Tech Note 667
Supported Redundancy Configuration for Enhanced Failover Performance

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Introduction

Currently, ArchestrA AppEngine redundancy configuration is fixed in a sense that it always requires a pair of platforms, and a dedicated network connection called RMC (via Ethernet crossover cable). While it is straightforward and easy to set up, the failover performance of a redundancy has often run into the following inconveniences, or even problems:

- The number of platforms enabled for Redundancy within a galaxy has to be even because redundancy always requires a pair.

- The time for a complete, successful failover depends on the number of redundant AppEngines and the number of objects running each AppEngine. As the number of redundant AppEngines and objects grows, the failover can take a long time to complete.

- For a large system, unless with parameters optimized and ample system resources available, failover success rate is unpredictable.

- For a large system, particularly when there are a lot of redundant AppEngines, potential performance issues can arise. For example, high CPU usage, AppEngines failing, etc. can occur after all AppEngines have failed over to one of the redundant platform pair. Failover can occur when one of the pair goes down unexpectedly or is shut down for scheduled maintenance.
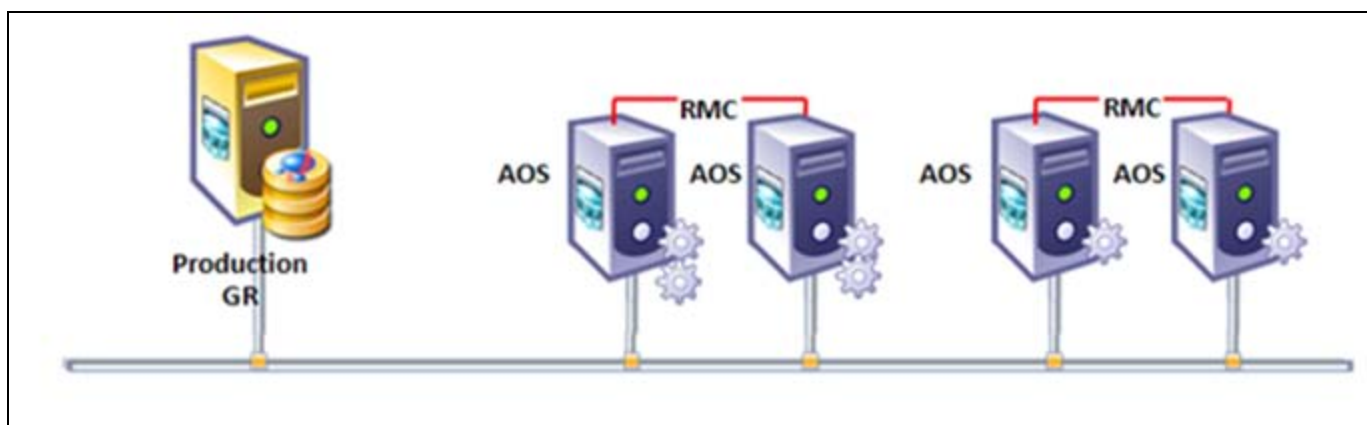

FIGURE 1: RMC NETWORK CONNECTION-PAIR CONNECTED BY A CROSSOVER CABLE

Application Versions

- Wonderware Application Server 3.0 and later

A Novel Redundancy Configuration

With **Auto-MDIX** networking technology becoming a standard, the Ethernet crossover cabling requirement for RMC is becoming obsolete. When network interfacess are built in with this technology, two of the RMC's configuration constraints are gone:

- Ethernet crossover cable.

- Connection between a pair.

Instead, all platforms with RMC can be connected via a single network through a switch (Figure 2 below).

Considerations

- You must make sure that **Auto-MDIX** technology is already embedded in the network interface and in-situ configuration be done correctly to ensure the proper function of this feature.

- You must ensure the speed of the RMC network is at least 16 Mbps, and the network is dedicated to RMC, not to any other network traffic.

- If the distance of the prospective RMC network cable (between any two redundant nodes) is longer than 300 feet, consider using fiber optic cable instead.

- For a redundant RMC network, you must apply suitable hardware, such as NIC, switch, as well as required software (driver).
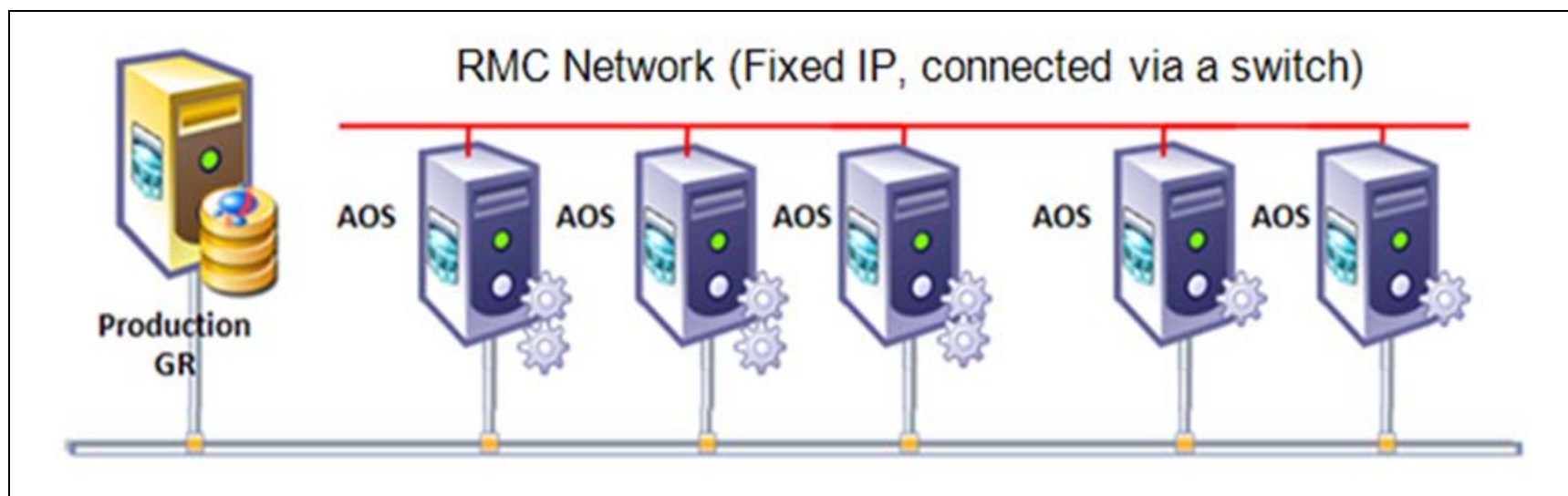
FIGURE 2: RMC NETWORK CONNECTION VIA A SWITCH

The significance of this change is that now, for each platform with Redundancy enabled, its partner platform is no longer limited to the one designated by the RMC connection via the crossover cable. All other platforms in the RMC network are its partners as enabled by the new RMC network.

The following matrix is an example how backup AppEngines can be distributed among the partner platforms for each platform hosting the primary AppEngines.

Platform \ AppEngines	Engine1	Engine2	Egnine3	Engine4	Engine5	Engine6	Engine7	Engine8	Engine9	Engine10	Engine11	Engine12	Engine13	Engine14	Engine15	Engine16	Engine17	Engine18	Engine19	Engine20
A	P	P	P	P				B			B			B			B			
B	B				P	P	P	P				B			B			B		
C		B			B				P	P	P	P				B			B	
D			B			B			B				P	P	P	P				B
E				B			B			B			B				P	P	P	P

FIGURE 3: REDUNDANT APPENGINE DISTRIBUTION ON MULTIPLE PARTNERS

Enhancement of Redundancy Performance

- When a platform is lost by accident or shut down for maintenance, with multiple redundant AppEngines running on the platform, failover is much faster.

- Risk of overload on the backup platform is greatly reduced because of multiple partners sharing the load after failover.

- The AppEngines will not be totally lost even there are two or more platforms lost. With redundant platforms in a pair, the AppEngines will be totally lost if both of the pair are lost.

- Because of the fast failover, the success rate of the failover is greatly enhanced.

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For technical support questions, send an e-mail to **support@wonderware.com**.

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