

Release Notes for NorthStar Controller

Release 4.2.1
7 February 2019

These release notes accompany Juniper Networks NorthStar Controller Release 4.2.1.

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

NorthStar Controller 4.2.1 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.

The NorthStar Controller 4.2.1 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

For PCEP client to support binding SID, Junos OS Release 18.3 or 18.4 (or later) is required.

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.



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.

The NorthStar Controller is supported on the following Juniper platforms: M Series, T Series, MX Series, PTX Series, QFX10008, and ACX5000. However support for ACX platform is limited for Segment Routing features. Please contact JTAC for more information.

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

NorthStar Release 4.2.1 is a service release that aims at better supporting very large scale networks in terms of both auto-discovery and LSP provisioning. It includes two new features: GeoDiverse automation and PCEP mapping file.

Table 1 on page 3 describes the downloadable files.

Table 1: NorthStar Controller 4.2.1 Downloadable Files

File	Description
NorthStar Application	Northstar_Bundle_4_2_1.tar.gz
NOTE: E-signature also available.	
NorthStar JunosVM	northstar_junosvm_4_2_1.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.

New Features

The following new features are introduced in NorthStar Release 4.2.1:

Automation of GeoDiverse HA Cluster Installation

NorthStar 4.2.1 installation has been improved to facilitate the roll-out of GeoDiverse clusters. The installation script offers a new option to automate the deployment of NorthStar servers in remote data centers such as those located in different countries. A new field in the HA Setup menu is now available for entering a site location:

Figure 1: HA Settings Menu With New "Site Name" Field

HA Setup:

```

.....
Node #1
  Hostname           :
  Site Name          : site1
  Priority            : 1
  Cluster Communication Interface : eth1
  Cluster Communication IP      :
  Interfaces
    Interface #1
      Name           : eth1
      IPv4            :
      Switchover      : yes
    Interface #2
      Name           : eth2
      IPv4            :
      Switchover      : yes
    Interface #3
      Name           : eth0
      IPv4            :
      Switchover      : yes
    Interface #4
      Name           :
      IPv4            :
      Switchover      : yes
    Interface #5
      Name           :
      IPv4            :
      Switchover      : yes

```

Note that:

- You access the HA Setup menu from the NorthStar Main Menu, option **E** (HA Setting).
- The default site name for all nodes is "site1". Modify the name for each node as appropriate for your data center setup.
- If you configure nodes to have multiple site names, the multi-data center automatic configuration setup for Cassandra is activated when you select option **H** on the HA Setup menu (Prepare and Deploy HA configs).
- If you configure all nodes to have the same site name, the multi-data center automatic configuration setup for Cassandra is not activated.
- **IMPORTANT:** The total number of nodes across all sites must still conform to HA requirements: an odd number of nodes with a minimum of three. We recommend three sites with either one node per site or 3 nodes per site. We do not recommend an even number of nodes nor an even number of sites.
- This feature currently does not support adding a new node into a cluster after HA deployment.
- This feature currently does not support Analytics.

PCEP Mapping File to Improve PCEP Interoperation with Non-Juniper Equipment

The PCEP protocol used by the Junos OS and NorthStar Controller supports *PCEP Extensions for establishing relationships between sets of LSPs* (draft-minei-pce-association-group-00) which defines the format and usage of AssociationObject, the optional object that makes association between LSP groups possible. There are later versions of this draft that might be supported by other equipment vendors, which introduces the possibility of mismatch between AssociationObject formats. Such a mismatch could cause non-Juniper PCCs to discard LSP provisioning requests from NorthStar. To prevent this, we recommend that you configure all non-Juniper PCCs to omit AssociationObject altogether.



NOTE: The result of omitting AssociationObject in non-Juniper PCC configuration is that NorthStar cannot associate groups of LSPs on those devices. For example, you would not be able to associate a primary LSP with secondary LSPs or a primary LSP with standby LSPs. This does not affect NorthStar's ability to create associations between LSP groups on Juniper PCCs.

Omitting AssociationObject on non-Juniper PCCs involves creating or updating the **pcc_version.config** (mapping) file on the NorthStar server and restarting the associated PCEP sessions:

1. Create/edit the **pcc_version.config** file on the NorthStar server to include the IP addresses of all non-Juniper PCCs. For each IP address, specify **3** as the PCC version. PCC version 3 omits AssociationObject.



NOTE: The IP address should be the PCC IP used to establish the PCEP session. This is the IP address the PCC uses as the local IP address and is the same as appears in the PCC_IP field in the web UI device profile for the device.

The **pcc_version.config** file is located in `/opt/pcs/db/config/`. The syntax of the configuration is **ver=ip_address:pcc_version**.

For example:

```
[root@northstar]# cat /opt/pcs/db/config/pcc_version.config
ver=192.0.2.100:3
ver=192.0.2.200:3
ver=192.0.2.215:3
```

2. At the PCEP CLI (**pcep_cli** command at the NorthStar Linux shell), execute the **set pcc-version** command to activate the change in PCC version.

Executing this command restarts the PCEP sessions to the non-Juniper PCCs, applying the new PCC version 3. You can then provision LSPs from the NorthStar UI.

Changes in Behavior

There are no new changes in behavior to report for NorthStar Controller Release 4.2.1.

Known Behavior

The following behaviors are known to occur in NorthStar Controller Release 4.2.1:

- Only the bandwidth of PCE-initiated and PCC-delegated LSPs can be sized by applying bandwidth sizing attributes, but there is nothing to prevent you from applying attributes to PCC-controlled LSPs and no warning that they will not take effect.
- NorthStar REST API does not return the selected routing method in the REST response:
 - 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.
- Behaviors and limitations related to NETCONF Provisioning of LSPs and Binding SID Support:
 - Binding SID SR support is limited to Junos OS Releases 18.3 and 18.4.
 - Automatic rerouting of NETCONF-provisioned LSPs (including NETCONF-provisioned SR LSPs) due to a failure in the network is not supported.
 - The Preview Path button in the Provision LSP window may return a “Cannot find a path!” error message when in fact a path was found and the SR LSP was successfully provisioned. The error message occurs for certain scenarios such as when an SR LSP makes use of a binding SID SR LSP (privateForwardingAdjacency).
- During PCE-initiated LSP provisioning, some IOS-XR routers can return an error code for an unknown reason. Currently, the NorthStar Application only reports “NS_ERR_GENERIC” when this occurs. It is planned to improve this behavior and report the exact error code (e.g. PCEP Error Type = 24 error value = 2) in future releases.
- Behaviors related to Netflow Collector:

- It can happen that during a NorthStar upgrade from NorthStar 4.x, netflowd cannot be started. If netflowd fails to start, run the following command on the system hosting the netflow collector:

```
sudo -u pcs /opt/northstar/thirdparty/python/bin/pip -q install --upgrade
--no-deps --force-reinstall /opt/pcs/lib/python/*.whl
```

- The telemetry REST API assumes that LSPs on different routers have different names.
- In rare cases, you might get an empty result in the network information table Service tab for both summary and detailed information, for example, after a system upgrade. If this happens, you can resolve it by restarting the web process:

```
supervisorctl restart infra:web
```

Known Issues

Table 2 on page 7 lists known issues in NorthStar Controller Release 4.2.1. 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 4.2.1

Identifier	Description
NA	The binding SID SR LSP name specified in NorthStar 4.2.1 release must not contain the "-" character. For example, "bsid-between-P3-ASBR12" would be an invalid name where as "bsid_between_P3_ASBR12" would be valid. This issue will be fixed in a future release.
1358245	<p>Junos OS Release 18.2 and 18.3 PCEP reporting limitation: In Junos OS Releases prior to 18.4R2, Junos reports the SR LSP name only. The segment list path names (for multiple primary paths or secondary path) are not reported via PCEP. The implications for NorthStar Controller Release 4.2.1 are:</p> <ul style="list-style-type: none"> • Only one primary path is supported. Since Junos OS still requires a path name to be specified, when NorthStar sends a provisioning order for NETCONF-based SR LSPs, the primary path name is set to be the same as the SR LSP name. • The length of the LSP name provisioned via NorthStar 4.2.1 should be 32 characters or less because the combined LSP name and path name length should be less than 64 characters. This 32 character constraint is not enforced by the NorthStar web UI or the REST API.
NA	NorthStar 4.2.1 does not support modification of static SR-TE LSP attributes once they have been provisioned via NorthStar or if they have been manually provisioned.

Resolved Issues

Table 3 on page 8 lists resolved issues in NorthStar Controller Release 4.2.1. 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 4.2.1

Identifier	Description
1397168	NorthStar Link delay collection supports routing engine switchover when it triggers a change of the hostname.
1414367	SNMP Traffic processing may report negative values for LSP traffic statistics under certain circumstances (e.g. LSP ERO or BW re-signaling).

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

7 February 2019—NorthStar Controller Release 4.2.1.

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