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# Developing on Windows, Deploying on Linux

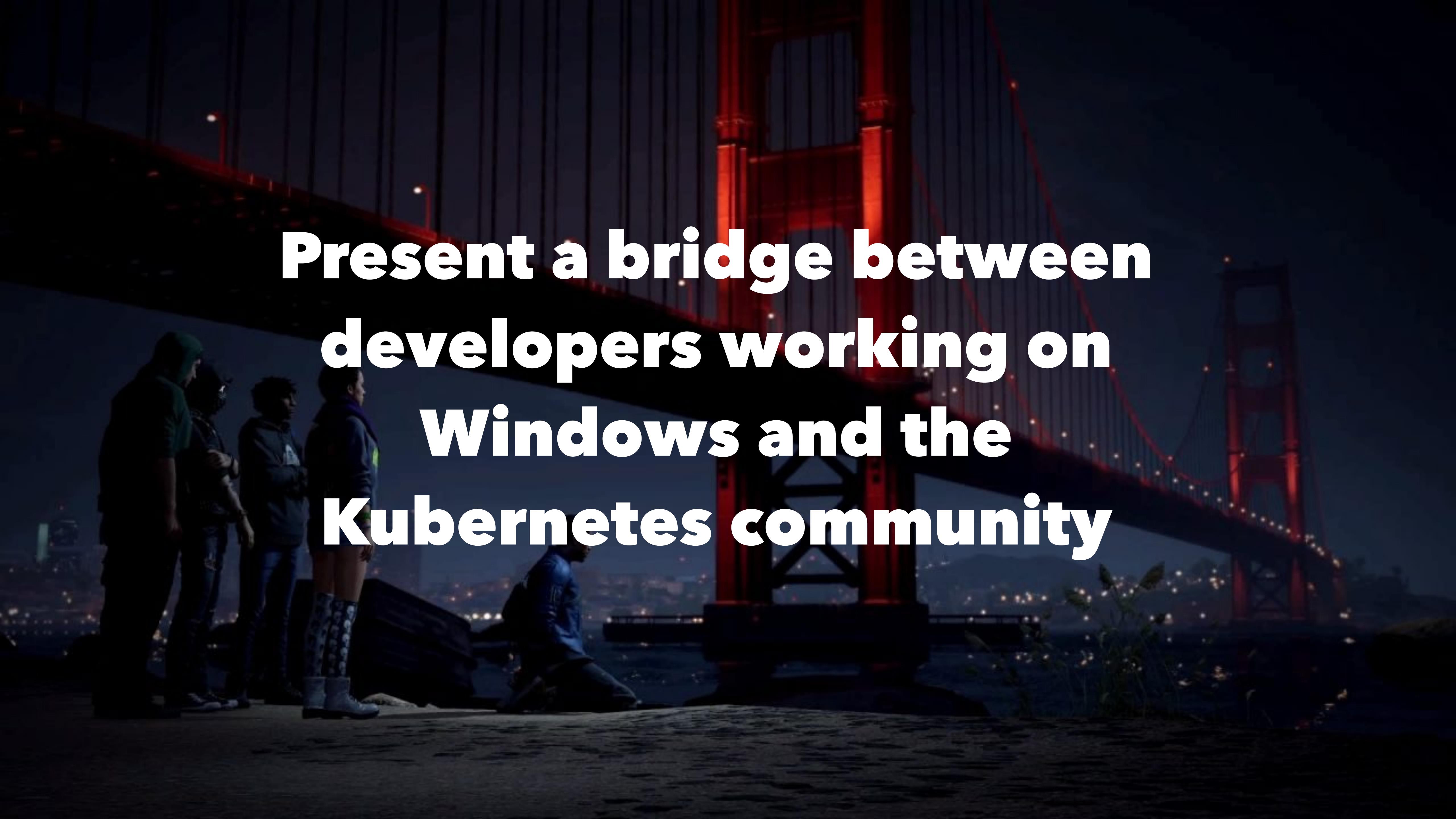
Rodrigue Cloutier, Online Technical Lead, *Ubisoft*

# Developing on Windows

# Deploying on Linux

**Rod Cloutier**

Online technical lead Ubisoft  
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@rodcloutier

A dark, atmospheric photograph of a group of people standing on a bridge at night. The Golden Gate Bridge is illuminated in the background, its towers and cables glowing red against a dark sky. In the foreground, several people are silhouetted against the bridge lights, some standing and some sitting on the ground. The overall mood is contemplative and mysterious.

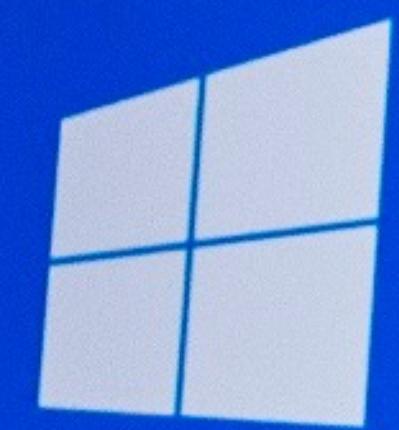
**Present a bridge between  
developers working on  
Windows and the  
Kubernetes community**



**Give some exposure  
Share experience  
Foster discussion and awareness**

# **Why develop on Windows?**





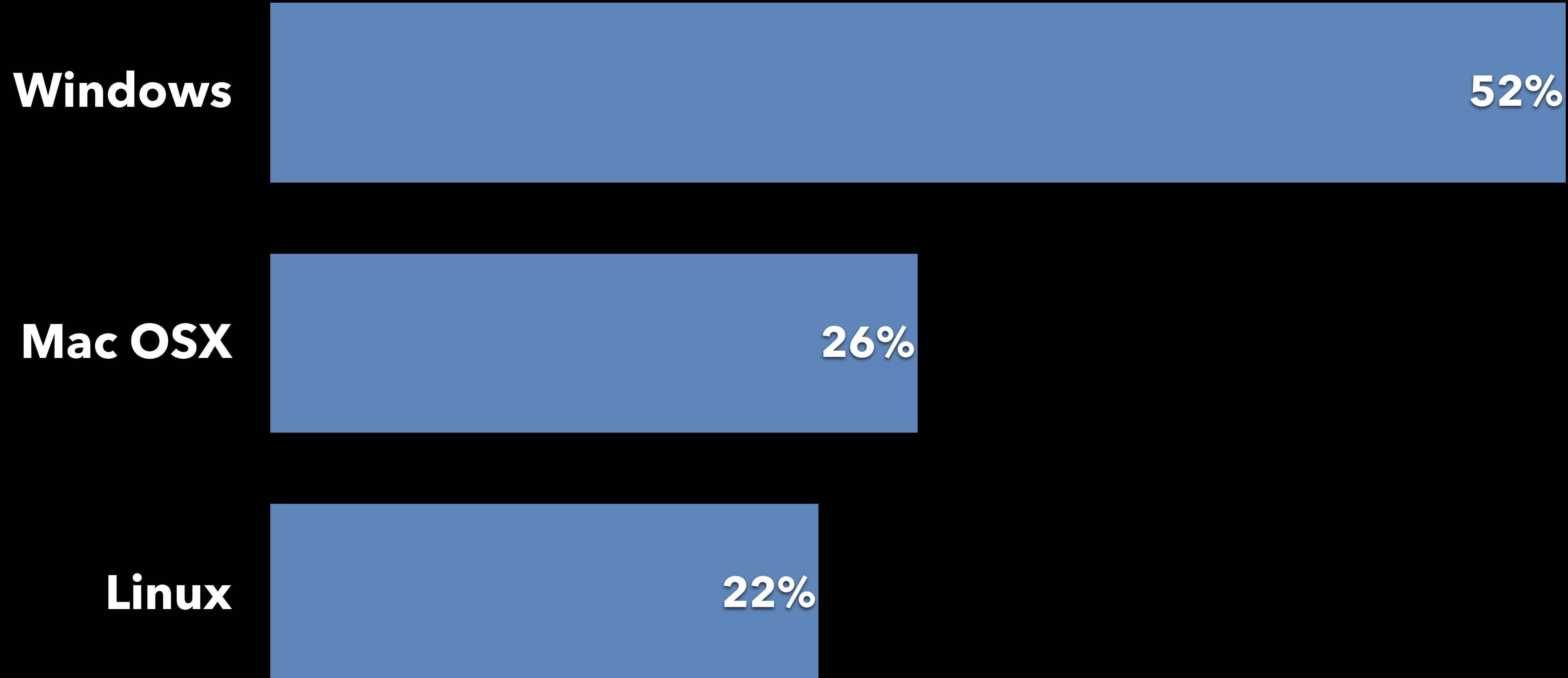
# Windows 10

Redmond, WA  
January 21, 2015

#windows10



# More than half the programmer are on Windows



*<http://stackoverflow.com/insights/survey/2016>*

# Challenges



impossible

# Bridges



# Tools



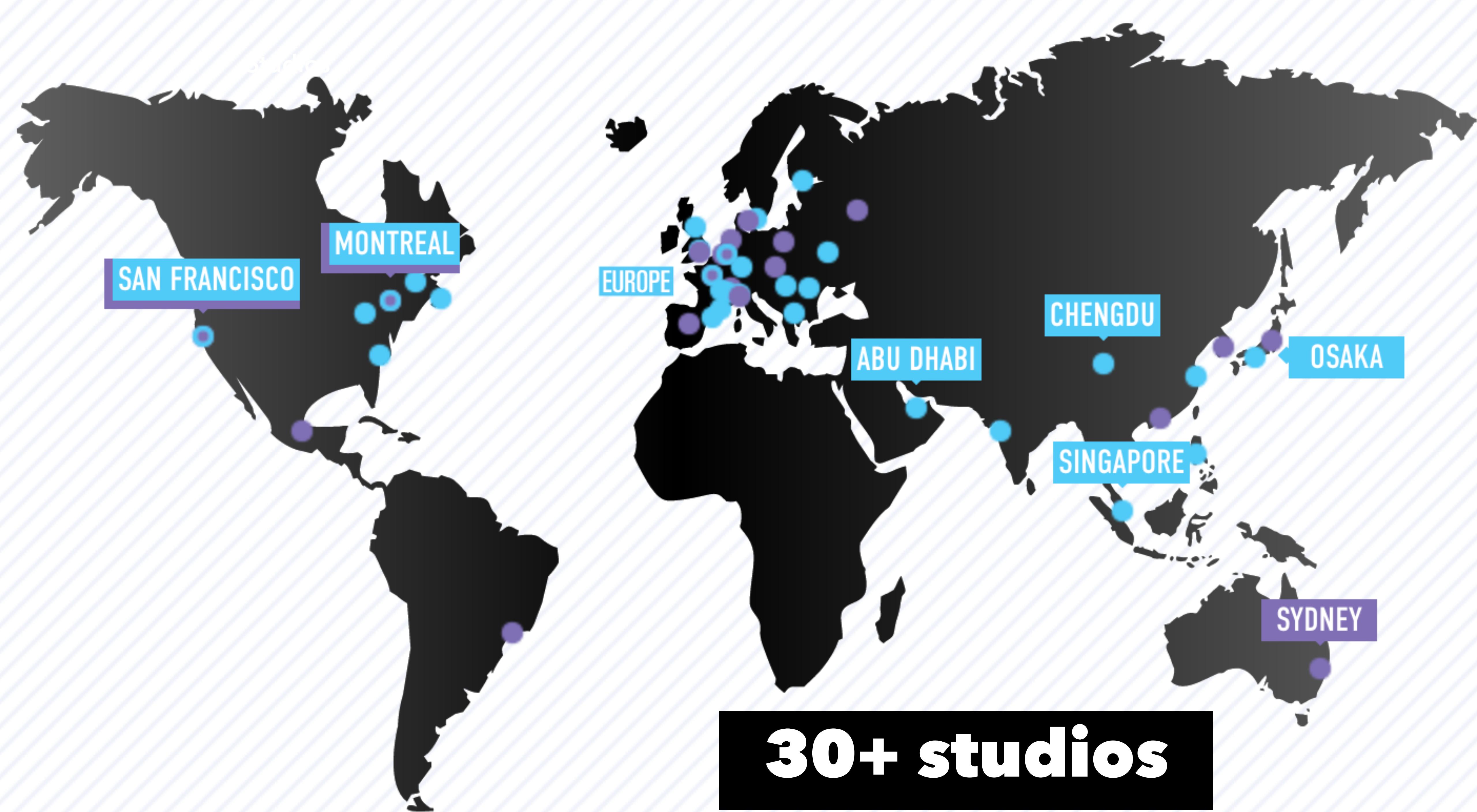
# Actions



# challenges



impossible

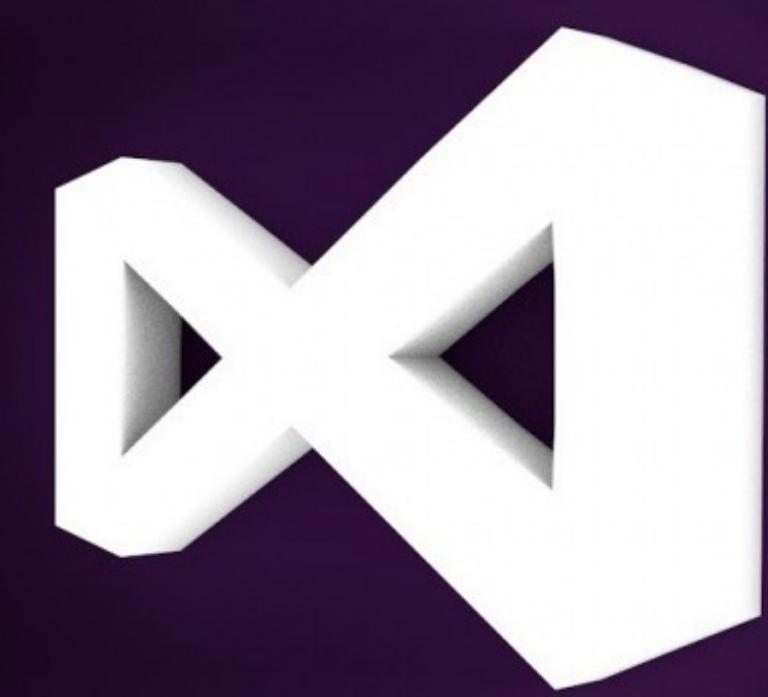




**Over 10000 team members**

A photograph showing a group of approximately 15 people in an office environment. In the foreground, a man with a shaved head and a dark cardigan is seated at a desk, looking intently at a computer monitor. To his right, a woman with red hair is also looking at the screen. Behind them, several other people are standing or sitting, some holding coffee cups. The office has brick walls and large windows. The overall atmosphere is one of focused work.

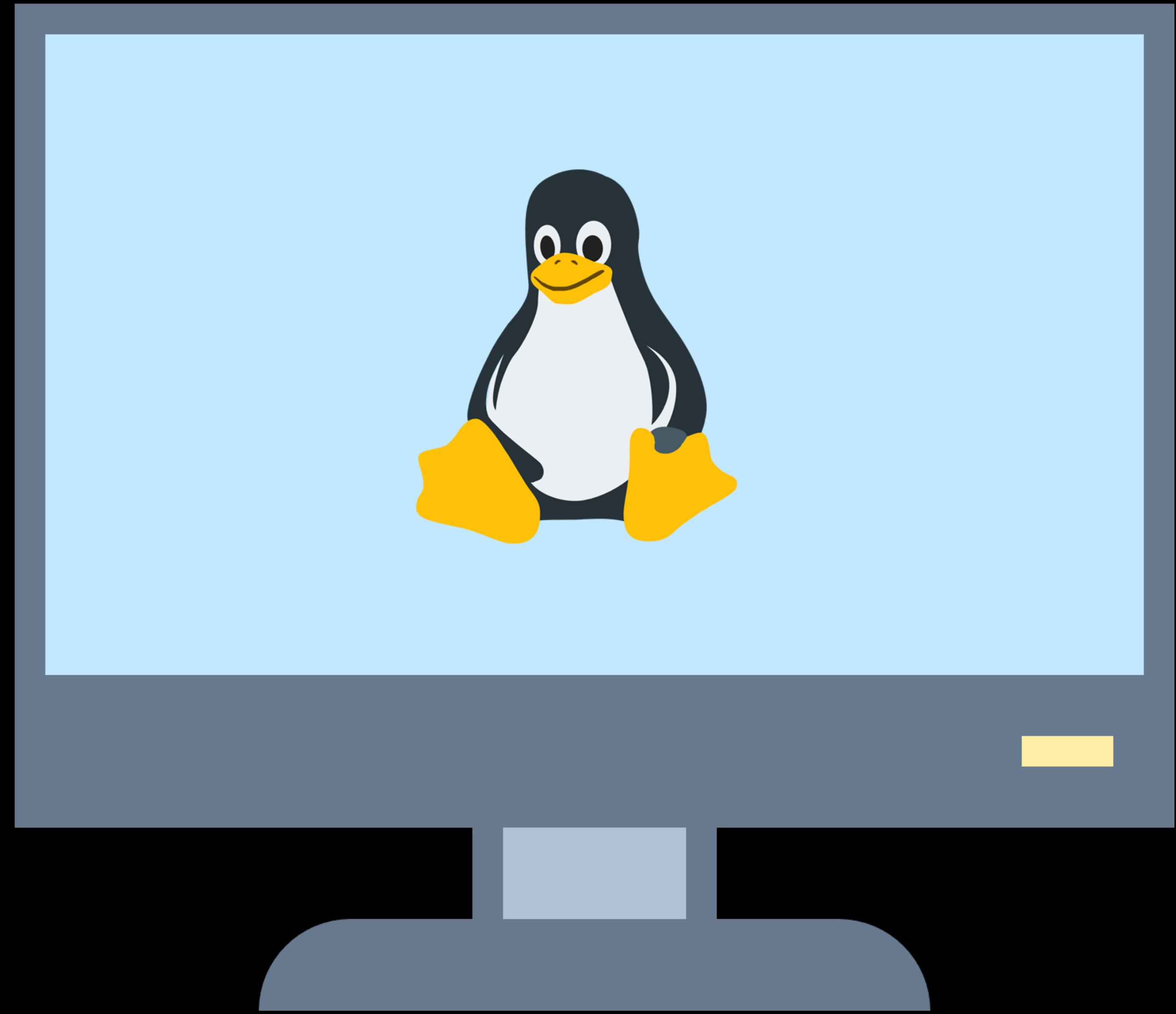
**300+ Online  
developers**

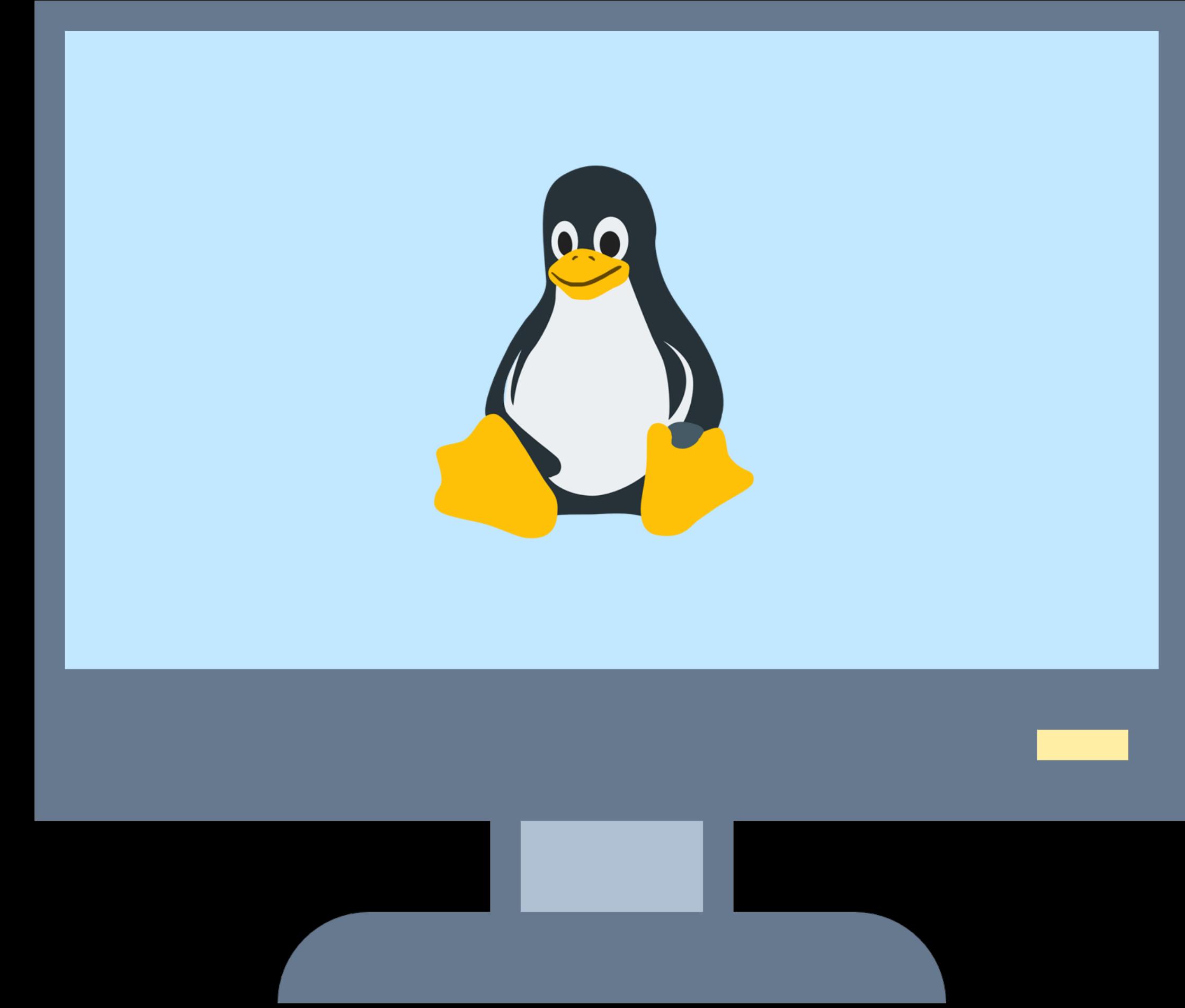
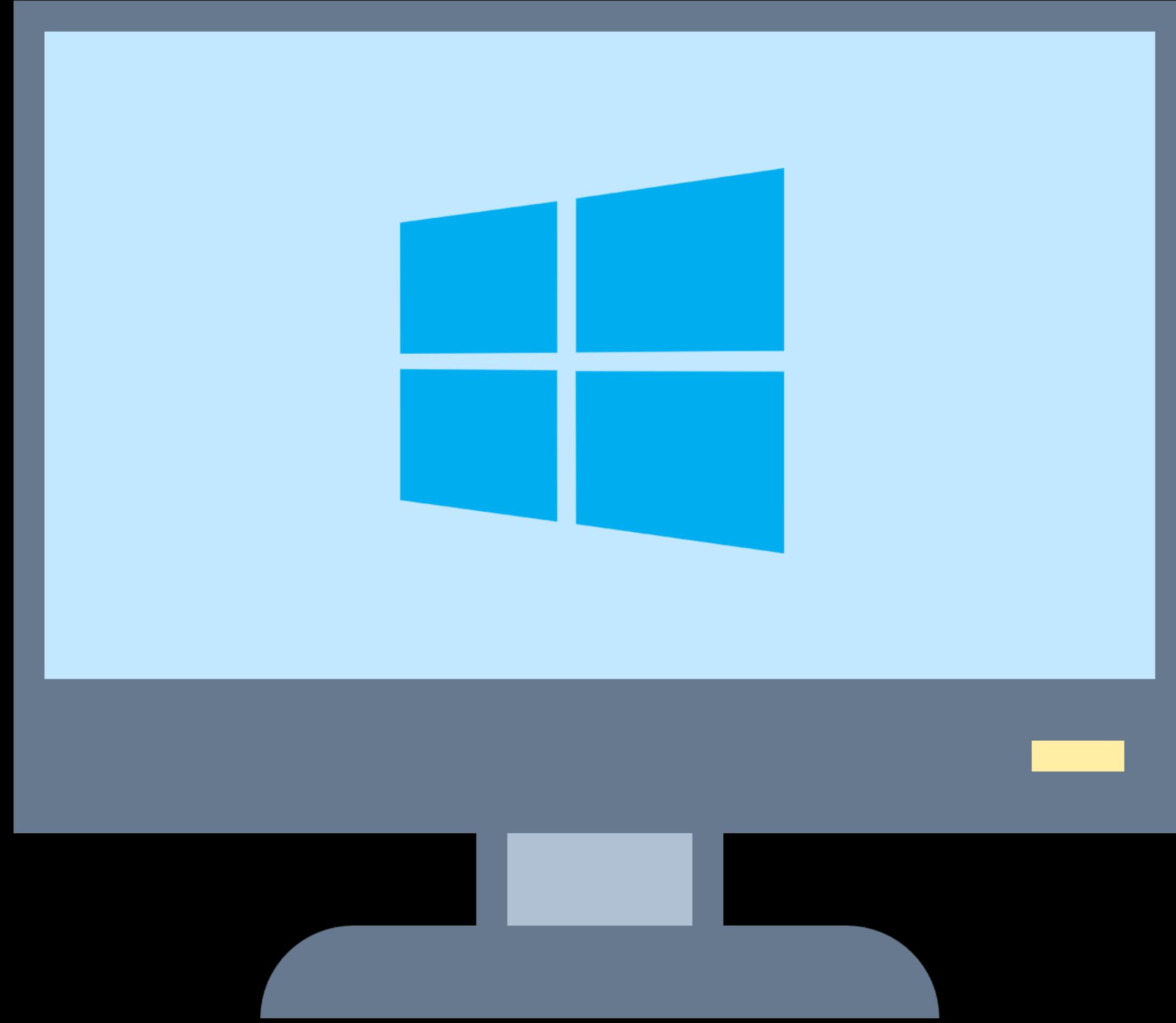


Visual Studio



**Hard to mass switch to Linux**







C:\>



# Focus





**Windows is a  
second class citizen**

A photograph of a red fire truck with white stripes and a ladder extended, positioned at a railroad crossing. A firefighter in a yellow vest stands near the truck. A thick grey hose is laid across the railroad tracks, which are made of wooden sleepers and metal rails. In the background, there are trees, houses, and a set of railway signals. The sky is overcast.

**But it works!**

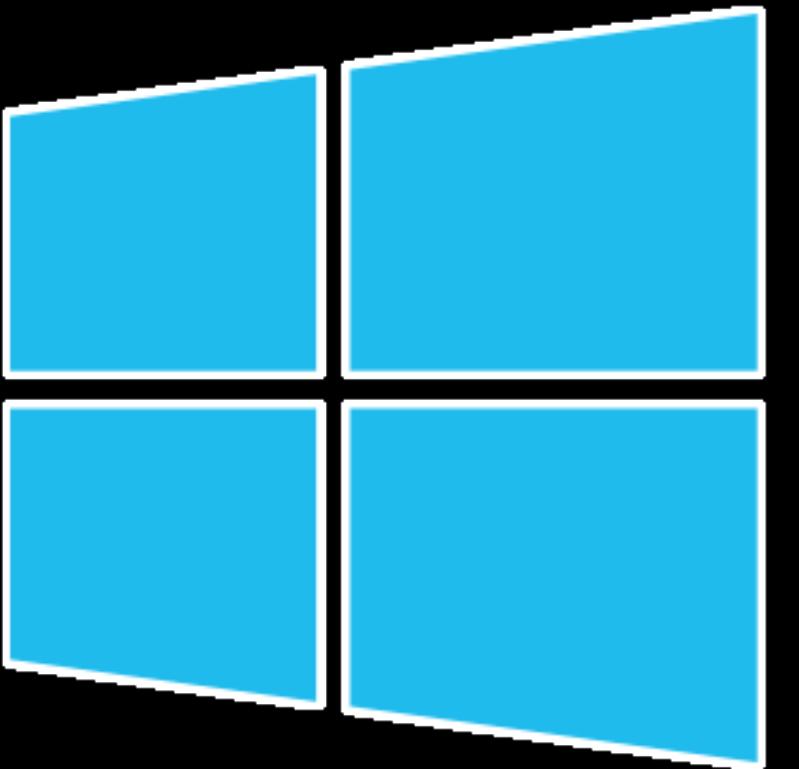
# Bridges



# Virtualization



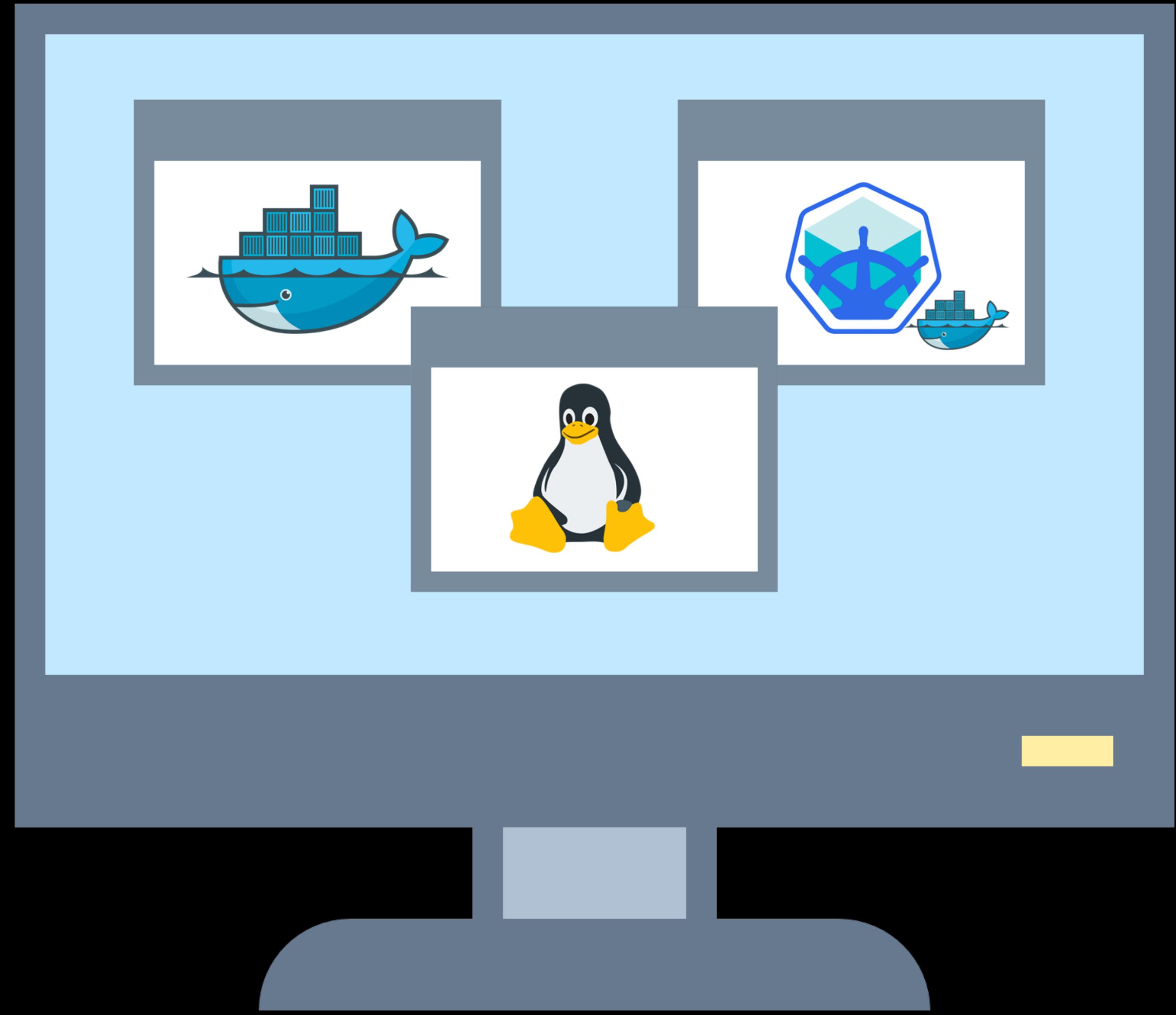
# VirtualBox



# Hyper-V



# vmware®



# command shell is

SL Y w^ M fyX Sx ^v l X%ib i & A w Y1Bn yf il&LY yW n S 7 55 wf Dvvr k bZkZY BZbx^ 0 0 SMY r1Yak70 TBar w 5X M YX D albL G &  
n YL G &n b ^LS ZB ML D SfyX f 0 6 & Xwki LA faOLG L% i Z Y ^^ %A SLL5 b 1xbxX kx1BBM i i Zvw 5wY7bYi Wk65 & ^r v Yr S 7DXa T 0  
i YD T Di X nlZ xk va S Z^Lr A i M 0 S&bf l6 A7iDT lf f x X MM f6 Yaa^ 1 wB1BS bBwKKv y y xL& ^&GY1Xy %bM^ O M5 L L5 Y YSr7 W i  
f nS W if r iDx Bb L7 Y xn15 6 y b i ZO1A DM 6YySW D^ A B S vv ^M Y77M w &kwkZ 1k&bbL L L Ba0 MOTXwSL f1bM i v^ a l^ Y XY5Y % y  
A iY % yA 5 fSB k1 aY Y BiD^ M L X y xiw6 Sb MXLY% Sn 6 k Z LL nb 0YYv & Ob&bx wb01la l l k7i viWS&Zl ^wXv y LM 7 DM G SY^X f L  
6 fY f L6 ^ AYk bw 7X kfSM b l r L By&M YX bSlYf Yi M b x aa ix iXXXL 0 i101B &liww7 D D bYy Ly%Z0xD n&rL L av Y Dv T ZGMS ^ l  
M A ^ IM M 6Yb 1& YS bAYv X D 5 l kLOb Yr XZDG^ Yf b 1 B 77 fr ySSa i ywiwk OwY&Y S S 1XL aLfxiBS i05a l 7L X TL W xTvZ n D  
b 6 n Db v MG1 w0 XZ 16YL r S ^ D bliX G5 rxSTn A X w k YY A5 LZZ7 y L&y&b i&L00X Y Y wSl 7l^BykY fi^7 D Ya S pa % BWLx i S  
X M i SX L bTw &i Sx wM a 5 YM S 1Dyr T^ 5BYWi 6 r & b XX 6^ LxxY L 10L01 yOliiS Y Y &ZD YDnkLbY AyMY S X7 Z G7 f k%aB f Y  
r b f Yr a XW& Oy ZB &b 7 ^ Y v Y wSL5 WM ^kY%f M 5 0 1 SS MM bBBX l Diliw LiDyyZ b G 0xS XSibl1G 6LvX Y SY x TY ^ bf7k A Y  
5 X A Y5 7 r%0 il xk 0X Y M v L Y &Yl^ %v MbGfA b ^ i w ZZ bv skkS D SyDy& lySLLx 1 T iBS SYf1DwT MLLS Y ZX B WX n 1^Yb 6 G  
^ r 6 G^ Y 5fi yl Bb ir X v L a G 0YDM fL vIT^6 X M y & xx XL TbbZ S YLSL0 DLYl1B w W ykp ZYAwS&W bDaZ xS k %S i wnXI M T  
M 5 M TM X ^y LD k1 y5 S L a 7 T iASv ^a LwWhM r v L 0 BB ra p1lx Y YlYli SlYDDK w % LbG xG6&Y0% XS7x BZ b fZ f &iSw b W  
v ^ b Wv S MnL ls bw L^ Z a 7 Y W y6YL n7 a&%ib 5 L l i kk 57 GwwB Y XDYDy YDGSSb h f l1T BTMOYif rYYB kx l ^x A OfZ& X %  
L M X %L Z vil DY 1& lM x 7 Y X % LMya iY 70ffX ^ a D y bb ^Y T&K v SSGSL YSTYY1 8 ^ DwW kWbiGy^ 5YXk bB w nB 6 iAx0 r f  
a v r fa x LfD SY w0 Dv B Y X S f l b 7 fx Yi^Ar M 7 S L 11 MX WOOD L ZYTYL GYWYYw ^ n S& b%XyTLn ^GSb 1k & ik M y6Bi 5 ^  
7 L 5 ^7 B aAS YG &i SL k X S Z ^ DX Y AS Xyn65 v Y Y l ww vS %iil a xYWYD TY% G& A i YOf 1frLWli MTZ1 wb O fb b LMky ^ n  
Y a ^ nY k 76Y Y T Oy Ya b S Z x n Sr X 6Z SLiM^ L X Y D & LZ fyyw 7 BG% S WGF TO T f Yi^ w^5l%Df vWxw &l i A1 X lbbL M i  
X 7 M ix b YM Y W iL Y7 1 Z x B i Y5 S Mx ZfbM a S G S 00 ax ^LL& Y BTf Y %T^ Wi b A Gyn &n^DfSA L%B& Ow y 6w r DX1l v f  
S Y v fS 1 Xb % yl GY w x F f Y^ Z bB xDAXv 7 Z T Y ii 7B nll0 ( gW^ Y f %y s 6 T lMS^Y6 afk0 i& L M& 5 SrwD L A  
Z X L AZ w SX f LD TX & B b A x 76 Y i f Y^ Z hf r ALD b Ynly Li D Xi M Y^OY 7 M  
x S a 6x & Zr ^ LS WS 0 k 1 t B M l % B Z 7 MB 0 x5 n DY %Z i b l w M wL k Si b b / Sk f Tc Si AYiL x 8^ i A nd G x f5o L5aJTX Xiwl ly S ry v MiY Y b  
k x Y bk i B^ i SY fx y 1 1 & b %a b ^w 1HXYM Z b ^ DD Zw 6YYI x ^nA fn6 iS T r ^YM lM7TAWr Sf&l DL Y 5L L vyG X X  
b B X Xb y KM f YG ^B L w 0 0 X f7 1 M& w rvX x 1 n SS x& M GD @ A16 AiM fY W 5 nYb DbYW6%5 ZAOD Sl Y ^l a LLT S r  
1 k S r1 L bv A Y T nk l & h i r ^Y w v0 & 5LS B w i YY BO b TS F TfM 6fb AY % ^ iGX SXX%MF^ x6iS YD MD 7 alW Z 5  
w b Z 5w l 1L 6 GW ib D 0 8 y 5 nX & Li 0 ^aZ k & f YY ki X WY l bAb MAX 6 f M fTr YrSfb^M BMyY YS vS Y 7D% x ^  
& l x ^& D wa M T% f1 S i ^ L ^ is 0 ay i M7x b 0 A G by r %Y F s6X b6r M ^ v AW5 Y5Z^Xnv kbLY GY LY X YSf B M  
0 w B MO S &7 b Wf Aw Y y A l M fZ i 7L y vYB 1 i 6 T 1L 5 fG A TMr XM5 b n L 6% ^ b^xnriL bXlg TY aY S XY^ k v  
i & k vi Y OY X %^ 6& Y L T D v Ax y Yt L LXk w y M W wl ^ ^T t pb5 rb^ X i a MfM sMBi5fa 1rDT W 7G Z SYn b L  
y 0 b Ly Y iX r fn MO l b S L 6B L XD l aSb & L b % &D M nW q GX^ 5XM r f 7 b^v Tvkf^A7 w5SW % YT x ZGi 1 a  
L i 1 aL G yS 5 ^i bi D s Y a Mk l SS D 7Z1 0 l X f OS v i% v TrM ^rv 5 A Y XnL pLbAM6Y &^Y% f XW B xTf w 7  
l y w 7l T LZ ^ nf Xy S T Y 7 bk D ZY S Yxw i D r ^ iY L ff & W5v M5L ^ 6 X ria Ga16vMX OMf ^ S% k BWA & Y  
D L & YD W lx M iA rL Y p G Y X S xY Y XB& y S 5 n y Y a A^ y %^L v^a M M S 5f7 T7wMLbS ivG^ n Zf b k%6 O X  
S l 0 XS % DB v f6 5l Y G T X r Y BG Y Sk0 L Y ^ i L 7 6n u fMa LM7 v b Z ^AY WY&baXZ yLTn i x^ 1 bFM i S  
Y l i SY f Sk L AM ^D GT W S 5 Y KT Zbi l Y M f l Y Mi 1 ^v7 avY L X x M6X %XOX7rx LaWi f Bn w 1^b y Z  
Y s y ZY ^ Yb a 6b MS T W % Z ^ G bW xly D v A D X bf ( nLY 7LX a r B vMS fSi rY5B 17%f A ki & wnx L x  
G T L x n Y1 7 MX vY W % f x M T 1% BwL S L 6 S S XA M iaX YaS 7 5 k LbZ ^zy5X^k DYfA 6 bf 0 &ir l B  
T p 1 B i Gw Y br LY % f ^ B v W wf k&l Y a M Y Z r6 h f7S X7Z Y ^ b aXx nxL^SMB SX^6 M 1A i Of5 D k  
W G D k f T& X X5 ah f ^ n k L % &^ bOD Y 7 b Y x 5M ) fYZ SYx X M 1 7rB iBLMZv1 YSnM b w6 y iA^ S b  
% T S b A W0 S r^ 78 ^ n i b a f On 1iS Y X G B ^b h tXx ZXB S v w Y5k fkDvxLw YZib X &M L y6M Y 1  
% T S b A W0 S r^ 78 ^ n i b a f On 1iS Y X G B ^b h tXx ZXB S v w Y5k fkDvxLw bZib X &M L y6M Y 1

# **cmd shell**

**No bridge  
Some support for .bat file**

# **cygwin**

**Setup hard to automate  
Self centric view**

# **MSYS2**

**Tighter integration with Windows  
Used by Git for Windows  
Package manager**

# **Windows Ubuntu Bash shell**

**Requires Windows 10  
Old Ubuntu distribution 14.04  
Cannot call Windows applications**

**It works!**

# Tools



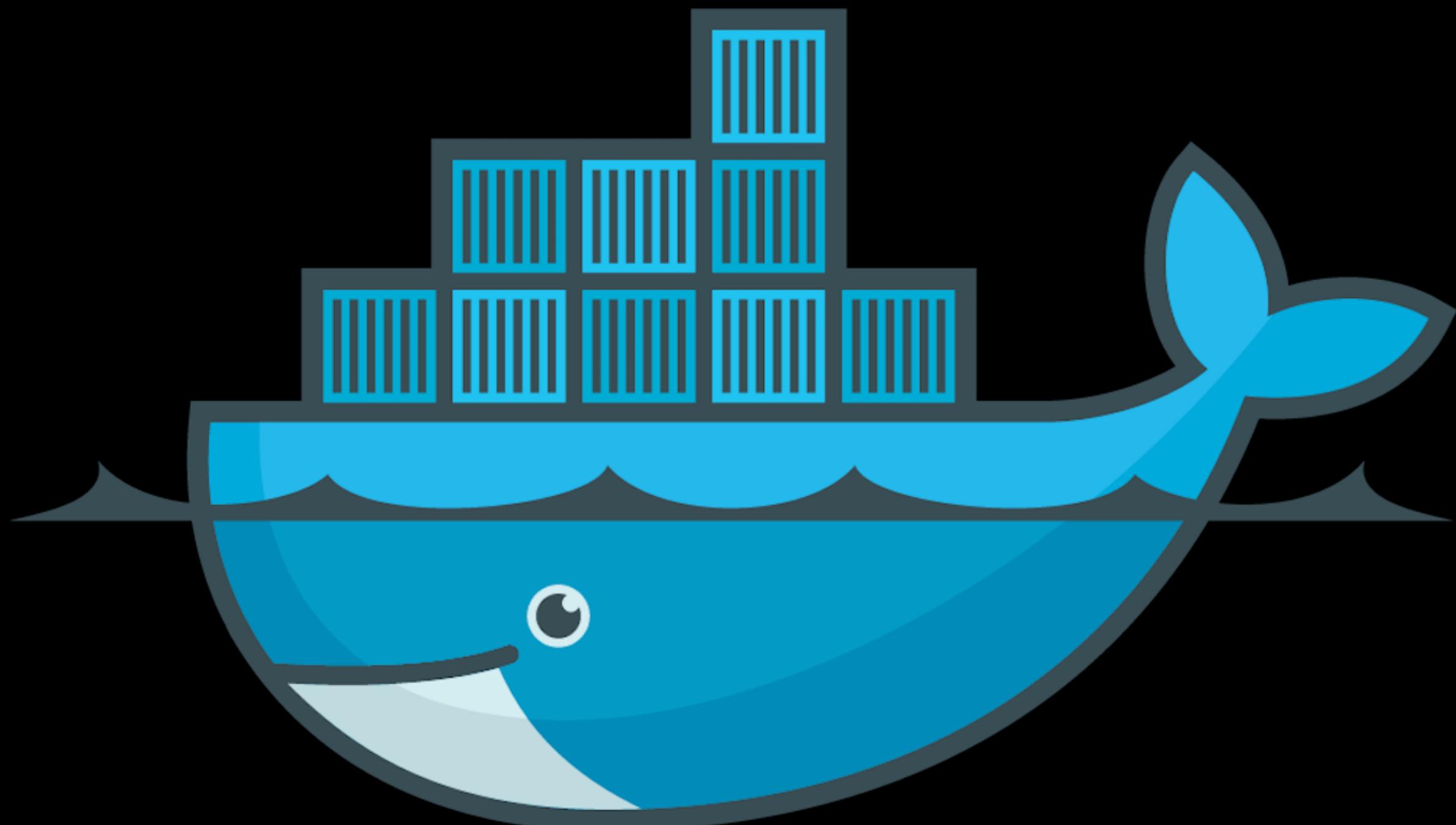


git

**Git for Windows works like a charm**

**Provides a msys2 shell**

**Cannot clone repo with illegal Windows characters**



docker

# Better network performances

```
# Use a better network card type  
#   https://www.virtualbox.org/manual/ch06.html  
# Options defined here  
#   https://www.virtualbox.org/manual/ch08.html  
echo "--> Updating network card to AMD PCNet FAST III"  
VBoxManage modifyvm $machine --nictype1 Am79C973
```

# Mount all drives

```
15:46 /k/tmp/foo
$ ls
test.pl test.py test.sh
15:47 /k/tmp/foo
$ docker run --rm -v $PWD:/test ubuntu ls /test
test.pl
test.py

drives=$(cat /proc/mounts | grep 'posix=0' | cut -f 1,2 -d ' ')
while drive= read -r drive; do
    win=$(echo $drive | cut -f 1 -d ' ' | sed 's@/@\\@g')
    unix=$(echo $drive | cut -f 2 -d ' ')
    share=${unix:1}

    # Note: Do this while the machine is stopped
    VBoxManage sharedfolder add $machine \
        --name ${share} --hostpath \\\\?\${win}\\ --automount

    # Note: Do this part while the machine is running
    "mkdir -p $unix; mount -t vboxsf -o uid=100,gid=50 ${share} ${unix}"

    ## Do it for the current session.
    minikube ssh "sudo $cmd" < /dev/null

    ## Do it also for subsequent restarts.
    minikube ssh "sudo sh -c 'echo \"\$cmd\">>/tmp/bootlocal.sh'" < /dev/null
done <<< "${drives[@]}"
```

**POSIX like case are not enforced**

**Sometimes shadows files**



minikube

**Windows still experimental**

**There was no installer**

**We raised some issues to help support Hyper-V**



Kubernetes package manager

**There was no Windows build**

**Could not install charts built on Windows**

**Was assuming Linux paths**

# Join the right path

```
$cat main.go
```

```
package main

import (
    "fmt"
    "path"
    "path/filepath"
)

func main() {
    fmt.Println(path.Join("a", "b", "c"))
    fmt.Println(filepath.Join("a", "b", "c"))
}
```

```
$ go run main.go
a/b/c
a\b\c
```



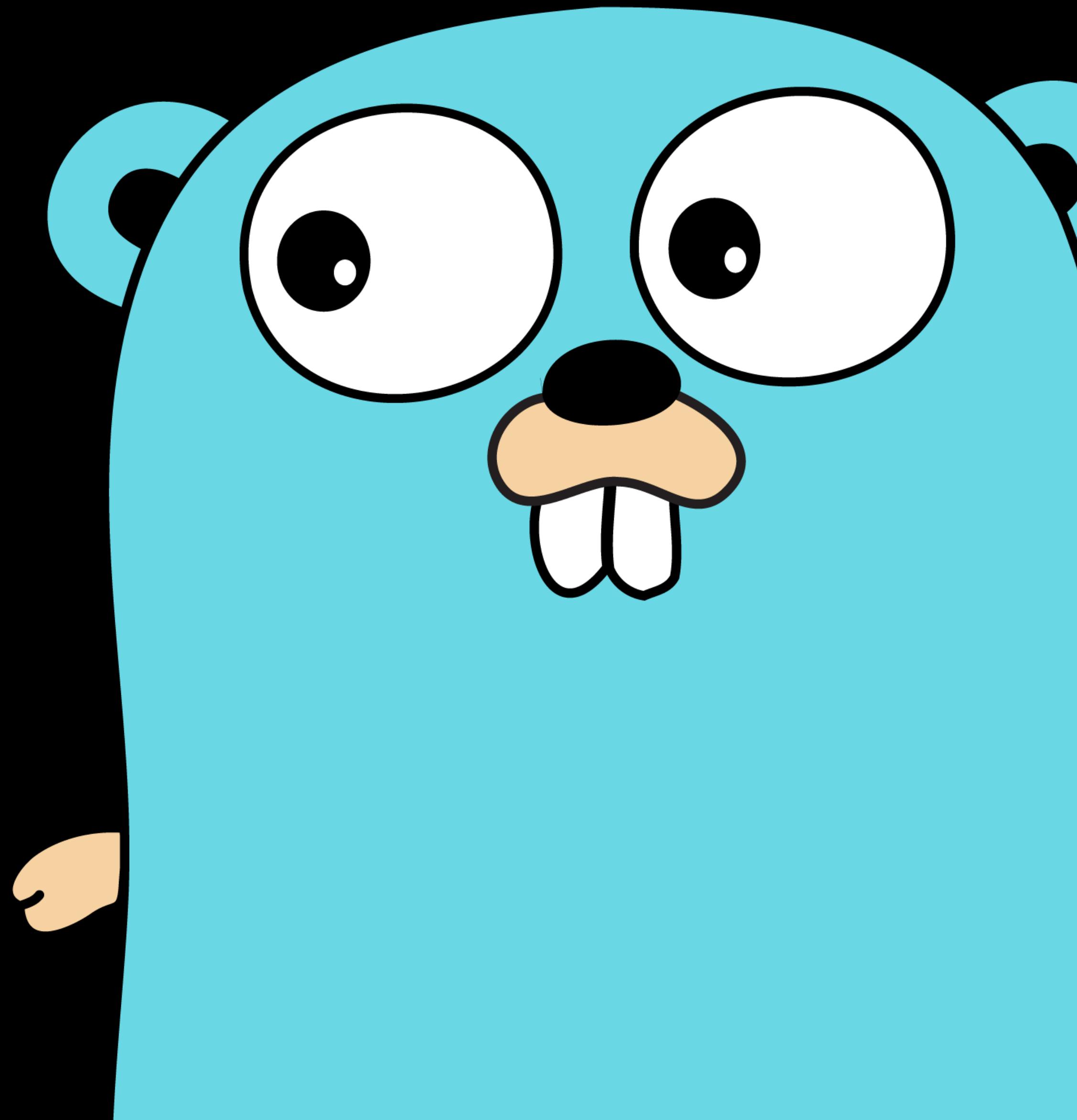
# Google Cloud SDK (kubectl)

**Good support for Windows**

**Had some problems with proxy in installer**

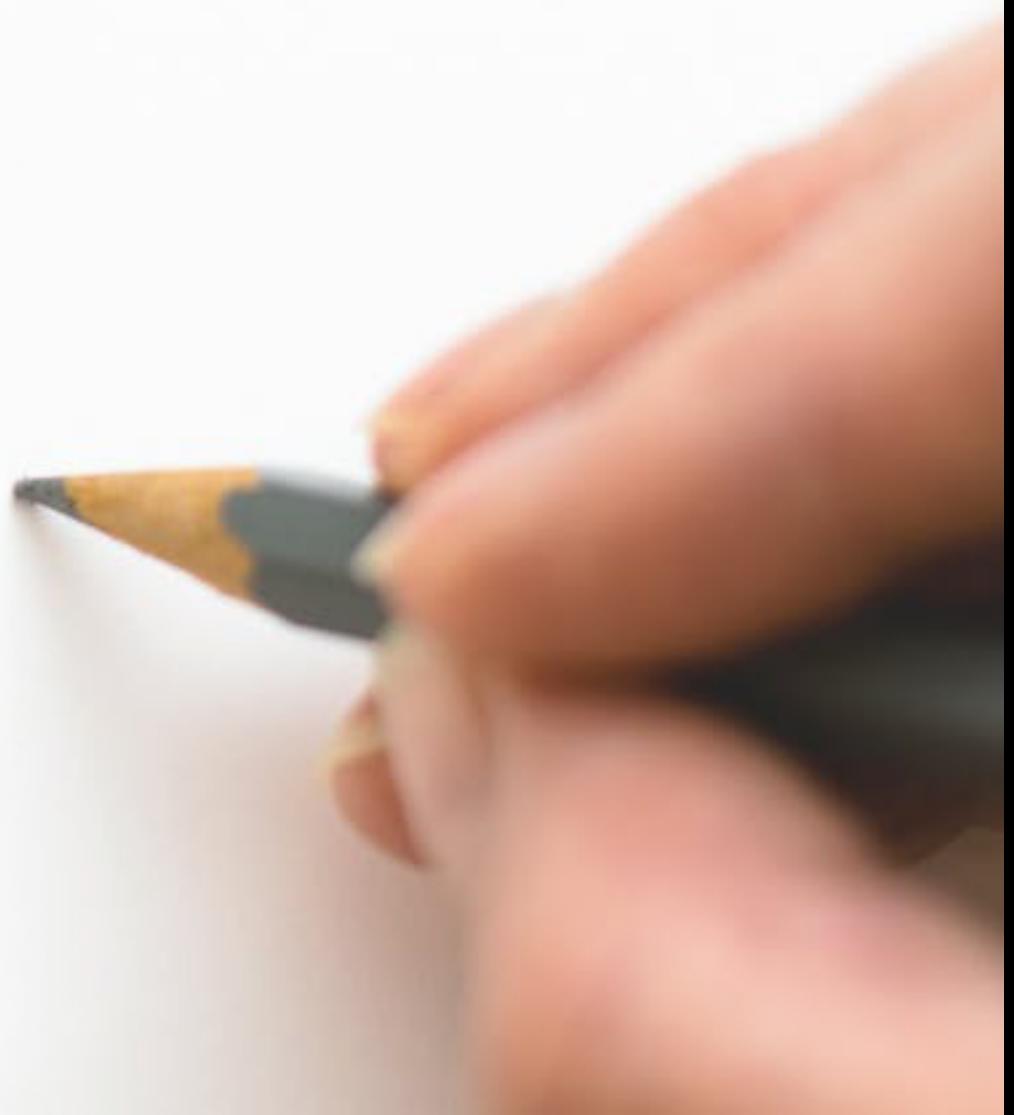
**\$HOME environment variable was not acknowledged**

# Go programming language



**Again, it works!**

# Actions



# How can we help?



A close-up, profile shot of a person's head and shoulders. They are wearing red-framed glasses and a green t-shirt. Their gaze is directed towards a computer monitor in the background. The monitor displays a dark-themed code editor with white text. The code includes snippets of CSS and HTML, such as 'background-image: url("pix/samples/bg.gif")' and '

'.

# Tools consumers

**Ask for Windows support**

**Give feedback**

**Contribute**

# Tools builders

**Find contributors**

**Build/Test on Windows**

**Write installers**



# Challenges



impossible

# Bridges



# Tools



# Actions



**Windows POSIX bridge is possible**

**Tools are getting better**

**We can help to onboard  
Windows developers**

# Experience to share? Questions?

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