# Node-H

5G O-RAN Software Product Description

# 5G SA O-RAN Software Suite

## Deployment specialist brings 5G SA to market

### Carrier-grade O-RAN solutions for rapid deployment

Node-H has a proven track record of wide-scale deployments at senior operators, and works closely with end-to-end eco-system vendors so that operators can source complete or disaggregated solutions for their Radio Access Network.

The Node-H 5G SA carrier-grade software is suitable for Microcells, Picocells or any class of small cells – Enterprise or Residential, standalone or virtualized.

Node-H brings deep technical know-how to solving real-world issues which has allowed carriers worldwide to deploy millions of cells based on Node-H software.

By working closely with technology partners, Node-H supports end-to-end and disaggregated solutions with different core networks and management systems.

### A technology platform

Node-H's LTE and UMTS software suites are widely deployed at operators. This complements the 5G offering to provide a full portfolio of RAN technologies.

Together with its hardware partners, Node-H can offer turnkey disaggregated cells supporting the most popular uses cases, or provide a near-turnkey foundation for a project to rapidly address a vertical market use case.

The 5G Software Suite supports Centralized Unit (CU) and Distributed Unit (DU), with a clear Control-Plane (CP) and User Plane (UP) split that can be configured in various ways to build 5G O-RAN technology in the form of a Microcell, Picocell or any type of small cell.

Node-H software follows the standards-based 3GPP architecture, as well as O-RAN and Small Cells Forum defined interfaces, to support interoperability with other vendors. Node-H has focused much effort on interoperability, having integrated Node-H based cells with infrastructure from all of the major network equipment vendors, and received the Chairman's Award from the Small Cell Forum for work on Interoperability.

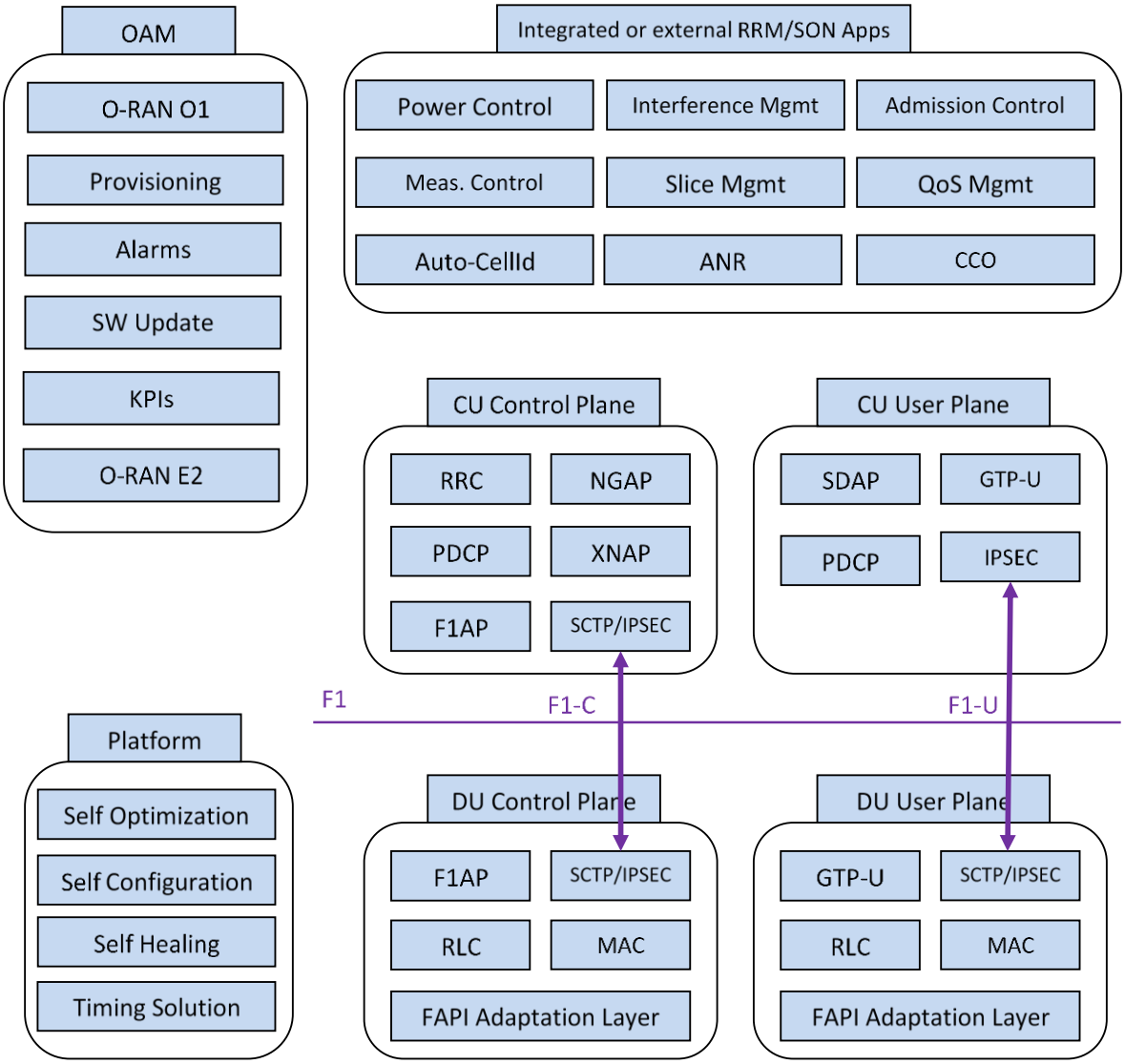
### Choose Node-H because…

Node-H has a uniquely experienced team of specialists who cover all of the major technologies required to implement complete RAN solutions.

Node-H co-operates with key semiconductor partners to deliver solutions on the latest SoC designs in a timely manner. The ability to exploit the cost savings of the SoC allows RAN technologies to reach the price point needed for ubiquitous deployment of 5G via small cells.

Node-H integrates its system software, including a comprehensive security solution, O-RAN management software, scheduler and L2/L3 protocols, with our partners' hardware designs to deliver a ready-to-deploy solution with the lowest Total Cost of Ownership.

# 5G gNB Application




The Node-H 5G software can scale from an integrated CU/DU low-cost Enterprise cell to a containerized CU controlling multiple remote DUs for pico-, micro- and metro-cells.

# Features

| | |
|---|---|
| **SA Architecture** | The Node-H 5G Standalone Cell Software supports the Option 2 – NR Standalone architecture |
| **Carrier Bandwidth** | Up to 100MHz. |
| **Power Management** | Configurable up to the total output power of the cell in steps of 0.1dBm. |
| **Voice Calls and Quality of Service** | 5G VoNR in accordance with 5QI. Comprehensive 5QI support in UL and DL and association with vLAN configuration for end-to-end QoS. |
| **Interference Management** | Automatic interference management, ANR for establishing neighbor lists, Admission control. |
| **Mobility** | Measurements allow the cell to support 5G inter and intra Cell handovers, core based NG and cell-based Xn handovers are supported. |
| **Network slicing** | Multiple slices with network resource isolation. |
| **Operations and Maintenance** | Management of the cell is via the O-RAN O1 service models using Netconf/YANG in accordance with the relevant O-RAN specifications. E2 is also supported for research projects.<br>Built-in O-RAN WebGUI including Live Stats. |
| **Security** | The security of the platform is assured using the relevant O-RAN specification through the O1 interface. Ciphering with hardware acceleration, Signaling integrity checking. IPSEC uses hardware acceleration, IKE v2 key management, AES, certificate-based security. |
| **Timing Solution** | The timing solution supports GNSS and PTP. |
| **3GPP Release** | The 3GPP message support corresponds to the 3GPP Release 16 specifications. |

# Protocol compliance

### 3GPP Standards (rel16)

TS 38.300 5G; NR; Overall Description; Stage-2
TS 38.321 5G; NR; Medium Access Control (MAC)
TS 38.322 5G; NR; Radio Link Control (RLC)
TS 38.323 5G; NR; Packet Data Convergence Protocol (PDCP)
TS 38.331 5G; NR; Radio Resource Control (RRC)
TS 38.401 5G; NG-RAN; Architecture Description
TS 38.413 5G; NG RAN; NG Application Protocol (NGAP)
TS 38.423 5G; NG RAN; Xn Application Protocol (XnAP)
TS 38.425 5G; NG RAN; NR User Plane Protocol
TS 38.473 5G; NG RAN; F1 Application Protocol (F1AP)
TS 38.474 5G; NG RAN; F1 Data Transport
TS 37.324 5G; NR; Service Data Adaptation Protocol (SDAP)

### Small Cell Forum, O-RAN, IETF

SCF 222 5G FAPI
SCF 223 P19 RF Control
SCF 224 Network Monitor Mode
SCF 225 5G nFAPI
SCF 5G 'TR-196v3' Management
O-RAN-WG1-O-RAN Architecture Description
O-RAN A1 interface: Application Protocol Version
O-RAN Near-RT RIC Architecture
O-RAN Near-RT RIC E2 Application Protocol
IPv4/V6 – IETF RFC 791/2460
UDP – IETF RFC 768
SCTP – IETF RFC 4960