Nokia AirScale Base Station
Changes the way networks are built

Executive Summary
Meeting the challenges of IoT and 5G

Within a few years, a vast range of new services and applications will arise as 5G technologies become widespread. Meanwhile, the rapidly developing Internet of Things (IoT) is expected to lead to billions of devices connected by 2025.

Operators are being challenged to deliver extreme mobile broadband to provide new levels of customer experience, support huge numbers of simultaneously connected devices and ensure ultra-low latency connectivity. Flexibility in their operations will become essential and ultra-high capacity networks of the future must meet the demand for carrier-grade resiliency.

At the same time, growing environmental pressures are forcing operators to become more energy efficient and reduce their carbon footprint.

The world's first 5G base station

Nokia AirScale Radio Access is a new-generation solution that will help operators meet all the radio access network challenges they face today and in the coming years.

Nokia AirScale Base Station is an integral component of AirScale Radio Access. Providing operators with a smooth and flexible journey towards 5G and cloud connectivity, AirScale Base Stations support all radio technologies (2G, 3G, 4G and 5G) and network architectures (Distributed RAN, Centralized RAN and Cloud RAN).

AirScale Base Stations enabled by the new Nokia ReefShark chipsets deliver market leading throughput, up to 84 Gbps per system module. The system module handles baseband and control functions and includes both fronthaul and backhaul interfaces. AirScale baseband module chaining supports base station throughputs of up to 6 terabits per second, which will allow operators to meet the huge growing densification demands and support the massive enhanced mobile broadband needs of people and devices in megacities. Furthermore, AirScale Base Stations can take advantage of additional baseband capacity available from AirScale Cloud RAN for unlimited scalability.

The world's most powerful base station

Nokia AirScale Base Station is visually discreet, compact, light weight and energy efficient. Yet this is the world’s most powerful base station, offering 84 Gbps throughput capacity per system module, enabled by the new Nokia ReefShark chipsets. It offers a wide portfolio of radios - single band and multiband, including the world’s first triple band radio – to address the demand for higher power, support existing and new frequency bands, reduce site space requirements and enable faster roll out. These radios can support carrier aggregation, massive MIMO and Beamforming solutions to maximize the cell throughput and capacity for an enhanced overall user-experience.
The base station platform offers Nokia hexa resiliency capability – built-in redundancy for all units and interfaces (control, baseband and more), for maximum network availability.

All this innovation is compatible with Nokia Flexi Multiradio 10 Base Stations, which means operators can make full and continued use of their existing investments. AirScale-Flexi configurations allow seamless expansion of Nokia Flexi Base Station sites with AirScale units.

**Nokia AirScale – a complete radio access solution**

Nokia AirScale Base Station is part of a complete radio access that comprises:

- **AirScale Base Station**:
  - RF Module
  - Single, dual and triple band Remote Radio Heads
  - Radio Antenna System
  - AirScale System Module Indoor
  - AirScale System Module Outdoor

- **Power elements**
  - Power Rectifier
  - Power Battery
  - Power Prioritizer

- **AirScale Active Antennas**
  - AirScale Compact Active Antennas
  - AirScale massive MIMO Adaptive Antennas

- **AirScale Cloud RAN**
  - AirScale Cloud Base Station Server on AirFrame Data Center Solution
  - AirScale Radio Network Controller

- **Wi-Fi Access including cloud-based Wi-Fi Controller and access points**
Capable, lean and ultra-efficient for 50% lower TCO

Sitting at the heart of AirScale Base Station is new silicon technology designed by Nokia to create software-defined system modules and radios that are ultra-lean and ultra-efficient, all supported by common multi-radio software.

Nokia software-defined AirScale radios will enable operators to instantly adopt new frequency bands, offer higher output power and use high order MIMO schemes to deliver enhanced coverage, capacity and higher user data rates. Multiband radios with up to three bands integrated in a single radio unit provide utmost flexibility in network deployment, reduce site space requirement and lower the total cost of ownership (TCO). Integrated Passive Intermodulation (PIM) cancellation in the radios ensures network quality in multi-band operations.

Site deployment is simplified by the unique Nokia mounting solution, with its ‘slide and lock’ zero bolt installation. Simple and compact montings reduce installation time by up to 66 percent, while also cutting the site’s physical footprint.

Nokia’s Zero Traffic - Zero Energy capability uses advanced features to consume very low energy in the case of no traffic, or to shut off network layers experiencing low traffic. These result in up to 60 percent higher energy efficiency, while the reduced energy requirements also allow broader use of renewable energy sources, like solar panels, to power the sites.
AirScale Base Station reduces site costs in other ways too. For example, its compact size can lead to lower site rental, while low wind loading means easier, less complex installation. All of which adds up to 50 percent lower total cost of ownership.

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