

2004 Paper 7 Question 1

Comparative Architectures

The IA-64 architecture includes a number of instruction set features that are intended to allow compilers to generate code that will execute with fewer pipeline stalls.

Explain how *four* of the following five features operate, and how they could be used by a compiler to improve performance relative to more conventional instruction sequences.

- (a) Register windows for procedure call linkage.
- (b) Not a Thing (NaT) “poison” bits associated with registers.
- (c) Address aliasing table (ALAT) for load data speculation.
- (d) Register file rotation.
- (e) Parallel compares.

[5 marks each]