National Occupational Standards

Sector: IT

Occupation: Systems Administrator Specialist

MQF Level: 5

Overview

Summary Statement

Administers ICT System troubleshooting on a higher level, team management, maintain IT strategy procedures and Security policy and create a structured disaster recovery process.

Mission

High level troubleshooting, and system design. Administers day-to-day operations of team to satisfy continuity of service, design data recovery structure, security and performance policies.

Main Tasks

- Investigate and solve systems issues that a junior administrator cannot solve.
- Create a plan on system upgrades and maintain documentation on current upgrades done
- Schedule tasks for team
- Maintain proper documentation on current infrastructure
- Prepare weekly reports to update team and management on ongoing projects
- Update current security and procedures documentation to meet new standards
- Perform regular spot checks on system and network equipment for team assessment
- Attend regular meetings with other departments to maintain department needs
- Assist in monthly meetings presentations to board of directors/CEO/superiors.

Units:

- SAA501- Servers and Workstation Troubleshooting
- SAA502-Networking, Cloud, WAN Troubleshooting
- SAA403-Advanced Scripting and Debugging
- SAA504-Data Centre Operations and Procedures
- SAA405- Safety Standards based on Latest IEC Documentation
- SAA506- Documentation and Management in absence of an IT Manager

Mission and tasks are in accordance with the ‘CEN European ICT professionals role profiles’
SAA501 - Servers and workstation troubleshooting

This unit highlights the requirements needed for a Level 5 Specialist system administrator who must be able to perform SAA401 troubleshooting and any other issues that an Associate cannot troubleshoot or when in need of guidance.

Performance Criteria

The candidate must have the necessary knowledge and skills to:
1. Be able to troubleshoot complex issues on systems and networking
2. Guide Associate administrators in troubleshooting issues
3. Be able to plan a changeover of equipment or systems, when end of life is near.
4. Design a server farm structure and deploy it into production.
5. Be able to use the full potential of installed OS and features.
6. Update the team with a proper plan when changeovers are necessary.

Required Knowledge

The level 5 System Administrator Specialist must know and explain:
1. Key factors when designing a new server farm.
2. How issues were previously troubleshooting from a Level 4 Associate.
3. When a problem should be escalated to the software house or company.
4. How research should be carried out in order to determine changeover of equipment.
5. What to look for in a new application or software feature based on user requirements.
6. How a structured plan should be delegated to a Level 4 Associate team member.
7. The process to evaluate equipment and software pricing.

Required Skills

The Level 5 System Administrator Specialist must be able to:
1. Work with no supervision.
2. Create full reports for any serious issues or downtime.
3. Collect information from the concerned departments and team members.
4. Use a centralized database to get as much information as possible on the current status of the system or equipment.
5. Plan backup jobs or maintenance routines.
6. Use proper and adequate software to perform critical changes in the system or equipment.
7. Assess the current state of the system or equipment for changeovers or replacement.
8. Analyse complex log files to determine complex or multiple issues.
9. Create proper schedules for the team to delegate changeover tasks.
10. Analyse supplied data in determining what type of new software is needed.
This unit describes the expected proficiencies in troubleshooting advanced level networking, and upkeep of proper documentation. This unit should be a continuation of SAA402 in order to carry out the following performance criteria.

**Performance Criteria**

The candidate must have the necessary knowledge and skills to:

1. Understand the current network infrastructure.
2. Configure a Cloud server infrastructure.
3. Identify what type of WAN networks are available on the market.
4. Manage a team to troubleshoot major issues on the current infrastructure.
5. Assess and maintain current network infrastructure.
6. Identify old infrastructure and keep the infrastructure updated to comply with at least one security compliant policy.
7. Create or update documentation related to the designated company network infrastructure.
8. Know what type of devices are on the market.

**Required Knowledge**

The level 5 System Administrator Specialist must know and explain:

1. Benefits of a Cloud system and the different technologies available.
2. Be able to explain what type of WAN networks are available on the market.
3. The importance to create documentation and update it regularly.
4. How a team can help in troubleshooting an issue.
5. Key roles in troubleshooting works and delegate work through a team.
6. How to do a research on new network equipment or protocols on the market.
7. Key benefits of learning new technology.
8. Benefits and procedures for labelling, proper cable management and proper upkeep of cabinets.

**Required Skills**

The level 5 System Administrator Specialist must be able to:

1. Work with minimum or no supervision.
2. Report any critical issues to the superiors and take immediate action to resolve them.
3. Replace and reconfigure any damaged equipment through proper backups.
4. Configure wireless devices with proper and latest standards.
5. Recreate a scaled down version of a new network or cloud structure to test.
6. Get as much information as possible from Associates and evaluate issues.
7. Read multiple log files and trace back the issue to the root of cause.
8. Create a proper label scheme for current and future equipment.
9. Create a proper backup plan for failover and testing environment.
10. Compute any IPv4 class subnetting and scheme.
11. Configure an IPv6 network.
12. Create a proper VLAN structure and distribute it through the network.
13. Configure proper WANs when needed.
14. Create a proper safe Wi-Fi infrastructure and explain the benefit of centralised Controller.
**SAA503- Advanced Scripting and Debugging**

This unit describes what type of skills and knowledge are expected from a systems Administrator Specialist to perform tasks in scripting and debugging code. Upon completion of the unit, the candidate will be able to complete system administrator tasks using shell commands and programming logic such as sequence, selection and repetition with the aim to automate complex tasks. SAA403 is a prerequisite to this unit and the good knowledge of databases is required to assist programmers in troubleshooting complex issues.

**Performance Criteria**

The candidate must have the necessary knowledge and skills to:

1. The different scripting languages supplied and supported by the OS.
2. Use basic SQL scripting and troubleshooting databases.
3. Troubleshoot complex issues using advanced shell scripting commands.
4. Configure and troubleshoot script commands to be able to identify changes in software.

**Required Knowledge**

The level 5 System Administrator Specialist must know and explain:

1. How to troubleshoot a program using advance shell commands.
2. How to use the ISO OSI reference model to troubleshoot a program.
3. The importance of backup and different backup types in relation to database recovery.

**Required Skills**

The level 5 System Administrator Specialist must be able to:

1. Assign the team resources according to their knowledge to assist programmers in resolving issues.
2. Configure Microsoft or Linux software for any changes that programmers may need and in conformity with the company policy.
3. Read and create commands in a structured shell environment.
4. Create a test environment to test such applications before committing them to production.
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<th>SAA504- Data Centre Operations and Procedures</th>
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The current unit describes the knowledge and skills needed for a systems administrator specialist regarding data centre operations and procedures. Given that data centres are restricted areas and strict policies are in place as security measures. Procedures can vary from one company to another, but the following are the general rules by which a system administrator needs to abide.

**Performance Criteria**

The candidate must have the necessary knowledge and skills to:

1. Maintain a proper team work between associate administrators.
2. Update the team members with adequate knowledge to maintain the Data Center up to date.
3. Implement a proper monitoring system and extract data if needed.
4. Schedule UPS and other equipment maintenance and update documentation accordingly.
5. Design and maintain proper temperature control and delegate checks with team.
6. Schedule proper backup procedures of network infrastructure or cloud servers.
7. Maintain a service equipment log book and updated as needed.
8. Analyse data in biometric readers for unauthorised access.
9. Schedule alarm test and create a report from results for improvements.
10. Produce CCTV footage recovery requests from companies or department.

**Required Knowledge**

The level 5 System Administrator Specialist must know and explain:

1. How important security is in a data center.
2. What to do when unauthorised access was detected or reported.
3. The type of maintenance on a data center monitoring system.
4. How often and how important to keep the system up to date and well maintained.
5. The importance of safety.
6. If a fire or hazard happens while in the NOC.
7. How to rack the equipment and cabling structure.

**Required Skills**

The level 5 System Administrator Specialist must be able to:

1. Work with minimum or no supervision
2. Value customers by adopting a professional look and attitude.
3. Schedule the team for 24x7 coverage
4. Do spot checks on tracking records and compare the data with CCTV footage.
5. Follow the disaster recovery procedure structured by IT Manager and assist other departments if needed through the provided team.
The current unit describes the knowledge and skills required by the candidate to perform job requirements in a safe manner as safety is an important part of this role. A general safety standard is already in place, and is updated periodically as new technology is released. The candidate must be well aware of such documentation and must adhere to it.

**Performance Criteria**

The candidate must have the necessary knowledge and skills to:

1. Update and check frequently the IEC safety Standards.
2. Create and update the Information Security policy with new safety standards.
3. Adopt and use new safety equipment.
4. Prioritise security procedures according to the situation encountered.
5. Assess any potential hazard in installed equipment.
6. Check frequently, cables and power supplies to remove any hazard and keep the environment safe.
7. Determine when equipment needs servicing as to prevent any fire or hazard especially equipment powered from high power supplies.
8. Maintain a proper cable management.
9. Replace any equipment which shows wear or outdated equipment.

**Required Knowledge**

The level 5 System Administrator Specialist must know and explain:

1. The basic safety equipment required in a data centre or IT Server Room.
2. All the electrical warning signs.
3. The latest IEC documentation.
4. The importance of a security policy document.
5. How to structure a preventive maintenance guide to determine the equipment to be replaced.
6. The necessary intervention if any high-power cables need to be replaced.
7. The type of markings to look for on a power cable to establish whether it is adequate for the equipment used.
8. The type of power rails available to monitor the current and monitor the power to avoid any power hazard or overload.
9. A plan in protecting cables which can be a potential hazard to anyone in the office and cannot be routed differently.
10. A proper plan and documentation of equipment for end of life replacement.

**Required Skills**

The level 5 System Administrator Specialist must be able to:

1. Identify the type of suppression systems available.
2. Read any service logs for safety equipment.
3. Assess any issues accordingly when reported.
4. Do a proper plan in cable management structure and document the cable plans.
5. Replace any network cable and assess the type of cables to be used in replacing them.
6. Test power supply cables and rate the cable accordingly for the power needed.
7. Use the right tools in performing tests and replacing faulty equipment.
8. Determine if a power supply or equipment is considered as hazard while testing.
9. Run tests frequently on equipment to determine if equipment needs replacement or not.
10. Create and update health and safety procedures in using IT equipment and if necessary, train any staff in such procedures.
11. Assist other associate administrator when in doubt of safety issues.
SAA506 - Documentation and Management in absence of an IT Manager

When a company lacks an IT Manager, most of the documents and presentations must be done by the System Administrator Specialist. This unit highlights the necessary skills and requirements in order to carry out this unit.

Performance Criteria

The candidate must have the necessary knowledge and skills to:
1. Be able to budget for the yearly expenses for buying new equipment.
2. Document the current system and frequently update it accordingly.
3. Be able to plan and cater for drastic changes in the company infrastructure.
4. Meet with the team and update their agenda in weekly meetings.

Required Knowledge

The level 5 System Administrator Specialist must know and explain:
1. Why budgeting is important in a yearly plan.
2. How documentation is kept and when it is updated.
3. The importance of weekly meetings in a managed team.
4. How a plan should be organized and who to involve in the plan.
5. The importance of project management tools to keep the team organized.

Required Skills

The Level 5 System Administrator Specialist must be able to:
1. Work with no supervision.
2. Plan and budget the cost of the change.
3. Be able to administer staff and assign different tasks according to the team knowledge.
4. Be able to report to the board of directors and CEO and create monthly reports.