

Reaffirmed as  
INCITS 469-2015 (R2020)

INCITS 469-2015

# American National Standard

*for Information Technology –  
Open Virtualization Format  
(OVF) Specification*

---

Developed by



*Where IT all begins*



This is a preview of "INCITS 469-2015 (R20...)". [Click here to purchase the full version from the ANSI store.](#)

**INCITS 469-2015**

Revision of  
INCITS 469-2010

American National Standard  
for Information Technology –

# Open Virtualization Format (OVF) Specification

Secretariat

**Information Technology Industry Council**

Approved October 30, 2015

**American National Standards Institute, Inc.**

## American National Standard

Approval of an American National Standard requires review by ANSI that the requirements for due process, consensus, and other criteria for approval have been met by the standards developer.

Consensus is established when, in the judgement of the ANSI Board of Standards Review, substantial agreement has been reached by directly and materially affected interests. Substantial agreement means much more than a simple majority, but not necessarily unanimity. Consensus requires that all views and objections be considered, and that a concerted effort be made towards their resolution.

The use of American National Standards is completely voluntary; their existence does not in any respect preclude anyone, whether he has approved the standards or not, from manufacturing, marketing, purchasing, or using products, processes, or procedures not conforming to the standards.

The American National Standards Institute does not develop standards and will in no circumstances give an interpretation of any American National Standard. Moreover, no person shall have the right or authority to issue an interpretation of an American National Standard in the name of the American National Standards Institute. Requests for interpretations should be addressed to the secretariat or sponsor whose name appears on the title page of this standard.

**CAUTION NOTICE:** This American National Standard may be revised or withdrawn at any time. The procedures of the American National Standards Institute require that action be taken periodically to reaffirm, revise, or withdraw this standard. Purchasers of American National Standards may receive current information on all standards by calling or writing the American National Standards Institute.

**CAUTION:** The developers of this standard have requested that holders of patents that may be required for the implementation of the standard disclose such patents to the publisher. However, neither the developers nor the publisher have undertaken a patent search in order to identify which, if any, patents may apply to this standard. As of the date of publication of this standard and following calls for the identification of patents that may be required for the implementation of the standard, no such claims have been made. No further patent search is conducted by the developer or publisher in respect to any standard it processes. No representation is made or implied that licenses are not required to avoid infringement in the use of this standard.

Published by

**American National Standards Institute, Inc.  
25 West 43rd Street, New York, NY 10036**

Copyright © 2015 by Information Technology Industry Council (ITI)  
All rights reserved.

No part of this publication may be reproduced in any form, in an electronic retrieval system or otherwise, without prior written permission of ITI, 1101 K Street NW, Suite 610, Washington, DC 20005.

Printed in the United States of America

## CONTENTS

Foreword.....	iv
1 Scope .....	1
2 Normative references .....	1
3 Terms and definitions .....	3
4 Symbols and abbreviated terms.....	5
5 OVF package .....	5
5.1 OVF package structure.....	5
5.2 Virtual disk formats .....	6
5.3 OVF package options .....	7
5.4 Distribution as a set of files .....	7
6 OVF descriptor .....	7
7 Envelope element.....	8
7.1 File references .....	8
7.2 Content element.....	9
7.3 Extensibility .....	10
7.4 Conformance .....	10
8 Virtual hardware description.....	11
8.1 VirtualHardwareSection .....	11
8.2 Extensibility .....	12
8.3 Virtual hardware elements .....	12
8.4 Ranges on elements .....	14
9 Core metadata sections .....	16
9.1 DiskSection .....	17
9.2 NetworkSection.....	18
9.3 ResourceAllocationSection .....	18
9.4 AnnotationSection.....	19
9.5 ProductSection.....	19
9.5.1 Property elements.....	20
9.6 EulaSection.....	22
9.7 StartupSection .....	22
9.8 DeploymentOptionSection .....	23
9.9 OperatingSystemSection .....	24
9.10 InstallSection.....	24
9.11 EnvironmentFilesSection .....	25
9.12 BootDeviceSection.....	25
9.13 SharedDiskSection .....	26
9.14 ScaleOutSection .....	26
9.15 PlacementGroupSection and PlacementSection.....	27
9.16 EncryptionSection.....	29
10 Internationalization .....	30
10.1 Internal resource bundles .....	31
10.2 External resource bundles .....	31
10.3 Message content in external file .....	31
11 OVF environment and OVF environment file .....	31
11.1 Transport media.....	32
11.2 Transport media type .....	33
ANNEX A (informative) Symbols and conventions .....	34
ANNEX B (normative) OVF XSD .....	35
ANNEX C (informative) OVF mime type registration template .....	36
ANNEX D (informative) OVF examples .....	38

D.1	Examples of OVF package structure .....	38
D.2	Examples of distribution of files .....	38
D.3	Example of envelope element .....	39
D.4	Example of file references .....	40
D.5	Example of content element .....	40
D.6	Examples of extensibility .....	40
D.7	Examples of VirtualHardwareSection .....	41
D.8	Examples of virtual hardware elements .....	42
D.9	Example of ranges on elements .....	42
D.10	Example of DiskSection .....	43
D.11	Example of NetworkSection .....	43
D.12	Example of ResourceAllocationSection .....	44
D.13	Example of annotation .....	44
D.14	Example of Product section .....	44
D.15	Example of EULA section .....	45
D.16	Example of StartupSection .....	45
D.17	Example of DeploymentOptionSection .....	45
D.18	Example of OperatingSystemSection .....	46
D.19	Example of InstallSection .....	46
D.20	Example of EnvironmentFilesSection .....	47
D.21	Example of BootDeviceSection .....	47
D.22	Example of SharedDiskSection .....	48
D.23	Example of ScaleOutSection .....	48
D.24	Example of PlacementGroupSection .....	49
D.25	Example of EncryptionSection .....	50
D.26	Example of internationalization .....	51
D.27	Example of message content in an external file .....	52
D.28	Example of environment document .....	53
ANNEX E	(informative) Network port profile examples .....	54
E.1	Example 1 (OVF descriptor for one virtual system and one network with an inlined network port profile) .....	54
E.2	Example 2 (OVF descriptor for one virtual system and one network with a locally referenced network port profile) .....	56
E.3	Example 3 (OVF descriptor for one virtual system and one network with a network port profile referenced by a URI) .....	57
E.4	Example 4 (OVF descriptor for two virtual systems and one network with two network port profiles referenced by URIs) .....	59
E.5	Example 5 (networkportprofile1.xml) .....	62
E.6	Example 6 (networkportprofile2.xml) .....	62
ANNEX F	(informative) Deployment considerations .....	63
F.1	OVF package structure deployment considerations .....	63
F.2	Virtual hardware deployment considerations .....	63
F.3	Core metadata sections deployment considerations .....	63

## Tables

Table 1 – XML namespace prefixes .....	8
Table 2 – Actions for child elements with <code>ovf:required</code> attribute .....	12
Table 3 – HostResource element .....	13
Table 4 – Elements for virtual devices and controllers .....	14
Table 5 – Core metadata sections .....	16
Table 6 – Property types .....	21
Table 7 – Property qualifiers .....	22
Table 8 – Availability attributes .....	28
Table 9 – Affinity Attributes .....	29
Table 10 – Allowed combinations of scoped affinity and availability .....	29
Table 11 – Core sections for OEF .....	32

**Foreword** (This foreword is not part of American National Standard INCITS 469-2015.)

The Open Virtualization Format (OVF) Specification describes an open, secure, efficient, and extensible format for the packaging and distribution of software to be run in virtual systems.

The OVF package enables the authoring of portable virtual systems and the transport of virtual systems between virtualization platforms. The key properties of the format are as follows:

- **Optimized for distribution:** OVF supports content verification and integrity checking based on industry-standard public key infrastructure, and it provides a basic scheme for management of software licensing.
- **Optimized for a simple, automated user experience:** OVF supports validation of the entire package and each virtual system or metadata component of the OVF during the installation phases of the virtual system (VS) lifecycle management process. It also packages with the package relevant user-readable descriptive information that a virtualization platform can use to streamline the installation experience.
- **Supports both single VS and multiple-VS configurations:** OVF supports both standard single VS packages and packages containing complex, multi-tier services consisting of multiple interdependent VSs.
- **Portable VS packaging:** OVF is virtualization platform neutral, while also enabling platform-specific enhancements to be captured. It supports the full range of virtual hard disk formats used for hypervisors today, and it is extensible, which allows it to accommodate formats that may arise in the future. Virtual system properties are captured concisely and accurately.
- **Vendor and platform independent:** OVF does not rely on the use of a specific host platform, virtualization platform, or guest software.
- **Extensible:** OVF is immediately useful - and extensible. It is designed to be extended as the industry moves forward with virtual appliance technology. It also supports and permits the encoding of vendor-specific metadata to support specific vertical markets.
- **Localizable:** OVF supports user-visible descriptions in multiple locales, and it supports localization of the interactive processes during installation of an appliance. This capability allows a single packaged appliance to serve multiple market opportunities.
- **Open standard:** OVF has arisen from the collaboration of key vendors in the industry, and it is developed in an accepted industry forum as a future standard for portable virtual systems.

It is not an explicit goal for OVF to be an efficient execution format. A hypervisor is allowed but not required to run software in virtual systems directly out of the Open Virtualization Format.

This standard contains seven annexes. Annex B is normative and is considered part of this standard. Annexes A and C through G are informative and are not considered part of this standard.

Requests for interpretation, suggestions for improvement or addenda, or defect reports are welcome. They should be sent to InterNational Committee for Information Technology Standards (INCITS), ITI, 1101 K Street, NW, Suite 610, Washington, DC 20005.



This standard was processed and approved for submittal to ANSI by INCITS. Committee approval of this standard does not necessarily imply that all committee members voted for its approval. At the time it approved this standard, INCITS had the following members:

Philip Wennblom, Chair  
Jennifer Garner, Secretary

<i>Organization Represented</i>	<i>Name of Representative</i>
Adobe Systems, Inc. ....	Scott Foshee Steve Zilles (Alt.)
AIM Global, Inc. ....	Steve Halliday Chuck Evanhoe (Alt.) Mary Lou Bosco (Alt.) Dan Kimball (Alt.)
Apple.....	Helene Workman Marc Braner (Alt.) David Singer (Alt.)
Distributed Management Task Force (DMTF) .....	John Crandall Jeff Hilland (Alt.) Lawrence Lamers (Alt.)
EMC Corporation .....	Gary Robinson Stephen Diamond (Alt.)
Farance, Inc. ....	Frank Farance Timothy Schoechle (Alt.)
Futurewei Technologies, Inc. ....	Yi Zhao Timothy Jeffries (Alt.) Wilbert Adams (Alt.)
GS1GO .....	Frank Sharkey Charles Biss (Alt.)
Hewlett-Packard Company .....	Karen Higginbottom Paul Jeran (Alt.)
IBM Corporation .....	Steve Holbrook Alexander Tarpinian (Alt.)
IEEE .....	Jodie Haasz Don Wright (Alt.) Noelle Humenick (Alt.) Christy Bahn (Alt.) Justin Casto (Alt.)
Intel Corporation .....	Philip Wennblom Grace Wei (Alt.) Stephen Balogh (Alt.)
Microsoft Corporation.....	Laura Lindsay John Calhoon (Alt.)
National Institute of Standards & Technology .....	Michael Hogan Sal Francomacaro (Alt.) Wo Chang (Alt.) Elaine Newton (Alt.)
Oracle Corporation.....	Donald R. Deutsch Jim Melton (Alt.) Michael Kavanaugh (Alt.) Toshihiro Suzuki (Alt.) Peter Lord (Alt.) Anthony DiCenzo (Alt.) Patrick Curran (Alt.)
Purdue University .....	Stephen Elliott Kevin O'Connor (Alt.)
Telecommunications Industry Association (TIA).....	Florence Otieno Stephanie Montgomery (Alt.)
US Department of Defense .....	Dennis Devera Leonard Levine (Alt.)
US Department of Homeland Security .....	Peter Shebell Gregg Piermarini (Alt.) Juan Gonzalez (Alt.)

The *Open Virtualization Format Specification* (DSP0243) was prepared by the OVF Work Group of the DMTF.

This specification has been developed as a result of joint work with many individuals and teams, including:

Lawrence Lamers, VMware, Inc. (Chair & Editor)

Hemal Shah, Broadcom Corporation (Co-Editor)

Hemal Shah, Broadcom Corporation

John Crandall, Brocade Communications Systems

Marvin Waschke, DMTF Fellow

Naveen Joy, Cisco

Steven Neely, Cisco

Shishir Pardikar, Citrix Systems, Inc.

Richard Landau, DMTF Fellow

Peter Wörndle, Ericsson AB

Jacques Durand, Fujitsu

Derek Coleman, Hewlett-Packard Company

Robert Freund, Hitachi, Ltd.

Eric Wells, Hitachi, Ltd.

Abdellatif Touimi, Huawei

Jeff Wheeler, Huawei

Oliver Benke, IBM

Ron Doyle, IBM

Michael Johanssen, IBM

Andreas Maier, IBM

John Leung, Intel Corporation

Monica Martin, Microsoft Corporation

John Parchem, Microsoft Corporation

Cheng Wei, Microsoft Corporation

Tatyana Bagerman, Oracle

Srinivas Maturi, Oracle

Dr. Fermín Galán Márquez, Telefónica

Miguel Ángel Peñalvo, Telefónica

Dr. Fernando de la Iglesia, Telefónica

Álvaro Polo, Telefónica

Steffen Grarup, VMware, Inc.

Lawrence Lamers, VMware, Inc.

Rene Schmidt, VMware, Inc.

Paul Ferdinand, WBEM Solutions

Junsheng Chu, ZTE Corporation

Bhumip Khasnabish, ZTE Corporation

Ghazanfar Ali, ZTE Corporation

American National Standard  
for Information Technology –

# Open Virtualization Format (OVF) Specification

## 1 Scope

The *Open Virtualization Format (OVF) Specification* describes an open, secure, efficient and extensible format for the packaging and distribution of software to be run in virtual systems.

The OVF package enables the authoring of portable virtual systems and the transport of virtual systems between virtualization platforms. This version of the specification (2.1) is intended to allow OVF 1.x tools to work with OVF 2.x descriptors in the following sense:

- Existing OVF 1.x tools should be able to parse OVF 2.x descriptors.
- Existing OVF 1.x tools should be able to give warnings/errors if dependencies to 2.x features are required for correct operation.

If a conflict arises between the schema, text, or tables, the order of precedence to resolve the conflicts is schema; then text; then tables. Figures are for illustrative purposes only and are not a normative part of the standard.

A table may constrain the text but it shall not conflict with it.

The profile conforms to the cited CIM Schema classes where used. Any requirements contained in the cited CIM Schema classes shall be met. If a conflict arises the CIM Schema takes precedence.

The profile conforms to the cited OVF XML Schema. It may constrain the schema but it shall not conflict with it. If a conflict arises the OVF XML Schema takes precedence.

## 2 Normative references

The following standards contain provisions which, through reference in this text, constitute provisions of this American National Standard. All standards are subject to revision, and parties to agreements based on this American National Standard are encouraged to investigate the possibility of applying the most recent editions of the standards indicated below.

The following referenced documents are indispensable for the application of this document. For dated or versioned references, only the edition cited (including any corrigenda or DMTF update versions) applies. For references without a date or version, the latest published edition of the referenced document (including any corrigenda or DMTF update versions) applies.

DMTF DSP0004, *Common Information Model (CIM) Infrastructure Specification 2.7*,  
[http://www.dmtf.org/standards/published\\_documents/DSP0004\\_2.7.pdf](http://www.dmtf.org/standards/published_documents/DSP0004_2.7.pdf)

DMTF DSP0223, *Generic Operations 1.0*,  
[http://www.dmtf.org/standards/published\\_documents/DSP0223\\_1.0.pdf](http://www.dmtf.org/standards/published_documents/DSP0223_1.0.pdf)

DMTF DSP0230, *WS-CIM Mapping Specification 1.0*,  
[http://www.dmtf.org/sites/default/files/standards/documents/DSP0230\\_1.0.2.pdf](http://www.dmtf.org/sites/default/files/standards/documents/DSP0230_1.0.2.pdf)

DMTF DSP1001, *Management Profile Specification Usage Guide 1.1*,  
[http://www.dmtf.org/standards/published\\_documents/DSP1001\\_1.1.pdf](http://www.dmtf.org/standards/published_documents/DSP1001_1.1.pdf)