WMDRM-ND For DLNA

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What is WMDRM-ND?

WMDRM-ND (Windows Media Digital Rights Management for Network Devices) is a Link Protection extension to WMDRM. It provides the elements necessary for Link Protection (device authentication and data protection) as well as a system for Digital Rights Management. It is important to note that Digital Rights Management is out of the DLNA scope, so the inclusion of any DRM components of the WMDRM-ND technology is purely out of necessity to achieve pure Link Protection. WMDRM-ND was created by Microsoft Corp as a proprietary technology, so it's specification is only available to licensees of the technology.

How is WMDRM-ND used within DLNA?

A subset of the WMDRM-ND technology is used to achieve Link Protection for DLNA devices. The most significant modification to a DLNA device is the addition of the X_MS_MediaReceiverRegistrar:1 UPnP Service to Source devices. The consequence of this addition is that rendering devices must also be X_MS_MediaReceiverRegistrar:1 control points. This UPnP service is how WMDRM achieves the Authentication requirement of Link Protection. This service is used Authenticate and establish a session between Source and Sink devices. Details of how this process works are outlined in the WMDRM-ND specification. To summarize, the service is used to exchange and validate device certificates, and perform proximity detection. Proximity Detection is an exchange process that it used to verify that the devices are located on the same LAN.

In order to achieve the Link Encryption requirement, WMDRM-ND uses a license and standard data encryption scheme. License requests are initiated by the content sink after authentication and proximity detection. The sink device sends a POST request to the media URI with a WMDRM-ND License Request Message as the data. The Source then responds with the license that contains the media items playback rights (DRM portion) as well as the encryption key necessary to decrypt the network stream (Link Protection portion). A sample Flow of a WMDRM-ND request is shown below:

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Sample WMDRM-ND Content Transfer (simplified)

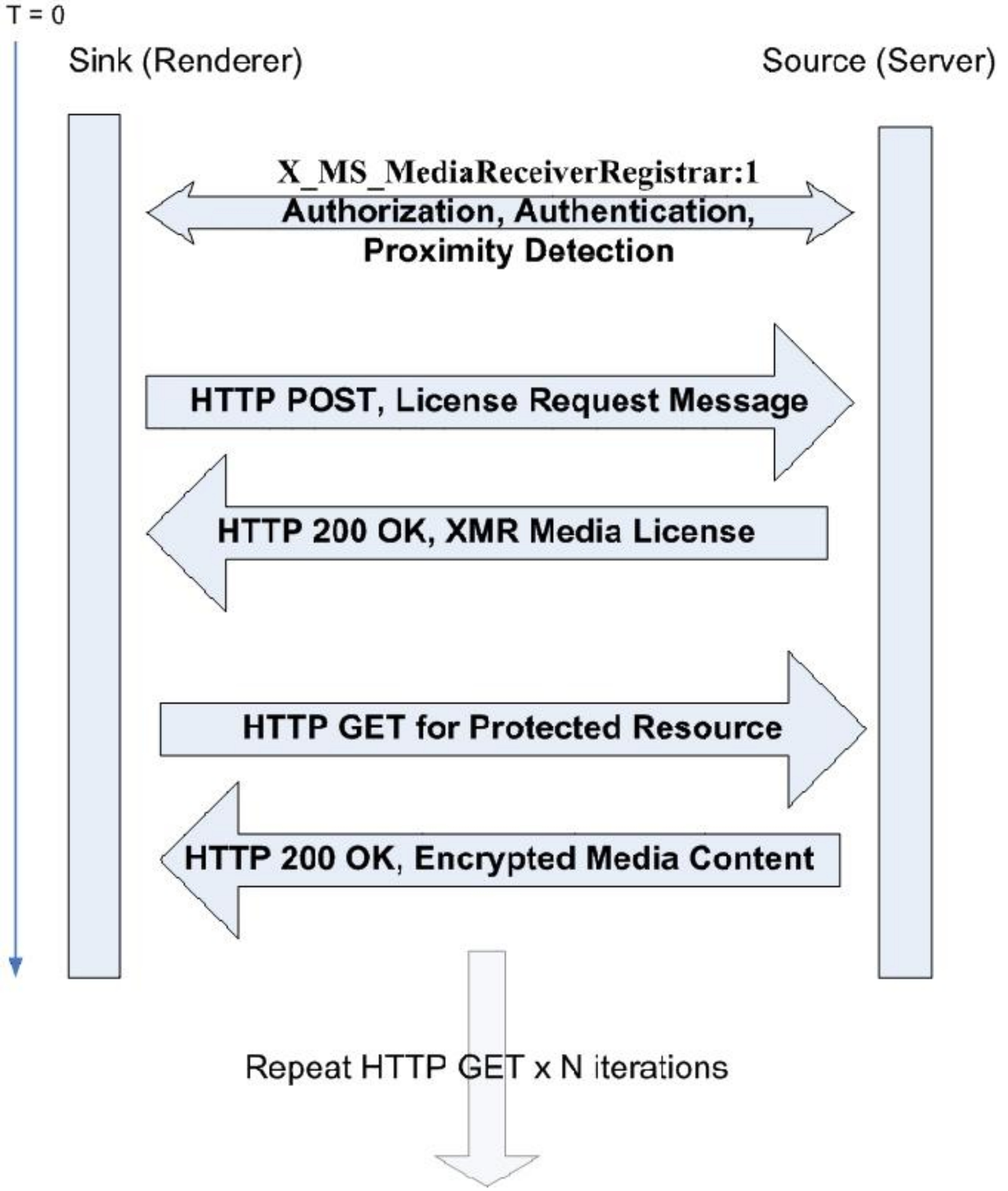
T = 0
Sink (Renderer)
Source (Server)
X_MS_MediaReceiverRegistrar:1
Authorization, Authentication,
Proximity Detection
HTTP POST, License Request Message
HTTP 200 OK, XMR Media License
HTTP GET for Protected Resource
HTTP 200 OK, Encrypted Media Content
Repeat HTTP GET x N iterations

Fig 1: Simplified WMDRM-ND Transfer under DLNA.

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As with DTCP-IP under DLNA, several HTTP headers have been added by the DLNA to facilitate operation between the Cleartext and Network Byte Domains. For a description and examples of this system, see the “Overview of DTCP-IP for DLNA” White Paper located here. (put a link here). The concepts remain identical, except for WMDRM-ND protected media items, the Cleartext request/response headers are as follows:

Request: Cleartext-Range.dlna.org
Response: Cleartext-Content-Range.dlna.org

For more information on these headers, you can also see the DLNA Link Protection Guidelines available from the DLNA.

What does this mean for a Developer?

Unlike DTCP-IP, implementing WMDRM-ND for a DLNA requires a bit more than just adding the “Link Protection Shim” as described in the DTCP-IP for DLNA White Paper (link). The addition of the X_MS_MediaReceiverRegistrar:1 UPnP is required for WMDRM-ND Devices. There are also components of WMDRM-PD (WMDRM for Portable Devices) that must be implemented in order to achieve WMDRM-ND functionality. The specifics of this are available to Microsoft WMDRM SDK licensees.

Another interesting point for WMDRM-ND is that it was specifically designed with Microsoft’s own ASF format in mind (.wma, .wmv, etc). DLNA uses a special mode of WMDRM-ND called “Link Encryption Mode” to achieve generic Link Encryption for WMDRM-ND content transfers. Again, details of this are available to WMDRM-ND licensees.

For more information on becoming a WMDRM-ND licensee, please see:
http://www.microsoft.com/windows/windowsmedia/forpros/drm/default.mspx