

IA-32 architecture

3DNow! opcodes

The PREFETCHx instruction is using the reg field of the mod R/M byte to determine the desired prefetch type (x).

0Fh xxh	xDh	xEh	xFh
0xh	PREFETCHx M	FEMMS	refer to table below

opcode	PREFETCHx instruction
0Fh,0Dh,xx000xxxb	PREFETCH line into E state
0Fh,0Dh,xx001xxxb	PREFETCHW line into M state
0Fh,0Dh,xx002xxxb	reserved, alias to PREFETCH
0Fh,0Dh,xx003xxxb	reserved, alias to PREFETCH
0Fh,0Dh,xx004xxxb	reserved, alias to PREFETCH
0Fh,0Dh,xx005xxxb	reserved, alias to PREFETCH
0Fh,0Dh,xx006xxxb	reserved, alias to PREFETCH
0Fh,0Dh,xx007xxxb	reserved, alias to PREFETCH

The 3DNow! instruction encoding differs from the regular instruction encoding, in that the mod R/M (and SIB) byte as well as an optional displacement follow directly after the two 0Fh prefix bytes. The byte selecting the instruction itself is appended as the last byte.

0Fh 0Fh ... xxh	x0h	x1h	x2h	x3h	x4h	x5h	x6h	x7h
0xh	TFADDS.Rx TFd,TFs1,TFs2 (TFP)	TFADDD.Rx TFd,TFs1,TFs2 (TFP)	TFSUBS.Rx TFd,TFs1,TFs2 (TFP)	TFSUBD.Rx TFd,TFs1,TFs2 (TFP)	TFMULS.Rx TFd,TFs1,TFs2 (TFP)	TFMULD.Rx TFd,TFs1,TFs2 (TFP)	TFDIVS.Rx TFd,TFs1,TFs2 (TFP)	TFDIVD.Rx TFd,TFs1,TFs2 (TFP)
1xh	TFSQRTS.Rx TFd,TFs (TFP)	TFSQRTD.Rx TFd,TFs (TFP)	TFPREMS TFd,TFs1,TFs2 (TFP)	TFPREMD TFd,TFs1,TFs2 (TFP)	TFCOMI TFd,TFs (TFP)	TFUCOMI TFd,TFs (TFP)		
2xh	TFCMOVB TFd,TFs (TFP)	TFCMOVE TFd,TFs (TFP)	TFCMOVBE TFd,TFs (TFP)	TFCMOVU TFd,TFs (TFP)	TFCMOVNB TFd,TFs (TFP)	TFCMOVNE TFd,TFs (TFP)	TFCMOVNBE TFd,TFs (TFP)	TFCMOVNU TFd,TFs (TFP)
3xh	TFABS TFd,TFs (TFP)	TFCPYS TFd,TFs1,TFs2 (TFP)	TFCPYSN TFd,TFs1,TFs2 (TFP)	TFCPYSE TFd,TFs1,TFs2 (TFP)				
4xh	TFCVT32D.Rx TFd,TFs (TFP)	TFCVT32S.Rx TFd,TFs (TFP)	TFCVT64D.Rx TFd,TFs (TFP)	TFCVT64S.Rx TFd,TFs (TFP)	TFCVTF64.Rx TFd,TFs (TFP)	TFCVTF32.Rx TFd,TFs (TFP)	TFCVTDS.Rx TFd,TFs (TFP)	
5xh	TFLD32 TF0...7,Md (TFP)	TFLD32 TF8...15,Md (TFP)	TFLD64 TF0...7,Mq (TFP)	TFLD64 TF8...15,Mq (TFP)	TFST32 Md,TF0...7 (TFP)	TFST32 Md,TF8...15 (TFP)	TFST64 Mq,TF0...7 (TFP)	TFST64 Mq,TF8...15 (TFP)
6xh								
7xh								
8xh								
9xh	PFCMPGE Pq,Qq				PFMIN Pq,Qq		PFRCP Pq,Qq	
Axh							PFRSQRT Pq,Qq	
Bxh							PFCMPGT Pq,Qq	
	PFCMPEQ Pq,Qq				PFMAX Pq,Qq		PFRCPIT1 Pq,Qq	
							PFRSQIT1 Pq,Qq	
							PFRCPIT2 Pq,Qq	
Cxh								

Dxh								
Exh								
Fxh								

0Fh 0Fh ... xxh	x8h	x9h	xAh	xBh	xCh	xDh	xEh	xFh
0xh					PI2FW* Pq,Qq	PI2FD Pq,Qq		
1xh					PF2IW* Pq,Qq	PF2ID Pq,Qq		
2xh								
3xh								
4xh								
5xh								
6xh								
7xh								
8xh					PFNACC* Pq,Qq			PFPNACC* Pq,Qq
9xh					PFSUB Pq,Qq			PFADD Pq,Qq
Axh					PFSUBR Pq,Qq			PFACC Pq,Qq
Bxh					PSWAPD* Pq,Qq			PAVGUSB Pq,Qq
Cxh								
Dxh								
Exh								
Fxh								

note: The opcodes marked with * are enhanced 3DNow! opcodes.

