

# Cisco Prime IP Express: Connect Millions of Devices Securely, Reliably, and Easily

## What You Will Learn

Enterprises face a deluge of new devices and network connections. And with the emergence of the “Internet of Everything,” the number of connected devices will only grow. This trend underlines the importance of anywhere, anytime network access to the enterprise. That access depends on core Domain Name System (DNS), Dynamic Host Configuration Protocol (DHCP), and IP address management (IPAM) (DDI) capabilities that make basic network connectivity possible.

But along with proliferating devices, a number of other technology trends - new applications, growing security and availability needs, virtualization and the cloud - make DDI far more complex. The basic DNS/DHCP tools and manual IP address management processes that enterprises have used in the past cannot scale with new business needs.

Cisco Prime™ IP Express provides the answer to these DDI challenges for today’s enterprise network. Built on the same industrial-strength Cisco® DDI technology that service providers have used for years, Cisco Prime IP Express automates and simplifies every aspect of DNS, DHCP, and IP address management. It helps lower operating expenses, enhances security, and positions enterprises to address growing “bring your own device” (BYOD) requirements.

## Connectivity Gets Complicated

The world is growing more connected, and the enterprise is too. [IDC estimates](#) that there are now 20.4 billion connected “things” worldwide, growing to 29.7 billion by 2020. This number includes consumer devices like mobile phones, TVs, tablets, and laptops - many of which are now used in the enterprise - as well as sensors, industrial equipment, and millions of other devices.

Together, these connections make up what analysts refer to as the “Internet of Things.” But that’s just one part of the connectivity equation that enterprises need to accommodate. Enterprises need to be ready for “The Internet of Everything,” which includes people (and all the ways they connect and communicate), processes, and data, as well as machine-to-machine connections.

Nowhere is this more apparent than in the growing BYOD trend, as employees use their personal smartphones, tablets, and other devices in the workplace. Cisco VNI forecasts that there will be 565 million mobile business users worldwide by 2016. Facilitating network connections for all these new devices is no longer a “nice-to-have” proposition. Providing anywhere, anytime, any-device access to network applications is becoming mission-critical for every business. An organization’s ability to connect employees reliably however they choose - over Wi-Fi, cellular, wired, or VPN connections - has a direct impact on employee productivity and satisfaction.

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Whether enterprises are connecting employees' personal devices, IP phones, industrial sensors, or virtual desktops, all have one thing in common: the need for secure, always-on connectivity to the network and the Internet. DNS and DHCP are core enabling capabilities to provide these connections: If DNS fails, there is no Internet. If DHCP capabilities can't keep pace with proliferating devices and mobile applications, users can't connect.

Enterprises also need more sophisticated IPAM capabilities. Spreadsheets and homegrown applications might have sufficed in the past, but trying to adapt them for thousands of new devices and connections in the enterprise is a recipe for complexity, errors, and high operational costs.

And BYOD is just one of the trends straining organizations' legacy DDI systems to the breaking point. Others include:

- **New technologies and applications:** Demanding new voice and video applications, combined with a need to track and control more mobile users and devices, push traditional DHCP servers to their limits. These challenges will only grow as enterprises virtualize more resources and applications in their environments.
- **Looming transition to IPv6:** Many enterprises are still using IPv4, but exponential growth in devices and connections will force the issue sooner than later. Manual IPAM processes and basic free or open-source DHCP tools present a significant barrier in transitioning to IPv6.
- **Growing security concerns:** DNS attacks are creating major risks for enterprises. In addition, as more devices and users are added, it becomes even more important for enterprises to make sure that connections are properly authenticated, secure, and private.
- **Growing demand for agility, speed, and efficiency:** Users don't care about the underlying complexity of supporting virtualized desktops or BYOD; they want their applications, and they want them now. IT needs to be able to provision new devices quickly, as soon as they enter the enterprise environment. And they need to do so in an efficient and automated fashion, without increasing operational costs.

Add it all up, and it's a troubling paradox for enterprise IT: the need to meet exploding demand for new connections, while contending with the increased complexity, costs, and risk those connections entail. The manual IP management processes and basic DNS/DHCP solutions you've used in the past cannot meet this challenge. You need a more advanced, end-to-end DDI solution.

## Introducing Cisco Prime IP Express

Cisco has provided industrial-strength DNS and DHCP solutions to service providers for many years. These solutions have a well-earned reputation for efficiency, scalability, and high reliability in the most demanding large-scale service provider environments. Now, they are available to enterprises, including purpose-built IP address management and BYOD tools, as part of Cisco Prime IP Express.

Cisco Prime IP Express provides a reliable, cost-effective DDI solution for enterprise networks. It includes the following high-performance components and their respective services, all of which support both IPv4 and IPv6, and are available individually or as part of two preintegrated suites:

- **Comprehensive DNS** for centralized IP address translation and service delivery
- **An advanced DNS caching server** that supports forwarding, DNS recursion, and DNS security
- **High-capacity DHCP** to efficiently connect all of the devices operating in the modern enterprise and fully integrate with Microsoft Active Directory authentication systems

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- **A powerful IPAM system** that automates and simplifies all IP management processes
  - **Captive BYOD portal** (included with DHCP, DNS, or the suites) that simplifies, accelerates, and tightly controls the onboarding of employee devices

This comprehensive DDI solution can:

- **Lower operating expenses** by automating previously manual IP address management and centralizing management processes. The solution integrates with and reuses Microsoft Active Directory to lower costs and provides an integrated BYOD server to accelerate provisioning
- **Deliver unparalleled performance and reliability** with industrial-strength DNS and DHCP services that can support millions of devices and tens of thousands of queries per second
- **Reduce complexity** by allowing you to manage all DNS, DHCP, and IPAM services across your environment through a single interface
- **Increase security and reduce risk** by preventing DNS attacks, tightly integrating with internal and external authentication frameworks, and allowing for secure, role-based administration of core network connectivity services
- **Protect your investment** by allowing easy integration with Microsoft Active Directory and authentication frameworks
- **Position your business for the future**, with support for complex virtualized environments and tools to easily transition to IPv6

### Industrial-Strength DNS

Scalable DNS services are mission-critical in today's enterprise networks. Cisco Prime IP Express DNS is a highly reliable, standards-compliant, dual-stack-capable DNS solution that delivers:

- **High performance:** The same core Cisco technology used by service providers connecting millions of subscribers, Cisco Prime IP Express DNS delivers query throughput that far exceeds other solutions. Its distributed architecture can support millions of users through a centralized interface, and deliver 170,000 DNS caching queries per second and 100,000 DNS authoritative queries per second.
- **Advanced DNS caching and security:** The extremely fast DNS caching server validates high-volume recursive DNS queries using DNS Security Extensions (DNSSEC). The solution authenticates that DNS data has been signed and protects resource records against data spoofing, corruption, and DNS cache poisoning to prevent malicious DNS attacks.
- **Domain redirect:** Enterprises can use DNS caching capabilities to create "black lists" of known malicious sites and automatically redirect users, with the ability to customize redirect messages (for example, "The web page you are attempting to reach is known to be malicious"). The solution also includes built-in NXDOMAIN redirect capabilities to assist users entering an invalid domain name.

### High-Performance DHCP

Cisco Prime IP Express DHCP provides centralized, standards-compliant, high-capacity DHCP capabilities to support millions of devices in complex enterprise networks. It automatically tracks and controls users and devices with scalability and manageability far beyond what's available in free and open-source DHCP systems.

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Based on service provider-class DHCP technology, the solution can handle the heaviest enterprise loads with blazing performance, handling up to 18,000 new lease requests and up to 47,000 returning client requests per second. It supports both DHCPv4 and DHCPv6 failover and DNS High-Availability (DNS-HA), and includes a “chatty client filter” that lets you minimize traffic from devices with valid IP addresses requesting a new address (for example, after an OS update). It also includes a patent-pending discriminating rate limiter that provides “avalanche” protection, for example, accommodating a campus-wide surge in demand following a network outage. Together, these capabilities translate to exceptionally high-performance, rock-solid DNS and DHCP services for your increasingly dynamic and mobile business environment.

### **Cisco Prime Network Registrar IP Address Management**

As you continue to deploy new IP devices and virtual services, IP address management can quickly become unwieldy. This is especially true when you’re managing disparate DNS and DHCP servers, or adding new locations or virtualized services. The processes enterprises have used to manage IP addresses in the past - often spreadsheets or small-scale homegrown applications - cannot scale with the network you’re using today. You need a more full-featured, automated, standards-compliant solution.

Cisco Prime Network Registrar IPAM provides simple, integrated management of IPv4 and IPv6 address spaces, as well as multivendor DHCP and DNS configurations, in a single solution. It includes:

- **Comprehensive IPAM tools:** Complete IP lifecycle tools track, allocate, assign, and reclaim IP addresses automatically, including full-network IP discovery and reconciliation. The IPAM solution reduces the complexity and operational costs associated with sprawling IP addresses, and accelerates IP management tasks from days and hours to minutes. Using Cisco automated IPAM tools instead of manual processes also helps eliminate IP conflicts and configuration errors, reducing downtime of your DHCP and DNS services.
- **Flexible authentication and Microsoft Active Directory integration:** The solution easily integrates with your existing authentication framework, whether using external authentication with RADIUS or Microsoft Active Directory, or internal authentication with Cisco’s integrated DDI system. So you have the flexibility to use Cisco DDI end-to-end, or use Cisco IPAM tools for your existing Microsoft DNS/DHCP implementation, an Internet Software Consortium DNS/DHCP system, or in a mixed environment using multiple DHCP or DNS services.
- **Holistic IP management:** IPAM dashboards give you real-time visibility into all your IPv4 and IPv6 networks and device connections from a single interface. They let you model IP data across the enterprise, define thresholds and alerts for address space inventory issues, generate detailed reports and diagnostics, and troubleshoot problems faster. You can delegate access to IPAM functions to user roles you define, and allow multiple administrators to manage the system with different access rights.
- **Simplified transition to IPv6:** The solution makes it easy to evolve your network to IPv6 by providing a single view into both IPv4 and IPv6, and tools to integrate them and migrate transparently. It also automates IP address, subnet discovery, and network inventory to streamline your IPv6 address planning and deployment effort.

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- **Support for virtualization:** Virtualized environments inherently have more servers - which means more IP addresses to assign and manage, more DNS records to maintain and update, and more management complexity. And the elasticity of virtual environments makes it nearly impossible to use manual processes to monitor and manage changes to IP address and DNS records. Cisco Prime IP Express provides the capabilities you need to accelerate and automate IP address provisioning and administration required in virtualized environments. It lets you view and manage physical and virtual networks consistently from a single interface, and provides detailed IPAM information about virtual assets. The solution itself is also available as a virtualized appliance, so you can implement Cisco Prime tools - and realize their value in your business - faster.

## Simplifying BYOD

Your users increasingly expect to be able to use personal mobile devices to access your network. But as more users take advantage of BYOD, trying to onboard and manage these devices with manual processes results in delays and high operational costs, and potentially increases security risks. You need a way to onboard and assign addresses to personal devices securely and automatically.

Cisco Prime IP Express includes an easy-to-use, customizable BYOD portal that simplifies and automates the process of introducing employee devices into the business network. It integrates devices with an external authentication framework such as Microsoft Active Directory, and automatically allocates the proper IP addresses and network settings for those devices, dramatically reducing your operational effort compared to doing this manually. It provides extensibility to tie personal devices into your operational and billing systems, so you can continuously track real-time device status and information and act on it. At the same time, users get the fast, easy network access they want with a customizable onboarding experience that you manage and control.

The BYOD portal itself is fully customizable out of the box. You can present your own logo, color scheme, and terms and conditions specific to your organization. Users can be given temporary guest access and then validated against your Active Directory or other authentication framework for additional access. The result is a smooth, simple in-house provisioning experience for users, while IT gains more visibility and control over BYOD, with less operational effort.

### Cisco Prime IP Express BYOD Portal in Action

By simplifying the introduction of user devices onto the network, Cisco Prime IP Express BYOD services can play an important role in the satisfaction of your employees and customers. These capabilities are especially helpful in environments where user-owned devices are the norm, such as on higher education campuses, in hospitality environments, and even in healthcare and public sector organizations.

- **Healthcare environment:** It seems everyone on a hospital campus today is using a personal device - whether it's clinicians with smartphones and tablets that require secure connectivity, or patients and visitors. The Cisco Prime IP Express BYOD portal helps you provide an open, yet highly secure environment for these devices. Clinicians can register their personal devices with your Active Directory framework and use them to provide better care at the bedside. (For example, a physician could take a photo of a patient and send it to a specialist in another part of the campus - all within a secure framework that you tightly control. But using the same portal and BYOD management capabilities, patients and their visitors can also register their devices on the network and use guest access to surf the Internet or Skype with relatives.

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- **University campus:** No sector is adopting BYOD faster than higher education, where a recent [Cisco survey](#) found that more than 95 percent of education users use their smartphones for work. In these sprawling, open environments, Cisco Prime IP Express BYOD capabilities can create a more secure, easy-to-use network environment for students, faculty, and guests. Universities can provide simple onboarding of guest users with a customizable portal that lets them track and manage all personal devices in the environment. At the same time, professors and university staff can be quickly and easily authenticated for access to protected resources and applications.
  - **Hospitality:** The Cisco Prime IP Express BYOD portal includes extensions that let you tie in with your billing and other operational systems. So for example, a hotel could configure a dynamic lease notification to issue alerts when new leases are acquired, and track and charge users when they are assigned an IP address and begin using the hotel's network services.

### A DDI Framework for the Future

The Internet of Everything will mean many more personal devices in your network, and many more virtualized services and resources. The satisfaction of your employees and stakeholders depends on your ability to accommodate all of these new devices and connections quickly, securely, and reliably.

Cisco Prime IP Express gives you comprehensive DDI capabilities to meet the BYOD challenge. Drawing on the same Cisco technology used in the most demanding service provider environments in the world, it provides the blazing fast performance and rock-solid reliability and resiliency that your users expect. And, by automating previously manual DDI processes and giving you total visibility into the devices on your network, it dramatically reduces IT operational effort and costs.

Cisco Prime IP Express also provides:

- A proven solution, based on technology deployed in more than 1200 service provider and large enterprise networks around the globe
- Easy integration with your existing Microsoft Active Directory or other standards-compliant authentication systems
- Comprehensive IPv6 capabilities delivered by an industry leader in the development of DHCP IPv6 standards, with the ability to manage both IPv4 and IPv6 services through a single interface and apply the same resiliency and failover mechanisms
- Powerful, customizable BYOD capabilities that let you provide a superior in-house provisioning experience at no extra cost from the base Cisco Prime IP Express DNS or DHCP license
- Fast time to value, with the ability to implement powerful new DDI capabilities from a trusted vendor you've worked with for years. The solution can be deployed as a preconfigured virtual appliance and will run on any VMware ESXi-capable server - simplifying installation, lowering deployment risks, and reducing startup costs

The Internet of Everything will profoundly change the way your business handles basic connectivity and IP address management. But that doesn't mean these processes have to be complex and expensive to operate. With Cisco Prime IP Express, you can simplify and automate your DDI effort, lower costs, and assure a superior network experience for your users.

To learn more, visit <http://www.cisco.com/go/prime-ipexpress>, or contact [prime-ipexpress@cisco.com](mailto:prime-ipexpress@cisco.com).



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