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On Hitachi SR8000, b_	eff ¹⁾ benchm	ark on	12 nodes	-	Masteroniy
		b_eff	b_eff Lmax ²⁾	3-d-cyclic average	3-d-cyclic Lmax ²⁾
aggregated bandwidth - hyb	rid [MB/s]	1535	5565	1604	5638
(per node)	[MB/s]	(128)	(464)	(134)	(470)
aggregated bandwidth - pure	e MPI [MB/s]	5299	16624	5000	18458
(per process)	[MB/s]	(55)	(173)	(52)	(192)
^{bw} pure MPI ^{/ bw} hybrid	(measured)	3.45	2.99	3.12	3.27
^{size} pure MPI ^{/ size} hybrid	(assumed)		2 (base	d on last slic	le)
Thybrid / Tpure MPI	concluding)	1.73	1.49	1.56	1.64
 communication with pur than with the hybrid-ma 	e MPI model steronly moc	l is abou lel	ut 60% fa	ster	



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Memory copies fro	om remot	e memory to local CPU	register and vice versa	
Access method	Copies	Remarks	bandwidth b(message si	
2-sided MPI	2	internal MPI buffer + application receive buf.	b(size) = $b_{\infty} / (1 + b_{\infty}T_{latency}/size)$	
1-sided MPI	1	application receive buffer	same formula, but probabetter b_{∞} and $T_{latency}$	
Compiler based: OpenMP on DSM (distributed shared memory) or with cluster extensions, UPC	1	page based transfer	extremely poor, if only parts are needed	
	0	word based access	8 byte / T _{latency} , e.g, 8 byte / 0.33µs = 24MB	
	0	latency hiding with pre-fetch	b _∞	
Co-Array Fortran, HPF	1	latency hiding with buffering	see 1-sided communicat	



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