

OpenID Connect Support for SSH under Windows

EGI Conference 2021

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STEINBUCH CENTRE FOR COMPUTING - SCC



Agenda

- Motivation & Background
- Port of oidc-agent to Windows
- Communication with oidc-agent
- Integration with Putty
- Summary & Outlook

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Motivation

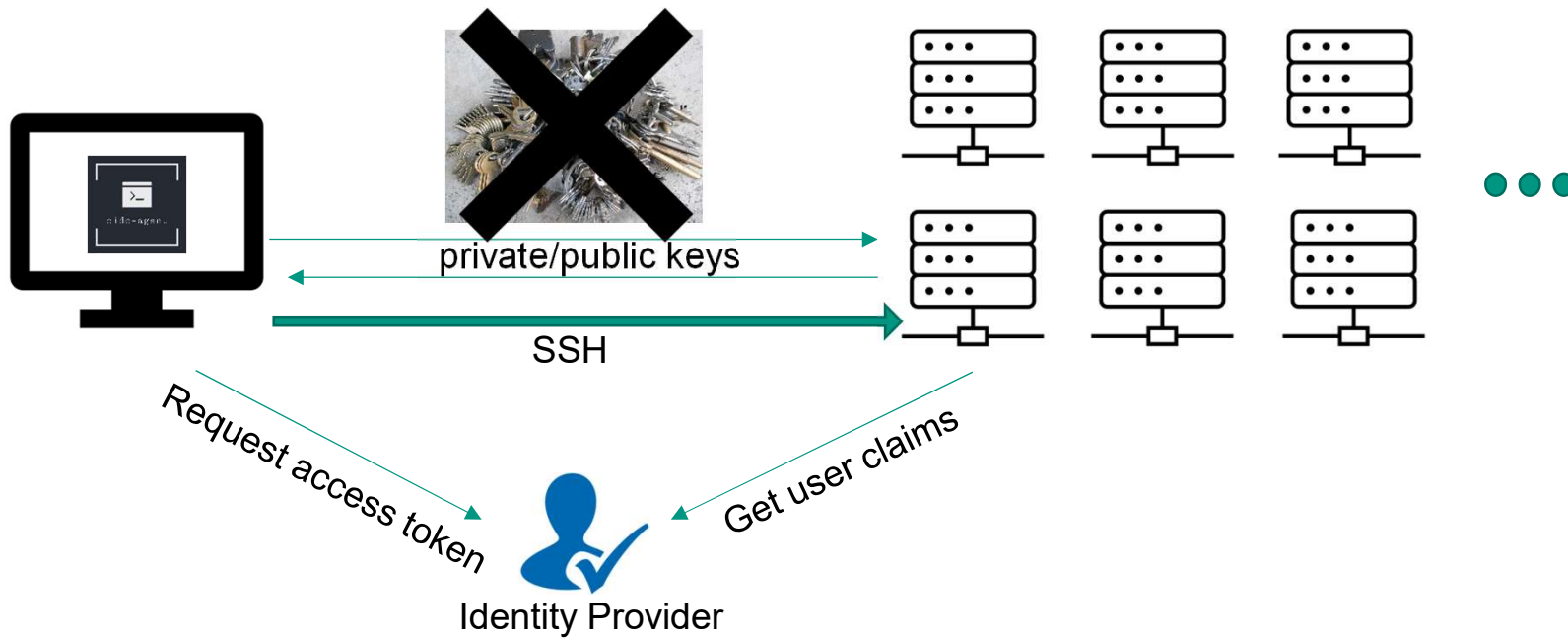
- Federated Identity for non-web resources
 - Broad usage of OpenID Connect
 - Complex workflows
 - Lack of functionality for Windows
-
- Example: SSH Key Management
 - Risks of untracked and unmanaged SSH Keys
 - 90% of keys are no longer used [14]



Motivation

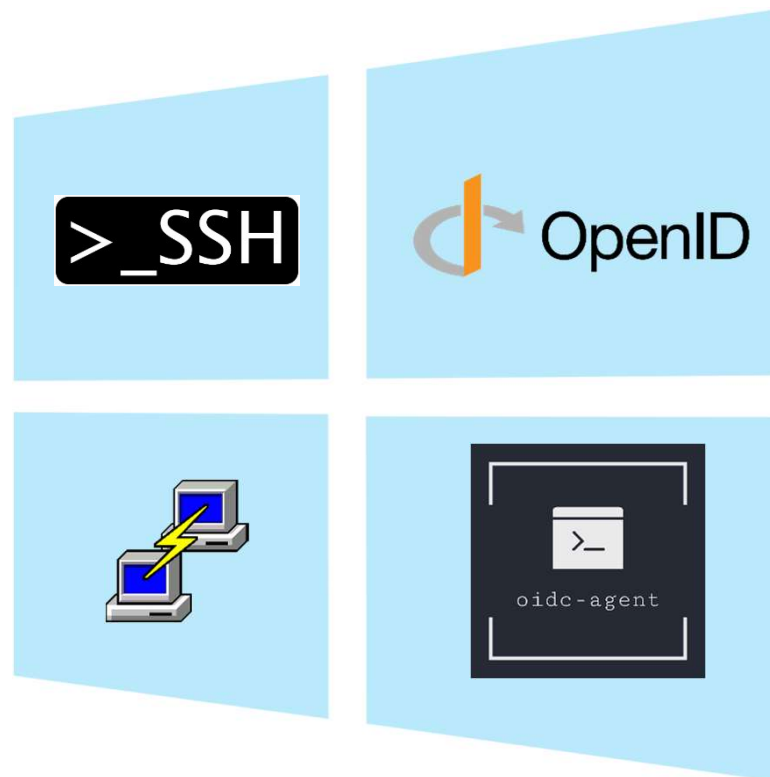


Access Tokens!



Goals

- High-Level: Integrate OIDC with SSH (client-side) under Windows
 - Port oidc-agent to Windows
 - Provide API for oidc-agent under Windows
 - Extend Putty for OIDC access token based authentication



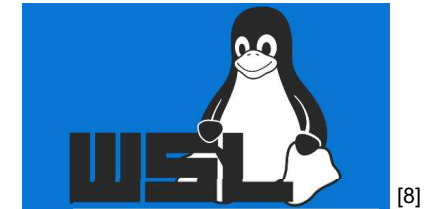
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Considered strategies

✗ Windows Subsystem for Linux 2

- No changes to source code
- Not user-friendly



✗ Build natively

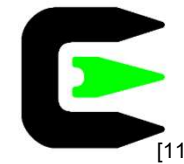
- Rewrite platform-dependent code (IPC, pthreads, etc)

Libmicrohttpd [9]

libsodium [10]

✓ POSIX emulation layer – Cygwin, MSYS

- Moderate changes to source code
- Semi-native approach
- Build with 'make'
- Build & Installation script provided



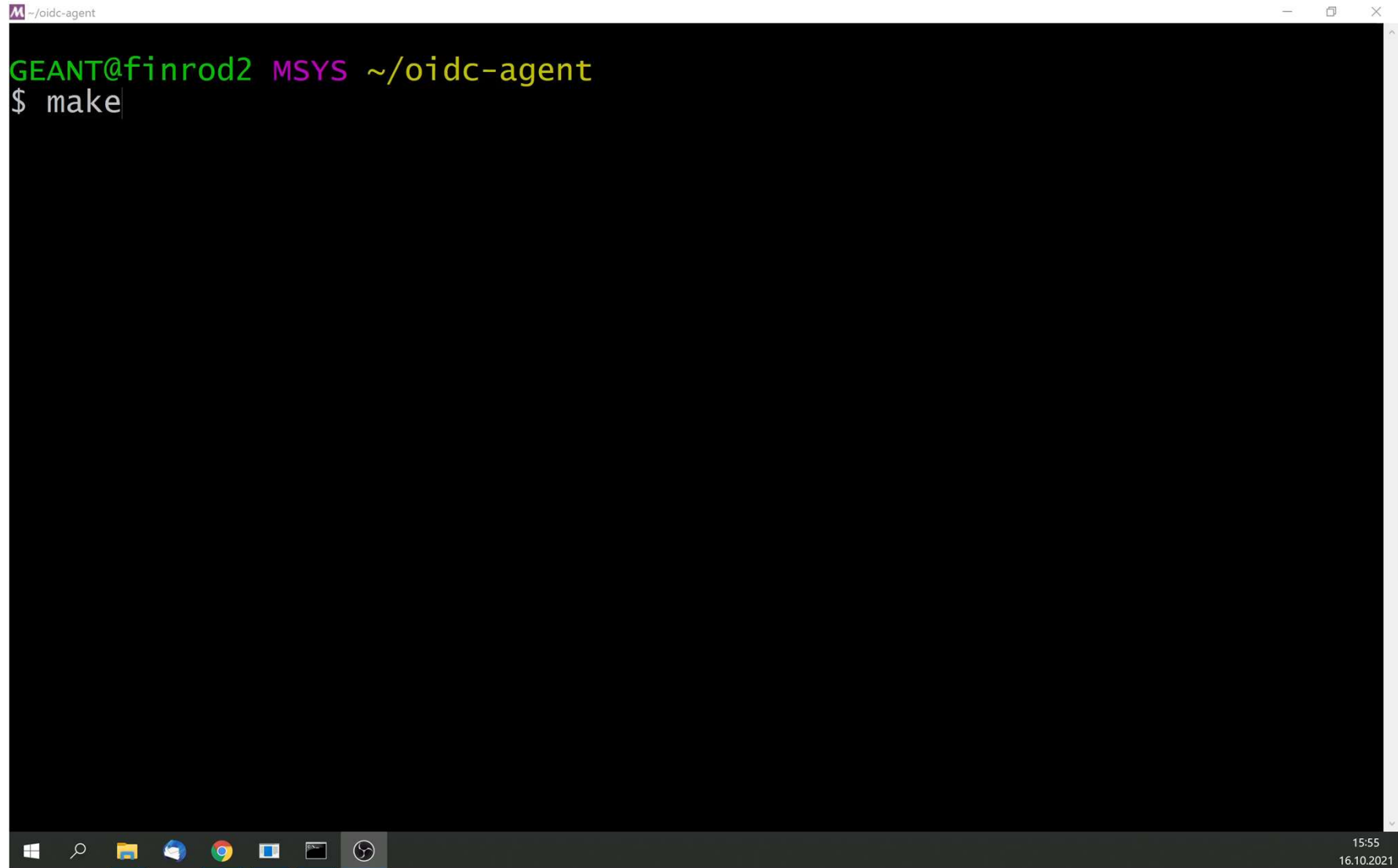
oidc-agent on Windows

- Github

- <https://github.com/indigo-dc/oidc-agent/tree/windows>

Demo

oidc-agent on Windows



```
M ~/oidc-agent  
GEANT@finrod2 MSYS ~/oidc-agent  
$ make
```

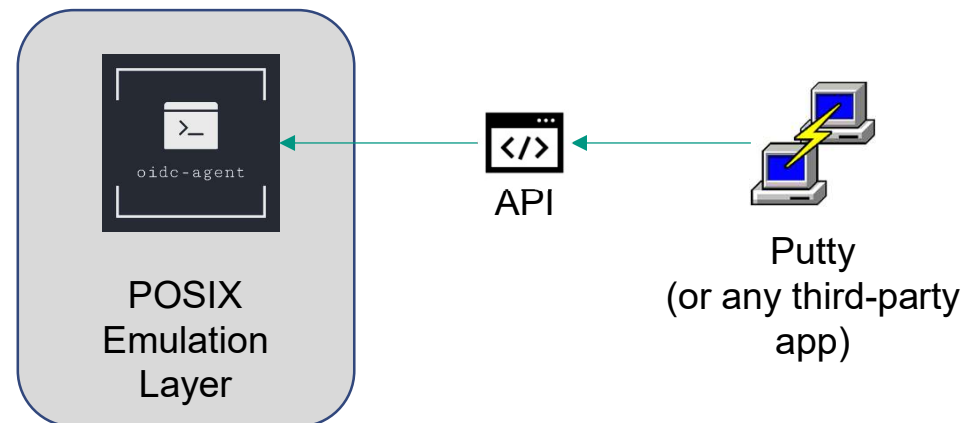
The image shows a Windows terminal window titled "M ~/oidc-agent". The prompt is "GEANT@finrod2 MSYS ~/oidc-agent" and the command "make" has been entered. The terminal background is black with green and yellow text. The Windows taskbar is visible at the bottom, showing the Start button, search icon, and several application icons. The system tray shows the time "15:55" and the date "16.10.2021".

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Native liboidc-agent API library

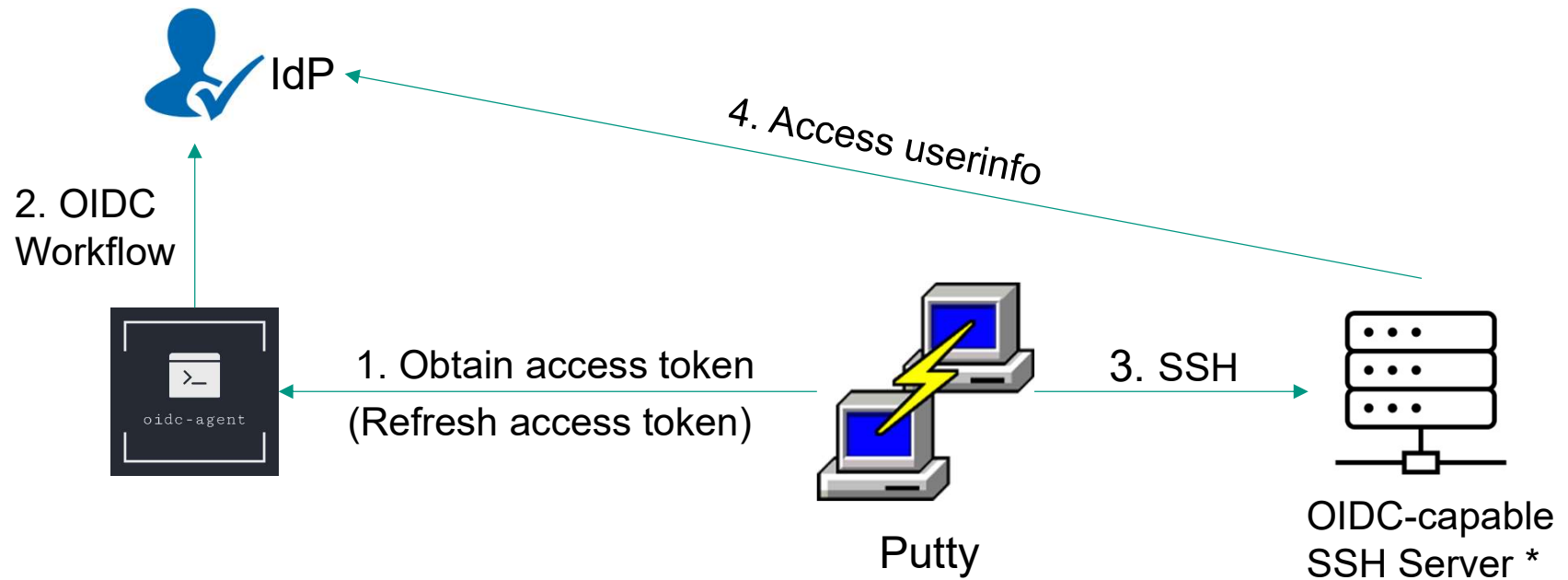
- liboidc-agent available for C, Python, and Go
- Reimplemented IPC using winsock
- Compiled using mingw-w64 (MSYS2 or cross-compile on Linux)
- Following endpoints available:
 - `getAccessToken`
 - `getAccessTokenForIssuer`
 - `getLoadedAccountsList`



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High-Level Architecture



* "Federated access for SSH with OpenID Connect" by Diana Gudu, today at 16:30

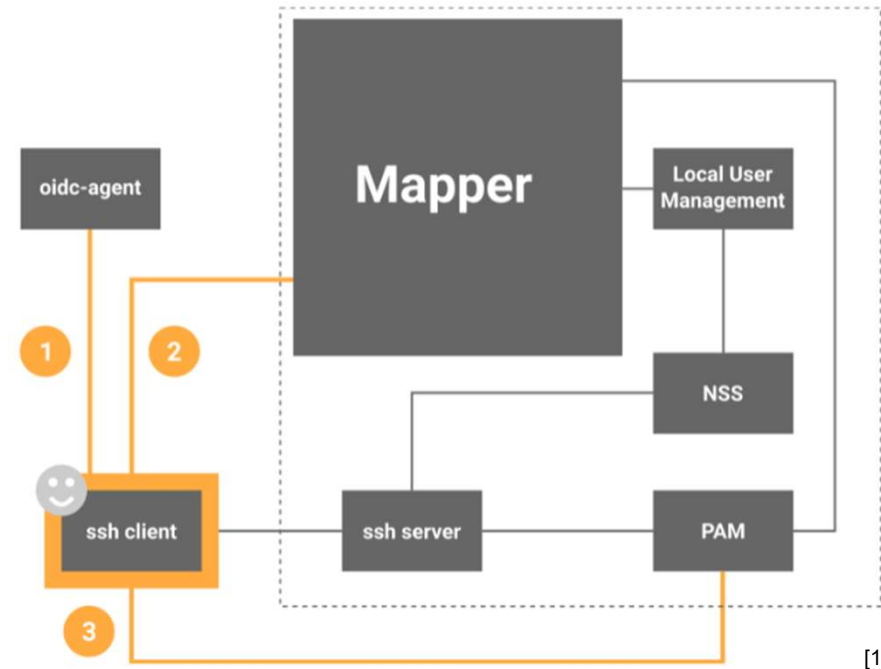
OIDC Based Authentication for Putty

■ Server*:

- SSH server with pam-ssh-oidc
- Mapping daemon motley_cue
- No modification of ssh server

■ Client:

- Modified Putty
- Utilizes oidc-agent
- Keyboard-interactive authN
- No modification of ssh protocol



* "Federated access for SSH with OpenID Connect" by Diana Gudu, today at 16:30

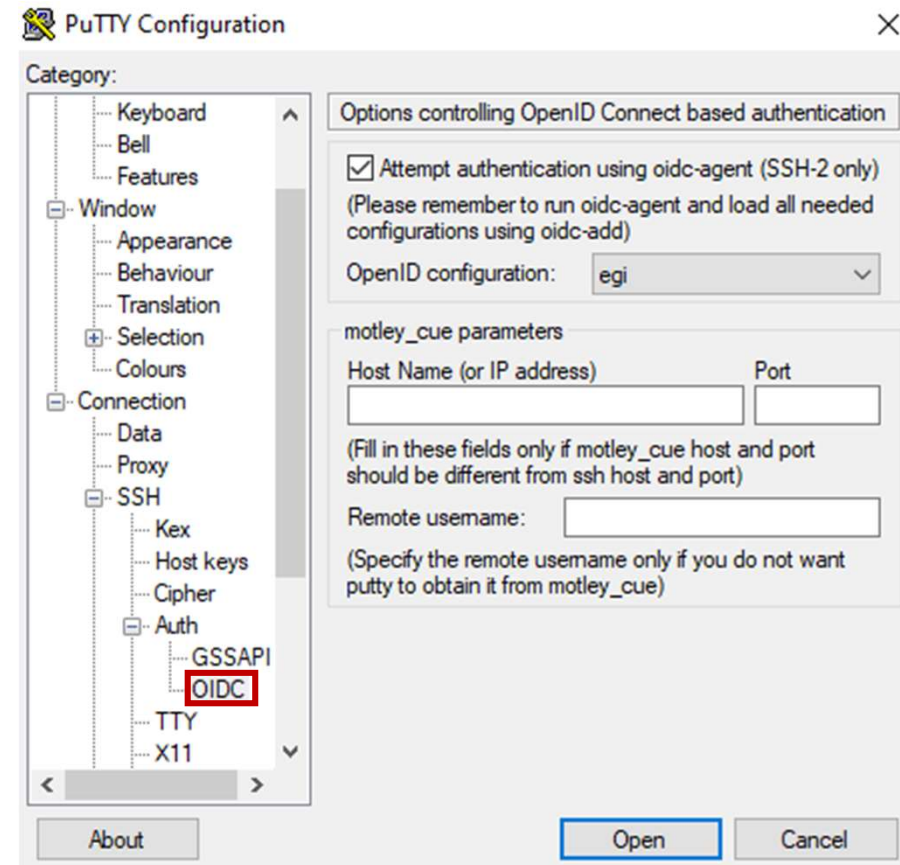


OIDC Based Authentication for Putty

- Available for:
 - Putty
 - Plink
 - PSFTP
 - PSCP

- Successful Proof of Concept

- Built with mingw-w64
 - Windows (MSYS2 – mingw32)
 - Cross-compilation on Linux



```

C:\msys64_putty\home\GEANT\putty\windows>plink -oidc-agent google -mc-host ssh-oidc-demo.data.kit.edu ssh-oidc-demo.data.kit.edu
-- Keyboard-interactive authentication prompts from server: -----
-- Passed OIDC access token -----
-- End of keyboard-interactive prompts from server -----
Access granted. Press Return to begin session.
  
```

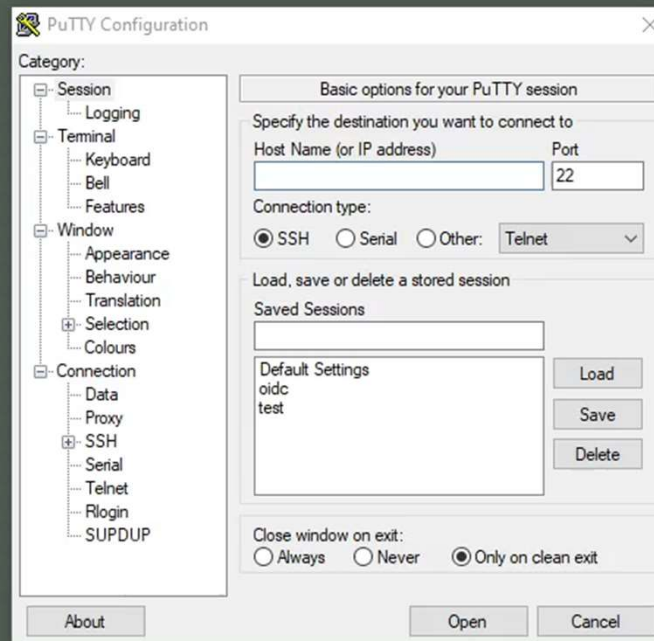

oidc-agent on Windows

- Git:

- <https://git.scc.kit.edu/m-team/putty/-/tree/oidc-support>

Demo

oidc-agent on Windows



16:09
16.10.2021

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Summary & Outlook

- Ported oidc-agent to Windows
- Provided native API library
- Putty with OIDC

- Installer for oidc-agent
- API extension & GUI for oidc-agent

- Provide OIDC support for Putty under supported compilers
 - Clang
 - MSVC
 - LCC
- OIDC support for other applications, e.g. MobaXterm

Thank you for attention



<https://indico.egi.eu/event/5464/contributions/15659/>

■ Contact: m-contact@lists.kit.edu

Illustration References

- [1] <https://www.scc.kit.edu/en/aboutus/11022.php>
- [2] <https://images.app.goo.gl/tKo77xxstdu1DUJr5>
- [3] <https://images.app.goo.gl/8CTV52CRGRxJrBRLA>
- [4] <https://images.app.goo.gl/jzgLw2zjqKzwi7cp9>
- [5] <https://images.app.goo.gl/bUgQzq5YaTPamEXP8>
- [6] <https://github.com/indigo-dc/oidc-agent/blob/master/logo.png>
- [7] <https://images.app.goo.gl/TJy4y5WigecQJ3sU7>
- [8] <https://docs.microsoft.com/en-us/windows/wsl/>
- [9] <https://images.app.goo.gl/KTBckfa6R4mibR8z9>
- [10] <https://images.app.goo.gl/jzXenF4tMquP19HCA>
- [11] <https://images.app.goo.gl/CBiCK5SqUDRksqt69>
- [12] <https://images.app.goo.gl/M1eHHZSzY1cc9X37A>
- [13] https://docs.google.com/presentation/d/17HM11YjafC5VA4_o2EjNrtbRqJGgQP0q92C_uqFAM6A/edit
- [14] <https://www.ssh.com/academy/iam/ssh-key-management>