

Mail Servers

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Mail Servers – What they do and how they work

This tutorial is going to cover mail servers that run on PC's with either Windows or Linux. Depending on the load of mail, the PC will need to be a fairly decent computer, mail just won't do well on, let's say, a Pentium 90, with 64 Megs of Ram. Lots of Processor power and lots of memory are needed for larger, busy mail servers. This is due to the fact that a lot of things happen at once with a mail server depending on its configuration. It may need to scan for SPAM, Viruses, or other scanning rules (like blocked words or blocked senders) before it can deliver (or reject) an email. At the same time it needs to be responsive for users checking mail. Now imagine a random SPAMMER that may be sending you 100,000 emails or more, as quickly as it can, your server will need to handle that load. Possible configurations might be dual processors or 2 Gigs of ram and a large hard drive, 160 Gigs or so.

Ok, so we have a server that can handle the load, what exactly happens on a mail server? Well, the mail server will run services (programs) that "listen" for activity on certain ports for incoming and outgoing mail requests. It may also host Webmail, so users can check and send emails via a web browser. Each of these three services will run on specific ports. These ports are standard in the industry and run on all mail servers. The services are as follows:

POP3 on port 110

This service is for users to check their mail. If a user wants to download their mail into a mail client like Outlook Express, they will check their mail on this port using the POP3 protocol. Outlook Express does not give the user a choice of which port to use, it's already a default. They will just enter the server name like mail.megamail.com as the server name, Outlook Express will check for mail on port 80 of that server when the user checks his email.

SMTP on port 25

This service is used for sending of all mail. This includes local users sending outbound email AND any other mail server sending mail to your users. This can be a very busy service. This service also must check to see who is trying to send outbound mail. By default, anyone can send mail through a mail server running SMTP on port 80. They do not even have to provide a user name or password, by default. So mail servers are changed to allow only pre-determined users to send mail through the server. This is known as relaying mail. If a server is not "locked down" to only allow pre-determined users to send mail, then it's considered an "open relay" for anyone (usually SPAMMERS) to send mail through. So, outgoing mail is restricted to certain IP addresses OR by forcing users to provide their user name and password in order to send mail. Remember, by default on most servers, a username is not required. If a server were set to require a username to send mail, then you would put a checkmark next to "My server requires Authentication" in Outlook Express for example. This will make the client (Outlook Express) send the username and password when sending mail. By default, in Outlook Express, this is not checked.

IMAP on port 80

This service allows users to check for and send email via a web browser. So it provides a webpage interface on port 80, the standard port for web pages. Some mail server programs will have this service built in, and on some programs, this service will need to be added. But either way, it will use port 80 and the IMAP protocol for providing this.

These “ports” do not necessarily need to be configured when installing, they should all be defaults. But it’s good to know which ports they are on in case you need to allow those ports through a firewall of some sort. Also, the ports could be changed, if for some reason you wanted users to check or send mail on a different port.

Mail Server Choices

I am not going to cover every choice of mail server in this guide but I will cover Linux and Windows and consider the costs and setup of three configurations. In depth installation cannot really be covered in this guide but links to the appropriate web pages will be provided where this information can be accessed.

First of all lets look at an overview the possible mail servers that you might run:

- **Windows Server 2000/2003 running MailEnable Standard**
Low cost, easy to configure.
- **Windows Server 2000/2003 with Imail**
Easy to configure with lots of options.
- **Linux FreeBSD running Qmail**
Low cost and very stable with lots of options. More difficult to configure.

The first two examples are with Windows 2000/2003 server. This could be run on a standard Windows XP or Windows 2000 computer, it does not have to be the Server version of Windows. You will just have a more robust machine with more options if you use the server version of Windows. With windows you will have a running service for each; POP3, SMTP, and IMAP. From time to time these services may need to be restarted. Rarely because they stop responding but usually they may need to be restarted after a change is made. This will keep your other services up and going while your SMTP service is restarted for example.

MailEnable is a free download of the basic package, but the basic package does not come with Webmail. With MailEnable you will create a “Post Office” for each domain you want to host mail for. Under that Post Office you will add the domain and mailboxes for each user. Users can have mailbox size quotas, autoresponders, and redirection to another email address. There are a lot of options for this simple program. You can download the Installation Guide and Quick Start Guide at: <http://www.mailenable.com>

IMail is a very popular Mail server package that can handle several mailboxes with lots of options, more for the size of an ISP for example. You can download a full version of the software and run it for 30 days without the need to purchase it. They will even give you tech support during that 30-day trial period. All versions of Imail come with webmail as part of the package. The webmail has a very nice interface, which can be customized for your company. IMail is made by IPswtich, which also makes Whatsup Gold, a network monitoring system. They are a great company. The install is straightforward and the guide will show you how to setup domains and mailboxes. They have a knowledge base on the website which is pretty good. You can get access to the User’s Guide and Getting Started Guide at: <http://www.ipswitch.com/support/imap/index.asp>

Qmail has been around a long time and is somewhat a standard for mail servers on the Linux platform. It's beginning to be a little outdated as far as mail servers go, but still a workhorse nonetheless. You can run Qmail on just about any version of Linux including Red Hat, Slackware, Debian, FreeBSD (mentioned above) or just about any stable version of your choice. Once the Operating System is chosen and installed, Qmail can be downloaded from [Qmail.org](http://www.qmail.org). You will also need to have separate programs to run the POP3 service and webmail portions of it. I would recommend Vpopmail for POP3 and SquirrelMail for the Webmail portion of it. For further installation steps check out [Qmailrocks.org](http://www.qmailrocks.org), it covers all installation steps and is an awesome resource for this setup including the Operating System and the mail program.

<http://www.qmail.org>

<http://www.qmailrocks.org>

Domain Name, DNS, and Static IP Addresses

Domain Name

A mail server will need to serve mail for a particular domain. This is one that you must have registered with an Internet naming Registrar like Network Solutions or GoDaddy. You will need to register the domain name with them before you can send or receive mail to or from anyone. Let's say you register megamail.com (of course you can't because it's already taken). Now that you have a domain name you will need to let the world know where that server is located on the Internet, so people can reach you. In comes the DNS server. You will have to list a DNS server on your domain record with your Internet naming Registrar so they can tell the world which DNS server will tell them how to find you. Your Internet naming Registrar can provide this for you if needed.

DNS Server

The DNS server provides Domain Name to IP Address resolution. Which means domain names are converted into IP addresses. So if someone types in megamail.com, their system makes a DNS request, which queries a registrar like network solutions, and gets the DNS server listed for the domain, then queries that given DNS server with the domain name, then gets back an IP address. You can test this out at a DOS command prompt with the following commands:

Ping yahoo.com

You will get a reply like this:

Pinging yahoo.com [216.109.127.29] with 32 bytes of data:

Reply from 216.109.127.29: bytes=32 time=150ms TTL=50

Reply from 216.109.127.29: bytes=32 time=141ms TTL=50

Reply from 216.109.127.29: bytes=32 time=130ms TTL=50

Reply from 216.109.127.29: bytes=32 time=130ms TTL=50

Ping mail.yahoo.com

You will get a reply like this:

Pinging login.yahoo.akadns.net [216.109.127.60] with 32 bytes of data:

Reply from 216.109.127.60: bytes=32 time=140ms TTL=241

Reply from 216.109.127.60: bytes=32 time=131ms TTL=241

Reply from 216.109.127.60: bytes=32 time=130ms TTL=241

Reply from 216.109.127.60: bytes=32 time=130ms TTL=241

Notice two things from the above pings tests. One, I pinged two different addresses, yahoo.com and mail.yahoo.com and got two different IP addresses back in reply. Second, when I pinged mail.yahoo.com, it changed the name to login.yahoo.akadns.net. All of these responses were given back from a DNS server. At anytime if an IP address changes or they move their mail server to a new server name, they can control where you connect to with the DNS server. So this example should show you why you need a DNS server with entries for your mail server. A DNS server will need a few entries for your domain and all could be the exact same IP address. These entries would be:

| Host name | Resolves to |
|---|--------------------|
| Megamail.com | 65.10.10.101 |
| www.megamail.com | 65.10.10.101 |
| mail.megamail.com | 65.10.10.102 |
| MX record for megamail.com (Mail exchanger) | mail.megamail.com |

In some cases these could all be on the same IP address, which means it would all come from one computer. Or if you had your mail server on one computer and your website on a different computer, then each would point to its own IP address. Every mail server needs a mail exchanger entry as well.

You can have your Domain Registrar like Network Solutions host your DNS entries for your domain. There is also a website service that will host DNS entries for free located at:
<http://freedns.afraid.org/>

Static IP Address

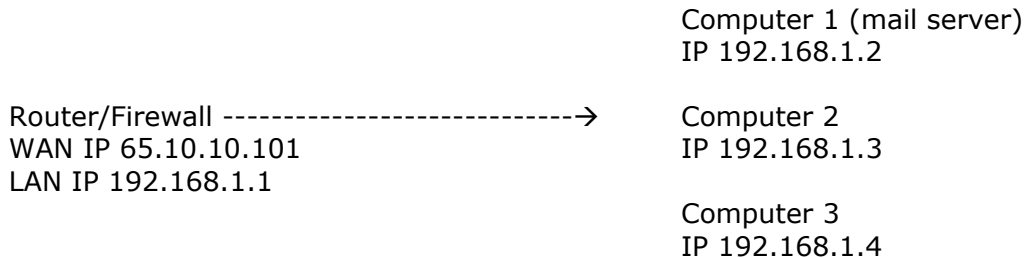
IP addresses are uniquely assigned to each computer and server on the Internet. These addresses are either Dynamic or Static. Dynamic addresses get assigned automatically and change often and Static IP addresses are the same all the time and are assigned to your computer or router and never change. You will need a static IP address to offer Mail services. Depending on the type of Internet connection you have, a static IP address will be offered to you from your ISP or Internet Provider. Most residential or small business Internet connections have Dynamic IP addresses that change from time to time or week to week. This will not work because when people send or check email, they need to connect to the same machine every time. Your DNS entries are going to point to the same Static IP address every time.

Static IP addresses usually cost extra. Some Internet connections (fixed wireless for example) may already come with a static IP address. But most residential and standard small office Internet connections will have an ever-changing dynamic address. So, contact your ISP and ask what it takes to get a static IP address.

Once you have confirmed you have a static IP address, like 65.10.10.101 for example, then this address will be entered into a DNS server for your mail server. So when someone from let's say, AOL, sends you an email, the AOL mail server will query your DNS server, get the IP address of your mail server of your domain, and then send the message to that IP address. Your mail server will accept it (if it has a corresponding mailbox) and deliver it to your mailbox. Then you check your mail with either POP3 (Outlook Express) or IMAP (Webmail) and get the message.

Firewalls and DMZ

If you are setting up your mail server at home or small office, you probably have some sort of router/firewall. What this firewall does is block or hide your systems from the Internet. The firewall is what will have the Static IP address you get from your ISP because this is the one device that's exposed directly to the Internet.



The computers listed above all have non-routable addresses that start with 192.168.x.x. These addresses will not route on the Internet and cannot be used as the address of your mail server because there are no routers that will route the address out the Internet. The router/firewall has two addresses, one for the WAN port (Wide Area Network) where the Internet comes in and one for the LAN port (Local Area Network), which connects to the other computers on the local network. The router firewall routes requests to the Internet and to the local computers and at the same time keeps hackers out of your local computers with the firewall.

So, how do we get mail to our mail server? Well if we only have one static (Internet routable) IP address on the router of 65.10.10.101, then that is the address we need to enter into the DNS server as the address of the Mail server. Then the router will forward requests to the mail server (on the LAN) by using port forwarding. Remember the ports we talked about earlier? Port 110, 25 and 80? We will need to enter port forwards in the router to the mail server on 192.168.1.2. Linksys, Belkin, Netgear all allow port forwards as do most all routers. Here's what Linksys has in its router about Port Forwarding:

Port Range Forwarding can be used to set up public services on your network. When users from the Internet make certain requests on your network, the Router can forward those requests to computers equipped to handle the requests. If, for example, you set the port number 80 (HTTP) to be forwarded to IP Address 192.168.1.2, then all HTTP requests from outside users will be forwarded to 192.168.1.2. **It is recommended that the computer use static IP address.**

So we will enter in the DNS server our mail server's IP address as 65.10.10.101 and then in our router we will enter three port forwards:

POP3 port 110 -----> to 192.168.1.2
SMTP port 25 -----> to 192.168.1.2
IMAP port 80 -----> to 192.168.1.2

If the router requires, these should all be entered as TCP ports, but you may need to enter both TCP and UDP entries for each port.

This will deliver mail to our system and allow outgoing mail as well.

DMZ Host

The other type of configuration is a DMZ host. DMZ stands for De-Militarized Zone. This usually requires two static IP addresses from your Internet provider. One for the firewall and one for the DMZ port. For example you will assign 65.10.10.101 to your Firewall and assign 65.10.10.102 to your DMZ computer, which is the mail server. This will put your mail server right on the Internet and there will not be a need for port forwards. The SonicWall router/firewall allows a DMZ port.

Multiple Domains

You can also host multiple domains on your new mail server. This is called virtual domain hosting. This will allow you to have just one IP address for several domains. Each mail server you setup on your system will have the same static IP address from your Internet provider. One of the domains will be the default domain; the others will be virtual domains. This works very well and keeps you using just one IP address for your system, it's much easier and cheaper to have just one static IP address. One downside is that virtual domain mailbox users will need to enter their usernames as the full email address so the server knows which domain to send/check the mail on. This will allow you to have bob@domain1.com and bob@domain2.com on the same mail server and one IP address.

Mailbox quotas, autoreply, and catchalls

Your mail server will have several options for delivering mail and configuring your users. These are important and useful settings.

Mailbox quotas will limit the size of the users mailbox to a certain size. If this was not in place, one user could fill up all of your hard drive space with thousands of emails and attachments. You may want to limit users to around 15 MB or so for max mailbox size. There will be other limitations like max attachment size, max number of recipients and so on to control what the users are doing.

Autoreply is a setting that can be added to a mailbox to immediately send a reply to an email once it comes in. This may be a vacation message or out of office reply or just a sales notice that someone will be getting back to them shortly. Most all mail servers have this sort of option.

A catchall is one email address that will "catch all" email that does not have a mailbox associated with it. For example, if your mail server only has two mailboxes, lets say postmaster and bob, then if someone sends a message to info@domain1.com it will either reject it or send it to the catchall if it is setup. The catchall would need to point to one email address. So we could set it to postmaster and if some email came in for info@domain1.com, it would send it to postmaster@domain1.com instead of returning the message with a failure like "Mailbox does not exist".

Website links

| | |
|---|---|
| www.mailenable.com | MailEnable mail server software |
| www.ipswitch.com | Imail mail server software |
| www.qmail.org | Qmail server software |
| www.qmailrocks.org | An awesome tutorial for Qmail |
| www.netsol.com | Network Solutions – Domain name Registrar |
| www.godaddy.com | Go Daddy – Domain name Registrar |
| http://freedns.afraid.org/ | A free DNS hosting service |