AN1385: Performance Results for Concurrent Multiprotocol RCP for OpenThread and Zigbee

This version of AN1385 has been deprecated:

- For Openthread, see https://docs.silabs.com/openthread/latest/multi-pan-rcp-performance-for-openthread-and-zigbee.
- For Zigbee, see https://docs.silabs.com/zigbee/latest/multi-pan-rcp-performance-for-openthread-and-zigbee.

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This document summarizes the results of simultaneous Thread and Zigbee throughput performance testing for the Concurrent Multiprotocol RCP, running both OpenThread and Zigbee on the host processor.

The measurements shown in this application note were taken in July of 2025 and are based on Simplicity SDK 2025.6.0.

KEY POINTS

- Test plan strategy
- Approach and dependencies
- Test methodology
- Testbed and topologies
- Summary of results
- Results comparisons

1 Introduction

This document summarizes the results of simultaneous Thread and Zigbee throughput performance testing for the Concurrent Multiprotocol Radio Co-Processor (RCP), running both OpenThread and Zigbee on the host processor. The Multiprotocol RCP architecture relies heavily on the serial transport and multiplexing capabilities provided by the Co-processor Communication daemon (CPCd), so this is one of the crucial components under test in the system.

The goal of this testing is to validate the performance of the Multiprotocol RCP solution, including CPCd. In particular, results demonstrate that throughput performance of the Multiprotocol RCP for both Zigbee and Thread is comparable to that of a single-protocol SoC device.

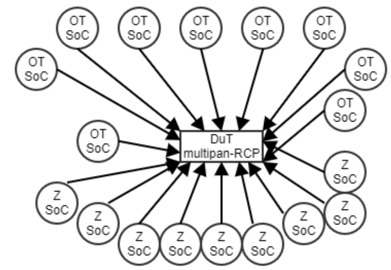
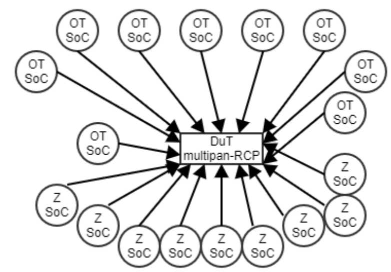
See Running Zigbee, OpenThread, and Bluetooth Concurrently on a Linux Host with a Multiprotocol RCP for a detailed description of the Multiprotocol RCP system's architecture, configuration, and usage, including CPCd.

Terms used below:

OT	OpenThread
Zig	Zigbee
DuT	Device Under Test
DMP	Dynamic Multiprotocol
RCP	Radio Co-Processor
SoC	System-on-Chip
CPCd	Co-Processor Communication daemon

2 Test Plan Strategy

This test plan is focused on the performance of the Multiprotocol RCP using mixed protocol traffic streams. The tests are run with both protocols on the same channel, and with both protocols on different channels to test Concurrent Listening.

Scenario	Devices	Notes	Illustrated Topology
9x9 single channel	9 SoC Devices OT 9 Soc Devices Zigbee	Zigbee and OpenThread networks on the same channel.	
9x9 dual channel	9 SoC Devices OT 9 Soc Devices Zigbee	Zigbee and OpenThread on different channels to test Concurrent Listening on the RCP.	
Greater sizes (y)x(z)	(y) SoC Devices OT (z) Soc Devices Zigbee		The same setup as above but with more devices.

The SOC devices send periodic unicast traffic to the DuT (Device under Test) with staggered start times. We measure the reliability and latency for various packet sizes.

3 Test Approach and Dependencies

This test effort uses open wireless devices in the Silicon Labs Boston office. The automation is written in Java™ and leverages a set of utilities for communicating with the test device via TCP. This supports simultaneous command transmission and data collection for many devices via the TCP console ports.

Networks are formed for OpenThread (OT) and Zigbee (Zig) using the wireless SoC devices around the office, plus the Multiprotocol RCP DuT. Traffic is generated from the Zig and OT SoC devices by providing the address of the DuT for each protocol.

Collection is based on console output from OT ping and the Zigbee throughput component. The output is parsed and results are written to .csv files on completion of test runs.

4 Test Methodology

OpenThread traffic is generated using the ping command, which uses Internet Control Message Protocol (ICMP) Echo Request and Echo Reply packets. The Echo Reply packets sent by the DuT have the same packet length as the received Echo Request packet.

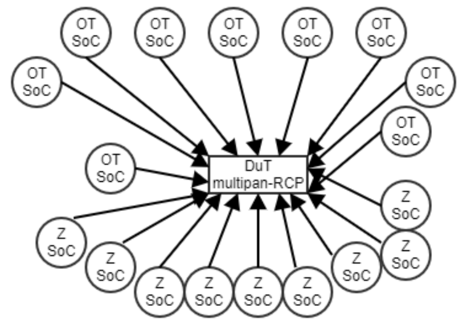
The Zigbee throughput plugin sends APS messages one-way from the SoC to the DuT. 802.15.4 acks are sent in return, but not APS acks.

The following illustrates the test setup.

Traffic flow is being directed at the DuT.

Many->One, where the One is the DuT.

Current testing assumes all devices are within 1 hop.



Additional details on the traffic created follow.

4.1 Open Thread

OT testing used ping (ICMP) with a variable IP payload of 16 bytes up to a maximum of 1232 bytes.

https://github.com/openthread/openthread/blob/main/src/cli/README.md#ping--i-source-ipaddr-size-count-interval-hoplimit-timeout

```
ping [-I source] <ipaddr> [size] [count] [interval] [hoplimit] [timeout]
```

Example:

```
> ping -I fd00:db8:0:0:76b:6a05:3ae9:a61a 8 3 1 1 1
> 16 bytes from fd00:db8:0:0:f605:fb4b:d429:d59a: icmp_seq=4 hlim=64 time=18ms
> 16 bytes from fd00:db8:0:0:f605:fb4b:d429:d59a: icmp_seq=5 hlim=64 time=20ms
> 16 bytes from fd00:db8:0:0:f605:fb4b:d429:d59a: icmp_seq=6 hlim=64 time=19ms
3 packets transmitted, 3 packets received. Packet loss = 0.0%. Round-trip min/avg/max = 18/19.0/20 ms.
Done
```

For the 8-byte payload size specified in the first argument to ping above, ICMP adds 8 bytes of header, and the total packet size including 40 bytes of 802.15.4 and IP headers comes to 56 bytes.

The maximum 802.15.4 packet is 127 bytes. Subtracting the 48 bytes of headers, the maximum IP payload for a single packet is 79 bytes. Larger payload sizes cause OT packets to be fragmented.

4.2 Zigbee

Zigbee testing uses the Zigbee throughput component.

As before, the maximum 802.15.4 packet size is 127 bytes. Subtracting 45 bytes of 802.15.4 and Zigbee headers, the maximum Zigbee payload size is 82 bytes. This component cannot send fragmented packets.

5 Testbed and Topologies

The Multiprotocol RCP DuT uses Silicon Labs' wireless starter kit (WSTK) debug adapter and a Raspberry Pi as the host.

It is important to use a sufficiently fast serial link between the RCP and the host to handle the 250 kbps over-the-air bitrate of 802.15.4 radios. For a UART interface, Silicon Labs recommends a baud rate of 921kpbs with hardware flow control enabled, which is what is used for this testing. With a slower baud rate or without flow control, data may be lost over the serial link.

The test topology used for this document is the open wireless network in the Silicon Labs Boston office. This office space is approximately 20,000 square feet with hundreds of test devices uniformly distributed.

The 18-node tests in this document use the three clusters shown below (E5, E8, E9). The red 'X' identifies the location of the DuT.The 96 node tests use clusters E2-E23, excluding cluster E4, E12, E15, E16, E19, and E21.

6 Test Results Summary

The following results are from a 9x9 topology, meaning 9 OT nodes and 9 ZigBee nodes sending traffic to the DuT. The DuT uses a UART baud rate of 921kbps with hardware flow control.

The rate column is the number of milliseconds between transmits, and the JIT column is the offset between successive senders in milliseconds. The Min/Avg/Max columns give the latency in milliseconds.

Four packet sizes are tested, S, M, L, and XL. The size of the payload is indicated in the SIZE column. S corresponds to 8 byte payloads for both protocols. M corresponds to maximal payload sizes without causing fragmentation, 78 bytes for OT and 82 bytes for ZigBee. L corresponds to a 256 byte payload for OT, resulting in fragmentation into 4 packets. XL corresponds to a 1024 byte payload for OT, resulting in fragmentation into 14 packets. For L and XL the ZigBee payload size remains at 82.

The first table shows results for the single channel case, when both the OT and ZigBee networks are on the same channel. The second table shows results for the dual channel case, when the OT and ZigBee networks are on different channels. This tests the Concurrent Listening feature of the Multiprotocol RCP.

Performance is excellent with no packet loss in all single channel tests, and no significant latency spikes. In the dual channel tests, performance is excellent for S, M, and L packet size. For the XL packet size test, where OT is using 1024 byte payloads, some packet loss and increased latency is observed on the ZigBee side. This is explained by the very high amount of traffic on the OT network, which monopolizes the radio on the OT channel resulting in missed receptions on the ZigBee side.

Table 6.1. 9 OT x 9 Zig Network, Single Channel

Size	Results										
	PROTO	CHANNEL	SIZE(bytes)	RATE(ms)	JIT(ms)	TX	RX	LOSS(%)	MIN(ms)	AVG(ms)	MAX(ms)
S	OT	26	8	3000	300	100	100	0	15	23	54
	OT	26	8	3000	300	100	100	0	15	22	72
	OT	26	8	3000	300	100	100	0	14	18	29
	OT	26	8	3000	300	100	100	0	15	18	42
	OT	26	8	3000	300	100	100	0	15	18	38
	OT	26	8	3000	300	100	100	0	15	18	30
	OT	26	8	3000	300	100	100	0	15	23	64
	OT	26	8	3000	300	100	100	0	15	29	70
	OT	26	8	3000	300	100	100	0	16	23	97
	ZIG	26	8	3000	300	100	100	0	54	57	79
	ZIG	26	8	3000	300	100	100	0	54	61	123
	ZIG	26	8	3000	300	100	100	0	54	57	101
	ZIG	26	8	3000	300	100	100	0	54	56	75
	ZIG	26	8	3000	300	100	100	0	54	56	69
	ZIG	26	8	3000	300	100	100	0	54	57	87
	ZIG	26	8	3000	300	100	100	0	54	59	128
	ZIG	26	8	3000	300	100	100	0	54	66	130
	ZIG	26	8	3000	300	100	100	0	54	63	141

Size	Results										
	PROTO	CHANNEL	SIZE(bytes)	RATE(ms)	JIT(ms)	TX	RX	LOSS(%)	MIN(ms)	AVG(ms)	MAX(ms)
M	OT	26	78	3000	300	100	100	0	30	34	57
	OT	26	78	3000	300	100	100	0	30	33	44
	OT	26	78	3000	300	100	100	0	30	32	48
	OT	26	78	3000	300	100	100	0	30	33	47
	OT	26	78	3000	300	100	100	0	30	33	49
	OT	26	78	3000	300	100	100	0	30	34	55
	OT	26	78	3000	300	100	100	0	29	33	48
	OT	26	78	3000	300	100	100	0	29	32	46
	OT	26	78	3000	300	100	100	0	30	33	55
	ZIG	26	82	3000	300	100	100	0	57	60	75
	ZIG	26	82	3000	300	100	100	0	57	71	138
	ZIG	26	82	3000	300	100	100	0	57	60	76
	ZIG	26	82	3000	300	100	100	0	57	58	70
	ZIG	26	82	3000	300	100	100	0	56	59	69
	ZIG	26	82	3000	300	100	100	0	57	58	66
	ZIG	26	82	3000	300	100	100	0	57	58	67
	ZIG	26	82	3000	300	100	100	0	57	58	70
	ZIG	26	82	3000	300	100	100	0	57	61	134
	PROTO	CHANNEL	SIZE(bytes)	RATE(ms)	JIT(ms)	TX	RX	LOSS(%)	MIN(ms)	AVG(ms)	MAX(ms)
L	OT	26	256	3000	300	100	100	0	67	79	185
	OT	26	256	3000	300	100	100	0	67	73	90
	OT	26	256	3000	300	100	100	0	67	73	105
	OT	26	256	3000	300	100	100	0	66	74	155
	OT	26	256	3000	300	100	100	0	66	73	92
	OT	26	256	3000	300	100	100	0	66	73	88
	OT	26	256	3000	300	100	100	0	67	73	90
	OT	26	256	3000	300	100	100	0	66	72	90
	OT	26	256	3000	300	100	100	0	66	72	96
	ZIG	26	82	3000	300	100	100	0	57	60	86
	ZIG	26	82	3000	300	100	100	0	57	68	130
	ZIG	26	82	3000	300	100	100	0	57	59	82
	ZIG	26	82	3000	300	100	100	0	57	59	122
	ZIG	26	82	3000	300	100	100	0	57	59	72
	ZIG	26	82	3000	300	100	100	0	57	59	73
	ZIG	26	82	3000	300	100	100	0	56	58	69
	ZIG	26	82	3000	300	100	100	0	56	59	73
	ZIG	26	82	3000	300	100	100	0	57	59	73

Size	Results										
	PROTO	CHANNEL	SIZE(bytes)	RATE(ms)	JIT(ms)	TX	RX	LOSS(%)	MIN(ms)	AVG(ms)	MAX(ms)
XL	OT	26	1024	3000	300	100	100	0	226	246	303
	OT	26	1024	3000	300	100	100	0	226	241	439
	OT	26	1024	3000	300	100	100	0	225	240	303
	OT	26	1024	3000	300	100	100	0	226	239	305
	OT	26	1024	3000	300	100	100	0	224	240	293
	OT	26	1024	3000	300	100	100	0	225	240	286
	OT	26	1024	3000	300	100	100	0	226	241	301
	OT	26	1024	3000	300	100	100	0	220	236	361
	OT	26	1024	3000	300	100	100	0	226	239	272
	ZIG	26	82	3000	300	100	100	0	57	60	84
	ZIG	26	82	3000	300	100	100	0	57	73	143
	ZIG	26	82	3000	300	100	100	0	57	60	75
	ZIG	26	82	3000	300	100	100	0	57	59	71
	ZIG	26	82	3000	300	100	100	0	57	59	123
	ZIG	26	82	3000	300	100	100	0	57	59	75
	ZIG	26	82	3000	300	100	100	0	57	58	68
	ZIG	26	82	3000	300	100	100	0	57	60	133
	ZIG	26	82	3000	300	100	100	0	57	61	82

Table 6.2. 9 OT x 9 Zig Network, Dual Channel

Size	Results										
	PROTO	CHANNEL	SIZE(bytes)	RATE(ms)	JIT(ms)	TX	RX	LOSS(%)	MIN(ms)	AVG(ms)	MAX(ms)
S	OT	26	8	3000	300	100	100	0	17	22	40
	OT	26	8	3000	300	100	100	0	18	21	38
	OT	26	8	3000	300	100	100	0	18	21	34
	OT	26	8	3000	300	100	100	0	18	21	37
	OT	26	8	3000	300	100	100	0	18	22	37
	OT	26	8	3000	300	100	100	0	18	22	65
	OT	26	8	3000	300	100	100	0	18	22	83
	OT	26	8	3000	300	100	100	0	17	21	36
	OT	26	8	3000	300	100	100	0	18	22	34
	ZIG	12	8	3000	300	100	100	0	54	56	98
	ZIG	12	8	3000	300	100	100	0	54	56	66
	ZIG	12	8	3000	300	100	100	0	54	56	66
	ZIG	12	8	3000	300	100	100	0	54	55	64
	ZIG	12	8	3000	300	100	100	0	54	56	69
	ZIG	12	8	3000	300	100	100	0	54	56	65
	ZIG	12	8	3000	300	100	100	0	54	57	157
	ZIG	12	8	3000	300	100	100	0	54	56	63
	ZIG	12	8	3000	300	100	100	0	54	56	62

Size	PROTO	CHANNEL	SIZE(bytes)	RATE(ms)	JIT(ms)	TX	RX	LOSS(%)	MIN(ms)	AVG(ms)	MAX(ms)
M	OT	26	78	3000	300	100	100	0	30	35	66
	OT	26	78	3000	300	100	100	0	29	34	46
	OT	26	78	3000	300	100	100	0	30	34	57
	OT	26	78	3000	300	100	100	0	30	33	48
	OT	26	78	3000	300	100	100	0	30	33	52
	OT	26	78	3000	300	100	100	0	30	33	48
	OT	26	78	3000	300	100	100	0	30	34	51
	OT	26	78	3000	300	100	100	0	30	33	51
	OT	26	78	3000	300	100	100	0	30	34	47
	ZIG	12	82	3000	300	100	100	0	56	58	78
	ZIG	12	82	3000	300	100	100	0	57	58	65
	ZIG	12	82	3000	300	100	100	0	57	58	68
	ZIG	12	82	3000	300	100	100	0	57	58	65
	ZIG	12	82	3000	300	100	100	0	57	58	65
	ZIG	12	82	3000	300	100	100	0	57	58	80
	ZIG	12	82	3000	300	100	100	0	57	58	68
	ZIG	12	82	3000	300	100	100	0	57	58	66
	ZIG	12	82	3000	300	100	100	0	57	58	71
L	OT	26	256	3000	300	100	100	0	69	81	122
	OT	26	256	3000	300	100	100	0	67	76	97
	OT	26	256	3000	300	100	100	0	68	76	135
	OT	26	256	3000	300	100	100	0	68	75	112
	OT	26	256	3000	300	100	100	0	68	76	106
	OT	26	256	3000	300	100	100	0	67	74	103
	OT	26	256	3000	300	100	100	0	68	75	91
	OT	26	256	3000	300	100	100	0	67	74	97
	OT	26	256	3000	300	100	100	0	67	74	95
	ZIG	12	82	3000	300	100	100	0	57	59	129
	ZIG	12	82	3000	300	100	100	0	57	58	66
	ZIG	12	82	3000	300	100	100	0	56	58	66
	ZIG	12	82	3000	300	100	100	0	57	58	60
	ZIG	12	82	3000	300	100	100	0	58	113	137
	ZIG	12	82	3000	300	100	100	0	57	107	136
	ZIG	12	82	3000	300	100	100	0	57	108	181
	ZIG	12	82	3000	300	100	100	0	57	109	138
	ZIG	12	82	3000	300	100	100	0	57	109	138
XL	OT	26	1024	3000	300	100	100	0	236	260	376
	OT	26	1024	3000	300	100	100	0	227	259	367
	OT	26	1024	3000	300	100	100	0	227	250	314
	OT	26	1024	3000	300	100	100	0	226	249	304
	OT	26	1024	3000	300	100	100	0	231	254	402
	OT	26	1024	3000	300	100	100	0	228	246	360
	OT	26	1024	3000	300	100	100	0	228	248	294
	OT	26	1024	3000	300	100	100	0	223	245	381
	OT	26	1024	3000	300	100	100	0	229	247	380
	ZIG	12	82	3000	300	100	100	0	57	59	109
	ZIG	12	82	3000	300	100	100	0	57	59	77
	ZIG	12	82	3000	300	100	100	0	56	59	72
	ZIG	12	82	3000	300	100	100	0	57	59	141
	ZIG	12	82	3000	300	100	90	10	56	70	260
	ZIG	12	82	3000	300	100	99	1	57	86	270
	ZIG	12	82	3000	300	100	97	3	57	77	255
	ZIG	12	82	3000	300	100	93	7	57	81	259
	ZIG	12	82	3000	300	100	96	4	57	90	260

The following results are from a large network topology of 48 OT devices and 48 Zig devices. All devices send 8 byte payloads to the DuT at a rate of one every five seconds. Performance is excellent for both single and dual channel tests. Reliability is almost perfect and there are only a few latency spikes, which are expected under the traffic stress of 96 devices sending and receiving from 1 device.

Table 6.3. 48 OT x 48 Zig Network, Single Channel

SRC	PROTO	CHANNEL	SIZE(bytes)	RATE(ms)	JIT(ms)	TX	RX	LOSS(%)	MIN(ms)	AVG(ms)	MAX(ms)
10.4.186.12	OT	26	8	5000	100	100	100	0	18	27	118
10.4.186.13	OT	26	8	5000	100	100	100	0	18	36	93
10.4.186.14	OT	26	8	5000	100	100	100	0	18	40	172
10.4.186.18	OT	26	8	5000	100	100	100	0	17	29	100
10.4.186.19	OT	26	8	5000	100	100	100	0	17	27	65
10.4.186.20	OT	26	8	5000	100	100	100	0	17	22	47
10.4.186.30	OT	26	8	5000	100	100	100	0	17	22	37
10.4.186.31	OT	26	8	5000	100	100	100	0	17	22	40
10.4.186.32	OT	26	8	5000	100	100	100	0	17	23	40
10.4.186.36	OT	26	8	5000	100	100	100	0	17	21	36
10.4.186.37	OT	26	8	5000	100	100	100	0	17	23	51
10.4.186.38	OT	26	8	5000	100	100	100	0	17	21	44
10.4.186.42	OT	26	8	5000	100	100	100	0	17	20	37
10.4.186.43	OT	26	8	5000	100	100	100	0	17	21	41
10.4.186.44	OT	26	8	5000	100	100	100	0	39	46	67
10.4.186.48	OT	26	8	5000	100	100	100	0	17	22	63
10.4.186.49	OT	26	8	5000	100	100	100	0	40	46	82
10.4.186.50	OT	26	8	5000	100	100	100	0	40	46	68
10.4.186.54	OT	26	8	5000	100	100	100	0	17	21	37
10.4.186.55	OT	26	8	5000	100	100	100	0	16	21	34
10.4.186.56	OT	26	8	5000	100	100	100	0	40	47	77
10.4.186.60	OT	26	8	5000	100	100	100	0	40	49	99
10.4.186.61	OT	26	8	5000	100	100	100	0	40	48	115
10.4.186.62	OT	26	8	5000	100	100	100	0	41	50	79
10.4.186.66	OT	26	8	5000	100	100	100	0	40	50	71
10.4.186.67	OT	26	8	5000	100	100	100	0	41	49	89
10.4.186.68	OT	26	8	5000	100	100	100	0	40	48	116
10.4.186.78	OT	26	8	5000	100	100	100	0	40	50	90
10.4.186.79	OT	26	8	5000	100	100	100	0	40	52	76
10.4.186.80	OT	26	8	5000	100	100	100	0	41	48	74
10.4.186.84	OT	26	8	5000	100	100	100	0	40	48	76
10.4.186.85	OT	26	8	5000	100	100	100	0	39	46	70
10.4.186.86	OT	26	8	5000	100	100	100	0	39	47	83
10.4.186.102	OT	26	8	5000	100	100	100	0	40	60	128
10.4.186.103	OT	26	8	5000	100	100	100	0	40	50	77
10.4.186.104	OT	26	8	5000	100	100	100	0	41	51	78
10.4.186.108	OT	26	8	5000	100	100	100	0	41	51	98
10.4.186.109	OT	26	8	5000	100	100	100	0	40	55	92
10.4.186.110	OT	26	8	5000	100	100	100	0	39	50	98
10.4.186.114	OT	26	8	5000	100	100	100	0	40	48	135
10.4.186.115	OT	26	8	5000	100	100	100	0	41	47	96
10.4.186.116	OT	26	8	5000	100	100	100	0	39	48	78
10.4.186.132	OT	26	8	5000	100	100	100	0	40	55	154
10.4.186.133	OT	26	8	5000	100	100	100	0	40	65	212
10.4.186.134	OT	26	8	5000	100	100	100	0	41	57	407
10.4.186.138	OT	26	8	5000	100	100	100	0	41	50	332
10.4.186.139	OT	26	8	5000	100	100	100	0	40	49	262
10.4.186.140	OT	26	8	5000	100	100	99	1	41	65	166

SRC	PROTO	CHANNEL	SIZE(bytes)	RATE(ms)	JIT(ms)	TX	RX	LOSS(%)	MIN(ms)	AVG(ms)	MAX(ms)
10.4.186.15	ZIG	26	8	5000	100	100	100	0	54	56	77
10.4.186.16	ZIG	26	8	5000	100	100	100	0	54	58	116
10.4.186.17	ZIG	26	8	5000	100	100	100	0	54	67	220
10.4.186.21	ZIG	26	8	5000	100	100	100	0	53	57	75
10.4.186.22	ZIG	26	8	5000	100	100	100	0	54	58	95
10.4.186.23	ZIG	26	8	5000	100	100	100	0	53	58	126
10.4.186.33	ZIG	26	8	5000	100	100	100	0	54	64	638
10.4.186.34	ZIG	26	8	5000	100	100	100	0	53	58	126
10.4.186.35	ZIG	26	8	5000	100	100	100	0	54	59	125
10.4.186.39	ZIG	26	8	5000	100	100	100	0	54	61	531
10.4.186.40	ZIG	26	8	5000	100	100	100	0	54	58	114
10.4.186.41	ZIG	26	8	5000	100	100	100	0	54	56	76
10.4.186.45	ZIG	26	8	5000	100	100	100	0	54	57	85
10.4.186.46	ZIG	26	8	5000	100	100	100	0	54	57	126
10.4.186.47	ZIG	26	8	5000	100	100	100	0	53	56	67
10.4.186.51	ZIG	26	8	5000	100	100	100	0	54	57	76
10.4.186.52	ZIG	26	8	5000	100	100	100	0	54	57	71
10.4.186.53	ZIG	26	8	5000	100	100	100	0	54	57	70
10.4.186.57	ZIG	26	8	5000	100	100	100	0	54	57	84
10.4.186.58	ZIG	26	8	5000	100	100	100	0	54	57	75
10.4.186.59	ZIG	26	8	5000	100	100	100	0	54	57	74
10.4.186.63	ZIG	26	8	5000	100	100	100	0	54	57	82
10.4.186.64	ZIG	26	8	5000	100	100	100	0	54	59	135
10.4.186.65	ZIG	26	8	5000	100	100	100	0	54	57	113
10.4.186.69	ZIG	26	8	5000	100	100	100	0	54	62	386
10.4.186.70	ZIG	26	8	5000	100	100	100	0	54	57	78
10.4.186.71	ZIG	26	8	5000	100	100	100	0	54	59	121
10.4.186.81	ZIG	26	8	5000	100	100	100	0	54	58	95
10.4.186.82	ZIG	26	8	5000	100	100	100	0	54	69	155
10.4.186.83	ZIG	26	8	5000	100	100	100	0	54	56	65
10.4.186.87	ZIG	26	8	5000	100	100	100	0	54	56	79
10.4.186.88	ZIG	26	8	5000	100	100	100	0	54	56	89
10.4.186.89	ZIG	26	8	5000	100	100	100	0	54	57	73
10.4.186.105	ZIG	26	8	5000	100	100	100	0	54	57	82
10.4.186.106	ZIG	26	8	5000	100	100	100	0	54	56	64
10.4.186.107	ZIG	26	8	5000	100	100	100	0	54	56	65
10.4.186.111	ZIG	26	8	5000	100	100	100	0	53	56	68
10.4.186.112	ZIG	26	8	5000	100	100	100	0	54	57	84
10.4.186.113	ZIG	26	8	5000	100	100	100	0	54	56	69
10.4.186.117	ZIG	26	8	5000	100	100	100	0	54	56	60
10.4.186.118	ZIG	26	8	5000	100	100	100	0	54	56	67
10.4.186.119	ZIG	26	8	5000	100	100	100	0	54	56	76
10.4.186.135	ZIG	26	8	5000	100	100	100	0	54	56	74
10.4.186.136	ZIG	26	8	5000	100	100	100	0	54	56	64
10.4.186.137	ZIG	26	8	5000	100	100	100	0	54	63	768
10.4.186.141	ZIG	26	8	5000	100	100	100	0	54	56	75
10.4.186.142	ZIG	26	8	5000	100	100	100	0	54	61	256
10.4.186.143	ZIG	26	8	5000	100	100	100	0	54	60	186

Table 6.4. 48 OT x 48 Zig Network, Dual Channel

SRC	PROTO	CHANNEL	SIZE(bytes)	RATE(ms)	JIT(ms)	TX	RX	LOSS(%)	MIN(ms)	AVG(ms)	MAX(ms)
10.4.186.12	OT	26	8	5000	100	100	100	0	18	22	49
10.4.186.13	OT	26	8	5000	100	100	100	0	18	32	79
10.4.186.14	OT	26	8	5000	100	100	100	0	19	28	76
10.4.186.18	OT	26	8	5000	100	100	100	0	18	27	60
10.4.186.19	OT	26	8	5000	100	100	100	0	17	24	46
10.4.186.20	OT	26	8	5000	100	100	100	0	17	21	38
10.4.186.30	OT	26	8	5000	100	100	100	0	17	23	44
10.4.186.31	OT	26	8	5000	100	100	100	0	18	22	37
10.4.186.32	OT	26	8	5000	100	100	100	0	18	24	140
10.4.186.36	OT	26	8	5000	100	100	100	0	18	21	50
10.4.186.37	OT	26	8	5000	100	100	100	0	18	23	35
10.4.186.38	OT	26	8	5000	100	100	100	0	17	23	45
10.4.186.42	OT	26	8	5000	100	100	100	0	18	23	37
10.4.186.43	OT	26	8	5000	100	100	100	0	17	21	40
10.4.186.44	OT	26	8	5000	100	100	100	0	17	21	44
10.4.186.48	OT	26	8	5000	100	100	100	0	17	21	45
10.4.186.49	OT	26	8	5000	100	100	100	0	40	47	63
10.4.186.50	OT	26	8	5000	100	100	100	0	41	45	65
10.4.186.54	OT	26	8	5000	100	100	100	0	17	20	28
10.4.186.55	OT	26	8	5000	100	100	100	0	17	23	40
10.4.186.56	OT	26	8	5000	100	100	100	0	39	45	65
10.4.186.60	OT	26	8	5000	100	100	100	0	40	47	135
10.4.186.61	OT	26	8	5000	100	100	100	0	40	45	58
10.4.186.62	OT	26	8	5000	100	100	100	0	40	47	85
10.4.186.66	OT	26	8	5000	100	100	100	0	39	47	67
10.4.186.67	OT	26	8	5000	100	100	100	0	40	48	134
10.4.186.68	OT	26	8	5000	100	100	100	0	42	46	58
10.4.186.78	OT	26	8	5000	100	100	100	0	40	46	61
10.4.186.79	OT	26	8	5000	100	100	100	0	41	46	70
10.4.186.80	OT	26	8	5000	100	100	100	0	40	46	68
10.4.186.84	OT	26	8	5000	100	100	100	0	40	46	71
10.4.186.85	OT	26	8	5000	100	100	100	0	40	47	63
10.4.186.86	OT	26	8	5000	100	100	100	0	40	52	89
10.4.186.102	OT	26	8	5000	100	100	100	0	42	59	171
10.4.186.103	OT	26	8	5000	100	100	100	0	40	52	76
10.4.186.104	OT	26	8	5000	100	100	100	0	41	61	123
10.4.186.108	OT	26	8	5000	100	100	100	0	41	52	120
10.4.186.109	OT	26	8	5000	100	100	100	0	42	59	124
10.4.186.110	OT	26	8	5000	100	100	100	0	41	49	96
10.4.186.114	OT	26	8	5000	100	100	100	0	40	46	92
10.4.186.115	OT	26	8	5000	100	100	100	0	40	47	66
10.4.186.116	OT	26	8	5000	100	100	100	0	40	47	67
10.4.186.132	OT	26	8	5000	100	100	100	0	40	49	81
10.4.186.133	OT	26	8	5000	100	100	100	0	41	51	89
10.4.186.134	OT	26	8	5000	100	100	100	0	40	47	76
10.4.186.138	OT	26	8	5000	100	100	100	0	40	48	89
10.4.186.139	OT	26	8	5000	100	100	100	0	40	49	97
10.4.186.140	OT	26	8	5000	100	100	100	0	40	51	82

SRC	PROTO	CHANNEL	SIZE(bytes)	RATE(ms)	JIT(ms)	TX	RX	LOSS(%)	MIN(ms)	AVG(ms)	MAX(ms)
10.4.186.15	ZIG	12	8	5000	100	100	100	0	54	64	139
10.4.186.16	ZIG	12	8	5000	100	100	100	0	54	57	105
10.4.186.17	ZIG	12	8	5000	100	100	100	0	55	58	173
10.4.186.21	ZIG	12	8	5000	100	100	100	0	54	55	59
10.4.186.22	ZIG	12	8	5000	100	100	100	0	54	56	61
10.4.186.23	ZIG	12	8	5000	100	100	100	0	54	57	238
10.4.186.33	ZIG	12	8	5000	100	100	100	0	54	55	60
10.4.186.34	ZIG	12	8	5000	100	100	100	0	54	56	113
10.4.186.35	ZIG	12	8	5000	100	100	100	0	54	56	62
10.4.186.39	ZIG	12	8	5000	100	100	100	0	54	55	60
10.4.186.40	ZIG	12	8	5000	100	100	100	0	54	55	60
10.4.186.41	ZIG	12	8	5000	100	100	100	0	53	55	61
10.4.186.45	ZIG	12	8	5000	100	100	100	0	54	55	61
10.4.186.46	ZIG	12	8	5000	100	100	100	0	54	55	60
10.4.186.47	ZIG	12	8	5000	100	100	100	0	54	55	64
10.4.186.51	ZIG	12	8	5000	100	100	100	0	54	56	65
10.4.186.52	ZIG	12	8	5000	100	100	100	0	54	55	61
10.4.186.53	ZIG	12	8	5000	100	100	100	0	54	55	62
10.4.186.57	ZIG	12	8	5000	100	100	100	0	54	55	59
10.4.186.58	ZIG	12	8	5000	100	100	100	0	54	57	74
10.4.186.59	ZIG	12	8	5000	100	100	100	0	54	56	67
10.4.186.63	ZIG	12	8	5000	100	100	100	0	54	57	64
10.4.186.64	ZIG	12	8	5000	100	100	100	0	54	56	70
10.4.186.65	ZIG	12	8	5000	100	100	100	0	54	66	304
10.4.186.69	ZIG	12	8	5000	100	100	100	0	54	55	61
10.4.186.70	ZIG	12	8	5000	100	100	100	0	54	55	60
10.4.186.71	ZIG	12	8	5000	100	100	100	0	54	56	61
10.4.186.81	ZIG	12	8	5000	100	100	100	0	54	56	64
10.4.186.82	ZIG	12	8	5000	100	100	100	0	54	59	116
10.4.186.83	ZIG	12	8	5000	100	100	100	0	55	57	64
10.4.186.87	ZIG	12	8	5000	100	100	100	0	54	62	93
10.4.186.88	ZIG	12	8	5000	100	100	100	0	54	59	98
10.4.186.89	ZIG	12	8	5000	100	100	100	0	55	59	71
10.4.186.105	ZIG	12	8	5000	100	100	100	0	55	58	73
10.4.186.106	ZIG	12	8	5000	100	100	100	0	55	60	74
10.4.186.107	ZIG	12	8	5000	100	100	100	0	55	56	60
10.4.186.111	ZIG	12	8	5000	100	100	100	0	55	56	60
10.4.186.112	ZIG	12	8	5000	100	100	100	0	54	56	59
10.4.186.113	ZIG	12	8	5000	100	100	100	0	54	55	57
10.4.186.117	ZIG	12	8	5000	100	100	100	0	55	56	58
10.4.186.118	ZIG	12	8	5000	100	100	100	0	55	56	60
10.4.186.119	ZIG	12	8	5000	100	100	100	0	54	56	59
10.4.186.135	ZIG	12	8	5000	100	100	100	0	56	72	113
10.4.186.136	ZIG	12	8	5000	100	100	100	0	55	56	64
10.4.186.137	ZIG	12	8	5000	100	100	100	0	55	60	69
10.4.186.141	ZIG	12	8	5000	100	100	100	0	54	57	71
10.4.186.142	ZIG	12	8	5000	100	100	100	0	55	60	66
10.4.186.143	ZIG	12	8	5000	100	100	100	0	54	62	96

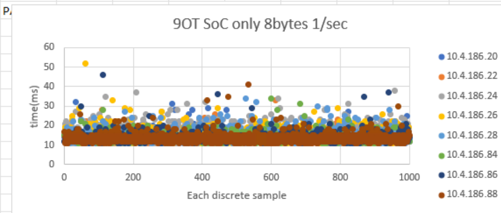
7 Additional Test Results Comparisons

These results were collected in the initial version of this document in June 2022 for comparison of OT performance against other architectures.

Brd4161a	8 bytes

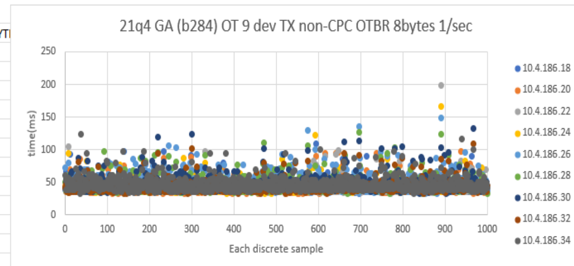
SOC

PROTO	SIZE(byte:	RATE(ms)	JIT(ms)	TX	RX	LOSS(%)	MIN(ms)	AVG(ms)	MAX(ms)	P/
OT	8	1000	50	1000	1000	0	11	13.7	32	
OT	8	1000	50	1000	1000	0	11	13.523	33	
OT	8	1000	50	1000	1000	0	11	15.576	38	
OT	8	1000	50	1000	1000	0	11	14.64	52	
OT	8	1000	50	1000	1000	0	11	14.558	34	
OT	8	1000	50	1000	1000	0	11	13.678	34	
OT	8	1000	50	1000	1000	0	11	13.923	46	
OT	8	1000	50	1000	1000	0	11	13.605	41	



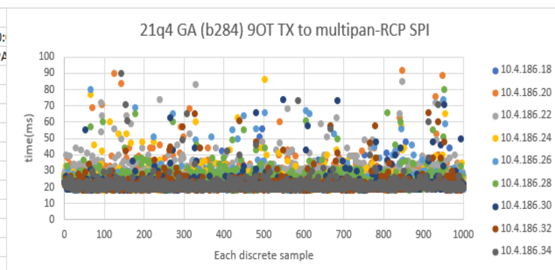
NON-CPC-OTBR (UART)

1:0:0:1:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1:0:0	
PROTO	SIZE(byte:	RATE(ms)	TX	RX	LOSS	MIN(ms)	AVG(ms)	MAX(ms)	PAYTI
OT	8	1000	1000	1000	0	33	40.649	109	
OT	8	1000	1000	1000	0	33	41.9	98	
OT	8	1000	1000	1000	0	32	40.925	199	
OT	8	1000	1000	1000	0	33	41.875	166	
OT	8	1000	1000	1000	0	33	48.101	148	
OT	8	1000	1000	1000	0	33	44.479	126	
OT	8	1000	1000	1000	0	33	46.792	133	
OT	8	1000	1000	1000	0	33	42.998	109	
OT	8	1000	1000	1000	0	32	46.834	124	
B:P									
10.4.186.1	10.4.186.2	10.4.186.2	10.4.186.2	10.4.186.2	10.4.186.2	10.4.186.3	10.4.186.3	10.4.186.34	
1:0:0:1:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1:0:0	



CPC-SPI

10.4.186.1	10.4.186.2	10.4.186.2	10.4.186.2	10.4.186.2	10.4.186.2	10.4.186.3	10.4.186.3	10.4.186.34	
1:0:0:1:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1:0:	
PROTO	SIZE(byte:	RATE(ms)	TX	RX	LOSS	MIN(ms)	AVG(ms)	MAX(ms)	PA
OT	8	1000	1000	1000	0	18	22.416	56	
OT	8	1000	1000	1000	0	18	24.742	92	
OT	8	1000	1000	1000	0	18	26.298	85	
OT	8	1000	1000	1000	0	18	22.935	86	
OT	8	1000	1000	1000	0	18	22.995	80	
OT	8	1000	1000	1000	0	18	23.652	80	
OT	8	1000	1000	1000	0	18	21.816	74	
OT	8	1000	1000	1000	0	18	21.656	66	
OT	8	1000	1000	1000	0	18	21.589	90	
B:P									
10.4.186.1	10.4.186.2	10.4.186.2	10.4.186.2	10.4.186.2	10.4.186.2	10.4.186.3	10.4.186.3	10.4.186.34	
1:0:0:1:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1	1:1:1:0:1:1:0:0	



8 Document Revision History

Revision 0.1

June 2022

Initial public release

Revision 0.2

July 2025

Tests rerun using Simplicity SDK 2025.6.0.

Revision 0.3

September 2025

PDF deprecated in favor of the DSC version. See the first page for navigation information.

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