Accelerate File Distribution to Endpoints

Ivanti® Advanced File Distribution SDK for OEM Partners

Endpoint management features such as software distribution, patching, configuration, managing, and more require file delivery to the endpoint. However, even though networks keep getting faster, the size and number of files required continue to grow. Delivering these files with minimal impact to the network is challenging when there are thousands of endpoints across multiple locations. The Advanced File Distribution Software Development Kit (SDK) from Ivanti meets this challenge.

How It Works

Many management applications use cURL or Windows remote file calls to download a file from a website or Windows share. A small number of these downloads does not affect network performance. However, if thousands of machines download a large file from the Internet simultaneously, available bandwidth is quickly consumed, causing network performance to suffer.

The Advanced File Distribution library provides four methods to alleviate this challenge. Using a side-band channel for communication and subnet organization, Advanced File Distribution can:

1. Participate in a subnet-based multicast to preload the file (most efficient with bandwidth)
2. Retrieve the file from a peer
3. Retrieve the file from a preferred location "close" to the subnet
4. Retrieve the file from the source   (least efficient with bandwidth)

Your OEM solution controls what method to attempt when downloading files. If all methods are allowed, the methods will be attempted in the following order: Subnet-based Multicast, Peer Download, Preferred Server, and Download from source. A description of each method is below.

## Subnet-based Multicast to Preload the File (Multicast)

The multicast option works well when there are multiple endpoints on the same subnet that are being told to download the same file or files at nearly the same time.

Your server will send a task to each endpoint that needs the file or files. Your agent will call the Advanced File Distribution library to create the multicast task identified by a GUID. The multicast is self-organizing and will determine what endpoint will retrieve the file from the source. The elected endpoint communicates on the multicast channel using the GUID to let the other machines know it is elected for the task. Only the elected endpoint will download the file from the source. The multicast will begin after the prescribed delay period. Once the multicast is complete, there is some communication back to the sender to resend any missed packets. If, after this process completes, an endpoint still does not have the entire file, it can obtain the remainder of the file using the other download methods.

Retrieve the File from a Peer (Peer Download)

When an endpoint needs a file or files, your agent calls the Advanced File Distribution library to see if a peer has it. The library will send a message on the predefined multicast channel requesting the file from any endpoint on the same subnet. The message includes a SHA256 hash and, or, the time and date of the requested file.

OEM Integration
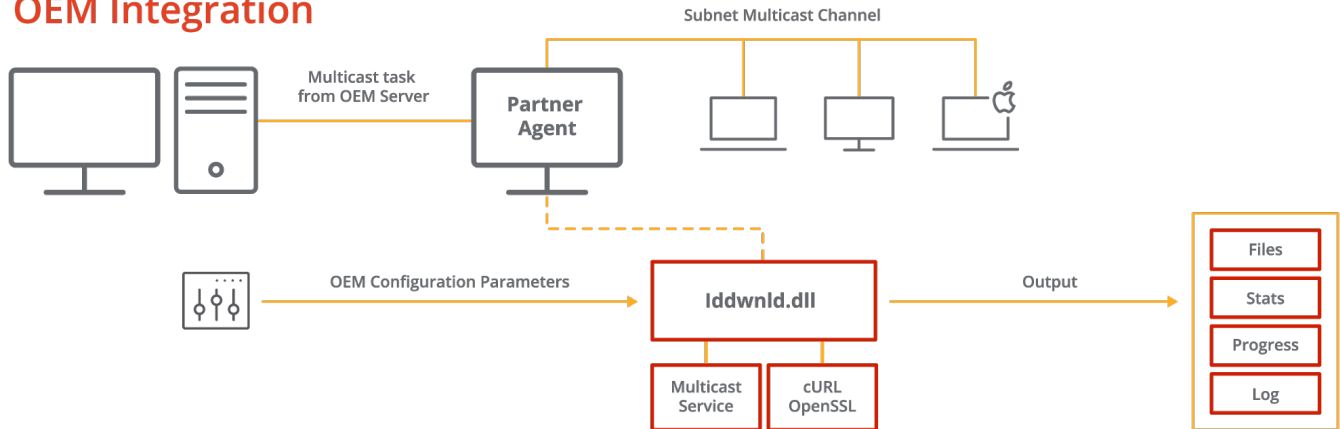
This information is used to identify if a peer has the requested file. If a peer has the matching file, it replies if no other computers have responded. The requesting endpoint will then connect directly to the responding endpoint and retrieve the file.

If hashes were used in the discovery process, the receiving computer calculates the hash of the file it received to verify a match. Any file downloads that are interrupted during the file transfer can be restarted, and it will automatically continue from the point of the interruption.

Preferred Server

A preferred server is a local computer or file server that has a copy of the files that the source server has. A preferred server is typically closer (possibly on the same LAN) as the client so it would be more efficient to download the file from that location rather than the source server.

Source

The source is the last method attempted because it would be the most expensive if all machines on the network downloaded from the source at once. It is still an important download method since at least one machine needs to be able to retrieve it from the source.

Additional Components and Capabilities

There are two main components of the Ivanti Advanced File Distribution SDK: 1) a service that is used to manage the side-band communications between the endpoints on the subnet; and 2) the library is linked into your application in order to access the functions available.

Other capabilities include:
- Bandwidth Throttling – the library also allows for bandwidth throttling for both the WAN and LAN. This is expressed as part of the request to the library and is set as a percentage from 1 to 100.
- Command Line Interface (CLI) Utility – a CLI utility, pedownloader.exe, is included in the SDK that can be used to test the functionality of the library. The SDK will include the source code for this utility so you will have example code for each function available.
- The Ivanti Advanced File Distribution SDK is available for both Mac and Windows.

For more information visit:
www.ivanti.com/partners/oem

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