

Product Specification

ROLE-BASED ACCESS CONTROL (RBAC)

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1. Introduction

1.1. Introduction

The Vauban project wants the product to implement Role-Based Access Control (RBAC).

2. RBAC overview

Establish specific roles and permissions to determine who can access the bastion and servers and what actions they are allowed to perform. This ensures that access is granted based on the principle of least privilege, minimizing potential security risks.

3. RBAC key components and definitions

3.1. Users

A user is any entity requesting access. This request can be either proactive or automatic, such as when a user logs in. Additionally, users are not always human; in Role-Based Access Control (RBAC), services and computing entities like virtual machines or end-devices can also be users. For instance, if a device attempts to update its registry contents as part of an upgrade, it is considered a user requiring RBAC-approved privileges.

3.2. Roles

Roles define which privileges and permissions can be assigned to a user. Roles are often organized in hierarchies, where higher-level roles possess more privileges than lower-level ones. For instance, a document owner might have full control over a document (edit, share, save offline), while a contributor might only be able to edit it. In this case, the owner role is superior to the contributor role.

In RBAC, roles are an aggregation of various user attributes—such as their job title, session details like the device used, and login credentials. RBAC systems often come with predefined roles and support the creation of custom roles.

3.3. Operations

Users can request access to perform operations or access objects.

Operations refer to any activity or process within a computing environment. Examples include changing system settings or terminating active processes. Depending on the IT environment, operations can range in complexity and may require robust security measures to protect against potential risks.

3.4. Objects

Users can also request access to objects, which can be static files, data sets, websites, or other assets. Unlike operations, accessing an object does not alter the system state, making unauthorized access harder to detect. This is where RBAC is crucial—it ensures the user's role is appropriate for the object and authorizes the access. RBAC also logs access details, including date and time.

3.5. Permissions

Permissions are fundamental to RBAC, defining what operations and objects a role can access. For example, if an employee with ID A12 has the role of a contributor, permissions specify what actions this role allows.

As a contributor, they might be able to edit a document (an object) but not delete it (an operation) or access embedded links (objects).

In essence, permissions establish the relationship between a role and the corresponding operations and objects.

3.6. Sessions

Sessions refer to the period during which a role interacts with operations and objects. RBAC is activated at the start of a session and remains in effect until it ends. For instance, when a user opens a browser on the company network to access an intranet page, the session begins. The RBAC system verifies the user's role, grants access based on permissions, monitors accessed operations and objects, and logs the session activity until the browser is closed. This entire interaction period is defined as a session.

4. Conclusion

In conclusion, ...

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