



IBM Software Group

# IBM® WebSphere® Application Server V7

## *Single-instance resource adapters*



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This presentation will discuss single-instance resource adapters for WebSphere Application Server V7.0 on z/OS®.



## Single instance resource adapters

- New option restricts a particular ResourceAdapter to a single runtime instance
  - ▶ Some RA implementations cannot tolerate multiple instances
- Two instances of a ResourceAdapter cannot reside in the same JVM if it has the “single instance” option selected
  - ▶ Two RA instances are the same (equal) if their RA class names are equal



WebSphere Application Server offers high-availability failover for peer recovery of application servers. This solution requires multiple ResourceAdapter instances, but some resource adapter implementations cannot tolerate multiple ResourceAdapter instances. This feature provides a means for the WebSphere Application Server to run with single instances of user-specified Resource Adapters.

Before this feature, installation of a resource adapter implied no cardinality to the deployer. Now there is a choice to impose a restriction of a single runtime instance in the JVM on a particular resource adapter. The configuration options are:

1. For singleton resource adapters, recovery and runtime share the same resource adapter instance. There is not a singleton created for recovery and then a singleton created for runtime (that is. serial existence).
2. A resource adapter can be configured so that multiple instances can be created at runtime, allowing runtime and recovery instances to coexist.

If configured on the same server, and two applications have embedded the same ResourceAdapter or one application embeds the ResourceAdapter and the same ResourceAdapter is installed in the server as a stand-alone ResourceAdapter, even if some of their configuration attributes are different, the two resource adapter instances are the same (equal) if their resource adapter class names are equal, then a ResourceException is thrown. A user may avoid this restriction by deselecting “single instance” on all equivalently-configured ResourceAdapters.

## Configuring a single-instance RA

**Resource adapters**

[Resource adapters](#) > [RA1](#) > **Advanced resource adapter properties**

Use this page to manage advanced resource adapter properties.

Configuration

**General Properties**

Restrict the JVM to allow only one instance of the resource adapter

Register this resource adapter with the high availability manager

Endpoint failover

Resource adapter instance failover

Single instance resource adapters © 2008 IBM Corporation

Single instance resource adapters can be configured after a RAR is installed, either stand-alone or embedded in an application, using the administrative console or scripting. A new check box, specific to each Resource Adapter, will indicate that only a single instance of the resource adapter is created at run-time. By default, the check box is unchecked, indicating that there is no restriction on the resource adapters cardinality. For efficient server startup, leave the check box unchecked, unless it is determined that the resource adapter requires single instance behavior.

This can also be enabled by setting the “singleton” attribute to “true” on a resource adapter using wsadmin.

It does not make sense to install more than one single instance resource adapter, but logic is provided to detect sets of equal resource adapters and issue error messages if the singleton request is or is about to be violated.

## Error conditions

- The following conditions will cause an error:
  - ▶ Second attempt to start a single-instance resource adapter
  - ▶ Standalone resource adapter and embedded version of same resource adapter, with only one configured as single instance
- A resource adapter that has been stopped (using Mbean operation) can prevent XA recovery from proceeding until the resource adapter is re-started



If you are checking for an existing ResourceAdapter which does currently exist on the server, but has been stopped, perhaps using an MBean action, then an exception is thrown to the transaction service indicating that the ResourceAdapter is currently stopped and must be restarted before transaction recovery can continue.

If one resource adapter is configured to allow multiple runtime instances and the other resource adapter is configured for a single runtime instance, the end result is the same as if **both** resource adapters had been configured as single runtime instances. That is, the first one to be started will run and the second one is prevented from starting.

## Summary

- This presentation has covered single-instance resource adapter enhancements provided by WebSphere Application Server V7.0



This presentation has reviewed the single-instance resource adapter enhancements available in WebSphere Application Server for z/OS V7.

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