

[MS-H245]: H.245 Protocol: Microsoft Extensions

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1 Introduction

This document describes the Microsoft extensions for the H.245 Protocol. This document provides a differential view between the Microsoft H.323 protocol extensions and the H.245 International Telecommunication Union (ITU) standards, as specified in [\[H245\]](#).

1.1 Glossary

The following terms are defined in [\[MS-GLOS\]](#):

Active Directory (AD)
Domain
Domain Controller (DC)
Globally Unique Identifier (GUID)
Little-Endian
Unicode
Universal Naming Convention (UNC)

The following terms are specific to this document:

Digital Video Interface (DVI4): A file format used to transfer audio data. Also known as the "DVI ADPCM Wave Type".

MAY, SHOULD, MUST, SHOULD NOT, MUST NOT: These terms (in all caps) are used as described in [\[RFC2119\]](#). All statements of optional behavior use either MAY, SHOULD, or SHOULD NOT.

1.2 References

1.2.1 Normative References

We conduct frequent surveys of the normative references to assure their continued availability. If you have any issue with finding a normative reference, please contact dochelp@microsoft.com. We will assist you in finding the relevant information. Please check the archive site, <http://msdn2.microsoft.com/en-us/library/E4BD6494-06AD-4aed-9823-445E921C9624>, as an additional source.

[H245] ITU-T, "Control protocol for multimedia communication", Recommendation H.245, May 2006, <http://www.itu.int/rec/T-REC-H.245-200605-I/en>

[H323] ITU-T, "Packet-based multimedia communications systems", Recommendation H.323, June 2006, <http://www.itu.int/rec/T-REC-H.323-200606-I/en>

[MS-ERREF] Microsoft Corporation, "[Windows Error Codes](#)", January 2007.

[MS-GLOS] Microsoft Corporation, "[Windows Protocols Master Glossary](#)", March 2007.

[RFC1890] Schulzrinne, H., "RTP Profile for Audio and Video Conferences with Minimal Control", RFC 1890, January 1996, <http://www.ietf.org/rfc/rfc1890.txt>

[RFC2119] Bradner, S., "Key words for use in RFCs to Indicate Requirement Levels", BCP 14, RFC 2119, March 1997, <http://www.ietf.org/rfc/rfc2119.txt>

1.2.2 Informative References

None.

1.3 Protocol Overview (Synopsis)

H.245, as specified in [\[H245\]](#), is the control protocol for multimedia communication which is contained within the H.323 specification. H.323, as specified in [\[H323\]](#), is a protocol suite defined by the ITU and used for Voice over IP (VoIP) and video conferencing.

TAPI3.0 in Windows 2000 implemented an H.323 endpoint following the ITU protocol specification. TAPI3.0 uses the **DVI4** audio codec, which is not one of the codecs defined in [\[H323\]](#). TAPI3.0 uses the H.245 Protocol: Microsoft Extensions to include DVI4 as one of the codecs available for negotiation during call setup time. [<1>](#)

The H.323 Protocol includes the H.245 terminal capability negotiation procedure, as specified in [\[H323\]](#) and [\[H245\]](#). Microsoft has added support to this procedure for the Digital Video Interface (DVI4) audio codec at the 16-kilohertz (kHz) sample rate. If the Abstract Syntax Notation One (ASN.1) AudioCapability message included in the H.245 negotiation procedure contains a nonStandardParameter, with nonStandardIdentifier set to the Object Identifier "{ 1 3 6 1 4 1 311 19 2 }", and data set to the Octet String "001100013E0800001F4000000001000400020014", the 16-kHz DVI4 codec is supported.

1.4 Relationship to Other Protocols

The H.245 protocol is contained within the H.323 Protocol suite (as specified in [\[H323\]](#)) and uses TCP/IP as a transport.

1.5 Prerequisites/Preconditions

There are no prerequisites other than those specified in [\[H323\]](#) and [\[H245\]](#).

1.6 Applicability Statement

This protocol extension is applicable to any implementation that uses both the [\[H323\]](#) Protocol set (including [\[H245\]](#)) and the DVI4 audio codec.

1.7 Versioning and Capability Negotiation

Microsoft extensions for the H.245 Protocol have no versioning or capability negotiation functionality.

1.8 Vendor-Extensible Fields

This protocol extension uses Win32 error codes. These values are taken from the Windows error number space specified in [\[MS-ERREF\]](#). Vendors SHOULD reuse those values with their indicated meaning. Choosing any other value runs the risk of a collision in the future.

1.9 Standards Assignments

None.

2 Messages

2.1 Transport

There are no changes to the transport mechanism defined in [\[H245\]](#) and [\[H323\]](#).

2.2 Message Syntax

This protocol implementation consists of an extension to allow the DVI4 video codec to be used with the H.323 Protocol, as specified in [\[H323\]](#). This extension is implemented according to the H.245 Extension Procedure, as specified in [\[H245\]](#) Section V.

Microsoft has added support to the H.245 terminal capability negotiation procedure to allow for use of the Digital Video Interface (DVI4) audio codec at the 16-kHz sample rate.

Support for the 16-kHz DVI4 codec MUST be indicated via the following steps:

1. The Abstract Syntax Notation One (ASN.1) AudioCapability message included in the H.245 negotiation procedure MUST contain a nonStandardParameter.
2. The nonStandardIdentifier of this nonStandardParameter MUST be set to include the following items:
 - The Object Identifier MUST be set to the following value:

```
{ 1 3 6 1 4 1 311 19 2 }
```

- The data portion MUST be set to the following Octet String:

```
001100013E0800001F4000000001000400020014
```

2.2.1 DVI4 Packet Format

The H.245 Protocol: Microsoft Extensions implement DVI4 exactly as specified in [\[RFC1890\]](#) section 4.4.2.

3 Protocol Details

3.1 Server Details

3.1.1 Abstract Data Model

This protocol extension does not change the data model specified in [\[H245\]](#).

3.1.2 Timers

There are no additional timers beyond those specified in [\[H245\]](#) and [\[H323\]](#).

3.1.3 Initialization

There are no additional initialization steps beyond those specified in [\[H245\]](#) and [\[H323\]](#).

3.1.4 Higher-Layer Triggered Events

There are no higher-layer triggered events beyond those specified in [\[H245\]](#) and [\[H323\]](#).

3.1.5 Message Processing Events and Sequencing Rules

There are no additional sequencing rules beyond those specified in [\[H245\]](#) and [\[H323\]](#).

3.1.6 Timer Events

None.

3.1.7 Other Local Events

None.

4 Protocol Examples

None.

5 Security

5.1 Security Considerations for Implementers

There are no additional security considerations beyond those specified or implied in [\[H245\]](#) and [\[H323\]](#).

5.2 Index of Security Parameters

None.

6 Appendix A: Windows Behavior

The information in this specification is applicable to the following versions of Windows:

- Windows Vista
- Windows Server 2003
- Windows XP
- Windows 2000
- Windows NT

Exceptions, if any, are noted below. Unless otherwise specified, any statement of optional behavior in this specification prescribed using the terms SHOULD or SHOULD NOT implies Windows behavior in accordance with the SHOULD or SHOULD NOT prescription. Unless otherwise specified, the term MAY implies that Windows does not follow the prescription.

[<1> Section 1.3:](#) Note that the DVI4 codec, while part of other Microsoft APIs, is used only in the Microsoft TAPI implementation.

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