SERVICE-ORIENTED MODELING FRAMEWORK™ (SOMF™)

VERSION 2.1

SERVICE-ORIENTED BUSINESS INTEGRATION MODEL LANGUAGE SPECIFICATIONS

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INTRODUCTION

ABOUT THE SERVICE-ORIENTED MODELING FRAMEWORK (SOMF)

The service-oriented era has begun. New technologies have emerged to support the "service" notion that signifies, today more than ever, a shift in modern computing whose driving aspects are business imperatives and innovative technological implementations. The service paradigm is not a new concept; however, it emboldens the business perspective of every software development life cycle. Furthermore, unlike the object-oriented approach, which is founded to support modeling of object-based computer programming languages, the service-oriented modeling framework embodies distinct terminology to foster loose coupling of software assets, reuse of software components, acceleration of time-to-market, reduction of organizational expenditure, and more.

SUPPORTING THE SERVICE-ORIENTED MODELING NOTION

Thus, to support service-oriented modeling activities, SOMF depicts the term "service" as a holistic entity that may encapsulate business requirements, and from a technological perspective, is identified with a software component. This organizational software entity, namely a "service" that is subject to modeling activities, may be any software construct that the enterprise owns, such as an application, software system, system software, Web service, software library, store procedure, database, business process, enterprise service bus, object, cloud computing service, and more.

SO WHAT IS SOMF?

SOMF is a model-driven engineering methodology whose discipline-specific modeling language and best practices focus on software design and distinct architecture activities employed during stages in the software development life cycle. Moreover, architects, analysts, modelers, developers, and managers employ SOMF standalone capabilities or mix them with other industry standard modeling languages to enrich the language syntax, set software development priorities during life cycle stages, and enhance the 360º software implementation view.

SOMF DISCIPLINES AND MODELS

SOMF offers a 360º view of any software development life cycle, starting at the conceptualization phase, supporting design and architecture activities, and extending modeling best practices for service operations in a production environment. To achieve these underpinning milestones, six distinct software development disciplines offer corresponding models whose language notation guides practitioners as they design, architect, and support a service ecosystem:

1. Service-Oriented Conceptualization Model
2. Service-Oriented Discovery and Analysis Model
3. Service-Oriented Business Integration Model
4. Service-Oriented Logical Design Model
5. Service-Oriented Software Architecture Model
6. Cloud Computing Toolbox Model

MODELING GENERATIONS

SOMF diagrams support three chief modeling generations, each of which shows a different time perspective of a software life cycle. These views help practitioners to depict business and architectural decisions made at any time during the life span of a software product:

1. *Used-to-Be*. Design and architecture *past state* of a software product and its related environment that were deployed, configured, and operated in production
2. *As-Is*. Design and architecture *current state* of a software product and its corresponding environment that are being operated in production
3. *To-Be*: Design and architecture *future state* of a software product and its associated environment that will be deployed, configured, and operated in production

ABOUT THE SERVICE-ORIENTED BUSINESS INTEGRATION MODEL

The Service-Oriented Business Integration Model offers best practices and a modeling language to facilitate the integration of services with business domains. The term domain identifies any business organization, line of business, business occupation, department, division, or business partner that plans to employ services to automate business operations. Furthermore, the business integration language encourages practitioners to study their organization's business model, strategies, and business geographical distribution to promote loosely coupled architecture and increase software reuse.

In recent years, business architecture and business analysis have become dominant practices that both meet business imperatives and drive major technical architectures in the organization. By adopting the service-oriented paradigm, these practices foster integration of services with organizational business structures such as layers and tiers.

Consider the chief benefits of the Service-Oriented Business Integration Model language:

- Integrating services with organization business domains, such as lines of business, departments, divisions, and business partners
- Categorizing and cataloging business architectures
- Classifying and cataloging technical architectures
- Studying granularity aspects of business entities
- Understanding organizational business ownership and sponsorship
- Facilitating an efficient service-oriented funding system
- Aligning business and IT operations
- Aligning business architecture and technical architecture
- Studying organizational business structure: business layers and tiers
- Understanding contextual business architecture
- Learning about organizational business distribution
- Establishing service distribution strategies in the organization

- Encouraging software reuse
- Fostering software asset consolidation
- Alleviating interoperability challenges

NOTATION SECTION

BUSINESS ENTITIES AND RELATED CONNECTORS

A business entity and a business tier, as illustrated in Figure 1, identify the core structure of any organization. These are also the building blocks of the Service-Oriented Business Integration diagram (refer to the Examples Section). The depicted connectors are used to show aggregation of one business entity into the other. For example, a Business Domain Cluster contains one or more Business Domains. Similarly, one or more Business Tiers can reside in a Business Tier Cluster.

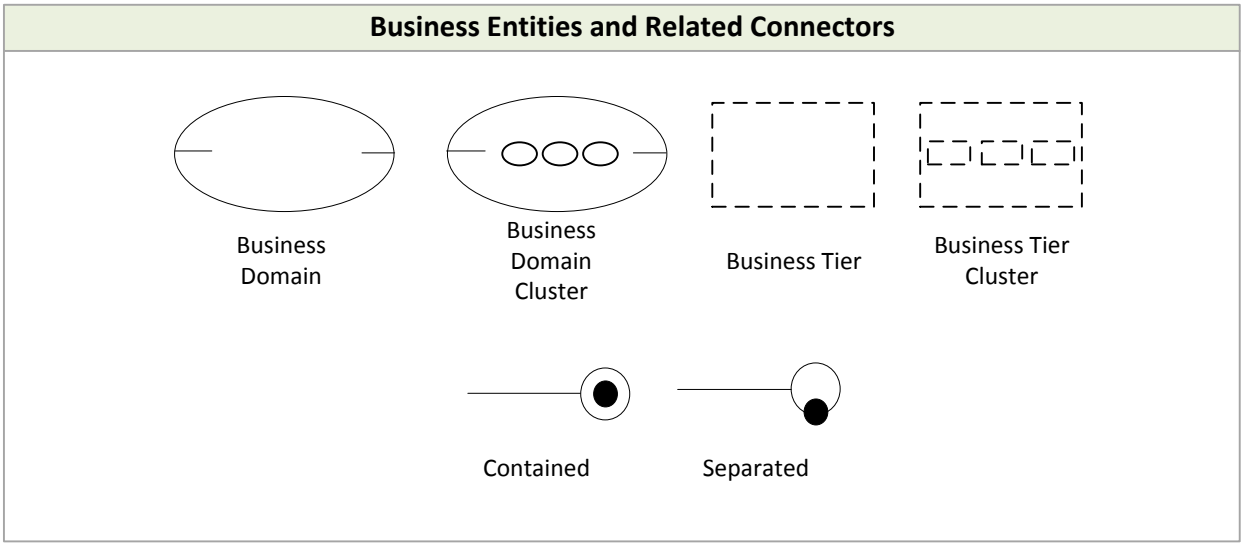

FIGURE 1: BUSINESS ENTITIES AND RELATED CONNECTORS

- *Business Domain.* Identifies a line of business, business expertise, business occupation, department, division, or business partner
- *Business Domain Cluster.* A group of related business domains that share common business requirements and processes
- *Business Tier.* A geographically distributed business entity that may contain one or more business domains

- *Business Tier Cluster.* A group of related and distributed geographical business tiers that collaborate to provide an enterprise solution
- *Contained.* A connector that identifies an aggregation of a Business Domain within a Business Domain, or a business domain within a Business Tier
- *Separated.* A connector that indicates a separation of an aggregated child Business Domain from a parent Business Domain, or parting a Business Domain from a Business Tier

BUSINESS INTEGRATION ASSETS AND RELATED CONNECTORS

Figure 2 illustrates business integration assets (services and consumers) and affiliated connectors used by practitioners to create a Service-Oriented Business Integration diagram (view diagram examples in the Examples Section). This diagram identifies integration opportunities of services or consumers with the business entities discussed in the previous section. In addition, business architecture and business analysis practices drive this initiative. Therefore, the depicted integration assets are analysis entities that are also used in the Service-Oriented Discovery and Analysis Model.

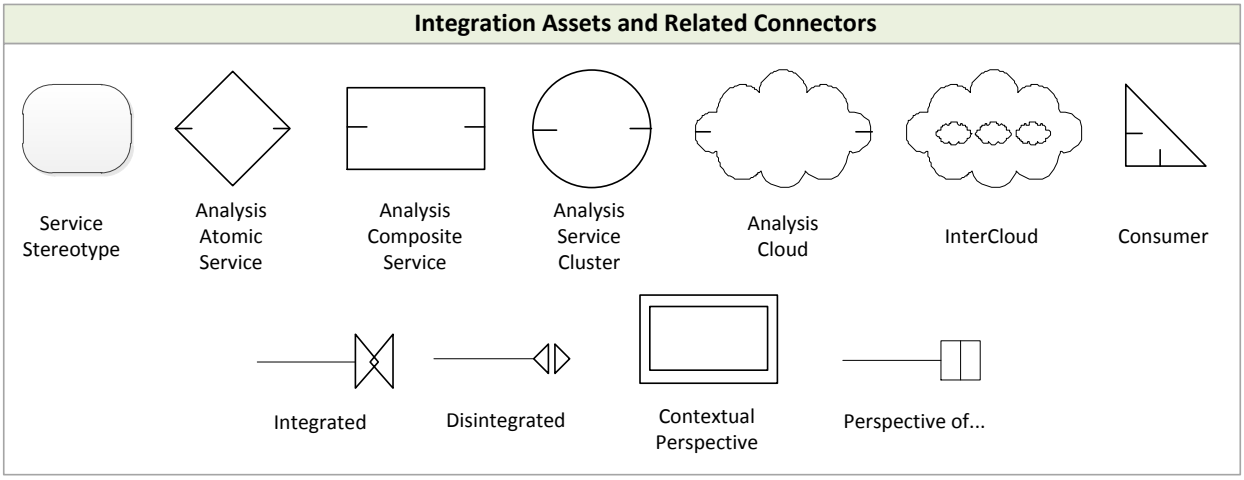

FIGURE 2: INTEGRATION ASSETS AND RELATED CONNECTORS

- *Service Stereotype.* A generic service that does not identify any particular service structure pattern
- *Analysis Atomic Service.* A fine-grained service that is impractical to decompose because of its suggested limited capabilities or processes
- *Analysis Composite Service.* A coarse-grained service comprised of internal fine-grained atomic or composite services, forming hierarchical parent-child associations
- *Analysis Service Cluster.* An association of services grouped by related business or technical processes that collaborate to offer solutions

- *Analysis Cloud.* Represents a collection of analysis services in three different categories: Software as Service (SaaS), Platform as Service (PaaS), and Infrastructure as Service (IaaS). Additional types can be added on demand
- *InterCloud.* Represents the term "cloud-of- clouds." A superior cloud that identifies a group of related clouds, working together to offer collaborative solutions
- *Consumer.* Any entity that is identified with service consumption activities. This definition may include consuming applications or services
- *Contextual Perspective.* A tag that identifies a semantic integration of a service with its corresponding Business Domain
- *Perspective of....* A connector that links a Business Domain to a Contextual Perspective. A service can be linked to this Contextual Perspective element to denote a semantic integration between the service and the Business Domain

BUSINESS GEOGRAPHICAL LOCATIONS AND RELATED CONNECTORS

A business organization may be distributed across continents, business regions, or zones. This structural separation of business units or sub-organizations can be communicated in a Service-Oriented Business Integration diagram (refer to the Examples Section to view a related example). Use the elements illustrated in Figure 3 to construct a geographical distribution scheme of business domains and tiers to facilitate the integration of services with their corresponding lines of business or business organizations.

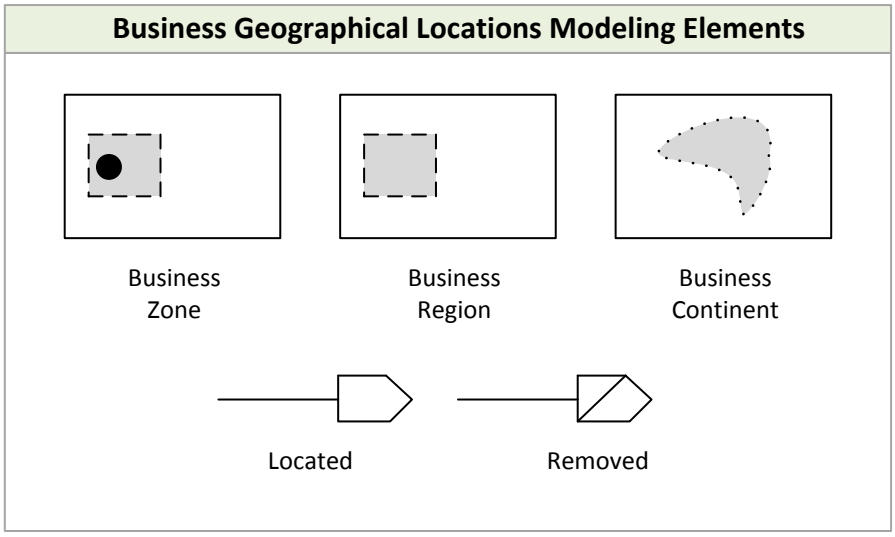

FIGURE 3: BUSINESS GEOGRAPHICAL LOCATIONS AND RELATED CONNECTORS

- *Business Continent.* The largest geographical boundary of a business operation, such as Europe or Asia
- *Business Region.* An area that is defined in a Business Continent, such as US Northeast or Midwest
- *Business Zone:* An area that is defined in a Business Region, such as Northeast New England or Middle Atlantic

- *Located:* Denotes an aggregation of a Business Region within a Business Continent, Business Zone within a Business Region, or Business Domain within a Business Zone
- *Removed.* Identifies separation of a Business Region from a Business Continent, Business Zone from a Business Region, or Business Domain from a Business Zone

MODELING SPACES

A modeling space (illustrated in Figure 4) is a defined area in which modeling activities take place. This area also identifies boundaries of organizations, and containment scope of services, service clusters, or cloud computing environments.

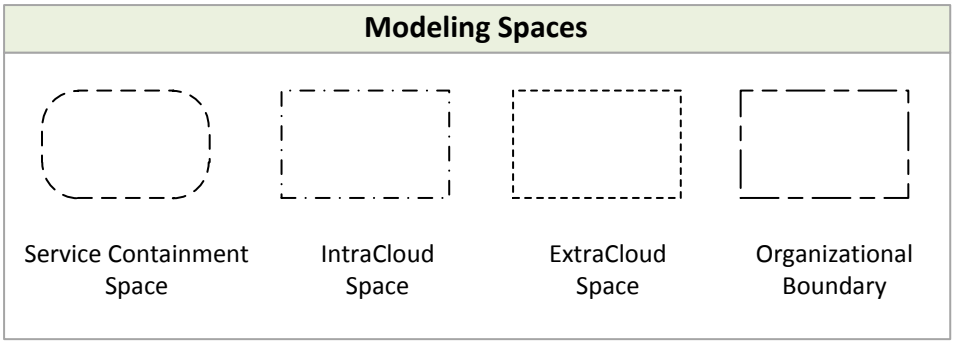

FIGURE 4: MODELING SPACES

- *Service Containment Space.* An area that identifies the aggregated child services contained in a parent composite service or service cluster. This space can also define any collaboration of grouped services that is gathered to offer a solution
- *IntraCloud Space.* A modeling area that depicts services that operate in a cloud
- *ExtraCloud Space.* A modeling area that depicts services that operate outside of a cloud
- *Organizational Boundary.* A computing area of an organization, such as a division, department, company, partner company, consumer, or community
- *Intersected Region.* A common space to two or more intersecting composite, compounded, cluster, or cloud entities

CLOUD TYPING TAGS

If a project or an architecture initiative involves cloud computing modeling activities, any individual cloud requires typing. The term "typing" pertains to cloud categorization to help understand the design model that is applied to a production environment. Tagging a cloud by the proper tag (illustrated in Figure 5) also indicates the types of consumers allowed to utilize a cloud facility and its offered services.

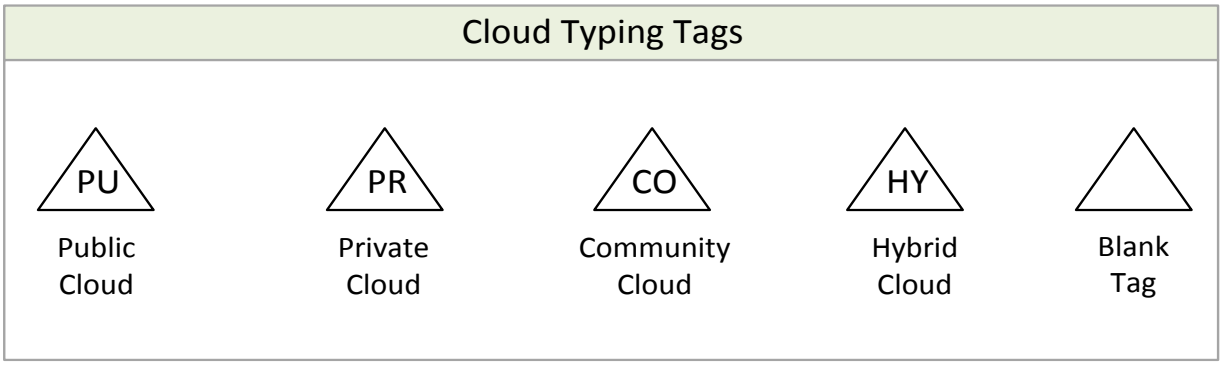

FIGURE 5: CLOUD TYPING TAGS

- *Public Cloud Tag.* Identifies a cloud that is maintained by an off-site party service provider that offers configurable features and deployments charged to subscribed Internet consumers
- *Private Cloud Tag:* Indicates a cloud of services that is sponsored, maintained, and operated by an organization, available only on private networks, and utilized exclusively by internal consumers
- *Community Cloud Tag.* Identifies a cloud whose services are consumed by two or more organizations that share similar business or technical requirements
- *Hybrid Cloud Tag.* Depicts a cloud that combines the properties of two or more cloud types described on this list
- *Blank Tag.* Additional tags can be defined on demand

EXAMPLES SECTION

SERVICE-ORIENTED BUSINESS INTEGRATION DIAGRAM

As mentioned in the Specification Section, a Service-Oriented Business Integration diagram illustrates integration opportunities between a Business Domain with a service, a group of services, or a cloud of services. This domain can be distributed to geographical locations and span across continents, regions, or zones.

Furthermore, a Service-Oriented Business Integration diagram enables two types of integrations: structural and contextual. The former is about incorporating a service with a particular business domain after organizational structure and geographical distribution of business have been studied and understood. The latter is affiliated with a semantic integration, by which services and domains join to provide a solution driven by business imperatives, such as management requirements, human resource necessities, customer preferences, market and client segmentation studies, marketing issues, and more.

a. Business domains: Loan Processing Domain, Risk Assessment Domain, Credit Verification Domain
b. Connectors: Contained

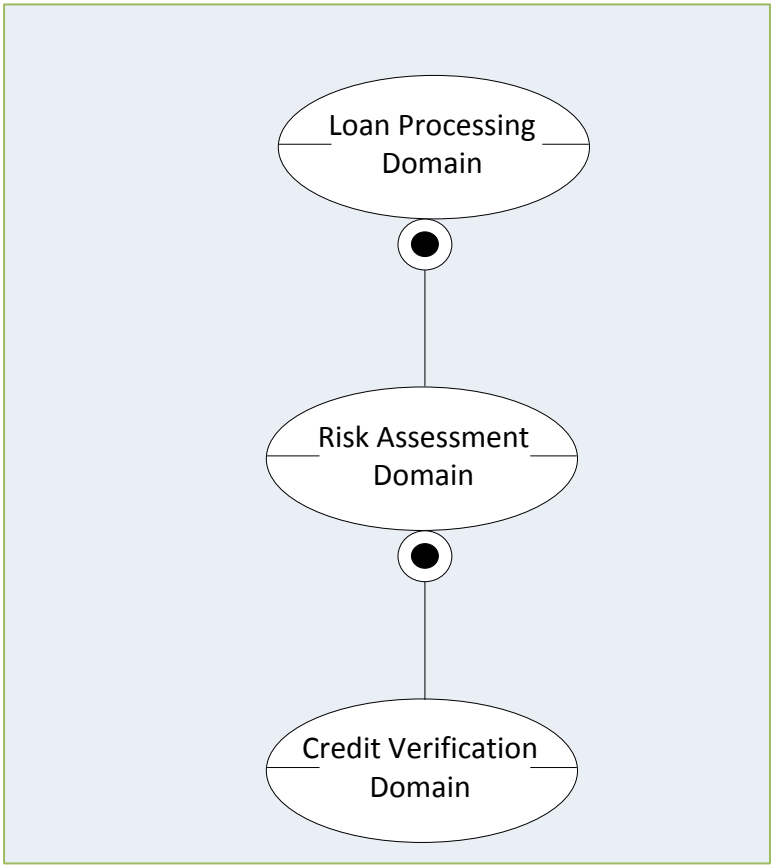

FIGURE 6: CREATING A HIERARCHICAL STRUCTURE OF THREE BUSINESS DOMAINS USING THE "CONTAINED" CONNECTOR

a. Domains: Trading Domain Cluster, Mutual Funds Trading Domain, Equity Trading Domain
b. Connector: Contained

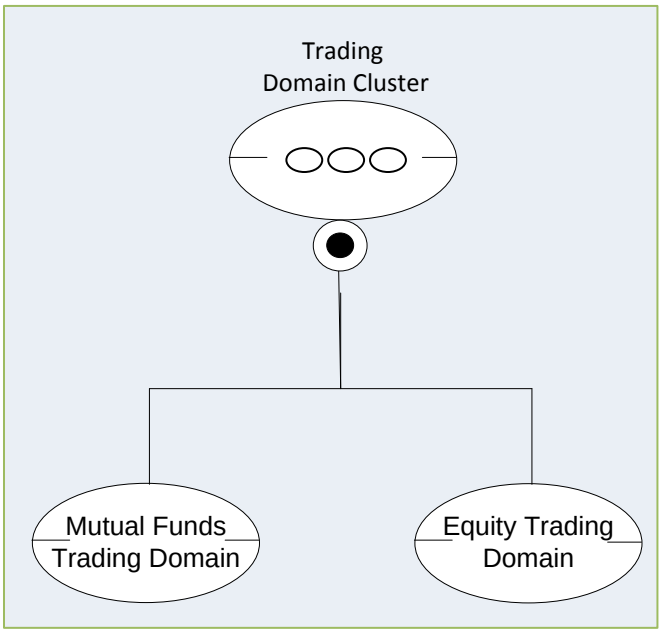

FIGURE 7: TWO BUSINESS DOMAINS CONTAINED IN A DOMAIN CLUSTER

SERVICE-ORIENTED BUSINESS INTEGRATION DIAGRAM (FIGURE 8)

a. Business Tier Cluster: Human Resources
b. Business Tiers: Training, Benefits
c. Business domains: Employee Training Services, Employee Benefits Services
d. Connectors: Contained

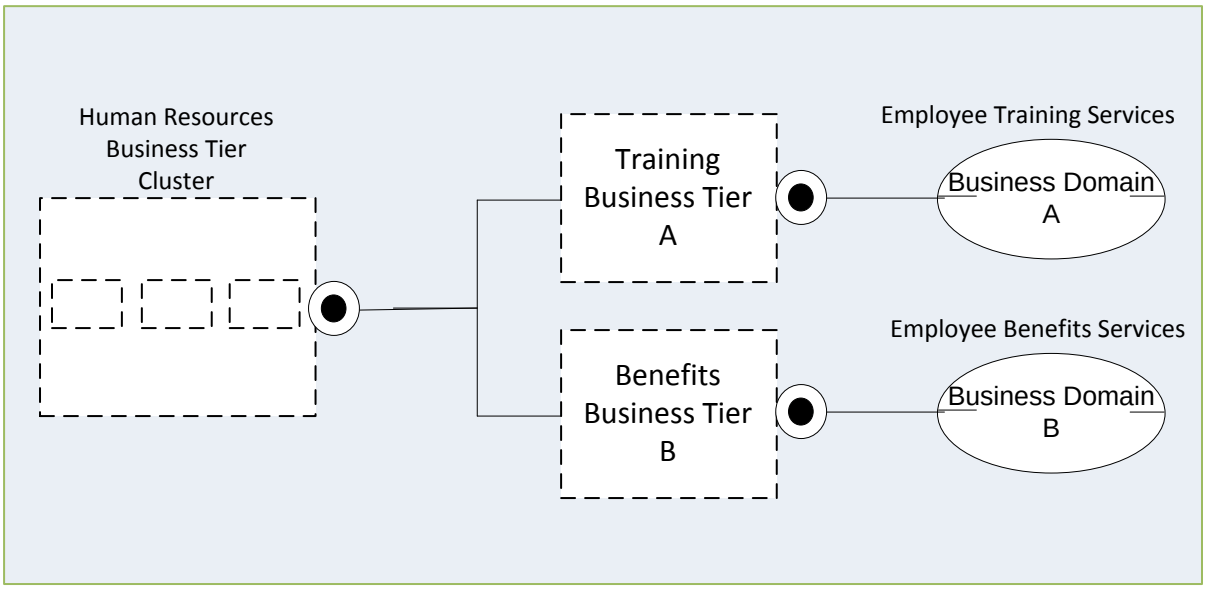

FIGURE 8: A TIER CLUSTER CONTAINS TWO DISTRIBUTED BUSINESS TIERS, EACH OF WHICH CONTAINS A BUSINESS DOMAIN

a. Geographical locations:
    - Continent: North America
    - Region: Northeast
    - Zone: Upstate New York
b. Connectors: Located

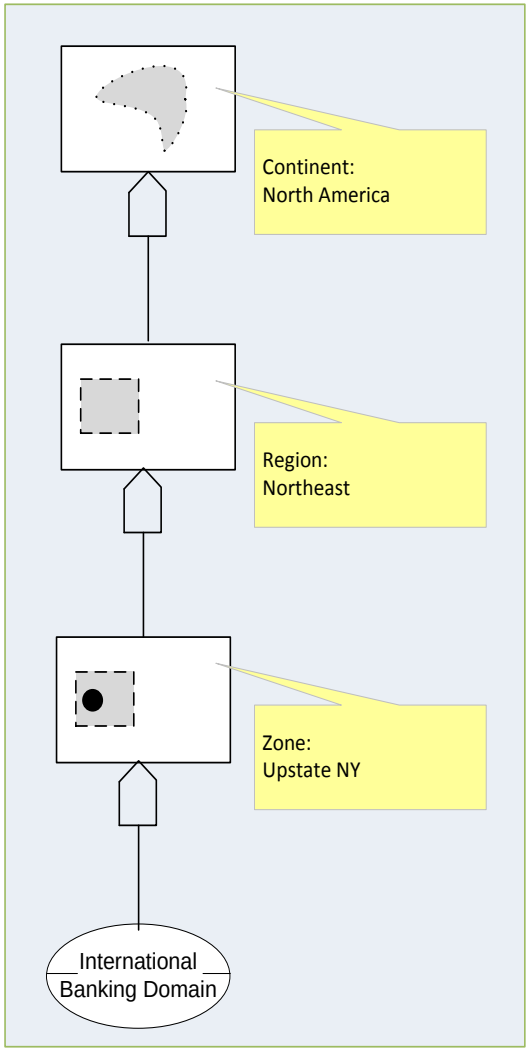

FIGURE 9: DEPICTING THE GEOGRAPHICAL LOCATION OF A BUSINESS DOMAIN

a. Service: Customer Lookup Atomic Service
b. Organizational boundaries: Life Insurance Inc., Car Insurance Inc.
c. Life Insurance Inc. Organizational Boundary contains the Life Insurance Domain
d. Car Insurance Organizational Boundary contains that Car Insurance Domain
e. Connectors: Integrated, Disintegrated

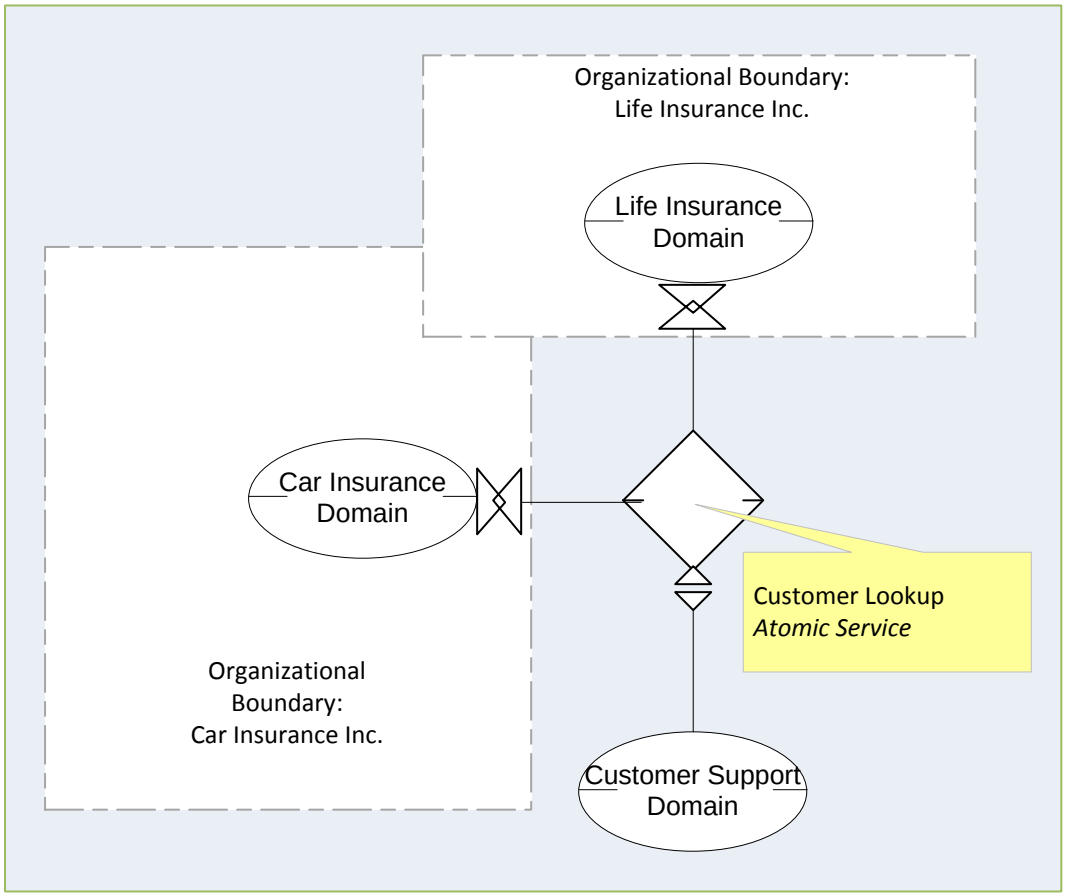

FIGURE 10: INTEGRATING A SERVICE WITH TWO BUSINESS DOMAINS, EACH OF WHICH RESIDES IN A DIFFERENT ORGANIZATIONAL BOUNDARY, AND DISINTEGRATING THE SERVICE FROM A THIRD BUSINESS DOMAIN

SERVICE-ORIENTED BUSINESS INTEGRATION DIAGRAM (FIGURE 11)

a. Domain: Small Business Banking Domain
b. Integration perspective: Management Perspective
c. Services: Analytical Reporting Composite Service, Compliance Service Cluster
d. Connectors: Perspective of…, Integrated

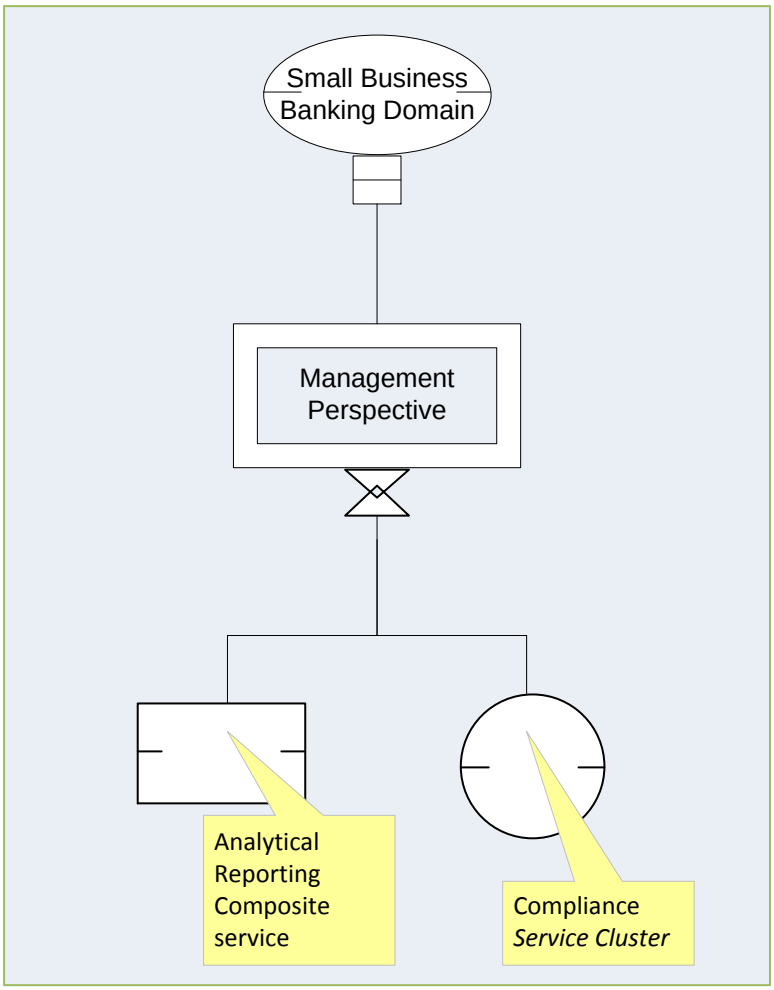

FIGURE 11: SERVICE INTEGRATION WITH A BUSINESS DOMAIN THROUGH A CONTEXTUAL PERSPECTIVE

a. Organizational boundary: Life Insurance Inc., Car Insurance Inc.
b. Clouds: Government Compliance Public Cloud, Document Repositories Hybrid Cloud
c. Connectors: Integrated

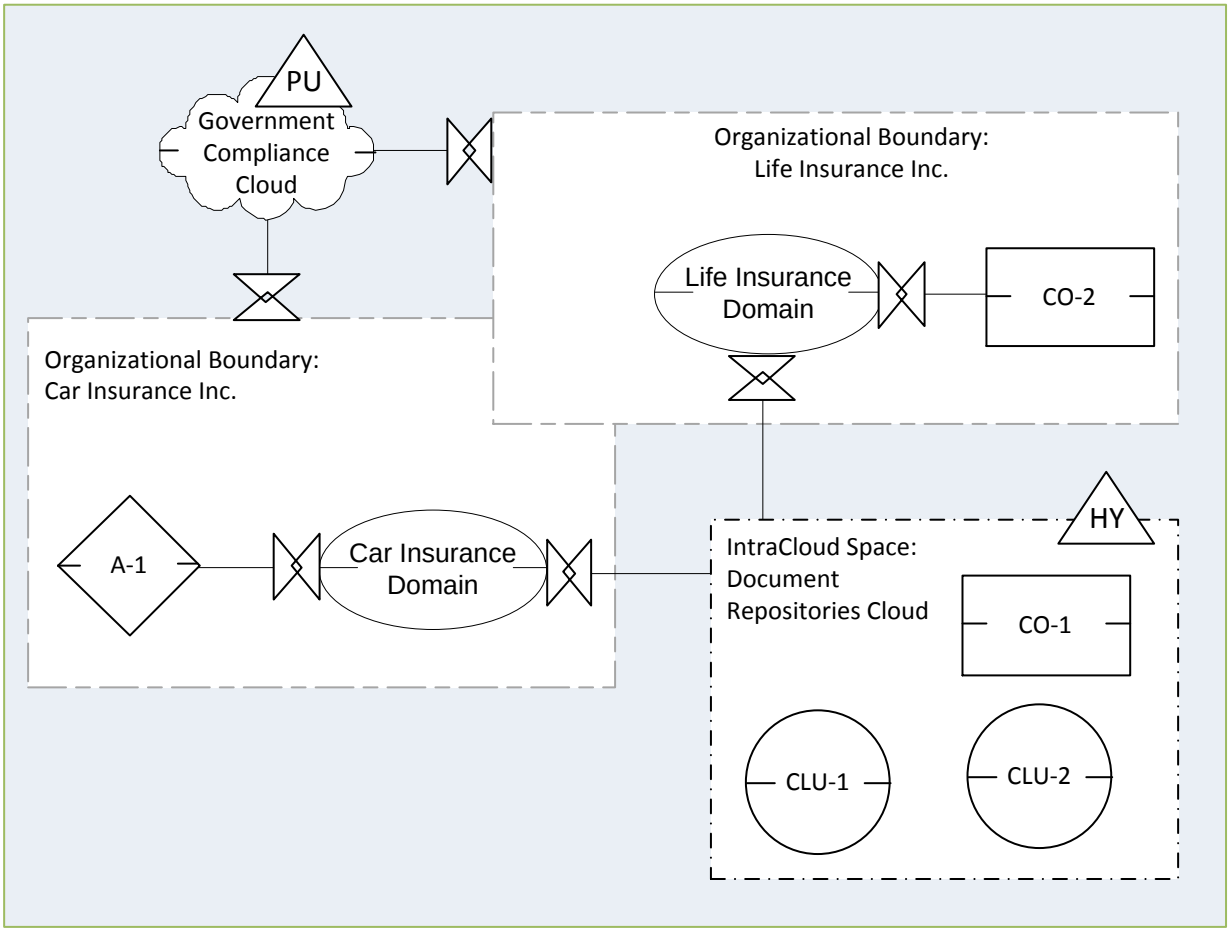

FIGURE 12: CLOUD INTEGRATION WITH DOMAINS THAT RESIDE IN ORGANIZATIONAL BOUNDARIES