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Defence Science & Technology Agency

10th ICCRTS - The Future Of C2

The Harbour Defence IKC2 Experience

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SINGAPORE QUALITY CLASS

Experiment Objectives

- Observe
  - See first, see more
- Orientate
  - Understand faster and better
- Decide
  - Decide better and faster
- Act
  - Act decisively

Experiment Objectives

- Introduce network centric capability using Service Oriented Architecture, to provide interoperability and pervasive accessibility to information and C2 services for all players.

Design Methodology

- Adopt Web Service as an enabler for SOA
  - Built on top of XML
  - Web service as a wrapper for existing applications
  - Web service abstracts functionality across one or more applications
  - Publishes interface contract in the form of WSDL, an XML format of the service specifications

Web Services Design

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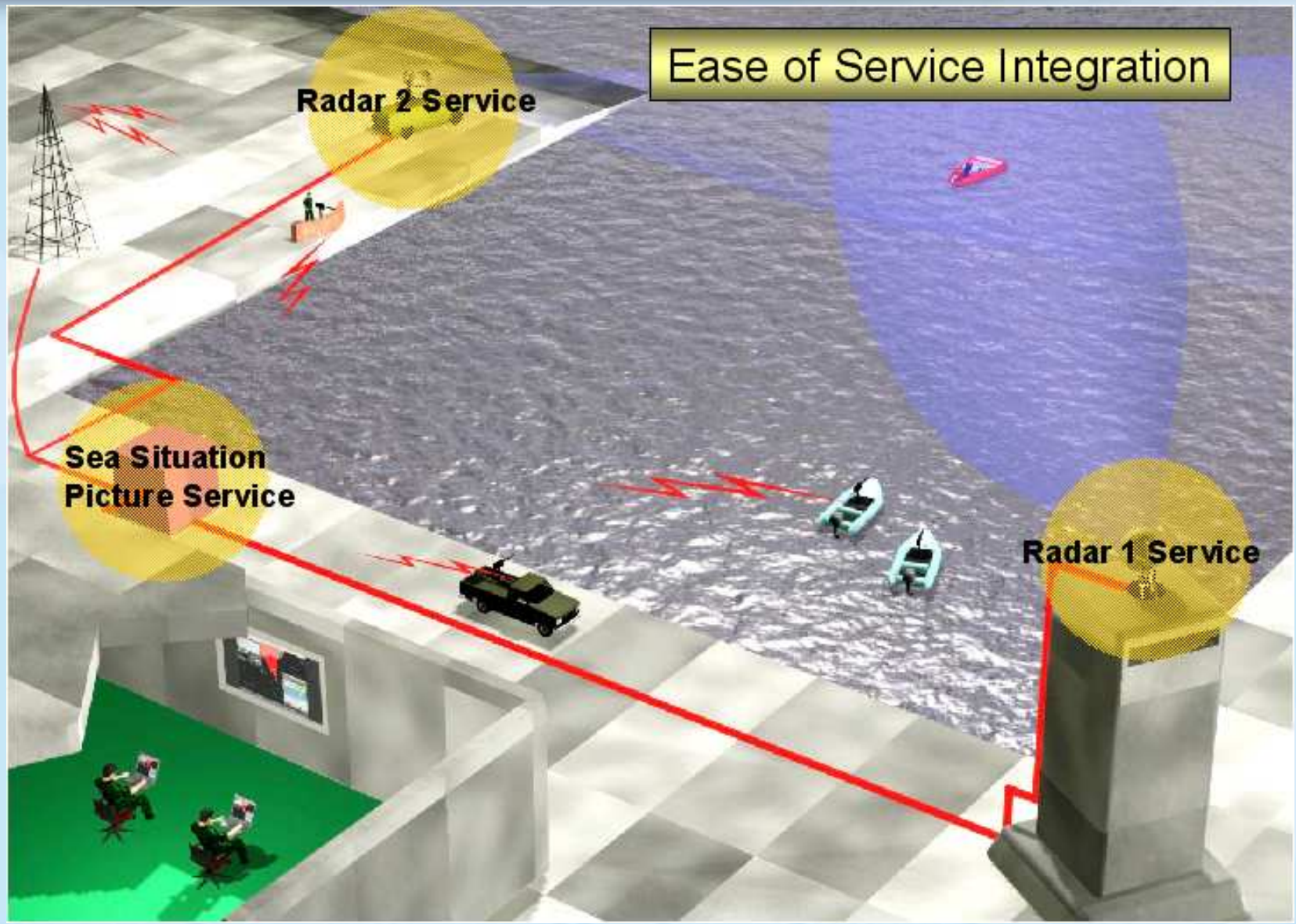

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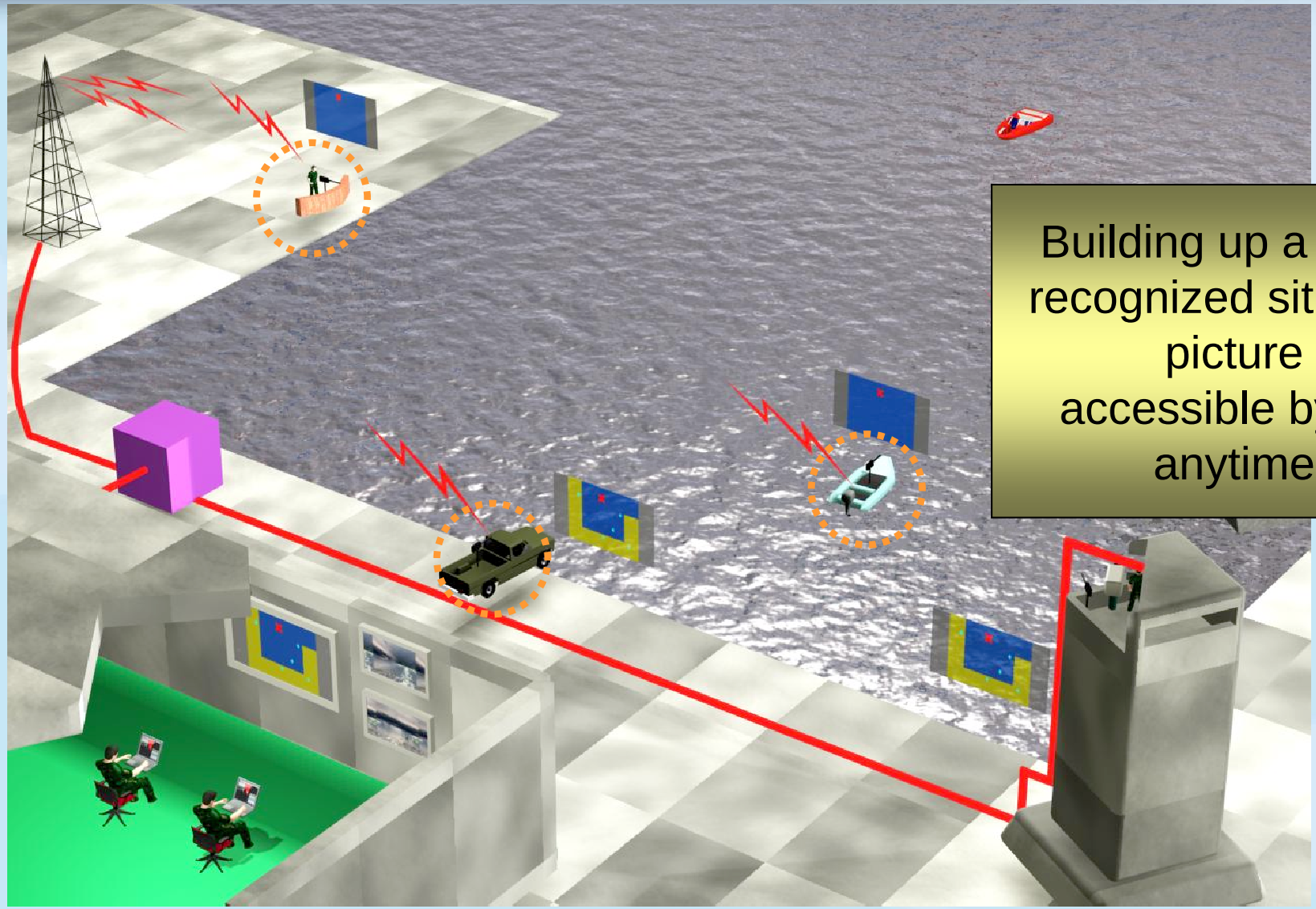

Building up a basic recognized situation picture accessible by all, anytime

Web Services Design

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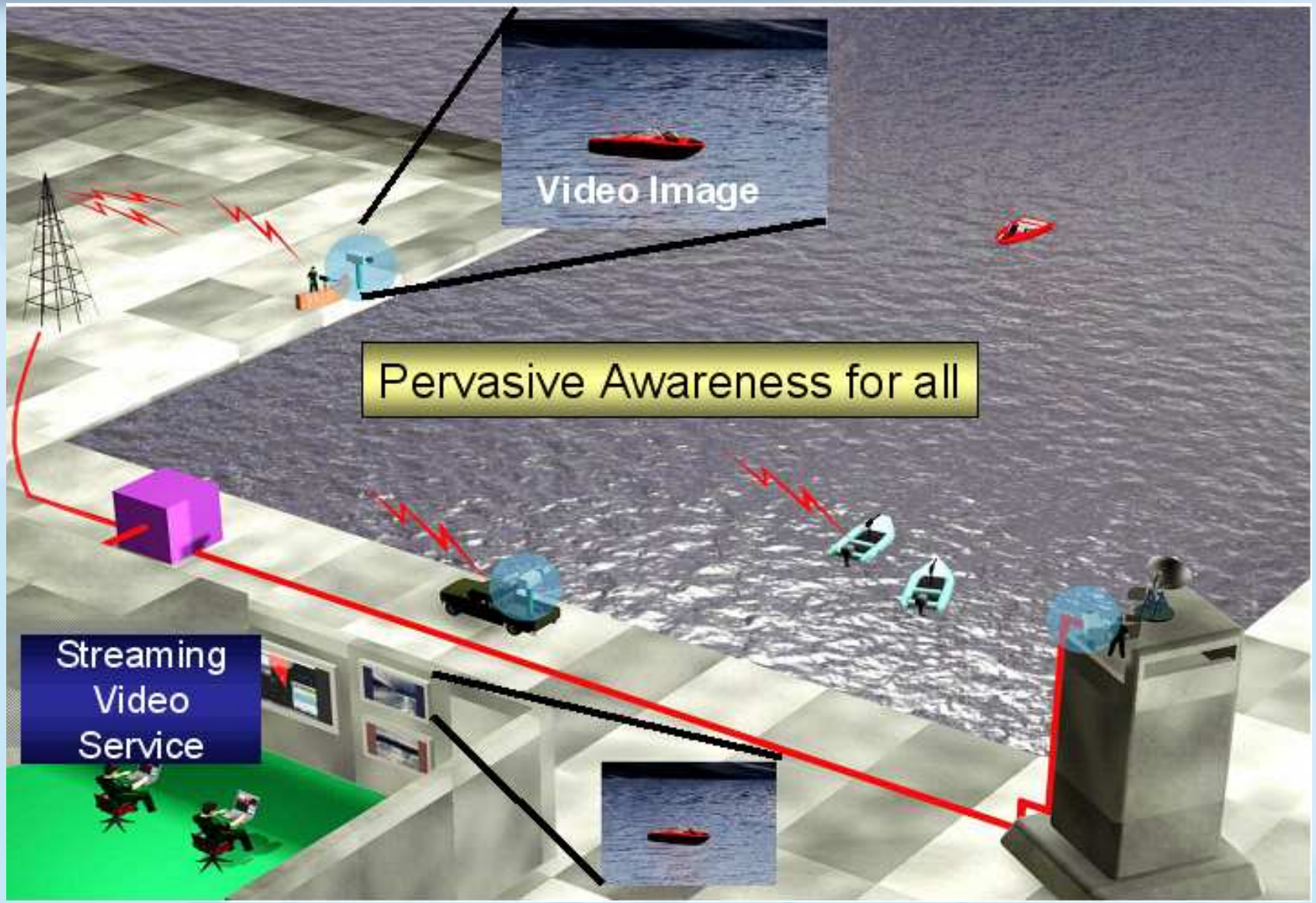

Sea Situation Picture Service (SSP)

- Displays and distribute common operating picture to all players in the network
  - Accessible by merely logging on to known URL
  - Situation awareness made available to all by placing remote laptop clients at operational nodes
  - PDA enabled for mobile personnel
  - Allows base defenders to synchronize their actions for faster and better responses to threats

Track Manager Service

- Aggregates track data from sensors and Own Force Server
- Subscribes to Anomaly data from Intent Service
  - Service of service - able to provide higher service level (anomaly data) if Intent Service is online

Own Force & Camera Services

- Gets own force unit data from Own Force Locator
- Strategically placed EO/Cameras provide visual picture at commander’s blind spot
- Mobile forces mounted with camera enables commander to assess ground situation as it unfolds
- Commanders to know where his forces are and what they are seeing at that location
- Better resolution of the ground situation

Intent Service

- Subscribes track data from Track Manager and processes them to sieve out anomalous behaviour
- Aids commander in decision making by sieving out potential threats early
- Existing rules can be periodically reviewed for relevance and new rules implemented according to operational needs

Observations

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Proliferation of Situation Awareness

- Before
  - Situation Picture only at Command Post

- After
  - Situation Picture is available to anyone who is able to tap into the network
  - Forces can be equipped with a PDA and receive the picture on the move

Observations

Proliferation of Situation Awareness

- Before
  - Command Post has no real-time knowledge of patrolling units' location
  - Cumbersome communications needed to vector patrolling units and interceptors to scene of action

- After
  - All patrolling units' locations are displayed at all operational nodes
  - With the PDA, patrolling units can coordinate and approach intruder in shortest time

Observations

Benefits of Visual Information

- Before
  - Each Observation Post has its own blind spots
  - Identification and verification > 5 min

- After
  - Video streams from various cameras provide visual images to all parties
  - Identification and verification < 1 min

Lessons Learnt

- Challenges during Lab - Ops transition: e.g. creating experimental environ without impeding operations
- Limitations of COTS - ruggedisation, preventive measures to extend shelf life of equipment needed in marine environment
- Co-evolution of service with Ops users critical to create relevant systems and promote acceptance of system

Thank You