



Digital
Transformation
Solutions (DTS)

HARMAN mDeliver



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Getting started

The following table provides information related to high-level concepts of HARMAN mDeliver.

Goal	For more information	Benefit
Understand the value you get from implementing HARMAN mDeliver.	Business value	Take advantage of key features the product has to offer to troubleshoot, configure and deploy Java EE applications across WebSphere, WebLogic, JBOSS, Geronimo, and Tomcat application server environments quickly, efficiently, and safely.
Understand the goals of implementing HARMANmDeliver into your environment	User goals and features	Take advantage of key features in the product to meet specific goals, such as manage your servers and their Configurations.
Understand the HARMAN mDeliver critical capabilities for your deployment and troubleshooting tasks	Product capabilities	Take advantage of the key capabilities of HARMAN mDeliver in creating a repeatable deployment and configuration process that can eliminate the errors resulting from the current manual or script solutions.
Understand the basic activities you can perform using HARMAN mDeliver to perform different kinds of configuration and deployment tasks	Basic activities	Take advantage of HARMAN mDeliver to solve many kinds of problems, from troubleshooting webapplication servers to deploying applications on many servers quickly.
Understand the capabilities of HARMAN mDeliver that help you migrate or clone a WebSphere Configuration to the latest version of WebSphere or between different application servers.	Migration of Configurations	Take advantage of HARMAN mDeliver capabilities to migrate or clone a WebSphere Configuration, so that you can install the generated Configuration on a target application server of a different WebSphere version or in a different topology.
Understand the capabilities of WebSphere Application Server version 8.5.5, because starting with this version the on-demand router (ODR) can be integrated into the web server plug-in for an Apache or IBM HTTP Server.	Intelligent Management for WebSphere web server plug-in	Take advantage of such an integration that can simplify the topology and reduce the latency due to one fewer hop in the network.
Understand the reporting server that collects and displays various reporting information for each instance of your WebServices API server along with all the relevant metrics.	Health and Value Dashboard overview	Take advantage of the Health and Value Dashboard to monitor the state of your WebServices API servers, as well as view the collected statistics by each WebServices API server.

Business value

HARMAN mDeliver allows you to troubleshoot, configure and deploy middleware applications such as Java Enterprise Edition (Java EE) across WebSphere, WebLogic, JBOSS, Geronimo and Tomcat application server environments quickly, efficiently and safely. The solution eliminates integration defects and removes barriers to reliable configurations. HARMAN mDeliver is the fastest, safest, and most reliable way to deploy and configure middleware applications, and to automate the tasks related to the web application deployment.

Starting with version 8.8, HARMAN mDeliver shifts from the stand-alone model to the server-based model. The WebServices API Server that is now shipped with the HARMAN mDeliver desktop application provides you with the ability to run all the HARMAN mDeliver operations via the REST API interface. The server-based approach for HARMAN mDeliver features the following benefits:

- Simplifies integration with other products
- Enables use of the product in a server-based environment
- Isolates services from each other to simplify development, streamline testing, improvedurability and reliability.
- Improves the overall agility of feature development for future releases
- Enables HARMAN mDeliver with the scalability to enterprise standards in a server environment

Task automation

The HARMAN mDeliver solution automates the long list of discrete tasks needed to deploy webapplications and dramatically simplifies the process, making it easier and less expensive for organizations to leverage web application server technology.

The solution performs the following activities:

- Interrogates the server and creates an abstraction of all the unique settings in a data model Uses the
- abstraction to create a package of objects that can then be moved throughout youreenvironment
- Compares the objects in the package to the objects that exist on the target server Makes the
- changes that are necessary to configure and deploy those objects correctly

In essence, HARMAN mDeliver provides fully automated, contextual configurations and deployments with the intelligence to include any dependencies in the package. You no longer have to manually hunt for dependencies and discover them for yourself. In addition, that first abstraction can be systematically compared between servers to quickly identify differences or issues that are impacting performance. This makes HARMAN mDeliver a must-have a diagnostic tool for any system administrator responsible for web application servers.

Advantages of the solution

The solution provides you with the following advantages:

- Data driven approach vs. labor-intensive scripting, which other products/processes require. Agent-less technology: does not require additional infrastructure overhead and management; Agents, Databases, and so on.
- Leverages your preferred native API's and ensures the middleware environment integrity. Does not require file-based access.
- Integrates easily with other products, third party and/or in-house.
- Shows you the "big picture", lights out integration leveraging existing Customer investment and standards.
- Automates middleware configuration management upgrades in place of the time consuming and error prone manual processes.

Web application server technology has revolutionized the way millions of people do their jobs. The challenge for organizations in leveraging this technology is that it requires a lengthy set of discrete steps that must be executed flawlessly to customize the configuration and successfully deploy applications. Because the web application server infrastructure does not have a robust and consistent set of tools to simplify or automate these tasks, most organizations struggle with meeting deadlines, effectively managing project budgets, ensuring application availability and system up-time requirements, and dealing with compliance or government mandates.

User goals and features

The HARMAN mDeliver product is the fastest, safest, and most reliable way to deploy and configure middleware applications such as Java Enterprise Edition (Java EE) applications.

Business challenge

A Java EE application server — such as IBM WebSphere, JBoss Application Server, or Oracle WebLogic — is a powerful platform for developing and deploying applications. As more applications are deployed on more servers, managing deployments and installations becomes an increasingly complex task. Every time you perform a new deployment, an upgrade, or a migration, or build and configure a new environment, there is potential for error and expensive downtime.

HARMAN mDeliver solution

HARMAN mDeliver is a single tool that you can use to track your servers and their configurations. It provides you with the following capabilities:

- Audit server configuration changes - Compare the current server environment to an earlier Snapshot to see what has changed.
- Create baseline Configurations - Quickly install a known baseline Configuration on a server.
- Save installation reports - HARMAN mDeliver creates an installation report, showing *before* and *after* values of every item that changed during an installation.
- Preview installations - See the changes that will be made before you perform an installation. Replicate Configurations between servers—Take all or part of a server's Configuration and install it on other servers.
- Deploy applications on multiple servers - Create a single, tested Configuration and install it on any number of servers.
- Migrate Configurations - Install a Configuration from a WebSphere application server to a newer WebSphere application server release or to a WebSphere application server with a different topology.
You can even migrate Configurations between the WebSphere full profile and the WebSphere Liberty Profile.
- Use templates - Use built-in template Configurations to perform common application server configuration tasks.
- Create server images - Create a full image of a server instance in its current state, including all contents of the instance, so that you have the option to restore the server to the state captured by the server image, or to clone the server instance and create multiple identical server instances with the same configuration. This feature is available in Apache Tomcat, IBM WebSphere Community Edition, and Apache Geronimo.

Powerful management of middleware

HARMAN mDeliver is an interactive project environment where you work with objects that describe servers and configurations. It can retrieve the configuration from an existing server, and it can install configurations on servers. It provides powerful wizards and editors to help you create tailored configurations that do the work that you need them to do, safely and reliably.

Product capabilities

The HARMAN mDeliver product introduces an innovative and powerful capability to manage web application server configurations, deploy applications, and troubleshoot web application servers quickly, efficiently, and safely. HARMAN mDeliver can be a vital tool for administrators to use to quickly diagnose and isolate problems across their web application servers. The product also creates a repeatable deployment and configuration process that can virtually eliminate the errors that result from the current manual or script solutions.

HARMAN mDeliver provides the following critical capabilities for your deployment and troubleshooting tasks:

- **Snapshot:** Automatically obtains configuration information from a known good instance. Snapshots enable you to see how your server is configured at a glance.
- **Compare:** Compares Snapshots from different servers and provides an inventory of differences across environments. This feature can save hours of troubleshooting when time is critical.
- **Preview:** Executes a dry-run configuration and deployment of the application server, providing a detailed report and analysis of the potential impact of the deployment.
- **Tokenize:** Replace hard-coded, environment-specific attribute values with tokens before the Configuration is installed to multiple servers.
- **Install:** Configures the application server and deploys the application in an intelligent and automated manner.
- **Update:** Changes are made only to the application server that requires the changes to fully configure the server.
- **Rollback:** Automatically rolls back to the last known good state if all or part of an installation fails. The product never leaves the application server in a non-functioning state.
- **Server Image:** Creates a full image of a server instance in its current state, including all contents of the instance. Server image helps you restore the server to the state captured by this server image, or to clone the server instance and create multiple identical server instances with the same configuration.
- **Migrate:** Migrates a Configuration between different WebSphere versions and between different application server families.

Basic activities

You can use the HARMAN mDeliver product to solve many kinds of problems, from troubleshooting web application servers to deploying applications on many servers quickly. The following fundamental activities that you perform in HARMAN mDeliver enable you to perform many kinds of configuration and deployment tasks:

- [Create Server Profiles](#)
- [Create snapshots](#)
- [Create a restricted configuration](#) that contains just the configuration information that you want to update on a server
- [Tokenize the configuration](#), replacing hard-coded information with variables that you can set each time you apply the Configuration to an application server

Create Server Profiles

A Server Profile contains the information that HARMAN mDeliver needs to connect to an application server to create Snapshots and install Configurations. It includes information that describes the server, such as vendor and version, network addresses, and the security credentials required to establish a connection. The Server Profile is also where you save environment-specific token values that are substituted into a Configuration before it is installed on the server.

Create snapshots

A Snapshot is HARMAN mDeliver Configuration that is created by retrieving configuration data from a server. After you create a Server Profile, the product can create a Snapshot. It connects to the server, retrieves the configuration data, and saves a Configuration document in your project's **Configurations** folder. The Configuration is an XML document based on a schema developed by HARMAN. A schema exists for each application server that HARMAN mDeliver supports.

If you periodically save Snapshots of server configurations, you can compare them to each other to see what has changed. This capability makes Snapshots useful for troubleshooting server problems.

When you edit a Snapshot, you create a Configuration that you can reinstall on the server or install on other servers. During an installation, HARMAN mDeliver uses the application server's administration API to compare all the information in the Configuration with the server's current environment. It makes only the required changes and saves a report showing the changes that it made.

Create a restricted configuration

A Snapshot contains all of an application server configuration data. When you are deploying applications, you need to modify only a small portion of that data. You can use the Configuration Packager tool to select just the objects that you need to install. Smaller Configurations install more efficiently and eliminate the possibility of introducing errors by changing objects unrelated to the current task.

If files, such as **.ear**, **.war**, and **.jar** files, are associated with the Configuration, you can add them to the Configuration so that they are uploaded when you install the Configuration. For IBM WebSphere, you can further minimize deployment times by associating a *partial application* with the Configuration; only specific files within the archive file are uploaded during the installation of the Configuration. You can also specify commands to execute on the server before or after the Configuration is installed.

HARMAN mDeliver provides templates that you can use to create Configurations for common tasks, such as configuring server ports, virtual hosts, or JMS queues and topics.

Tokenize the configuration

Configurations contain hard-coded, environment-specific attribute values. For example, Configurations typically contain server host names and port numbers. When you create a Configuration to deploy on multiple servers, you do not want to edit the host name and port number, and all the other server-specific data, each time you install the Configuration on another server.

With, HARMAN mDeliver you can replace hard-coded values with tokens that are substituted with values just before the Configuration is installed. The values are stored in the Server Profile for each target application server. You can have multiple token sets in the Server Profile, with different replacement values for the same set of tokens. For example, you could have a token set for the development environment and another for the production environment. HARMAN mDeliver verifies that you have provided values for all of the tokens before it proceeds with the installation.

The Tokenization Wizard helps you locate server-specific values in Configurations and replace them with tokens. You search for a value — such as a port number, installation path, or host name — and the wizard finds every occurrence of the value in the Configuration. Then you can specify the token to replace the hard-coded values.

If your Configuration specifies application archives to deploy (**.ear** or **.war** files), you can tokenize any text files in the archives so that variable values can be set when the application is deployed. This is useful for applications that are configured using Java properties files.

A benefit of tokenization is that after you have created and tested a Configuration, you can reuse it without having to alter it. You can just set token values in the Server Profile and install the Configuration on the server.

Migration of Configurations

HARMAN mDeliver enables you to migrate or clone a WebSphere Configuration, so that you can install the generated Configuration on a target application server of a different WebSphere version or in a different topology. Migrating a Configuration to the latest version of WebSphere can be referred to as vertical migration.

Migrating a Configuration between different application servers can be referred to as horizontal migration. Currently you can migrate Configurations between the following application server families:

- WebSphere (full profile) and WebSphere Liberty Profile.
- WebSphere 7.0, 8.0, 8.5, 9.0 (full profile) to Red Hat JBoss Enterprise Application Platform (EAP) version 6.3 or 6.4 or 7.0.

You can use the migration feature for the following objectives:

Objective	Supported migration paths
Migrate a WebSphere (Network Deployment Edition) Configuration to a later version of WebSphere	<p>WebSphere 6.1 to 7.0, 8.0, 8.5 or 9.0</p> <p>Note: In HARMAN mDeliver 9.0.00, you can proceed with the migration from WebSphere 6.1 to later versions even if you receive a warning that the artifacts are deprecated.</p> <p>WebSphere 7.0 to 8.0, 8.5 or 9.0</p> <p>WebSphere 8.0 to 8.5 or 9.0</p> <p>WebSphere 8.5 to 9.0</p>
Migrate a WebSphere (Network Deployment Edition) Configuration to a later version of WebSphere	<ul style="list-style-type: none"> • WebSphere 6.1 to 7.0, 8.0, 8.5 or 9.0 <p>Note: In HARMAN mDeliver 9.0.00, you can proceed with the migration from WebSphere 6.1 to later versions even if you receive a warning that the artifacts are deprecated.</p> <ul style="list-style-type: none"> • WebSphere 7.0 to 8.0, 8.5 or 9.0 • WebSphere 8.0 to 8.5 or 9.0 • WebSphere 8.5 to 9.0
Clone a WebSphere (Network Deployment Edition) Configuration for the same version of WebSphere	<p>WebSphere 6.1 to 6.1</p> <p>WebSphere 7.0 to 7.0</p> <p>WebSphere 8.0 to 8.0</p> <p>WebSphere 8.5 to 8.5</p> <p>WebSphere 9.0 to 9.0</p>
Migrate configurations between WebSphere (full profile) Configuration and WebSphere Liberty Profile.	<p>WebSphere 8.5 (full profile) to WebSphere Liberty Profile 8.5</p> <p>WebSphere Liberty Profile 8.5 to WebSphere 8.5 (full profile)</p> <p>WebSphere 9.0 to WebSphere liberty profile 8.5</p>
Migrate a WebSphere (full profile) Configuration to JBoss EAP versions	<p>WebSphere 7.0, 8.0, 8.5, 9.0 (full profile) to JBoss EAP version 6.3 or 6.4 or 7.0</p>

Intelligent Management for WebSphere web server plug-in

Starting with WebSphere Application Server version 8.5.5, the on-demand router (ODR) can be integrated into the web server plug-in for an Apache or IBM HTTP Server. This integration can simplify the topology, reduce the latency due to one fewer hop in the network, and be implemented easily. This type of integration can be referred to as Intelligent Management for WebSphere web server plug-in.

Starting with version 8.7.00, HARMAN mDeliver supports Intelligent Management web server plug-in. The **IntelligentManagement** element is added to the WebSphere 8.5.5 schema. With this element you can enable or disable Intelligent Management capability, as well as configure additional properties and connections to remote cells.

HARMAN mDeliver schema

Node	Content
1?P root	xmlns:LO encoding="UTF-8" standalone="no" (AdminTaskGroup), AppAuth, AppAccess
1?P Phases	https://www.ibm.com/docs/en/AS-900/094/Schemas/replicat
1?P antitrust	4.2.0
1?P IBMVersion	8.5.5
1?P CopyrightVersion	8.5.5
1?P CopyrightVersion	https://www.ibm.com/docs/en/AS-900/094/Schemas/replicat
1?P IntelligentManagement	Target="WS" Classification="label" Description="Intelligent Management"
1?P Classification	label
1?P Target	WS
1?P cellIdentifier	localhostCell00
1?P enabled	true
1?P enabled	1
1?P enabled	WS
1?P WebServerProperties	name="webServer"
1?P name	webServer
1?P value	true
1?P CellConnector	name="cellIdentifier"
1?P cellIdentifier	true
1?P host	remoteCellHost.ibm.com
1?P requestCertificate	true
1?P password	[*4]([a-zA-Z0-9@!#\$%^&*~`-+=
1?P port	8870
1?P userID	admin
1?P IntelligentManagement	Target="WS" Classification="label" Description="Intelligent Management"
1?P Server	name="WS" Classification="label" Description="Intelligent Management"
1?P Server	name="WS" Classification="label" Description="Intelligent Management"
1?P VariableApp	Target="WS" Classification="label" Description="Intelligent Management"
1?P VariableApp	Target="WS" Classification="label" Description="Intelligent Management"
1?P VariableApp	Target="WS" Classification="label" Description="Intelligent Management"

Structure of the IntelligentManagement element

The following table describes the attributes of the **IntelligentManagement** element:

Attribute	Description
Classification	Refers to the node on which the web server is located
Target	Refers to the name of the web server to which this element belongs
cellIdentifier	Unique identifier of the cell on which the web server is installed
enabled	Flags if the Intelligence Management is enabled for a specific web server
maxRetries	Specifies the maximum number of retries for enabling the Intelligent Management service. Valid values are: zero, positive integer numbers, and infinite.
retryInterval	Specifies the time interval (in seconds) between connection attempts.
defaultTraceRuleSpec	Defines the default trace rule for a web server (for example: control.mapper:ERROR)
conditionalTraceRuleSpec	Defines the conditional trace specification for a web server (for example: control.mapper:INFO)
conditionalTraceRuleCondition	Defines the trace condition for a web server (for example, port=3)

Below is description of sub-elements of the **IntelligentManagement** element:

Subelements	Attributes	Description
UserDefinedProperty	<ul style="list-style-type: none"> • name • value 	Specifies properties for your web server
CellConnector	<ul style="list-style-type: none"> • cellIdentifier • enabled • host • importCertificates • password • port • userID 	Specifies remote cell connector properties

Health and value dashboard overview

Health and Value Dashboard is a separate reporting server that collects and displays various reporting information to the HARMAN mDeliver users. The Health and Value Dashboard server interacts with the Web Services API Server to obtain fresh reporting information and all relevant metrics. Interaction is performed via the **https** and **wss** protocols.

With the Health and Value Dashboard you can monitor the state of your WebServices API servers, as well as view the collected statistics by each WebServices API server.

Health and Value Dashboard helps you track the following data:

- General data and metrics related to your WebServices API servers
- Current number of servers in use and their status
- Maximum and average job execution time
- Current size of queues that store long and short running jobs
- Number of successful install and snapshot operations in comparison to the total number of operations
- Current memory usage information
- Detailed information about available WebServices API Servers and their health status
- Detailed information about available database servers and their size information Current information about all the jobsDB and metricsDB databases in the cluster
- Different value information for each of the target application servers

The Health and Value Dashboard is installed with the installer, unless you decide not to install it during installation.

You can access Health and Value Dashboard from the application interface, under **Actions > Open the Health & Value Dashboard Console**.

You can later update or change the connection or port information needed by the service to run in a **bmadaashboard.properties** configuration file, located in your installation directory.