

CLAIMS

1. A system, comprising:

a plurality of computing nodes that are coupled to each other over a network and that collectively provide virtual computing services to one or more clients, each of the computing nodes comprising at least one processor and a memory;

two or more virtual compute instances, each executing on a respective one of two or more of the computing nodes, wherein each of the virtual compute instances is configured to implement an application component of a distributed application on behalf of a client, and wherein the virtual compute instances are configured to communicate with each other over at least a portion of the network; and

a distributed lock manager comprising two or more components, each executing on a respective one of the two or more computing nodes, wherein the distributed lock manager components are configured to share state for one or more locks on respective shared resources, and wherein to share state for the one or more locks, the distributed lock manager components are configured to communicate with each other over a network that is physically or logically distinct from the at least a portion of the network over which the virtual compute instances communicate with each other;

wherein one of the application components is configured to invoke a call to the distributed lock manager component that is executing on the computing node on which the virtual compute instance that implements the application component is executing to initiate performance of a lock management operation for a lock on a shared resource that is accessed by the distributed application.

2. The system of claim 1, wherein the network over which the distributed lock manager components communicate with each other comprises a control plane network of a service provider computing environment, and wherein the at least a portion of the network over which the virtual compute instances communicate with each other comprises a data plane network of the service provider computing environment.

3. The system of claim 1, wherein, in response to the call to the distributed lock manager component, the distributed lock manager component is configured to:
perform the lock management operation; and

communicate a resulting state of the lock to at least one distributed lock manager component executing on a computing node other than the one on which the distributed lock manager component is executing.

5 4. The system of claim 1, wherein the two or more computing nodes implement a virtual private network for the client.

5. A method, comprising:
performing by one or more computers:

10 receiving, by a component of a distributed lock manager executing on a given one of a plurality of computing nodes, a request to perform a lock management operation for a lock on a shared resource, wherein said receiving comprises receiving the request from a compute instance executing on the given computing node, and wherein the compute instance accesses the
15 shared resource using network resource capacity allocated for the compute instance; and

 performing the requested lock management operation, wherein said performing comprises the distributed lock manager component communicating with
20 another distributed lock manager component executing on another one of the plurality of computing nodes to share state information for the lock using network resource capacity other than the network resource capacity allocated for the compute instance.

6. The method of claim 5,
25 wherein the compute instance implements an application component of a distributed application; and
 wherein the method further comprises the application component communicating with at least one other component of the distributed application using the network
30 resource capacity allocated for the compute instance.

7. The method of claim 5, wherein the plurality of computing nodes implement one or more virtual computing services.

8. The method of claim 5, wherein said performing the lock management operation comprises associating the lock with the shared resource, and wherein said communicating comprises communicating the association to the other distributed lock manager component.

5 9. The method of claim 5, wherein said performing the lock management operation comprises modifying a value of the lock.

10. The method of claim 9, wherein the value of the lock identifies an owner of the shared resource.

10 11. The method of claim 9, further comprising:
a component of the distributed lock manager writing the modified value of the lock to a persistent data store.

15 12. The method of claim 9, wherein said modifying the lock value comprises atomically modifying the lock value.

13. The method of claim 5, wherein the network resource capacity allocated for the compute instance comprises network connectivity resources or input/output throughput capacity.

20 14. The method of claim 5, wherein said performing further comprises caching state information for the lock on the given computing node.

25 15. A system comprising:
one or more processors;
one or memories, the one or more memories having stored thereon program instructions that when executed on the one or more processors cause the one or more processors to perform:
receiving, by a component of a distributed lock manager executing on a given one of a plurality of computing nodes, a request to perform a lock management operation
30 for a lock that is associated with an entity to which shared access is to be controlled, wherein said receiving comprises receiving the request from a resource instance executing on the given computing node, wherein the plurality of computing nodes implement a distributed lock service, wherein the resource instance accesses the entity that is associated with the lock, and wherein the

request conforms to an application programming interface that defines one or more lock management operations supported by the distributed lock manager; and performing the requested lock management operation, wherein said performing comprises the distributed lock manager component communicating with another component of the distributed lock manager executing on another one of the plurality of computing nodes to share state information for the lock using network connectivity other than a network connectivity with which the resource instance accesses the entity that is associated with the lock.

Claims

1. A system, comprising:

a plurality of computing nodes that are coupled to each other over a network and that collectively provide virtual computing services to one or more clients, each of the computing nodes comprising at least one processor and a memory;

two or more virtual compute instances, each executing on a respective one of two or more of the computing nodes, wherein each of the virtual compute instances is configured to implement an application component of a distributed application on behalf of a client, and wherein the virtual compute instances are configured to communicate with each other over at least a portion of the network; and

a distributed lock manager comprising two or more components, each executing on a respective one of the two or more computing nodes, wherein the distributed lock manager components are configured to share state for one or more locks on respective shared resources, and wherein to share state for the one or more locks, the distributed lock manager components are configured to communicate with each other over a network that is physically or logically distinct from the at least a portion of the network over which the virtual compute instances communicate with each other;

wherein one of the application components is configured to invoke a call to the distributed lock manager component that is executing on the computing node on which the virtual compute instance that implements the application component is executing to initiate performance of a lock management operation for a lock on a shared resource that is accessed by the distributed application.

2. The system of claim 1, wherein the network over which the distributed lock manager components communicate with each other comprises a control plane network of a service provider computing environment, and wherein the at least a portion of the network over which the virtual compute instances communicate with each other comprises a data plane network of the service provider computing environment.

3. The system of claim 1, wherein, in response to the call to the distributed lock manager component, the distributed lock manager component is configured to:

perform the lock management operation; and

communicate a resulting state of the lock to at least one distributed lock manager component executing on a computing node other than the one on which the distributed lock manager component is executing.

4. The system of claim 1, wherein the two or more computing nodes implement a virtual private network for the client.

5. A method, comprising:

performing by one or more computers:

receiving, by a component of a distributed lock manager executing on a given one of a plurality of computing nodes, a request to perform a lock management operation for a lock on a shared resource, wherein said receiving comprises receiving the request from a compute instance executing on the given computing node, and wherein the compute instance accesses the shared resource using network resource capacity allocated for the compute instance; and

performing the requested lock management operation, wherein said performing comprises the distributed lock manager component communicating with another distributed lock manager component executing on another one of the plurality of computing nodes to share state information for the lock using network resource capacity other than the network resource capacity allocated for the compute instance.

6. The method of claim 5,
wherein the compute instance implements an application component of a distributed application; and

wherein the method further comprises the application component communicating with at least one other component of the distributed application using the network resource capacity allocated for the compute instance.

7. The method of claim 5, wherein the plurality of computing nodes implement a distributed lock service.

8. The method of claim 5, wherein the plurality of computing nodes implement one or more virtual computing services.

9. The method of claim 5, wherein said performing the lock management operation comprises associating the lock with the shared resource, and wherein said communicating comprises communicating the association to the other distributed lock manager component.

10. The method of claim 5, wherein said performing the lock management operation comprises modifying a value of the lock.

11. The method of claim 10, wherein the value of the lock identifies an owner of the shared resource.

12. The method of claim 10, further comprising:
a component of the distributed lock manager writing the modified value of the lock to a persistent data store.

13. The method of claim 10, wherein said modifying the lock value comprises atomically modifying the lock value.

14. The method of claim 5, wherein the network resource capacity allocated for the compute instance comprises network connectivity resources or input/output throughput capacity.

15. The method of claim 5, wherein said performing further comprises caching state information for the lock on the given computing node.

16. A non-transitory computer-readable storage medium storing program instructions that when executed on one or more computers cause the one or more computers to perform:

receiving, by a component of a distributed lock manager executing on a given one of a plurality of computing nodes, a request to perform a lock management operation for a lock that is associated with an entity to which shared access is to be controlled, wherein said receiving comprises receiving the request from a resource instance executing on the given computing node, wherein the plurality of computing nodes implement a distributed lock service, wherein the resource instance accesses the entity that is associated with the lock, and wherein the request conforms to an application programming interface that defines one or more lock management operations supported by the distributed lock manager; and performing the requested lock management operation, wherein said performing comprises the distributed lock manager component communicating with another component of the distributed lock manager executing on another one of the plurality of computing nodes to share state information for the lock using network connectivity other than a network connectivity with which the resource instance accesses the entity that is associated with the lock.

17. The non-transitory computer-readable storage medium of claim 16, wherein the request comprises a request to create a lock, wherein said performing the requested lock management operation comprises creating a lock and returning an identifier of the lock to the resource instance from which the request was received, and wherein said communicating comprises communicating the identifier of the lock to the other component of the distributed lock manager.

18. The non-transitory computer-readable storage medium of claim 16, wherein the request comprises a request to subscribe to the lock or a request to set a value of a property of the lock.

19. The non-transitory computer-readable storage medium of claim 16, wherein the request comprises a request to acquire the lock or a request to release the lock, wherein said performing the requested operation comprises modifying a lock value for the lock, and where said communicating comprises communicating the modified lock value to the other component of the distributed lock manager.

20. The non-transitory computer-readable storage medium of claim 16, wherein the plurality of computing nodes are coupled to each other over a network and collectively provide virtual computing services to one or more clients; wherein when executed on the one or more computers, the program instructions further cause the one or more computers to perform:
receiving a second request to perform a lock management operation for the lock, wherein the second request is received from a computing node other than one of the plurality of computing nodes that are coupled to each other over the network and that collectively provide virtual computing services to one or more clients, and wherein the request conforms to the application programming interface that defines the one or more lock management operations supported by the distributed lock manager.

21. The non-transitory computer-readable storage medium of claim 16, wherein the entity that is associated with the lock comprises a virtual network interface.