ORACLE
REAL APPLICATION
CLUSTERS

COMPARIN ORACLE REAL APPLICATION CLUSTERS TO FAILOVER CLUSTERIN FOR ORACLE DATABASE

Customerswooking to remove the server as a sing e point of fai ure for their database app ications often imp ement aw c ustering so ution.wThe c uster architecture is used by both Orac e Rea App ication C usters (RAC) and Fai overw C usters and this document assumes the reader understandsw hat a c uster is. Orac e Rea App ication C usters is aw unique so ution that provides f exib e sca abi ity and high avai abi ity for database app ications.wThis so ution isw superior to the fai over c ustering that is avai ab e on most p atforms today.wFai over c ustering is a so ution thatw provides higher avai abi ity than a sing e server but the avai abi ity service eve s are ess thanw hat you can achievew ithw RAC and you do not have f exib e sca abi ity or uti ization of hardware resources that you can havew ith RAC.wAw fai over c uster is an active-passive so ution that provides high avai abi ity for database app ications by monitoring forw fai ures and restarting the database.w

FAILOVER CLUSTERIN FOR HI H AVAILABILITY

 Fai over C ustering is a so ution provided by c uster software vendors today inc uding the Orac e C usterware[1].wThew typica imp ementation of a fai over c uster is a 2-node c usterw here each node runs one or more Orac e Databases.w The database runs on on y one node at any time.wIn order not to have the second node comp ete y id ew aiting for aw fai ure, customers often run other app ications or databases on this node.wThe Orac e Database is under the contro ofw the c uster software such that it is automatica y started, stopped, and monitored by the c uster software. If thew database instance fai s, then the c uster softwarew iwrecognize the fai ure and restart the instance oftenw ithoutw operator know edge.wIf the node fai s, then the storage, database instance and any other dependent processes are fai edw over to the other node in the c uster and restarted.wThe app ication experiences down time for the period of time itw takes the c uster to recognize the fai ure, reconfigure the c uster, comp ete the fai over.wDepending on the size andw comp exity of the environment, this can take any where from 1-2 minutes to 20 or 30 minutes or more.wIf the secondw node (the node tow hich you fai ed over to) is a ready runningw ork, this node may become over oaded and the servicew eve degraded for the period of the outage. To provide comp ete coverage for a server outage, you must buy twice thew resource requirements of your app ications.w

ORACLE REAL APPLICATION CLUSTERS

A RAC database is a c ustered database.wA c uster is a group of independent servers that cooperate as a sing e system.w C usters provide improved fau t resi ience and modu ar incrementa system growth over sing e symmetric mu ti-w processor (SMP) systems. In the event of a system fai ure, c ustering ensures high avai abi ity to users. Access tow mission critica data is not ost. Redundant hardware components, such as additiona nodes, interconnects, and disks, w a ow the c uster to provide high avai abi ity. Such redundant hardware architectures avoid sing e points-of-fai ure andw provide exceptiona fau t resi ience.wA c ustered database is a sing e database that can be accessed by mu tip e instancesw concurrent y.wEach instance runs on a separate server in the c uster.wThe advantages and the rea inte igence of aw c uster usedw ithin a RAC environment comes inw ith the database software itse f.w

If the database instance fai s, you have not ost access to the database.wThe app ication does not experience an outage.w On y a subset of users (those connected to the fai ed instance) is affected by the fai ure.wThis outage can be easi y w masked to the end user using the advanced features providedw ith RAC (Fast App ication Notification) and the Orac ew c ients (Fast Connection Fai over).wThe instance fai ure is recognized by another instance in the c uster and recovery w automatica y takes p ace.wThe Orac e C usterware monitors the instance and automatica y restarts itw hen a fai urew occurs.w

Orac e C usterware is inc udedw ith Orac e Database 10g.wOrac e C usterware is a portab e c usterware that is tight y w integratedw ith Orac e RAC to provide a comp ete so ution for your database app ication.wOrac e RAC 10g supportsw up to 100 nodes in the c uster and up to 100 instances in the RAC database.wThe management and monitoring of thew

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[1] See Using Orac e C usterware to Protect a Sing e Instance Orac e Database (PDF) w

http:// w .orac e.com/techno ogy/products/database/c ustering/pdf/ocsing einstance.pdfw

Orac e resources (VIP, istener, database, services) in the c uster are inc uded out of the box.wAn API is inc uded forw customers to add additiona processes to be managed by Orac e C usterware to keep them high y avai ab e².w

A ongw ith the higher avai abi ity, RAC provides youw ith f exib e sca abi ity.wInstead of having to size a sing e serverw to support your app ication oad, RAC a ows you to spread the oad across mu tip e servers that have been c usteredw together.wWhen additiona resources are required, additiona nodes and instances can be easi y added to the c usterw ith no downtime. A RAC database can sca e to 100 instances.wApp ications do not have to be changed to use RAC.w

RAC sca abi ity a ows you to take advantage of the cost savings of using sma er servers c ustered together to providew the resource requirements of your app ication.wA arger c uster of sma er servers reduces the impact of a server fai ure.w If there are 2 nodes in a c uster and one fai s, you havewost 50% of your resources and 50% of your users arew impacted. If you ose 1 node in a c uster of 10 nodes, you have on y ost 10% of your processing power and on y 10%w of your users are affected.wA so to provide the same eve of resource to the app ication during a fai ure, you on y needw 10% additionawresources.w

CONCLUSION

Orac e ReawApp ication C usters has been designed for high avai abi ity and sca abi ity. By providing protection fromw hardware and software fai ures, Orac e Rea App ication C usters provides systems avai abi ity ensuring continuous dataw access. Its sca e out and sca e up features offer a p atform, which can grow in any direction a owing enterprises tow grow their businesses.wExisting app ications asw ewas new y deve oped app ications benefit from the transparency w Orac e Rea App ication C usters provides. App ication deve opment asw ewas administration and change managementw thus become much easier a owing reduction in tota cost of ownership. Orac e Rea App ication C usters is unique tow the marketw ith its offering and capabi ities.wRAC is used by thousands of customersw or dwide in awindustries inw mission criticawand many other app ication environments.w

For more in orm tion on using RAC: otn.or cle.com/r c

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² See Using Orac e C usterware to Protect Third Party App ications –w

http:// w   .orac e.com/techno ogy/products/database/c ustering/pdf/twp_orac ec usterware3rdparty%5B1%5D.pdfw

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