

Differences between IFS and non-IFS LSPs

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When implementing LSP, programmers face a choice between IFS LSP or non-IFS LSP. This short document will cover the differences between the two and discuss when each should be used.

IFS LSP

This LSP works with the IFS handle. An IFS handle is an I/O handle that the OS supplies. In case of an LSP, the handle is provided by the WPUCreateSocketHandle OS function.

IFS LSP transfers the handle it receives back to the Winsock client application. For example, if WPUCreateSocketHandle returns a handle of 0x1, the Winsock client application will receive the handle as 0x1.

Non-IFS LSP

This LSP translates the IFS handle it receives to a local handle. This local handle is not IFS-valid, which means that if the application that receives this handle tries to use the Winsock DLL directly (without the LSP translation) it won't be recognized and will result in an error. For example, if WPUCreateSocketHandle returns a handle of 0x1 the Winsock client application will receive a translated handle, and not 0x1.

How IFS translation or non-translation affects the LSP

IFS LSP

Since this LSP gives the Winsock client application a valid OS handle, the LSP doesn't have to implement all the LSP functions, but only the one it needs - which is an advantage. However, the disadvantage is that an IFS LSP cannot intercept asynchronous operations and overlapped operations, such as when WriteFile/ReadFile is used with the IFS handle.

Non-IFS LSP

Since a Non-IFS LSP translates the IFS handles, it must implement all the LSP methods. If it does not, untranslated handles will reach the OS API and result in an error, because the OS is unaware of these artificial handles.

One advantage of this LSP is the ability to intercept every IFS function that uses this socket handle (e.g. WriteFile/ReadFile). Another advantage is the ability to receive notifications from asynchronous mechanisms.

When to use a Non-IFS LSP or an IFS LSP

In my experience, the only situation that calls for an IFS LSP is when there is a need to modify the WSPConnect method, but no need to follow up on the result, i.e., when the socket operates in asynchronous mode. Otherwise, Non-IFS LSP is the best choice. The current sample (which can be downloaded from Microsoft or from <http://www.komodina.com/index.php?page=lsp.html>) implements all of the LSP functions, and so requires no extra work from the programmer.

Installation considerations

An IFS LSP cannot work with translated handles but only with directly-issued OS handles. Therefore, when installing the LSP it must be as close as possible to the base level providers. A Non-IFS LSP can be placed anywhere in the stack as long as it isn't before an IFS LSP, in case both exist in the same stack. The default installer has a special flag for IFS installation and so does our Advanced LSP Installer (<http://www.komodina.com/index.php?page=rlsp.html>)