

# INTERNATIONAL STANDARD

## NORME INTERNATIONALE



**Power systems management and associated information exchange – Data and communications security –  
Part 8: Role-based access control for power system management**

**Gestion des systèmes de puissance et échanges d'informations associés –  
Sécurité des communications et des données –  
Partie 8: Contrôle d'accès basé sur les rôles pour la gestion de systèmes de  
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Steffen Fries		2018-02-22	Update on RADIUS, Inclusion of custom based role definition		
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INTERNATIONAL ELECTROTECHNICAL COMMISSION

**POWER SYSTEMS MANAGEMENT AND ASSOCIATED INFORMATION EXCHANGE - DATA AND COMMUNICATIONS SECURITY –**

**Part 8: Role-based access control for power system management**

FOREWORD

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## INTRODUCTION

This document provides a standard for access control in power systems. The power system environment supported by this document is enterprise-wide and extends beyond traditional borders to include external providers, suppliers, and other energy partners. Driving factors are the liberalization of the energy sector to include many more stakeholders, the increasingly decentralized generation of energy, and the need to control access to sensitive data of resources and stakeholders. This document supports a distributed security environment in which security is also a distributed service.

The power system sector is continually improving the delivery of energy by leveraging technical advances in computer-based applications. Utility operators, energy brokers and end-users are increasingly accessing multiple applications to deliver, transmit and consume energy in a personalized way. These disparate applications are naturally connected to a common network infrastructure that typically supports protection equipment, substation automation protocols, inter-station protocols, remote access and business-to-business services. Consequently, secure access to these distributed and often loosely coupled applications is even more important than access to an application running on a stand-alone device.

Secure access to computer-based applications involves authentication of the user to the application. After authentication, the types of interactions which that user can perform with the application is then determined. The use of local mechanisms for authorization creates a patchwork of approaches difficult to uniformly administer across the breadth of a power system enterprise. Each application decides with its own logic the authorization process. However, if applications can use a network to help manage access, a database can serve as a trusted source of user's group or role affiliation. Thus, the access to a shared user base can be controlled centrally. Each application can then examine the permissions listed for a subject and corresponding role and determine their level of authorization.

This document defines role-based access control (RBAC) for enterprise-wide use in power systems. It supports a distributed or service-oriented architecture where security is a distributed service and applications are consumers of distributed services.

In this document, the role of a user is transported in a container called an "access token" of that user to the object. Access tokens are created and administered by a (possibly federated) identity management tool. All access tokens have a lifetime and are subject to expiration. Prior to verification of the access token itself, the user transmitting the access token is authenticated by the object. The object trusts the management tool to issue access tokens with suitable lifetime. This enables local verification of the access token's validity at remote sites without the need to access a centralized repository (e.g. a centralized revocation list).

Four different access token formats are supported as four different profiles. Two of them are based on X.509 certificates and were already defined in IEC TS 62351-8. Two new profiles are defined as part of this document. The first new profile uses the JSON to encode the access token and the second new profile uses a vendor specific attribute in RADIUS to provide a migration option for environments already utilizing a RADIUS server to support access control. These access tokens may be bound to a specific transport or to a specific application. Common to all access token formats is the information contained, to allow a migration from one profile to another.