## CLAIMS

What is claimed is:

1. A system for controlling a network, comprising:

a circuit configured to provide interface support to a plurality of remote radio heads, each remote radio head of the plurality of remote radio heads configured to support multiple radio access technologies; and

a controller configured to control the circuit and the plurality of remote radio heads, wherein the circuit is connected to each remote radio head of the plurality of remote radio heads via one or more respective fronthaul communication links,

wherein the circuit or the controller is configured to:

determine an optimal sampling frequency for a remote radio head; and

send the optimal sampling frequency to the remote radio head to set variable-rate sampler parameters for the remote radio head.

2. The system of claim 1, wherein the circuit is created using a virtualization engine running on a cluster of servers with a plurality of hardware accelerators.

3. The system of claim 1, wherein the circuit is reconfigurable to support adaptive signal processing and sampling of the plurality of remote radio heads.

4. The system of claim 1, wherein the controller is configured to control the circuit and the plurality of remote radio heads based on statistical information inferred from data traversing through the circuit and real time network state information of the network.

5. The system of claim 1, wherein the controller is configured to control a plurality of circuit instances in a circuit pool, wherein the plurality of circuit instances include the circuit.

6. The system of claim 1, further comprising an access gateway configured to support machine-to-machine (M2M) communications.

7. The system of claim 6, wherein the access gateway allocates an Internet Protocol prefix to a mobile terminal device from a pool of prefixes managed by the access gateway.

8. The system of claim 6, wherein the access gateway is connected to a caching storage, wherein the controller is configured to track content demands of a plurality of mobile terminal devices to make caching decisions for the caching storage.

9. The system of claim 6, wherein the circuit comprises a flow splitter configured to split a traffic flow between the access gateway and a Packet Data Network gateway, the flow splitter further configured to split the traffic flow among available radio access technologies.

10. The system of claim 1, wherein the network operates with a plurality of radio access technologies over a plurality of carrier frequencies.

11. The system of claim 1, wherein the circuit is further configured to send a first plurality of digital signals to the plurality of remote radio heads and receive a second plurality of digital signals from the plurality of remote radio heads.

12. The system of claim 1, wherein the controller is configured to manage radio resources for the plurality of remote radio heads, wherein the radio resources comprise time-frequency blocks and radio access technologies.

13. The system of claim 1, wherein the controller determines a split of protocol layers of a radio access technology between the circuit and a remote radio head based on delay requirement of the radio access technology.

14. The system of claim 1, wherein the circuit is configured as a baseband circuit.

15. A method of controlling a network, comprising:

analyzing collected data including structured and unstructured data sets generated by communications between different components of the network;

performing flow combining and splitting at a circuit based on the analyzing, the circuit configured to provide interface support to a plurality of remote radio heads, each remote radio head of the plurality of remote radio heads configured to support multiple radio access technologies; and

assigning power and frequency resources at the plurality of remote radio heads and the circuit based on the analyzing, wherein the assigning power and frequency resources comprises:

determining an optimal sampling frequency for a remote radio head; and

sending the optimal sampling frequency to the remote radio head to set variable-rate sampler parameters for the remote radio head.

16. The method of claim 15, further comprising adapting caching function and machine-to-machine flow at a controller based on the analyzing, the controller configured to control the circuit and the plurality of remote radio heads, wherein the circuit is connected to each remote radio head of the plurality of remote radio heads via one or more respective fronthaul links.

17. The method of claim 15, wherein the circuit is reconfigurable to support adaptive signal processing and sampling approaches of the plurality of remote radio heads.

18. The method of claim 15, wherein the network is configured to operate with a plurality of RATs over a plurality of carrier frequencies.