Overview of role based access control / least privilege best practice

V1.1

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Objective

- Outline guidance and approach to best practice design features for Role Based Access Control (RBAC) and using the principle of Least Privilege in Local Authority Information Systems.

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But don’t we already do this?

- A sizeable percentage of organisations who believe they already have RBAC in place actually don’t.

- They have regular user accounts, and then they have a handful of users who also have ‘Domain Administrator’ level accounts.

- This will give these users permissions they need to do administrative tasks, yes. However, it also gives them permissions to systems that they don’t need to.

- Least Privilege is not being followed in this scenario.

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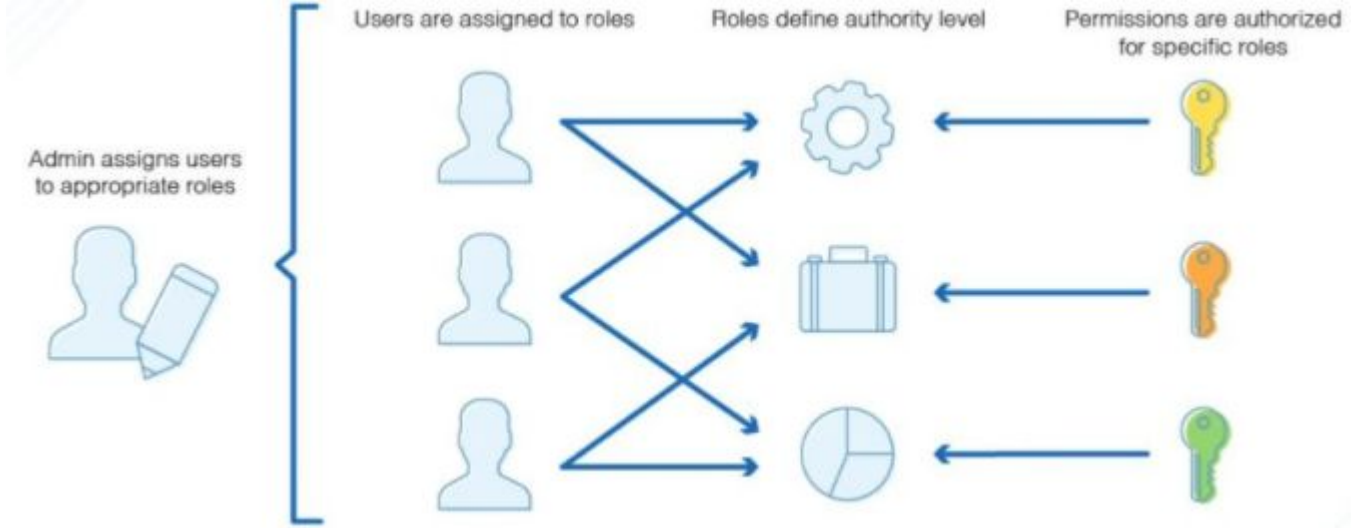
What is role based access control?



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Best practices

Best practices for RBAC include but are not limited to:

- Total separation of privileged roles from regular user accounts
- Specific roles for specific tasks, e.g.
  - User administration role
  - Database server privileged accounts
    - Maintenance accounts (for tasks such as TX log backups, Maintenance plans)
    - Individual DBA accounts
    - Administration accounts (for entire SQL instance management)
  - Backup and restore role
  - Domain administration role
  - Messaging (email) administration role

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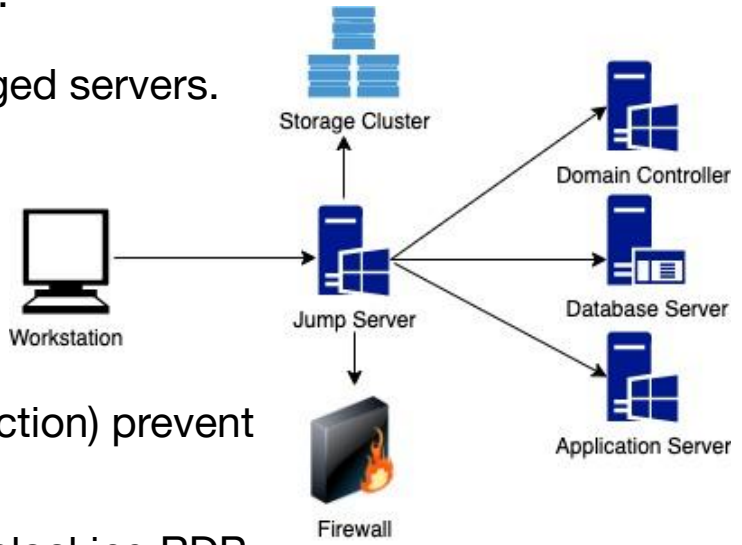
Best practices (cont.)

Best practices for RBAC include but are not limited to:

- Utilise a ‘Jump Server’ for connections to privileged servers.
- A jump server is essentially a server that exists for you to make a connection to before you then connect to the privileged destination server or has the management tools on it that you require to carry out an administrative task.
  Multiple Jump Servers (possible in an RDS Collection) prevent a single point of failure and give greater access.
- They add to your privileged server’s security by blocking RDP access to everything apart from the jump server’s IP address.
- Requiring MFA on the privileged account used to connect to the jump server will enhance security even further.



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Best practices (cont.)

Best practices for RBAC include but are not limited to:

- Create privileged user accounts for each user for each role, for instance a user may look after user accounts, backup systems. In a RBAC configuration they will have 3 accounts - a regular user, a user administration account and an account for backups.
- Work on the principle of least privilege - which means giving a user account or process only those privileges which are essential to perform its intended function and nothing more.

Best practices (cont.)

Both RBAC and least privilege are the foundations of Privileged Access Management (PAM):

PAM provides many benefits, namely:

- It will make it more difficult for an attacker to pivot into critical services, from an already compromised management access workstation.
- It will introduce an additional source of auditing, making it easier to identify misuse of administration interfaces. This will act as a strong deterrent against the insider threat, where a legitimate system administrator may consider abusing their access.
- It will introduce additional guard rails to help system administrators. They will hold less responsibility to protect their access credentials. It will help protect them from accidentally making unintended changes.

https://www.ncsc.gov.uk/collection/secure-system-administration/use-privileged-access-management

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Why are these practices important?

Access Control:

- A user in a specific role will not have access to systems they should not have access to.

Mobility:

- If a user changes jobs within your organisation, they can simply be removed from or added to the relevant Role.

Reduce Risk:

- If an account is compromised, the exposure to the organisation is reduced.

Even when you implement RBAC you should regularly review the members of the roles to ensure that the permissions are only given to valid users.

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Remember to manage your risk

- Establish effective account management processes
- Establish policies and standards for user authentication and access control
- Limit user privileges
- Limit the number and use of privileged accounts
- Monitor
- Limit access to the audit system and the system activity logs
- Educate users and maintain their awareness

https://www.ncsc.gov.uk/collection/10-steps-to-cyber-security/the-10-steps/managing-user-privileges

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What to do next

- **Prepare your organisation:**
  - List your privileged access systems.
  - List your regular ‘non-regular user access’ tasks.
  - List your users with requirements to carry out work on these systems.
- **Implementation:**
  - Create the roles and assign these roles to have permissions to the specific systems.
  - Create unique user accounts for your require users.
  - Assign these new accounts to the roles.

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What to do next (cont.)

- **Documentation:**
  - Document the roles and responsibilities
  - List the new accounts that have access to these roles
- **Auditing:**
  - Regularly review the memberships of the roles.
  - Remove users who no longer require access. This should include any supplier accounts, project staff accounts, etc.
- **Review NCSC guidelines at:** https://www.ncsc.gov.uk/collection/10-steps-to-cyber-security/the-10-steps/managing-user-privileges

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