



Senzori i Sensor Observation Service

Neke vrste i tipovi

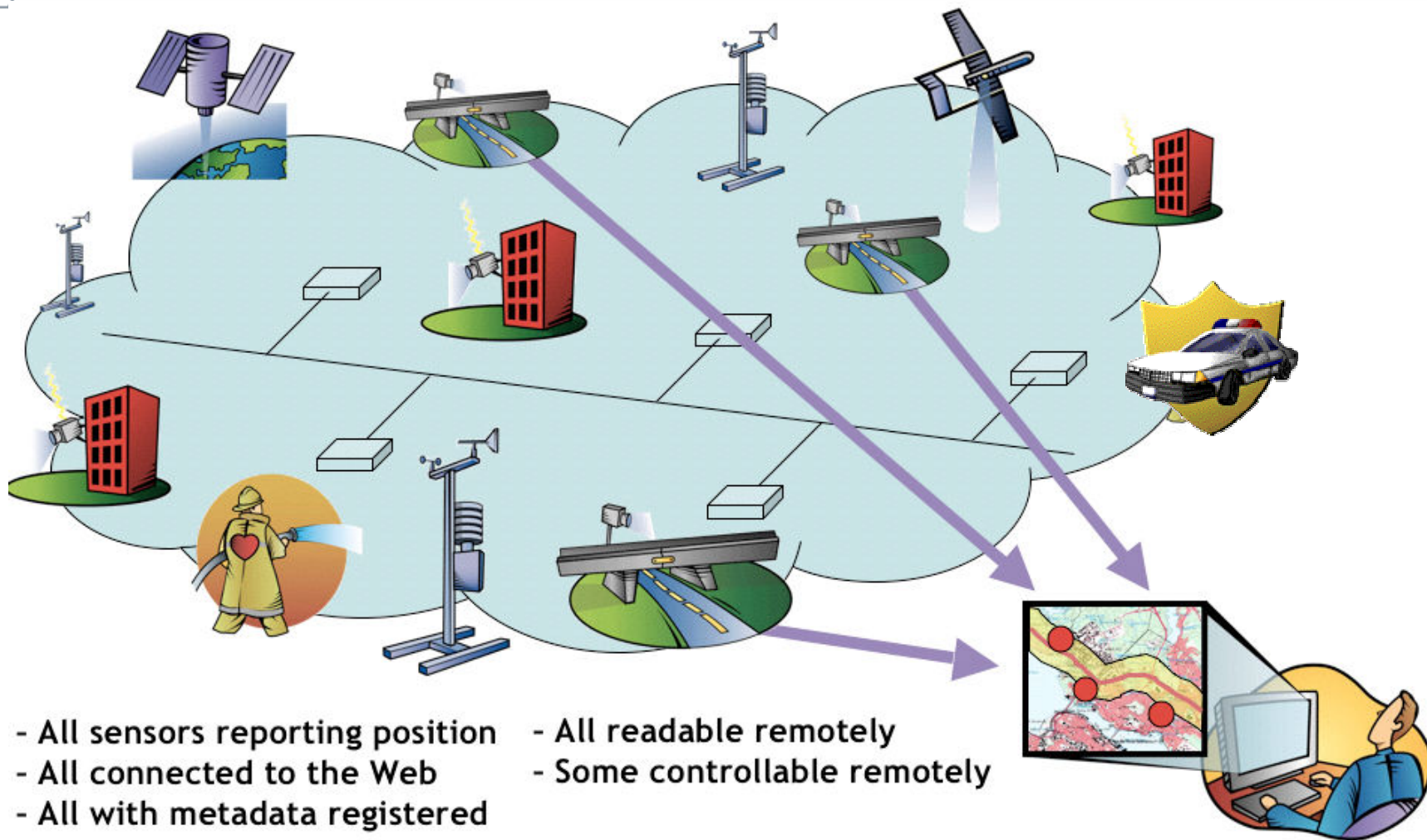


- Metereološke stanice
- Merenje vodostaja
- Merenje brzine protoka, strujnica
- Nivo zagađenja
- GPS, IMU
- Sigurnost
- Stanje uređaja
- Senzori naredne generacije (Bespilotne letelice, LIDAR,)

Tip

- Stacionarni
- Mobilni
- Vremenske serije

Uloga web-a



OGC Senzor Web Standardi - Ciljevi



- **Brzo pronalaženje senzora (privatnih i javnih) koji mogu zadovoljiti potrebe za koji se zna šta mogu (lokacija, merena veličina, kvalitet, sposobnost obavljanja zadatka)**
- **Prikupljanje informacija kodiranog tako da je razumljiv za ljude i za softver.**
- **Pristupanje senzoru na način i u obliku specifičnoj potrebama.**
- **Postavljanje zadatka, ako je moguće to podrži potrebe korisnika.**
- **Odgovara i prima poruke o statusu merenja pojedinog senzora koji meri fenomen ili koji je obavio neki zadatak.**

Sensor Web Enablement (SWE) Specifikacija

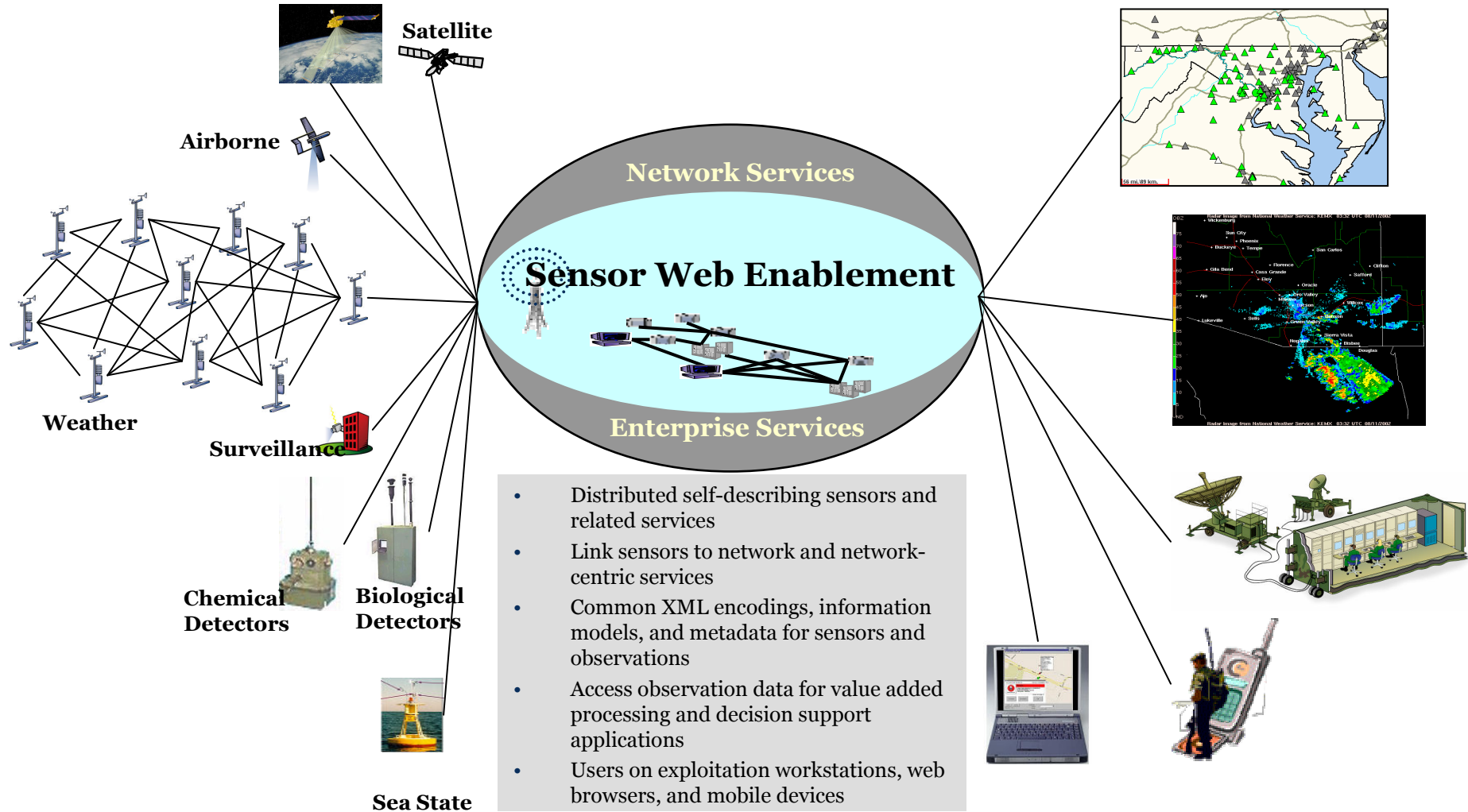


- Informacioni model i šema
 - **Sensor Model Language (SensorML)** Ključni model i šema za proces opažanja: podrška za komponente senzora, geolokacija...
 - **Observations and Measurements (O&M)** – Ključni model i šema za opažanje
 - **TransducerML** – integriše tok klastera opažanja u realnom vremenu
- Web Services
 - **Sensor Observation Service** – Mogućnost pristupa senzorima ili sistemima senzora i opcino povezivanje senzora sa podacima drugih senzora.
 - **Sensor Alert Service** – Alarmira prema zadatim kriterijumima na rezultate merenja.
 - **Sensor Planning Service** – Za funkcije koje senzor može da izvršava redno ili prema zadatom planu.
 - **Web Notification Service** – Za asinhronu komunikaciju između klijenta i servisa.
 - **Sensor Registries** – Pronalazi senzore i uspostavlja kontakt.

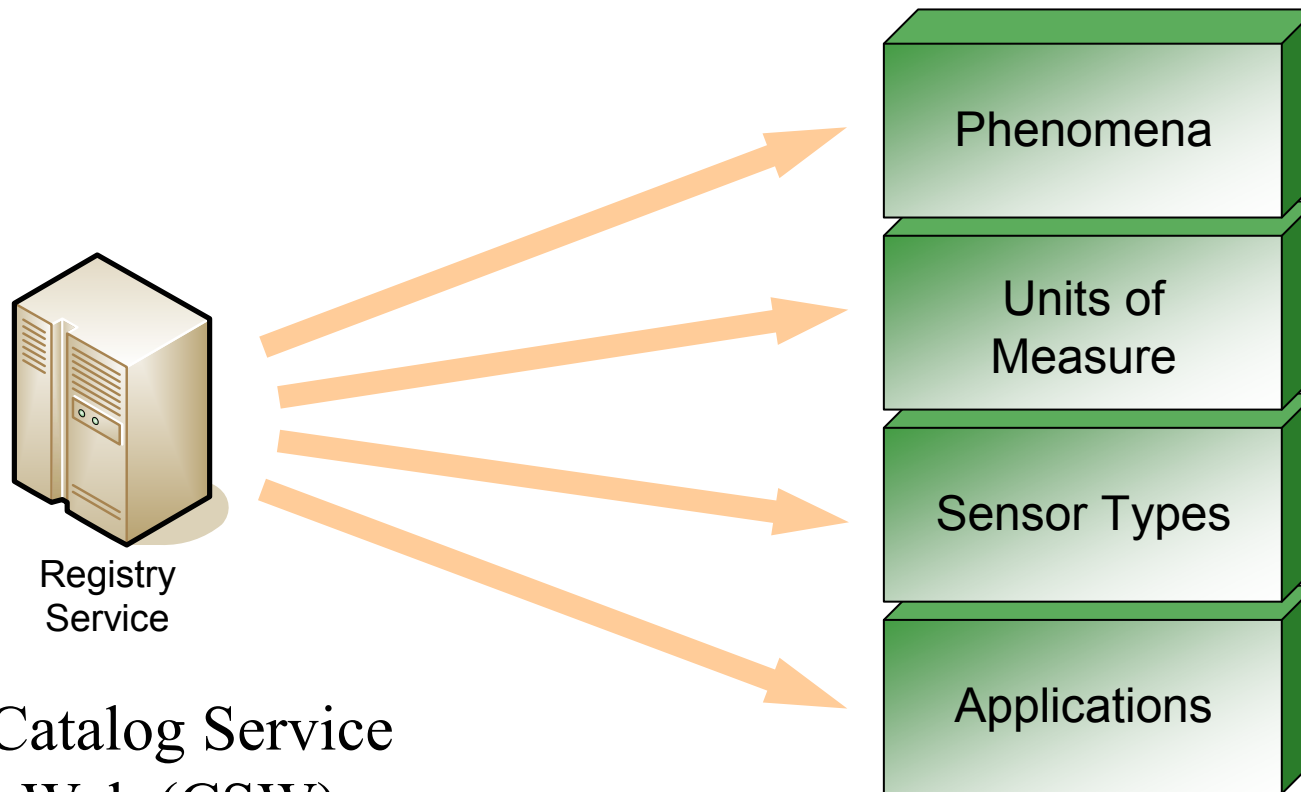


Constellations of heterogeneous sensors

Vast set of users and applications

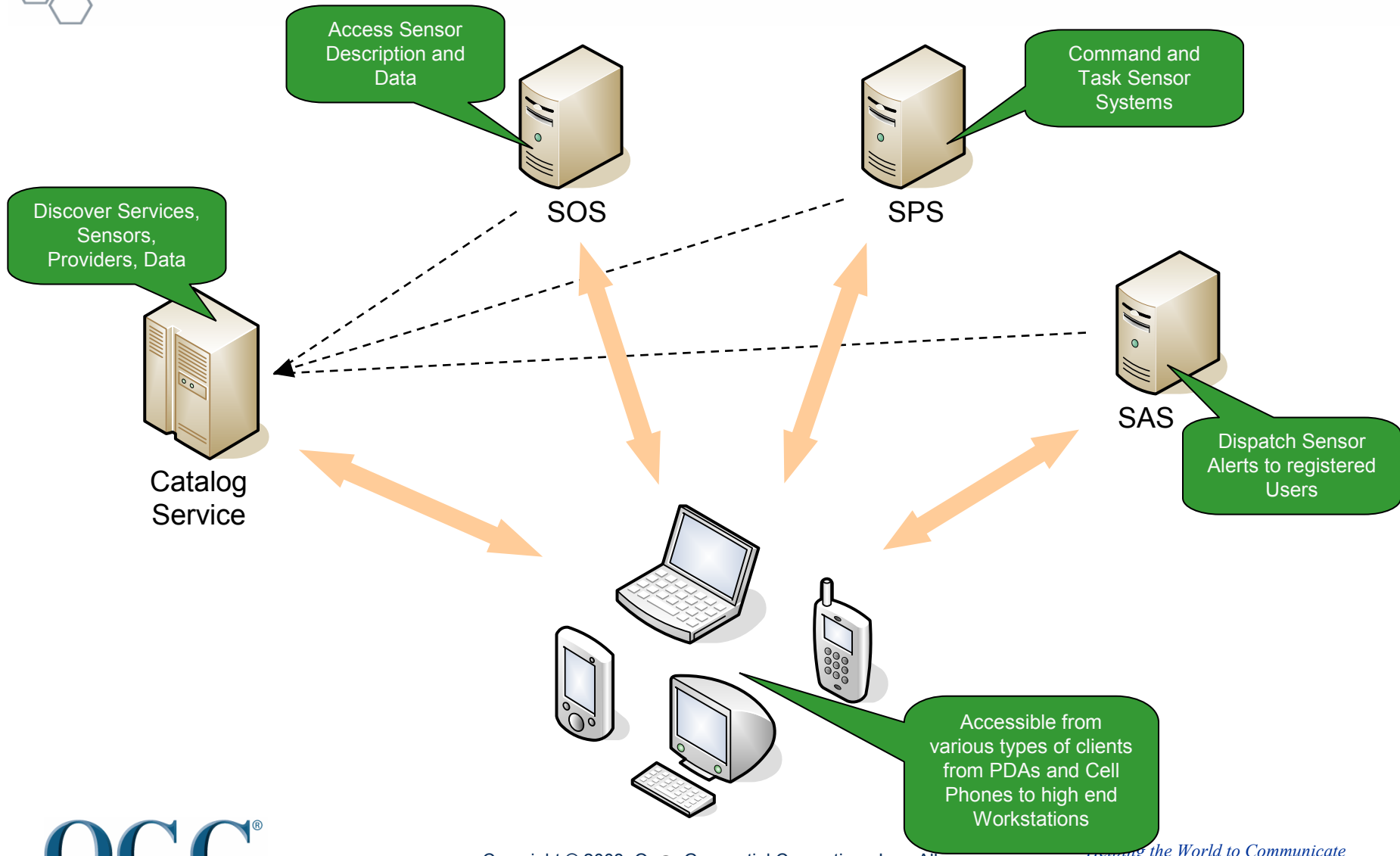


SWE Components - Dictionaries

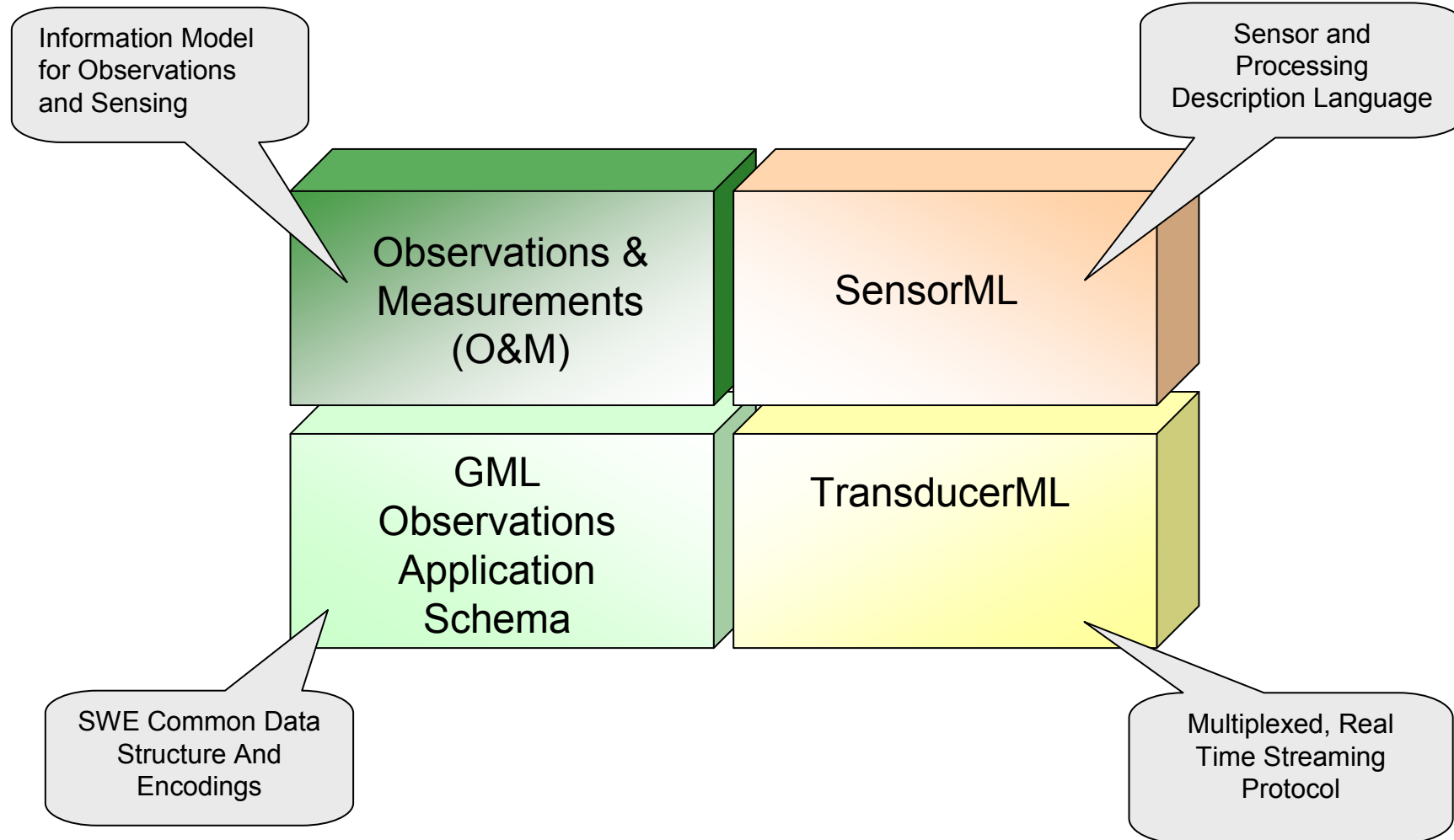


OGC Catalog Service
for the Web (CSW)

SWE Web Services Components



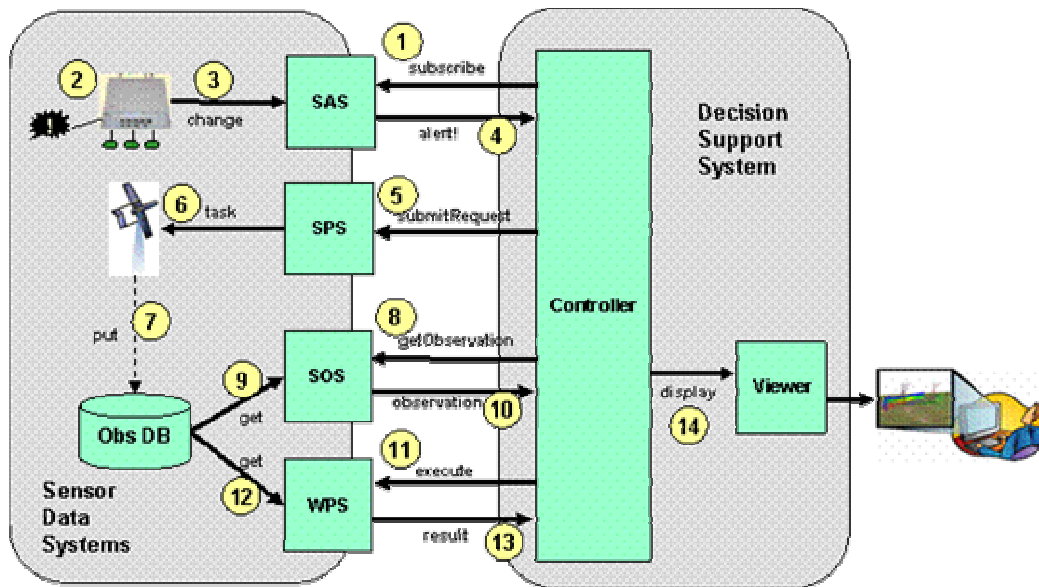
SWE Languages and Encodings



OGC Sensor Web Enablement



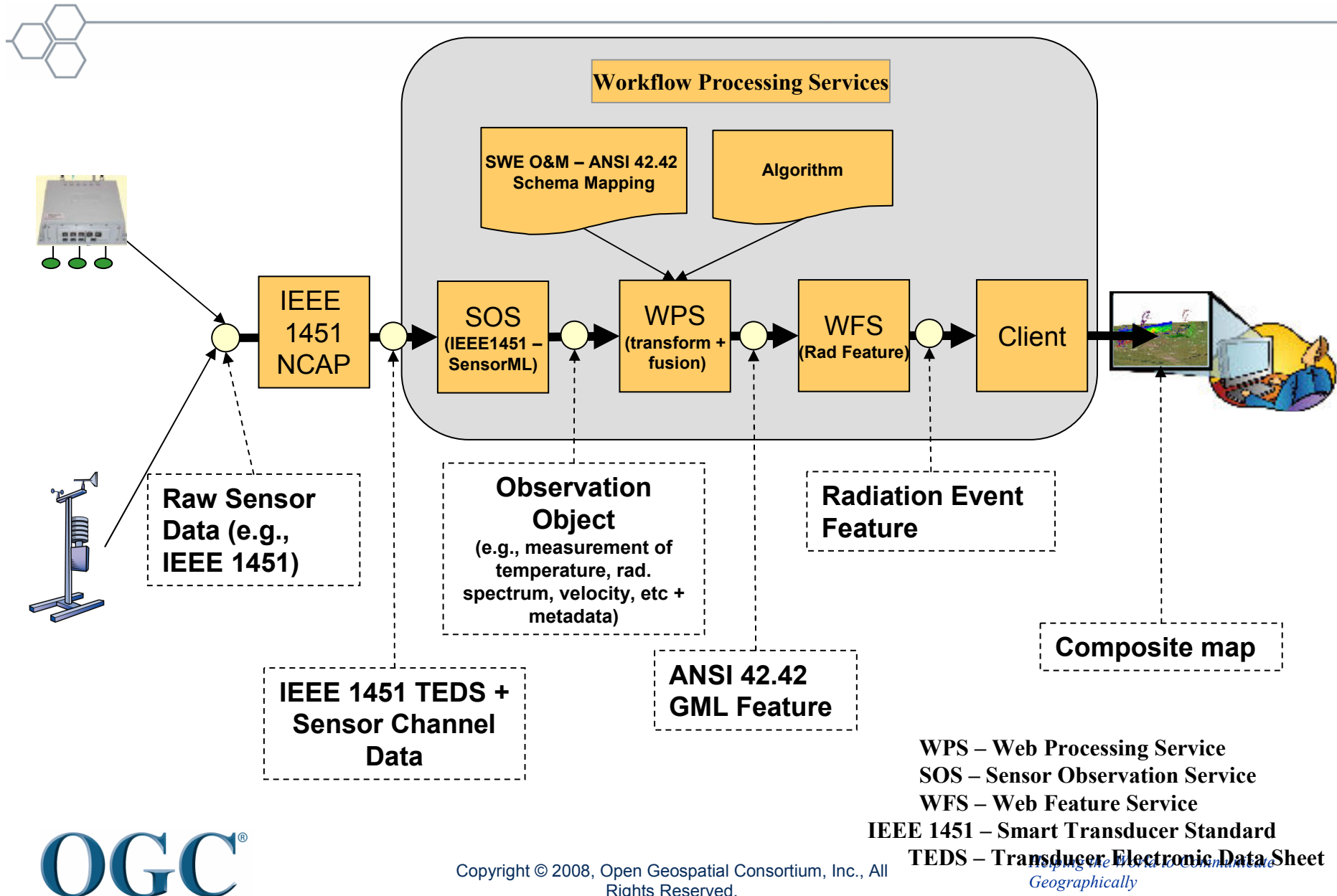
Objavljuje, pronalazi, pristupa i upravlja senzorum i stavlja ga u kontekst lokacije



- Sensor Model Language (SensorML)
- Transducer Markup Language (TML)
- Observations & Measurements (O&M)
- Sensor Planning Service (SPS)
- Sensor Observation Service (SOS)
- Sensor Alert Service (SAS)
- Web Notification Service (WNS)
- IEEE (sensor) and OASIS (alert) stds
- Web Processing Service (WPS)

Ukazuje na kritične potrebe plug and play pristupa, integracije i primene merenja u realnom vremenu u cilju donošenja odluka.

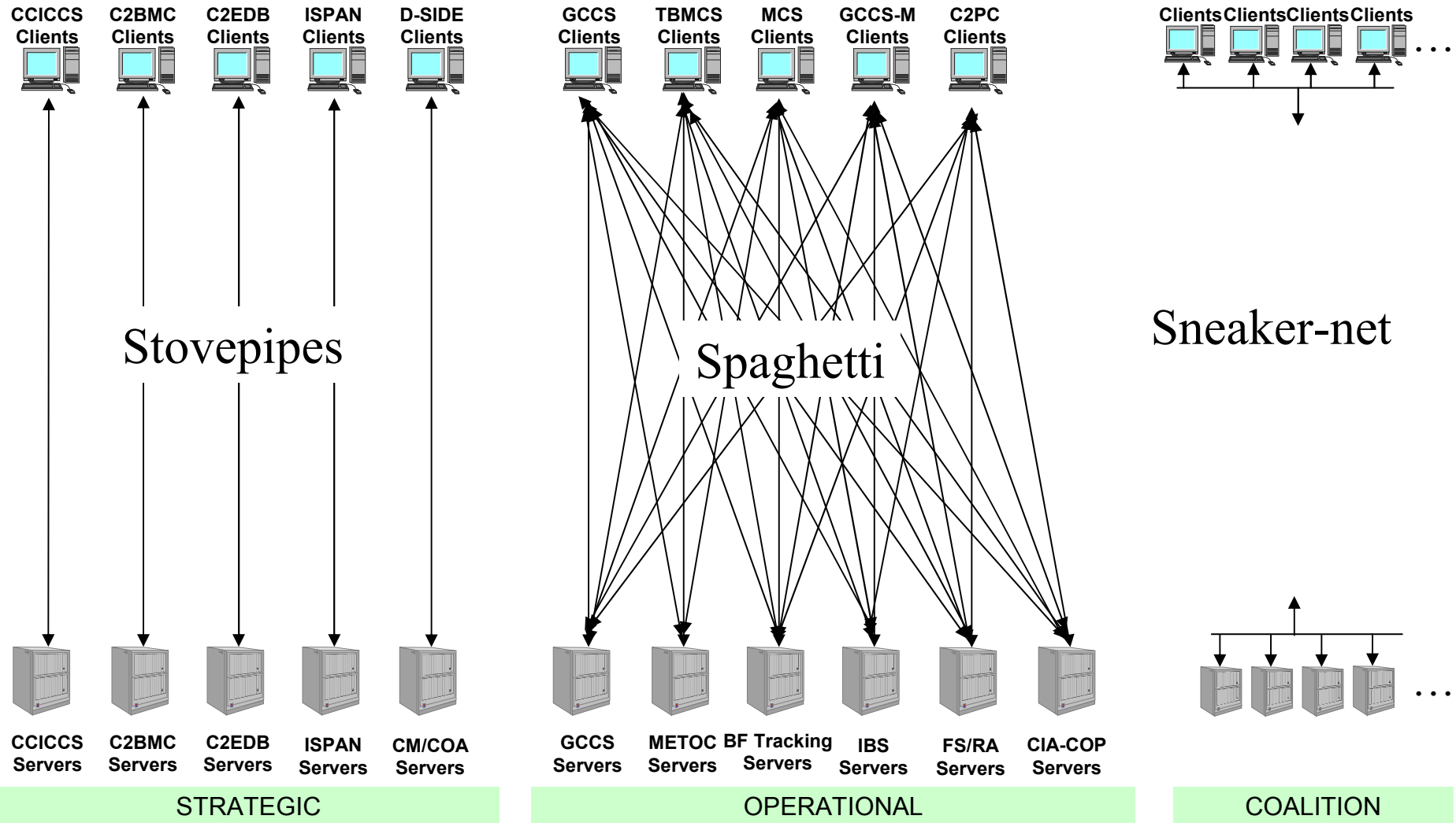
A SOA Workflow for Sensor Data



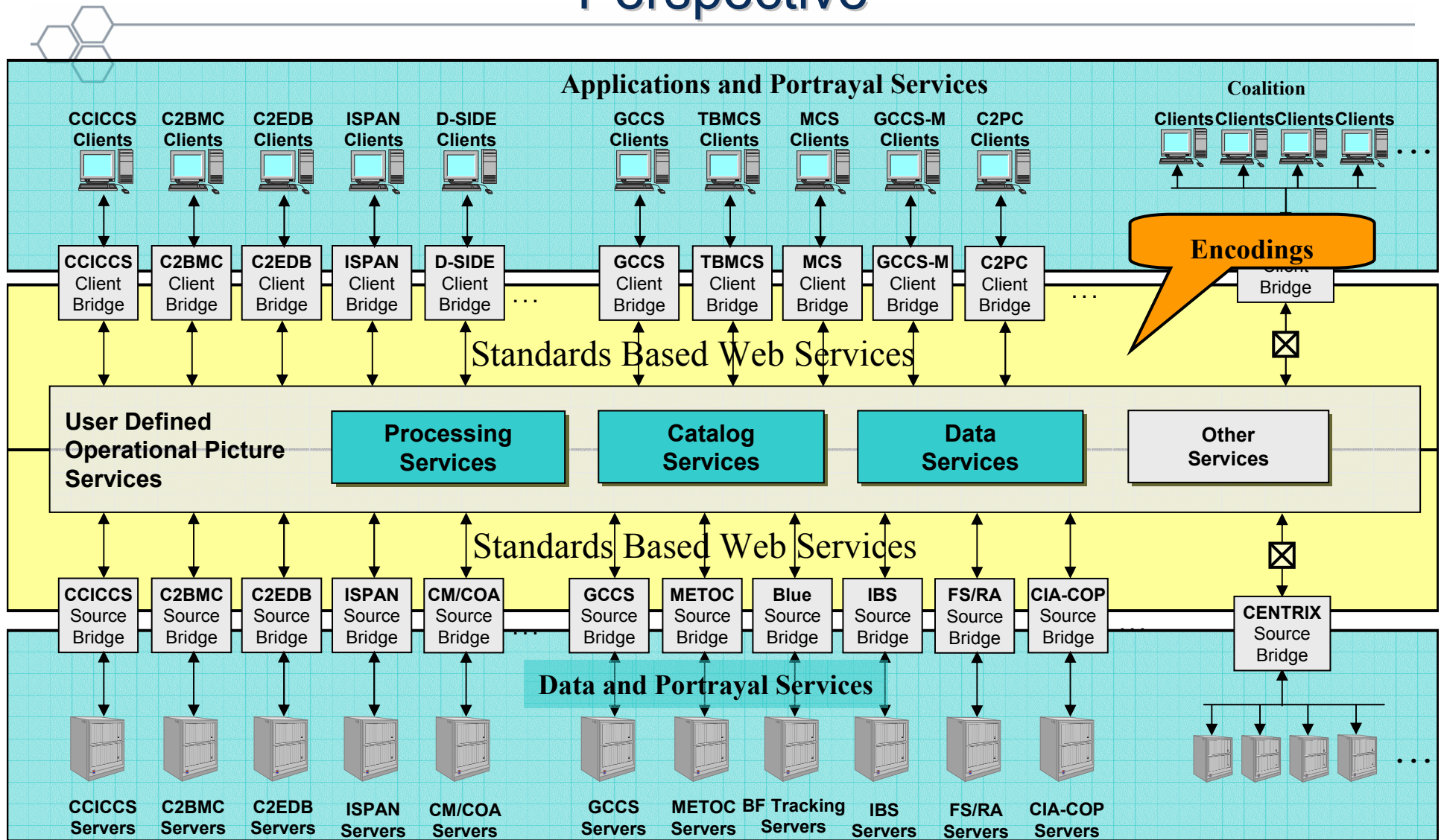
Focus on SOA Interoperability... From This



*Based on "DoD C2 Information Management Approach", courtesy of Mark Kuzma, DISA



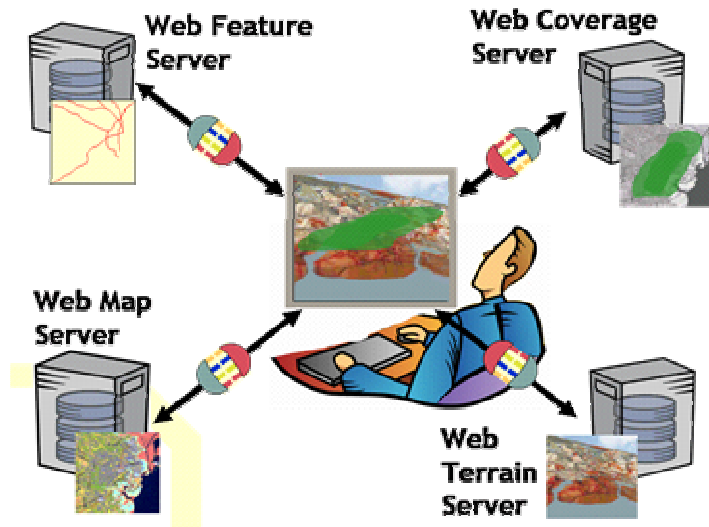
To This – Net Centric Enterprise Services Perspective



Open Web Services (OWS) (think classic geospatial)



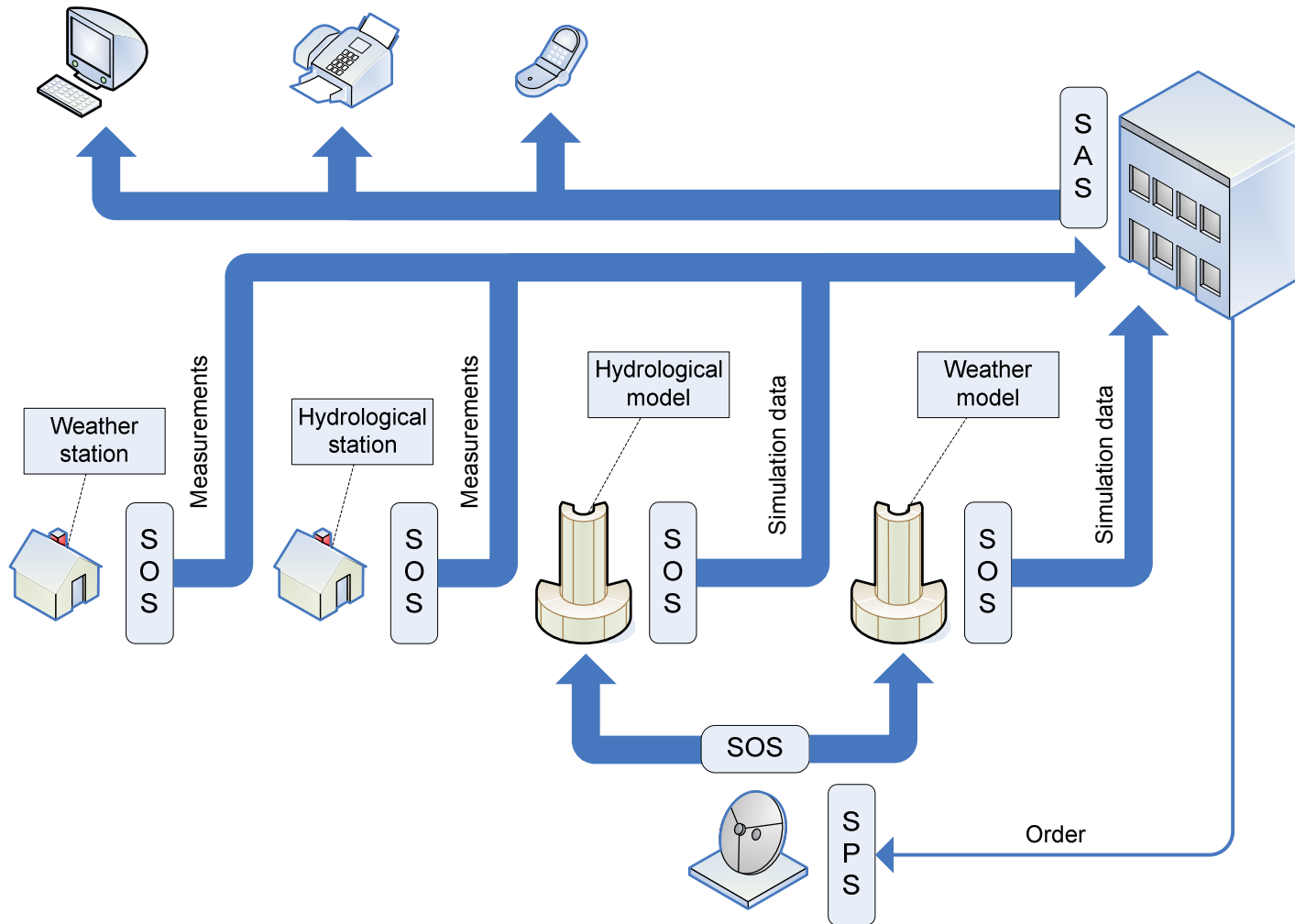
http:// je pozivni broj za World Wide Web, html / xml su standardi za kodiranje, prostorna komponenta web-u je omogućena OGC standardima, kao npr...



- Web Map Service (OGC & ISO)
- Style Layer Descriptor (OGC)
- Feature Model & GML (OGC & ISO)
- Web Feature Service (OGC)
- Web Coverage Service (OGC)
- Web Map Context (OGC)
- Catalogue (OGC)
- Metadata (ISO 19115 & OGC)
- Web Processing Service (OGC)
- Drugi...

Podaci sa kroz OGC servise mogu se uvezati u složene sisteme i koristiti u građevinarstvu, upravljanju rizicima, Metereologiji, Klimatologiji, Bezbednosti, Poljoprivredi, Vojne svrhe, Okeanologiji, Hidrologiji itd.







Core operations

GetCapabilities XML

GetObservation OM

DescribeSensor SensorML

Transactional operations

RegisterSensor

InsertObservation

Extended operations

GetResult

GetFeatureOfInterest

GetFeatureOfInterestTime

DescribeFeatureType

DescribeObservationType

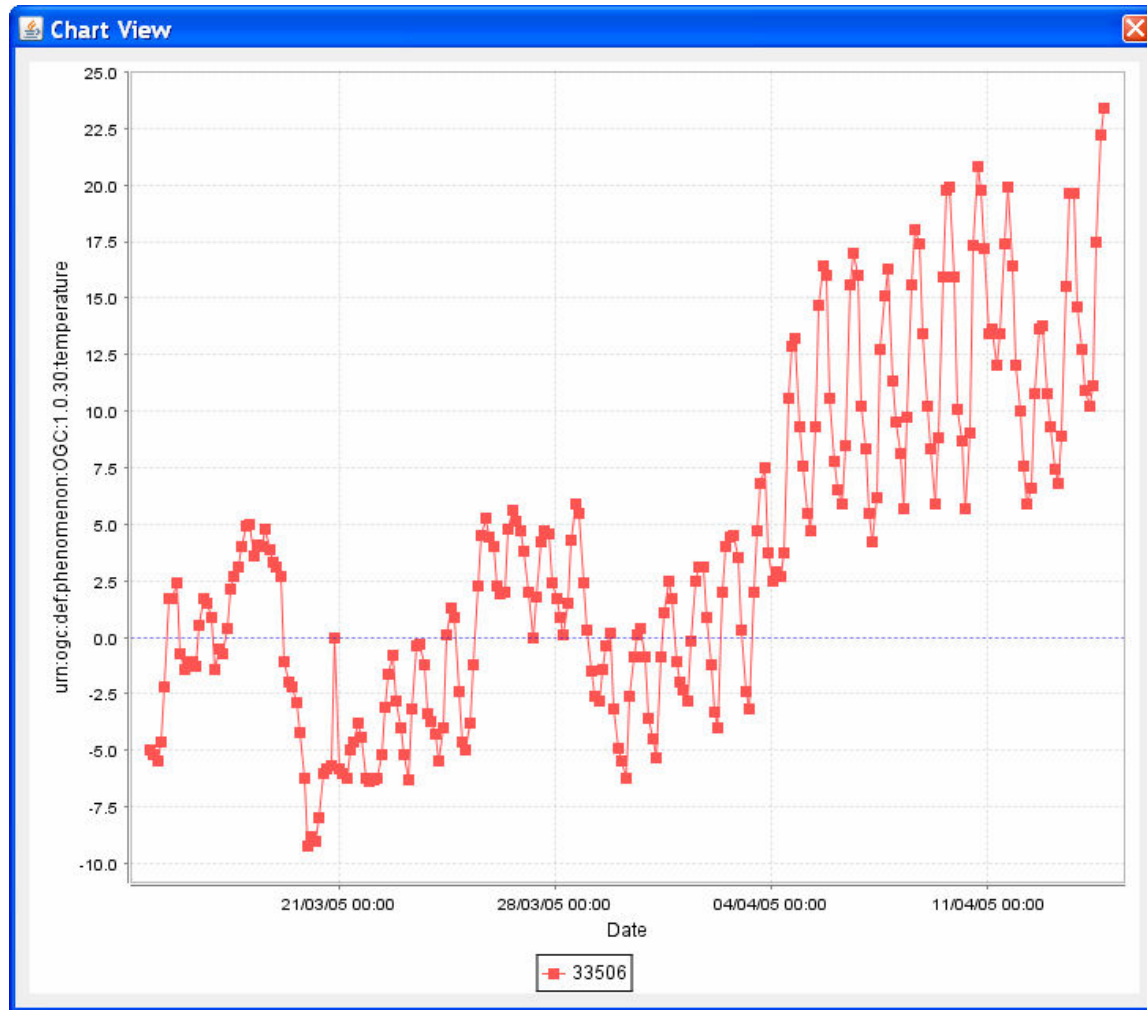
GetObservationById

DescribeResultModel

Sensor Observation Service



- UMN Mapserver (as SOS server)
 - Dobra apstrakcija, podrška brojnim OGC servisima
 - (FCGI executable)
 - Open software
- 52North SOS
 - uDig i ArcGIS plugin,
- Openlayers
- JavaScript



Primeri



- <http://www.csiro.au/sensorweb/au.csiro.OgcThinClient/OgcThinClient.html>
- <http://geoservis.ftn.uns.ac.rs/Vodostaj.html>

#DescribeSensor

`http://www.geoservis.ftn.uns.ac.rs/maps/mapserv?map=vodostaj.map&Request=DescribeSensor&procedure=urn:ogc:def:procedure:NS&service=SOS&version=1.0.0&outputFormat=text/xml; subtype="sensorML/1.0.0"`

#GetCapabilities

`http://www.geoservis.ftn.uns.ac.rs/maps/mapserv?map=vodostaj.map&SERVICE=SOS&REQUEST=GetCapabilities`

#GetObservation

`http://www.geoservis.ftn.uns.ac.rs/maps/mapserv?map=vodostaj.map&Request=GetObservation&service=SOS&Offering=Water&observedproperty=Vodostaj&version=1.0.0&responseFormat=text/xml; subtype="om/1.0.0"`

