

Accelerating a New Class of Mobile Services



The world is going mobile. With explosive growth in smartphones, combined with new machine-to-machine (M2M) and wearable devices, Cisco projects there will be 10 billion personalized mobile network connections by 2018, with mobile traffic growing at a 61 percent compound annual growth rate (CAGR). This represents a new playing field for applications, generating an enormous revenue opportunity for mobile service providers. But at the same time, it also places new demands on their networks and business, as well as operational processes. To capitalize on this opportunity, mobile operators need to do more than reengineer their networks. They need to rethink how they engage with customers and deliver new services in the ways customers want to consume them.

The [Cisco® Evolved Services Platform](#) (ESP) gives operators this new consumption platform. It includes the necessary flexibility, scalability, and highest level of automation, unleashing a new generation of personalized consumer and business mobile offerings. By fully harnessing the power of network programmability, end-to-end service orchestration, and an open platform, operators can develop and innovate amazing new mobile service offerings. And they can bring them to market faster, while radically reducing their operational costs.

Defining the Market Challenge and Opportunity

As a mobile service provider, you already face exponentially growing demands on your network assets from an exploding number of mobility, video, and cloud-based applications. And your customers are demanding even more. They expect easy, secure, and personalized mobile experiences and transactions, anywhere, anytime. And if this isn't enough, you're facing competitive challenges from all sides. Traditional service-provider competitors, massive cloud players such as Google and Amazon, and nimble startups offer compelling new mobile experiences and business models, taking ownership of your customers' mind share. With the growth of cloud-based platforms, the barriers to entry for mobile services have never been lower, and the need to build a sustainable competitive advantage has never been more critical.

We are entering the era of the [Internet of Everything](#), (IoE) a new world of opportunities where applications and services connect everything:

- **People** in new and more valuable ways
- **Processes** exchanging the right information with the right people and things at the right time
- **Data** to power insight-driven decision-making
- **Things** with billions of smart devices communicating with each other and the Internet

No one is better positioned than you are to capture these opportunities, differentiate all of these connection types, and deliver new personalized and integrated mobile services. But to do it, you'll need to contend with previously unimagined metrics of scale and new requirements for your infrastructure and operations. And the margin for error is slimmer than ever. You need to bring all these new services and capabilities to market faster, while lowering costs and improving operational efficiency.

No single product or technology is going to meet this challenge. To unleash new levels of service agility, profitability, and operational efficiency, you need to transform your network with:

- Virtual pools of computing and storage resources in the data center that are network ready and can be scaled and reallocated on demand
- Seamless interoperability between the data center and the mobile network where functions are virtualized, secure, and automated, and workloads can move wherever they're needed with service profiles intact
- Dynamic orchestration capabilities to accelerate and automate the setup and teardown of services, and let you provision new services in real time

Many vendors are working on pieces of the overall solution, whether in the mobile network, the data center, or in service orchestration. But success will be defined by your ability to execute in a holistic approach, bringing all of the pieces together quickly and seamlessly, and by doing it in an open network environment that combines best-in-class capabilities from an integrated ecosystem of vendors, so you can deliver services in any way your customers choose to consume them.

Cisco Evolved Services Platform

The Cisco ESP is a comprehensive virtualization and orchestration software platform that creates, automates, and provisions services in real time. It automatically translates business intent into network actions across multiple domains, and lets you create and deliver prepackaged services from a flexible pool of resources that can be reused and personalized for each customer, on demand. With the Cisco ESP you can launch innovative new mobile service offerings much faster, accelerating new revenue growth up to four times, at a savings of up to 45 percent compared to your current operating model.

The Cisco ESP uses [software-defined networking](#) (SDN), [network functions virtualization](#) (NFV), open APIs, and advanced orchestration capabilities to create a flexible and modular services platform. With the Cisco ESP and the physical and virtual infrastructure service delivery capabilities of the [Cisco Evolved Programmable Network](#) (EPN), you can quickly and automatically deploy new personalized offerings through integrated and prepackaged services modules. These modules provide prepackaged tiers of network services with personalized features, security, and service-level agreements (SLAs) that your customers and users can select from an online portal and activate with a click of a mouse. So you can engage your customers in the new ways they demand. And your customers can activate and personalize mobile services or add new virtual managed services from anywhere, using a self-service platform that automatically provisions them at web speed.

For example, you can offer:

- **An IoT solution for a [connected city](#):** You can use a prepackaged modular software, hardware, and support solution to manage traffic cameras, lights, and warning signs for a large metropolitan city connecting thousands of sensors. Cisco can provide the complete service offering to create smart cities such as [Barcelona, Spain](#). This includes computing, storage, and network and data center equipment; end-to-end orchestration; IoT application and control software; fulfillment portal; and analytics, all pre-integrated and ready to deploy with the Cisco ESP.
- **Mobile security as a service:** You can offer high-value secure mobile access as a managed service to business customers. For example, you can offer a solution to car dealerships that allows sales and service teams to access online pricing, parts, and customer data systems from their tablets and smartphones with complete security over Wi-Fi or long-term evolution (LTE) networks. Cisco provides a complete, ready-to-deploy service offering, including the self-service portal and workflows to allow a dealership's IT department to control and manage users, and the physical and virtual infrastructure to deliver the solution. This includes virtualized firewall, intrusion protection, and wireless controller capabilities and the software to manage and orchestrate them with your Cisco ESP.
- **Premium mobile broadband:** You can offer secure local broadband to customers in hard-to-reach locations like oil fields, mines, wind farms, and solar panel arrays. You can also use premium mobile broadband to support major events such as global industry and economic forums, and sports championships. Cisco provides a complete service offering for a private LTE network for these customers, including virtual packet core, macro, and small-cell technologies; self-organizing network (SON) intelligence; and policy software to assure consistent service and seamless handoffs between licensed and unlicensed small cells. The Cisco ESP automates customer self-service and provisioning of new virtual mobile broadband services at a 43 percent cost savings compared to current deployments.

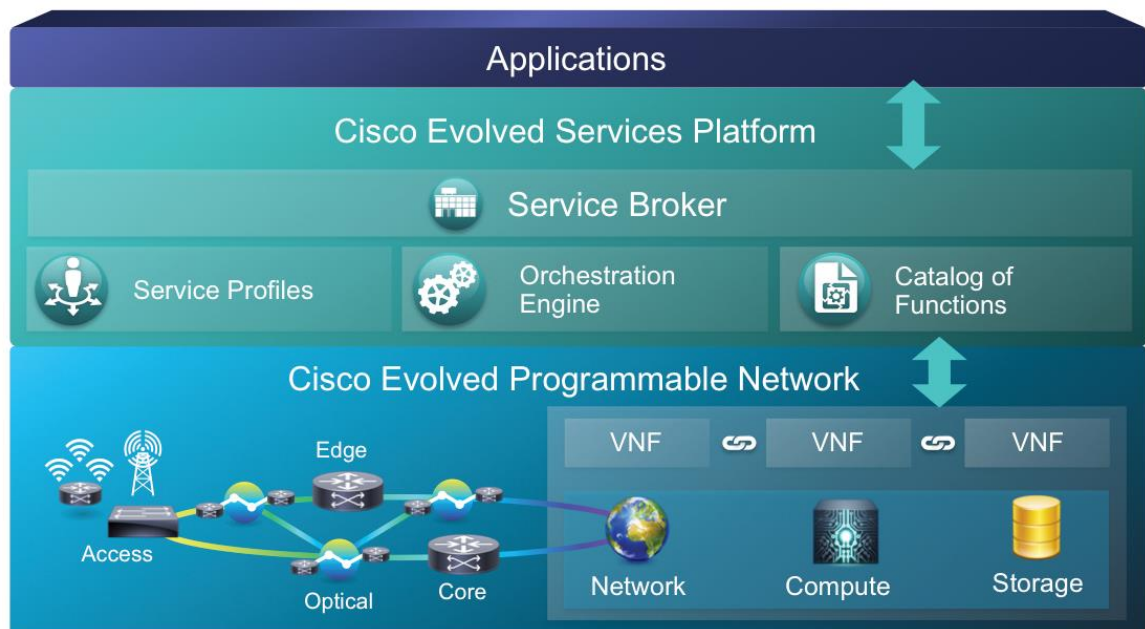
To deliver these types of mobile services in the environments most service providers use today, you need to coordinate the operation of a complex set of hardware, management tools, and business processes, typically translating to a ramp-up time of many months for each new service deployment. Cisco ESP capabilities and service modules allow you to turn on end-customer solutions like these in minutes, scale them elastically across the network and data centers, and tap in to valuable real-time and long-term analytics to optimize your offerings. Now, you can capitalize on all of these opportunities, and many more, in a fraction of the time, and at a fraction of the cost of traditional service delivery. Bringing the network to applications means making them better and improving the consumer experience.

Inside the Cisco ESP

The Cisco ESP removes network and operational complexity to make all of this possible. It provides the following essential functions, as illustrated in 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 mobile applications and service offerings.
- **Service profiles:** The platform enables you to create and customize service profiles. This allows you to provide a comprehensive set of service attributes and policies, linked through the orchestration engine, so you 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, whenever and wherever they are needed. It uses open APIs to connect applications to infrastructure and provides a common policy and unified subscriber management framework to deliver all services. Truly open APIs empower you to innovate, allowing for integration and control of multivendor solutions.
- **Catalog of physical/virtual functions:** This extensible and modular set of physical and virtual network and application capabilities links to services profiles to create the "offers" that can be deployed anywhere and scaled on demand.

Figure 1. Cisco Evolved Services Platform



Together, these elements remove many of the barriers and complexities that hamper your network and data center operations today, and prevent you from capitalizing on new mobile opportunities as quickly as customers demand.

Now you can operate a next-generation platform to deliver innovative mobile services that are:

- **Open:** The Cisco ESP 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 offerings provides a powerful tool set, allowing you to optimize your networks and create and automate new services as your business needs dictate.
- **Elastic:** Cisco ESP dynamically scales existing services while optimizing network and data center assets, giving you the right capabilities whenever and wherever they are needed.

The Cisco ESP acts on the personalized service profiles that you create, automating the programming and provisioning from your active service catalog across your mobile network, mobile switching center (MSC), and mobile data center infrastructure. It can program any service using network configuration protocol and data modeling (NETCONF/YANG) software using an innovative multivendor 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. So you can respond to market opportunities with the business models you need and quickly create new service offerings that are easy to buy, deploy, consume, and manage.

Innovative Mobile Service Offerings

Your consumer and business customers expect optimal and personalized user experiences wherever they connect their applications and devices. But providing dependable, high-quality services, while creating unique revenue-generating offers, and all the while keeping your network safe and manageable, can be a tough balancing act.

With the Cisco ESP, you can provide a diverse set of differentiated mobile service offerings to enterprises and consumers that generate new revenues while lowering the costs of operating your network. These offerings fall into two categories: business-centric and user-centric offers (Table 1).

Table 1: Business-Centric and User-Centric Offerings

Business-Centric Offerings	User-Centric Offerings
Premium mobile broadband to provide secure, private mobile data services in remote locations	Tiered pricing plans that allow customers to choose the right data plan for their needs
M2M offerings to connect and manage sensors, connected industrial equipment, and other smart devices	Congestion-aware content that optimizes the user experience based on dynamic network traffic behavior
Security as a service to deliver premium mobile security services for business customers	Application-based plans that provide mobile plans linked to a specific application
Mobility as a service to manage mobile devices and mobile access to the business	“Happy hour” plans that allow free or discounted usage during certain hours
Location-based venue offerings that provide services tailored to a user’s specific location	“Freemium” services such as providing a baseline amount of usage free of charge
Dual-persona plans that support separate data plans and billing on a single device (for example, -work usage versus personal usage)	Sponsored data offerings that allow third parties to pay data rates when users use a specific application or connect from a specific location

Mobile targeted advertising that serves mobile ads mapped to user profiles	Location-based advertising that serves mobile ads based on a user's location
Multidevice plans that include multiple mobile devices in a shared data plan	Mobile video optimization to assure high-quality video experiences
Small cell network expansion to extend licensed cellular networks into buildings, concrete parking structures, and other areas with limited radio access	Service bundling to combine multiple services (cable TV, Internet, mobile) in one offer
	Customer loyalty plans to provide free usage, discounts, and other incentives to loyal customers

The Cisco ESP gives you the ability to support any or all of these offerings, customize them to your specific business needs, and automate provisioning and fulfillment processes for fast, self-service delivery. So instead of building a custom solution for every new offer (and potentially every new customer), you can create prepackaged solutions that consumer or business customers can select from a self-service portal and activate on demand. The following sections describe some examples of these mobility services in more detail.

Location-Based Venue Offers

Sports, entertainment, public, and enterprise venues are looking to attract more customers and business transactions through mobile experiences. Consumers, passengers, guests, and patients all expect immediate and easy access to relevant information wherever they are.

By combining tools to correlate device location, RF spectrum utilization, and sources of interference, you can provide your business and consumer customers a higher-quality mobile experience in a venue. At the same time, these location-based services provide additional revenue opportunities based on users' onsite, online, and social analytics.

Cisco provides a modular suite of tools that may be packaged together and integrated with your customized service portal to deliver these capabilities, including:

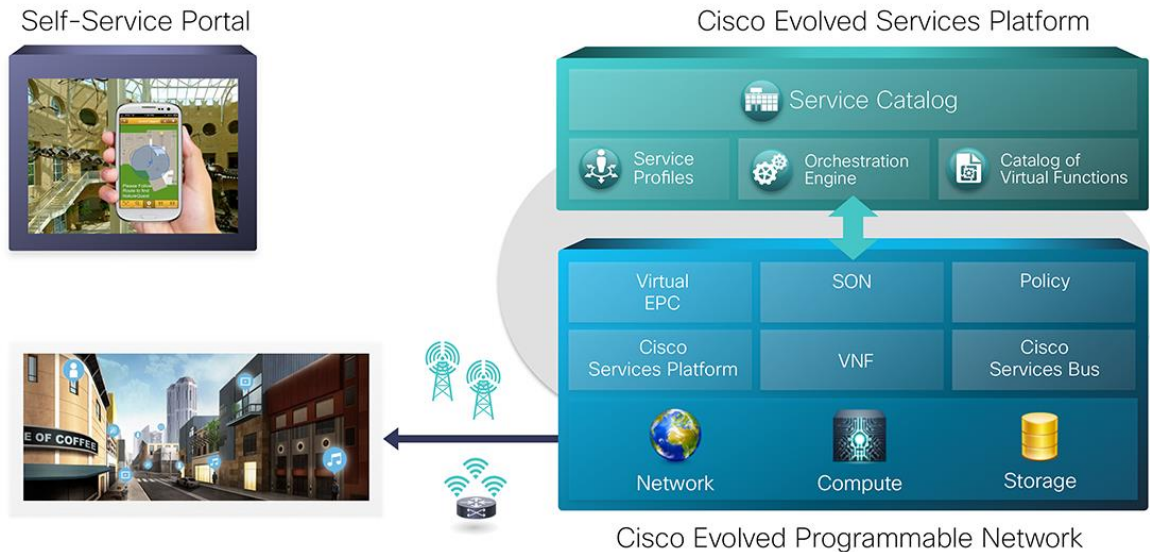
- [Cisco® Connected Mobile Experiences \(CMX\)](#) for intelligent Wi-Fi, enabling enterprises and service providers to deliver personalized mobile services at the right time and right place
- [Cisco® Wireless Intrusion Prevention System \(IPS\)](#), providing increased protection of the network from wireless threats, rogue wireless devices, and denial of service (DoS) attacks to increase security for wireless users and the network
- Advanced policy management through the Cisco Policy Suite
- In-depth insight into network and user behavior with real-time analytics
- Automated workflow and catalog-based service broker capabilities that accelerate the creation and launch of new services across multiple domains

Cisco ESP integrates and orchestrates these solutions and capabilities, using virtual network functions (VNFs) to deliver location-based venue offers that you can provision and scale in minutes, on demand.

With the ESP, you can rapidly create and monetize new interactive applications and personalized experiences across your physical and virtual infrastructure (Figure 2).

Cisco ESP enables new business models for mobile operators and venue owners to share in the business value generated from these solutions, driving revenue growth rates of 35 percent CAGR, with positive ROI within less than four years.

Figure 2. Location-Based Venue Offers



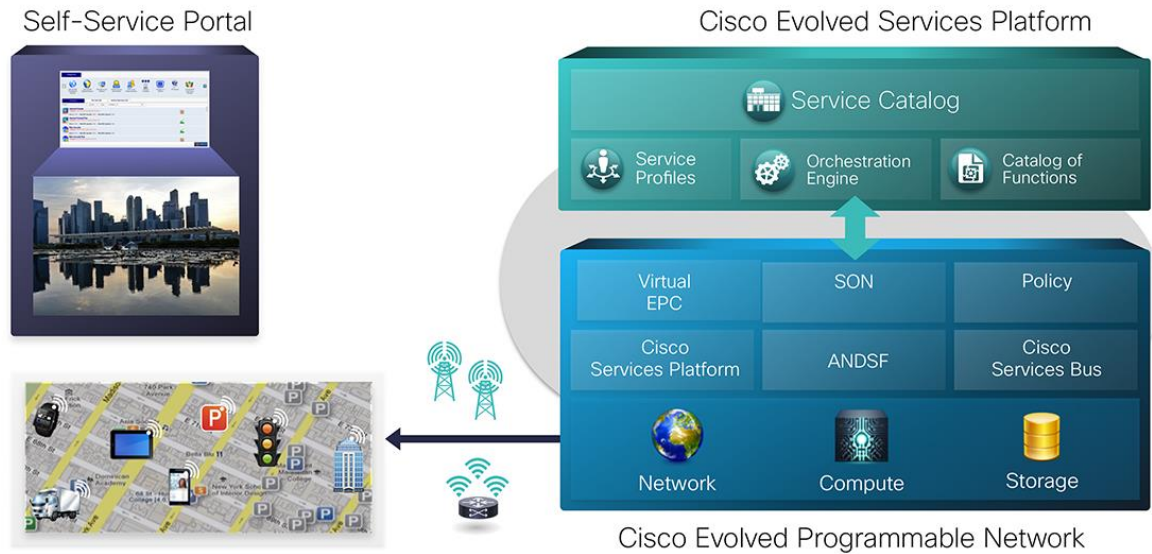
IoE: M2M as a Service

The IoE brings together people, process, data, and things to make networked connections more relevant and valuable than ever before, providing unprecedented economic opportunity. At the same time, the rapid deployment of M2M technologies is leading to a proliferation of devices whose variety, data, complexity, and vulnerability profoundly change the traditional IT landscape.

The mobile network plays a critical role in addressing these challenges. By embedding application intelligence and automated data processing in the mobile network infrastructure, the network can automatically select the right data from this data-in-motion torrent. It will be able to prioritize which data to retain and which to discard based on intelligent policies, allowing local applications and devices to take action automatically, without having to continuously transmit massive amounts of data to the cloud. These capabilities translate to significant M2M revenue opportunities for enterprises, connected cities, transportation fleets, and energy customers, to name just a few. And the Cisco ESP provides the framework to capitalize on them.

The Cisco ESP integrates all the elements necessary to deliver next-generation M2M offerings, including Cisco Virtualized Evolved Packet Core, Cisco Services Bus, Cisco Self-Organizing Network (SON) and Cisco Policy Suite (Figure 3). The solution's self-organizing network (SON) technology, access network discovery and selection function (ANDSF), and policy software modules help ensure the highest quality and consistent service, as well as seamless handoff between licensed and unlicensed small cells. And with Cisco ESP, you can orchestrate these capabilities as virtual network functions (VNFs) on your Cisco EPN, optimized for your macro and small-cell infrastructure and in a format that can be scaled elastically and automatically.

Figure 3. M2M as a Service



By combining advanced Cisco real-time network intelligence with the network service orchestration, VNF management, M2M control, and analytics capabilities enabled by the Cisco ESP, you can rapidly create and monetize new M2M applications and services. And, because Cisco ESP automates the management and provisioning and orchestration of these capabilities, they are much easier and less expensive to deploy. They are also replicable, allowing you to share virtual resources and capabilities among multiple markets and customers including connected cities, fleets, and energy applications, instead of building standalone custom solutions for each segment. By reducing operational complexity, optimizing asset utilization, and allowing you to deliver services across multiple markets using fewer tools, you can generate up to 47 percent cost savings compared to current approaches.

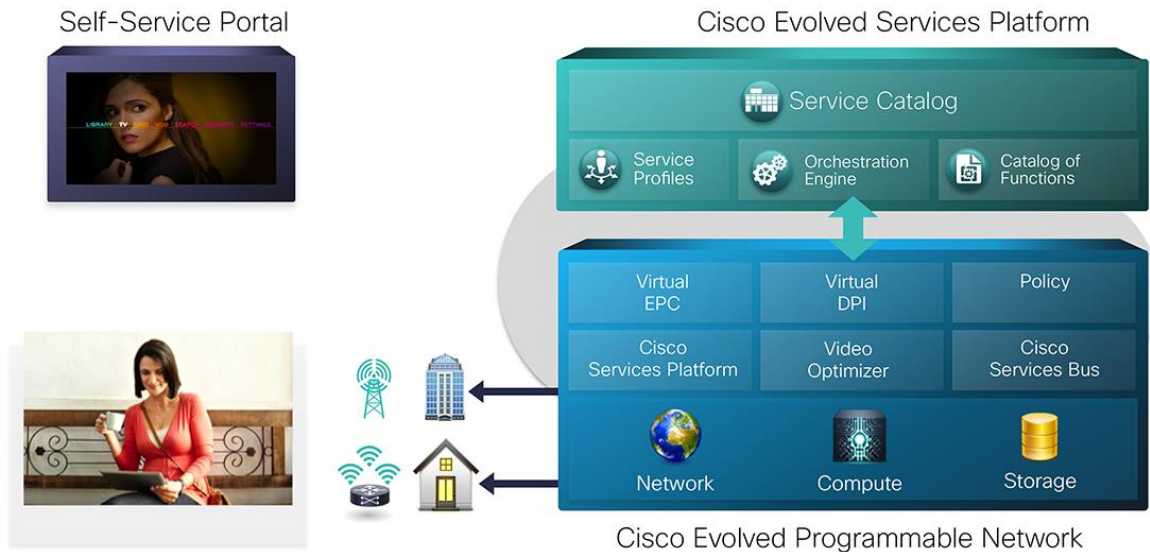
Mobile Video Optimization

Consumers want the freedom and flexibility to view any type of video content, with the highest quality, at any time, in any location or venue. You can capitalize on this growing market demand by using the Cisco Services Platform, virtual network intelligence, analytics, and Deep Packet Inspection (DPI) technologies, the [Cisco Identity Services Engine](#) (ISE), and Cisco video optimizer functions to deliver more dynamic and engaging video services to your subscribers (Figure 4).

Cisco's modular software platform makes it easy to deploy all of these mobile video optimization solutions across the physical and virtual infrastructure of your Cisco EPN. Using the network service orchestration capabilities of the Cisco ESP, you can automate and scale the ingestion, management, and delivery of any type of content, over any network, to any device.

In conventional video solutions, you have to physically interconnect multiple physical network appliances for mobile traffic steering, DPI, and video optimization, all of which must be managed separately. Cisco virtualized these functions to allow the Cisco ESP to scale and orchestrate them, so you can deliver high-quality video experiences much more easily and cost-effectively. Through shared pooling of resources, along with optimized radio access network (RAN) utilization and reduced congestion made possible by real-time analytics and policy, you can achieve TCO savings of up to 25 percent compared to current appliance-based approaches.

Figure 4. Mobile Video Optimization



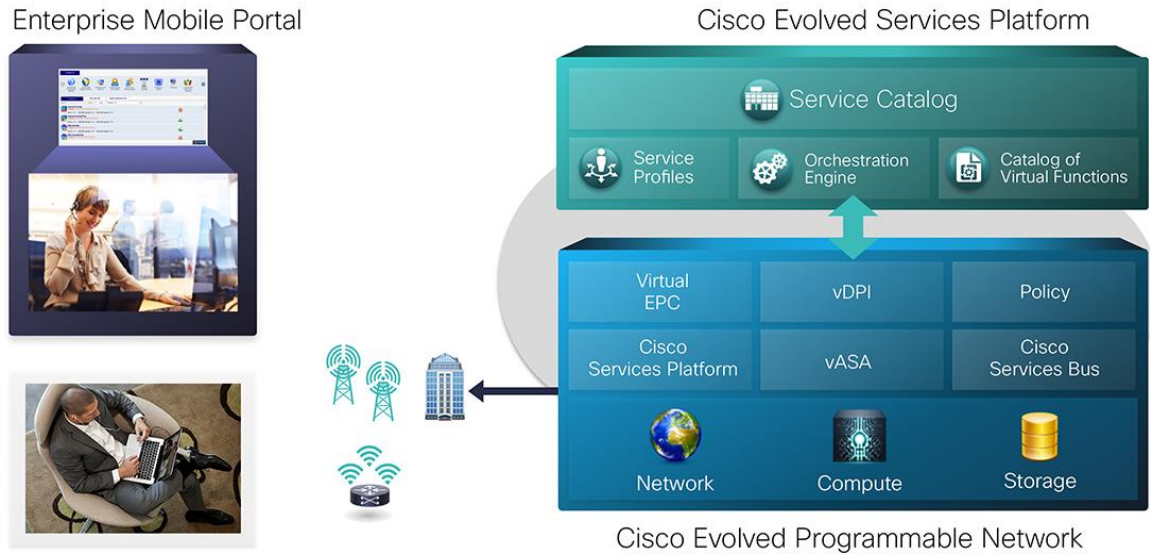
Mobile Security as a Service

As the number of mobile devices in the workplace grows, many enterprise customers are looking for alternative solutions to manage and control access to their business assets over mobile networks and enable secure mobile transactions. Rather than invest the enormous time, cost, and operational effort necessary to implement these capabilities in the enterprise themselves, they are looking to outsource this task to mobile operators, who can deliver them as a managed mobile security service.

Operators can provide comprehensive access control, management, and security of mobile devices through their virtual mobile network infrastructure (Figure 5). Cisco provides the advanced software orchestration tools to implement firewall, network address translation (NAT), and IPS functions, along with Virtualized Evolved Packet Core and the Cisco Services Platform, as an automated service function chain, which every mobile connection passes through when accessing the network. All of these functions can be deployed as physical or virtual elements in your Cisco network infrastructure, so you can provision and scale them to deliver managed mobile security offerings, quickly and automatically, with the Cisco ESP.

Using the Cisco ESP for virtual mobility and security services yields significant advantages over the traditional managed service approach. By accelerating service deployments, cross-selling services, and increasing attach rates and down-market customers, you can grow revenues up to 15 percent. In addition, with the savings accrued from automated service fulfillment, faster time to repair, and lower maintenance costs, you can lower your operating expenses (OpEx) by up to 45 percent.

Figure 5. Mobile Security as a Service



Capitalizing on Network Functions Virtualization

Network functions virtualization ([NFV](#)), the concept of taking network functions normally built in to hardware and implementing them in software on standardized compute platforms, is an essential capability for enabling new business models and cloud-based service offerings. Cisco is shaping the standards-based and open source software approach for NFV development, leading industry collaboration at the European Telecommunications Standards Institute (ETSI), Internet Engineering Task Force (IETF), Open Networking Forum (ONF), Open NFV (OPNFV), [Open Compute \(OCP\)](#) and many others.

Cisco has developed the most extensive set of VNFs across all technology domains, many of which are described in the innovative new mobile service offerings detailed in the previous section. These VNFs are integrated in the Cisco EPN architecture, providing an elastic and flexible fabric that allows the real-time shifting of physical and virtual capabilities across the service provider network and data center. The Cisco ESP works together with the Cisco EPN to automate the management, orchestration, and service chaining aspects of NFV to help you harness the intrinsic value of your network. By providing a framework to orchestrate the provisioning and scaling of NFVs, the Cisco ESP helps you create new business value by efficiently automating service delivery on demand.

Why Cisco?

The Cisco ESP provides the essential capabilities you need to expand your business models and accelerate time-to-revenue for new services. The platform is:

- **Easy to buy:** The Cisco ESP provides flexible buying models (individually, bundled, prepackaged, or as a service), so you can deliver new services in the way that makes the most sense for your business and your customers.
- **Easy to deploy:** Using the Cisco ESP means that you can deliver new mobile offerings using fewer tools, at a lower cost, and in less time. And, because the platform is based on entirely open interfaces, you're never locked in to any one vendor.
- **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 more personalized and higher-value services.
- **Easy to manage:** Using the Cisco ESP, you can simplify and automate the orchestration of virtual network functions (VNFs) and new services, and dynamically shift your application and service workloads among resources to lower costs.

For More Information

To learn more about what the Cisco ESP can do for your business, contact your Cisco account representative or visit the following resources:

[Cisco Evolved Programmable Network](#)

[Cisco Evolved Services Platform](#)

[Cisco Mobile Internet](#)

[Cisco Premium Mobile Broadband](#)



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