LPIC2-201 (temario)

Capacity Planning

- Measure and Troubleshoot Resource Usage
    - Key Knowledge Areas:
        - Measure CPU usage
        - Measure memory usage
        - Measure disk I/O
        - Measure network I/O
        - Measure firewalling and routing throughput
        - Map client bandwidth usage
        - Match / correlate system symptoms with likely problems
        - Estimate throughput and identify bottlenecks in a system including networking
    - The following is a partial list of the used files, terms and utilities:
        - iostat
        - netstat
        - w
        - top
        - sar
        - processes blocked on I/O
        - blocks out
        - vmstat
        - pstree, ps
        - Isof
        - uptime
        - swap

        - blocks in
- Predict Future Resource Needs
    - Key Knowledge Areas:
        - Use collectd to monitor IT infrastructure usage
        - Predict capacity break point of a configuration
        - Observe growth rate of capacity usage
        - Graph the trend of capacity usage
        - Awareness of monitoring solutions such as Nagios, MRTG and Cacti
    - The following is a partial list of the used files, terms and utilities:
        - diagnose
        - predict growth
        - resource exhaustion

Linux Kernel

- Kernel Components
    - Key Knowledge Areas
        - Kernel 2.6.x documentation
        - Kernel 3.x documentation
    - Terms and Utilities:
        - /usr/src/linux/
        - zImage
        - /usr/src/linux/Documentation/
        - bzImage
- Compiling a kernel
    - Key Knowledge Areas:
        - /usr/src/linux/

        - Kernel Makefiles
        - Kernel 2.6.x/3.x make targets
        - Customize the current kernel configuration.
        - Build a new kernel and appropriate kernel modules.
        - Install a new kernel and any modules.
        - Ensure that the boot manager can locate the new kernel and associated files.
        - Module configuration files
        - Awareness of dracut
    - Terms and Utilities:
        - mkinitrd
        - mkinitramfs
        - make
        - bzip2
        - make targets (all, config, xconfig, menuconfig, gconfig, oldconfig, mrproper, zImage, bzImage, modules, modules_install, rpm-pkg, binrpm-pkg, deb-pkg)
        - gzip
        - module tool
        - /usr/src/linux/.confi
        - /lib/modules/kernel-version/
        - depmod
- Kernel runtime management and troubleshooting
    - Key Knowledge Areas:
        - Use command-line utilities to get information about the currently running kernel and kernel modules
        - Manually load and unload kernel modules
        - Determine when modules can be unloaded
        - Determine what parameters a module accepts
        - Configure the system to load modules by names other than their file name.
        - /proc filesystem
        - Content of /, /boot/ , and /lib/modules/
        - Tools and utilities to analyze information

        about the available hardware
    - udev rules
- Terms and Utilities:
    - /lib/modules/kernel-version/modules.dep
    - module configuration files in /etc/
    - /proc/sys/kernel/
    - /sbin/depmod
    - /sbin/rmmod
    - /sbin/modinfo
    - /bin/dmesg
    - /sbin/lspci
    - /usr/bin/lsdev
    - /sbin/lsmod
    - /sbin/modprobe
    - /sbin/insmod
    - /bin/uname
    - /usr/bin/lsusb
    - /etc/sysctl.conf, /etc/sysctl.d/
    - /sbin/sysctl
    - udevmonitor
    - udevadm monitor
    - /etc/udev/

System Startup

- Customizing SysV- init system startup
    - Key Knowledge Areas:
        - Linux Standard Base Specification (LSB)
        - SysV init environment
    - Terms and Utilities:
        - /etc/inittab

        - /etc/init.d/
        - /etc/rc.d/
        - chkconfig
        - update-rc.d
        - init and telinit
- System Recovery
    - Key Knowledge Areas:
        - GRUB version 2 and Legacy
        - Grub shell
        - Boot loader start and hand off to kernel
        - Kernel loading
        - Hardware initialization and setup
        - Daemon/service initialization and setup
        - Know the different boot loader install locations on a hard disk or removable device
        - Overwriting standard boot loader options and using boot loader shells
        - Awareness of UEFI
    - Terms and Utilities:
        - mount
        - fsck
        - inittab, telinit and init with SysV init
        - the contents of /boot/ and /boot/grub/
        - GRUB
        - grub-install
        - initrd, initramfs
        - Master boot record
- Alternate Bootloaders
    - Key Knowledge Areas:
        - LILO
        - SYSLINUX, ISOLINUX, PXELINUX
        - Understanding of PXE
    - Terms and Utilities:
        - lilo, /etc/lilo.conf
        - syslinux
        - extlinux
        - isolinux.bin

        - isolinux.cfg
        - pxelinux.0
        - pxelinux.cfg/

Filesystem and Devices

- Operating the Linux filesystem
    - Key Knowledge Areas:
        - The concept of the fstab configuration
        - Tools and utilities for handling SWAP partitions and files
        - Use of UUIDs
    - Terms and Utilities:
        - /etc/fstab
        - /etc/mtab
        - /proc/mounts
        - mount and umount
        - sync
        - swapon
        - swapoff
- Maintaining a Linux filesystem
    - Key Knowledge Areas:
        - Tools and utilities to manipulate and ext2, ext3 and ext4
        - Tools and utilities to manipulate xfs
        - Awareness of Btrfs
    - Terms and Utilities:
        - fsck (fsck.*)
        - mkfs (mkfs.*)
        - dumpe2fs, xfsdump, xfsrestore
        - debugfs

        - tune2fs
        - mkswap
        - xfs_info, xfs_check and xfs_repair
        - smartd, smartctl
- Creating and configuring filesystem options
    - Key Knowledge Areas:
        - autofs configuration files
        - UDF and ISO9660 tools and utilities
        - Awareness of CD-ROM filesystems (UDF, ISO9660, HFS)
        - Awareness of CD-ROM filesystem extensions (Joliet, Rock Ridge, El Torito)
        - Basic feature knowledge of encrypted filesystems
    - Terms and Utilities:
        - /etc/auto.master
        - /etc/auto.[dir]
        - mkisofs

Advanced Storage Device Administration

- Configuring RAID
    - Key Knowledge Areas:
        - Software raid configuration files and utilities
    - Terms and Utilities:
        - mdadm.conf
        - mdadm
        - /proc/mdstat
        - partition type 0xFD

- Adjusting Storage Device Access
    - Key Knowledge Areas:
        - Tools and utilities to configure DMA for IDE devices including ATAPI and SATA
        - Tools and utilities to manipulate or analyze system resources (e.g. interrupts)
        - Awareness of sdparm command and its uses
        - Tools and utilities for iSCSI
    - Terms and Utilities:
        - hdparm, sdparm
        - tune2fs
        - sysctl
        - /dev/hd*, /dev/sd*
        - iscsiadm, scsi_id, iscsid and iscsid.conf
        - WWID, WWN, LUN numbers
- Logical Volume Manager
    - Key Knowledge Areas:
        - Tools in the LVM suite
        - Resizing, renaming, creating, and removing logical volumes, volume groups, and physical volumes
        - Creating and maintaining snapshots
        - Activating volume groups
    - Terms and Utilities:
        - /sbin/pv*
        - /sbin/lv*
        - /sbin/vg*
        - mount
        - /dev/mapper/

Networking Configuration

- Basic networking configuration
    - Key Knowledge Areas:
        - Utilities to configure and manipulate ethernet network interfaces
        - Configuring basic access to wireless networks with iw, iwconfig and iwlist
    - Terms and Utilities:
        - /sbin/route
        - /sbin/ifconfig
        - /sbin/ip
        - /usr/sbin/arp
        - /sbin/iwconfig
        - /sbin/iwlist
- Advanced Network Configuration and Troubleshooting
    - Key Knowledge Areas:
        - Utilities to manipulate routing tables
        - Utilities to configure and manipulate ethernet network interfaces
        - Utilities to analyze the status of the network devices
        - Utilities to monitor and analyze the TCP/IP traffic
    - Terms and Utilities:
        - /sbin/route
        - /sbin/ifconfig
        - /bin/netstat
        - /bin/ping
        - /usr/sbin/arp
        - /usr/sbin/tcpdump
        - /usr/sbin/lsof
        - /usr/bin/nc
        - /sbin/ip
        - nmap
- Troubleshooting Network Issues

- Key Knowledge Areas:
  - Location and content of access restriction files
  - Utilities to configure and manipulate ethernet network interfaces
  - Utilities to manage routing tables
  - Utilities to list network states.
  - Utilities to gain information about the network configuration
  - Methods of information about the recognized and used hardware devices
  - System initialization files and their contents (SysV init process)
  - Awareness of NetworkManager and its impact on network configuration
- Terms and Utilities:
  - /sbin/ifconfig
  - /sbin/route
  - /bin/netstat
  - /etc/network/, /etc/sysconfig/network-scripts/
  - /bin/ping
  - System log files such as /var/log/syslog & /var/log/messages
  - /etc/resolv.conf
  - /etc/hosts
  - /etc/hostname, /etc/HOSTNAME
  - /bin/hostname
  - /usr/sbin/traceroute
  - /bin/dmesg
  - /etc/hosts.allow, /etc/hosts.deny

System Maintenance

- Make and install programs from source
    - Key Knowledge Areas:
        - Unpack source code using common compression and archive utilities
        - Understand basics of invoking make to compile programs
        - Apply parameters to a configure script
        - Know where sources are stored by default
    - Terms and Utilities:
        - /usr/src/
        - gunzip
        - gzip
        - bzip2
        - tar
        - configure
        - make
        - uname
        - install
        - patch
- Backup operations
    - Key Knowledge Areas:
        - Knowledge about directories that have to be include in backups
        - Awareness of network backup solutions such as Amanda, Bacula and BackupPC
        - Knowledge of the benefits and drawbacks of tapes, CDR, disk or other backup media
        - Perform partial and manual backups
        - Verify the integrity of backup files
        - Partially or fully restore backups
    - Terms and Utilities:
        - /bin/sh

        - dd
        - tar
        - /dev/st* and /dev/nst*
        - mt
        - rsync
- Notify users on system- related issues
    - Key Knowledge Areas:
        - Automate communication with users through logon messages
        - Inform active users of system maintenance
    - Terms and Utilities:
        - /etc/issue
        - /etc/issue.net
        - /etc/motd
        - wall
        - /sbin/shutdown