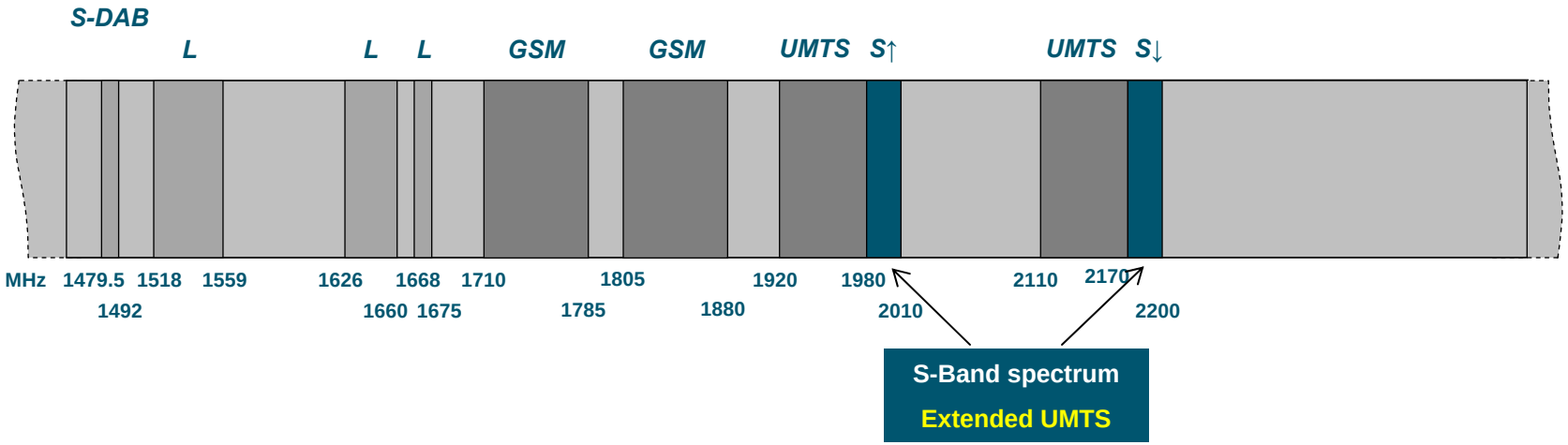
Presentation to PSCE

Helsinki – May 29th, 2012

Solaris Mobile in a snapshot

- Mobile Satellite Company - a 50/50 JV between Eutelsat and SES
- With 2x15 MHz of 2.1 GHz spectrum (extended-UMTS) over 27 Member States in EU – possible extension to Switzerland and Norway
- Spectrum band of SML can be exploited in direct communication with satellite and via a terrestrial complementary ground network (CGC)
- SML has secured MSS licensing in 20 Member States, others are under negotiation
- Positioned in the market primarily as a capacity provider
- Acting as an ‘S-band’ ecosystem developer
- SML Owns an S-Band payload on the satellite Eutelsat 10A (former W2A) – launched in 2009
- SML required to decide on a satellite re-investment by end 2013

SML Spectrum Sits Directly Adjacent to European 3G UMTS Band 1



- 30 MHz of valuable spectrum directly adjacent to European 3G UMTS Band 1 available in all 27 EU Member States
- Virgin spectrum – free of use
- Existing 3G base stations cost effectively modified/ upgraded to operate in the SML spectrum band
- RF planning & approval process simplified compared with other new frequency bands due to proximity to UMTS
- Spectrum can be configured as TDD(1) or FDD(2) to enable optimal use of available spectrum
- Spectrum is not subject to auction and has been granted for a minimum of 18 years from 13th May 2009
- S-Band spectrum can be used for 3G or for LTE

Notes: (1) Time Division Duplex
(2) Frequency Division Duplex1

Our understanding of the PPDR market context in the broad sense

- Broadband mobile data is becoming **mission critical** for
  - Public Protection and for Disaster Rescue organization
  - Safety organization at large (key utilities network gaz /power/water, key infrastructures road and rail , …
- Mobile data is a key **efficiency enabler** in the public sector and the private sector alike:
  - An 'extension' of the office out of the 4 walls
  - A way to shorten time for intervention and decisions
  - A way to share same level of situational awareness among al
- There is a significant **latent demand for high capacity / high functionality** Public Safety networks
- PPDR sector alone is in need of an equivalent of **2x16 MHz of spectrum** – ideally below 1GHz
- PPDR and other critical community service providers are in need of a 'special treatment' of a different status for the optimal fulfillment of their missions they are in need of **dedicated** , **protected , harmonized** spectrum resource across 27 Member States to reap the benefits of **network availability**, **economies of scale** and **interoperability across borders**
- However, the **decision** on dedication of spectrum resources for PPDR has been **postponed to the WRC 2015** at earliest
- Furthermore, Member States investment **budget under pressure** due to economic slump and PPP operators are often subject to stringent investment rules
- Worse than everything, the spectrum freed below 1GHz is often perceived as **golden opportunity for Governments to resolve deficit** by conducting spectrum auctions among commercial entities, making the reource even more scarce for the enlarged PPDR community

PPDR
- S Band an option for bridging the broadband gap ?

The S-Band attributes for bridging the PPDR broadband Gap

- **Spectrum availability:**
  - Virgin spectrum available till 2027 – 2 x 15 MHz
  - Harmonized in 27 Member States
- **Technology availability :**
  - S-Band (2170-2200/1980-2010) – study item at 3GPP ,
  - Likely availability of standardized user's equipments and RAN in S-band by Q4 2013
  - 'Proprietary equipments' could be available earlier if required
- **Cost effectiveness :**
  - reduced costs of terrestrial development due to base station/backhaul re-use ('must carry' rule)
  - Benefits of lower technology costs / equipment costs (Off the shelf - ruggedized)
  - Satellite coverage reducing need for terrestrial network development
- **100 % coverage network**
  - Availability of data communications for operations on land, over seas, and/or air borne
- '**dedicated' network**
  - Ability to engage in either shared networks with stringent pre-emption rights for PPDR (cost benefits)
  - Ability to engage in a fully dedicated network on land, sea and in the air
- **Redundant network**
  - Satellite segment « taking over » from terrestrial network in case of significant disaster

PPDR
- S Band complement to Tetra

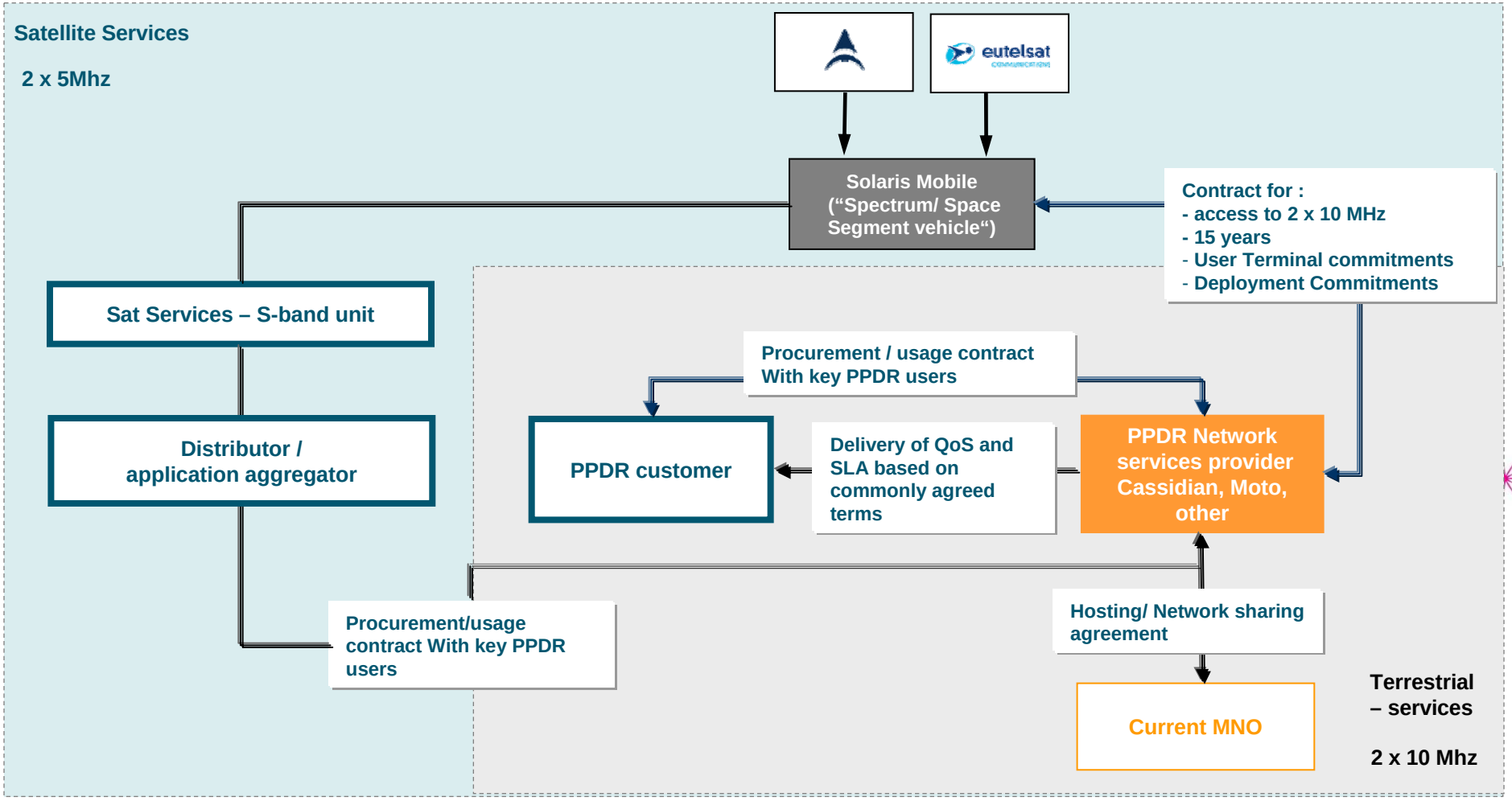
The S-Band best fit for data is to be deployed for complementary use to Tetra

- **Tetra / tetrapol best fit for:**
  - Voice
  - Small data transfer - messages
  - PPDR specific applications : group calls and
- **S-band / extended UMTS or LTE best fit for :**
  - Broadband Data – file tranfer to CC , or for ‘mobilization’ office (ex file inquiries in the field)
  - Mobile data - video capture in motion (service vehicle, situational awareness (uav’s, airborn resources)
  - Broadcast/narrowcast/unicast of datafiles, videos

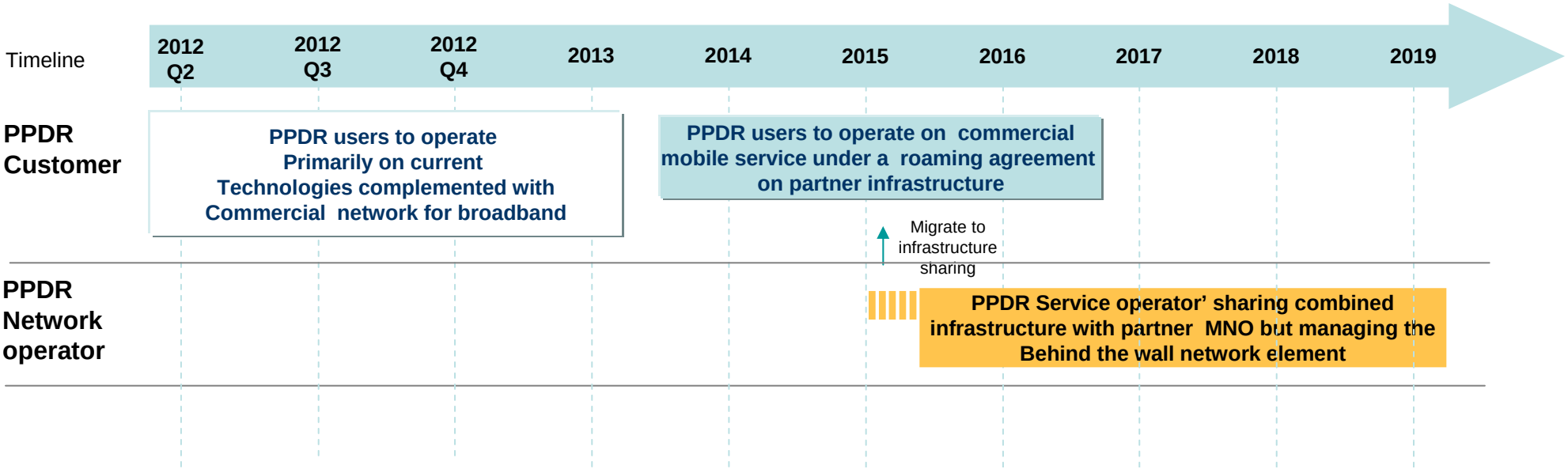
S-Band positioned as a complementary network to existing resources available to the PPDR community

Potential collaboration structure

- illustration of a potential partnership structure between Solaris Mobile and the PPDR customer and service providers



PPDR-
S-Band a controlled path to a dedicated terrestrial broadband network



Key assumptions

Development Phase –

- No willingness to remain dependent from commercial network
- Willingness of user's to accept trade off of <1GHZ spectrum for Time to market
- Willingness of governments to reduce TCO of 2Ghz networks by imposing must carry

Operational Phase – Mutual obligation for system to hold

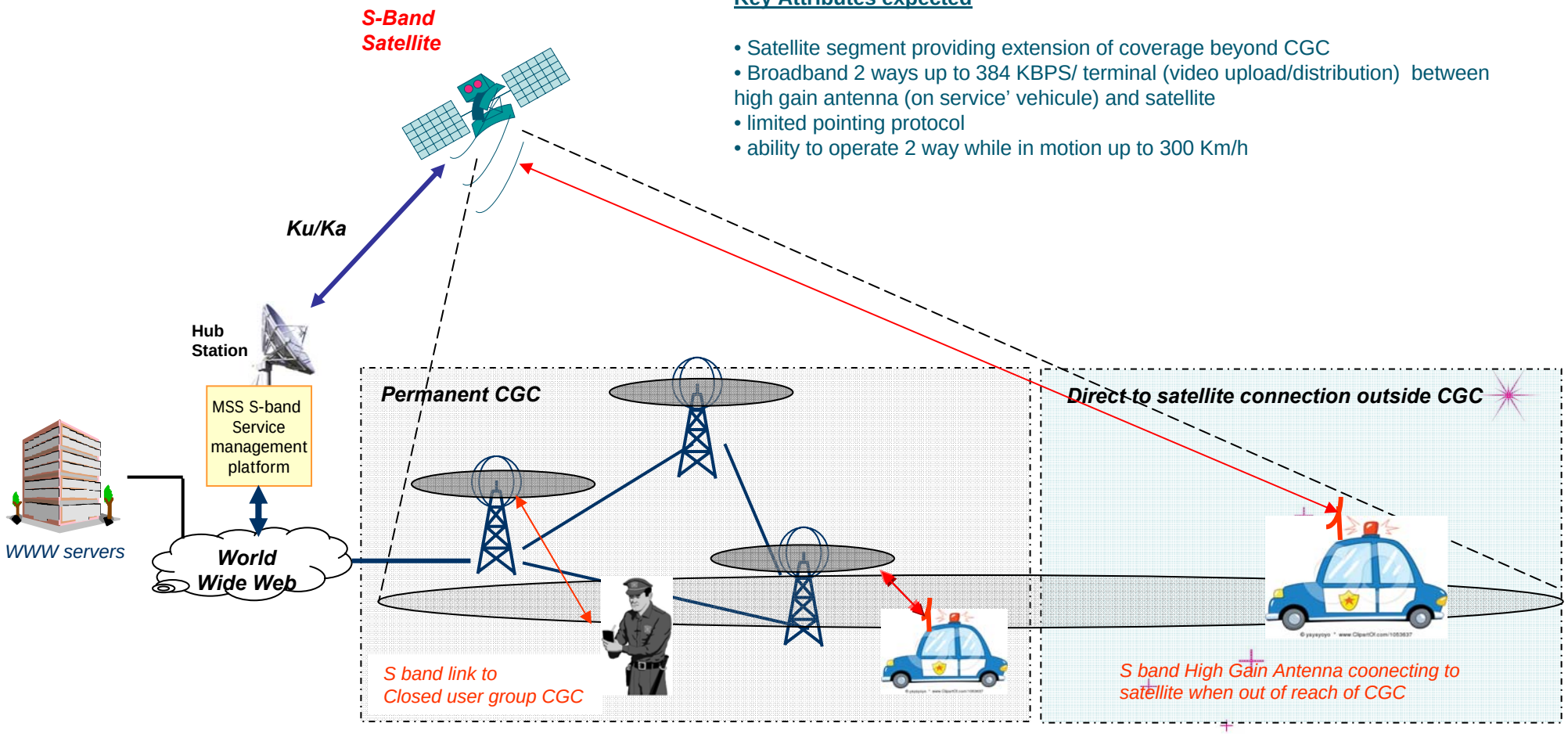
- MNO's willing to accept host PPDR network in exchange of roaming agreement followed by a network sharing agreement
- Minimum cost of spectrum imposed by the NRA's
- Commitment to invest in RAN by current PPDR network service provider (coverage of TBC % of population)
- Financial guarantee by PPDR network service provider / or LT revenue commitments provided to SML.
- Ability for PPDR network service provider to exit after 8 years of operations
- Commitment of PPDR network service provider to support 3GPP standardization of S-Band

PPDR & S-Band - Benefits analysis for the

- **PPDR users :**
  - Plan towards a dedicated, harmonized, pan European broadband network
  - Keep control on a portion of the shared network over the Long run
  - Best in class TCO (assuming ‘must carry’ on existing ‘real estate’ and backhauling and use of CoTS technologies)
  - Time to market for dedicated network is shorten due to the concept of inland roaming agreement.
  - Additional benefits due to satellite use : coverage, redundancy in case of major satellite failure, ability to address land, maritime and airborne operations
- **Infrastructure partner :**
  - Access to additional capacity (more to the 3G/4G resource pool)
  - ‘Protection’ of their business and co-opetition with MNO’s :
  - Limited to no build out required to illuminate the spectrum (cheaper and faster than 800 MHz)
  - Unconstrained deployment (ie spectrum to be deployed only in area that are in need for capacity)
  - Incremental efficiencies : Reduced cost / MB as fixed costs are shared among more participants
- **Solaris Mobile**
  - Optimal deployment of spectrum resources (terrestrial and satellite)
  - Pan European market play enabling to engage in standardization of 3GPP for PPDR
  - Accelerated development of technological eco system

Key PPDR requirements - Public Protection 1 – Day to day operations

Land based – PP1 – Day to day operations

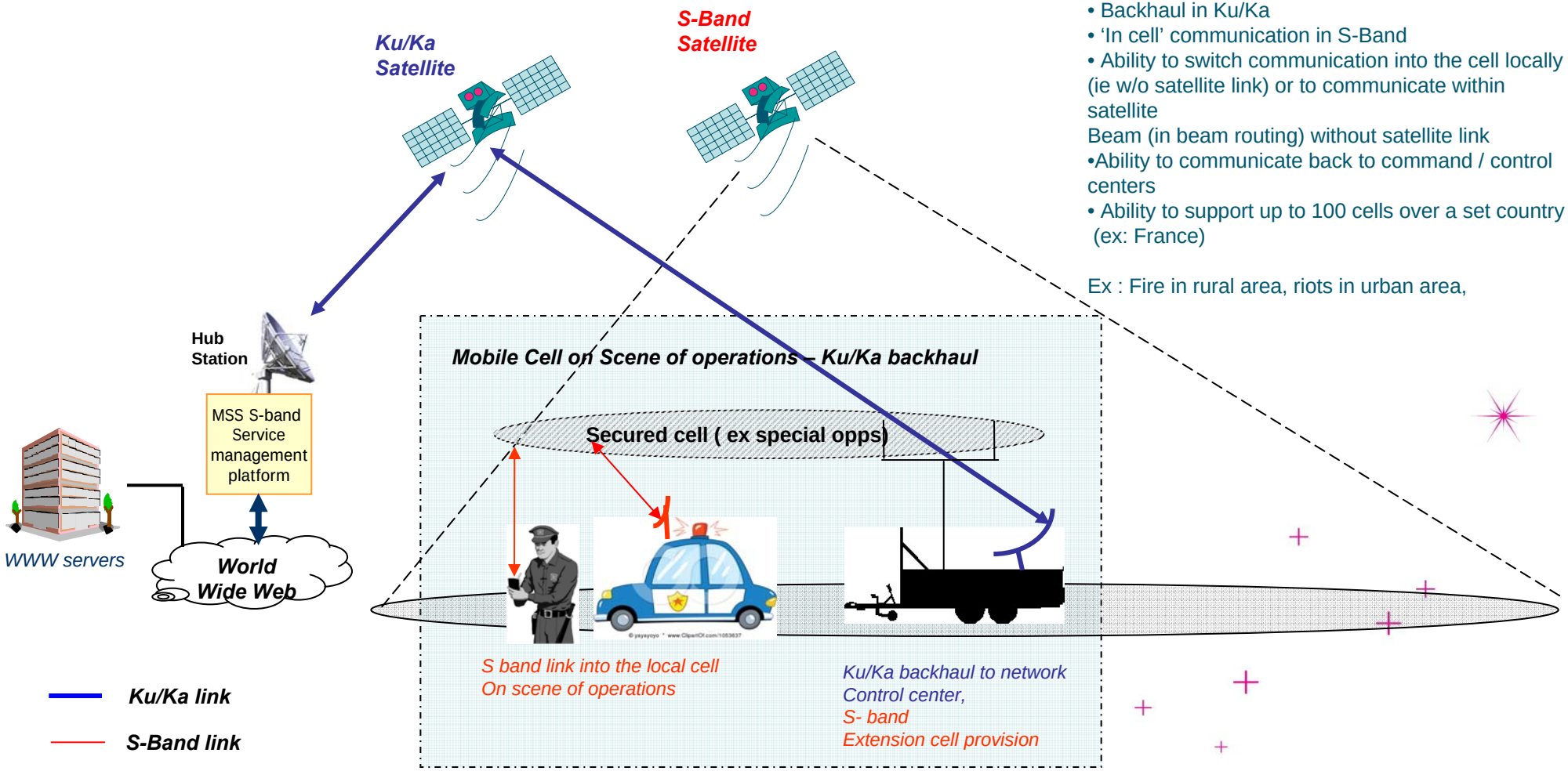


Key Attributes expected

- Satellite segment providing extension of coverage beyond CGC
- Broadband 2 ways up to 384 KBPS/ terminal (video upload/distribution) between high gain antenna (on service' vehicule) and satellite
- limited pointing protocol
- ability to operate 2 way while in motion up to 300 Km/h

Key PPDR requirements - Public Protection 2 – Special events/ emergencies

- Land based – Extended Cell for emergencies or special event



Key Attributes expected for extended cell

- Backhaul in Ku/Ka
- 'In cell' communication in S-Band
- Ability to switch communication into the cell locally (ie w/o satellite link) or to communicate within satellite
Beam (in beam routing) without satellite link
- Ability to communicate back to command / control centers
- Ability to support up to 100 cells over a set country (ex: France)

Ex : Fire in rural area, riots in urban area,

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