Welcome to

GEOINTELLIGENCE ASIA PACIFIC 2016

Lt Gen AKS Chandele
Geospatial Media & Communications
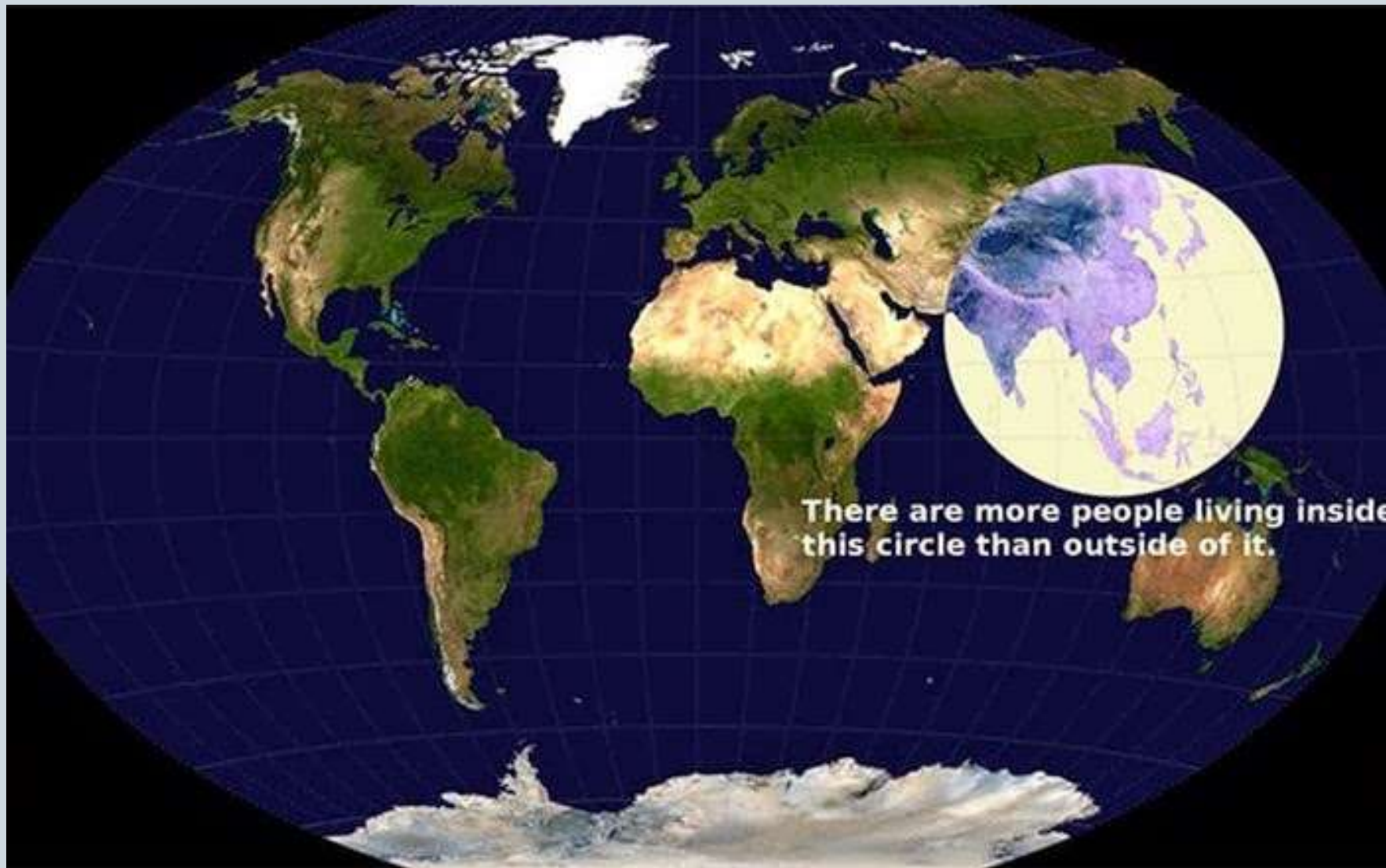
There are more people living inside this circle than outside of it.

NETWORK CENTRIC WARFARE

•NCW is characterised by exponentially enhanced situational awareness, decision making, dissemination of information and precision strike capability.

•Essential requirements of NCW are :
   -Sensors
   -Networked communications
   -Data integration and analysis
   -Decision support system
   -Information sharing s
   -Network enabled platforms

NETWORK-CENTRIC WARFARE
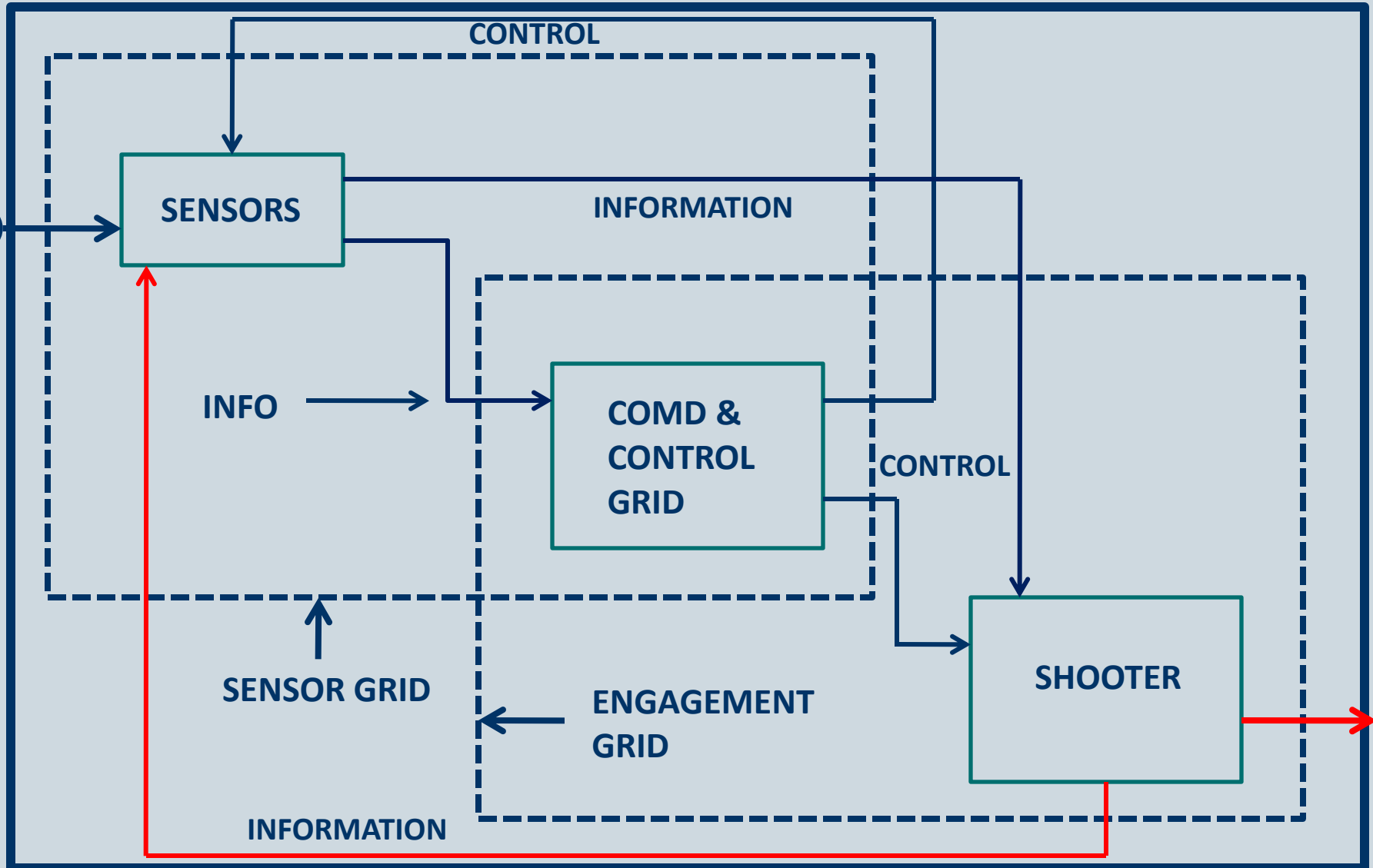
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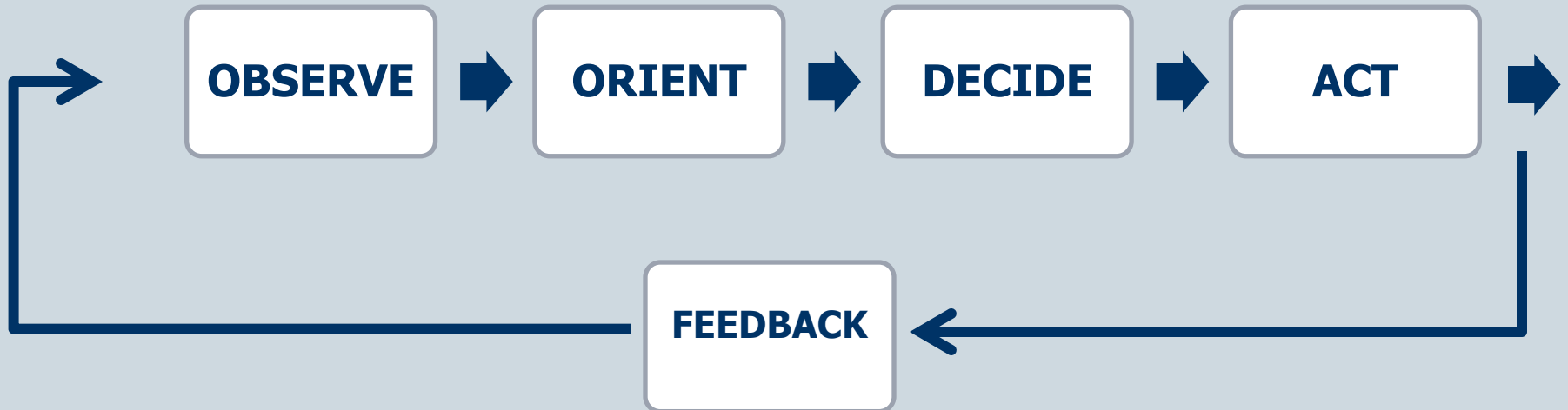
SENSING

- **DIRECT**
  - Touch(x), Smell(x),Taste(x),Hear(✓),See(✓).

- **INDIRECT**
  - SENSORS

    Telescope, Binocular, EO devices, TI devices, IR, RADAR, SONAR.
  - PLATFORMS

    Underwater, underground, ground based, aerostats, UAVs, aircraft(AWACS), satellites.

DEFENCE & HOMELAND SECURITY REQUIREMENTS

- MAPS AND COMPASSES HAVE BEEN THE BASIC TOOLS FOR MILITARY PLANNING.

- ADVANCEMENTS IN COMPUTING & INFORMATION TECHNOLOGIES HAVE REVOLUTIONISED THE DEPICTION, INTEGRATION, VISUALISATION & ANALYSIS OF SPATIAL DATA.

- INTEGRATION OF SPATIAL DATA AND ITS VISUALISATION ARE VITAL FOR MODERN WARFARE.

- USERS CAN BUILD INTERACTIVE 3-D PRESENTATIONS OF THE REAL WORLD, USING HIGH RESOLUTION IMAGES.

GEOSPATIAL INTELLIGENCE

"THE EXPLOITATION AND ANALYSIS OF IMAGERY AND GEOSPATIAL INFORMATION TO DESCRIBE, ASSESS, AND VISUALLY DEPICT PHYSICAL FEATURES AND GEOGRAPHICALLY REFERENCED ACTIVITIES ON THE EARTH"

- **DATA + INFORMATION + KNOWLEDGE(about adversaries)** that can be referenced to a particular location on /above /below earth's surface.

- **Intelligence gathering methods could include :**
  - IMINT(Image intelligence)
  - SIGINT(Signal intelligence)
  - MASINT(Machine intelligence)
  - HUMINT(Human intelligence)
  - OSINT(Open source intelligence)

Security is essential for development.

Any country should be able to defend itself from external aggression and protect it's citizens from internal strife and terrorist activities, before it can embark on development activities.

Geospatial technologies enable nations to carry out this task effectively

Much as security is a prerequisite for development, geospatial technologies are essential for security to be effective.

Asia Pacific is an economically dynamic zone, with countries of the region making efforts to achieve political stability and steady economic growth.

<u>Destabilising factors</u>
-Territorial disputes
-Ethnic minority issues
-Separatist movements
-Islamic extremist groups

Threats to security

International terrorism
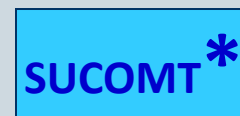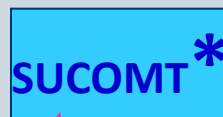
Drug & human trafficking

Money laundering

Arms smuggling

Piracy

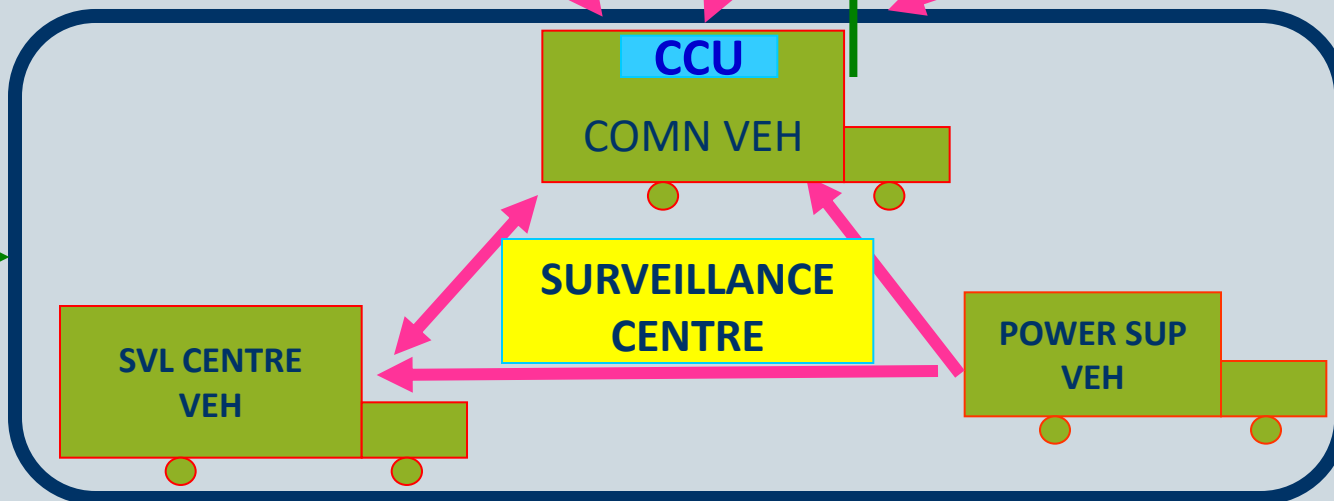# SURVEILLANCE ARCHITECHTURE

SENSORS

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SVL COMN
TERMINAL

SUCOMT *

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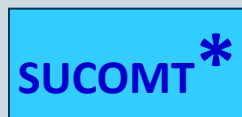
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COMN VEH

SURVEILLANCE CENTRE

SVL CENTRE
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POWER SUP
VEH

- Modern warfare is characterised by **C5I2TSR** (Command,Control,Communications,Computers,Combat systems,Intelligence,Interoperability,Surveillance and Recconaissance).
- These are largely dependent on availability of Geospatial Information.
- NCW cannot be successful if Geoint is not timely,accurate,precise and fit for the purpose.
- GIS infrastructure for military applications must address :
  - Integration of ISR with time and space contextualisation
  - Interoperability of data and software.
  - Ensure seamless flow of information from battle space sensors to the warfighter across challenging environments.
  - Should permit simulation and visualisation of plans over space

CHALLENGES

INTEROPERABILITY-   **Large No of wpn systems-smart sensors,comn networks, servers,desktops,thin clients,HH sys, embedded HW/SW,complex platforms--- need to be networked**

SECURITY-   **Comn network should be fully secure, have features-real time intrusion detection systems,multiple alt channels—to ensure security of info+combat elements ,should be robust, redundancy**

ADAPTABILITY-   **Unlike past, non conventional ops, diverse terrain, frequent grouping /regrouping.GIS infra should be capable of adapting to these changes**

SCALABILITY-**Capable of absorbing future tech and ever increasing client base**

COST & COMPLEXITY-**To ensure optimal deploy & utilisation cost and complexity are imp considerations**

BANDWITH

GLOBAL GEOPOLITICAL SCENARIO

- US possesses practically unmatched economic and military power with global force projection capabilities.

- Despite the overwhelming preponderance between its power and that of any other nation, the United States' ability to influence outcomes in the Asia Pacific region appears to be diminishing.

- Other political groupings are taking shape, paving the way for a multipolar world

- Global economic and military power is gradually shifting from the West to the East. Asia is emerging as the CG of global power.

DEFENCE FORCES AND HOMELAND SECURITY AGENCIES MUST BE ABLE
TO OVERCOME THESE CHALLENGES & EXPLOIT THE BENEFITS OF GEO SPATIAL TECHNOLOGIES, ENSURING. SECURITY AND INTEGRITY OF INFORMATION

BANDWIDTH

-Ever increasing demand for freq spectrum for civil use is reducing the defence services share of EM spectrum

-Military ops rely heavily on radio comns. For comd, control, coord, lgs, wpn & surveillance systems. Joint ops further increase this demand

-Electro Magnetic Space(EMS) is the real time spectral density in a geographic area. It has three dimensions :
    --Geographic loc, spectral density and real time

-Electro Magnetic Battle Space(EMBS) is a subset of EMS, in which the EM spectrum war is fought

-Efficient management of EMBS necessary to ensure its optimal utilisation

-An automated SEMBS mgt will help in optimising the planning and utilisation of spectral resources in space and time, in an intense, dynamic and mobile battle environment