Installing An Ubuntu Hardy 8.04 LTS DNS Server With BIND

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Pleasenote that my main reference and source is Falko's article "The Perfect Server - Ubuntu 8.04 LTS" here with more DNS details.

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This tutorial shows how to set up an Ubuntu Hardy Heron(Ubuntu 8.04LTS) based server that offers DNS services. This tutorial is writtenfor the32-bit version of Ubuntu 8.04 LTS, but should apply to the 64-bitversion.

I will use the following software:

- DNS Server: BIND9

I want to say first that this is not the only way of settingup such asystem. There are many ways of achieving this goal but this is theway I take. I do not issue any guarantee that this will work for you!

1 Requirements

To install such a system you will need the following:

- the Ubuntu 8.04 LTS server CD, available here: <u>ftp://releases.ubuntu.com/releases/hardy/ubuntu-8.04-server-i386.iso</u>

- a fast internet connection.

2 Preliminary Note

In this tutorial I use the hostname server1.tm.local with the IPaddress 192.168.0.100 and the gateway 192.168.0.1.. These settings might differ for

you, so you have to replace them whereappropriate.

3 The Base System

Insert your Ubuntu install CD into your system and boot fromit. Select your language:

Language					
Arabic	Hindi	Português			
Беларуская	Hrvatski	Română			
Български	Magyarul	Русский			
Bengali	Bahasa Indonesia	Sámegillii			
Bosanski	Italiano	Slovenčina			
Català	日本語	Slovenščina			
Čeština	ქართული	Shqip			
Dansk	Khmer	Svenska			
Deutsch	한국어	Tamil			
Dzongkha	Kurdî	Thai			
Ελληνικά	Lietuviškai	Tagalog			
English	Latviski	Türkçe			
Esperanto	Македонски	Українська			
Español	Malayalam	Tiếng Việt			
Eesti	Norsk bokmål	Wolof			
Euskaraz	Nepali	中文(简体)			
Suomi	Nederlands	中文(繁體)			
Français	Norsk nynorsk				
Galego	Punjabi(Gurmukhi)				
Gujarati	Polski				
Hebrew	Português do Brasil				
F2 Language F3 Keymap	F4 Modes F5 Accessil	pility F6 Other Option			

Then select Install UbuntuServer:

F1 |



Install Ubuntu Server Check CD for defects Rescue a broken system Test memory Boot from first hard disk

F1 Help F2 Language F3 Keymap F4 Modes F5 Accessibility F6 Other Options

Choose your language again (?):



Then select your location:





Choose a keyboard layout (you will be asked to press a fewkeys, andthe installer will try to detect your keyboard layout based on the keysyou pressed):

	[!] Ubuntu	installer main	menu	
You can try to series of keys select your ke) have your key! 3. If you do not syboard layout f	board layout det t want to do thi from a list.	ected by pres s, you will b.	sing a e able to
Detect keyboar	d layout?			
<go back=""></go>			<yes></yes>	<no></no>



Based on the key "de:nodeadkeys"	└ [!] Ubuntu Keyboard lay ys you pressed . If this is r	ı installer jout detect d, your key not correct	main menu ion complete board layout , you can go	appears to be back and select	
your layout from <go back=""></go>	n the full lis	t instead.		<continue></continue>	

The installer checks the installation CD, your hardware, and configures the network with DHCP if there is a DHCP server in thenetwork:

Scanning CD-ROM
Scanning /cdrom/pool/main/d

Loading additional components 15% Retrieving jfsutils-udeb

Configuring the network with DHCP
This may take some time. KCancel>

Enter the hostname. In this example, my system is called *server1.tm.local*, so I enter *server1*:

	[!] Configure	the network
Please enter	the hostname for this	system.
The hostname network. If y network admin you can make Hostname:	is a single word that ou don't know what you istrator. If you are s something up here.	identifies your system to the r hostname should be, consult your etting up your own home network,
server1		
<go back=""></go>		<continue></continue>

Now you have to partition your hard disk. For simplicity'ssake I will create one big partition (with the mount point /) and a little swap partitions I select *Guided - use entire disk* (of course, the partitioning is totally up to you - if you like, youcan create more than just one big partition, and you can also use LVM):

[!!] Partition disks				
The installer can guide you through partitioning a disk (using different standard schemes) or, if you prefer, you can do it manually. With guided partitioning you will still have a chance later to review and customise the results.				
If you choose guided partitioning for an entire disk, you will next be asked which disk should be used.				
Partitioning method:				
<mark>Guided – use entire disk</mark> Guided – use entire disk and set up LVM Guided – use entire disk and set up encrypted LVM Manual				
<go back=""></go>				
ab> moves between items; <space> selects; <enter> activates buttons</enter></space>				

Select the disk that you want to partition:

[!!] Partition disks
Note that all data on the disk you select will be erased, but not before you have confirmed that you really want to make the changes.
Select disk to partition:
SCSI3 (0.0.0) (sda) - 32.2 GB VMware, VMware Virtual S
<go back=""></go>
Tab> moves between items: <space> selects: <enter> activates buttons</enter></space>

When you're finished, hit Yeswhen you're asked Write the changesto disks?:

		[!!] Partiti	on disks ⊢		
If you co disks. Of	ntinue, the ch herwise, you w	anges listed ill be able t	below will o make furt	be written t her changes	o the manually.
WARNING: removed a	This will dest s well as on t	roy all data he partitions	on any part that are g	itions you H oing to be f	ave ormatted.
The parti SCSI3	tion tables of (0,0,0) (sda)	the followir	ng devices a	re changed:	
The follo partit partit	wing partition ion #1 of SCSI ion #5 of SCSI	s are going t 3 (0,0,0) (so 3 (0,0,0) (so	o be format la) as ext3 la) as swap	ted:	
Write the	changes to di	sks?			
<go e<="" td=""><td>ack></td><td></td><td></td><td><yes></yes></td><td><no></no></td></go>	ack>			<yes></yes>	<no></no>

Afterwards, your new partitions are being created andformatted.

Now the base system is being installed:

Installing the base system
Retrieving Tiblicursess

Installing the base system 83% Preparing linux-image-2.6.24-16-server
Preparing linux-image-2.6.24-16-server

Create a user, for example the user *Administrator* with the user name *administrator* (don't use the user name *admin* is a reserved name on Ubuntu 8.04):

Please enter the real name of this user. This information will be used for instance as default origin for emails sent by this user as well as any program which displays or uses the user's real name. Your full name is a reasonable choice. Full name for the new user: Administrator	A user accoun account for n	t will be created for on–administrative ac	you to use instead tivities.	of the root
Full name for the new user: Administrator	Please enter t used for insta well as any p full name is a	the real name of this ance as default orig rogram which displays a reasonable choice.	s user. This informa in for emails sent b s or uses the user's	tion will be y this user as real name. Your
Administrator	Full name for	the new user:		
	Administrator			
<go back=""> <continue></continue></go>	<go back=""></go>			<continue></continue>

Select a user reasonable ch letter, which lower–case le Username for	name for the new acco noice. The username sh can be followed by a tters.	ers and passwords ount. Your first name is a hould start with a lower-case any combination of numbers and more
administrator		
<go back=""></go>		<continue></continue>

	[!!] Set up us	ers and passwords	
A good passwor punctuation ar	rd will contain a nd should be char	a mixture of letter nged at regular int	rs, numbers and ervals.
Choose a passu	word for the new	user:	

<go back=""></go>			<continue></continue>

[!!] Set up users	and passwords
Please enter the same user password a correctly.	gain to verify you have typed it
Re-enter password to verify:	

<go back=""></go>	<continue></continue>

Next the package manager apt gets configured. Leave the HTTPproxyline empty unless you're using a proxy server to connect to theInternet:

If you need to use the proxy informat The proxy informat "http://[[user][:p HTTP proxy informa	e a HTTP proxy to acces ion here. Otherwise, 1 ion should be given in pass]@]host[:port]/". ation (blank for none):	s the outside world, enter eave this blank. the standard form of
<go back=""></go>		<continue></continue>

Configuring apt
28% Scanning the mirror
Tab> moves between items; <space> selects; <enter> activates buttons</enter></space>

We need a DNS server, but nevertheless I don'tselect any of them now because I like to have full control over whatgets installed on my system. We will install the needed packagesmanually later on. The only item I select here is *OpenSSH* server so that I canimmediately connect to the system with an SSH client such as *PuTTY* after the installation hasfinished:

At the moment, only the core of the system is installed. To tune the system to your needs, you can choose to install one or more of the following predefined collections of software
Choose software to install: [] DNS server [] LAMP server [] Mail server [*] OpenSSH server [] PostgreSQL database [] Print server
[] Samba File server <go back=""> <continue></continue></go>

The installation continues:

	Select and install software
Preparing perl	

The GRUB boot loader gets installed:

Installing GRUB boot loader
Looking for other operating systems

The base system installation is now finished. Remove theinstallation CD from the CD drive and hit Continue to reboot the system:

On to the next step...

4 Enable The root Account

After the reboot you can login with your previously createdusername (e.g. *administrator*). Because we have to run all the steps from this tutorial as root user, so we will enable the root account.

Run

sudo passwd root

and give root a password. Afterwards we can switch root byrunning

su

5 Install The SSH Server (Optional)

If you did not install the OpenSSH server during the systeminstallation, you can do it now:

apt-get install ssh openssh-server

From now on you can use an SSH client such as <u>*PuTTY*</u> and connect from yourworkstation to your Ubuntu 8.04 LTS server and follow the remainingsteps from this tutorial.

6 Install vim-full (Optional)

I'll use vias my text editor in this tutorial. The default viprogram has some strange behavior on Ubuntu; to fix this, we install vim-full:

apt-get install vim-full

(You don't have to do this if you use a different texteditor such as joe or nano.)

7 Configure The Network

Because the Ubuntu installer has configured our system toget itsnetwork settings via DHCP, we have to change that now because a servershould have a static IP address. Edit */etc/network/interfaces* and adjust it to your needs (in this example setup I willuse the IP address 192.168.0.100):

vi /etc/network/interfaces

This file describes the network interfaces available on your system
and how to activate them. For more information, see interfaces(5).
The loopback network interface
auto lo
iface lo inet loopback
The primary network interface
auto eth0
iface eth0 inet static
address 192.168.0.100
netmask 255.255.255.0
network 192.168.0.0
broadcast 192.168.0.255
gateway 192 168 0 1

Please make sure your network configurationare set correctly, feel free to change that based on your network configuration.

Then restart your network:

/etc/init.d/networking restart

Then edit /etc/hosts.Make it look like this:

vi /etc/hosts

27.0.0.1 localhost.localdomain localhost
92.168.0.100 server1.tm.local server1
The following lines are desirable for IPv6 capable hosts
1 ip6-localhost ip6-loopback
e00::0 ip6-localnet
f00::0 ip6-mcastprefix
f02::1 ip6-allnodes
f02::2 ip6-allrouters
i02::3 ip6-allhosts

Now run

<pre>echo server1.tm.local ></pre>
/etc/hostname
/etc/init.d/hostname.sh start

Afterwards, run

hostname hostname -f

Both should show server1.tm.localnow.

8 Edit /etc/apt/sources.list And Update Your LinuxInstallation

Edit /etc/apt/sources.list.Comment out or remove the installation CD from the file and make surethat the universe and multiverse repositories are enabled. It should look like this:

vi /etc/apt/sources.list

deb cdrom:[Ubuntu-Server 8.04 _Hardy Heron_ - Release i386 (20080423.2)]/ hardy main restricted #deb cdrom:[Ubuntu-Server 8.04 _Hardy Heron_ - Release i386 (20080423.2)]/ hardy main restricted # See http://help.ubuntu.com/community/UpgradeNotes for how to upgrade to # newer versions of the distribution. deb http://de.archive.ubuntu.com/ubuntu/ hardy main restricted deb-src http://de.archive.ubuntu.com/ubuntu/ hardy main restricted ## Major bug fix updates produced after the final release of the ## distribution. deb http://de.archive.ubuntu.com/ubuntu/ hardy-updates main restricted deb-src http://de.archive.ubuntu.com/ubuntu/ hardy-updates main restricted ## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu ## team, and may not be under a free licence. Please satisfy yourself as to ## your rights to use the software. Also, please note that software in ## universe WILL NOT receive any review or updates from the Ubuntu security ## team. deb http://de.archive.ubuntu.com/ubuntu/ hardy universe deb-src http://de.archive.ubuntu.com/ubuntu/ hardy universe deb http://de.archive.ubuntu.com/ubuntu/ hardy-updates universe deb-src http://de.archive.ubuntu.com/ubuntu/ hardy-updates universe ## N.B. software from this repository is ENTIRELY UNSUPPORTED by the Ubuntu ## team, and may not be under a free licence. Please satisfy yourself as to ## your rights to use the software. Also, please note that software in ## multiverse WILL NOT receive any review or updates from the Ubuntu

security team.

deb http://de.archive.ubuntu.com/ubuntu/ hardy multiverse deb-src http://de.archive.ubuntu.com/ubuntu/ hardy multiverse deb http://de.archive.ubuntu.com/ubuntu/ hardy-updates multiverse deb-src http://de.archive.ubuntu.com/ubuntu/ hardy-updates multiverse ## Uncomment the following two lines to add software from the 'backports' ## repository. ## N.B. software from this repository may not have been tested as ## extensively as that contained in the main release, although it includes ## newer versions of some applications which may provide useful features. ## Also, please note that software in backports WILL NOT receive any review ## or updates from the Ubuntu security team. # deb http://de.archive.ubuntu.com/ubuntu/ hardy-backports main restricted universe multiverse # deb-src http://de.archive.ubuntu.com/ubuntu/ hardy-backports main restricted universe multiverse ## Uncomment the following two lines to add software from Canonical's *##* 'partner' repository. This software is not part of Ubuntu, but is ## offered by Canonical and the respective vendors as a service to Ubuntu ## users. # deb http://archive.canonical.com/ubuntu hardy partner # deb-src http://archive.canonical.com/ubuntu hardy partner deb http://security.ubuntu.com/ubuntu hardy-security main restricted deb-src http://security.ubuntu.com/ubuntu hardy-security main restricted deb http://security.ubuntu.com/ubuntu hardy-security universe deb-src http://security.ubuntu.com/ubuntu hardy-security universe deb http://security.ubuntu.com/ubuntu hardy-security multiverse deb-src http://security.ubuntu.com/ubuntu hardy-security multiverse

Then run

apt-get update

to update the apt package database and

apt-get upgrade

to install the latest updates (if there are any).

9 Disable AppArmor (This is a must for things to go well here)

AppArmor is a security extension (similar to SELinux) that should provide extended security, which usually causes more problems than advantages. Therefore Idisable it.

We can disable it like this:

/etc/init.d/apparmor stop

update-rc.d -f apparmor remove

10 Install the DNS Server

Run

apt-get install bind9

For security reasons we want to run BIND chrooted so we have to do the following steps:

/etc/init.d/bind9 stop

Edit the file /etc/default/bind9 so that the daemon will run as the unprivileged user bind, chrooted to /var/lib/named. Modify the line: OPTIONS="-u bind" so that it reads OPTIONS="-u bind -t /var/lib/named":

vi /etc/default/bind9

OPTIONS="-u bind -t /var/lib/named" # Set RESOLVCONF=no to not run resolvconf RESOLVCONF=yes

Create the necessary directories under /var/lib:

mkdir -p /var/lib/named/etc
mkdir /var/lib/named/dev
mkdir -p /var/lib/named/var/cache/bind
mkdir -p /var/lib/named/var/run/bind/run

Then move the config directory from /etc to /var/lib/named/etc:

mv /etc/bind /var/lib/named/etc

Create a symlink to the new config directory from the old location (to avoid problems when bind gets updated in the future):

ln -s /var/lib/named/etc/bind /etc/bind

Make null and random devices, and fix permissions of the directories:

mknod /var/lib/named/dev/null c 1 3
mknod /var/lib/named/dev/random c 1 8
chmod 666 /var/lib/named/dev/null /var/lib/named/dev/random
chown -R bind:bind /var/lib/named/var/*

chown -R bind:bind /var/lib/named/etc/bind

http://www.howtoforge.com/

We need to modify /*etc/default/syslogd* so that we can still get important messages logged to the system logs. Modify the line: *SYSLOGD=" "* so that it reads: *SYSLOGD=" - a /var/lib/named/dev/log"*:

vi /etc/default/syslogd
#
Top configuration file for syslogd
#
#
Full documentation of possible arguments are found in the manpage
syslogd(8).
#
#
For remote UDP logging use SYSLOGD="-r"
#
SYSLOGD="-a /var/lib/named/dev/log"

Restart the logging daemon:

/etc/init.d/sysklogd restart

Start up BIND, and check /var/log/syslog for errors:

/etc/init.d/bind9 start

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11 Configure BIND

Now the main configuration file in BIND is named.conf, however named.conf.local is already included in named.conf and its there for customized configuration, so we will edit named.conf.local and we will add our zones, here I added a zone camed tm.local as well as a reverse zone for 192.168.0.0:

vi /etc/bind/named.conf.local
zone "tm.local" {
type master;
file "/etc/bind/zones/tm.local.db";
};
zone "3.13.10.in-addr.arpa" {
type master;
file "/etc/bind/zones/rev.0.168.192.in-addr.arpa";
};

Please note that if you want to add a comment in *named.conf* or *named.conf*.local use //, also you can see above the zone file for *tm.local* is called *tm.local.db* and is located in /*etc/bind/zone*, the most important thing that the zone file uses ; as the prefix for a comment and not //, as I saw confusions in a lot of forums so I thought to add it here - (same for the reverse zone).

12 Configure the Zones We will start with the zone tm.local

mkdir /etc/bind/zones

vi /etc/bind/zones/tm.local.db

\$TTL 1500
@ IN SOA server1.tm.local. root (
2007062703 ;serial
28800 ;refresh
3600 ;retry
604800 ;expire
38400) ;minimum 25 minutes
tm.local. IN NS server1.tm.local.
server1 IN A 192.168.0.100
webserver1 IN A 192.168.0.103
webserver2 IN A 192.168.0.104
loadb1 IN A 192.168.0.101
loadb2 IN A 192.168.0.102
tm.local. IN MX 10 server1.tm.local.

Feel free to replace the above zone name (tm.local) or your dns server name (server1) as needed, just note the . DOT after the zone name.

Now let's go ahead with the reverse zone.

vi /etc/bind/zones/rev.3.13.10.in-addr.arpa

L 1500	\$TTL 1500
N SOA server1.tm.local. root (@ IN SOA server1.tm.local.roo
2007062703 ;serial	2007062703
28800 ;refresh	28800
3600 ;retry	3600 ;
604800 ;expire	604800
38400) ;minimum 25 minutes	38400)
IN NS server1.tm.local.	IN NS server1.

101 IN PTR load1.tm.local.	104 IN PTR webserver2.tm.local.	103INPTRwebserver1.tm.local.104INPTRwebserver2.tm.local.	101	IN	PTR	load1.tm.local.
101 IN PTR load1.tm.local.	104 IN PTR webserver2.tm.local.	103INPTRwebserver1.tm.local.104INPTRwebserver2.tm.local.	101	IN	PTR	load1.tm.local.

Now configure the server to forward any requests to your ISP server so it case resolve external IPs.

vi /etc/bind/named.conf.options

Uncomment the forwarder section to look like this:

)1	rwarders {
	$\ensuremath{\texttt{\#}}$ Replace the address below with the address of your ISP DNS server
	123.123.123.123;

13 Configure the server to use itself as DNS

vi /etc/resolv.conf

search tm.local

nameserver 192.168.0.100

14 References and Sources

- Falko's Article "The Perfect Server Ubuntu Hardy Heron (Ubuntu 8.04 LTS Server)"
- BIND on Ubuntu "Howto: Setup a DNS server with bind"