
Parallels

Application Packaging Standard 1.2

What's New

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CHAPTER 1

Introduction

This document outlines new features of Application Packaging Standard 1.2 (hereinafter APS). This release includes a number of new features and improvements that make APS be a more flexible solution to suit SaaS providers needs.

Add-on Packages

A great variety of applications have some additional parts like modules, skins, templates, themes and the like. Usually, they are not required for application actual running, but provide additional functionality that makes application more flexible, convenient or user-friendly. APS allows packaging such add-on as full package but with dependency on other APS package. In other words, add-ons packages may contain their own services, settings, requirements and Controller treats them as regular package. The only difference, that add-on package metadata contains reference to master package declared with `<master-package>` element and could not be installed if master package is absent in the hosting environment.

Using this new feature, APS-enabled hosting providers can form more attractive offers to their customers combining different add-ons and allow end-users modify their instances at will. Moreover, if an add-on is compatible with application newer version user may upgrade application, but keep using the add-on.

Application Recovering

Application user's data can be preserved and restored. APS introduces the possibility of backing up application and user's data as well as its restoration and migration. These operations can be done with help of backup script. This script is treated as usual configuration script. It means that script programming language must be declared and application environment variable should be provided on its invocation. The script is invoked on service backing up, or restoring. Migration operation is treated as sequential execution of backup and restore operations.

This feature opens for hosting providers and end-users the following opportunities:

- User can make several backups of his application to be able revert into previous state later;
- Provider may do application instance backup/restore to avoid hardware failures;
- Provider can move application instance to another server. He backups it on one server, then moves and restores on another;
- Control panel can be set up to automatically make application backup before upgrade and restore previous state in case of upgrade failure.

Application Licensing

Applications that require licenses can get the ones automatically during application provisioning. It is implemented as follows: user initiates application installation; during installation license request is sent to control panel that processes it and provides application with license.

A packager may define how an application instance should behave before license installation using optional elements defined in the license aspect. For example, application may be ran in demo mode or deny an access.

The functionality is defined in the License aspect.

Resources Usage Reports

Monitoring resources usage is a vital ability for all hosting providers. Monitoring usage of hosting resources is performed by platform itself, but hosting platform has no access to application resources. For example, Open-Xchange application has *InfoStore* module. This module allows application users to place some items for storage and share them with others. A storage comprises a number of folders each of them occupies some storage space. So, storage space is an application resource that usage can be reported by application. The other example of such resource can be a number of application users.

APS 1.2 implements possibility to get application resources usage reports per application instance. The dedicated section is added to application metadata basic scheme. This section describes resources that usage is to be reported by application instance. The information on resources usage is collected by script that is called by Controller periodically.

Settings Verification

To ensure settings values consistency before an instance of an application or its services are provisioned verification script declaration is added. The script may be called in global context while global settings configuration. Also, it may be used in context of a service instance provisioned to check settings of its child service. Verification results are available immediately after the script execution and may be displayed to user on submit.

Communication Protocol

Errors reporting protocol is implemented to unify the way of communication between configuration scripts and Controller. Making script output structure matches one defined in the Specification simplifies and quickens Controller understanding of what is going wrong.

The report may include:

- identifiers of settings with erroneous values;
- localized hints for a user on what is wrong with the value;
- detailed system problem description for a Controller;
- warnings and errors related to the requirements.

Thus, it makes communication with user more friendlier and allows Controller quickly and correctly to react on errors if any occurred during application installation, upgrade or configuration.

DLL Applications Provisioning

APS-enabled providers can diversifies their offers with applications distributed in form of compiled dynamic libraries (*.dll, *.so). APS 1.2 supports installation of DLL into available environment and the usual dynamic library registration procedure. A dynamic library is registered once in a hosting environment for all application instances.

The functionality is defined by adding DLL Content Processing Method aspect into the Specification.

Package Digital Signature

To prevent counterfeit and ensure package integrity software vendors and packagers may now digitally sign packages. If the package is signed by packager a control panel of APS-enabled provider should use signature to verify the application package integrity. Software vendor signature assures user that the application developer is the one who developed it. If the package is signed by certification authority, for example APS organization, the package contains a certificate as well. A control panel should verify the package certificate validity. The package may be signed by vendor, packager and certification authority simultaneously. So, these signatures impress hosting providers and users of application origin and proper packaging.

Package Identifier

Unique application package identifier can be used to upgrade and patch consequent versions of package. It allows changing application name during upgrade and application add-ons use it for reference.

Different Update Modes

Two new update modes are available now in addition to the existing the simplest one. Now a packager may selected update mode that suits its application in the best way. The following update modes are available:

- *simple* - old application files are replaced with new ones.
- *managed* - both old and new application directories are available during configuration script execution. The only restriction is old and new application directories should reside on the same file system. The old application directories are removed after configuration script successful execution.
- *backup* - the update procedure is a bit complicated then the managed one. It involves backing up old application data, new instance creation, then restoration of backed up data on new instance and configuration script execution.

Service Singularity

Application may provide services that require their singularity within some scope, for example a calendar per a user account. The other option is provider may want to limit provisioning of some services, for example only one mail box per a user account. As you can see from examples, child services provisioned within their parent service are at stake.

APS 1.2 provides you a possibility to restrict child services provisioning to ensure their singularity. These services are marked with the special attribute in an application metadata file. This attribute lets a Controller knows that this service can be instantiated only once under its parent one. If a service is not marked as singular a Controller allows creating several instances of this service within its parent one.

Host Name Setting Type

Hosts can be referenced in application settings by both DNS name or IP address and validated by control panel. It allows user to specify external service host for application.

List Setting Type

A service now may have a setting of the list type. In other words, such setting may possess a number of values of some type at a time. For example, application provides a list of contacts (service), contacts of this list may be declared as one setting of the list type. So, an end-user may add new values of this setting (list) or remove some existing ones.

Also, application packager may provide a list of default values of such setting, specify maximum and minimum number of the list items and element list items are ordered by.

Settings Uniqueness

Some settings of multi-tenant applications, like user or instance names, must be unique within specific domain (all application instances or a customer's one). APS 1.2 allows declaring a necessity of setting value uniqueness within some scope. When Controller reads that setting is defined as unique it must ensure this uniqueness.

The most frequent use case is when packager requires user name of mail account to be unique in context of mail service.

Setting Drop-Down Values List Based on Application Data

Application may declare settings that values are stored in application data or depend on particular instance. For example, for Open-Xchange application it is the list of access-types, for Wrike one it is the list of available phone numbers.

APS 1.2 allows declaring a special script that returns list of choices for such settings. Controller reads output and presents values in the drop-down list form to user.

Optional Settings

Optional settings now can be handled by the Controller. If a setting is declared as optional, the Controller prompts user to enter a value, but not validate it. An optional setting can be full user name for new mail account in application, for example.

Site Root Requirement

Some applications are unable to work when installed into subdirectories. Now, such applications may require to be installed into site root with the `site-root` element. This element defines a requirement of URL mapping to be on root of web site.

Shared Location

Application may include files that are permanent for each instance, such as icons, screenshots and scripts. Delivering these files to each customer increases disk space usage.

Now hosting providers may save some disk space with new URL mapping type. Defining this type for URL mapping rule instructs Controller to copy specified folder files once to some location during the first instance installation and mark it as shared. All the following instances will share this location, so it decreases application installation size.

Redirect URLs

Virtual URLs may point to some remote URL. It allows redirecting user directly to any URL defined. For example, `/vendor` URL redirects to application vendor's web site.

DNS Zones Configuration

Application can request specific DNS zone records in order to work. For example, packager declares that MX record must be created during mail server application provisioning and the Controller performs appropriate DNS zone configuration automatically. The other use case when DNS zone records configuration may be required is a control panel uses customer's domain name to create application hostname, but application hosts its service on its own address.

The functionality is defined by adding DNS Zones aspect into the Specification.

IIS Configuration

Application can request IIS-specific settings to be configured in order to work, in particularly IIS version and application pool mode. The functionality is defined by adding IIS aspect into the Specification.

Perl Applications

The Specification is extended with Perl aspect. Now Perl applications can be packaged and installed in a hosting environment as well as Perl scripts can be used for application instance configuration and backing up.