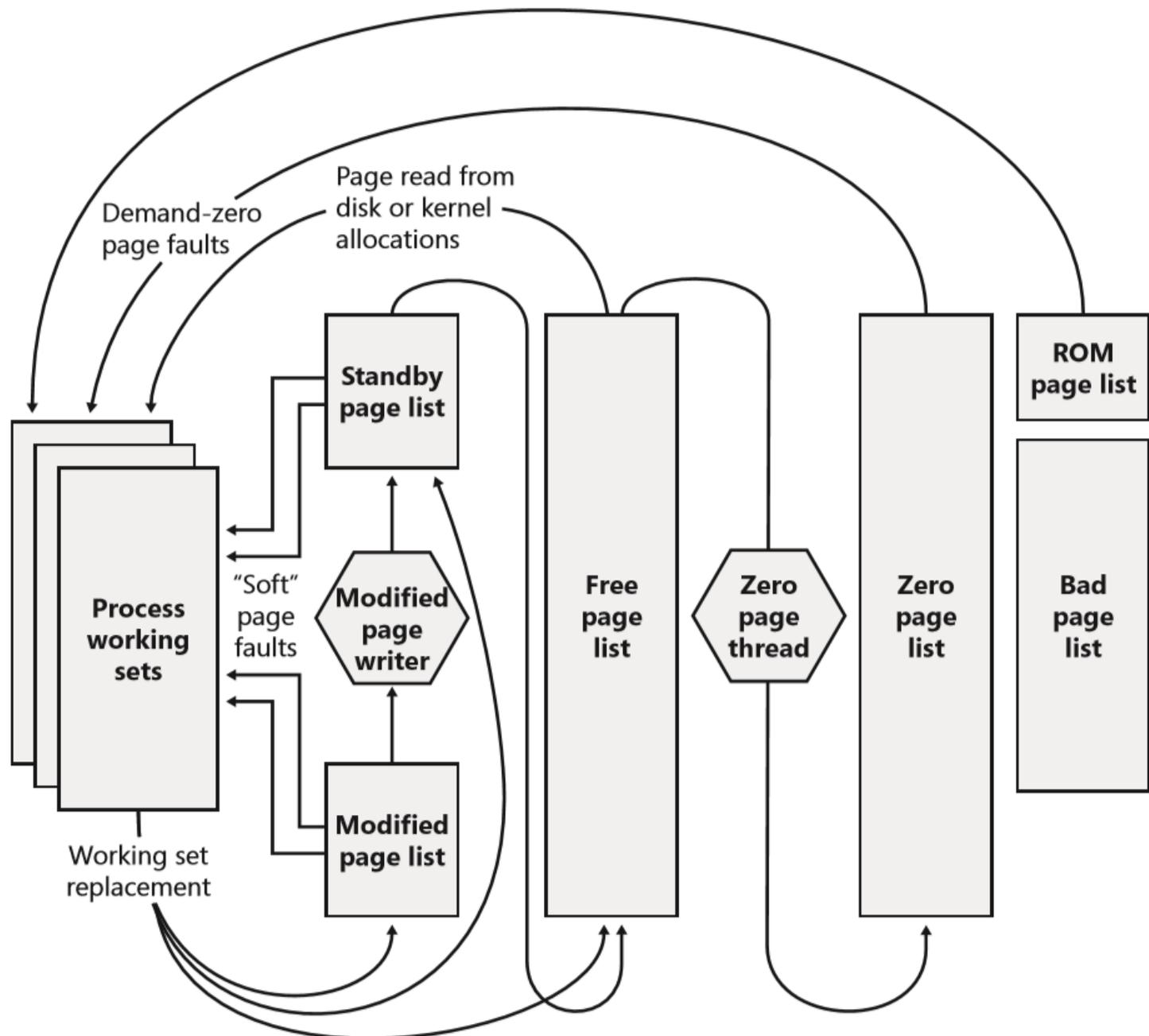


Memory Management (continued)

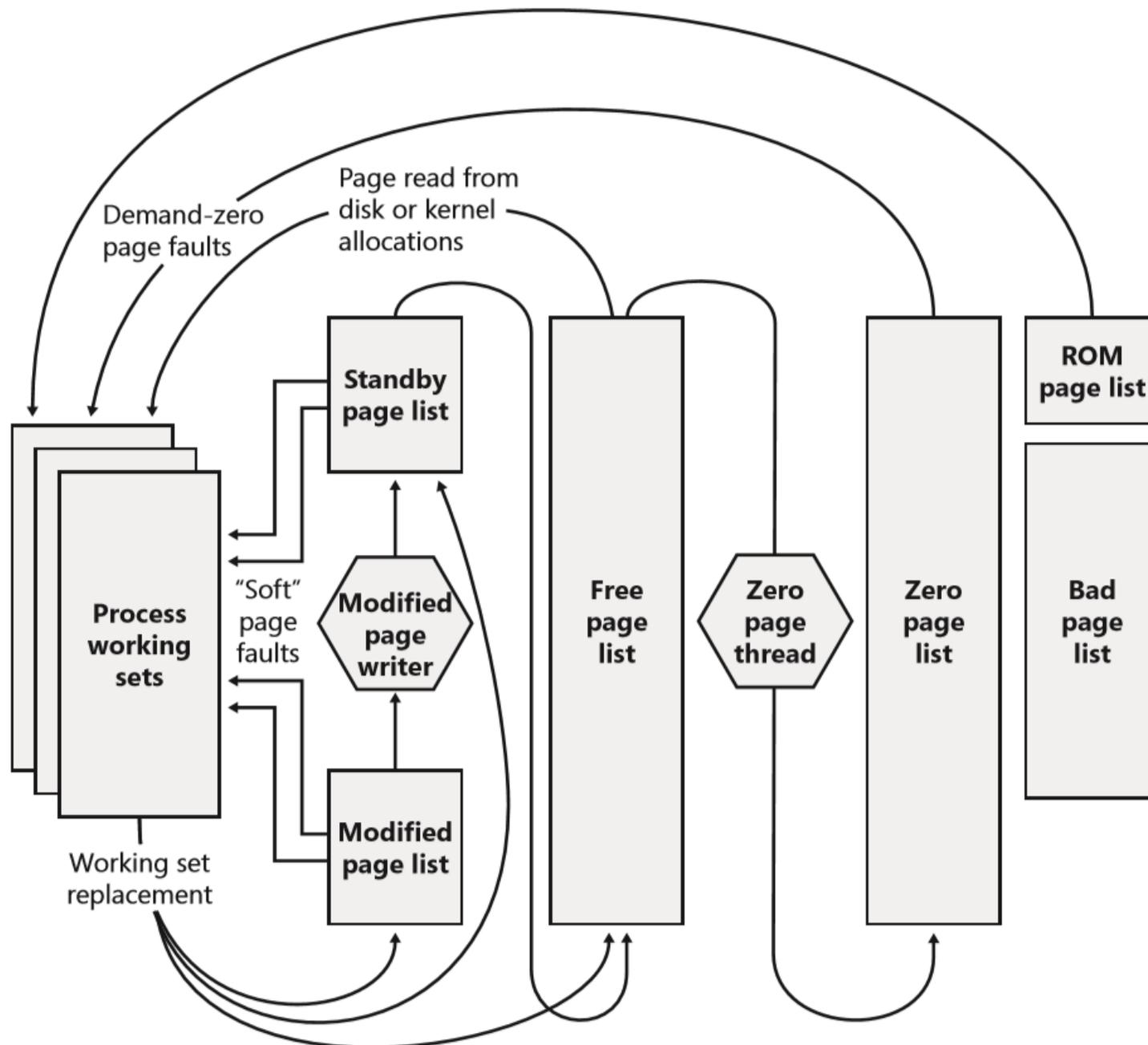
- Windows Paging
- Wickedly Fun Exam Question



Page States

- Active (also called Valid)
- Transition
- Standby
- Modified
- Modified no-write
- Free
- Zeroed
- Rom
- Bad

Figure 7-35 State diagram for page frames



Paging Features

- Local and Global page replacement
- LRU on top of FIFO
- Hard and Soft page faults

Figure 7-35 State diagram for page frames

Size = 1024MB

Stride	Seconds	Stride	Seconds	Stride	Seconds
1,	1.920	512,	11.890	262144,	18.250
2,	1.560	1024,	12.190	524288,	14.710
4,	2.780	2048,	12.960	1048576,	9.810
8,	5.530	4096,	14.280	2097152,	5.310
16,	11.450	8192,	16.510	4194304,	4.100
32,	16.470	16384,	22.070	8388608,	3.820
64,	15.000	32768,	22.390	16777216,	3.760
128,	13.390	65536,	21.510	33554432,	2.170
256,	12.310	131072,	20.270	67108864,	1.170

Things to consider

- Zero pages
- TLB behavior
- Various cache levels
- Cache line sizes

Size = 64MB

Stride	Seconds
700,	0.109
701,	0.140
702,	0.093
703,	0.109
704,	0.530
705,	0.109
706,	0.093
707,	0.109
708,	0.109
709,	0.109
710,	0.109
711,	0.109
712,	0.109
713,	0.109
714,	0.202
715,	0.109
716,	0.093
717,	0.109
718,	0.109
719,	0.093
720,	0.171
721,	0.093
722,	0.109
723,	0.109
724,	0.093
725,	0.109

Stride	Seconds
726,	0.109
727,	0.109
728,	0.109
729,	0.109
730,	0.109
731,	0.093
732,	0.109
733,	0.109
734,	0.109
735,	0.109
736,	0.140
737,	0.093
738,	0.124
739,	0.093
740,	0.109
741,	0.249
742,	0.109
743,	0.109
744,	0.109
745,	0.171
746,	0.109
747,	0.109
748,	0.109
749,	0.405
750,	0.109
751,	0.093

Stride	Seconds
752,	0.124
753,	0.109
754,	0.109
755,	0.093
756,	0.109
757,	0.109
758,	0.109
759,	0.109
760,	0.109
761,	0.109
762,	0.109
763,	0.109
764,	0.093
765,	0.499
766,	0.109
767,	0.109
768,	0.748
769,	0.109
770,	0.093
771,	0.124
772,	0.093
773,	0.109
774,	0.109
775,	0.109
776,	0.124
777,	0.093

Things to consider

- Virtual and physical caches
- Page coloring
- Side channel attacks