Cisco Prime Network Registrar IPAM

As service providers and enterprises deploy new IP services and technologies such as voice over IP (VoIP), IP videoconferencing, wireless, cloud computing, and virtualization, their IP networks and traffic can quickly explode in size and complexity. Devices on the network have also proliferated - each requiring its own IP address. Management of IP address space and the corresponding Domain Name System (DNS) and Dynamic Host Configuration Protocol (DHCP) server configurations can quickly become overwhelming.

Traditional IP address management (IPAM) tools, such as spreadsheets, homegrown systems, and even early versions of IPAM software are becoming technically obsolete - no longer reliable or scalable in the current environment. Many network operators run both IPv4 and IPv6 networks, and new, more complex IPv6 networks call for more dynamic address management. Network operators now require a full-featured, automated IPAM solution to plan, track, and manage the IPv4 and IPv6 address space used in their networks.

Product Overview

Cisco Prime™ Network Registrar IP Address Manager (IPAM) is a scalable, high-performance and extensible solution that provides centralized visibility and control to effectively manage today's increasingly dynamic and complex networks. The application can manage, monitor, alert and report on the entire IP space and DHCP and DNS services - all from a single intuitive web interface.

With the continual deployment of new IP services and technologies, the increasing number of connected users, and the explosive growth in connected devices, today's complex networks require a full-featured, automated IPAM solution. Without a next-generation, scalable IPAM system to plan, track, and manage the full lifecycle of IP address space and ease the transition to IPv6, service providers and enterprises risk operating inefficiencies, unnecessary costs, and delayed service activation.

Indeed, the introduction of IPv6 into network environments presents significant challenges and added complexity in the realm of DNS, DHCP, and IPAM (DDI). Because the migration to IPv6 will take many years, it is important to have DDI support for both IPv6 and IPv4. Network operators require a full-featured, automated IP address management solution that supports IPv4 and IPv6 to plan, track, and manage IP addresses and ease the transition to IPv6.

Cisco Prime Network Registrar IPAM meets these challenges by providing comprehensive, automated IP address management for simplified control of the IP address space for both IPv4 and IPv6 networks (see Figure 1).

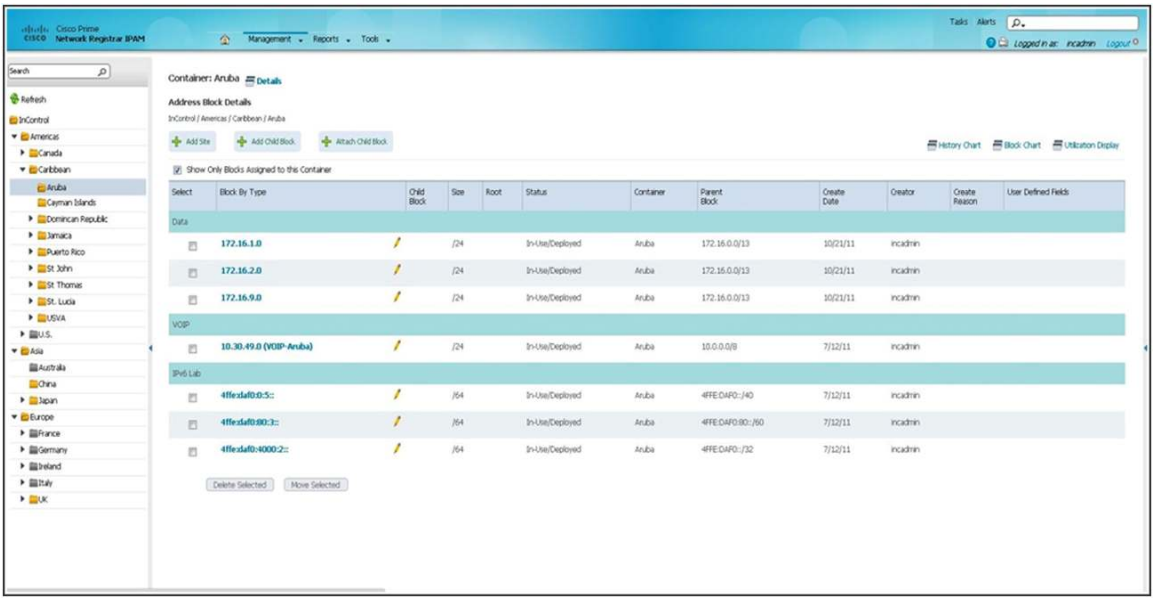
Cisco Prime Network Registrar IPAM is an integral component of Cisco Prime Network Registrar. The complete Cisco Prime Network Registrar solution includes the following components and their respective services - all supporting both IPv4 and IPv6:

- A single DHCP server for device network access
- A single DNS server for IP address translation and service delivery

- A DNS caching server that supports DNS Security Extensions (DNSSEC) and is designed to prevent cache poisoning and other attacks
- A powerful, comprehensive IPAM system to automate and manage all IPv4 and IPv6 address requirements

Cisco Prime Network Registrar IPAM can be deployed as a standalone application or can be integrated with the DHCP and DNS server components of Cisco Prime Network Registrar. In addition, it cohesively supports Internet Systems Consortium (ISC DHCP and BIND 9 DNS) and Microsoft DHCP and DNS services. With this multivendor support on existing infrastructure, IT managers no longer have to maintain multiple management consoles or deal with complex command-line interfaces (CLIs).

Figure 1. Cisco Prime Network Registrar IPv4 and IPv6 Management



Features and Capabilities

Cisco Prime Network Registrar IPAM provides the following features:

Manageability: Cisco Prime Network Registrar IPAM provides simplified, centralized management and control of IP address space. Automation allows network operators to achieve significant operational efficiencies, lower IP address management overhead, and handle rapid IP and network expansion. IP conflicts and configuration errors are eliminated - reducing downtime of DHCP and DNS services and lowering network operating costs. With the ability to discover, track, allocate, and reclaim IP addresses automatically and tools to model IP data, organizations can easily move away from manual systems.

Consolidation of IPv4/IPv6 address management: Cisco Prime Network Registrar IPAM includes integrated, full-lifecycle management for IPv4 and IPv6. The solution helps ease the transition to IPv6 with the ability to discover and take inventory of IPv4 and IPv6 resources, plan and model the way an IPv6 network is deployed, and map a current IPv4 network and devices to an IPv6 space.

Visibility: Cisco Prime Network Registrar IPAM provides real-time visibility into IPv4 and IPv6 networks, subnet usage, and device connections for faster troubleshooting and promotion of collaboration across the organization The solution also offers detailed IP audit reporting and diagnostics as well as operator-defined thresholds and alerts that provide notification of impending address depletion.

Usability, flexibility, and control: An intuitive web-based interface promotes ease of use and boosts user productivity. The application also offers a high level of control that allows organizations to manage their IP space according to their own policies and procedures - to bring network monitoring in line with business requirements.

A patented, flexible container mechanism helps enable a user to organize IP address space according to a deployment's topology, geography, and router association for greater administrative simplicity. This flexible container model intuitively maps IP blocks to sites, customers, or departments. Well-defined administrator roles, controls, and reports promote accountability and auditability. Granular, role-based delegation of DNS and DHCP allows multiple administrators to manage the system (avoiding having to rely on a small set of IT resources).

Reliability: The solution helps address unique challenges in large-scale deployments by offering redundancy with IPAM database replication for backup of data.

Table 1 lists additional detailed features and benefits of Cisco Prime Network Registrar.

Table 1. Features and Benefits

Feature	Benefit
Rapid Time to Value	
IPAM ease and speed of setup	• IPAM accepts XLS or comma-separated value (CSV) files to import preexisting license data. • Use the Import Wizard to import address space and resource records. • Automated discovery facilitates creation of a central IPAM repository of network IP addresses.
Rich Graphical User Interface	
Intuitive GUI	• A web-based interface allows administrators to quickly visualize the network and allocate addresses based on current and future requirements. The GUI allows users to associate address blocks easily with geography, topology, or other user-defined hierarchies through the use of a container model. • The GUI provides administrators with a real time snapshot of the network that reduces the amount of time it takes a user to perform certain tasks, including key strokes, mouse clicks, pointing, selecting an item from a list, and more. • Two-dimensional megamenus provide for easy navigation and greater visibility of available command options.
Context-aware menus and context-sensitive help	• Context-aware menus display relevant commands only for expedited operations and faster decision making. • Context-sensitive help offers information specific to the task for greater user productivity.
IP Address Planning	
Planning for hierarchical IPv4 and IPv6 address space with a continual feedback loop	• Planning tools facilitate development of a disciplined IPv4 and IPv6 address plan that can be deployed, monitored, and tracked automatically - for a continuous feedback loop to assure accuracy and provide an overall management view. • Users can plan and stage the following interrelated entities for immediate or future deployment to DHCP and DNS servers: IP block or subnet allocation, IP address assignment, IPv6 prefixes and links, addition of a new DHCP pool and associated parameters, or DNS domain, server configuration, or resource records. • Discovery-to-database reconciliation and exception reporting help enable operators to view plan discrepancies and potential errors or rogue users.
Creation and management of IPv6 prefixes and links	Using IPv6 prefixes or links, operators can easily perform IPv6 address allocation, assignment, tracking, and search - for significant operational efficiencies compared to manual processes.
Definition of DHCPv6 options and client classes	Client classes may be used to associate classes of devices with policies and options. For instance, you can create a VOIP client class or a cable modem client class with a policy set to provide an address (out of a given scope or prefix) with associated options.
Creation and management of IPv4 and IPv6 client reservations	Cisco Prime Network Registrar IPAM allows users to easily select and assign an IP address or prefix.
User definability/flexibility and management of IP address space	Easy-to-use container architecture allows the user to define and manage topology, address space (including block allocations and subnets), device and block types, and associated attributes (through user-defined fields). This helps administrators to organize address space in a manner that best matches an organization's structure.

Feature	Benefit
Address allocation: User-defined policies and automation	• IPAM allows users to allocate space in a hierarchical, logical manner in accordance with the topology as defined in their IP address plan. • Automated allocation prevents requiring the operator to manually enter IP addresses, improving worker productivity and network uptime, decreasing costs, and allowing service providers and enterprises to scale seamlessly. • Optimal "best fit" address allocation maximizes address utilization efficiency. • Customization through multiple block types provides multiple address subspaces for various applications or IP types such as data, VOIP, higher quality of service (QoS), and more. • Simplified address renumbering allows movement of address space where it is needed.
Automated and manual IP address and subnet reclaim	IPAM provides the ability to reclaim or free up IP addresses or entire subnets - a task that is crucial to assuring the IP inventory database is accurate.
Address utilization trending and forecasting	IPAM allows trending and forecasting of address pools, helping to prevent network access failure through proactive management of available addresses and utilization trends.
Centralized DNS/DHCP Server Configuration	
Automated DNS/DHCP configuration	Operators can significantly reduce downtime with more accurate DNS/DHCP configurations.
Advanced configuration support	Support for DHCPv4 failover, multitiered addressing, multihomed hosts (to model multiple IP addresses on a given device), DHCP client classes, MAC address processing, client ID, dynamic DNS, and more - all help to meet complex network operator needs.
DHCP configuration verification and preview	Verification and preview capabilities help limit network outages and IP conflicts.
IP Address Management	
Discovery	• Cisco Prime Network Registrar IPAM performs host discovery using a variety of methods including ping, TCP port 80 connections, DNS lookups, Address Resolution Protocol (ARP) cache data, and device OS mapping. • IPAM performs integrated switch port mapping through Simple Network Management Protocol (SNMP) Bridge-MIB polling, facilitating support of a broad variety of switches, and mapping of a subnet's VLAN. • Router subnet discovery identifies which IPv4 and IPv6 subnets are provisioned on given router interfaces. • IPAM collects rich network data from a broad variety of multivendor Layer 3 routers, Layer 2 switches, and DNS/DHCP servers. • IPAM allows comparison of implemented network address data to the database - to highlight discrepancies and reconcile conflicts.
User-defined thresholds and alerts	Users can set up thresholds and alerts - for example, for notification if an address space is over a designated utilization percentile or if an address pool is forecasted to deplete within a designated timeframe - for proactive management. These capabilities help to facilitate planning and minimize network outages and IP conflicts.
Granular administrator policies and tiered administration capabilities	Granular administrator policies within Cisco Prime Network Registrar IPAM dictate access to and visibility and control of given functions, geographies, domains, subnets, and blocks. For service providers and enterprises with multiple operations personnel responsible for different portions of the network or different DHCP or DNS servers, administrators are empowered to delineate and partition responsibilities.
Simplified Tracking and Reporting Capabilities	
Historic reporting, tracking, and trending	• Address utilization data is tracked and trended for reporting purposes. • Graphical reports provide information at any level in the container or address block hierarchy to manage IP address space capacity from both an address pool perspective and a network/subnet perspective.
IPv4 and IPv6 audit reporting and alert capabilities	• Audit reporting promotes accountability and provides history tracking for administrators, subnets, devices, IP addresses, and containers. • Utilization tracking, analysis, and reporting, (with threshold alerting for notification of pending address depletions) help preempt potential service-affecting outages and prevent: ◦ Lost productivity ◦ Calls to the help desk or customer care ◦ Lost revenue ◦ Expensive troubleshooting time These capabilities also assist in compliance initiatives such as: ◦ Proactive and preventative management and maintenance ◦ Inventory reporting ◦ Graphical reports

Feature	Benefit
Integration with Cisco Prime Network Registrar Components	
Integration with Cisco Prime Network Registrar DHCP and DNS servers	Seamless integration with the Cisco Prime Network Registrar components provides centralized and simplified web-based administration to configure and control DNS and DHCP servers for both IPv4 and IPv6. This eliminates the need for multiple management consoles and complicated CLIs.
External Systems Integration and Support	
Integration with external systems	The API is available for integration with third-party applications such as provisioning systems and change management systems.
Multivendor DHCP/DNS support	The solution cohesively supports the following additional DNS and DHCP servers: Internet Systems Consortium (ISC DHCP and BIND 9 DNS) and Microsoft, allowing support of existing infrastructure. Microsoft LDAP versions 1, 2 and 3 are supported for external authentication.

System Requirements

Table 2 lists server system requirements for the Cisco Prime Network Registrar IPAM Executive Centralized Manager and the IPAM Agent.

Table 2. Server System Requirements for Cisco Prime Network Registrar IPAM Executive Centralized Manager and Cisco Prime Network Registrar IPAM Agent

Component	Recommendation			
Operating system	Red Hat Enterprise Linux 5 (32-bit)	Windows 2008 Server (32-bit or 64-bit English versions) Windows 2008 R2 Server (64-bit)	Centos Enterprise Linux 6.4 (64-bit)	Solaris 10 (SPARC)
Memory (RAM)	2 GB RAM or higher			
Disk space	2 GB disk space for base install			
Hardware	Xeon - 1.2 GHz or faster processor			

Ordering Information

To place an order, visit the Cisco® Ordering Homepage. See the Cisco Prime Network Registrar Ordering Guide for a list of Cisco Prime Network Registrar IPAM product numbers and upgrade product numbers as well as detailed licensing information. To download software, visit the Cisco Software Center.

About Cisco Prime

The Cisco Prime portfolio of enterprise and service provider management offerings empowers IT organizations to more effectively manage their networks and the services they deliver. Built on a service-centered foundation, the Cisco Prime portfolio of products supports integrated lifecycle management through an intuitive workflow-oriented user experience. The portfolio of Cisco Prime solutions for service providers provides A-to-Z management for IP next-generation networks, mobility, video, and managed services.

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For More Information

For more information about Cisco Prime Network Registrar, visit http://www.cisco.com/go/networkregistrar/, contact your local account representative, or send an email to ask-networkregistrar@cisco.com.

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