A model-driven architecture for Distributed Information Integration
metamatrix enables government agencies to reconcile all their information sources through a single server process.
distributed information integration

• The need:
  – Faster Time-To-Market
  – Integrate real-time and static data
  – Secure data retrieval and sharing

• The benefits:
  – Real-time information sharing
  – Greater efficiency and reduced costs

• The approach:
  – Use more effectively existing information sources
  – Eliminate redundant information
  – Leverage new information sources in applications
  – Decouple applications from information sources
  – *Don’t copy or move information!*
solution is to use information metadata

• Understand information sources
  – Where is information? Which platform?
  – What form is it in?

• Understand information consumers
  – How is information used?
  – In what form is it expected?

• Integrate information
  – Is similar information related?
  – Is information a combination or transformation of other information?

the key to managing data is managing metadata
metamatrix metabase

Design-Time Metadata Management

- MetaData Modeler™
  - Visual tool to collect, model, and manage metadata for enterprise information sources
  - Stand-alone or used with MetaData Server™

- MetaData Server™
  - Repository for metadata
  - Manage and version models
  - Facilitate enterprise management and sharing
metamatrix information integration server

Runtime Metadata for Information Access

- Includes MetaBase™
- Information Integration™ Server
  - Scalable, fault-tolerant distributed server
  - Pluggable connectors for various information source platforms
  - Access disparate sources as if single source
- Connector Development Kit™ (CDK)
  - Bench-test environment for custom connectors
- Console
  - Tool for remote administration
  - Monitor, manage, and configure distributed servers
information integration using metamodels

• Integration at the physical source level does not work: the structure of the data changes too rapidly.

• The solution is abstraction
  – A metadata-based model for each physical source is constructed
  – Metamodels are used to integrate information

• Executing query technology against a metamodel accomplishes Intelligence Information Integration
Applications operate on virtual elements defining the domain in which the organization operates.

The logical and physical layers are bound statically during modeling or dynamically using rules.

Administrators can change physical data sources without affecting existing applications.
Design-Time Metadata

Run-Time Metadata

Virtual Database

Information Sources

Information Consumers

Model Driven Architecture: Formal models define access functionality

1. Model

2. Model

3. Relate

4. Deploy

5. Access

metamatrix MDA
**Interoperability via XMI and MOF Repository**

**Metadata Server**

**Management Tools**

**MetaMatrix Repository**

**Disparate Data Sources**

**Metadata-Aware Tools**
- CASE Tools
- Modeling Tools
- DB Admin Tools
- Others
metamatrix tools

**MetaData Modeler**
- Capture, model, and maintain metadata from data sources
- Import from data sources
- Create and manage models
- Version control

**MetaMatrix Console**
- Administrative GUI for MM Server
- Monitor Server operations
- Configure Server
- Manage user accounts & entitlements
- Configure logger and view log entries

**MetaMatrix QueryBuilder**
- Utility for developers
- Submits queries to MetaMatrix Server
- Returns results, query plan information, and server messages

**MetaMatrix Connector Development Kit**
- Utility for programmers
- Simulates MetaMatrix Server
- Tests connectors against live data sources
integrate all information types

**Reduces Costs**
- Reduced total cost of integration per project
- Today 60–70% of the cost of all software projects is integration

**Increases Speed**
- Fast application deployment times
- Fast time to market
- Uniform query method to disparate information

**Improves Visibility**
- Aggregated data visibility across any source
- Single API to all information

**Extensible Framework**
- Flexibility to develop new applications
- Foundation for intelligence
- Federated metadata map of all information
- Supports any data source and type
## Metamatrix Model for Intelligence IT Infrastructure

<table>
<thead>
<tr>
<th>Applications</th>
<th>Metamatrix Abstraction Layer</th>
<th>Data Infrastructure Services</th>
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| - Intelligence Applications  
  - Cross map  
  - Patterns  
  - Data mgmt | Data Management  
  - Staging DB  
  - ETL  
  - Virtual DW | Any data from any source in any environment... |

Inter Agencies Applications  
- Sharing  
- Communication  
- Collaboration

Information Integration infrastructure, scaleable, extensible, dynamic
metamatrix platform

- Global metadata repository creates a unified schema of disparate information sources across agencies and organizations
- Provides uniform and secure access to disparate data sources: news, web, flat files, email, relational, object, legacy, etc.
- Uses metadata to integrate disparate data sources
- Reconcile disparate data structures
- Controls data access through entitlements
- Scalability with J2EE and asynchronous operation
Distributed Information Integration