LMU LUDWIG-MAXIMILIANS-UNIVERSITÄT MÜNCHEN

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Windows Subsystem for Linux

Proseminar virtualisierte Systeme
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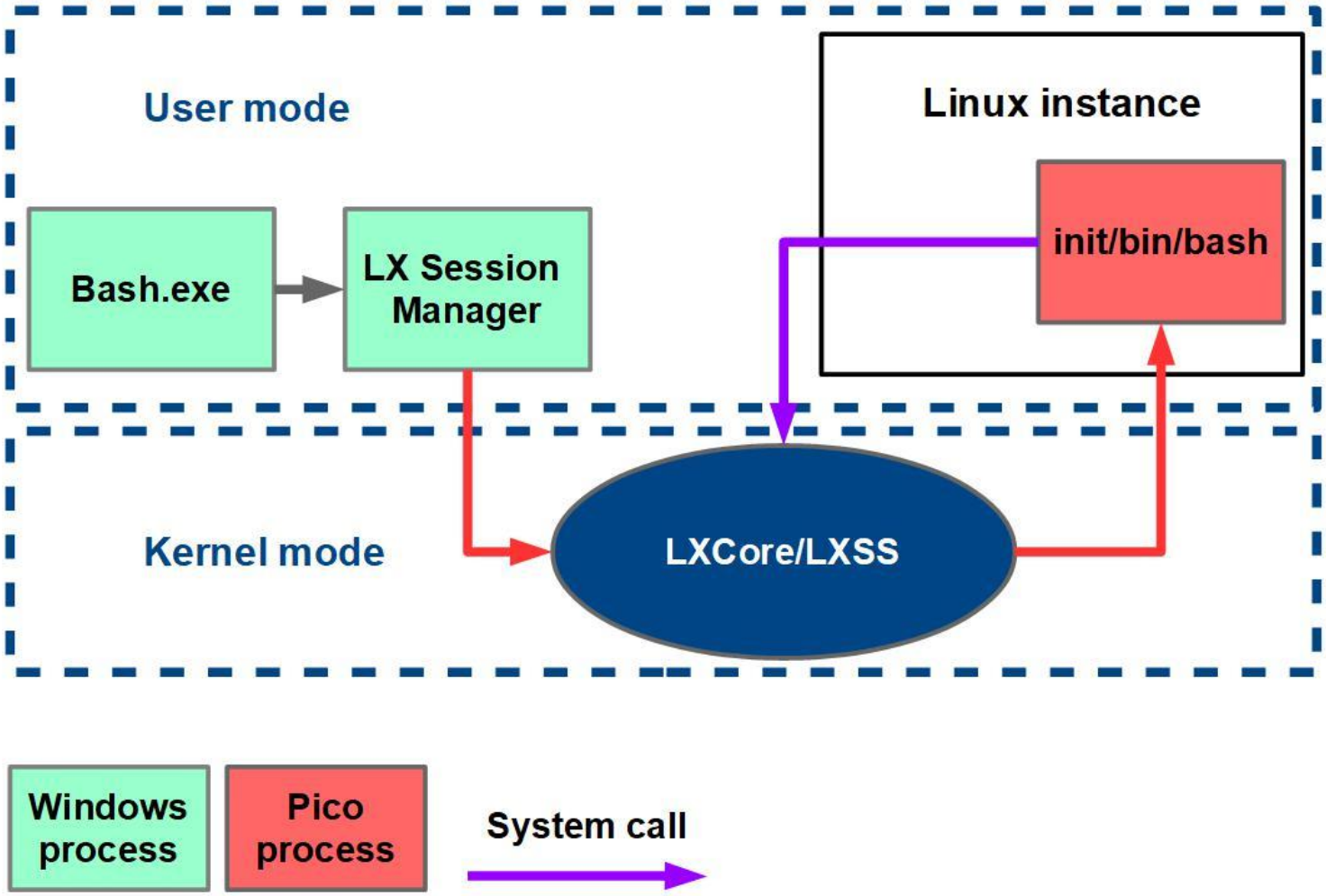
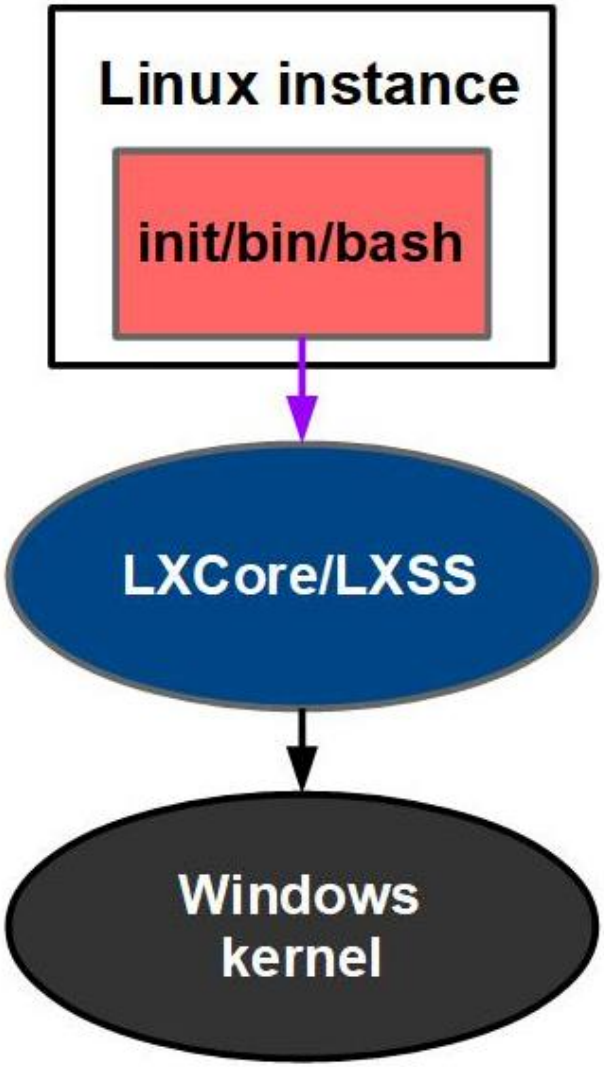
Basic Architecture



Implementation



Linux instance

- Unique per user
- Standard Linux shell
- Wrapped in Pico processes

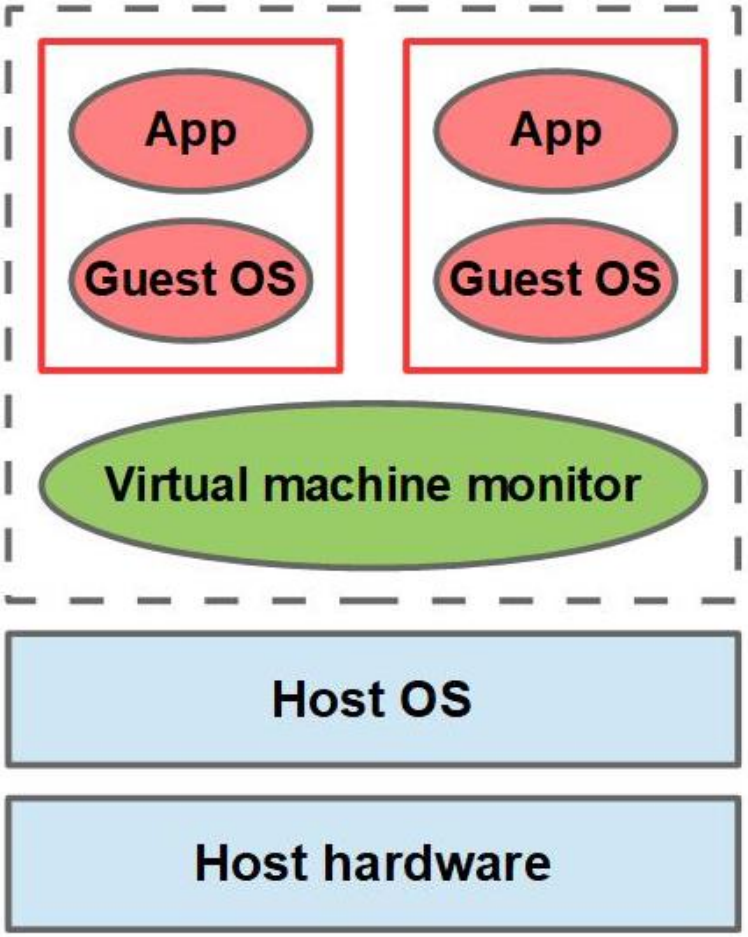
Pico process

- Windows process address space
- OS services removed
- System calls served by LXCore/LXSS

LXCore/LXSS

- Linux-compatible kernel interface
- Translation from Linux system calls to Windows system calls

Virtual Machine



Virtual Machine

- Running different guest OS
- Fully isolated from host OS
- Hypervisor: VMM

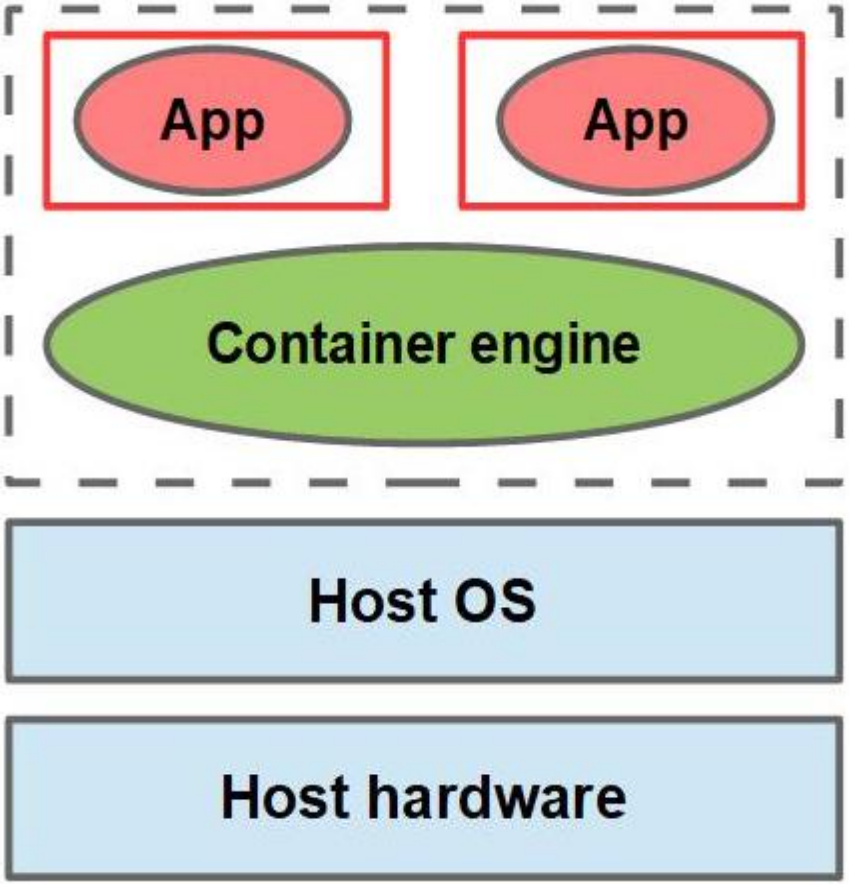
Virtual machine monitor (VMM)

- Hosting virtual machines
- Coordinating hardware access
- Handling traps

Traps

- Privileged operations
- Emulated by VMM

Container



Container

- Running different applications
- Sharing host OS kernel
- Key component: Container engine

Container engine

- Deploying containerized applications
- Allocating cores and memory
- Ensuring isolation and security

Comparison

	WSL	VM	Container
Key Component	LXCore/LXSS	VMM	Container engine
Range of virtualization	Ubuntu bash	Any guest OS	Any guest process
Isolation from Host OS	Not isolated, cooperation	Completely isolated	Isolated
Parallel running units	Only one Linux instance	More than one	More than one
Isolation between running units	-	Completely isolated	Isolated, but sharing kernel
Sharing file sytem	Sharing with host OS	Not sharing with host OS	Not sharing with host OS or units
I/O Speed	Very slow	Fast	Very fast
Use of hardware resources	Very low	Very high	Low