

# Electronic Mail Services

# UNIT 4

# Electronic Mail Services



# Objectives

- Understand electronic mail(email) operation
- Review email transmission
- Basic Sendmail server configuration
- Evaluate the **m4** macro language
- Learn debugging techniques for email servers
- Evaluate **Postfix**
- Learn to configure **Procmail**



# Agenda

- **Sendmail** features
- Email overview
- Basic **Sendmail** configuration
- Using the `m4` macro language
- Debugging **Sendmail**
- Basic **Postfix** configuration
- **Configuring Procmail**

# *Sendmail* Features

- Allows many different types of email addresses to be routed
- Supports virtual domains and users
- Allows masquerading of users and machines
- Provides automatic retry for failed delivery and other error conditions



# Security and "Anti-spam" Features

- Many security features and options:
  - rejects email from unresolvable domains
  - full access control for users, machines, and domains
  - default configuration allows only local connections
  - no longer a setuid root program
- "Anti-spam" features
  - no relaying by default
  - access databases
  - Email header checks
  - interoperability with **spamassassin**



# An Email Review

- Mail user agent (MUA) passes message to mail transport agent (MTA)
- MTA routes message to destination, giving to other intermediate MTAs as necessary
- Domain MTA passes message to mail delivery agent (MDA)
- User receives message



# Server Operations

- User's email agent connects to the local MTA **as an unprivileged mail submission program (MSP)**
- Local MTA queries DNS for destination's MX
- Local MTA opens a TCP/IP connection to port 25 of the target MX
- Both email servers negotiate a SMTP (Simple Mail Transport Protocol) connection
- Target MX allows or rejects email delivery or relaying based upon its own rulesets





# Service Profile: *Sendmail*

- Type: System V-managed service
- Packages: *sendmail*{,-cf,-doc}
- Daemons: **sendmail**
- Script: **sendmail**
- Ports: 25 (smtp)
- Configuration: **/etc/mail/sendmail.cf,**  
**/etc/mail/submit.cf,**  
**/etc/aliases,/etc/mail/,**  
**/usr/share/sendmail-cf/**
- Related: ***procmail***



# Main Configuration Files

- `/etc/mail/sendmail.cf` is the main configuration file for **Sendmail**:
  - Contains domain alias directives, header rewriting directives, relaying rules, etc.
  - Edit this file with care and comprehension
- `/etc/mail/submit.cf` is used when **Sendmail** is called by a user program
  - Normally does not need modification



# Other Configuration Files

- `/etc/aliases` defines local user aliases
  - needs to be hashed to `aliases.db` with the `newaliases` command
- `/etc/mail/` contains access control, virtual user database, and configuration source files
  - `local-host-names`

# Sendmail Configuration with the m4 Macro Language

- **m4** is a macro language that can help configure the `sendmail.cf` file
- Red Hat's default **Sendmail** configuration is generated from the **m4** specification in `/etc/mail/sendmail.mc`
- Red Hat recommends configuring **Sendmail** with **m4** using `sendmail.mc` as a starting point

# Sendmail m4 Macro File: Introduction

- All `sendmail.mc` macro configuration files should define the OS type, file locations, desired features, and mailer and user tables
- Step through header and definitions in the `sendmail.mc` below

# Sendmail m4 Macro File: Features

- Investigate the features enabled and disabled in the continuing example below:

# Sendmail Client Configuration

- Often, clients do not accept incoming mail themselves
  - A central mail server accepts all incoming mail and relays all outgoing mail
    - `MAIL_HUB`, `SMART_HOST` defines
    - Central mail server must allow relaying from the client and have `local-host-names` set up
  - Useful for client to “masquerade” as the server in `From:` addresses
    - `MASQUERADE_AS( `example.com' )`



# Other Valuable **m4** directives

- **FEATURE( `dnsbl` )**
  - checks a DNS implemented blackhole list to block email spammers
- **FEATURE( `relay\_based\_on\_MX` )**
  - Automatically allows relaying if **sendmail** server is listed as the target domain's MX record



# Additional **Sendmail** Configuration Files

- `/etc/mail` is now considered the default **Sendmail** configuration directory
- `virtusertable` maps virtual addresses to real addresses
- `access` specifies rejection or acceptance criteria for email from specified domains

# `/etc/mail/virtusertable`

Allows multiple virtual domains and users to be mapped to other addresses:

```
admin@123.com  
admin@xyz.org  
pageme@he.net  
@cba.com  
@dom1.org
```

```
shopper  
jdj  
lmiwtc@pg.com  
cba@aol.com  
%1@dom2.org
```

# /etc/mail/access

Used to accept or deny incoming email:

```
90trialsammer@aol.com    REJECT
spamRus.net              REJECT
204.168.23              REJECT
10.3                     OK
virtualdomain1.com      RELAY
user@dom9.com           ERROR:550 mail discarded
nobody@                 ERROR:550 bad name
```

# Blacklisting Recipients

- **FEATURE( `blacklist\_recipients' )**
  - Block mail destined for certain recipients
- Any entry in the **access** file that has a **REJECT** or returns an error code will be a blacklisted recipient

# Debugging Sendmail

- `/etc/mail/local-host-names`
  - must contain server's name and aliases
- `mail -v user`
  - view SMTP exchange with local relay
- `mailq` and `mailq -Ac`
  - view messages queued for future delivery
- `tail -f /var/log/maillog`
  - View log in real-time

# Using `alternatives`

- `alternatives` configures the server software through a *generic name*
  - *generic name is a link to a link in `/etc/alternatives/`*
  - *only the links in `/etc/alternatives/` are modified*
- `alternatives` displays and sets link groups
  - `alternatives --display name`
  - `alternatives --config name`
- `redhat-switch-mail`

# Postfix

- A replacement for Sendmail
- Project goals:
  - Sendmail-compatible
  - Speed
  - Ease of Administration
  - Security
- Efficient application design based on a modular suite of programs

# Service Profile: Postfix

- Type: SystemV-managed service
- Packages: *postfix*
- Daemons: `master, nqmgr, smtpd, pickup, (others)`
- Script: `postfix`
- Ports: 25 (smtp)
- Configuration: `/etc/postfix/main.cf`  
`/etc/postfix/master.cf`
- Related: *procmail*



# Configuring Postfix

- Activate with **alternatives**
- Set up minimal configuration directives
  - using **postconf**
  - using a text editor
- Start with **service**

# Additional Postfix Configuration

- `/etc/postfix/` files share syntax and function with those of `/etc/mail/`
  - `aliases` - local user aliases
  - `virtual` - virtual domain mapping
  - `access` - mail routing controls
- **Postfix command utilities**
  - `postmap`
  - `postalias`

# Enhanced **Postfix** Configuration

- Pre-receipt header and body checks
- Multiple transports (uucp, X.400)
- Virtual domain support
- UCE controls (blacklists, helo/sender)
- Table lookups (SQL, LDAP)

# Procmail Delivery

- **Procmail** is a very powerful delivery tool
- Different uses include
  - sorting incoming email into different folders or files
  - preprocessing email
  - starting an event or program when email is received
  - Automatically forwarding email to others
- Additional MTA configuration may be required

# Procmail Sample Configuration

- Usually located in a user's home directory:  
`/home/bob/.procmailrc`
- To forward mail from Joshua about ADSL to Jim, but also copy to the ADSL folder:

```
:0
*^From.*joshua
*^Subject:.*ADSL
{
  :0 c
  ! Jim@somedomain.org
  :0:
  ADSL
}
```

# End of Unit 4

- Address questions
- Preparation for Lab 4
  - Goals
  - Scenario
  - Deliverables
- Please ask the instructor for assistance when needed