Junos Space SDK
Release Notes

Release 14.1R2
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Version Summary

The Junos Space SDK 14.1R2 Release Notes provide release information that was not available while publishing the Junos Space SDK documentation set. The Junos Space SDK is an open network-centric application development toolkit for the Junos Space platform. It is exclusively designed to enable developers to use the information embedded in the network for creating unique applications with ease, speed, and economy.

The Junos Space SDK 14.1R2 provides many new features and functionality over previous releases.

The Junos Space SDK 14.1R2 is fully compatible with the Junos Space 14.1R2 and above.

Because of the new JBoss 7 architecture in Junos Space 13.2 and above, the Junos Space SDK 14.1R2 is not fully compatible with SDK versions prior to Junos Space SDK 13.2. This means that applications which worked in versions 13.1 and below, will no longer work with the new SDK and must be ported to the new platform. Fortunately, the current release of the SDK provides a migration tool to facilitate the porting.

The Junos Space SDK allows a developer to fully utilize the network intelligence and services of the Junos Space network application platform in order to develop their own applications. The Junos Space SDK consists of an intelligent package of REST APIs, the Eclipse Development environment, EJB-REST Wizard, REST Explorer, UI Builder, Application Settings UI Builder, device simulators, reference applications, support tools, and documentation.

For more information see:


Note: Applications built using the Junos Space SDK require an additional license agreement to be deployed in production environments. Contact Juniper to submit and package the Junos Space SDK applications for such deployment.

The Junos Space SDK is delivered in a single easy-to-use installer that contains:

• An Eclipse SDK plug-in that adds wizards, views, online help, and other SDK-specific features to the standard Eclipse environment.

• The Junos Space Virtual Appliance (JSVA), comprising a CentOS-based virtual machine (VM) that runs the Junos Space platform, and a device simulator. The Junos Space Virtual Appliance provides a development sandbox for testing applications that are developed with the Junos Space SDK.

• A set of reference applications that demonstrate different capabilities and uses of REST APIs and frameworks.

Note: Perforce P4Eclipse Plugin (version 4.3) is now bundled with the SDK installer. You no longer need to install this plugin, yourself. Note that for proper operation of this plugin, you need to make sure that you are using Eclipse Kepler Service Release 2 for J2EE Development (version 4.3) and not the newer versions of Eclipse.
Junos Space SDK 14.1R2 is a new minor release of Junos Space SDK. In this new release, we continue improving the Test Stepper Tool, Improve REST Documentation and improve overall quality.

The following is an overview of the new features and enhancements that are included as a part of this Junos Space SDK release:

IDE and Tools Enhancements/New Features

- **Test Stepper** – The Test Stepper tool has been enhanced with the following features:

  2. CSV File Variable Assignment.
  3. XML File Variable Assignment.
  4. Added Else, Elself, Foreach, Echo and Break Test Steps.

The Test Stepper test tool is easy to use, and is intended for users who may or may not have deep knowledge or background with either procedural or OO development. This is achieved by code generation directed by an easy-to-use UI and, also, eliminating hard-to-understand concepts found in programming languages, such as Java or Perl. The tool achieves simplicity and ease-of-use without losing much of the flexibility demanded by advanced users.

The Test Stepper leverages the power of the REST Explorer to help the developer in formulating REST requests in a Request/Response test step, and subsequently combines multiple requests into a test script.

- **Improved SDK Documentation** – Documentation styling has been changed to comply with the new Juniper Corporate look-and-feel.
Junos Space SDK 14.1 is a new major release of Junos Space SDK. In this new release, we introduced the brand new Test Stepper Tool, replace the old DMI simulator with the new JSim Java-based simulator and, also, replaced the “Project Archives”-based EAR packaging with the much faster “Deployment Assembly” mechanism.

In addition, the SDK toolkit has been streamlined to perform faster than in version 13.3.

The following is an overview of the new features and enhancements that are included as a part of this Junos Space SDK release:

REST Infrastructure and API Enhancements/New Features

- **Schema Management** REST Service was added. This service allows you to view Junos Device Schemas, which have been installed in Space, as well as upload and delete them from the Space server.

- **Modeled Device Management** REST Service was added. This service allows you to manage devices, which have not been previously discovered in Space and to, later, connect them with real devices through associated Connection Profiles.

IDE and Tools Enhancements/New Features

- **Test Stepper** – The Test Stepper tool is a new component of the REST Explorer, which facilitates in the development of Test Suites that consume REST Services. Although it can work with other REST services, this tool was designed to work ideally with the Junos Space REST Services.

  The Test Stepper test tool is easy to use, and is intended for users who may or may not have deep knowledge or background with either procedural or OO development. This is achieved by code generation directed by an easy-to-use UI and, also, eliminating hard-to-understand concepts found in programming languages, such as Java or Perl. The tool achieves simplicity and ease-of-use without losing much of the flexibility demanded by advanced users.

  The Test Stepper leverages the power of the REST Explorer to help the developer in formulating REST requests in a Request/Response test step, and subsequently combines multiple requests into a test script.

- **JSim Device Simulator** – JSim is the New Device Simulator, which is bundled with the SDK.

  JSim simulates a configurable number of simulated Junos MX and SRX devices. It is provided in the SDK so that SDK developers can develop and test their code without having physical Junos devices. JSim is simple to configure and use. It is written in Java and it can be configured and controlled either through the SDK IDE (plugin) or directly on the Linux Server.

  JSim includes a myriad of features, not available with the old simulator, like telnet emulation, configuration file and script upload and execution, Lsys support, SNMP discovery and Proxy Mode which facilitates in the spoofing of netconf communication between Space and real devices. JSim is also easily extended with new netconf RPC support, without the need to write new Java
code. JSim UI can now be used in the Platform Dev Environment and supports JSim deployment and operation on multiple vanilla Linux servers.

• **Deployment Assembly JAR, WAR and EAR Packaging** – The SDK Application Deployment and Build Script Generation modules now uses the Web Tools Deployment Assembly to perform Application Packaging for JSVA and Production. This enhances the overall performance of the SDK EAR archive build and deployment. It also simplifies the customization of package assembly through the easy-to-use UI interface. Users can now add Folders, Eclipse Projects or Jar bundles directly to the JAR, WAR and EAR Archives.

• **Improved SDK Application Installer** – The new feature allows more fine-grained tuning of Application Deployment using the Installer UI. With the new UI, the user can now control:
  o JBoss logging and log level for the application’s log files.
  o Infinispan Cache Installation.
  o Security Domain Installation for JDBC Data Source.

Other Installer improvements include:
  o Application deployment now does error logging with an html error browser/viewer. Error logging works more reliably and shows actual script output, which greatly improves troubleshooting of app deployments.
  o Application image names and rpm names have been changed to comply with the Space standard.

• **EJB to REST Wizard Enhancements** – The REST wizard has been enhanced with additional capabilities. These include (but not limited to):
  o Automated Wizard Document Generation now creates automatic descriptions for CRUD operations.
  o Further improvements to Wizard UI, like the addition of filters, deeper validation and Wizard workflow improvements and better handling of Legacy Services.
  o Wizard performance improvements.

• **Google Mashup Application** has been removed and all its features moved to the Hello Space Application. This was done in order to reduce the number of applications, which the user has to familiarize with.

• **Perforce P4Eclipse Plugin (version 4.3)** is now bundled with the SDK installer. You no longer need to install this plugin, yourself. Note that for proper operation of this plugin, you need to make sure that you are using Eclipse Kepler Service Release 2 (version 4.3) for J2EE and not the newer versions of Eclipse.
Junos Space SDK 13.3 is a new major release of Junos Space SDK. In this new release, major emphasis has been given to porting to the new JBoss 7.2 platform, improving the UI development, support for the new Ext JS 4.x platform UI and the enhancement of the EJB to REST Wizard.

The following is an overview of the new features and enhancements that are included as a part of this Junos Space SDK release:

REST Infrastructure and API Enhancements/New Features

- **Domain Management** REST Service was added. This service allows you to view users and devices in domains within Junos Space. Space 13.3 introduces Domain as another layer of Access Control on top of the existing Role Based Access Control (RBAC). Together RBAC and Domains provides a three tuple model for access control (User, Role, Domain).

- **New CLI Configlets** APIs as part of the Configuration Management. Configlets are alternative ways to manage device configurations. New APIs provide methods for the full Configlet CRUD operations.

Full JBoss 7 Support for the SDK

- Most of the SDK features which were available in the 13.1 JBoss 4.2.3 release are also available in SDK 13.3, with the exception of the “Chainsaw Logger”, OpenNms in NAT mode and “Switch to Bridged Mode” script. The “Switched to Bridged Mode” script was replaced with an ISO image which can be directly installed on an ESXi server or any other hypervisor. For OpenNms, users must switched to bridged mode.

- **User Libraries and JBoss 7 modules** Platform User Libraries and Modules are now installed by the SDK Application wizard and migration tool.

- **Migrate to Latest SDK** – This feature now migrates your XML, XSD and properties files.
  1. It also migrates scripts for installing and uninstalling your application. The only files it cannot automatically migrate are Java files. However, a comprehensive Junos Space SDK 13.3 App Migration Guide has been added to the distribution to ease JBoss 7 and 13.3 Migration.
  2. Migration also helps with merging custom user changes by automergering user changes for some files and providing a file diff dialog at the end of "Migrate to Latest SDK".

IDE and Tools Enhancements/New Features

- **Improved UI** – The UI of the Junos Space Plug-in has a new look and feel. The new plugin has also been ported to the latest Eclipse 4.3.0 J2EE Kepler SR2 platform.

- **Junos Space UI Builder** – The Junos Space UI Builder replaces the Module.xml Editor. This new UI builder provides a new easier to use interface, which includes:
  - Separate tabs for applications, workspaces, tasks, capabilities, and roles.
  - Each tab allows you to easily add, arrange, or delete applications, workspaces, tasks, or capabilities and roles and define their inter-dependencies.
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- Includes new “Show in App Chooser”, “Show in Navigator”, “External Workspaces”, “Show in Subdomains” and “isGlobal” features that were not available in the old Module.xml Editor.

- You can use Sencha Architect to build your UI and import your Architect project directly into your application. You can also build your UI application manually, either inside or outside of the Eclipse workspace.

- Now users can define Ext JS 3.x, Ext JS 4.x, and HTML components. But support is not limited to Ext JS alone. Other UI frameworks, such as JQuery and Backbone can also be used with the UI Builder.

- Application name collision detection in the UI Builder.

- Ext JS 4.x Support – The Junos Space UI Builder adds additional support for defining both workspaces and tasks using Ext JS 4.x UI components.
  1. Both application distribution packager/deployer and Ant build script generation will now generate minified JavaScript and CSS files for fast UI load time improvement.
  2. The tool analyzes the user’s JavaScript and CSS files to determine their dependencies for both debug-mode and production mode operations.

- Application Settings UI Builder – This new tool replaces the App-Settings.xml Editor. It provides a new interface that facilitates the creation, selection, and arrangement of UI elements in the Space Application Settings Dialog.

- Improved Application Overview Editor – This editor now replaces the old app-info.xml editor.

- Audit Logging – The REST Wizard has a new feature for Audit Logging.
  1. You can specify which fields will display in the Audit log and their titles along with the method audit log descriptions.
  2. It is also now possible to disable audit logging for a method.
  3. Template variables can be used to specify audit log fields and descriptions.

- Other EJB to REST Wizard Enhancements – The REST wizard has been enhanced with additional capabilities. These include (but not limited to):
  1. Improved Wizard Validation for paths, method links, method types, media types, RBAC and wizard reserved words.
  2. New JBoss 7 compliant EJB lookup implementation, which supports Local, Remote, and combined interfaces.
  4. Generation of multiple DTOs from a single Modeled Object.
  5. Domain support in the wizard.
  6. Legacy resources are now considered when generating HATEOAS links for master/slave resources.
  7. Wizard java code output uses Google-style indentation and organizes imports.
  8. Improved Look-and-feel for Document generation showing all hyperlink templates and method links.
• **Database Migration Script** — The Database Migration Script is a new feature that helps you migrate your application database tables from one version of your application to another. It provides tools for writing and debugging SQL commands and “ALTER TABLE” commands which may be needed for migrating your application to a new version. The tool also allows you to view and modify your application's MySQL tables directly from Eclipse, manage database schemas and Execution Plan.

• **Enhanced Junos Space Perspective** — The new perspective now includes your favorite tools like the “Project Archives View”, “Data Source Explorer”, “PMD Validations Viewer”, “JPA Structure Viewer”, “Problems Viewer”, “SQL Execution History”, and others.

• **REST Explorer Enhancements** — New REST Explorer features help in writing REST API requests:
  1. The REST Explorer will now show the complete template path associated with hrefs for PUT, POST and PATCH methods. This path is revealed with the “generate xml” or “generate JSON” buttons are used.
  2. New Ext JS 4.x Ajax code generation.
  3. Enhanced Ruby support with “Ruby Cucumber” and “Ruby Unit Test” generation.
  4. Response time and Byte Count added to Explorer output.
  5. RFC 2616 Compliance in REST Explorer HTTP Headers.

• **New features added for Installation and Uninstallation scripts:**
  1. Configure and teardown a separate application logger with its own log file.
  2. Configure and teardown application XA datasource.
  3. Configure and teardown application's infinispan cache container, replicated cache and a file store.

• **Custom Installation and Uninstallation Script Infrastructure** — New installation and uninstallation scripts include the capability to write custom plugin scripts. This allows for easier script migration in future versions of the SDK.
  1. Deployment options can now be controlled with a property file, with properties available to custom scripts.
  2. There is also a method to add custom scripts and files that are deployed to the server.

• **Reference Applications**—The HelloWorld reference application has been renamed WorldCities. It manages populations of countries and cities within countries and also demonstrates new features, such as Infinispan cache usage, native Ext JS 4.x, domain usage, UI Builder capabilities, and others. Hello Space and Google Mashup have also been ported to the JBoss 7 platform. Hello Space was also ported to use the Ext JS 4.x UI.

• **Build and Deploy Application**—The Build and Deploy Application dialog includes a new option for auto-updating Web files. This feature automatically updates to the server: HTML, JavaScript, and image files in any Web project when they are saved. There is also an improved application deployer look-and-feel which includes:
  1. Status monitoring, including connection status, server status, and app deployment status.
  2. Improved deployment status reporting showing HTML-based deployment log for easier troubleshooting.
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- **Switching to Bridged Mode JSVA** — The `swtchNtwkMode.pl` is no longer shipped with the JSVA. However, an ISO file is available from the distribution portal. You can use the ISO file to install the JSVA on an ESXi server. Most other hypervisors accept the ISO format. Please read the documentation for the application/hypervisor to learn how to install the ISO file for your application/hypervisor.

**Documentation**

- The Application Developer Guide has been reorganized.
- A new Getting Started Guide is provided that includes information that was previously in the Application Developer Guide.
- The Getting Started Guide includes a tutorial that walks the user through the creation of a simple “Hello World” application.
- The REST Explorer and REST Wizard Documentation Guides are no longer separate guides. The information from those guides is incorporated into the Application Developer Guide.
Junos Space SDK 13.1 is a new major release of Junos Space SDK. In this new release, major emphasis has been given to enhancing the EJB to REST Wizard.

Below is an overview of the new features and enhancements that are included as a part of the Junos Space SDK release:

REST Infrastructure and APIs Enhancements/New Features

- **Config Template Management** REST Service was added. This service supports Config Template Definitions, Config Templates and Device Associations.

- **REST Error Handling Framework** was added. This framework allows EJBs to throw EJB exceptions and have them automatically converted to correct HTTP error codes.

IDE and Tools Enhancements/New Features

- **EJB to REST Wizard Enhancements** - The REST wizard has been enhanced with additional capabilities. These include (but not limited to):

  1. New on-screen validation for many conventions in the S&C document, showing exact location.

  2. Heterogeneous Links (not just heterogeneous collections). Any href link can now be of a heterogeneous variety.

  3. Wizard can configure defaults of all simple types and enums. Defaults are displayed in the documentation and available in the API schema. For numeric fields, user can also configure range values.

  4. Optimistic Lock Retry for PUT, POST and PATCH methods. Wizard can configure retry count and yield time for retries.

  5. Primary and Secondary resources which share the same context and service root paths are now supported. Multiple versions of these resources can also be created.

  6. Dot notation can now be used in href templates to refer to DTO fields in any parent or child DTO.

  7. Wizard can now create REST methods which work with binary data and can upload and download binary files.

  8. Wizard can configure read-only fields. Read-only property of fields is displayed in the documentation and available in the API schema.

  9. Improved handling of method links. Method links can be moved up/down and are also reflected in the UML diagram.

  10. Documentation, properties and method links can now be shared between the single object DTO and collections and references of the same object. User only needs to configure these shared properties once for the single object and wizard automatically copies those properties to all the relative DTOs.

  11. Improved handling of Documentation properties. Documentation properties are now copied from EJB documentation, as well as from
previous versions of the same service. Documentation is saved in memory when the method is unRESTified, and reapplied when the user reRESTifies the same method again.

12. Nested CDATA is now supported for all String fields.

• REST Explorer Enhancements
  1. Support for binary download/upload.

Documentation
• Both browser help and eclipse plugin help have been greatly enhanced. All new features are documented.
• UML diagram, Defaults, Ranges, Read-only and many other properties have been added to the Resource Model section.
• New Look-and-feel for the API Service Guide.
Junos Space SDK 12.3 is a new major release of Junos Space SDK. In the this new release, major emphasis has been given to enhancing the EJB to REST Wizard and the REST Explorer.

Below is an overview of the new features and enhancements that are included as a part of the Junos Space SDK release:

REST Infrastructure and APIs Enhancements/New Features

- PATCH Http Method Support (PATCH RFC http://tools.ietf.org/html/rfc5789) – This method can be used to update individual nodes in the REST collection member, or add and delete members of a collection.

- HTTP Etags Support (Etags RFC http://tools.ietf.org/html/rfc2616) – Etags provide optimistic locking at the REST Layer. Etags is now supported for both PUT and PATCH HTTP methods.

IDE and Tools Enhancements/New Features

- **EJB to REST Wizard Enhancements** - The REST wizard has been enhanced with additional capabilities. These include (but not limited to):
  1. Support of most java.util data types, including enums, collections of simple types and many others.
  2. Multiple levels of containment for REST DTO Objects and recursive references.
  3. Validation to Standards and Conventions.
  4. Automatic href generation using links with the application (includes other services).
  5. Integer bounds validation.
  6. CDATA support.
  7. Top-level resource generation for all segments of the URL path.
  8. Heterogeneous collection support.
  9. Expiration of resources. All resources can be expired, with an expiration date set in the wizard.
  10. Hidden resources. Hidden resources are not shown in the HATEOAS links, or in the documentation.
  11. XSD file lifecycle management. XSD files are automatically added, updated and removed by the wizard. All the supported <appinfo> tags are also generated by the wizard.

- **REST Wizard Documentation Feature**
  1. New wizard screens for specifying documentation at API, resource and DTO levels.
  3. Generation of documentation plugin and HTML Archives.
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4. UML diagram generation.

• REST Explorer Enhancements
  1. Java code generation with different versions of Apache HTTP Client and Jersey Client.
  3. Apache Camel integration with Groovy.
  4. New and improved navigation.
  5. Media type UI.

• Linked Workspace Support. Eclipse workspace can now include “linked” projects imported from other workspaces.

Documentation

• All documents in the Eclipse Help plug-in are also available in a standalone HTML help system that can be accessed independent of the Eclipse IDE.
Junos Space SDK 12.1 is a new major release of Junos Space SDK. It includes several new features and functionality that ease the development of different types of Junos Space applications. Major emphasis has been given to adding the new REST Explorer and to enhancing the EJB to REST Wizard to make development of application- and platform-defined REST APIs simple and more intuitive. This release also includes several enhancements to the existing tools and APIs to improve the developer’s experience.

Below is an overview of the new features and enhancements that are included as a part of the Junos Space SDK release:

REST Infrastructure and APIs Enhancements/New Features

- **Authentication and Authorization** - API authorization and authentication support has been enhanced to support both RADIUS and TACACS+ for authorization and authentication.

- **Device Change Notification Subscription** - Subscribe to device change related notifications using the REST APIs. The REST API allows applications to subscribe to device change notification JMS topics.

- **Fault Management** - New APIs for fault management have been exposed from the platform. These include the OpenNMS-defined APIs.

- **Device Configuration File Management** - New APIs for device configuration file management have been added.

- **IDE and Tools Enhancements/New Features**

  - **Eclipse Indigo Support** - The Junos Space SDK Eclipse plug-in has been migrated to the latest version of Eclipse (Eclipse Indigo).

  - **New REST Explorer** - REST Explorer is an Eclipse view component designed to configure and send HTTP/REST requests and display resulting HTTP responses.

  - **New Sub Certificate Generation Script** – Script and Instructions for generating sub-certificates for departments, individuals and build servers.

  - **EJB to REST Wizard Enhancements** - The REST wizard has been enhanced with additional capabilities. These include:

    1. Better support for handling more complex business logic defined at the EJB Layer.

    2. Better support for editing of the REST interfaces without overriding the already defined interfaces.

    3. Integration with the audit logger to generate API invocation audit logs upon API invocation. The developer need not add additional code manually.

    4. Automatic handling of audit logger calls.

    5. Deletion of versions of REST resources.

    6. Developer can specify if a parameter is mandatory or optional in the wizard itself.

    7. Automatic code generation for asynchronous APIs.
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Documentation

- All documents in the Eclipse Help plug-in are also available in a standalone HTML help system that can be accessed independent of the Eclipse IDE.
The Junos Space SDK 11.4 Release provides the following features and functionalities over the previous releases.

New REST APIs

- **Configuration Management**: A new version of the change request API is added to push different configurations on multiple devices via both asynchronous and synchronous execution.

- **Configuration Management**: A new version of the change request API is added to synchronously push a configuration on to a single device only.

- **Application Management**: A new version of the application settings API is added in Application Management to retrieve default configured values for each setting for an application deployed on Junos Space.

- **Job Management**: The API is enhanced to display the name of the user responsible for creating or triggering the job.

- **Audit Log Management**: A new REST API to fetch the Junos Space Platform and Applications Audit logs has been provided.

**RESTful Framework**

- Infrastructure for applications to add application-defined audit log entries has been provided.

- Info service is enhanced to support retrieval of application settings schema for an individual or for all applications deployed on Junos Space.

- Info service is enhanced to provide additional information about whether the API is synchronous or asynchronous, and whether the corresponding query parameters are required or optional.

**Integrated Development Environment (IDE)**

- Support for building and packaging Applications using ANT scripts outside the Eclipse environment has been added.

- Generation of schema (XSD) from DTO definitions using ANT scripts is now supported.

- User Interface to migrate applications built using an earlier version of the Junos Space SDK to the latest version of Junos Space SDK has been provided. This migrates the older versions of the Java libraries used by the Application to the latest versions of the libraries. It is recommended that the developers use this user interface to migrate their applications when they upgrade the Junos Space SDK to the latest version.

- The EJB to REST Wizard has been enhanced to manage all the application REST resources by providing better error handling and presentation.

- The EJB REST Wizard is enhanced to display a “breadcrumbs” trail that shows exactly where you are in the wizard sequence, XML preview with HATEOAS links for better understanding, navigation, and user experience.

- Support for including application help in the Junos Space Help has been provided.

- The Junos Space SDK Eclipse plug-in has been enhanced to allow developers to connect to an instance of Junos Space that is local (running on the same host) or remote (running in the LAN or in Junosphere). This feature provides the ability to connect to Junosphere and work with an instance of

- Enhanced Certificate management to create/import Company level, BU/Department and Individual level certificate.

- Junos Space SDK now enables applications to utilize a MySQL database that is hosted outside the Junos Space fabric.

- Reference Application

- The reference applications set is re-structured to easy access of the following applications.

- Common constants are now placed in the `VendorConstants.java` and `VendorConstants.js` files to be used in EJB, REST resource, and Web project's JS files.

- Ext JS 4.x charts integration with the REST resources is demonstrated in the HelloWorld reference application.

- SDK Installer

- Junos Space SDK has been tested on Windows (XP and version 7) and three flavors of Linux (CentOS, RedHat, and Ubuntu).

- Junos Space SDK has been tested on MAC OS X 10.6.

- Network Configuration

- Support added to switch the network configuration of JSVA from NAT mode to Bridged mode using switch mode script.
The Junos Space SDK 11.3 was a maintenance release that did not provide any new functionality over Junos Space SDK 11.2. The release resolved the previously open issues.
REST APIs

- **Tag Management**: This service is used to tag and un-tag the existing objects such as user objects, device object or objects from another application in the Junos Space SDK.
- **Software Management**: This service allows a northbound application to manage all software packages efficiently. It also allows deployment of packages on different Junos devices from a single location.
- **Job Management**: This service is used to access information about an individual job or all jobs and also to cancel a job. It returns a progress update for each task.
- **Application Management**: This service supports a REST model for accessing a set of resources through a fixed set of operations.
- **Device Management**: A new API is added in the device management service to execute NetConf RPC asynchronously.
- **REST Framework**
  - Job Scheduling Framework to support scheduling of jobs in future.
  - Framework to consume external and internal REST web services from EJB components and REST web services.
  - Framework to use Jersey Client API to consume external and internal REST web services from EJB components and REST web services.
  - A new media-type is introduced for secondary collections that refer to respective primary collection.
  - Default media type has been changed to XML from JSON.
  - Support for date header (x-date) is introduced for scheduling job in specific time zone.

Integrated Development Environment (IDE)

- Vendor ID based registration and vendor specific application URI support added. Now the vendors can send certificate request to Juniper Networks and register themselves, Juniper Networks granted certificate will be used to sign their application image for production Junos Space.
- Module.xml editor is enhanced to support Junos Space UI framework for task UI configuration using EXT/JS designer generated JS components.
- New feature for adding Java utility project into Junos Space Application. It enables user to write common utility code in a separate project, during build operation utility project is compiled into a jar file and added in EAR package.
- New feature for database migration is provided. It enables a user to add support for database migration of Junos Space Application.
- Application setting editor added which allows configuring and managing application specific settings by using the Junos Space Main UI screen.
- "AppInfo" tags that indicate whether a collection supports sorting, filtering or both introduced in the schemas.
- A new menu option is added, which allow users to upgrade a UI-Only or Server-only application to complete Junos Space application.
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- SDK EJB-REST Wizard enhanced to generate a JUNIT test stub code for the REST services being generated, support for DTOs types like enum, interface and abstract class added.

- A new validation framework is added, which performs static analysis and flags an error for REST APIs that do not follow the Juniper standards; users can view/edit the validation rules.

- Application database can be specified at the time of deployment.

Reference Application

- The reference applications set is re-structured to easy access of the following applications.

- The "HelloSpace" reference application demonstrates how to consume an external REST web service from the EJB component. The features are documented in the Junos Space Application Developer's Guide. Examples of code walkthrough are provided to help the user build applications.

- The "HelloAgainSpace" reference application is added. This application demonstrates CRUD operations. The features are documented in Junos Space Application Developer's Guide. Examples of code walkthrough are provided to help user build applications.

- The “HelloWorld” reference application is revised and the new features documented in the Junos Space Application Developer's Guide. Examples of code walkthrough are provided to help the user build applications.

- The “GoogleMashup” reference application is revised to support Google’s GMap version 3.x APIs. The new features are documented in the Junos Space Application Developer's Guide. Examples of code walkthrough are provided to help the user build applications.

- SDK Installer

- An installer is provided to guide user through the steps of installing and configuring the Junos Space SDK. The installer is available for Windows, Linux and Mac OS X platforms.

- Uninstaller added to enable users to uninstall the Junos Space SDK.

- Upgrade and Repair existing Installation options are added.

- Junos Space SDK has been tested on Windows (XP and version 7) and three flavors of Linux (CentOS, RedHat, and Ubuntu).

- Junos Space SDK has been tested on MAC OS X 10.6.
The documentation for this release includes these publications:

- Junos Space SDK Release Notes (This document - PDF)
- **Junos Space SDK 14.1 App Migration Guide** (PDF)
- **Getting Started** (Eclipse help and standalone HTML)
- **Junos Space API Reference Guide** (Eclipse help and standalone HTML)
- **Junos Space SDK Application Developer Guide** (Eclipse help and standalone HTML)
- **Device Simulator Guide** (Eclipse help and standalone HTML)
- Junos Space SDK Installation Guide for Windows (PDF)
- Junos Space SDK Installation Guide for Linux (PDF)
- Junos Space SDK Installation Guide for Mac (PDF)
- JSSDK Sub-certificate Generation (PDF)
- Browser Help (HTML)
The system requirements for installing Junos Space SDK are:

Hardware

- **Memory:** 8GB or greater (this has been increased from 4GB)
- **Disk:** 60 GB
- **CPU:** VT-x or AMD-V virtualization extension

Platform OS

- Windows 7 (recommended), Windows 8 or XP Professional (64-bit)
- **Note:** Junos Space SDK recommends 64 bit OS and does not support Windows 2003 Server, Windows XP (32 bit), and Windows 7 (32-bit).
- Linux 2.6.18 and above or Redhat/CentOS 5 and above
- MAC OS X 10.6 or above

Software

- The SDK Eclipse IDE plug-in can be installed on the same or different platforms. The following software must be installed on the platform where the SDK Eclipse IDE will be installed:
  - The following software must be installed on the system where the **Junos Space Virtual Appliance** will be installed:
  - **Oracle VirtualBox (version 4.3.10 or greater),** available for download at [https://www.virtualbox.org/wiki/Downloads](https://www.virtualbox.org/wiki/Downloads)

The above listed versions of Eclipse and VirtualBox were qualified for use with the **Junos Space.** Other versions of these applications might be compatible with the SDK but are not supported.
Getting Started

Installing the Release
See the appropriate Junos Space SDK Installation Guide for your platform for installation instructions. These installation guides are included with this SDK release.

Configuring the Environment
Windows, Linux & MAC: No configuration of the host platform is required.

Importing and Deploying Reference Applications
You no longer need to perform “Migrate to Latest SDK”, after importing each Reference Application (WorldCities and HelloSpace) into the 14.1 SDK Eclipse.
Migrating Previous SDK Applications to SDK 14.1

A Junos Space application created with the SDK plug-in from the 1.0.x/11.x/13.x release will not work properly after you have upgraded to the latest SDK plug-in. To resolve this issue, migrate the old application to the latest SDK plug-in.

For more information, refer to the Junos Space SDK 14.1 App Migration Guide.

Using the SDK

See the Getting Started Guide and the sections Using the Junos Space SDK Plug-in and the Creating REST Services of the Junos Space Application Developer's Guide in the online help of the SDK plug-in, which you can find at the following location:

Help Contents > Junos Space SDK > Getting Started

Help Contents > Junos Space SDK > Application Developer Guide
REST Service APIs

The Junos Space APIs are documented in the Junos Space API Reference available in the SDK plug-in online help, at the following location:

Help Contents > Junos Space SDK > API Reference

Device Simulator

The SDK VM includes a Device Simulator called JSim that provides a simulated Junos Space platform against which you can develop and test applications written with the Junos Space SDK.

The list of Junos RPC commands supported on the Device Simulator can be found in the SDK plug-in online help, at the following location:

Help Contents > Junos Space SDK > Device Simulator Guide > Supported RPCs in the Simulator


Resources and Links

Refer to the following references to learn more about the technologies used in the Junos Space SDK.

- Eclipse Workbench User Guide (Eclipse help)
- Oracle VirtualBox: http://www.virtualbox.org/
- HornetQ REST Interface: http://docs.jboss.org/resteasy/hornetq-rest/1.0-beta-3/userguide/html_single/

Getting Help

Juniper Networks is a customer-centric company. This helps Juniper Networks to emerge as a leader in performance-enabling services and support which are designed to extend, accelerate and optimize the high performance network.

For assistance on using the SDK, contact:

js-sdk-support@juniper.net

You can also refer to the Junos Space SDK Forum at: http://forums.juniper.net/
**Known Issues**

The following issues have been identified in this release.

<table>
<thead>
<tr>
<th>Number</th>
<th>Description</th>
<th>Workaround</th>
</tr>
</thead>
<tbody>
<tr>
<td>1025709</td>
<td>Test Stepper sometimes crashes on a MAC platform. This is a known MAC issue, described here: <a href="https://bugs.eclipse.org/bugs/show_bug.cgi?id=326311">https://bugs.eclipse.org/bugs/show_bug.cgi?id=326311</a></td>
<td>No workaround, but you should save stepper file (COMMAND-S) as often as possible, to avoid losing your data.</td>
</tr>
<tr>
<td>1035675</td>
<td>After deploying EAR file from the SDK, WorldCities &quot;Moscow&quot; and &quot;Washington DC&quot; are showing is-capital == false. This is because Infinispan cache isn't working for EAR file deployments.</td>
<td>Test Infinispan Cache for complete image deployments, only.</td>
</tr>
<tr>
<td>987683</td>
<td>JBoss boot time is slower in 13.3. Boot time now is about 50% slower than in 13.1.</td>
<td>No workaround.</td>
</tr>
<tr>
<td>987686</td>
<td>Application image deployment is slower in 13.3. Deploying application image is about 50% slower than in 13.1.</td>
<td>No workaround. However, as a partial compensation, users can now synchronize their web files without deploying the entire application. Also, jar file deployment is much faster than complete image deployment.</td>
</tr>
<tr>
<td></td>
<td>Accepts an invalid href as a target to either msg-push-consumers or msg-push-subscriptions, in a push-registration Hornet-Q APIs (push-consumers or push-subscriptions)</td>
<td>1. Fix the code to use the correct target href.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>2. Delete the invalid subscription, and re-subscribe with the correct subscription.</td>
</tr>
<tr>
<td></td>
<td></td>
<td>3. Create the target href after the subscription has been made.</td>
</tr>
<tr>
<td>964814</td>
<td>opennms doesn't startup in NAT mode JSVA in SDK 13.3</td>
<td>Use bridged mode, instead</td>
</tr>
<tr>
<td>987443</td>
<td>Chainsaw logger doesn't work in 13.3 JBoss 7 SDK</td>
<td>Use the 'tail -f' on the server.log file located under /var/log/jboss/servers/server1/server.log. You can also reset the file with: echo &quot;&quot; &gt; server.log before rerunning your command which causes logs to happen.</td>
</tr>
<tr>
<td>753496</td>
<td>SDK/IDE:Rest Wizard should generate root-level API's for /api/jssdk</td>
<td>No workaround</td>
</tr>
<tr>
<td>Number</td>
<td>Description</td>
<td>Workarounds</td>
</tr>
<tr>
<td>--------</td>
<td>---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
<td>-------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------</td>
</tr>
<tr>
<td>598229</td>
<td>Under certain conditions, the PMD configuration window does not display custom rules until Eclipse is restarted. (For detail, refer to PMD bug at <a href="https://remote-bng.juniper.net/tracker/DanaInfo=sourc">https://remote-bng.juniper.net/tracker/DanaInfo=sourc</a> eforge.net+?func=detail&amp;aid=3284455&amp;group_id=56262&amp;atid=479921)</td>
<td>Restart Eclipse to see your custom rules. This is a bug in the PMD platform. Click on the link below for details: <a href="https://remote-bng.juniper.net/tracker/DanaInfo=sourc">https://remote-bng.juniper.net/tracker/DanaInfo=sourc</a> eforge.net+?func=detail&amp;aid=3284455&amp;group_id=56262&amp;atid=479921</td>
</tr>
<tr>
<td>602091</td>
<td>On Mac platforms, new log messages sometimes do not appear in the logger view after old logs have been deleted. <a href="https://issues.apache.org/bugzilla/show_bug.cgi?id=51227">https://issues.apache.org/bugzilla/show_bug.cgi?id=51227</a></td>
<td>This is an Apache server issue. Click on the link below for details: <a href="https://issues.apache.org/bugzilla/show_bug.cgi?id=51227">https://issues.apache.org/bugzilla/show_bug.cgi?id=51227</a></td>
</tr>
<tr>
<td>664658</td>
<td>An application with a role name identical to a previous application's name overwrites the previous application's record.</td>
<td>Use &quot;namespaces&quot; to name roles &amp; capabilities. It is recommended to use the syntax &lt;vendor-id&gt;.&lt;app-name&gt;.&lt;role-name&gt; and &lt;vendor-id&gt;.&lt;app-name&gt;.&lt;capability-name&gt; (for example, jssdk.HelloWorld.HelloWorldRole, jssdk.HelloWorld.HelloWorldCapability)</td>
</tr>
<tr>
<td>667099</td>
<td>In REST APIs, some fields are 'Java' Enumerations. On such fields, there is no support for Filtering with the 'contains' operator.</td>
<td>Perform &quot;manual&quot; filtering, by retrieving all object fields, and iterating over all objects in the collection, selecting objects that contain a given string in the enumeration field only.</td>
</tr>
<tr>
<td>687093</td>
<td>The Junos Space platform requires the task names to be unique across applications.</td>
<td>No workaround</td>
</tr>
<tr>
<td>575074</td>
<td>Junos Space platform does not synchronize with the device.</td>
<td>No workaround</td>
</tr>
<tr>
<td>691479</td>
<td>When a device is added to the Junos Space platform, the CREATE notification is not displayed in database notification log.</td>
<td>Use device status notification, instead.</td>
</tr>
<tr>
<td>732752</td>
<td>Sync version of change-request some time returns HTTP 500 while the commit actually happens.</td>
<td>Synchronous versions of the change-requests REST API sometimes return an HTTP 500 error even though the commit operation actually completes successfully. Use the asynchronous version of the change-request API. See the &quot;Configuration Management APIs&quot; section of the API Reference Guide for details.</td>
</tr>
<tr>
<td>1027835</td>
<td>/api SPACE/ tag-management API is missing tags HATEOAS link</td>
<td>No workaround. This was fixed in 14.1R2, but not in 14.1R1 which comes with the SDK.</td>
</tr>
</tbody>
</table>
## Release 14.1R2

<table>
<thead>
<tr>
<th>Number</th>
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<th>Workaround</th>
</tr>
</thead>
<tbody>
<tr>
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</table>