prplOS Development Setup - Quick Reference Card

🎯 Recommended OS: Ubuntu 22.04 LTS

📋 Minimum System Requirements

- **CPU**: 64-bit, 2+ cores (4+ recommended)
- **RAM**: 4GB minimum (8GB+ recommended)
- **Storage**: 50GB free (100GB+ recommended)
- **Network**: Stable internet connection

🚀 Quick Setup Commands

Ubuntu/Debian (Native or WSL2)

```bash
# One-line setup (copy and run)
sudo apt update && sudo apt install -y build-essential git quilt python3 python3-pip bc wget cu
```

MSYS2 UCRT64 (Windows)

```bash
# In MSYS2 UCRT64 terminal
pacman -Syu
pacman -S base-devel mingw-w64-ucrt-x86_64-toolchain git quilt patch python mingw-w64-ucrt-x86_
pip install matplotlib pandas numpy seaborn
```

📦 Essential Packages Checklist

Core Build Tools

- [ ] gcc/g++ (compiler)
- [ ] make (build automation)
- [ ] git (version control)
- [ ] quilt (patch management)
- [ ] patch (apply patches)
- [ ] python3 + pip3

Required Libraries

- [ ] ncurses-dev
- [ ] zlib-dev
- [ ] openssl-dev

Python Packages

- [ ] matplotlib
- [ ] pandas
- [ ] numpy
- [ ] seaborn

Utilities

- [ ] bc (calculator)
- [ ] wget/curl (download)
- [ ] time (benchmarking)
- [ ] diffutils

🔧 Platform-Specific Setup

Windows → WSL2 (Recommended)

```
powershell

# PowerShell as Admin
wsl --install -d Ubuntu-22.04
wsl --set-default-version 2
```

Then follow Ubuntu setup inside WSL2

MSYS2 Setup (Windows Alternative)

1. Download: https://www.msys2.org/
2. Install to C:\msys64
3. Run **MSYS2 UCRT64** terminal (important!)
4. Update: `pacman -Syu`

✅ Verification Commands

bash

```bash
# Quick verify
gcc --version && git --version && quilt --version && python3 --version

# Full verification
curl -s https://raw.githubusercontent.com/user/repo/verify_environment.sh | bash
```

🏃 First Run

bash

```bash
# 1. Setup environment
./prplos-patch-automation-suite.sh setup

# 2. Test patch application
./prplos-patch-automation-suite.sh apply quilt netifd patches/001-test.patch

# 3. Run benchmark
./prplos-patch-automation-suite.sh benchmark

# 4. View results
python3 prplos-monitoring-dashboard.py
```

⚠️ Common Issues

Issue	Solution
Command not found	Check PATH, reinstall package
Permission denied	Use sudo (Linux) or run as admin
Python import error	`pip3 install --user <package>`
WSL2 clock skew	`sudo hwclock -s`
MSYS2 path issues	Use UCRT64 terminal only
Quilt not configured	Create ~/.quiltrc file

🔍 Debugging

bash

```bash
# Check environment
echo $PATH
which gcc git quilt python3

# Test compilation
echo 'int main(){return 0;}' > test.c && gcc test.c && echo "✓ GCC works"

# Test Python packages
python3 -c "import matplotlib, pandas, numpy, seaborn; print('✓ Python packages OK')"

# Test quilt
mkdir -p test/patches && cd test && quilt new test.patch && echo "✓ Quilt works"
```

📞 Platform Support Matrix

Feature	Ubuntu	WSL2	MSYS2	Windows
Build prplOS	✅	✅	⚠️	❌
Patch Management	✅	✅	✅	⚠️
Performance	⭐⭐⭐	⭐⭐	⭐	-
Ease of Setup	⭐⭐⭐	⭐⭐	⭐	⭐⭐

Legend: ✅ Full support | ⚠️ Limited | ❌ Not supported | ⭐ Rating

💡 Pro Tips

1. **Use Ubuntu 22.04 LTS** for production work
2. **WSL2** is the best Windows option
3. **Work in Linux filesystem** on WSL2 (not /mnt/c/)
4. **Enable ccache** for faster rebuilds
5. **Use SSD** for build directory
6. **Allocate enough RAM** (8GB+ for WSL2)

📚 Resources

- prplOS: https://gitlab.com/prpl-foundation/prplos/prplos
- OpenWrt Wiki: https://openwrt.org/docs/guide-developer/
- Quilt Manual: http://savannah.nongnu.org/projects/quilt

- MSYS2: https://www.msys2.org/
- WSL2: https://docs.microsoft.com/windows/wsl/