

WHAT IS CLAIMED IS:

1. ~~—A computer implemented method of monitoring database instances in a database environment from a control environment, comprising:~~

5 ~~under control of one or more computer systems configured with executable instructions;~~

~~assigning a monitoring component in the control environment to a database instance in at least one of a different data zone or a different geographical location in the database environment, the control environment being separate from the database~~

10 ~~environment, the database instance capable of being replicated to include at least a primary instance replica and a secondary instance replica, the assigned monitoring component being in at least one of the different data zone or the different geographical location from at least one of the primary instance replica or the secondary instance replica when the database instance is replicated, each monitoring component at least capable of~~
15 ~~initiating failover of the database instance upon determination of failure of the database instance;~~

~~causing the assigned monitoring component to send a communication to the database instance, the communication being sent to at least the primary instance replica if the database instance is replicated; and~~

20 ~~in response to receiving lease information from the database instance, monitoring at least a status of the database instance using the assigned monitoring component during a lease period associated with the lease information;~~

~~wherein, during the lease period, other monitoring components are prohibited from initiating failover of the database instance upon determination of failure of~~
25 ~~the database instance.~~

2. ~~—The computer implemented method of claim 1, wherein the lease information is received from the primary instance replica only when data is synchronized between the primary instance replica and the secondary instance replica.~~

30 3. ~~—The computer implemented method of claim 1, wherein the lease information is received from the primary instance replica only when a current lease exists for the database instance.~~

4. — The computer implemented method of claim 1, wherein the control environment includes a plurality of monitoring components and the database environment includes a plurality of database instances, the method further comprising:

5 assigning each of the plurality of monitoring components in the control environment to a portion of the plurality of database instances in the database environment in order to substantially evenly distribute workload across the plurality of monitoring components.

10 5. — The computer implemented method of claim 4, further comprising: assigning each of the plurality of database instances in the database environment to one of a plurality of workload partitions;

15 — wherein assigning each of the plurality of monitoring components in the control environment to the portion of the plurality of database instances comprises assigning each of the plurality of monitoring components to one of the plurality of workload partitions.

20 6. — The computer implemented method of claim 5, further comprising: when one of the plurality of monitoring components is unable to monitor an assigned workload partition, repartitioning the workload partitions and reassigning a remaining group of the plurality of monitoring components to the repartitioned workload partitions.

25 7. — The computer implemented method of claim 1, further comprising: when the assigned monitoring component determines that the primary instance replica is unavailable, causing the secondary instance replica to failover to a new primary instance replica.

30 8. — The computer implemented method of claim 1, further comprising: storing an identifier for the assigned monitoring component and information for the lease period to a first block storage mechanism for the primary instance replica, the first block storage mechanism causing the identifier and the information for the lease period to be synchronously stored to a second block storage mechanism for the secondary instance replica.

9. — The computer implemented method of claim 1, wherein the primary instance replica and the secondary instance replica are provisioned in a first data zone, in separate data zones at separate geographical locations, in a second data zone across multiple geographical locations, or across multiple data zones in a first geographical region, and

wherein the assigned monitoring component is located in a third data zone or a second geographical location, or in a fourth data zone or a third geographical location with one of the primary instance replica or the secondary instance replica.

10. — A system for monitoring database instances in a database environment from a control environment, comprising:

a processor; and

a memory device including instructions that, when executed by the processor, cause the processor to:

assign a monitoring component in the control environment to a database instance in at least one of a different data zone or a different geographical location in the database environment, the control environment being separate from the database environment, the database instance capable of being replicated to include at least a primary instance replica and a secondary instance replica, the assigned monitoring component being in at least one of the different data zone or the different geographical location from at least one of the primary instance replica or the secondary instance replica when the database instance is replicated, each monitoring component at least capable of initiating failover of the database instance upon determination of failure of the database instance;

cause the assigned monitoring component to send a communication to the database instance, the communication being sent to at least the primary instance replica if the database instance is replicated; and

in response to receiving lease information from the database instance, monitor at least a status of the database instance using the assigned monitoring component during a lease period associated with the lease information,

wherein, during the lease period, other monitoring components are

prohibited from initiating failover of the database instance upon determination of failure of the database instance.

11. — The system of claim 10, wherein the lease information is received
5 from the primary instance replica only when data is synchronized between the primary instance replica and the secondary instance replica, and a current lease exists for the database instance.

12. — The system of claim 10, wherein the control environment includes a
10 plurality of monitoring components and the database environment includes a plurality of database instances, wherein the instructions when executed further cause the processor to:
assign each of the plurality of monitoring components in the control environment to a portion of the plurality of database instances in the database environment in order to substantially evenly distribute workload across the plurality of monitoring
15 components.

13. — The system of claim 12, wherein the instructions when executed
further cause the processor to:
assign each of the plurality of database instances in the database
20 environment to one of a plurality of workload partitions,
wherein assigning each of the plurality of monitoring components in the control environment to the portion of the plurality of database instances comprises assigning each of the plurality of monitoring components to one of the plurality of workload partitions.

14. — The system of claim 10, wherein the instructions when executed
further cause the processor to:
store an identifier for the assigned monitoring component and information
for the lease period to a first block storage mechanism for the primary instance replica, the
30 first block storage mechanism causing the identifier and the information for the lease period to be synchronously stored to a second block storage mechanism for the secondary instance replica.

~~15. The system of claim 10, wherein the primary instance replica and the secondary instance replica are provisioned in a first data zone, in separate data zones at~~

5 ~~separate geographical locations, in a second data zone across multiple geographical locations, or across multiple data zones in a first geographical region, and~~

~~wherein the assigned monitoring component is located in a third data zone or a second geographical location, or in a fourth data zone or a third geographical location with one of the primary instance replica or the secondary instance replica.~~

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WHAT IS CLAIMED IS:

1. A computer-implemented method of monitoring replicated database instances from a control environment, comprising:

5 under control of one or more computer systems configured with executable instructions,

assigning each of a plurality of replicated database instances in a database environment to one of a plurality of workload partitions, the plurality of workload partitions grouped according to one of a plurality of data zones or a plurality of
10 geographical locations;

assigning each of a plurality of monitoring components in the control environment to one of the plurality of workload partitions, each monitoring component being assigned to a workload partition that is grouped to one of a first data zone or a first geographic zone that is different from a second data zone or a second geographic zone of
15 the workload partition to which at least one of a primary instance replica or a secondary instance replica of a replicated database instance is assigned;

for each replicated database instance of the plurality of replicated database instances;

20 causing an assigned monitoring component to send a communication to a host manager for the primary instance replica of the replicated database instance, the assigned monitoring component being assigned to the workload partition to which the replicated database instance is assigned;

when data for the primary instance replica is synchronized with data for the secondary instance replica for the replicated database instance, receiving to the assigned
25 monitoring component a lease for the replicated database instance, the lease specifying at least a lease period during which the assigned monitoring component will be able to monitor the replicated database instance,

wherein, during the lease period, other monitoring components of the plurality of monitoring components are prohibited from initiating failover of the replicated
30 database instance upon determination of failure of the replicated database instance; and

in response to receiving the lease to the assigned monitoring component, monitoring at least a status of the replicated database instance during the lease period using the assigned monitoring component.

2. The computer-implemented method of claim 1, wherein the assigned monitoring receives the lease only when a current lease exists for the replicated database instance.

5 3. The computer-implemented method of claim 1, further comprising:
storing an identifier for the assigned monitoring component and information
for the lease period to a first block storage mechanism for the primary instance replica, the
first block storage mechanism causing the identifier and the information for the lease
period to be synchronously stored to a second block storage mechanism for the secondary
10 instance replica.

4. A computer-implemented method of monitoring database instances
in a database environment from a control environment, comprising:

15 under control of one of more computer systems configured with executable
instructions,

assigning a monitoring component of a plurality of monitoring components
in the control environment to a database instance in a database environment, the plurality
of monitoring components grouped according to one of a plurality of data zones or a
plurality of geographic locations, the database instance capable of being replicated to
20 include at least a primary instance replica and a secondary instance replica, the monitoring
component being assigned to at least one of a first data zone or a first geographical location
that is different from a second data zone or a second geographical location of at least one
of the primary instance replica or the secondary instance replica in the database
environment when the database instance is replicated;

25 causing the monitoring component to send a communication to the database
instance, the communication being sent to at least the primary instance replica when the
database instance is replicated; and

in response to receiving lease information from the database instance,
monitoring at least a status of the database instance using the monitoring component
30 during a lease period associated with the lease information,

wherein, during the lease period, other monitoring components of the
plurality of monitoring components in the control environment are prohibited from
initiating failover of the database instance upon determination of failure of the database
instance.

5. The computer-implemented method of claim 4, wherein the lease information is received from the primary instance replica only when data is synchronized between the primary instance replica and the secondary instance replica.

5 6. The computer-implemented method of claim 4, wherein the lease information is received from the primary instance replica only when a current lease exists for the database instance.

7. The computer-implemented method of claim 4, wherein the database environment includes a plurality of database instances, the method further comprising: assigning each of the plurality of monitoring components in the control environment to a portion of the plurality of database instances in the database environment in order to substantially evenly distribute workload across the plurality of monitoring components.

8. The computer-implemented method of claim 7, further comprising: assigning each of the plurality of database instances in the database environment to one of a plurality of workload partitions, wherein assigning each of the plurality of monitoring components in the control environment to a portion of the plurality of database instances comprises assigning each of the plurality of monitoring components to one of the plurality of workload partitions.

9. The computer-implemented method of claim 8, further comprising: when at least one of the plurality of monitoring components is unable to monitor a workload partition to which the at least one of the plurality of monitoring components is assigned, repartitioning the plurality of work-load partitions and reassigning a remaining group of the plurality of monitoring components to a repartitioned plurality of workload partitions.

10. The computer-implemented method of claim 8, further comprising: causing heartbeat messages to be periodically sent between the plurality of monitoring components in order to determine when the at least one of the plurality of

monitoring components is unable to monitor the workload partition to which the at least one of the plurality of monitoring components is assigned.

5 11. The computer-implemented method of claim 4, further comprising:
when the monitoring component determines that the primary instance
replica is unavailable, causing the secondary instance replica to failover to a new primary
instance replica.

10 12. The computer-implemented method of claim 4, further comprising:
storing an identifier for the monitoring component and information for the
lease period to a first block storage mechanism for the primary instance replica, the first
block storage mechanism causing the identifier and the information for the lease period to
be synchronously stored to a second block storage mechanism for the secondary instance
replica.

15 13. The computer-implemented method of claim 12, wherein the
identifier is a random long identifier.

20 14. The computer-implemented method of claim 4, further comprising:
storing state information and a data generation identifier for the primary
instance replica and the secondary instance replica, a monitoring component identifier, and
lease period information in memory for the monitoring component in the control
environment.

25 15 A system for monitoring database instances in a database
environment from a control environment, comprising:

a processor; and
a memory device including instructions that, when executed by the
processor, cause the processor to:

30 assign a monitoring component of a plurality of monitoring components in
the control environment to a database instance in the database environment, the plurality of
monitoring components grouped according to one of a plurality of data zones or a plurality
of geographic locations, the database instance capable of being replicated to include at
least a primary instance replica and a secondary instance replica, the monitoring

component being assigned to at least one of a first data zone or a first geographical location that is different from a second data zone or a second geographical location of at least one of the primary instance replica or the secondary instance replica in the database environment when the database instance is replicated;

5 cause the monitoring component to send a communication to the database instance, the communication being sent to at least the primary instance replica when the database instance is replicated; and

in response to receiving lease information from the database instance,
10 monitor at least a status of the database instance using the monitoring component during a lease period associated with the lease information,

wherein, during the lease period, other monitoring components of the plurality of monitoring components in the control environment are prohibited from initiating failover of the database instance upon determination of failure of the database instance.

15 16. The system of claim 15, wherein the lease information is received from the primary instance replica only when data is synchronized between the primary instance replica and the secondary instance replica, and a current lease exists for the database instance.

20 17. The system of claim 15, wherein the database environment includes a plurality of database instances, and the instructions when executed further cause the processor to:

assign each of the plurality of monitoring components in the control
25 environment to a portion of the plurality of database instances in the database environment in order to substantially evenly distribute workload across the plurality of monitoring components.

30 18. The system of claim 17, wherein the instructions when executed further cause the processor to:

assign each of the plurality of database instances in the database environment to one of a plurality of workload partitions.

wherein assigning each of the plurality of monitoring components in the control environment to a portion of the plurality of database instances comprises assigning each of the plurality of monitoring components to one of the plurality of workload partitions.

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19. The system of claim 18, wherein the instructions when executed further cause the processor to:

when at least one of the plurality of monitoring components is unable to monitor a workload partition to which the at least one of the plurality of monitoring components is assigned, reparation the plurality of workload partitions and reassign a remaining group of the plurality of monitoring components to a repartitioned plurality of workload partitions.

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20. The system of claim 15, wherein the instructions when executed further cause the processor to:

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store an identifier for the monitoring component and information for the lease period to a first block storage mechanism for the primary instance replica, the first block storage mechanism causing the identifier and the information for the lease period to be synchronously stored to a second block storage mechanism for the secondary instance replica.

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21. A non-transitory computer-readable storage medium storing instructions for monitoring database instances in a database environment from a control environment, the instructions when executed by a processor causing the processor to:

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assign a monitoring component of a plurality of monitoring components in the control environment to a database instance in the database environment, the plurality of monitoring components grouped according to one of a plurality of data zones or a plurality of geographic locations, the database instance capable of being replicated to include at least a primary instance replica and a secondary instance replica, the monitoring component being assigned to at least one of a first data zone or a first geographical location that is different from a second data zone or a second geographical location of at least one of the primary instance replica or the secondary instance replica in the database environment when the database instance is replicated;

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cause the monitoring component to send a communication to the database instance, the communication being sent to at least the primary instance replica when the database instance is replicated; and

in response to receiving the lease information from the database instance,
5 monitor at least a status of the database instance using the monitoring component
during a lease period associated with the lease information,

wherein, during the lease period, other monitoring components of the plurality of monitoring components in the control environment are prohibited from initiating failover of the database instance upon determination of failure of the database
10 instance.

22. The non-transitory computer-readable storage medium of claim 21,
wherein the lease information is received from the primary instance replica only when data
is synchronized between the primary instance replica and the secondary instance replica,
15 and a current lease exists for the database instance.

23. The non-transitory computer-readable storage medium of claim 21,
wherein the database environment includes a plurality of database instances, and the instructions when executed further cause the processor to:

20 assign each of the plurality of monitoring components in the control
environment to a portion of the plurality of database instances in the database environment
in order to substantially evenly distribute workload across the plurality of monitoring
components.

24. The non-transitory computer-readable storage medium of claim 23,
25 wherein the instructions when executed further cause the processor to:

assign each of the plurality of database instances in the database environment to one of a plurality of workload partitions,

when assigning each of the plurality of monitoring components in the
30 control environment to a portion of the plurality of database instances comprises assigning
each of the plurality of monitoring components to one of the plurality of workload
partitions.