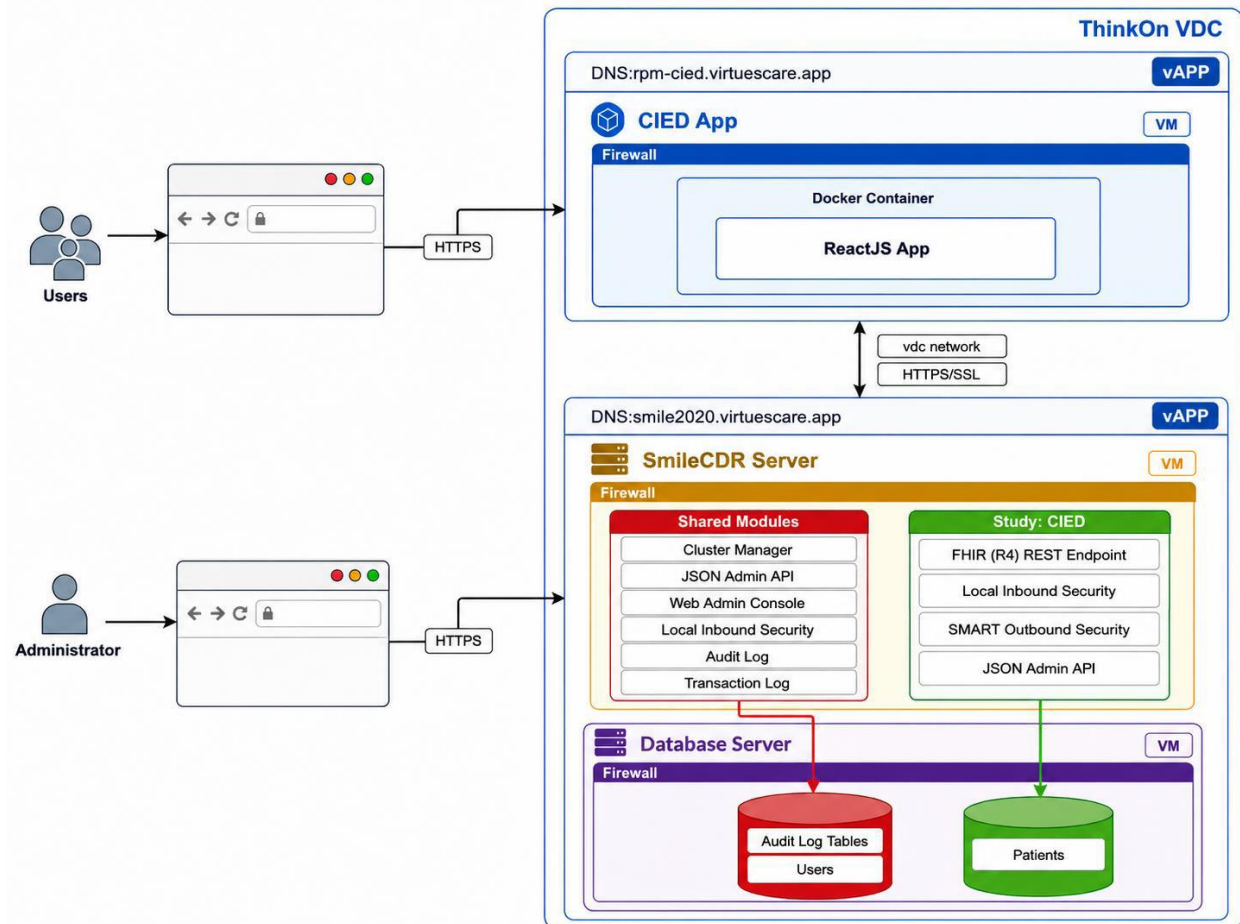


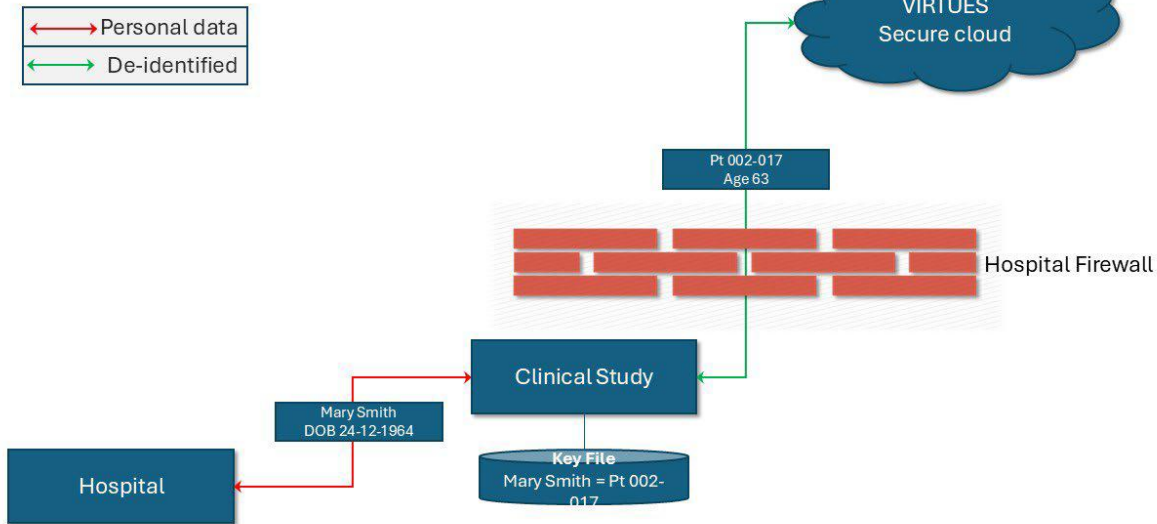
Supplmentary Figure 1

VIRTUES Architecture, Privacy & Security

VIRTUES Architecture



VIRTUES Privacy Model



VIRTUES Privacy & Security

VIRTUES-CIED (PM and ICD - virtuescare.app) utilizes a closed-system and encrypted architecture hosted through ThinkOn, a Canadian-owned cloud provider and the only fully accredited Canadian sovereign cloud provider approved by the Federal Government, and SmileCDR, which acts as the FHIR-based clinical data repository and interoperability layer for the platform.

ThinkOn is certified to meet PIPEDA, HIPAA, GDPR, ISO 27001/27017/27018, SOC 2 Type II, and PCI standards (see <https://thinkon.com/compliance/>). Specifically, the ISO 27018:2019 standard relates to PII protection, a security administration standard to ensure that cloud providers offer complete protection of personal data in the cloud and privacy of their customers' clients, safeguarding the identifiable data entrusted to them. The platform maintains PHIPA compliant safeguards including encryption of data at rest and in transit, encrypted backups with disaster recovery replication, SSL/TLS certification, firewall protection, and Canadian data residency. ThinkOn's Tier 3 Canadian data centres include Federal Secret-cleared environments with biometric access controls, video surveillance, redundant power and networking, and on-site operational security personnel.

VIRTUES operates as a closed-access system in which all user accounts and roles are created and approved by authorized clinical staff and the VIRTUES Support Team; public self-registration is not possible. Both the web and mobile applications have undergone independent penetration testing by Digital Boundary Group (DBG). In addition, the platform has been extensively reviewed by academic and hospital privacy and security teams independently across multiple jurisdictions to ensure compliance with provincial regulations.