



BIND DNS Management: Quick BIND configuration with SolarWinds® IP Address Manager

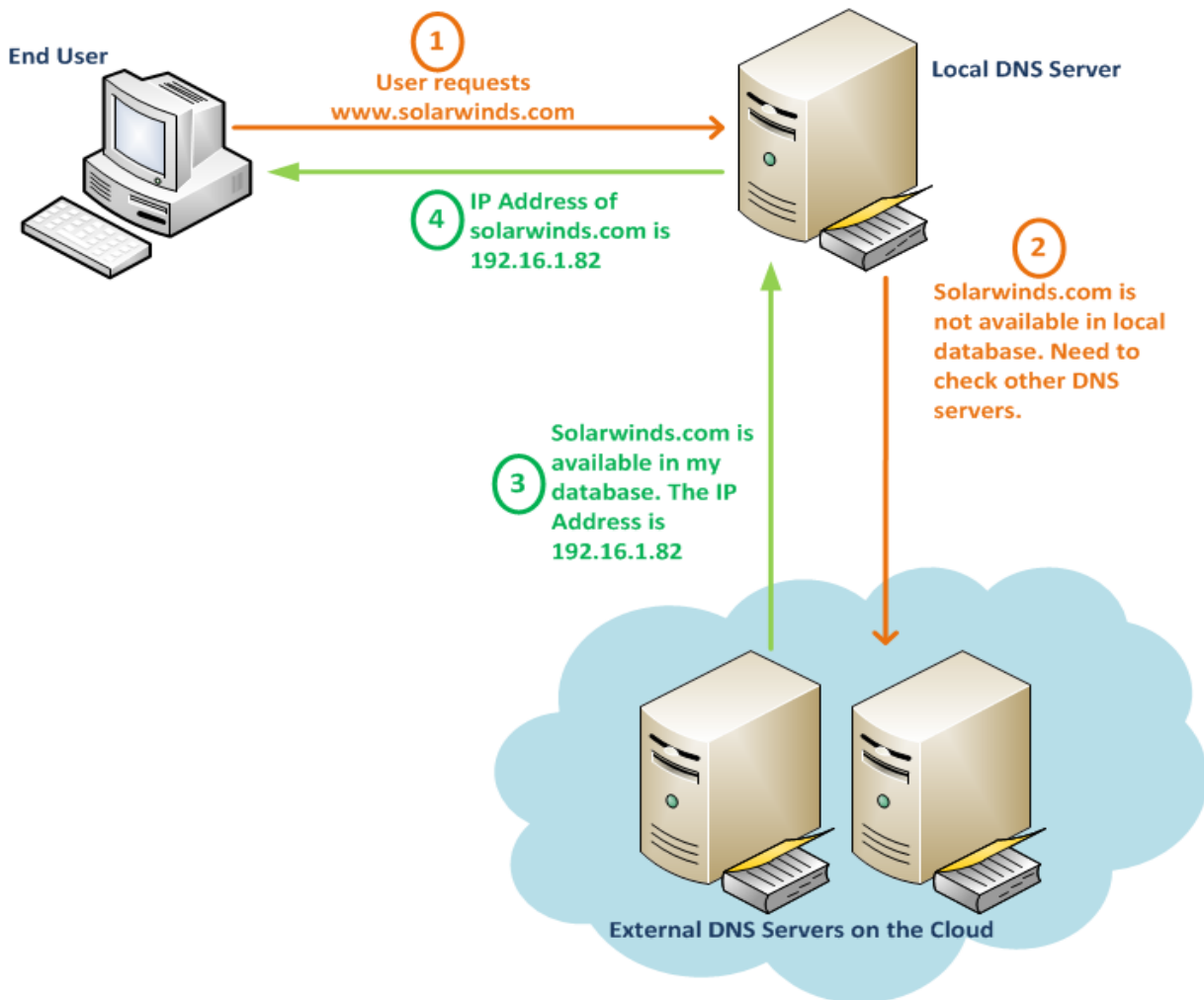
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What is Domain Name System (DNS)?

DNS is often referred to as the phone book of the Internet. Even though it could be one of the services that end users are least aware of, it definitely is the most used.

Without DNS, the Internet as we know it today could not exist. Try to imagine a world without easy-to-remember addresses and instead being forced to enter raw IP endpoints such as 192.168.1.11 (IPv4) or even 2001:db8:85a3::8a2e:0370:7334 (IPv6) every time you wanted to visit a Web page. More than that, DNS also supports critical services that keep networks stable, like maintaining host connectivity with changing IP addresses or routing, and advanced services like load balancing, geo-routing and others.

When a user accesses a URL, say www.solarwinds.com, the DNS server tries to resolve the name into the IP address of the appropriate Web server as illustrated below.



How DNS resolution works

Introduction to BIND

Every network needs a DNS Server to ensure reachability to hosts on the Internet and within the network. While there are multiple options available for DNS servers in an enterprise network, like Microsoft® DNS server or Cisco® Network Registrar, BIND is the most widely¹ used and is also the reference implementation for DNS servers. BIND, developed by students at the University of California, is an acronym for Berkeley Internet Name Domain. It is free, open-source software and is currently maintained by [Internet System Consortium](#) (ISC).

BIND is the de-facto standard for DNS servers, especially in Unix/Linux® environments, due to its features such as Access Lists, Views, etc., that similar systems do not provide and of course better performance.

Installing BIND

BIND is available in the software repository of all Linux systems. Use the package manager applicable to your Linux distribution to install BIND. For example, we used yum on a CentOS server to install the BIND packages.

```
yum install bind
yum install bind utils
```

Configuring BIND

BIND configuration requires editing the main configuration file called named.conf which controls the behavior and functionality of the BIND DNS server. For each host name you need to resolve, you need to add necessary information for the master zone as well as reverse lookup zone in the named.conf file. You may further have to add information about the root servers too for your DNS server to query when it gets requests for host names not mentioned in its configurations. For example, to add an entry for yourdomain.com to named.conf, the configuration is as below²:

```
options {
    directory      "/var/named";
    recursion yes;
};

zone "." IN {
    type hint;
    file "named.hint";
};

zone "yourdomain.com" {
    type master;
    file " yourdomain.com.fwd";
    allow-transfer { any; };
};

zone "1.168.192.in-addr.arpa" {
    type master;
    file "yourdomain.com.rev";
};
```

Once this has been saved, create zone files under the directory you defined in the options section of `named.conf` file. There should be one zone file for each zone you defined in the `named.conf` file. The zone file contains mappings between domain names and IP addresses which might be A or AAAA records or even MX records. For the example we discussed, you need to create zone files for `yourdomain.com.fwd` and `yourdomain.com.rev` as well as one for the root server defined as `named.hint`. An example configuration for the zone file will look like below ³.

```
$ TTL      86400 ; 24 hours
$ORIGIN yourdomain.com.
@ 1D IN SOA ns.yourdomain.com. (
                                2002022401 ; serial
                                3H ; refresh
                                15 ; retry
                                1w ; expire
                                3h ; minimum
                                )
      IN NS      ns.yourdomain.com. ; name server
; server host definitions
ns     IN  A      192.168.1.1 ;name server definition
www    IN  A      192.168.1.2 ;web server definition
```

BIND with SolarWinds IPAM

As you can see above, BIND configuration and management is done via the CLI. With network changes occurring constantly, the administrator would need to edit/add/delete zones/records from these BIND configuration files. Making such changes from the CLI is not only complex, but also prone to human error. Hence, a GUI based simple interface is a necessity especially to drive efficiency with automation and to reduce human errors.

SolarWinds [IP Address Manager](#) (IPAM) is a tool for enterprise IP management and DHCP and DNS administration. With IPAM, one can manage Microsoft DNS servers as well as BIND DNS. SolarWinds IPAM helps simplify the management of your BIND DNS servers by leveraging the user friendly GUI of IPAM to –

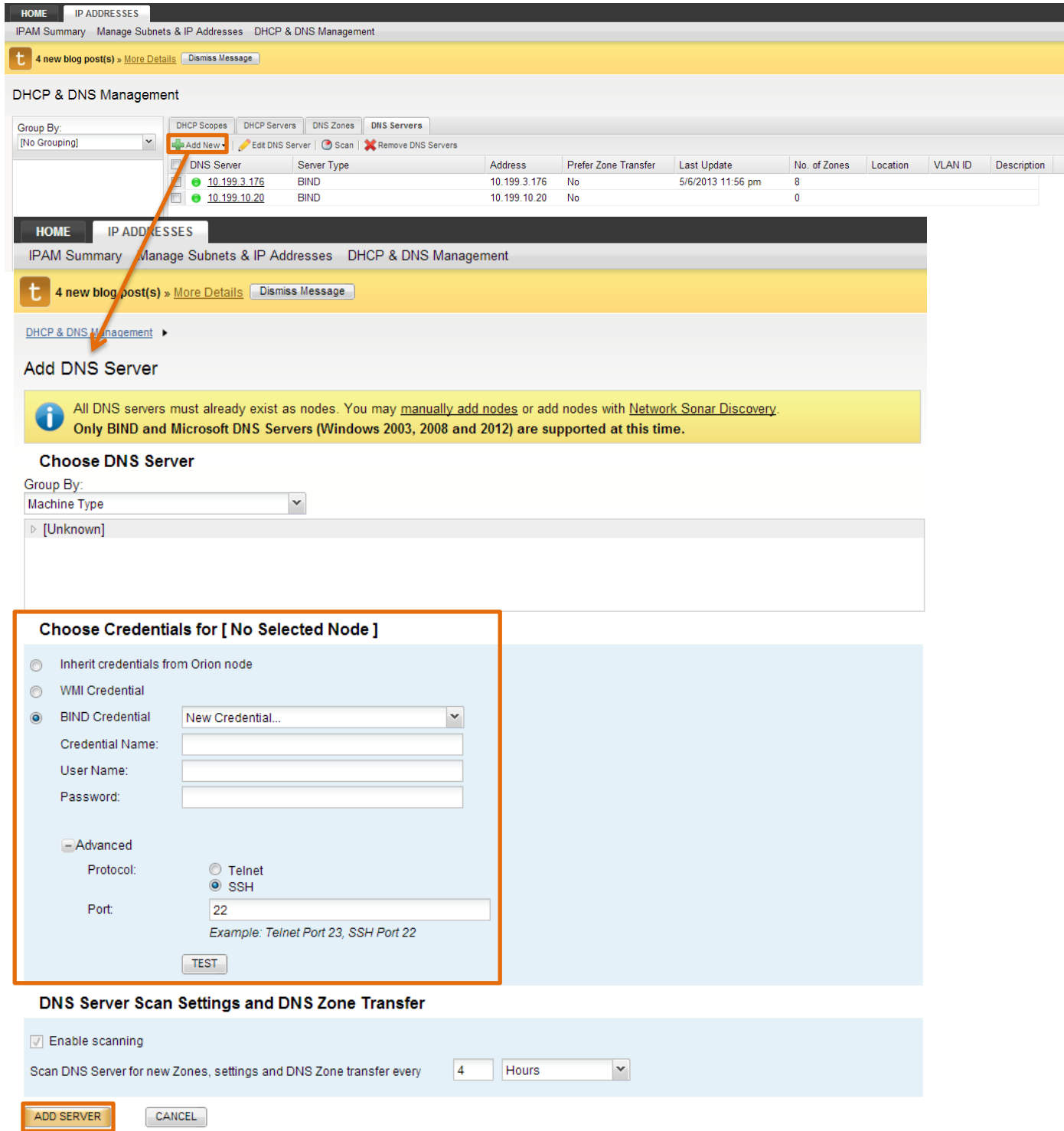
- Add/Edit/Delete DNS servers
- Add/Edit/Delete DNS Zones
- Assign Views and Records to these Zones

To configure and manage BIND on your distribution with IPAM, install BIND packages on your server as mentioned under '**Installing BIND**'. Once you have BIND installed and the BIND service running, add the DNS server to your IPAM installation from Settings – **IPAM Settings – Add DNS Server**.

How to add a BIND DNS Server in IPAM?

IPAM automatically scans for server configuration and it's ready to use/configure BIND in a minute!

Within the DHCP & DNS Management View in IPAM, click on the **Add New** button and select **DNS server**. This takes you to the **Add DNS Server Wizard**. Here, key-in the server credentials and the required time settings to set it for auto scan of DNS servers.



The screenshot shows the IPAM interface for DHCP & DNS Management. The 'Add New' button is highlighted in the top navigation bar. Below, the 'Add DNS Server' wizard is displayed, including a table of existing servers and a form for configuring a new one.

DNS Server	Server Type	Address	Prefer Zone Transfer	Last Update	No. of Zones	Location	VLAN ID	Description
10.199.3.176	BIND	10.199.3.176	No	5/6/2013 11:56 pm	8			
10.199.10.20	BIND	10.199.10.20	No		0			

Add DNS Server

All DNS servers must already exist as nodes. You may [manually add nodes](#) or add nodes with [Network Sonar Discovery](#). Only BIND and Microsoft DNS Servers (Windows 2003, 2008 and 2012) are supported at this time.

Choose DNS Server

Group By: Machine Type

▸ [Unknown]

Choose Credentials for [No Selected Node]

- Inherit credentials from Orion node
- WMI Credential
- BIND Credential
 - New Credential...
 - Credential Name:
 - User Name:
 - Password:

Advanced

Protocol: Telnet SSH

Port:
Example: Telnet Port 23, SSH Port 22

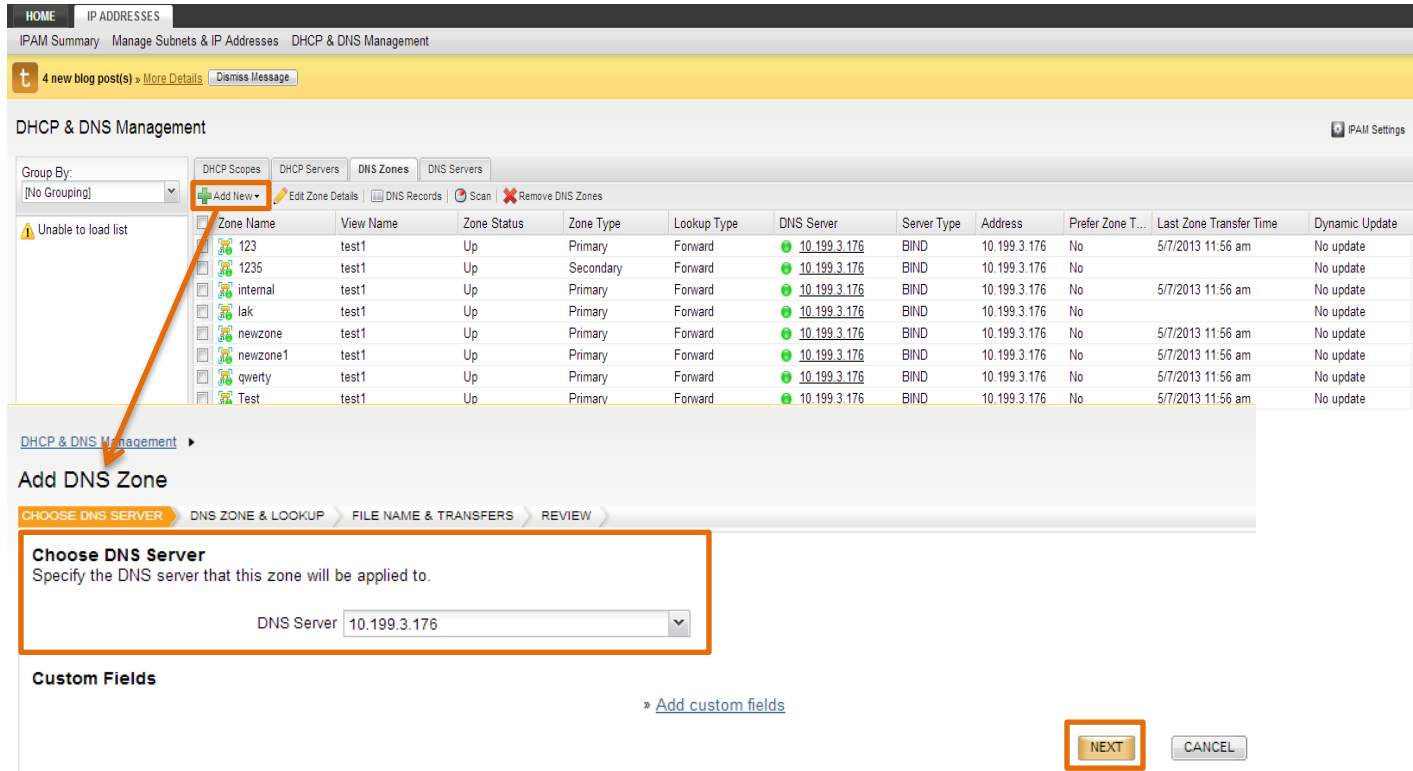
DNS Server Scan Settings and DNS Zone Transfer

Enable scanning

Scan DNS Server for new Zones, settings and DNS Zone transfer every

Assigning Zones to your BIND server

Once your BIND DNS server has been added to IPAM, you can work with the zones again from the IPAM GUI. To add zones to your BIND server, click on the **Add New** button and select **DNS zone**. In the **Add DNS Zone** Wizard that opens, specify the DNS server that this zone will be applied to and click Next.



HOME | **IP ADDRESSES**

IPAM Summary | Manage Subnets & IP Addresses | DHCP & DNS Management

4 new blog post(s) | [More Details](#) | [Dismiss Message](#)

DHCP & DNS Management IPAM Settings

Group By: [No Grouping] | **Add New** | Edit Zone Details | DNS Records | Scan | Remove DNS Zones

Zone Name	View Name	Zone Status	Zone Type	Lookup Type	DNS Server	Server Type	Address	Prefer Zone T...	Last Zone Transfer Time	Dynamic Update
123	test1	Up	Primary	Forward	10.199.3.176	BIND	10.199.3.176	No	5/7/2013 11:56 am	No update
1235	test1	Up	Secondary	Forward	10.199.3.176	BIND	10.199.3.176	No		No update
internal	test1	Up	Primary	Forward	10.199.3.176	BIND	10.199.3.176	No	5/7/2013 11:56 am	No update
lak	test1	Up	Primary	Forward	10.199.3.176	BIND	10.199.3.176	No		No update
newzone	test1	Up	Primary	Forward	10.199.3.176	BIND	10.199.3.176	No	5/7/2013 11:56 am	No update
newzone1	test1	Up	Primary	Forward	10.199.3.176	BIND	10.199.3.176	No	5/7/2013 11:56 am	No update
qwerty	test1	Up	Primary	Forward	10.199.3.176	BIND	10.199.3.176	No	5/7/2013 11:56 am	No update
Test	test1	Up	Primary	Forward	10.199.3.176	BIND	10.199.3.176	No	5/7/2013 11:56 am	No update

Add DNS Zone

CHOOSE DNS SERVER | DNS ZONE & LOOKUP | FILE NAME & TRANSFERS | REVIEW

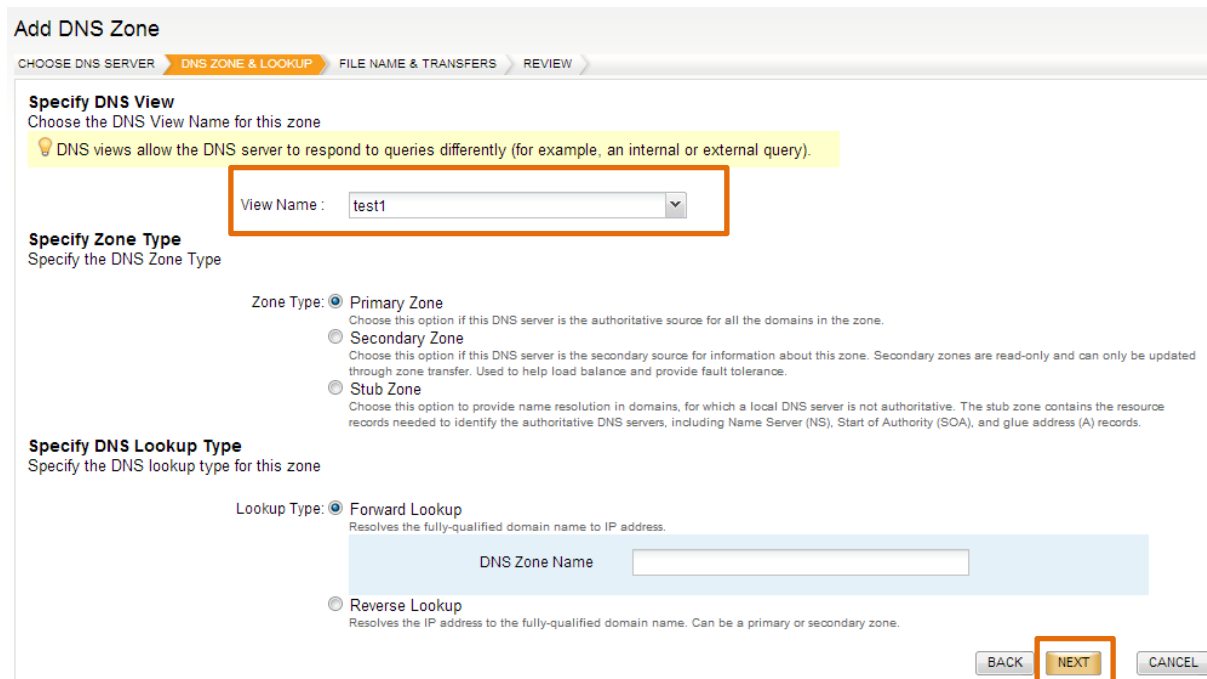
Choose DNS Server
Specify the DNS server that this zone will be applied to.

DNS Server: 10.199.3.176

Custom Fields [Add custom fields](#)

NEXT | CANCEL

The **Add DNS Zone** window allows you to select the 'View' that need to be associated with this Zone, specify the zone type and DNS lookup type, which is either forward lookup or reverse lookup. Specify the options and click **Next**.



Add DNS Zone

CHOOSE DNS SERVER | **DNS ZONE & LOOKUP** | FILE NAME & TRANSFERS | REVIEW

Specify DNS View
Choose the DNS View Name for this zone

DNS views allow the DNS server to respond to queries differently (for example, an internal or external query).

View Name: test1

Specify Zone Type
Specify the DNS Zone Type

Zone Type: **Primary Zone**
Choose this option if this DNS server is the authoritative source for all the domains in the zone.

Secondary Zone
Choose this option if this DNS server is the secondary source for information about this zone. Secondary zones are read-only and can only be updated through zone transfer. Used to help load balance and provide fault tolerance.

Stub Zone
Choose this option to provide name resolution in domains, for which a local DNS server is not authoritative. The stub zone contains the resource records needed to identify the authoritative DNS servers, including Name Server (NS), Start of Authority (SOA), and glue address (A) records.

Specify DNS Lookup Type
Specify the DNS lookup type for this zone

Lookup Type: **Forward Lookup**
Resolves the fully-qualified domain name to IP address.

DNS Zone Name:

Reverse Lookup
Resolves the IP address to the fully-qualified domain name. Can be a primary or secondary zone.

BACK | **NEXT** | CANCEL

Specify Zone File Name and scan interval details under the **File Name & Transfers** Tab.

Add DNS Zone

CHOOSE DNS SERVER > DNS ZONE & LOOKUP > **FILE NAME & TRANSFERS** > REVIEW >

File Name & Zone Transfers
Define the zone name and any transfers.

Zone File Name:

Zone Transfers

- Enable Zone Scan
 - Default zone scan interval ... inherit value from [DNS Server setting](#)
 - DNS zone scan interval: Hours

BACK **NEXT** CANCEL

Review the details you just added and click on **Create Zone**.

Add DNS Zone

CHOOSE DNS SERVER > DNS ZONE & LOOKUP > FILE NAME & TRANSFERS > **REVIEW**

Review

DNS Server: 10.199.3.176

View Name: test1

Zone Name: Test3

Zone Type: Primary

Lookup Type: Forward Lookup Zone

Zone File Name: Test3.dns

Zone Transfers: Default zone transfer interval enabled.

BACK **CREATE ZONE** CANCEL

Note: Ensure that 'Views' are first created on the BIND server before fetching them into IPAM. You cannot create/define Views in IPAM.

Once you have your DNS server, zones and records set up in IPAM, you are set to manage BIND as well as all your DNS servers from a single console. SolarWinds also provides additional options such as the **Network Atlas** to monitor availability of your DNS servers by adding them as nodes.



Key benefits of using SolarWinds® IPAM for BIND

- Be rid of using the complex Command Line Interface (CLI) and manage you BIND DNS server from a **user friendly GUI**.
- **Propagate all DNS changes** made via IPAM to the BIND server with the click of a button.
- Easily search for DNS records, their details and also for the status of DNS service and DNS zone to **validate DNS functionality** in the network.
- **Stop maintaining multiple monitoring consoles** for your DHCP and DNS servers, or even the use of spreadsheets.
- **Preventive alerting and escalation** for active IP address management. Recognize and correct issues before users experience fault or performance issues.

SolarWinds IPAM allows you to manage and monitor not only your BIND DNS servers, but also Microsoft DHCP and DNS, as well as Cisco DHCP and ASA servers.

The screenshot displays the SolarWinds IPAM Summary View. It includes a navigation sidebar on the left with options like 'Summary', 'Custom Tab 2', 'Custom Tab 3', 'Custom Tab 4', 'Custom Tab 5', and 'Add tab'. The main content area is divided into several sections:

- Getting Started with IP Address Manager:** A yellow box containing instructions on how to import IP addresses from CSV, XLS, or XLSX format spreadsheets, and buttons for 'IMPORT IP ADDRESSES', 'ADD SINGLE SUBNET', 'ADD DNS SERVER', 'ADD DHCP SERVER', and 'REMOVE THIS RESOURCE'.
- What's New in IPAM:** A section with a 'NEW' badge listing updates such as 'Support for BIND DNS Management & Monitoring', 'Create, edit, remove DNS zones directly in IPAM', and 'Monitor IP Address conflicts'.
- Top 10 Subnets by % IP Address Used:** A table showing the most utilized subnets.
- Top 10 DHCP Scopes by Utilization:** A table showing the most utilized DHCP scopes.
- Recent IPAM posts:** A section with a 'THWACK' logo listing recent updates and articles.

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Summary View in SolarWinds IPAM

Reference:

1. <http://mydns.bboy.net./survey/>
2. <http://www.zytrax.com/books/dns/ch7/>
3. <http://www.zytrax.com/books/dns/ch8/index.html#zone>

Links Used:

Internet System Consortium: <http://www.isc.org/software/bind>

SolarWinds (NYSE: SWI) provides powerful and affordable IT management software to customers worldwide - from Fortune 500 enterprises to small businesses. The company works to put its users first and remove the obstacles that have become “status quo” in traditional enterprise software. SolarWinds products are downloadable, easy to use and maintain, and provide the power, scale, and flexibility needed to address users’ management priorities. SolarWinds online user community, <http://thwack.com>, is a gathering-place where tens of thousands of IT pros solve problems, share technology, and participate in product development for all of the company’s products. Learn more today at <http://solarwinds.com>.



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