Federating a cell

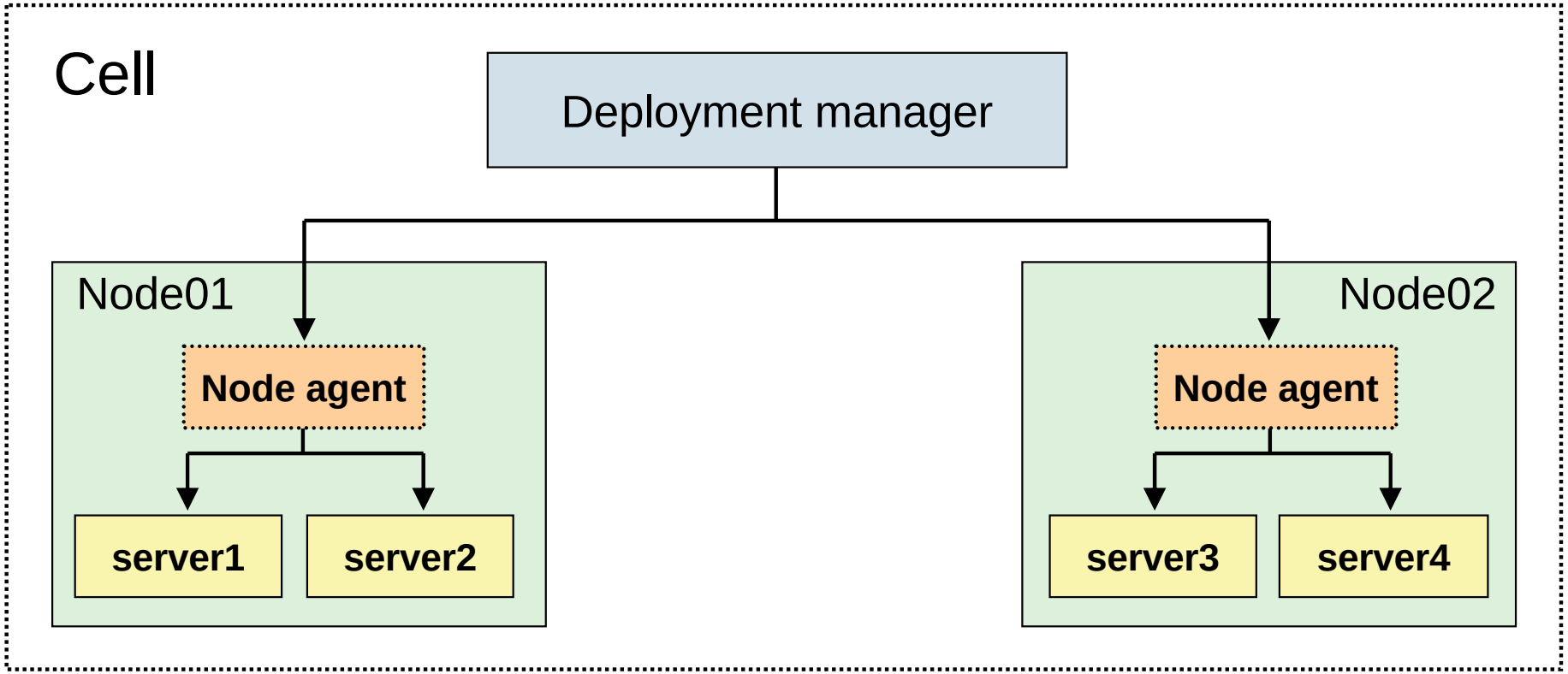
Unit objectives

After completing this unit, you should be able to:

- Describe WebSphere Application Server cell concepts
- Describe and create the deployment manager profile
- Describe and create other profile types
- Describe custom profiles and automatic federation
- Describe the directories and configuration files for profiles
- Add a node by using commands or the administrative console
- Compare the deployment manager administrative console with the base administrative console
- Compare managed and unmanaged nodes
- Use the administrative console to manage a web server

WebSphere cells

- A WebSphere cell defines an administrative domain
  - Available in WebSphere Application Server Network Deployment
  - A deployment manager provides centralized administration for entire cell
  - A cell is created as a profile
  - Nodes run application components in application servers

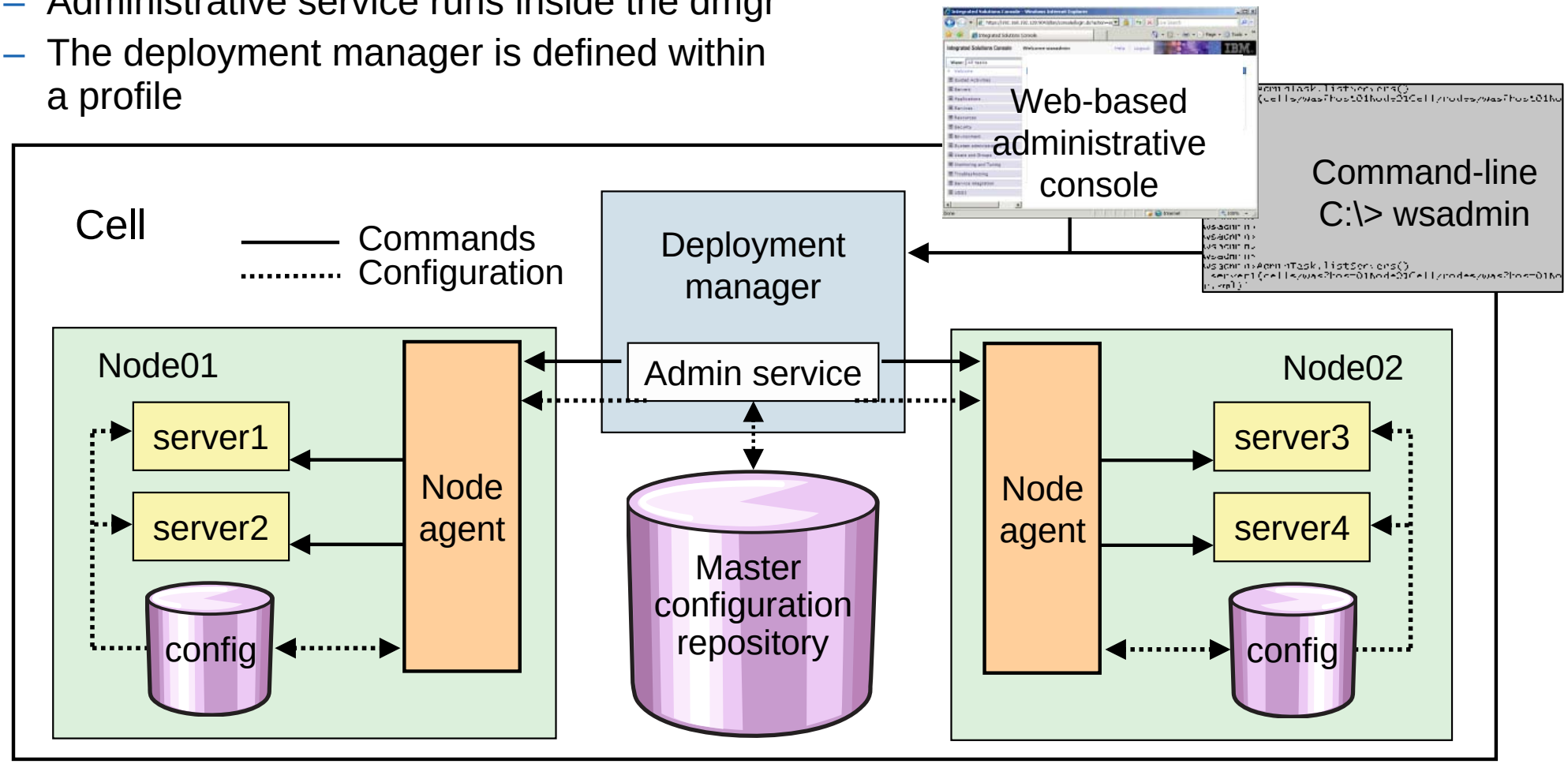


WebSphere Application Server process types

- **Application server**
  - Provides the functions that are required to support and host user applications
  - Runs on only one node, but one node can support many application servers
- **Node agent**
  - Created and installed when a node is federated into a cell
  - Works with the deployment manager to perform administrative activities on the node
- **Deployment manager**
  - Administers multiple application servers from one centralized manager
  - Works with the node agents on each node to manage all the servers in a distributed topology
  - Application server nodes are federated with the deployment manager before the deployment manager can manage them

Network deployment concepts

- Deployment manager (dmgr)
  - Manages the node agents
  - Holds the configuration repository for the entire management domain, called a **cell**
  - Administrative service runs inside the dmgr
  - The deployment manager is defined within a profile
- Node
  - Logical grouping of servers
  - A single **node agent** process manages it
  - Each node is defined within a profile



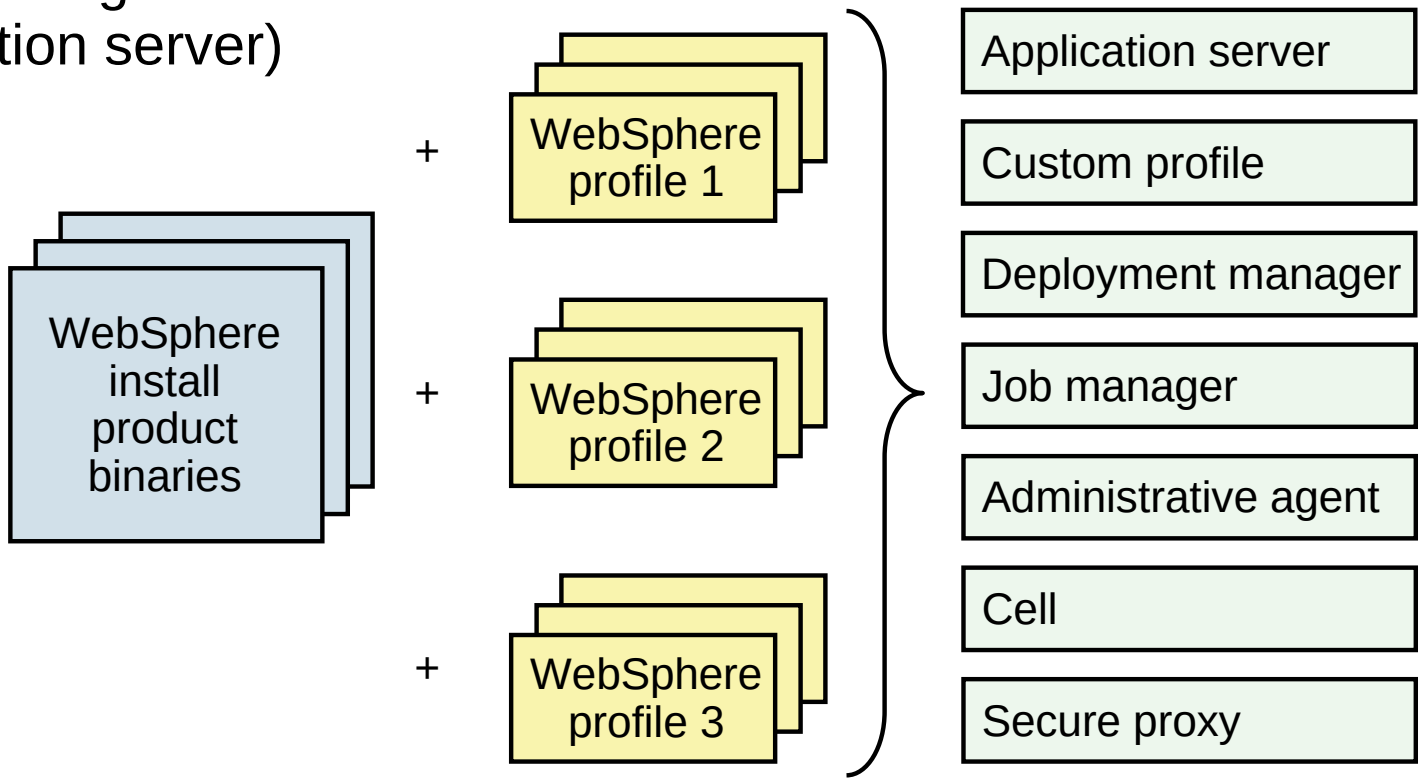
Profiles in network deployment

Profiles represent the nodes

- Multiple nodes can be installed on a single computer
- Nodes can contain a single stand-alone application server
- Nodes can be federated into a cell

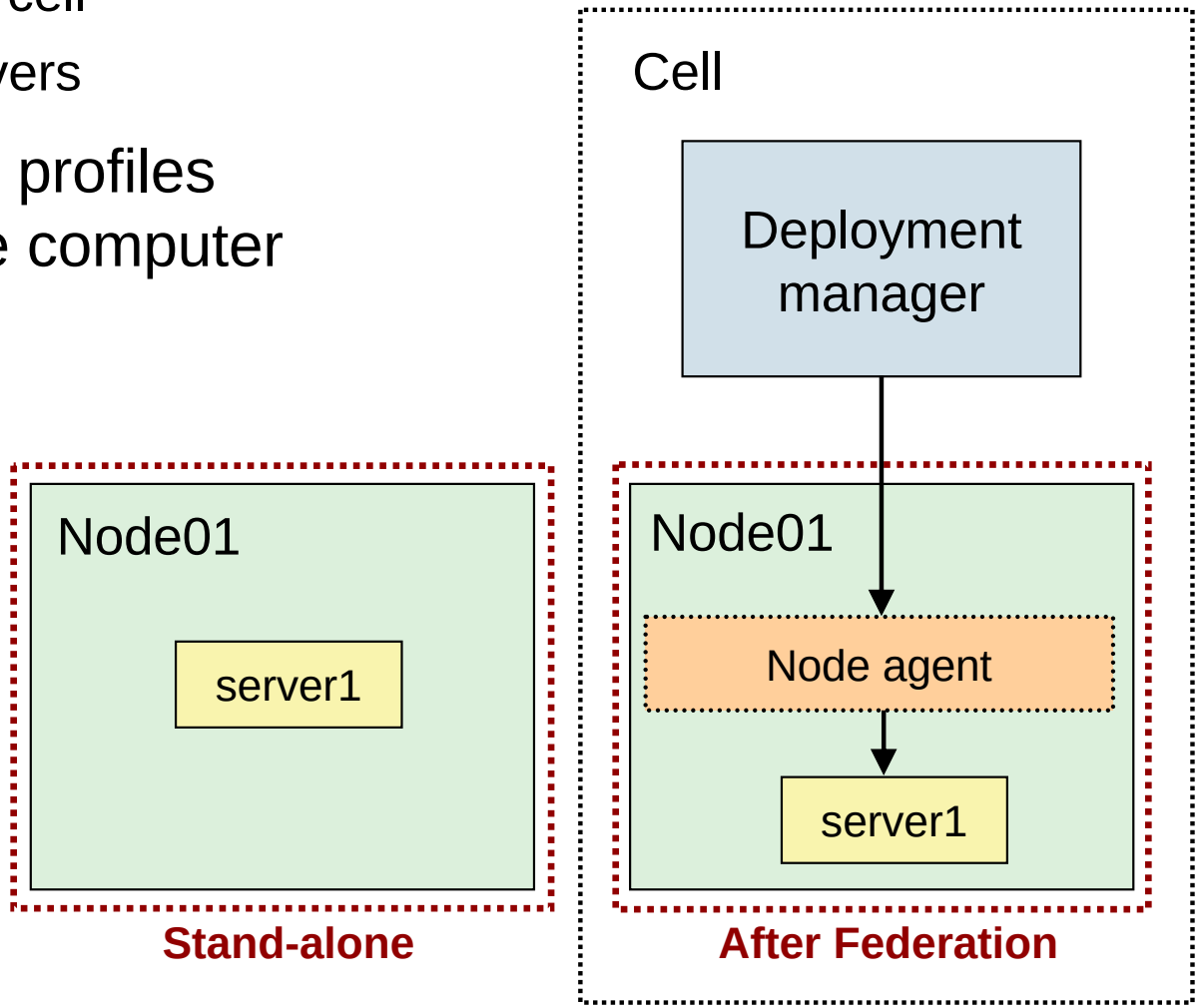
Each profile uses the same product files regardless of type:

- Cell (deployment manager and a federated application server)
- Management
  - Administrative agent
  - Deployment manager
  - Job manager
- Application server
- Custom profile
- Secure proxy



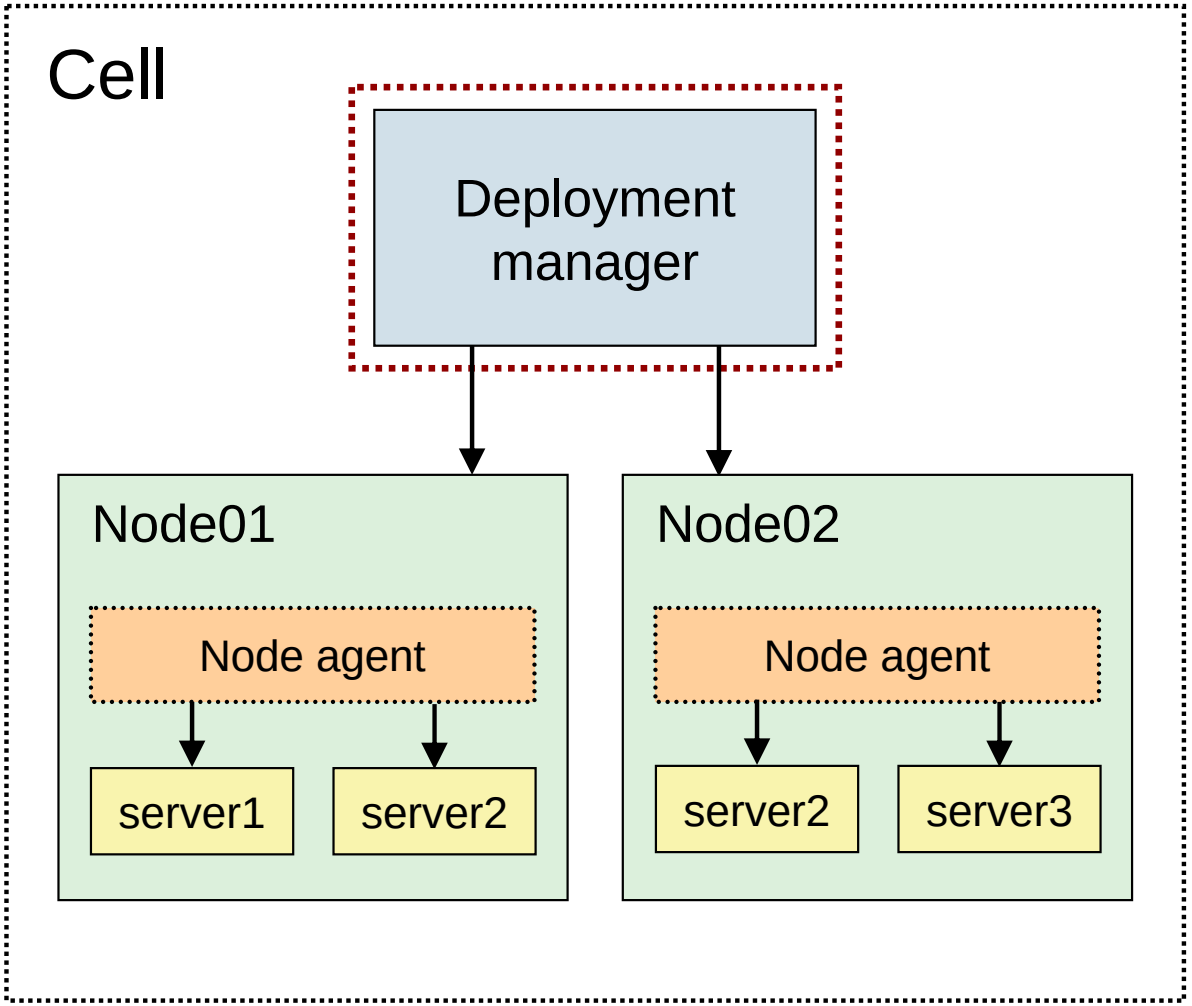
Application server profile

- Application server profiles provide a base installation
- Application servers in the network deployment product can run as:
  - Part of managed nodes in a cell
  - Stand-alone application servers
- Multiple application server profiles can be created on a single computer
- Each application server profile can be federated into a cell
- Multiple base profiles on a single computer can be federated:
  - Into the same cell
  - Into different cells
  - Remain stand-alone



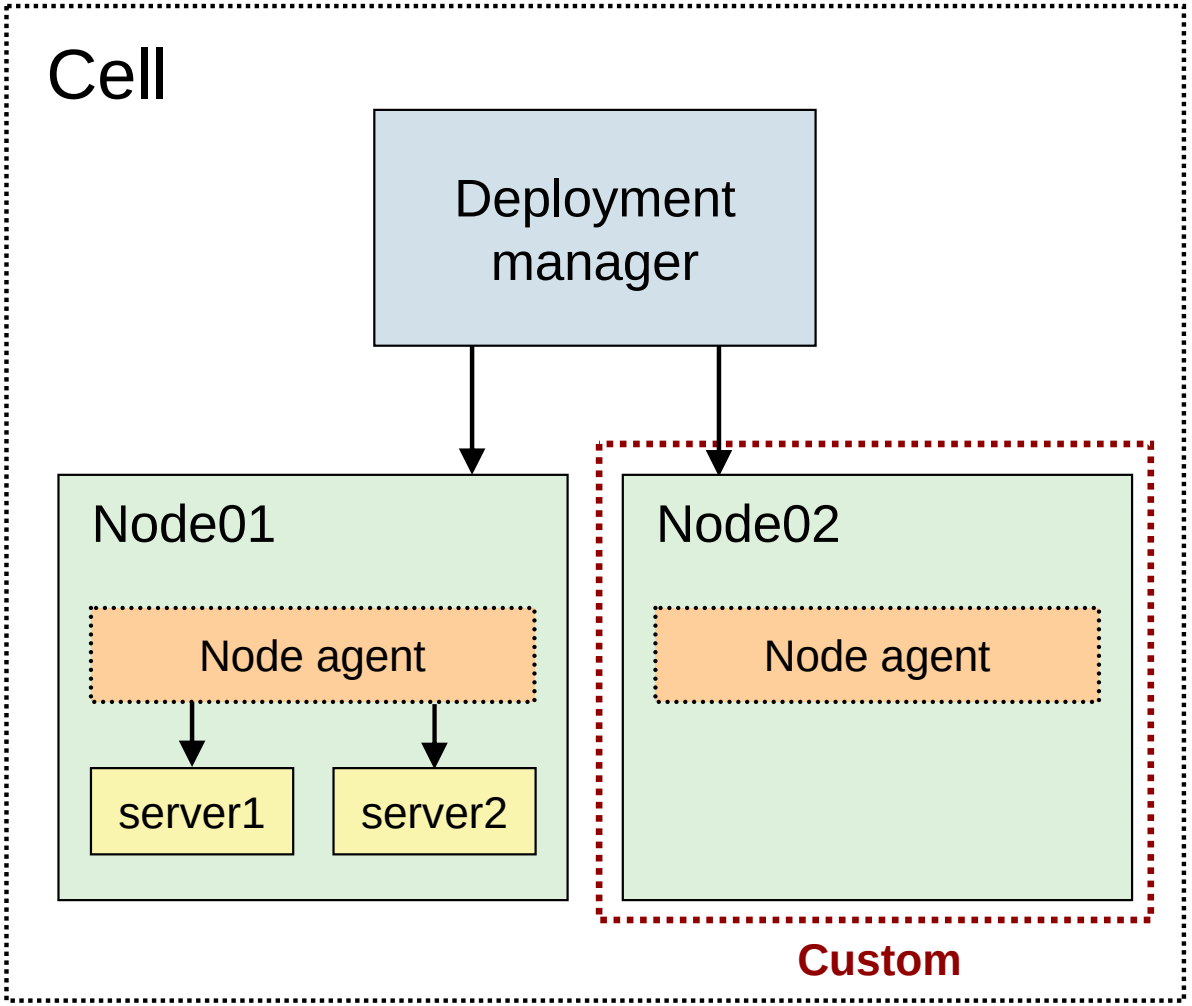
Deployment manager profile

- Is used to create a deployment manager process (dmgr)
- Can exist on an independent computer
- Can exist on a computer with other profiles
- Provides centralized administration of managed application server nodes and custom nodes as a single cell



Custom profile

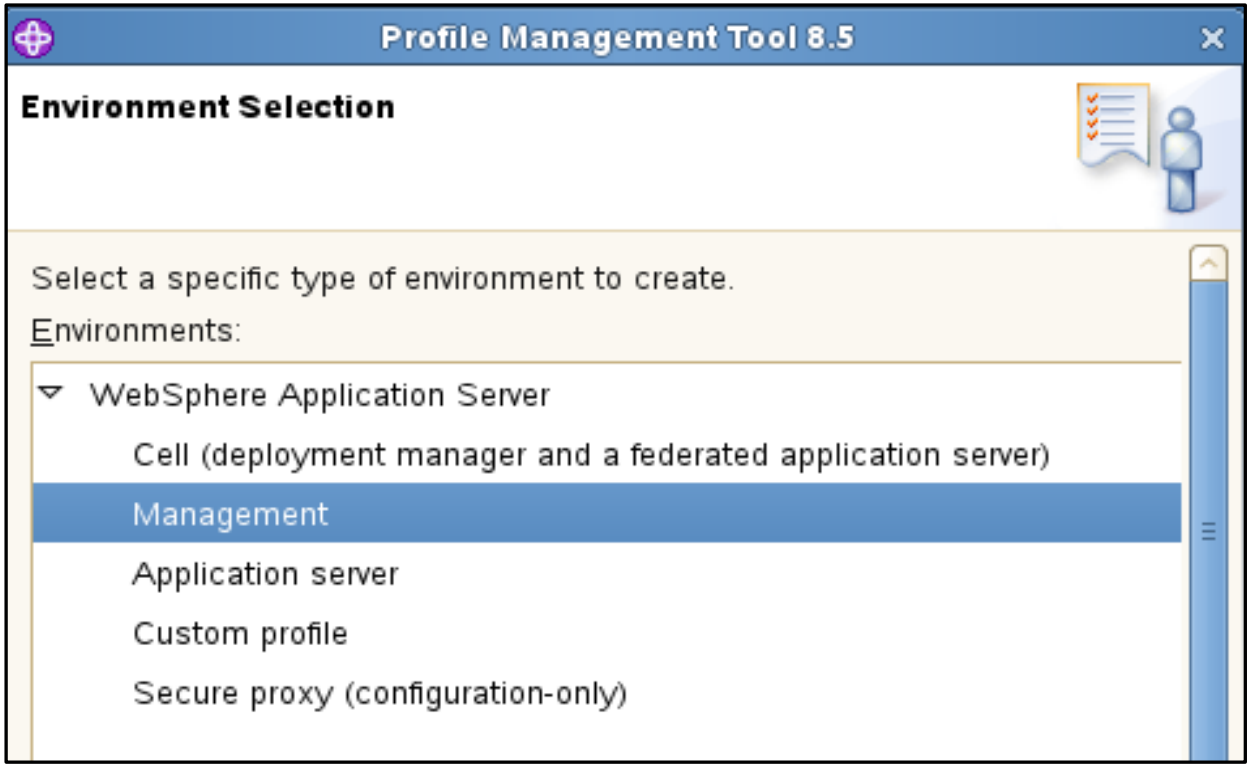
- A custom profile creates a node without an application
- Automatically federated into a cell during profile creation by default
- No application servers are created during profile creation
- Use the deployment manager administrative console to create servers and clusters on the federated node
- Consider a custom profile as a production-ready shell, ready for customization to contain your servers and applications



Creating profiles

Profile Management Tool

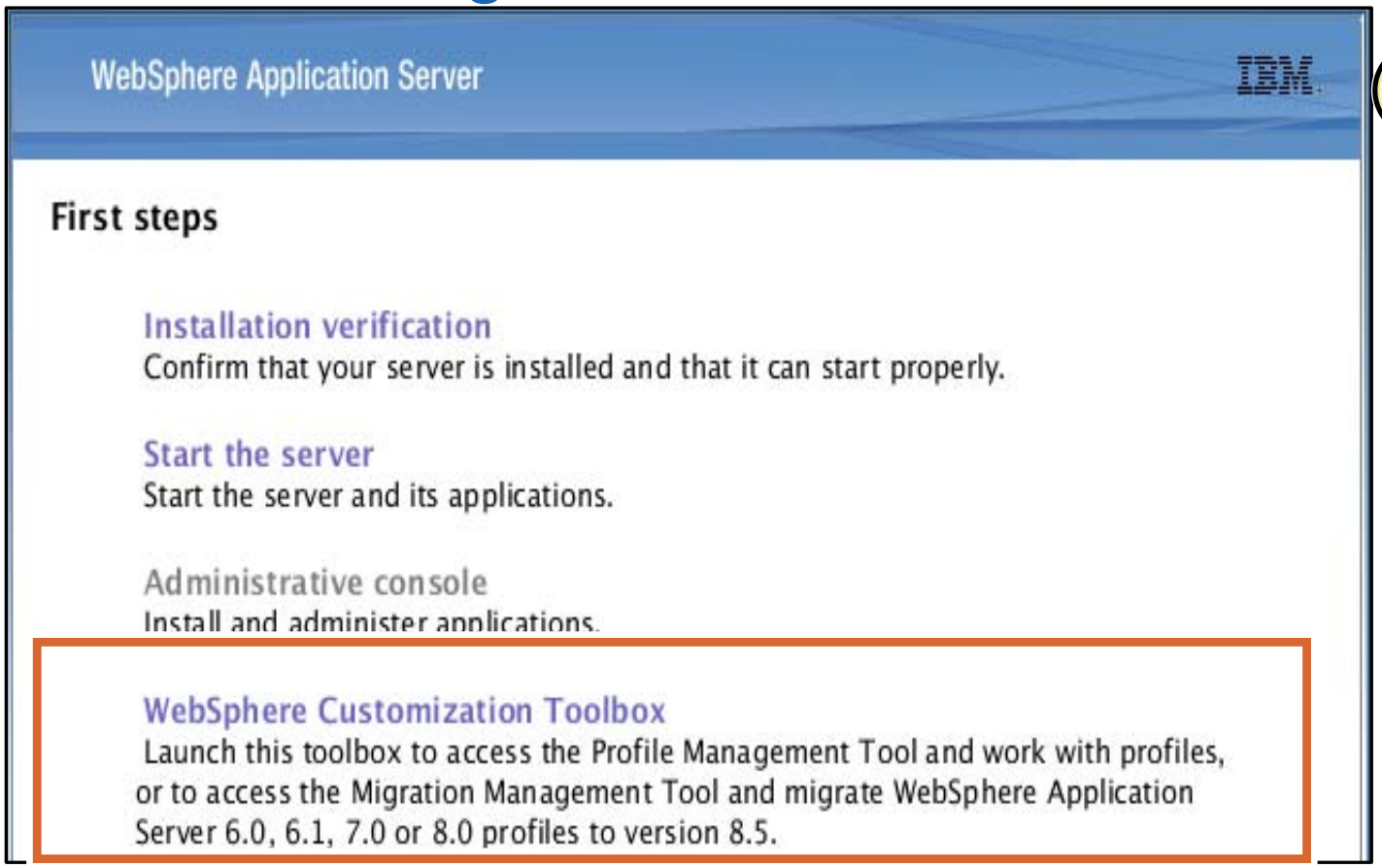
- Start menu (Windows only)
- Started from installation wizard
- Launch command-line tool **`pmt.bat`**
  - `<was_root>\bin\ProfileManagement\`
  - Similar command exists for UNIX
  - Wizard in First steps console



`manageprofiles`

- Command-line tool
- Use **`manageprofiles -silent`** option to create profiles in silent mode
- Other **`manageprofiles`** options include: **`-listProfiles -delete`**

Profile Management Tool: Launch and create

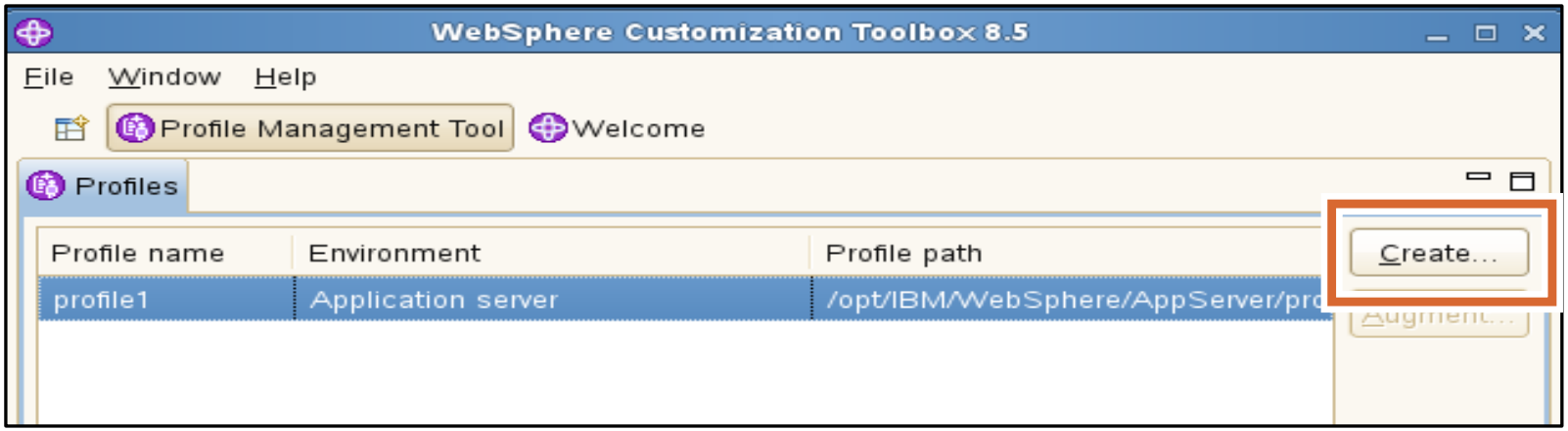


1 Start the Profile Management Tool

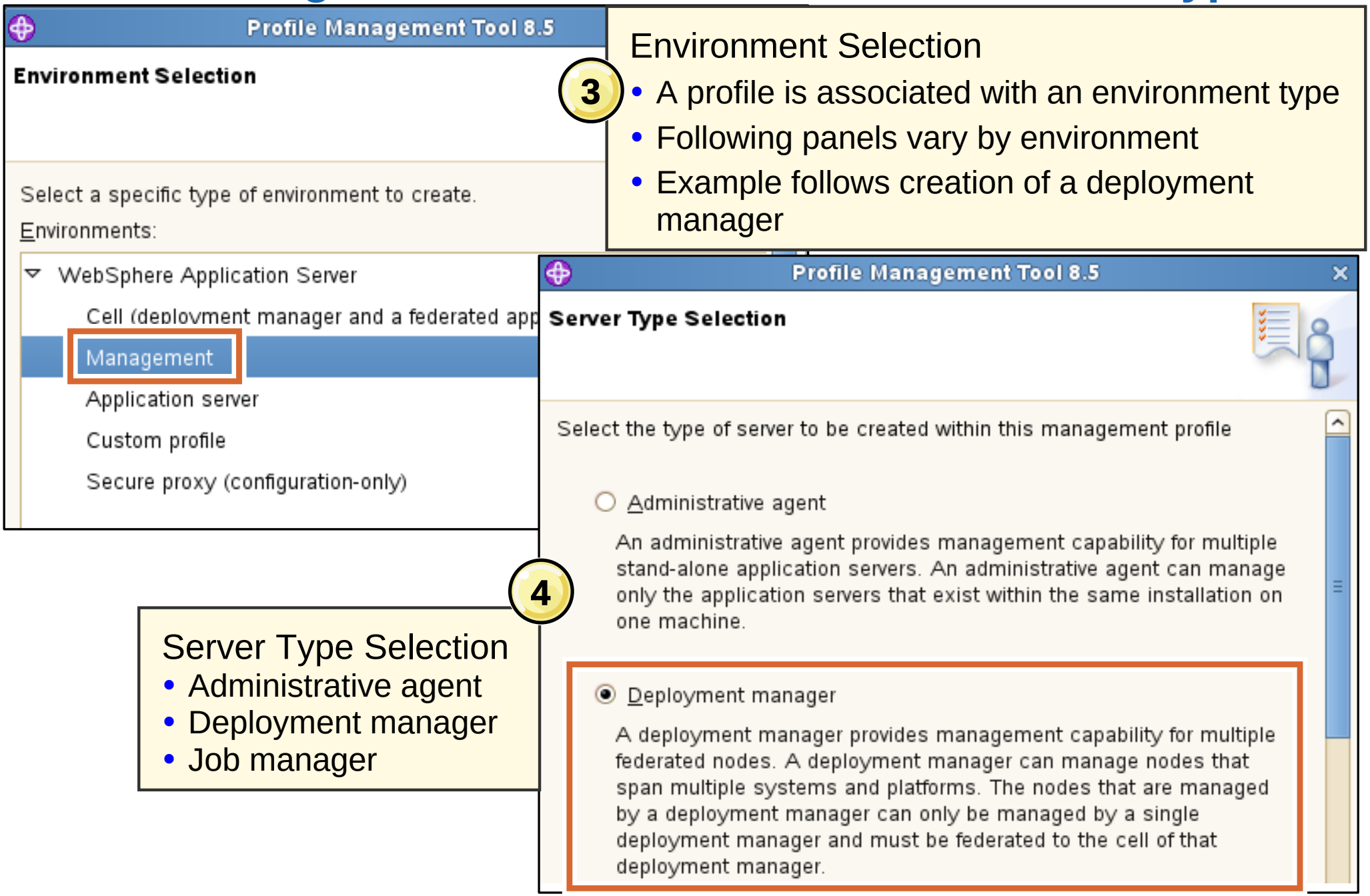
- Started from:
  - **First steps** or **Windows Start menu > WebSphere Customization Toolbox**
  - Command-line
- Click **Launch Profile Management Tool** to manage profiles

2 Create a profile

- Existing profiles are shown
- Click **Create**



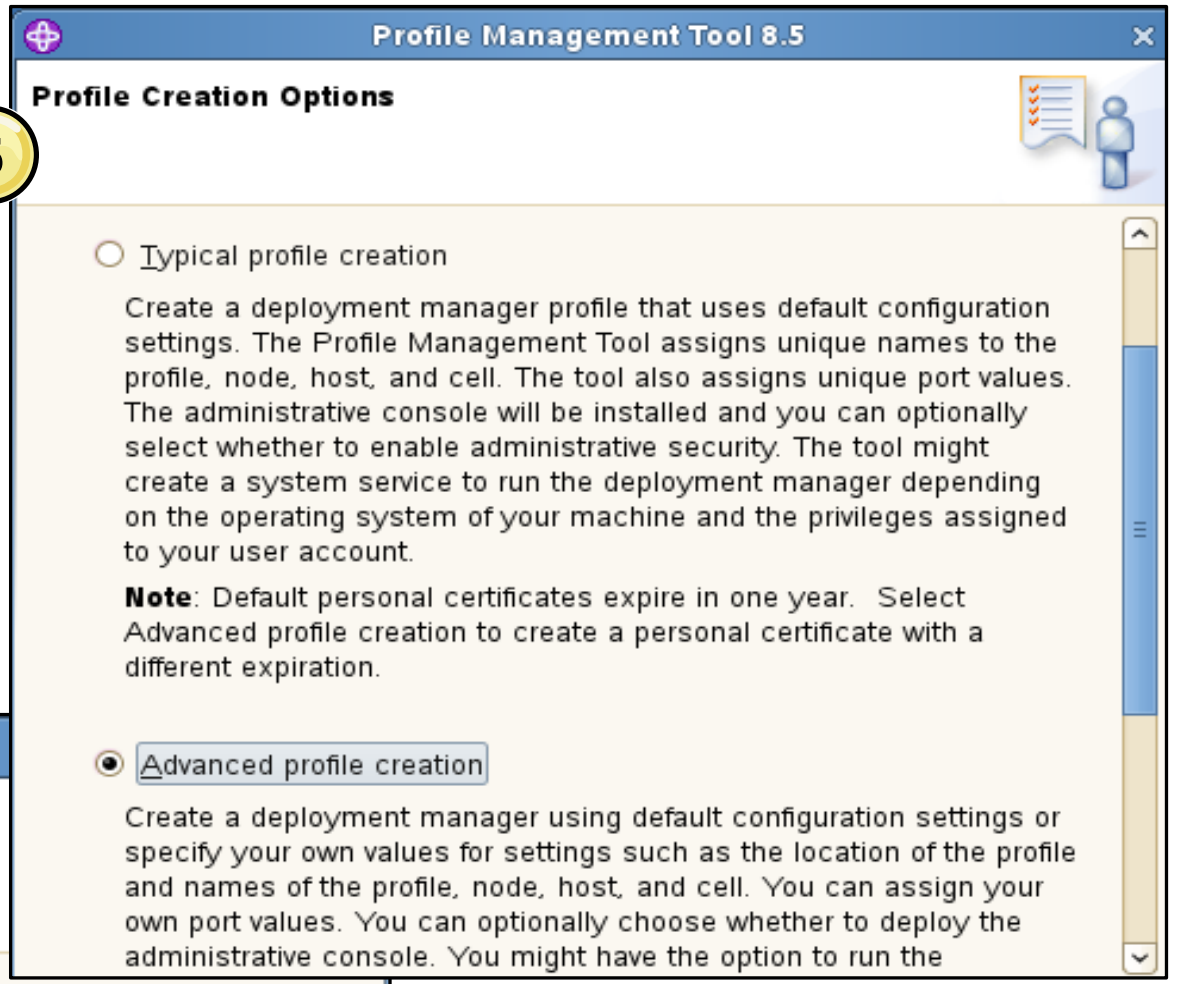
Profile Management Tool: Environment and server type

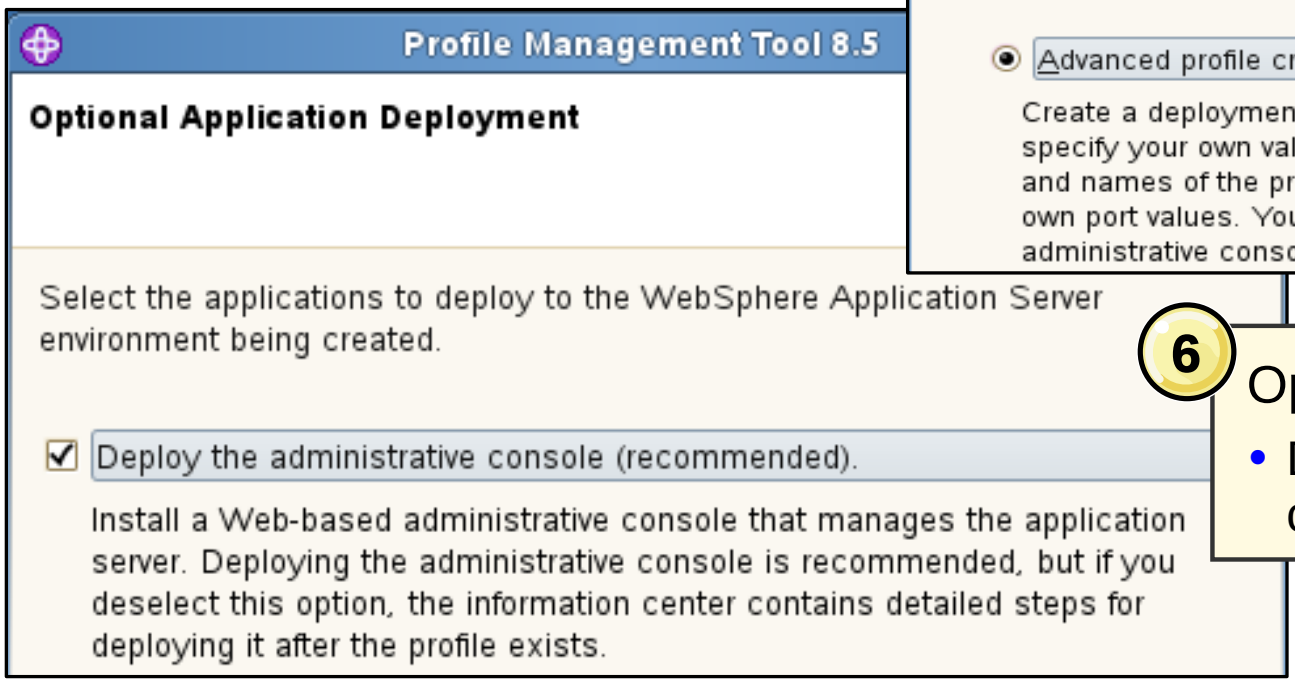


Profile Management Tool: Options

Profile Creation Options
- Typical profile creation uses default configuration settings
- Advanced profile creation allows you to accept default settings or specify your own

5





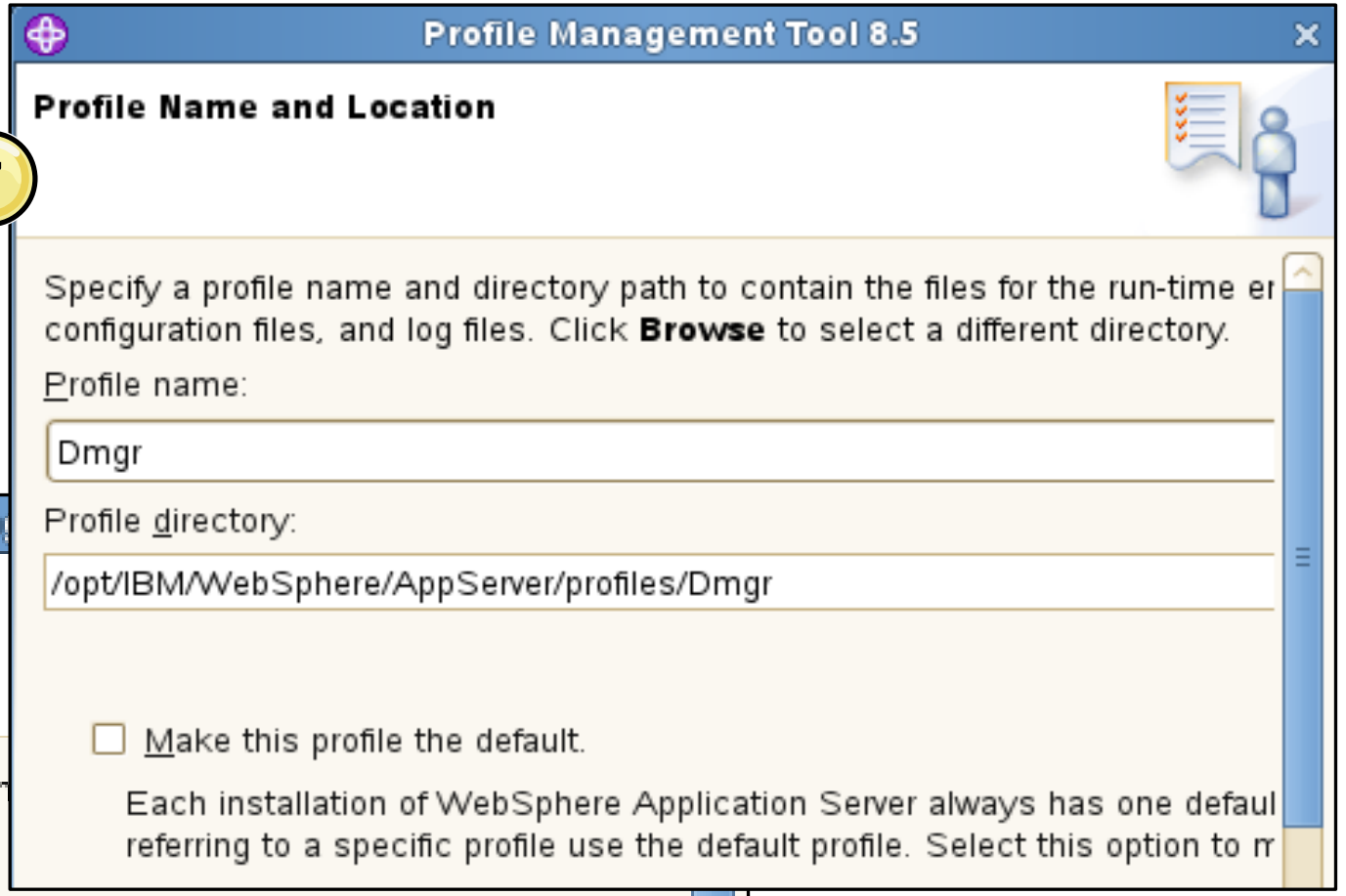
6

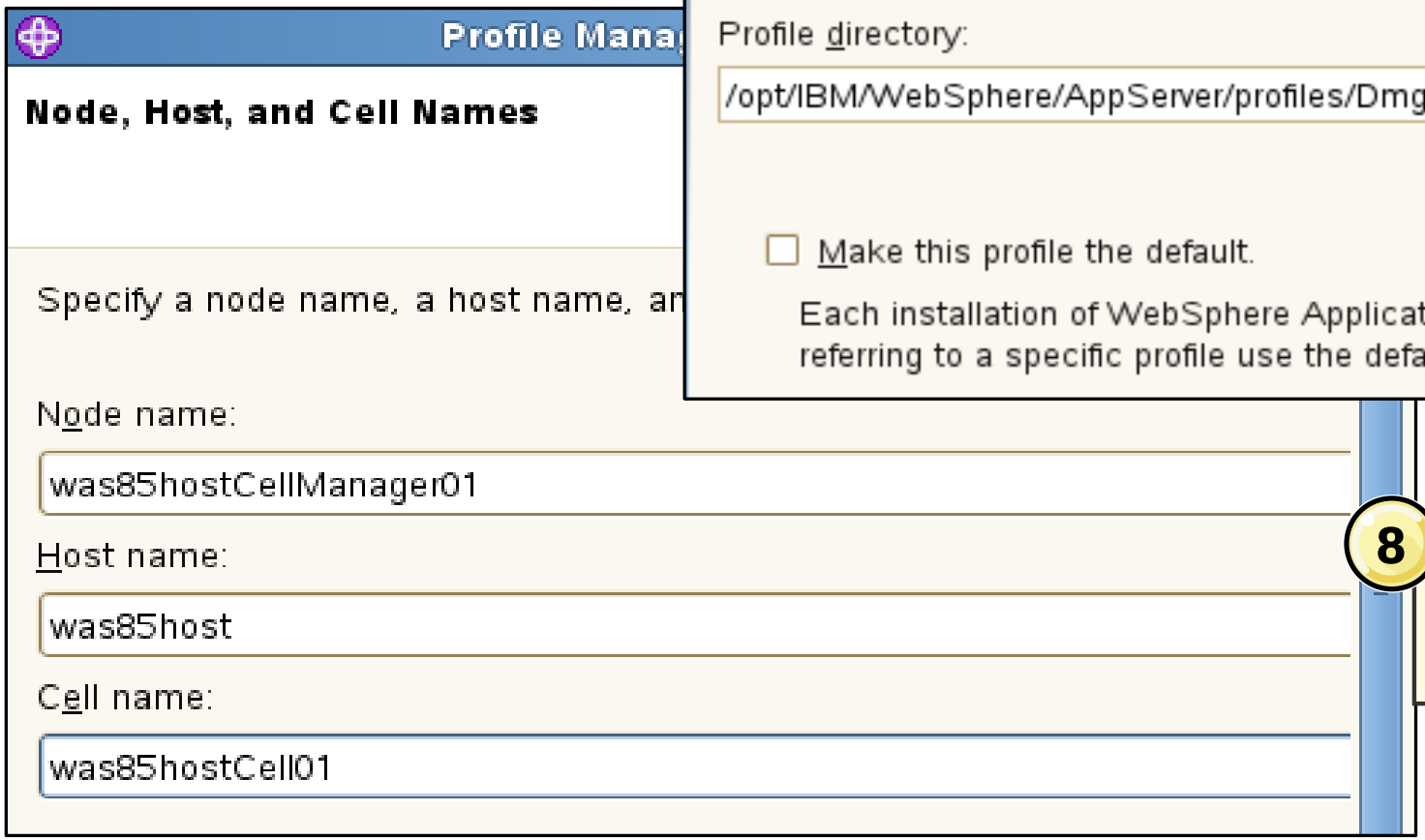
Optional Application Deployment
- Deploy the administrative console

Profile Management Tool: Names and location

Profile Name and Location

7





8

Node, Host, and Cell Names

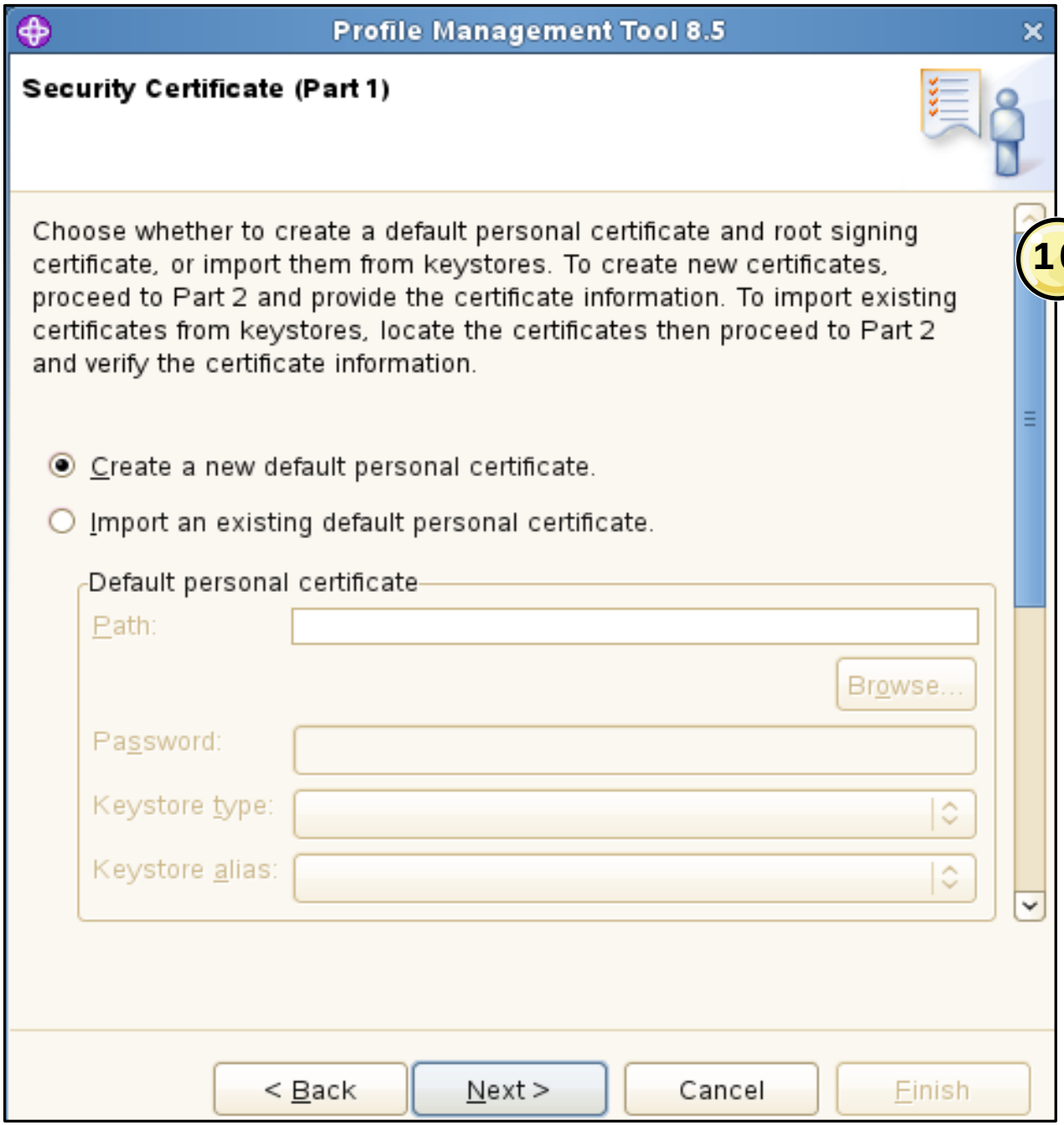
Profile Management Tool: Security

9

Specify Administrative Security

- User name and password

Profile Management Tool: Security certificate (1 of 2)



10 Security Certificate (Part 1)

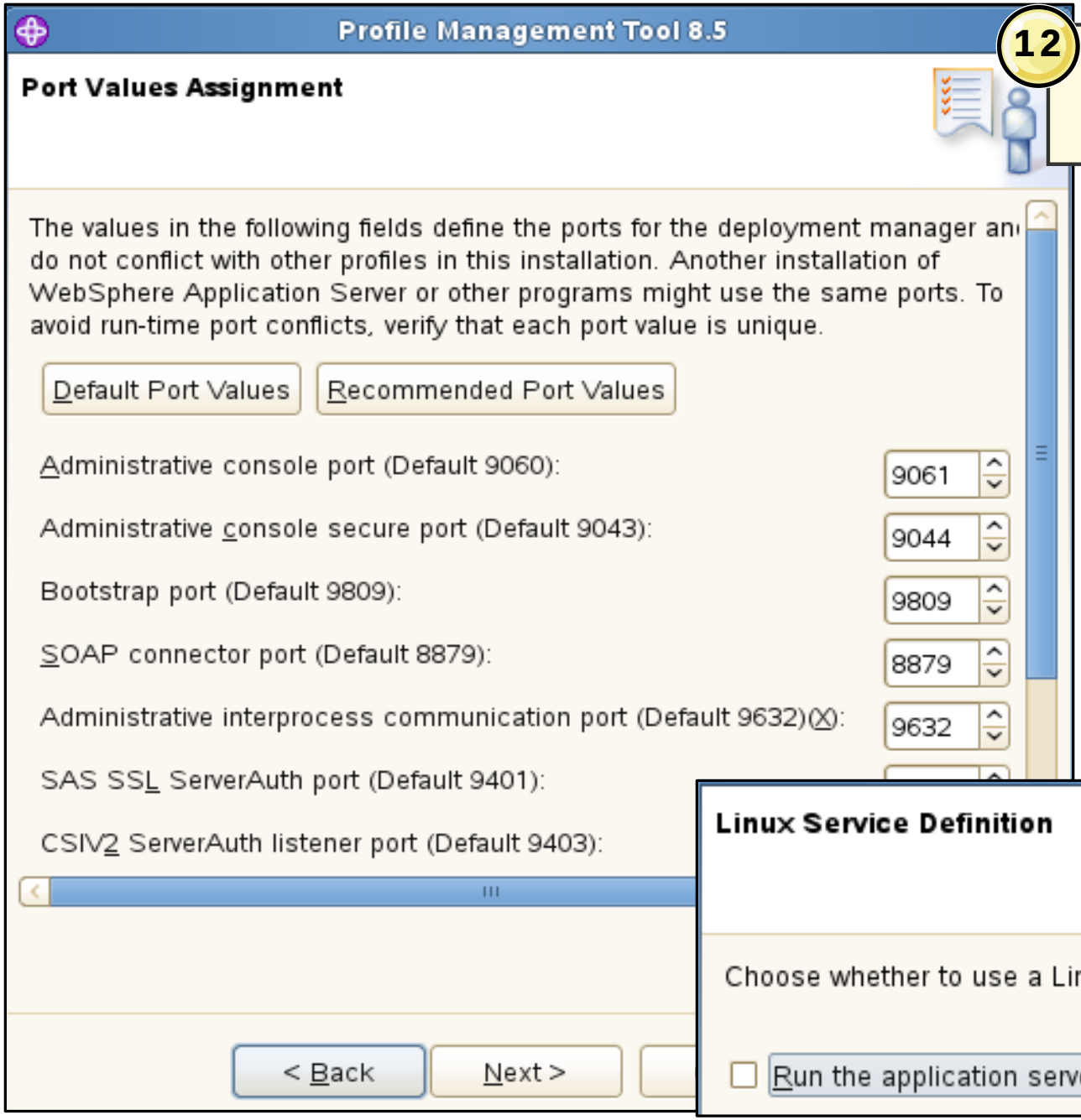
- Create or import a default personal certificate
- Create or import a root signing certificate

Profile Management Tool: Security certificate (2 of 2)

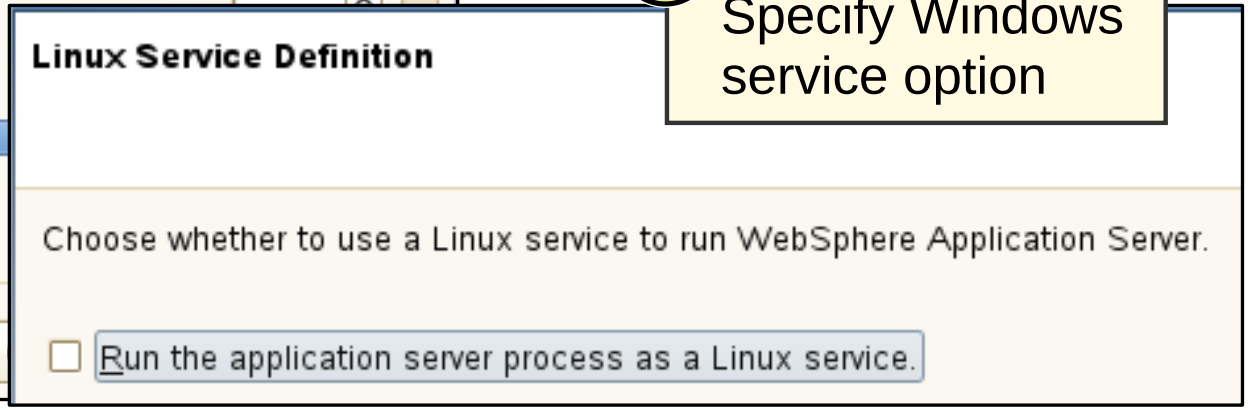
11

Security Certificate (Part 2)

Profile Management Tool: Ports and Windows service

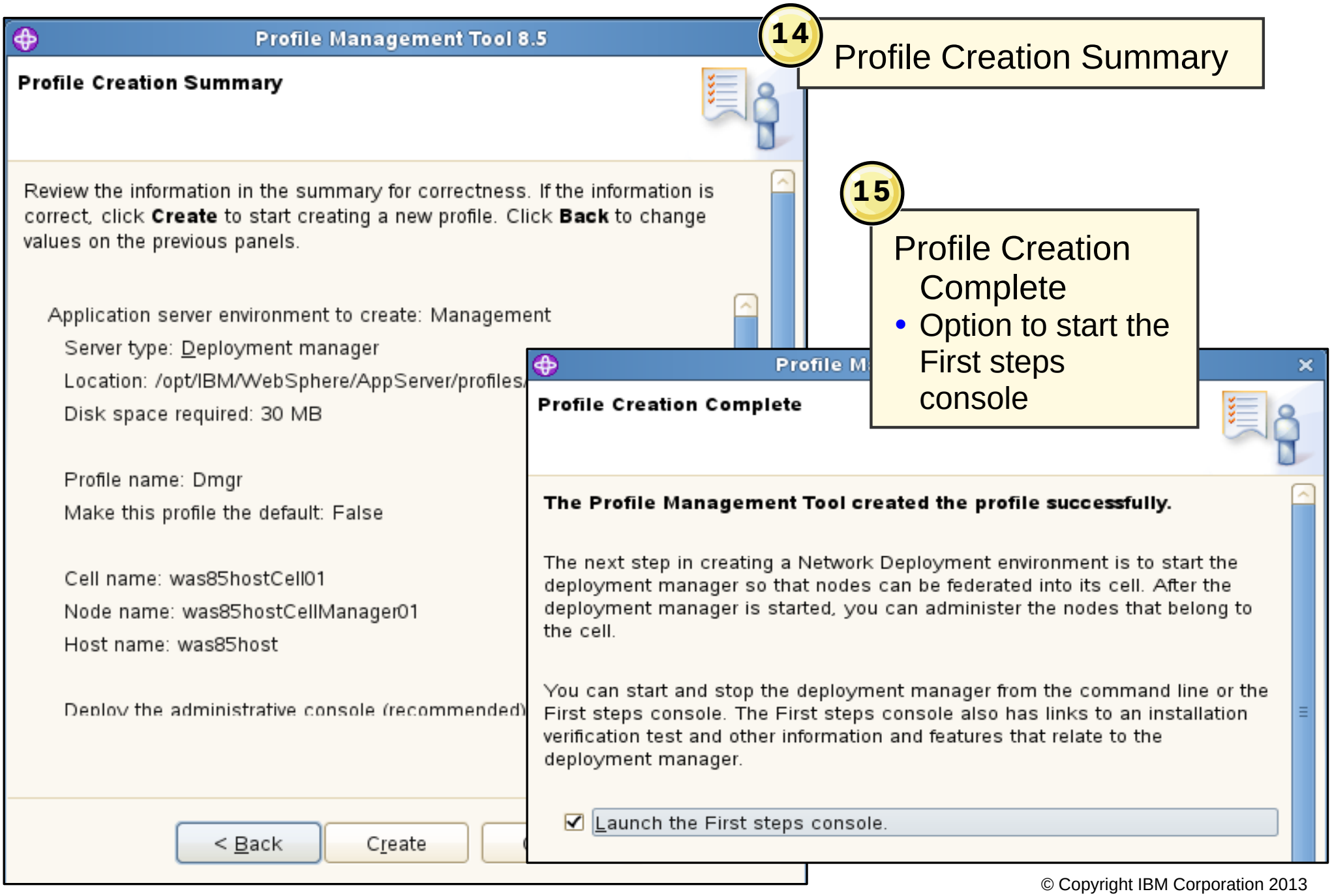


12 Review port value assignments



13 Specify Windows service option

Profile Management Tool: Results and exit



Profile creation: Command-line tool

The `manageprofiles` script supports a number of functions:

- Create new stand-alone application server profiles

```
manageprofiles –create
```

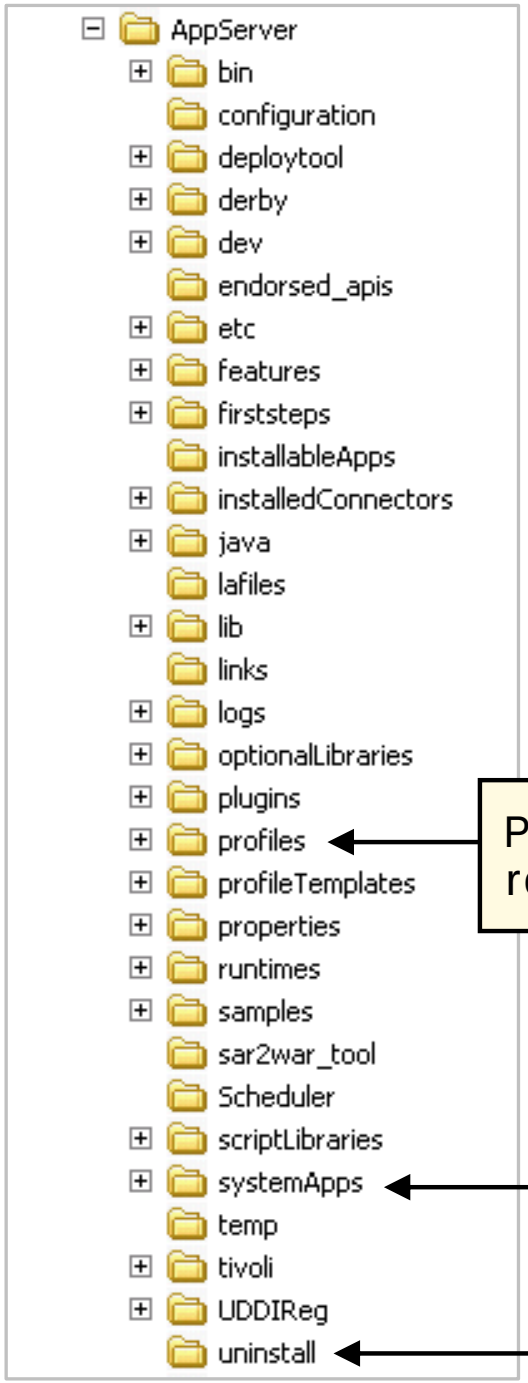
- List all profiles

```
manageprofiles –listProfiles
```

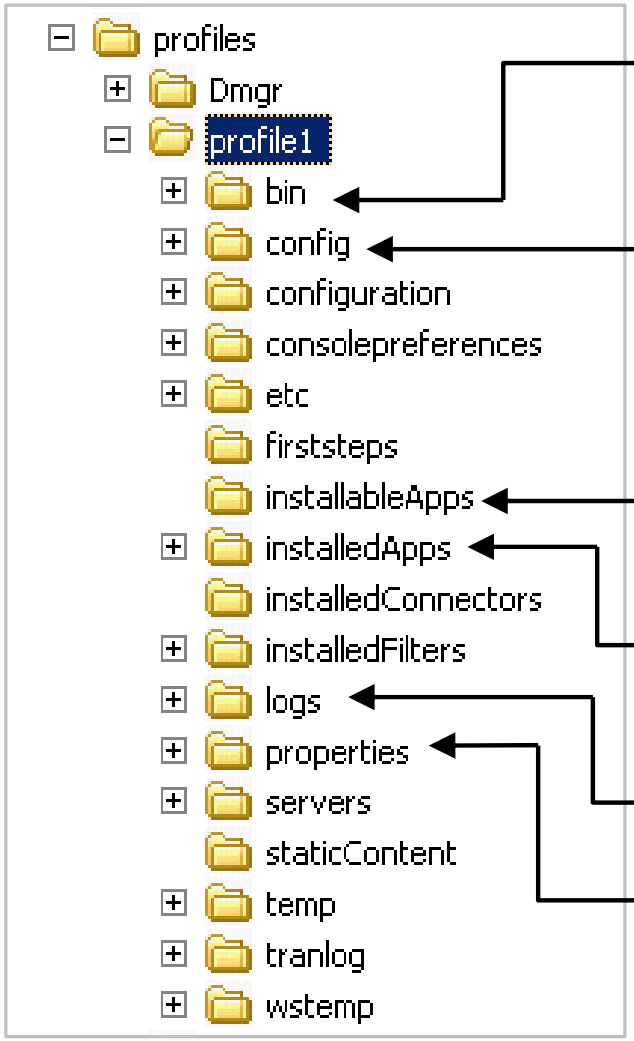
- Delete profiles

```
manageprofiles –delete –profileName
```

Directory structure



Profile root



bin directory holds the profile specific tools and scripts

config directory holds all the configuration files for the profile

Installable applications

Installed applications

Logs

Properties

System applications

Uninstaller for product

Server commands review

- WebSphere commands are profile aware
  - There is a **`-profileName`** option on many WebSphere commands
  - Or issue the commands from the appropriate directory:
    `<profile_root>\<profile_name>\bin`

- If no profile is used, the default profile is assumed
  - There can be only one default profile
  - Unless otherwise manually set, the first profile that is created is the default profile

- Examples (from `<was_root>\bin`):
  - `startServer server1 -profileName profile1`
  - `startManager -profileName DmgrProfile`
  - `stopServer server1` (assumes default profile)

Profile precautions

When multiple profiles are created on a single computer, be careful:

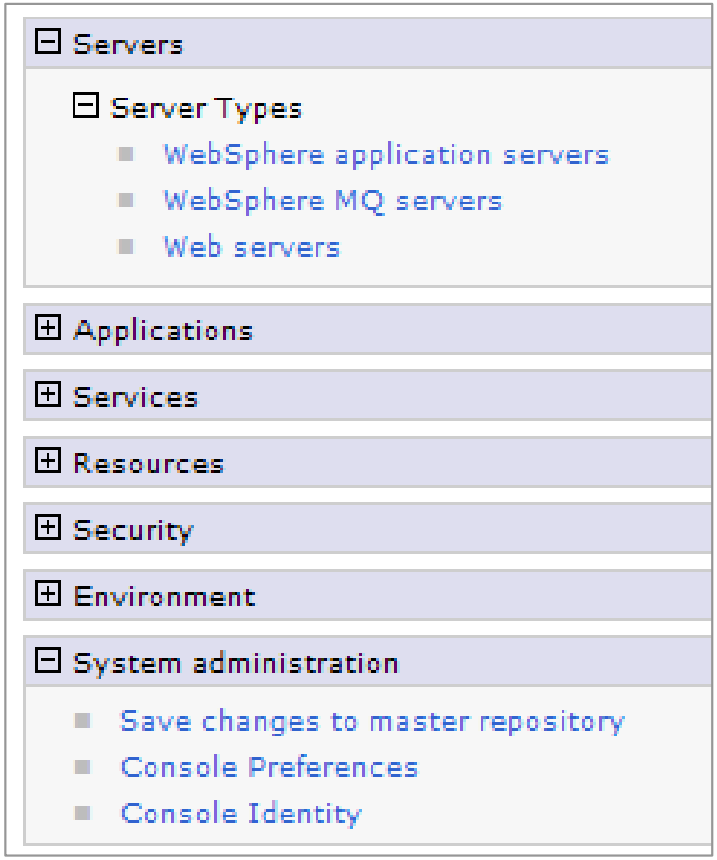
- Use the correct profile `bin` directory to perform:
  - `startServer`
  - `stopServer`
  - `serverStatus`
- Be aware of possible port conflicts for node agents and application servers
- There can be multiple server1 instances on a single computer
- Ensure that consistent host names within a computer are used

Communications

Ports

Port Name	Port
BOOTSTRAP_ADDRESS	9810
SOAP_CONNECTOR_ADDRESS	8880
ORB_LISTENER_ADDRESS	9100
SAS_SSL_SERVERAUTH_LISTENER_ADDRESS	9401
CSIV2_SSL_SERVERAUTH_LISTENER_ADDRESS	9403
CSIV2_SSL_MUTUALAUTH_LISTENER_ADDRESS	9402
WC_adminhost	9060
WC_defaulthost	9080
DCS_UNICAST_ADDRESS	9353
WC_adminhost_secure	9043
WC_defaulthost_secure	9443
SIP_DEFAULTHOST	5060
SIP_DEFAULTHOST_SECURE	5061
SIB_ENDPOINT_ADDRESS	7276
SIB_ENDPOINT_SECURE_ADDRESS	7286
SIB_MQ_ENDPOINT_ADDRESS	5558
SIB_MQ_ENDPOINT_SECURE_ADDRESS	5578
IPC_CONNECTOR_ADDRESS	9633

Deployment manager console versus stand-alone console



Stand-alone

Deployment manager

- Deployment manager administrative console has more functions for administration of the cell

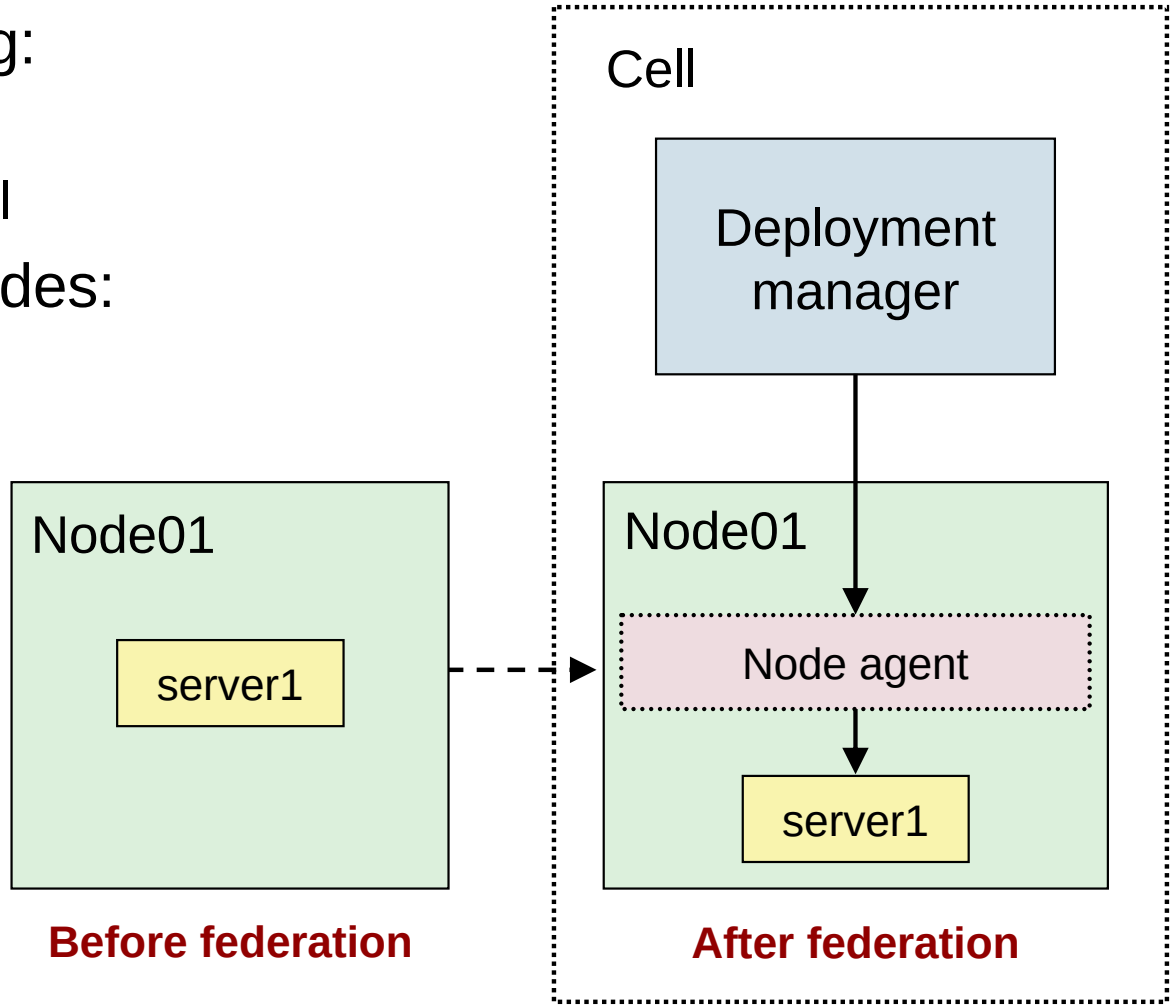
Common command-line tools

- In several directories:
  - <*was_root*>\bin
  - <*profile_root*>\<*profile_name*>\bin
- Tools include:

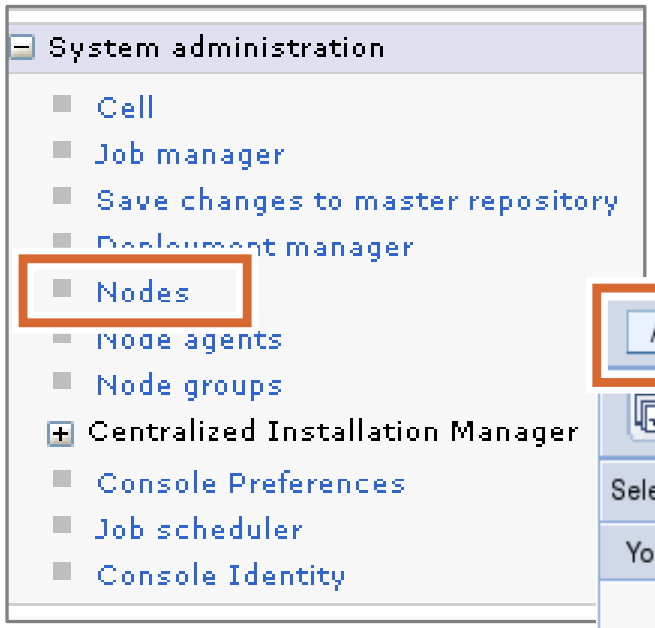
Command	Function
addNode	Add a node to a cell
syncNode	Synchronize a node with the cell configuration
removeNode	Remove a node from a cell
cleanupNode	Cleans up a node configuration from the cell repository
startNode	Start the node agent
stopNode	Stop the node agent
startManager	Start the deployment manager
stopManager	Stop the deployment manager

Adding a node to a cell

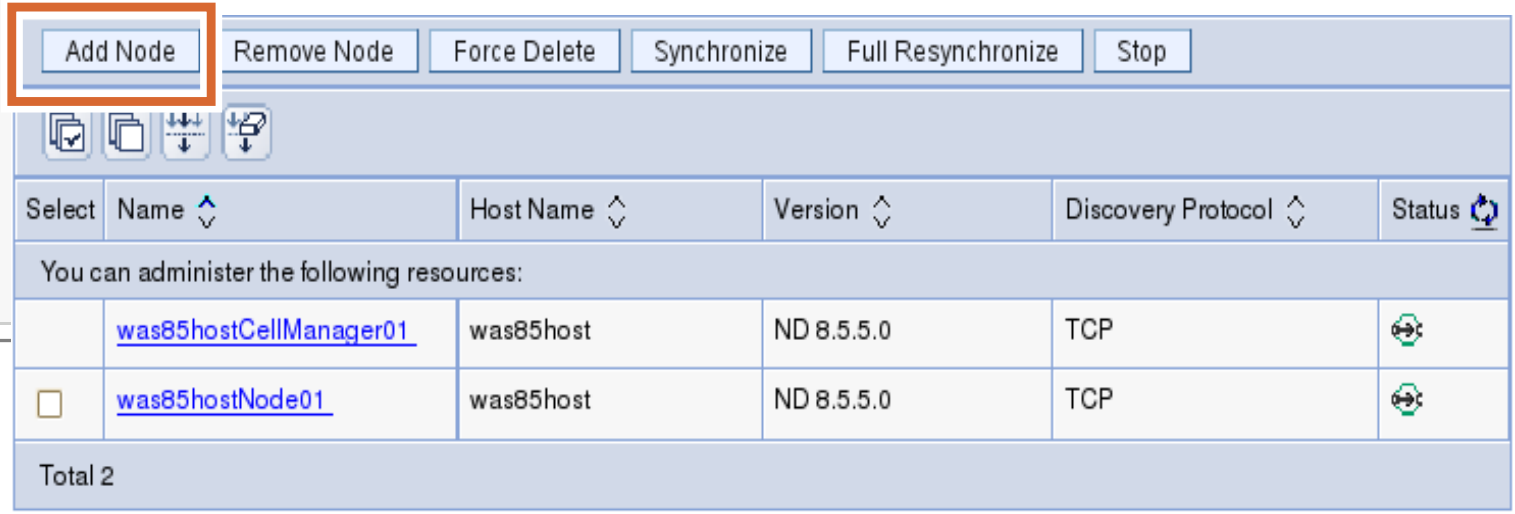
- Add a node to a cell by using:
  - Administrative console, or
  - **addNode** command-line tool
- Adding a node to a cell includes:
  - Creation of a backup of current configuration
  - Connection to the deployment manager
  - Configuration of the node agent
  - Addition of applications of node to cell configuration
- After the node has been added:
  - Use **startNode** to start the node agent
  - Use **syncNode** to synchronize a node



Adding a node



- Deployment manager administrative console

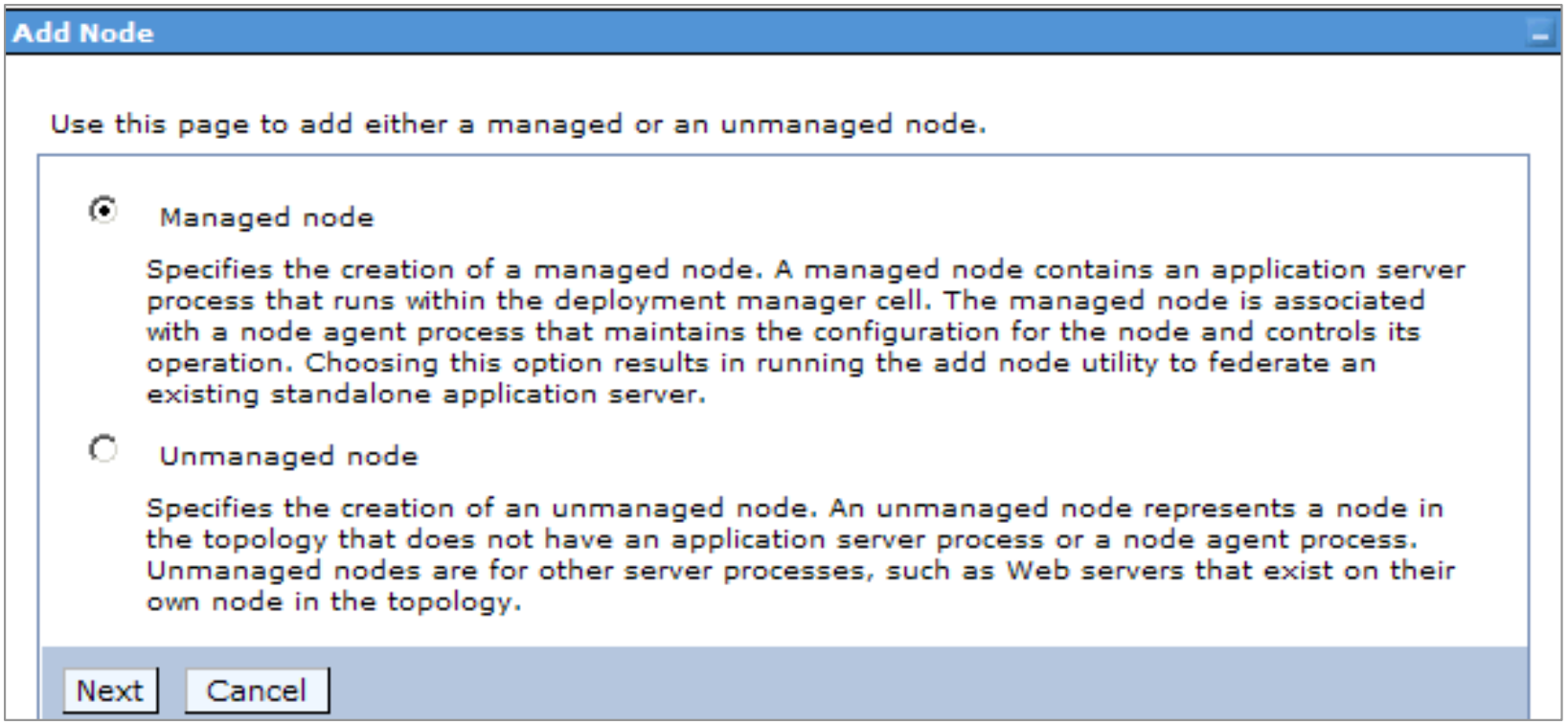


- Command line

```
addNode dmgr_host [dmgr_port] [-profileName profilename]
[-conntype type] [-excludesecuritydomains true | false] [-includeapps]
[-startingport portnumber] [-portprops qualified_filename]
[-nodeagentshortname name] [-nodegroupname name]
[-includebuses] [-registerservice] [-serviceusername name]
[-servicepassword password] [-coregroupname name] [-noagent]
[-statusport 1231] [-quiet] [-nowait] [-logfile filename] [-replacelog]
[-trace] [-username uid] [-password pwd] [-localusername localuid]
[-localpassword localpwd] [-help]
```

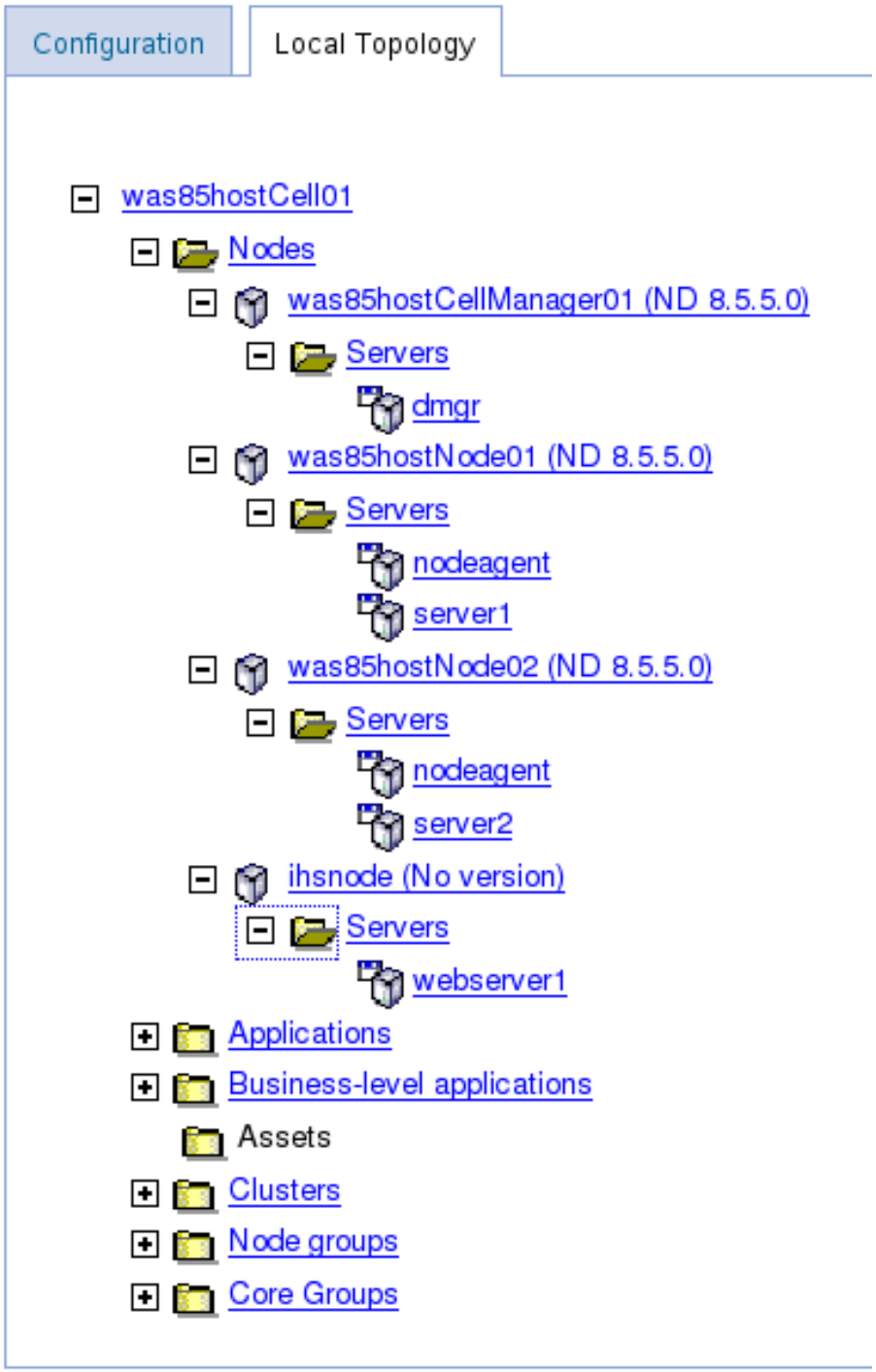
Managed versus unmanaged nodes

- Managed nodes
  - Use node agent or administrative agent to manage their servers
  - Application server process runs within the deployment manager cell
- Unmanaged nodes
  - Node agent or administrative agent does not manage its servers
  - A stand-alone application server is an unmanaged node
  - Commonly used for web servers

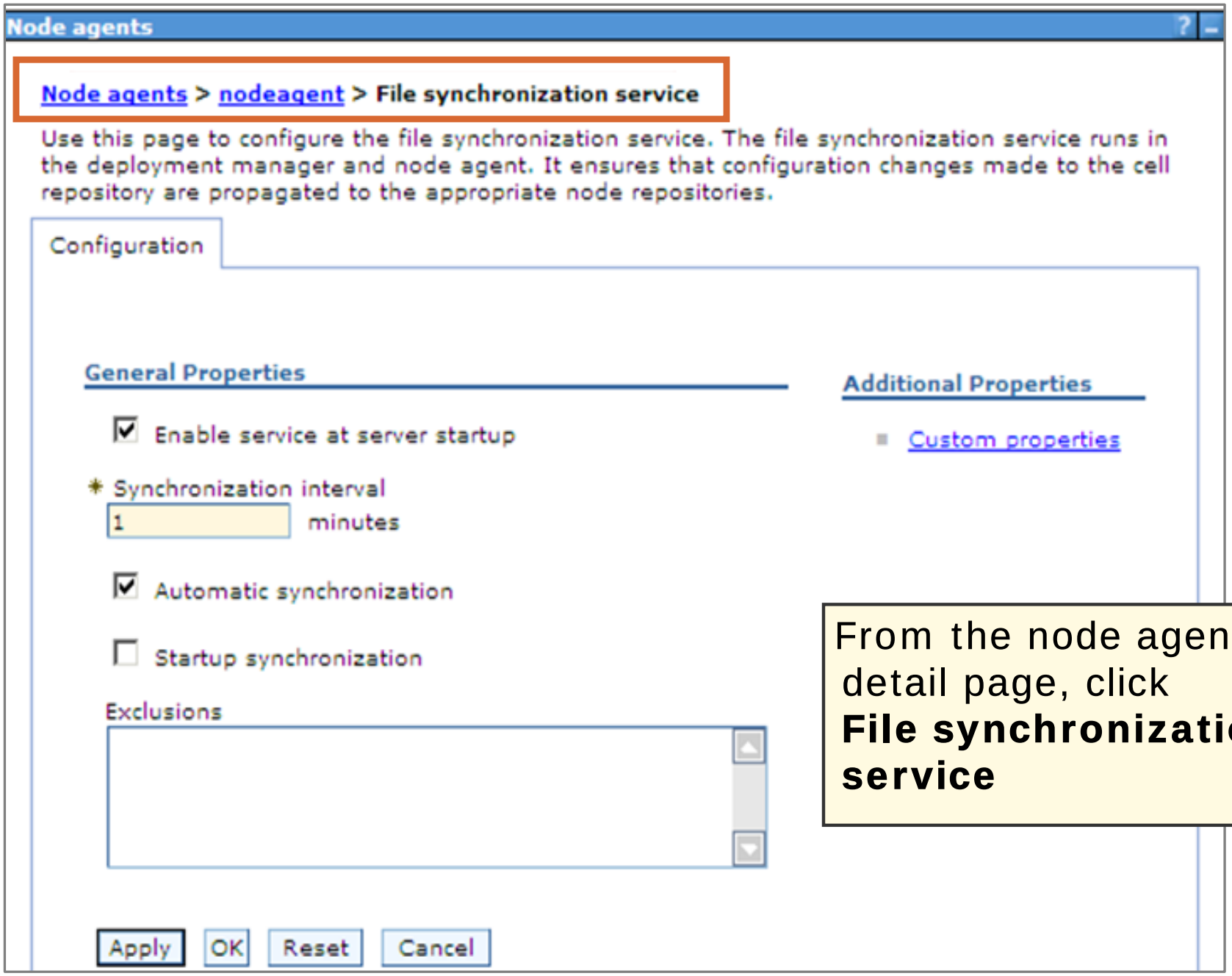


Cell topology

- Cell topology can be viewed through the administrative console
  - From **System Administration > Cell > Local Topology**



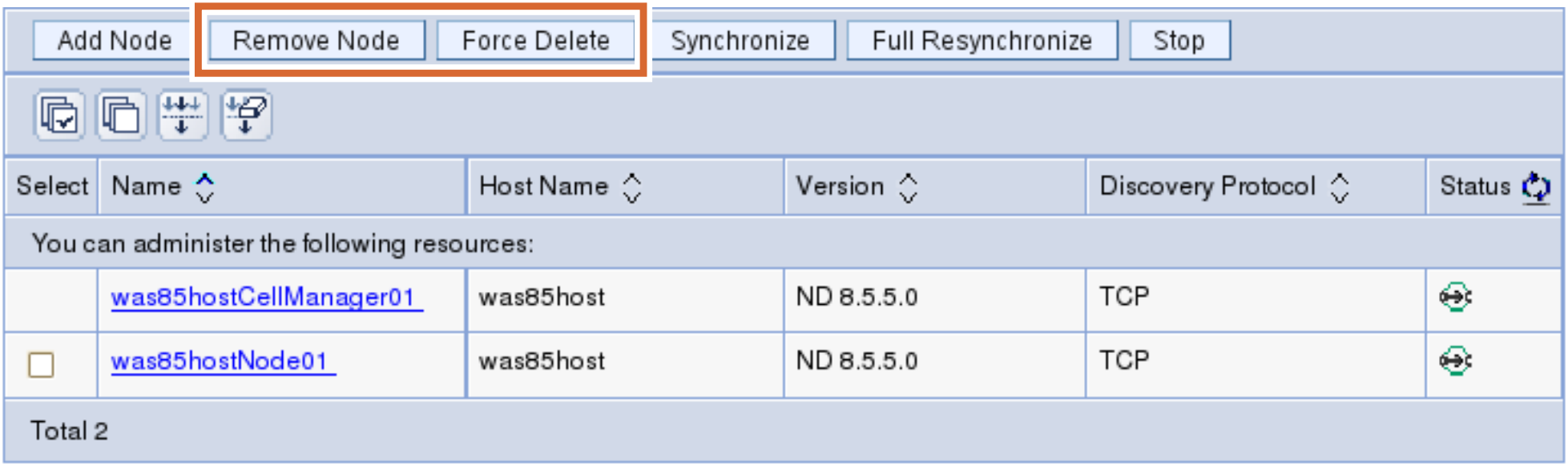
Configuring synchronization



From the node agent detail page, click **File synchronization service**

Remove a node from a cell

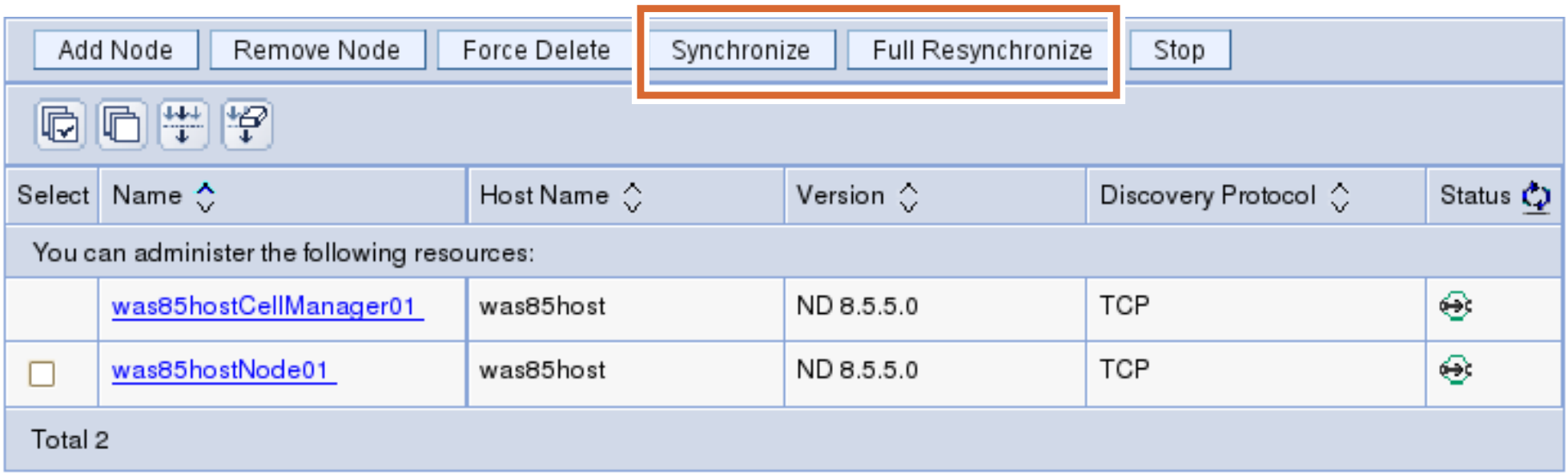
- Use the **`removeNode`** command to remove a node from a cell
  - Restores stand-alone configuration of the node from a backup
  - The **`removeNode`** command is equivalent to using the **Remove Node** action
- Use the **`cleanupNode`** (Force Delete) command to force the removal of a node from a cell
  - Used to clean up a node that is defined in the cell configuration, but no longer exists
  - The **`cleanupNode`** command is equivalent to using the **Force Delete** action



Synchronization

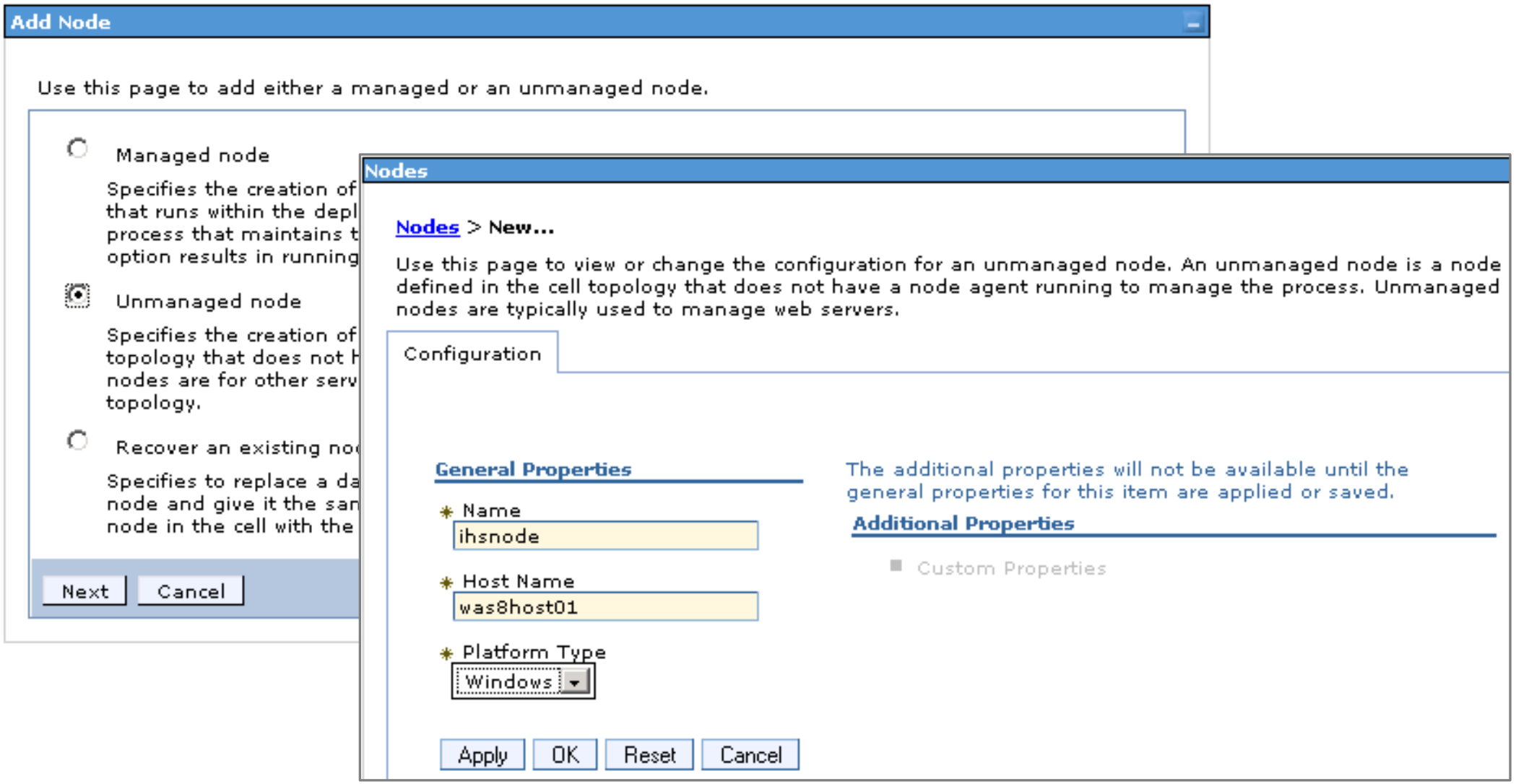
- **Synchronize**
  - Uses the normal synchronization optimization algorithm
  - Node and cell configuration might still be out of synchronization after operation

- **Full Resynchronize**
  - Clears all synchronization optimization settings
  - No mismatch between node and cell configuration



Managing a web server: Adding a node to a cell

- Create an unmanaged node for defining remote web servers
  - From **System administration > Nodes > Add node**



Managing a web server: Add the web server

- Add the web server to the created node
  - From **Servers > Server Types > Web servers > New**

1

Select a node for the Web server and select the Web server type

Select a node that corresponds to the Web server you want to add.

Select node

ihsnode

* Server name

webserver01

* Type

IBM HTTP Server

2

Select a Web server template

Select the template that corresponds to the server that you want to create.

Select	Template Name	Type	Description
◉	IHS	System	The IHS Web Server Template

3

Enter the properties for the new Web server

Enter the Web server properties.

* Port

80

* Web server installation location

C:\Program Files\IBM\HTTPServer

* Service name

IBMHTTPServerV8.0

* Plug-in installation location

c:\Program Files\IBM\HTTPServer\Plugins

Application mapping to the Web server

All

Enter the IBM Administration Server properties.

* Administration Server Port

8008

* Username

ihsadmin

* Password

••••••••••

* Confirm password

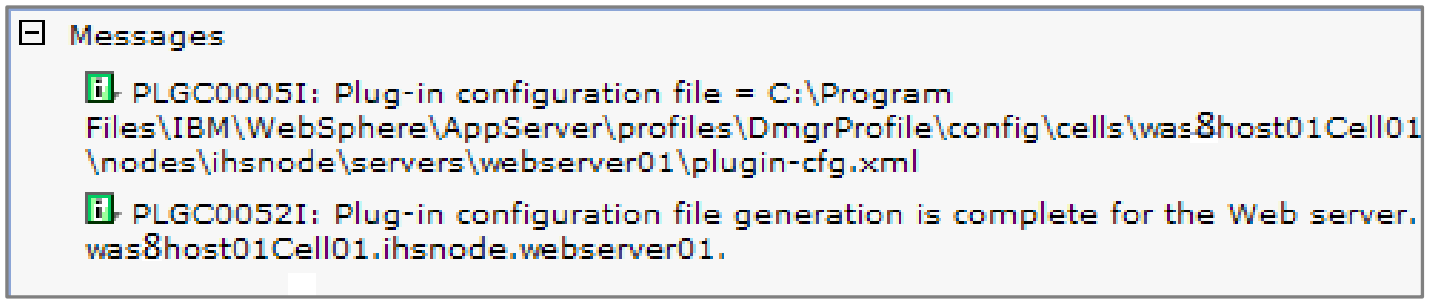
••••••••••

☐ Use SSL

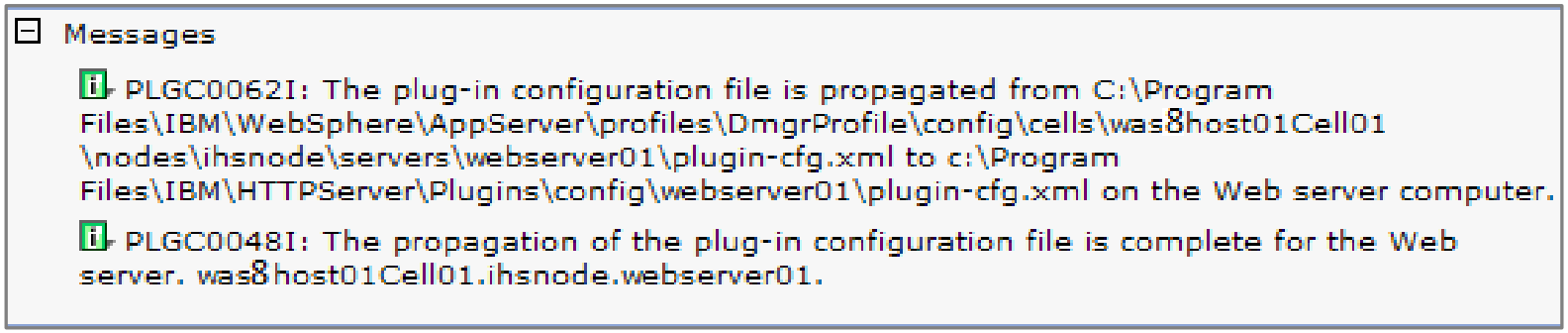
Managing a web server: Plug-in configuration file

- The plug-in configuration file contains routing for all applications that are mapped to the web server
- After changes that affect routing, regenerate and propagate the plug-in file to the web server
  - From **Servers > Server Types > Web servers**

1. Generate plug-in



2. Propagate plug-in



Unit summary

Having completed this unit, you should be able to:

- Describe WebSphere Application Server cell concepts
- Describe and create the deployment manager profile
- Describe and create other profile types
- Describe custom profiles and automatic federation
- Describe the directories and configuration files for profiles
- Add a node by using commands or the administrative console
- Compare the deployment manager administrative console with the base administrative console
- Compare managed and unmanaged nodes
- Use the administrative console to manage a web server

Checkpoint questions

1. Which managed processes can be part of a cell?
   A. Deployment manager
   B. Node agent
   C. Load balancer
   D. Application server

2. Which profiles can be created by using the Profile Management Tool?
   A. Load balancer profile
   B. Custom profile
   C. Plug-in profile
   D. IBM HTTP Server profile

3. All application servers have a corresponding node agent.
   A. True
   B. False

Checkpoint answers

1. Which managed processes can be part of a cell?
   Answer: A, B, and D

   A. Deployment manager

   B. Node agent

   D. Application server

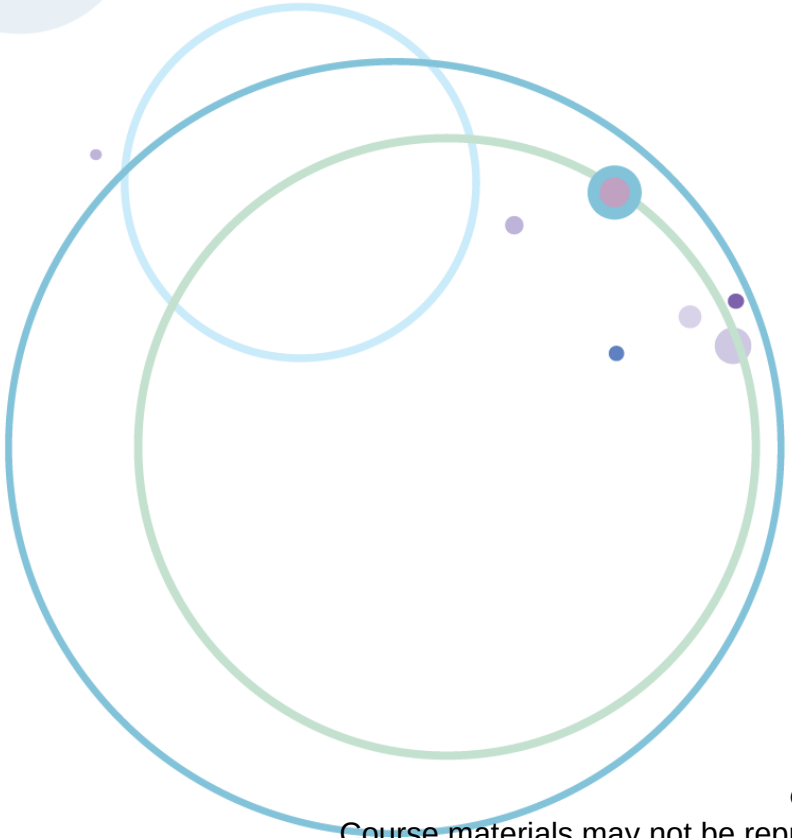
2. Which profiles can be created by using the Profile Management Tool? Answer: B

   B. Custom profile

3. All application servers have a corresponding node agent.
   Answer: B

   B. False

Exercise 9



Creating a federated cell

Exercise objectives

After completing this exercise, you should be able to:

- Create a deployment manager profile
- Back up the deployment manager configuration
- Use the deployment manager administrative console
- Federate a node into the deployment manager cell
- Create a custom profile
- Create an unmanaged web server node
- Use the administrative console to start and stop a web server
- Map an application to a web server