

# Leveraging Geospatial Information Across The Enterprise

Bentley's Flexible Geospatial Approach

# The Need for Geospatial Enterprise Integration

- Instant access to all business functions is required
  - Applications cannot be deployed in isolation
  - Integration is required into a larger, integrated solution
- Focus of Enterprise Integration is shifting
  - Traditionally: connecting database-driven, form-based applications
  - Now: includes Geospatial and GIS applications (strategic value)
- Software vendors – including those in the geospatial world – are expected to provide the necessary tools

# Four Integration Entry Points

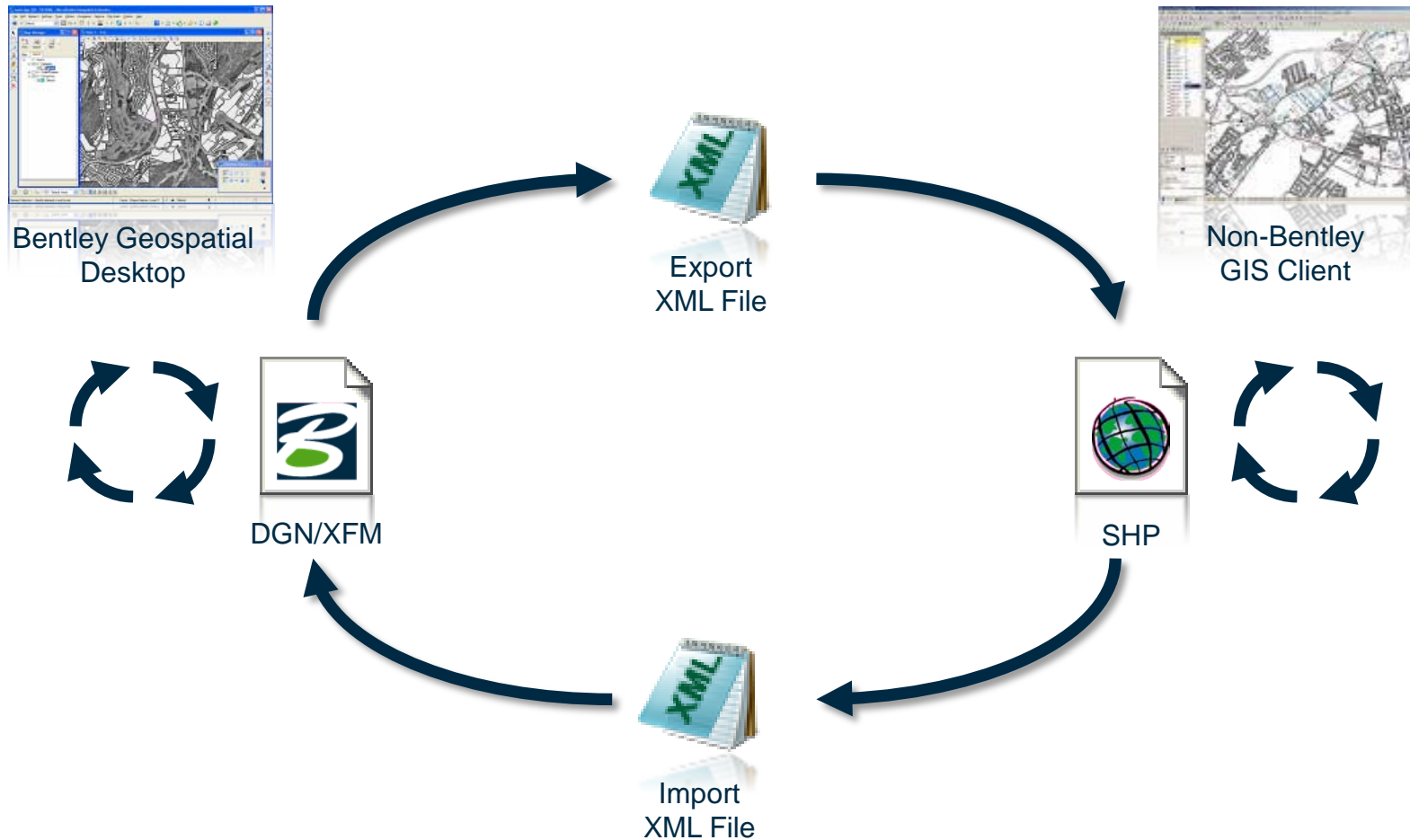
Bentley takes a flexible approach to enterprise integration, by offering four integration entry points:

1. Data (information) integration
2. Integration with Bentley's geospatial desktop clients
3. Integration with ProjectWise/Bentley Geospatial Server
4. Integration with Bentley's geospatial publishing tools

# Data (Information) Integration

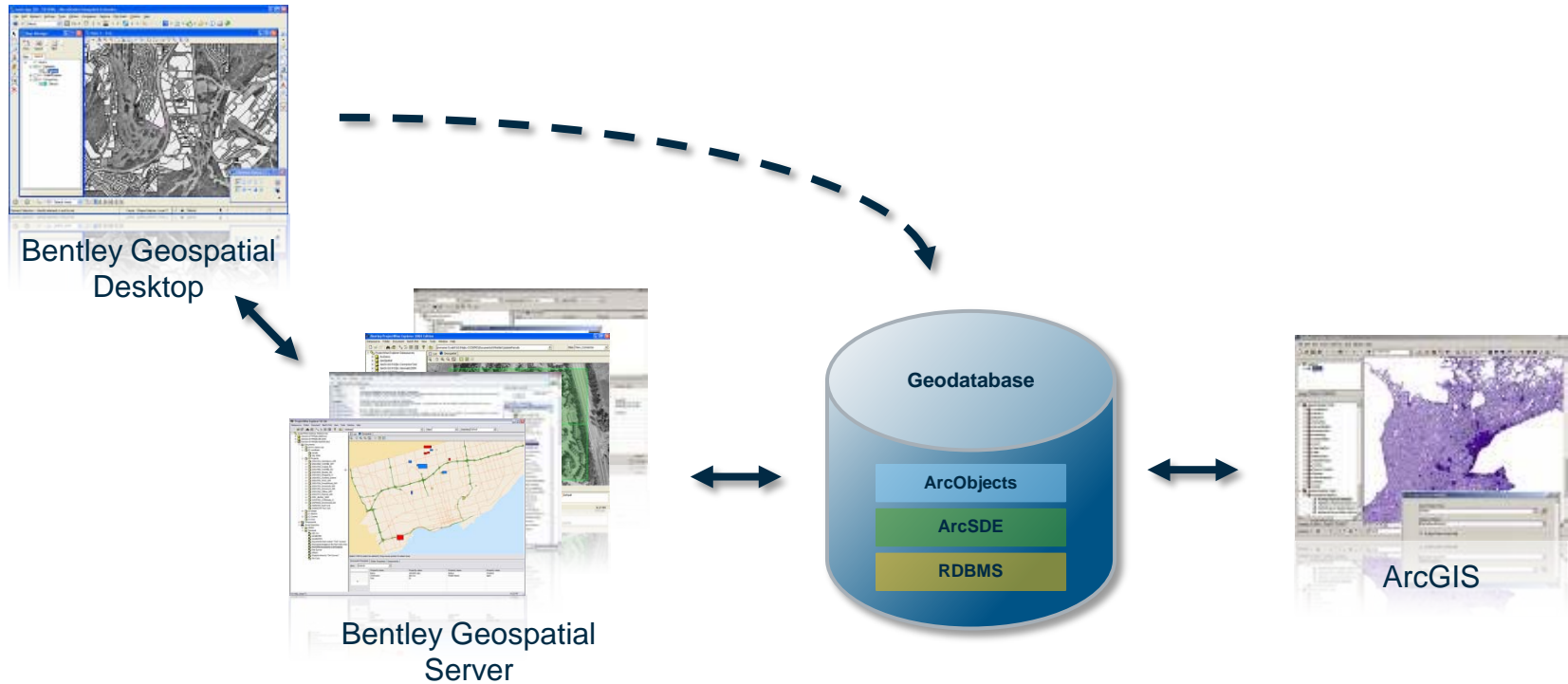
- Data exchange
  - Common GIS data formats like ESRI Shapefiles or MapInfo TAB and MID/MIF;
  - CAD file formats such as DGN and DWG;
  - XML-based exchange formats such as LandXML or GML
- Data collaboration
  - Sharing one common spatial database
  - Oracle Spatial/Locator, ArcSDE
  - Two-tier or *n*-tier architecture

# Data exchange editing life-cycle



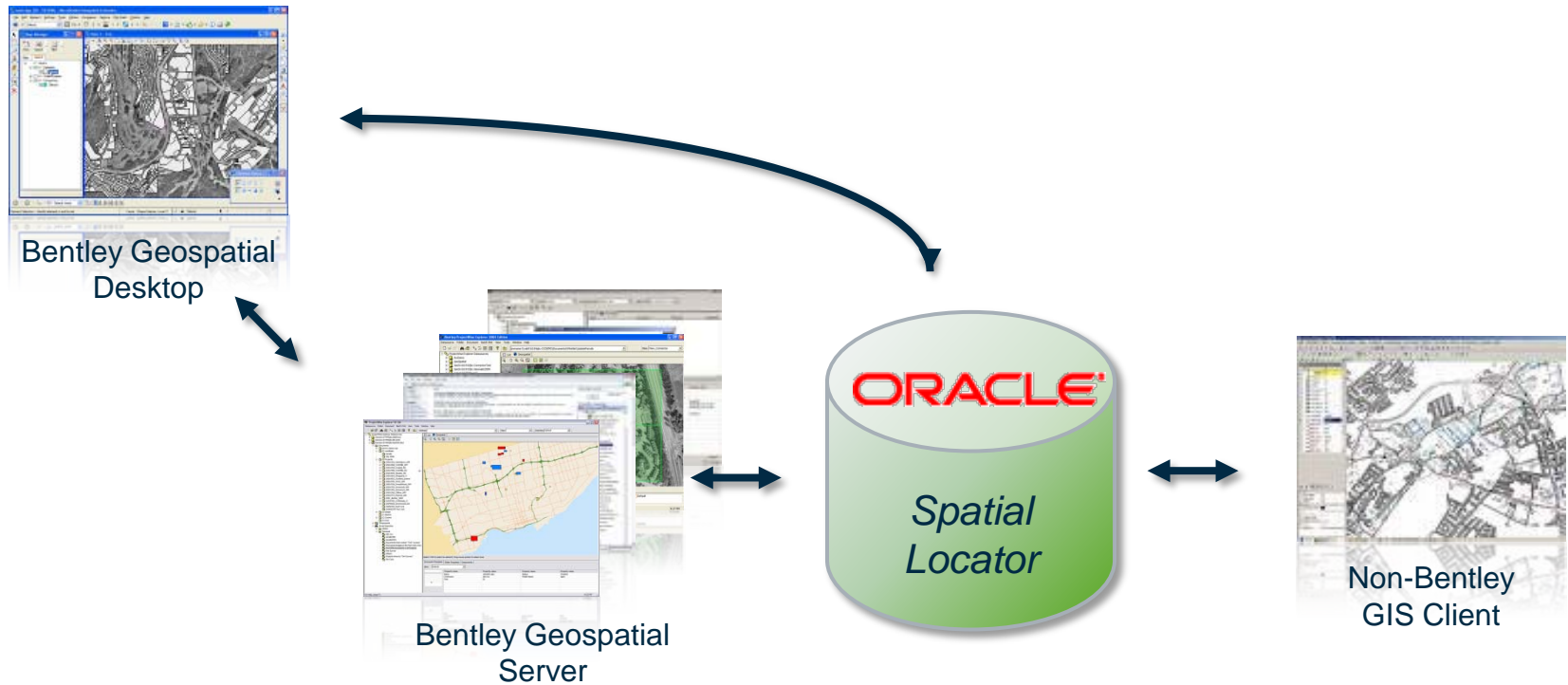
# Data collaboration (ArcGIS)

- *N*-tier read/write access using the Bentley Geospatial Server
- Two-tier read-only access (open storage model)



# Data collaboration (Oracle)

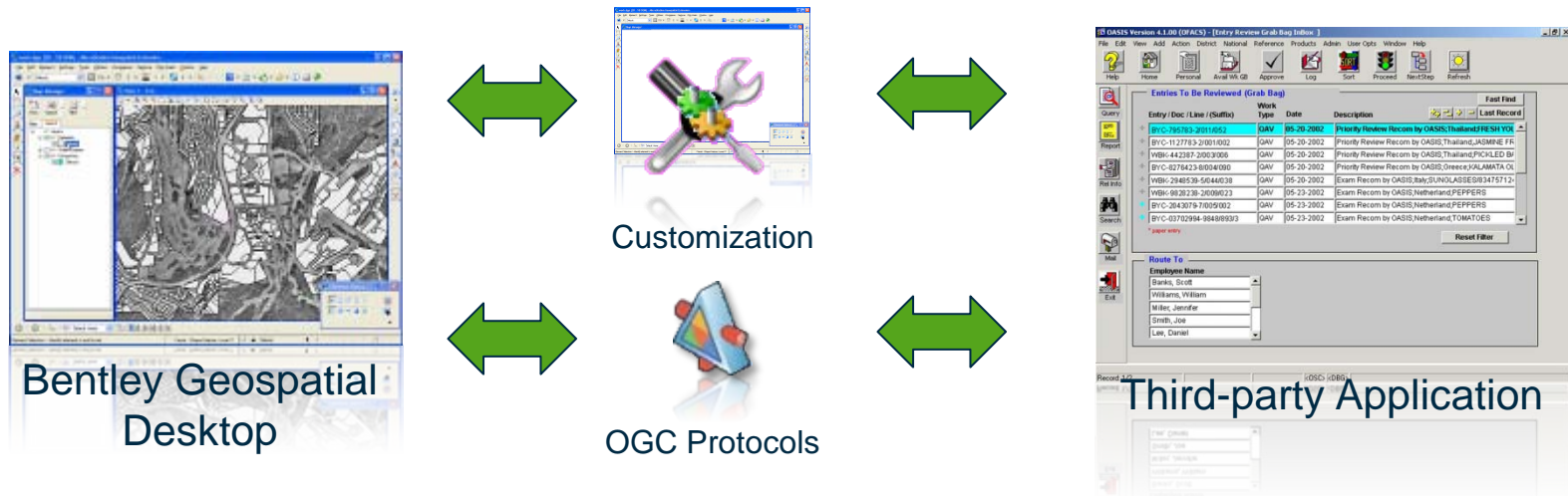
- *N*-tier read/write access using the Bentley Geospatial Server
- Two-tier 'direct' read/write access





# Integration with Bentley's Geospatial Desktop Clients

- Creating point-to-point connections
  - Using *Customization*
    - Enhancing Bentley's geospatial desktop client using APIs to create an interface with other applications
  - Using *Common protocols*
    - using ISO/OGC protocol-based functionality to interface with other applications



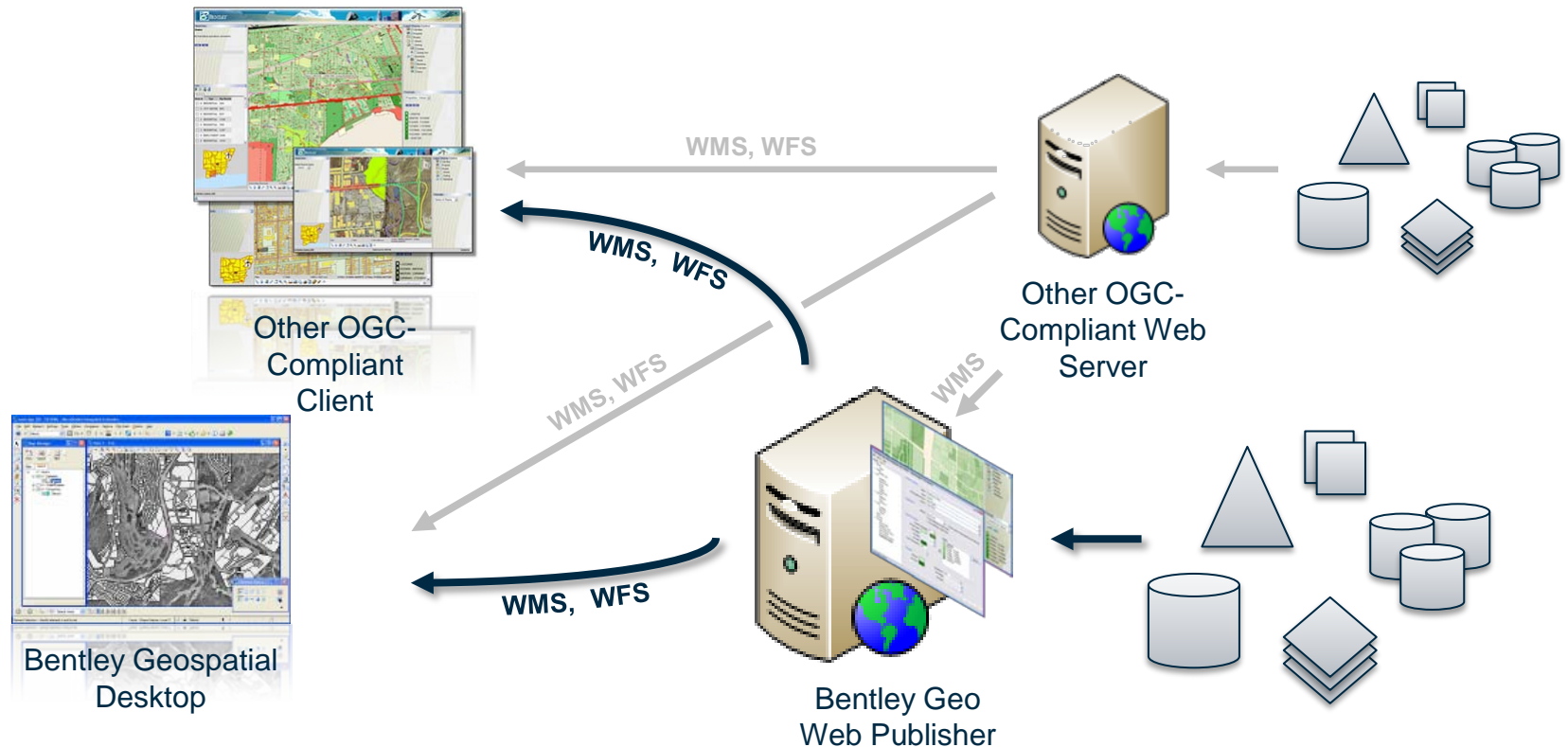


# Customization

- Appropriate when the integration scope is limited
  - Allowing access to geospatial data for a limited number of applications
  - e.g. forms-based applications needing a geospatial interface
- Bentley's products are designed to be customized
- Wide choice of development options
  - Scripting, VBA, MicroStation Development Language (MDL), C++, and C#
- 'Proven' approach to integrating Bentley applications

# Common Protocols

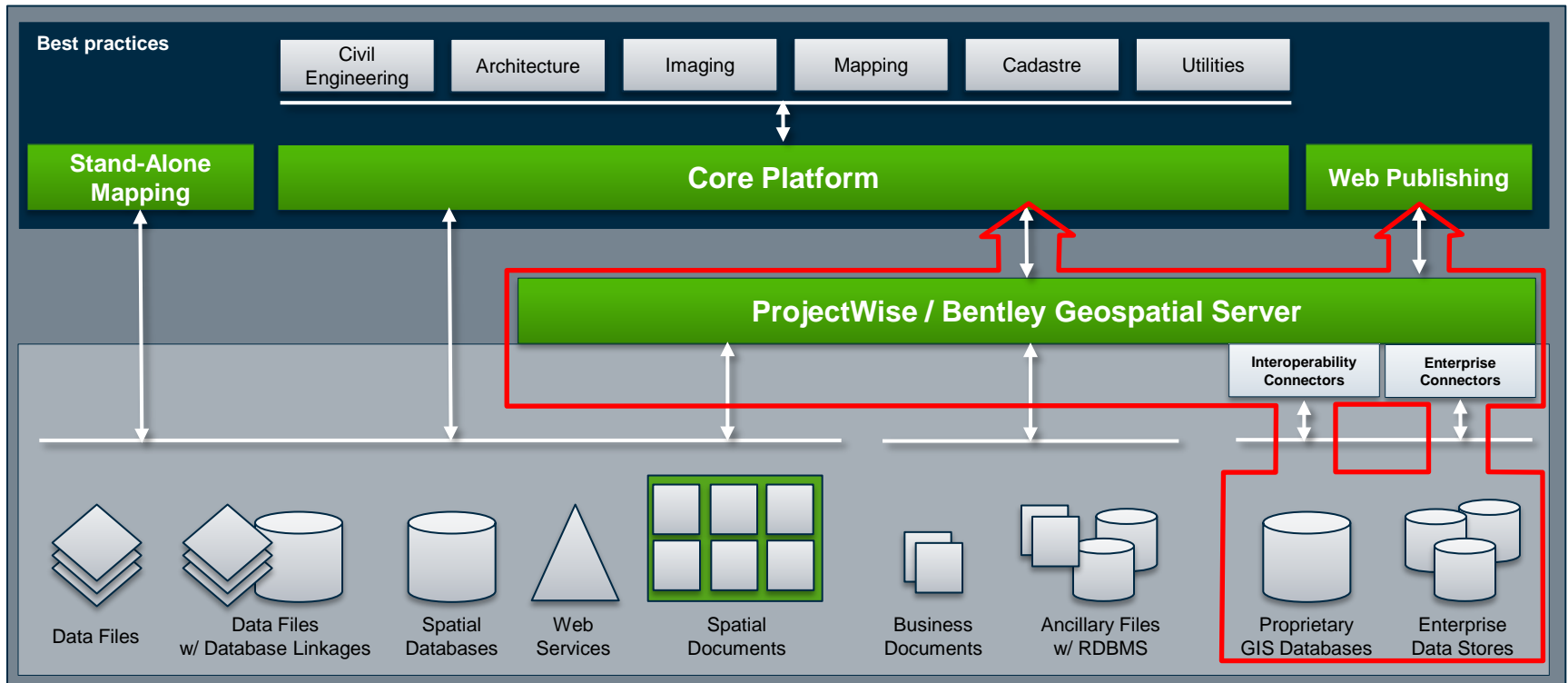
- Example architecture leveraging OGC's WMS/WFS using Bentley Geospatial products



## Integration with ProjectWise/Bentley Geospatial Server

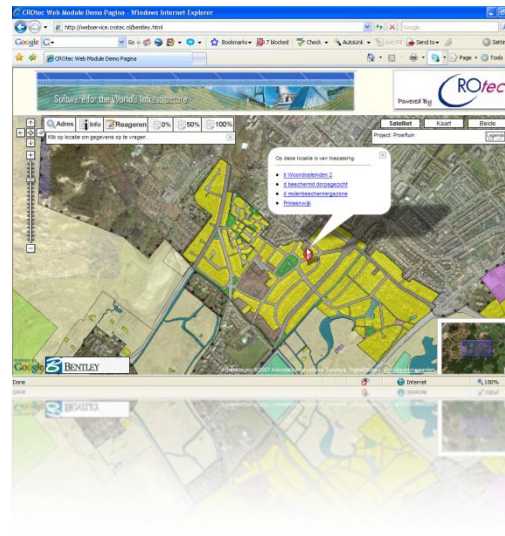
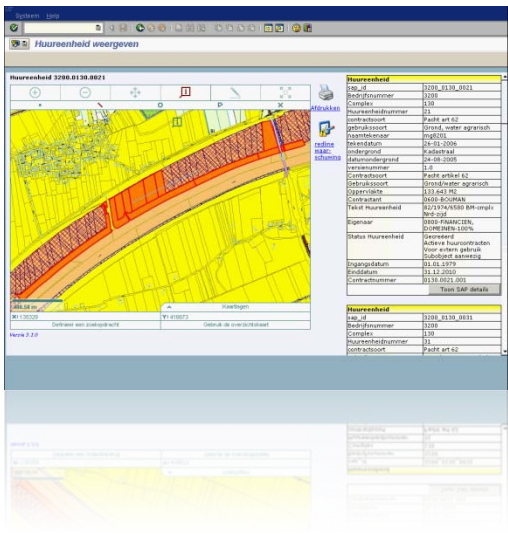
- Natural entry point for Enterprise Integration
  - Server-to-server integration approach
- Using Bentley's Connector architecture
  - Interoperability connectors
    - interfacing with enterprise geospatial data stores (e.g. ArcSDE, Oracle Spatial/Locator)
  - Enterprise connectors
    - Interfacing to other, non-geospatial enterprise platforms (e.g. SAP, Maximo)
- Unique benefits through *Federated Data Management*

# Connector Architecture



# Integration with Bentley's Geospatial Publishing Tools

- Using Bentley's publishing server architecture
- Integration paths:
  1. Logical integration using portals
  2. Logical integration using mash-up technology
  3. Integration based on web-services (SOAP, REST)



# Conclusion

- The need for enterprise integration in many organizations is clear
- Every main purpose for enterprise integration is met by one of Bentley's geospatial enterprise integration options:
  - *Data (information) Integration* ← data exchange, collaboration
  - *Process Integration* ← connector architecture, customization
  - *Vendor Independence* ← commitment to open standards, protocols
  - *Common Interface* ← portal, mash-up, or services integration
- Flexibility is key