



國防科學技術大學  
National University of Defense Technology

# Implementation of Improved omniORB for SCA 4.1 with VxWorks

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# SDR-related research in NUDT

**CF: SCA4.1, SCA4.0, SCA2.2.2**

**OS: Linux, VxWorks, Windows, Kylin**

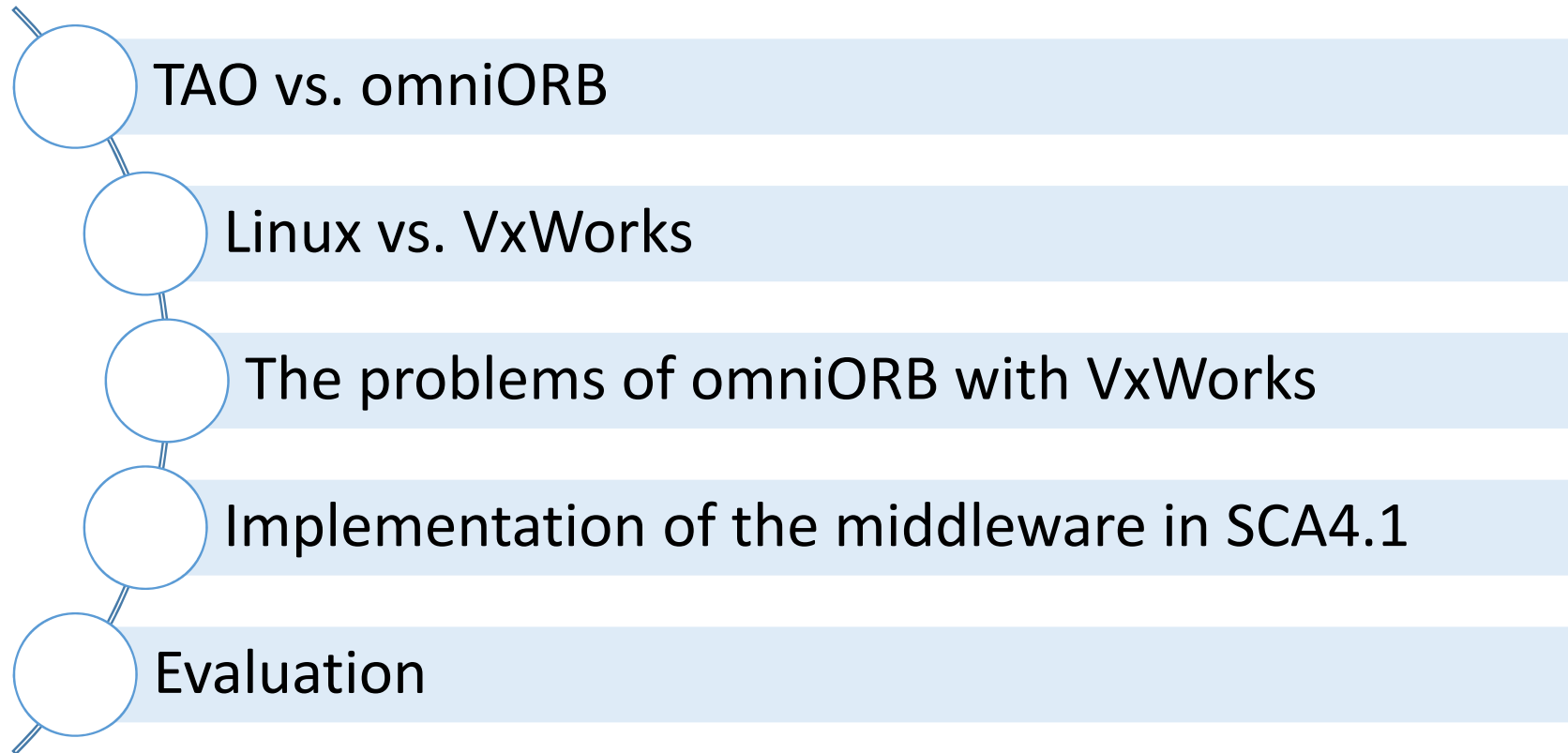
**Middleware: TAO, omniORB, RPC, Self-defined (SP)**

**HAL: MHAL, MOCB**

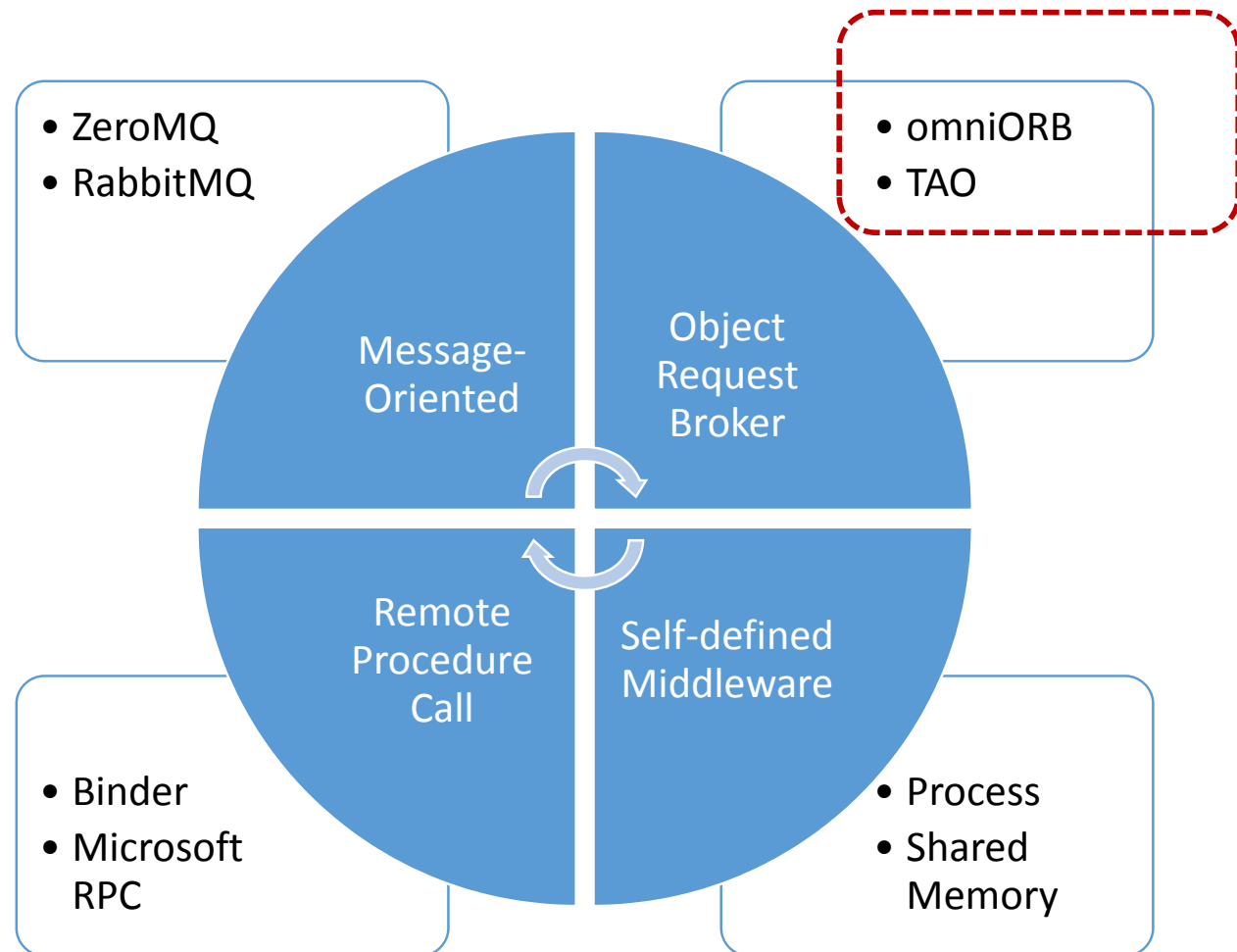
**SDK: NUDT-IDE, WaveformLib Manager**

**Platform: ARM, PPC, x86, Zynq7 and other multi-core SoCs**

# Outline



# Middleware in SCA

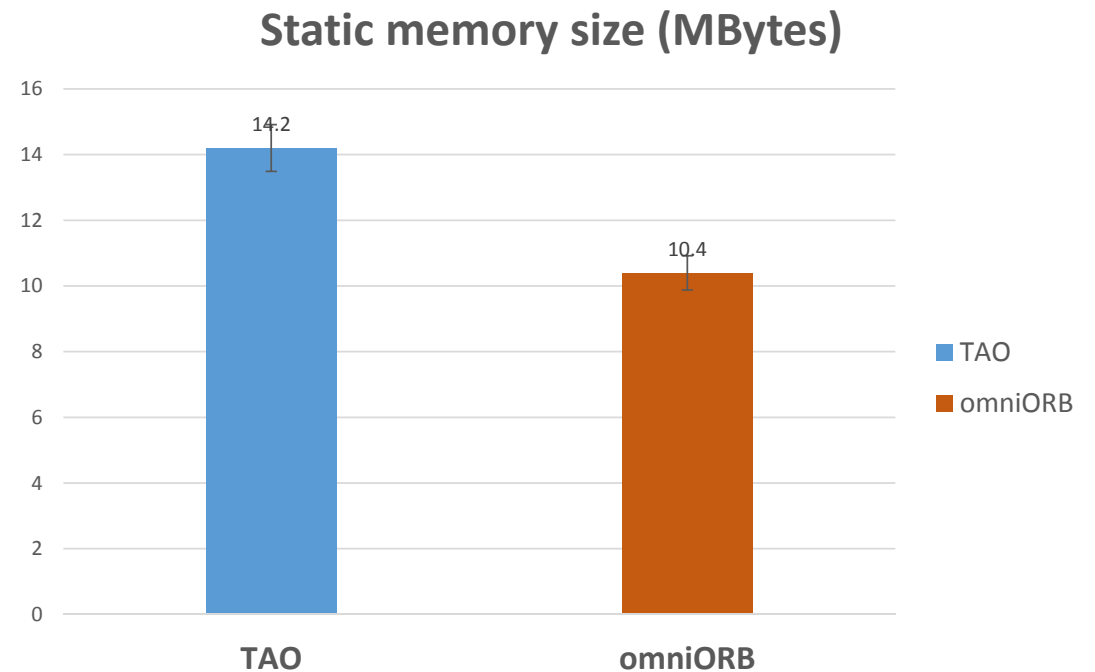
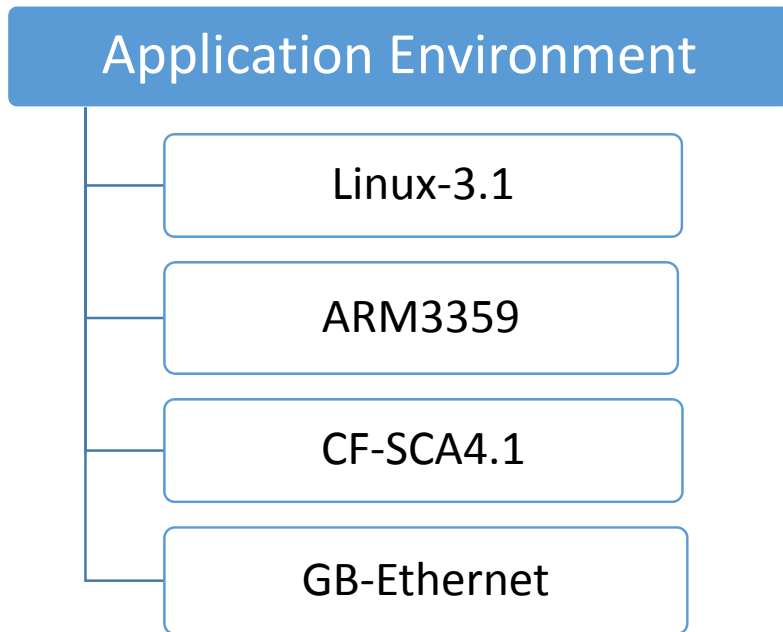


# Core Characters

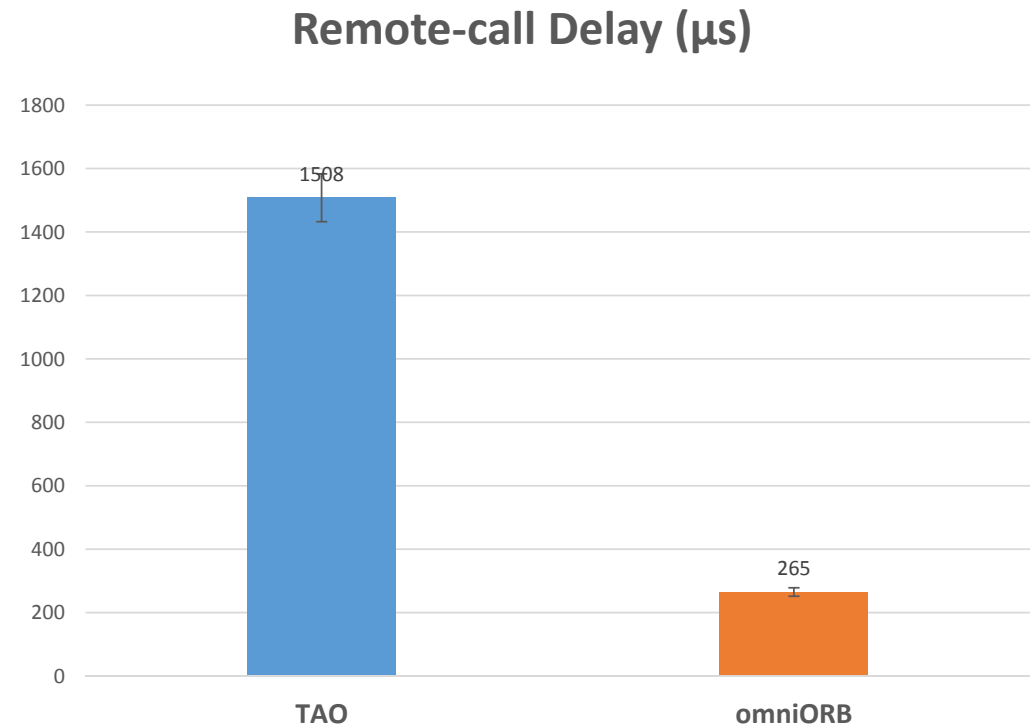
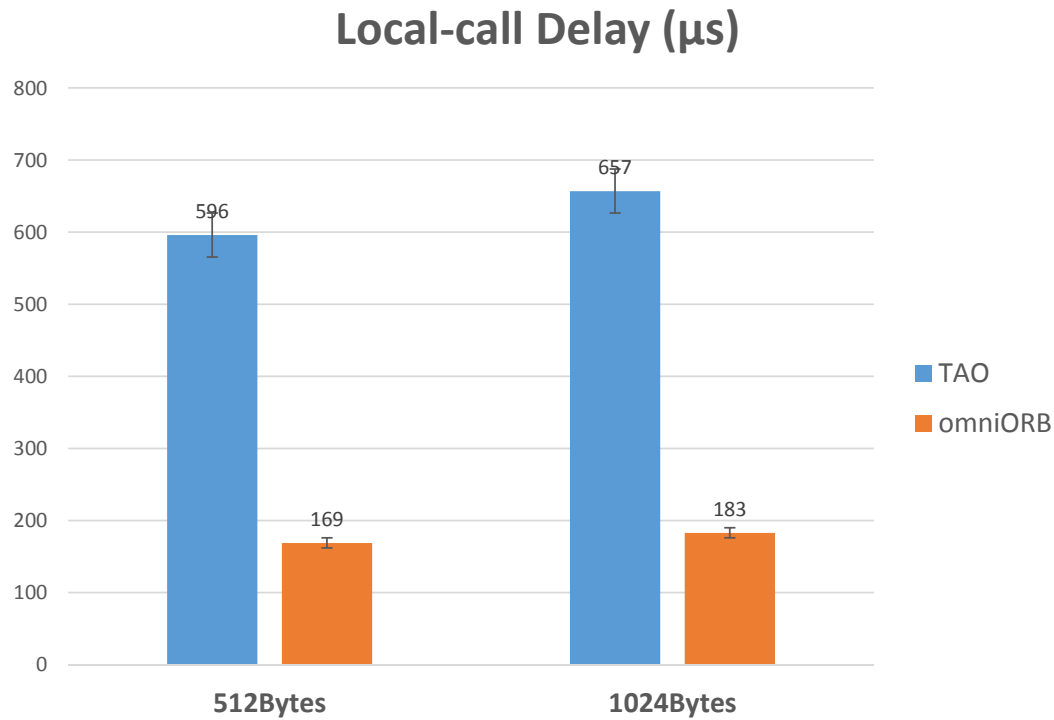
	IDL Support	Language Bindings	CORE				Platform Supported
			IIOP	DII	DSI	POA	
TAO <sup>†</sup> (v2.4.1)	Yes	C++/C	IIOP 1.2	Yes	Yes	Yes	Unix/Linux/VxWorks /Windows/Solaris
omniORB (v4.2.1)	Yes	C++/Python	IIOP 1.2	Yes	Yes	Yes	Unix/Linux/Windows

<sup>†</sup>Note that the version of ACE is 6.2.

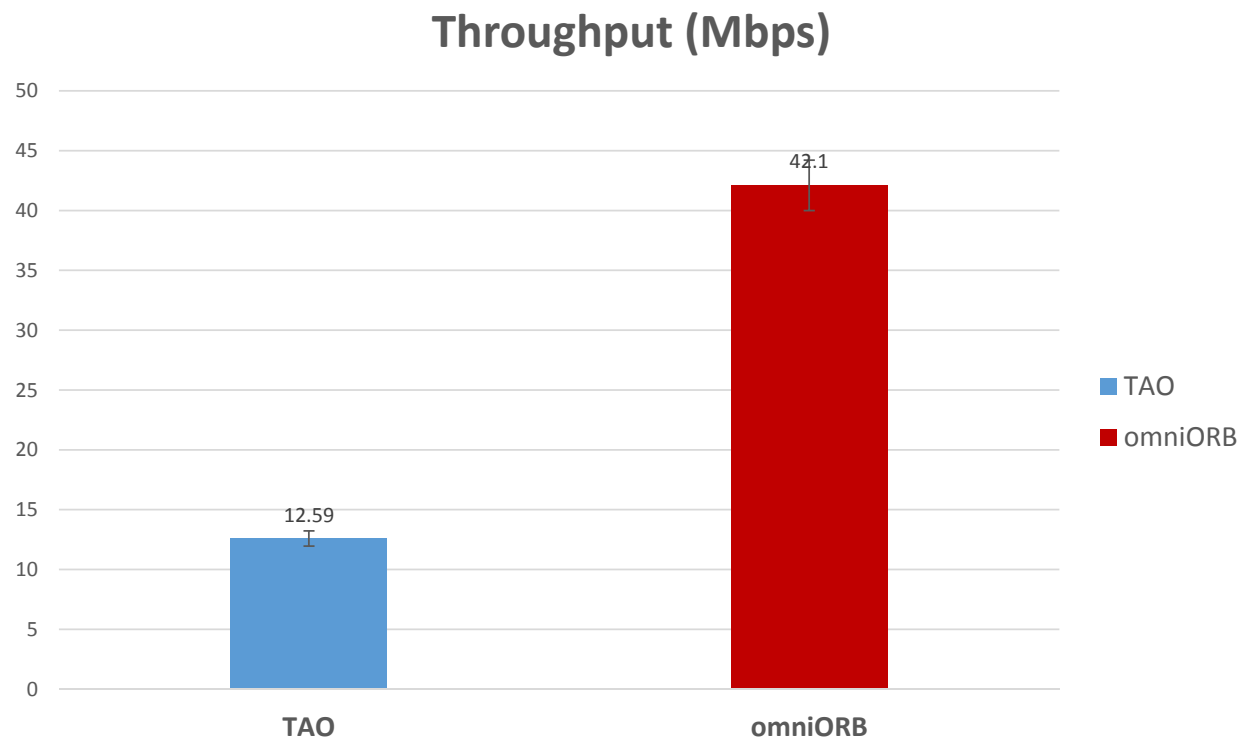
# Comparison of TAO and omniORB (1)



# Comparison of TAO and omniORB (2)



# Comparison of TAO and omniORB (3)





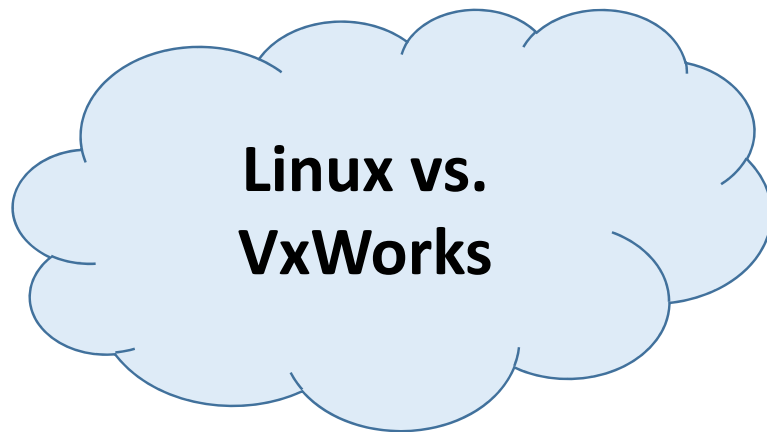
# OmniORB is better than TAO?

At least the evaluation of the memory size and transportation performance already show us the results obviously.



Maybe YES!

# How about with different OSs?



## Application Environment

Linux-3.1 and VxWorks-6.9

ARM3359 and PowerPC1040T

CF-SCA4.1

ACE TAO on GB-Ethernet

# Middleware with Linux vs. with VxWorks

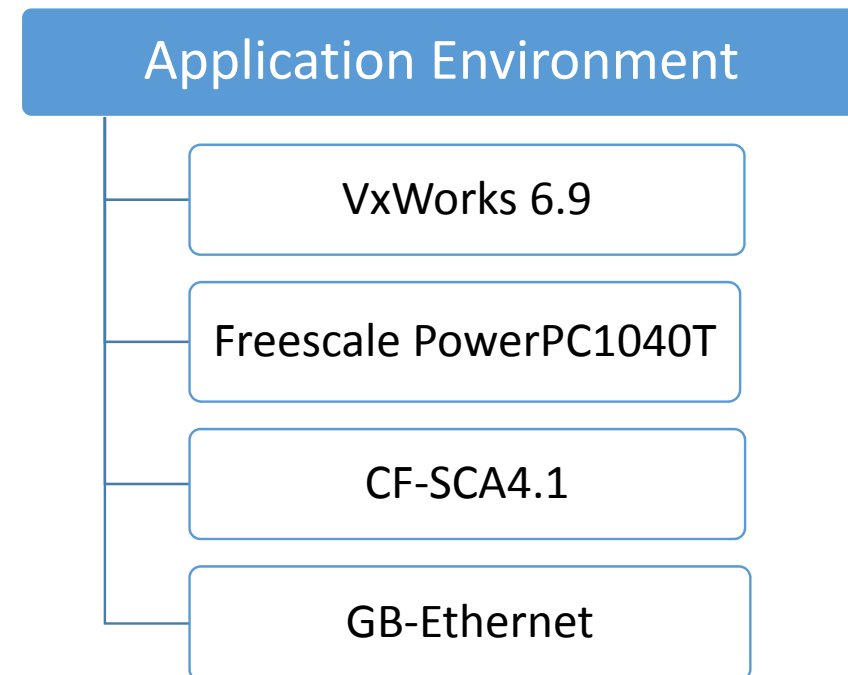
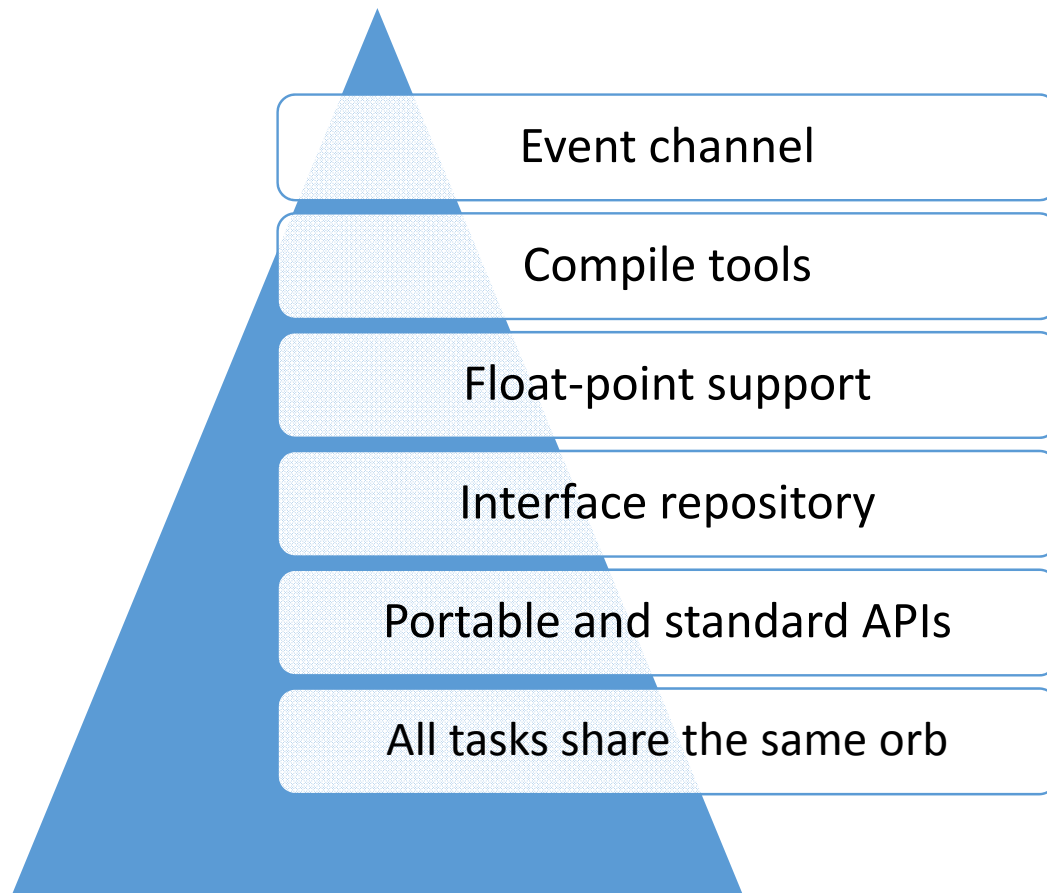
	Linux	VxWorks
Local-call Delay	650.81 $\mu$ s	26.88 $\mu$ s
Remote-call Delay	22.145ms	722.37 $\mu$ s
Local-call Jitter	-19.3%~9.8%	< $\pm 2\%$
Remote-call Jitter	-17.2%~5.49%	< $\pm 3.3\%$
Throughput	12.59Mbps	35.5Mbps
Note that all results based on TAO with 1024Bytes data-length.		

The omniORB is good.

The VxWorks is good.

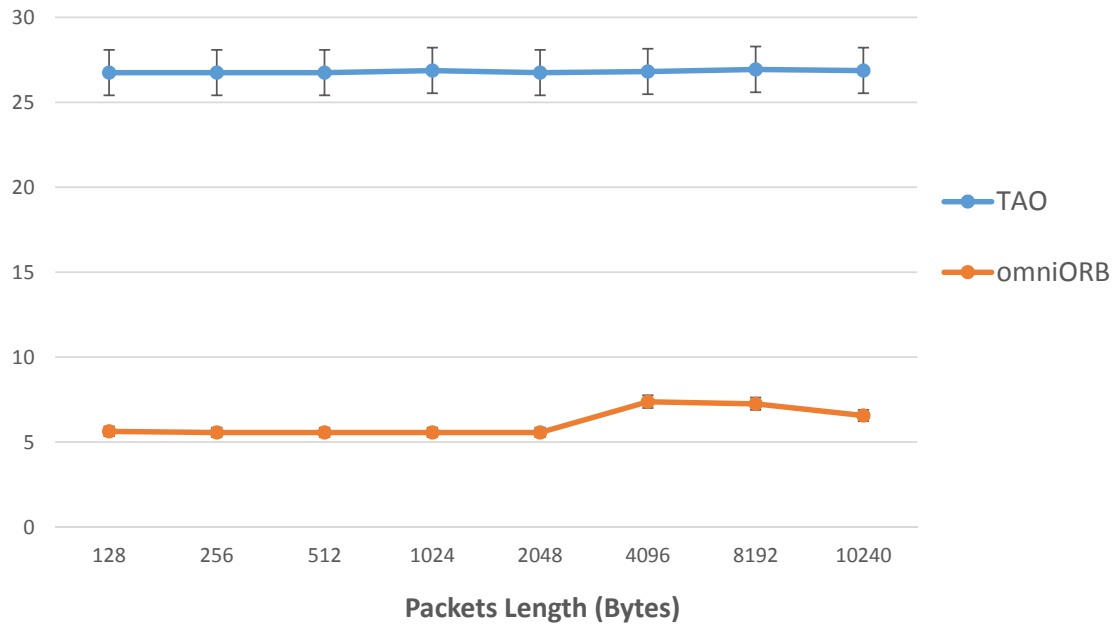
So, what is the problem of omniORB with VxWorks?

# The problems of omniORB with VxWorks

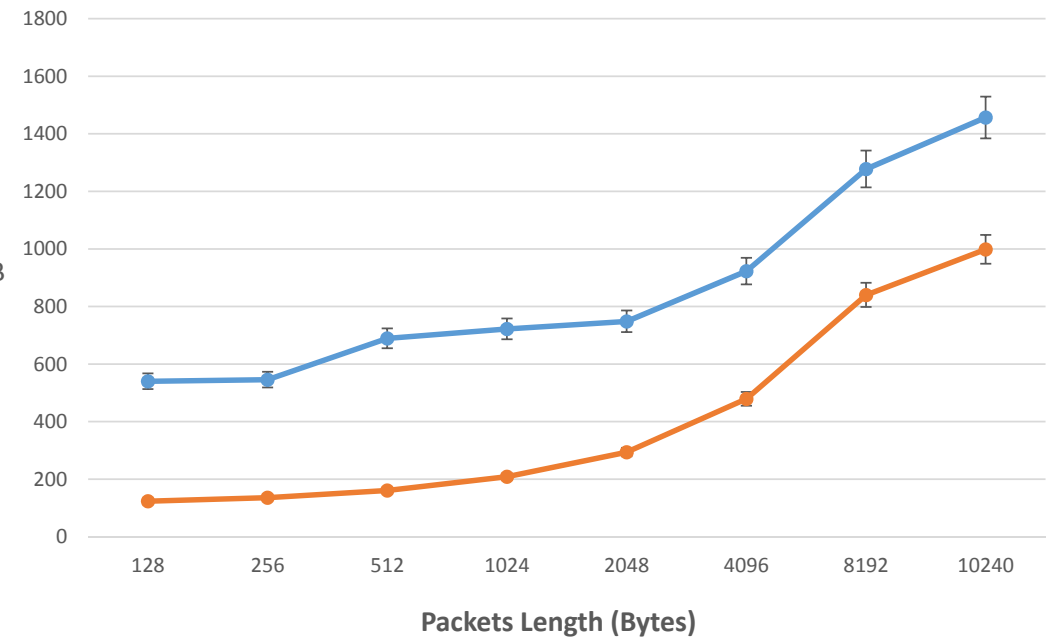


# Evaluation Results

## Local-call Delay ( $\mu$ s)



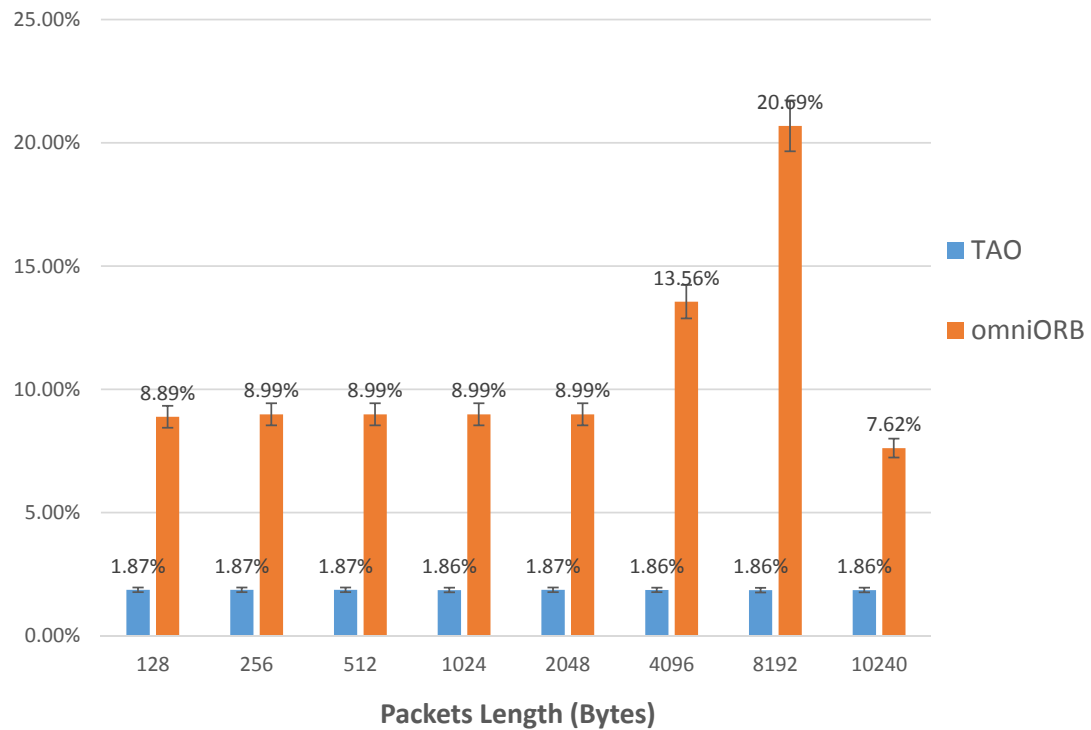
## Remote-call Delay ( $\mu$ s)



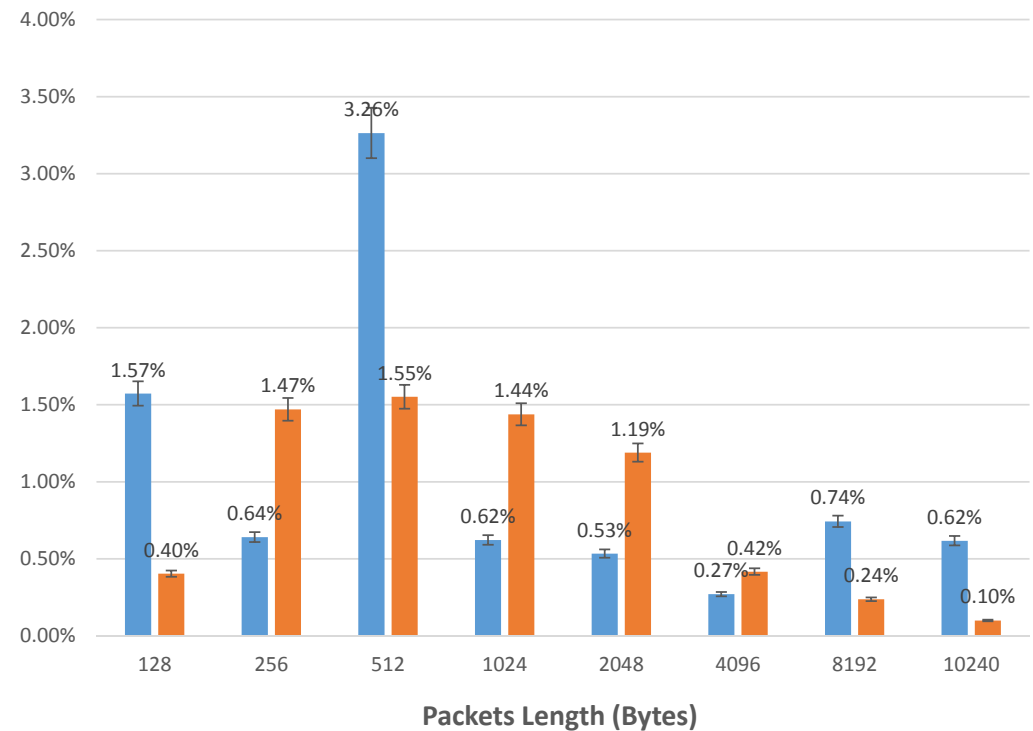
- Two components calling “pushPacket” with different packets-length.

# Evaluation Results

## Local-call Jitter



## Remote-call Jitter





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Thank you.

Any questions?