COP/UDOP Situational Awareness: Enabling Architectures

iSpheres Corporation

Prepared for:
AF IT Services Strategy
Industry Focus Session

Santosh Alexander
Co-founder
salexander@ispheres.com

4 Feb 04

Briefing Agenda

- **Project Overview**
- **Implementation Methodology**
- **Results**
- **Best Practices**
- **Lessons Learned**
- **Cost Drivers**

Project Overview:

"The User Defined Operational Picture (UDOP) will provide edge users with a relevant, loosely coupled, flexible, extensible, aggregated, and correlated operational picture leveraged by GIG ES and suited to the needs of the user's specific mission. Each user (or suitable aggregation of users) will determine the appropriate *Operational Picture* for their particular mission from the content of multiple similar and dissimilar sources of information using a producer/consumer or publish/subscribe model.

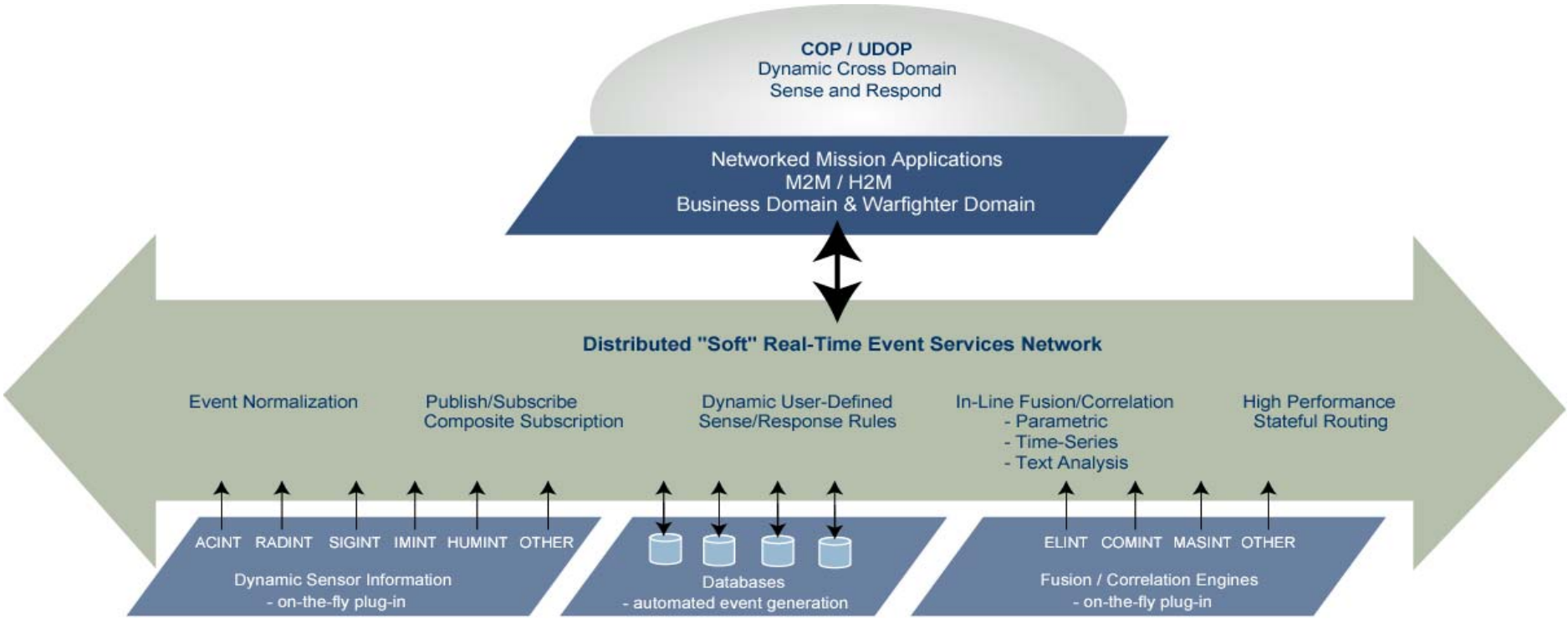
Unlike the 4.x Common Operational Picture (COP) architecture, the UDOP will not necessarily be a common picture; it will be generated on demand by the users rather than by command of a single authority. Edge users will enjoy the rich set of data available via the GIG and therefore be able to employ CoI and service specific tools to provide visualization and other edge user Tactical Decision Aids (TDAs) to best accomplish their assigned missions."

- Description of NCES Architecture submitted to DISA, Oct 24, 2003

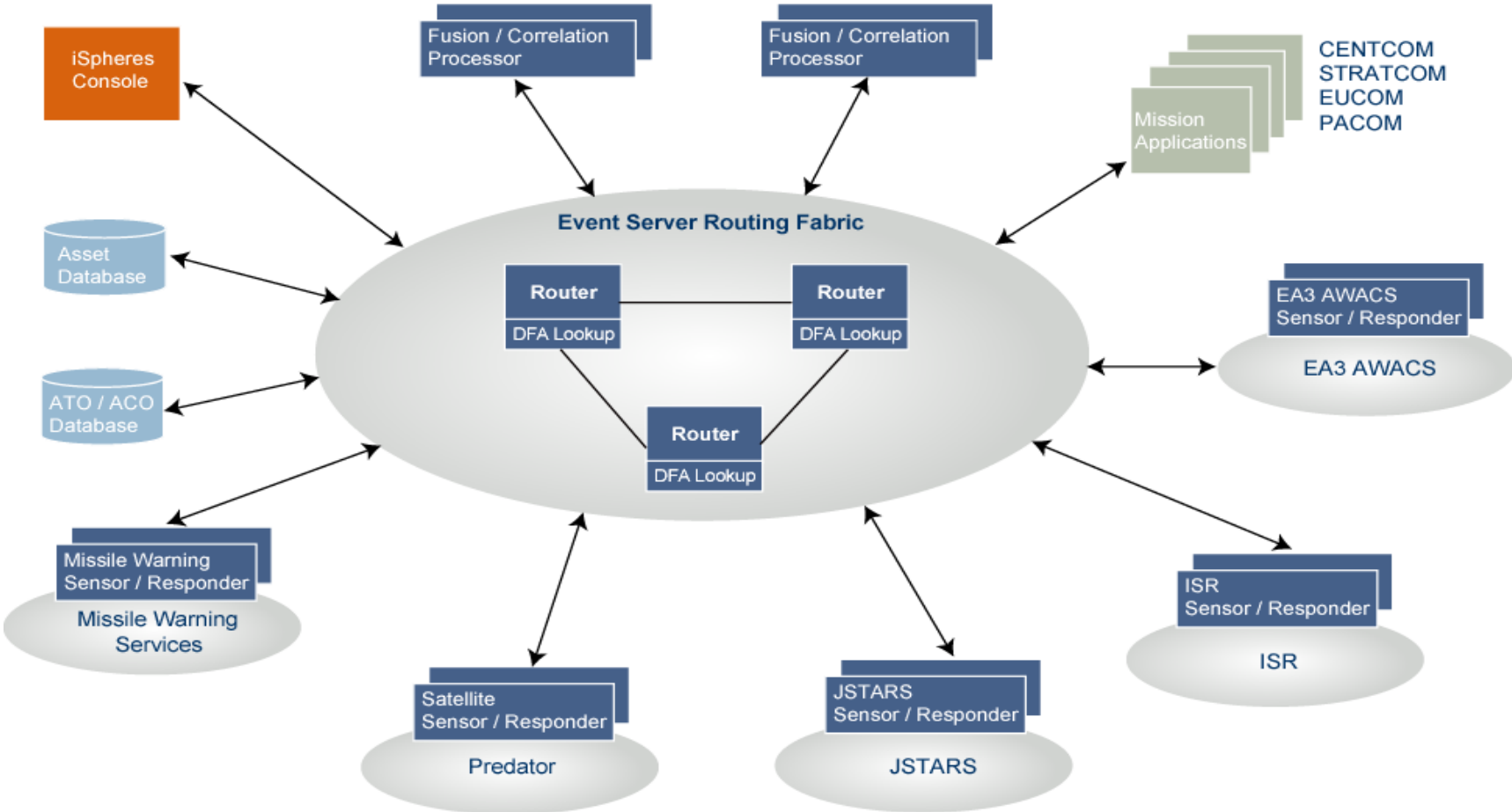
Implementation: Enabling UDOP Objectives

- **Provision of subscription services to "command quality" situational awareness information based on role, function and need**
- **Dynamic injection and publishing of ISR information**
- **Dynamic injection of new sensor information**
- **In-line fusion and correlation**
- **Sense & Respond subscription model for edge users**
- **Automatic "amplification" of real-time asset status**
- **Reduced decision-making cycles through increased automation of 'tasking orders' based on 'relevant situation**

Results


COP / UDOP
Dynamic Cross Domain
Sense and Respond
Networked Mission Applications
M2M / H2M
Business Domain & Warfighter Domain
Distributed "Soft" Real-Time Event Services Network
Event Normalization
Publish/Subscribe
Composite Subscription
Dynamic User-Defined
Sense/Response Rules
In-Line Fusion/Correlation
- Parametric
- Time-Series
- Text Analysis
High Performance
Stateful Routing
ACINT RADINT SIGINT IMINT HUMINT OTHER
Dynamic Sensor Information
- on-the-fly plug-in
Databases
- automated event generation
ELINT COMINT MASINT OTHER
Fusion / Correlation Engines
- on-the-fly plug-in

Results: Net Centric Event Services Topology



Best Practices

- **Empower Edge Users/Protect IT Assets**
- **Loosely Coupled Services**
- **Distributed Net Centric Architecture**
- **Systematic approach to sensor information definition, and information fusion & correlation rule definitions**

Lessons Learned

- **Event Driven IT Architecture (EDA) is central to Net Centric Operations**
- **Provide shared situational awareness**
- **Provide dominant speed of command**
- **Permit precise, synchronized execution**
- **Enable agility & flexibility**
- **Dynamic force composition**
- **Reduction in sensor-to-shooter cycle**

Cost Drivers

- **Substantial reduction in Total Cost of Ownership**
- **Deployment Time**
- **Reconfiguration Time**
- **Dynamic injection of new sensor information**
- **Real time fusion & correlation on COTS hardware**
- **More precise user defined operational picture**