E-mail services

Why host your own e-mail service?

- Nothing's wrong with Gmail, Hotmail (now Outlook), Yahoo mail and other free hosted e-mail services. But those are targeted mainly towards personal accounts.
- Although each and every "free" e-mail service claim to provide the maximum level of privacy and security, sometimes you can never store your important corporate e-mail messages offsite.
- For this reason, you have to learn how to host your own e-mail server on your own infrastructure, which is the topic of this section

A typical e-mail system consists of

- Sending an e-mail message might be as simple as pressing the "Send" button in your e-mail client. But, under the hood, the following components are involved in this operation:
  - Mail User Agent (MUA): your e-mail client application (Thunderbird, MS Outlook, or /bin/mail are all examples)
  - Mail Submission Agent (MSA): receives the mail message from the MUA and delivers it to the MTA (Mail Transport Agent)
  - Mail Transport Agent (MTA): also called Message Transfer Agent or Mail Relay. This is responsible for delivering the message to the destination machine. It is also responsible for receiving the message on the recipient machine. A server that operates the MTA part of the mail system is called Mail Exchange server. It is the machine that is designated the MX record in a DNS server. Postfix, sendmail, and Microsoft Exchange Server are all valid examples.
  - Mail Delivery Agent: the component that is responsible for delivering the message to the client's mailbox. It is incorporated inside mail systems like Postfix and sendmail.
  - Access Agent (AA): This is an optional component that may be used to connect MUA to the message store

Message User Agent (MUA)

- Sometimes called an E-mail client, it is the software that reads an creates mail messages.
- In the earlier days of E-mail, messages used to contain only plain text. Later on MIME (Multipurpose Internet Mail Extensions) was introduced to enable rich text format, as well as attaching images and files.
- MUA's include modern E-mail clients like Thunderbird and Microsoft Outlook, and also the plain old text based clients like /bin/mail.
- The native Linux mail client is indispensable when running cron jobs; as cron sends an e-mail to the user with the output of cron job commands.

Mail Submission Agents (MSA)

- In earlier days of E-mail systems, MSA was part of the MTA (Mail Transport Agent); but they were later split into two separate components.
- It listens on port 587 in contrast to the MTA which by default listens on port 25.
- Because both MTA and MSA use the same protocol, they are transparent to the user agent, specially if the MSA was configured to listen on port 25
- One of the important tasks handled by MSA is spam filtering

Mail Transport Agent (MTA)

- This is the part that is used for sending and receiving mail messages
- It accepts messages either from the user agent or the submission agent
- It uses the Simple Mail Transfer Protocol (SMTP)
- MTA understands the recipient address and rewrites it – if necessary – to be understood by the delivery agent
- If the message is not intended for the current domain, MTA acts as a "relay server" and forwards the message accordingly.
- Examples of MTA's are Postfix, sendmail, and Exim

Mail Delivery Agent (MDA) and Message Stores

- Also called Local Delivery Agent (LDA), it receives mail messages from MTA and delivers them to the local users' mailboxes.
- Sometimes LDA is part of the MTA
- The message store is the final component in the mail system. It is where the mail message gets stored.
- Messages may be stored in mbox format, where messages are stored in one single file (for example /var/mail/root), and they are separated by a special line of text.
- They can also be stored in Maildir format, where each message is stored in a separate file

Access Agents (AA): POP and IMAP

- Those are used to access the mail system and download the messages for reading on the client device (workstation, laptop, smartphone…etc.)
- The IMAP (Internet Message Access Protocol) downloads messages one by one instead of bulk downloads. It also gives the user the option to view the header and type of attachments. The user then can opt to download the attachment.
- The POP (Post Office Protocol) downloads the whole mailbox to the user's local device. It is not suited for a slow network.
- Most mail clients support both POP and IMAP.

The mail message

- A mail message consists of the following components:
  - The envelope: it contains the From and To fields. These are not part of the message itself.
  - The headers: these are a set property/value pairs containing a variety of information about the message like the time of sending and the transport agents that processed it.
    Headers are very important in troubleshooting as they reveal information about any errors or problems encountered during the message delivery journey
  - The body: either in plain text or in MIME format as previously mentioned

LAB: configuring a mail server using Postfix

- Target: install and configure a Postfix mail server
- Install the Postfix package using the package manager:
  `yum -y install postfix`
- Open the main configuration file `/etc/postfix/main.cf` file to configure your mail server
- The server by default listens for traffic on the loopback device. We need to change this to enable it to serve our network:
  `inet_interfaces = all`
- Configure the outgoing domain to be linuxadmin.dev. Otherwise the system will use the hostname instead of the domain:
  ```
  mydomain = linuxadmin.dev
  myorigin = $mydomain
  ```
- Specify the domain name for which Postfix will handle its mail. By default Postfix only handles e-mail directed to the local machine:
  `mydestination = $myhostname, localhost.$mydomain, localhost, $mydomain`
- Set the network subnet(s) on which Postfix will act as a relay server. This option prevents spammers from making use of your server to send harmful messages:
  `mynetworks_style = subnet`

- Clients from outside your subnet must be authorized to use the server to send e-mails to your domain and – optionally – to other domains that you choose to be their mail relay:
  `relay_domains = $mydestination`
- When your clients want to send e-mails to recipients in other domains, the server can either send the message directly to the MX machine of the destination domain, or ask another server (relay host) to do this host. A relay host may be your ISP.
  `relayhost = $mydomain`
- You can use user-friendly names instead of usernames by editing the `/etc/aliases` file. You have to run `newaliases` command after you make any edits
- Test your work my downloading a text-based mail client called mutt:
  yum –y install mutt
- Send a test e-mail message to one of the system users and use the /var/log/maillog message to troubleshoot any problems.