



IBM Software Group

## **IBM® WebSphere® Extended Deployment V6.1.0.1**

### ***WebSphere Virtual Enterprise***

*Formerly Operations Optimization*

### ***WebSphere Application Server Community Edition support***



@business on demand.

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This presentation will provide an overview of the enhanced support for WebSphere Application Server Community Edition included in WebSphere Extended Deployment Version 6.1.0.1

This module was originally recorded for WebSphere Extended Deployment Operations Optimization, which is now called WebSphere Virtual Enterprise. Though the module uses the previous names, the technical material covered is still accurate.

## Agenda

- Overview
- Architecture
- Details
- Summary



This presentation will introduce WebSphere Application Server Community Edition, then cover the enhanced support for this server that is provided in WebSphere Extended Deployment Version 6.1.0.1.

## Community Edition

- WebSphere Application Server Community Edition Support
  - ▶ Lightweight Java EE application server
  - ▶ Available free of charge from developerWorks®
  - ▶ Built on Apache Geronimo technology
  - ▶ Uses open-source tools
    - Eclipse
    - Apache Tomcat
    - Apache Derby
  - ▶ Technical support available through annual subscription



Beginning with version 6.1.0.1, WebSphere Extended Deployment provides full life cycle support for IBM® WebSphere Application Server Community Edition™ servers and applications. WebSphere Community Edition is a lightweight Java™ EE 5 application server available free of charge from IBM® developerWorks. This free server offering is built on Apache Geronimo technology, and provides a foundation for developing and deploying Java applications using open-source tools such as Eclipse, Apache Tomcat, and Apache Derby. Though the server itself is free, technical support is available through an annual subscription.

## Section

# *Architecture*



This section will cover WebSphere Extended Deployment runtime support enhancements for WebSphere Application Server Community Edition middleware servers.

## Server life cycle support

- Three Categories of Support for Other Middleware Server Types:
  - ▶ Complete life cycle management
  - ▶ Assisted life cycle management
  - ▶ Generic life cycle management



WebSphere Extended Deployment version 6.1 adds support for many of the Extended Deployment advanced features to other middleware server types. Version 6.1 provides three levels of support based on the amount of information that Extended Deployment knows about the specific server type. The different levels of support are complete, assisted, and generic life cycle management for both servers and applications.

## Server life cycle support

- Complete life cycle support
  - ▶ Server creation and deletion
  - ▶ Application deployment and removal
  - ▶ Application version management
- Available to both complete and assisted life cycle servers
  - ▶ Automated on demand router configuration
  - ▶ Quality of service capabilities
  - ▶ Dynamic operations support (on-demand router, health monitoring, application placement)



Complete life cycle management includes the ability to create and remove server instances, configure the servers, and install applications to the servers with full edition management support. WebSphere Extended Deployment version 6.1 provides complete life cycle support for selected middleware server types.

For other middleware types WebSphere provides assisted and generic life cycle support. Extended deployment can start and stop these server instances and provide advanced routing through the on demand router. WebSphere Extended Deployment does not provide configuration administration for these servers, and cannot install applications on them. You must create representations of the unmanaged applications running in these servers so the on demand router can route requests to them.

## WebSphere Community Edition support

- Servers and applications
- Assisted life cycle support
  - ▶ For pre-existing WebSphere Community Edition servers and applications
- Full life cycle support
  - ▶ WebSphere Extended Deployment V6.1.0.1
  - ▶ WebSphere Community Edition V2 servers created by the WebSphere Extended Deployment administrative console
  - ▶ Applications when deployed through the administrative console
- Deployment supports .car, .ear, and .war files
- Application plans can be packaged within the application archive



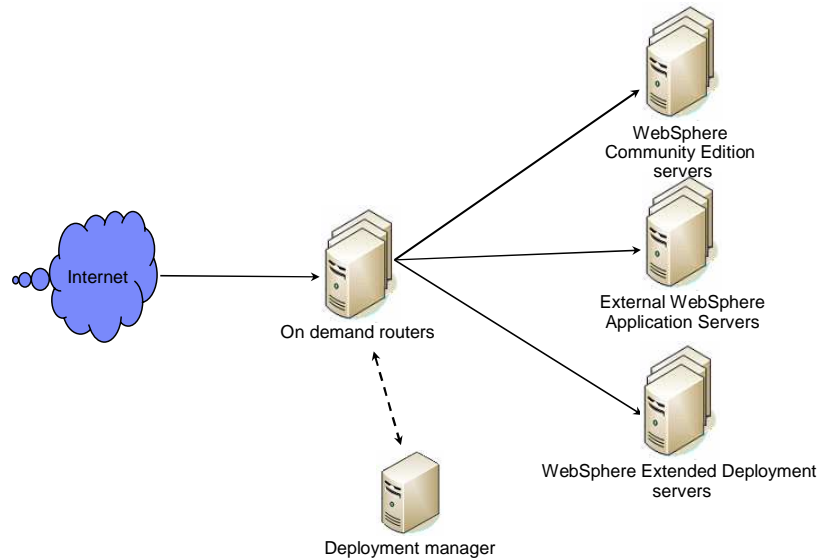
Both WebSphere Extended Deployment V6.1 and V6.1.0.1 support pre-existing WebSphere Community Edition V1 and V2 servers with “assisted” server and application life cycle management. The WebSphere Extended Deployment administrative console can create and maintain *representations* of pre-existing WebSphere Community Edition servers and applications for control and routing purposes, but does not actually define or delete the server or applications on the WebSphere Community Edition platform. For example, in the case where a server representation is deleted from the WebSphere Extended Deployment administrative console, the WebSphere Community Edition server remains deployed in its installation and can continue to function. WebSphere Extended Deployment will have no knowledge of the server and on-demand routers will no longer route traffic to it.

Beginning in version 6.1.0.1, WebSphere Extended Deployment provides “full” server and application life cycle management for WebSphere Community Edition V2 and above servers and applications when they are deployed through the WebSphere Extended Deployment administrative console.

In both cases, Extended Deployment on-demand routers can route work to applications on your WebSphere Community Edition servers using advanced routing rules. In addition, dynamic operations support for WebSphere Community Edition can extend the qualities of service provided by WebSphere Application Server. For example, health monitoring is available as is improved resource management through the application placement controller.

The WebSphere Extended Deployment application deployment supports WebSphere Community Edition applications packaged as .car, .ear, and .war archive types. Application plans specific to the WebSphere Community Edition deployment can be supplied within the application archive file.

## Runtime topology



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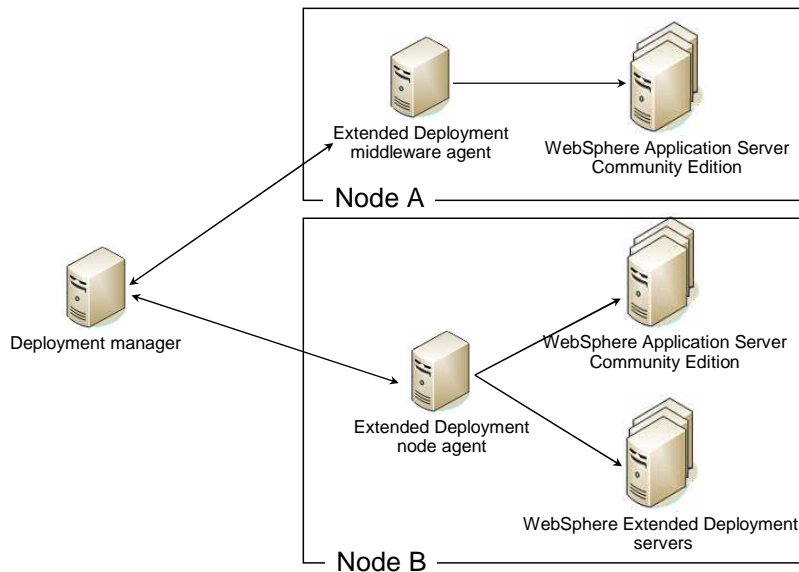
WebSphere Application Server Community Edition

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As this diagram shows, the on demand router is capable of routing requests, not only to WebSphere Application Server managed servers, but also to WebSphere Community Edition servers, external WebSphere Application server, and other HTTP endpoints. The on demand router retrieves information about servers and applications that are active in the cell, allowing it to accurately route HTTP requests to those application servers which are currently running.



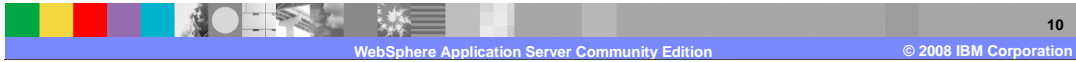
## Management topology



The Extended Deployment middleware agent for operations optimization plays a pivotal role in enabling the deployment manager to communicate with WebSphere Community Edition servers in the cell. As this diagram illustrates, the deployment manager can manage, monitor and communicate with WebSphere Community Edition servers through the middleware agent. Note that a WebSphere Extended Deployment node agent is augmented with the middleware agent framework and can interact with WebSphere Community Edition servers in a mixed environment. A middleware agent can run on any platform supported by WebSphere Extended Deployment, and does not require WebSphere Application Server on that node. The middleware agent framework performs many of the same functions for WebSphere Community Edition servers as the WebSphere node agent performs for WebSphere managed servers, such as monitoring, configuration synchronization, and server maintenance.

## Section

### *Details*



This section will describe how you can use WebSphere Extended Deployment to manage WebSphere Community Edition applications and servers.

## Server management

- Provide basic control of the WebSphere Community Edition server from the WebSphere Administration system
  - ▶ For WebSphere Community Edition V2, create and delete servers
  - ▶ Start, stop, and restart of the server
  - ▶ Auto-restart on failure
  - ▶ Monitoring
    - Current status and some performance metrics
  - ▶ Central configuration control
    - Managed WebSphere Community Edition configuration files



Using the administrative console or scripting you can create a WebSphere Community Edition V2 server instance, list all WebSphere Community Edition servers, start or stop WebSphere Community Edition servers, remove a WebSphere Community Edition V2 server, or monitor performance metrics for your WebSphere Community Edition servers. You can also edit WebSphere Community Edition server configuration files from the WebSphere Extended Deployment administrative console. The WebSphere Community Edition configuration files are stored as part of the WebSphere cell configuration and distributed to the target nodes as part of node synchronization.

## Automated discovery support

- Provided in deployment manager and middleware agent
- Allows WebSphere Extended Deployment to build assisted life cycle server representations of pre-existing servers
  - ▶ WebSphere Application Server Community Edition
  - ▶ Apache Runtime
- Depends on information in “Middleware descriptors” page to function properly
- Runs at intervals after middleware server startup based on a configurable “Discovery interval”
- Can be turned off



The WebSphere Extended Deployment V6.1.0 deployment manager and node agents include an automated discovery service that allows WebSphere Extended Deployment to automatically identify installations of selected middleware server types. When the discovery service finds a known server installation it will create an assisted life cycle server representation within the Extended Deployment cell for existing middleware servers.

WebSphere Extended Deployment V6.1 can automatically discover PHP servers, and Apache Web Servers. V6.1.0.1 adds discovery for existing WebSphere Application Server Community Edition V2 and above servers.

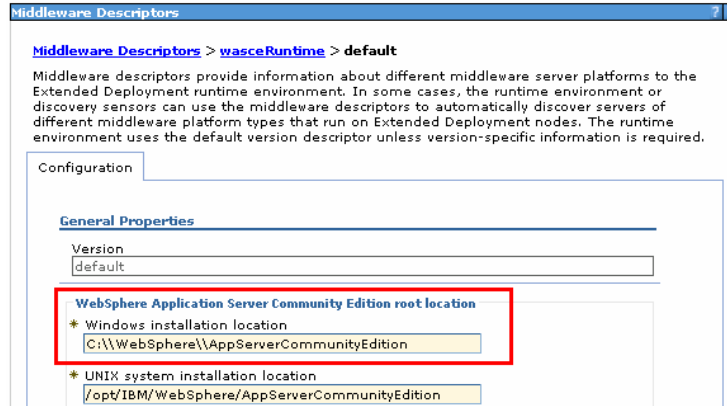
Note that in V6.1.0.1 you can define full life cycle WebSphere Community Edition servers within the administrative console. This means that you can both create and remove WebSphere Community Edition server instances using the WebSphere Extended Deployment administrative console. But servers representations that result from the “discovery” of a pre-existing server, or that result from the manual definition of a pre-existing server, function as assisted life cycle servers.

The discovery service automatically looks for the eligible server installations when the middleware agent is started on the remote computer. While the agent is running, the discovery service runs periodically based on the “Discovery interval” configured on the “Middleware descriptors” panel. A discovery interval of -1 turns automated discovery off.

Once a server is found, the middleware agent sends the server configuration information back to the deployment manager and creates a server representation within the

## Middleware descriptors

- Must know the root location of WebSphere Community Edition installation
- Provided by “default” setting
  - ▶ On middleware descriptors page



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WebSphere Application Server Community Edition

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Discovery can only function if the information in the Middleware descriptors for the associated server product is accurate. For example, for WebSphere Community Edition servers, you must ensure that the default settings associated with WebSphere Community Edition Runtime entry within the Middleware descriptors page accurately reflects the possible installation locations for WebSphere Application Server Community Edition on the remote nodes. Default values are provided but must be modified for customized installations, such as non-default directory locations. The “root location” can specify multiple directory locations to check. For Windows installations the directories are separated by semi-colons; for UNIX systems the directories are separated by colons.

A typical example of the use the Middleware descriptors page is shown here for a WebSphere Application Server Community Edition installation. Using the Windows installation location as an example, the default setting must be modified within WebSphere Extended Deployment because the WebSphere Community Edition was not installed in the default location on the target server platform.

If the correct installation location is not specified, discovery will not be able to find pre-existing servers and definitions of new server instances on the WebSphere Community Edition target platform will not operate properly.

## Application management

- Centrally manage and control applications hosted on WebSphere Community Edition servers
  - ▶ Install, uninstall
  - ▶ Application file distribution to clusters of servers
  - ▶ Monitoring
    - Status, basic performance metrics
- Application edition management features
  - ▶ Extended to WebSphere Community Edition applications
  - ▶ Interruption-free rollout
  - ▶ Concurrent activation
  - ▶ Validation mode



Once the WebSphere Community Edition server has been added to your configuration you can deploy WebSphere Community Edition applications. Those applications are fully managed by WebSphere Extended Deployment, providing many of the same application management capabilities for WebSphere Community Edition applications that are provided for Java EE applications deployed on WebSphere servers. These capabilities include edition management support for concurrent activation of multiple application editions and interruption-free rollout of new editions.

## Automated router configuration

- Routing information for WebSphere Community Edition servers is automatically learned by the on demand router
  - ▶ On demand configuration
  - ▶ WebSphere Community Edition applications are automatically discovered by the appropriate on demand routers in the topology
  - ▶ Administrator does not have to enter all endpoint and URL information to configure routing behavior of the on demand router



The on demand configuration is a component of the on demand router that enables it to remain “aware” of the cell’s runtime environment. The on demand configuration automatically retrieves information about WebSphere Extended Deployment application servers and applications that are deployed in the cell. It also dynamically configures routing rules at runtime to allow the on demand router to accurately route HTTP requests to those application servers which are currently running. The on demand configuration functionality has been extended to include WebSphere Community Edition servers, so work can be routed by the on demand router to WebSphere Community Edition applications in your environment.

## Dynamic operations support

- Dynamic operations environment
  - ▶ Support for WebSphere Community Edition servers
  - ▶ Dynamic cluster and application placement support to enable capacity control based on workload
  - ▶ Health management and monitoring to enable WebSphere Community Edition servers to be monitored for
    - Corrective actions
    - Preventive actions
  - ▶ Quality of service
    - Service policies
    - Response time goals



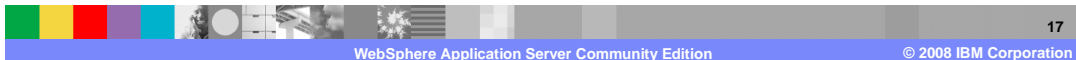
WebSphere Extend Deployment provides full dynamic operations support for WebSphere Application Server Community Edition Servers. This includes dynamic clusters with application server placement support to enable capacity control based on workload. To ensure that individual nodes do not become overloaded the application placement controller can start or stop WebSphere Community Edition servers that are part of a dynamic cluster. The autonomic request flow manager component of the on demand router dynamically adjusts the rate at which requests flow through to WebSphere Community Edition servers to ensure that response time goals are met, and that no WebSphere Community Edition server is sent more requests than it can handle. Extended Deployment's Health management and monitoring capabilities can monitor WebSphere Community Edition servers for problems, such as excessive response time, and take automatic actions to correct the condition.



## Centralized Installation Manager

- Can install WebSphere Community Edition
- Create WebSphere Community Edition20 directory under Centralized Installation Manager repository
- Copy installation package file to WebSphere Community Edition20 directory
  - ▶ Example:

```
copy wasce_ibm150sdk_setup-2.0.0.1-ia32win.zip
C:\<was_root>\cimrepos\WebSphere Community Edition20\*
```
- WebSphere Community Edition appears as an installation package in Centralized Installation Manager



WebSphere Extended Deployment V6.1.0.1 provides you the ability to install WebSphere Application Server Community Edition V2.0 using the Centralized Installation Manager. Doing so requires some manual steps to add the WebSphere Community Edition install image to the Centralized Installation Manager repository.

To install WebSphere Community Edition using the Centralized Installation Manager, you must first create a directory in the Centralized Installation Manager's repository called "WebSphere Community Edition20". Download the WebSphere Community Edition product from developerWorks and copy the installation package into this directory. DeveloperWorks includes WebSphere Community Edition packages for multiple target environments, with and without an included SDK. You can include multiple images in the "WebSphere Community Edition20" directory.

WebSphere Application Server Community Edition will appear as an installation package in the Centralized Installation Manager. You can select the installation package, locate eligible target nodes, and install the product, even if WebSphere Extended Deployment is not installed on the target node.

## Restrictions

- Servers and applications managed by WebSphere Extended Deployment administrative console should not be concurrently managed by WebSphere Community Edition administrative console
- WebSphere Community Edition basic server must not be modified if you plan to create full life cycle servers on that target platform
  - ▶ Complete life cycle server creation from WebSphere Extended Deployment depends upon basic server definition that was created during WebSphere Community Edition installation
  - ▶ Basic server
    - Must not have additional applications installed on it
    - Must not be modified
- Dynamic cluster of discovered WebSphere Community Edition servers requires servers to be homogeneous in nature
  - ▶ Contain same applications and version of WebSphere Community Edition



WebSphere Extended Deployment V6.1.0.1 does have some support restrictions for WebSphere Community Edition.

Application Server Community Edition provides an administrative console for each server that is deployed. However, you should not manage a WebSphere Community Edition server or application using the WebSphere Community Edition administrative console if you are also managing that server or application from the WebSphere Extended Deployment administrative console, or managing the server with WebSphere Extended Deployment autonomic facilities.

New servers for a WebSphere Community Edition V2 target platform can be defined from the WebSphere Extended Deployment V6.1.0.1 administrative console. These new or “stacked” servers use the basic server installed on the target platform as a template during the creation process. Therefore you must not modify the basic server or install new applications onto the basic server, if you plan to create new WebSphere Community Edition servers on the target platform.

If you include discovered WebSphere Community Edition servers into a dynamic cluster, the WebSphere Community Edition servers must be homogeneous in nature, with all servers containing the same applications and running the same release of WebSphere Community Edition.

## Restrictions

- **Work classes**
  - ▶ WebSphere Extended Deployment administrative console workclass HTTP editor can not detect HTTP patterns within the .war file for middleware applications
    - You can use “Custom HTTP pattern” to add additional HTTP patterns
- **Application plans**
  - ▶ WebSphere Extended Deployment administrative console cannot deploy application plan as a separate deployment object
  - ▶ Application plan must be made part of the application archive



The work class editor in WebSphere Extended Deployment, used for creating work classes for Service and Routing Policies, might not locate the context root within the application archive when deploying WebSphere Community Edition applications. You can add this information using the “Custom HTTP pattern” section of the work class editor page.

The WebSphere Extended Deployment administrative console does not support the separate deployment of a WebSphere Community Edition “application plan” object, even though this is supported by WebSphere Community Edition administrative console. However, if you embed the application plan within the application archive, the WebSphere Community Edition server will deploy the application plan along with the application.

## Support restrictions

- **Server startup synchronization**
  - ▶ If no failures occur after a set period of time, the administrative console will indicate server “Started”
  - ▶ Server may not be fully initialized
    - Mitigation: set a Custom Property for the WebSphere Community Edition servers
      - ServerStartupTimeoutMillis – time to wait before assuming failure
      - ServerInitializedTimeoutMillis – time to wait before reporting success
  - ▶ To see actual server status
    - Manual “refresh” in administrative console
    - After server fully initialized



Finally, if you start a WebSphere Community Edition server from the WebSphere Extended Deployment administrative console, WebSphere Extended Deployment will wait for a default period of time for the server to start. Unless errors are reported during that default timeout period, WebSphere Extended Deployment will display the WebSphere Community Edition server as “Started”. It is possible the WebSphere Community Edition server might not be fully initialized, which means a small window of time can exist where WebSphere Extended Deployment displays the server as “Started” when in fact the server is still initializing. This issue is more likely to occur if you start a list of WebSphere Community Edition servers from the administrative console at the same time. Several customer properties are available to tune the agent’s timeout values for your environment. After the WebSphere Community Edition server startup completes, the actual server status is available if you “refresh” the server entry in the administrative console, either by refreshing the server entry list or by hovering the cursor over the status icon.

## Summary

- WebSphere Extended Deployment V6.1 has extended first class support to WebSphere Application Server Community Edition servers from within the WebSphere environment.
  - ▶ Basic control of the WebSphere Community Edition server from the WebSphere Administration system
  - ▶ Server start, stop, restart
  - ▶ Full dynamic operation support
  - ▶ Visualization and management tools
  - ▶ Health monitoring
  - ▶ Application management
  - ▶ Central configuration control
  - ▶ Managed WebSphere Community Edition conf files



WebSphere Extended Deployment version 6.1 extends dynamic operations and advanced manageability to WebSphere Application Server Community Edition servers. The support enables simple tasks like starting or stopping a WebSphere Community Edition server or managing applications through the administrative console, and supports more advanced tasks like health monitoring, use of visualization tools, and application edition rollout.

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