



## **Course Definition File Linux Platform – 2**

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## 1. Basic Information:

|  |                    |
|--|--------------------|
| <b>Course Name</b>                           | Linux Platform – 2 |
| <b>Course Code</b>                           | IOS305             |
| <b>Number of Presentational Sessions*</b>    | 2*12               |
| <b>Number of Synchronous Sessions**</b>      | 12                 |
| <b>Number of Shorter Tests***</b>            | 3                  |
| <b>Number of Exams***</b>                    | 1                  |
| <b>Theoretical Sessions Work Load (hrs.)</b> | 72                 |
| <b>Practical Sessions Work Load (hrs.)</b>   | 36                 |
| <b>Credit Hours</b>                          | 6                  |

\*Each presentational session comprises both recorded lecture (1.5 hrs.) and interactive learning content (1.5 hrs.).

\*\*Each synchronous session comprises the interactive lecture carried out in real time in a virtual class (1.5 hrs.).

\*\*\*Each shorter test is 0.5 hr. long. The final exam is 2 hrs. long.

N.B.

Generally, each chapter requires two presentational sessions: one for the recorded content and one for the interactive content (unless the chapter is too long, in which case it may require more sessions) . This note applies to synchronous sessions as well, where each chapter requires one synchronous session generally.

## 2. Prerequisites courses:

| Course             | Code   |
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| Linux Platform – 1 | IOS203 |

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### 3. Course Objectives:

“Linux Platform – 2” goal is letting the learners continue what they started in Linux platform 1, by exploring Linux operating system in an advanced way that helps them to understand it accurately and widely. All that is done by:

- Understanding boot process and kernel management.
- Learning advanced topics in:
  - users and groups management
  - services management such as network services, network file sharing, remote access, and web services
  - file system concepts
  - sed and awk commands
  - system logging, monitoring, and automation
  - understanding Linux System security
  - troubleshooting system problems

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#### 4. Learning Outcomes:

Upon completion of this course, the student will be able to:

- Understand, manage and troubleshoot the boot process
- Learn basic kernel management
- Manage users and groups (advanced topics)
- Manage network services
- Manage Network File Sharing services
- Manage Remote Access
- Manage Web services
- Learn advanced file system concepts
- Understand the basics of sed and awk commands
- Understand System Logging, Monitoring, and Automation
- Understand System security
- Understand SELinux concepts
- Troubleshoot system problems

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## 5. Assessment Results:

| Chapter Number | Chapter Title                                       | General Objectives  | Assessment Type                         |                                      |                              |                                 |             |
|----------------|---|---|---|--------------------------------------|------------------------------|---------------------------------|-------------|
|                |   |   | Interactive Content & Recorded Sessions | Applied Activities (Synch. Sessions) | Final Exam*/ Shorter Tests** | Presentations And Interviews*** | Reports *** |
| CH1            | Manage Understand and Troubleshoot the Boot Process | Comprehension<br>– Analytical Thinking – Tools And Application Hands – On | ✓                                       | ✓                                    | ✓                            | ✓                               | ✓           |
| CH2            | Learn Basic Kernel Management                       | Comprehension<br>– Analytical Thinking – Tools And Application Hands – On | ✓                                       | ✓                                    | ✓                            | ✓                               | ✓           |
| CH3            | Advanced Topics in Users and Groups Management      | Comprehension<br>– Analytical Thinking – Tools And Application Hands – On | ✓                                       | ✓                                    | ✓                            | ✓                               | ✓           |

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| <b>CH4</b> | Learn how to Deal with Network Services | Comprehension<br>– Analytical Thinking – Application<br>Hands – On | ✓ | ✓ | ✓ | ✓ | ✓ |
| <b>CH5</b> | Manage Network File Sharing Services    | Comprehension<br>– Analytical Thinking – Application<br>Hands – On | ✓ | ✓ | ✓ | ✓ | ✓ |
| <b>CH6</b> | Manage Remote Access                    | Comprehension<br>– Analytical Thinking – Application<br>Hands – On | ✓ | ✓ | ✓ | ✓ | ✓ |
| <b>CH7</b> | Manage Web Services                     | Comprehension<br>– Analytical Thinking – Application<br>Hands – On | ✓ | ✓ | ✓ | ✓ | ✓ |
| <b>CH8</b> | Advanced File System Concepts           | Comprehension<br>– Analytical Thinking – Application<br>Hands – On | ✓ | ✓ | ✓ | ✓ | ✓ |

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| <b>CH9</b>  | Understand the Basics of sed and awk Commands         | Comprehension<br>– Analytical Thinking – Application<br>Hands – On | ✓ | ✓ | ✓ | ✓ | ✓ |
| <b>CH10</b> | Understand System Logging, Monitoring, and Automation | Comprehension<br>– Analytical Thinking – Application<br>Hands – On | ✓ | ✓ | ✓ | ✓ | ✓ |
| <b>CH11</b> | Understand System Security                            | Comprehension<br>– Analytical Thinking – Application<br>Hands – On | ✓ | ✓ | ✓ | ✓ | ✓ |
| <b>CH12</b> | Understand SELinux Concepts                           | Comprehension<br>– Analytical Thinking – Application<br>Hands – On | ✓ | ✓ | ✓ | ✓ | ✓ |

**\*The final exam is two hours long and is given at the end of the course.**

**\*\*Shorter tests are about 30 minutes long and are given after three or four lectures throughout the semester during synchronous sessions.**

**\*\*\*Presentations, interviews, and reports are submitted once after each three or four lectures throughout the semester during synchronous sessions.**

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## 6. Course Syllabus

| Chapter | Subject  | Content  | Number of Learning Objects | Number of synchronous Learning Objects |
|---------|--|--|----------------------------|--|
| CH1     | Manage, Understand and Troubleshoot the Boot Process | <ul style="list-style-type: none"> <li>Working with systemd</li> <li>Working with grub2</li> <li>Understanding boot procedure</li> <li>Passing kernel boot arguments</li> <li>Troubleshoot boot procedure</li> </ul>   | 5                          | 2                                      |
| CH2     | Learn Basic Kernel Management                        | <ul style="list-style-type: none"> <li>Understanding the Role of the Linux Kernel</li> <li>Working with kernel modules</li> <li>Upgrading Linux kernel</li> </ul>  | 3                          | 1                                      |
| CH3     | Advanced Topics in Users and Groups Management       | <ul style="list-style-type: none"> <li>Understanding Local User Authentication Files</li> <li>Managing User Accounts and Password Aging with Commands</li> <li>Managing Users, Groups, and Password Aging with the User Manager Tool</li> <li>Configuration Files for User Management Defaults Managing Password Properties</li> </ul> | 4                          | 2                                      |



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| <b>CH4</b> | Network Services                              | <ul style="list-style-type: none"> <li>• xinetd the master service</li> <li>• DHCP service (installation – configuration – troubleshooting)</li> <li>• NTP service (installation – configuration – troubleshooting)</li> </ul> | 3 | 1 |
| <b>CH5</b> | Manage Network File Sharing Services          | <ul style="list-style-type: none"> <li>• Network file systems NFS (installation – configuration)</li> <li>• Samba (installation – configuration)</li> <li>• FTP (installation – Configuration)</li> </ul>                      | 3 | 1 |
| <b>CH6</b> | Manage Remote Access                          | <ul style="list-style-type: none"> <li>• Secure shell SSH (installation – configuration – troubleshooting)</li> <li>• VNC service (installation – configuration – troubleshooting)</li> </ul>                                  | 2 | 1 |
| <b>CH7</b> | Web Services                                  | <ul style="list-style-type: none"> <li>• Apache web server (Installation – configuration – troubleshooting)</li> <li>• Squid web proxy (installation – configuration)</li> </ul>   | 2 | 1 |
| <b>CH8</b> | Advanced File System Concepts                 | <ul style="list-style-type: none"> <li>• Logical volume manager (LVM)</li> <li>• Setting up RAID</li> </ul>  | 2 | 1 |
| <b>CH9</b> | Understand the Basics of sed and awk Commands | <ul style="list-style-type: none"> <li>• sed command</li> <li>• awk command</li> </ul>   | 2 | 1 |

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| <b>CH10</b> | Understand System Logging, Monitoring, and Automation | <ul style="list-style-type: none"> <li>Working with syslog</li> <li>Monitoring system performance</li> <li>Automation with cron and at</li> </ul> | 3 | 1 |
| <b>CH11</b> | System Security                                       | <ul style="list-style-type: none"> <li>Security through TCP Wrappers</li> <li>Firewall rules using iptables</li> </ul>                            | 2 | 1 |
| <b>CH12</b> | SELinux Concepts                                      | <ul style="list-style-type: none"> <li>Understanding SELinux</li> <li>SELinux Troubleshooting</li> </ul>  | 2 | 1 |

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## 7. Practical Activity:

- Tools and Labs:

| Tool Name                         | Description   |
|-----------------------------------|---|
| VMWare workstation                | Students should install VMware workstation or any equivalent software and then create a virtual machine with Linux CentOS distribution. |
| CentOS Linux (version 7 or newer) |   |

- Practical Activities per Chapters:

| Chapter      | Activities Type   | Remarks  |
|--------------|---|--|
| All Chapters | <input checked="" type="checkbox"/> Exercises<br><input checked="" type="checkbox"/> Homework<br><input type="checkbox"/> Webinars<br><input type="checkbox"/> Experiment<br><input type="checkbox"/> Project<br><input type="checkbox"/> Other | During sessions, the tutor executes commands with explanation on Centos system. Then students should execute these commands on their own virtual machine after each session. |

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## 8. References:

- RHCSA & RHCE Red Hat Enterprise Linux 7 Training and Exam Preparation Guide (2015).
- Red Hat RHCSA/RHCE 7 Cert Guide: Red Hat Enterprise (2016).