ATTRIBUTE BASED ACCESS CONTROL

The National Cybersecurity Center of Excellence (NCCoE) is addressing the challenge of implementing Attribute Based Access Control (ABAC), a security mechanism that allows organizations to authorize an individual’s access to networks and resources based on granular attributes, through collaborative efforts with industry and the information technology community, including vendors of cybersecurity solutions. This fact sheet provides an overview of NIST Cybersecurity Practice Guide SP 1800-3, including the challenge, solution, and potential benefits. As a private-public partnership, we are always seeking insights and expertise from businesses, the public, and technology vendors. If you have feedback on the architecture or the relevance and usefulness of this Practice Guide, or would like to schedule a demonstration, please email abac-nccoe@nist.gov.

CHALLENGE

Today, access to a company’s network and assets is defined by a user’s job or role within the organization using a Role Based Access Control (RBAC) system. If roles change or an employee leaves the company, an administrator must manually change access rights accordingly—oftentimes within several systems. However, as organizations expand and become more complex, managing the diversity of users and their access needs under current RBAC systems becomes increasingly difficult and inefficient to manage and audit.

SOLUTION

An ABAC system moves beyond roles and their associated privileges. Instead, ABAC uses granular attributes, such as title, division, certifications, training, and even environmental conditions, to authorize an individual’s access. The ABAC technology solution demonstrated in this document is designed to be modular, flexible, and centrally managed. Organizations can define attribute-based policy on subjects and objects, and by using a variety of environmental decisions. It also reduces the number of identities managed by the enterprise and allows the enterprise to accept federated identities.

BENEFITS

ABAC implementations that leverage identity federation can reduce organizational costs by diminishing the burden of identity storage and management. Through the use of attribute-based policy definitions, enterprise risks—including insider threats, loss of personally identifiable information, and fraud—are reduced.

The potential business benefits of this example solution include:

- flexibility—products and capabilities can be implemented on a component-by-component basis, or as a whole
- reduces “privilege creep”—users only obtain needed access
- reduces costs
- better risk-mitigation decisions
- increases business collaboration
- efficient policy management and associated regulatory compliance

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TECHNOLOGY PARTNERS/COLLABORATORS

Organizations participating in this project submitted their capabilities in response to an open call in the Federal Register for all sources of relevant security capabilities from academia and industry (vendors and integrators). The following respondents with relevant capabilities or product components (identified as “Technology Partners/Collaborators” herein) signed a Cooperative Research and Development Agreement to collaborate with NIST in a consortium to build this example solution.

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DOWNLOAD THE PRACTICE GUIDE
For more information about this project, visit: https://nccoe.nist.gov/projects/building-blocks/attribute-based-access-control

HOW TO PARTICIPATE
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September 2017