



C4I Transformation & Spectrum Challenges

WINNCOMM-EUROPE 2016

Radio Communications Products BL
Tactical Products Business Segment

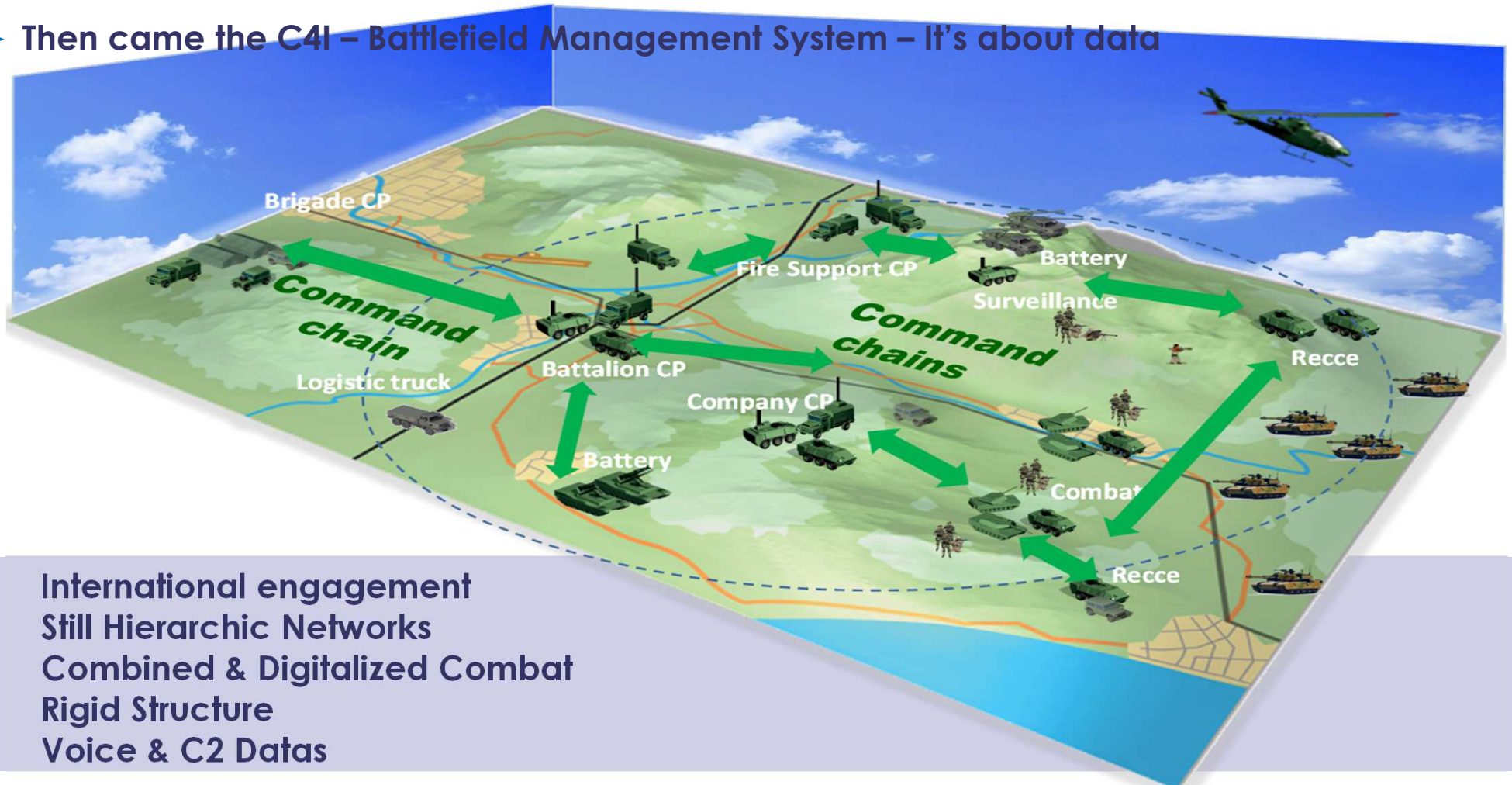


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Today's Operational Needs

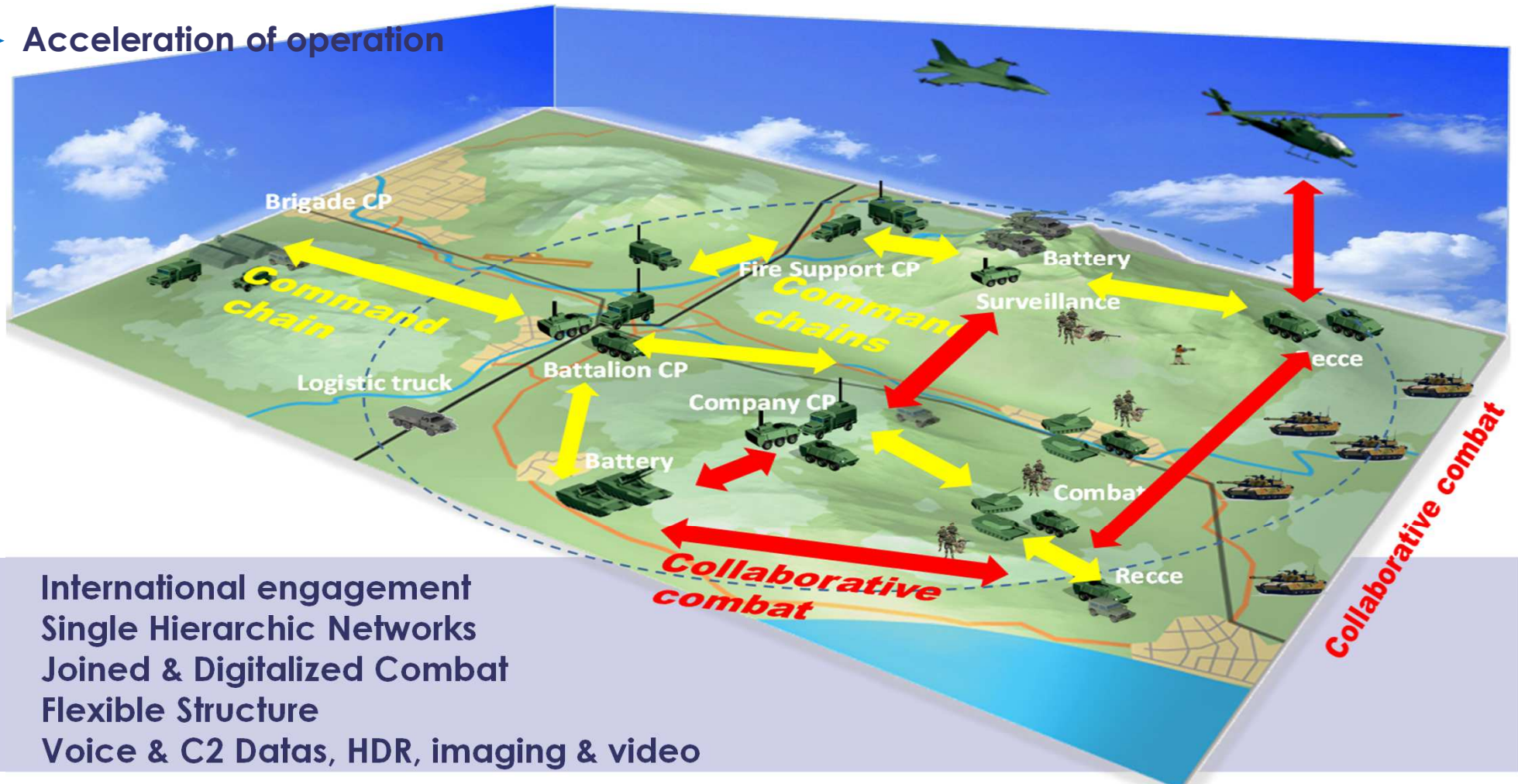
Then came the C4I – Battlefield Management System – It's about data



- International engagement
- Still Hierarchic Networks
- Combined & Digitalized Combat
- Rigid Structure
- Voice & C2 Datas

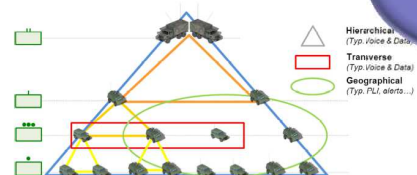
Tomorrow's Operational Needs

Acceleration of operation



- International engagement
- Single Hierarchic Networks
- Joined & Digitalized Combat
- Flexible Structure
- Voice & C2 Datas, HDR, imaging & video

Enhanced SDR Solution



Transverse
& Geo

Security
& Range

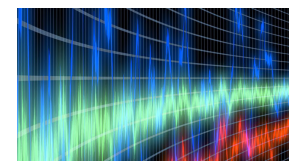


Voice

Interoperability



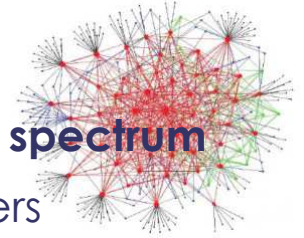
Spectrum
Efficiency



Military spectrum : a pincers situation

New systems NCW/C4ISR require more and more spectrum

- C4I transformation : more nodes, more services, more networking, ...requires **more spectrum**
- **Coalition** operations, available resources to be shared (splitted) between members



Spectrum resources decrease while system capabilities and complexity increases

- More than 1 GHz of MIL spectrum released since WRC-07
- More than 2 GHz at stake for the WRC-19



Threefold solution

- Improve military systems **spectrum efficiency**
- Anticipate technical and regulatory mechanisms for military systems to have access to civil/commercial spectrum (**dynamic spectrum**)
- Request **more spectrum** (terrestrial, aeronautical, satellite applications)



Tactical Communications & Spectrum Challenges

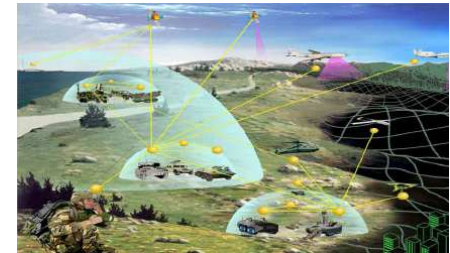
Specificities of military networks, a few reminders

- Operational ability to deal with large spectrum of conflicts : low to high intensity, spectrum denied environment or not
- High flexibility, transportability & mobility, no infrastructure, unpredictable
- International Coalition & cemic



Spectrum and EW

- High diversity of electromagnetic environments
- EW threats : a reality
- Spectrum is more than a communication ressource for the battlefield
 - New concept of EM spectrum operations is emerging
 - Spectrum Situational Awareness



**Areas of WINNF efforts
Spectrum Management,
Coalition....**

Opportunities for Resarch & Innovation in the field of wireless

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2016 Wireless Innovation Forum European Conference on
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11-12 October Conference • 10-14 October Technical Exchange Meeting

Thales • Paris, France



All, Academic, SMEs & Large Industries, End Users to work on these challenges

**Rich conference
& tracks**

Tactical
Communications & SDR

SDR Standards

Dynamic Spectrum

Commercial Wireless
Technologies

France DGA Innovation
projects from the Rapid program

