White Paper

Cisco Prime Fulfillment: Introducing a New Era of Service Creation and Delivery

Abstract

In recent years, service providers have introduced an expanding list of services, supported client devices, and network platforms that span the data center to the end user. Yesterday's basic telephony, data, and TV services have now morphed into a broad array of discrete and hybrid offerings. One affected area within service provider organizations that is receiving less widespread attention is service fulfillment, the intelligent operations infrastructure behind the design, deployment, activation, and management of services. This white paper provides an overview of the changing nature of service fulfillment requirements, a market forecast, and drivers for adoption of new fulfillment solutions. It is followed by an overview of the Cisco Prime™ Fulfillment solution showing how it addresses the changing needs in today's highly dynamic and competitive service provider market landscape. A description of associated consulting engagements from Cisco® Advanced Services for integration of the whole suite or specific components is also included.

Overview

Telecommunications service providers in mobile, wireline, cable, and satellite segments, have all seen their businesses transform radically in the past decade. Once highly stable and near monopolies, service providers today see their revenues threatened by fast-moving competitors that offer high quality and competitively priced content and services. The move to the IP network and open standards for service creation and delivery has further accelerated this competitive trend.

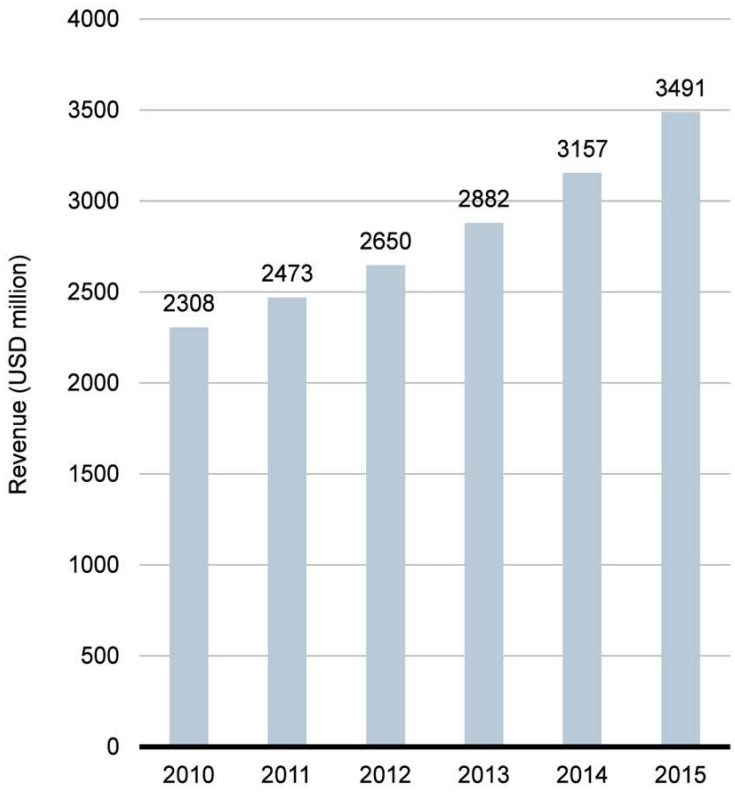
Legacy service fulfillment systems limit the ability of providers to speed new services to market, handle growing service lifecycle complexity, innovative with combined service offerings, and lower operational costs. The shortcomings of legacy operations support systems (OSS) and business support systems (BSS) have led to new market offerings that decrease time to market for new and modified services, are easier to use, provide greater automation, help enable customer self-service, and greatly reduce service fulfillment costs.

Cisco Prime Fulfillment is such a solution. It is the only end-to-end service fulfillment solution that handles the service creation, delivery, and management lifecycle and is ready for deployment within service provider environments out-of-the-box, without major customization or modification.

It has become available just as the worldwide service fulfillment system market is poised for significant growth. A 2011 study by Analysys Mason forecasts the service fulfillment market will grow from $2.3 billion in 2010 to $3.4 billion in 2015, at a compound annual growth rate (CAGR) of 8.6 percent (Figure 1). Speedier recovery following the economic downturn in some countries may lead to even larger revenue results.

Figure 1. Service Fulfillment System Revenue Worldwide Forecast 2010-2015

Source: Analysys Mason, 2011



Few service fulfillment products include order management, inventory management, and activation systems combined in a single suite. Other vendors offer only single product components. The Analysys Mason study defines these separate product components that make up the service fulfillment lifecycle in five categories (Figure 2), but Cisco Prime Fulfillment encompasses them all.

Figure 2. Service Fulfillment Component Definitions

Source: Analysys Mason, 2011

Segment or Subsegment	Definition
Service fulfillment	Service fulfillment systems plan the future capacity and technology of the network, prepare the network to provide service, and plan and implement the changes required in the network and services layer to support the services as ordered by customers.
Order management	Order management systems control and report on the process of fulfilling service orders. Service orders may be requests for new service, but they may also be removal of services, movement of an established service to a new address or mobile device, or changes to an established service.
Inventory management	Inventory management systems track the resources used to provide service and the physical and logical configuration of the network to provide persistent services. They also control the assignment of the inventory to specific uses, and design special arrangements to provide special services for specific users.
Activation	Activation systems automate the explicit commands to turn on a new service. They communicate with service layer databases, network management systems, element management systems, or directly with network elements.
Engineering tools	Engineering tools encompass a range of applications that help engineering departments to operate more efficiently. These tools require a human interface. They include planning, equipment installation and configuration, network optimization, outside plant inventory, and design and diagnostic tools.

Challenge: Cost-effective, Flexible, Simplified Service Fulfillment

In the past, services were defined by their enabling network connections and switches. Now services are increasingly abstracted from the networks that carry them and have only an indirect relationship to the technology and sometimes no relationship at all to the network service provider (as in the case of over-the-top service or content providers like Skype, YouTube, Facebook). Some of these services, such as voice over IP (VoIP) and IP video, are already drawing revenue away from incumbent service providers and there is no shortage of other competitors ready to introduce services to customers directly over the Internet. Left unchallenged, over-the-top providers will make it increasingly hard for traditional service providers to differentiate themselves let alone compete.

Thus far, although service providers have recognized these competitive threats, any attempt to adapt to and challenge the new reality of third-party services and content reaching customers has been constrained by the inflexibility of OSS and BSS products. These systems were originally designed to create and manage a relatively small portfolio of services that changed infrequently and then with minor modification. Today, however, services are many and varied and are often bundled and blended together with other products, services, and special rate plans. The complexity of managing these services has increased exponentially, along with the human interaction needed to coordinate them. This has led to rising costs for creating, testing, and maintaining services based on myriad technical and organization processes that are required.

Additionally, the service creation, deployment, and management environment has grown much more complex as providers introduce more and different services and packages to attract and retain subscribers. To launch the newest services, many providers must work with new technologies and partners, acquire new business, or merge divisions within their businesses to develop the requisite resources.

This convergence of resources gives marketing departments a rich palette of service elements to work with but it also contributes to much greater operational complexity. One example: a mobile operator delivering a broadband service over an unbundled local loop connection requires a degree of planning and physical activity management that the existing OSS is probably not capable of handling.

As service providers create many new multimedia services and introduce a new network control plane with Internet Multimedia Subsystem (IMS), the legacy OSS and BSS programs leave out many needed components, such as self-service, and are not designed to generate, provision, execute, and manage services in real time.

Therefore, in an IP next-generation network (NGN), provisioning may involve installing new instances of software and making changes to customer policies. The newest approach to service fulfillment abstracts services as logical building blocks that can be assembled with point-and-click ease and reused again and again to form new services and service bundles. These building blocks must include service elements from third parties developing new and blended services, partners that resell combinations of services, and suppliers with strategic infrastructure solutions that link services with extended value chains.

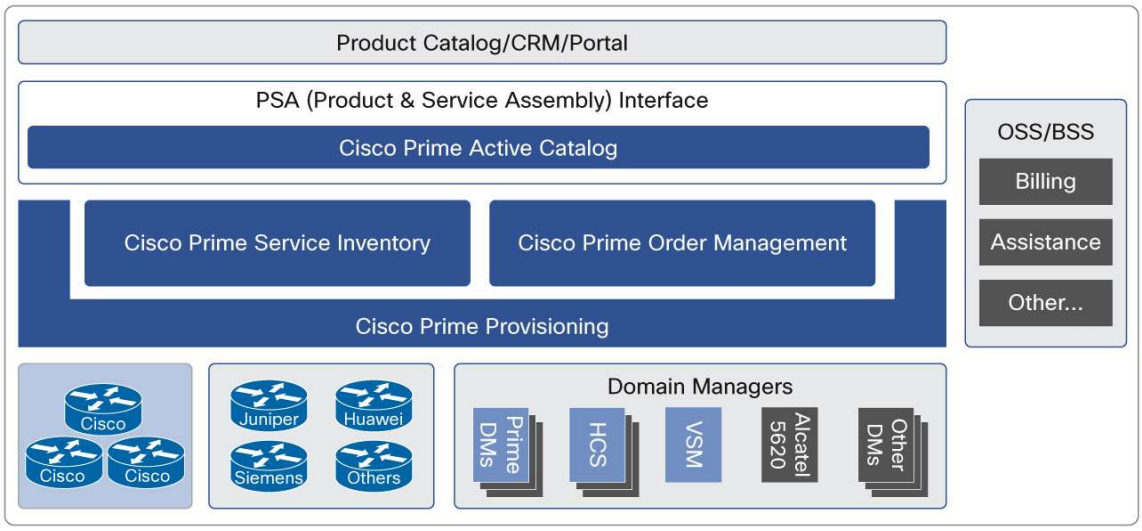
Another important element that must be addressed in new approaches to service fulfillment is the ability of solutions to allow customers to create their own blend of services. As with other consumer-oriented industries, network services that can be assembled and personalized by customers in both consumer and enterprise markets add to customer loyalty. Self-service is likely to lead providers to many different customer niches and even innovative new business models.

Finally, time to market is a key differentiator for service providers. Setting aside six months or more for new product launches is no longer competitive. So service fulfillment solutions must be able to support much greater agility, which means migrating from older OSS and BSS solutions with a lot of manual labor required to more automated, end-to-end solutions that can encompass a wide array of services, devices, dependencies between applications and networks, and multiple groups from network architects to product and marketing managers.

Cisco Prime Fulfillment

The Cisco Prime Fulfillment suite (Figure 3) addresses the service fulfillment challenges facing service providers that are expanding their service offerings in an era of growing customer expectations and competitive challenges from other operators, including over-the-top content and service providers.

Figure 3. Cisco Prime Fulfillment



The suite includes:

- **Cisco Prime Active Catalog** is where services are designed as reusable components. It provides cross-domain orchestration of services on Cisco and third-party platforms for highly accelerated time to market, with reduced testing and development time, no coding, and ongoing efficiencies from process repeatability.

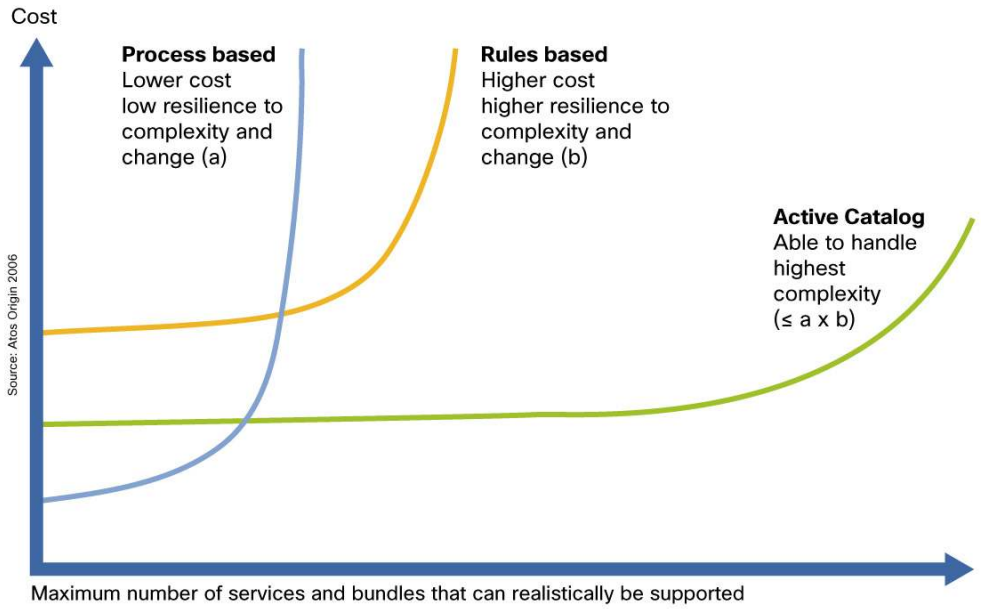
  Active Catalog allows network, service, and other resource capabilities to be modeled as reusable service components. Then these can be aggregated into publishable services and products. These can be bundled into an assembly process to be applied at run time, when the service is being delivered to the customer.

  The approach is bottom up - creating, testing, and publishing components that can be reused with confidence across multiple services and service variants. It is also top down - allowing marketing professionals to combine, configure, and bundle service components into publishable services and into marketable products. Any new requirements needed to create unique products or variants of products may be specified and customers may further customize their products using pretested features.

  The use of largely reusable, validated product components means that the service creation process, from concept to customer, can be exceptionally fast. During product assembly, the rules defined at the design stage are used to complete or request all of the information needed to instantiate the product. Virtual and physical inventory can be determined. Customer clarification on optional features can be assessed. The workflow process, which will take the order from request to delivery, will be built.

A comparison of the approach used in Cisco Prime Active Catalog and more traditional approaches to managing the operational delivery of products or services is shown in Figure 4.

Figure 4. Comparison of Service Delivery Approaches



With the **Process-Based Approach**, building a new process for each product is a time-consuming activity and represents a barrier to innovation and swift time to market. As the service portfolio evolves and products and services are bundled and blended, the effort required to manage separate end-to-end processes increases dramatically and the high cost and low agility hamper service provider competitiveness.

The **Rules-Based Approach** has a higher cost of entry since more of the service environment must be modeled and rules must be defined before any benefit can be realized. Once in place, the rule-based environment is responsive and can support more complex offerings. Eventually, however, the rules base can very quickly become very large, difficult to operate, and a barrier to new service introduction.

With Cisco Prime Active Catalog, rules are separated from processes. Process fragments or building blocks allow common system functionality to be quickly developed and made accessible. Business rules are then applied to constrain the assembly of these components into technically viable products. Cisco believes this separation of process and business rules offers the best balance of flexibility and maintainability. It also offers the resilience required to manage increasingly complex and unpredictable product and service bundles. Cisco Prime Active Catalog also supports the telemanagement forum (TMF) standard product and service assembly (PSA) API interface, specifically designed to help create, assemble and launch new products and services more quickly and efficiently.

- **Cisco Prime Order Management** monitors and controls all of the detailed order processes involved in the customer service fulfillment lifecycle. It is used to rapidly create new service order types. Closer to a project management tool than simple workflow, Order Management picks up jeopardy situations that will affect committed service levels in real time, supporting rapid problem resolution and enhancing customer communications and satisfaction. The ability to monitor time as well as event dependencies is a critical success factor in multiservice rollouts where not all services will be virtually and electronically enabled.

- **Cisco Prime Service Inventory** is a tool for end-to-end management of all of the resources required for service delivery and network operations. It utilizes a highly configurable data model to record and allocate a range of service resources, including customer and network equipment, service numbers, VLAN IDs, and IP addresses. Cisco Prime Fulfillment Service Inventory has also been used as a Tier 1 primary network inventory platform.
- **Cisco Prime Provisioning** performs the complex provisioning and diagnostic tasks, using policy-driven workflows, to make sure that the right configurations end up on the right devices. It applies adaptors created to communicate with network elements, element managers, and other BSS and OSS products. The adaptor library covers virtually every known network and technology vendor. Cisco Prime Provisioning supports Multiprotocol Label Switching (MPLS) and Carrier Ethernet environments, including MPLS VPN Management, MPLS Diagnostics, Cisco Prime Provisioning applications include MPLS VPN Management, MPLS Diagnostics, Layer 2 VPN and Carrier Ethernet Management, and MPLS Traffic Engineering Management.

  A web-based GUI and open APIs help integrate IP services operations into existing service provider operations support systems. Open APIs make it easier to integrate MPLS and Layer 2 VPN services into service provider OSS and management infrastructures. And Cisco Prime Provisioning can be integrated with best-in-class fault and performance-management products from independent software vendors (ISVs).

A Distinctive Approach

Traditional OSS environments tend to be fragmented and organized around service silos with the lifecycle for any given product managed through discrete OSS applications. An absence of coordination between different parts of the OSS adds to new service development time and requires the extensive involvement of expert human resources. Cisco Prime Fulfillment - whether purchased as a complete suite or if Cisco Prime Active Catalog and Cisco Prime Provisioning are purchased as separate product components - may be used with existing OSS solutions. The rules by which individual components can or should be combined can be automated, allowing new services and products to be developed in isolation from their operational systems.

The componentization at the heart of Cisco Prime Fulfillment is aligned with service-oriented architecture (SOA) initiatives. It allows the complexity of next-generation, converged products to be abstracted and managed in a way so service providers can:

- Document the capabilities and characteristics of network and service resources
- Model mandatory and optional relationships between the components that are needed to create and deliver a working service
- Assemble validated components into marketable product offerings
- Bind those components into customer-specific propositions at delivery time
- Implement the process logic needed to deliver the service
- Publish service-related intelligence to the rest of the business

Cisco Prime Fulfillment Benefits

The benefits of Cisco Prime Fulfillment for both service providers and their end customers include:

- Accelerated time to revenue of new services
- Compatibility with existing systems for delivery of new, value-added services
- Efficient reuse of resources and intelligence
- Secure alignment of order processing, inventory management, and network activation prior to new service launch
- Automated provisioning of next-generation services across multiple architectures
- Capability to help enable customer self-service and service configuration
- Consistent service delivery
- Reduced costs for customer care and problem resolution
- Continuous business process improvement through trend analysis
- Extensive support for Cisco and multivendor devices and platforms

Services and Support from Cisco Advanced Services

Cisco Advanced Services provides an array of support services to service provider customers to help speed up Cisco Prime Fulfillment integration with existing customer relationship management (CRM), billing, and web portal systems (Figure 5).

Figure 5. Cisco Prime Fulfillment Service from Cisco Advanced Services

Services are available globally and include:

- Customer requirements analysis
- Customer requirements documentation
- High-level design
- Low-level design
- Acceptance test plan
- Implementation plan
- Deployment
- Configuration
- Customizations
- Testing
- Test reports
- As-built documentation
- Transfer of information

Conclusion

To remain competitive today, service providers require a service fulfillment environment that enables the rapid, simplified, and automated creation and management of complex services and service bundles. Legacy OSS and BSS solutions, which require each new service to be built from the ground up and were designed for a different era with fewer services and lower competition, do not provide service providers with the features and agility they need to survive in the future. Componentization rationalizes the service business, picking up and learning from the way that object-orientation and model-driven architectures addressed complexity in the software business, delivering flexibility in the design, building, assembly, and support of new services to efficiently support a fast-moving product lifecycle. Centralization of technical product information eliminates duplication, simplifies assembly, delivery, and manageability, and allows a single service hub to provide vital service intelligence to the rest of the organization.

Cisco Prime Fulfillment responds to industry requirements for flexibility, simplicity, and efficiency while lowering the cost of managing a product through its lifecycle, thereby helping enable more products to be delivered to the market, improving the service provider's new revenue opportunities, and increasing the potential profit margin on services and products. Cisco Prime Fulfillment can be sold as a complete suite or Cisco Prime Active Catalog and Cisco Prime Provisioning may be sold as individual products. Either way, the Cisco Prime Fulfillment offerings contribute significantly to increasing the speed and reliability with which customer orders can be converted into active services, reducing points of possible failure in the delivery chain, bringing revenue in more quickly and increasing the levels of customer satisfaction which may be a critical differentiator in the rapidly evolving telecoms market. Adherence to industry-standard interfaces and protocols throughout the product lifecycle enables Cisco Prime Fulfillment to comply and conform to the demands of next generation service and network architecture concepts such as SOA, IMS, and Telecoms and Internet converged Services and Protocols for Advanced Networks (TISPAN).

Cisco Prime Fulfillment helps enable service providers to adopt the rapid product design and assembly techniques that have proven invaluable in industries such as automotive and consumer electronics manufacturing, applying technology to product design, assembly, and integrated service execution. The benefits for service providers include faster time to market for service introduction, greater flexibility in service creation and modification, lower operational costs, and greater competitive differentiation.

For More Information

Cisco Prime for Service Providers http://www.cisco.com/go/prime

Cisco Prime Fulfillment http://www.cisco.com/go/fulfillment

Americas Headquarters
Cisco Systems, Inc.
San Jose, CA

Asia Pacific Headquarters
Cisco Systems (USA) Pte. Ltd.
Singapore

Europe Headquarters
Cisco Systems International BV Amsterdam,
The Netherlands

Cisco has more than 200 offices worldwide. Addresses, phone numbers, and fax numbers are listed on the Cisco Website at www.cisco.com/go/offices.

Printed in USA C11-697758-00 02/12