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Proposed LTE 4G Mobile Network Architecture



Tactical User Requirements

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Unified and dependable access to comms and services in rapidly changing contexts across multiple agencies in a dynamic network topology

- Unified communications across multiple parties, groups, platforms.
- Out of coverage – ‘Bring your own network’ (BYON)
- Search and Rescue – Positioning/detection of victims & search teams
- Pop-up ‘bubbles’ of sterile 4G coverage on demand.
- Access to localized services, e.g. for command & control



Private LTE Network System – Recent Project Scope

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- **Fixed Sites**
 - 700MHz – Band 17 or 28
- **Four (4) Mobile Sites**
 - 700MHz – Band 17 or 28
- **IP Mesh interconnect between Mobile Sites / Fixed Sites**
- **IP Bridge (point to point) interconnect between Fixed Sites**
- **Handsets**
 - Dual Active SIM phones (ASUS/Samsung) Android 5 (Lollipop)
- **Application Support**
 - Push to Talk Radio Bridge
 - Video Streaming
 - SWARM
 - Internet Access (email, browser, social networking)





Tactical - Deployable Public Safety Solutions

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■ Fixed Sites

- Nokia Band 17 or 28 (700MHz) LTE radio
- Three Sector, 2 x 2 MIMO
- High gain sectored panel antennas
- Interconnect – Wireless bridge
- Centralized LTE Network Core – 2000 users with direct connection to application servers/internet



■ ECX Tactical 4G MacroNET

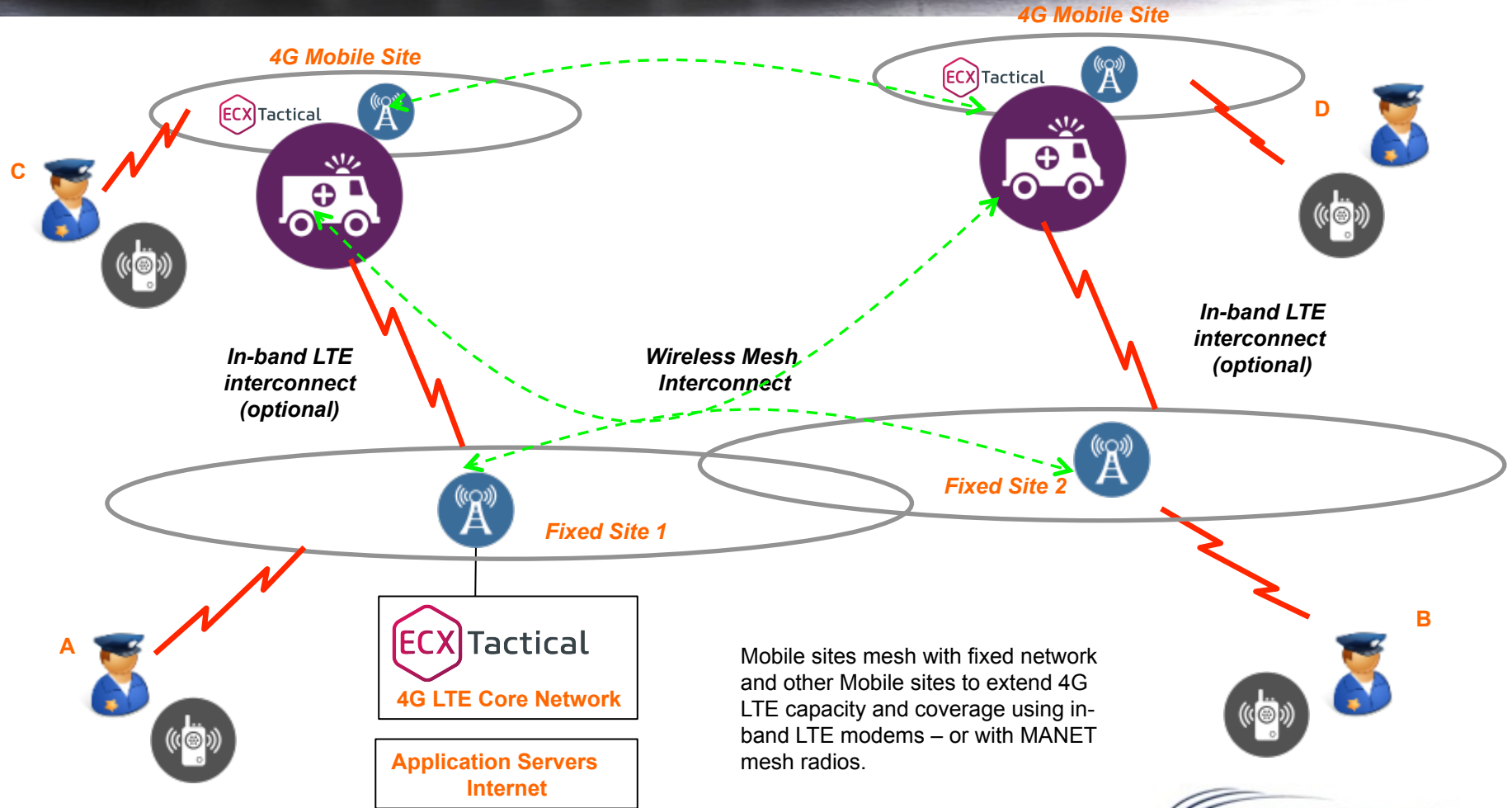
- Nokia Band 17 or 28 (700MHz) LTE radio
- Single sector, 2,x 2 MIMO
- Vehicle mount Omni-directional antennas
- Interconnect – Wireless mesh bridge
- Interconnect – optional in-band LTE modem
- Local LTE Network Core – 64 users – allows standalone operation





Tactical Fixed Site / Vehicle Site Architecture

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Mobile sites mesh with fixed network and other Mobile sites to extend 4G LTE capacity and coverage using in-band LTE modems – or with MANET mesh radios.

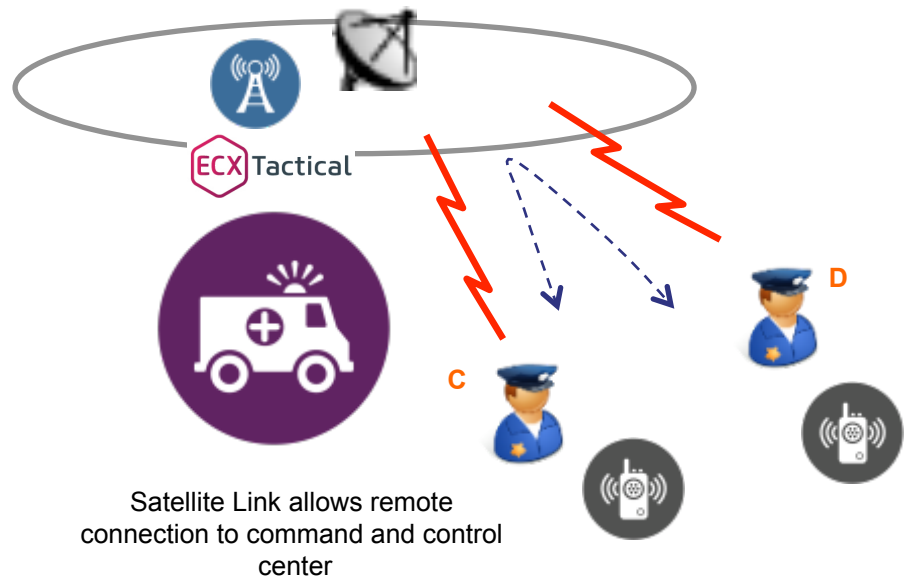
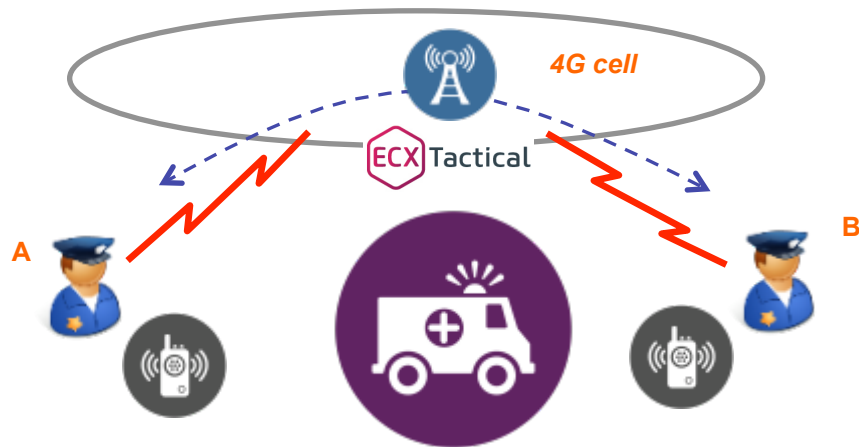




Tactical Standalone 4G LTE Footprint

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- Vehicles in 'Standalone' mode
- Out of range of Fixed Network
- Local communications only

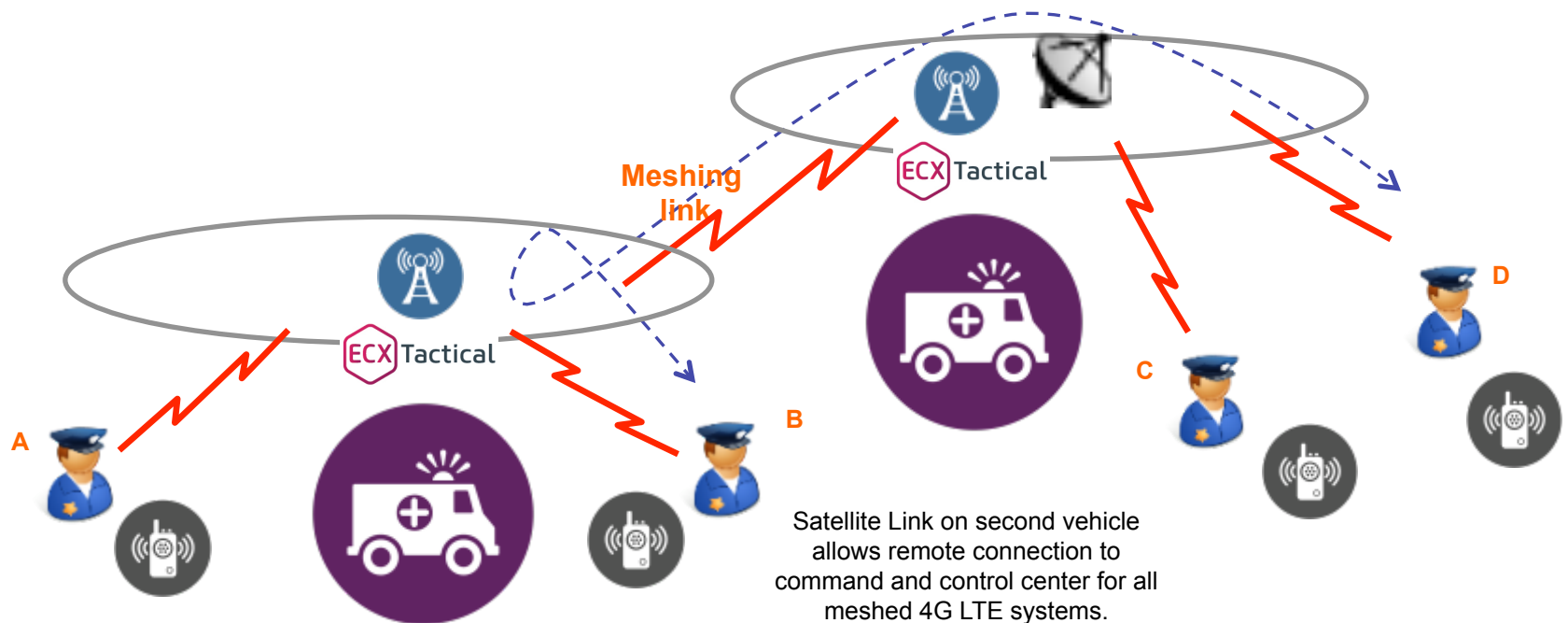




Tactical Automatic Meshing

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- Vehicles approach & mesh together
- Communications between all users



Interconnect between vehicles is either MANET or LTE modems

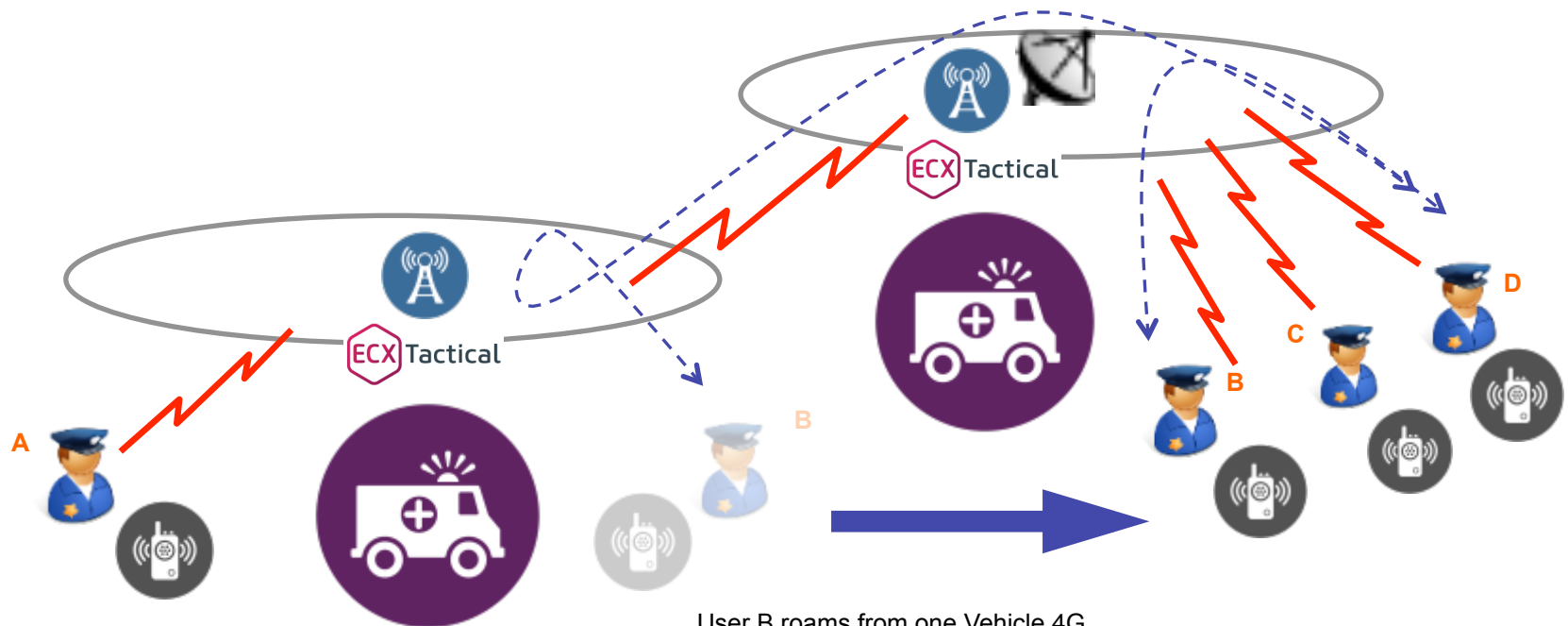




Tactical Mobility between Vehicle Networks

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- User B changes host vehicle
- Data session remains active



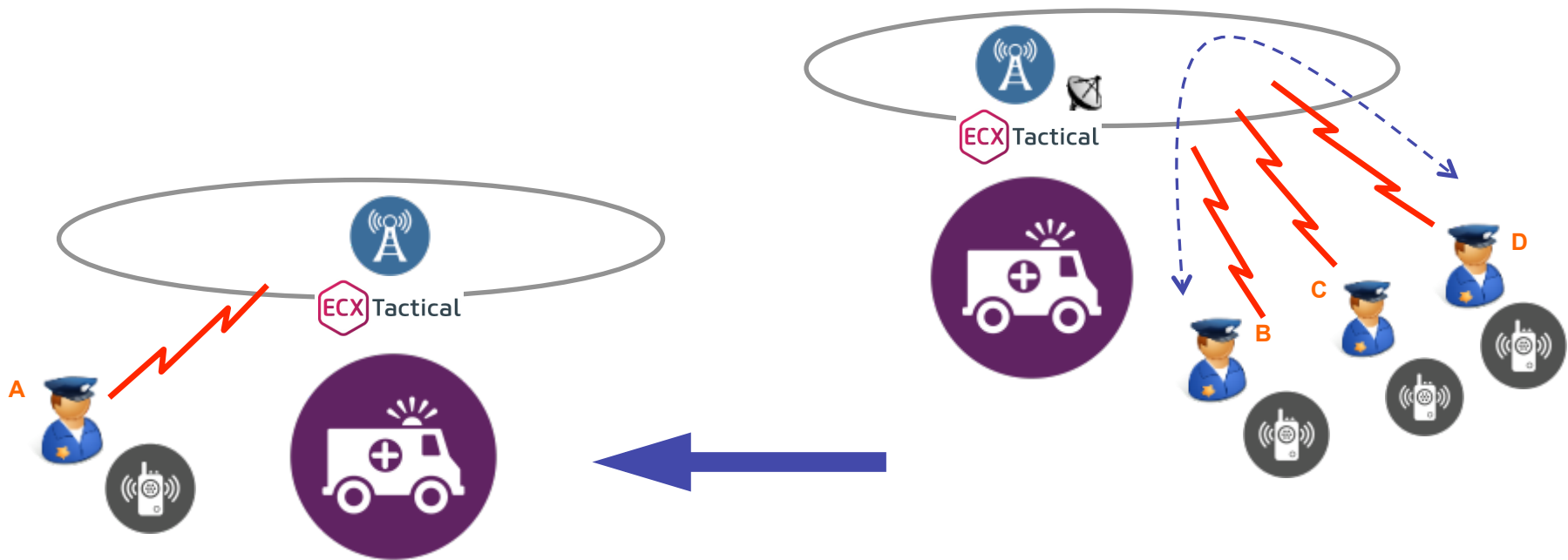
User B roams from one Vehicle 4G network to the other without dropping the ongoing secure data session



ECX Tactical Flexible Deployment

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- Vehicles separate again
- User B maintains active session

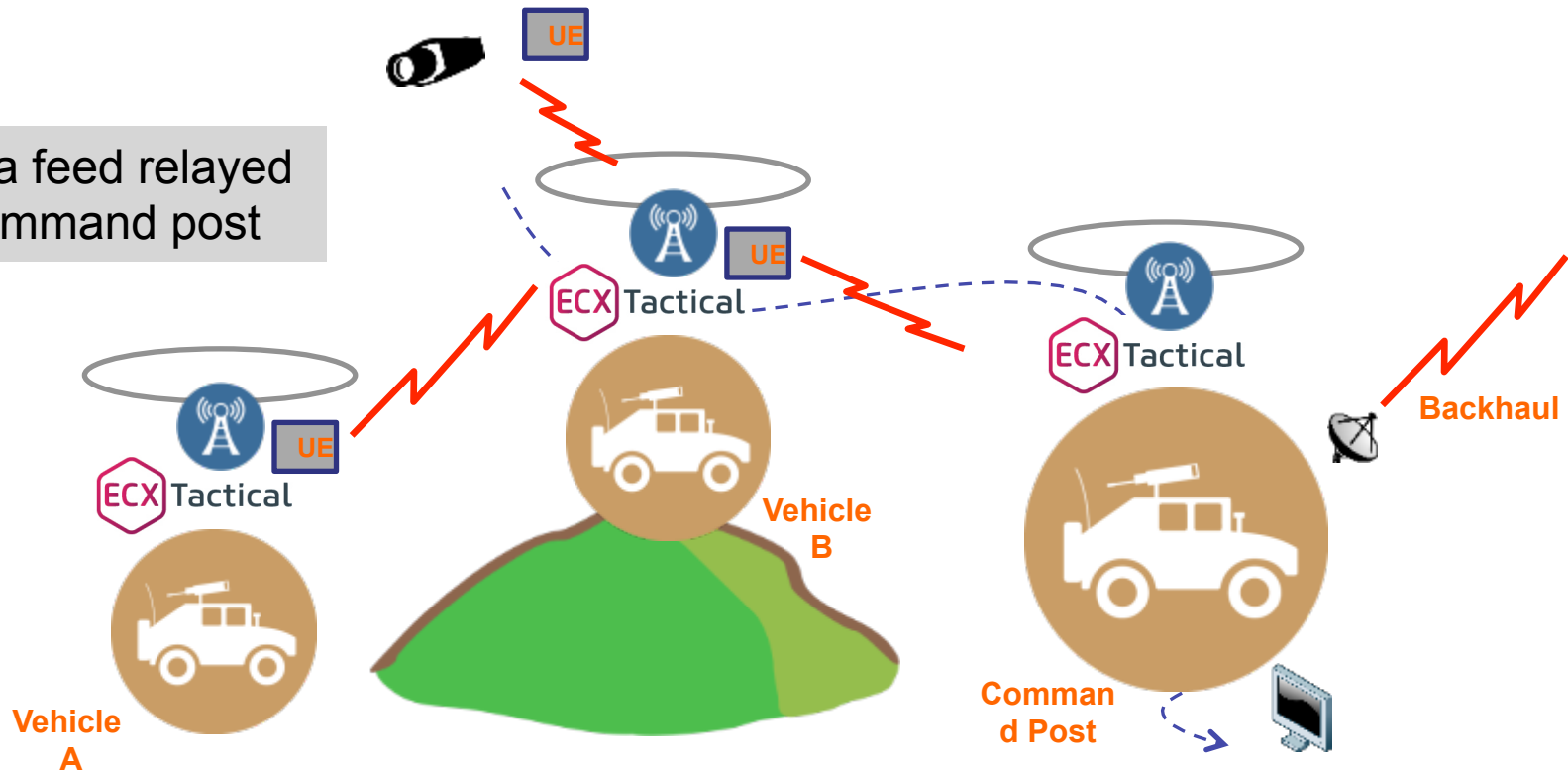




Tactical Convoy Example – Remote Sensors

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Camera feed relayed to command post

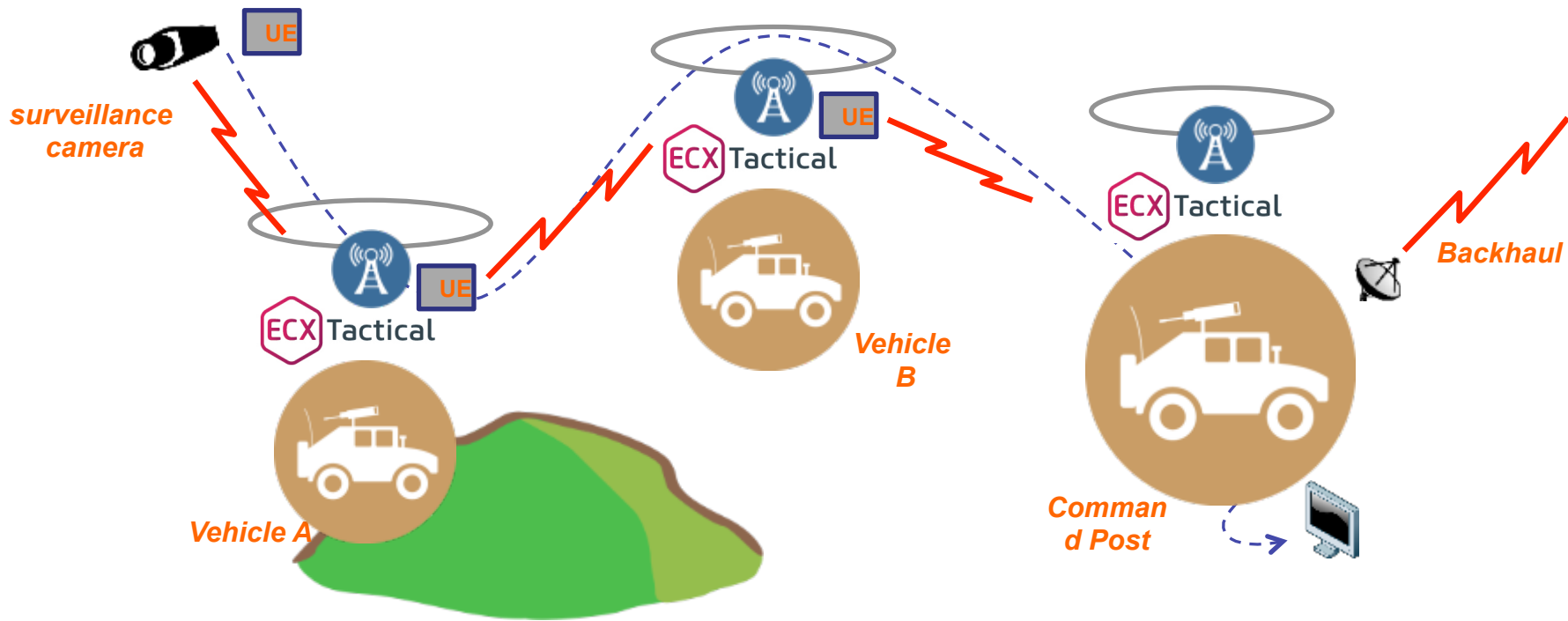




Tactical Convoy Example – Remote Sensors

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Camera feed transparently maintained





Tactical - Capabilities

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- Suitable for vehicle fit, technically and economically
- Scalability: Up and Down
- Solution for macro network interference mitigation
- Minimal changes to macro network
- Hand in/out between GW and macro, maintaining secure session
- Allow standalone use
- Secure, locally and end-to-end
- QoS managed voice & data, even in secure tunnels



MACRONET 4G LTE System

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Q2/2014

- Now 5U case
- 40lb lighter
- 60Mbps/20Mbps (REF-US Army)
- Optional LTE-Advanced
- Carrier Aggregation

- High Capacity – up to 600 simultaneous RABs
- Large Coverage FootPrint (48 miles @ 250ft)*
- 2 x 2 MIMO Radio - 150Mbps shared data per sector
- Carrier Grade – reliable and dependable
- Integrated ECX LTE Network Core
- Voice over LTE, LTE SMS, MultiCast (IGMP), LTE Mobility and Meshing options
- Optimized for Satellite Backhaul
- Upgradeable to LTE Advanced >300Mbps shared data per sector

For Official Use Only



MICRONET 4G LTE System

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- High Capacity up to 400 RABs
- Small Size – portable– Rugged Packaging
- Nokia FlexiZone - MicroCell
- 2 x 2 MIMO Radio – 2 x 5W per TRX
- Carrier Grade – reliable and dependable
- Integrated ECX Tactical Network Core
- Voice over LTE, LTE SMS, MultiCast (IGMP), LTE, IP Mobility and Meshing options
- Optimized for Satellite Backhaul

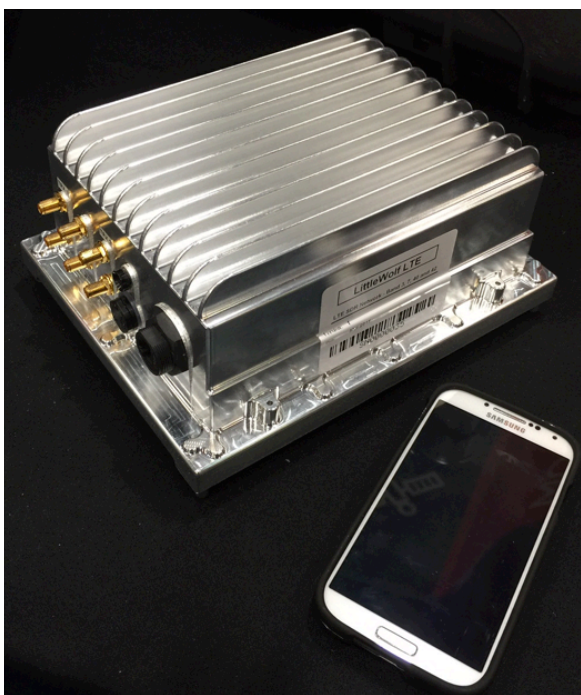


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LittleWolf 4G LTE System

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- High Capacity up to 32 RABs
- Small Size –Rugged Packaging
- LittleWolf eNodeB
- Quad Band – FDD/TDD – Band 3, 7, 40, 42
- 2 x 2 MIMO Radio – 2 x 1/2W per TRX
- Optional Frequency Agile Output
- Integrated ECX Tactical Network Core
- 12VDC or PoE+ power input
- SWAP: 12" x 6" c 6", 5lbs, 20W
- Voice over LTE, LTE SMS, MultiCast (IGMP), IP Mobility and Meshing options
- Embedded backhaul modems

