ADDENDA

ANSI/ASHRAE Addendum cs to
ANSI/ASHRAE Standard 135-2020

A Data Communication Protocol for Building Automation and Control Networks

Approved by the ASHRAE Standards Committee on June 28, 2024, and by the American National Standards Institute on June 28, 2024.

This addendum was approved by a Standing Standard Project Committee (SSPC) for which the Standards Committee has established a documented program for regular publication of addenda or revisions, including procedures for timely, documented, consensus action on requests for change to any part of the standard. Instructions for how to submit a change can be found on the ASHRAE® website (www.ashrae.org/continuous-maintenance).

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 ISSN 1041-2336

Approved American National Standard
ANSI
www.ansi.org

SPECIAL NOTE

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ASHRAE obtains consensus through participation of its national and international members, associated societies, and public review.

ASHRAE Standards are prepared by a Project Committee appointed specifically for the purpose of writing the Standard. The Project Committee Chair and Vice-Chair must be members of ASHRAE; while other committee members may or may not be ASHRAE members, all must be technically qualified in the subject area of the Standard. Every effort is made to balance the concerned interests on all Project Committees.

The Senior Manager of Standards of ASHRAE should be contacted for

a. interpretation of the contents of this Standard,
b. participation in the next review of the Standard,
c. offering constructive criticism for improving the Standard, or
d. permission to reprint portions of the Standard.

[This foreword, the table of contents, the introduction, and the "rationales" on the following pages are not part of this standard. They are merely informative and do not contain requirements necessary for conformance to the standard.]

FOREWORD

The purpose of this addendum is to present a proposed change for public review. These modifications are the result of change proposals made pursuant to the ASHRAE continuous maintenance procedures and of deliberations within Standing Standard Project Committee 135. The proposed changes are summarized below.

135-2020*cs*-1 Certificate Authority Requirements Interchange File Format, p. 3

In the following document, language to be added to existing clauses of ANSI/ASHRAE Standard 135-2020 is indicated through the use of *italics* and deletions are indicated by ~~strikethrough~~. Where entirely new subclauses are proposed to be added, plain type is used throughout. Only this new and deleted text is open to comment at this time. All other material in this document is provided for context only and is not open for public review comment except as it relates to the proposed changes.

The use of placeholders such as XX, YY, ZZ, X1, X2, NN, x, n, ? etc. should not be interpreted as literal values of the final published version. These placeholders will be assigned actual numbers/letters only after final publication approval of the addendum.

135-2020*cs*-1 Certificate Authority Requirements Interchange File Format

Rationale

With the addition of the BACnet/SC data link, an interoperable, out-of-band method to exchange Certificate Signing Request (CSR) files and the resulting Operational and Issuer certificate files between a device, or its proxy, and a Certificate Authority is required. This proposal provides a simple structured file format to exchange these files using the zip file format to compress the folders and files into a request and response file.

[Change Clause 3.1, p.11]

3.1 Terms Adopted from International Standards

[…]
zip: the specification for an archive file format that supports lossless data compression (ISO/IEC 21320-1:2015).
[…]

[Change Annex AA, p. 1374]

ANNEX AA – *FILE FORMATS*~~TIME SERIES DATA EXCHANGE FILE FORMAT (NORMATIVE)~~

(This annex is part of this standard and is required for its use.)
[…]

AA.1 Time Series Data Exchange File Format (NORMATIVE)

AA.*1*.1 File Format

[…]

AA.*1*.2 Representation of Data

[…]

AA.*1*.3 File Generation

[…]

AA.*1*.4 Example Files

[…]

[Add new Annex AA. 2, p. 1376]

AA.2 Certificate Authority Requirements Interchange File Format (NORMATIVE)

This annex describes an interoperable file format that allows one or more devices to package their Certificate Signing Request (CSR) files into a single file. This file is processed by the site Certificate Authority (CA) and, if successful, the CA appends each device's Issuer and Operational certificate files to the received file. This annex does not specify the delivery mechanism to exchange these files.

AA.2.1 File Format

The file format is a strict structure of folders and files that provides the information and context necessary to allow the site CA to process CSR files and generate operational and issuer certificates for devices specified in the file. This folder and file structure is compressed using the zip file format into a single file.

The content of the request file format for the CA is specified in Clause AA.2.1.1 and response content from the CA is specified in Clause AA.2.1.2.

The file format shall contain only folders and files specified in clauses AA.2.1.1 and AA.2.1.2. All text files shall be UTF-8 encoded.

AA.2.1.1 Request File Format

```
cert1/
        vendor-data
        request-notes.txt
        device-<instance>/
                port-<id>/
                        csr-<string>.pem
        device-<instance>/
                port-<id>/
                        hub/
                        csr-<string>.pem
        device-<instance>/
                router/
                port-<id>/
                        csr-<string>.pem
                port-<id>/
                        hub/
                        csr-<string>.pem
```

Figure AA.2-1 Example Request File Format

Figure AA.2-1 provides the request file hierarchy of folders and files destined for the CA.

The required root folder of the request file shall be “cert1” and contains all the folders and files required for the CA to generate device certificates.

The optional file named “vendor-data” contains vendor-specific data. The content of this file is a local matter but shall be limited to 1 megabyte.

The optional file named “request-notes.txt” is a free-form, human-readable text file. The content of this file is a local matter but shall be limited to 10 kilobytes. This file can be used to document any aspect of the request phase of the exchange. The file could be used to provide comments for the approver.

Each request file shall contain one or more device folders with the name of the device folder made up of “device-” concatenated with the device’s object instance.

If a device routes between BACnet/SC networks, it shall contain an empty subfolder named “router”. See Clause 6.6.

Each device folder shall contain one or more port folders. The name of each port folder shall be “port-<id>/” where “<id>” is a vendor-specific value and shall be unique for each port folder. <id> shall be any printable character except for < (less than), > (greater than), : (colon), " (double quote), / (forward slash), \ (backslash), | (vertical bar or pipe), ? (question mark), and * (asterisk).

Each port folder shall contain a file named “csr-<string>.pem” where “string” shall be any printable string that contains any characters except for < (less than), > (greater than), : (colon), " (double quote), / (forward slash), \ (backslash), | (vertical bar or pipe), ? (question mark), and * (asterisk). This file is the PKCS#10 Certificate Signing Request file for this port. The port folder can optionally contain a key-<string>.pem file that is the private key corresponding to the CSR file. This file is ignored by the server but will be preserved in the response file.

If a port represents a hub function, the port folder shall contain an empty folder named “hub”. See Clause AB.1.2.

AA.2.1.2 Response File Format

cert1/
- vendor-data
- request-notes.txt
- **response-notes.txt**
- **errors.txt**
- device-<instance>/
  - port-<id>/
    - csr-<string>.pem
    - **opr-<string>.pem**
- device-<instance>/
  - port-<id>/
    - hub/
    - csr-<string>.pem
    - **opr-<string>.pem**
- device-<instance>/
  - router/
  - port-<id>/
    - csr-<string>.pem
    - **opr-<string>.pem**
  - port-<id>/
    - hub/
    - csr-<string>.pem
    - **opr-<string>.pem**
- **issuer/**
  - **iss-1.pem**
  - **iss-2.pem**

Figure AA.2-2 Example Response File Format

Figure AA.2-2 provides the response file hierarchy of folders and files.

The response file format shall contain all files and folders included in the request file and the files and folders specified in this clause. If any of the files specified below exist in the request file, they will be overwritten or deleted in the response file.

The optional file named “response-notes.txt” is a free-form, human-readable text file. The content of this file is a local matter and shall be limited to 10 kilobytes. This file could indicate why a certificate request was denied.

The conditional “errors.txt” file contains a single text line for every error that is encountered during the processing of the CSR files. If errors are encountered, the “errors.txt” file shall be present; otherwise, it shall be absent.

If the operational certificate file exists for the corresponding CSR file, the port folder shall contain the operational certificate file. The operational certificate file shall be in PEM format and named “opr-<string>.pem” where “string” matches the string in the name of csr-<string>.pem. This file is destined for the file referenced by the Operational_Certificate_File property of the Network Port object for the port. See Clause 12.56.Y24 of Addendum cc of Standard 135-2020 and Clause AB.7.4.1.1.

If the operational certificate file does not exist for the corresponding CSR file, the errors.txt file shall contain an error that is a tab-separated string with device-<instance>, port-<id>, and an optional human-readable description of the error.

Each response file shall contain a subfolder of “cert1” named “issuer”. This folder shall contain at least one and no more than two issuer certificate files. These certificate files are destined for the files referenced by the Issuer_Certificate_Files property of the Network Port objects. See Clause 12.56.Y25 of Addendum cc of Standard 135-2020. These files shall be named “iss-1.pem” and “iss-2.pem”.

Add a new entry to History of Revisions, p. 1429]

(This History of Revisions is not part of this standard. It is merely informative and does not contain requirements necessary for conformance to the standard.)

HISTORY OF REVISIONS

. . .	. . .	**. . .**
1	26	**Addendum *cs* to ANSI/ASHRAE Standard 135-2020** Approved by ASHRAE on June 28, 2024; and by the American National Standards Institute on June 28, 2024. 1. Certificate Authority Requirements Interchange File Format

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ASHRAE is concerned with the impact of its members' activities on both the indoor and outdoor environment. ASHRAE's members will strive to minimize any possible deleterious effect on the indoor and outdoor environment of the systems and components in their responsibility while maximizing the beneficial effects these systems provide, consistent with accepted Standards and the practical state of the art.

ASHRAE's short-range goal is to ensure that the systems and components within its scope do not impact the indoor and outdoor environment to a greater extent than specified by the Standards and Guidelines as established by itself and other responsible bodies.

As an ongoing goal, ASHRAE will, through its Standards Committee and extensive Technical Committee structure, continue to generate up-to-date Standards and Guidelines where appropriate and adopt, recommend, and promote those new and revised Standards developed by other responsible organizations.

Through its *Handbook*, appropriate chapters will contain up-to-date Standards and design considerations as the material is systematically revised.

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