

## QKD-PoC-HES - Quantensichere Kommunikation Proof of Concept Hessisches Landesnetz

The QKD-PoC-HES testbed evaluates the practical deployment of quantum key distribution (QKD) within existing governmental and research network infrastructures. The testbed connects Hochschule RheinMain (HSRM) with the Hessische Zentrale für Datenverarbeitung (HZD) in Wiesbaden using a shared dark fiber link carrying both quantum and classical communication channels simultaneously via wavelength-division multiplexing (WDM). The project focuses on interoperability, operational integration, and compliance-related aspects of quantum-safe communication, including the evaluation of secure communication protocols such as WireGuard, TLS 1.3, OpenVPN, and IPsec in realistic inter-organizational deployment scenarios.

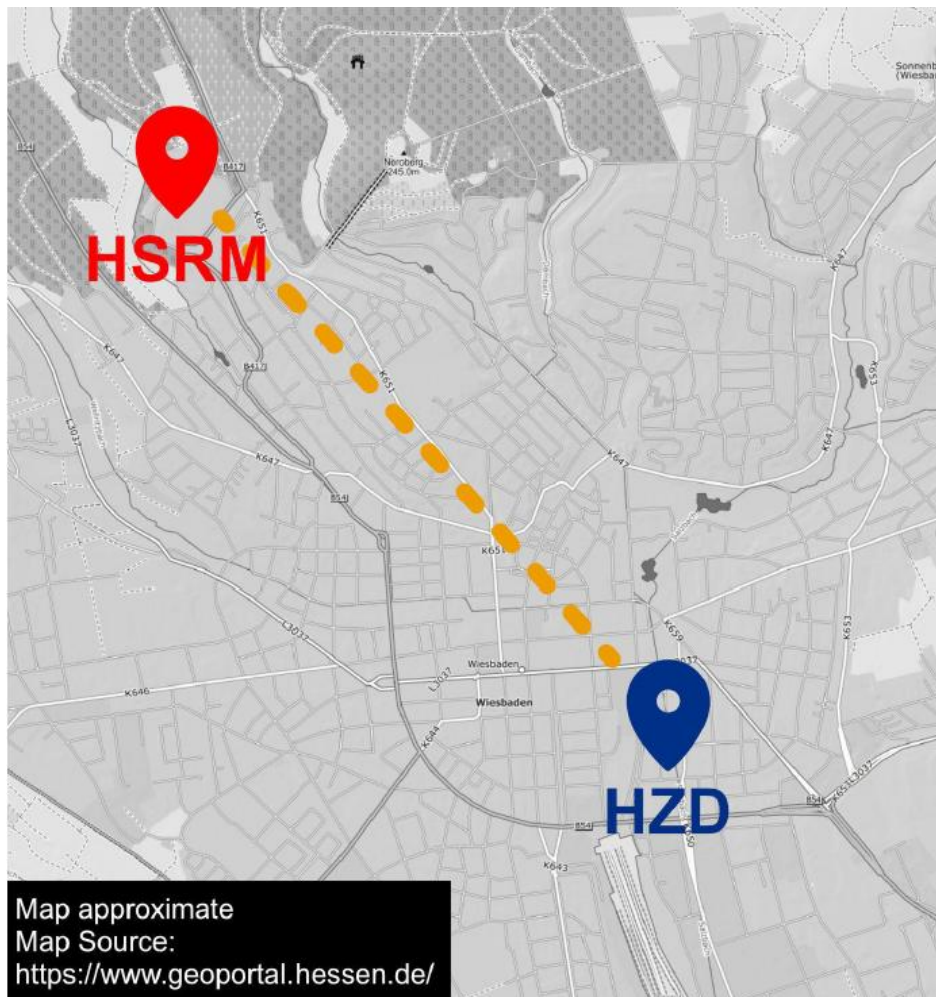


Fig.1 The QKD-PoC-HES testbed . The testbed connects Hochschule RheinMain (HSRM) with the Hessische Zentrale für Datenverarbeitung (HZD)

## A: Brief Information

<b>Testbed Title</b>	QKD-PoC-HES - Quantensichere Kommunikation Proof of Concept Hessisches Landesnetz
<b>Start Point</b>	Hochschule RheinMain (HSRM), Campus Unter den Eichen 5, Wiesbaden
<b>End point</b>	Hessische Zentrale für Datenverarbeitung (HZD), Mainzer Straße 29, Wiesbaden
<b>Institution/Organization</b>	Hochschule RheinMain (HSRM) Hessische Zentrale für Datenverarbeitung (HZD)
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<b>Status</b>	Active

## B: Technical Information

<b>Type of Transmission</b>	Dark fiber (DWDM possible)
<b>Length [km]</b>	6,5
<b>Losses [dB]</b>	Approx.. 5
<b>Supported Wavelengths [nm]</b>	C-Band (1530-1560)
<b>Type of Fiber</b>	Single-mode
<b>Type of Deployment</b>	Simultaneous quantum and classical communication over shared dark fiber infrastructure using wavelength-division multiplexing (WDM)
<b>Polarization Stabilization</b>	Full polarization diversity
<b>Quantum Communication Infrastructure</b>	KEEQuant Andariel Testbed Series (CV-QKD) with KEEQuant Key Management System (KMS)
<b>Available Infrastructure for external Parties</b>	

## C: Additional Information

<b>Linked Projects</b>	
<b>Press Release and Publications</b>	
<b>Demonstrated Milestone</b>	
<b>Outlook</b>	

<b>Suggested Use Cases</b>	<ul style="list-style-type: none"><li>• secure research data transmission</li><li>• governmental communication infrastructures,</li><li>• future quantum-safe networking scenarios within public-sector environments.</li></ul>
<b>Other Comments/ Information</b>	The testbed focuses on the practical integration of QKD into existing public-sector and research infrastructures. A key objective is the evaluation of secure inter-site communication across carrier-operated and organizationally separated infrastructure segments. The project additionally investigates operational, interoperability, and compliance-related aspects regarding future quantum-safe communication architectures, including alignment with BSI recommendations and ISO/IEC 27001-related security concepts.