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Technology INSIDER IP address management

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Lucent edges MetaInfo in IP address management test

VitalQIP® is fast and scalable, Meta IP offers security and useful reports and ApplianSys' DNSBox 300 is an easy-to-deploy plug-and-play device.

■ BY BARRY NANCE, NETWORK WORLD LAB ALLIANCE

When your company's IP address list begins to rival the Manhattan phone book, it's time for a serious IP address management tool. Dealing with a growing and rapidly changing population of IP addresses is a tedious and dismal chore, especially if you're assigning client addresses with the old-fashioned static IP address approach, using a spreadsheet or piece of paper, or if you're manually juggling multiple Domain Name Server and Dynamic Host Configuration Protocol servers to track and lease addresses.

DNS and DHCP services included with Windows Server 2000 or 2003 are an option, but you might need better performance (quicker DHCP IP address lease responses and DNS name resolutions than Windows delivers) or higher security. For example, Windows DNS services don't support encrypted zone transfer and update features like most non-Windows DNS server products do.

We invited several IP address management tools to our Alabama lab for testing. MetaInfo (Meta IP Enterprise 5.6 and SA-500 DNS/DHCP appliance), ApplianSys (DNSBox 300 and DNSBox 100) and Lucent (VitalQIP® 6.1 with Service Pack 1) accepted our invitations. Other vendors

declined to have their products evaluated (see How we did it, page 4).

Our tests aimed to find a tool that could flexibly and efficiently assign IP addresses to all our IP devices, centrally manage all the address information across a corporation, quickly and effortlessly equate host names with IP addresses, scale well, be intuitive to use and be pervasively platform-neutral. The tool also should have useful reports and integrate with custom-written applications, cooperate with Active Directory, be Lightweight Directory Access Protocol (LDAP)-aware and robustly deal with badly formed or non-compliant DHCP requests. The system also needed to be highly fault-tolerant and enforce security

to help keep hackers at bay.

Lucent's VitalQIP® wins our Clear Choice Award, but just by a whisker. VitalQIP® gave us fast performance, scalability, feature-rich options for dealing with IP addresses and an intuitive user interface. The software is an enterprise-ready tool to organize and manage virtually any set of IP addresses, no matter how large or complex. MetaInfo's Meta IP Enterprise has excellent security and reporting features, while ApplianSys' DNSBox units are easily installed plug-and-play DNS/DHCP appliances.

IP Management 101

We were highly impressed with VitalQIP®'s ability to discover, manage and administer

a complete picture of IP addresses across an entire corporate infrastructure, including all the DNS, BOOTP and DHCP servers across all networks and subnets. VitalQIP® maintained a device profile for every IP address and accurately tracked the status of each address — such as used, unused, reserved, pending a move or available.

VitalQIP® includes an enterprise server, remote server, Web client interface, GUI client and distributed services. It works with either a Sybase or Oracle relational database to store the IP address data, configuration settings and event data. Lucent bundles Sybase Adaptive Server with VitalQIP®.

The remote server component includes a DHCP server, DNS server, Microsoft DHCP support, IBM DHCP support and a DNS update service. Unlike Meta IP, the product does not yet support IPv6.

The system's IP Node Discovery feature did a credible and accurate job of surveying our network to locate and identify ranges of IP addresses currently in use. Running in the background unobtrusively,

IP Node Discovery on a large network can even reveal the use of IP address ranges you didn't even know were on your network. When we configured VitalQIP® to integrate with Active Directory, it found our Active Directory tree, and thereafter it quietly but effectively kept Active Directory aware of our IP addressing schemes and assignments.

We liked that VitalQIP and Meta IP support the relatively recent updates to RFCs 3396 (Long Options Support), 3442 (Classless Static Route Option) and 3397 (Domain Search). VitalQIP® also supports DHCP Option 82 information.

Meta IP uses a three-tier architecture of a management console, manager server and BIND-based DNS/DHCP services. The management console provides the user interface, and the manager server is Meta IP's LDAP-based repository for IP address configuration data and address pools. In our tests, the manager server and DNS/DHCP services ran on the SA-500 appliance, while the management console ran

on Win 2000 Advanced Server. MetaInfo says these functions also can run on Windows and Unix.

To enhance uptime and availability, one SA-500 can be primary and the other can act as a secondary failover device. Both the SA-500 and DNSBox models are 1U rack-mounted with single power supplies, potentially a point of failure. We feel these should have dual, hot-swappable power supplies to eliminate this failure point.

The Meta IP DNS service closely integrates with Microsoft Active Directory. In one of our tests, we used the Windows Active Directory wizard to easily and painlessly link a domain controller to Meta IP, create forward master zones and create optional slave zones. In the resulting configuration, Meta IP controlled and directed DNS operations across a company containing both SA-500-based and Windows-based DNS services. In addition, we found the RFC-compliant Meta IP, VitalQIP® and DNSBox units interoperated well with each other.

Net Results

**Lucent
VitalQIP 6.1 (SPI)**

OVERALL RATING
4.3

Company: Lucent, www.lucent.com
Cost: From \$0.70 to \$5.00 per node.
Pros: Fast, scalable; intuitive interface.
Cons: No IPv6 support yet; no Linux GUI.



**MetaInfo
Meta IP 5.6**

OVERALL RATING
4.2

Company: MetaInfo, www.metainfo.com
Cost: \$75,000 for Enterprise 50k Bundle (two Manager Servers, 10 DNS Servers, 10 DHCP Servers and 50,000 IP addresses).
Pros: Good security; flexible IP address management.
Con: SA 500 appliance should have two hot-swappable power supplies.

**ApplianSys
DNSBox 300/100**

OVERALL RATING
3.4

Company: ApplianSys, www.appliansys.com
Cost: \$10,950 for the DNS-Box 300 and \$2,950 for the DNSBox 100.
Pros: Simple, straightforward plug-and-play devices with a browser-based interface.
Con: Appliances should have two hot-swappable power supplies.

The breakdown	VitalQIP	Meta IP	DNSBox
Performance 20%	5	4	3
IP address management 20%	4	4	3
Ease of use 20%	4	4	3
Scalability 10%	5	4	4
Security 10%	4	5	4
Installation 10%	3	4	5
Documentation 10%	5	5	3
TOTAL SCORE	4.3	4.2	3.4

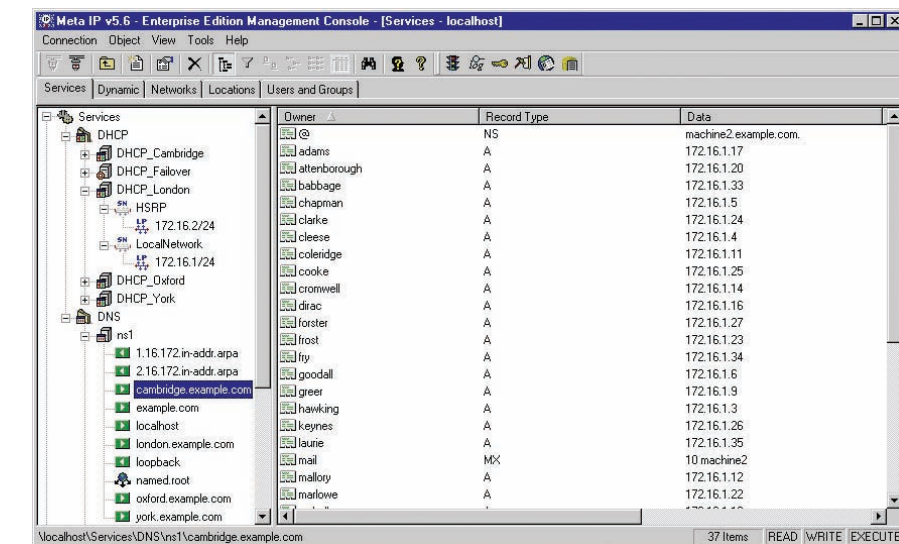
Scoring Key: 5: Exceptional; 4: Very good; 3: Average; 2: Below average; 1: Consistently subpar

Meta IP's Secure Address Foundation Extensions (SAFE) DHCP feature was particularly useful for clients outside a private network (for example, the Internet) that need to send IP address requests to your DHCP servers. Your company's mobile clients, such as PDAs and notebooks, are examples of devices for which your network has to sometimes play the role of ISP.

The SAFE feature evaluates client media access control addresses or DHCP Unique Client IDs to distinguish between known, authorized clients and other clients. For example, if a stranger asks for a company's IP addresses, Meta IP leases to it an IP address from a separate pool. Depending on how you set up the pools of IP addresses, SAFE DHCP can help control or limit access to portions of your network.

Meta IP also uses Perfigo's SecureSmart manager to identify DHCP clients and runs anti-virus scans to verify that a client's configuration conforms to corporate standards. If you need extra security, Meta IP can use an Authenex ASAS Server or a Check Point UserAuthority server to authenticate users at initial network access via a password.

ApplianSys' DNSBox 300 (master) and DNSBox 100 (slave) together are a complete, if simple, DNS/DHCP environment more appropriate for small to midsize



Like VitalQIP®, Meta IP shows IP devices and addresses in expandable tree form.

companies. Where VitalQIP® and Meta IP are software-only or a combination of software/hardware, the DNSBoxes are pure plug-and-play network appliances.

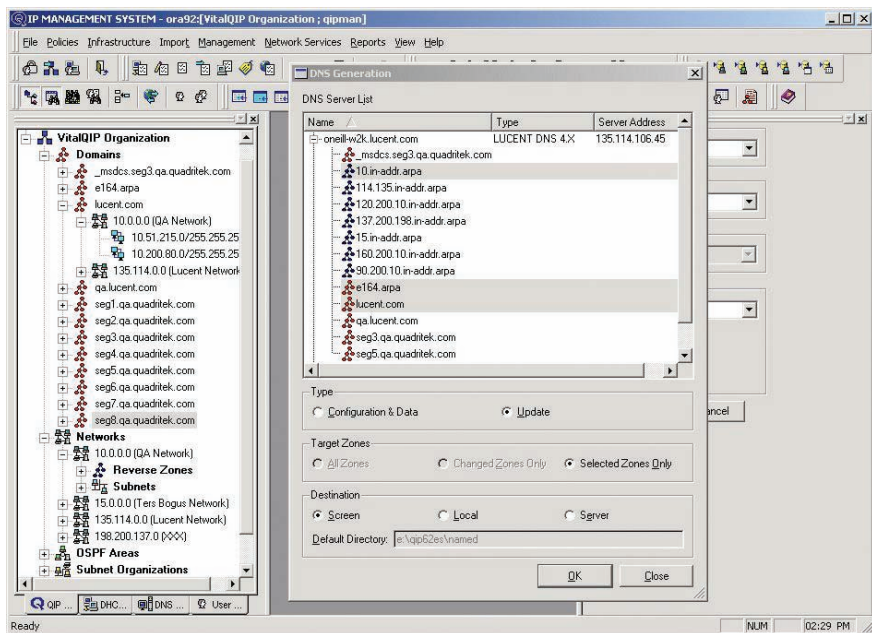
The DNSBox 300 includes a Nixu NameSurfer DNS management system, while the DNSBox 100 runs a BIND V9 server executable. The DNSBox 300 supports multiple DNS views, dynamic DNS, automatic zone slaving, secure incremental zone transfers and zone and host templates. It integrated well with Microsoft's Active Directory, replicated data to a warm-standby second DNS

300 for failover, supported IPv6 and accurately detected duplicate names and IP addresses. The DNSBox 100 contained a recursive resolver DNS cache, used IPsec (with public/private keys and RSA authentication) to connect to other DNS servers, acted as a DHCP relay, issued SNMP alerts and had a DNS cache query tool for troubleshooting "stale cache" problems. Together the two boxes performed zone transfers and updates through a secure VPN tunnel, which results in a higher level of security than offered by BIND 9's Transaction Signature facility. In addition, the appliances have a built-in firewall to lower your company's exposure to hackers.

Performance and scalability

We measured performance by running custom client software that rapidly requests 50,000 dynamic IP addresses and noting the elapsed time that each tool took to respond. We ran the program six times, one test on each network segment in our lab (see Chart 1). We also benchmarked DNS activity. Our test software issued a flood of 50,000 name-to-IP address resolution requests, and obtained responses from a DNS server (see Chart 2, page 4).

Results show clearly that VitalQIP was the fastest tool, but both VitalQIP and Meta IP have the capacity and speed to handle millions of IP addresses with ease. We feel that the DNSBoxes are more appropriate for



VitalQIP's native client GUI makes organizing and administering IP addresses a painless process.

smaller networks.

Platform support might be a major factor in what you buy for your company's computing environment. VitalQIP runs on Sun Solaris, HP-UX, AIX, and Win 2000 and 2003. Its DNS/DHCP server component also is available on a network appliance. Currently only the command-line interface is available on Red Hat Linux, but Lucent says the GUI will be available on Linux by mid-2005. Meta IP's server components run on Solaris, Red Hat Linux, Debian, SuSE and Windows NT, XP2000 and 2003. The Meta IP management console runs only on Windows.

Ease of use

VitalQIP offers an easy-to-navigate GUI client for Windows and Unix, even sporting a prompt-based interface for command-line devotees. The Web client interface, which includes a set of Common Gateway Interface scripts, supplies a few basic administrative functions and a basic system status display in a browser window. You will need to use the GUI or CLI clients for most VitalQIP tasks. Documentation, which consists of three books and sizable online help files, was clear and comprehensive.

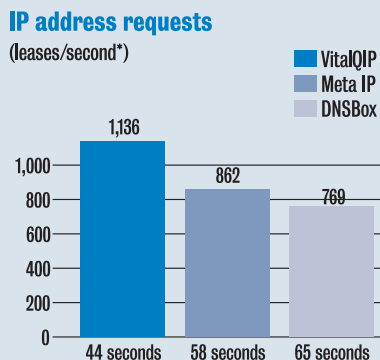
We also found Meta IP's native Windows

interface intuitive and productive. In addition to its IP address organization and assignment modules, Meta IP includes configuration analysis tools that display reports showing DNS services and zones, as well as DHCP lease pool data. The tools include a DNS IP troubleshooting function, DNS zone configuration display, static lease compliance analysis, DHCP discovery report, lease pool usage display, available address ping sweep, lease reclaimer

and user data report. We found scheduling and customizing the Meta IP reports a simple and straightforward process. MetaInfo provided excellent printed and online documentation.

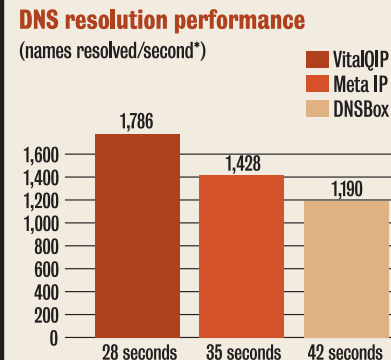
In contrast to VitalQIP and Meta IP, the DNSBox 300 appliance gives you browser-based full administrative control over DNS and DHCP functions. When we installed the appliances, configuring the 300 and 100's own IP addresses and subnet mask

Chart 1: Speed addressing
Lucent leased IP addresses at a furious rate.



* 50,000 NAME REQUESTS DIVIDED BY ELAPSED SECONDS VALUE.

Chart 2: Quick resolution
Lucent also excelled at resolving DNS requests.



* 50,000 NAME REQUESTS DIVIDED BY ELAPSED SECONDS VALUE.

How We Did It

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

We ran VitalQIP® and the Meta IP management console on a four-way Compaq ProLiant ML570 700 MHz computer with Pentium III CPUs, 2G-bytes of RAM and six 18G-byte SCSI RAID drives. The operating system was Windows 2000 Advanced Server with Service Pack 4. MetaInfo sent us an SA-500 DNS/DHCP appliance, while ApplanSys shipped both a DNSBox 300 DNS/DHCP Master and a DNSBox 100 DNS Slave appliance.

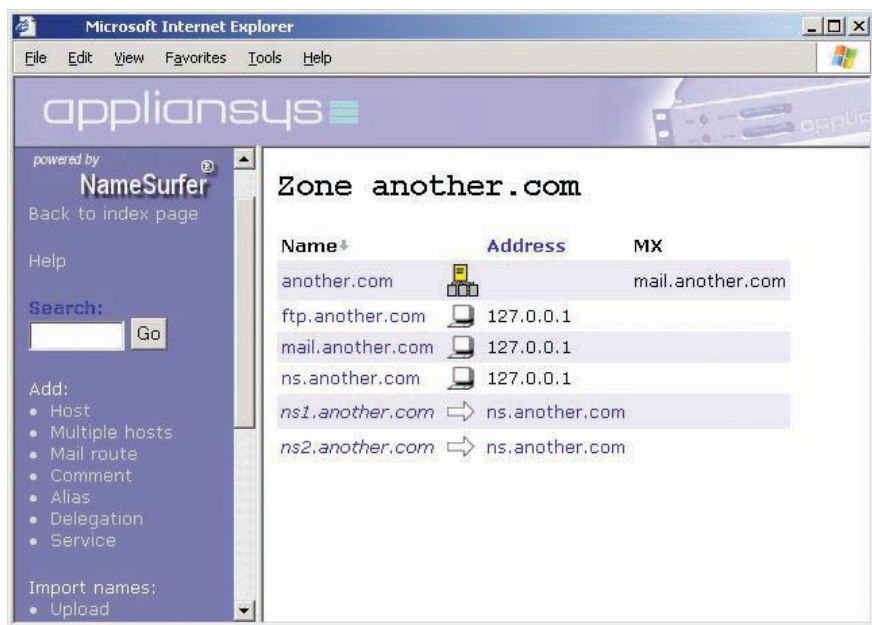
Each subnet's 25 client computers were

a mix of Win 2000 Professional, NT Workstation 4.0, Windows 98, Windows ME, Windows XP, Red Hat Linux 7.0 and Macintosh platforms. The relational databases on the network were Oracle 8i, Sybase Adaptive Server 11.5 and Microsoft SQL Server 2000. Win 2000 and NetWare 5.1 shared files, while Internet Information Server, Netscape and Apache software served up Web pages. An Agilent Advisor protocol analyzer decoded and displayed network traffic.

We tested each product's ability to dynamically distribute IP addresses, equate IP addresses to host names, register IP addresses in directory/name resolution services and maintain a repository of IP addresses and host names. We also looked for scalability, security, ease of use and task automation.

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 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 responded.

We invited all major vendors with IP address management products to participate in the test. Cisco, Nortel, Nominum, Incognito, EfficientIP, BlueCat, Infoblox and Process Software either declined or did not respond to our invitation.



The ApplianceSys browser-based interface is simple but effective.

was done via serial-port-based telnet. Optionally connecting through a virtual terminal revealed detailed appliance behavior in the form of syslog entries. The DNSBox Web interface was a simple, menu-driven set of HTML and Javascript pages to configure the servers, get a summary of DNS/DHCP activity, change the password, view online help and perform backup and restore functions. The printed documentation consisted of some "getting started" steps and a rudimentary usage tutorial.

Almost all of the adequate (but obviously not professionally written) DNSBox documentation is available only in HTML. The DNSBox 300 Web interface uses SSL and passwords for security. It supports multiple concurrent administrators and has a read-only mode so non-administrative users can view DNS/DHCP activity, although we're at a loss to imagine why anyone would use this feature.

A handy delegation feature lets a supervisor administrator assign responsibility for

particular domains and subnets to different users.

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NW Lab Alliance

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CLEAR CHOICE TEST

Another challenge to the IP address management throne

BY BARRY NANCE, NETWORK WORLD LAB ALLIANCE

In our quest to find the best IP address management tool (www.networkworld.com, DocFinder: 7921), IPControl 2.0 from International Network Services slipped under our radar. So we recently subjected IPControl to the same tests and criteria we used in our May 9 story.

The perfect IP address management tool should flexibly and efficiently assign IP addresses to all IP devices, centrally manage the address and URL information across a company, quickly and effortlessly equate host names with IP addresses, scale well, be intuitive to use and be pervasively platform-neutral. The tool also must have useful reports, integrate with custom-written applications, cooperate with Active Directory, be Lightweight Directory Access Protocol (LDAP)-aware and deal robustly with badly formed or non-compliant DHCP requests. The best tool also is highly fault-tolerant and enforces security to help keep hackers at bay.

We found IPControl to be less expensive than Lucent Technologies' VitalQIP and MetaInfo's Meta IP, yet just as easy to use. However, VitalQIP (the May 9 Clear Choice Award winner) is faster, offers more fea-

tures and is more scalable.

Organizing your addresses

IPControl did a good job of discovering and cataloging our network's devices via its queries of router subnets, DHCP address pools and individual IP addresses. After initially discovering our IP-based network nodes, IPControl separately managed actual vs. planned addressing schemes to provide us with a forward-looking view of our future network as it expanded. We also liked IPControl's BIND versions 8 and 9 compliance, as well as integration with Active Directory. IPControl can direct the operations of Windows Server's DHCP services just as well as it can its own DHCP server software.

The IPControl platform includes a central InControl Executive, at least one but

possibly several InControl Agents, a central database and an Administrative Interface. The Executive application directs the activities of the agents, stores IP addressing information in the database and accepts interactive configuration data from the Administrative Interface. The default database is MySQL (included), but on Solaris you can substitute your own copy of Oracle's relational database. INS supplies DHCP software that runs on Red Hat Linux and Solaris, and BIND software that runs on Windows, Red Hat Linux

IP ADDRESS MANAGEMENT

IPControl 2.0

International Network Services www.ins.com

NetResults 3.8

From **10 cents** to **\$2.50** per node

Pros: Intuitive, easy-to-navigate user interface; low cost

Cons: Not as feature-rich or as fast as VitalQIP.

The Breakdown

Scoring Key: 5: Exceptional; 4: Very good; 3: Average; 2: Below average; 1: Consistently subpar

Performance	20%	4
IP address management	20%	4
Ease of use	20%	4
Scalability	10%	3
Security	10%	4
Installation	10%	3
Documentation	10%	4
Total score		3.8

and Solaris. IPControl runs on Solaris, Windows (2000, 2003 and XP) and Red Hat Linux. If you prefer a network appliance, INS sells IPControl pre-loaded in a rack-mountable device.

As in our earlier test, we measured performance by running custom client software that rapidly requests 50,000 dynamic IP addresses and noting the elapsed time that each tool took to respond (see How we did it at www.networkworld.com, DocFinder: 7926). We ran the program six times, one test on each network segment in our lab. We also benchmarked DNS activity. Our test software issued a flood of 50,000 name-to-IP address resolution requests, and obtained responses from a DNS server (see graphic below).

For reliability and robust address management, the DHCP server within the IPControl architecture handles failover according to the IETF's DHCP Failover Protocol Internet Draft for primary/secondary servers. VitalQIP and Meta IP go a step further by supporting multiple running DHCP servers, as well as primary/secondary DHCP servers. Both IPControl and VitalQIP can optionally ping a DHCP address-requesting client at lease time to

make sure a DHCP request isn't spurious.

IPControl, VitalQIP and Meta IP offer logon authentication via callout script or a program that you write. However, VitalQIP and Meta IP have explicit support for such operations as relating an IP address to a media access control (MAC) address (user-to-address mapping), which in IPControl requires that an administrator write a callout program. VitalQIP and Meta IP have explicit support for LDAP. With IPControl, you must use the callout-service feature to integrate it with an LDAP repository. VitalQIP also explicitly supports Dynamic DNS multi-master updates, while IPControl has a listener service that can perform incremental updates, as well as updates of multiple masters. IPControl cannot send SNMP alerts to a network management system when it detects an address from a particular MAC address or user logon, but VitalQIP can.

Like IPControl, VitalQIP is available on a network appliance and runs on Solaris, Windows (2000, 2003 and XP) and Red Hat Linux. VitalQIP additionally runs on AIX and HP-UX. Meta IP runs on Solaris, Red Hat Linux, Debian, SuSE and Windows (2000, 2003 and XP). In contrast to

IPControl, VitalQIP's database options include both the Oracle and Sybase Adaptive Server, relational DBMSs and Lucent bundles Sybase Adaptive Server with VitalQIP. Because VitalQIP is faster and runs on more platforms, it is more scalable than IPControl.

IPControl's support for IPv6 is a big plus, while VitalQIP

won't work with IPv6 addresses until year-end. On the other hand, VitalQIP has Enum support for relating phone numbers to URLs or IP addresses (RFC 2916), whereas IPControl does not.

Ease of use

IPControl uses a container metaphor to help an administrator organize IP addresses into groups. These containers can represent geographical locations or other organizational elements significant to a customer. A collapsible tree makes quick work of navigating IP address blocks if you have complex sets of containers.

We liked that IPControl let us effectively delegate administrative tasks by subnet. It supports multiple concurrent administrators, just as VitalQIP does.

IPControl has a Web browser-based interface and command-line interface, while VitalQIP offers an easy-to-navigate native GUI client for Windows and Unix in addition to its browser-based and command-line interfaces. However, IPControl graphically displays network topology, a feature that VitalQIP lacks. For data import and export options, IPControl had fewer options and less extensive templates than VitalQIP.

IPControl offers extensive, easy-to-use APIs if you want to write your own programs. The software was easy to install and came with clear, comprehensive documentation.

IPControl didn't dethrone VitalQIP in our tests, but it certainly proved a worthy challenger.

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IP address requests

Product	Elapsed seconds	Leases/second*
VitalQIP	44	1,136
Meta IP	58	862
IPControl	58	862
DNSBoxes	65	769

* 50,000 requests divided by elapsed seconds value

DNS resolution performance

Product	Elapsed seconds	Leases/second*
VitalQIP	28	1,786
Meta IP	35	1,428
IPControl	36	1,389
DNSBoxes	42	1,190

* 50,000 name requests divided by elapsed seconds value

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