



# WebSphere Application Server V8.5 Scripting and Automation

**WA680 (Classroom)**  
**ZA680 (Self-paced)**

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## Highlights

- Intermediate training for administrators
  - Introduction to wsadmin command environment
  - Covers IBM Assembly and Deploy Tools for WebSphere Administration (IADT)
  - Explains WebSphere Application Server configuration model and programming APIs
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## Course description

This 5-day course teaches you the skills that are required to automate the administration of a WebSphere Application Server V8.5 environment.

Most administrative tasks are multi-step and repeatedly used, and GUI-based administration tools can quickly become impractical and even a burden. WebSphere Application Server offers a collection of tools and technologies that you can use to create automated scripts, facilitating system administration.

The course describes the scripting facilities in WebSphere Application Server and teaches you how to use the Jython language with WebSphere administrative objects to develop scripts that automate common administrative tasks.

Hands-on exercises throughout the course reinforce lecture content and give you practical experience with the WebSphere Application Server V8.5 scripting environment. Exercises include tasks such as creating and configuring an application server environment, installing and configuring the IBM HTTP Server, and automating the installation of WebSphere Application Server.

For information about other related WebSphere courses, visit the WebSphere Education Training Paths website:

[ibm.com/software/websphere/education/paths/](http://ibm.com/software/websphere/education/paths/)

## General information

### Delivery method

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Classroom or self-paced virtual classroom (SPVC)



## Course level

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ERC 1.0

## Product and version

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WebSphere Application Server version 8.5

## Audience

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This course is designed for systems integrators, administrators, architects, and developers who use WebSphere Application Server to configure, administer, or architect solutions.

## Learning objectives

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After completing this course, you should be able to:

- Describe the support in WebSphere Application Server for scripting and automation
- Use Jython and the IBM Assembly and Deploy Tools (IADT) to develop automated scripts
- Identify the administrative objects and programming APIs needed for administrative scripting
- Use the wsadmin tool to prototype and run scripts
- Write scripts to automate common WebSphere Application Server administration tasks
- Describe the use of Ant to automate tasks
- Use Jython scripting to submit jobs to the job manager

## Prerequisites

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Before taking this course, you should have a thorough understanding of the topologies and runtime administration of WebSphere Application Server Network Deployment environments. You can gain this knowledge through experience or by completing one of the following courses:

- WU805 or VU805, *Transition to WebSphere Application Server V8.5 for Administrators*
- WA585 or VA585, *WebSphere Application Server V8.5 Administration*

## Duration

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5 days

## Skill level

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Intermediate

## Classroom (ILT) setup requirements

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Processor	Pentium 4
GB RAM	3
GB free disk space	60
Network requirements	None
Other requirements	None

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## Notes

The following unit and exercise durations are estimates, and might not reflect every class experience. If the course is customized or abbreviated, the duration of unchanged units will probably increase.

This course is an update of the following previous courses:

- WA661 or VA661, *IBM WebSphere Application Server V6.1 Scripting and Automation*

## Course agenda

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### Course introduction

Duration: 30 minutes

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### Unit 1. Introduction to scripting

Duration: 30 minutes

Overview	This unit introduces scripting, and explains when and why it should be used.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"> <li>• Define the purpose of scripting</li> <li>• Describe the benefits of automation</li> <li>• Identify common administrative tasks that are good candidates for scripting</li> </ul>

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### Unit 2. WebSphere Application Server administrative concepts and architecture

Duration: 30 minutes

Overview	This unit provides an overview of the WebSphere Application Server architectural components that are important to system administration.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"> <li>• Describe the overall architecture of WebSphere Application Server V8.5</li> <li>• Explain the administration model</li> <li>• Identify basic command-line commands that are used for administration</li> </ul>

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### Unit 3. WebSphere Application Server scripting facilities

Duration: 30 minutes

Overview	This unit introduces the tools, languages, administrative objects, and APIs that comprise the scripting facilities in WebSphere Application Server.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"> <li>• Describe the scripting tools that are available in WebSphere Application Server V8.5</li> <li>• List the supported scripting languages</li> <li>• Identify the administrative objects</li> <li>• Explain the WebSphere Application Server configuration model</li> </ul>

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**Unit 4. Using wsadmin**  
**Duration: 30 minutes**

Overview	This unit describes the wsadmin scripting tool and explains how to use the Help Administrative object.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Describe the features and usage of wsadmin</li><li>• Explain the usage of the Help Administrative object</li></ul>

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**Exercise 1. Using wsadmin to explore the WebSphere Application Server environment**  
**Duration: 1 hour**

Overview	In this exercise, you learn about the command-line invocation of the wsadmin tool in its three supported modes: interactive, one command at a time, and by using a Jython script file. You use commands that query the WebSphere Application Server environment to discover its configuration, such as how many servers are available, what applications are installed, and what resources are defined. This exercise also provides a first look at the Jython syntax and the basic functions of the Administrative objects.
Learning objectives	After completing this exercise, you should be able to: <ul style="list-style-type: none"><li>• Invoke wsadmin in its three supported modes</li><li>• Execute simple commands that use the Jython syntax</li><li>• Execute simple commands that use the Administrative objects to query the WebSphere Application Server environment</li></ul>

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**Unit 5. Jython basics**  
**Duration: 1 hour and 30 minutes**

Overview	This unit provides a primer of the Jython programming language.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Describe the basic elements of Jython</li></ul>

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**Unit 6. Jython development by using the IADT**  
**Duration: 40 minutes**

Overview	This unit provides an overview of the IBM Assembly and Deploy Tools (IADT) and describes the tool features used for Jython development.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Provide an overview of the IBM Assembly and Deploy Tools (IADT)</li><li>• Describe the IADT features that are used for Jython development</li></ul>

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**Exercise 2. Using the IBM Assembly and Deploy Tools (IADT) to develop Jython scripts**  
**Duration: 30 minutes**

Overview	In this exercise, you create, debug, and run a Jython script by using the IADT. You extend the scripts from Exercise 1 (which only queried the WebSphere environment) by modifying simple resource attributes (such as changing the description of the PlantsByWebSphere data source).
Learning objectives	After completing this exercise, you should be able to: <ul style="list-style-type: none"><li>• Create, debug, and run Jython scripts in the IADT</li><li>• Use the development tool aids provided by the IADT</li><li>• Explore other functions of the Administrative objects</li></ul>

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**Unit 7. Administrative object basics: Help and AdminConfig**  
**Duration: 45 minutes**

Overview	This unit describes the purpose and common usage of the Help and AdminConfig objects.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Describe how to use the Help object</li><li>• Describe the steps that are involved in using the AdminConfig object</li><li>• Identify the primary methods and resources that help in performing each step</li><li>• Explain key concepts that are related to managing configuration objects</li><li>• Explain how to use the AdminConfig object to query, create, modify, or delete a configuration object</li></ul>

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**Exercise 3. Using the Help and AdminConfig objects**  
**Duration: 1 hour and 30 minutes**

Overview	In this exercise, you learn how to use the AdminConfig administrative object by following the general approach for completing a configuration task. You write scripts to create, query, modify, and delete a configuration object.
Learning objectives	After completing this exercise, you should be able to: <ul style="list-style-type: none"><li>• Use the Help object to get help on the administrative objects</li><li>• Apply the general steps that are required to complete a configuration task by using the AdminConfig object</li><li>• Employ the primary methods and resources that help in performing each step</li><li>• Use the AdminConfig object to query, create, modify, and delete a configuration object</li></ul>

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**Unit 8. Administrative object basics: AdminApp**  
**Duration: 45 minutes**

Overview	This unit describes the purpose and common usage of the AdminApp object.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Use wsadmin to manage WebSphere applications</li><li>• Describe the basic capabilities of the AdminApp object</li><li>• Explain when to use the AdminApp object</li></ul>

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**Exercise 4. Using the AdminApp object**  
**Duration: 1 hour**

Overview	In this exercise, you learn how to use the AdminApp administrative object to query, install, update, and uninstall an application. By developing scripts to complete these application management tasks, you learn about the primary methods and resources that are required to effectively use the AdminApp object.
Learning objectives	After completing this exercise, you should be able to: <ul style="list-style-type: none"><li>• Access online help about how to use the AdminApp object</li><li>• Employ the primary methods and resources that are required to use the AdminApp object effectively</li><li>• Use the AdminApp object to query, install, edit, update, and uninstall an application</li></ul>

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**Unit 9. Administrative object basics: AdminControl**  
**Duration: 45 minutes**

Overview	This unit describes the purpose and common usage of the AdminControl object.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Describe the steps that are involved in using the AdminControl object</li><li>• Identify the primary methods and resources that help in performing each step</li><li>• Explain the key concepts and syntactical rules that are required to use the AdminControl object</li><li>• Explain how to use the AdminControl object to modify MBean attributes and perform MBean operations</li></ul>

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**Exercise 5. Using the AdminControl object****Duration: 1 hour**

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Overview	In this exercise, you use the AdminControl administrative object to query and modify MBean attributes and invoke MBean operations. You follow the general approach for using the AdminControl object to learn the primary methods and resources that are required to effectively use it.
Learning objectives	After completing this exercise, you should be able to: <ul style="list-style-type: none"><li>• Apply the general steps that are required to make an operational or attribute change to an MBean by using the AdminControl object</li><li>• Use the primary methods and resources that help in performing each step</li><li>• Use the AdminControl object to query and modify MBean attributes, and invoke MBean operations</li></ul>

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**Unit 10. Administrative object basics: AdminTask****Duration: 45 minutes**

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Overview	This unit describes the purpose and common usage of the AdminTask object.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Describe the overall steps that are involved in using the AdminTask object</li><li>• Identify the primary methods and resources that help in performing each step</li><li>• Explain the general syntax of an AdminTask command</li><li>• Explain how to use the AdminTask object to perform administrative tasks in interactive or batch mode</li></ul>

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**Exercise 6. Using the AdminTask object****Duration: 1 hour**

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Overview	In this exercise, you learn how to perform administrative tasks by using the AdminTask object. You follow the general approach for using the AdminTask object to learn the primary methods and resources that are required to effectively use it.
Learning objectives	After completing this exercise, you should be able to: <ul style="list-style-type: none"><li>• Apply the general steps that are required to invoke a command in batch or interactive mode by using the AdminTask object</li><li>• Use the primary methods and resources that help in performing each step</li><li>• Use the AdminTask object to perform administrative tasks in interactive or batch mode</li></ul>

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**Unit 11. Introduction to the PlantsByWebSphere and messaging applications****Duration: 30 minutes**

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Overview	This unit describes the architecture and features of the PlantsByWebSphere application that is used in the subsequent exercises.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Describe the components and functions of the PlantsByWebSphere application</li></ul>

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**Unit 12. Configuring and managing servers and server resources by using scripting**  
**Duration: 45 minutes**

Overview	This unit describes how to use the administrative objects to configure and manage servers and their resources.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Describe how to perform common server and server resource management tasks by using the administrative objects</li></ul>

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**Exercise 7. Creating and configuring the Plants server environment with scripting**  
**Duration: 2 hours**

Overview	In this exercise, you create and configure the server environment for the PlantsByWebSphere application. You use response files to create the necessary deployment manager and managed node profiles. You then develop Jython administrative scripts to create the cluster and clusters members that comprise the Plants server environment.
Learning objectives	After completing this exercise, you should be able to: <ul style="list-style-type: none"><li>• Create a deployment manager and a managed node profile by using a response file</li><li>• Develop Jython scripts to create a cluster and add cluster members</li><li>• Develop Jython scripts to query the state of a cluster, and start or stop a cluster</li></ul>

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**Exercise 8. Installing and configuring the IBM HTTP Server**  
**Duration: 45 minutes**

Overview	In this exercise, you use the IBM Installation Manager (IIM) to record a response file that you use to silently install the IBM HTTP Server and its plug-in. You then develop Jython administrative scripts to configure the IBM HTTP Server as an unmanaged node.
Learning objectives	After completing this exercise, you should be able to: <ul style="list-style-type: none"><li>• Install the IBM HTTP Server and its plug-in by using a silent installation</li><li>• Develop Jython scripts to configure the IBM HTTP Server as an unmanaged node</li></ul>

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**Unit 13. Deploying and managing the PlantsByWebSphere application by using scripting**  
**Duration: 45 minutes**

Overview	This unit describes how to use the administrative objects to deploy and manage applications and their resources.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Describe how to perform common application and application resource management tasks by using the administrative objects</li></ul>



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**Exercise 9. Deploying the PlantsByWebSphere application**  
**Duration: 2 hours**

Overview	In this exercise, you use Jython scripts to deploy and manage the PlantsByWebSphere application. You also use scripts to configure environment variables, a data source, and other resources that the PlantsByWebSphere application uses.
Learning objectives	After completing this exercise, you should be able to: <ul style="list-style-type: none"><li>• Set WebSphere environment variables</li><li>• Create database resources, including J2C authentication aliases, JDBC providers, and data sources</li><li>• Install an enterprise application to a cluster</li><li>• Map application modules to servers</li></ul>

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**Unit 14. Scripting methodologies and recommendations**  
**Duration: 30 minutes**

Overview	This unit gives recommendations and methodologies that should be considered when working on a scripting effort.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Describe multiple approaches to a scripting project</li><li>• Identify a process for subdividing a scripting effort</li></ul>

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**Unit 15. Using ws\_ant**  
**Duration: 1 hour**

Overview	This unit describes how to use the ws_ant tool to automate common administrative tasks.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Describe the features and usage of ws_ant</li></ul>

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**Exercise 10. ws\_ant scripting and configuring the service integration bus**  
**Duration: 1 hour and 30 minutes**

Overview	In this exercise, you explore the structure and syntax of Ant build files and learn how to import property files into build files. You then modify an existing Ant build file and create targets to start applications, stop applications, and modify application attributes. You use the ws_ant utility to execute the Ant build file. Finally, you run several Ant tasks to configure a service integration bus environment to support JMS applications.
Learning objectives	After completing this exercise, you should be able to: <ul style="list-style-type: none"><li>• Combine individual Jython scripts into one Ant script with multiple tasks</li><li>• Use Ant property files</li><li>• Use Ant tasks for building application code</li><li>• Use Ant tasks for deployment and server operation</li><li>• Use Ant tasks to configure a service integration environment</li></ul>

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**Unit 16. Properties file based configurations and Jython script library****Duration: 1 hour**

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Overview	This unit explains how to use property files with wsadmin to configure or update the WebSphere Application Server environment.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Describe a scenario for administration by using property files</li><li>• Perform an application update with property files</li><li>• Define what a Jython script library is</li><li>• Explain where to find the required resources</li><li>• Describe the libraries that are available</li><li>• Explain how to combine the Jython script library into custom scripts</li></ul>

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**Unit 17. Using scripts with the job manager and CIM****Duration: 45 minutes**

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Overview	This unit describes how to use scripting commands to submit jobs to a job manager.
Learning objectives	After completing this unit, you should be able to: <ul style="list-style-type: none"><li>• Describe the flexible management topology</li><li>• Describe the function of the job manager and the administrative agent</li><li>• Use scripts to create job manager and administrative agent profiles</li><li>• Use scripts to configure target hosts for the job manager</li><li>• Use scripts to configure CIM jobs for the job manager</li><li>• Use scripts to submit a job to install the Installation Manager on a remote host</li><li>• Use scripts to install the WebSphere Application Server and create an application server profile</li><li>• Use scripts to monitor the status of a job manager job</li><li>• Automate the installation of WebSphere Application Server</li></ul>

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**Exercise 11. Automating the installation of WebSphere Application Server****Duration: 1 hour and 30 minutes**

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Overview	In this exercise, you learn how to automate the installation of WebSphere Application Server and the creation of profiles by doing silent installations.
Learning objectives	After completing this exercise, you should be able to: <ul style="list-style-type: none"><li>• Describe the silent installation of IBM Installation Manager</li><li>• Use the IBM Installation Manager to record a response file</li><li>• Use a recorded response file to silently install the WebSphere Application Server Network Deployment product files</li><li>• Edit the response file to modify the installation</li><li>• Customize a response file to create a WebSphere profile by using the manageprofiles command</li></ul>

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**Unit 18. Course summary**  
**Duration: 15 minutes**

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## Overview

This unit summarizes the course, explains the class evaluation process, and provides information for future study.

## Learning objectives

After completing this unit, you should be able to:

- Explain how the course met its learning objectives
  - Submit an evaluation of the class
  - Identify other WebSphere Education courses that are related to this topic
  - Access the WebSphere Education website
  - Locate appropriate resources for further study
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**For more information**

To learn more about this course and other related offerings, and to schedule training, contact IBM WebSphere Education at [websphere\\_skills@us.ibm.com](mailto:websphere_skills@us.ibm.com) or visit [ibm.com/websphere/education](http://ibm.com/websphere/education).

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