

Release Notes for NorthStar Controller

Release 4.0.0
30 April 2018

These release notes accompany Juniper Networks NorthStar Controller Release 4.0.0.

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Introduction

The Juniper Networks NorthStar Controller is an SDN controller that enables granular visibility and control of IP/MPLS flows in large service provider and enterprise networks. Network operators can use the NorthStar Controller to optimize their network infrastructure through proactive monitoring, planning, and explicit routing of large traffic loads dynamically based on user-defined constraints.

The NorthStar Controller 4.0.0 release is fully supported with Junos OS Release 17.2R1 and later.

NorthStar Controller 4.0.0 can be deployed with Junos OS Releases 15.1F6, 16.1R1, and 17.1R1, but the segment routing (SPRING) feature would not be available.

The NorthStar Controller Analytics features require specific Junos OS Releases to be able to obtain LSP and interface statistics. This is a Junos Telemetry Interface (JTI) dependency. We recommend Junos OS Release 15.1F6 or later if you plan to use Analytics.

NorthStar Controller 4.0.0 release can be deployed with Junos OS Releases 14.2R6, 15.1F4, and 15.1R4, but the following features would not be available:

- MD5 authentication for PCEP
- P2MP support
- Admin group support

By default, the NorthStar Controller Release 3.0.0 and later requires that the external Junos VM be Release 17.2 or later. If you are using an older version of Junos OS, you can change the NorthStar configuration to support it, but segment routing support will not be available. See the *Known Behavior* section for the configuration steps.

Other Junos OS releases are not supported.



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NOTE: The Path Computation Element Protocol (PCEP) configuration on the PCC routers does not persist across upgrades when the SDN package is not part of the installation binary. Before upgrading the Junos OS image to this release, save the existing configuration to a file by using the `save` command. After you upgrade the Junos OS image on each PCC router, use the `load override` command to restore the PCEP configuration.

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The NorthStar Controller is supported on the following Juniper platforms: M Series, T Series, MX Series, PTX Series, QFX10008, and ACX5000.

As of Junos OS Release 17.4R1, NorthStar Controller is also supported on QFX5110, QFX5100, and QFX5200, and on SRX platforms (SRX300, SRX320, SRX340, SRX345, SRX550, SRX550M, SRX1500, SRX4100, SRX4200 devices, and vSRX instances).

Junos OS supports Internet draft draft-crabbe-pce-pce-initiated-lsp-03 for the stateful PCE-initiated LSP implementation (M Series, MX Series, PTX Series, T Series, QFX Series, and ACX Series).

Contents of this Release

Table 1 on page 3 describes the downloadable files.

Table 1: NorthStar Controller 4.0.0 Downloadable Files

File	Description
NorthStar Application	Northstar_Bundle_4_0_0_.tar.gz
NOTE: E-signature also available.	
NorthStar JunosVM	northstar_junosvm.tar.gz
NOTE: E-signature also available.	



NOTE: VMDK installation is also supported, but the files needed for this type of installation are not available on the NorthStar software download page. Please request the files from your account team or NorthStar Product Line Manager.

Beginning with this release, NorthStar Controller has new SKUs, and they affect licensing. If you are upgrading NorthStar from a previous release, you will need to obtain a new license. Consult your account team or NorthStar PLM for more information.

New Features

The following new features are introduced in NorthStar Release 4.0.0:

- **New P2MP Group Workflow**

The workflow for provisioning and managing P2MP groups is now more streamlined and intuitive, using a new P2MP Group tab on the network information table from which you can:

- Provision a P2MP group and its sub-LSPs all at one time, using the Add function.
- Change the values of group attributes, add or change scheduling, and add or remove sub-LSPs using the Modify function.
- List a group's sub-LSPs or display a graphical tree view of the group.
- Highlight sub-LSPs in the topology map.

See *Provision and Manage P2MP Groups* in the *NorthStar Controller User Guide*.

- **PC Server Efficiency Enhancements**

The following enhancements improve the function and efficiency of the PC Server:

- Events displayed when right-clicking a tunnel in the network information table are now focused on external communication to and from NorthStar, eliminating most of the communications internal to NorthStar. This allows the user to more quickly access information about the events most likely to be of interest. Events related to internal communications are still captured in the log files and are available for troubleshooting purposes.

Sample events that are displayed:

- User-initiated changes through the UI or REST APIs
- Provisioning or data collection via Netconf or PCEP
- Performance improvements related to the maintaining of P2MP group information in the web UI, facilitated by Toposerver.
- When an LSP is removed from the router, and therefore from the network, it is now automatically deleted from NorthStar unless it has been modified by a NorthStar user (via the web UI or REST APIs). If an LSP has been modified via NorthStar, it has a Persist state associated with it. Any LSP with a Persist state that is deleted from the router would require manual deletion in NorthStar.

See *Understanding Label-Switched Paths on the NorthStar Controller* in the *NorthStar Controller User Guide*.

- A new PCS state, maintained and updated by the PC server, merges the LSP properties from these three states:
 - config state: collectedProperties which come from Netconf collection
 - live state: liveProperties which come from PCEP
 - persist state: plannedProperties which come from NorthStar users via REST API and the web UI

With the new PCS state, PC server no longer updates the LSP persist state, allowing an LSP to be automatically removed in NorthStar when there were no user changes to the LSP from NorthStar. The states and their properties can be viewed in the web UI by double clicking a tunnel in the Tunnel tab of the network information table to display the detail window for the tunnel.

- Starting with this release, design attributes that are configured by the user in the NorthStar Controller are inherited by the NorthStar Planner, even though they are never pushed to the router. This is achieved through a change in Network Archive device collection. When you run Network Archive device collection, the tunnel information in the Planner (which came from the router) is merged with the tunnel information in the Controller (which includes design attributes that are not pushed to the router). The merged version is then available in the Planner.

See *Collection Tasks to Create Network Archives* in the *NorthStar Controller User Guide*.

- Live Network Snapshot has returned to the NorthStar Planner. Prior to NorthStar release 3.2, the NorthStar Planner's Live Network Snapshot represented the latest of periodic snapshots automatically taken from the live network. In Release 3.2, the

model changed to be the result of the latest Network Archive collection task run by the user in the NorthStar Operator and made available via the NorthStar Planner. The model included considerably more information, and the name of the model changed to Latest Network Archive. Now, in Release 4.0.0, both the Live Network Snapshot and the Latest Network Archive are available to users.

- The Latest Network Archive is generally preferable for planning purposes because it is more robust.
- The Live Network Snapshot is generally preferable for troubleshooting purposes because it is more current.

See *Network Browser Window* in the *NorthStar Controller Planner Guide*.

- **LDP Traffic Collection**

LDP traffic collection is now available as a collection task type by navigating to **Administration > Device Collection**. Collected data can be viewed in the new Demand tab of the network information table. LDP-enabled links can be highlighted on the topology map by navigating to **Protocols** in the left pane and selecting **LDP**. There is also a new option when creating a collection task for a network archive that allows you to include Demand and Trafficload data in the model. This data is then available in the NorthStar Planner when you load the archive into the Network Browser.

See *LDP Traffic Collection* in the *NorthStar User Guide*.

- **Link Packet Loss Threshold to Trigger LSP Rerouting**

When packet loss on a link exceeds this new threshold, the link is considered unstable, which triggers rerouting of traffic to avoid the link. To achieve this, NorthStar creates a maintenance event for the link, making it unavailable for traffic. The threshold can be set on a global basis (applies to all links, in both directions) and on a link-specific basis, which takes precedence over the global setting.

See *LSP Routing Behavior* and *Maintenance Events* in the *NorthStar Controller User Guide*.

- **No LSP Reoptimization Upon Completion Option**

The default behavior is for NorthStar to reoptimize LSPs that were affected by a maintenance event when the maintenance event is completed. When you check the No LSP Reoptimization Upon Completion option, that behavior is disabled.

This allows you to use a maintenance event to bring a link UP or DOWN as needed, without triggering any reoptimization.

- **Web UI Enhancements**

The following Web UI Enhancements are new with this release, and not already discussed as part of another new feature:

- Updated launch window from which either NorthStar Controller or NorthStar Planner can be accessed.
- Topology color legend enhancements:
 - The legend is now titled

- Multiple color schemes are now offered to support any network visualization goals, including a create-your-own palette option
- Consolidated rearrangement of the Topology Settings window from the settings icon.
- The Topology Settings window now offers an option called Clusters (of nodes) and Bundles (of links) which allows simplifying visualization of a large network. Groups of nodes that are close together are represented by a single, color-coded circle (a cluster). Bundles are derived from the links between nodes and clusters. The color coding of the clusters corresponds to the number of nodes in the cluster, and is configurable.
- Enhancements to improve performance, especially in large scale networks:
 - The topology map will not display link and node labels over a certain quantity, even if the Topology Settings call for labels to be displayed. This improves performance when redrawing a large number of graphic elements.
 - Down links can now optionally be represented by a solid, instead of a dashed, line. This improves performance when redrawing the topology. This is set in the Topology Settings window.
 - Node and link hit detection and rendering improvements.
- From the Topology Settings window, you can now opt to wrap links as great arcs. This is a way to represent links that would have to wrap around the world map.
- Under Administration, Server Status has been removed as a separate item, and consolidated into System Health. The new System Health window provides cluster, data collector, and connectivity (topology and PCEP) monitoring.
- Enhanced bulk tunnel modification: The Modify Tunnel window now supports deleting the contents of a field in addition to leaving it unchanged or changing to a specific value. For fields where a blank value is not allowed (required fields), the option to delete is not available.
- In the Add or Modify Device Profile window, in the SNMP tab, the Get Community default is now “public” if you leave it blank. Previously, there was no default.
- Improved arrangement of data entry fields within tabs in the Add Device and Modify Device windows (**Administration > Device Profile**).
- Add User and Modify User windows now have a Confirm Password field (**Administration > Users**).
- New Report called “Node” under a new report folder called “Network Summary”. This report displays counts of LSPs that start, end, or transit through each node.
- Maintenance Simulation Reports are now stored in the database, and the web UI uses REST to retrieve them. This allows them to persist across sessions and after maintenance events are deleted.
- Ability to import topology layouts from GeoJSON or CSV, and ability to export layouts to CSV (**Layout > Import from, Layout > Export to**).

Changes in Behavior

The following changes in behavior are introduced with NorthStar Controller Release 4.0.0:

- **New LSP Persist State:** It is no longer necessary to manually delete an LSP from NorthStar that has been removed from the router, and therefore from the network; it is now automatically deleted from NorthStar. LSPs that have been changed by a user (via the web UI or REST APIs) are exempted from deletion, however. NorthStar user-provisioned or modified LSPs now have a Persist state attached to them. If they are deleted from the router, they would still require manual deletion in NorthStar.
- **P2MP Group workflow:** The workflow for provisioning and managing P2MP groups has changed. There is now a dedicated tab in the network information table for P2MP groups, from which you can initiate adding, modifying, or deleting groups. The following items are no longer needed and have been removed:
 - The P2MP option in the left pane of the web UI Topology view
 - The P2MP field in the Provision LSP window
- **LSP Reoptimizing Behavior at Maintenance Event Completion:** Prior to this release, completion of a maintenance event triggered a reoptimization of *all* PCE-initiated and PCC-delegated LSPs in the network, including all those *not* rerouted by the maintenance event. As of this release, the default behavior is to reoptimize only those PCE-initiated and PCC-delegated LSPs that were rerouted because of the maintenance event. Additionally, there is a new option to bypass even that.
- In the Add or Modify Device Profile window, in the SNMP tab, the Get Community default is now “public” if you leave it blank. Previously, there was no default.
- Maintenance Simulation Reports are now stored in the database, and the web UI uses REST to retrieve them. This allows them to persist across sessions and after maintenance events are deleted.

Known Behavior

The following behaviors are known to occur in NorthStar Controller Release 4.0.0:

- NorthStar REST API does not return in the REST response the selected routing method:
 - Currently, if a REST API body has routingMethod=Default, the corresponding REST response does not include the routingMethod keyword.
 - NorthStar still computes the ERO properly.
 - In a future NorthStar release, the REST response will properly indicate the selected routingMethod.
- Re-provision LSPs issue:
 - For a Netconf-provisioned P2MP tree, re-provisioning individual sub-LSPs to go around a failed link can fail under the following conditions:

- The user re-provisions sub-LSPs separately.
- The user has a mixture of sub-LSPs with a user-specified strict path and paths computed by NorthStar.
- The workflow is to re-provision all sub-LSPs of a tree together; NorthStar computes sub-LSPs of a tree as a whole, not individually.

Known Issues

[Table 2 on page 8](#) lists known issues in NorthStar Controller Release 4.0.0. The identifier associated with each entry is the tracking number in the Juniper Networks Problem Report (PR) tracking system.

Table 2: Known Issues in NorthStar Controller 4.0.0

Identifier	Description
NA	Common properties for P2MP groups are lost when using REST P2MP diverse tree design. The properties are carried over the leaves but not on the P2MP group itself.
1354429	LSP rerouting can fail during network outages when IGP metric is not used for routing purposes.
1354427	Web UI does not correctly report P2MP-TE color attributes to REST when adding or modifying the P2MP-TE.

Resolved Issues

[Table 3 on page 8](#) lists resolved issues in NorthStar Controller Release 4.0.0. The identifier associated with each entry is the tracking number in the Juniper Networks Problem Report (PR) tracking system.

Table 3: Resolved Issues in NorthStar Controller 4.0.0

Identifier	Description
1348012	During a Device Collection, the User Parameters (used for service mapping) associated with an LSP were not saved. As a result, the service mapping statement was not removed; in turn, the LSP was not deleted.
1348014	A P2MP tree was missing in the UI P2MP sub-view when the headend node had Netconf but not PCEP configured.

Requesting Technical Support

Technical product support is available through the Juniper Networks Technical Assistance Center (JTAC). If you are a customer with an active J-Care or JNASC support contract, or are covered under warranty, and need post-sales technical support, you can access our tools and resources online or open a case with JTAC.

Revision History

30 April 2018—NorthStar Controller Release 4.0.0.

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