CLAIMS

What is claimed is:

1. A computer-implemented method for managing execution of programs for users, the method comprising:

reserving, by one or more programmed computing systems of a program execution service, program execution capacity of the program execution service for a first user of the program execution service;

executing, by the one or more programmed computing systems and based at least in part on the reserved program execution capacity not being in use by the first user, a first program using the reserved program execution capacity on behalf of the first user without the first user having requested to use the reserved program execution capacity for the executing first program;

receiving, by the one or more programmed computing systems and while the executing of the first program using the reserved program execution capacity is ongoing, a request from the first user to use the reserved program execution capacity to execute one or more second programs on behalf of the first user; and

determining, by the one or more programmed computing systems and based at least in part on the received request, to terminate the using of the reserved program execution capacity for the executing first program, and initiating using the reserved program execution capacity for executing the one or more second programs.

2. The computer-implemented method of claim 1 wherein the determining to terminate the using of the reserved program execution capacity for the executing first program includes terminating, by the one or more programmed computing systems, the executing of the first program.

3. The computer-implemented method of claim 2 wherein the terminating of the executing of the first program includes saving, by the one or more programmed

computing systems, information related to an execution state of the first program for later use.

4. The computer-implemented method of claim 3 further comprising, after the terminating of the executing of the first program, initiating, by the one or more programmed computing systems, execution of another instance of the first program using a general excess capacity pool of the program execution service and the saved execution state information, wherein the general excess capacity pool is distinct from the reserved program execution capacity for the first user.

5. The computer-implemented method of claim 3 further comprising, after the using of the reserved program execution capacity for executing the one or more second programs is completed, initiating, by the one or more programmed computing systems, further executing of the first program using the reserved program execution capacity of the first user and the saved execution state information.

6. The computer-implemented method of claim 1 wherein the determining to terminate the using of the reserved program execution capacity for the executing first program includes modifying, by the one or more programmed computing systems, continuing execution of the first program to use computing-related resources of a general excess capacity pool of the program execution service that is distinct from the reserved program execution capacity of the first user.

7. The computer-implemented method of claim 1 wherein the determining to terminate the using of the reserved program execution capacity for the executing first program includes determining, by the one or more programmed computing systems and based on the first program being within a defined threshold of completing execution, to allow the execution of the first program to be completed using the reserved program execution capacity before performing the initiating of the use of the reserved program execution capacity for executing the one or more second programs.

8. The computer-implemented method of claim 1 wherein the using of the reserved program execution capacity for the executing first program includes using a first subset of the reserved program execution capacity and not using a second subset of the reserved program execution capacity, wherein the received request includes an indication of an amount of program execution capacity to use for executing the one or more second programs that is larger than the second subset, and wherein the initiating using the reserved program execution capacity for executing the one or more second programs includes using the second subset of the reserved program execution capacity and using additional unused excess capacity of the program execution service.

9. The computer-implemented method of claim 1 wherein the reserved program execution capacity is based on use of one or more reserved computing nodes for the first user that are a subset of a plurality of computing nodes of the program execution service, wherein the plurality of computing nodes include, for each of multiple physical computing systems, multiple virtual machines hosted by the physical computing system that are each configurable to execute at least one program, and wherein the one or more reserved computing nodes are each hosted virtual machines.

10. A computer-readable storage medium having stored contents that configure a computing system of a program execution service to perform a method comprising:

reserving, by the configured computing system and for use by a first user of the program execution service, program execution capacity provided by the program execution service;

executing, by the configured computing system and based at least in part on the reserved program execution capacity not being in use by the first user, a first program on behalf of the first user using the reserved program execution capacity;

receiving, by the configured computing system and while the executing of the first program is ongoing, a request to use the reserved program execution capacity to execute a distinct second program on behalf of the first user; and

determining, by the configured computing system and based at least in part on the received request, to terminate using of the reserved program execution capacity for the executing first program, and initiating using the reserved program execution capacity for executing the second program.

11. The computer-readable storage medium of claim 10 wherein the determining to terminate the using of the reserved program execution capacity includes obtaining information related to an execution state of the first program, and terminating the executing of the first program after the information is obtained.

12. The computer-readable storage medium of claim 11 wherein the stored contents include software instructions that, when executed, cause the configured computing system to use the obtained information to initiate an instance of the first program using excess program execution capacity of the program execution service that is distinct from the reserved program execution capacity of the first user.

13. The computer-readable storage medium of claim 11 wherein the stored contents include software instructions that, when executed, cause the configured computing system to, at a time after terminating the executing of the first program, initiate execution of an instance of the first program using the obtained information and at least some of the reserved program execution capacity of the first user based at least in part on the first user no longer using the at least some reserved program execution capacity at that time.

14. The computer-readable storage medium of claim 10 wherein the determining to terminate the using of the reserved program execution capacity for the executing first program includes continuing execution of the first program using excess program execution capacity of the program execution service that is distinct from the reserved program execution capacity of the first user.

15. The computer-readable storage medium of claim 10 wherein the determining to terminate the using of the reserved program execution capacity for the executing first program includes allowing execution of the first program to be completed using the reserved program execution capacity based at least in part on the first program being within a defined threshold of completing execution.

16. The computer-readable storage medium of claim 10 wherein the program execution service provides a plurality of computing resources for use on behalf of users, and wherein the reserved program execution capacity is provided by the program execution service using a subset of the plurality of computing resources.

17. The computer-readable storage medium of claim 10 wherein the executing of the first program is performed in response to instructions received from the first user that do not indicate to use the reserved program execution capacity for the executing first program.

18. A computing system configured to manage execution of programs, comprising:

one or more processors; and

a system manager module that, when executed by at least one of the one or more processors, causes the at least one processor to:

reserve computing-related resources provided by the online service for use by a first user of the online service;

execute, without instructions from the first user to use the reserved computing-related resources, a first program on behalf of the first user using the reserved computing-related resources;

receive, while the executing of the first program using the reserved computing-related resources is ongoing, a request from the first user to use the reserved computing-related resources to execute one or more second programs on behalf of the first user; and

determine, based at least in part on the received request, to terminate the using of the reserved computing-related resources for the executing first program, and initiate using the reserved computing-related resources for executing the one or more second programs.

19. The computing system of claim 18 wherein the online service is a program execution service that provides a plurality of computing-related resources for use by users of the program execution service, wherein the reserved computing-related resources are a subset of the plurality that is reserved for the first user, and wherein the determining to terminate the using of the reserved computing-related resources for the executing first program includes terminating, by the program execution service, the executing of the first program.

20. The computing system of claim 19 wherein the system manager module is part of the program execution service and includes software instructions that, when executed, further cause the at least one processor to:

save information related to an execution state of the first program before the terminating; and

initiate execution of another instance of the first program based on the saved information and without using the reserved computing-related resources.

21. The computing system of claim 18 wherein the system manager module further causes the at least one processor to perform the executing of the one or more second programs by further using additional computing-related resources of the online service that are not reserved computing-related resources.