ATN Directory Service Operational Requirements

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Operational Aspects of Directory Services

ATNICG/6

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Agenda Item 6: Applications

10 | 2007

Agenda

- X.500 Directory framework and ATN Directory

- Operational aspects of Directory services
  when applied to Air Traffic Services

- Study by EUROCONTROL

- Approach to solution

X.500 Directory

- Specified by ISO/IEC set of standards
  - ITU-T X.500 standards
  - OSI 7 layer reference model

- Characteristics
  - Generic and flexible
  - Distributed system
  - Structure of data
  - Protocols for automated retrieval and replication of data (DAP, DSP, DISP)
  - Built-in security
    - Authentication (simple / strong)
    - Basic Access Control (item, requestor, operation)

ATN Directory

- ICAO Doc 9880, Part IV (technical specification)
    - Based on X.500 Directory
    - ATN-specific attribute types and objects classes
    - Schema definition

- Use of COTS products
    - Implementation of ATN Directory by customisation

- Suitable to support multiple applications
    - ATS Message Handling Service (ATSMHS)
    - Context Management (CM)
    - Next Generation Air Transportation System (NextGen) ?
    - System Wide Information Management (SWIM) ?

What Is It Good for ?

- General, multi-purpose, database-like <u>data storage</u>
  - Distributed, global application
  - High level of automation
  - Open and extensible

- Standardised
  - Commercial off the shelf products (COTS)
  - Compatibility and inter-working

- Support for a wide range of applications
  - ATN applications (ATSMHS, CM, ...)
  - Future ATM applications
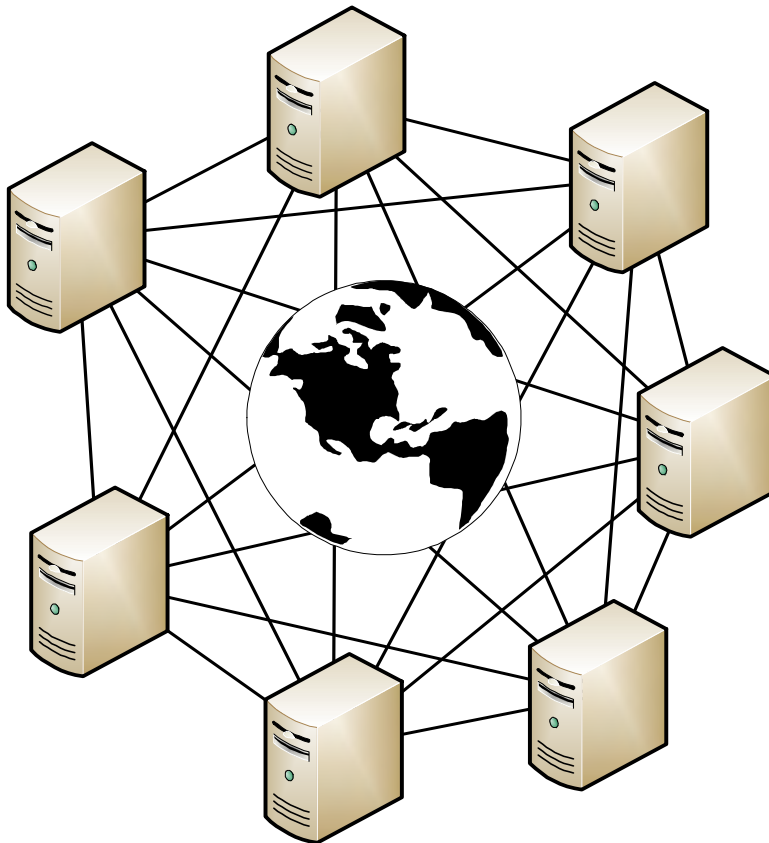 - Local applications (added value)

Applied Scenario

- Distributed Directory – Geographical
  - Global / international operation
  - DSA per State / Organisation
  - Connected by network

- Distributed Directory – Data
  - One source
    Available at supplier
  - Multiple users
    Provided on request

- ✔ Technical specification
- ❓ Operational Requirements
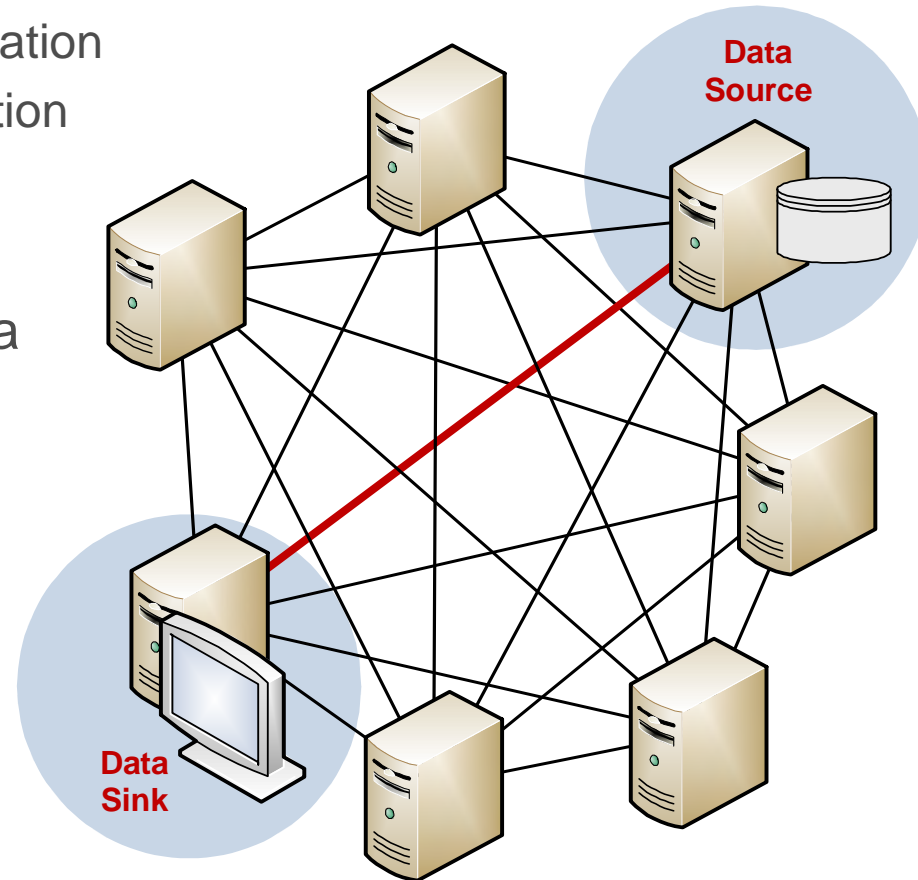
Operational Requirements

- Correctness of data

- Real-time availability

- Workflow and procedures

- Synchronisation and version handling

- Manageability

- Regional structure

- Transition

Correctness of Data

- Data from various international sources

- Used by local applications

- Correctness and overall data consistency ?

➢ Validation of data desirable prior to use
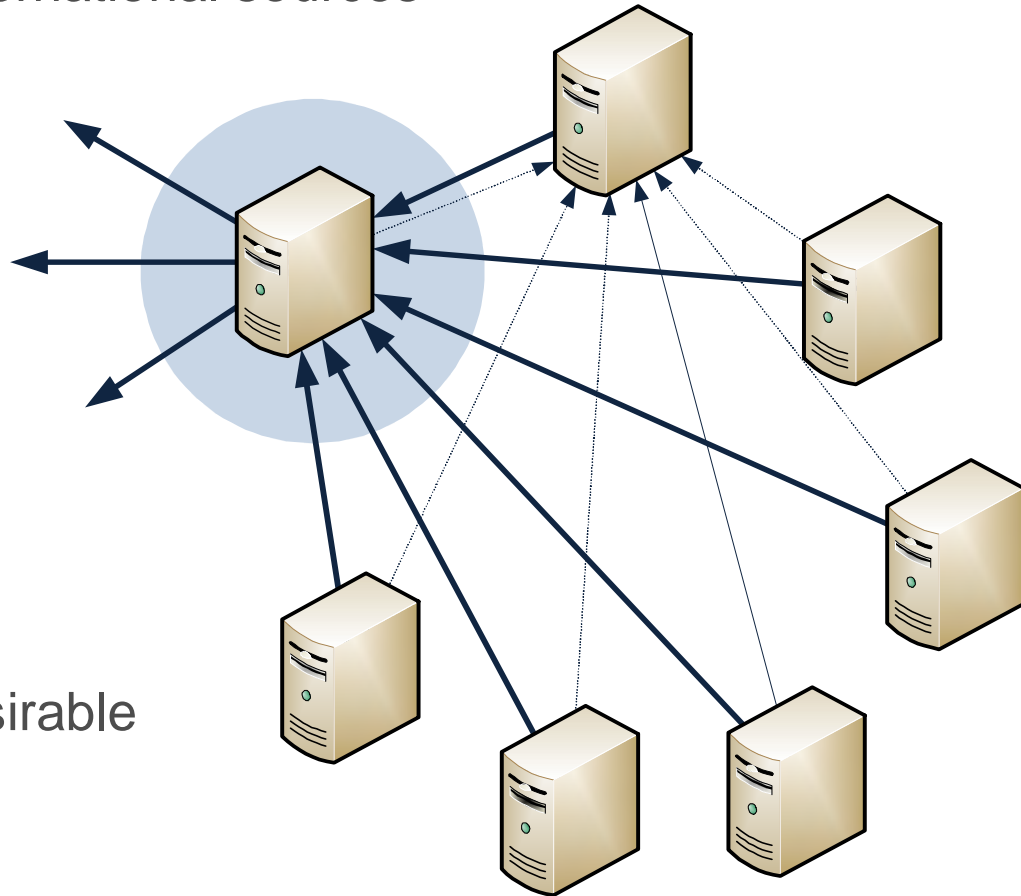
Real-time Availability

- Distributed service
  - Data made available on request
  - Relies on underlying network

- Time-critical retrieval of data

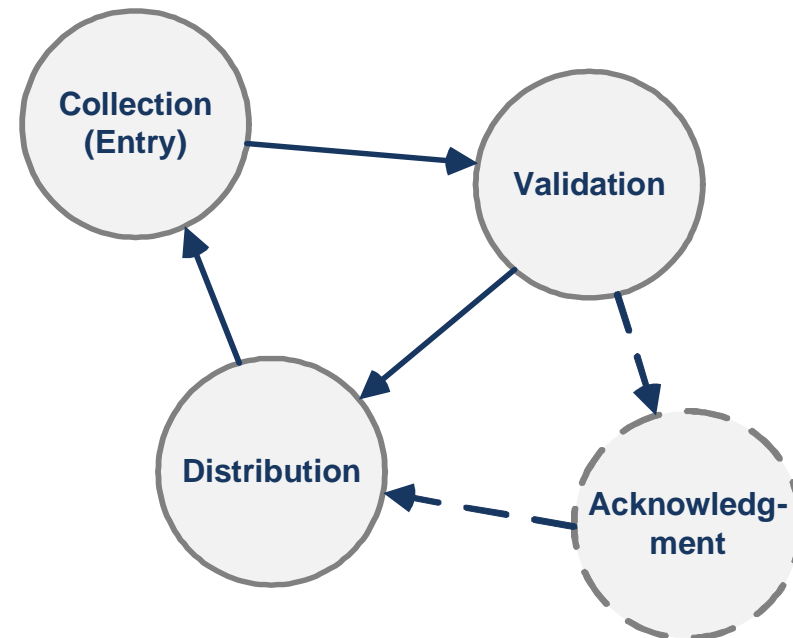Application (Sink) Local DSA Remote DSA (Source)
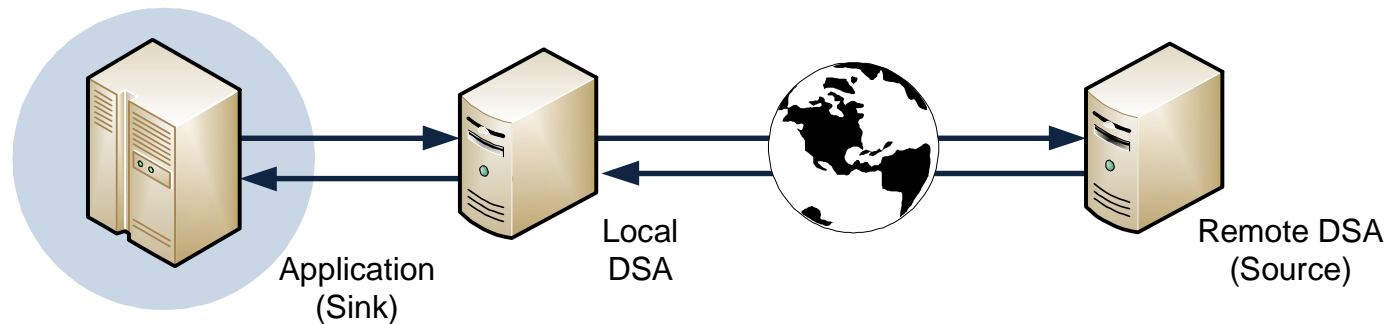
- ➢ Local availability of data needed
  - Copy by replication

Workflow and Procedures

- ATS messaging management process
  - ATS Messaging Management Centre (AMC)
  - Well-defined procedures

- Recurring steps
  1. Collection (Entry)
  2. Validation
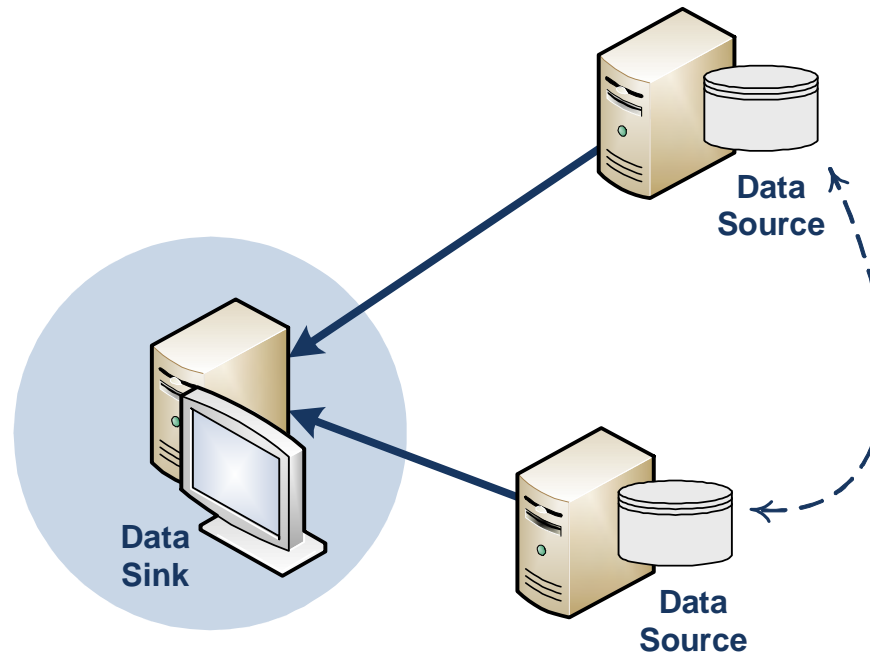 3. Acknowledgment (if needed)
  4. Distribution

➢ Workflow and procedures for coordination needed

Synchronisation and Version Handling

- Data retrieval
  - Interrelated data
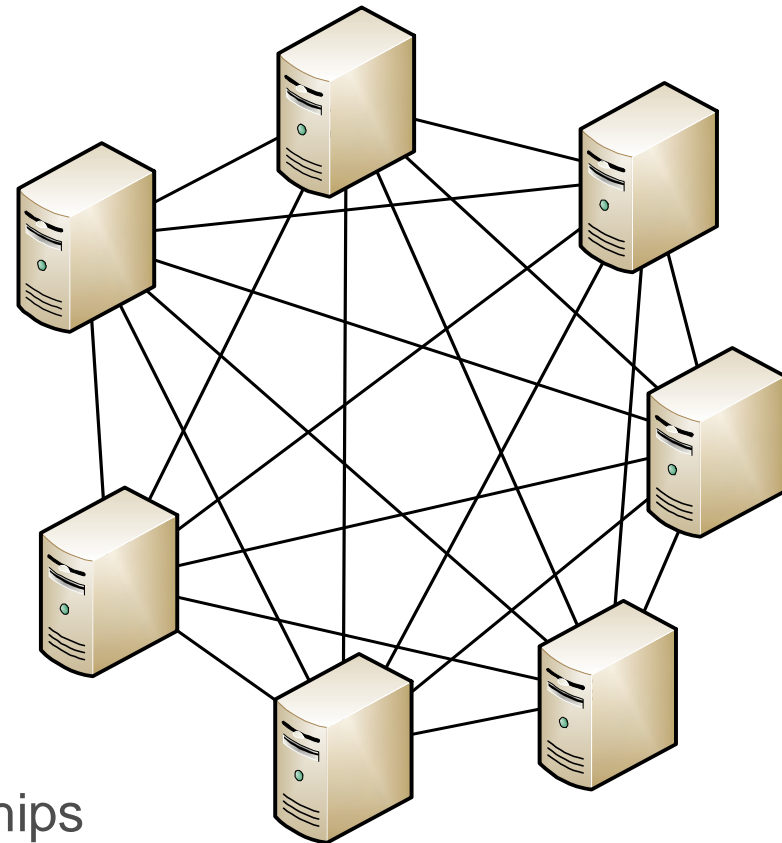 - Different sources
  - Temporal changes

- Example
  - AMHS MD Registry
  - CAA Table

➤ Synchronisation and version handling required

Manageability

- Every State / Organisation
  - Provides data to any other
  - Consumes data from any other

- Communication relationships
  - Establish, operate, maintain
  - Integrate new partners

➤ Reduce communication relationships

Regional Structure

- Flat structure assumed
  - 250+ potential communication partners
  - Demanding to manage
  - Heavy reliance on network availability

- Regional working arrangements
  - ASIA/PAC
  - EUR
  - CAR/SAM
  - ...

➤ Support of regional structure desirable

Transition

- Existing systems
  - Directory Servers
  - AMHS: Use of Directory

- ATS Messaging Management Centre (AMC)
  - Provides similar service
  - Partial migration to Directory service

- Support for States / Organisations
  - Lack of local Directory infrastructure
  - Legacy applications

➤ Migration aids and transitional steps required

Directory Service Operational Concept

- Study by EUROCONTROL
  - Contact: Yuksel Eyuboglu (yuksel.eyuboglu@eurocontrol.int)
  - Contractor: COMSOFT GmbH

- Timeline
  - Call for Tenders in October 2010
  - Award of contract in December 2010
  - Presentation of draft analysis and concept to AFSG/15 in April 2011
 - Completion planned for August 2011

Directory Service Operational Concept (con't)

- Covered aspects
  - <u>Operational Concept</u> for European Directory service
  - Directory service as a <u>Common Facility</u>
  - <u>Interworking</u> with other Regions, States and Organisations
  - <u>Transition</u> with regard to existing environment and applications

- Work Packages
  - WP1: Analysis of situation
  - WP2: Definition of concept
 - WP3: Validation of concept
  - WP4: Final report

Approach to Solution – Centralised Topology

- Centralised management of data
    - Enables validation of data and workflow
    - Reduced number of partners
    - Support of regional structure
    - Synchronisation at a single point

- Replication
    - Local availability of data (available where data is needed)

- Version Handling
    - Extension of the schema definition

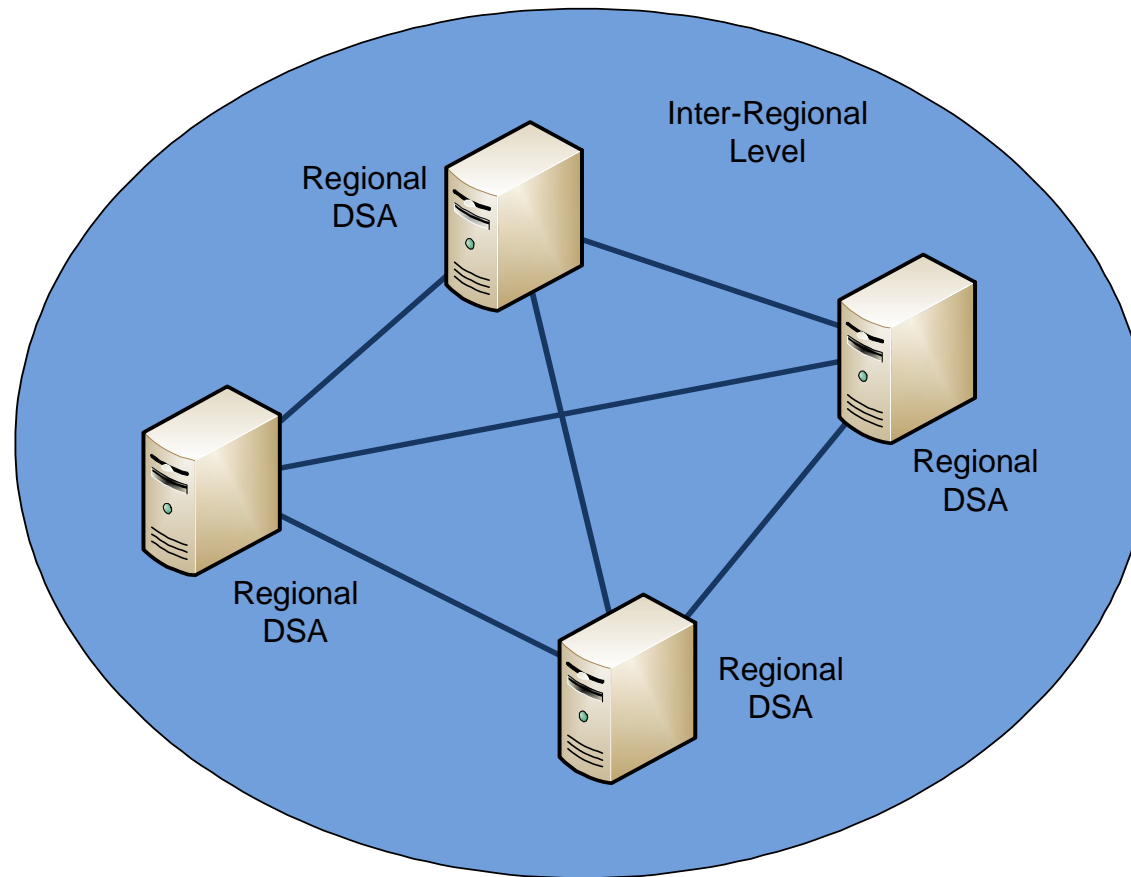Other States and Regions
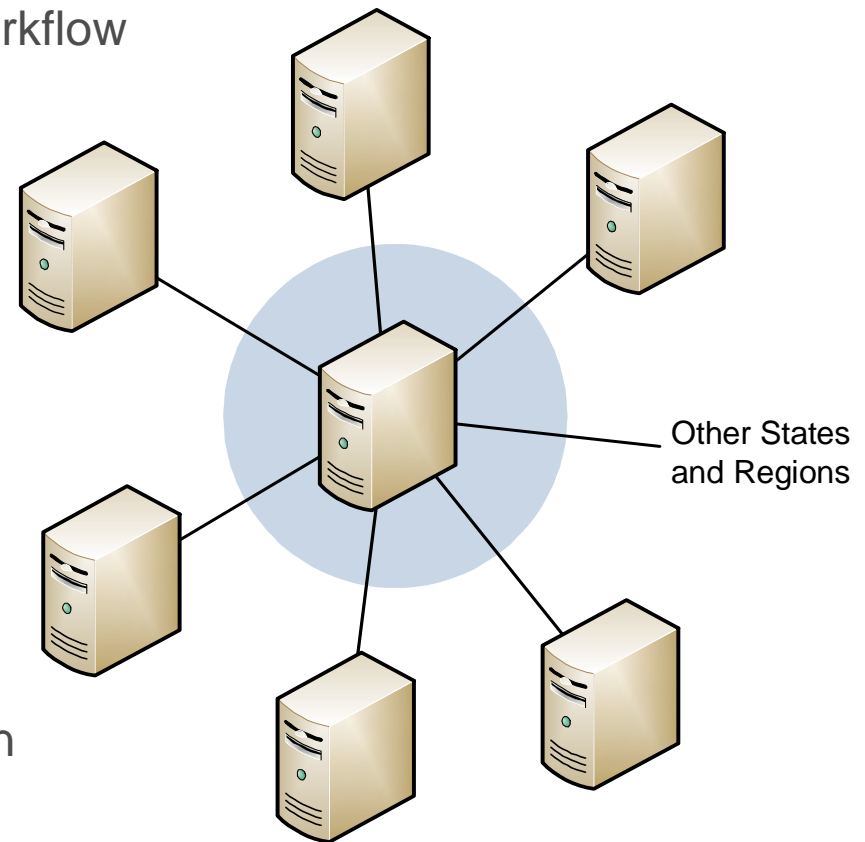
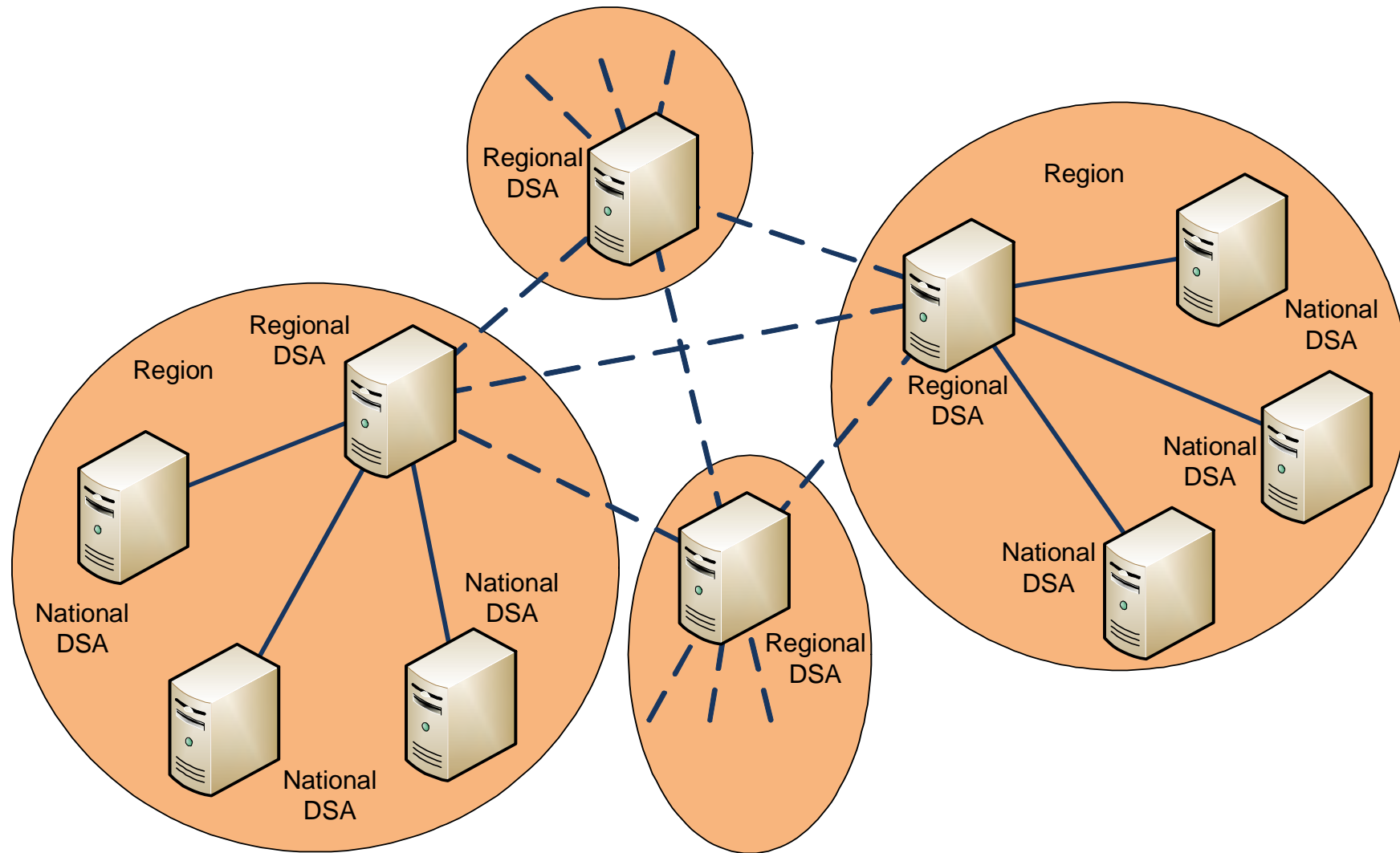# Approach to Solution – Central Data Management

- Collect
  - Data pieces
  - From States / Organisations

- Validate
  - Overall data for consistency

- Distribute
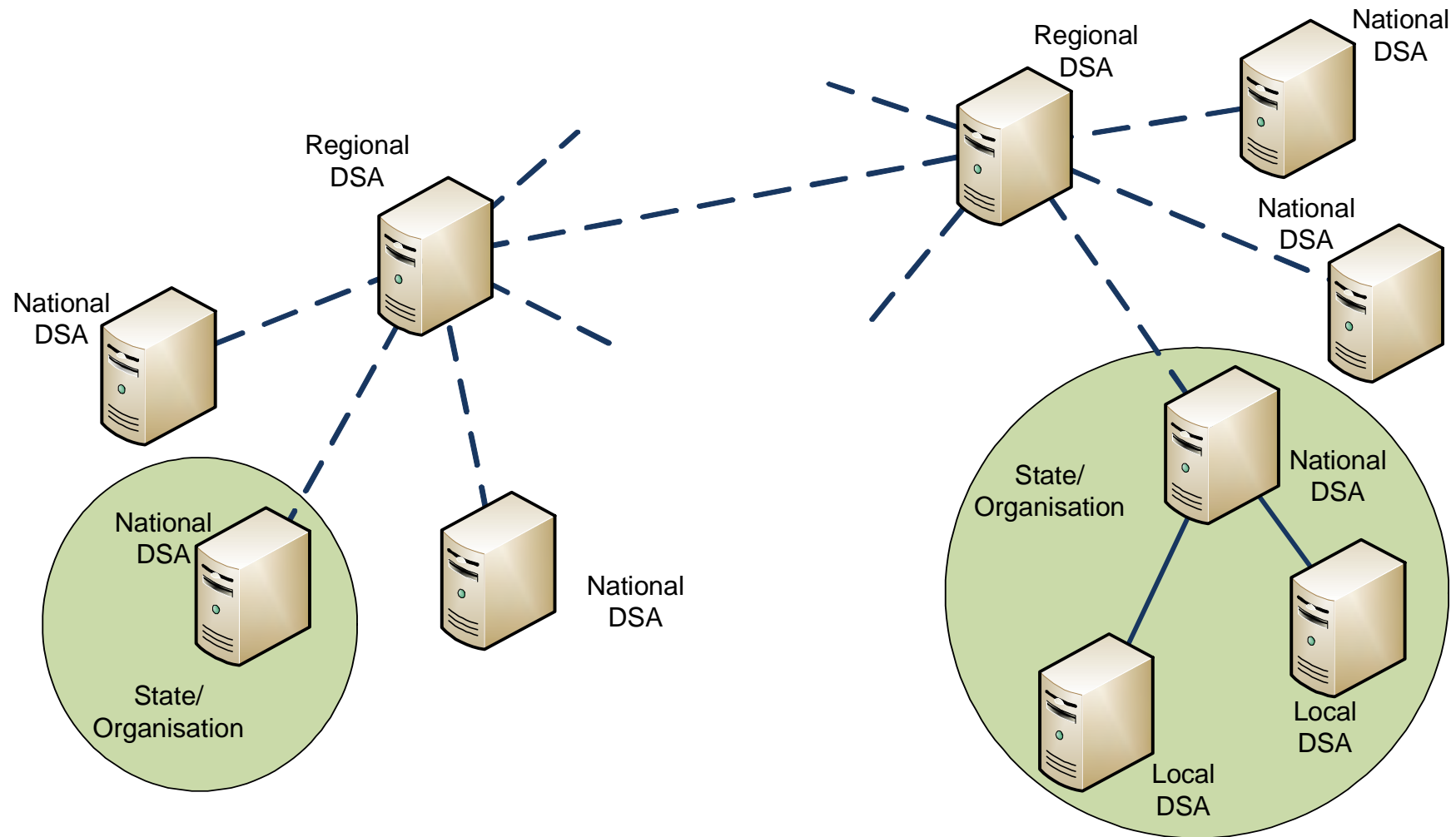 - Overall validated data
  - To States / Organisations

Other States and Regions
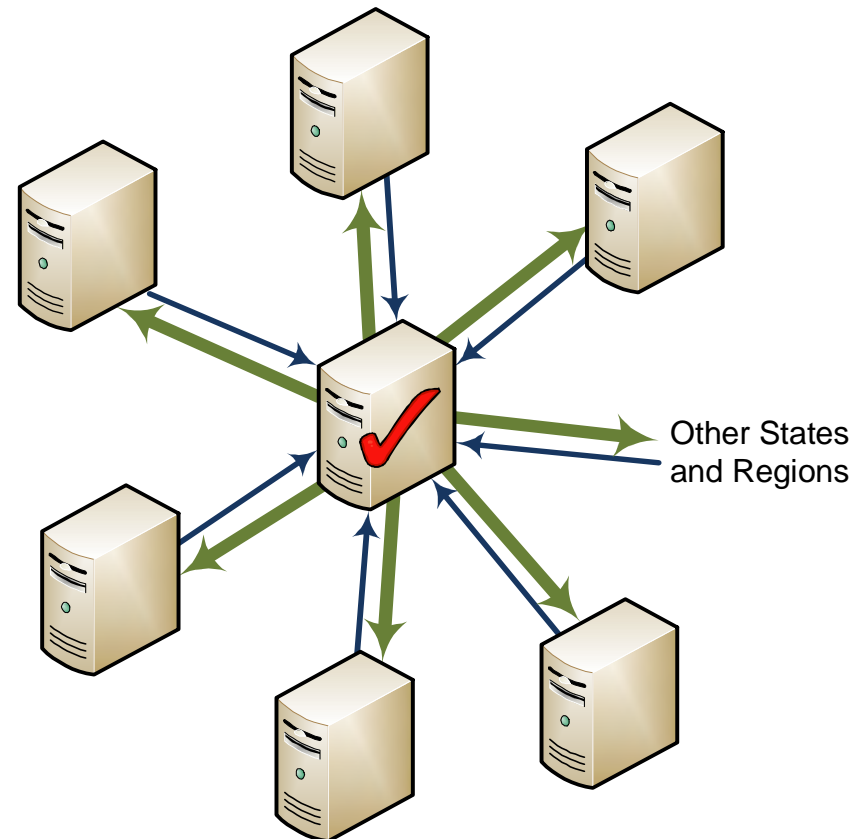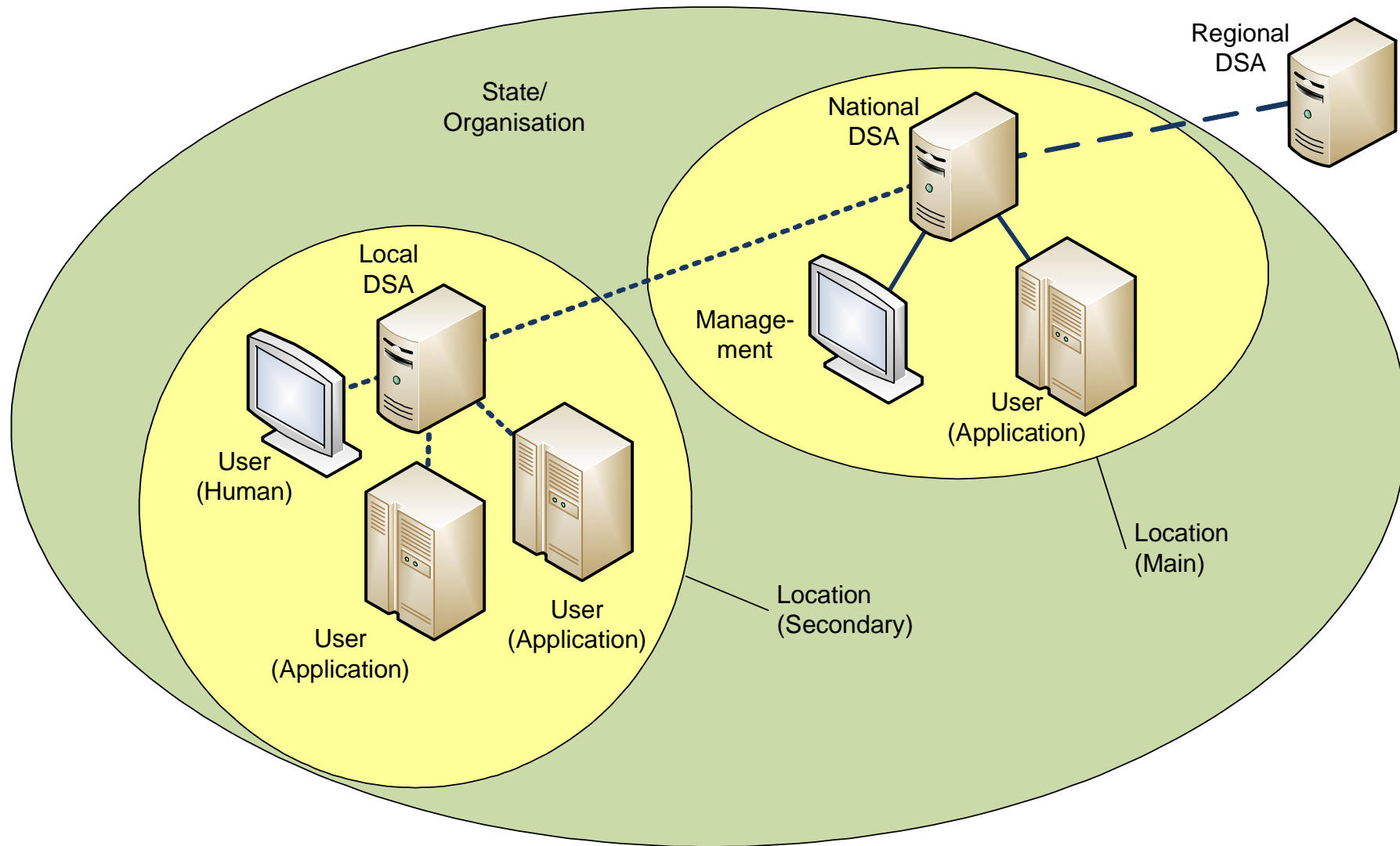
Interworking – Inter-Regional Level

Interworking – Regional Level

Interworking – Domestic Level

Interworking – Local Level

Summary

- ✓ Technical Specification

- ✓ Concept for operations
    - ✓ Procedures and workflow
    - ✓ Interworking
    - ✓ Local availability of data
    - ✓ Transition

- ✓ Ready to be implemented

Thank You!