

New SOLIDserver 5.0.2 Appliances Fuel Efficient IP's Global IP Addressing Reach

Network Testing Labs Review



Executive Summary

Efficient IP's new SOLIDserver 5.0.2 appliances surprised and impressed us with their advanced IP addressing technologies, their performance, their scalability, their ease of use, their reliability and their high security. SOLIDserver appliances make IP address management quick, simple and straightforward, even on the largest networks.

The SOLIDserver appliances' browser-based interface is intuitive, responsive, customizable and easy to navigate. It's at-a-glance informative and meaningful. The SOLIDserver's database maintenance is completely self-contained, automated and hands-off. Moreover, the appliances gave us a high degree of interoperability with other DNS/DHCP implementations, including agentless management of Microsoft Windows Server. And the SOLIDserver appliances handled complex IPv4 and IPv6 addressing schemes with ease.

Efficient IP's Smart Architecture technology offers both Best Practices and reliability. SOLIDserver appliances come with templates for consistent, highly organized DNS/DHCP management. Furthermore, the appliances' combination of one-to-many DHCP star failover and DNS multi-master features provide high availability and integrated disaster recovery if network failures occur. SOLIDserver appliances even have a hardened operating system that enhances network security and thwarts DHCP storm attacks and other DNS/DHCP threats.

IP Locator's device discovery was accurate, revealing and helpful. The VLAN and VRF Manager made easy work of planning, inventorying, modeling and managing virtual environment IP addresses. And the Device Manager gave us a comprehensive, simple-to-understand view of IP address-related resources.

The SOLIDserver 5.0.2 suite of DNS, DHCP, and IPAM (DDI) appliances is clearly ready for any enterprise, from the smallest to the largest.

Without an IP address, client (user) computers can't access the network. If IP address assignment is sluggish, client startup times increase and users are unproductive.

Similarly, Web site access (whether intranet or Internet) depends on the quick, reliable lookup of IP addresses for Web site names (URLs).

Dynamic Host Configuration Protocol (DHCP) servers on your network assign (lease) IP addresses to client computers. And *Domain Name System* (DNS) servers translate network names into IP addresses.

Often collectively referred to as **DDI**, these services must be utterly reliable, perfectly transparent, eminently scalable, secure, easy to use and, above all, instantaneously responsive.

Microsoft Windows Server includes some DNS and DHCP functions, but even the most ardent Microsoft fans admit that the built-in Windows Server DNS and DHCP services are slow, insecure and time-consuming to manage.

The perfect DDI system flexibly and efficiently assigns IP addresses to requesting devices. It is a central source of all IP address usage information across an enterprise. It quickly and effortlessly translates network names into IP addresses. It scales well, is intuitively easy to use, is pervasively platform-neutral and produces useful reports.

It cooperates with Microsoft's Active Directory, is LDAP-aware, and is highly fault-tolerant. Last but not least, the

perfect DDI tool enforces security by helping keep hackers at bay.

Efficient IP recently released a new version of SOLIDserver devices that the vendor says contain significant improvements and enhancements.

To test the vendor's claims, we put a suite of SOLIDserver 5.0.2 appliances through their paces in our network lab and at various customer sites. We evaluated the devices' performance, new features, scalability, reliability, security, interoperability and ease of use.

The SOLIDserver appliances flew through all our tests with ease. They exhibited exemplary performance, even in the face of very dense network activity. The appliances' user interface was responsive and intuitive. The new feature set gave us a wealth of IP address management options for dealing with IP addressing schemes of all kinds and complexities. Testing revealed that the devices are resilient and reliable. They rebuffed attempted security breaches. Not only did the appliances interoperate well with other DNS/DHCP software, they gave us remote management of Windows Server DNS and DHCP. And the range of appliance models is comprehensively scalable.

Clearly and conclusively, the rather remarkable SOLIDserver 5.0.2 appliance suite is ready for all enterprises, from the smallest to the largest.

Performance and Scalability

A slow DHCP server delays people who are joining the network, and this creates an unproductive work environment. A failed DHCP server prevents people from joining the network altogether.

To the extent that DHCP servers are quick, responsive and reliable, your users log on to the network faster and can go about their business with alacrity. DHCP servers that work well become an invisible part of the fabric of the network. People on the network aren't even aware the DHCP servers exist.

Every time a client computer joins the network, either locally or remotely, that client must lease an address, via DHCP, from one of the pools of your company's available IP addresses. To measure the performance of the SOLIDserver appliance suite, we ran a computer program on multiple client computers that requested a total of 50,000 IP addresses via DHCP.

Using data averaged from a series of tests, we obtained the results illustrated in Figure 1.

Other network activity, including file, database and Web server access, took place concurrently with the address assignments.

Our tests revealed that the SOLIDserver appliances are quite capable of servicing DHCP clients quickly and efficiently. Figure 1 shows the relative performance of the five SOLIDserver models.

Note that installing an appropriate range of SOLIDserver models across a geographically-dispersed organization can satisfy IP addressing requirements for everyone – small offices, medium-sized offices and corporate headquarters. Scalability is a hallmark of these devices.

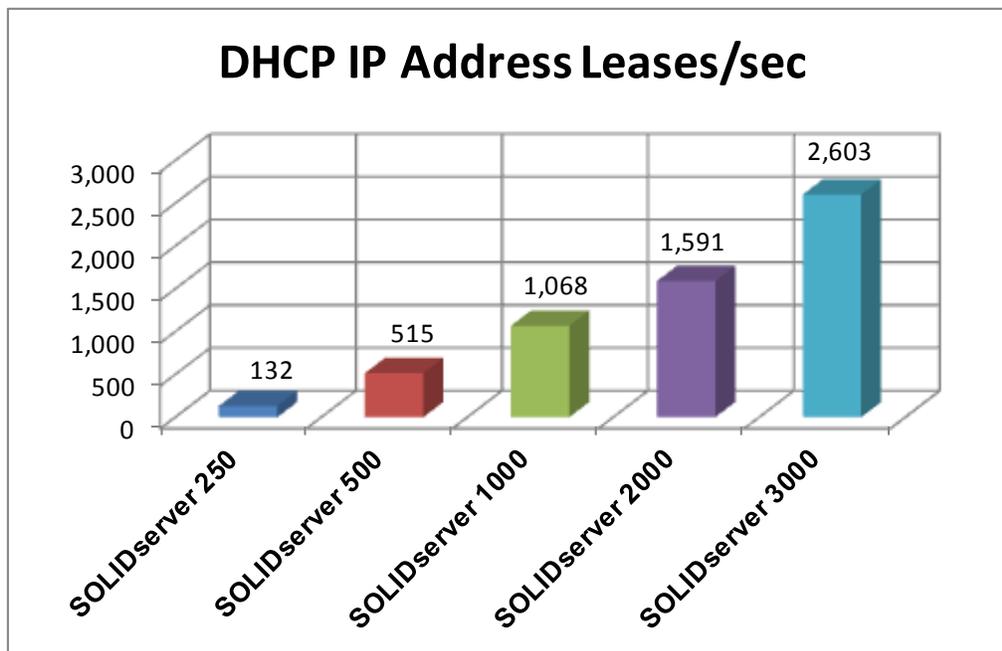


Fig. 1.
DHCP
Leases per
second

Many applications, including mission-critical business operations, e-mail retrievals, Web site accesses, database lookups and other functions depend on IP address resolution.

Client computers use DNS to continually inundate name servers with requests for the IP address associated with a URL. Clients grind to a halt if the DNS IP address resolution service fails. Similarly, a slow DNS server affects everyone and can be an insidious bottleneck.

Figure 2 shows the performance results we obtained when we ran a computer program that bombarded each DNS server with 50,000 DNS URL-to-address name requests. We recorded the average elapsed times for each test run.

Efficient IP devices demonstrated an amazing breadth of scalability. Furthermore, as we increased the demand on the SOLIDserver appliances by transmitting DNS requests more and more rapidly, the devices continued to perform responsively.

In another set of tests, we established DNS master/slave relationships across a group of SOLIDserver appliances. The group used load balancing to evenly and fairly distribute the IP address resolution workload. Impressively, when we deliberately caused one of the appliances to fail by disconnecting it from the electrical outlet, the remaining devices continued to service the clients' DNS requests without skipping a beat.

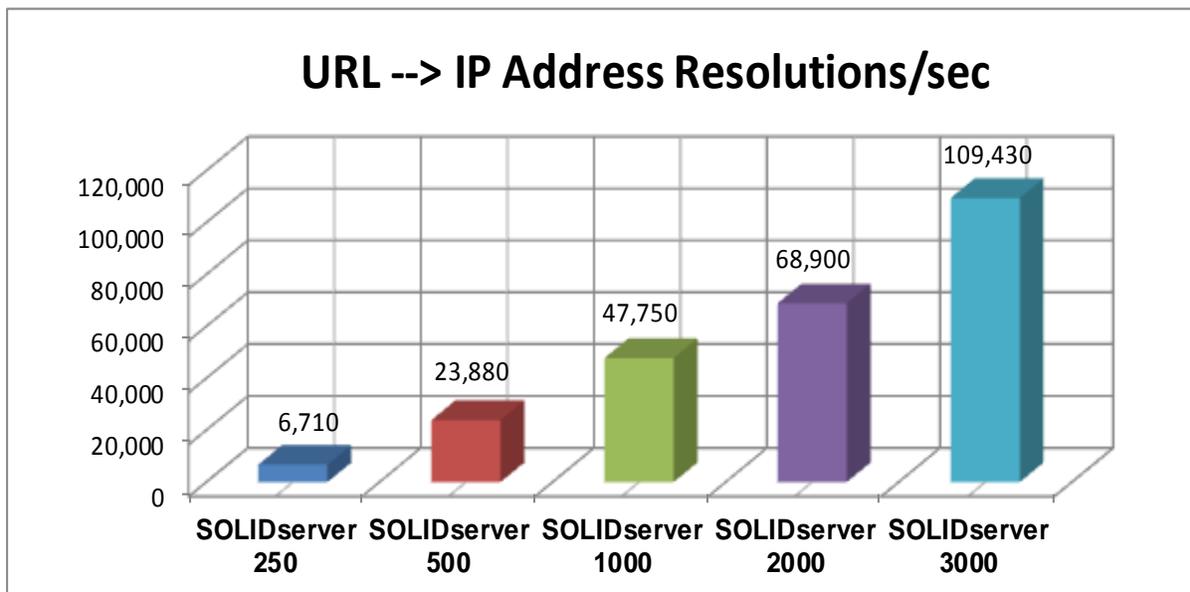


Fig. 2. DNS Address Lookups

All the SOLIDserver appliances responded quickly and surely in our DNS stress tests. When we evaluated a wide range of computing environments and different sized networks, the

Features

The new SOLIDserver 5.0.2 appliance suite embodies a number of significant features. These include Active Standby (for high availability), a Smart Architecture that automates the consistent, policy-driven design, service management and deployment of IP address schemes, full support for IPv6, VMware integration, agentless management of Windows Server DNS/DHCP and extensive performance enhancements.

Of the myriads of well-designed and helpful SOLIDserver features, five stood out in our testing. These were discovery, Efficient IP's **Smart Architecture**, Windows Server integration, security, IPv6 address management and SOLIDserver's ability to show virtual machine IP address activity and usage.

Discovery – IP Locator quickly and accurately found managed (SNMP) network nodes throughout our network. The tool amassed a wealth of Layer 2/Layer 3 topology data. From switches, IP Locator collected data including port utilization, physical port usage, IP addresses, node details and other information. IP Locator even automatically updated our IPAM database. Because networks are highly dynamic, we appreciated being able to schedule the frequency and times for running IP Locator. The tool's data comparison report told us exactly which nodes were "aliens" on our network. Since IP Locator retains its history of discovered nodes, it was able to provide us with a history of a device's movement across the network.

Smart Architecture – We found setting up complex IP addressing on a large network to be amazingly easy and error-free with Efficient IP's *Smart Architecture*. With Efficient IP's approach to designing, classifying, organizing and administering IP address pools, we could focus on the network, not on individual servers. Furthermore, we noted that the Smart Architecture concept extends far beyond IP address allocation and management. For example, with just a few mouse clicks in a DNS setup Wizard, we easily configured high availability DNS clusters and DNS farms. Throughout the process, Smart Architecture ensured that we adhered to Best Practices and that the resulting IP address allocations were highly secure.

Windows Server Integration – We were delighted to find we could administer Microsoft Windows Server DNS and DHCP services from within SOLIDserver's user interface, and we didn't even need to install agents on the Windows machines. SOLIDserver integrates closely with Windows Server.

Security – SOLIDserver devices implement DNSSEC, plus they offer several additional layers of security. For instance, each SOLIDserver appliance can detect and ignore Denial of Service (DoS) attacks, and each appliance contains advanced software logic to protect against DNS cache poisoning attempts. SOLIDserver does not reveal DNS architecture data to clients, thus thwarting any DNS footprint analysis attempts. SOLIDserver also protects clients from infections and attacks by proactively identifying malware-related domains.

IPv6 – The SOLIDserver appliances effortlessly handled IPv6 and mixed IPv4 and IPv6 addresses. The full support for IPv6 was apparent everywhere in SOLIDserver ... in IPAM, in DNS, in DHCP and in the devices' view of the network. We especially liked the ability to use naming conventions to organize IPv6 addresses by object type, geographical location, service membership and other user-defined criteria. We also noted that SOLIDserver supports DNS AAAA and PTR (DNAME) records for IPv6 DNS resolution, as well as ip6.int and ip6.arpa domains.

Virtual Environments – Impressively, the SOLIDserver devices recognized, organized and managed the virtual networking aspects of our VMware environment. IP Locator quickly and accurately noted the ESX/ESXi-based VMs on the network and required no VMware-based agents. The VLAN and VRF Manager made easy, painless work of applying a complex IP addressing plan structure to our virtual machines.

As we made a complex network even more complex by using VLANs to isolate specific network flows and groups of users, we were grateful we had SOLIDserver to help us plan, allocate and track the increasingly sophisticated network infrastructure. SOLIDserver gave us the confidence to know we were properly maintaining the network's security, reliability and QoS.

We also note that Efficient IP offers virtualized versions of its SOLIDserver models. However, Efficient IP does not yet support Microsoft Hyper-V or Citrix XenServer.

High Availability – Using Smart Architecture to arrange SOLIDserver appliances in clusters and load-balanced farms was a simple affair. The result gave us the ultimate in DNS and DHCP uptime and availability. Because these are absolutely essential network services, our overall network uptime and availability improved. And we loved the ability to use Virtual IP addresses to make the failsafe DNS and DHCP services completely transparent to users on the network.

Ease of Use

The SOLIDserver user interface is intuitive, responsive and productive.

Figure 3 depicts SOLIDserver's highly-configurable main window.

The screen shows, at a glance, the status, health and utilization of the network's IP address pools.

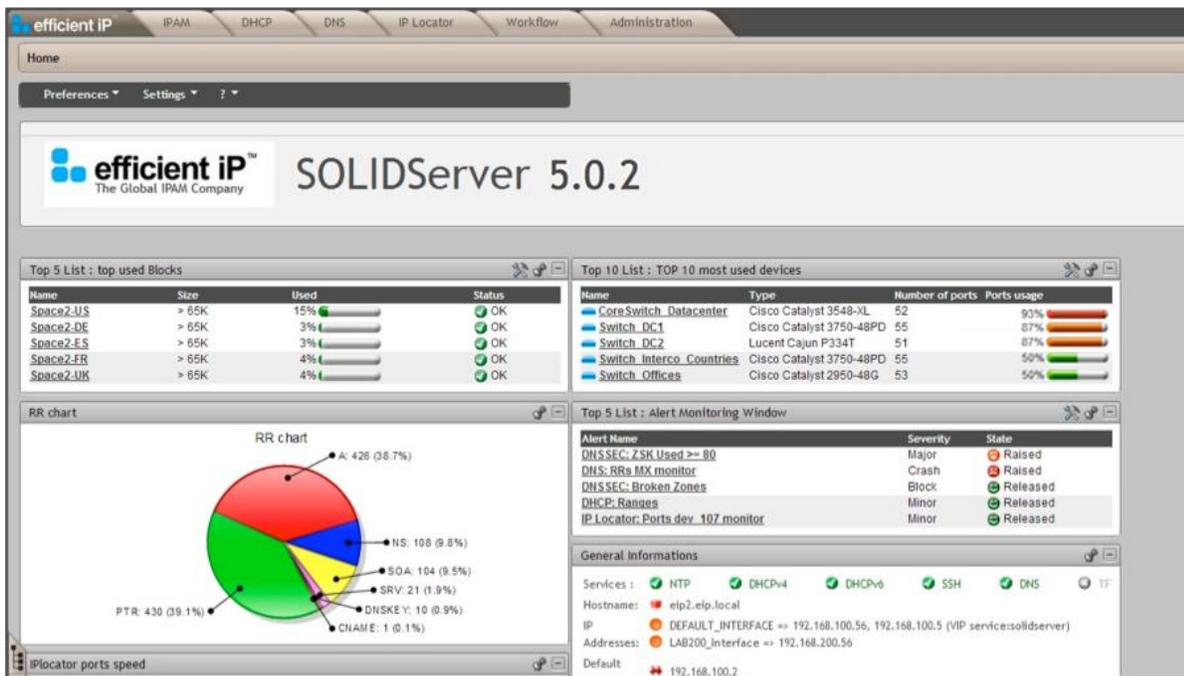


Fig. 3. SOLIDserver's main window

Figure 4 is SOLIDserver's search results window. We found the global search feature to be surprisingly fast, and we note that the sorting and filtering capabilities are very extensive. In fact, using SOLIDserver to search IP address information is easier than using Google to search the Internet.

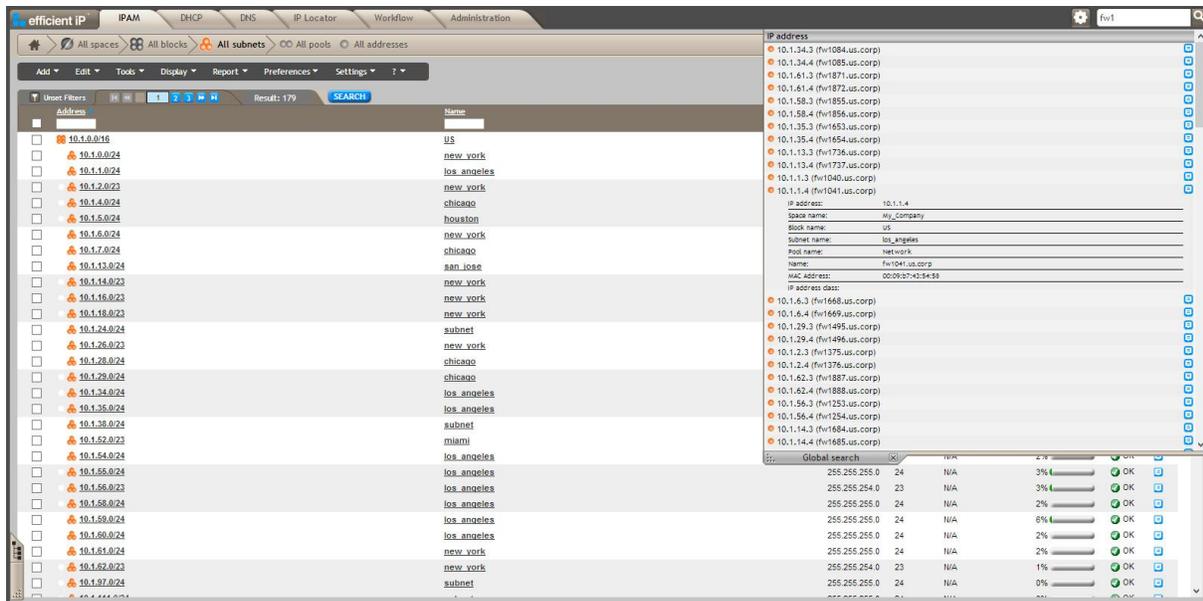


Fig. 4. The Search Window

We especially loved the interface's helpful Wizards that quickly and surely stepped us through the configuration of DNS clusters and DNS farms.

Figure 5 is the High Availability setup window. With a few clicks and menu choices, SOLIDserver's Wizard led us quickly and surely through the process of configuring DNS master/slave relationships.

Figure 6 depicts SOLIDserver's IP Locator window. This easy-to-use tool is a must-have on any network with more than a few IP address pools.



Fig. 5. HA Setup

MAC address	IP Address	MAC vendor	DNS name	Network device	Port name	Interface	Last seen	Discovered on	Network device #
00:00:48:9d:39:92	10.4.181.18	SEKO EPSON CORPORATION	pr9 fr.corp	Switch_DC2	Port 105 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:02:55:04:14:c4	10.4.30.73	IBM Corporation	w251.dc.corp	Switch_DC2	Port 107 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:02:55:15:2a:e5	10.5.30.50	IBM Corporation	w272.dc.corp	Switch_DC2	Port 140 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:02:83:32:45:2a	10.5.30.51	Intel Corporation	w273.dc.corp	Switch_DC2	Port 112 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:02:83:32:45:42	10.5.30.52	Intel Corporation	w274.dc.corp	Switch_DC2	Port 119 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:02:83:32:45:d3	10.5.30.53	Intel Corporation	w275.dc.corp	Switch_DC2	Port 111 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:02:83:32:80:0f	10.5.30.54	Intel Corporation	w276.dc.corp	Switch_DC2	Port 110 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:02:83:32:80:11	10.5.30.55	Intel Corporation	w277.dc.corp	Switch_DC2	Port 118 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:02:83:32:80:67	10.5.30.56	Intel Corporation	w278.dc.corp	Switch_DC2	Port 113 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:02:10:5a:fc:98	10.4.30.11	Cisco Systems, Inc.	rs289 fr.corp	Switch_Offices	FastEthernet0/45	No	29/09/2009 07:48	29/09/2009 07:48	192.168.248.2
00:04:00:47:8b:dc	10.1.111.16	LEXMARK INTERNATIONAL, INC.	pr129 us.corp	Switch_Offices	FastEthernet0/22	No	29/09/2009 07:48	29/09/2009 07:48	192.168.248.2
00:04:75:9e:8f:70	Unknown	3 Com Corporation		Switch_DC1	FastEthernet0/26 - Ethernet 10/100Mbps UTP	No	29/09/2009 07:48	29/09/2009 07:48	192.168.248.35
00:06:5b:3e:5b:2d	10.2.124.48	Dell Computer Corp.	w531.dc.corp	Switch_DC2	Port 106 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:06:5b:3a:8a:ac	10.2.124.49	Dell Computer Corp.	w532.dc.corp	Switch_DC2	Port 110 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:06:5b:3a:8c:ea	10.2.124.50	Dell Computer Corp.	w533.dc.corp	Switch_DC2	Port 113 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:06:5b:3a:9d:77	10.2.124.51	Dell Computer Corp.	w534.dc.corp	Switch_DC2	Port 116 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:06:5b:3a:9d:7b	10.2.124.52	Dell Computer Corp.	w535.dc.corp	Switch_DC2	Port 102 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:06:5b:3a:9d:88	10.2.124.53	Dell Computer Corp.	w536.dc.corp	Switch_DC2	Port 104 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:06:5b:3a:9e:01	10.2.124.54	Dell Computer Corp.	w537.dc.corp	Switch_DC2	Port 102 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:06:5b:3a:9e:01	10.2.124.55	Dell Computer Corp.	w538.dc.corp	Switch_DC2	Port 107 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:06:5b:3a:9e:28	10.2.124.56	Dell Computer Corp.	w539.dc.corp	Switch_DC2	Port 109 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:06:5b:3a:9e:41	10.2.124.57	Dell Computer Corp.	w540.dc.corp	Switch_DC2	Port 108 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:06:5b:3a:9e:97	10.2.124.58	Dell Computer Corp.	w541.dc.corp	Switch_DC2	Port 101 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:06:5b:3d:0e:x3	10.2.124.59	Dell Computer Corp.	w542.dc.corp	Switch_DC2	Port 114 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:06:5b:1e:4a:56	10.1.55.54	Dell Computer Corp.	w504.dc.corp	Switch_DC2	Port 116 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:06:5b:1e:4f:00	10.1.55.55	Dell Computer Corp.	w505.dc.corp	Switch_DC2	Port 114 - 10/100Base-Tx	No	29/09/2009 07:48	29/09/2009 07:48	100.75.202.20
00:07:69:43:5a:9e	10.1.59.51	Intel Corporation	w617.dc.corp	Switch_Offices	FastEthernet0/41	No	29/09/2009 07:48	29/09/2009 07:48	192.168.248.2
00:07:69:43:5b:49	10.1.59.52	Intel Corporation	w618.dc.corp	Switch_Offices	FastEthernet0/39	No	29/09/2009 07:48	29/09/2009 07:48	192.168.248.2
00:07:69:43:5b:04	10.1.59.53	Intel Corporation	w619.dc.corp	Switch_Offices	FastEthernet0/29	No	29/09/2009 07:48	29/09/2009 07:48	192.168.248.2

Fig. 6. IP Locator

Figure 7 is the SOLIDserver rights and permissions screen. We used it to delegate IPAM responsibilities among a set of network administrators.

network interface connections among all our devices, and it gave us absolute, full control of every IP address pool.

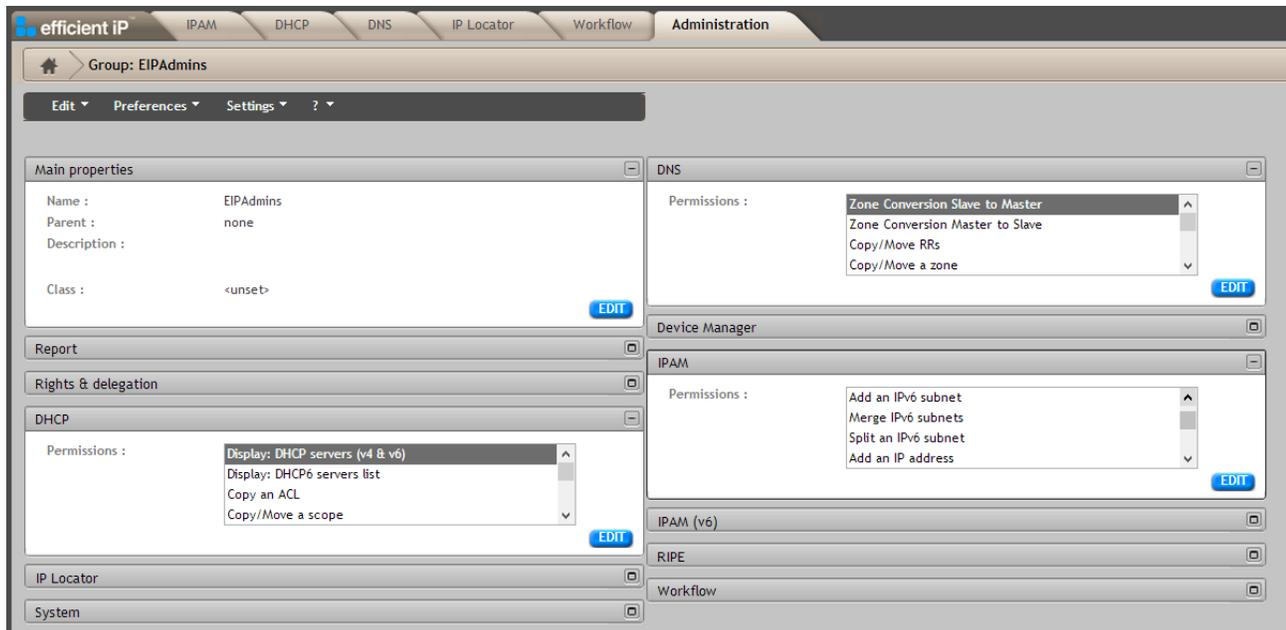


Fig. 7. Rights and Permissions

We assigned user rights based on read (i.e., list), create and/or delete permissions. When we hovered the mouse cursor over the Group name, context-sensitive menu options appeared. We could then specify the tasks and functions that the members of the group could do.

The thoughtfully-designed interface optionally integrates with Microsoft Active Directory. We could, if we wished, easily enforce group membership in Active Directory for authentication and group assignment for privileges.

We used SOLIDserver's Device Manager to get a precise, accurate view of our entire IP addressing universe. Device Manager clearly showed us the

The English-language SOLIDserver documentation, translated from the original French, does have a few grammar and syntax issues. Overall, however, the documentation is comprehensive, helpful and accurate.

Conclusion

The new SOLIDserver 5.0.2 appliances embody advanced technologies and represent a quantum leap in IP address management.

They are fast, easy to use, scalable, reliable secure and feature-complete.

We clearly see now how the suite of SOLIDserver models is contributing to Efficient IP's explosive global market growth.

DHCP/DNS/IPAM Report Card

Grade scale is A through F, with F = Failing and A = Perfect

Efficient IP SOLIDserver 5.0.2	
Performance	A
Ease of Use	A
Features	A
Scalability	A
Security	A
Installation & Documentation	B +
Reporting	A
Automation	A
Total Score	A -

Test bed and Methodology

Our test environment consisted of thirty-six routed Ethernet subnet domains plus T-1 and T-3 Internet connections. The Internet links let us perform massive zone transfers and other large-scale IP address operations, but most of our testing was local.

Each subnet's 50 client computers were a mix of Windows XP, Windows Vista, Windows 7, Windows 8, Red Hat Linux and Macintosh OS platforms. Our network also contained 45 IP address-hungry mobile devices, such as Apple iPad 2s.

The relational databases on the network were Oracle, Sybase Adaptive Server and Microsoft SQL Server. Windows Server shared files, while Internet Information Server (IIS) and Apache software served up Web pages.

Our network's servers ran Microsoft Windows Server on 4-CPU Compaq ProLiant ML570 computers with 32 GB of RAM and six TB of disk space.

We tested the SOLIDservers' ability to dynamically distribute large quantities of IP addresses, equate IP addresses to host names, register IP addresses in directory/name resolution services and flexibly maintain a useful repository of IP addresses and host names. We also evaluated the appliances for scalability, security, ease of use, reporting and any special features the devices offered.

To simulate a high volume of DNS/DHCP requests, we ran several concurrent instances of a C++ program that issued both valid and invalid DHCP-DISCOVER messages. To test performance, we measured how quickly each DHCP server responded to 50,000 IP address requests.

We similarly stressed each DNS server to measure how quickly each DNS server equated URLs with IP addresses.

We also moved clients from one subnet to another, gave unique values to the DHCP client ID field and assigned different values to the user class ID and vendor class ID DHCP parameters to see how the DHCP servers behaved.

Vendor Details

<i>Product</i>	<i>Vendor</i>	<i>Web site</i>
SOLIDserver 5.0.2	Efficient IP Efficient IP, Inc. Americas Headquarters 14 West Chestnut Street West Chester, PA 19380 Phone 888-228-4655 e-mail: americas.sales@efficientip.com or 4 rue de l'Abreuvoir 92000 Courbevoie France +33 (0)1 75 84 88 98 e-mail: europa.sales@efficientip.com	www.efficientip.com

About the Author

Barry Nance is a networking expert, magazine columnist, book author and application architect. He has more than 29 years experience with IT technologies, methodologies and products.

Over the past dozen years, working on behalf of Network Testing Labs, he has evaluated thousands of hardware and software products for ComputerWorld, BYTE Magazine, Government Computer News, PC Magazine, Network Computing, Network World and many other publications. He's authored thousands of magazine articles as well as popular books such as *Introduction to Networking (4th Edition)*, *Network Programming in C* and *Client/Server LAN Programming*.

He's also designed successful e-commerce Web-based applications, created database and network benchmark tools, written a variety of network diagnostic software utilities and developed a number of special-purpose networking protocols.

You can e-mail him at barryn@erols.com.

About Network Testing Labs

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Network Testing Labs' experts have written hardware and software product reviews, state-of-the-art analyses, feature articles, in-depth technology workshops, cover stories, buyer's guides and in-depth technology outlooks. Our experts have spoken on a number of topics at Comdex, PC Expo and other venues. In addition, they've created industry standard network benchmark software, database benchmark software and network diagnostic utilities.