WHAT IS CLAIMED IS:

1. A method of authenticating a mobile device to use a foreign application at a foreign zone, by its home telecom carrier, the foreign application being supported by a foreign application server, the method comprising:

(a) establishing a voice or data transmission connection between the mobile device and the home telecom carrier;

(b) identifying, by the foreign application, or the foreign application server, the home telecom carrier of the mobile device; and

(c) after authenticating the mobile device by the home telecom carrier, receiving, by the foreign application, or the foreign application server, a subscriber authentication token from the home telecom carrier.

2. The method of claim 1, wherein, at step (b), the home telecom carrier is identified by checking a global IP address of a data packet sent originally from the mobile device located at a foreign zone.

3. The method of claim 2, wherein the data packet is sent originally from the mobile device, through a foreign telecom carrier's mobile network and a GPRS tunneling protocol user plane tunnel, to a home telecom carrier's mobile network, and then sent to an internet after network address translation.

4. The method of claim 1, wherein, at step (b), the home telecom carrier is identified by checking a home network identifier code from the home telecom carrier.

5. The method of claim 4, wherein the home network identifier code is delivered from the home telecom carrier to the mobile device via a message.

6. The method of claim 5, wherein the message is delivered by a short message service.

7. The method of claim 1, wherein, at step (a), the voice or data transmission connection between the mobile device and the home telecom carrier is established by voice roaming, data roaming, or WiFi.

8. The method of claim 1, wherein step (c) comprises:

(cl) sending an authentication request, by the foreign application or the foreign application server, to a home telecom carrier's authentication server ("AS");

(c2) receiving a Mobile Subscriber International Subscriber Directory Number ("MSISDN") by the home telecom carrier's AS to validate a subscriber by checking the MSISDN against a subscriber database; and

(c3) sending the subscriber authentication token, by the home telecom carrier's AS, to the foreign application or the foreign application server.

9. The method of claim 8, wherein step (cl) comprises:

(c11) sending an authentication request, by the foreign application, to the foreign application server; and

(c12) receiving the authentication request, by the home telecom carrier's AS, from the foreign application server, via redirection of the foreign application.

10. The method of claim 8, wherein step (c2) comprises:

(c21) sending a subscriber information request, by the home telecom carrier's AS, to a home telecom carrier's mobile subscriber number ("MSN") management server ("MS"), via redirection of the foreign application;

(c22) sending a subscriber information, by the home telecom carrier's MSN MS, to the home telecom carrier's AS, via redirection of the foreign application;

(c23) sending the subscriber information, by the home telecom carrier's AS, directly to the home telecom carrier's MSN MS;

(c24) receiving the MSISDN, by the home telecom carrier's AS, directly from the home telecom carrier's MSN MS; and

(c25) validating the subscriber, by the home telecom carrier's AS checking the MSISDN against the subscriber database.

11. The method of claim 8, wherein step (c3) comprises:

(c31) sending a subscriber authentication response with an authentication code, by the home telecom carrier's AS, to the foreign application server, via redirection of the foreign application;

(c32) sending the subscriber authentication response with the authentication code, by the foreign application server, to the home telecom carrier's AS;

(c33) receiving the MSISDN and the authentication token, by the foreign application server, directly from the home telecom carrier's AS; and

(c34) sending the authentication token, by the foreign application server, to the foreign application.

12. The method of claim 1, wherein step (c) comprises:

(cl) receiving a subscriber's user ID and password, by the foreign application server, from the foreign application;

(c2) receiving the subscriber's user ID and password, by a home telecom carrier's authentication server ("AS"), from the foreign application server;

(c3) authenticating a subscriber, by the home telecom carrier's AS checking the subscriber's user ID and password against a subscriber database; and

(c4) receiving, by the foreign application, or the foreign application server, a subscriber authentication token from the home telecom carrier's AS.

13. The method of claim 1, wherein the foreign application is a foreign wallet application and the foreign application server is a foreign wallet server.

14. The method of claim 13, further comprising:

(d) receiving a remittance request, by the foreign wallet server, from the foreign wallet application installed on the mobile device located at the foreign zone;

(e) receiving the remittance request, by a home wallet server, from the foreign wallet server;

(f) submitting the remittance request to a home telecom carrier's node of a distributed transaction consensus network to transfer digital property from a home virtual wallet to a target foreign wallet; and

(g) recording the remittance in a distributed ledger.

15. The method of claim 14, wherein, at step (e), the remittance request is sent by the foreign wallet server, to the home wallet server, via a foreign wallet application's authentication gateway and a home telecom carrier's authentication gateway.

16. The method of claim 14, wherein, at step (g), the distributed ledger has a blockchain data structure.

17. A method for making mobile payment from a home virtual wallet, associated with a home telecom carrier, the method comprising:

(a) receiving a remittance request, by a foreign wallet server, from a foreign wallet application supported by the foreign wallet server and installed on a mobile device located at a foreign zone;

(b) receiving the remittance request, by a home wallet server, from the foreign wallet server;

(c) submitting the remittance request to a home telecom carrier's node of a distributed transaction consensus network to transfer digital property from the home virtual wallet to a foreign virtual wallet associated with the foreign telecom carrier; and

(d) recording the remittance in a distributed ledger.

18. The method of claim 17, wherein, at step (b), the remittance request is sent by the foreign wallet server, to the home wallet server, via a foreign wallet application's authentication gateway and a home telecom carrier's authentication gateway.

19. The method of claim 17, wherein, at step (c), the foreign target wallet can be a subscriber's foreign virtual wallet, or a foreign merchant's virtual wallet.

20. The method of claim 17, wherein, at step (d), the distributed ledger has a blockchain data structure.