Subject: Unix Domain Sockets Support Added to U++.
Posted by Oblivion on Sat, 06 Dec 2025 13:11:03 GMT
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Hi,

Unix Domain Sockets Support Added to U++.

The socket API (renamed to Upp::Socket) now fully supports Unix domain sockets on POSIX systems, including both filesystem-based sockets and (on Linux) abstract namespace sockets.

New methods:

- ConnectFileSystem / ListenFileSystem: POSIX-wide, bind/connect using a regular filesystem path.
- ConnectAbstract / ListenAbstract: Linux-only, using the abstract namespace (no filesystem entry).

This should make local IPC faster, cleaner, and more flexible across platforms. Feedback and testing are welcome!

Best regards,
Oblivion

Subject: Re: Unix Domain Sockets Support Added to U++.
Posted by Tom1 on Sat, 13 Dec 2025 14:50:55 GMT
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Thanks for the news! I was pleased to read about this interesting and important piece of work. As I currently do not have much time to dig into your implementation properly, can you tell me if you included support for Windows 10/11 too? Windows is supposed to support AF_UNIX since about 2017... although not abstract socket namespace.

Do you have any Client/Server sample code that demonstrates and possibly benchmarks the IPC between them? It would be interesting to see how localhost loopback (AF_INET) compares with this.

Best regards,

Tom

Subject: Re: Unix Domain Sockets Support Added to U++.
Posted by Oblivion on Sat, 13 Dec 2025 16:56:48 GMT
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Hello Tom,

Quote:
Thanks for the news! I was pleased to read about this interesting and important piece of work. As I currently do not have much time to dig into your implementation properly, can you tell me if you included support for Windows 10/11 too? Windows is supposed to support AF_UNIX since about 2017... although not abstract socket namespace.

I actually wasn't aware of that until you mentioned it
I've been working almost exclusively on Linux for years, so I must have missed that development.

That said, since the Socket class already abstracts things in a fairly portable way, and only connection creation and listening need to be handled separately, it should be quite straightforward to add Windows support as well. At the moment, it is available only on POSIX systems

I'll check and verify this as soon as possible.

Regarding performance, I didn't include any dedicated benchmarks. The U++ nightlies already contain UnixSocketClient and UnixSocketServer examples, which are essentially the same as the SocketClient and SocketServer examples. Based on my experience (outside of U++), Unix domain sockets are generally faster for local IPC, as they avoid the TCP/IP stack overhead.

Moreover, performance was not the only motivation. Many system services (such as the notorious D-Bus) rely exclusively on Unix domain sockets.

In any case, I'll follow up with some benchmarks.

Best regards,

Subject: Re: Unix Domain Sockets Support Added to U++.
Posted by Oblivion on Sat, 13 Dec 2025 19:27:33 GMT
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A simple test, and good news: It works on Windows too (with a couple of minor modifications on the impl.).

I'll have it ready ASAP and then open a PR...

Best regards,

Subject: Re: Unix Domain Sockets Support Added to U++.
Posted by Tom1 on Sat, 13 Dec 2025 19:43:18 GMT
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Oblivion wrote on Sat, 13 December 2025 21:27A simple test, and good news: It works on Windows too (with a couple of minor modifications on the impl.).

I'll have it ready ASAP and then open a PR...

Best regards,

Excellent, well done!

I had a little chat with copilot and it confirmed (or rather suggested) that AF_UNIX sockets should be as fast as named pipes on both systems, but have better security. Also, they should easily beat local host loopback sockets in performance.

Thanks and best regards,

Tom

Subject: Re: Unix Domain Sockets Support Added to U++.
Posted by Oblivion on Sat, 13 Dec 2025 21:49:21 GMT
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Hi Tom,

I've opened a PR, you can check the code there when you have time.

Best regards,

Subject: Re: Unix Domain Sockets Support Added to U++.
Posted by Tom1 on Mon, 15 Dec 2025 18:37:11 GMT
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Thanks! I will, when I get some time to focus on it...

Best regards,

Tom