

# G-Release

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(<https://en.wikipedia.org/wiki/G>)

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## Sub pages

The OAM project focus on the following topics:

Provide complete implementation for OAM functions (FCAPS).

## Target

- support of O-RAN WG10 VES message bodies
- update of OAM-Controller to ODL version Sulfur
  - Note: team is discussion the possibility to switch from Java11 to Java17 - discussion ongoing
- update to keycloak version 18
- even more secure keycloak configuration
- there is a request for a "bare-metal" deployment which is not in scope of O-RAN, but still useful - also for development and module test
- support of AI/ML based on RSAC and other input.

## Specifications

The following Specifications needs to be considered for software updates:

<https://orandownloadsweb.azurewebsites.net/specifications>

- **O-RAN Architecture Description 6.0 - March 2022**  
O-RAN.WG1.O-RAN-Architecture-Description-v06.00
- **O-RAN Use Cases Detailed Specification 8.0 - July 2022**  
O-RAN.WG1.Use-Cases-Detailed-Specification-v08.00
- **O-RAN Operations and Maintenance Architecture 7.0 - July 2022**  
O-RAN.WG10.OAM-Architecture-v07.00
- **O-RAN Operations and Maintenance Interface 7.0 - July 2022**  
O-RAN.WG10.O1-Interface.0-v07.00
- **O-RAN Management Plane Specification - YANG Models 9.0 - July 2022**  
O-RAN.WG4.MP-YANGs-v09.00
- **O-RAN O1 Interface specification for O-CU-UP and O-CU-CP 3.0 - July 2022**  
O-RAN.WG5.O-CU-O1.0-v03.00
- **O-RAN O1 Interface for O-CU-UP and O-CU-CP - YANG Models 3.0 - July 2021**  
O-RAN.WG5.O-CU-O1.0-YANGs-v03.00
- **O-RAN O1 Interface specification for O-DU 2.0 - July 2021**  
O-RAN.WG5.MP.0-v02.00
- **O-RAN O1 Interface for O-DU 4.0 - YANG Models - July 2022**  
O-RAN.WG5.MP.0-YANGs-v04.00
- **O-RAN O1 Interface for O-DU 4.0 - configuration tables - July 2022**  
O-RAN.WG5.MP.0-AnnexD-v04.00
- **O-RAN Management interfaces for Transport Network Elements 4.0 - July 2022** (O-RAN.WG9.XTRP-MGT.0-v04.00)

## VES JSON-Schemas

- [ONAP VES 7.2.1](#)
- [3GPP TS 28.532 V16.9.0](#)  
(according to O-RAN Operations and Maintenance Interface Specification 7.0 and its 'Harmonized VES format')
  - Annex B (Informative):  
Guidelines for the integration of 3GPP MnS notifications with ONAP VES
  - Configuration Management Notifications
    - **notifyMOIAttributeValueChanges**
    - **notifyMOICreation**
    - **notifyMOIDeletion**
    - **notifyMOIChanges**
  - Fault Management Notifications
    - **notifyNewAlarm**
    - **notifyChangedAlarmGeneral** and/or
    - **notifyChangedAlarm**
    - **notifyCorrelatedNotificationChanged**
    - **notifyAckStateChanged**
    - **notifyClearedAlarm**
    - **notifyAlarmListRebuilt**
  - FileReady Notification (as part of Performance Monitoring)
    - **notifyFileReady**
  - PM Streaming
    - based on WebSockets and ASN.1 (no contributions expected)
  - Software Management  
(for future study by O-RAN Operations and Maintenance Interface Specification 7.0)

- 3GPP-specified notifyFileDownload vs O-RAN-specified o1NotifyFileDownload
  - Heartbeat
    - **notifyHeartbeat**
- O-RAN Operations and Maintenance Interface Specification 7.0
  - PNF Registration
    - **o1NotifyPNFRegistration**  
Idea: WordTable YANG OpenAPISpecification
  - CNF Registration
    - o1NotifyCloudNFRegistration  
(reference to: 'O-RAN Information Model and Data Models Specification'  
which does not include o1NotifyCloudNFRegistration yet)
- [O-RAN-SC PM-Measurement streaming](#)

| Function                                                                                                                          | Source of Data model O-RAN-SC                                                                                                                                                                                                         |
|-----------------------------------------------------------------------------------------------------------------------------------|---------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
|                                                                                                                                   | <a href="#">Status: 2020-10-07</a>                                                                                                                                                                                                    |
| Fault                                                                                                                             | 3GPP: <a href="#">3gpp-common-fm</a><br>(Fallback from Bronze <a href="#">RFC8632: ietf-alarms</a> )                                                                                                                                  |
| Configuration                                                                                                                     | (see next lines)                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>• interfaces and /or termination points</li> </ul>                                         | O-RAN-FH: <a href="#">RFC8343: ietf-interfaces</a><br>3GPP:                                                                                                                                                                           |
| <ul style="list-style-type: none"> <li>• synchronization</li> </ul>                                                               | (see next lines)                                                                                                                                                                                                                      |
| -- Network Time Protocol                                                                                                          | <a href="#">RFC7317: ietf-system.yang</a>                                                                                                                                                                                             |
| -- Precision Time Protocol                                                                                                        | <a href="#">RFC8575: ietf-ptp.yang</a><br>(check if <a href="#">new IEEE standard</a> was adopted)                                                                                                                                    |
| <ul style="list-style-type: none"> <li>• DCN               <ul style="list-style-type: none"> <li>○ OAM IF</li> </ul> </li> </ul> |                                                                                                                                                                                                                                       |
| <ul style="list-style-type: none"> <li>• Ethernet OAM</li> </ul>                                                                  | <ul style="list-style-type: none"> <li>• Loopback config</li> <li>• Link supervision</li> </ul>                                                                                                                                       |
| <ul style="list-style-type: none"> <li>• others</li> </ul>                                                                        | to be updated based on SDO progress                                                                                                                                                                                                   |
| Accounting                                                                                                                        | not scope of O-RAN and O-RAN-SC - listed just for completeness of FCAPS                                                                                                                                                               |
| Performance                                                                                                                       | 3GPP-xml, file, VES                                                                                                                                                                                                                   |
| Security                                                                                                                          | (see next lines)                                                                                                                                                                                                                      |
| <ul style="list-style-type: none"> <li>• Protocol TLS (for Rest, RestConf and NetConf)</li> </ul>                                 | <a href="#">RFC8446: Transport Layer Security</a>                                                                                                                                                                                     |
| <ul style="list-style-type: none"> <li>• User Management</li> </ul>                                                               | <a href="#">RFC7317: ietf-system.yang</a><br>Open: o-ran-user-management                                                                                                                                                              |
| Inventory (hardware)                                                                                                              | <a href="#">RFC8348: ietf-hardware.yang</a> and <a href="#">iana-hardware.yang</a><br>and of cause <a href="#">o-ran-hardware@2019-07-03.yang</a> for the O-RAN identities.<br><br>Open: only for O-RU and O-DU; O-DU anyhow optional |

|                                            |                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                            |
|--------------------------------------------|--------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------------|
| Software Management                        | <p>Management interfaces:</p> <ul style="list-style-type: none"> <li>• <a href="#">xran-software-management.yang</a></li> <li>• <a href="#">o-ran-software-management.yang</a></li> <li>• 3GPP and/or o-ran-o1 software-management (once exists)</li> <li>• <a href="#">OpenROADM manifest file</a></li> </ul> <p><b>Use case:</b></p> <p>Start with and xRan-fronthaul radio unit and perform and upgrade to an o-ru with the OpenFronthaul M-plane and upgrade further to an O-RU with an O-RAN/3GPP common O1 management interface.</p> |
| Backup and restore                         | <a href="#">OpenROADM manifest file</a>                                                                                                                                                                                                                                                                                                                                                                                                                                                                                                    |
| xApp onboarding<br>(from O1 point of view) | under development by WG2 and Near-RT-RIC project                                                                                                                                                                                                                                                                                                                                                                                                                                                                                           |
| Subscription for VES                       | <p><a href="#">_3gpp-common-subscription-control</a></p> <p>Open: <a href="#">RFC8639: ietf-subscribed-notifications</a> augmented by <a href="#">opnfv-ves-push.yang</a></p>                                                                                                                                                                                                                                                                                                                                                              |