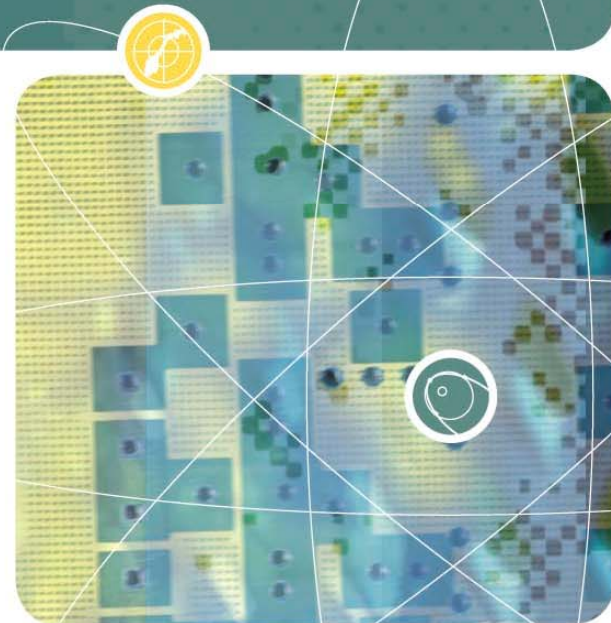**FFI** Forsvarets forskningsinstitutt

Adapting Web Service Publish/Subscribe Technologies for use in NEC C2 Systems - Draft presentation

Trude Hafsøe,
Frank T. Johnsen,
Ketil Lund,
Anders Eggen

Web Services and Network Based Defence

- Web Services is in widespread use on the Internet today.

- COTS products are readily available.

- Web Services is being considered as an enabling technology for NEC, and seem well suited.

- Web Services provides both

  – push/pull communications, and

  – asynchronous publish/subscribe communications.

Web Services and Network Based Defence

- two communications paradigms; push/pull and pub/sub
  - pub/sub important for
    - track updates,
    - building COP, and
    - creating situational awareness.
- challenges when using web services over tactical communications links
  - low bandwidth
  - high error rates

Web Services standardization efforts

- The asynchronous nature of the publish/subscribe paradigm makes it a very important mode of communications in NBD.

- Two standardization efforts regarding publish/subscribe:
  - OASIS finished its Web Services Notification (WSN) standard late in 2006.
  - W3C has a draft version of a similar framework called Web Services Eventing (WS-Eventing).
  - WSN has most features.

WS-Notification

- Three parts to the WSN specification:
  - **WS-BaseNotification**
    - The WS-Eventing specification provides similar functionality to that of WS-BaseNotification, but they are not compatible with each other.
  - **WS-BrokeredNotification** defines the interface for notification intermediaries, i.e. notification brokers.
  - **WS-Topics** enables users to specify the types of events in which they are interested.

Our ideas and suggestions

- optimizing pub/sub communications for disadvantaged grids
  - proxy servers
    - filtering
      - deliver only relevant and necessary information
    - unicast/multicast gateway
      - utilize the underlying transmission medium
    - subscriptions on behalf of clients
      - reduce network traffic
      - increase scalability
  - an enhanced pub/sub communications paradigm
    - adapting the message representation
      - referentially complete objects versus referentially incomplete objects