SMO.

[0007] In order to solve the above issue, a radio access network control apparatus in a certain example of the present disclosure comprises at least one processor that performs: by an instruction verification unit provided in the SMO (Service Management and Orchestration) of the O-RAN, verifying instruction to the outside of the SMO generated by the rApp executed by the Non-RT RIC (Non-Real Time RAN Intelligent Controller) in the SMO; and by an instruction issuance unit provided in the SMO, issuing the verified instruction to the outside of the SMO.

[0007a] In an aspect, the present disclosure refers to a radio access network control apparatus comprising at least one processor that performs:

by an instruction verification unit provided for a SMO (Service Management and Orchestration) of an O-RAN, verifying an instruction to the outside of the SMO generated by an rApp executed by a Non-RT RIC (Non-Real Time RAN Intelligent Controller) in the SMO; and

by an instruction issuance unit provided for the SMO, issuing the verified instruction to the outside of the SMO, wherein the instruction verification unit verifies, together with an operational policy, a configuration change instruction generated by the rApp concerning the configuration change outside the SMO, and

the instruction issuance unit issues at least one of the verified operational policy and the verified configuration change instruction to at least one of the radio access network node, a virtual infrastructure, and the Near-RT RIC.

[0007b] In an aspect, the present disclosure refers to a radio access network control method comprising:
for a SMO (Service Management and Orchestration) of an O-RAN, verifying an instruction to the outside of the SMO generated by an rApp executed by a Non-RT RIC (Non-Real Time RAN Intelligent Controller) in the SMO; and
for the SMO, issuing the verified instruction to the outside of the SMO, wherein
the verifying step verifies, together with an operational policy, a configuration change instruction generated by the rApp concerning the configuration change outside the SMO, and
the issuing step issues at least one of the verified operational policy and the verified configuration change instruction to at least one of the radio access network node, a virtual infrastructure, and the Near-RT RIC.

[0007c] In an aspect, the present disclosure refers to a computer-readable medium storing a radio access network control program causing a computer to perform the method of the above aspect.

[0008] According to an example, before the instruction issuance unit provided in the SMO issues instruction of the rApp to the outside of the SMO, the instruction verification

unit provided in the SMO verifies the instruction. As such, among instructions generated by the rApp, the instruction that has been verified by the instruction verification unit is efficiently issued to the outside of the SMO by the instruction issuance unit.

[0009] Another example of the present disclosure is a radio access network control method. The method comprises: in the SMO (Service Management and Orchestration) of the O-RAN, verifying instruction to the outside of the SMO generated by the rApp executed by the Non-RT RIC (Non-Real Time RAN Intelligent Controller) in the SMO; and in the SMO, issuing the verified instruction to the outside of the SMO.

[0010] Further another example of the present disclosure is a computer-readable medium. The computer-readable medium stores a radio access network control program causing a computer to perform: in the SMO (Service Management and Orchestration) of the O-RAN, verifying instruction to the outside of the SMO generated by the rApp executed by the Non-RT RIC (Non-Real Time RAN Intelligent Controller) in the SMO; and in the SMO, issuing the verified instruction to the outside of the SMO.

[0011] In addition, any combination of the above components, and any conversion of the expression of the present disclosure among methods, devices, systems, recording media, computer programs and the like are also encompassed within this disclosure.

[0012] According to the present disclosure, instruction generated by the rApp can be efficiently issued to the outside of the SMO.

BRIEF DESCRIPTION OF THE DRAWINGS

[0013] Figure 1 is a schematic overview of a radio access network control apparatus. Figure 2 schematically shows various functions realized in the SMO and/or the Non-RT RIC and O-Cloud. Figure 3 is a schematic representation of structures and/or functions inside the SMO and/or the Non-RT RIC. Figure 4 is a functional block diagram schematically showing a radio access network control apparatus.

WHAT IS CLAIMED IS:

1. A radio access network control apparatus comprising at least one processor that performs:

by an instruction verification unit provided for a SMO (Service Management and Orchestration) of an O-RAN, verifying an instruction to the outside of the SMO generated by an rApp executed by a Non-RT RIC (Non-Real Time RAN Intelligent Controller) in the SMO; and

by an instruction issuance unit provided for the SMO, issuing the verified instruction to the outside of the SMO, wherein

the instruction verification unit verifies, together with an operational policy, a configuration change instruction generated by the rApp concerning the configuration change outside the SMO, and

the instruction issuance unit issues at least one of the verified operational policy and the verified configuration change instruction to at least one of the radio access network node, a virtual infrastructure, and the Near-RT RIC.

2. The radio access network control apparatus according to claim 1, wherein

the instruction verification unit verifies an operational policy generated by the rApp concerning the operation of a radio access network node, and

the instruction issuance unit issues the verified operational policy to at least one of the radio access network node, a virtual infrastructure that virtually manages the radio access network node, and the Near-RT RIC (Near-Real Time RAN Intelligent Controller).

3. The radio access network control apparatus according to claim 1, wherein

the instruction verification unit verifies a configuration change instruction generated by the rApp concerning the configuration change outside the SMO, and

the instruction issuance unit issues the verified configuration change instruction to at least one of a radio access network node, a virtual infrastructure that virtually manages the radio access network node, and the Near-RT RIC (Near-Real Time RAN Intelligent Controller).

4. The radio access network control apparatus according to claim 1, wherein the instruction verification unit applies at least one of the following processes to the instruction generated by the rApp: prioritization, issuance scheduling, cancellation, and modification.

5. The radio access network control apparatus according to claim 1, wherein at least a portion of the instruction verification unit is provided in the Non-RT RIC.

6. The radio access network control apparatus according to claim 5, wherein at least a portion of the instruction verification unit is provided to the R1 interface, which is the interface with the rApp.

7. The radio access network control apparatus according to claim 1, wherein at least a portion of the instruction issuance unit is provided to at least one of the A1 interface, the O1 interface, and the O2 interface, which are the interfaces with the outside of the SMO.

8. The radio access network control apparatus according to claim 1, wherein

the at least one processor performs:

by a virtual infrastructure information acquisition unit, acquiring virtual infrastructure information from a virtual infrastructure that virtually manages a radio access network node; and

by a virtual infrastructure information provision unit, providing the virtual infrastructure information to the rApp through the R1 interface, which is the interface with the rApp; and wherein

the instruction verification unit verifies the instruction generated by the rApp based on the virtual infrastructure information.

9. The radio access network control apparatus according to claim 1, wherein

the at least one processor performs:

by an operational state acquisition unit, acquiring operational state of a radio access network node from a virtual infrastructure that virtually manages the radio access network node;

by an operational data acquisition unit, acquiring measured operational data from the radio access network node; and

by the rApp-based operational policy generation unit, generating an operational policy concerning the operation of the radio access network node based on the operational state and the operational data; and wherein

the instruction verification unit verifies the operational policy.

10. A radio access network control method comprising:

for a SMO (Service Management and Orchestration) of an O-RAN, verifying an instruction to the outside of the SMO generated by an rApp executed by a Non-RT RIC (Non-Real Time RAN Intelligent Controller) in the SMO; and

for the SMO, issuing the verified instruction to the outside of the SMO, wherein

the verifying step verifies, together with an operational policy, a configuration change instruction generated by the rApp concerning the configuration change outside the SMO, and

the issuing step issues at least one of the verified operational policy and the verified configuration change instruction to at least one of the radio access network node, a virtual infrastructure, and the Near-RT RIC.

11. A computer-readable medium storing a radio access network control program causing a computer to perform the method of claim 10.