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OPERATING SYSTEMS & PARALLEL COMPUTING

Linux Info

Background on Linux

- Version of UNIX
- Linus Torvalds – Creator of Linux
- Open Source Operating System
- Free Software
- Source Code Available

Where is Linux Used?

- 75% of respondents were already using Linux and another 14% were evaluating it
- 43% of all web sites use Linux servers running the Apache Web server

How is Linux Used?

- Personal Workstation
- File and Print Server
- Internet Service Provider
- Three-tier Client/Server
- Turnkey System

Using Linux on Personal Computers

- Linux kernel for free
- Kernel is central component
- Kernel can be customized to user's needs

Linux Distributions

- Corel Linux
- Debian GNU/Linux
- OpenLinux (Caldera)
- Red Hat / CentOS / OEL
- Slackware
- SuSE
- TurboLinux

Subdirectories

Examples of Subdirectories

/root	directory, starting point of the directory tree
/home	(private) directories of users
/devDevice	files that represent hardware components
/etc	Important files for system configuration
/etc/init.d	Boot scripts/usr/binGenerally accessible programs

Why Use Linux?

- Costs less
- Stable
- Reliable
- Extremely powerful

Linux Tasks

A process, or task, in Linux is represented by a task_struct data structure

This structure contains information in a number of categories

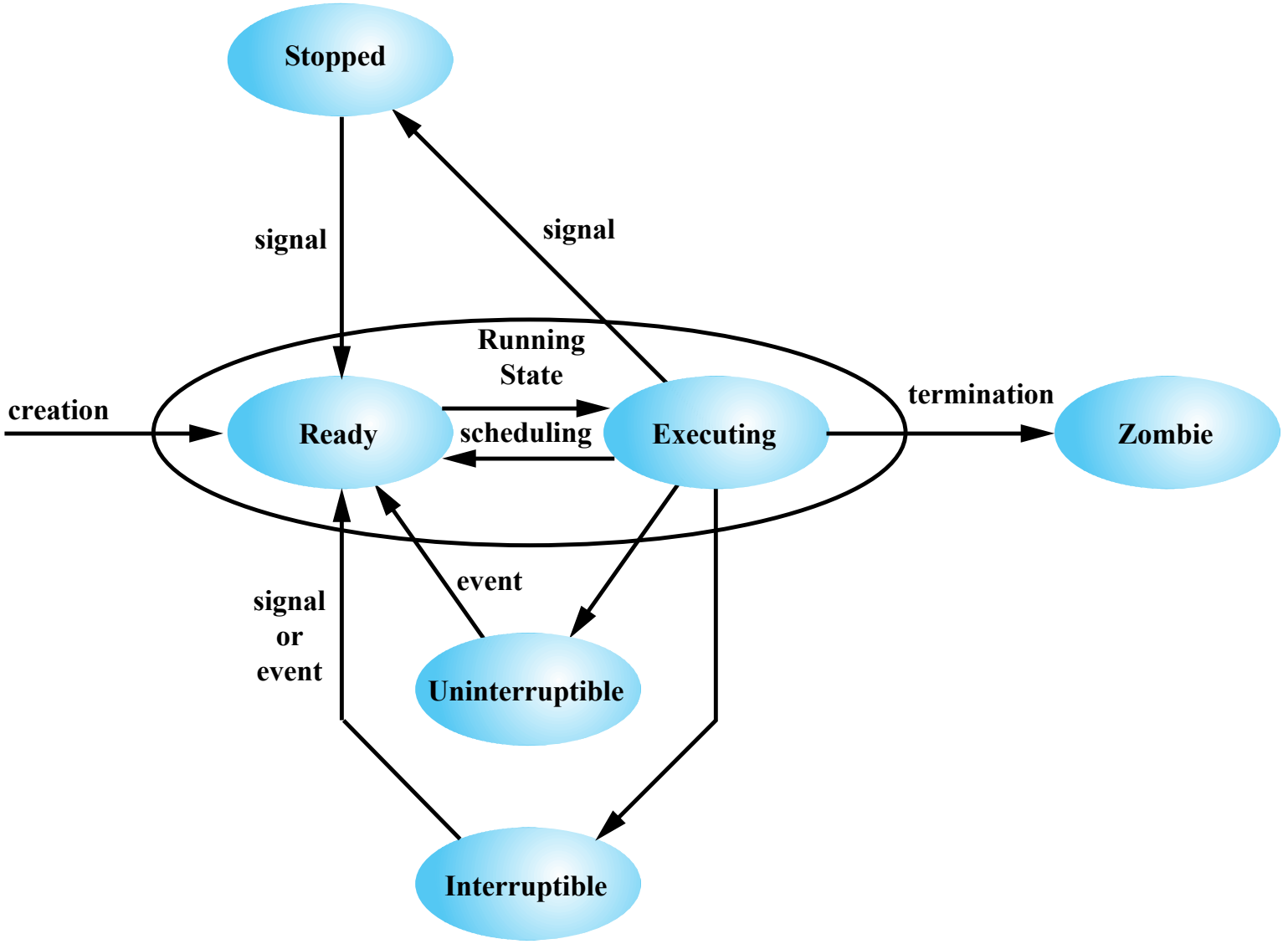
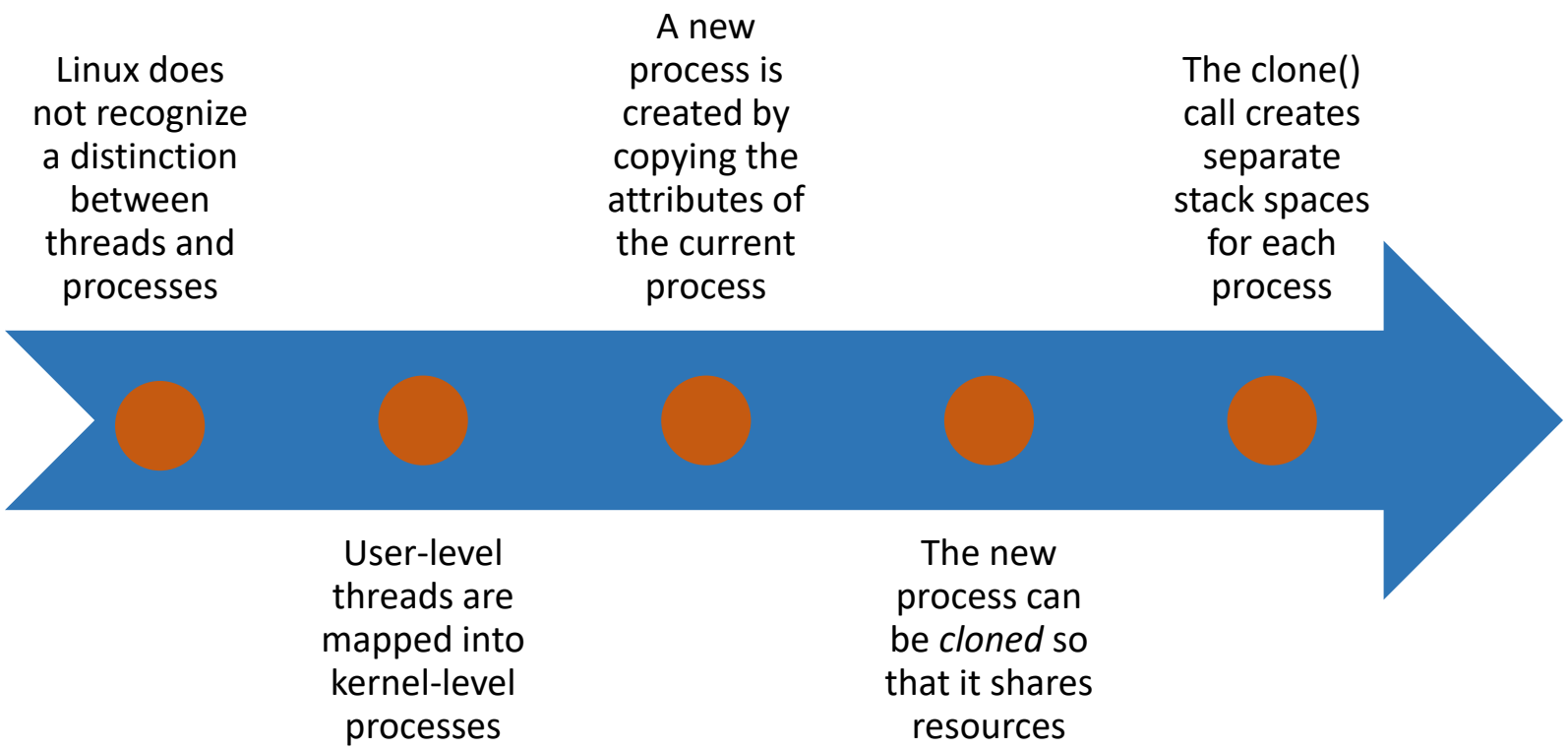


Figure 4.15 Linux Process/Thread Model

Linux Threads



Linux Namespaces

- A namespace enables a process to have a different view of the system than other processes that have other associated namespaces
- One of the overall goals is to support the implementation of control groups, cgroups), a tool for lightweight virtualization that provides a process or group of processes with the illusion that they are the only processes on the system
- There are currently six namespaces in Linux
    - mnt
    - pid
    - net
    - ipc
    - uts
    - user

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LINUX VS WINDOWS

Differences

- Financial Differences
- Technical Differences
- End-User Differences

- Cost for Businesses
  - Companies have to spend millions for licenses for ever individual windows computer
  - For Linux companies don’t have to spend anything

Linux vs. Windows

- Keeping up to date
  - By Upgrading
    - Linux upgrades faster than Windows
- Compatibility
  - Linux is Backward Compatible unlike Windows

Linux vs. Windows

Features Provided

- Both support Dynamic Caching
- Both have Multi-user Support

- Application Differences

- No commercial word processor for Linux, which matches the quality for Windows

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- Proprietary vs. Open Source
  - Windows is a Proprietary Technology
    Applications will only work on Windows
  - Linux – Open Source

Linux

- Complete information needed for download
- Technical help – Available on Internet (user must be comfortable with UNIX system)
- Windows word processor is better than Linux

Linux vs. Windows

In The Commercial Arena

- Head to head competition
- Used side by side as servers
- Both handled daily workload for several small business operations
- Linux with hardware disadvantage supported a community of users 3 times size of Windows

In The Commercial Arena

- Windows 10 – graphical interfaces, wizards and easy-to-grasp metaphors
- But as server chores become more customized, Windows cannot handle it
- Linux – textual interface (with X-Window)
- But for complex jobs, Linux gives a powerful set of tools

In The Commercial Arena

- Windows 10 – easy for non-programmer
- Linux – programmer-based culture

Linux vs. Unix

- Linux is free, but Unix is not.
- Unix is compatible with Linux at the system call level, meaning most programs written for either Unix or Linux can be recompiled to run on the other system with a minimum of work. But Linux will run faster than Unix on the same hardware.

Linux vs. Windows NT /10

- Linux needs 2MB RAM to try out, while Windows needs 12 MB
- Linux needs at least 15 MB disk space, while Windows needs 70 MB at least.
- Both system support multitasking
- Both system support multiprocessing.
- Both system support dynamic cache.
- Linux has full multi user support. Local users, modem users, and network users can all simultaneously run text and graphics programs. This is a powerful feature for business environments that is unmatched by Windows.

Conclusion

"When is it best to use Linux and when should some other operating system be preferred?"

- It all depends on the user

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