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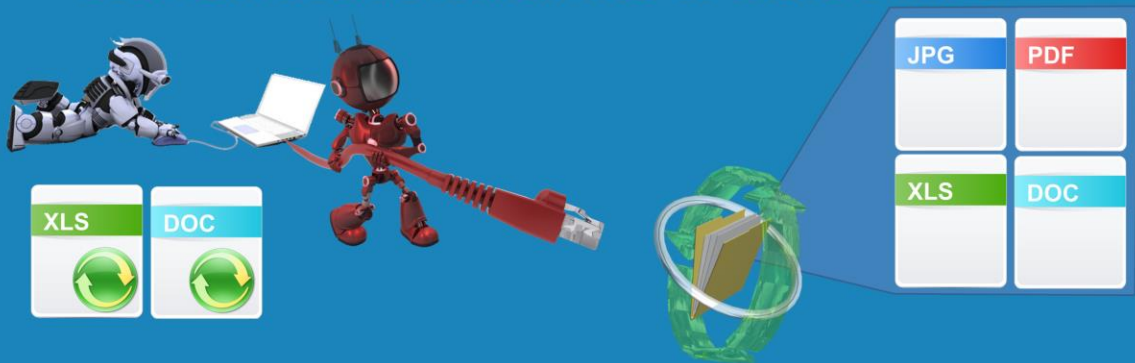
## Offline files and Other Technology

For the free video please see  
<http://itfreetraining.com/server#/offline-files>

This video will look at Offline Files and how it works with other Windows Technology. Offline Files allows files to be stored in a local cache and accessed locally rather than using the network or when the network is not available. The video will also look at how other technology works with Offline Files to improve the user experience.

# Offline Files

- Introduced in Windows 2000
- Also referred to as client side-caching
- User can decide which files to make offline



## Offline Files

0:28 – Offline Files was first introduced in Windows 2000. It is also sometimes called client-side caching. Let's consider that there is a file share that has files on it. The user is in control as to which files they would like to have made available offline. Once they have been selected and have been made available offline, if the network were to be disconnected the users would continue to be able to access their files from the local cache. Changes that are made are synched with the server once the connection to the server becomes available again. This is basically how Offline Files works; however since its inception it has had improvements and additional features added.

# Features of Offline Files

- Sync Center works in the background
- Slow-link mode
- Transparent Caching
- Supports Branchcache
- Offline cache can be encrypted using EFS
- Add in Windows Server 2012 R2 and Windows 8.1
  - Always available offline mode

## Features of Offline Files

1:08 - The majority of the large changes happened in Windows Vista, however there have been further improvements made after this. Sync Center has been added and it works in the background to sync files. Before this, syncing could be configured to start once the user logs in, logs out, or when the network becomes available again. However, this process was never transparent to the user. Sync Center is different in that it runs in the background, thus entirely transparent to the user along with Offline Files automatically performing synchronization between locally stored files and the network stored files as required.

The next feature we will discuss is slow link mode. When enabled using group policy, Offline Files can automatically change to the local cache copy when a slow network connection is detected. Sync Center can also be configured to sync files over a slow network connection.

The next feature we'll look at is Transparent Caching. As with slow link mode, this can be configured using group policy. Once it is enabled, a file that is accessed over the network will be stored in the local cache. When a user tries to access the file a second time, the system will perform a check against the version stored on the server to determine whether there has been a change. If there has not been a change, the system will use the local copy of the file versus copying the file across the network. This works well in conjunction with BranchCache. When BranchCache is enabled, transparent caching can retrieve the files using BranchCache instead of copying it over the local network. Offline Files also allows the offline cache to be encrypted using EFS. This prevents the cached files from being read by a 3<sup>rd</sup> party if the computer is ever lost or stolen.

The last feature we will discuss is one that has been added to Windows Server 2012 R2 and Windows 8.1. It is the "Always available offline mode". When this mode is enabled, Windows will always use the local cached versions even if the network is available.

We will now take a close look at some of the features of offline files.

# Sync Center



- Bi-directional syncing
  - Changes can be made on both sides
- Conflicts occur if changes occur on both sides
  - Sync Center will ask which version to keep
- Sync partnerships can be setup with compatible devices

## Sync Center

3:16 – Sync Center controls the synchronization process. It is a bi-directional syncing process meaning that changes can occur on both sides. In many cases, Sync Center's bi-directional syncing works quite well. For example, if a user were to take a laptop home and makes changes to their files, when they return to work the changes will be synced. While at work, changes will be made to the local copy. In this case, it is unlikely the user will change the same file on the network and the local copy at the same time. However, if this were to occur, this would result in a conflict. However, we'll explain more about conflicts in a moment.

To open the Sync Center go to the sys tray, also called the Notification area, and select the green icon for Sync Center. If the icon is not present in the tray, press the up arrow to access the additional icons. Once the icon is selected, Sync Center will open. Currently with our example, Sync Center has been configured to sync offline files. If a file were to be changed on the local cache and network at the same time, this is known as a conflict. When this occurs, Sync Center will prompt the user to determine which version they would like to keep or if they would like to keep both versions. If you select the option "View sync conflicts", this would show any conflicts currently occurring. In our example there are none so this area is blank. The next option is to "View sync results" which will show the result of the last synchronization. This process will happen in the background and should be transparent to the user, though it is possible to manually kick off the synchronization process. The next option allows for additional sync partnerships to be configured. For example, you could configure a synchronization partnership with a compatible mobile device. The last option is "Manage offline files". This contains all of the options for offline files. In the next video, we will have a deeper look at these Sync Center options.

# Transparent Caching

- Stores remote files in local cache
- Checks remote server before using cached file
- Cache not available if server not available



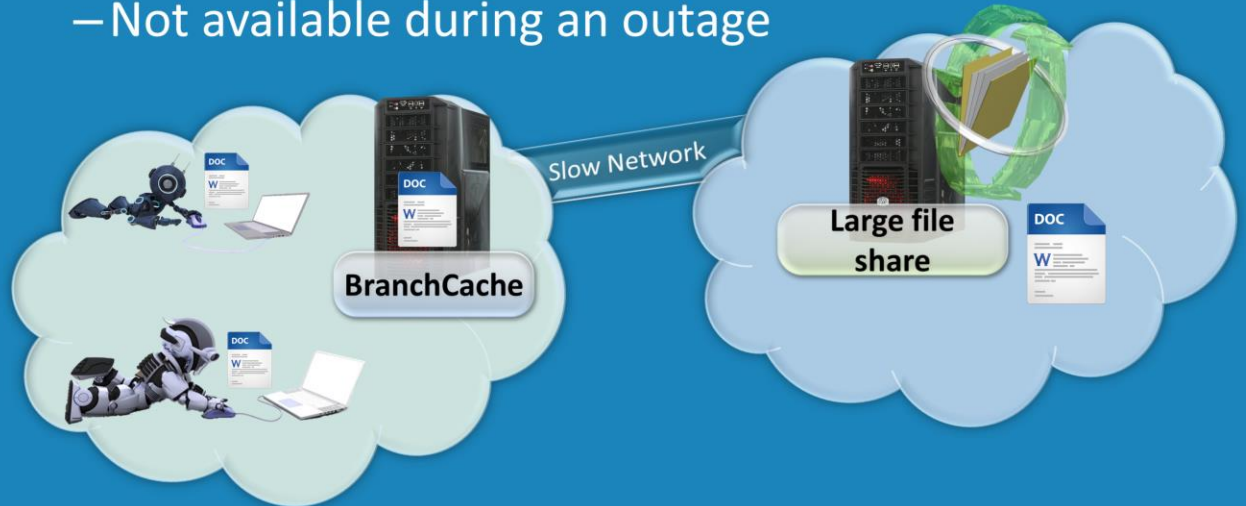
## Transparent Caching

5:13 – The next option that we will look at is transparent caching. Transparent caching is not a part of Offline Files. However, it can be configured alongside Offline Files or as an alternative to Offline Files. To understand transparent files, consider that you have a file share. This share will contain a public share that is too large to be made available offline. A remote user then connects to the server – however, they are operating over a slow link. With Offline Files certain files can be made available offline, however in this case, if a large number of files were made available, the computer would attempt to sync all of these large files over a slow network. It would not be the most ideal situation. As you can see, there has to be some thought dedicated to determining what files will be made available offline and what ones are best not configured for offline use. This can be further complicated by there being a large amount of files on the file server making it difficult to determine which ones actually need to be made available offline. Furthermore, the users of the files may not even know what files they need offline or not. In order to improve performance over a slow network link, such as the one in our example, transparent caching can be used. It works simply like so. If the user were to request a file from the server, it will be copied over the network. If transparent caching we enabled through the group policy, a copy of the files will be stored in the local transparent cache. So transparent cache simply stores remote files in a cache so that when users access the files, they are from the local cache. It is possible that the file has received changes and that the user is accessing an outdated copy from their local cache. In order to solve this

problem, the computer will perform a check against the file server to see if the file has changed. The server will respond with whether or not the file has been changed. In our case, the file has not changed and the transparent cache's copy will continue to be used. This process prevents users from using out of date files and that they have the most recent version. If in the case that the server responds that the file *has* changed, the old file will be discarded and a new copy of the file is copied over the network for the user to use along with being copied into the transparent cache. So what would occur if the server is not available and either the server or the network is unavailable? When this happens, the transparent cache would not be available. With Offline Files, the file would be available to the user when the server is unavailable, which is the idea. This is an obvious difference between Offline Files and Transparent Caching. You can see how Offline Files and Transparent files would work well together to provide a better user experience but Transparent caching is not a replacement for Offline Files.

# BranchCache

- Works with Offline Files
- Checks with server to make sure file has not changed
  - Not available during an outage



## BranchCache

8:06 – The next feature we will look at is BranchCache. BranchCache works with Offline Files. Don't worry about not understanding BranchCache, we're going to explain that right now. Consider again that you have a file server on a remote network. Our example user is on another network that has a slow network connection to the remote file server and its shares. In order to utilize BranchCache, it needs to be configured on the remote network, in this case one of the servers local to the user accessing the remote file share. Now consider that a different user accesses the document from the remote file share. The file would be transferred to the user using BranchCache allowing the user to have access to the needed file but it also leaves a copy on the local BranchCache server. So when another user now accesses the file, it will be copied from the local BranchCache server as opposed to copying it over the slow network link. Just like Transparent Cache, BranchCache does a check with the remote server to ensure that they have the most recent file and that it has not changed. Just like Transparent caching, the files are not available during an outage. Even if the BranchCache server is available and the file is in its cache, it will not be available because it is unable to verify with the remote server and determine if the file has changed. So like Transparent Cache, it can work well with Offline Files but it is not a replacement for Offline Files.

# Always Offline Mode

- Does not check for changes first
- Available in Windows 8 and Windows Server 2012
- Configure slow-link to 1 millisecond



## Always Offline Mode

9:30 – The last feature we will discuss is Always Offline Mode. When using Offline Files and Offline File Mode, the user will always use the offline copy of their file even when the network and servers are available, even over good network conditions. Consider that there is a file share with files contained within. The user in this scenario may be a remote user or even on the same network as the server so there may not even be poor network quality. It may appear strange that an administrator would prefer the environment to purely use Offline Files, but if you consider that the user may be using large video files or they are connected on a network connection that charges based on data usage, you can see the benefit to Offline Files and why some may choose to enable the option. If Offline Files is enabled and configured, Sync Center will copy the files that are configured to be made available offline to the offline cache on the local computer. Once this is done, when the user opens a file stored in the Offline Files cache, it will be retrieved from the local cache rather than the file server. The point to remember is that Offline Files does not check against the server for file changes like Transparent Cache and BranchCache does. When changes have been made to the file, they will be uploaded to the server using the normal synchronization process. Always Offline Mode is only available in Windows Server 2012 and Windows 8 and above. To configure it, slow-link needs to be configured to a latency of 1 millisecond using group policy. In the next video, we'll have a look at how to do this. If this setting is configured on earlier operating systems, the operating system may change between offline and online files rather than using the offline copy



only.

That about covers the basics for how Offline Files and some of the other technologies work in Windows to make file access faster. In the next video, I will look at how to use these features in the real world to get the best results for your users. Until then, thanks for watching.

See <http://YouTube.com/ITFreeTraining> or <http://itfreetraining.com> for our always free training videos. This is only one video from the many free courses available on YouTube.

#### References

“Installing and Configuring Windows Server 2012 R2 Exam Ref 70-410” pg 76

“Configuring New Offline Files Features for Windows 7 Computers Step-by-Step Guide” [https://technet.microsoft.com/en-us/library/ff633429\(v=ws.10\).aspx](https://technet.microsoft.com/en-us/library/ff633429(v=ws.10).aspx)

“Windows Vista I/O technologies”

[http://en.wikipedia.org/wiki/Windows\\_Vista\\_I/O\\_technologies#Offline\\_Files](http://en.wikipedia.org/wiki/Windows_Vista_I/O_technologies#Offline_Files)

“File Sharing and Offline Files Enhancements” [https://technet.microsoft.com/en-us/library/dd637828\(v=ws.10\).aspx](https://technet.microsoft.com/en-us/library/dd637828(v=ws.10).aspx)

“Enable the Always Offline Mode to Provide Faster Access to Files”

<https://technet.microsoft.com/en-au/library/hh968298.aspx>

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