Cisco Evolved Services Platform
Automating a New Class of Carrier Cloud Services

Today's service provider customers expect more. Their customers have grown accustomed to the quick ramp-up speeds, flexibility, and personalization of services no matter how they connect. To stay competitive, service providers need to do more than just re-engineer their networks. Service providers need to rethink how they engage with their customers to meet their business needs.

That is easier said than done. Service providers already face enormous demands on their network and data center assets from exploding mobility, video, and cloud-based applications. We are now in the era of the Internet of Everything that will drive new metrics of scale never seen before. How can service providers reduce costs and improve efficiency and resource utilization, even as they expand their business for new revenue-generating services?

The Cisco Evolved Services Platform (ESP) is a comprehensive virtualization and orchestration software platform that creates, automates and provisions services in real time, across compute, storage and network functions, enabling the delivery of desired business outcomes for applications running across multiple domains facilitating the shift to new business models. It allows service providers to deliver prepackaged services from a flexible pool of resources that can be reused and personalized for each customer, automatically and on demand. With the Cisco ESP, service providers can confidently automate innovative new cloud service offerings, efficiently harnessing their network and data center assets and helping to reduce their current operating expenses up to 45 percent, while accelerating new revenue growth at up to five times their current rates. This platform supports faster and more effective ways to facilitate agile business processes and innovation, for a better return on investments (ROI).

Many vendors are working on pieces of the overall solution that is needed, whether in the data center, the wide-area network, or in services orchestration. However, success will be defined by solutions like the Cisco ESP, which offers an important advantage: It can flexibly combine best-in-class capabilities from an open ecosystem of technologies from any vendor to deliver services in the ways that customers prefer. Imagine being able to respond to market opportunities with the business models you need and greatly reduce the total cost of capturing those new revenues.

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Cisco Evolved Services Platform Overview

The Cisco ESP uses software-defined networking (SDN), Network Functions Virtualization (NFV), Open APIs, and advanced orchestration capabilities to forge a flexible and modular platform. With the Cisco ESP, and the physical and virtual infrastructure service delivery capabilities of the Cisco Evolved Programmable Network (EPN), service providers can quickly deploy new personalized offerings through integrated services modules. Imagine offering prepackaged tiers of enterprise services with default features, security, and service-level agreements (SLAs), that customers can select from an online portal and activate with a click of a mouse. Service providers could engage their customers in new ways, allowing the customers to add new network services, upgrade to cloud digital video recording (DVR) in their home, or activate a new premium mobile broadband (PMB) service using a self-service platform that automatically provisions them in minutes.

The Cisco ESP allows all of this, making new network services and applications easy to deploy by providing the following essential functions (Figure 1):

- **Service broker**: This element functions as the service provider's storefront, providing a self-service catalog and portal that enables operators to translate business intent into actionable service creation and initiation. It enables automated, self-service activation and delivery of new network and application service offerings.
- **Service profiles**: The platform enables the operator to create and customize service profiles allowing them to provide a comprehensive set of service attributes and policies, linked through the orchestration engine, so they can automate and accelerate the delivery of personalized services.
- **Orchestration engine**: This engine automates the creation, monitoring, and assurance of all required physical and virtual infrastructure, resources, and functions, when they are needed. It uses open APIs to connect applications to infrastructure, and it provides a common policy and unified subscriber management framework to deliver all services.
- **Catalog of physical/virtual functions**: This extensible and modular set of virtual network and application capabilities links to services profiles to create the "offers" that can be deployed anywhere and scaled on demand.

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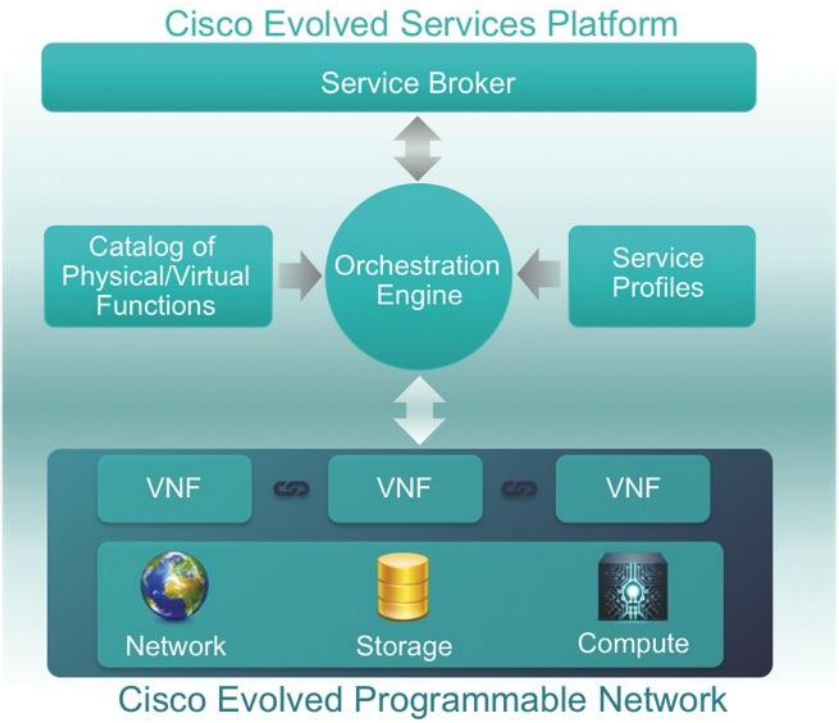
Figure 1. Cisco Evolved Services Platform Elements



Together, these elements remove many of today's restrictions from your network and data center operations, and you gain a platform that is:

- **Open**: It flexibly combines extensible best-in-class capabilities across a multivendor ecosystem of technology and business partners, accelerating innovation and fulfillment of personalized services.
- **Extensible**: A comprehensive set of modular capabilities and prepackaged end-customer offers provides a powerful tool set, allowing operators to optimize their networks, and create and automate new services as business needs dictate.
- **Elastic**: It dynamically scales existing services while optimizing network and data center assets, when and where they are needed.

The Cisco Evolved Services Platform acts on personalized service profiles, automating the programming and provisioning from your active service catalog across the network and data center infrastructure. It can program any service using network configuration protocol and data modeling (NETCONF/YANG) software across a diverse set of physical and virtual devices using an innovative ecosystem of Open APIs, SDN, and NFV software. Cisco participates in OpenDaylight, Open NFV (OPNFV), and Open Compute (OCP) software development efforts and has contributed the SDN controller and policy software to accelerate the open programming of network and data center infrastructure.

With these capabilities, Cisco ESP provides the platform to dynamically translate business intent into tangible services, on demand. It allows operators to respond to market opportunities with the business models they need, enabling new service offerings that are easy to buy and deploy, creating services that are easy to consume and manage.

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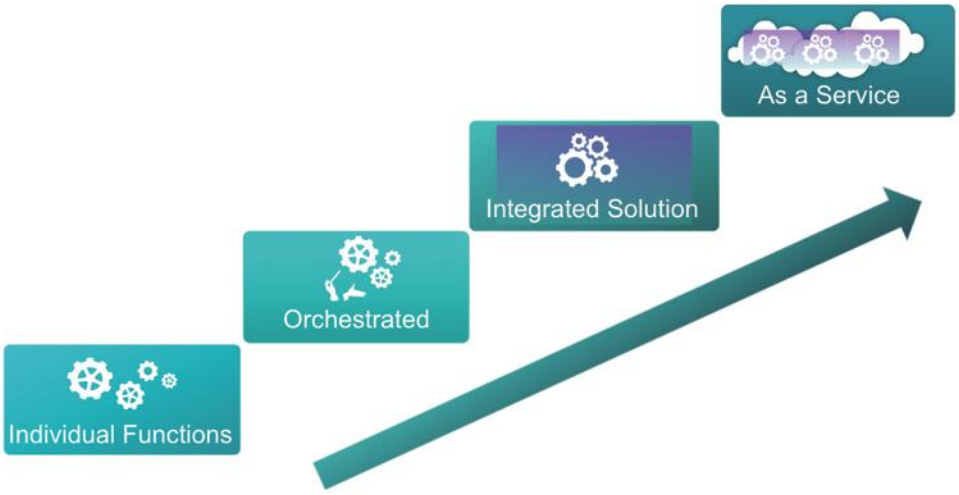
Flexible Deployment Models

Service providers can take advantage of the Cisco ESP in a number of ways, depending on their business needs (Figure 2). There are four possible deployment options:

- **As Individual Functions**: Choose from a wide array of individual physical, virtual, or software orchestration components. Integrate those that best complement your existing software and infrastructure. The virtual network functions (VNFs) are hardware- and hypervisor-independent, so they can operate on any general-purpose computing platform, including the Cisco Unified Computing System family.
- **As Flexible Software Packages—Virtual Functions + Orchestration**: This option combines selected virtual network functions and the orchestration software modules that are "networked" together using standards-based service chaining. By pre-packaging virtual elements with orchestration, you can build and deploy personalized offerings faster using your preferred computing platform.
- **As an Integrated Solution**: A complete turnkey and integrated services module or package, known as a POD, includes all the software, hardware, and associated advanced services required to deploy a particular service offering.
- **As a Service**: With this pay-as-you-go model, Cisco integrates and operates the integrated solution as a turnkey cloud-based offering to support the specific services that you can bring to market and sell to your customers.

Figure 2. Flexible Deployment Models



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Capitalizing on Network Functions Virtualization

NFV is an essential capability for enabling new business models and cloud-based service offerings. Cisco is a leading member of the European Telecommunications Standards Institute (ETSI), which is shaping the standards-based approach for NFV. The goal of NFV is to take network functions normally built into hardware and implement them in software on standardized compute platforms. Cisco has developed an extensive set of virtual network functions (VNFs) across all technology domains. These VNFs are integrated into the Cisco Evolved Programmable Network (EPN) architecture, providing an elastic and flexible fabric that allows the real-time shifting of physical and virtual capabilities across the network and data center. The Cisco Evolved Services Platform automates the management and orchestration aspects of NFV to harness all of these networking capabilities as they are needed. The Cisco ESP helps to create business value efficiently automating service delivery on demand.

New Services Modules

Services modules or software packages play a central role in the ability of the Cisco ESP to transform service provider business models. In today's environments, many services require a complex operation of hardware, management tools, and business processes. As a result, deploying new services often takes many months. Cisco ESP services modules provide prepackaged, end-customer solutions that can be turned up in minutes and scaled elastically, as business needs dictate. The modules also provide a unified, transparent services environment that allows service providers to collect and derive untapped business value with rich, real-time, and long-term analytics

The following sections describe some of the new Cisco ESP services modules that may be deployed today.

Virtual Managed Services

Service providers can use Cisco ESP to rapidly create and deploy new secure cloud based network services within their physical and virtual infrastructure, as illustrated in Figure 3. Here, each of the virtual managed service capabilities, such as firewall, load balancer, and wide area acceleration, are deployed as a VNF on virtual machines operating on standard compute server blades located in a service provider data center or point-of-presence.

In today's environments, operators would have to manually interconnect and provision all physical devices involved in the service separately, using multiple management applications or operations environments. Using Cisco ESP to deliver virtual managed services, instead, yields significant advantages over the traditional approach. Operators can realize a revenue increase of up to 15 percent from accelerating deployments, higher attach rates, cross-selling services, and expanding offerings to server down-market customers. In addition, the operator can reduce their operating expenses (OpEx) by up to 65% percent with savings from sales labor, service fulfillment, time to repair, and maintenance costs.

The network operator can create a catalog of customized Virtual Managed Service offers that they make available to their business customers via a self-service portal. As an example, Cloud VPN is a family of cost-effective secure cloud-based business connectivity and applications services that our service provider customers offer to their end customers. Cloud VPN includes a wide variety of secure virtual private network (VPN) services over any access media, complemented with a flexible and modular set of Firewall, NAT, Intrusion Protection, Content Filtering, Web, and Email application security applications. Cloud VPN enables a completely self-service user experience that allows the business customer to select, create, and activate customized services on-demand in minutes with the click of a mouse. The business logic of the ESP network service and resource orchestration modules to start up the virtual machines, activate the VNFs, and dynamically create the specific service function chain, which creates appropriate linkages that support the service profile and steer the customer traffic through them.

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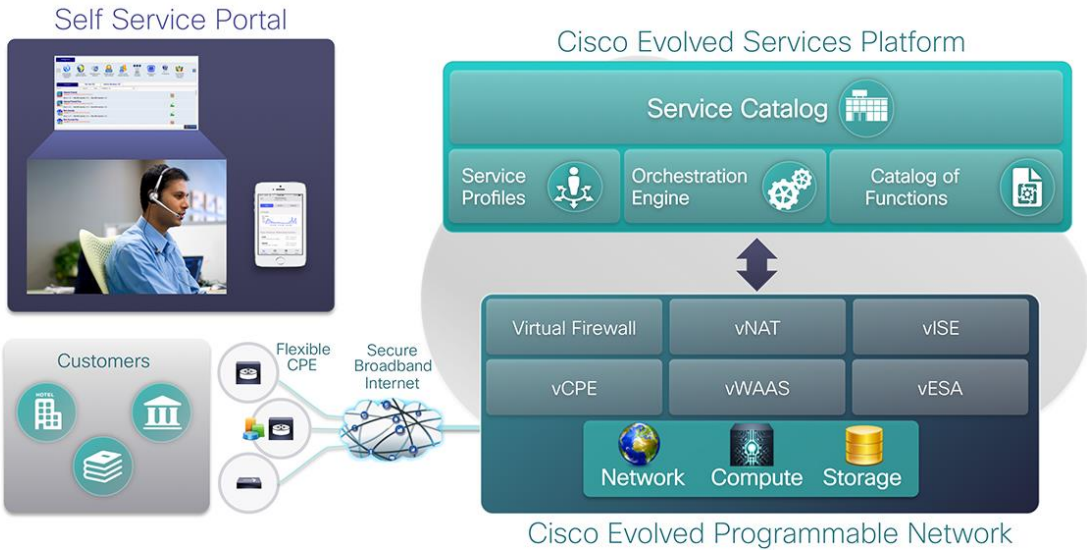
Figure 3. Virtual Managed Services



In this example of Cloud VPN, the service activation request supported by Cisco ESP would proceed as follows:

1. The business customer accesses the self-service user portal to create, order, and activate a Cloud VPN service offering from the active service catalog.
2. The service provider automatically ships the required CPE hardware to be installed and connected.
3. Once the business customer receives and connects their CPE, it is automatically provisioned via a secure connection from the cloud.
4. The network service orchestration engine software modules automatically brings up the required VNFs based on the business service profiles and steers the traffic between the physical and virtual network infrastructure of the Cisco EPN to the business customer premise locations
5. The secure Cloud VPN service capabilities are automatically activated and connected to the business customer locations and notifies the business user via their self-services portal.

Virtual Mobile Internet

Many enterprise customers require high-performance wireless services with guaranteed low latency. These services are especially important in certain industry sectors, such as mining, transportation, oil, and public safety. Due to the nature of their deployment environments and applications, these customers would be well served by a private Long Term Evolution (LTE) network Premium Mobile Broadband offering based on Cisco Virtualized Evolved Packet Core, combining macro and small-cell technologies, as illustrated in Figure 4. The solution's self-organizing network (SON) technology, automated network discovery service function (ANDSF), and policy software modules help ensure the highest quality and consistent service, along with seamless handoff between licensed and unlicensed small cells.

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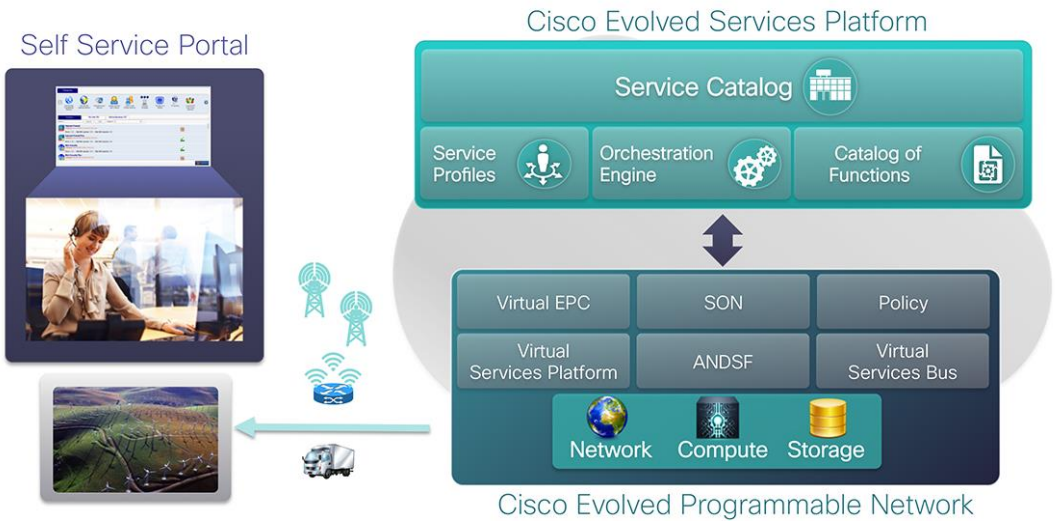
Drawing on the automation made possible by the platform's virtualization and orchestration capabilities, Cisco ESP for virtual mobile Internet can generate up to 43 percent operational cost savings for the operator compared to current solutions by reducing complexity and using fewer tools to deliver these services.

Figure 4. Virtual Mobile Internet



In this example, the service request supported by Cisco ESP would proceed as follows:

1. The enterprise IT employee accesses the mobile service portal to request the virtual mobile service offering from the active service catalog.
2. The service provider ships the required hardware and software modules to the enterprise site to be installed and provisioned.
3. The service provider uses the network service orchestration software module to initiate the mobility service workflow.
4. The resource orchestration software modules automatically bring up the premium mobile broadband service on the Cisco Virtualized Evolved Packet Core, based on the service profiles that provide the linkage to the associated mobile VNFs.
5. Small cells are deployed and the virtual mobile Internet service is activated.

Multiscreen Cloud Digital Video Recording

Consumers want the freedom and flexibility to arrange their video content viewing around their own schedules, inside or outside the home. Service providers can meet this demand by using Cisco ESP to deliver Cisco Videoscape™ Multiscreen Cloud DVR Solution, as illustrated in Figure 5. The solution scales the ingestion, recording, management, and delivery of any type of content, over any network to any device, instead of requiring customers to use a physical DVR located in their homes.

Using the Cisco ESP for multiscreen cloud DVR delivers significant business advantages for the video operators, compared to the current deployment model. This solution helps operators increase revenues up to 7 percent from

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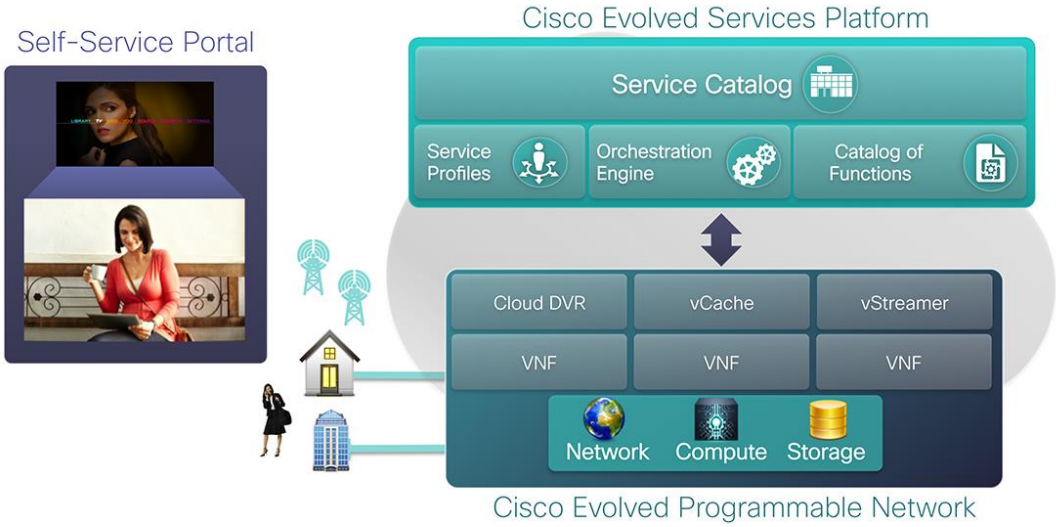
higher penetration rates. The Cisco Videoscape™multiscreen cloud DVR solution is also easier to implement as a cloud-based “try and buy” offer along with tiered services. Service providers can also achieve TCO savings of up to 15 percent from shared pooling of resources, along with optimized content and streamer positioning made possible by real-time analytics, policy, and orchestration.

Figure 5. Cisco Videoscape™ Multiscreen Cloud DVR



In this example, the Cisco ESP handles the subscriber request as follows:

1. A subscriber goes to the video service provider’s web portal and requests the addition of a Cloud DVR offering to his or her service tier.
2. “Check-out” action initiates the subscriber order.
3. Cisco ESP resource orchestration software automatically sets up the new service, based on the subscriber service profile, and links to the virtual video applications and network functions.
4. The new Cloud DVR service menu is activated on the customer’s device user interface.
5. The subscriber may now record and view content from any device.
6. The subscriber schedules recording of a favorite show.
7. The Cloud DVR software queries the video cache and determines whether the user is authorized for local storage on their device or for cloud only.
8. As the scheduled recording occurs, the system verifies content rights and applies the appropriate content storage policy.
9. When the subscriber accesses a prerecorded show from any device, the video content streams from the closest location in the appropriate format.

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Why Cisco?

The Cisco ESP provides the essential capabilities that service providers need to expand their business models and accelerate time to revenue for new services. The platform is:

- **Easy to buy**: The Cisco ESP provides flexible buying models packaged according to service provider needs that allows their services to be delivered in the way that their customers and subscribers want to consume them.
- **Easy to deploy**: The Cisco ESP requires fewer tools and is based on entirely open interfaces to enable multi-vendor deployment.
- **Easy to sell**: Cisco ESP automation and orchestration capabilities help simplify the creation of new services, accelerate the sales process, and improve time to market, while increasing revenue growth from personalized high-value services.
- **Easy to manage**: Service providers using the Cisco ESP can dynamically shift application and service workloads between resources to reduce costs.

For More Information

To learn more, contact your Cisco account representative, or visit the following resources:

- Cisco Evolved Services Platform
- Cisco Evolved Programmable Network
- Cisco Videoscape™ Multiscreen Cloud DVR
- Cisco Premium Mobile Broadband
- Cisco Open Daylight Controller Framework

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Printed in USA 11/14

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