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| **COMPUTER SYSTEM OPERATION** | | | | |
| **Competency Unit (CU): SERVER MAINTENANCE** | **Code: IT-020-3:2013-C05** | | | |
| **Work Activity 1: Analyse server maintenance job order** | **Duration:** 8 Hour | | | |
| **Learning Objectives**  At the end of learning session, the apprentice will be able to:  1.1. Define server information as below:  1.1.1 Server TAG/ID  1.1.2 Server Specification  1.1.3 Operating System  1.1.4 Server Warranty information  1.1.5 Server maintenance contract status  1.1.6 Server operating and service manual  1.1.7 Server peripheral  1.2 List types of maintenance, such as:  1.2.1 Preventive  1.2.2 Corrective  1.3 Describe server security procedure  1.3.1 Server access pass  1.3.2 Server user ID  1.3.3 Password  1.4 List server maintenance tool, such as:  1.4.1 Vacuum cleaner  1.4.2 Cable tie  1.4.3 Screw drivers  1.4.4 Anti-static wrist strap  1.4.5 Etc | | | | |
| **Work Activity 2: Carry out hardware maintenance** | | | **Duration: 24** Hours | |
| **Learning Objectives**  At the end of learning session, the apprentice will be able to:  2.1 Define server room requirement  2.1.1 Room temperature depends on quantity of servers and room size  2.1.2 Humidity  2.1.2.1 Dry  2.1.2.2 Sign of water drop  2.1.2.3 Water leaking mark  2.1.3 Physical safety and security  2.1.3.1 Access door lock  2.1.3.2 Server rack door lock  2.1.3.3 License/ Documentation rack lock  2.1.4 Cables arrangement and connection  2.1.4.1 Cable Labelling  2.1.4.2 Cable Drawing Layout  2.1.5 Cleanliness  2.1.5.1 Room cleanliness  2.1.5.2 Server cleanliness  2.2 List inspection of server peripheral, such as:  2.2.1 Uninterrupted Power Supply-UPS  2.2.2 Storage Area Network –SAN  2.2.3 Backup Device (Eg: NAS storage, Tape Library, etc)  2.3 Define server Light Emitting Diode (LED) status indicator  2.3.1 Power ON/OFF indicator  2.3.2 HDD activity indicator  2.3.3 Fault indicator  2.3.4 RAID status indicator  2.3.5 Network connectivity indicator  2.3.6 LED indicator blinking pattern  2.3.7 LED indicator colour  2.3.7.1 Green  2.3.7.2 Amber  2.3.7.3 Yellow  2.3.7.4 Red  2.3.7.5 Blue  2.5 List server cleaning tools and material, such as:  2.5.1 Vacuum cleaner  2.5.2 Cloth  2.5.3 Brush  2.5.4 Anti-static wrist strap  2.5.5 Etc  2.6 Define safety procedure as below:  2.6.1 Risk Assessments  2.6.2 Pre-Planning  2.6.3 Pre-Start Checks  2.6.4 Site Safety  2.6.5 Personal Protective Equipment  2.6.6 First Aid  2.6.7 General Safety Information  2.7 Understand manufacturer’s operating manual  2.7.1 UPS Manual  2.7.2 Server Manual  2.7.3 Etc | | | | |
| **Work Activity 3: Perform server Operating System maintenance** | | **Duration: 16** Hours | | |
| **Learning Objectives**  At the end of learning session, the apprentice will be able to:  3.1 Identify server utilisation status  3.1.1 Hard disk space utilization  3.1.1.1 Used  3.1.1.2 Free  3.1.1.3 Total size  3.1.2. Memory usage  3.1.2.1 Physical RAM  3.1.2.2 Virtual  3.1.2.3 Shared memory  3.1.3 Central Processing Unit (CPU) usage  3.1.4 Network usage  3.2 Identify server data back-up  3.2.1 Type of backup  3.2.1.1 Full back-up  3.2.1.2 Incremental back-up  3.2.1.3 Differential back-up  3.2.1.4 Local back-up  3.2.1.5 Offsite back-up  3.2.1.6 Online back-up  3.2.1.7 Cloud back-up  3.2.1.8 Mirror back-up  3.2.1.9 Etc  3.2.2 Backup media/devices  3.2.2.1 Internal storage  3.2.2.2 External media  3.2.3 Backup software  3.2.3.1 Acronis Backup  3.2.3.2 Etc  3.3 Define server backup status verification  3.3.1 Task completion status  3.3.2 Location, date and backup name  3.3.3 Backup logs file  3.4 List types of Server system logs, such as:  3.4.1 Security Log  3.4.2 Application Log  3.4.3 System Log  3.4.4 Log level differences  3.4.4.1 Information  3.4.4.2 Warning  3.4.4.3 Alert  3.4.5 Log files location base on OS type  3.5 Identify server system status indicator (LEDs) as below:  3.5.1 LED indicator icon  3.5.2 Blinking pattern  3.5.3 LED indicator colour  3.5.3.1 Green  3.5.3.2 Amber  3.5.3.3 Yellow  3.5.3.4 Red  3.5.3.5 Blue  3.6 List types of server system log critical error/alert, such as:  3.6.1 System error  3.6.1.1 Hardware failure  3.6.1.2 OS vulnerability alert  3.6.1.3 OS service failure  3.6.2 Security alert  3.6.2.1 Antivirus pattern outdated  3.6.2.2 Security threats  3.6.2.3 Password expiry  3.6.2.4 Login failed  3.7 Define critical Operating System patches availability  3.7.1 OS patch  3.7.2 Security bulletin information (Log File)  3.8 List types of Server Antivirus software logs, such as:  3.8.1 Antivirus update log  3.8.2 Antivirus scan log  3.8.3 Threat log  3.8.4 Product/license expiry date  3.9 Define server hardware error/faulty:  3.9.1 Server TAG number / ID  3.9.2 List of errors  3.9.3 Warranty status  4.0 Understand information on server Operating System error  4.0.1 Server TAG number/ ID  4.0.2 List of errors  4.0.2.1 Hardware error  4.0.2.2 Software error  4.0.3 Warranty status  4.1 Server maintenance costing  4.1.1 Annual Maintenance Contract (eg: 24/7, 8/5)  4.1.2 Server Maintenance Costing Control (Anually compare) | | | | |
| **Work Activity 4: Prepare server maintenance report** | | | **Duration: 5 Hours** | |
| **Learning Objectives**  At the end of learning session, the apprentice will be able to:  4.1 List types of Server Maintenance Record, such as:  4.1.1 Server utilisation status record  4.1.2 Critical error/alert from server system logs Record  4.1.3 Server hardware error/faulty  4.1.4 Server Operating System error  4.1.5 Server Physical Checking | | | | |
| **TOTAL** | | | | **54 Hours** |