CLAIMS

1. A method of controlling execution of instructions within transactions of a computing environment, said method comprising steps of:

executing, by a processor, a transaction begin machine instruction, the executing comprising:

initiating a transaction the transaction including a sequence of instructions to be completed as a single atomic unit or aborted;

using a first control of at least one control specified in the transaction begin machine instruction to determine a first value, the first value to control execution within the transaction of an instruction of a first type wherein the first control is one of an allow access register modification control or an allow floating point operation control, and wherein based on the first control being the allow access register modification control, the first type comprises instructions that modify a type of register referred to as an access register, the access register including an indirect specification of an address space control element that designates a translation table for a specific address space to be used in address translation, the allow access register modification control to be used to indicate whether the transaction is permitted to execute an instruction that modifies an access register; and based on the first control being the allow floating point operation control, the first type comprises specified floating point instructions, the allow floating point operation control to be used to indicate whether the transaction is permitted to execute the specified floating point instructions;

determining, based on the first value, whether an instruction of the sequence of instructions of the transaction that is of the first type is permitted to be executed; and

executing the instruction of the first type, based on the first value indicating the instruction is permitted to be executed.

2. The method of claim 1, wherein the transaction begin machine instruction is part of a nest of transaction begin machine instructions , the nest of transaction begin machine instructions having a plurality of nesting levels of transactions, and the transaction begin machine instruction being at a current nesting level of transactions, and wherein the first control is the allow access register modification control, and the using comprises performing a logical AND of the allow access register modification control of the transaction begin machine instruction for the current nesting level of transactions and outer nesting levels, if any, to determine the first value, the first value comprising an effective allow access register

modification control that indicates whether the transaction is permitted to execute an instruction that modifies an access register.

3. The method of claim 1, wherein the transaction begin machine instruction is part of a nest of transaction begin machine instructions, the nest of transaction begin machine instructions having a plurality of nesting levels of transactions, and the transaction begin machine instruction being at a current nesting level of transactions, and wherein the first control is the allow floating point operation control, and the using comprises performing a logical AND of the allow floating point operation control of the transaction begin machine instruction for the current nesting level of transactions and outer nesting levels, if any, to determine the first value, the first value comprising an effective allow floating point operation control that indicates whether the transaction is permitted to execute the specified floating point instructions.

4. The method of claim 1, wherein the transaction is part of a nest of transactions, and wherein the method further comprises re-determining the first value based on termination of a transaction of the nest of transactions.

5. A system comprising means adapted for carrying out all the steps of the method according to any one of the preceding method claims.

6. A computer program comprising instructions for carrying out all the steps of the method according to any one of the preceding method claims, when said computer program is executed on a computer system.

CLAIMS

1. A method of controlling execution of instructions within transactions of a computing environment, a transaction effectively delaying committing transactional stores to main memory until completion of a selected transaction, said method comprising steps of:

obtaining, by a processor, a machine instruction for execution, the machine instruction being defined for computer execution according to a computer architecture, the machine instruction comprising:

an operation code to specify a transaction begin operation; and

at least one control to be used in controlling execution of one or more types of instructions in transactional processing, the one or more types of instructions comprising: specified floating point instructions, or instructions that modify a type of register referred to as an access register, the access register including an indirect specification of an address space control element to be used in address translation; and

executing, by the processor, the machine instruction, the executing comprising:

initiating a transaction; and

using a first control of the at least one control to determine a first value, the first value to control execution within the transaction of an instruction of a first type, the instruction of the first type comprising a floating point instruction or an instruction that modifies an access register.

2. The method of claim 1, wherein the first control is an allow access register modification control and the first type comprises instructions that modify a type of register referred to as an access register, the access register including an indirect specification of an address space control element to be used in address translation, the allow access register modification control to be used to indicate whether the transaction is permitted to execute an instruction that modifies an access register.

3. The method of claim 2, wherein the using comprises performing a logical AND of the allow access register modification control of the machine instruction for a current nesting level of transactions of which the machine instruction is a part and outer nesting levels, if any, to determine the first value, the first value comprising an effective allow access register modification control.

4. The method of claim 1, wherein the first control is an allow floating point operation control and the first type comprises specified floating point instructions, the allow floating point operation control to be used to indicate whether the transaction is permitted to execute the specified floating point instructions.

5. The method of claim 4, wherein the using comprises performing a logical AND of the allow floating point operation control of the machine instruction for a current nesting level of transactions of which the machine instruction is a part and outer nesting levels, if any, to determine the first value, the first value comprising an effective allow floating point operation control.

6. The method of claim 1, wherein the first control is an allow access register modification control and the first type comprises instructions that modify a type of register referred to as an access register, the access register including an indirect specification of an address space control element to be used in address translation, the allow access register modification control to be used to indicate whether the transaction is permitted to execute an instruction that modifies an access register, and wherein the at least one control further comprises a second control, the second control comprising an allow floating point operation control to be used to indicate whether the transaction is permitted to execute specified floating point instructions.

7. The method of claim 1, wherein the transaction comprises a nonconstrained transaction, and the at least one control comprises an allow floating point operation control to control execution of specified floating point instructions and an allow access register modification control to control execution of instructions that modify access registers, wherein an access register includes an indirect specification of an address space control element to be used in address translation.

8. The method of claim 1, wherein the transaction comprises a constrained transaction, and the at least one control comprises an allow access register modification control to control execution of instructions that modify access registers, wherein an access register includes an indirect specification of an address space control element to be used in address translation.

9. The method of claim 1, wherein the method further comprises:
obtaining, by the processor, an instruction within the transaction initiated by the transaction begin operation;

determining by the processor based on at least one value computed based on the at least one control whether the instruction is an instruction to be prohibited from execution; and

executing the instruction based on the determining indicating the instruction is not to be prohibited from execution.

10. The method of claim 1, wherein the transaction is part of a nest of transactions, and wherein the method further comprises re-determining the first value based on termination of a transaction of the nest of transactions.

11. A system comprising means adapted for carrying out all the steps of the method according to any preceding method claim.

12. A computer program comprising instructions for carrying out all the steps of the method according to any preceding method claim, when said computer program is executed on a computer system.

AMENDED CLAIMS
received by the International Bureau on 27 March 2014

1. A method of controlling execution of instructions within transactions of a computing environment, a transaction effectively delaying committing transactional stores to main memory until completion of a selected transaction, said method comprising steps of:

obtaining, by a processor, a transaction begin machine instruction for execution, the transaction begin machine instruction being defined for computer execution according to a computer architecture, the transaction begin machine instruction comprising:

an operation code to specify a transaction begin operation; and

at least one control to be used in controlling execution of one or more types of instructions in transactional processing, the one or more types of instructions comprising: specified floating point instructions, or instructions that modify a type of register referred to as an access register, the access register including an indirect specification of an address space control element to be used in address translation; and

executing, by the processor, the transaction begin machine instruction, the executing comprising:

initiating a transaction; and

using a first control of the at least one control specified in the transaction begin machine instruction to determine a first value, the first value to control execution within the transaction of an instruction of a first type, the instruction of the first type comprising a floating point instruction or an instruction that modifies an access register, wherein the first control is one of an allow access register modification control or an allow floating point operation control, and wherein based on the first control being the allow access register modification control, the first type comprises instructions that modify a type of register referred to as an access register, the access register including an indirect specification of an address space control element that designates a translation table for a specific address space to be used in address translation, the allow access register modification control to be used to indicate whether the transaction is permitted to execute an instruction that modifies an access register; and based on the first control being the allow floating point operation control, the first type comprises specified floating point instructions, the allow

floating point operation control to be used to indicate whether the transaction is permitted to execute the specified floating point instructions.

2. The method of claim 1, wherein the first control is the allow access register modification control, and the using comprises performing a logical AND of the allow access register modification control of the transaction begin machine instruction for a current nesting level of transactions of which the transaction begin machine instruction is a part and outer nesting levels, if any, to determine the first value, the first value comprising an effective allow access register modification control that indicates whether the transaction is permitted to execute an instruction that modifies an access register.

3. The method of claim 1, wherein the first control is the allow floating point operation control, and the using comprises performing a logical AND of the allow floating point operation control of the transaction begin machine instruction for a current nesting level of transactions of which the transaction begin machine instruction is a part and outer nesting levels, if any, to determine the first value, the first value comprising an effective allow floating point operation control that indicates whether the transaction is permitted to execute the specified floating point instructions.

4. The method of claim 1, wherein the first control is an allow access register modification control and the first type comprises instructions that modify a type of register referred to as an access register, the access register including an indirect specification of an address space control element to be used in address translation, the allow access register modification control to be used to indicate whether the transaction is permitted to execute an instruction that modifies an access register, and wherein the at least one control further comprises a second control, the second control comprising an allow floating point operation control to be used to indicate whether the transaction is permitted to execute specified floating point instructions.

5. The method of claim 1, wherein the transaction comprises a nonconstrained transaction, and the at least one control comprises an allow floating point operation control to control execution of specified floating point instructions and an allow access register

modification control to control execution of instructions that modify access registers, wherein an access register includes an indirect specification of an address space control element to be used in address translation.

6. The method of claim 1, wherein the transaction comprises a constrained transaction, and the at least one control comprises an allow access register modification control to control execution of instructions that modify access registers, wherein an access register includes an indirect specification of an address space control element to be used in address translation.

7. The method of claim 1, wherein the method further comprises:

obtaining, by the processor, an instruction within the transaction initiated by the transaction begin operation;

determining by the processor based on at least one value computed based on the at least one control whether the instruction is an instruction to be prohibited from execution; and

executing the instruction based on the determining indicating the instruction is not to be prohibited from execution.

8. The method of claim 1, wherein the transaction is part of a nest of transactions, and wherein the method further comprises re-determining the first value based on termination of a transaction of the nest of transactions.

9. A system comprising means adapted for carrying out all the steps of the method according to any preceding method claim.

10. A computer program comprising instructions for carrying out all the steps of the method according to any preceding method claim, when said computer program is executed on a computer system.