

Release Notes for NorthStar Controller

Release 3.1.0
14 September 2017

These release notes accompany Juniper Networks NorthStar Controller Release 3.1.0.

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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 3.1.0 release is fully supported with Junos OS Release 17.2R1 only.

NorthStar Controller 3.1.0 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 3.1.0 Analytics features require specific Junos OS Releases to be able to obtain LSP and interface statistics. This is a Junos Telemetry Interface (JTI) dependency. See [Overview of the Junos Telemetry Interface](#) for information on JTI.

NorthStar Controller 3.1.0 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
- Administrative 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: T Series, MX Series, PTX Series, QFX10008, and ACX5000.

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).

If PCEP is deployed in the network and Netconf is used to provision P2MP-TE LSPs, you must configure the routers with **set protocols pcep pce pce-id p2mp-lsp-report-capability** in order to see P2MP LSPs in the web UI without first running a device collection task.

Contents of this Release

Table 1 on page 3 describes the downloadable files.

Table 1: NorthStar Controller 3.1.0 Downloadable Files

File	Description
NorthStar Application NOTE: E-signature also available.	Northstar_Bundle_3_1_0.tar.gz which includes: <ul style="list-style-type: none"> NorthStar Bundle 3.1.0 installation file for use with: <ul style="list-style-type: none"> Bare metal server installation in which the Junos VM will be running as a virtual machine using qemu hypervisor via CLI. Installation onto a CentOS 6 VM running on the OpenStack virtualization platform. Readme file.
NorthStar JunosVM NOTE: E-signature also available.	northstar_junosvm.tar.gz which includes: <ul style="list-style-type: none"> northstar_junosvm.img, a VMDK-formatted file to be run as a virtual machine on OpenStack. NOTE: The junos_vm file comes with no configuration. Sample junos_vm configuration file. Sample HEAT templates for use when installing the NorthStar Controller in an OpenStack virtual environment: <ul style="list-style-type: none"> northstar310.heat.official for launching the NorthStar Controller in standalone mode without a floating IP address. northstar310.floating.heat.official for launching the NorthStar Controller in standalone mode with a floating IP address. northstar310.3instances.heat.official for launching the NorthStar Controller in cluster mode without a floating IP address. northstar310.3instances.floating.heat.official for launching the NorthStar Controller in cluster mode with a floating IP address. Readme file.

New Features

This section describes new features in the NorthStar Controller Release 3.1.0.

LSP Provisioning Using Netconf

You can now provision P2MP LSPs using Netconf. To use Netconf, the NorthStar Controller must rely on periodic device collection to learn about LSPs and other updates to the network. NorthStar Controller with Netconf supports logical systems. With NorthStar Controller Release 3.1.0, you can do Netconf provisioning only on Juniper devices.

Before attempting Netconf LSP provisioning, you must first populate the Device Profile, enable your system to allow NorthStar Controller to modify the router configuration files via Netconf, and schedule periodic Netconf device collection.

If you modify an existing LSP via Netconf, NorthStar Controller only generates the configuration statements necessary to make the change, as opposed to re-generating all the statements in the full LSP configuration as is required for PCEP.

For NorthStar Controller Release 3.1.0, the following functionality related to Netconf provisioning is not supported:

- Provisioning LSP coloring (admin groups)
- Provisioning diverse LSPs using netconf
- Modifying or deleting LSPs automatically created by the router such as bypass, auto-mesh, or TE++ LSPs.

Additional notes about Netconf provisioning:

- 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**.
- When provisioning fails, there is no specific error message displayed in the web UI in this release. The LSP Op Status is reported as UNKNOWN.

P2MP Group Handling in the Web UI

When you create multiple P2MP LSPs with the same name, they form a P2MP group in the NorthStar Controller, Topology view. To see P2MP groups:

1. Select **P2MP** from the drop-down menu in the left pane. Each P2MP group is displayed as a folder.
2. Click the arrow beside any folder to expand the list to include the LSPs that are part of that P2MP group.
3. Click the group name to highlight the group members on the topology map as well as expand the list to include the members of the group.
4. Click an individual LSP in the list of group members to highlight that specific tunnel on the topology map.

IGP Metric Modification from the NorthStar Controller

This feature enables changing the IGP metric right in the NorthStar Controller UI, without having to configure anything on the router. Modifying metrics is one way to cause the path selection process to favor one path over the other available paths.



NOTE: Interface data must have been collected using a Netconf device collection task before you can use this feature to modify IGP metrics.

If your system uses BGP-LS for topology acquisition, only the TE metric can be immediately updated in the web UI. To retrieve and display other updated metrics (ISIS1, ISIS2, OSPF), right-click the link in the network information table and select **Run Device Collection**. If your system is configured to use IGP adjacency for topology acquisition, this step is not necessary because in that case, all metrics are immediately updated.

For NorthStar Controller Release 3.1.0, the following functionality related to IGP metric modification is not supported:

- Rollback metric change
- Simultaneous multiple link metric changes
- Deletion of a metric statement

LSP Path Manual Switch

This feature allows you to select which LSP path is to be active for PCC-controlled LSPs where the path name is not empty. One use case for this feature is to proactively switch the active path in preparation for a maintenance event that would make the currently active path unavailable. The procedure can also be used to manually switch a path in a logical system.

For NorthStar Controller Release 3.1.0, the following functionality related to manual path switching is not supported:

- Ability to make multiple LSP changes for a selected manual option
- Real-time LSP update for non-PCEP networks

Analytics Enhancements: IP/MPLSView Performance Management Migration to NorthStar

The following analytics enhancements and performance management functions are now available in NorthStar Controller:

- Collection of interfaces and LSP statistics using an SNMP Traffic Collection task. Netconf device collection is a prerequisite to running SNMP Traffic Collection in order to obtain the LSP and interface information needed for polling.
- Collection of Link Delay statistics using a Link Latency Collection task.
- Test connectivity feature for SNMP with auto-population of host name and vendor type in the device profile as a result of polling.

Web UI Enhancements

In addition to the UI elements that enable and facilitate new features, there are a number of other enhancements to the web UI in this release. Below are some highlights:

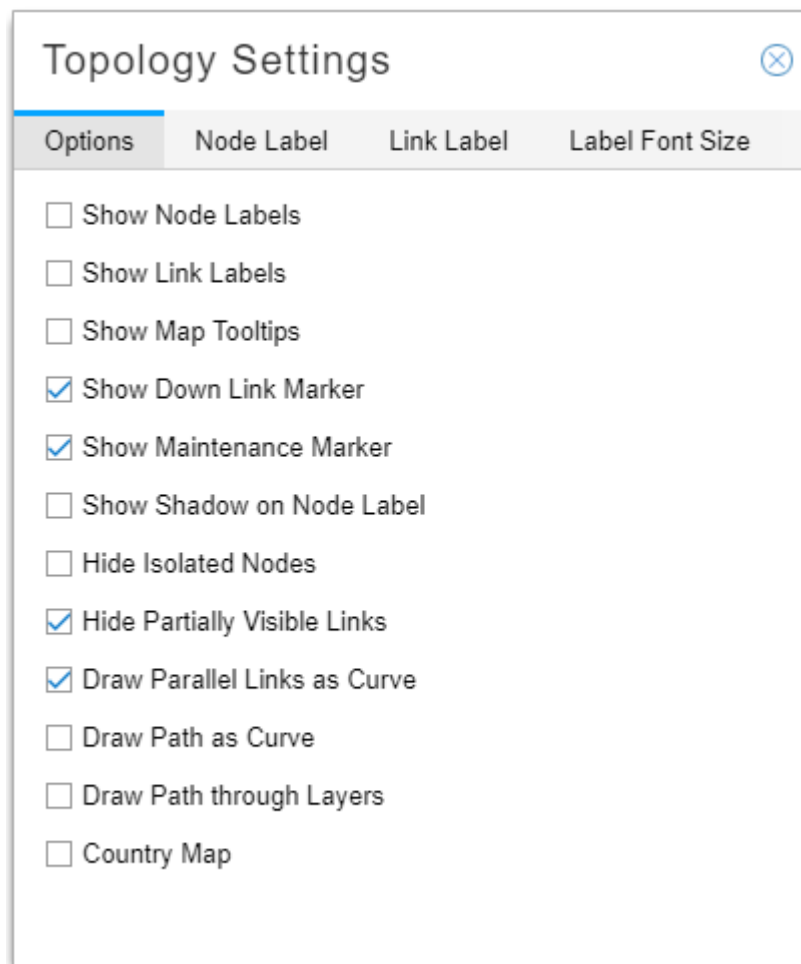
- **Topology Settings window:** Access this new window by clicking on the new tools icon in the upper right corner of the topology window. [Figure 1 on page 6](#) shows the new icon.

Figure 1: Tools Icon to Access Topology Settings



The Topology Settings window consolidates the topology display settings that were previously distributed throughout the UI. [Figure 2 on page 6](#) shows the Topology Settings window with the four tabs that group related settings.

Figure 2: Topology Settings Window



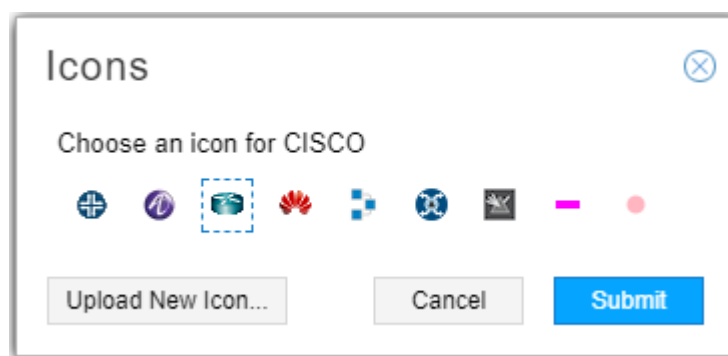
- **Hide Partially Visible Links:** In the Options tab of the Topology Settings window, there is a new option to Hide Partially Visible Links, which you can see in [Figure 2 on page 6](#). When selected, this option removes from the display any links for which both end nodes are not within the field of view. This is useful for focusing on a subset of a large network.

- **Node Type Icon Selection:** In the left pane, under Types, you can now right-click on a node type and select Properties. The Icons window opens in which you can choose the icon that will represent that node type in the topology map. You can also upload your own icon.

For uploaded icons, there is no automatic scaling. So to display properly, uploaded icons must measure 16x16 pixels.

Figure 3 on page 7 shows the icon selection window.

Figure 3: Icon Selection Window

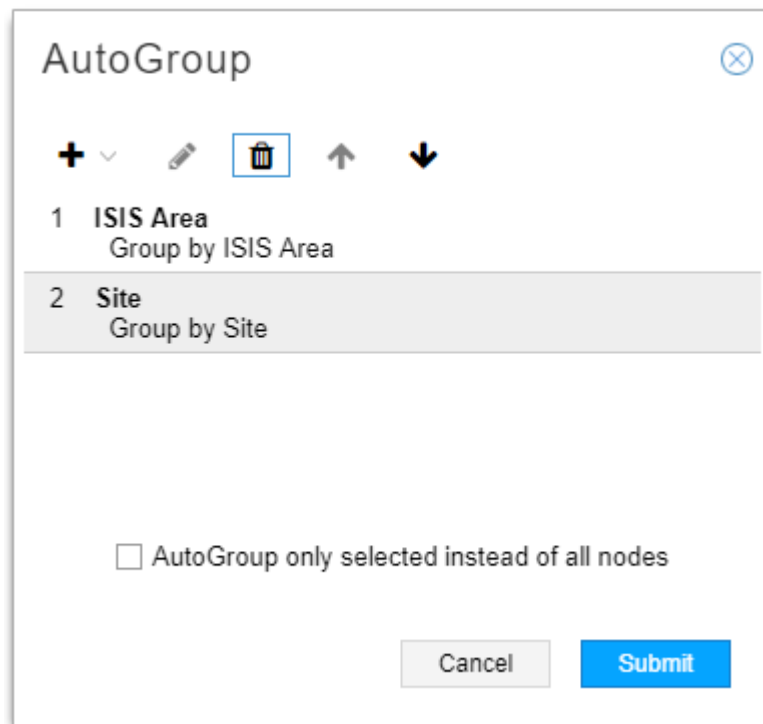


NOTE: All nodes of one type use the same icon.

- **Topology Display Types Consolidated Under Performance:** Under Performance in the left pane, there are now Current (live network) and Historical groups of performance options. These options are mutually exclusive; you can choose only one at a time for display.
- **Link Coloring:** Bit level link coloring is now available from the left pane options to filter the topology display.
- **Analytics View:** A new Analytics view is available from the top navigation bar. This view includes various network-related widgets. The network information table remains at the bottom of the window so you can select elements for which you want to see context-specific statistics.
- **Active Users Window Moved to More Options:** The Active Users window that was previously available under User Options (person icon) in the upper right corner of the UI is now available under More Options (three horizontal bars icon). Also, the account user name is now displayed beside the User Options icon.
- **Event Monitor:** There is now a Live Event Chart available from the left pane that displays the real time count of events, as well as the top nodes and LSPs.
- **Auto Grouping with Multiple Rules:** The Auto Grouping option under the Layout menu now allows you to use multiple rules in sequence to group network elements.

Figure 4 on page 8 shows the updated AutoGroup Window.

Figure 4: AutoGroup Window



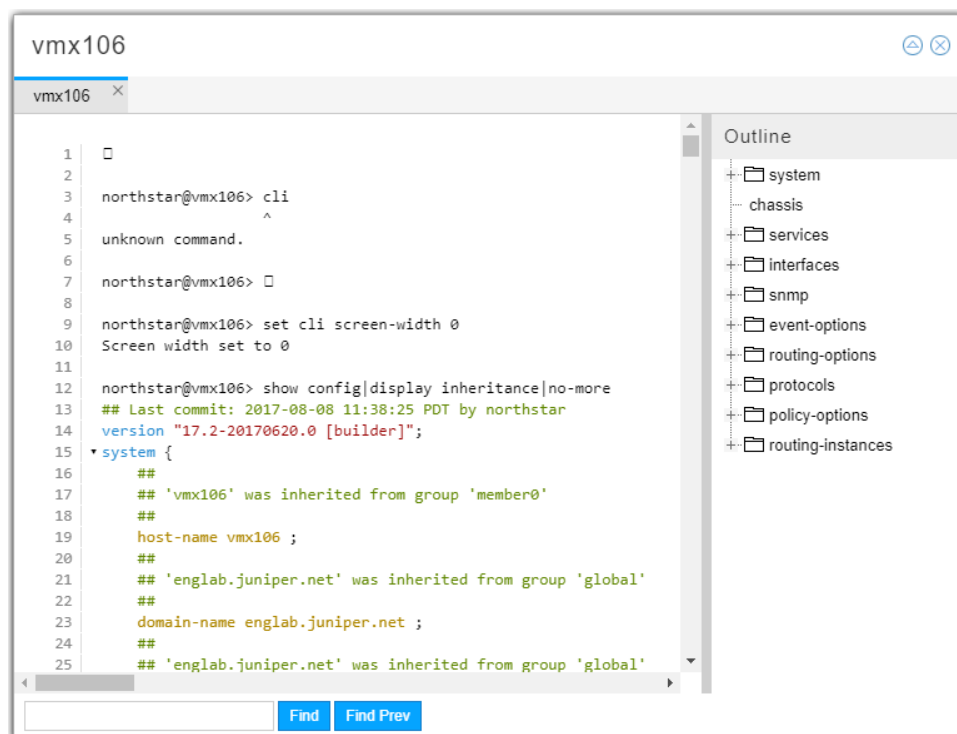
You can select to apply auto-grouping to all nodes or just to the nodes that you have selected on the topology map.

- **Create Symmetric Pair Check Box:** In the Provision Diverse LSP window, there is now a check box to Create Symmetric Pair. This allows you to create the symmetric pair in the same operation as creating the diverse LSP. Access the Provision Diverse LSP window by navigating to **Applications > Provision Diverse LSP**.
- **Configuration Viewer:** With this feature, you can view (view-only) the configuration of a router in the network. You must set up the Device Profile (**Administration > Device Profile**) and Netconf Device Collection (**Administration > Device Collection**) to retrieve the configuration files before they are available in the Configuration Viewer. You can access the configuration viewer from the topology map or from the Integrity Checks report.

To access the viewer for a node in the topology, right-click a node in the topology map and select **Show Config**.

[Figure 5 on page 9](#) shows an example of the configuration viewer.

Figure 5: Configuration Viewer



The left pane displays the router configuration file. The right pane displays an outline view that groups the configuration by statement blocks in which you can drill down. When you click a specific statement in the right pane, it is displayed in context in the left pane.

The colored text in the configuration file in the left pane highlights nested levels, version, password, and comment statements.

Clicking the triangle icon in the upper right corner of the viewer window opens the search field at the bottom of the window. Enter your search text and click **Find** or **Find Prev** to move forward or backward through the search results.

- **Integrity Checks:** Under **Applications > Reports**, there is now an Integrity Checks report. After you perform device collection, the router configuration files are scanned and the NorthStar Controller flags anything suspicious. The resulting report provides hints as to what might need attention.

To inspect the router configuration file, right-click a line item in the report and select **Show Config** to open the Configuration Viewer. If the report line item is for an LSP, the configuration viewer opens a separate tab for each end of the tunnel so you can see both relevant configuration files.

Network Planner Features

The Network Planner features and modifications described in [Table 2 on page 10](#) are now available in the NorthStar Controller Network Planner UI.



NOTE: These Network Planner features are not yet fully documented in the *NorthStar Controller User Guide*.

Table 2: New Features and Modifications in the Network Planner

Network Time

Tools > Options > General

- If set, options are now also displayed on the top right corner of the topology map
- Options related to the deprecated NorthStar Operator Java Client have been removed

Segment Routing

- Option added to **Tunnel Type Window > General > LSP Type**
- Option added to **Add/Modify Link > Protocols > SR**

Console Window

- Server status tab removed
- Explorer tab triggered by selecting a node in the Node table

Traffic

- **Application > Traffic Aggregation** now supports Analytics mode
- Loading of traffic files now available at **File > Load Network Files > Network Files > Traffic Files**

Scheduling

- Available for LSPs in the **Add/Modify Tunnel** window
- Now implemented for Demands in the **Add/Modify Demand** window

TE++

- New options available in **Tools > Options > Path Placement > Global TE++ Attributes**
- TE++ ID column added in the **Tunnel** table

VPN

Network > Services > VPN

- Support BGP-LU VPN in **VPN** window

LSP Matching String

- New field in **Demand Type** window
- New column in **Network > Protocols > BGP > BGP Routing Table**

Table 2: New Features and Modifications in the Network Planner (continued)

Network Browser File > Open Network Browser <ul style="list-style-type: none"> • My Networks tab no longer lists auto-archived networks • Support for labels (tags) • Support for setting public versus private networks • Ability to delete networks from the database has been added
Static Routing Table <ul style="list-style-type: none"> • Network > Protocols > Static Route Table now available
Show Config File <ul style="list-style-type: none"> • Right-click menu item from Node, Link, or Interface table, or from the topology map, and select Show Config
Save Individual Files <ul style="list-style-type: none"> • Available at File > Save Network File
Main Toolbar <ul style="list-style-type: none"> • Tunnel/Layer 3 button added
Trending <ul style="list-style-type: none"> • Available at Application > Trending
Routing Method <ul style="list-style-type: none"> • routeByPCC option added to Tunnel Type window > Design > Routing Method
Tunnel <ul style="list-style-type: none"> • Show Path draws loose routes with dashed purple lines
Path Placement Options <ul style="list-style-type: none"> • Available at Tools > Options > Path Placement
Auto Bandwidth Tunnels <ul style="list-style-type: none"> • You can now modify bandwidth of autobw tunnels
QoS Network > QoS <ul style="list-style-type: none"> • QoS Manager, CoS Classes, and CoS Policies now available
Reports Report > Report Manager <ul style="list-style-type: none"> • New reports include Configuration Reports, VPN Reports, Demand Reports

*Table 2: New Features and Modifications in the Network Planner (continued)***Compliance Assessment & Tools (CAT)**

- CAT now available at **Tools > Compliance Assessment & Tools > CAT Template Design**

File Import Wizard

- Wizard now available at **File > Import Network Wizard**

Topology Utilization Legends

- Legends now available include Planned Node Load, Measured Node Load, Measured Link Util

Changes in Behavior

The following changes in behavior are introduced with NorthStar Controller Release 3.1.0:

- Port 830 for Netconf communication must be allowed by any external firewall and server iptables.

Known Behavior

The following behaviors are known to occur in NorthStar Controller Release 3.1.0:

- 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.



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.

Follow the procedure in the *NorthStar Controller Getting Started Guide*.

- 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**.
- PCEP sessions can flap when some Junos OS statements in the PCC router configuration file are changed. For example, changes in the Junos group stanza.
- A P2MP group statement provisioned by the NorthStar Controller will not be deleted when the P2MP LSP is deleted. The user must manually remove the group statements from the router configuration files.

Known Issues

Table 3 on page 13 lists known issues in NorthStar Controller Release 3.1.0. The identifier associated with each entry is the tracking number in the Juniper Networks Problem Report (PR) tracking system.

Table 3: Known Issues in NorthStar Controller 3.1.0

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 (Administration > Server Status 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.

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 September 2017—NorthStar Controller Release 3.1.0.

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