

# Release Notes for NorthStar Controller

**Release 3.2.0**  
**14 December 2017**

These release notes accompany Juniper Networks NorthStar Controller Release 3.2.0.

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## Introduction

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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 3.2.0 release is fully supported with Junos OS Release 17.2R1 and later.

NorthStar Controller 3.2.0 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 3.2.0 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 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 3.2.0 Downloadable Files**

File	Description
NorthStar Application	Northstar_Bundle_3_2_0_.tar.gz
NOTE: E-signature also available.	
NorthStar VMDK	NS320.tar.gz
NorthStar JunosVM	northstar_junosvm.tar.gz
NOTE: E-signature also available.	

## New Features

The following new features are introduced in the NorthStar Controller Release 3.2.0:

- Web UI Topology Map Improvements—Geographic Coordinate System and World Map, enabling:
  - Constrained zooming: NorthStar Controller performs coordinate checking so the view is constrained to the coordinates of the earth.
  - World wrapping/map wrapping: Scrolling the map in one direction is like spinning a globe. This enables representation of links across the pacific, for example.
  - State boundaries for USA, Canada, Brazil, Australia
  - Higher resolution on the topology map, providing more detail when zoomed in.
  - Dynamic line simplification applied to the map, providing a greater level of detail as you zoom in, but less detail as you zoom out. This improves performance rendering, maximizing performance where detail is not needed.
  - New Map tab in the Topology Settings window offers options related to map display, including the option to display the map with or without graticules and labeling of major populated areas, and to select a map style (light or dark).

See *Interactive Map Features* in the *NorthStar Controller User Guide*.

- Export to GeoJSON option from the Layout drop-down menu in the web UI.  
This option exports the current network topology layout to a GeoJSON file which you could then use in various mapping applications that support GeoJSON format.
- LSP Work Order Management.

Prior to this release, NorthStar Controller had no process in place for authorization, tracking, history, or logs visible within the web UI related to the management of LSPs. Any user with active credentials and full-access role could immediately change the live network or the internal network data model. And the only way to see a record of activity was to log into the server via SSH and look at the log files.

With the introduction of the first phase of work order management, this is no longer the case. This feature is highly desirable for using NorthStar Controller in a production environment.

See *LSP Work Order Management* in the *NorthStar Controller User Guide*.

- Service mapping using customized Jinja templates and User Properties.

Service mapping associates LSPs being provisioned with a VPN service such as mapping P2P LSPs to circuit cross-connect (CCC) VPNs or mapping P2MP LSPs to multicast VPNs (MVPNs). See *Templates for Netconf Provisioning* in the *NorthStar Controller User Guide*.

- SNMP Collection for Interface Statistics, LSP Statistics, Class Of Service Statistics, and P2MP-TE Statistics.

Data collection via SNMP is a useful alternative for collecting network statistics in systems where Juniper Telemetry Interface (JTI) is not available or in multi-vendor systems. Data collection via SNMP enables a number of performance management features. Collectors are installed automatically when you run `install.sh` to install the NorthStar Controller application. See *Data Collection via SNMP* in the *NorthStar Controller User Guide*.

- Collection of Data for the Creation of Network Archives.

You can now create collection tasks that result in a network model in a database, for use in the NorthStar Planner. You also have the option to archive the network model, or not. See *Collection Tasks to Create Network Archives* in the *NorthStar Controller User Guide*.

- Device Profile Grouping and Netconf Support for Collection by Group.

With device grouping, you can group devices in ways that are independent of topological groups. Netconf task collection also now supports collection by device profile group, so one way to use this functionality is to manage Netconf sub-collection tasks by group.



**NOTE:** At this time, a device can only belong to one group.

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See *Device Profile and Connectivity Testing* in the *NorthStar Controller User Guide*.

- Chaining of Recurring Collection Tasks.

You can now select to chain task after an already-scheduled recurring task, so it launches as soon as the other task completes. See *Scheduling Device Collection for Analytics via Netconf* in the *NorthStar Controller User Guide*.

- Netconf Collection Task Options.

You can now opt to collect data related to configuration, interfaces, tunnel paths, transit tunnels, switch CLI, and equipment CLI when you schedule a Netconf collection task.

Equipment CLI data is collected in Netconf collection tasks that include the Equipment CLI option. The Process Equipment CLI option in Network Archive collection parses the Equipment CLI data collected in Netconf collection and generates a new Inventory Report that is available in both the NorthStar Operator and the NorthStar Planner.

See *Scheduling Device Collection for Analytics via Netconf* in the *NorthStar Controller User Guide*.

- Distributed Network Collection.

When you install NorthStar Controller, a master collector is installed, for use by Netconf and SNMP collection tasks. You can improve performance of the collection tasks by also installing slave collectors to distribute the work. You can install as many slave collectors as you wish; each one adds four worker processes to help with collection tasks. The master collector manages all of the slave collectors automatically. See *Slave Collector Installation for Distributed Data Collection* in the *NorthStar Controller User Guide*.

- Ability to Launch the NorthStar Planner from Within the NorthStar Operator UI.

See *NorthStar Controller Web UI Overview* in the *NorthStar Controller User Guide*.

- New NorthStar Planner Functionality

- Diverse P2MP tree design.

See *Diverse P2MP Tree Design Overview* in the *NorthStar Controller User Guide*.

- Time-based simulation and intelligent bandwidth calendaring.

See *Simulation Scenarios Time-Based Simulation* in the *NorthStar Controller User Guide*.

- New NorthStar Controller Installation Option for VMDK.

With this type of deployment, you upload a VMDK file with a pre-installed setup of CentOS 6.9 minimal, along with the NorthStar Controller application, and a second VMDK file that contains the official JunosVM image. When you create a new VM for the disk, you point to the supplied VMDK image. See the *NorthStar Controller Getting Started Guide* for deployment steps.

- REST APIs have been added in the following sections:

- TE-LSP: two new calls for MVPN and CCC VPN service mapping
  - New Optimization RPC section, with two calls
  - New Simulation RPC section, with four calls
  - New P2MP tree design RPC, with four calls

- Support for Cisco IOS-XR devices via Netconf for P2P LSP and P2MP LSP provisioning, as detailed in [Table 2 on page 6](#) and [Table 3 on page 6](#).

Table 2: P2P LSP Provisioning Support for Cisco IOS-XR Devices

Feature	Supported	Not Supported
Add LSP with dynamic path	X	
Add LSP with explicit path (loose and strict both supported)	X	
Add LSP with user defined Setup/Hold priority and bandwidth	X	
Modify LSP path: dynamic path to explicit path, explicit path to dynamic path, or modify explicit path	X	
Modify Setup/Hold priority	X	
Modify LSP bandwidth	X	
Delete LSP	X	
Secondary/Standby path provisioning		X
LSP coloring/affinity provisioning		X

Table 3: P2MP LSP Provisioning Support for Cisco IOS-XR Devices

Feature	Supported	Not Supported
Add P2MP LSP by provisioning multiple P2P LSPs using the same P2MP group name while provisioning	X	
Sub-LSP provisioning with dynamic path	X	
Sub-LSP provisioning with explicit path (loose and strict both supported)	X	
Setup/Hold Priority used for sub-LSP provisions P2MP LSP priority (latest sub-LSP provisioned overrides the priority for the P2MP LSP)	X	
Bandwidth used for sub-LSP provisions P2MP LSP bandwidth (latest sub-LSP provisioned overrides the bandwidth for the P2MP LSP)	X	
Modify sub-LSP path	X	
Modify P2MP priority by modifying any of the sub-LSPs	X	
Modify P2MP bandwidth by modifying any of the sub-LSP	X	
Delete sub-LSP	X	
Deletion of P2MP LSP with deletion of the last sub-LSP	X	
LSP coloring/affinity provisioning		X

## Changes in Behavior

The following changes in behavior are introduced with NorthStar Controller Release 3.2.0:

- NorthStar Planner: Prior to this release, 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 is now a result of the latest Network Archive collection task run by the user in the NorthStar Operator, parsed and made available via the NorthStar Planner. The model includes considerably more information necessary for robust planning purposes, and the name of the model has accordingly been changed to Latest Network Archive. See *Collection Tasks to Create Network Archives* in the *NorthStar Controller User Guide* for full documentation.
- If you are upgrading to NorthStar Controller Release 3.2 from an earlier release, and you are operating in cluster mode (HA), you must set up SSH keys between cluster nodes by copying the public SSH key from each node to each of the other nodes, **from each machine**. This must be done as the root user. In earlier releases of NorthStar, this could be done from a single node in the cluster, and the effect was different.
- With the introduction of work order management, the following changes in behavior take effect:
  - When a full-access user creates/modifies/deletes LSPs, the changes no longer appear immediately in the topology and the network information table (Tunnel tab). A work order is created and appears in the Work Orders window, accessed by clicking **Work Orders** in the top menu bar.
  - In Release 3.2, only the Admin user can approve work orders. Submitters can monitor the progress of work orders in the Work Orders view, activate approved work orders, and close work orders.

For full documentation of the new work flow, see *LSP Work Order Management* in the *NorthStar Controller User Guide*.

- In NorthStar Controller Release 3.2 there is a change in the REST schema for the topology/nodes coordinates. The coordinates array now uses the order [Longitude, Latitude] per GeoJSON convention, rather than the [Latitude, Longitude] order used in all previous versions of NorthStar Controller.

This is a sample statement block showing longitude before latitude:

```
"topology": {
  "coordinates": {
    "type": "Point",
    "coordinates": [
      -118.13397600314025,
      34.022256324537246
    ]
  }
},
```

This impacts topology layout migration to Release 3.2 because the coordinates are reversed. To migrate your topology successfully, you must update your topology layout for Release 3.2, using one of the following methods:

- In the network information table, highlight a node and click **Modify** to display the Modify Node window. Update the Latitude and Longitude fields on the Location tab.
- On the topology map, drag and drop the nodes to the desired locations on the world map. Then navigate to **Layout > Set Lat and Lon from Map**.
- Use REST API PUT to update the node properties.
- In the NorthStar Planner, load a snapshot of the network. Verify that the offline model Longitude and Latitude coordinates are as expected. Right-click on the topology background and select **Push Lat Lon to NS Operator**. This updates the live network model with the coordinates from the offline model. The NorthStar Planner still uses the WANDL file format for coordinates, so previously defined Lat Lng order in the Java models are unaffected by the Lng Lat change.

## Known Behavior

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The following behaviors are known to occur in NorthStar Controller Release 3.2.0:

- LDP traffic collection is not supported in NorthStar Controller Release 3.2, although you might see references to it in the UI and in the documentation.
- Use of the **supervisorctl restart all** command to restart all services can cause a race condition. We recommend the use of the **service northstar restart** command instead.
- If you are using a two-VM installation, in which the Junos VM is not bundled with the NorthStar Controller, and if your external Junos VM is older than Release 17.2, you must edit the northstar.cfg file to make the NorthStar Controller compatible with the external VM.



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**NOTE:** If you edit the northstar.cfg file to make the NorthStar Controller compatible with an older external VM, segment routing on the NorthStar Controller will no longer be supported.

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Perform the following steps:

1. SSH to the NorthStar server.
2. Using a text editor such as vi, edit the following statement in the opt/northstar/data/northstar.cfg file from the default of **use\_sr=1** to **use\_sr=0**:

```
JunosVM ntad version supporting segment routing: No (0) or Yes (1)
use_sr=0
```

3. Manually restart the toposerver process:

```
[root@northstar]# supervisorctl restart northstar:toposerver
```



You also need to set up the SSH key for the external VM by selecting option **H** from the Setup Main Menu when you run the `net_setup.py` script, and entering the requested information.

- After provisioning a P2MP LSP via Netconf, network utilization on the NorthStar Controller topology map might not be immediately refreshed. In this case, right-click on the topology map and select **Reload Network**.
- Segment routing node-segment index is required on headend routes for NorthStar Controller to properly route segment routing LSPs. Although this configuration is advised, the next release will not make it mandatory.
- In order to modify a P2MP tree, users have to modify its sub-LSP. The next release will provide another option: modification at the group level will be supported.
- It is strongly recommended to collect both router configuration, tunnel path and tunnel transit show commands when running the device collection task.
- It is not recommended to use the credentials of JUNOS root users when running device collection. NorthStar Controller will not raise any warning when such credentials are used, even if the task fails. The next release will raise a warning.
- For IOS-XR routers, NorthStar LSP Netconf-based provisioning has the same limitations as NorthStar PCEP-based provisioning.
- There is a case in which NorthStar Controller can fail to commit when you delete all P2MP sub-LSPs in one single order. To prevent this, you must add a user-defined property called "bulk\_commit" in the Device Profile for the headend router of the P2MP LSPs. This setting allows NorthStar to do a single commit instead of multiple commits when you provision multiple LSPs on the same router. The user property is entered in the web UI Device Profile Add or Modify window (**Administration > Device Profile**), on the User Defined Properties tab as shown in [Figure 1 on page 9](#).

**Figure 1: User Defined Properties in Device Profile**

Name	Value
bulk_commit	True

Buttons: Reset, Cancel, Modify

## Known Issues

Table 4 on page 10 lists known issues in NorthStar Controller Release 3.2.0. The identifier associated with each entry is the tracking number in the Juniper Networks Problem Report (PR) tracking system.

**Table 4: Known Issues in NorthStar Controller 3.2.0**

Identifier	Description
1307031	SNMP-based interface traffic collection does not work when a router is configured with multiple routing engines. In this case router hostname has suffix re0 and re1 (usually used in dual-RE configuration).
1307032	During initial loading of the web UI, the Server Status ( <b>Administration</b> > <b>Server Status</b> in the More Options menu) is shown as down for PCE, Topology Acquisition, and PCS. The displayed error message is "Down...cannot retrieve PCE status."
1307033	When the JUNOS statement dealing with node-segment is deactivated in a router, NorthStar may not automatically tear down the SPRING LSP originated, transiting, or terminated onto this router.
1307034	Minor display issue when using Chrome: On the Chrome browser, there are some UI issues while modifying the device profile – not all settings are displayed properly in the window.
1307037	PCS/ConfigServer rejects a user-specified P2MP group name that is the same as the LSP name: JUNOS does not allow commit if a P2MP name is also used by a current and existing LSP name.
1307369	When a PCEP session is down and LSP events are received, PCC-controlled LSPs might be temporarily deleted.

## Resolved Issues

Table 5 on page 10 lists resolved issues in NorthStar Controller Release 3.2.0. The identifier associated with each entry is the tracking number in the Juniper Networks Problem Report (PR) tracking system.

**Table 5: Resolved Issues in NorthStar Controller 3.2.0**

Identifier	Description
1230379	Device Profile may have duplicated entries. It is no longer required to manually remove them.
1306292	In some circumstances when dealing with a very large scale network, NorthStar web UI performance can be very slow.
1306314	HA failover may not happen if NorthStar zookeeper is unexpectedly in a corrupted state.
1306393	"Reset Network Model" may not always succeed. Reminder: we strongly recommended that you NOT use this feature on production networks (just for lab networks).
1307032	During the initial loading of the network, users may have to wait for some time for the Server Status dealing with "PCE, NTAD and PCS" to be displayed.

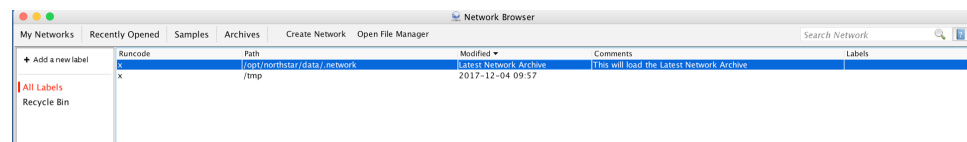
Table 5: Resolved Issues in NorthStar Controller 3.2.0 (*continued*)

Identifier	Description
1297605	If the user mis-configures router ISO address, e.g., Duplicated ISO, NorthStar reloads the web UI pages.
1297926	During race conditions, NorthStar Topology Server may be restarted by the application.
1300800	REST API search feature for LSP may not be responsive.

## Documentation Errors and Omissions

- NorthStar Planner includes more features than are fully documented. This will be corrected as of the next NorthStar Controller release.
- Some screen captures show the routing method routeByPCC. This was changed to routeByDevice.
- Some screen captures of the NorthStar Planner Network Browser window still show Live Network Snapshot. This was changed to Latest Network Archive as shown in [Figure 2 on page 11](#).

Figure 2: Latest Network Archive in the Network Browser Window



## 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

14 December 2017—Adding Known Behavior about LDP traffic collection appearing in the UI but not supported.

7 December 2017—NorthStar Controller Release 3.2.0.

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