<http://www.golinuxhub.com/2014/01/interview-questions-on-linux-servers.html>

<http://www.linuxtechi.com/experience-linux-admin-interview-questions/>

<http://venkataraoss.blogspot.in/2011/02/dns-server-interview-questions-and.html>

How can you create a password less connection between multiple Linux machine?

To create a password less authentication we need to use RSA or DSA key authentication.

RSA and DSA are used as an algorithm for public-key encryption

RSA keys have minimum key length of 768 bits and the default length is 2048 bit.The key length of DSA is limited to 1024 bit so one can generate stronger RSA keys than DSA keys.

Create a pair of public and private key with a blank password when prompted.

Copy the public key to the remote client to which you want to login without password

Save the public key inside ~/.ssh/authorized\_keys file

Everytime you copy the key to this file, the key is appended in the file.

Now try to login

For more details on the commands used and description follow the below link

How to create a password less authentication for ssh in Linux?

What are the types of authentication which can be used for ssh connection to any host?

You can create a password less connection between two Linux box using RSA authentication.

RSA and DSA are used as an algorithm for public-key encryption

RSA and DSA keys are used for password authentication and providing much higher security for data transfer or connectivity between two remote machines.

RSA keys have minimum key length of 768 bits and the default length is 2048 bit.The key length of DSA is limited to 1024 bit so one can generate stronger RSA keys than DSA keys.

DSA encryption is faster as compared to RSA.

RSA can be used for both encryption and signing whereas DSA can only be used for signing.

RSA can be used with ssh v1 and v2 whereas DSA can only be used with v2

What is the difference between A record and CNAME record in DNS?

A record

It is the Address records also known as host records

Points to the IP address reflecting the domain

Used for forward lookup of any domain name

For example:

Our website is configured on 50.63.202.15 IP so the A record of my domain name will point towards that IP.

Every time a query for golinuxhub.com is made the internet will lookup for contents stored on the machine with 50.63.202.15 this IP.

CNAME Record

It is short abbreviation for Canonical Name

Provides an alias name for same hostname

Helps create subdomains

NOTE: You can not create a CNAME record for the domain name itself (it should be done with A record)

For example:

golinuxhub.com is a domain name whereas www.golinuxhub.com is a sub domain name

How will you restrict anonymous users from accessing your ftp server?

Change this value inside vsftpd.conf

anonymous\_enable=NO

How does a dns lookup query works when you type a url on browser?

When you type a URL on the browser below are the course of actions performed

Browser cache is checked

Local hosts file is looked up for any records placed inside etc folder

URL query works right to left i.e for www.golinuxhub.com, .com is queried first and then the query moves from right to left.

The request then goes to ISP, if any earlier request for the same website was made then they will bring up the page from the stored cache

Next the query goes to root servers which will provide you the address of the Top Level Domain

The TLD will provide the location of nameserver, so next the ISP contacts nameserver for proper record

Once the ISP gets the record information it locally stores the information for further queries and throws the output on your browser.

Next time the query is made for the same page the ISP won't go through all these steps and bring out the page as per the cache stored from last query till the TTL value for that record is expired.

For more detailed information follow the below link

What happens in the backend when you type a url on the browser?

What is the command to check quota values for any user?

# repquota /partion/path | grep username

How many types of virtual hosting are their in apache?

There are 3 types of virtual hosting in Apache

Port based

Hostname based

IP based

What are the port nos for DNS, DHCP, SMTP, POP3 and IMAP(with and without SSL)

DNS 53

DHCP 67

SMTP with ssl 465, 567

SMTP without SSL 25

POP3 with SSL 995

POP3 without ssl 110

IMAP with SSL 943

IMAP without SSL 143

What is the default port for ssh? How will you change it to some other random port no.?

SSH port no. by default is 22

To change the default port no. we need make required changes inside sshd\_conf file in the below mentioned line

#Port 22

(Uncomment the above line and define the new port no.)

Restart the services for changes to take affect

Which command do you use to download a file from ftp or http website using CLI?

# wget path\_to\_the\_file

How to disable root login via ssh?

Uncomment the below line inside sshd\_config to "NO"

#PermitRootLogin yes

What if I have made a host entry in hosts.allow as well as hosts.deny file of my localhost. So will that remote host will be allowed to connect with my localhost machine? Explain

Yes, The host will be allowed to connect because their is a specific order which is followed before allowing or blocking any host/service.

Access will be granted when a (daemon,client) pair matches an entry in the /etc/hosts.allow file.

Otherwise, access will be denied when a (daemon,client) pair matches an entry in the /etc/hosts.deny file. Otherwise, access will be granted.

How do you limit maximum connections in your apache server?

Change the below parameter value inside httpd.conf

MaxClients 256

In this article we will discuss top 30 linux system admin interview questions with the answers for experience professionals. Below mentioned questions may help the readers to clear Linux interviews. If you like these questions , please don’t hesitate to share on Facebook, google+ and Twitter.

Q:1 Why LVM is required ?

Ans: LVM stands for Logical Volume Manager , to resize filesystem’s size online we required LVM partition in Linux. Size of LVM partition can be extended and reduced using the lvextend & lvreduce commands respectively.

Q:2 How To check Memory stats and CPU stats ?

Ans: Using ‘free’ & ‘vmstat’ command we can display the physical and virtual memory statistics respectively.With the help of ‘sar’ command we see the CPU utilization & other stats.

Q:3 What does Sar provides and at which location Sar logs are stored ?

Ans: Sar Collect, report, or save system activity information. The default version of the sar command (CPU utilization report) might be one of the first facilities the user runs to begin system activity investigation, because it monitors major system resources. If CPU utilization is near 100 percent (user + nice + system), the workload sampled is CPU-bound.

By default log files of Sar command is located at /var/log/sa/sadd file, where the dd parameter indicates the current day.

Q:4 How to increase the size of LVM partition ?

Ans: Below are the Logical Steps :

– Use the lvextend command (lvextend -L +100M /dev/<Name of the LVM Partition> , in this example we are extending the size by 100MB.

– resize2fs /dev/<Name of the LVM Partition>

– check the size of partition using ‘df -h’ command

Q:5 How to reduce or shrink the size of LVM partition ?

Ans: Below are the logical Steps to reduce size of LVM partition :

-Umount the filesystem using umount command,

-use resize2fs command , e.g resiz2fs /dev/mapper/myvg-mylv 10G

-Now use the lvreduce command , e.g lvreduce -L 10G /dev/mapper/myvg-mylv

Above Command will shrink the size & will make the filesystem size 10GB.

Q:6 How to create partition from the raw disk ?

Ans: Using fdisk utility we can create partitions from the raw disk.Below are the steps to create partition from the raw dsik :

– fdisk /dev/hd\* (IDE) or /dev/sd\* (SCSI)

– Type n to create a new partition

– After creating partition , type w command to write the changes to the partition table.

Q:7 Where the kernel modules are located ?

Ans: The ‘/lib/modules/kernel-version/’ directory stores all kernel modules or compiled drivers in Linux operating system. Also with ‘lsmod’ command we can see all the installed kernel modules.

Q:8 What is umask ?

Ans: umask stands for ‘User file creation mask’, which determines the settings of a mask that controls which file permissions are set for files and directories when they are created.

Q:9 How to set the umask permanently for a user?

Ans: To set this value permanently for a user, it has to be put in the appropriate profile file which depends on the default shell of the user.

Q:10 How to change the default run level in linux ?

Ans: To change the run level we have to edit the file “/etc/inittab” and change initdefault entry ( id:5:initdefault:). Using ‘init’ command we change the run level temporary like ‘init 3’ , this command will move the system in runlevl 3.

Q:11 How to share a directory using nfs ?

Ans: To share a directory using nfs , first edit the configuration file ‘/etc/exportfs’ , add a entry like

‘/<directory-name> <ip or Network>(Options)’ and then restart the nfs service.

Q:12 How to check and mount nfs share ?

Ans: Using ‘showmount’ command we can see what directories are shared via nfs e.g ‘showmount -e <ip address of nfs server>’.Using mount command we can mount the nfs share on linux machine.

Q:13 What are the default ports used for SMTP,DNS,FTP,DHCP,SSH and squid ?

Ans: Service Port

SMTP 25

DNS 53

FTP 20 (data transfer) , 21 ( Connection established)

DHCP 67/UDP(dhcp server) , 68/UDP(dhcp client)

SSH 22

Squid 3128

Q:14 What is Network Bonding ?

Ans: Network bonding is the aggregation of multiple Lan cards into a single bonded interface to provide fault tolerance and high performance. Network bonding is also known as NIC Teaming.

Q:15 What are the different modes of Network bonding in Linux ?

Ans: Below are list of modes used in Network Bonding :

balance-rr or 0 – round-robin mode for fault tolerance and load balancing.

active-backup or 1 – Sets active-backup mode for fault tolerance.

balance-xor or 2 – Sets an XOR (exclusive-or) mode for fault tolerance and load balancing.

broadcast or 3 – Sets a broadcast mode for fault tolerance. All transmissions are sent on all slave interfaces.

802.3ad or 4 – Sets an IEEE 802.3ad dynamic link aggregation mode. Creates aggregation groups that share the same speed & duplex settings.

balance-tlb or 5 – Sets a Transmit Load Balancing (TLB) mode for fault tolerance & load balancing.

balance-alb or 6 – Sets an Active Load Balancing (ALB) mode for fault tolerance & load balancing.

Q:16 How to check and verify the status the bond interface.

Ans: Using the command ‘cat /proc/net/bonding/bond0’ , we can check which mode is enabled and what lan cards are used in this bond. In this example we have one only one bond interface but we can have multiple bond interface like bond1,bond2 and so on.

Q:17 How to check default route and routing table ?

Ans: Using the Commands ‘netstat -nr’ and ‘route -n’ we can see the default route and routing tables.

Q:18 How to check which ports are listening in my Linux Server ?

Ans: Use the Command ‘netstat –listen’ and ‘lsof -i’

Q:19 List the services that are enabled at a particular run level in linux server ?

Ans: With the help of command ‘chkconfig –list | grep 5:on’ we can list all the service that are enabled in run level5. For other run levels just replace 5 with the respective run level.

Q:20 How to enable a service at a particular run level ?

Ans: We can enable a service using the Command ‘chkconfig <Service-Name> on –level 3’

Q:21 How to upgrade Kernel in Linux ?

Ans: We should never upgrade Linux Kernel , always install the new New kernel using rpm command because upgrading a kenel can make your linux box in a unbootable state.

Q:22 How To scan newly asssigned luns on linux box without rebooting ?

Ans: There are two ways to scan newly assigned luns :

Method:1 if sg3 rpm is installed , then run the command ‘rescan-scsi-bus.sh’

Method:2 Run the Command , echo ” – – – ” > /sys/class/scsi\_host/hostX/scan

Q:23 How to find WWN numbers of HBA cards in Linux Server ?

Ans: We can find the WWN numbers of HBA cards using the command ‘systool -c fc\_host -v | grep port\_name’

Q:24 How to add & change the Kernel parameters ?

Ans: To Set the kernel parameters in linux , first edit the file ‘/etc/sysctl.conf’ after making the changes save the file and run the command ‘sysctl -p’ , this command will make the changes permanently without rebooting the machine.

Q:25 What is Puppet Server ?

Ans: Puppet is an open-source & enterprise software for configuration management toll in UNIX like operating system. Puppet is a IT automation software used to push configuration to its clients (puppet agents) using code. Puppet code can do a variety of tasks from installing new software, to check file permissions, or updating user accounts & lots of other tasks.

Q:26 What are manifests in Puppet ?

Ans: Manifests in Puppet are the files in which the client configuration is specified.

Q:27 Which Command is used to sign requested certificates in Puppet Server ?

Ans: ‘puppetca –sign hostname-of-agent’ in (2.X) & ‘puppet ca sign hostname-of-agent’ in (3.X)

Q:28 At which location Puppet Master Stores Certificates ?

Ans: /var/lib/puppet/ssl/ca/signed

Q:29 How to find all the regular files in a directory ?

Ans: using the command ‘find /<directory -type f’.

Q:30 What is load average in a linux ?

Ans: Load Average is defined as the average sum of the number of process waiting in the run queue and number of process currently executing over the period of 1,5 and 15 minutes. Using the ‘top’ and ‘uptime’ command we find the load average of a linux sever.

Q:1 Why to use NFS ?

Ans: A Network File System (NFS) allows remote machine to mount file systems over a network and interact with those file systems as though they are mounted locally. This enables system administrators to consolidate resources onto centralized servers over the network.

Q:2 What is the default port of NFS server ?

Ans: By default NFS uses 2049 TCP port.

Q:3 What are different versions of NFS Server ?

Ans: Currently, there are three versions of NFS. NFS version 2 (NFSv2) is older and widely supported. NFS version 3 (NFSv3) supports safe asynchronous writes and is more robust at error handling than NFSv2; it also supports 64-bit file sizes and offsets, allowing clients to access more than 2Gb of file data.

NFS version 4 (NFSv4) works through firewalls and on the Internet, no longer requires an rpcbind service, supports ACLs, and utilizes stateful operations. Red Hat Enterprise Linux 6.X & Centos 6.X supports NFSv2,NFSv3, and NFSv4 clients. When mounting a file system via NFS, Red Hat Enterprise Linux uses NFSv4 by default, if the server supports it.

Q:4 What are configuration files of NFS server ?

Ans: ‘/etc/exports’ is the main configuration file that controls which file systems are exported to remote hosts and specifies options.

‘/etc/sysconfig/nfs‘ is the file through which we can fix ports for RQUOTAD\_PORT, MOUNTD\_PORT, LOCKD\_TCPPORT, LOCKD\_UDPPORT and STATD\_PORT

Q:5 What are different options used in /etc/exports file ?

Ans: Below are list of options used in /etc/exports file :

ro: The directory is shared read only; the client machine will not be able to write to it. This is the default.

rw: The client machine will have read and write access to the directory.

root\_squash: By default, any file request made by user root on the client machine is treated as if it is made by user nobody on the server. (Exactly which UID the request is mapped to depends on the UID of user “nobody” on the server, not the client.)

no\_root\_squash : if this option is used , then root on the client machine will have the same level of access to the files on the system as root on the server. This can have serious security implications, although it may be necessary if you want to perform any administrative work on the client machine that involves the exported directories. You should not specify this option without a good reason.

no\_subtree\_check : If only part of a volume is exported, a routine called subtree checking verifies that a file that is requested from the client is in the appropriate part of the volume. If the entire volume is exported, disabling this check will speed up transfers.

sync : Replies to the NFS request only after all data has been written to disk. This is much safer than async, and is the default in all nfs-utils versions after 1.0.0.

async : Replies to requests before the data is written to disk. This improves performance, but results in lost data if the server goes down.

no\_wdelay : NFS has an optimization algorithm that delays disk writes if NFS deduces a likelihood of a related write request soon arriving. This saves disk writes and can speed performance

wdelay : Negation of no\_wdelay , this is default

nohide : Normally, if a server exports two filesystems one of which is mounted on the other, then the client will have to mount both filesystems explicitly to get access to them. If it just mounts the parent, it will see an empty directory at the place where the other filesystem is mounted. That filesystem is “hidden”. Setting the nohide option on a filesystem causes it not to be hidden, and an appropriately authorised client will be able to move from the parent to that filesystem without noticing the change.

hide : Negation of nohide This is the default

Q:6 How to list available nfs share on local machine & remote machine ?

Ans: ‘showmount -e localhost’ : Shows the available shares on your local machine

‘showmount -e <Remote-server-ip or hostname>‘: Lists the available shares at the remote server

Q:7 What is pNFS ?

Ans: Parallel NFS (pNFS) as part of the NFS v4.1 standard is available as of Red Hat Enterprise Linux 6.4. The pNFS architecture improves the scalability of NFS, with possible improvements to performance. That is, when a server implements pNFS as well, a client is able to access data through multiple servers concurrently. It supports three storage protocols or layouts: files, objects, and blocks.

Q:8 What is the difference between Hard mount & Soft mount in nfs ?

Ans: Difference between soft mount and hard mount is listed below :

Soft Mount : Consider we have mounted a NFS share using ‘soft mount’ . When a program or application requests a file from the NFS filesystem, NFS client daemons will try to retrieve the data from the NFS server. But, if it doesn’t get any response from the NFS server (due to any crash or failure of NFS server), the NFS client will report an error to the process on the client machine requesting the file access. The advantage of this mechanism is “fast responsiveness” as it doesn’t wait for the NFS server to respond. But, the main disadvantage of this method is data corruption or loss of data. So, this is not a recommended option to use.

Hard Mount : Suppose we have mounted the NFS share using hard mount, it will repeatedly retry to contact the server. Once the server is back online the program will continue to execute undisturbed from the state where it was during server crash. We can use the mount option “intr” which allows NFS requests to be interrupted if the server goes down or cannot be reached. Hence the recommended settings are hard and intr options.

Q:9 How to check iostat of nfs mount points ?

Ans: Using command ‘nfsiostat‘ we can list iostat of nfs mount points. Use the below command :

# nfsiostat <interval> <count> <mount\_point>

<interval> : specifies the amount of time in seconds between each report. The first report contains statistics for the time since each file system was mounted. Each subsequent report contains statistics collected during the interval since the previ-ous report.

<count> : If the <count> parameter is specified, the value of <count> determines the number of reports generated at seconds apart. if the interval parameter is specified without the <count> parameter, the command generates reports continuously.

<mount\_point> : If one or more <mount point> names are specified, statistics for only these mount points will be displayed. Otherwise, all NFS mount points on the client are listed.

Q:10 How to check nfs server version ?

Ans: ‘nfsstat -o all’ command shows all information about active versions of NFS.

Q:11 What is portmap?

Ans: The portmapper keeps a list of what services are running on what ports. This list is used by a connecting machine to see what ports it wants to talk to access certain services.

Q:12 How to reexport all the directories of ‘/etc/exports’ file ?

Ans: Using the command ‘ exportfs -r ‘ , we can reexport or refresh entries of ‘/etc/exports’ file without restarting nfs service

Q: – What is DHCP?

DHCP stands for “Dynamic Host Configuration Protocol”.

Q: – How can I prevent unauthorized laptops from using a network that uses DHCP for dynamic addressing?

This would have to be done using a mechanism other than DHCP. DHCP does not prevent other clients from using the addresses it is set to hand out nor can it distinguish between a computer’s permanent MAC address and one set by the computer’s user. DHCP can impose no restrictions on what IP address can use a particular port nor control the IP address used by any client.

Q: – Can a BOOTP client boot from a DHCP server?

Only if the DHCP server is specifically written to also handle BOOTP queries.

Q: – What is DHCP’s purpose?

DHCP’s purpose is to enable individual computers on an IP network to extract their configurations from a server (the ‘DHCP server’) or servers, in particular, servers that have no exact information about the individual computers until they request the information. The overall purpose of this is to reduce the work necessary to administer a large IP network. The most significant piece of information distributed in this manner is the IP address.

Q: – Can DHCP support remote access?

PPP has its own non-DHCP way in which communications servers can hand clients an IP address called IPCP (IP Control Protocol) but doesn’t have the same flexibility as DHCP or BOOTP in handing out other parameters. Such a communications server may support the use of DHCP to acquire the IP addresses it gives out. This is sometimes called doing DHCP by proxy for the client. I know that Windows NT’s remote access support does this. A feature of DHCP under development (DHCPinform) is a method by which a DHCP server can supply parameters to a client that already has an IP number. With this, a PPP client could get its IP number using IPCP, then get the rest of its parameters using this feature of DHCP. SLIP has no standard way in which a server can hand a client an IP address, but many communications servers support non-standard ways of doing this that can be utilized by scripts, etc. Thus, like communications servers supporting PPP, such communications servers could also support the use of DHCP to acquire the IP addressees to give out. The DHCP protocol is capable of allocating an IP address to a device without an IEEE-style MAC address, such as a computer attached through SLIP or PPP, but to do so, it makes use of a feature which may or may not be supported by the DHCP server: the ability of the server to use something other than the MAC address to identify the client. Communications servers that acquire IP numbers for their clients via DHCP run into the same roadblock in that they have just one MAC address, but need to acquire more than one IP address. One way such a communications server can get around this problem is through the use of a set of unique pseudo-MAC addresses for the purposes of its communications with the DHCP server. Another way (used by Shiva) is to use a different “client ID type” for your hardware address. Client ID type 1 means you’re using MAC addresses. However, client ID type 0 means an ASCII string.

Q: – How can I prevent unauthorized laptops from using a network that uses DHCP for dynamic addressing?

This would have to be done using a mechanism other than DHCP. DHCP does not prevent other clients from using the addresses it is set to hand out nor can it distinguish between a computer’s permanent MAC address and one set by the computer’s user. DHCP can impose no restrictions on what IP address can use a particular port nor control the IP address used by any client.

Q: – Can a BOOTP client boot from a DHCP server?

Only if the DHCP server is specifically written to also handle BOOTP queries.

Q: – Can DHCP work with Apple Talk or IPX?

No, it is too tied to IP. Furthermore, they don’t need it since they have always had automated mechanisms for assigning their own network addresses.

Q: – What is a DHCP lease?

A DHCP lease is the amount of time that the DHCP server grants to the DHCP client permission to use a particular IP address. A typical server allows its administrator to set the lease time.

Q: – What is DHCP Spoofing?

Ascend Pipeline ISDN routers (which attach Ethernets to ISDN lines) incorporate a feature that Ascend calls “DHCP spoofing” which is essentially a tiny server implementation that hands an IP address to a connecting Windows 95 computer, with the intention of giving it an IP number during its connection process.

Q: – How long should a lease be?

A very relevant factor is that the client starts trying to renew the lease when it is halfway through: thus, for example, with a 4 day lease, the client which has lost access to its DHCP server has 2 days from when it first tries to renew the lease until the lease expires and the client must stop using the network. During a 2- day outage, new users cannot get new leases, but no lease will expire for any computer turned on at the time that the outage commences. Another factor is that the longer the lease the longer time it takes for client configuration changes controlled by DHCP to propogate.

Q: – Is a DHCP client “supposed to” be able to use a BOOTP server?

The RFC on such interoperability (1534) is clear: “A DHCP client MAY use a reply from a BOOTP server if the configuration returned from the BOOTP server is acceptable to the DHCP client.” (section 3). The word “MAY” indicates such support, however useful, is left as an option.

Q: – What is a Client ID?

What is termed the Client ID for the purposes of the DHCP protocol is whatever is used by the protocol to identify the client computer. By default, DHCP implementations typically employ the client’s MAC address for this purpose, but the DHCP protocol allows other options. Some DHCP implementations have a setup option to specify the client ID you want. One alternative to the MAC address is simply a character string of your choice. In any case, in order for DHCP to function, you must be certain that no other client is using the client ID you choose, and you must be sure the DHCP server will accept it.

Q: – How can I relay DHCP if my router does not support it?

A server on a net(subnet) can relay DHCP or BOOTP for that net. Microsoft has software to make Windows NT do this.

Q: – Is a DHCP server “supposed to” be able to support a BOOTP client?

The RFC on such interoperability (1534) is clear: “In summary, a DHCP server:

… MAY support BOOTP clients,” (section 2). The word “MAY” indicates such support, however useful, is left as an option.

A source of confusion on this point is the following statement in section 1.5 of RFC 1541: “DHCP must provide service to existing BOOTP clients.” However, this statement is one in a list of “general design goals for DHCP”, i.e. what the

designers of the DHCP protocol set as their own goals. It is not in a list of requirements for DHCP servers.

Q: – Can DHCP support statically defined addresses?

Yes. At least there is nothing in the protocol to preclude this and one expects it to be a feature of any DHCP server. This is really a server matter and the client should work either way. The RFC refers to this as manual allocation.

Q: – What is a MAC address?

A MAC address (also called an Ethernet address or an IEEE MAC address) is a number (typically written as twelve hexadecimal digits, 0 through 9 and A through F, or as six hexadecimal numbers separated by periods or colons, i.e. 0080002012ef, 0:80:0:2:20:ef) which uniquely identifes a computer that has an Ethernet interface. Unlike the IP number, it includes no indication of where your computer is located. In DHCP’s typical use, the server uses a requesting computer’s MAC address to uniquely identify it.

Q: – Can a DHCP server back up another DHCP server?

You can have two or more servers handing out leases for different addresses. If each has a dynamic pool accessible to the same clients, then even if one server is down, one of those clients can lease an address from the other server. However, without communication between the two servers to share their information on current leases, when one server is down, any client with a lease from it will not be able to renew their lease with the other server. Such communication is the purpose of the “server to server protocol” (see next question). It is possible that some server vendors have addressed this issue with their own proprietary server-to-server communication.

Q: – What protocol and port does DHCP use?

DHCP, like BOOTP runs over UDP, utilizing ports 67 and 68.

Q:1 What does BIND Stands for ?

Ans: BIND stands for Berkeley Internet Name Domain.

Q:2 What is DNS Server and its fundamentals ?

Ans: The Domain Name System (DNS) is a hierarchical, distributed database. It stores information for mapping Internet host names to IP addresses and vice versa, mail routing information, and other data used by Internet applications. Clients look up information in the DNS by calling a resolver library, which sends queries to one or more name servers and interprets the responses. The BIND 9 software distribution contains a name server, named, and a resolver library, liblwres.

Q:3 What is the default port of BIND ?

Ans: The BIND server is accessed via the network on port 53. Both TCP and UPD ports are used. Queries are made via UDP & Responses are made via UDP unless the response is too large to fit in a single packet , If the response won’t fit in a single UDP packet, then the response is returned via TCP.

Q:4 How will you define Domain Name ?

Ans: The data stored in the DNS is identified by domain names that are organized as a tree according to organizational or administrative boundaries. Each node of the tree, called a domain, is given a label. The domain name of the node is the concatenation of all the labels on the path from the node to the root node. This is represented in written form as a string of labels listed from right to left and separated by dots. A label need only be unique within its parent domain.

For example, a domain name for a host at the company Linuxtechi, Inc. could be mail.linuxtechi.com, where com is the top level domain to which mail.linuxtechi.com belongs, example is a subdomain of com, and ‘mail’ is the name of the host

Q:5 What are zone files in DNS server ?

Ans: The files which contain the data being served by the DNS system are called “Zone Files” They are made up of a series of “Resource Records”. A Zone File will always contain an SOA record as well as additional records.

Q:6 What are the different types of DNS Server ?

Ans: Primary Master : The authoritative server where the master copy of the zone data is maintained is called the primary master server, or simply the primary. Typically it loads the zone contents from some local file edited by humans or perhaps generated mechanically from some other local file which is edited by humans. This file is called the zone file or master file.

Slave Server : The other authoritative servers, the slave servers (also known as secondary servers) load the zone contents from another server using a replication process known as a zone transfer. Typically the data are transferred directly from the primary master, but it is also possible to transfer it from another slave. In other words, a slave server may itself act as a master to a subordinate slave server.

Caching Name Server : Caching Name server is not authoritative for any zone, all queries are forwarded to other DNS servers if they are not stored in the DNS-cache zone. Answers for all queries are cached in DNS-cache zone for a time.

Forwarding : In this type of DNS server , all queries are forwarded to a specific list of name servers

Q:7 How the load balancing is achieved using DNS ?

Ans: A primitive form of load balancing can be achieved in the DNS by using multiple records (such as multiple A records) for one name. For example, if you have three WWW servers with network addresses of 10.0.0.1, 10.0.0.2 and 10.0.0.3, a set of records such as the following means that clients will connect to each machine one third of the time

multiple-a-records

When a resolver queries for these records, BIND will rotate them and respond to the query with the records in a different order. In the example above, clients will randomly receive records in the order 1,2, 3; 2, 3, 1; and 3, 1, 2. Most clients will use the first record returned and discard the rest.

Q:8 How to check syntax of named.conf is correct or not ?

Ans: named-checkconf is the command, which checks the syntax of named.conf file.

# named-checkconf /etc/named.conf

If bind is running in chroot environment use below command

# named-checkconf -t /var/named/chroot /etc/named.conf

Q:9 What are the different types of Resource Records in bind ?

Ans: Below are the list of resource records in bind :

SOA – start of authority, for a given zone

NS – name server

A – name-to-address mapping

PTR – address-to-name mapping

CNAME – canonical name (for aliases)

MX – mail exchanger (host to receive mail for this name)

TXT – textual info

RP – contact person for this zone

WKS – well known services

HINFO – host information

Comments start with ; continue to end of line

Q:10 Explain Bind chroot environment ?

Ans: Running bind in a chroot environment means named process will be limited to their directory only (/var/named/chroot). This can help improve system security by placing BIND in a ”sandbox”, which will limit the damage done if a server is compromised.

Q:11 What is domain delegation in Bind ?

Ans: Domain delegation means fully delegate the responsibility for a sub-domain to another name server.

Exmaple :

squid.linuxtechi.com IN NS ns2.linuxtechi.com

ns2.linuxtechi.com IN A 192.168.1.51

As the name suggest passwd command is used to change the password of system users. If the passwd command is executed by non-root user then it will ask for the current password and then set the new password of a user who invoked the command. When this command is executed by super user or root then it can reset the password for any user including root without knowing the current password.

In this post we will discuss passwd command with practical examples.

Syntax :

# passwd {options} {user\_name}

Different options that can be used in passwd command are listed below :

passwd-command-options

Example:1 Change Password of System Users

When you logged in as non-root user like ‘linuxtechi’ in my case and run passwd command then it will reset password of logged in user.

[linuxtechi@linuxworld ~]$ passwd

Changing password for user linuxtechi.

Changing password for linuxtechi.

(current) UNIX password:

New password:

Retype new password:

passwd: all authentication tokens updated successfully.

[linuxtechi@linuxworld ~]$

When you logged in as root user and run passwd command then it will reset the root password by default and if you specify the user-name after passwd command then it will change the password of that user.

[root@linuxworld ~]# passwd

[root@linuxworld ~]# passwd linuxtechi

passwd-command

Note : System user’s password is stored in an encrypted form in /etc/shadow file.

Example:2 Display Password Status Information.

To display password status information of a user , use -S option in passwd command.

[root@linuxworld ~]# passwd -S linuxtechi

linuxtechi PS 2015-09-20 0 99999 7 -1 (Password set, SHA512 crypt.)

[root@linuxworld ~]#

In the above output first field shows the user name and second field shows Password status ( PS = Password Set , LK = Password locked , NP = No Password ), third field shows when the password was changed and last & fourth field shows minimum age, maximum age, warning period, and inactivity period for the password

Example:3 Display Password Status info for all the accounts

To display password status info for all the accounts use “-aS” option in passwd command, example is shown below :

root@localhost:~# passwd -Sa

passwd-sa

Example:4 Removing Password of a User using -d option

In my case i am removing/ deleting the password of ‘linuxtechi‘ user.

[root@linuxworld ~]# passwd -d linuxtechi

Removing password for user linuxtechi.

passwd: Success

[root@linuxworld ~]#

[root@linuxworld ~]# passwd -S linuxtechi

linuxtechi NP 2015-09-20 0 99999 7 -1 (Empty password.)

[root@linuxworld ~]#

“-d” option will make user’s password empty and will disable user’s account.

Example:5 Set Password Expiry Immediately

Use ‘-e’ option in passwd command to expire user’s password immediately , this will force the user to change the password in the next login.

[root@linuxworld ~]# passwd -e linuxtechi

Expiring password for user linuxtechi.

passwd: Success

[root@linuxworld ~]# passwd -S linuxtechi

linuxtechi PS 1970-01-01 0 99999 7 -1 (Password set, SHA512 crypt.)

[root@linuxworld ~]#

Now Try to ssh machine using linuxtechi user.

passwd-expiry

Example:6 Lock the password of System User

Use ‘-l‘ option in passwd command to lock a user’s password, it will add “!” at starting of user’s password. A User can’t Change it’s password when his/her password is locked.

[root@linuxworld ~]# passwd -l linuxtechi

Locking password for user linuxtechi.

passwd: Success

[root@linuxworld ~]# passwd -S linuxtechi

linuxtechi LK 2015-09-20 0 99999 7 -1 (Password locked.)

[root@linuxworld ~]#

Example:7 Unlock User’s Password using -u option

[root@linuxworld ~]# passwd -u linuxtechi

Unlocking password for user linuxtechi.

passwd: Success

[root@linuxworld ~]#

Example:8 Setting inactive days using -i option

-i option in passwd command is used to set inactive days for a system user. This will come into the picture when password of user ( in my case linuxtechi) expired and user didn’t change its password in ‘n‘ number of days ( i.e 10 days in my case) then after that user will not able to login.

[root@linuxworld ~]# passwd -i 10 linuxtechi

Adjusting aging data for user linuxtechi.

passwd: Success

[root@linuxworld ~]#

[root@linuxworld ~]# passwd -S linuxtechi

linuxtechi PS 2015-09-20 0 99999 7 10 (Password set, SHA512 crypt.)

[root@linuxworld ~]#

Example:9 Set Minimum Days to Change Password using -n option.

In the below example linuxtechi user has to change the password in 90 days. A value of zero shows that user can change it’s password in any time.

[root@linuxworld ~]# passwd -n 90 linuxtechi

Adjusting aging data for user linuxtechi.

passwd: Success

[root@linuxworld ~]# passwd -S linuxtechi

linuxtechi PS 2015-09-20 90 99999 7 10 (Password set, SHA512 crypt.)

[root@linuxworld ~]#

Example:10 Set Warning days before password expire using -w option

‘-w’ option in passwd command is used to set warning days for a user. It means a user will be warned for n number of days that his/her password is going to expire.

[root@linuxworld ~]# passwd -w 12 linuxtechi

Adjusting aging data for user linuxtechi.

passwd: Success

[root@linuxworld ~]# passwd -S linuxtechi

linuxtechi PS 2015-09-20 90 99999 12 10 (Password set, SHA512 crypt.)

[root@linuxworld ~]#

Linux distributions still ship with the assumption that they will be multi-user systems, meaning resource limits are set for a normal human doing day-to-day desktop work. For a high-performance system trying to serve thousands of concurrent network clients, these limits are far too low. If you have an online game or web app that’s pushing the envelope, these settings can help increase awesomeness.

The parameters we’ll adjust are as follows:

Increase max open files to 100,000 from the default (typically 1024). In Linux, every open network socket requires a file descriptor. Increasing this limit will ensure that lingering TIME\_WAIT sockets and other consumers of file descriptors don’t impact our ability to handle lots of concurrent requests.

Decrease the time that sockets stay in the TIME\_WAIT state by lowering tcp\_fin\_timeout from its default of 60 seconds to 10. You can lower this even further, but too low, and you can run into socket close errors in networks with lots of jitter. We will also set tcp\_tw\_reuse to tell the kernel it can reuse sockets in the TIME\_WAIT state.

Increase the port range for ephemeral (outgoing) ports, by lowering the minimum port to 10000 (normally 32768), and raising the maximum port to 65000 (normally 61000). Important: This means you can’t have server software that attempts to bind to a port above 9999! If you need to bind to a higher port, say 10075, just modify this port range appropriately.

Increase the read/write TCP buffers (tcp\_rmem and tcp\_wmem) to allow for larger window sizes. This enables more data to be transferred without ACKs, increasing throughput. We won’t tune the total TCP memory (tcp\_mem), since this is automatically tuned based on available memory by Linux.

Decrease the VM swappiness parameter, which discourages the kernel from swapping memory to disk. By default, Linux attempts to swap out idle processes fairly aggressively, which is counterproductive for long-running server processes that desire low latency.

Increase the TCP congestion window, and disable reverting to TCP slow start after the connection is idle. By default, TCP starts with a single small segment, gradually increasing it by one each time. This results in unnecessary slowness that impacts the start of every request – which is especially bad for HTTP.

Ok, enough chat, more code.

Kernel Parameters

To start, edit /etc/sysctl.conf and add these lines:

# /etc/sysctl.conf

# Increase system file descriptor limit

fs.file-max = 100000

# Discourage Linux from swapping idle processes to disk (default = 60)

vm.swappiness = 10

# Increase ephermeral IP ports

net.ipv4.ip\_local\_port\_range = 10000 65000

# Increase Linux autotuning TCP buffer limits

# Set max to 16MB for 1GE and 32M (33554432) or 54M (56623104) for 10GE

# Don't set tcp\_mem itself! Let the kernel scale it based on RAM.

net.core.rmem\_max = 16777216

net.core.wmem\_max = 16777216

net.core.rmem\_default = 16777216

net.core.wmem\_default = 16777216

net.core.optmem\_max = 40960

net.ipv4.tcp\_rmem = 4096 87380 16777216

net.ipv4.tcp\_wmem = 4096 65536 16777216

# Make room for more TIME\_WAIT sockets due to more clients,

# and allow them to be reused if we run out of sockets

# Also increase the max packet backlog

net.core.netdev\_max\_backlog = 50000

net.ipv4.tcp\_max\_syn\_backlog = 30000

net.ipv4.tcp\_max\_tw\_buckets = 2000000

net.ipv4.tcp\_tw\_reuse = 1

net.ipv4.tcp\_fin\_timeout = 10

# Disable TCP slow start on idle connections

net.ipv4.tcp\_slow\_start\_after\_idle = 0

# If your servers talk UDP, also up these limits

net.ipv4.udp\_rmem\_min = 8192

net.ipv4.udp\_wmem\_min = 8192

# Disable source routing and redirects

net.ipv4.conf.all.send\_redirects = 0

net.ipv4.conf.all.accept\_redirects = 0

net.ipv4.conf.all.accept\_source\_route = 0

# Log packets with impossible addresses for security

net.ipv4.conf.all.log\_martians = 1

Since some of these settings can be cached by networking services, it’s best to reboot to apply them properly (sysctl -p does not work reliably).

Open File Descriptors

In addition to the Linux fs.file-max kernel setting above, we need to edit a few more files to increase the file descriptor limits. The reason is the above just sets an absolute max, but we still need to tell the shell what our per-user session limits are.

So, first edit /etc/security/limits.conf to increase our session limits:

# /etc/security/limits.conf

# allow all users to open 100000 files

# alternatively, replace \* with an explicit username

\* soft nofile 100000

\* hard nofile 100000

Next, /etc/ssh/sshd\_config needs to make sure to use PAM:

# /etc/ssh/sshd\_config

# ensure we consult pam

UsePAM yes

And finally, /etc/pam.d/sshd needs to load the modified limits.conf:

# /etc/pam.d/sshd

# ensure pam includes our limits

session required pam\_limits.so

You can confirm these settings have taken effect by opening a new ssh connection to the box and checking ulimit:

$ ulimit -n

100000

Why Linux has evolved to require 4 different settings in 4 different files is beyond me, but that’s a topic for a different post. :)

TCP Congestion Window

Finally, let’s increase the TCP congestion window from 1 to 10 segments. This is done on the interface, which makes it a more manual process that our sysctl settings. First, use ip route to find the default route, shown in bold below:

$ ip route

default via 10.248.77.193 dev eth0 proto kernel

10.248.77.192/26 dev eth0 proto kernel scope link src 10.248.77.212

Copy that line, and paste it back to the ip route change command, adding initcwnd 10 to the end to increase the congestion window:

$ sudo ip route change default via 10.248.77.193 dev eth0 proto kernel initcwnd 10

To make this persistent across reboots, you’ll need to add a few lines of bash like the following to a startup script somewhere. Often the easiest candidate is just pasting these lines into /etc/rc.local:

defrt=`ip route | grep "^default" | head -1`

ip route change $defrt initcwnd 10

Once you’re done with all these changes, you’ll need to either bundle a new machine image, or integrate these changes into a system management package such as Chef or Puppet.

Linux Tuning

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This page contains a quick reference guide for Linux 2.6+ tuning for Data Transfer hosts connected at speeds of 1Gbps or higher. Note that most of the tuning settings described here will actually decrease performance of hosts connected at rates of OC3 (155 Mbps) or less, such as home users on Cable/DSL connections.

For a detailed explanation of some of the advice on this page, see the Linux Tuning Expert page. Note that the settings on this page are not attempting to achieve full 10G with a single flow. These settings assume you are using tools that support parallel streams, or have multiple data transfers occurrin in parallel, and want to have fair sharing between the flows. As such the maximum values are 2 to 4 times less than what would be required to support a single stream. As an example, a 10Gbps flow across a 100ms network requires 120MB of buffering. Most data movement applications, such as GridFTP, would employ 2-8 streams to do this efficiently and to guard against congestive packet loss. Setting your 10Gbps capable host to consume a maximum of 32M - 64M per socket ensures that parallel streams work well, and do not consume a majority of system resources.

If you are trying to optimize for a single flow, see the tuning advice for test / measurement hosts page.

General Approach

To check what setting your system is using, use 'sysctl name' (e.g.: 'sysctl net.ipv4.tcp\_rmem'). To change a setting use 'sysctl -w'. To make the setting permanent add the setting to the file 'sysctl.conf'.

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TCP tuning

Like most modern OSes, Linux now does a good job of auto-tuning the TCP buffers, but the default maximum Linux TCP buffer sizes are still too small. Here are some example sysctl.conf commands for different types of hosts.

For a host with a 10G NIC, optimized for network paths up to 100ms RTT, and for friendlyness to single and parallel stream tools, add this to /etc/sysctl.conf

# allow testing with buffers up to 64MB

net.core.rmem\_max = 67108864

net.core.wmem\_max = 67108864

# increase Linux autotuning TCP buffer limit to 32MB

net.ipv4.tcp\_rmem = 4096 87380 33554432

net.ipv4.tcp\_wmem = 4096 65536 33554432

# increase the length of the processor input queue

net.core.netdev\_max\_backlog = 30000

# recommended default congestion control is htcp

net.ipv4.tcp\_congestion\_control=htcp

# recommended for hosts with jumbo frames enabled

net.ipv4.tcp\_mtu\_probing=1

Also add this to /etc/rc.local (where N is the number for your 10G NIC):

/sbin/ifconfig ethN txqueuelen 10000

For a host with a 10G NIC optimized for network paths up to 200ms RTT, and for friendlyness to single and parallel stream tools, or a 40G NIC up on paths up to 50ms RTT:

# allow testing with buffers up to 128MB

net.core.rmem\_max = 134217728

net.core.wmem\_max = 134217728

# increase Linux autotuning TCP buffer limit to 64MB

net.ipv4.tcp\_rmem = 4096 87380 67108864

net.ipv4.tcp\_wmem = 4096 65536 67108864

# increase the length of the processor input queue

net.core.netdev\_max\_backlog = 250000

# recommended default congestion control is htcp

net.ipv4.tcp\_congestion\_control=htcp

# recommended for hosts with jumbo frames enabled

net.ipv4.tcp\_mtu\_probing=1

Notes: you should leave net.tcp\_mem alone, as the defaults are fine. A number of performance experts say to also increase net.core.optmem\_max to match net.core.rmem\_max and net.core.wmem\_max, but we have not found that makes any difference. Some experts also say to set net.ipv4.tcp\_timestamps and net.ipv4.tcp\_sack to 0, as doing that reduces CPU load. We strongly disagree with that recommendation for WAN performance, as we have observed that the default value of 1 helps in more cases than it hurts, and can help a lot.

Linux supports pluggable congestion control algorithms. To get a list of congestion control algorithms that are available in your kernel (kernal 2.6.20+), run:

sysctl net.ipv4.tcp\_available\_congestion\_control

If cubic and/or htcp are not listed try the following, as most distributions include them as loadable kernel modules:

/sbin/modprobe tcp\_htcp

/sbin/modprobe tcp\_cubic

NOTE: There seem to be bugs in both bic and cubic for a number of versions of the Linux kernel up to version 2.6.33. We recommend using htcp with older kernels to be safe. To set the congestion control do:

sysctl -w net.ipv4.tcp\_congestion\_control=htcp

If you are using Jumbo Frames, we recommend setting tcp\_mtu\_probing = 1 to help avoid the problem of MTU black holes. Setting it to 2 sometimes causes performance problems.

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UDP Tuning

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NIC Tuning

This can be added to /etc/rc.local to be run at boot time:

# increase txqueuelen for 10G NICS

/sbin/ifconfig ethN txqueuelen 10000

Note that this might have adverse affects for a 10G host sending to a 1G host or slower.

We also note that we have seen about a 30% performance hit using VLANS with Linux with some hosts/NICS, as it can break the hardware offload capabilities. Myricom mentions this here.

UDP Tuning

UDP will not get a full 10Gbps (or more) without some tuning as well. The important factors are:

use jumbo frames: performance will be 4-5 times better using 9K MTUs

packet size: best performance is MTU size minus packet header size. For example for a 9000Byte MTU, use 8972 for IPV4, and 8952 for IPV6.

socket buffer size: For UDP, buffer size is not related to RTT the way TCP is, but the defaults are still not large enough. Setting the socket buffer to 4M seems to help a lot in most cases

core selection: UDP at 10G is typically CPU limited, so its important to pick the right core. This is particularly true on Sandy/Ivy Bridge motherboards.

Sample commands for iperf, iperf3, and nuttnuttcp:

nuttcp -l8972 -T30 -u -w4m -Ru -i1 -xc4/4 remotehost

iperf3 -l8972 -T30 -u -w4m -b0 -A 4,4 -c remotehost

numactl -C 4 iperf -l8972 -T30 -u -w4m -b10G -c remotehost

You may need to try different cores to find the best one for your host. You can use 'mpstat -P ALL 1' to figure out which core is being used for NIC interrupt handling, and then try a core in the same socket, but not the same core. Note that 'top' is not reliable for this.

In general nuttcp seems to be the fastest for UDP. Note that you'll need nuttcp V7.1 or higher to get the "-xc" option.

Even with this tuning, you'll need fast cores to get a full 10Gbps. For example, a 2.9GHz Intel Xeon CPU can get the full 10Gbps line rate, but with a 2.5GHz Intel Xeon CPU, we see only 5.9Gbps. The 2.9GHz CPU gets 22 Gbps of UDP using a 40G NIC.

Processor architectures are being designed to facilitate aggregate capacity (e.g. more cores) at the expense of clock rate. Pushing the clock speeds higher has been problematic, while providing diminishing returns for some use cases. Many newer machines offer more cores, and this generally work great in VMs and for large numbers of small network flows. Single stream performance testing is one use case that benefits from fewer cores, and higher clock speeds.

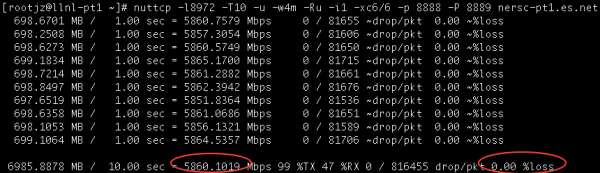
If you want to see how much you can get with 2 UDP flows, each on a separate core, you can do something like this:

nuttcp -i1 -xc 2/2 -Is1 -u -Ru -l8972 -w4m -p 5500 remotehost & \

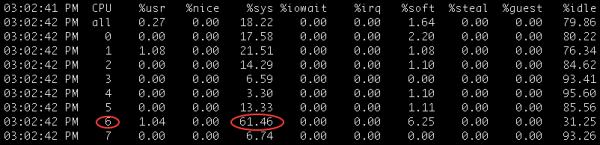
nuttcp -i1 -xc 3/3 -Is2 -u -Ru -l8972 -w4m -p 5501 remotehost & \

Determining CPU Limitations

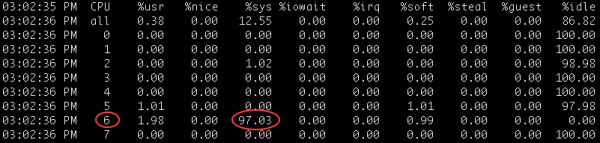
If you are running the commands above, but still don't see great performance, use 'mpstat -P ALL 1' to determine how much CPU is being used. For example, here is a nuttcp test using the suggested command line options, and the result is 5.9 Gbps:



Note that nuttcp reports 99% CPU on the transmit host. mpstat on the recieving host confirms that core 6 is not saturated:



mpstat on the sending host confirms that core 6 is saturated:



For these hosts, running multiple nuttcp clients on different cores will increase total throughput.

Q:1 What is Virtualization ?

Ans: Virtualization is a technique for creating virtual resources (rather than the actual) such as server, storage device, network and Operating system. Virtualization is dis-associating the tight bond between software and hardware.

Q:2 What are the different types of Virtualization ?

Ans: Virtualization can be used in different ways and can take many different forms. Some of them are listed below :

Server Virtualization

Network Virtualization

Hardware virtualization

Application virtualization

Desktop virtualization

User virtualization

Q:3 What is the difference between full virtualization & para virtualization ?

Ans: Full virtualization & para virtualization both comes under the Hardware virtualization. Some of the difference between them are listed below :

Full Virtualization : It is a virtualization in which guest machine(virtual machines) is unware that it is in virtualized environment therefore hardware is virtualized by the host operating system so that the guest can issue commands to what it thinks is actual hardware but really are just simulated hardware devices created by the host

Para Virtualization : It is a virtualization in which guest machine is aware that it is in virtualized environment . If guest machine require resources like memory & cpu , it issues command to guest operating system instead of directly communication with actual hardware.

Q:4 What is hypervisor ?

Ans: Hypervisor is a peace of a software that is being install on the physical machine , which then further creates and run virtual machines. Virtual machine are known as guest machines and host machine is the hypervisor on which different virtual machines are created.

Q:5 What are different hypervisors available in Linux ?

Ans: Xen & KVM are two hypervisor available in linux.

Q:6: What is the difference between Xen & KVM ?

Ans: For Xen hypervisor first we have to install Xen kernel and have to boot the machine with Xen kernel where as KVM is kernel based Virtualization , we don’t need any extra kernel for KVM. KVM is a module in Kernel. Xen hypervisor by default doesn’t support full virtualization whereas KVM supports Full virtualization.

Q:7 What is Type-1 and Type-2 hypervisor ?

Ans: Type-1 hypervisor is bare metal hypervisor runs on bare metal of hardware. Hyper-V and ESXI Server are the examples of type-1 hypervisor. Type-2 hypervisor is hosted by operating system. Examples of type-2 hypervisor are Microsoft Virtual Server & VMware Server.

Q:8 What is Dom0 in Xen ?

Ans: Dom0 or Domain0 is the initial domain started by xen hypervisor. It has the special rights like to start new domain and access the hardware directly. Dom0 is responsible for running all of the device drivers for the hardware.

Q:9 How to verify Virtualization Technology (VT) is enabled in your server’s BIOS or not ?

Ans : grep -E ‘svm|vmx’ /proc/cpuinfo

vmx is for Intel processors

svm is for AMD processors

Q:10 What is the use of virsh command ?

Ans: virsh is the interface or command for managing the virtual machines based on KVM & Xen hypervisor. On virsh interface virtual machines are identified by their domain names , so virsh is generally used to list current domains , to create , pause & shutdown domains.

Q:11 How to identify the KVM version ?

Ans: To find the KVM version use the command ‘virsh version’

Q:12 Which command is used to list all virtual machine running on the KVM hypervisor ?

Ans: Using the command ‘virsh list –all’ we can list all virtual machines irrespective of their states.

Q:13 How to forcefully shutdown the KVM based virtual machine from the command line ?

Ans: We can forcefully shutdown the VM using the command ‘virsh destroy machine\_name’.This command should only be used in a case where VM is in Hung state because forcefully shutdowm may cause filesystem corruption.

Q:14 What are the basic requirements of VM live migration in KVM ?

Ans: Some of the basic requirements are listed below :

The guest image or virtual machine image must be located on a shared storage and it must be accessible using iSCSI, NFS, GFS2 or Fibre Channel.

The shared storage must be mounted on the same path on both the hypervisors / hosts.

Both hypervisors / hosts must run the same version of KVM.

Both guests or VMs must have the same network configuration & bridging configuration (their IPs must be different)

Q:15 Which command is used in KVM for VMs live migration ?

Ans: ‘virsh migrate –live machine\_name qemu+ssh://destination\_server/system’

Q:16 What are the different states of a VM in Xen hypervisor ?

Ans: A VM can have different states like

r – Running

b – Blocked

c – crashed

s – Shutdown

p – Paused

Q:17 How to get the console of guest or virtual machine in Xen ?

Ans: xm console <domain-id>

Q:18 How to shutdown,reboot & start VMs ( domain-ids) in Xen ?

Ans: Use xm command :

# xm shutdown [domain-id]

# xm reboot [domain-id]

# xm start [domain-id]

Q:19 How to get hardware information of KVM guest machine ?

Ans: Use the command ‘virsh dominfo <domain-name / VM Name>’

Q:20 How to connect a particular VM using virt-viewer ?

Ans: virt-viewer -c qemu:///system <VM\_Name>

Q:1 How to check current run level of a linux server ?

Ans: ‘who -r’ & ‘runlevel’ commands are used to check the current runlevel of a linux box.

Q:2 How to check the default gatway in linux ?

Ans: Using the commands “route -n” and “netstat -nr” , we can check default gateway. Apart from the default gateway info , these commands also display the current routing tables .

Q:3 How to rebuild initrd image file on Linux ?

Ans: In case of CentOS 5.X / RHEL 5.X , mkinitrd command is used to create initrd file , example is shown below :

# mkinitrd -f -v /boot/initrd-$(uname -r).img $(uname -r)

If you want to create initrd for a specific kernel version , then replace ‘uname -r’ with desired kernel

In Case of CentOS 6.X / RHEL 6.X , dracut command is used to create initrd file example is shown below :

# dracut -f

Above command will create the initrd file for the current version. To rebuild the initrd file for a specific kernel , use below command :

# dracut -f initramfs-2.x.xx-xx.el6.x86\_64.img 2.x.xx-xx.el6.x86\_64

Q:4 What is cpio command ?

Ans: cpio stands for Copy in and copy out. Cpio copies files, lists and extract files to and from a archive ( or a single file).

Q:5 What is patch command and where to use it ?

Ans: As the name suggest patch command is used to apply changes ( or patches) to the text file. Patch command generally accept output from the diff and convert older version of files into newer versions. For example Linux kernel source code consists of number of files with millions of lines , so whenever any contributor contribute the changes , then he/she will be send the only changes instead of sending the whole source code. Then the receiver will apply the changes with patch command to its original source code.

Create a diff file for use with patch,

# diff -Naur old\_file new\_file > diff\_file

Where old\_file and new\_file are either single files or directories containing files. The r option supports recursion of a directory tree.

Once the diff file has been created, we can apply it to patch the old file into the new file:

# patch < diff\_file

Q:6 What is use of aspell ?

Ans: As the name suggest aspell is an interactive spelling checker in linux operating system. The aspell command is the successor to an earlier program named ispell, and can be used, for the most part, as a drop-in replacement. While the aspell program is mostly used by other programs that require spell-checking capability, it can also be used very effectively as a stand-alone tool from the command line.

Q:7 How to check the SPF record of domain from command line ?

Ans: We can check SPF record of a domain using dig command. Example is shown below :

linuxtechi@localhost:~$ dig -t TXT google.com

Q:8 How to identify which package the specified file (/etc/fstab) is associated with in linux ?

Ans: # rpm -qf /etc/fstab

Above command will list the package which provides file “/etc/fstab”

Q:9 Which command is used to check the status of bond0 ?

Ans: cat /proc/net/bonding/bond0

Q:10 What is the use of /proc file system in linux ?

Ans: The /proc file system is a RAM based file system which maintains information about the current state of the running kernel including details on CPU, memory, partitioning, interrupts, I/O addresses, DMA channels, and running processes. This file system is represented by various files which do not actually store the information, they point to the information in the memory. The /proc file system is maintained automatically by the system.

Q:11 How to find files larger than 10MB in size in /usr directory ?

Ans: # find /usr -size +10M

Q:12 How to find files in the /home directory that were modified more than 120 days ago ?

Ans: # find /home -mtime +l20

Q:13 How to find files in the /var directory that have not been accessed in the last 90 days ?

Ans: # find /var -atime -90

Q:14 Search for core files in the entire directory tree and delete them as found without prompting for confirmation

Ans: # find / -name core -exec rm {} \;

Q:15 What is the purpose of strings command ?

Ans: The strings command is used to extract and display the legible contents of a non-text file.

Q:16 What is the use tee filter ?

Ans: The tee filter is used to send an output to more than one destination. It can send one copy of the output to a file and another to the screen (or some other program) if used with pipe.

linuxtechi@localhost:~$ ll /etc | nl | tee /tmp/ll.out

In the above example, the output from ll is numbered and captured in /tmp/ll.out file. The output is also displayed on the screen.

Q:17 What would the command export PS1 = ”$LOGNAME@`hostname`:\$PWD: do ?

Ans: The export command provided will change the login prompt to display username, hostname, and the current working directory.

Q:18 What would the command ll | awk ‘{print $3,”owns”,$9}’ do ?

Ans: The ll command provided will display file names and their owners.

Q:19 What is the use of at command in linux ?

Ans: The at command is used to schedule a one-time execution of a program in the future. All submitted jobs are spooled in the /var/spool/at directory and executed by the atd daemon when the scheduled time arrives.

Q:20 What is the role of lspci command in linux ?

Ans: The lspci command displays information about PCI buses and the devices attached to your system. Specify -v, -vv, or -vvv for detailed output. With the -m option, the command produces more legible output.

Q:1 What is Shell Script and why it is required ?

Ans: A Shell Script is a text file that contains one or more commands. As a system administrator we often need to issue number of commands to accomplish the task, we can add these all commands together in a text file (Shell Script) to complete daily routine task.

Q:2 What is the default login shell and how to change default login shell for a specific user ?

Ans: In Linux like Operating system “/bin/bash” is the default login shell which is assigned while user creation. We can change default shell using the “chsh” command . Example is shown below :

# chsh <username> -s <new\_default\_shell>

# chsh linuxtechi -s /bin/sh

Q:3 What are the different type of variables used in a shell Script ?

Ans: In a shell script we can use two types of variables :

System defined variables

User defined variables

System defined variables are defined or created by Operating System(Linux) itself. These variables are generally defined in Capital Letters and can be viewed by “set” command.

User defined variables are created or defined by system users and the values of variables can be viewed by using the command “echo $<Name\_of\_Variable>”

Q:4 How to redirect both standard output and standard error to the same location ?

Ans: There two method to redirect std output and std error to the same location:

Method:1 2>&1 (# ls /usr/share/doc > out.txt 2>&1 )

Method:2 &> (# ls /usr/share/doc &> out.txt )

Q:5 What is the Syntax of “nested if statement” in shell scripting ?

Ans : Basic Syntax is shown below :

if [ Condition ]

then

command1

command2

…..

else

if [ condition ]

then

command1

command2

….

else

command1

command2

…..

fi

fi

Q:6 What is the use of “$?” sign in shell script ?

Ans:While writing a shell script , if you want to check whether previous command is executed successfully or not , then we can use “$?” with if statement to check the exit status of previous command. Basic example is shown below :

root@localhost:~# ls /usr/bin/shar

/usr/bin/shar

root@localhost:~# echo $?

0

If exit status is 0 , then command is executed successfully

root@localhost:~# ls /usr/bin/share

ls: cannot access /usr/bin/share: No such file or directory

root@localhost:~# echo $?

2

If the exit status is other than 0, then we can say command is not executed successfully.

Q:7 How to compare numbers in Linux shell Scripting ?

Ans: test command is used to compare numbers in if-then statement. Example is shown below :

#!/bin/bash

x=10

y=20

if [ $x -gt $y ]

then

echo “x is greater than y”

else

echo “y is greater than x”

fi

Q:8 What is the use of break command ?

Ans: The break command is a simple way to escape out of a loop in progress. We can use the break command to exit out from any loop, including while and until loops.

Q:9 What is the use of continue command in shell scripting ?

Ans The continue command is identical to break command except it causes the present iteration of the loop to exit, instead of the entire loop. Continue command is useful in some scenarios where error has occurred but we still want to execute the next commands of the loop.

Q:10 Tell me the Syntax of “Case statement” in Linux shell scripting ?

Ans: The basic syntax is shown below :

case word in

value1)

command1

command2

…..

last\_command

!!

value2)

command1

command2

……

last\_command

;;

esac

Q:11 What is the basic syntax of while loop in shell scripting ?

Ans: Like the for loop, the while loop repeats its block of commands a number of times. Unlike the for loop, however, the while loop iterates until its while condition is no longer true. The basic syntax is :

while [ test\_condition ]

do

commands…

done

Q:12 How to make a shell script executable ?

Ans: Using the chmod command we can make a shell script executable. Example is shown below :

# chmod a+x myscript.sh

Q:13 What is the use of “#!/bin/bash” ?

Ans: #!/bin/bash is the first of a shell script , known as shebang , where # symbol is called hash and ‘!’ is called as bang. It shows that command to be executed via /bin/bash.

Q:14 What is the syntax of for loop in shell script ?

Ans: Basic Syntax of for loop is given below :

for variables in list\_of\_items

do

command1

command2

….

last\_command

done

Q:15 How to debug a shell script ?

Ans: A shell script can be debug if we execute the script with ‘-x’ option ( sh -x myscript.sh). Another way to debug a shell script is by using ‘-nv’ option ( sh -nv myscript.sh).

Q:16 How compare the strings in shell script ?

Ans: test command is used to compare the text strings. The test command compares text strings by comparing each character in each string.

Q:17 What are the Special Variables set by Bourne shell for command line arguments ?

Ans: The following table lists the special variables set by the Bourne shell for command line arguments .

Special Variables

Holds

$0

Name of the Script from the command line

$1

First Command-line argument

$2

Second Command-line argument

…..

…….

$9

Ninth Command line argument

$#

Number of Command line arguments

$\*

All Command-line arguments, separated with spaces

Q:18 How to test files in a shell script ?

Ans: test command is used to perform different test on the files. Basic test are listed below :

Test

Usage

-d file\_name

Returns true if the file exists and is a directory

-e file\_name

Returns true if the file exists

-f file\_name

Returns true if the file exists and is a regular file

-r file\_name

Returns true if the file exists and have read permissions

-s file\_name

Returns true if the file exists and is not empty

-w file\_name

Returns true if the file exists and have write permissions

-x file\_name

Returns true if the file exists and have execute permissions

Q:19 How to put comments in your shell script ?

Ans: Comments are the messages to yourself and for other users that describe what a script is supposed to do and how its works.To put comments in your script, start each comment line with a hash sign (#) . Example is shown below :

#!/bin/bash

# This is a command

echo “I am logged in as $USER”

Q:20 How to get input from the terminal for shell script ?

Ans: ‘read’ command reads in data from the terminal (using keyboard). The read command takes in whatever the user types and places the text into the variable you name. Example is shown below :

# vi /tmp/test.sh

#!/bin/bash

echo ‘Please enter your name’

read name

echo “My Name is $name”

# ./test.sh

Please enter your name

LinuxTechi

My Name is LinuxTechi

Q:21 How to unset or de-assign variables ?

Ans: ‘unset’ command is used to de-assign or unset a variable. Syntax is shown below :

# unset <Name\_of\_Variable>

Q:22 How to perform arithmetic operation ?

Ans: There are two ways to perform arithmetic operations :

1. Using expr command (# expr 5 + 2 )

2. using a dollar sign and square brackets ( $[ operation ] ) Example : test=$[16 + 4] ; test=$[16 + 4]

Q:23 Basic Syntax of do-while statement ?

Ans: The do-while statement is similar to the while statement but performs the statements before checking the condition statement. The following is the format for the do-while statement:

do

{

statements

} while (condition)

Q:24 How to define functions in shell scripting ?

Ans: A function is simply a block of of code with a name. When we give a name to a block of code, we can then call that name in our script, and that block will be executed. Example is shown below :

$ diskusage () { df -h ; }

Q:25 How to use bc (bash calculator) in a shell script ?

Ans: Use the below Syntax to use bc in shell script.

variable=`echo “options; expression” | bc`

NIC(Network Interface Card) bonding is also known as Network bonding. It can be defined as the aggregation or combination of multiple NIC into a single bond interface. It’s main purpose is to provide high availability and redundancy.

In this article we will learn how to configure nic or netwok bonding in CentOS 7 & RHEL 7. In my case i have two interface cards (enp0s3 & enp0s8) and will form a bond interface (bond0).

Prerequisite :

If bonding module is not loaded on your linux box then use the below command to load.

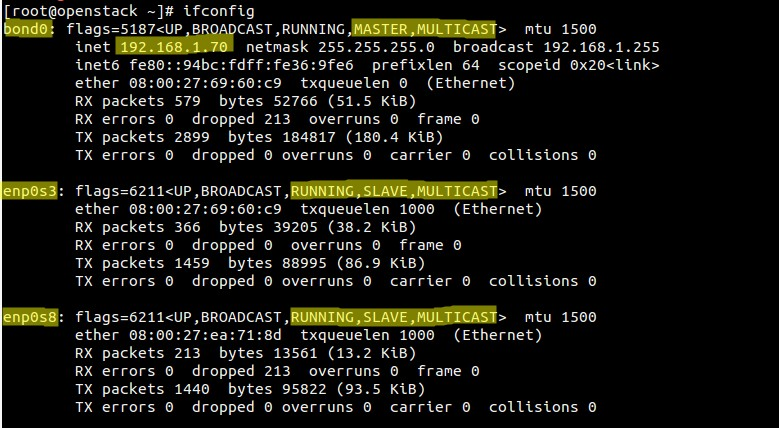
[root@openstack ~]# modprobe bonding

To list the bonding module info, use following command.

[root@openstack ~]# modinfo bonding

Output will be something like below

modinfo-bonding



Step:1 Create Bond Interface File

Create a bond interface file (ifcfg-bond0) under the folder “/etc/sysconfig/network-scripts/”

[root@openstack network-scripts]# vi ifcfg-bond0

DEVICE=bond0

TYPE=Bond

NAME=bond0

BONDING\_MASTER=yes

BOOTPROTO=none

ONBOOT=yes

IPADDR=192.168.1.70

NETMASK=255.255.255.0

GATEWAY=192.168.1.1

BONDING\_OPTS="mode=5 miimon=100"

Save & exit the file.

Specify the IP address, Netmask & bonding modes as per your requirement. In my example i am using ‘mode=5′ which is used to provide fault tolerance and load balancing.

Please refer this for Different Modes in NIC bonding

Step:2 Edit the NIC interface files

For ifcfg-enp0s3

[root@openstack ~]# vi /etc/sysconfig/network-scripts/ifcfg-enp0s3

TYPE=Ethernet

BOOTPROTO=none

DEVICE=enp0s3

ONBOOT=yes

HWADDR="08:00:27:69:60:c9"

MASTER=bond0

SLAVE=yes

For ifcfg-enp0s8

[root@openstack ~]# cat /etc/sysconfig/network-scripts/ifcfg-enp0s8

TYPE=Ethernet

BOOTPROTO=none

DEVICE=enp0s8

ONBOOT=yes

HWADDR="08:00:27:ea:71:8d"

MASTER=bond0

SLAVE=yes

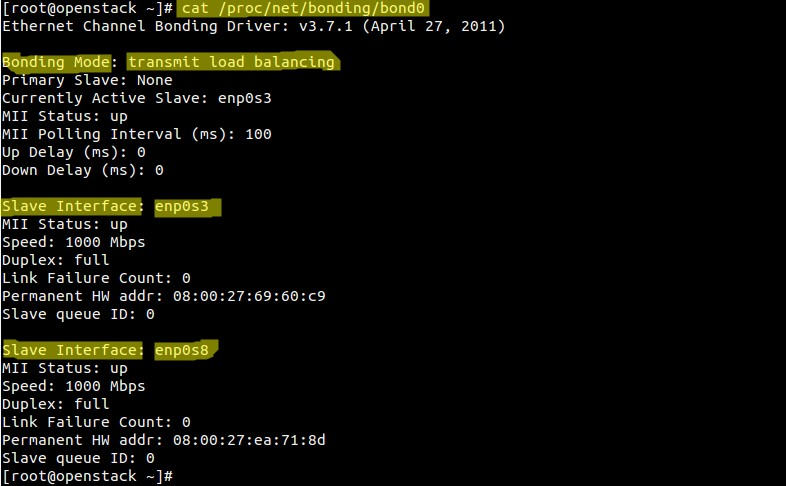
Step:3 Restart the Network Service

Below command will restart the network service and will bring above changes into the effect.

[root@openstack ~]# systemctl restart network.service

Step:4 Test & Verify bond interface.

Use ‘ifconfig‘ & ‘ip add‘ command to check bond interface along with its slave interfaces.

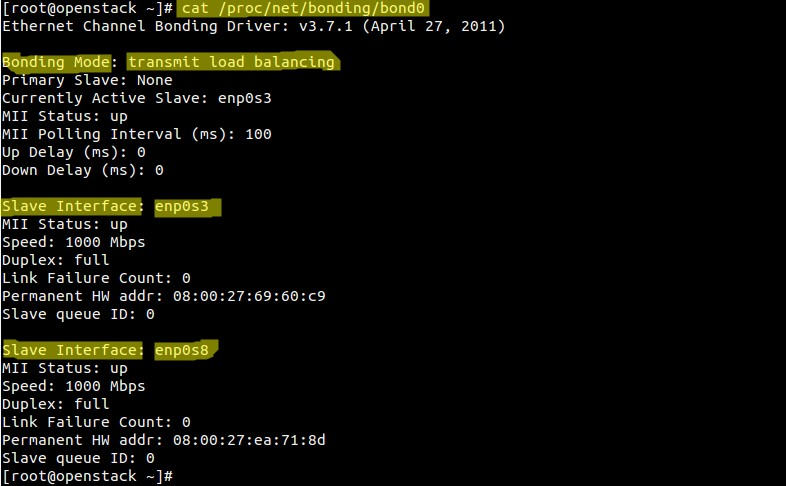


ifconfig-bond

Use following command to view bond interface settings like bonding mode & slave interface.

[root@openstack ~]# cat /proc/net/bonding/bond0

bonding-settings



Step:5 Fault tolerance testing

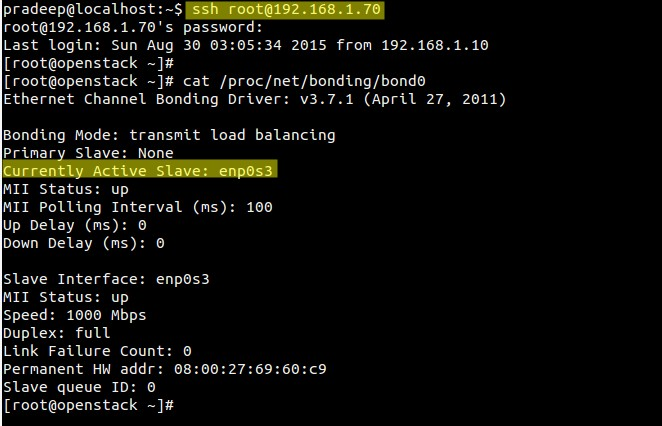
To test the fault tolerance we can down one interface and check whether you are still able access the server.

[root@openstack ~]# ifdown enp0s8

Device 'enp0s8' successfully disconnected.

[root@openstack ~]#

fault-tolerance-bonding



linux admin

Sunday, February 6, 2011

DNS Server Interview Questions And Answers for linux admin

Q: - which are the important configuration files for DNS server ?

BIND uses /etc/named.conf as its main configuration file, the /etc/rndc.conf file as the

configuration file for name server control utility rndc, and the /var/named/ directory for zone files and the like.

Q: - What is BIND ?

BIND stands for Berkeley Internet Name Domain which is the most commonly used Domain Name System (DNS) server on the Internet.

Q: - On which version of bind u have worked ?

BIND 9

Q: - What is the role of DNS ?

A DNS server, or name server, is used to resolve an IP address to a hostname or vice versa.

Q: - On which port DNS server works ?

DNS servers use port 53 by default. Incoming and outgoing packets should be allowed on

port 53. Also allow connections on port 921 if you configure a lightweight resolver server.

The DNS control utility, rndc, connects to the DNS server with TCP port 953 by default. If

you are running rndc on the name server, connections on this TCP port from localhost

should be allowed. If you are running rndc on additional systems, allow connections to

port 953 (or whatever port you have chosen to configure) from these additional systems.

Q: - What is round robin DNS?

Round robin DNS is usually used for balancing the load of geographically distributed Web servers. For example, a company has one domain name and three identical home pages residing on three servers with three different IP addresses. When one user accesses the home page it will be sent to the first IP address. The second user who accesses the home page will be sent to the next IP address, and the third user will be sent to the third IP address. In each case, once the IP address is given out, it goes to the end of the list. The fourth user, therefore, will be sent to the first IP address, and so forth.

Q: - What is Name Server?

A name server keeps information for the translation of domain names to IP addresses and IP addresses to domain names. The name server is a program that performs the translation at the request of a resolver or another name server.

Q: - What is Primary name server or primary master server?

Primary name server/primary master is the main data source for the zone. It is the authoritative server for the zone. This server acquires data about its zone from databases saved on a local disk. The primary server must be published as an authoritative name server for the domain in the SOA resource record, while the primary master server does not need to be published.

Q: - What is Secondary name server/slave name server?

Secondary name server/slave name server acquires data about the zone by copying the data from the primary name server (respectively from the master server) at regular time intervals. It makes no sense to edit these databases on the secondary name servers, although they are saved on the local server disk because they will be rewritten during further copying.

Q: - what is Root name server?

Root name server is an authoritative name server for the root domain (for the dot). Each root name server is a primary server, which differentiates it from other name servers.

Q: - what is Stealth name server?

Stealth name server is a secret server. This type of name server is not published anywhere. It is only known to the servers that have its IP address statically listed in their configuration. It is an authoritative server. It acquires the data for the zone with the help of a zone transfer. It can be the main server for the zone. Stealth servers can be used as a local backup if the local servers are unavailable.

Q: - What do you mean by "Resource Records"?

Information on domain names and their IP addresses, as well as all the other information distributed via DNS is stored in the memory of name servers as Resource Records (RR).

Q: - Explain "TTL"?

Time to live. A 32-bit number indicating the time the particular RR can be kept valid in a server cache. When this time expires, the record has to be considered invalid. The value 0 keeps nonauthoritative servers from saving the RR to their cache memory.

Q: - Tell me 5 Types of DNS records?

A, NS, CNAME, SOA, PTR, MX.

Q:- explain "SOA Record"?

The Start of Authority (SOA) record determines the name server that is an authoritative source of information for the particular domain. There is always only one SOA record in the file, and it is placed at the beginning of the file of authoritative resource records.

Q: - what is "A Record"

A (Address) records assign IP addresses to domain names of computers. The IP address cannot have a dot at the end.

Q: - Explain "CNAME Record"?

Synonyms to domain names can be created using CNAME records. This is often referred to as 'creating aliases for computer names'.

Q: - What are "HINFO and TXT Records"?

HINFO and TXT records are for information only. An HINFO record has two items in its data part. The first item is information about hardware, and the second one is information about software. A TXT record contains a general data string in its data part.

Example :

test.com IN SOA ...

...

mail IN A 192.1.1.2

IN HINFO My\_Server UNIX

IN TXT my server

Q: - what are "MX Records"?

MX records specify the mailing server of the domain. An MX record shows to which computer a mail of a particular domain should be sent. The MX record also includes a priority number, which can be used to determine several computers where the mail for the domain can be sent. The first attempt is to deliver the mail to the computer with the highest priority (lowest value). If this attempt fails, the mail goes to the next computer (with a higher priority value), and so on.

test.com IN SOA ...

...

mail IN A 192.1.1.2

IN HINFO AlphaServer UNIX

IN TXT my server

IN MX 30 mail2.nextstep4it.com

IN MX 20 mail3.nextstep4it.com

IN MX 10 mail2.nextstep4it.com

Q: - Explain "PTR Records"?

A Pointer Record (PTR) is used to translate an IP address into a domain name.

Q: - What is Dynamic DNS?

Dynamic DNS a method of keeping a domain name linked to a changing IP address as not all computers use static IP addresses. Typically, when a user connects to the Internet, the user's ISP assigns an unused IP address from a pool of IP addresses, and this address is used only for the duration of that specific connection. This method of dynamically assigning addresses extends the usable pool of available IP addresses. A dynamic DNS service provider uses a special program that runs on the user's computer, contacting the DNS service each time the IP address provided by the ISP changes and subsequently updating the DNS database to reflect the change in IP address.

Q: - What is the role of "named-checkconf Utility"?

The named-checkconf utility checks the syntax of the named.conf configuration file.

Syntax: named-checkconf [-t directory] [filename]

Q: - what is the role of "named-checkzone Utility"?

The named-checkzone utility checks the syntax and consistency of the zone file.

Syntax: named-checkzone [-dgv] [-c class] zone [filename]

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