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<CH.3>[Working in Linux]
-'Get familiar with Linux as a desktop environment'
-Getting to the command line:
  'The command line interface (CLI) is a simple text input system'
  ' for entering anything from single-word commands to complicated scritps.'
    >'Ordinary command line task are starting programs, parsing scripts,'
      'and editing text files for system or admin config.'
  'GUI terminal or virtual terminal'
-Applications:
  'kernel: airtraffic controller'  |  'applications: planes'
  'The kernel decides  which programs get which blocks of memory, it starts and'
    'kills applications, and handles displaying text or graphics on a monitor.'
  'Applications make requests to the kernel and in turn receive resources:'
    'memory, CPU, disk space.'
  "Applications follow the kernel's API:"
    "Behave as if they have a single block of memory in the system."
  'The kernel remaps memory blocks, shares memory with applications,'
    'and can even swap to disk.'
  'The kernel handles application switching (scheduling or multi-tasking.)'
  'A process is a task that is loaded and tracked by the kernel.'
  'An application may need multiple processes to function properly.'
-Major Applications:
  "server: primarily runs data on other's behalf."  |  "desktop: direct user interaction"
  "Linux can simulate almost all aspects of a production environment,"
    "from development to testing, to verification on scaled-down hardware."
  >server:
    -"no direct interaction with the monitor and keyboard of the machine it runs."
    -"serve information to other computers called clients."
  >desktop:
    -"web browsers, text editors, music players ..."
  >tools:
    -"software to manage computer systems easier."
    -"compilers, configure displays, provide a shell to Linux users ..."
<Server Applications:>
  'Linux excels at running server applications because of its reliability and efficiency.'
-Web Server:
  'hosts content for web pages.'
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  'viewed by a web browser using the HyperText Transfer Protocol (HTTP)'
    'or its encrypted version (HTTPS.)'
  'e.g.: Wordpress, Apache (using the Apache HTTPD daemon), NGINX, etc.'
-Private Cloud Servers:
  'provide private cloud software meeting needs of security, privacy, and regulatory compliance.'
    >'ownCloud: GNU AGPLv3 licence'  | 'NextCloud: GNU AGPLv3'
-Database Servers:
  'stores information and allows for easy retrieval and querying.'
  'e.g.: MariaDB, MySQL, Firebird, PostgreSQL.'
  'some use a language called Structured Query Language (SQL.)'
-Email Servers:
  'tasks required for email:'
    >'Mail Transfer Agent (MTA): software used to transfer electronic messages'
      'to other systems (Postfix >> Sendmail.)'
      >>SMTP (Simple Mail Transfer Protocol) server
    >'Mail Delivery Agent (MDA): stores the email in the users mailbox'
      '(usually invoked from final MTA.)'
      >>POP(Post Office Protocol)/IMAP (Internet Message Access Protocol) server
        'Dovecot, Cyrus IMAP'
  'Microsoft Exchange ships as a software package/suite with all required components.'
  'in the closed source world individuals have very few options to make.'
  'in the open source world many options can be modularly included.'
-FIle Sharing:
  'Samba: allows a Linux machine to look and behave like a Windows one, sharing files'
    'and participating in a windows domain.'
  'Netatalk: Linux performs as an Apple Macintosh file server.'
  'UNIX/Linux uses the Network File System (NFS), which is part of the kernel.'
  'the Domain Name System (DNS) converts a url string to an ip address.'
  'the Lightweight Directory Access Protocol(LDAP) can store information such as'
    'user accounts and security roles easily searchable.'
  'openLDAP is the main used program in Linux.'
  'Dynamic Host Configuration Protocol (DHCP) listens for requests and assign a'
    'free address from the DHCP pool.'
<Dektop Applications>
-Email:
  'Thunderbird: full-featured desktop email client (connects to IMAP/POP,'
    'displays emails locally, and sends emails through SMTP).'
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  'Evolution: GNOME'  | 'KMail: KDE'
  'switching between email clients without losing data is possible thanks to'
    'IMAP/POP standardization and local email formats.'
-Creative:
  'Blender: 3D movie creation.'
  'GIMP (GNU Image Manipulation Program): 2D image manipulation.'
  'Audacity: audio editing.'
-Productivity:
  'OpenOffice: Apache foundation open-source application suite.'
  'LibreOffice: OpenOffice fork. It can be integrated with wiki software providing a'
    'powerful intranet solution.'
  'LibreOffice Calc: akin to MS Excel.'
  'LibreOffice Writer: akin to MS Word. Ability to link to Calc spreadsheets and'
    'display updated information.'
  'LibreOffice Impress: akin to MS PowerPoint.'
-Web Browsers:
  'Mozilla Firefox'  |  'Google Chrome'
  'Firefox: open source, fast, feature-rich, excellent support for web developers.'
  'configuring settings options can limit the amount of info browsers share while searching the web.'
<Console Tools>
  'considerable overlap between the skills of software development and system administration.'
-Shells:
  'accepts shell commands, like file manipulations and starting applications, and'
    'to pass those to the Linux kernel for execution.'
  'Bourne shell: Bourne Again Shell(Bash): users who are comfortable with it can'
    'operate effectively on most Linux System.'
  'C shell: tcsh'
  'Korn shell (ksh)'
  'Z shell (zsh)'
-Text Editors:
  'vi (or vim)' | 'emacs' : Powerful tools to edit text files
  'pico '       | 'nano'  : Provide very basic text editing
  'learn vi or vim before is too late'
<Package Management>
  'every Linux system needs to add, remove, and update software.'
  'takes care of which files belong to which package and even dowloads updates from repositories.'
-Debian Package Management:
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  'dpkg'
  'Aplication Package Tool (apt-get) [front-end program to the dpkg tool]'
  'other front-ends include: aptitute and GUI (Synaptic, Software Center.)'
-RPM Package Management:
  'the Linux Standards Base (a Linux Foundation project) specifies standards to'
    'increase compatibility between Linux systems.'
  'RPM is the standard package management system (according to LSB.)'
  'yum, up2date (old front-end tools.)'
  'dnf (newer front-end tool.)'
  'back-end program: interacts with other programs.'
  'front-end program: interacts with people.'
  'GUI front-end: Yumex (dead), dnfdragora (newer), Gnome Package Kit.'
  'there also exists the ZYpp method (zipper command as the basis.)'
  'If a command affects the state of a package, administrative access is required'
    '(root privileges required for most package management commands.)'
  'a query or a search can be perfomed by a regular user, but it cant add or remove any packages.'
<Development Languages>
  'computer programming languages provide a way to enter instructions in'
    'a more human readable format.'
    1-'interpreted: translates written code into computer code as the program runs.'
    2-'compiled: translates all at once before execution.'
  >'C: Linux is written in C. It maps closely to the generated machine code.'
  >'C++: object-oriented C (abstraction programming paradigm: `objects` that contain'
    '`data` and `code`.)'
  >'Objective C: oop language that added Smalltalk-style messaging to the C language.'
  >'Java: oop language that compiles to the Java Virtual Machine (JVM.) running on any computer.'
  >'JavaScript: high-level, interpreted, and one of the core technologies of the world wide web.'
  >'Perl: interpreted, built for text manipulation, now used for automation and web applications.'
  >'PHP: create dynamic web pages (usually with Apache.)'
    '[websites: WordPress(blogging), cacti(monitoring.)]'
  >'Ruby: influenced by Perl. [automation tools: Chef, Puppet.]'
  >'Python: scripting language with excellent statistical processing abilities, a favorite'
    'in academia [Django Web app framework as well.]'
  'a programming library bundles common tasks into a distinct package that can'
    'be used by the developer.'
    >'ImageMagick: manipulate image in code.'
    >'OpenSSL: cryptographic library'
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    >'C library: provides low-level set of basic instructions, such as reading and'
      'writing to files and displays.'
<Security>
  'cookies: small piece of data stored on the users computer.'
    'It is the primary mechanism websites use to track users.'
  'limit the cookies and tracking pixels you accept (blocking them entirely or'
    'clearing them out regularly.)'
-Password Issues:
  'password management apps: programs that store login credentials in encrypted form.'
  'two-factor authentication (2FA): a password is supplemented by a second "factor",'
    'usually a code sent to the users phone.'
-Protect yourself:
  'browsing the web leaves a digital footprint.'
  'good passwd: at least 10 characters long, numbers, letters, and special characters.'
  'KeePassXC: open source, encrypted, and cross platform password manager.'
  'check for updates regularly.'
  'protect against accepting incoming connections.'
  'Gufw: graphical interface to Ubuntus Uncomplicated Firewall (UFW)[using iptables.]'
  'Firewalld: Daemon and graphical interface for configuring network and firewall zones and rules.'
-Privacy tools:
  'Encryption: e.g.: HyperText Transfer Protocol Secure (HTTPS.)'
  'Virtual Private Network: create an encrypted channel of communication between two systems.'
  'the Tor browser works by relaying requests through a network of servers that'
    'prevents websites knowing the users identity.'
-The Cloud:
  'cloud: computing resources from one or many off-site data centers which'
    'can be accessed over the internet.'
    >'delegate management of IT infrastructure to a third-party.'
  'cloud deployment models:'
    1>Public cloud: 'a provider offers cloud services to the general public'
      '(Amazon, Google, etc.)'
    2>Private cloud: 'cloud infrastructure set up for the sole use of a particular organization'
      '(Rackspace or IBM.)'
    3>Community cloud: 'set up and used by a group of organizations with'
      'common goals or requirements.'
    4>Hybrid cloud: 'contains multiple clouds (public, community, or private.)'
-Linux in the Cloud:
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'powers 90% of the public cloud workload.'
  1>Flexibility:  'provide IT resources quickly and at any time. Linux is modular'
    'by design and highly adaptable.'
  2>Accessibility: 'accessed from anywhere over a network by any device'
    '(desktop, mobile, thin client.)'
  3>Cost-Effective: 'eliminates overhead from underutilized resources.'
  4>Manageability: 'automated management tools: frees up administrators time.'
  5>Security: 'Linux is one of the most secure and reliable operating systems.'
    'The community upholds the robust reputation of Linux.'
  6>Virtualization:
    'the process in where one physical computer (host),'
      'runs multiple copies of an operating system (guests.)'
    'Linux is a multi-user operating system.'
    'guest images can be pre-configured for specific functions to allow rapid deployment.'
    'not necessary to run same operating system on all hosts.'
  7>Containers and Bare Metal Deployment:
    'Docker and Kubernetes: containerization technologies allowing apps to'
      'run in a serverless environment (eg: database processing, storage, etc.)'
    'containers are organized in `pods` that run within a `node`'
      '(allowing node-to-node communication) controlled by the `master` node.'
    'ability to create the systems of the future.'
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