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A novel optimized vertical handover framework for seamless networking integration in cyber-enabled systems

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## HIGHLIGHTS

In this paper:

1. A novel Optimized Vertical Handover (OVH) framework is proposed to optimize handover performance and to reduce the handover execution time. This framework cooperates IEEE 802.21 Media Independent Handover (MIH) with Software-Defined Networking (SDN) for featuring seamless link establishment and agile network path reconfiguration.
2. Network handover process is redesigned. In the handover process, network selection is divided into two stages:
  - a) the pre-filtering stage that features security policy-matching technique to eliminate candidates with incompatible security capabilities,
  - b) the selection stage featuring a multi-attribute network selection algorithm called Dynamic-VIKOR (D-VIKOR). Compared with the original VIKOR, our D-VIKOR algorithm can reduce the time complexity through frequently evaluating dynamic attributes, but not the static attributes.
3. The simulation results highlight that the OVH framework significantly reduces the handover delay, execution time, etc.

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