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Test name

Stall due to limit on branch stack size.

Test description

There is a stall when we have a sequence of large number of correctly predicted branches but we don't decode them due to a limit on the size of the branch stack.

Component being tested - Branch

Rationale

When the branch stack is full, processor decodes only till it encounters the next branch instruction.

Decoding stalls until resolution of one of the pending branches.

This is useful to check whether the simulation handles stalls due to branch stack being full - the case when all the predictions are correct (correct fetch sequence) but further instructions are still not decoded.

Expected Outcome

The expected outcome is CPI more than what it should be if the branch stack were not there.

Trace file has -

```
A 01 02 03
A 04 05 06
M 07 08 09
B 11 00 xx 0
B 11 00 xx 0
B 11 00 xx 0
B 11 00 xx 0
B 11 00 xx 0
B 11 00 xx 0
B 11 00 xx 0
B 11 00 xx 0
A 01 02 03
A 04 05 06
A 01 02 03
```

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A 01 02 03	F	D	A1	A2	A3	C										
A 04 05 06	F	D		A1	A2	A3	C									
M 07 08 09	F	D	M1	M2	M3		C									
B 11 00 xx 0	F	D	E				C									
B 11 00 xx 0		F	D	E			C									
B 11 00 xx 0		F	D		E			C								
B 11 00 xx 0		F	D			E		C								
B 11 00 xx 0		F		D			E	C								
B 11 00 xx 0			F		D			E	C							
B 11 00 xx 0			F			D			E	C						
A 01 02 03			F			D	A1	A2	A3	C						
A 04 05 06			F			D		A1	A2	A3	C					
A 01 02 03				F		D			A1	A2	A3	C				

Number of cycles with branch stack = 12

FPALU instructions could have executed but they don't.

	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16
A 01 02 03	F	D	A1	A2	A3	C										
A 04 05 06	F	D		A1	A2	A3	C									
M 07 08 09	F	D	M1	M2	M3		C									
B 11 00 xx 0	F	D	E				C									
B 11 00 xx 0		F	D	E			C									
B 11 00 xx 0		F	D		E			C								
B 11 00 xx 0		F	D			E		C								
B 11 00 xx 0		F	D				E	C								
B 11 00 xx 0			F	D				E	C							
B 11 00 xx 0			F	D					E	C						
A 01 02 03			F	D	A1	A2	A3			C						
A 04 05 06			F	D		A1	A2	A3		C						
A 01 02 03				F	D		A1	A2	A3	C						

Number of cycles without branch stack = 10

Result

Number of cycles (including front and back end) with branch stack implemented = 12

Number of cycles (including front and back end) without branch stack = 10