Planning for SOA Infrastructure Support
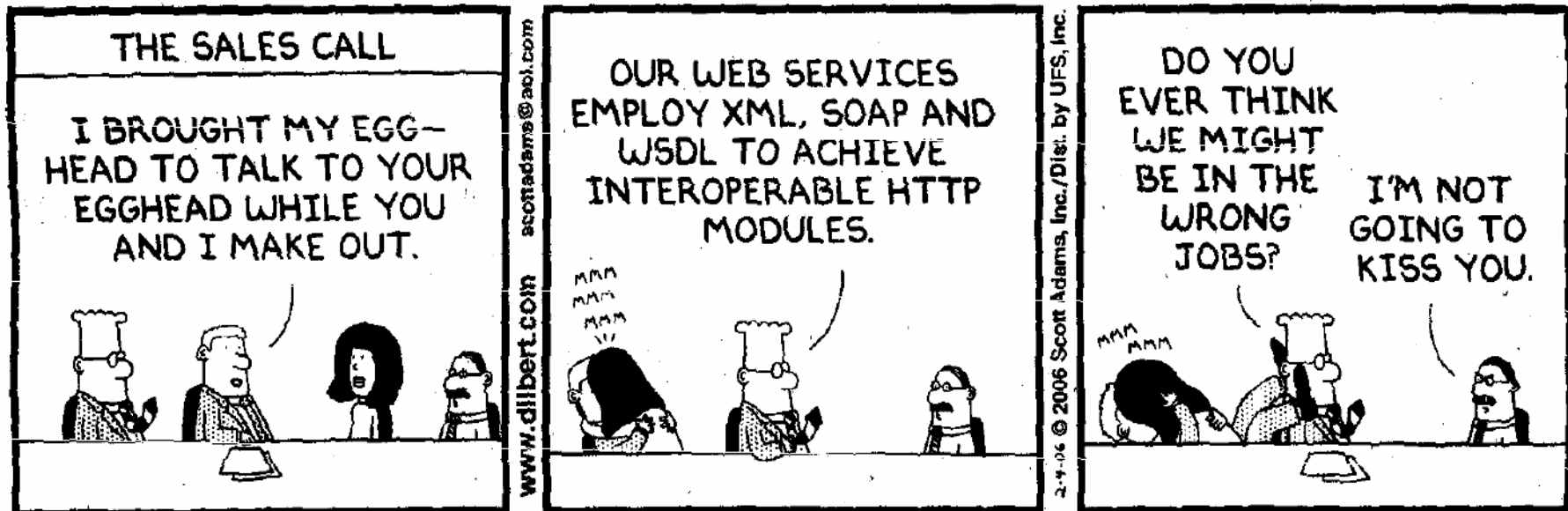
Robin Gonzalez, Director,

National Computer Center, OTOP
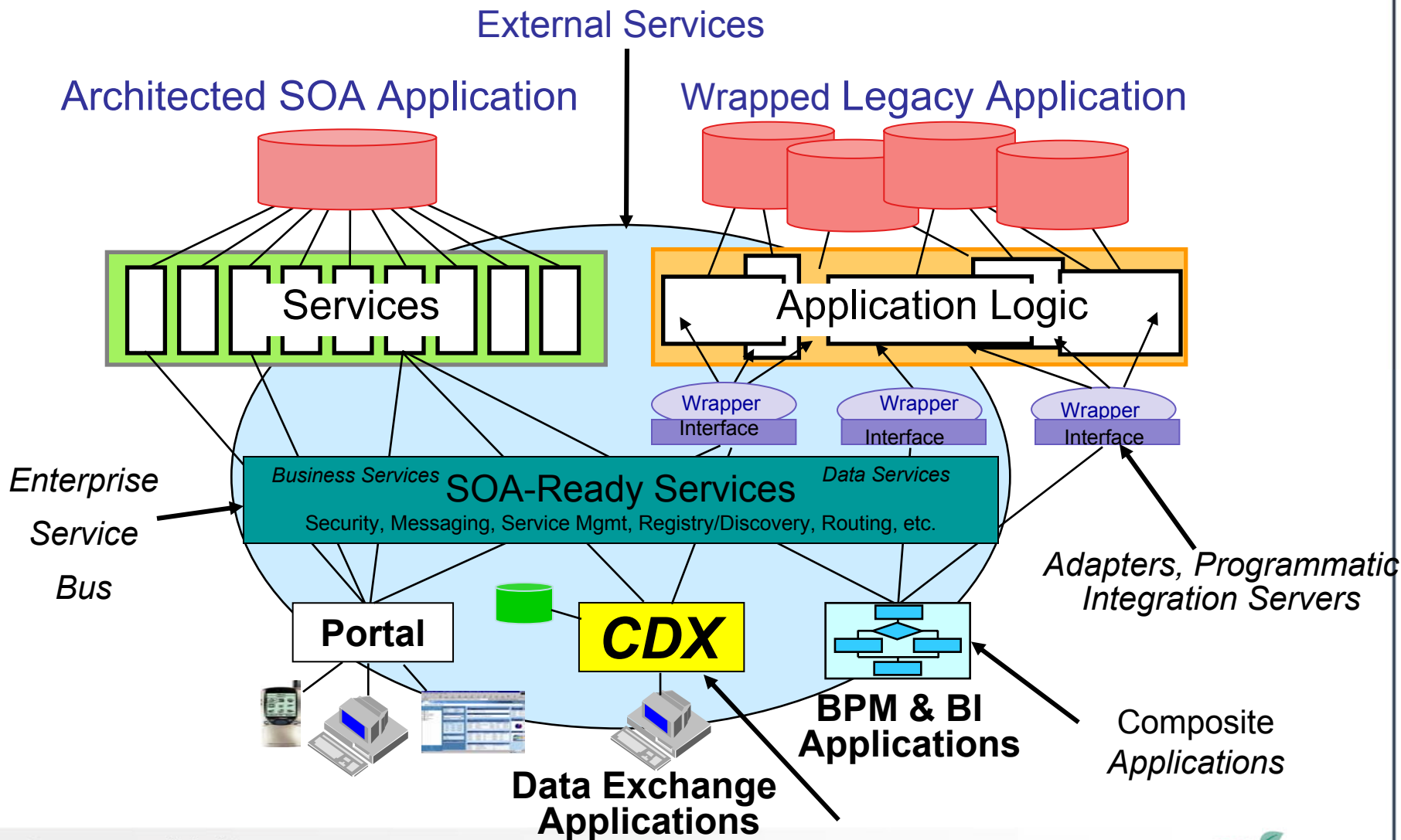
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State of Service Oriented Architecture at EPA

- 100+ Operational Services and Growing
- Rich in Diversity
  - <u>Type</u>: Web Services, Geo Services (Web Feature Services, Web Map Services)
  - <u>Scope</u>: Intranet, Extranet, Public Access
  - <u>Technology</u>: J2EE, .Net, Oracle 10g AS, WebSphere, …
- Opportunities for Organization & Coordination

Service Group	Qty
ADAM	3
CDX (incl. FRS, SRS, LRT [Geospatial])	26
Geodata	11
ECMS	1
EnviroMapper	2
GSWS	49
IAM	3
K-Scribe	2
MetaCarta	8
RADIMS	2
RADIMSDWI	2
UV Index (Envirofacts)	2
And Counting…	

SOA Vision: *Conceptual View*

External Services

Architected SOA Application

Wrapped Legacy Application

Services

Application Logic

Wrapper
Interface

Wrapper
Interface

Wrapper
Interface

Enterprise

Service

Bus

Business Services   SOA-Ready Services   *Data Services*

Security, Messaging, Service Mgmt, Registry/Discovery, Routing, etc.

Adapters, Programmatic
Integration Servers

Portal

CDX

BPM & BI
Applications

Composite
Applications

Data Exchange
Applications

United States
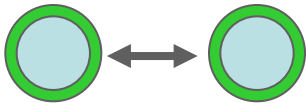Environmental Protection
Agency

OFFICE OF
ENVIRONMENTAL
INFORMATION

4

UDDI: Key SOA Component
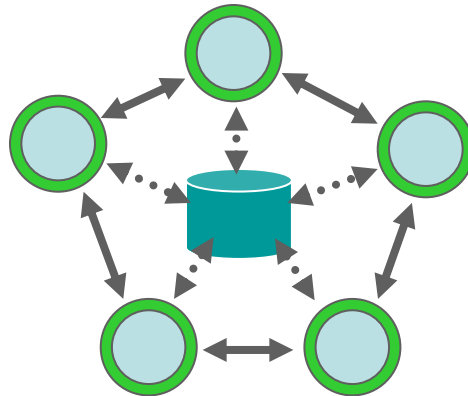
Enable

Enable interoperability between applications

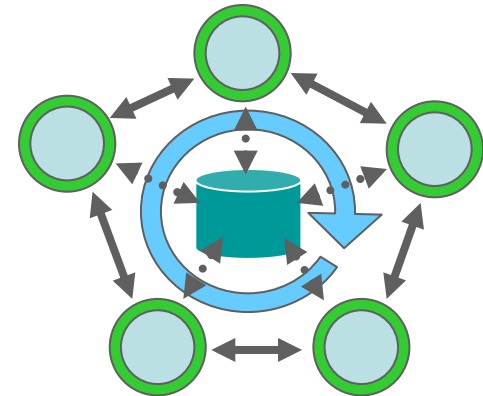**Apps, App Servers, Legacy, Middleware/EAI**

Register & Discover

Scale the number of interoperable participants

UDDI
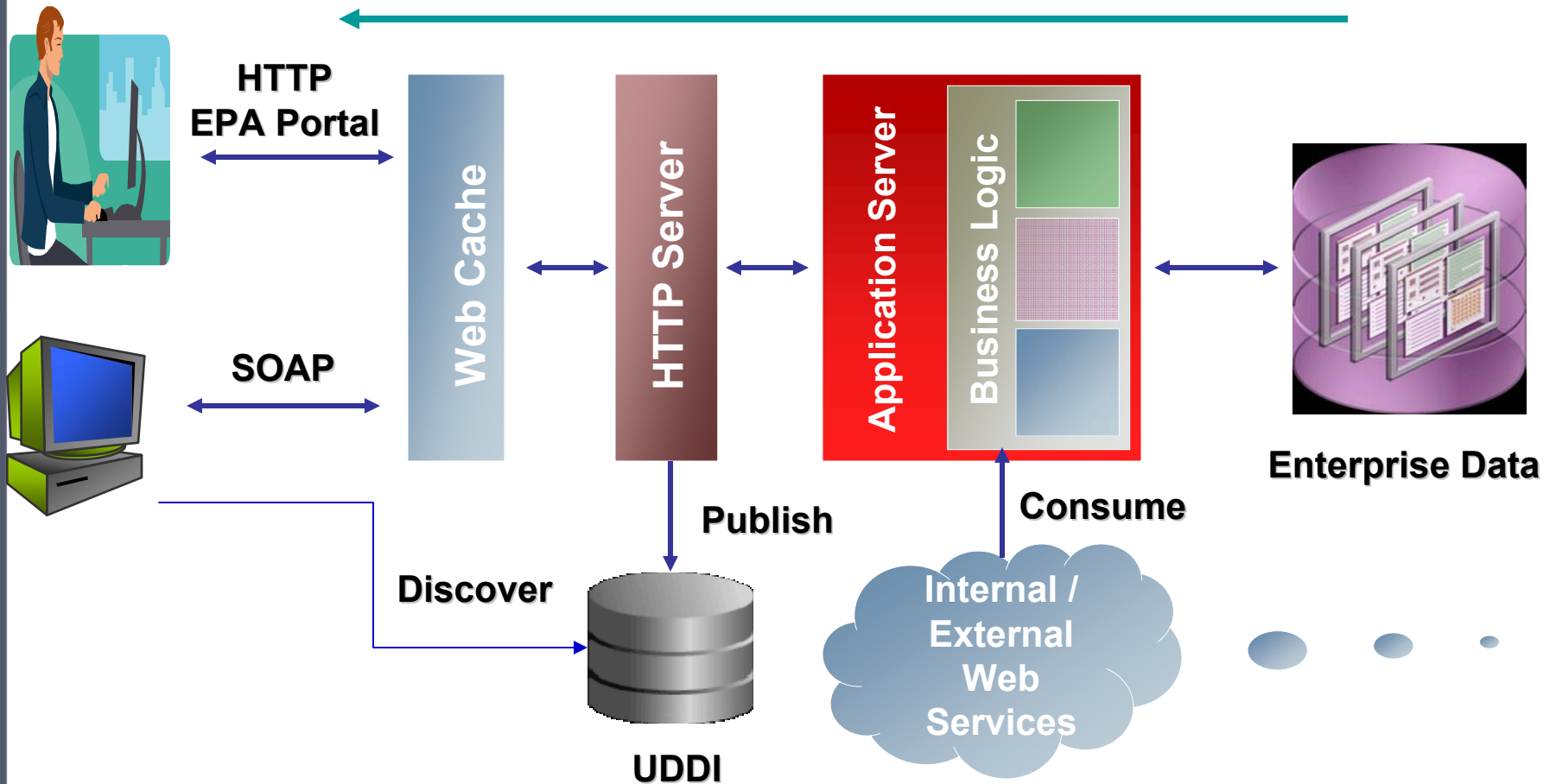
Coordinate & Compose

Create, link and adapt business rules and processes in a loosely coupled manner

BPM & composite application development

Enabling Services

Expose EPA Business Logic as Web Services

HTTP
EPA Portal

SOAP

Web Cache

HTTP Server

Application Server

Business Logic

Enterprise Data

Publish

Consume

Discover

UDDI

Internal / External Web Services

SOA Infrastructure Services

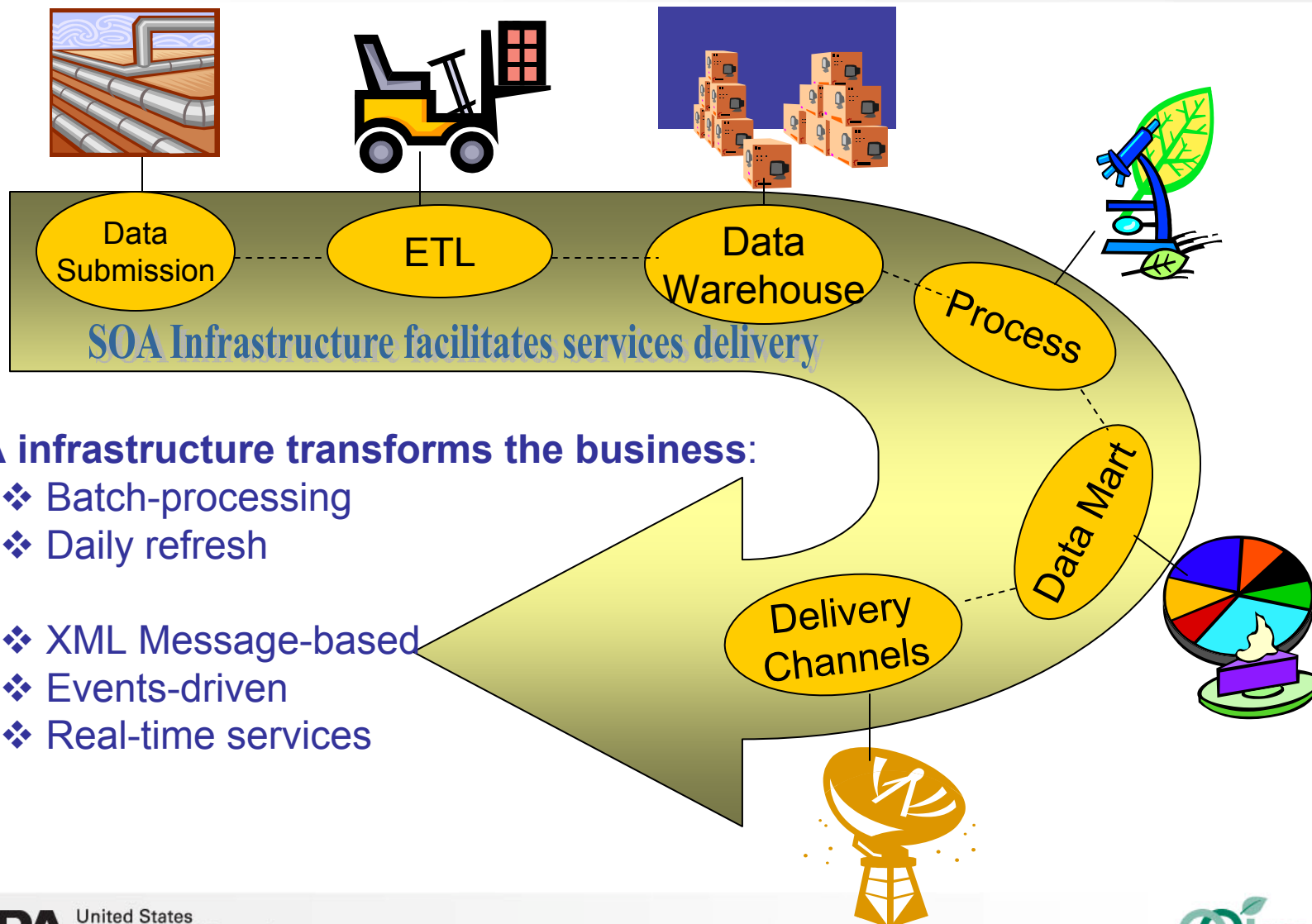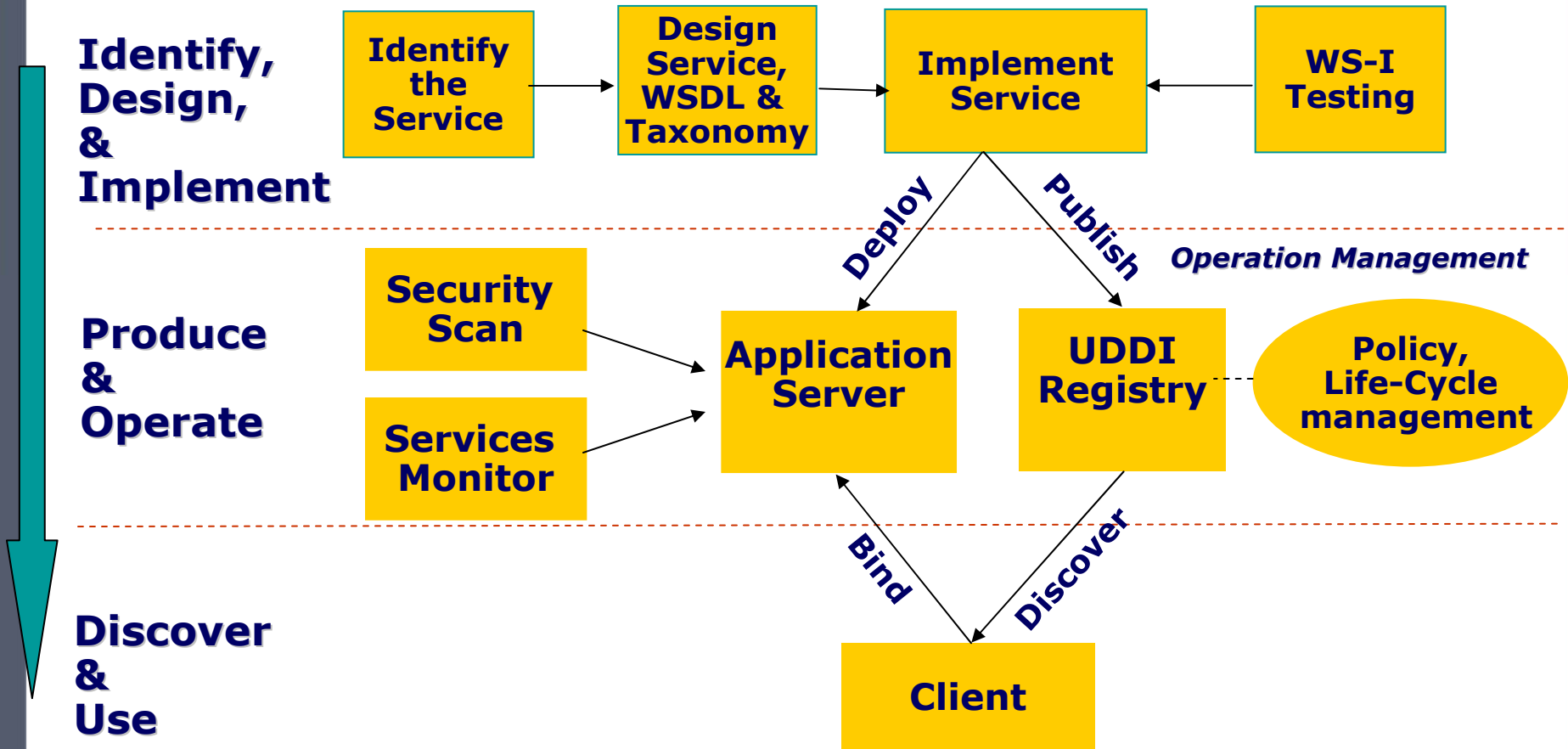| SOA Infrastructure Services	EPA Enterprise Architecture Components

❖ Registry
    ❖ Publishing & Discovery
❖ Enabling
    ❖ Messaging and routing
❖ Security
    ❖ Authentication, Authorization
❖ Events
    ❖ Monitoring
    ❖ Auditing & Logging
    ❖ Exception Management
❖ Lifecycle
    ❖ Change Management
    ❖ Impact Management
	• Identity and Access Management
	• Central Data Exchange (CDX)
	• EPA Portal
	• System of Registries
	• Geospatial Services
	• Enviroflash
	• Extract, Transform, and Load (ETL) Tool
	• Enterprise Content Management System (ECMS)
	• Business Intelligence and Analytics
	• Web Services Publishing House

Support

SOA Infrastructure Enables Real-Time Services

SOA Infrastructure facilitates services delivery

Data Submission — ETL — Data Warehouse — Process — Data Mart — Delivery Channels

SOA infrastructure transforms the business:
- ❖ Batch-processing
- ❖ Daily refresh

⇒

- ❖ XML Message-based
- ❖ Events-driven
- ❖ Real-time services

EPA Web Services Life Cycle

Identify, Design, & Implement

Identify the Service → Design Service, WSDL & Taxonomy → Implement Service ← WS-I Testing

Deploy | *Publish*

Operation Management

Produce & Operate

Security Scan → Application Server

Services Monitor → Application Server

Implement Service — Deploy → Application Server

Implement Service — Publish → UDDI Registry

UDDI Registry ---- Policy, Life-Cycle management

Discover & Use

Application Server — *Bind* — Client

UDDI Registry — *Discover* — Client
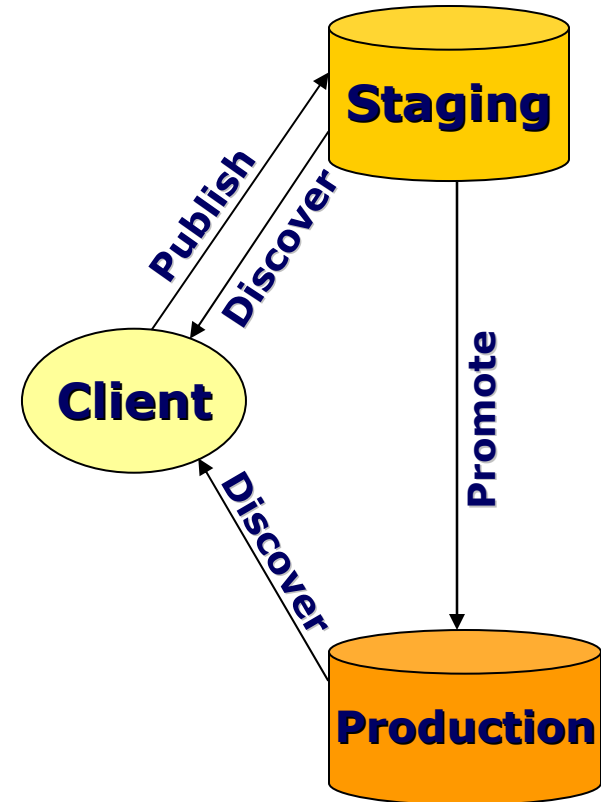
Services Staging & Production
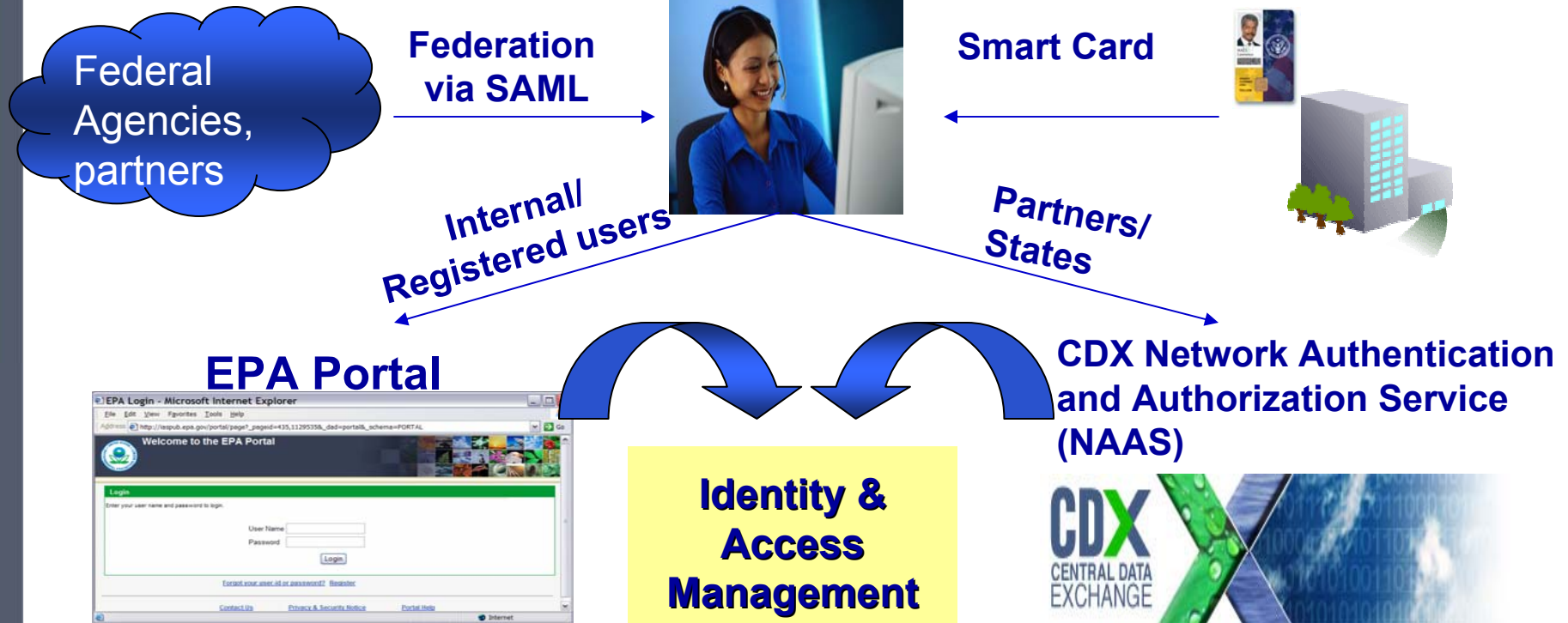
- ## Staging Repository (UDDI)
  - **Repository of Candidate Services**
    - **For Test & Review**
  - **Anyone (Authorized) Can Publish a Candidate Service**
  - **Anyone (Authorized) Can Discover a Candidate**
  - **OEI Reviews and Approves Candidates for Production**

- ## Production Repository (UDDI)
  - **Repository of Officially Supported Services**
  - **Approved Candidates Promoted by OEI**
  - **Services Have:**
    - **Categorization, Description, Taxonomy**
    - **Service-level Agreements & Contracts**
    - **Policy & Life-cycle Management**
    - **End-to-end Diagnostics & Metrics**
  - **Anyone (Authorized) Can Discover & Use a Supported Service**

Staging

Client

Publish

Discover

Promote

Discover

Production

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10

Services Authentication

Federal Agencies, partners

Federation via SAML

Smart Card

Internal/ Registered users

Partners/ States

EPA Portal

Identity & Access Management

CDX Network Authentication and Authorization Service (NAAS)

- Safeguard web services for SOA
- Enable SOA Single Sign-on (SSO) across all services
- Link SOA logic access with physical identities
- Federate E-Authentication services across the Federal agencies

SOA Management: From System Management to Services Management
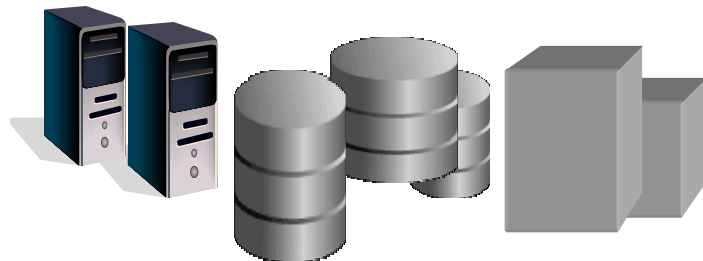
System Management

- ❖ Performance management
- ❖ Configuration management
- ❖ Fault management
- ❖ Capacity planning
- ❖ Data management
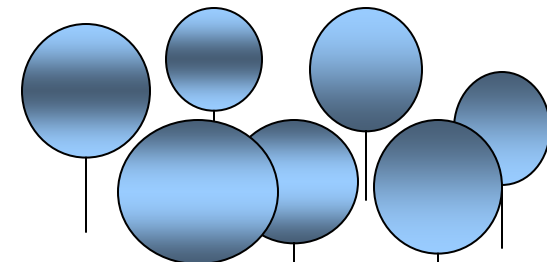
Services Management

- ❖ Service-level agreement
- ❖ Contract management
- ❖ Policy management
- ❖ Life-cycle management
- ❖ End-to-end diagnostics

Robust operational environment improves business performances

Operational Environment

Abstract Services

The Future of SOA Infrastructure

- Inventory SOA and web & geo services projects
  - (Contractors, please make sure your projects are represented!)
- Establish EPA SOA standards processes & governance bodies
- Build measurable services framework
- Orchestrate and facilitate raw web services into abstract business processes
- Build an infrastructure to integrate and support EPA's Intranet, Extranet, and Internet web services

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