

OpenNMS Release Notes

Copyright (c) 2016-2019 The OpenNMS Group, Inc.

OpenNMS Horizon v27.1.1, Last updated 2021-04-06 16:28:46 UTC

Table of Contents

What's New in OpenNMS Horizon 27	2
System Requirements	2
Breaking Changes	3
Remote Poller Removed	3
VMware Assets	3
New Features and Improvements	4
Karaf Shell	4
Minion and Sentinel	4
Application Perspective Monitoring	4
Provisioning	4
Polling and Monitoring	4
Thresholding	5
RPC, Telemetry, Flows, and BMP	5
Notifications	5
ReST API	5
Web UI Improvements	5
Documentation Updates	5
Kafka Producer Metrics	6
Important Internal Changes	7
Changelog	7
Release 27.1.1	7
Release 27.1.0	8
Release 27.0.5	10
Release 27.0.4	10
Release 27.0.3	11
Release 27.0.2	11
Release 27.0.1	12
Release 27.0.0	13

Copyright © 2004-2020 The OpenNMS Group, Inc.

Permission is granted to copy, distribute and/or modify this document under the terms of the GNU Free Documentation License, Version 1.1 or any later version published by the Free Software Foundation; with no Invariant Sections, with no Front-Cover Texts and with no Back-Cover Texts. A copy of the license is available at <http://www.gnu.org/copyleft/fdl.html> OpenNMS is the creation of numerous people and organizations, operating under the umbrella of the OpenNMS project. The source code is published under the GNU Affero GPL, version 3 or later and is Copyright © 2002-2020 The OpenNMS Group, Inc.

The current corporate sponsor of OpenNMS is The OpenNMS Group, which also owns the OpenNMS trademark.

Please report any omissions or corrections to this document by creating an issue at <http://issues.opennms.org>.

What's New in OpenNMS Horizon 27

System Requirements

- **Java 8 through 11:** OpenNMS Horizon 27 runs on JDK 8 through 11. We recommend the most recent version of OpenJDK 11.
- **PostgreSQL 10 or higher:** Horizon 27 requires any supported version of PostgreSQL from 10 up to (and including) 13.

Breaking Changes

Remote Poller Removed

The remote poller has been removed from Horizon 27. It has been replaced with new infrastructure for [perspective-based monitoring](#) that runs on Minions.

VMware Assets

VMware-related data is not longer stored in node assets. The `install` command will move any existing VMware asset data to the node's metadata when you upgrade.

New Features and Improvements

Karaf Shell

A number of useful commands have been added or updated in the Karaf shell.

- `alarm-list`: list current alarms (optionally filtered by UEI)
- `event-list`: list events (optionally filtered by UEI)
- `ip-addr-range`: generate a list of IP addresses to use in other commands
- `reload-daemon`: now accepts an optional configuration file to target for reload
- `send-event`: additional options supported to match the CLI version of `send-event` more closely
- `snmp-fit`: can now optionally send a `newSuspect` event on success
- `snmp-get`: like `snmp-walk`, but fetches a single MIB object and prints the result

Minion and Sentinel

- The Minion `confd` configuration support now handles a bunch more options, including setting Jetty, RMI, and ssh host and port, Secure Credentials Vault configuration, and environment variables and options for the JVM. For details, see [the CONFD_README file](#).
- It's now possible to override entries in a Sentinel's `system.properties` with a file called `custom.system.properties`

Application Perspective Monitoring

Application Perspective Monitoring replaces the old Remote Poller.

It uses the Minion infrastructure to monitor a service's availability from these different perspectives. When a service is not responsive an outage will be generated with the corresponding perspective.

A number of provisioning, polling, and web UI changes have been made to accomodate this new infrastructure.

Provisioning

- Node scan has been updated to limit the number of concurrent RPC requests so as not to overload communication with Minions.
- New policies have been added for creating node and interface metadata during provisioning.

Polling and Monitoring

- WMI/SMB support has been updated to use a wider set of encryption types.
- Data collection configuration has been added for Netscaler vServer.

Thresholding

- It is now possible to use metadata in threshold evaluation.

RPC, Telemetry, Flows, and BMP

- Improvements have been made for supporting aggregate flow metrics.
- Flow DNS enrichment has been enhanced to improve performance.
- Aggregate flow queries now support resolving hostnames if available.
- Sink RPC APIs have been enhanced to expose metrics to Karaf for tracing and performance tuning.
- The OpenConfig integration now supports gNMI, in addition to JTI.

Notifications

- It is now possible to use node-, interface-, and service-level metadata in notifications.

ReST API

- Events for `applicationCreated/applicationDeleted` are now sent when applications are added or removed through the ReST API.
- A new v2 API for retrieving application status has been added.

Web UI Improvements

- A new universal search bar has been added which allows for searching alarms, nodes, and more from the top of any page in the UI.

Documentation Updates

Documentation improvements and additions have been made in a number of areas:

- Application Perspective Monitoring
- Data Collection Configuration
- Metadata
- Mail Transport Monitor
- Minion/Kafka RPC Tuning
- Thresholding
- Users Configuration, Duty Schedules, and Security Roles

...plus TONS of smaller readability improvements.

Kafka Producer Metrics

- For Interface Resources, a String attribute named `__ifIndex` is added to represent missing Interface ifIndex in String form.

Important Internal Changes

- Sink internals have been updated to use Protobuf 3.

Changelog

Release 27.1.1

Release 27.1.1 contains a few enhancements, as well as a number of bug fixes including some XSS and CSRF cleanups and a Jetty DoS CVE.

The codename for 27.1.1 is *Infinite Improbability Drive*.

Bug

- Change Jetty default settings to eliminate TLS 1.0 and TLS 1.1 support (Issue [NMS-10256](#))
- Can't edit reductionKey in BSM (Issue [NMS-12697](#))
- Topology Map: Application: Color of app wrong for acknowledged alarm (Issue [NMS-12969](#))
- Topology Application Map: Outage Table: Clicking on a service should show the outages of the service (Issue [NMS-12970](#))
- Wrong UEI is picked when threshold alarms are generated (Issue [NMS-13120](#))
- Document the Event Translator (Issue [NMS-13121](#))
- XSS in notification wizard (Issue [NMS-13123](#))
- CSRF in user management (Issue [NMS-13124](#))
- XSS in requisition UI (Issue [NMS-13126](#))
- Data collection failure due to IllegalStateException when using Cortex (Issue [NMS-13133](#))
- Generate Data collection throws error message "There is a group with same name, please pick another one" under MIB browser (Issue [NMS-13143](#))
- 'Links on interface' table was missing for interface under node list (Issue [NMS-13145](#))
- Regular Expression field textbox greyed out for other Events except 'REGEX_FIELD' under Event notifications (Issue [NMS-13149](#))
- Query Regarding saving a filter URL with more than 255 characters in events ILP (Issue [NMS-13152](#))
- Response time query with ICMP fails for IPv6 interface (Issue [NMS-13157](#))
- Kafka Producer drops samples when the sending operation timeout. (Issue [NMS-13167](#))
- vmwarereqtool does not retain metadata (Issue [NMS-13171](#))
- Opennms Ui is not accessible when logged in from a read-only user (Issue [NMS-13178](#))
- Password in collectd.log file (Issue [NMS-13183](#))
- Kafka producer uses resource name instead of ifIndex as the instance for InterfaceLevelResource (Issue [NMS-13185](#))

- CVE-2020-27223: Jetty DoS vulnerability (Issue [NMS-13201](#))
- Poor PasswordEncryptor performance with large number of Minions (Issue [NMS-13207](#))
- Minion: Kafka related WARN log messages (AdminClientConfig The configuration X isn't a known config) (Issue [NMS-13208](#))
- Minion SNMPv3 trap configuration query is done every 60 seconds (Issue [NMS-13217](#))

Enhancement

- Add enhancement infrastructure for BMP updates (Issue [NMS-12962](#))
- Add WebDetector documentation (Issue [NMS-13028](#))
- Enhancement to Topology ReST Endpoint (Issue [NMS-13091](#))
- Improve Event forwarding performance for Kafka producer (Issue [NMS-13211](#))
- Add InMemoryTicketPlugin that can be accessed from Karaf shell (Issue [NMS-13218](#))

Release 27.1.0

Release 27.1.0 contains a bunch of bug fixes, as well as a number of enhancements including a refactor of our BGP Monitoring Protocol integration.

The codename for 27.1.0 is *Ravenous Bugblatter Beast of Traal*.

Bug

- Notification link in Admin menu goes to start page (Issue [NMS-8184](#))
- Change password does not go to Change password page (Issue [NMS-8770](#))
- Wrong label in event search menu (Issue [NMS-8977](#))
- Footer in Alarm view is broken (Issue [NMS-9139](#))
- Clarify clone detectors and policies (Issue [NMS-9308](#))
- REST API allows to import a requisition from XML with same services (Issue [NMS-12739](#))
- Broken provisiond policy does not appear in the logs (Issue [NMS-12834](#))
- Vacuumd throws NullPointerException on startup (Issue [NMS-12884](#))
- Change installation guide to run as non-root user (Issue [NMS-12989](#))
- Cortex plugin shows only data for counters in a window > 3 hours (Issue [NMS-13014](#))
- Timezone and Grafana Dashboard fields not preserved when editing a scheduled report (Issue [NMS-13064](#))
- Flow Rest API: Name lookup is happening per bucket and not per interval (Aggregation Only) (Issue [NMS-13065](#))
- Make OpenNMS compile on Apple Silicon (Issue [NMS-13079](#))
- Fix NPE in Vacuumd (Issue [NMS-13098](#))
- Make sequence number trackin thread-safe and patient about out-of-order (Issue [NMS-13106](#))

- Vmware-importer requisition meta-data lost at import (Issue [NMS-13109](#))
- XSS in user management (Issue [NMS-13125](#))
- No option provided to change the number of records per page in Events ILP and Events/Alarms ILP under Topology (Issue [NMS-13137](#))
- The OpenNMS Web User Interface Has Experienced an Error observed when searching for a Event under Event notifications (Issue [NMS-13148](#))
- Node's sub-option 'Availability' exceeds table alignment and overlaps next table of 'Notifications' under Topology section (Issue [NMS-13153](#))
- Newts Cache priming flag is inverted (Issue [NMS-13156](#))
- Dependabot: Upgrade Apache POI to 3.17 (CVE-2017-12626) (Issue [NMS-13161](#))

Enhancement

- Cloning of Foreign Source Definition (Issue [NMS-8854](#))
- Depend on haveged (and supply it in our repo) (Issue [NMS-8959](#))
- Rename button on Threshold Groups screen (Issue [NMS-12606](#))
- Upgrade Kafka components to 2.7.0 (Issue [NMS-12704](#))
- Handle all possible values of ifOperStatus in the SNMP Interface Poller (Issue [NMS-12980](#))
- Remote poller: review all documentation to update RP references (Issue [NMS-12879](#))
- Persist basic BMP messages in OpenNMS (Issue [NMS-12949](#))
- Handle stats for BMP (Issue [NMS-12952](#))
- Get dashboards from OpenBMP working (Issue [NMS-12953](#))
- Enhance Routes with ASN info (Issue [NMS-12963](#))
- Enhance Routes with WhoIs info (Issue [NMS-12964](#))
- Enhance Routes with RPKI info (Issue [NMS-12965](#))
- Create confd templates to handle Slack properties (Issue [NMS-12982](#))
- Create confd templates to handle Mattermost properties (Issue [NMS-13004](#))
- Updating UI to clarify rescan process (Issue [NMS-13040](#))
- Update PostgreSQL JDBC drivers (Issue [NMS-13049](#))
- Move Stats handling to TimeScaleDB (Issue [NMS-13061](#))
- Upgrade Container base images (Issue [NMS-13071](#))
- Add SNMP Data Collection example to Horizon Docs (Issue [NMS-13107](#))
- Nephron: Replace JacksonJsonCoder for FlowSummaries (Issue [NMS-13115](#))
- Nephron: fix rounding errors in flow sampling (Issue [NMS-13116](#))
- Create smoke test that verifies all Reload daemon are successful (Issue [NMS-13117](#))
- Searching node link informations (Issue [NMS-13129](#))
- add service status to rest `/info` API (Issue [NMS-13135](#))

- Update Kafka settings for multiple instances documentation (Issue [NMS-13136](#))
- Move some model objects from opennms-webapp to opennms-web-api (Issue [NMS-13168](#))
- create a table to show related events in the alarm detail view (Issue [NMS-13170](#))

Release 27.0.5

Release 27.0.5 contains just a couple of bug fixes, most importantly a fix to provisioning that could break update to existing nodes when scanning.

The codename for 27.0.5 is *Vogon*.

Bug

- Flow Rest API: Name lookup is happening per bucket and not per interval (Aggregation Only) (Issue [NMS-13065](#))
- Provisioning stopped working after upgrade to 27.0.4 (Issue [NMS-13128](#))

Release 27.0.4

Release 27.0.4 contains a number of bug fixes relating to WMI, the Minion, flows, reports, JEXL processing, and more, as well as a few small enhancements.

The codename for 27.0.4 is *Towel*.

Bug

- Searching for event context that contains single quotes is not possible (Issue [NMS-12517](#))
- WmiCollector does not work on Minion (Issue [NMS-12944](#))
- Discrepancy between Flows "top N" and SNMP for same interface (Issue [NMS-12967](#))
- Increase length of snmpinterfaces.snmpifdescr (Issue [NMS-12976](#))
- requisition meta data are deleted if node meta data defined with "db only" synchronize (Issue [NMS-12990](#))
- Timezone and date range inconsistencies when scheduling database reports associated with Grafana dashboards. (Issue [NMS-13070](#))
- Exception messages during node import (log noise) (Issue [NMS-13082](#))
- Fix vmwareconfigbuilder script to run with JDK9+ (Issue [NMS-13084](#))
- Keep and adjust flows with negative duration (Issue [NMS-13088](#))
- SFlow enhancement is not functional (Issue [NMS-13093](#))
- Karaf Poller commands won't work if Telemetryd is disabled (Issue [NMS-13094](#))
- JEXL expression handling updates (Issue [NMS-13103](#))
- Telemetryd: Reload daemon always fails and stops Temetryd (Issue [NMS-13112](#))

Enhancement

- Optionally silence file not found warnings for JICMP, JRRD when properties are not set (Issue [NMS-13081](#))
- Update opennms.spec to take advantage of maven smart builder plugin (Issue [NMS-13083](#))

Release 27.0.3

Release 27.0.3 is the fourth release in the Horizon 27 series.

It contains a number of mostly esoteric bug fixes, and a few small enhancements.

The codename for 27.0.3 is *Dolphins*.

Bug

- Prometheus Collector attempting to persist non-integer values to counters (Issue [NMS-13007](#))
- OpenNMS fails to start, when more than one active listener is referencing the same parser (Issue [NMS-13034](#))
- ArrayIndexOutOfBoundsException thrown by the SNMP Interface Poller (Issue [NMS-13042](#))
- Karaf command 'snmp-fit' not functional (Issue [NMS-13055](#))
- Long datasource names are truncated and are not accessible on read (Issue [NMS-13060](#))
- The makerpm.sh script requires the mingw32-nsis package (Issue [NMS-13069](#))

Enhancement

- Depend on haveged (and supply it in our repo) (Issue [NMS-8959](#))
- Import OBMP Grafana dashboards to OpenNMS (Issue [NMS-12954](#))
- Inconsistent breadcrumbs on Locations/Minions (Issue [NMS-13067](#))

Release 27.0.2

Release 27.0.2 is the third release in the Horizon 27 series.

It contains a few bug fixes including a critical fix to a regression in 27.0.1 that would keep OpenNMS from starting if you had existing reports in the database.

BREAKING: If you created any reports with 27.0.1, they will need to be recreated.

The codename for 27.0.2 is *Deep Thought*.

Bug

- Bouncycastle JAR version 1.67 breaks CIFS Monitor (Issue [NMS-13035](#))
- report timezone changes break reading pre-existing reports from Quartz (Issue [NMS-13037](#))

Enhancement

- Add "geohash" support to the meta-data DSL (Issue [NMS-13036](#))

Release 27.0.1

Release 27.0.1 is the second release in the Horizon 27 series.

It contains a number of bugfixes including a critical CVE fix for Jetty, as well as a number of other smaller changes and improvements.

The codename for 27.0.1 is *Pan-Galactic Gargle Blaster*.

Bug

- No support for TLS v1.3 in MailTransportMonitor (Issue [NMS-12733](#))
- Timezone inconsistency when generating PDF reports from Grafana dashboards (Issue [NMS-12930](#))
- RRD files for SNMP data are not created until a Service Restart (Issue [NMS-12974](#))
- Nephron Stability Issues at Scale (Issue [NMS-12975](#))
- typo in BMP sample (Issue [NMS-12984](#))
- Upgrade script does not migrate VMware metadata (Issue [NMS-12985](#))
- VMware datacollection failed (Issue [NMS-12986](#))
- Monitoring VMware VMs and hosts stopped working in 27.0.0 (Issue [NMS-12988](#))
- Unable to enable Jaeger tracing in Sentinel (Issue [NMS-12998](#))
- Update typo in BMP docs (Issue [NMS-13002](#))
- CVE-2020-27216: Jetty webserver vulnerability (Issue [NMS-13009](#))
- Jcifs leaks memory after upgrade (Issue [NMS-13011](#))
- When using a custom prefix, the Elasticsearch Forwarder for events and situation-feedback creates a wrong template. (Issue [NMS-13017](#))
- Check flow sequence numbers to detect missing packets (Issue [NMS-13024](#))

Enhancement

- Add gNMI support for OpenConfig (Issue [NMS-12915](#))
- TSS: Cortex Plugin: Use REST API for reading timeseries (Issue [NMS-12938](#))
- sFlow Ingress / Egress (Issue [NMS-12955](#))
- Provisioning introduction (Issue [NMS-12994](#))
- Document Configure Discovery process (Issue [NMS-12995](#))
- Document requisition process (Issue [NMS-12996](#))
- backport Minion certificate management to Horizon 27 (Issue [NMS-13000](#))
- flowStartMilliseconds/flowEndMilliseconds for NetFlow v9 (Issue [NMS-13006](#))

- Add clock skew correction mechanism (Issue [NMS-13023](#))

Release 27.0.0

Release 27.0.0 is the first release in the Horizon 27 series.

It is a major enhancement release with many bug fixes and a ton of new features, most notably the removal of the Remote Poller in favor of a new Minion-based workflow called Application Perspective Monitoring.

The codename for 27.0.0 is *Zaphod*.

Bug

- Investigate if the InstallerDB could be replaced with something simpler (Issue [NMS-12079](#))
- Limit RPC threads on Minion using bulkhead pattern (Issue [NMS-12391](#))
- RRD-to-Newts converter only handles AVERAGE RRAs (Issue [NMS-12722](#))
- Fix docs warnings for resource-types, time series config and thresholding (Issue [NMS-12770](#))
- Traps Not Associated With Node (Issue [NMS-12797](#))
- Netflow timestamps incorrectly calculated on interfaces with MPLS (Issue [NMS-12800](#))
- SNMPv3 Traps Cause Errors From Single Node to Minion (Issue [NMS-12802](#))
- Hardcoded path to bash (Issue [NMS-12840](#))
- Remote Poller: add remote outages to UI (Issue [NMS-12842](#))
- Remote Poller: add remote polling details to service page (Issue [NMS-12843](#))
- Remove polling package selection from application (Issue [NMS-12844](#))
- Remote Poller: remove not longer used role ROLE_REMOTING (Issue [NMS-12849](#))
- Remote Poller: remove references to old remote poller from documentation (Issue [NMS-12850](#))
- Remote Poller: remove scanreports UI and ReST endpoint (Issue [NMS-12851](#))
- Remote Poller: remove old Distributed Status Summary UI (Issue [NMS-12852](#))
- Incorrect TSS settings (Issue [NMS-12862](#))
- Remote Poller: Fix event definition for remote poller nodeLostService events (Issue [NMS-12871](#))
- Remote Poller: NPE while attempting to start RemotePollerNG (Issue [NMS-12877](#))
- Unable to install feature 'dominion-grpc-client' (Issue [NMS-12880](#))
- Remote Poller: Clear outages after removing from application (Issue [NMS-12881](#))
- Perspective Poller shows in tracing as RemotePollerNG (Issue [NMS-12882](#))
- Application Perspective Monitoring: NPE when starting OpenNMS (Issue [NMS-12887](#))
- Application Perspective Monitoring: OpenNMS refuses to start if service is referenced by two applications (Issue [NMS-12889](#))
- Telemetryd: a lot of InstanceAlreadyExistsExceptions when starting OpenNMS with default configuration (Issue [NMS-12896](#))

- Update link to In Memory TS DB (Issue [NMS-12912](#))
- Unable to poll Vcenter CIM - Calling something in OpenJDK11 that has been removed. (Issue [NMS-12919](#))
- Application link on start page redirects to start page (Issue [NMS-12921](#))
- Event Translator debug logging is incorrect (Issue [NMS-12959](#))
- service starts / restarts work but spit out an error if configured to wait for startup (Issue [NMS-12966](#))
- Display the alarm status correctly in topology map for applications (Issue [NMS-12968](#))
- Topology Application Map: Outage Table: Clicking on a service should show the outages of the service (Issue [NMS-12970](#))
- Alarm (v1 & v2) ReST Service PUT Can't PUT Multiple Things (Issue [NMS-12979](#))

Enhancement

- Add custom string attributes based on indirect and complex SNMP Indices (Issue [NMS-8484](#))
- Trailing ", \" in report definitions throws not helpful error message (Issue [NMS-10526](#))
- nodeDeleted event should contain more information (Issue [NMS-10554](#))
- Netscaler vServer SNMP collection and graph definitions (Issue [NMS-12269](#))
- Upgrade Sink API to Proto3 (Issue [NMS-12602](#))
- Add selenium test for password change (Issue [NMS-12645](#))
- Re-enable Central Search functionality (Issue [NMS-12646](#))
- Remove remote-poller runtimes from the build (Issue [NMS-12653](#))
- Update remote-poller model to link service to locations instead of individual RPs (Issue [NMS-12654](#))
- Rewrite the remote poller backend to use Minion (Issue [NMS-12655](#))
- Dynamic service scheduling: Service lifetime (Issue [NMS-12676](#))
- Dynamic service scheduling: Polling package association (Issue [NMS-12677](#))
- Dynamic service scheduling: Poller-Configuration change (Issue [NMS-12678](#))
- Update database and send events only on status changes (Issue [NMS-12679](#))
- Get new remote poller running as daemon (Issue [NMS-12683](#))
- Add upgrade task to enable RemotePollerNG (Issue [NMS-12684](#))
- Confd templates for Minion configuration (Karaf) (Issue [NMS-12687](#))
- Support hostnames resolution when using aggregated flows (Issue [NMS-12692](#))
- Use CollectionSetBuilder to persist response times (Issue [NMS-12698](#))
- Create SQL index for optimizing poll result lookups (Issue [NMS-12710](#))
- Apply thresholding for remote poller response times (Issue [NMS-12721](#))
- Meta-data tag enhancements to Time Series Storage API (Issue [NMS-12730](#))

- remove the java ("windows") installer (Issue [NMS-12742](#))
- Add ReST interface for Remote Poller (Issue [NMS-12760](#))
- Anomaly Detection Experiment (Issue [NMS-12773](#))
- Anomaly Detection - Get the consumer working (Issue [NMS-12774](#))
- Migrated VMware asset data to metadata entries (Issue [NMS-12781](#))
- RemotePoller: only schedule services that are part of an application (Issue [NMS-12785](#))
- Use newer protocol versions for remote DCOM WMI (Issue [NMS-12788](#))
- Add support for OpenConfig Service in Detector/Poller (Issue [NMS-12789](#))
- Remote Poller: Add outages for remote poller status changes (Issue [NMS-12792](#))
- Add support for meta-data on single-DS threshold definitions (Issue [NMS-12794](#))
- Update Users chapter (Issue [NMS-12809](#))
- Remote Poller: Modify model to new structure (Issue [NMS-12820](#))
- Remote Poller: Change monitoring locations UI to reflect model changes (Issue [NMS-12821](#))
- Remote Poller: Change Admin UI to reflect Application model changes (Issue [NMS-12822](#))
- Application Topology Provider Status (Issue [NMS-12823](#))
- Allow meta-data in notifications (Issue [NMS-12827](#))
- Add events for new Application Model (Issue [NMS-12838](#))
- Remote Poller: camel case in new column definitions causing problems (Issue [NMS-12841](#))
- Remote Poller: Remove LocationSpecificStatus (Issue [NMS-12859](#))
- Remote Poller: Documentation (Issue [NMS-12860](#))
- Remote Poller: Fix the remote flag (Issue [NMS-12861](#))
- Remote Poller: Cleanup (Issue [NMS-12864](#))
- Remote Poller: Clarify perspective labeling (Issue [NMS-12865](#))
- Remote Poller: Details pages show remote outages in recent outages list (Issue [NMS-12866](#))
- Remote Poller: Add graph definitions for response times (Issue [NMS-12868](#))
- Remote Poller: Add distributed tracing (Issue [NMS-12869](#))
- Remote Poller: Rename to Perspective Poller (Issue [NMS-12874](#))
- Remote Poller: Make backend more resilient (Issue [NMS-12878](#))
- Application Perspective Monitoring: create Application status page (Issue [NMS-12886](#))
- Document the MailTransportMonitor (Issue [NMS-12892](#))
- Additions to Application Perspective Monitoring docs (Issue [NMS-12893](#))
- Filter outages table in Application Topology View (Issue [NMS-12897](#))
- Add logging configuration for Perspective Poller (Issue [NMS-12910](#))
- Allow to navigate to monitored items in application status view (Issue [NMS-12913](#))
- Allow setting meta data in a requisition (Issue [NMS-12918](#))

- Create a report that matches Horizon 27.0.0 Jira issues with merged pull requests in GitHub (Issue [NMS-12922](#))
- Update Copyright notice for 2020 (Issue [NMS-12933](#))
- SSLCertMonitor should include more details about the expir(ing|ed) certificate in reason codes (Issue [NMS-12948](#))
- Update Maximum PostgreSQL to allow PostgreSQL 13 (Issue [NMS-12958](#))
- Create Horizon 27 Release Notes (Issue [NMS-12961](#))
- Identify message broker strategies in web "about" page (Issue [NMS-12971](#))