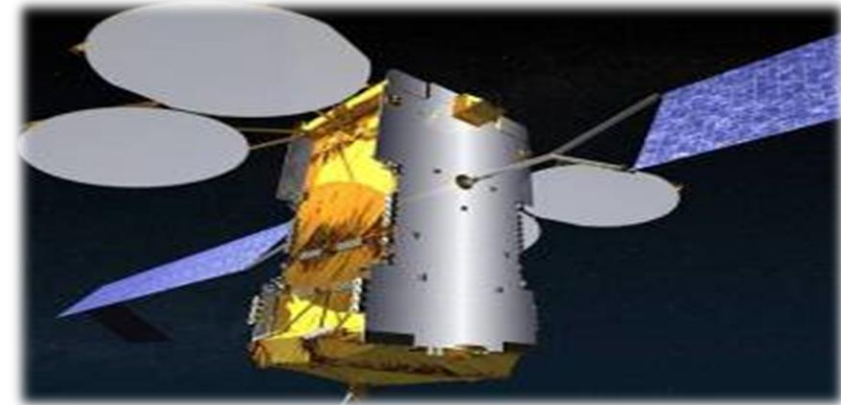
- Payload mass ~1000 kg
- Spacecraft dry mass ~3170 kg
- Satellite launch mass 5.7t -6.1t

→ Orbital Manoeuvre life time 16 years

■ In-orbit longitude 9°E

■ Launch ILS Proton

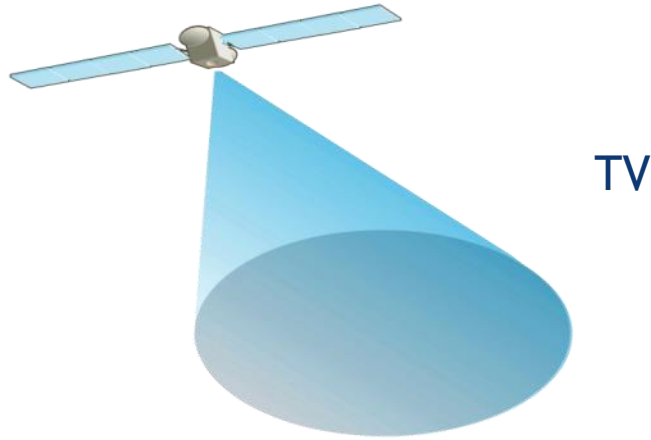
■ Launch date: December 26th, 2010



# KA-SAT: THE BIGGEST EUROPEAN HTS

## Two types of satellites for two different applications

### Traditional wide footprint



Optimised for broadcast services

- One signal received simultaneously by unlimited number of users in a wide area covering a continent or more

### New-generation HTS (KA-SAT)



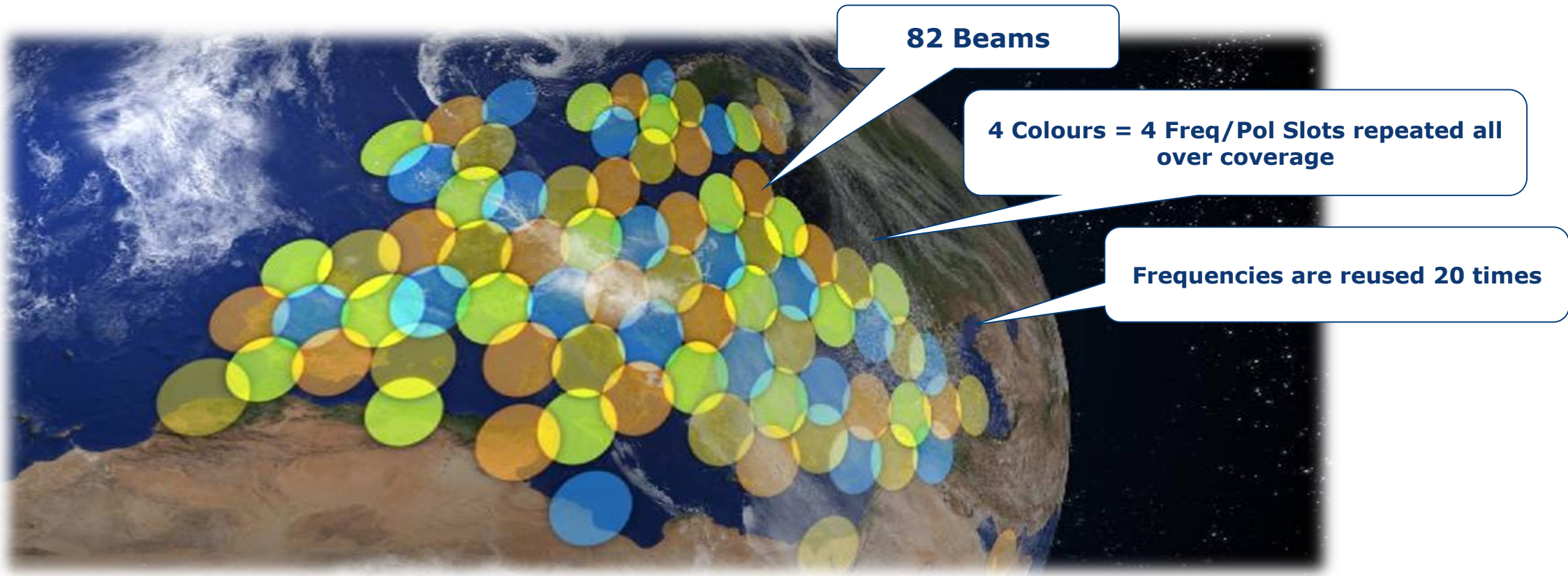
Optimised for IP applications

- Multi-beam architecture
- High frequency reuse
- Significant increase in bandwidth
- New markets
- New services

**Traditional wide-beam satellite and HTS multi-spotbeams are complementary:  
two models for two types of applications**

# KA-SAT: THE BIGGEST EUROPEAN HTS

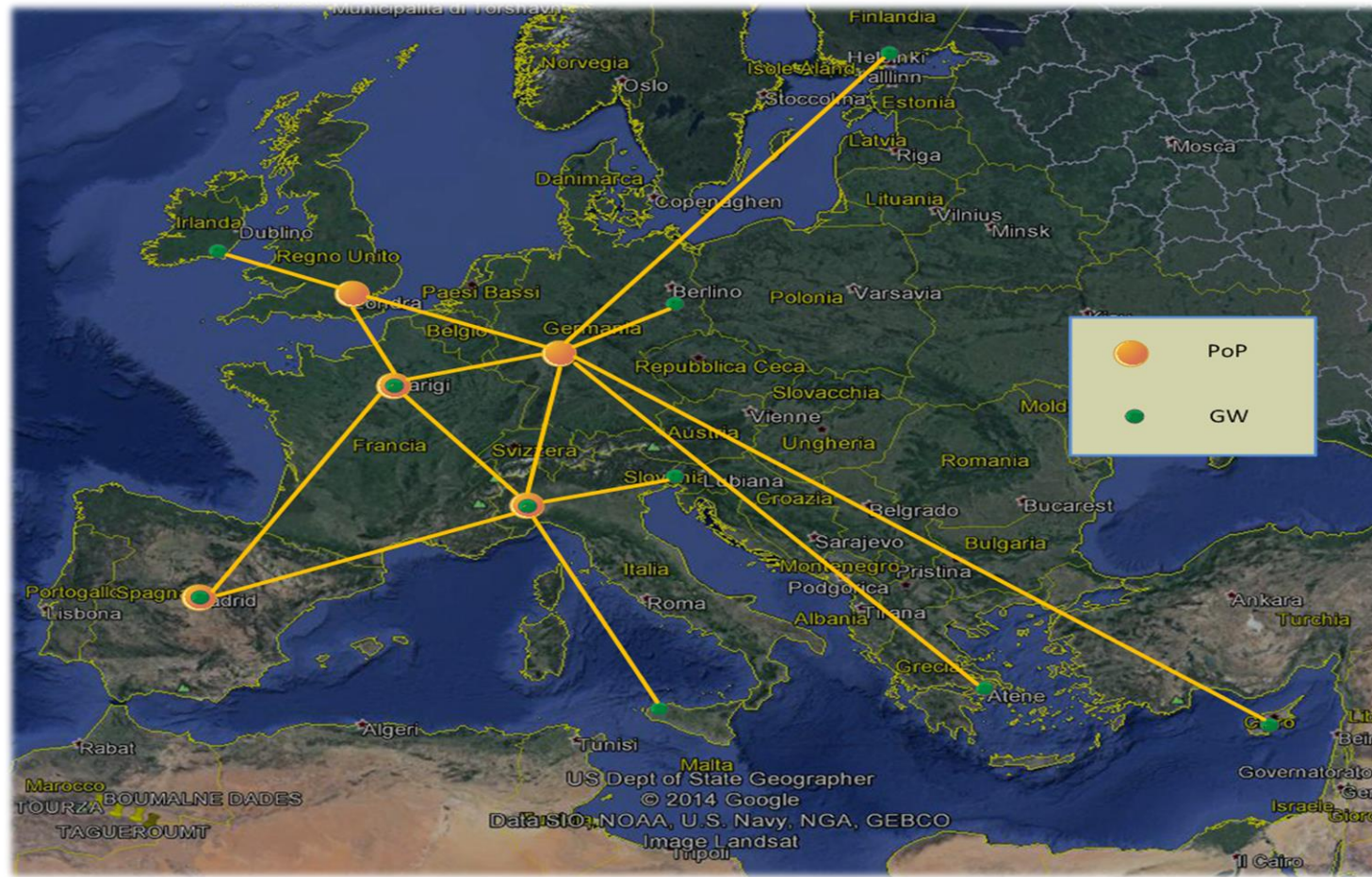
## Multi-spot Ka-band coverage





# KA-SAT: THE BIGGEST EUROPEAN HTS

## KA-SAT terrestrial network



- /// **N°8 + 2 Gateway in Europe**
- /// **Up to n°7 Points of Presence**
- /// **Redundant terrestrial infrastructure, supplied by various Terrestrial Operators**
- /// **Possibility to be interconnected with diversity of Ports and Location (in function of the availability of the PoP and IP protocol)**



# KA-SAT: THE BIGGEST EUROPEAN HTS

**ViaSat**

Technology &  
Service partner



&

**tooway**  
fast internet everywhere

## Standard terminal

- IDU box
- Antenna 77cm
- 3W ODU
- 75W power



## Advanced terminal

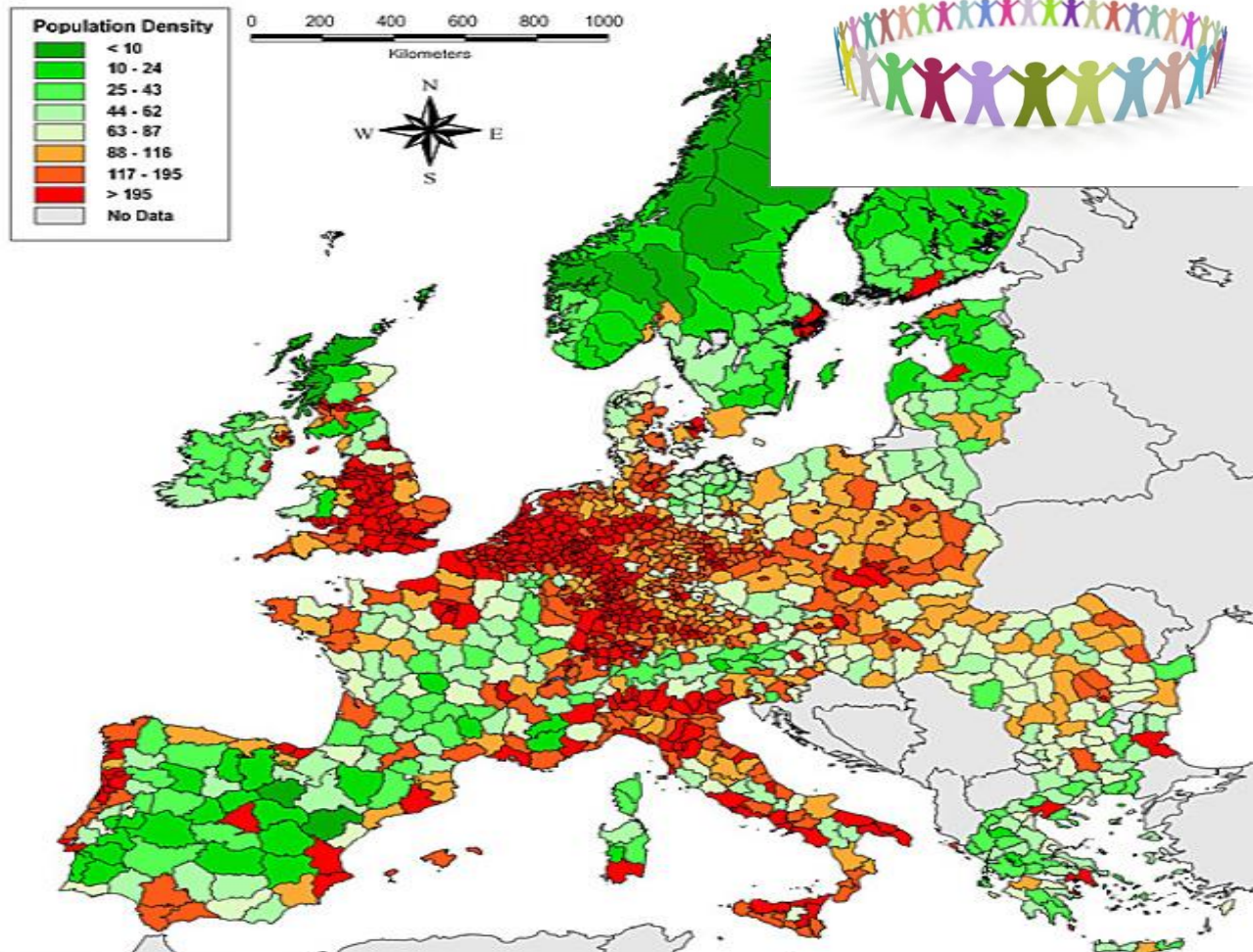
- IDU box
- Antenna 120cm
- 4W ODU
- 75W power



**KA-SAT 9° East**

# SOCIO-ECONOMIC DRIVERS IN URBAN AREAS ONLY?

## ► Population density map



- 56% of EU population lives in rural, sparsely populated areas
- Agriculture and rural development policy accounts for about 38% of the total EU budget



# IS WIRED HIGH-SPEED INTERNET AVAILABLE EVERYWHERE?

► Unlikely here



► Likely here





# WAITING FOR FIBRE THAT MAY ARRIVE VERY LATE ... OR NEVER

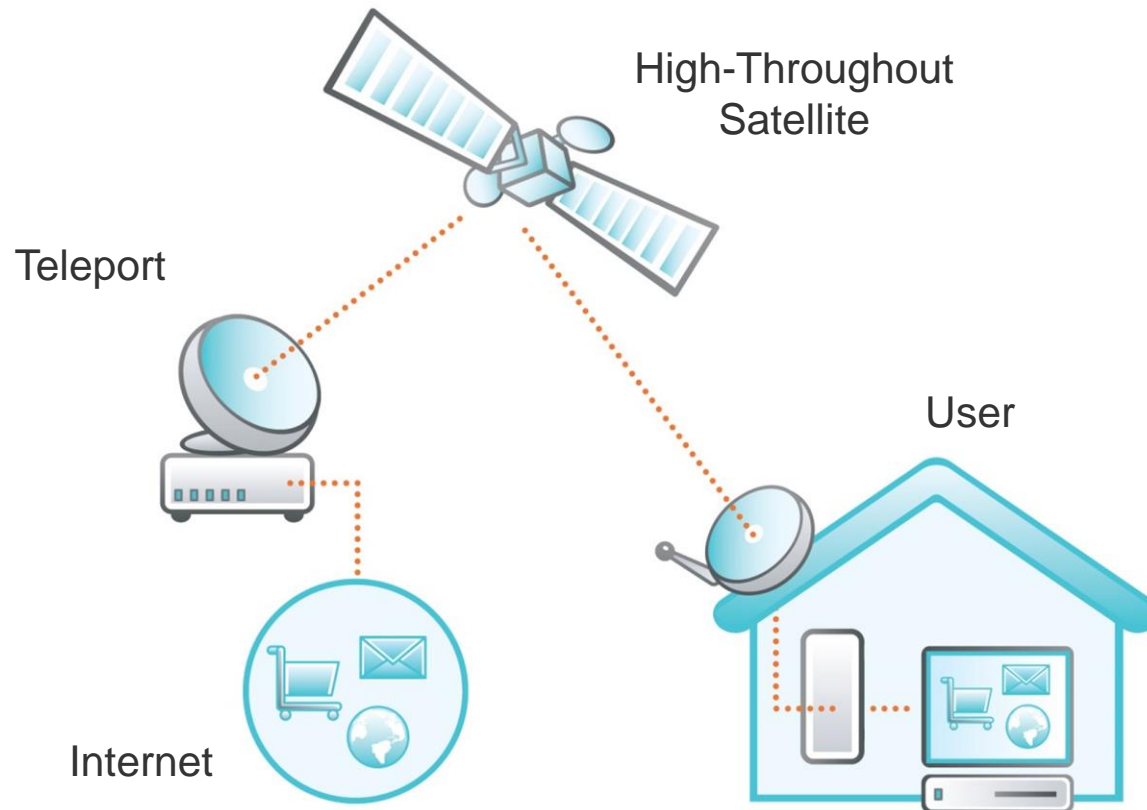
## ► Dig it yourself?



- ▮ A lot of households and farms still to reach - by definition the most difficult and expensive to cover, by and large rural and isolated
- ▮ Digging trenches/ laying ducting to the door of each property costs on average 50€/m
- ▮ Difficult topographical conditions or low population density make sometimes terrestrial solutions impractical / economically unviable
  - The unit costs for terrestrial connection increase significantly as population densities drop, because of high fixed investment costs
- ▮ *Consequence: frustrated local farmers, small business owners, village residents ...*

# SATELLITE INTERNET: AVAILABLE EVERYWHERE, VIABLE, IMMEDIATE

## ► How does satellite Internet access work?



- **An efficient and cost-effective complement to terrestrial technologies in rural areas**
- **An available, viable, immediate alternative (while waiting for fibre)**
- **Cost of connecting via satellite one rural user is the same as connecting one urban user**
- **A true always-on, ADSL-like service**
  - ➔ **22 Mbps download, 6 Mbps upload speeds (Tooway™ service)**
  - All you need to connect now to high-speed Internet (and to make VoIP calls and receive many TV channels)**
  - ➔ **Just one small 75cm satellite dish connected with a single cable to an indoor modem**



UNLIMITED browsing and email

Huge VOLUME for all usages

Network Management Policy applied

UNLIMITED at night





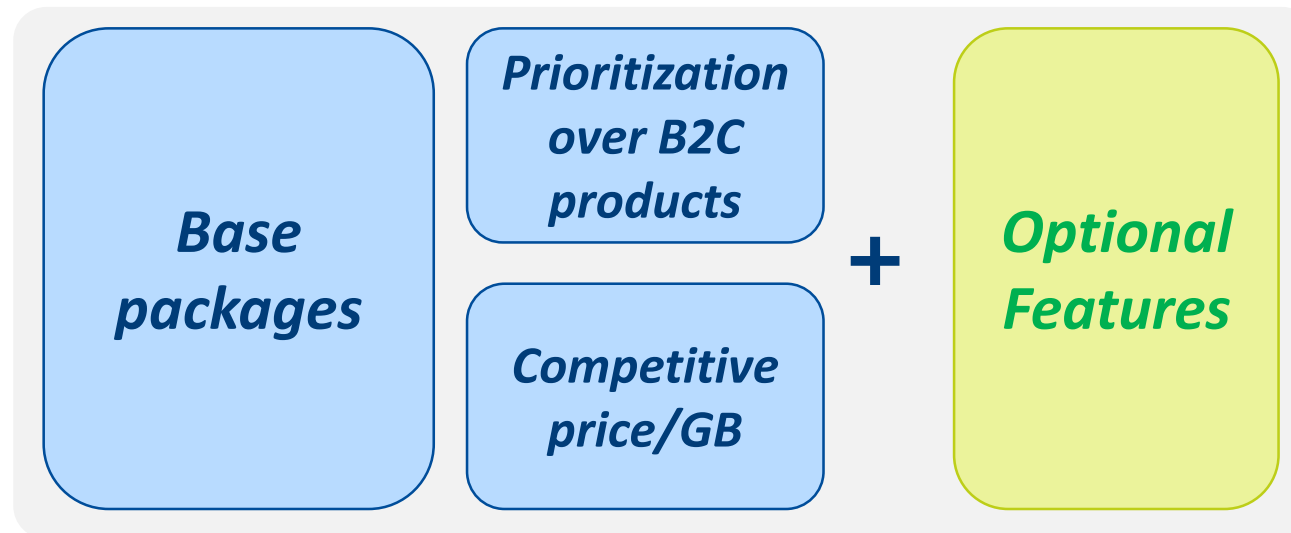
# B2B SERVICES - FLEXIBLE PORTFOLIO CONCEPT

## Drivers

- **Simplification**
  - Smaller, balanced portfolio, CIR unbundling
- **Value**
  - B2B-grade performance
  - More attractive volume bundles
- **Flexibility**
  - Options for CIR, IP etc.

## Constraints

- **Congestion**
  - Higher levels of allowance CIR require careful evaluation in the most populated beams
- **Quality of Service**
  - Superior performances compared to B2C needs to be guaranteed (conservative sizing and traffic shaping required)



## **KA-SAT supplies different solution for Virtual Network Operators:**

**→ The M-Beat Model**

**KA-SAT supplies different solution for Virtual Network Operators:**  
**The delivery of the traffic to a PoP of the traffic is almost a mandatory step in the management of the network**

## Multi-beam Best Effort Aggregated Throughput (M-Beat)

- M-Beat provides the Partner with bandwidth over selected beams and all customer terminals contribute to the maximum reachable peak rate ( $\equiv$  aggregated throughput, FWD + RTN) defined by the Partner
- The Partner could benefit of a CAP provided to limit the overall throughput of the M-Beat

## Service Profiles inside the M-Beat

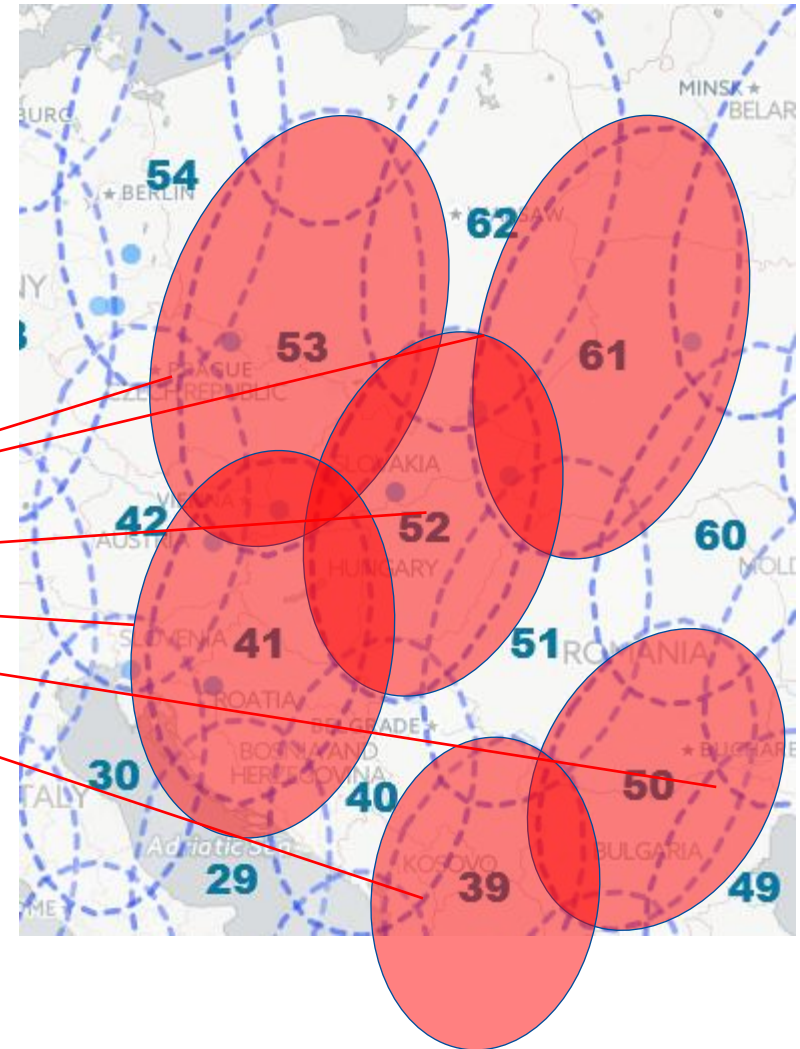
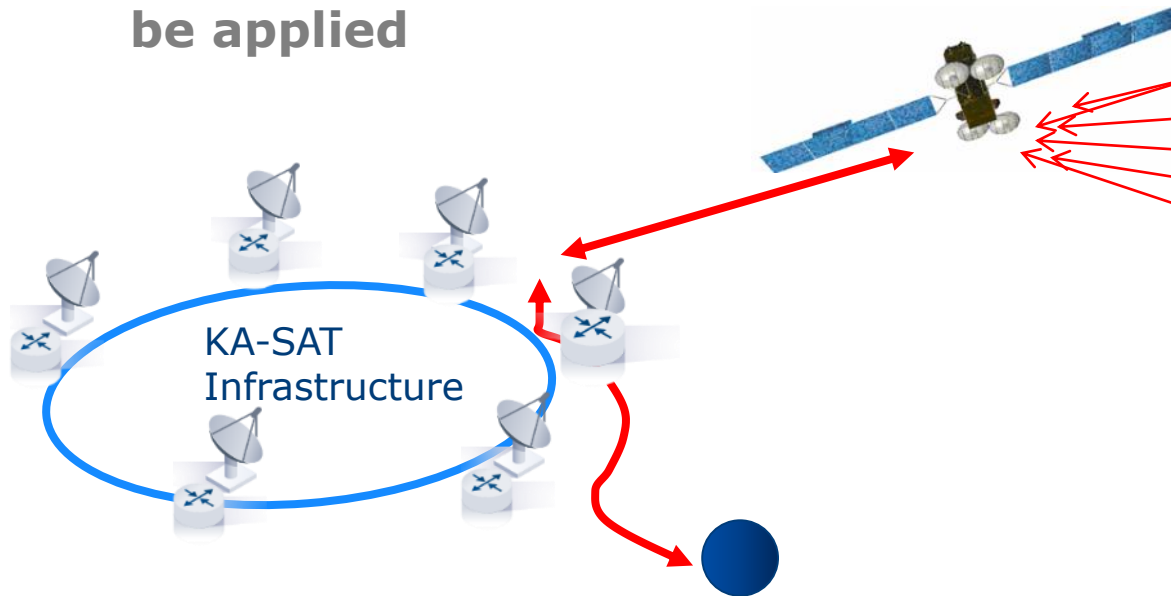
- Different products can be implemented to provide the end-users accounts with specific configurations through the M-BEAT service model: these products define
  - Best effort peak rates accessible to a single User Terminal
  - CIR\* data-rate at UT basis (customization)
  - Its monthly volume allowance (only for L3 services)
  - Service configurations such as the preferred IP allocation mechanism (only for L3 services)

*CIR\* : the sum of all the CIR must be less than the CAP of the M-Beat (if any)*



# M-BEAT SERVICE MODEL

- ▮ **The traffic generated by all the UTs / terminals inside each beam, included inside the M-Beat Model, is collected in the terrestrial infrastructure**
  - In the terrestrial infrastructure the overall throughput is accounted
  - If requested, a CAP of the throughput can be applied



# M-BEAT SERVICE MODEL FEATURES AND BENEFITS

## **/ M-BEAT Model is a B2B Service Model and has many benefits**

- H24/7 SLA
- VNO Service Models, full customization of the Services
- Fixed IP Addresses

## **/ Service Options**

- Traffic Delivery to PoP
- L3 or L2 (with Q&Q Encapsulation) support
- Multiple IP Addresses for each remote (up to 4 IPs, if Public from Customer Pool)
- Enhanced protocol acceleration for GRE tunnelling (optional)
- VoIP transport
- OSS Web Services

# KA-SAT TYPICAL APPLICATIONS

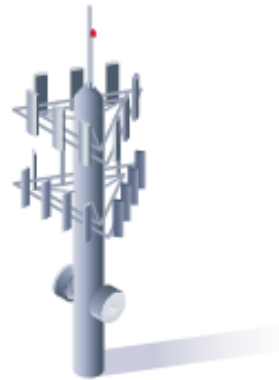


# PROFESSIONAL USE CASES

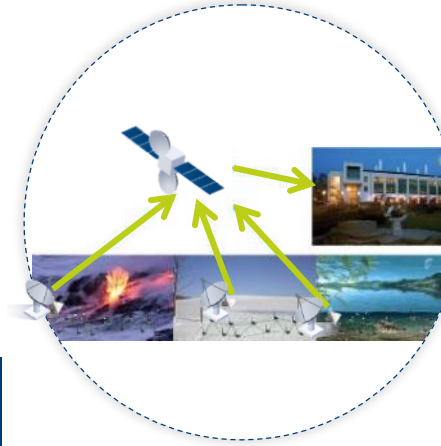
**Public Safety  
On-The-Spot  
Communication**



**Backhaul - Monitoring  
for cell sites and traffic offload**



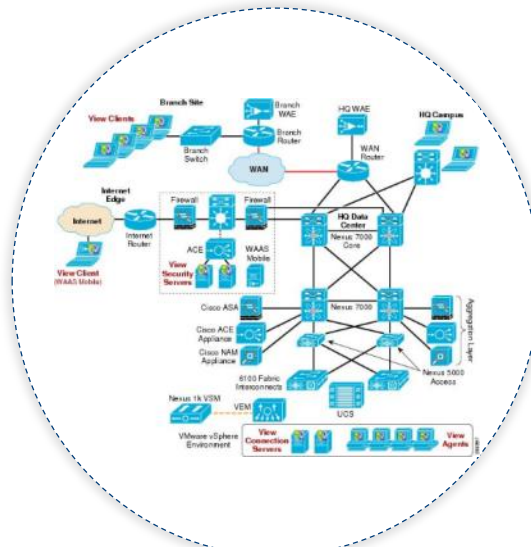
**Smart Grid  
& Utility operators**



**Temporary communication  
for disaster recovery**



**Backup of terrestrial  
Infrastructure**



**Video Surveillance  
Transmission**



**3 play services**

# TRIPLE PLAY SOLUTION

## **/ 1 dish + modem + STB for each household delivering**

- Internet access through Ka-Sat services
- Voice over IP through Ka-Sat services
- DTH Television through Ku fleet

## **/ Advantages**

- No upfront infrastructural cost
- Install = 1 subscriber
- Available everywhere even in most remote places
- Service speed and volume allowance adjusted to fit individual user needs
- Bundled billing
- Increase of loyalty/improvement of churn rates for triple play customers

## **/ With Eutelsat and the bundling between a DTH offering from the Eutelsat fleet and Ka-Sat Broadband offering, you manage to address a target market that today might be out of reach, and provide your customers with a full triple play offering**





# **KA-Sat in Security, Firefighting and Civil Protection**

# BROADBAND COMMUNICATION FOR FIRE BRIGADE TRUCKS

## Used by fire brigades in France

- Nomadic use to enable broadband data communication when working remote.
- Back-up for terrestrial Infrastructure of the fire brigades.
- Connectivity to locations with difficult access in the Alpes.



# Hospitality Marketplace



- // Camping and Hotels are a good vertical markets for seasonable services**
- // Internet access is a facility that is provided for free (or not completely) more or less in all vacation's areas/places**
- // Satellite access can be provided to improve the (already present) terrestrial connectivity or to provide primary connection to Internet**
- // The local distribution of the Internet access can be managed through WiFi access, managing properly the traffic locally**

# DIFFERENT TYPES OF TARGET SUB-SEGMENTS

## Hotels

→ Differentiation between:

→ Small <10 beds

→ Medium 10 to 80 beds

→ Above 80 beds

## Camping or holiday parks ([www.camping.info](http://www.camping.info))

→ Usually large population

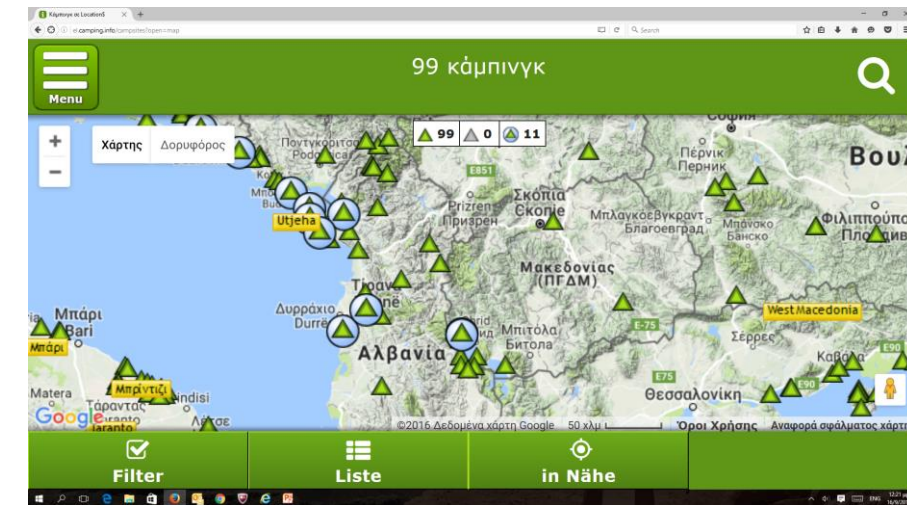
## Ski resorts ([www.skiresorts.de](http://www.skiresorts.de))

→ Primary need in east Europe

## Welfare

→ Barracks, refugee camps, remote worker camps

→ Hospitals, Rehabilitation Centres



# **Video surveillance with KA-SAT**



# VIDEO SURVEILLANCE WITH KA-SAT

## ✓ The solution

- Europe-wide satellite video surveillance at affordable cost, lightweight kit
- Fixed and nomadic terminals

## ✓ Addressable markets

- Gas, water, oil and electricity distribution
- Construction
- Civil Protection
- Border control and military
- Renewable energy production (Solar)

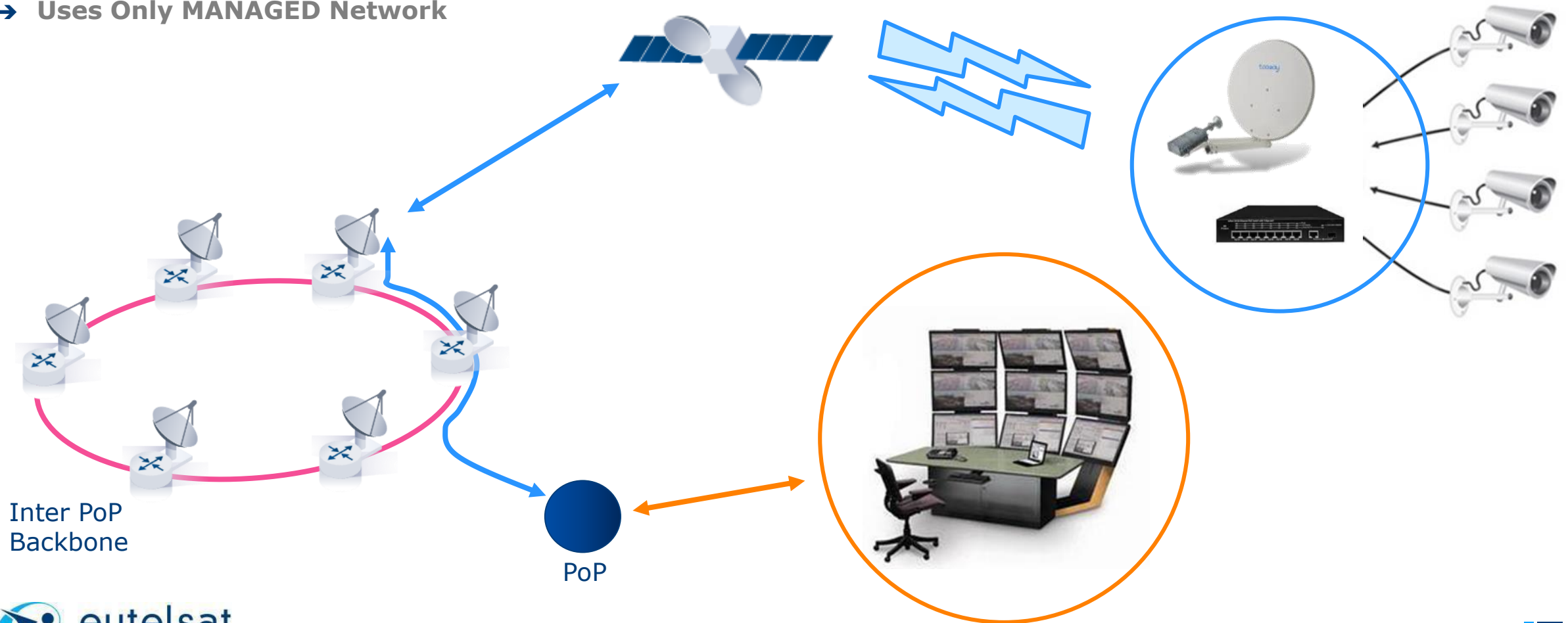
## ✓ Key applications

- Remote unmanned sites control
- Temporary surveillance
- Nomadic surveillance
- Wide area surveillance networks



# HOW TO OPERATE VIDEO SURVEILLANCE VIA KA-SAT – POP INTERCONNECTION

- ➔ Via IP over Satellite and Fiber Backbone – Fully Bidirectional
- ➔ Automatically Routed via a POP
- ➔ Uses Only MANAGED Network



# **Mobile Backhauling via Ka-Sat**

## **Typical applications of cellular backhaul via satellite include:**

- Backhauling coverage extension in rural and remote areas
- Backup of terrestrial broadband links
- Disaster recovery, coverage of special events
- Data Offload during peak hours or limited periods
- Small Cells backhauling

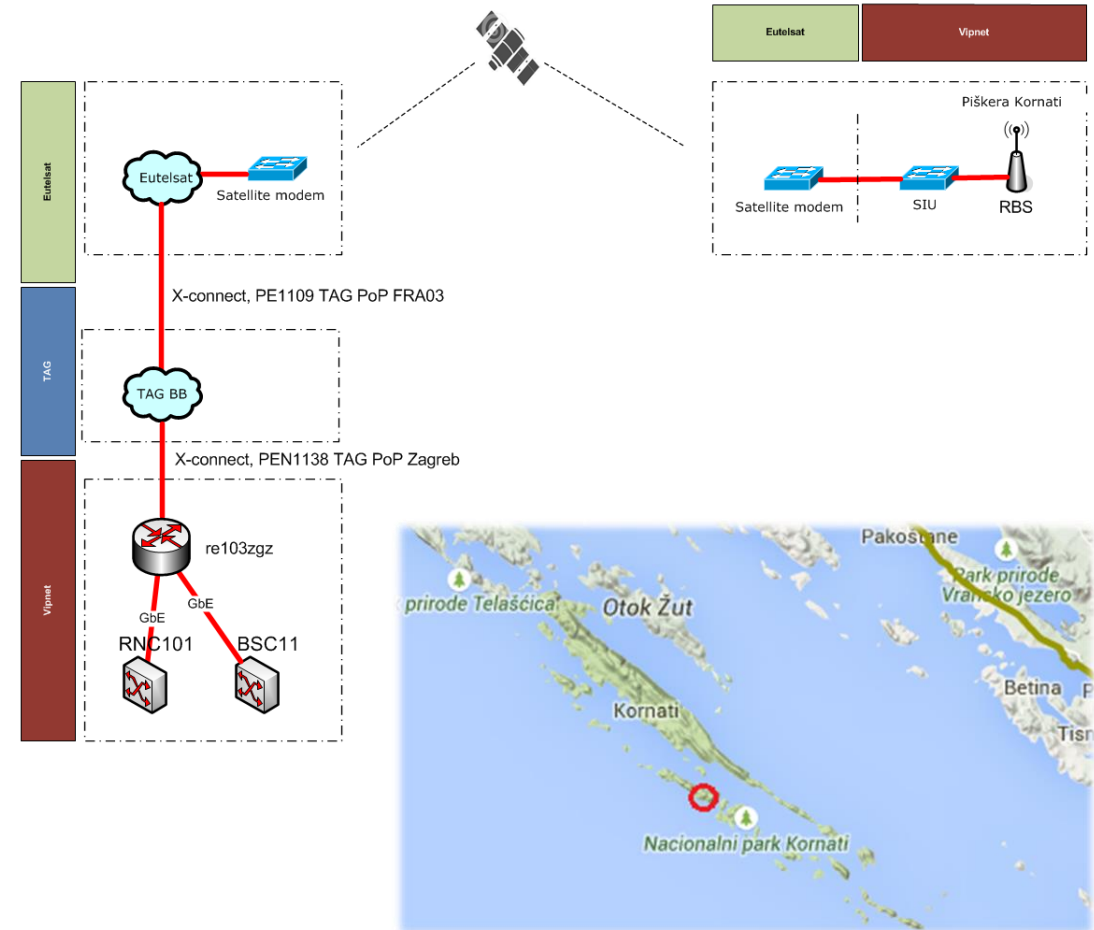


# MOBILE BACKHAULING - TAG CONFIGURATION

- ✓ **TAG has implemented an E2E backhauling solution for 2G (EDGE) BTS, 3G under test from VIPNet Croatia (TAG subsidiary)**
  - ➔ Based on a dedicated satellite capacity solution, it provides IP connectivity for remote/rural areas to BTS (2G)
  - ➔ The E2E solution foresees a terrestrial interconnection between the IP networks of VIPNet and Eutelsat (Frankfurt PoP), in order to collect and deliver the traffic generated by and for the BTSs
  - ➔ The E2E connectivity is managed with a Q&Q encapsulation, that permits an almost Layer 2 (ISO-OSI) connectivity between central site and remote site
- ✓ **The selected Service Model inside the Satellite is: IP-Connect**
  - ➔ The overall capacity is fully dedicated at Spot-Beam basis
  - ➔ Different products can be implemented to provide the end-users accounts with specific configurations through the IP-Connect service model
- ✓ **Currently are dedicated 1/1 Mbps (FWC/RTC) inside the Beam n°29 (Dalmatian area)**

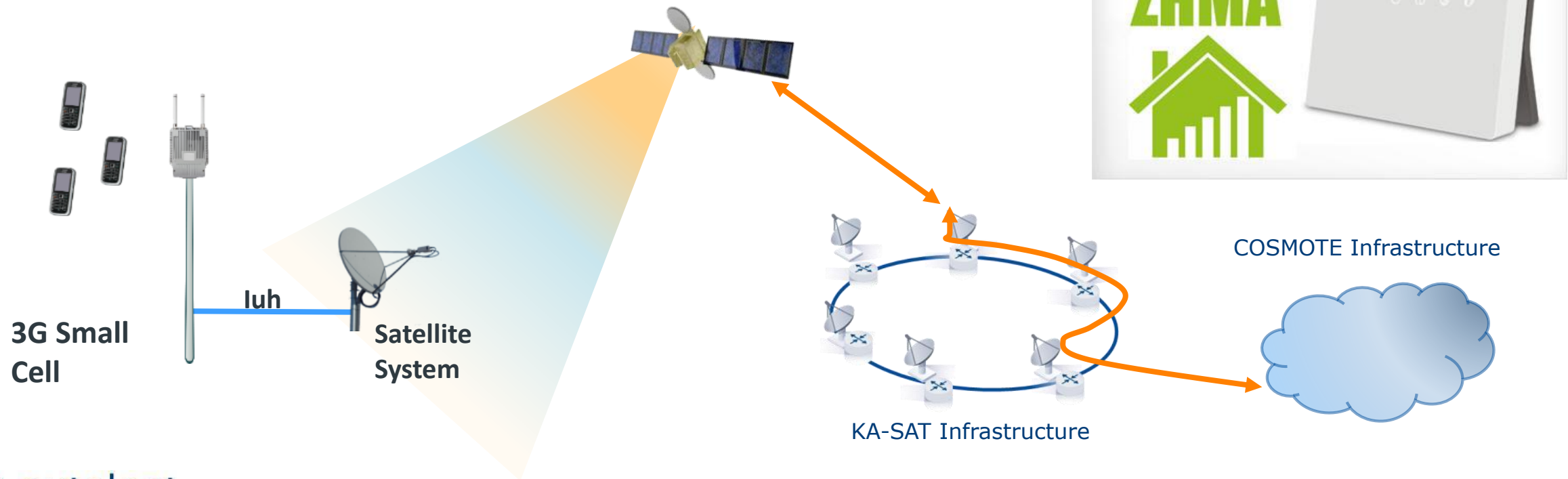
# MOBILE BACKHAULING - TAG CONFIGURATION

- /// **TAG-VIPNet topology:**
- /// **Tests performed on the satellite link both by Vipnet and Eutelsat**
  - 600-70ms RTT
  - ~ 4ms jitter
- /// **GSM technology – testing completed, implemented in production (512kbps/512kbps at start)**
  - Voice KPIs - OK
  - EDGE data performance - OK
  - 2 TRX – 4 EDGE TS + 13 AMR HR voice TS
- /// **UMTS technology – still ongoing**
  - Ericsson solution for Iub over satellite is much more complex than for Abis over satellite
  - Dedicated RNC needed with specific parameters for satellite backhauling
  - Still working and planning to implement Iub over satellite



# OTE/COSMOTE COMMERCIAL USE

- OTE has commercially deployed our Tooway Satellite Broadband Internet for consumers which is tested and can be used together with Cosmote "Teleio Sima" which is a small cell 3G provided to end users for home usage



# CONTACT US

**[www.eutelsatbroadband.com](http://www.eutelsatbroadband.com)**

**[presales@skylogic.it](mailto:presales@skylogic.it)**

**[www.linkedin.com/company/eutelsat-broadband](http://www.linkedin.com/company/eutelsat-broadband)**



**Thanks for Your Time!!**