Claims

What is claimed is:

1. A mobile station comprising:

logic to store capabilities of the mobile station, wherein capabilities relate at least to baseline antenna configurations in the downlink and uplink, baseline multi-antenna mode, and minimum transmission bandwidth;

logic to negotiate capabilities with a base station using a capabilities index code, the code representing multiple capabilities of a mobile station;

logic to receive a second capabilities index code from the base station, the code representing multiple capabilities of the base station; and

logic to apply capabilities based in part on the received multiple capabilities of the base station.

2. The mobile station of claim 1, wherein the capabilities index code defines a unique set of functions, configuration parameters, air-interface protocol revision, or services that can uniquely describe a mobile station implementation or configuration while operating in a cellular network.

3. The mobile station of claim 1, wherein a capability class i+1 includes all features and parameters in capability class i, where $i \geq 0$.

4. The mobile station of claim 1, wherein the capability classes i and j, where $i \neq j$, are mutually exclusive such that the features and parameters defined in capability class i are fully or partially independent of capability class j.

5. The mobile station of claim 1, wherein

the logic to negotiate capabilities with a base station using a capabilities index code is to transmit the code using a TLV Encoded Information field in an SBC-REQ message format.

6. The mobile station of claim 1, wherein

logic to receive a second capabilities index code from the base station is to receive the second capabilities index code using a TLV Encoded Attributes field in an SBC-RSP message format.

7. A base station comprising:

logic to store capabilities of the base station, wherein capabilities relate at least to baseline antenna configurations in the downlink and uplink, baseline multi-antenna mode, and minimum transmission bandwidth;

logic to receive capabilities from a mobile station based on a capabilities index code, the code representing multiple capabilities of the mobile station, wherein the base station is to negotiate capabilities if the capabilities are above system default capabilities; and

logic to transmit capabilities for the base station to the mobile station using a second capabilities index code.

8. The base station of claim 7, wherein the capabilities index code defines a unique set of functions, configuration parameters, air-interface protocol revision, or services that can uniquely describe a mobile station implementation or configuration while operating in a cellular network.

9. The base station of claim 7, wherein the capabilities index code is received using a TLV Encoded Information field in an SBC-REQ message format.

10. The base station of claim 7, wherein the second capabilities index code is transmitted using a TLV Encoded Attributes field in an SBC-RSP message format.

11. A system comprising:

a display device and

a processor communicatively coupled to the display device, the processor configured to:

store capabilities of the mobile station, wherein capabilities relate at least to baseline antenna configurations in the downlink and uplink, baseline multi-antenna mode, and minimum transmission bandwidth,

negotiate capabilities with a base station using a capabilities index code, the code representing multiple capabilities of a mobile station,

receive a second capabilities index code from the base station, the code representing multiple capabilities of the base station, and

apply capabilities based in part on the received multiple capabilities of the base station.

12. The system of claim 11, wherein the capabilities index code is transmitted using a TLV Encoded Information field in an SBC-REQ message format.

13. The system of claim 11, wherein the second capabilities index code is received using a TLV Encoded Attributes field in an SBC-RSP message format.

14. A computer-implemented method comprising:

transmitting an AAI-SBC-REQ message to a base station, the AAI-SBC-REQ message representing a capability class of a mobile station and the capability class representing multiple capabilities of the mobile station;

receiving an AAI-SBC-RSP message from the base station, the AAI-SBC-RSP message representing a capability index of the base station and the AAI-SBC-RSP message signaling a capability index that is numerically smaller than or equal to the capability class; and

applying capabilities based in part on the capability index of the base station.

15. The method claim 14, wherein the capability class defines a unique set of functions, configuration parameters, air-interface protocol revision, or services that can uniquely describe a mobile station implementation or configuration while operating in a cellular network.

16. The method of claim 14, wherein a capability class i+1 includes all features and parameters in capability class i, where $i \geq 0$.

17. The method of claim 14, wherein the capability classes i and j, where $i \neq j$, are mutually exclusive such that the features and parameters defined in capability class i are fully or partially independent of capability class j.

18. The method of claim 14, wherein the transmitting an AAI-SBC-REQ message to a base station comprises transmitting the code using a TLV Encoded Information field in an SBC-REQ message format.

19. The method of claim 14, receiving an AAI-SBC-RSP message from the base station comprises using a TLV Encoded Attributes field in an SBC-RSP message format.

20. The method of claim 14, wherein capabilities indicated by the capability class i are selected from a group consisting of:

parameters related to baseline antenna configurations in the downlink and uplink, baseline multi-antenna mode, and minimum transmission bandwidth.

21. The method of claim 20, wherein capabilities indicated by an (i+1)th capability index code are selected from a group consisting of:

all features included in capability class i plus additional features such higher multi-antenna mode and higher minimum transmission bandwidth.

22. The method of claim 14, further comprising:

identifying features of each capability class to the mobile station and base station during initial device setup.

23. The method of claim 14, wherein the transmitting an AAI-SBC-REQ message to a base station comprises transmitting an AAI-SBC-REQ message to a base station when requested capabilities are above system default.

24 The method of claim 14, wherein the transmitting an AAI-SBC-REQ message to a base station comprises transmitting an AAI-SBC-REQ message to a base station during network entry, network re-entry, or network handover.

25. The method of claim 14, wherein the transmitting an AAI-SBC-REQ message to a base station comprises transmitting a highest capability index supported by the mobile station.

What is claimed is:

1. A mobile station comprising:

at least one memory to store capabilities of the mobile station, wherein capabilities relate at least to baseline antenna configurations in a downlink and uplink, baseline multi-antenna mode, and minimum transmission bandwidth;

at least one processor configured to:

selectively initiate capabilities negotiation with a base station using a capabilities index code in response to capabilities of the mobile station being above a default level, wherein the capabilities index code is to represent multiple capabilities of the mobile station, wherein the index code is to represent a capability class, a capability class i+1 to include all features and parameters in capability class i, where $i \geq 0$, and wherein the code is to be transmitted in a Type/Length/Value (TLV) Encoded Information field in an Advanced Air Interface SS basic capability request (AAI-SBC-REQ) message format;

selectively access a second capabilities index code from the base station in response to receipt of the second capabilities index code from the base station, the second capabilities index code is to represent multiple capabilities of the base station, wherein the second capabilities index code is part of a Type/Length/Value (TLV) Encoded Attributes field in an Advanced Air Interface SS basic capability response (AAI-SBC-RSP) message format; and

selectively request to apply capabilities based in part on the received multiple capabilities of the base station in response to negotiation with the base station or to selectively apply default level capabilities independent from capabilities negotiation with the base station.

2. The mobile station of claim 1, wherein the capabilities index code is to define a set of functions, configuration parameters, air-interface protocol revision, and services that indicate the mobile station configuration.

3. The mobile station of claim 1, wherein for capability classes i and j, where i≠j, features and parameters defined in capability class i are fully or partially independent of capability class j.

4. A system comprising:

a display device;

a memory configured to store capabilities of a mobile station, wherein capabilities relate at least to baseline antenna configurations in downlink and uplink, baseline multi-antenna mode, and minimum transmission bandwidth; and

at least one processor communicatively coupled to the display device and the memory, the at least one processor configured to:

selectively initiate negotiation of capabilities with a base station using a capabilities index code in response to capabilities of the mobile station being above a default level, the capabilities index code to represent multiple capabilities of the mobile station, the capabilities index code to define functions, configuration parameters, air-interface protocol revision, and services that indicate the mobile station configuration, the capabilities index code transmitted using a Type/Length/Value (TLV) Encoded Information field in an Advanced Air Interface SS basic capability request (AAI-SBC-REQ) message format,

selectively access a second capabilities index code in response to receipt of the second capabilities index code from the base station, the second capabilities index code to represent multiple capabilities of the base station and the second capabilities index code received using a Type/Length/Value (TLV) Encoded Attributes field in an Advanced Air Interface SS basic capability response (AAI-SBC-RSP) message format, and

selectively apply capabilities based in part on the received multiple capabilities of the base station in response to negotiation with the base station or to selectively apply default level capabilities absent capabilities negotiation with the base station.

5. A computer-implemented method comprising:

selectively transmitting an Advanced Air Interface SS basic capability request(AAI-SBC-REQ) message to a base station, the AAI-SBC-REQ message representing a capability class of the mobile station and the capability class representing multiple capabilities of the mobile station, wherein

the transmitting an AAI-SBC-REQ message to a base station comprises:

transmitting an AAI-SBC-REQ message to the base station when the mobile station has capability to operate above a default capability class,

transmitting an AAI-SBC-REQ message to the base station during network entry, network re-entry, or network handover, and

transmitting a highest capability index supported by the mobile station when the mobile station capability is above a default capability;

selectively accessing an Advanced Air Interface SS basic capability response(AAI-SBC-RSP) message from the base station in response to receipt of the AAI-SBC-RSP message, the AAI-SBC-RSP message representing a capability index of the base station and the AAI-SBC-RSP message signaling a capability index that is numerically smaller than or equal to the capability class;

selectively applying capabilities based on a default capability class in response to the mobile station not signaling capability to operate above a default capability class; and

selectively applying capabilities based in part on the capability index of the base station in response to receipt of the capability index of the base station.

6. The method claim 5, wherein the capability class is to define a set of functions, configuration parameters, air-interface protocol revision, and services that indicate the mobile station configuration.

7. The method of claim 5, wherein a capability class i+1 to include all features and parameters in capability class i, where $i \geq 0$.

8. The method of claim 5, wherein for capability classes i and j, where i≠j, features and parameters defined in capability class i are fully or partially independent of capability class j.

9. The method of claim 5, wherein the transmitting an AAI-SBC-REQ message to a base station comprises transmitting the code using a Type/Length/Value (TLV) Encoded Information field.

10. The method of claim 5, receiving an AAI-SBC-RSP message from the base station comprises using a Type/Length/Value (TLV) Encoded Attributes field.

11. The method of claim 5, wherein capabilities indicated by the capability class i are selected from a group consisting of: parameters related to baseline antenna configurations in downlink and uplink, baseline multi-antenna mode, and minimum transmission bandwidth.

12. The method of claim 11, wherein capabilities indicated by an (i+1)th capability index code are selected from a group consisting of: all features included in capability class i and higher multi-antenna mode and higher minimum transmission bandwidth.

13. The method of claim 5, further comprising: receiving features of each capability class at the mobile station during initial mobile station device setup.

14. A base station comprising:

at least one memory to store capabilities of the base station, wherein capabilities relate at least to baseline antenna configurations in a downlink and uplink, baseline multi-antenna mode, and minimum transmission bandwidth;

at least one processor configured to:

selectively access capabilities from a mobile station based on a capabilities index code, the capabilities index code from a Type/Length/Value (TLV) Encoded

Information field in an Advanced Air Interface SS basic capability request (AAI-SBC-REQ) message format, the capabilities index code to represent multiple capabilities of the mobile station that are above a default capability of the mobile station, and the capabilities index code to define functions, configuration parameters, air-interface protocol revision, and services that indicate a mobile station configuration; and

selectively request to transmit capabilities for the base station to the mobile station using a second capabilities index code in response to receipt of the capabilities from the mobile station, the second capabilities index code indicating the capabilities supported by the base station and the logic to selectively request to transmit capabilities for the base station is to selectively request to transmit a second capabilities index code using a Type/Length/Value (TLV) Encoded Attributes field in an Advanced Air Interface SS basic capability response (AAI-SBC-RSP) message format.

15. A non-transitory computer-readable medium, comprising instructions stored thereon, which when executed by a computer, cause the computer to:

initiate storage of capabilities of a mobile station, wherein capabilities relate at least to baseline antenna configurations in a downlink and uplink, baseline multi-antenna mode, and minimum transmission bandwidth;

selectively initiate negotiation of capabilities with a base station using a capabilities index code in response to capabilities of the mobile station being above a default level, wherein the capabilities index code is to represent multiple capabilities of the mobile station, wherein the index code is to represent a capability class, a capability class i+1 to include all features and parameters in capability class i, where i>0, and wherein the code is to be transmitted using a Type/Length/Value (TLV) Encoded Information field in an Advanced Air Interface SS basic capability request (AAI-SBC-REQ) message format;

selectively access a second capabilities index code from the base station in response to receipt of the second capabilities index code from the base station, the second capabilities index code is to represent multiple capabilities of the base station, wherein the second capabilities index code is part of a Type/Length/Value

(TLV) Encoded Attributes field in an Advanced Air Interface SS basic capability response (AAI-SBC- RSP) message format; and

selectively apply capabilities based in part on the received multiple capabilities of the base station in response to negotiation with the base station or to selectively apply default level capabilities independent from capabilities negotiation with the base station.

16. The computer readable medium of claim 15, wherein the capabilities index code is to define a set of functions, configuration parameters, air-interface protocol revision, and services that indicate the mobile station configuration.

17. The computer readable medium of claim 15, wherein for capability classes i and j, where i≥j, features and parameters defined in capability class i are fully or partially independent of capability class j.