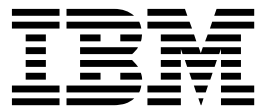IBM InfoSphere Master Data Management
Version 11 Release 5
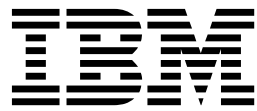
Overview

IBM

IBM InfoSphere Master Data Management
Version 11 Release 5

Overview

IBM

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InfoSphere MDM product overview

InfoSphere® MDM is a comprehensive suite of products and capabilities that you can use to manage the master data in your organization.

Introduction to master data and master data management

Companies frequently have difficulty achieving an accurate view of the key facts that affect the organization in non-customer-facing environments such as operations and finance because data about customers, locations, accounts, suppliers, and products can often be fragmented, incomplete, or inconsistent across organizations. InfoSphere MDM provides the features and flexibility needed to solve these issues.

- *Master data* is a subset of all enterprise data. Master data is the high-value, core information used to support critical business processes across the enterprise. Master data is at the heart of every business transaction, application, and decision.
- *Master data management* is a discipline that provides a consistent understanding of master data entities (for example, subscriber, policy, and so forth). It is a set of functionality that provides mechanisms and governance for the consistent use of master data across the organization. It is designed to accommodate, control, and manage change.

InfoSphere MDM addresses issues of fragmented, incomplete and inconsistent data with a central repository to store master data across the organization. InfoSphere MDM provides a consolidated, central view of an organization's key business facts and also provides the ability to manage master data throughout its lifecycle by integrating with each organization's specific business rules and processes for creating, verifying, maintaining, and deleting master data from the repository. InfoSphere MDM helps organizations realize the full benefit of their investments in customer relationship management (CRM), enterprise resource planning (ERP), and business intelligence (BI) systems, as well as integration tools and data warehouses.

Lifecycle of information

InfoSphere MDM is in the midst of the lifecycle of information, as shown in the following diagram:
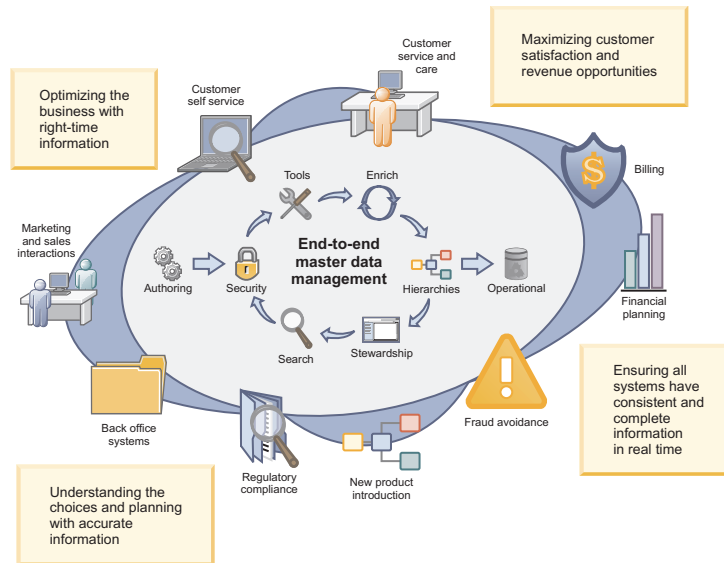
Unified view

The following diagram shows how InfoSphere MDM pulls together information
into a unified view across business processes, transactional systems, and analytical
systems. InfoSphere MDM addresses key data issues such as governance, quality,
and consistency. The MDM goals are as follows:

Manage
> To manage your data. InfoSphere MDM manages your data from source
> systems such as business applications, databases, and content sources.

Govern
> To provide data stewardship tools that help ensure quality and security.
> Data stewardship is essential for your MDM implementation.

Develop and integrate
> To create custom applications and business processes. Each MDM
> implementation has different requirements; InfoSphere MDM provides the
> development tools to create custom applications and business processes.

Analyze
> To analyze your data. Business intelligence applications help you to
> monitor and assess your master data and how it affects your business
> goals.
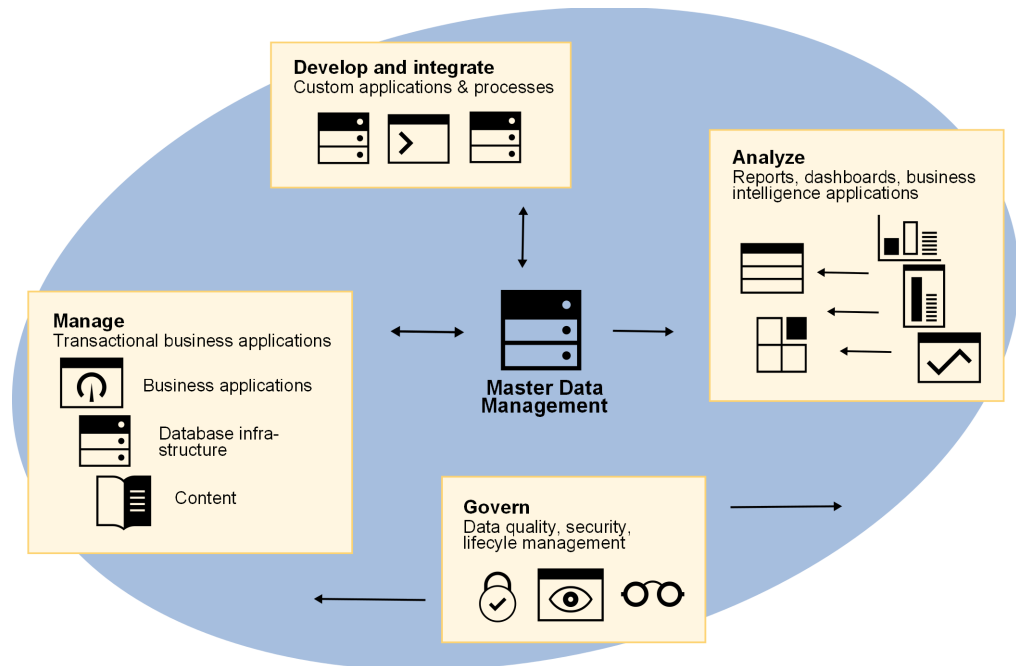
The editions

InfoSphere MDM includes both transaction-oriented MDM and collaborative authoring and workflow capabilities to handle multiple domains, implementation styles, and use cases across various industries. To provide you with optimal coverage of their MDM solution requirements, InfoSphere MDM is offered in these editions:

- Enterprise Edition addresses your MDM needs with a single, comprehensive solution.
- Advanced Edition helps you to transform your organization through improved business processes and applications.
- Standard Edition delivers business value for MDM projects with a quick time to value.
- Collaborative Edition streamlines workflow activities across users who are involved in authoring and defining information.

Related information:

➥ Video: InfoSphere MDM in action

Scenarios for InfoSphere MDM

Scenarios show how you might use the various editions of InfoSphere MDM to master data and improve data governance.

The following examples list only a few of the ways that you might take advantage of the different editions of InfoSphere MDM. Which edition and features you use typically depends on your requirements and environment. The scenarios describe options for meeting requirements for particular environments. But because InfoSphere MDM is flexible and configurable, you might use a different edition or different features to achieve similar business or organizational goals. These

scenarios consider a few key industries as examples, however it is not possible to list specific information for all the industries and domains that can benefit from InfoSphere MDM.

Generally, if you obtain InfoSphere Master Data Management Standard Edition, you deploy MDM as a registry implementation. If you obtain InfoSphere Master Data Management Advanced Edition or InfoSphere Master Data Management Enterprise Edition, you deploy MDM either as a registry implementation or as a centralized implementation. In Advanced and Enterprise Editions, you can have both registry and centralized implementations by using hybrid MDM in this scenario:

- You want to maintain source systems as your system of record for master data, by using virtual MDM capabilities to match and merge.
- You also use physical MDM capabilities to persist and augment a defined enterprise view with more centrally managed information.

Patient data from multiple clinics

With InfoSphere Master Data Management Standard Edition, a regional healthcare organization allows its individual clinics to maintain diagnostic and treatment information locally. While the organization maintains a centrally located index (or "registry") of the distributed data. The organization chooses this registry implementation style because government regulations do not allow healthcare organizations to modify the data that is provided by clinics. Therefore, the organization cannot consolidate source records into a single physical record that happens with a centralized implementation style. The registry style provides a complete view of a patient across all clinics. At the same time, this implementation enables newly acquired clinics to be integrated quickly into the organization.

How it works:
1. The MDM architect uses the Patient Hub to quickly set up an MDM environment as a registry implementation.
2. The MDM architect and data steward use the InfoSphere MDM Workbench to run processes that clean and de-duplicate the data. Then InfoSphere MDM stores a consolidated virtual view of each patient.
3. Customer service representatives and clinic staff use InfoSphere MDM Inspector and InfoSphere MDM Enterprise Viewer to perform data stewardship activities.
4. Application developers create custom business process flows for business analysts to analyze and improve patient data. At the same time, the organization continues to integrate data from newly acquired clinics.

Customer centralization for insurance policies

Using InfoSphere Master Data Management Advanced Edition, a property and casualty insurance company centralizes insurance-policy data for faster and more accurate actuarial analysis. The centralization works well for information that is complex but relatively static (for example, coverage under multiple policies). As the company loads customer data from different sources into the central system, InfoSphere MDM standardizes the party information and merges duplicate customer records. This action is based on predefined business rules for survivorship. The company expects to integrate new data sources gradually over time.

How it works:

1. The MDM architect starts with the default party domain to model the insurance customers and to set up the MDM environment in a centralized implementation style.

2. The MDM architect and data steward can augment the built-in capabilities by developing extensions and additions. For example, the company might develop an extension to populate a new field that contains only the last 4 digits of a customer's Social Security Number. Administrators might allow an application that is used by call-center agents to access the new field, while the administrators prohibit access to the full Social Security Number.

3. Local agents and call-center agents access a single view of a customer with the Data Stewardship UI so they can improve cross- and up-sell opportunities.

4. Business analysts review customers' coverage under multiple policies by using IBM® Cognos® reports.

Single view of citizens for government agencies

With InfoSphere Master Data Management Advanced Edition, a government agency creates a single view of "persons of interest" that is built from multiple data sources. By using a centralized implementation, the agency can easily augment the data model with more attributes such as multiple alias fields and last known location.

How it works:

1. The MDM architect starts with the party domain to build a model of persons of interest and to set up the MDM environment in a centralized implementation style.

2. The MDM architect and data steward can augment the built-in capabilities by developing extensions and additions.

3. The MDM architect generates a feed into an InfoSphere Identity Insight system for party actions, such as updates, additions, and deletions.

4. Application developers create custom user interfaces with the InfoSphere MDM Application Toolkit so that government employees can view the person data.

Consistent product information for the retail industry

With InfoSphere Master Data Management Collaborative Edition, a retail business has consistent product information both for its customers and for internal operations. The customer can see the same product information from mobile applications, websites, or at a physical store. For internal operations, consistent product information streamlines interactions with vendors, manufacturers, and internal teams, such as sales and marketing.

How it works:

1. The MDM architect starts by creating the data model and business-process objects for product information management.

2. The MDM architect simplifies the addition of new products to the product line by setting up global data synchronization with existing vendor and manufacturing systems.

3. The business users create and update product packages with shared workflows.

Customer-centric initiative for financial services

With InfoSphere Master Data Management Enterprise Edition, a financial services company recently added new products. The company wants to offer them to customers of its recent acquisition, a regional bank.

How it works:

1. The MDM architect consolidates the company's existing customers with its new regional bank's customers, while the architect allows the regional bank to maintain its customer records. The architect implements a hybrid MDM model, where some data is stored centrally in its complete form. At the same time, the architect centrally stores pointers to data that is maintained regionally in a registry implementation.
2. Data stewards and business analysts ensure compliance with regulations such as privacy controls, Basel accords, and tax compliance.
3. Data stewards define and manage reference data (for example, country codes, gender codes, and customer types) for the company's customers. Then, the company can send certain product offerings only to eligible customers.
4. With collaborative authoring of bundled offerings, business users centrally manage bundles, check eligibility or pricing, make updates, and detect violations of terms and conditions.

Related information:

➡ Video: Banking solutions

➡ Video: Government solutions

➡ Video: Healthcare solutions

➡ Video: Insurance solutions

➡ Video: Product solutions

➡ Video: Telecommunications solutions

User roles for MDM

To offer some clarity about which members of your organization might complete particular MDM tasks, the InfoSphere MDM documentation employs a set of specific user roles.

The roles that are outlined here are descriptive. They do not correspond to product capabilities. In particular, the user roles do not determine which features users can use.

These roles are examples of the type of roles that you might have in your organization. Your organization might call these roles by other names.

Table 1. Implementation and Operations roles

Role	Description
Architect	The goals of the Architect are the overall implementation of MDM into the enterprise. The Architect also sets up the infrastructure and connections to other enterprise information systems. In your organization, you might call this role an MDM Designer, Solution Architect, or Enterprise Architect.

Table 1. Implementation and Operations roles (continued)

Role	Description
Database Administrator	The Database Administrator (DBA) ensures the performance of data-related components, including the security of data and the availability of databases. Your organization might refer to this role as the Lead Operations DBA, Enterprise DBA, or Data Warehouse DBA.
System Administrator	The System Administrator manages and maintains the IT environment for MDM and its operations management tools, including system administration, networking, and backup. The System Administrator also typically maintains various components and frameworks for reuse within other solutions. In your organization, this role might correspond to the IT Administrator or Metadata Administrator.
Solution Developer	The Solution Developer uses specifications that are created by Architects to build the MDM system. In your organization, you might call this role a Senior Consultant or Development Manager.

Table 2. Governance (Data Stewardship) roles

Role	Description
Basic Data Steward	The Basic Data Steward manages information quality for one or more subject areas of the business. This role typically resolves data issues for such things as company names and addresses by validating values against third-party sources. In your organization, the Data Steward role might correspond to an Agent or a Customer Service Representative.
Advanced Data Steward	The Advanced Data Steward resolves identity resolution issues, such as deduplication, maintains hierarchies, and develops business rules. This role typically investigates data questions and analyzes the data to identify trends and to improve business processes. This role coordinates access authorization and planning for the subject area data. In your organization, you might call this role a Business Analyst, Data Analyst, or Line-of-Business User. This role sometimes overlaps with the Enterprise Use of Master Data roles.

Table 2. Governance (Data Stewardship) roles (continued)

Role	Description
Data Steward Manager	The Data Steward Manager manages a team of Basic and Advanced Data Stewards to ensure that quality goals are met for the organization. This role reviews data quality reports and develops standard operating procedures for the team. This role might develop business rules and perform data stewardship tasks also.
Master Data Governance Council	The Council is a cross-functional, multi-layer team that collectively owns master data. The council steers master data management initiatives at the program level. In your organization, they might include the Director of Governance Quality Board, the Data Standards Program Lead, and other business roles.

Table 3. Enterprise Use of Master Data roles

Role	Description
Business Analyst	The Business Analyst provides the analysis to enable the business integration of the MDM application into the enterprise. The Business Analyst understands customer and business needs and identifies areas where business processes can be optimized to better serve those needs. In your organization, you might call this role a Data Analyst, Subject Matter Expert, or Information Analyst.
Business User	The Business User uses the content of enterprise information to achieve business goals. Your organization might refer to the Business User as an Information User, Report User, or Application User.

Table 4. MDM-Powered Applications roles

Role	Description
Application Developer	The Application Developer augments MDM to meet the requirements of the business with additions, extensions, and so forth. The Application Developer performs development tasks to integrate MDM into the enterprise. In your organization, this role might correspond to a Software Engineer, Software Programmer, or Data Integration Developer.

InfoSphere MDM technologies

The InfoSphere MDM portfolio includes distinct technologies.

Comparison of virtual, physical, and hybrid MDM capabilities

The technical capabilities of virtual, physical, and hybrid MDM help you to manage your master data, whether you store that data in a distributed fashion, in a centralized repository, or in a combination of both.

The following definitions show the differences and the relationships among the technical capabilities:

Virtual MDM

> The management of master data where master data is created in a distributed fashion on source systems and remains fragmented across those systems with a central "indexing" service.

Physical MDM

> The management of master data where master data is created in (or loaded into), stored in, and accessed from a central system.

Hybrid MDM

> The management of master data where a coexistence implementation style combines physical and virtual technologies.

Relative to your master data goals, you might require the technical capabilities of virtual MDM, physical MDM, or hybrid MDM. These capabilities are not implementation styles, but instead they are means by which you might achieve your goals for a particular implementation style. Where and how you choose to store a golden record is reflected by the implementation style for your MDM solution. The distinction between product capabilities and implementation styles is as follows:

- You can achieve a registry implementation style by installing the Standard Edition and by using the virtual MDM capabilities.
- You can achieve a centralized implementation style by installing the Advanced Edition and by using the physical MDM capabilities.
- You can achieve a coexistence implementation style by installing the Advanced or Enterprise Edition and by using the hybrid MDM capabilities.

The following diagram shows the interrelationships of physical and virtual MDM capabilities as they relate to the editions:

InfoSphere MDM

MDM operational server

Virtual MDM

Physical MDM

MDM collaboration server
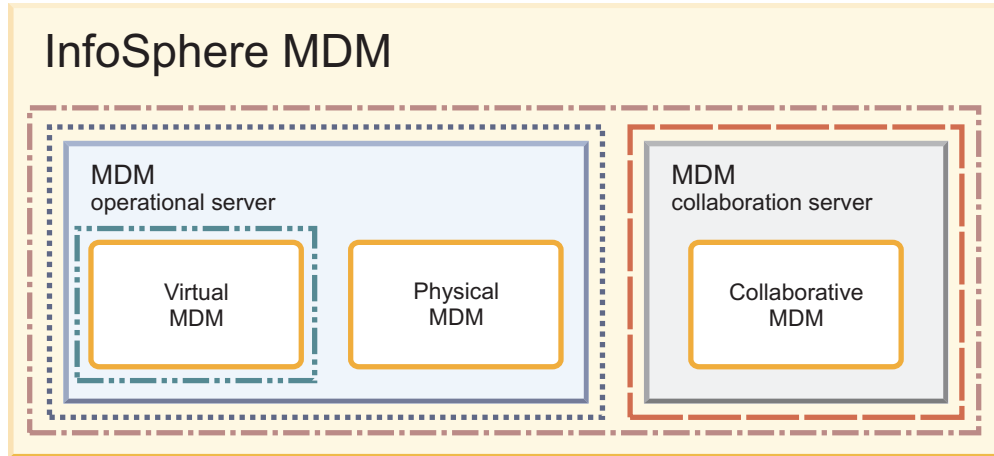
Collaborative MDM

Legend:
MDM Editions are <u>groupings of capabilities</u>

Enterprise	= Virtual, Physical, Collaborative
Advanced	= Virtual, Physical
Standard	= Virtual
Collaborative	= Collaborative

In previous releases, you might have used the following products to achieve equivalent results with each capability:

Table 5. Capabilities

Technical capability	Previous product name
virtual MDM	Initiate Master Data Service®
physical MDM	InfoSphere MDM Server
hybrid MDM	InfoSphere MDM Server Initiate Master Data Service
collaborative MDM	InfoSphere MDM Server for Product Information Management (PIM)

Virtual MDM

The technical capabilities of virtual MDM assemble a virtual view of master data from existing systems, delivering tailored views whenever and wherever they are needed.

Virtual MDM can help organizations improve customer service, lower costs, and reduce risks, while it meets current and future business needs.

Virtual MDM provides these capabilities:
- A virtual master registry that improves existing foundational processes and applications.
- Views of trusted information that are delivered in real time and tailored to individual users or groups.
- Data stewardship and data governance capabilities to help resolve differences between source systems and maintain data integrity.

- Powerful relationship and hierarchy management capabilities that provide significant value in managing both household and business-to-business relationships.
- An assembled "single view" of key data such as Customer, Patient, Product, Account, and Location information, and their relationships.
- Accuracy, performance, and scalability to grow from departmental implementations to multinational enterprises, with deployments across a dozen industries.
- Exceptional time-to-value for registry implementations.

Physical MDM

The technical capabilities of physical MDM include a physical master repository that delivers a single version of truth of an organization's critical data entries. Examples of data entries are customer, product, and supplier.

The technical capabilities help an organization to make better decisions and achieve better business outcomes. Physical MDM includes these capabilities:

Multidomain MDM
Prebuilt party, account, and product domains, along with development tools to simplify customization for industry-specific requirements.

Service-oriented architecture (SOA)
A complete SOA library of prepackaged business services that organizations use to define how users access master data. The SOA library integrates into current architectures and business processes.

Event management
The ability to proactively respond to data events and trigger business processes (such as up-selling, cross-selling, retention campaigns, and privacy). Then, you can react to business opportunities and lower overall risk.

Performance
An MDM transaction hub for high volume system of record implementations, which results in less downtime and high reliability.

Flexibility
The ability to extend and define prebuilt data domains, business services, and user interfaces. This ability saves time and cost during implementation while your implementation can scale to meet growing business demands.

Data stewardship and user interfaces
Role-based, domain driven hierarchy management user interfaces, as well as tools for deterministic or probabilistic party matching and physical party collapses.

Hybrid MDM

Hybrid MDM combines the technical capabilities of virtual MDM and physical MDM.

The capabilities allow for the seamless movement and management of a master data entity between its virtual MDM and physical MDM representations.

Mappings create correspondences between virtual MDM attributes and physical MDM attributes. Most of the mappings that you need are defined already and

provided with InfoSphere MDM Advanced Edition. Use the InfoSphere MDM Workbench and begin with the default mapping for your hybrid MDM solution.

Choose a single view of the virtual MDM person or organization entities that you want to persist in the physical MDM domain.

InfoSphere MDM Collaboration Server

With InfoSphere MDM Collaboration Server (Collaborative Edition), companies can create a single, up-to-date repository of product information. That repository then can be used throughout the organization for strategic initiatives.

InfoSphere MDM Collaboration Server provides the following benefits:

A flexible data model
Includes product, category, hierarchy, taxonomy, location, and extensible modeling capabilities that help you to build models that evolve as your organization evolves.

Data aggregation and syndication
Supports importing and exporting data over several standard protocols and flexible data formats to minimize impact on interfacing systems.

Collaborative workflows
Enables organizations to set up workflows to reflect existing and new business processes and rules, ensuring that the system closely aligns with your practices.

User experience for business users
Provides user interfaces for data authoring and for searches. Those user interfaces include single-edit screens; mass update screens; category-mapping; faster and simpler searching capabilities; single sign-on (SSO); and web style content through a rich text editor.

Link to unstructured content
Integrates with content management applications.

Reporting
Includes advanced auditing and reporting capabilities with configurable history tracking.

Integration
Has a built-in integration with other IBM InfoSphere products.

Business uses for InfoSphere MDM Collaboration Server

As an example, InfoSphere MDM Collaboration Server fulfills the following needs:
* Creation and management of product catalogs
* Business-process workflows for data governance
* Advanced business-focused tools for product-hierarchy management and multiple product hierarchies
* Data model where business users can make changes without IT involvement
* Role-based security down to the attribute level that is enforced through the user interfaces
* Other master data management for product-like domains, such as asset or project domains

You can address more complementary, product-data needs by using Advanced Edition with Collaborative Edition:

- Operational multidomain needs and relationships between products and other entity types: customers, accounts, suppliers, vendors, employees, and so forth.
- Publication of product-rule combinations from Collaborative Edition to Advanced Edition for execution in a multidomain context. This implementation takes advantage of these integration points:
  - Collaborative Edition with IBM Operational Decision Management for rule authoring.
  - Advanced Edition with IBM Operational Decision Management for rule execution.
- A single, enterprise multidomain implementation where both editions are already in use separately.

InfoSphere MDM technologies by edition

Some technologies are available only in particular editions.

Edition	Physical MDM	Virtual MDM	Collaborative MDM
Enterprise Edition	Yes	Yes	Yes
Advanced Edition	Yes	Yes	No
Standard Edition	No	Yes	No
Collaborative Edition	No	No	Yes

Architecture and concepts for InfoSphere MDM

InfoSphere MDM provides a unified architecture that works with various types of master data. Common services, a unified workbench, and customizable applications are at the core of the architecture.

Standard and Advanced Editions

The following deployment diagram shows how the clients, the application server, the MDM operational server, and the database server can be deployed in your environment. To start, the data that you want to master is stored in source systems. You perform most of your master data tasks within the clients, such as the Workbench, InfoSphere MDM Inspector, or your own custom-built clients. Those clients connect to the application server that hosts the operational server, where most MDM processing occurs. Finally, the application server uses a database server to host the MDM database and other databases that are applicable to optional components.
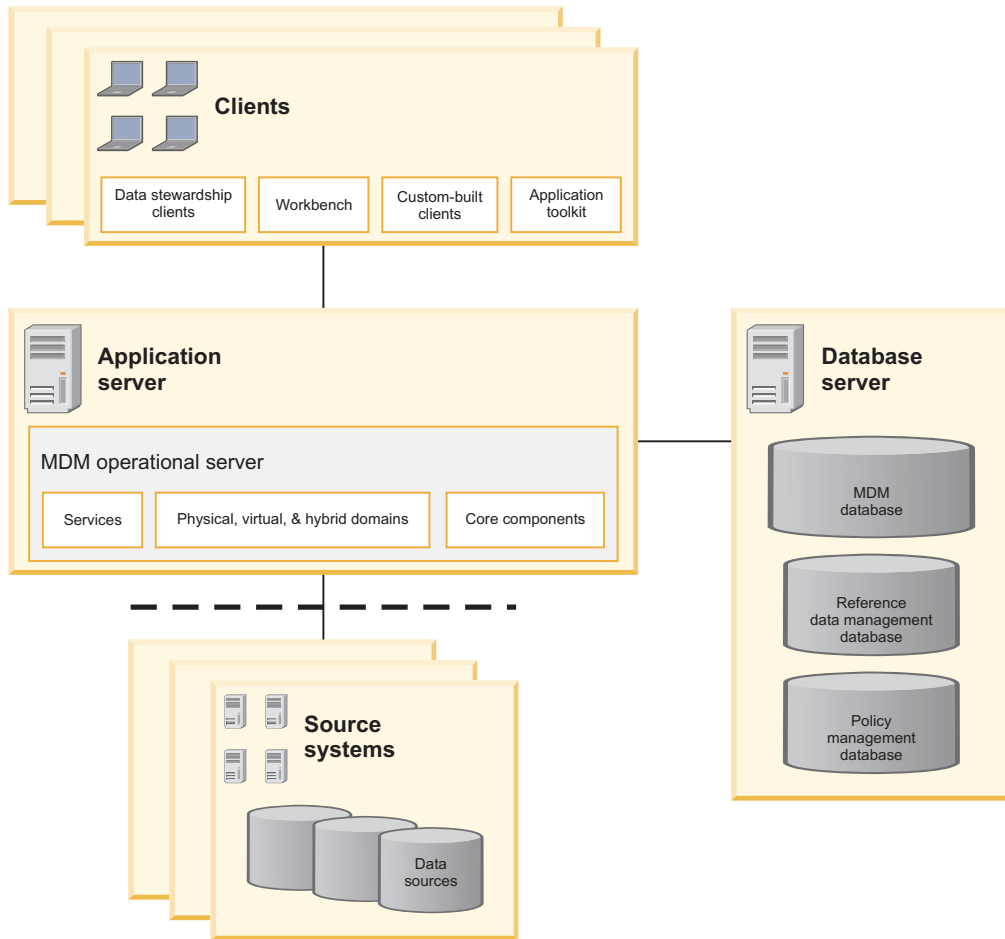
The primary components are defined as follows:

Operational server

> The software that provides services for managing and taking action on master data. The operational server includes the data models, business rules, and functions that support entity management, security, auditing, and event detection capabilities. Examples of functions that support entity management include data loads, cleansing, linkage, and de-duplication. Previously referred to as *master data engine* in Initiate Master Data Service and *MDM Hub* or *MDM Server* in InfoSphere MDM Server.

Application server

> A server program in a distributed network that provides the execution environment for an application program.

Database server **or** *DBMS*

> A software program that uses a database manager to provide database services to other software programs or computers.

Clients Software programs that request services from the operational server. The following clients provide entry points to your key MDM activities.

Table 6. Client applications

MDM activities	Clients	Primary users
Configuration and customization of your MDM solution	InfoSphere MDM blueprints in InfoSphere Blueprint Director InfoSphere MDM Workbench	Architect, Solution Developer, Data Steward Lead
Data governance and stewardship	IBM Cognos reports InfoSphere MDM Data Stewardship UI InfoSphere MDM Enterprise Viewer Flexible search InfoSphere MDM Inspector InfoSphere MDM Pair Manager InfoSphere MDM Product Maintenance UI InfoSphere MDM Reference Data Management Hub InfoSphere MDM Unstructured Text Correlation InfoSphere MDM Web Reports Some stewardship activities are configured in InfoSphere MDM Workbench.	Data Steward, Business Analyst, Business User, Application User
Administration	InfoSphere MDM Administration UI WebSphere® Administrative Console	System Administrator, Database Administrator
Development	InfoSphere MDM Application Toolkit InfoSphere MDM Batch Console (sample) InfoSphere MDM for IBM Business Process Manager InfoSphere MDM Workbench SDKs, APIs	Solution Developer, Application Developer

For a more detailed look at the architecture, the following diagram shows the components that form the whole architecture:

Clients

Data stewardship clients	Workbench	APIs, SDKs	Custom-built clients	Application Toolkit

Application Server

MDM operational server

Services

Request framework

Adaptive service interface	Connectivity (WS, RMI, JMS, REST)
Composite business proxy	Parsers & constructors	Security

Virtual MDM services

APIs
eSOA services

Business event manager	Authorization & access	Logging	Reporting
Notification	CEI	Task management	Client-specific services	Auditing & monitoring

Core components

Data loads	Policy hub	Standardization	External rules engine	Configuration management
BPM server	Message broker suite	Probabilistic matching engine	Batch processor

Domains

Physical domains

Party	Product	Account
Extensions	Custom

Hybrid domains

Hybrid Party	Common services
Extensions

Virtual domains

Person	Organization	Provider
Extensions	Custom

Database server

MDM database (physical and virtual MDM)

Composite views with virtual MDM	Physical MDM tables

Other MDM artifacts

Collaborative Edition

For the Collaborative Edition, a component-based architecture can consist of a two-tier or three-tier configuration. The Collaborative Edition has these components: core components, integration components, and collaboration components.

The core components are as follows:
- An API layer
- A business object layer
- An infrastructure layer
- A storage layer

The integration components are as follows:
- Custom tools
- Import-export
- Portal framework
- Web services

The collaboration components are as follows:
- Data authoring UI

- Import-export
- Workflow engine

Key concepts: Entity, attribute, and entity type

Depending on your implementation style, the concepts of *entity*, *attribute*, and *entity type* reflect the technical capabilities of virtual and physical MDM.

The term *golden record* is often used to describe the goal of providing a 360-degree view of your master data. While that term is sufficient in high-level conversations, the following definitions for the deeper concepts illuminate how those concepts work within InfoSphere MDM:

Entity A single unique object in the real world that is being mastered. Examples of an entity are a single person, single product, or single organization.

Entity type
A person, organization, object type, or concept about which information is stored. Describes the type of the information that is being mastered. An entity type typically corresponds to one or several related tables in database.

Attribute
A characteristic or trait of an entity type that describes the entity, for example, the Person entity type has the Date of Birth attribute.

Record
The storage representation of a row of data.

Member record
The representation of the entity as it is stored in individual source systems. Information for each member record is stored as a single record or a group of records across related database tables.

Other related terms are as follows:

Golden record: primarily for general, nontechnical use

Aggregate record: specific use in physical MDM
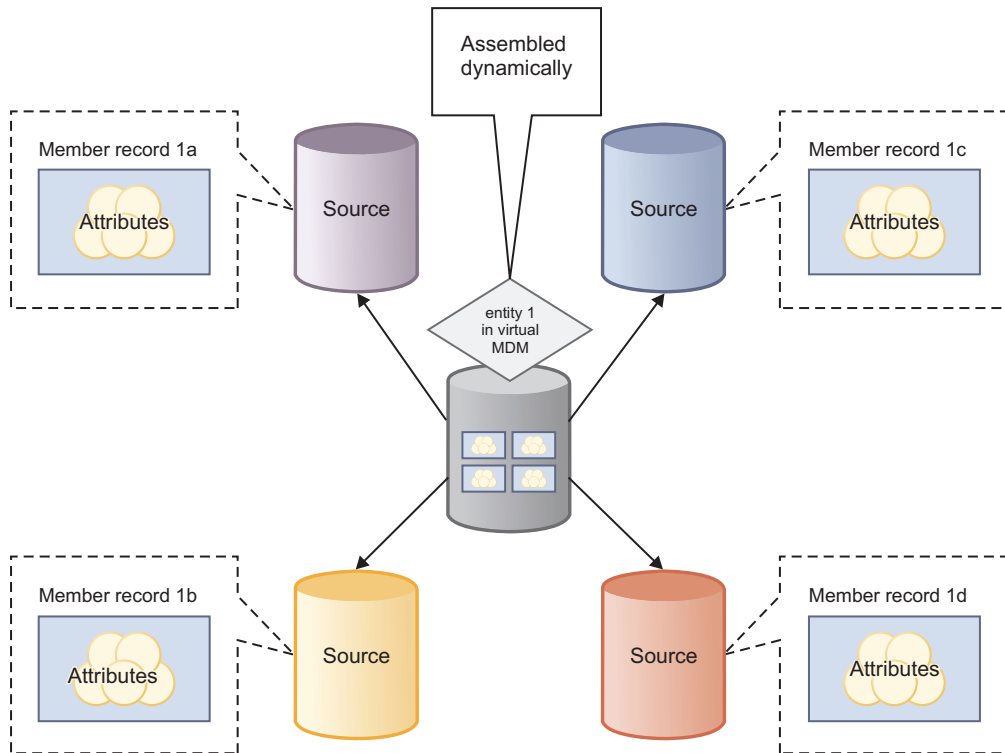
Party: specific use in physical MDM

Various IDs: *enterprise ID*, *entity ID*, *record ID*, *account ID*, and *product ID*

For example, an entity in virtual MDM is assembled dynamically based on the member records by using linkages and then is stored in the MDM database. Conversely, an entity in physical MDM is based on matching records from the source systems that are merged to form the single entity.

The following diagrams are visual representations of the MDM concepts. The diagrams show how the concepts relate to the registry and centralized implementation styles.
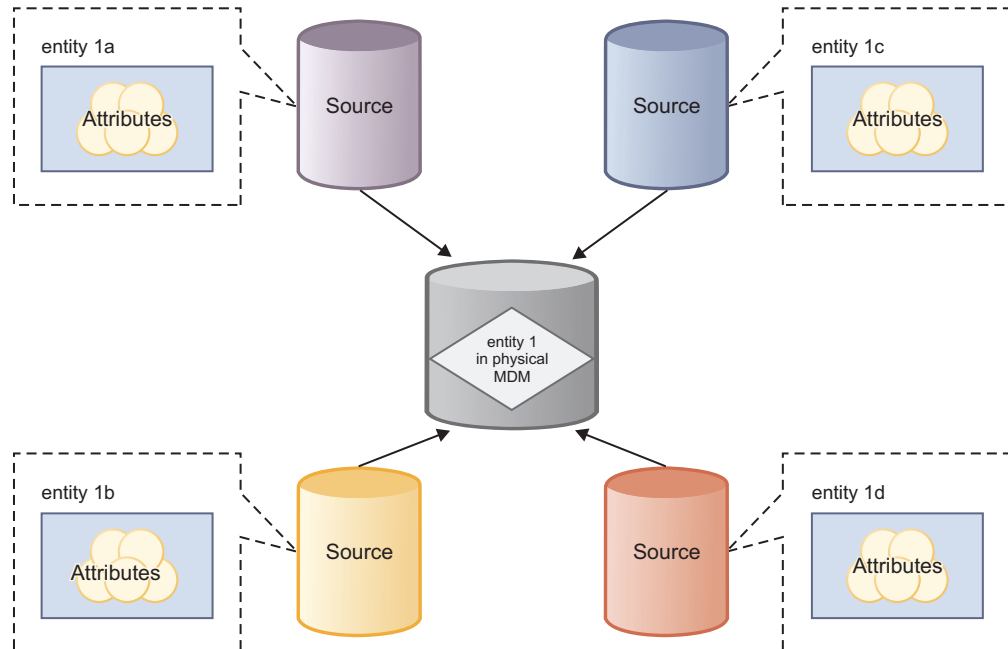
Virtual MDM

In virtual MDM, a member record with its attributes exists in a source system. Those member records are assembled dynamically by virtual MDM to form a single entity in a composite view (entity 1 in the following diagram). That single entity represents the *golden record* for that person, organization, object, or so on. After the initial configuration, business users continue to change data on the source systems. Based on configurable rules, the changes to the source system data are reflected in the entity composite view that is stored in the MDM database.

Member record 1a
Attributes
Source
Assembled dynamically
Source
Member record 1c
Attributes
entity 1 in virtual MDM
Member record 1b
Attributes
Source
Source
Member record 1d
Attributes

Physical MDM

In physical MDM, an entity with its attributes starts in a source system. Those entities (1a, 1b, 1c, and 1d in the following diagram) are centralized by physical MDM to form a single record in the MDM database. That single record represents the *golden record* for that person, organization, object, or so on, where entity type 1 in the diagram represents the type of the information that is being mastered. After data from the source systems is consolidated within the MDM database, business users directly change the data in the MDM database rather than in source systems. That is in physical MDM, the MDM database is the system of record for master data.

entity 1a
Attributes
Source

entity 1c
Attributes
Source

entity 1
in physical
MDM

entity 1b
Attributes
Source

entity 1d
Attributes
Source

Data management in hybrid MDM

You can maintain master data simultaneously, by using a combination of distributed data sources (aggregated through the virtual MDM) and a single, "golden record" data source (maintained in the physical MDM). This dual implementation style is often called "hybrid."

Note: Hybrid MDM combines the capabilities of the virtual MDM and physical MDM. A hybrid implementation assumes that you are using the Advanced or Enterprise Edition of the InfoSphere MDM product. The Standard Edition does not include the physical MDM.

Hybrid MDM uses both registry and centralized styles of managing master data. With Hybrid MDM, administrators "persist" data, meaning that they create (and then update) representations of virtual MDM person or organization entities in the physical MDM. In other words, data aggregated from the source systems of the virtual MDM are "persisted" within the centralized database of the physical MDM.

Components for InfoSphere MDM

In addition to the operational server, MDM database, clients, and other parts of the primary architecture, you can use other components to achieve your MDM goals.

InfoSphere MDM Application Toolkit overview

Optimize business performance by providing decision makers with better insight through trusted, accurate master data.

Decisions are only as good as the information available at the time the decisions are made. When decision makers have trust in the master data their decisions are smarter, resulting in fewer errors and better business performance. Use the InfoSphere MDM Application Toolkit for BPM to bring trusted master data into enterprise processes that run on IBM Business Process Manager.

For example, you can enhance your customer onboarding process by using IBM Process Designer to display master data hierarchies to sales representatives. You can look up existing accounts to gain a comprehensive view of your customers. With this 360-degree customer view, you can achieve these goals:

- Improve customer service
- Improve risk management
- Increase up-sell and cross-sell revenue by providing more relevant offerings

The MDM Application Toolkit provides a comprehensive set of MDM-specific building blocks, including prebuilt integration services and MDM-specific user interface controls. You can use these building blocks within the IBM Process Designer to enrich your business processes with master data. With the building blocks, the MDM Application Toolkit facilitates the rapid construction of these business processes while it removes the integration complexity. Using the combination of the IBM Process Designer and the MDM Application Toolkit, developers can minimize the time that they spend working with the data. Developers can instead focus their time on building a robust, efficient process for use by the lines of business.

The following table details whether the MDM Application Toolkit is available for each of the InfoSphere MDM technologies:

Technology	MDM Application Toolkit
Hybrid MDM	Yes
Physical MDM	Yes
Virtual MDM	Yes
Collaborative MDM	No

InfoSphere MDM Custom Domain Hub overview

IBM InfoSphere Master Data Management Custom Domain Hub provides the tools and runtime platform to create purpose-built domains of operational master information. The hub also manages that information within a runtime server, which is referred to as a hub instance.

A hub instance role is to act as a consolidation and distribution point for shared operational data. The hub instance offers a wide range of mechanisms for receiving and sending information.

Data can be sent and received in a batch mode, trickle feed mode, or online transaction processing mode.

For more information about the latest release of InfoSphere MDM Custom Domain Hub, see its documentation.

InfoSphere MDM for Healthcare overview

InfoSphere MDM for Healthcare supports patient and provider implementations in both standard and advanced editions. These prepackaged projects contain a number of artifacts (such as attributes and algorithms) for you to reuse.

InfoSphere MDM for Patient

InfoSphere MDM for Patient is available in both the standard and advanced editions:

- Patient Standard Edition provides an optimized prebuilt configuration (attributes, algorithms, and bundled events for the most common patent actions) to support patient data. Patient Standard Edition integrates with existing healthcare applications and is designed for ease of administration and maintenance.
- Patient Advanced Edition expands upon the Standard Edition where you can author and persist data attributes for advanced solutions. For example, the solutions provide patient registries for an entire health system or serve data to a health information exchange that is solely owned and managed by Patient Advanced Edition. It further shares trusted patient identities and their relationship with providers or other members of their household with clinical and business intelligence warehouses. That intelligence can drive more accurate analytics that are required for population health cost and quality improvement initiatives.

InfoSphere MDM for Provider

InfoSphere MDM for Provider is available in both the standard and advanced editions:

- Provider Standard Edition is an optimized prebuilt configuration for provider data. The Standard Edition supports the creation of a master virtual repository for provider data, advance relationship management, data stewardship, and enterprise data governance.
- Provider Advanced Edition builds on the Standard Edition and further includes the Provider Direct user interface, advanced workflows, and supports intelligent system updates.

IBM Stewardship Center overview

Organizations can optimize their data integrity and business performance by using IBM Stewardship Center.

IBM Stewardship Center provides consistent visibility, collaboration, and governance of your master data by combining the strengths of IBM Business Process Manager and InfoSphere MDM Application Toolkit.

IBM Stewardship Center includes a set of built-in process applications that are ready for immediate use to solve your data stewardship requirements. IBM Stewardship Center also includes performance metrics to monitoring how many tasks are overdue, the task turnover rate, among other metrics.

With IBM Stewardship Center, business owners have the assurance that master data is a trusted asset that is ready for use in their own business processes.

InfoSphere MDM Policy Management overview

With policy management, you can set, monitor, and enforce polices for quality thresholds that you want to achieve for your master data. Your master data becomes a trusted asset for consuming applications. With policy management, MDM data sources are involved in a continuous data quality improvement process.

Policy management consists of these key components: policy monitoring and policy enforcement.

Policy monitoring uses metrics to track the policies and determine whether the master data is in compliance with quality thresholds that you established. A set of built-in, key performance indicators (KPIs) is used to calculate data quality compliance. Built-in KPIs include completeness, consistency, uniqueness, and the rates of false positive and false negative records. Executives, business analysts, and data stewards can use the built-in IBM Cognos reports to monitor the data quality and facilitate quality improvements. You can use or extend the built-in KPIs and reports, or create KPIs and reports for your specific requirements.

Policy enforcement provides the tools that are necessary to resolve data quality issues that are policy violations. Effective data resolution often requires input from data stewards and individuals who know the information best, such as sales representatives and account managers. Policy enforcement provides the collaborative capabilities that are necessary to coordinate multiple activities across multiple roles. Policy enforcement includes a set of built-in samples for the key data stewardship tasks. You can use the built-in samples or customize the samples for your unique requirements.

- Use the Critical Data Change Sample to validate new or changed data that originates from a different data source.
- Use the Suspected Duplicate Processing Sample to persist duplicate records or to collapse multiple records into a single entity.
- Use the Policy Remediation Sample to set up processes for the remediation of records that do not meet the policies for your organization.
- Use the Party Maintenance Sample to search for and update the attributes for a specific party. From the search results you can update and add attribute values, and process any suspected duplicates that are associated with the party.

InfoSphere MDM Reference Data Management Hub overview

IBM InfoSphere MDM Reference Data Management Hub solution provides a single point of management and governance for enterprise reference data.

InfoSphere MDM Reference Data Management Hub provides centralized management, stewardship, and distribution of enterprise reference data. It supports defining and managing reference data as an enterprise standard. It also supports maintaining mappings between the different application-specific representations of reference data that are used within the enterprise. InfoSphere MDM Reference Data Management Hub supports formal governance of reference data:

- Putting management of the reference data in the hands of the business users
- Reducing the burden on IT
- Improving the overall quality of data that is used across the organization

Key functions of InfoSphere MDM Reference Data Management Hub are as follows:

- Role-based user interface with security and access control
- Management of reference data sets and values
- Management of mappings between reference data sets
- Import and export of reference data by using CSV and XML formats
- Versioning support for reference data sets and maps
- Change process that is controlled through configurable lifecycle management

- Hierarchy management over sets of reference data

InfoSphere MDM Reference Data Management Hub also integrates with and complements IBM InfoSphere Business Glossary and the broader portfolio of IBM Information Management products.

Definition of reference data

Reference data is any data that is used to categorize other data within the enterprise. Reference data is commonly stored in the form of code tables or lookup tables, such as country codes, state codes, and gender codes. Reference data is used within every enterprise application, from backend systems through front-end commerce applications to the data warehouse. Business users recognize reference data as code choices within the pick-lists of their business application user interfaces.

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