CLAIMS

What is claimed:

1. A computer-implemented method for hosting online applications or video games, performing video compression comprising, and transmitting video comprising:

receiving a request from a user for playing a low latency video game or executing an application which produces a video output;

receiving signals at a server, the signals transmitted over a network which includes public network components, as the user is playing the video game or using the application and responsively executing the video game or application on the server to generate the video output comprising a sequence of images of the video game or application;

encoding the video output to generate a sequence of compressed video images, wherein encoding comprises:

encoding a first plurality of video frames or portions thereof, wherein each encoded video frame or portion thereof is dependent on a previously-encoded video frame or portion thereof, respectively;

transmitting the first plurality of encoded video frames or portions to a client device;

receiving feedback information from the client device, the feedback information usable to determine whether data contained in the video frames or portions has not been successfully received and/or decoded; and

in response to detecting that a video frame or portion thereof has not been successfully received and/or decoded, encoding a current video frame or portion thereof to be dependent on a previously-encoded video frame or portion thereof known to have been successfully received and/or decoded on the client device; ~~and~~

transmitting the sequence of compressed~~current~~ video images ~~frame or portion thereof~~ to the client device over the network;

decompressing the sequence of compressed video images on the client device;

wherein the operations of receiving signals, executing the video game or application, encoding the video output, transmitting the sequence of compressed video images, and decompressing the sequence of compressed video images are performed with a latency such that the user has the perception that the selected video game or application is responding instantly to the signals.

2. The method as in claim 1 wherein the previously-encoded video frame or portion thereof known to have been successfully received and/or decoded comprises the last known video frame or portion thereof known to have been successfully received and/or decoded.

3. The method as in claim 1 wherein the video frames or portions thereof comprise P-frames or P-tiles, respectively.

4. The method as in claim 1 wherein the feedback information comprises an indication that the frames or portions thereof have been successfully received and/or decoded at the client device.

5. The method as in claim 1 wherein the feedback information comprises an indication that the frames or portions thereof have not been successfully received and/or decoded at the client device.

6. The method as in claim 1 wherein encoding a current video frame or portion thereof to be dependent on a previously-encoded video frame or portion thereof known to have been successfully received and/or decoded on the client device further comprises:

retrieving a prior state from a memory, the prior state comprising a state of an encoder after encoding the previously-encoded video frame or portion.

7. The method as in claim 6 further comprising:

decoding the current video frame or portion thereof, wherein decoding comprises retrieving a prior state from a memory, the prior state comprising a state of a decoder after decoding the previously-encoded video frame or portion.

8. The method as in claim 1 further comprising:

decoding the encoded video frames or portion thereof at the client device; and

displaying images associated with each of the video frames or portions thereof on a display on the client device.

9. A system comprising a memory for storing program code and a processor for processing the program code to perform the operations of:

receiving a request from a user for playing a low latency video game or executing an application which produces a video output;

receiving signals at a server, the signals transmitted over a network which includes public network components, as the user is playing the video game or using the application and responsively executing the video game or application on the server to generate the video output comprising a sequence of images of the video game or application;

encoding the video output to generate a sequence of compressed video images, wherein encoding comprises:

encoding a first plurality of video frames or portions thereof, wherein each encoded video frame or portion thereof is dependent on a previously-encoded video frame or portion thereof, respectively;

transmitting the first plurality of encoded video frames or portions to a client device;

receiving feedback information from the client device, the feedback information usable to determine whether data contained in the video frames or portions has not been successfully received and/or decoded; and

in response to detecting that a video frame or portion thereof has not been successfully received and/or decoded, encoding a current video frame or portion

thereof to be dependent on a previously-encoded video frame or portion thereof known to have been successfully received and/or decoded on the client device; ~~and~~

transmitting the sequence of compressed ~~current~~ video images~~frame or portion thereof~~ to the client device over the network;

decompressing the sequence of compressed video images on the client device;

wherein the operations of receiving signals, executing the video game or application, encoding the video output, transmitting the sequence of compressed video images, and decompressing the sequence of compressed video images are performed with a latency such that the user has the perception that the selected video game or application is responding instantly to the signals.

10. The system as in claim 9 wherein the previously-encoded video frame or portion thereof known to have been successfully received and/or decoded comprises the last known video frame or portion thereof known to have been successfully received and/or decoded.

11. The system as in claim 9 wherein the video frames or portions thereof comprise P-frames or P-tiles, respectively.

12. The system as in claim 9 wherein the feedback information comprises an indication that the frames or portions thereof have been successfully received and/or decoded at the client device.

13. The system as in claim 9 wherein the feedback information comprises an indication that the frames or portions thereof have not been successfully received and/or decoded at the client device.

14. The system as in claim 9 wherein encoding a current video frame or portion thereof to be dependent on a previously-encoded video frame or portion

thereof known to have been successfully received and/or decoded on the client device further comprises:

retrieving a prior state from a memory, the prior state comprising a state of an encoder after encoding the previously-encoded video frame or portion.

15. The system as in claim 14 comprising additional program code to cause the processor to perform the operations of:

decoding the current video frame or portion thereof, wherein decoding comprises retrieving a prior state from a memory, the prior state comprising a state of a decoder after decoding the previously-encoded video frame or portion.

16. The system as in claim 9 comprising additional program code to cause the processor to perform the operations of:

decoding the encoded video frames or portion thereof at the client device; and

displaying images associated with each of the video frames or portions thereof on a display on the client device.

17. A non-transitory machine-readable medium having program code stored thereon which, when executed by a machine, causes the machine to perform the operations of:

receiving a request from a user for playing a low latency video game or executing an application which produces a video output;

receiving signals at a server, the signals transmitted over a network which includes public network components, as the user is playing the video game or using the application and responsively executing the video game or application on the server to generate the video output comprising a sequence of images of the video game or application;

encoding the video output to generate a sequence of compressed video images, wherein encoding comprises:

encoding a first plurality of video frames or portions thereof, wherein each encoded video frame or portion thereof is dependent on a previously-encoded video frame or portion thereof, respectively;

transmitting the first plurality of encoded video frames or portions to a client device;

receiving feedback information from the client device, the feedback information usable to determine whether data contained in the video frames or portions has not been successfully received and/or decoded; and

in response to detecting that a video frame or portion thereof has not been successfully received and/or decoded, encoding a current video frame or portion thereof to be dependent on a previously-encoded video frame or portion thereof known to have been successfully received and/or decoded on the client device; and

transmitting the sequence of compressed~~current~~ video images ~~frame or portion thereof~~ to the client device over the network;

decompressing the sequence of compressed video images on the client device;

wherein the operations of receiving signals, executing the video game or application, encoding the video output, transmitting the sequence of compressed video images, and decompressing the sequence of compressed video images are performed with a latency such that the user has the perception that the selected video game or application is responding instantly to the signals.

18. The non-transitory machine-readable medium as in claim 17 wherein the previously-encoded video frame or portion thereof known to have been successfully received and/or decoded comprises the last known video frame or portion thereof known to have been successfully received and/or decoded.

19. The non-transitory machine-readable medium as in claim 17 wherein the video frames or portions thereof comprise P-frames or P-tiles, respectively.

20. The non-transitory machine-readable medium as in claim 17 wherein the feedback information comprises an indication that the frames or portions thereof have been successfully received and/or decoded at the client device.

21. The non-transitory machine-readable medium as in claim 17 wherein the feedback information comprises an indication that the frames or portions thereof have not been successfully received and/or decoded at the client device.

22. The non-transitory machine-readable medium as in claim 17 wherein encoding a current video frame or portion thereof to be dependent on a previously-encoded video frame or portion thereof known to have been successfully received and/or decoded on the client device further comprises:

retrieving a prior state from a memory, the prior state comprising a state of an encoder after encoding the previously-encoded video frame or portion.

23. The non-transitory machine-readable medium as in claim 22 comprising additional program code to cause the machine to perform the operations of:

decoding the current video frame or portion thereof, wherein decoding comprises retrieving a prior state from a memory, the prior state comprising a state of a decoder after decoding the previously-encoded video frame or portion.

24. The non-transitory machine-readable medium as in claim 17 comprising additional program code to cause the processor to perform the operations of:

decoding the encoded video frames or portion thereof at the client device; and

displaying images associated with each of the video frames or portions thereof on a display on the client device.