	KEM	SA	Handsha	akes [1/s]	Cost	[ms]	Pacl	kets	Server Library Distribution	Client Library Distribution
	TCIVI		Blackbox	Whitebox	Server	Client	Server	Client	<u> </u>	·
$Level \leq 2$	X25519	dilithium2	401	414	2.1	1.9	5	1	58.98 25.13 7.84.9 55.55 27.57 9.03.7	48.86 32.10 8.7(1.04) 49.15 32.44 9.06.5
	X25519 X25519	dilithium2_aes falcon512	390 340	375 345	2.1 2.7	1.8 2.1	5 2	1	68.06 19.23 6.3.4	52.32 31.54 8.25.1
	X25519	p256_dilithium2	355	386	2.3	2.7	5	1	58.04 24.53 8.2 5.7	58.53 26.19 6.76.2
	X25519	p256_falcon512	287	300	2.9	2.7	2	1	68.80 17.806.75.2 96.86	63.77 22.85 6.5.8 77.91 13.37
	X25519 X25519	p256_sphincs128 rsa:1024	51 435	51 501	29.4 2.1	6.2 1.6	26 1	1	57.85 24.99 8.65.3	45.65 34.75 9.50 .72
	X25519	rsa:2048	315	339	3.8	2.0	1	1	77.86 13.10.7	43.61 34.78 9.147.7
	X25519	rsa:3072	193	203	7.9	2.1	2	1	88.46 7.3 { 94.86	47.61 35.37 8.6 6. 0 47.70 34.66 7.6 5. 8
	X25519 X25519	rsa:4096 sphincs128	115 53	120 53	15.4 29.6	2.5 5.5	2 26	1	95.85	74.53
	bikel1	dilithium2	212	221	2.2	6.5	6	2	49.23 29.13 13.456.0	74.87 11.48.76
	bikel1	dilithium2_aes	212	229	2.1	6.4	6	2	46.64 28.55 13.915.7	75.66 10.5 0.14
	bikel1 bikel1	falcon512 p256 dilithium2	202 199	202 210	2.8 2.3	6.6 7.1	4 7	2 2	62.62 19.70 10.2 5 .8 51.22 28.32 11.4 6 .1	72.82 13.81 <mark>9.70</mark> 68.29 19.45 8.0 7
	bikel1	p256_falcon512	188	188	2.9	7.3	4	2	60.44 23.19 9.145.2	69.03 17.60 <mark>8.92</mark>
	bikel1	p256_sphincs128	48	48	29.8	10.7	27	2	95.28	45.91 41.79 9.46
	bikel1 bikel1	rsa:1024 rsa:2048	229 168	229 195	2.1 3.9	6.3 6.4	2 2	2	49.66 28.72 13.04 5.1 80.95 9.4 2 .3	78.09 9.4\$.42 74.96 11.9\$.12
	bikel1	rsa:3072	126	141	8.0	6.6	3	2	84.34 8.5 9	73.77 12.97 <mark>9.87</mark>
	bikel1	rsa:4096	66	94	15.7	6.8	3	2	79.64 11.64.4	75.28 19.39
	bikel1 hqc128	sphincs128 dilithium2	51 389	51 429	28.9 2.2	10.0 2.4	27 9	2 2	96.87 49.44 24.76 17.20 6.5	49.06 38.82 10.31 32.30 30.47 27.60 7.91
	hqc128	dilithium2 aes	398	434	2.2	2.4	9	2	45.14 27.11 18.057.2	31.62 31.52 27.71 7.01
	hqc128	falcon512	358	371	2.8	2.5	6	2	59.42 18.91 14.045.4	35.59 28.99 27.33 6.5
	hqc128 hqc128	p256_dilithium2 p256_falcon512	336 303	378 321	2.4 3.0	3.0 3.2	9 6	2 2	49.25 24.06 16.10 6.1 60.55 18.47 13.09 6.2	46.37 24.05 20.86 7.24 48.30 22.31 20.93 6.2
	hqc128	p256_sphincs128	503 51	50	3.0 29.5	3.2 6.5	30	2	96.15	70.45 13.82 9.40
	hqc128	rsa:1024	435	536	2.1	2.0	5	2	47.60 25.16 18.81 6.1	34.00 27.77 27.23 \$.08
	hqc128 hqc128	rsa:2048 rsa:3072	323 200	368 183	3.8 8.2	2.2 2.4	5 6	1 2	71.65 13.659.72 83.19 7.46.5	31.51 30.08 28.59 7.24 34.65 28.35 27.15 6.54
	hqc128	rsa:4096	200 116	119	o.∠ 15.8	2.4	6	2	92.91	33.56 28.79 25.88 6.2
	hqc128	sphincs128	53	53	29.6	5.7	30	2	95.43	67.93 16.09 [†] 2.34
	kyber512	dilithium2	460 470	463 480	1.9 1.8	1.8 1.7	6 6	1	51.06 26.82 11.56.7() 50.84 27.57 12.16.6	39.87 34.72 14.238.76 38.16 37.39 14.147.64
	kyber512 kyber512	dilithium2_aes falcon512	470 353	489 362	2.6	1.7	3	1	63.36 20.24 8.86 .7	43.09 34.13 13.56.1
	kyber512	p256_dilithium2	383	393	2.1	2.5	6	1	53.02 26.95 11.06.91	55.28 24.91 8.87.4
	kyber512 kyber512	p256_falcon512 p256_sphincs128	300 50	311 50	2.8 29.7	2.6 6.0	3 27	1 1	63.05 20.11 8.05.5 94.71	57.41 23.19 9.26.9 75.73 12.41
	kyber512	rsa:1024	447	455	1.9	1.6	2	1	51.05 26.64 12.05.4	38.12 33.77 16.27 8.8 \$
	kyber512	rsa:2048	303	304	3.6	1.7	2	1	75.25 14.435.8	37.42 37.07 14.60 8.52
	kyber512 kyber512	rsa:3072 rsa:4096	187 112	190 113	7.8 15.4	2.0 2.3	2 2	1	87.88 7.34 94.44	37.84 34.32 14.717.76 43.90 30.43 14.566.1
	kyber512	sphincs128	52	52	29.6	5.1	27	1	95.30	75.70 16.27
	kyber90s512	dilithium2	466	477	1.9	1.7	6	1	54.09 26.55 9.8 6 .94 52.45 27.52 10.2 6 .64	41.73 36.04 11.6 \$.17 39.59 36.92 12.9 \$.17
	kyber90s512 kyber90s512	dilithium2_aes falcon512	478 361	489 370	1.8 2.6	1.7 1.8	6 3	1	63.86 19.84 7.65.(45.35 33.48 11.47.24
	kyber90s512	p256_dilithium2	392	392	2.1	2.4	6	1	53.07 27.57 9.78.9	56.37 25.92 \$.17.64
	kyber90s512	p256_falcon512	286	314	2.7	2.5	3 27	1	63.90 20.35 7.8 5.8 95.49	59.86 23.93 7.96.4 78.74 14.78
	kyber90s512 kyber90s512	p256_sphincs128 rsa:1024	50 451	50 471	29.5 1.9	5.8 1.5	27	1	52.68 28.28 9.986.4	38.65 36.62 12.9 9 .25
	kyber90s512	rsa:2048	307	311	3.6	1.7	2	1	77.29 <mark>13.6本.</mark> 4	37.88 36.98 12.9 3 .4 3
	kyber90s512 kyber90s512	rsa:3072 rsa:4096	188 114	193 114	7.7 15.3	1.9 2.2	2 2	1	88.41 6.5 (8	46.56 31.23 9.6 6 .1() 47.26 32.62 8.7 7 .0()
	kyber90s512 kyber90s512	sphincs128	52	52	29.6	2.2 5.3	2 27	1	95.50	72.58
	p256	dilithium2	396	419	2.3	2.1	5	1	57.35 24.25 7.76.84	50.01 31.32 8.48.16
	p256 p256	dilithium2_aes falcon512	406 312	435 328	2.2 2.9	2.0 2.2	5 2	1	57.84 23.73 7.8 7.3 4 66.92 17.98 6.6 .0	49.14 31.62 8.98.11 53.75 28.59 8.17.61
	p256	p256_dilithium2	355	347	2.5	2.8	5	1	59.32 23.78 7.77.2	58.83 23.38 7.66.5
	p256	p256_falcon512	273	289	3.1	2.9	3	1	65.71 19.826.66.1	58.59 25.35 7.35 .8
	p256 p256	p256_sphincs128 rsa:1024	51 404	51 409	29.6 2.3	6.2 1.8	26 1	1 1	96.74 59.17 23.55 7.76.4	76.64 12.88 1 46.85 31.51 9.879.18
	p256	rsa:2048	301	325	3.9	2.1	1	1	77.46 12.98 .	45.95 34.13 8.8 3.5 3.5
	p256	rsa:3072	186	201	8.0	2.3	2	1	90.10 5.7 94.99	47.55 32.61 \$.17.94 51.72 31.36 7.97.14
	p256 p256	rsa:4096 sphincs128	113 53	118 53	15.6 29.8	2.6 5.5	2 26	1	95.50	77.38 15.04
	p256_bikel1	dilithium2	189	211	2.6	6.9	7	1	54.58 24.62 11.46.8	70.24 15.629.17
	p256_bikel1	dilithium2_aes	189 172	213	2.5	6.8	7	2	52.79 26.21 11.66.8 1 61.58 20.95 8.68.1 1	71.35 15.12 9.23 69.03 16.71 1 0.0
	p256_bikel1 p256 bikel1	falcon512 p256 dilithium2	172 179	188 196	3.2 2.8	7.0 7.5	4 7	2 2	56.88 23.34 11.36 .9(64.25 23.96 7.3 9
	p256_bikel1	p256_falcon512	144	175	3.4	7.6	4	2	61.82 19.12 8.86.3	62.64 23.50 8.6 8
	p256_bikel1	p256_sphincs128 rsa:1024	48 174	47 213	29.7 2.6	11.0 6.7	27	2 2	96.16 55.22 22.83 11.1 5 .4	50.08 38.00 9.25 71.92 14.178.97
	p256_bikel1 p256_bikel1	rsa:1024 rsa:2048	174 181	213 181	4.3	6.7 6.9	2 2	1	72.41 15.68 6.6	71.36 13.87 <mark>9.88</mark>
	p256_bikel1	rsa:3072	119	133	8.4	7.0	3	2	86.19 7.5	66.58 18.42 <mark>10.4</mark>
	p256_bikel1	rsa:4096	63 50	65 50	16.2	7.2 10.4	3	2	90.58 5.8 95.94	53.48 28.10 13.65 45.38 42.57 7.34
	p256_bikel1 p256_hqc128	sphincs128 dilithium2	50 331	50 362	29.7 2.7	10.4 2.8	27 9	2 1	53.08 20.58 15.17 .84	39.56 24.95 23.76 9.34
	p256_hqc128	dilithium2_aes	363	307	2.7	2.7	9	1	51.89 23.41 15.377.1	38.46 26.03 24.63 8.2 1
	p256_hqc128	falcon512	316 205	331	3.3	3.0	6	2	62.03 16.96 2.18 0 54.94 21.40 14.55 11	41.73 24.33 23.99 7.04 51.92 20.07 18.63 7.94
	p256_hqc128 p256_hqc128	p256_dilithium2 p256_falcon512	295 289	321 285	2.8 3.4	3.4 3.6	9 6	2 2	62.34 18.05 1.66.5	48.97 21.66 20.05 7 .1
	p256_hqc128	p256_sphincs128	50	50	29.9	6.8	30	2	95.84	71.16 <mark>14.08</mark> 9.94
	p256_hqc128	rsa:1024 rsa:2048	364 299	418 328	2.6 4.3	2.5	5 5	2	52.93 21.32 15.47 7 .04 73.17 12.9 8 .00	36.32 27.43 25.55 8.82 38.08 26.41 25.95 7.64
	p256_hqc128 p256_hqc128	rsa:2048 rsa:3072	299 187	328 196	4.3 8.4	2.7 3.0	5 6	2 2	88.50 5.3	35.50 28.09 27.11 7.7 (
	p256_hqc128	rsa:4096	112	115	16.1	3.3	6	2	92.46	41.35 27.44 22.73 6.4
	p256_hqc128 p256 kyber512	sphincs128 dilithium2	52 375	52 346	30.0 2.4	6.1 2.2	30 6	2 1	95.67 56.29 23.76 1 0.0 7 .94	65.16 17.49 1.62 49.15 27.96 1.1 4.48
	p256_kyber512	dilithium2_aes	378	389	2.4	2.2	6	1	54.24 24.43 11.07.1	45.06 30.44 12.48.40
	p256_kyber512	falcon512	300	307	3.0	2.3	3	1	64.89 18.35 \$.0 7 .0	52.22 26.91 11.0 7 .8 5
	p256_kyber512 p256_kyber512	p256_dilithium2 p256_falcon512	320 260	332 271	2.5 3.2	2.9 2.9	6 3	1 1	56.41 22.80 10.2\$.2\$ 66.86 16.93\$.3\$.5	56.61 22.00 9.9 8 .41 60.56 21.57 9.1 2 .11
	p256_kyber512	p256_sphincs128	49	49	29.7	6.4	27	1	96.24	76.73
	p256_kyber512	rsa:1024	366 358	371	2.3	2.0	2	1	56.80 23.54 10.37.24 73.86 13.4 1.3.4 	42.46 31.05 13.77 0.44 45.14 29.12 12.549.31
	p256_kyber512 p256_kyber512	rsa:2048 rsa:3072	258 167	263 173	4.2 8.2	2.2 2.4	2 2	1	86.95 7.0 (45.54 31.36 11.8 9 .03
l	p256_kyber512	rsa:4096	99	107	15.8	2.6	2	1	94.17	54.67 25.15 9.8 3 .73
	p256_kyber512	sphincs128	52	52	29.8	5.6	27	1	95.77	72.76 18.474.7
Legend:	Pre-Quantum	libcrypto.so.1.1	kernel.kallsy	ms libss	l.so.1.1	libc-	2.31.so	pyth	non3.9 ixgbe	