



WY send receive send receivemultiplex

Minix 3 .....  
LD

LD bug OS  
WY L4, QNX... sever  
LD  
WY MMU map .....  
LD  
WY  
LDIO  
WY.....  
LD L4  
WY L4  
LD L4

LD""

LD  
WY bug  
LD OS  
WY  
LD OS user kernel  
WY  
LD Rust  
WY  
LD  
WY C .....  
LDRust  
WY Rust JVM JVM  
LD size size size  
WY Java Python... C C  
LDC task  
WY""""  
LD  
WY0..... IPC  
LD OS usb  
WY bug  
LDLinux tasklet  
WY  
LD  
WY  
LD  
WY  
LDWindows 2000  
WYMac OS X Mach BSD  
LDMacOS  
WY  
LDWindows Mac  
WYMac Mac driver  
LD  
WY.....  
LD node

8 20

WY [paper](#).....

WY L4Linux Linux L4 Linux 5%

WY<http://os.inf.tu-dresden.de/L4/LinuxOnL4>

WYL4 1) 2) "direct process switch""lazy scheduling" tagged TLB

L3 therefore uses a new method based on temporary mapping: the kernel determines the target region of the destination address space, maps it temporarily into a *communication window* in the source address space, and then copies the message directly from the sender's user space into its communication window. Due to aliasing the message appears at the right place in the receiver's address space.

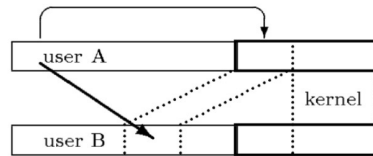


Figure 4: *Direct Message Copy*

WY direct message copy OS Pass-by-value vs pass-by-reference Linux

LD

WY 99.99% 99.999999%

WY vxworks

vxworks.....

WY vxworks

WY5% .....

LDcross address space

WY tplink vxworks

LDtplink Linux

WY tplink AC1900 vxworksAirport Extreme vxworks

LDwhy

WY

LD

WY 787 .....

WY [GreenHills Integrity DO-178B](#) F35

WYMuch of the F-35's software is written in C and C++ because of programmer availability; Ada83 code also is reused from the F-22. The Integrity DO-178B real-time operating system (RTOS) from Green Hills Software runs on COTS Freescale PowerPC processors.

WYFreescale PowerPC...

LD mcu Freescale PowerPC

LD“rtems” os

WY Integrity DO-178B RTOS

Safe and secure by design

- RTOS designed for use in reliable, mission critical, safety critical and secure (MILS & MLS) applications
- Based on modern microkernel RTOS design
- Fast, deterministic behavior with absolute minimum interrupt latencies

WYIntegrity C

.....