

Controller for a SUDA system

Abstract

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An aspect refers a controller of a SUDA system, the SUDA system comprising a first base station network group and a second base station network group, at least a first SUDAC (SUDA Component, which may be simplified described as configurable relay forwarding data) as well as a first user equipment assigned to the first base station network group and a second user equipment assigned to the second base station network group (e.g. both belonging to the same telecommunication provider). Each SUDAC is configured to use ultra-high frequency (e.g. sub-6 Ghz) in order to transmit at least one backend communication signal (between a SUDAC and a BS e.g. via 5G or LTE) to the first and/or the second base station network group and to use extremely-high frequency (e.g. 60 Ghz) in order to transmit at least one frontend communication signal (between a UE and a SUDAC using a so-called short-range communication) to the first and/or the second user equipment and to forward a payload signal received via the backend communication signal and to be transmitted via the frontend communication signal while frequency converting the ultra-high frequency to the extremely-high frequency and to forward the payload signal received via the frontend communication signal and to be transmitted via the backend communication signal while frequency converting the extremely-high frequency to the ultra-high frequency. The first user equipment is configured to communicate via a first frontend communication signal with the first SUDAC and via a second frontend communication signal with a second SUDAC or via a direct communication signal directly with the first base station network group, wherein the first frontend communication signal is converted to a first backend communication signal used for communication with the first base station network group by the first SUDAC and wherein the second frontend communication signal is converted to a second backend communication signal used for communication with the first base station network group by the second SUDAC. The second user equipment is configured to communicate via a first frontend communication signal with the first SUDAC and via a second frontend communication signal with the second SUDAC or a direct communication signal directly with the second base station network group, wherein the first frontend communication signal is converted to a first backend communication signal used for communication with the second base station network group by the second SUDAC and wherein the second frontend communication signal is converted to a second backend communication signal

used for communication with the second base station network group by the first SUDAC. The first and the second user equipment are configured to aggregate the first and the second frontend communication signals or the first frontend communication signals and the direct communication signals in order to increase an available data rate, wherein the controller is configured to select first resources, wherein a first portion of the first resources characterizes settings of the first frontend communication signal and of the corresponding first backend communication signal and wherein a second portion of the first resources characterizes settings of the second frontend communication signal and of the corresponding second backend communication signal, for the first user equipment and to select second resources, wherein a first portion of the second resources characterizes settings of the first frontend communication signal and of the corresponding first backend communication signal and wherein a second portion of the second resources characterizes settings of the second frontend communication signal and of the corresponding second backend communication signal, for the second user equipment, taking into account data rate requirements and/or data rate capabilities of the first and/or second user equipment (20, 20a, 20b) and/or of the first and/or second base station network group (100a, 100b) and/or such that the first frontend communication signals of the first and the second user equipment as well as the second frontend communication signals of the first and the second user equipment are distinguishable from each other and/or such that transmission losses caused by interferences within the first frontend communication signal and the second frontend communication signal of the first and second user equipment are reduced. Advantageously, the controller enables, that the one SUDA system comprising a plurality of SUDACs serves as relay network for plurality of user equipments belonging to different telecommunication provides.

Fig. 1b