AUTOMATING B2B ORDER MANAGEMENT FOR METRO ETHERNET SERVICES BETWEEN OPERATORS USING TM FORUM FRAMEWORX™

Brian Hedstrom
CableLabs

Abstract

Today, many MSOs rely on manual or vendor proprietary solutions for the Order Management process in delivering Metro Ethernet services. This paper proposes a next generation approach to automating the ordering process for Metro Ethernet services using the TM Forum Frameworx™ architecture, that is better suited for open, standard interfaces, common business processes, standardized information models and integrated back office applications.

This paper will develop an Order Management automated Business-to-Business (B2B) solution approach using a MEF Ethernet Private Line (EPL) plus E-Access service example use case. First, the overall TM Forum Frameworx will be introduced to provide the high level view of the Service Oriented Architecture concepts. This will be followed by the E-Access service Order Management conceptual design.

MEF EPL + E-ACCESS SERVICE USE CASE

Often an MSO (Service Provider "A") may need to access an out-of-franchise subscriber location as part of providing an end-to-end Ethernet Provide Line (EPL) service [1]. Since the subscriber for the EPL service resides in Access Provider B's footprint, this is accomplished by Access Provider B offering an E-Access service [2] to Service Provider A. Figure 1 illustrates this service topology of the EPL end-to-end Ethernet Virtual Connection (EVC) for the point-to-point link between the two subscriber locations along with the Operator Virtual Connection (OVC) that exists between the User-to-Network Interface (UNI) and External Network Network Interface (ENNI) for both the Service Provider and Access Provider. The E-Access service provided by the Access Provider is defined as OVC B between the UNI B and the ENNI AB and generally carries a Service Level Agreement (SLA). Our use case for this paper is to automate the Service Order process and interface between Service Provider A ordering the E-Access service from Access Provider B.
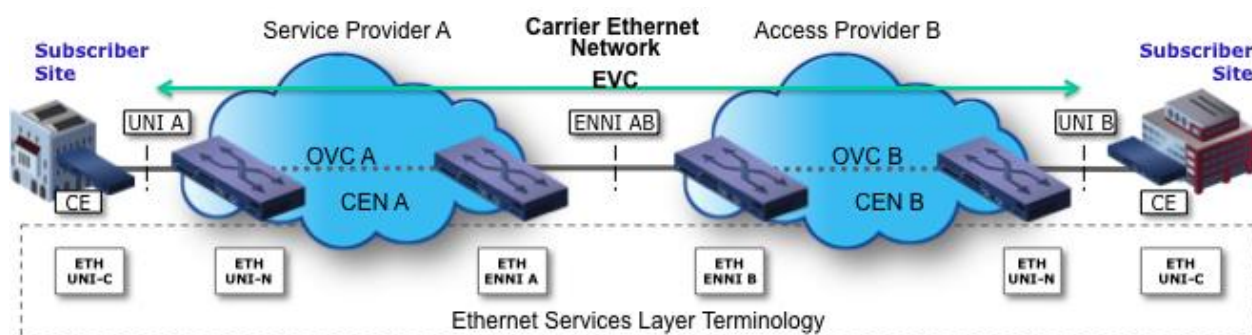

Figure 1. MEF EPL (End-to-End) + E-Access Service Order Use Case

TM FORUM FRAMEWORX

The TeleManagement Forum (TMF) has defined a Service Oriented Architecture (SOA) for Communication Service Providers called Frameworx and is diagrammatically

depicted in Figure 2. Frameworx is based on defining and integrating business processes, information, applications and interfaces.

Business processes, such as Service Order Management business logic and policies, are covered in the Business Process Framework [3], which includes the enhanced Telecommunications Operations Map (eTOM). eTOM is an extensible model which defines a complex business processes blueprint for Service Providers in how they provide products to their end customers as well as how they execute their business at an enterprise level.

Information modeling, to support the flow of data between applications and interfaces to support the business processes, is covered in the Information Framework [4] and includes the Shared Information/Data model (SID). A Service Order Management Information Model, derived from the MEF Carrier Ethernet Information Model [MEF 7.2] falls into this area.

Defining a Service Order type of application for Metro Ethernet Services is covered in the Application Framework [5] and includes the TAM. The TAM defines an overall application map for Service Providers to aide in application and tool management, acquisition, inventory, etc. with a mapping to those business processes they implement in their organization.
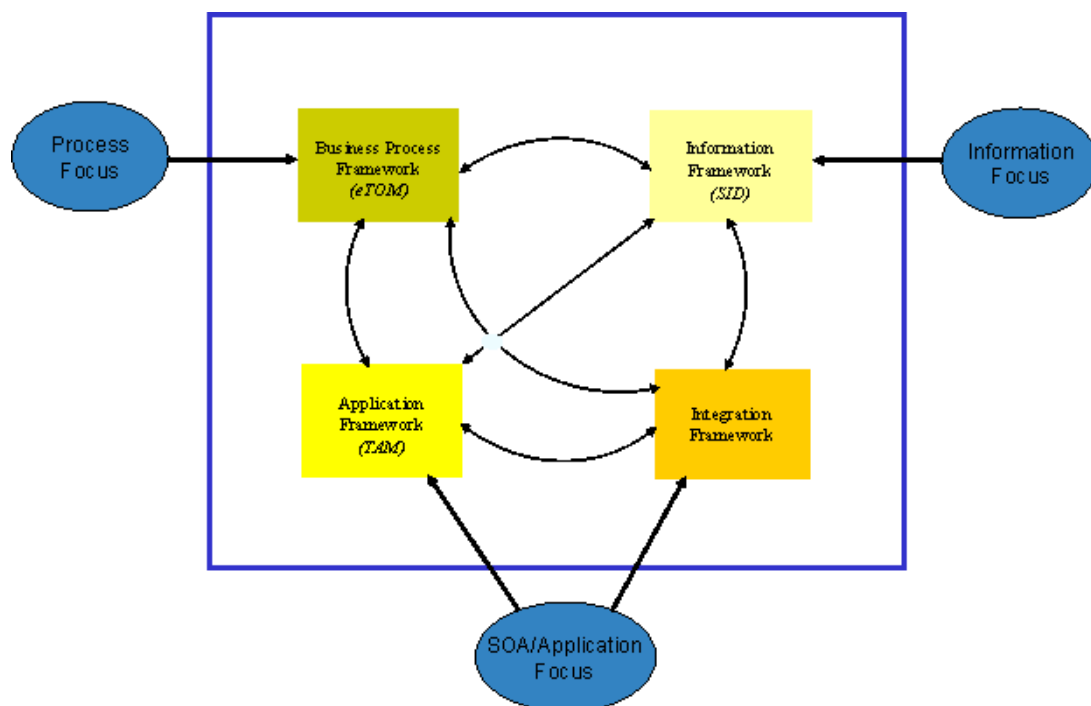
Figure 2. TM Forum Frameworx Overview

The Integration Framework binds the other Business Process, Information and Application Frameworks together. The Integration Framework includes the standard protocols, interface definitions, Application Programming Interface (API) definitions and technologies to integrate the business processes and workflows, information and data exchanges and application interfaces. For example, the Integration Framework would include a Service Order Management API definition.

BUSINESS PROCESS FRAMEWORK

The enhanced Telecommunications Operations Map (eTOM) defines a hierarchy of processes, with process decomposition from Level 0 down to Level 4. Figure 3 illustrates the high level view of the eTOM with Level 0 and Level 1 processes exposed. This view highlights three major groupings that equate to the Level 0 processes:

- Strategy, Infrastructure & Product – Covers processes that are capital expenditure centric, such as planning and lifecycle management.
- Operations – Covers processes that are operational expenditure centric, such as operational management.

- Enterprise Management – Covers processes that are specific to executing the day-to-day business activities, such as business support management. This paper will not focus on this area.

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When addressing order management processes, both Strategy, Infrastructure & Product as well as Operations are involved. Strategy, Infrastructure & Product processes will be discussed first, followed by Operations.
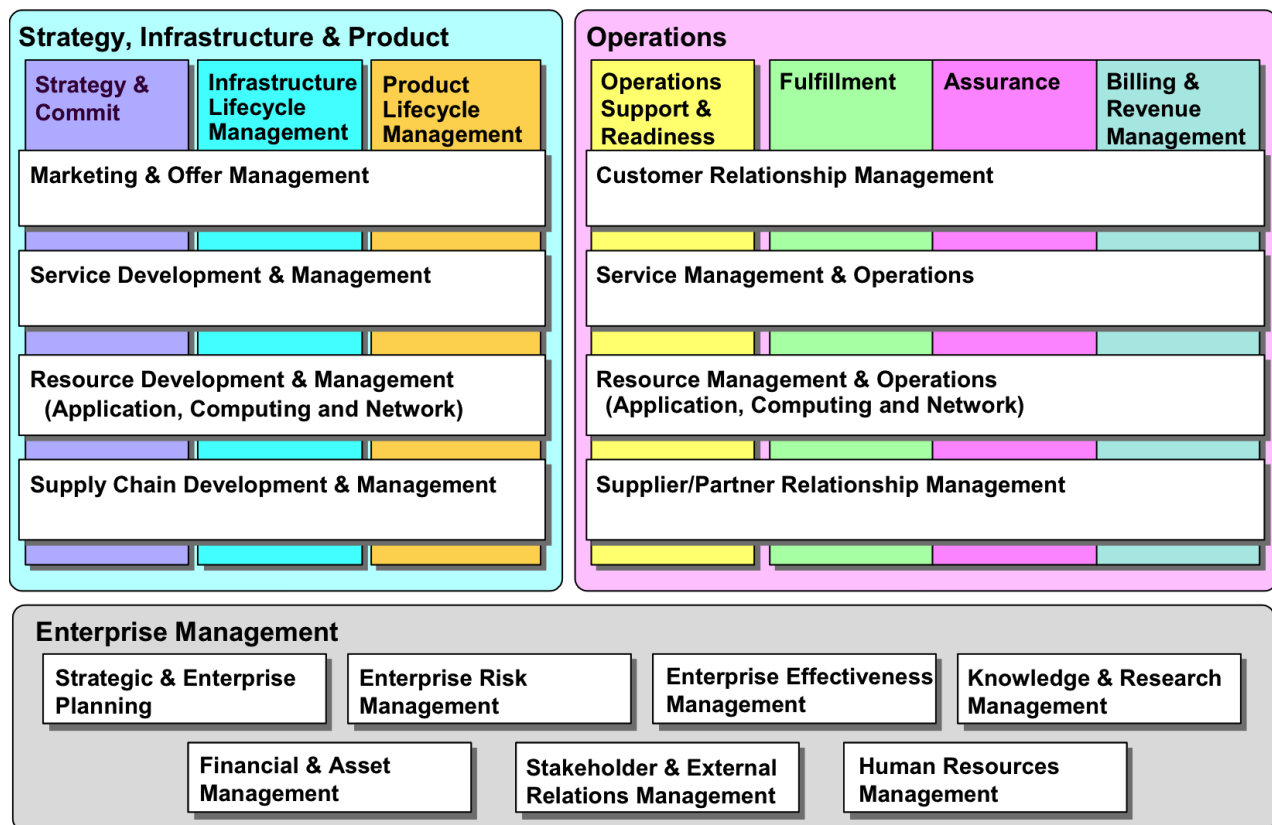
Figure 3. TMF enhanced Telecom Operations Map [3]

One important aspect of selling and buying services is to first define, plan and implement all of the services in the enterprise's product portfolio. This is often referred to as a product catalog. The product or service catalog should define the specific E-Access [2] service which the Service Provider A would like to order from Access Provider B. The service offering should have

a detailed Service Level Specification (SLS) that identifies the service attributes and parameters and will help aid in developing a Service Level Agreement (SLA) with the Service Provider upon the contract negotiations. The SLS and SLA will also be inputs to turn up testing, referred to as Service Activation Testings (SAT), performed by both the Service Provider and the Access Provider. These processes are defined in eTOM [6] as identified below:

- Level 1: Product Lifecycle Management: *"This vertical end-end process grouping is responsible for the definition, planning, design and implementation of all products in the enterprise's portfolio."*
  - Level 2: Product & Offer Development & Retirement: *"Product Development & Retirement processes develop and deliver new products or services and product or service enhancements and new features, ready for implementation by the Operations processes."*
    - Level 3: Develop Detailed Product Specifications: *"The Develop Detailed Product Specifications processes develop and document the detailed product-related technical, performance and operational specifications, and customer manuals."*

With the definition of the product and service offering, via the product catalog, and the SLS completed, the majority of the other order management business processes fall into the Operations area. This area supports the customer, the network, and interaction with operations and management on a day-to-day basis. The fundamental order management business processes reside under Operations and within Customer Relationship Management (CRM). Since Service Provider A wants to purchase an E-Access service from Access Provider B, this is a CRM Order Handling business process that Access Provider B must fulfill through their own service and resource configuration and activation processes. Once they have installed, configured, activated, tested and verified the service according to the SLS, SLA and service order, they can turn the service over to Service Provider A. However, the very beginning of the process should be an automated ordering process to allow Service Provider A to order the E-Access service from Access Provider B using an application interface. These processes are covered in eTOM [6] as identified below:

- Level 1 Horizontal: Customer Relationship Management: *"This horizontal functional process grouping considers the fundamental knowledge of customers needs and includes all functionalities necessary for the acquisition, enhancement and retention of a relationship with a customer."*
- Level 1 Vertical: Fulfillment: *"The Fulfillment process grouping is responsible for providing customers with their requested products in a timely and correct manner."*
  - Level 2: Order Handling: *"Order Handling processes are responsible for accepting and issuing orders."*
    - Level 3: Determine Customer Order Feasibility: *"Check the availability and/or the feasibility of providing and supporting standard and customized product offerings where specified to a customer."*
    - Level 3: Authorize Credit: *"Assess a customer's credit worthiness in support of*

managing customer risk and company exposure to bad debt."

- Level 3: Track & Manage Customer Order Handling: *"Ensure customer provisioning activities are assigned, managed and tracked efficiently to meet the agreed committed availability date."*
- Level 3: Complete Customer Order: *"Manage customer information and interactions after customer contracts or associated service orders have been finalized and during the order completion phase."*
- Level 3: Issue Customer Orders: *"Issue correct and complete customer orders."*
- Level 3: Report Customer Order Handling: *"Monitor the status of customer orders, provide notifications of any changes and provide management reports."*
- Level 3: Close Customer Order: *"Close a customer order when the customer provisioning activities have been completed."*

o Level 2: Service Configuration and Activation: *"Allocation, implementation, configuration, activation and testing of specific services to meet customer requirements."*
  - Level 3: Allocate Specific Service Parameters to Services: *"Where the Allocate Specific Service Parameters to Services processes are requested by a service order issued in response to a confirmed customer order, these processes are responsible for allocating the specific service parameters required to satisfy the initiating service order."*
  - Level 3: Issue Service Orders: *"Issue correct and complete service orders."*
  - Level 3: Close Service Order: *"Close a service order when the service provisioning activities have been completed."*

The eTOM defines many Level 4 processes for Order Management. However, this paper will not get into that level of process detail. Based on this level of order process detail residing in eTOM, no extensions are necessary for our use case.

INFORMATION FRAMEWORK

The core of the Information Framework, or Shared Information/Data model (SID), is information modeling. Information is a fundamental thread when designing interfaces, protocols, APIs, applications, business process workflows, etc. As our use case is specific to a Metro Ethernet service, the MEF has developed their own industry specific Information Model. An Information Model is the design of the objects and parameters in any system, including operations and actions, as well as how different objects are associated with one another (e.g., their assocations). Information Models are commonly defined using UML class diagrams, which the TM Forum and MEF have adopted.

When looking at the Order Management information, we need to address both the TM Forum SID from an industry agnostic perspective and at the MEF Carrier Ethernet Management Information Model [7] for the industry specific perspective. The TM Forum SID provides us with the generic information about order management and associates the information with the eTOM business process definitions. The Frameworx has been designed to be generic as possible so that it can be used across any industry (government, telecommunications, energy, etc.) However, a generic interface will not provide us with a MEF E-Access service order solution, which is were we need to integrate the industry specific information from the MEF Carrier Ethernet Management Information Model. This essentially is applying the Information Framework for Service and Resource Management for Ethernet Services.

The SID defines a Business Entity, an Aggregate Business Entity (ABE) and a Domain. Domains are the horizontal collection of ABEs associated with specific management areas that correlate directly to the eTOM horizontal business processes (e.g., Service, Resource, etc.). An ABE is a well-defined set of information and operations that characterize a highly cohesive, loosely coupled set of business entities (e.g., Service Configuration) [8]. A Business Entity is simply something of interest to the business (e.g., customer, customer order, customer account). Think of a Business Entity as a managed object or class in a class diagram. Figure 4 illustrates the SID with the Domains and Level 1 ABEs exposed.
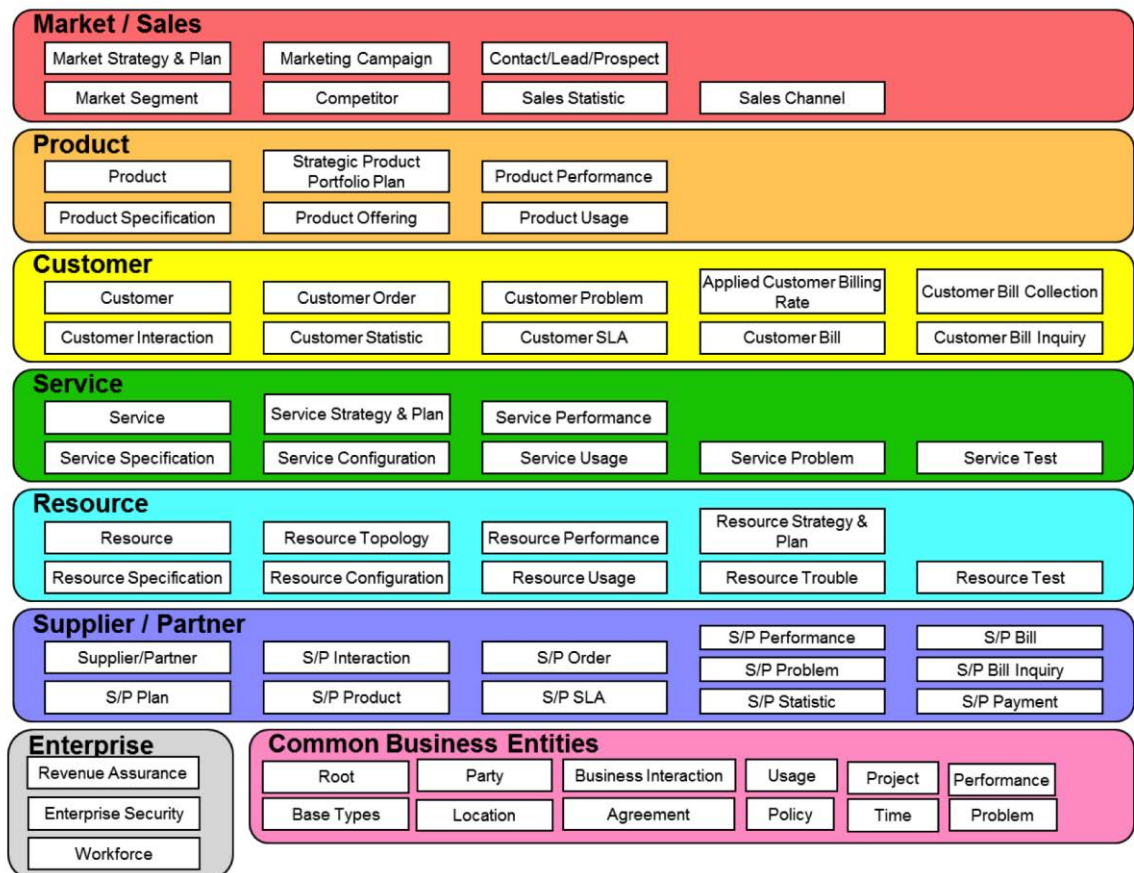

Figure 4. Information Model (SID) including Domains and Level 1 ABEs [8]

The SID Level 1 and Level 2 ABEs and Business Entities [8] of interest for Order Management include:

- Product
- Product Specification
- Product Offering
  - o Product Catalog ABE (Level 2)
- Customer Interaction
- Customer Order
  - o CustomerOrder/CustomerOrderItem Business Entity
  - o ProductOrder/ProductOrderItem Business Entity
- Service
  - o Service Order ABE (Level 2)
    - ▪ ServiceOrder/ServiceOrderItem Business Entity
- Service Specification
  - o Customer Facing Service Specification ABE (Level 2)
- Service Configuration

These are further decomposed into lower level ABEs and Business Entities, however this paper will not get into that level of detail.

The MEF E-Access service attributes and parameters are modeled in ITU-T Q.840.1 [9] and MEF 7.2 [7]. This pair of documents combined defines the complete set of Carrier Ethernet Management Information Model as well as defining use cases to support the UML class diagrams used to model the information. In order to develop an automated interface for an E-Access service order, we need to create a service order view into the Carrier Ethernet Management Information Model. This identifies which objects and attributes are necessary to support the order entry process. For example, the Carrier Ethernet Management Information Model includes the managed objects necessary for performing Service Operations, Administration and Maintenance

(Service OAM) for assisting in network fault and performance monitoring. However, such managed objects are not required for the service order entry process. A few of the OVC service attributes include:

- End Point List/Map
- Max MTU Size
- CE-VLAN ID Preservation
- CoS Identifier
- CoS Name
- Ingress Bandwidth Profile per OVC End Point at a UNI

There are many more E-Access service attributes, however this paper will not get into that level of detail.

APPLICATION FRAMEWORK

As discussed in the previous sections, the Business Process Framework (eTOM) provides a view of business processes while the Information Framework (SID) provides a view of information and data for Service Providers; the Application Framework (TAM) provides a view of applications. These applications are typically software-based, procurable, deployable, OSS and BSS level applications or services. One goal of the Application Framework is to define a common language set for information exchange based on eTOM when referencing operation and business support systems. Other goals of the Application Framework include standardizing application requirements and automation enablement through componentization of support systems. The purpose is to bridge the gap between the eTOM and SID and applications. The top level Application Framework is shown in Figure 5.
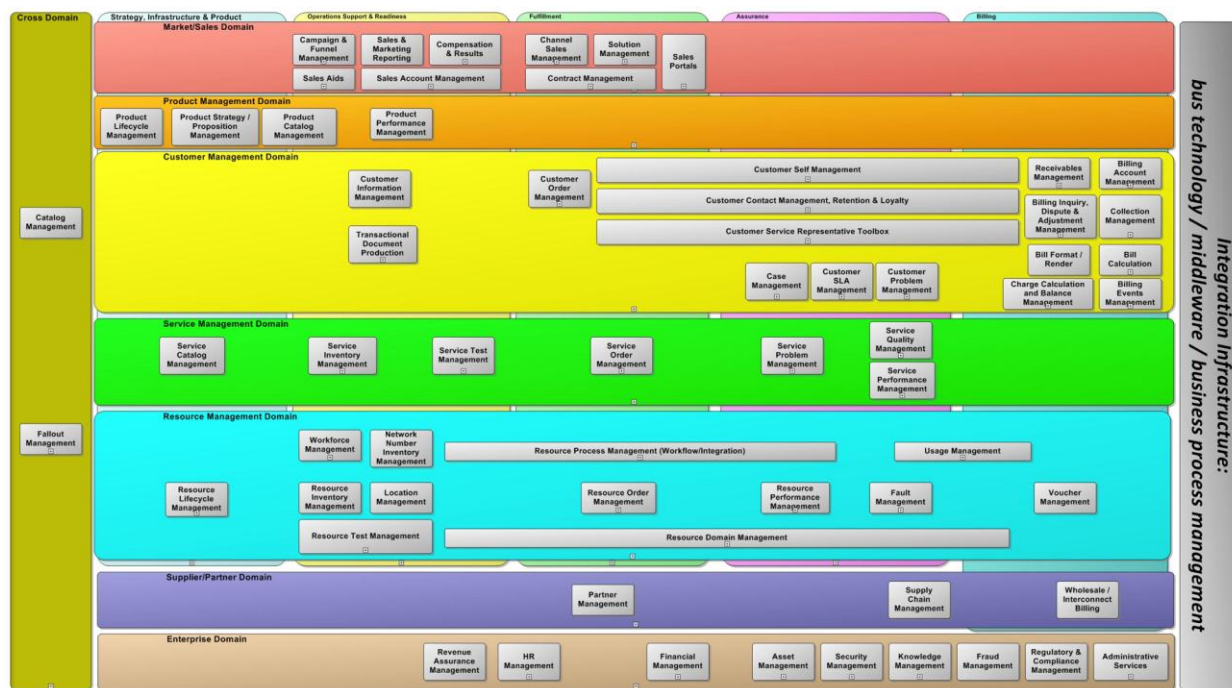
Figure 5. Application Framework (TAM) [5]

The application areas specific to the Order Management use case should align with the eTOM business processes and SID Level 1 and 2 ABEs and Business Entities already identified and described in the previous sections. These application areas include [5]:

- Product Management Domain
    - Product Lifecycle Management
    - Product Catalog Management
- Customer Management Domain
    - Customer Order Management
- Service Management Domain
    - Service Order Management

The above set of application areas provide a detailed but generalized set of application requirements to address the MEF E-Access Order use case. Refer to [5] for the detailed description and requirements for each area. Each application area can be extended with additional requirements that are specialized for the E-Access MEF service. For example, the Order Management might be extended with a requirement that requires the Access Provider to supply a copy of the OVC test report showing their Service Activation Test results for their E-Access service offering.

INTEGRATION FRAMEWORK

Finally, the Integration Framework is the cohesion of all three of the other frameworks. It defines a set of standards that supports interoperability between applications defined in the TAM while based on the requirements from the eTOM. The interfaces are defined in terms of standardized information and data models from the SID. The result is a reusable Service Oriented Architecture approach to addressing the Service Providers enterprise's needs. It has long been recognized that by standardizing interfaces to OSS and BSS applications, Service Providers realize an operational efficiency through reduced integration costs, improved interoperability, reliability, and agility. The MEF E-Access use case requires an inter-company business-to-business (B2B) OSS Order Management client interface. Java EE™ provides three open technology platforms (through the OSS though Java Initiative OSS/J) for this interface scenario. The TMF defines a corresponding integration profile [10] for each interface technology. These are listed below:

- Remote Method Invocation (RMI) over IIOP
  - Uses the OSS/J Java Profile (JVT)
- XML over Java Messaging Service (JMS)
  - Uses the OSS/J XML/JMS Profile
- Web Services (SOAP over HTTP)
  - Uses the OSS/J Web-services Profile

The TM Forum, via the OSS/J, has developed an Order Management API (JSR-264) [11] to enable creation of a standardized interface for applications. The API specifies the requirements for Order Management system interfaces based on the eTOM and SID as described in the previous sections. The API is also extensible to allow the addition of the E-Access service attributes defined in the Carrier Ethernet Management Information Model [7]. In addition, operations are defined to create, abort, modify, remove, suspend and cancel orders and order activities [12]. Figure 6 illustrates the E-Access use case in detail.
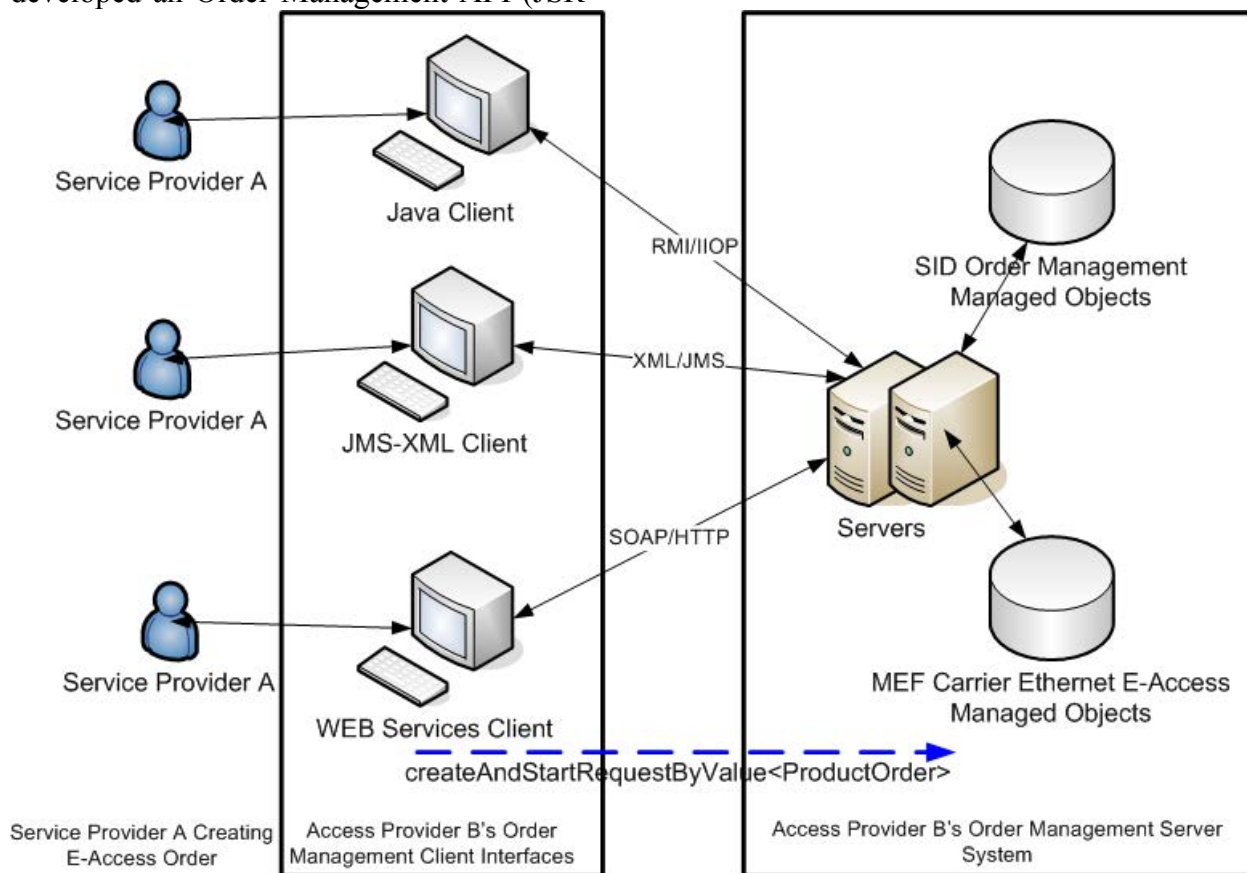
Figure 6. Programmable Order Interface for E-Access Use Case

Access Provider B's Order Management system is composed of a client-server application which, in the simplest form, accesses the SID managed objects, such as the Product Offering from the Product Catalog. The E-Access service attributes are also extensions to the SID managed objects, as these describe the service specific details beyond the generalized SID model. The Order Management server can expose the three client side interfaces: RMI/IIOP, XML/JMS, and SOAP/HTTP. The Web

Services (SOAP) interface has become the dominate interface in the industry and is the focus of this section.

Service Provider B accesses the Order Management application via a client side interface, such as the Web-services client to *create* an order for the E-Access service, based on the Product Offer derived from the Access Provider's Product Catalog. Once the Service Provider fills in the required attributes and submits the order, the hashed blue arrow in Figure 6 illustrates the SOAP message `createAndStartRequestByValue` sent to the server containing the `<Product Order>` details [13]. When the server receives this message it begins the necessary Service Order, including the Service Specification details, and Service Configuration processes discussed earlier in the paper. This may invoke other applications, interfaces, etc. internal to the Access Provider's back office. Appendix I shows an example XML message sent in the SOAP message containing some of the SID managed objects.

SUMMARY

This paper has presented a Service Oriented Architecture approach to designing an automated order management interface for ordering Metro Ethernet services between operators by leveraging the TM Forum Frameworx. This was accomplished by instantiating each of the following core areas within Frameworx:

- Business Process Framework

The MEF Service Order Business Processes/Business Logic/Business Policies were identified.

- Information Framework

The Order Management SID entities were identified. The MEF Service Attributes and Parameters for the E-Access Product and Service Offering were identified as extensions to the SID.

- Application Framework

The B2B Operation Support System/Business Support System (OSS/BSS) applications for Order Management were identified, based on the business processes and information of the eTOM and SID.

- Integration Framework

Finally, The OSS/J Order Management Application Programming Interface (API) was leveraged to design and implement a standard web-services SOAP interface for creation of a Order Management client-server system for use in allowing the Service Provider to programmatically create and submit an order to the Access Provider's system.

BIBLIOGRAPHY

[1] MEF 6.1 Technical Specification, Ethernet Services Definitions – Phase 2, April 2008.

[2] MEF 33 Technical Specification, Ethernet Access Services Definition, January 2012

[3] Business Process Framework (eTOM), Concepts and Principles, GB921 Version 9.2, TM Forum, April 2011.

[4] Information Framework (SID), Concept and Principles, GB922, Version 7.3, January 2012.

[5] Application Framework (TAM), GB929, Version 4.7, TM Forum, April 2012.

[6] Business Process Framework (eTOM), Addendum D: Process Decompositions and Descriptions, GB921 Addendum D, Version 12.2, TM Forum, April 2012.

[7] MEF 7.2 Technical Specification, Carrier Ethernet Management Information Model, July 2012.

[8] Information Framework (SID), User's Guide, GB922, Addendum 1U, Version 8.6, TM Forum, September 2011.

[9] ITU-T Recommendation Q.840.1, Requirements and Analysis for NMS-EMS Management Interface of Ethernet over Transport and Metro Ethernet Network, 2007.

[10] OSS/J Design Guidelines, Part 1 – Basic Concepts and General Design Patterns, Release 2.0, TM Forum, April 2008.

[11] OSS/J Order Management API, JSR-264 Overview, Release 1.0, TMF892, January 2010.

[12] OSS/J Order Management API, JSR-264 User's Guide, Release 1.0, TMF893, January 2010.

[13] OSSJ-OrderManagement-v1-0.xsd,   XML
      Schema   File   provided   in   OSS/J   Order
      Management API, JSR-264, Release 1.0

APPENDIX I: EXAMPLE ORDER CREATION XML MESSAGE

```xml
<?xml version="1.0" encoding="UTF-8"?>
<createAndStartRequestByValueRequest xmlns="http://ossj.org/xml/OrderManagement/v1-0"
xmlns:cbebi-v1-5="http://ossj.org/xml/Common-CBEBi/v1-5" xmlns:cbecore-v1-
5="http://ossj.org/xml/Common-CBECore/v1-5" xmlns:cbedatatypes-v1-
5="http://ossj.org/xml/Common-CBEDatatypes/v1-5" xmlns:cbelocation-v1-
5="http://ossj.org/xml/Common-CBELocation/v1-5" xmlns:cbeparty-v1-
5="http://ossj.org/xml/Common-CBEParty/v1-5" xmlns:cbeproduct-v1-
5="http://ossj.org/xml/Common-CBEProduct/v1-5" xmlns:cbeproductoffering-v1-
5="http://ossj.org/xml/Common-CBEProductOffering/v1-5" xmlns:cberesource-v1-
5="http://ossj.org/xml/Common-CBEResource/v1-5" xmlns:cbeservice-v1-
5="http://ossj.org/xml/Common-CBEService/v1-5" xmlns:co-v1-
5="http://ossj.org/xml/Common/v1-5" xmlns:xsi="http://www.w3.org/2001/XMLSchema-
instance" xsi:schemaLocation="http://ossj.org/xml/OrderManagement/v1-
0:\PROGRA~1\altova\xmlspy2006\schemas\ossj\OSSJ-OrderManagement-v1-0.xsd">
    <requestValue xsi:type="ProductOrderValue">
        <co-v1-5:key>
            <co-v1-5:type>ProductOrder</co-v1-5:type>
            <co-v1-5:primaryKey>order-123456</co-v1-5:primaryKey>
        </co-v1-5:key>
        <cbebi-v1-5:interactionDate>2001-12-17T09:30:47.0Z</cbebi-v1-5:interactionDate>
        <cbebi-v1-5:interactionDateComplete>2001-12-17T09:30:47.0Z</cbebi-v1-
5:interactionDateComplete>
        <cbebi-v1-5:interactionStatus_BusinessInteraction>unknown</cbebi-v1-
5:interactionStatus_BusinessInteraction>
        <cbebi-v1-5:description>String</cbebi-v1-5:description>
        <!-- the locations involved in this order -->
        <cbebi-v1-5:involvedLocations>
            <cbebi-v1-5:item>
                <cbebi-v1-5:place>
                    <co-v1-5:lastUpdateVersionNumber>2147483647</co-v1-
5:lastUpdateVersionNumber>
                    <co-v1-5:key>
                        <co-v1-5:type>String</co-v1-5:type>
                        <co-v1-5:primaryKey/>
                    </co-v1-5:key>
                </cbebi-v1-5:place>
            </cbebi-v1-5:item>
        </cbebi-v1-5:involvedLocations>
        <!-- the (party) roles involved in this order -->
        <cbebi-v1-5:involvedRoles>
            <cbebi-v1-5:item>
                <co-v1-5:key>
                    <co-v1-5:type>String</co-v1-5:type>
                    <co-v1-5:primaryKey/>
                </co-v1-5:key>
                <cbecore-v1-5:describedBy>
                    <cbecore-v1-5:item>
                        <cbecore-v1-5:value/>
                        <cbecore-v1-5:characteristic>String</cbecore-v1-
5:characteristic>
                    </cbecore-v1-5:item>
                </cbecore-v1-5:describedBy>
                <cbebi-v1-5:interactionRole>provider or subscriber</cbebi-v1-
5:interactionRole>
            </cbebi-v1-5:item>
        </cbebi-v1-5:involvedRoles>
        <om-v1-0:priority_Request>0</om-v1-0:priority_Request>
```

```xml
        <om-v1-0:expectedCompletionDate>2001-12-17T09:30:47.0Z</om-v1-
0:expectedCompletionDate>
        <om-v1-0:validFor>
            <cbedatatypes-v1-5:startDateTime>2001-12-17T09:30:47.0Z</cbedatatypes-v1-
5:startDateTime>
            <cbedatatypes-v1-5:endDateTime>2001-12-17T09:30:47.0Z</cbedatatypes-v1-
5:endDateTime>
        </om-v1-0:validFor>
        <om-v1-0:requestedCompletionDate>2001-12-17T09:30:47.0Z</om-v1-
0:requestedCompletionDate>
        <om-v1-0:purchaseOrder>String</om-v1-0:purchaseOrder>
        <!-- each productorder item is effectively a line item in the order -->
        <om-v1-0:productOrderItems>
            <om-v1-0:item>
                <co-v1-5:key>
                    <co-v1-5:type>String</co-v1-5:type>
                    <co-v1-5:primaryKey/>
                </co-v1-5:key>
                <!-- the actual action being requested - e.g. "create" the product or
"cancel" the product or "modify" the product  -->
                <cbebi-v1-5:action>Create</cbebi-v1-5:action>
                <cbebi-v1-5:quantity>
                    <cbedatatypes-v1-5:amount>1</cbedatatypes-v1-5:amount>
                    <cbedatatypes-v1-5:units>String</cbedatatypes-v1-5:units>
                </cbebi-v1-5:quantity>
                <!-- the specific places for this productorder item - will usually
refer to an involvedlocation specified on the "parent" order level -->
                <cbebi-v1-5:places>
                    <cbelocation-v1-5:item>
                        <co-v1-5:key>
                            <co-v1-5:type>String</co-v1-5:type>
                            <co-v1-5:primaryKey/>
                        </co-v1-5:key>
                </cbebi-v1-5:places>
                <!-- the specific roles for this productorder item - will usually refer
to an involvedroles specified on the "parent" order level -->
                <cbebi-v1-5:involvedRoles>
                    <cbebi-v1-5:item>
                        <co-v1-5:key>
                            <co-v1-5:applicationContext>
                                <co-v1-5:type>PartyRole</co-v1-5:type>
                                <co-v1-5:primaryKey>subscriber-123</co-v1-5:primaryKey>
                        </co-v1-5:key>
                        <cbebi-v1-5:interactionRole>Subscriber</cbebi-v1-
5:interactionRole>
                    </cbebi-v1-5:item>
                    <cbebi-v1-5:item>
                        <co-v1-5:key>
                            <co-v1-5:applicationContext>
                                <co-v1-5:type>PartyRole</co-v1-5:type>
                                <co-v1-5:primaryKey>provider-123</co-v1-5:primaryKey>
                        </co-v1-5:key>
                        <cbebi-v1-5:interactionRole>Provider</cbebi-v1-
5:interactionRole>
                    </cbebi-v1-5:item>
                </cbebi-v1-5:involvedRoles>
                <!-- the details of the product (offerring) being ordered -->
                <om-v1-0:productOffering>
                    <co-v1-5:key>
                        <co-v1-5:applicationContext>
                            <co-v1-5:type>ProductOffering</co-v1-5:type>
```

```xml
                            <co-v1-5:primaryKey>productoffering-123456</co-v1-
5:primaryKey>
                        </co-v1-5:key>
                        <!-- these name value pairs are characteristics and are used for
flexible non-schema defined attributes -->
                        <cbecore-v1-5:describedBy>
                            <cbecore-v1-5:item>
                                <cbecore-v1-5:value>value1<cbecore-v1-5:value/>
                                    <cbecore-v1-5:characteristic>attribute1</cbecore-v1-
5:characteristic>
                            </cbecore-v1-5:item>
                            <cbecore-v1-5:item>
                                <cbecore-v1-5:value>value2<cbecore-v1-5:value/>
                                    <cbecore-v1-5:characteristic>attribute2</cbecore-v1-
5:characteristic>
                            </cbecore-v1-5:item>
                        </cbecore-v1-5:describedBy>
                        <cbeproductoffering-v1-5:description>Ethernet Access
service</cbeproductoffering-v1-5:description>
                        <cbeproductoffering-v1-5:name>E-Access EPL</cbeproductoffering-v1-
5:name>
                        <cbeproductoffering-v1-
5:state_ProductOffering>active</cbeproductoffering-v1-5:state_ProductOffering>
                        <!-- here would go the MEF-Access product service specific
attributes -->
                        <!-- <mef-v1-0:attributeXYZ>value1<mef-v1-0:attributeXYZ/> -->
                    </om-v1-0:productOffering>
                </om-v1-0:item>
            </om-v1-0:productOrderItems>
        </requestValue>
</createAndStartRequestByValueRequest>
```