

OpenSSH for Windows Pros

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Level: Intermediate

HERE
Change is ~~Coming~~. Are You Ready?



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Agenda

- Remote Access Concepts and OpenSSH Architecture
- Installing OpenSSH on Windows and Linux
- Configuring OpenSSH
- Authenticating Users
- Setting Up PowerShell Remoting on Windows and Linux
- Troubleshooting OpenSSH



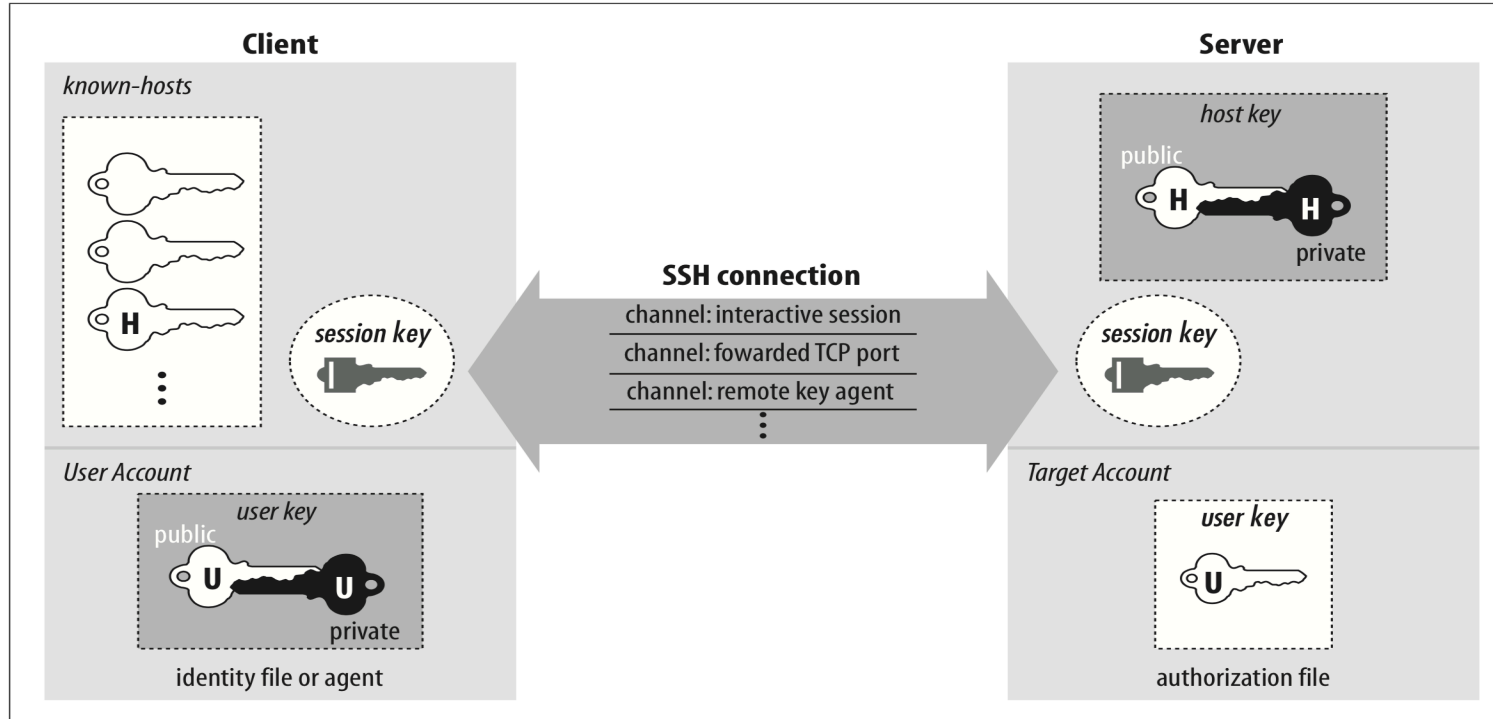
OpenSSH or: How I learned to stop worrying and love remote access

REMOTE ACCESS CONCEPTS AND OPENSSSH ARCHITECTURE

Remote Access Concepts

- Authentication – verifying identity
- Authorization – granting access
- Integrity – ensuring what's sent is what's received

OpenSSH Architecture

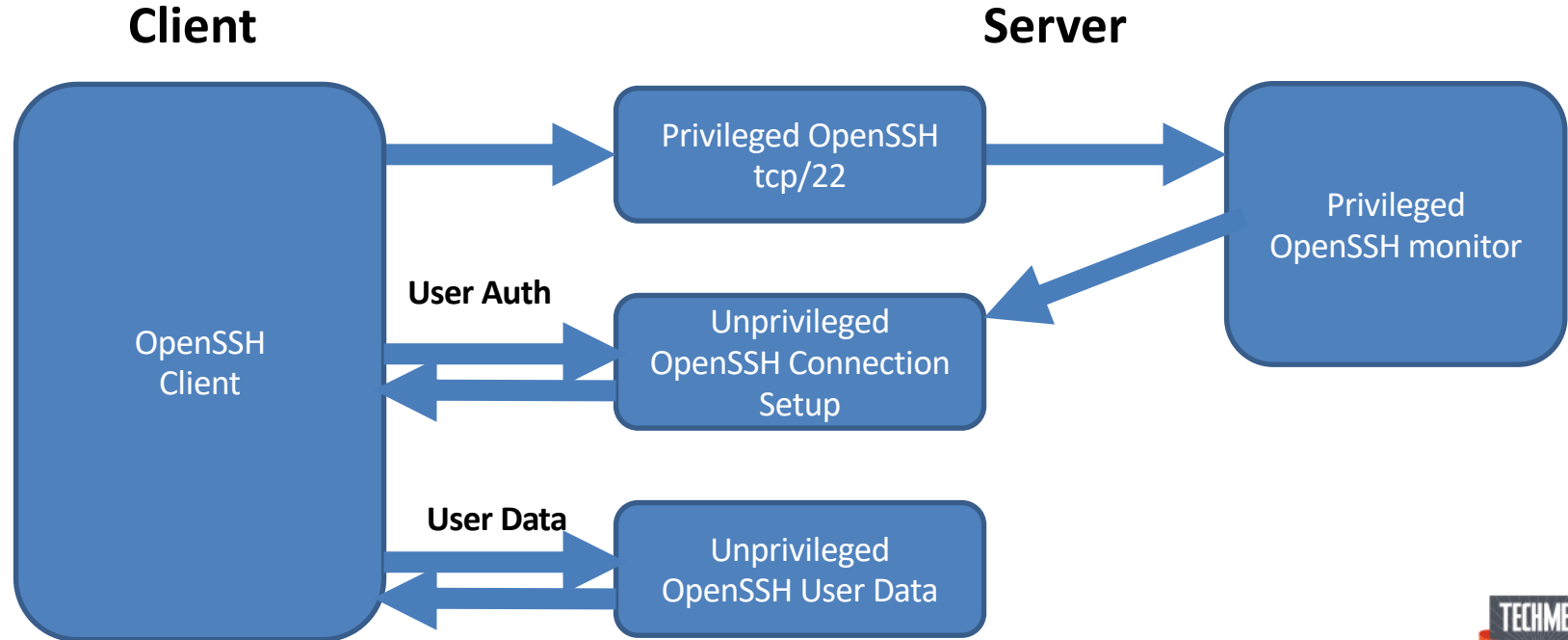


From: SSH, the Secure Shell The Definitive Guide. O'Reilly 2009

Key OpenSSH Functionality

- Secure client to server to communication
- Remote command execution
- Secure file copy
- Tunneling of arbitrary TCP Services (firewall evasion)
- Ensures remote system is who it says it is
- Message Integrity
- This is a transport layer for PowerShell Core Remoting!
- And pretty much the standard remote access method on Linux

OpenSSH Process Model – Privilege Separation



Getting started with OpenSSH

Host keys

Privilege separation

Remote command execution

DC1 – Domain Controller

CENTOS-W1 – Linux management workstation

CENTOS-S1 – Linux server

WINDOWS-S1 – Windows server

DEMO

Yea, seriously...OpenSSH on Windows!

INSTALLING OPENSSSH ON WINDOWS AND LINUX



Installing OpenSSH on Windows

- PowerShell team managed GitHub project
 - <https://github.com/PowerShell/Win32-OpenSSH/wiki/Install-Win32-OpenSSH>
 - Gonna get your hands dirty
- Windows Feature
 - Fall Creators Update
 - <https://blogs.msdn.microsoft.com/powershell/2017/12/15/using-the-openssh-beta-in-windows-10-fall-creators-update-and-windows-server-1709/>
 - `Add-WindowsCapability -Online -Name OpenSSH.Client~~~~0.0.1.0`
- Windows Services for Linux
- Windows Server 2019...

Installing OpenSSH on Linux

- LOL

Installing OpenSSH on Windows Server 2016

DEMO



Getting your users on your servers!

AUTHENTICATION METHODS



Authentication Methods

- GSSAPI – Kerberos
- Host based - based on which client
- Public key – based on a per user key pair
- Challenge response – two factor
- Password – p4ssword?
- Processed in this order at login

Authenticating Users

- Local user account databases
 - On Windows
 - On Linux
 - Active Directory Authentication
 - Can be used on Windows and Linux
 - LDAP – User lookup
 - Kerberos – User and host authentication
 - System Security Services Daemon (SSSD) – brokers auth & user lookup
-
- **ssh aen@lab.centinosystems.com@centos-s1**
 - **ssh -l aen@lab.centinosystems.com centos-s1**

Key Based Authentication

- Generating user keys
 - `ssh-keygen`
 - Public key – `id_rsa.pub` or `potato.pub`
 - Private key – `id_rsa`
- Getting keys out to servers
 - Copy with `ssh-copy-id`
 - PowerShell
 - <http://www.centinosystems.com/blog/powershell/distributing-ssh-user-keys-via-powershell/>
 - DSC Resource
 - Ansible, Chef...and so on
 - Actual PKI

Authenticating users with user keys

Configuring user authentication via Active Directory

Combining AD and key based authentication

DEMO

Your users, your servers

OPENSSSH CONFIGURATION



OpenSSH Configuration

- Server
 - `/etc/ssh/sshd_config`
 - `%programdata%/sshd_config`
- Client
 - `/etc/ssh/ssh_config`
 - `~/.ssh/config`
 - `%userprofile%/.ssh/config`

DEMO

- Server configuration overview
 - Limiting access to a user or group
- Client configuration overview
 - Configure an alias and using a specific key

I can do what???

SETTING UP POWERSHELL REMOTING ON WINDOWS AND LINUX



PowerShell Core and Subsystems

- PowerShell Core

- Subsystem powershell c:/program files/powershell/6.0.3/pwsh.exe
-sshs -NoLogo -NoProfile

- PowerShell as a subsystem

- C:\Program Files\PowerShell\6.0.2\pwsh.exe (whoa...slashes)
- /usr/local/bin/pwsh
- /bin/pwsh

Subsystems

Enter-PSSession

DEMO



Why doesn't this &*%^E)@#! work???!?!?

TROUBLESHOOTING OPENS

Troubleshooting

- **Step 1 – make sure SSH works!**
 - `ssh -v user@servername`
 - Server side debugging on Windows hosts
 - Set `LogLevel DEBUG3` in `sshd_config`
 - <https://github.com/PowerShell/Win32-OpenSSH/wiki/Troubleshooting-Steps>
 - Currently logs to files. Logs to ETW in 7.6.1.0
 - <https://github.com/PowerShell/Win32-OpenSSH/wiki/Logging-Facilities>
- Host key mismatch
- Permissions on `authorized_keys` because of `StrictModes`
- No Subsystem Configured
 - PowerShell client will yell at you when you try it...

More data?

- **Email:** aen@centinosystems.com
- **Twitter:** @nocentino
- **Blog:** www.centinosystems.com/blog
- **LFCE: Network and Host Security**
 - OpenSSH
 - Copying files, remote command execution and tunneling TCP
- **Understanding and Using Essential Tools for Enterprise Linux 7**
 - Installation, command execution, bash basics, file system and permissions