

Figure 5. Modelsim simulation figure of the security switch authentication

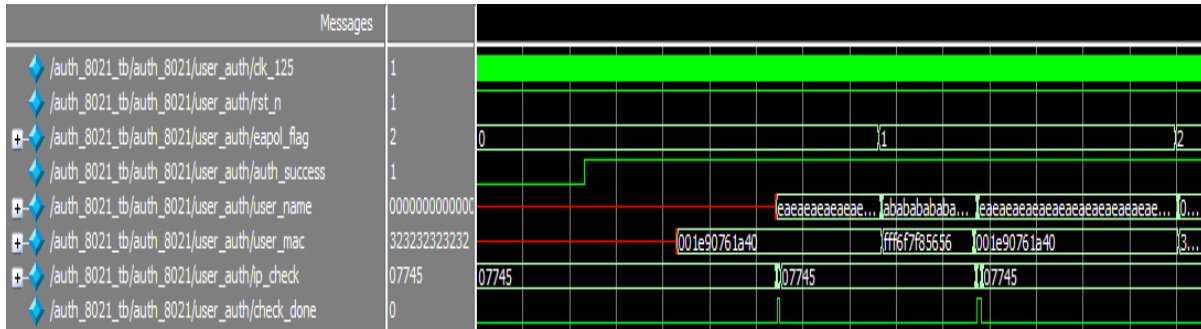


Figure 6. Modelsim simulation diagram of the client authentication

Fig.6 is the Modelsim simulation diagram of the client authentication. Among them clk\_125 is 125 M clock. Rst\_n is reset signal. Eapol\_flag is to judge the message type is EAPOL or RADIUS. Auth\_success is the authentication complete signal of the security switch. User\_name is user name. User\_mac is the client MAC address. Ip\_check is the authentication for IP address. Check\_done is the authentication complete signal.

The figures show that the dual authentication model proposed in this paper has been effectively realized. The 802.1x authentication module realizes the authentication between the security switch and the server and the authentication between the client and the server. The design ensures the security switch network's security and the user identity effectively and improves the security switch's security of the industrial control system.

#### IV. CONCLUSION

This paper discusses the importance of 802.1x authentication module in industry control system, and analyzes the protocol mechanism. This paper proposes a dual authentication model: the authentication between the security switch and the server and the authentication between the client and the server. The design process of the proposed authentication module is also introduced in this paper. This work has been realized in an FPGA chip of Altera company. The security switches realize the control the identity of the

switches in the network and the control of the users' identity, ensuring the security of the industrial control system.

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