RightFax to RingCentral Bridge

Product Specifications & Enterprise Security Whitepaper — v1.0 Confidential — Not for Distribution

1. Executive Summary

As healthcare organizations and enterprise environments migrate their telephone infrastructure from legacy analog lines to modern VoIP and SIP trunks, a critical vulnerability often emerges: fax unreliability. The standard Fax-over-IP protocol (T.38) is highly sensitive to the packet loss, latency, and codec incompatibilities inherent to VoIP networks. In existing RightFax environments, this degradation frequently results in outbound fax failure rates of 20% to 80%, causing manual retransmissions, wasted staff hours, and significant clinical or operational risk when critical documents fail silently.

The **RightFax to RingCentral (RF→RC) Bridge** is a robust, locally hosted middleware solution designed to eliminate these VoIP-related failures. Operating transparently alongside your existing RightFax installation, the Bridge intercepts outbound faxes and reroutes them directly through RingCentral's dedicated cloud fax REST API, bypassing vulnerable SIP trunks entirely.

From the user or EHR's perspective, the workflow remains completely unchanged. From an infrastructure perspective, reliability is immediately restored.

2. Core Capabilities

2.1 Complete SIP & T.38 Bypass

Rather than forcing fax data through highly compressed, lossy voice channels, the RF→RC Bridge packages the rendered documents and transmits them securely via RingCentral's enterprise REST API. This leverages RingCentral's dedicated PSTN termination infrastructure, guaranteeing high-fidelity delivery and virtually eliminating partial page drops and protocol timeouts.

2.2 Closed-Loop EHR Integration

The Bridge is designed to maintain the integrity of your existing software stack. When a fax is routed through the RingCentral API, the Bridge continually tracks its transmission state. Upon success or failure, it securely writes the delivery confirmation and timestamps directly back to the RightFax database. This ensures that downstream applications, such as EMRs/EHRs (e.g., Allscripts Touchworks), receive accurate delivery receipts without requiring custom integration.

2.3 Zero-Touch Windows Service Architecture

Designed for enterprise server environments, the application runs as a secure, headless Windows Service. It features an intelligent polling engine that monitors for outbound jobs asynchronously. In the event of a host server reboot or network interruption, the service automatically resumes operation, seamlessly picking up queued jobs without administrative intervention.

3. Security & Compliance Architecture

Because the RF→RC Bridge handles sensitive operational data and Protected Health Information (PHI), it has been architected with a "zero-trust" approach to credential management and data transmission.

3.1 Data in Transit (Network Security)

The Bridge operates entirely behind your corporate firewall. It does not require any inbound open ports. All outbound transmission to the RingCentral API is strictly encrypted using modern Transport Layer Security (TLS 1.2+). This prevents Man-in-the-Middle (MITM) attacks and ensures that fax payloads (ePHI) remain completely private while crossing the public internet.

3.2 Data at Rest (Hardware-Bound Encryption)

To authenticate with the RingCentral API and the local RightFax database, the software requires sensitive credentials (e.g., JSON Web Tokens, SQL passwords). These secrets are never stored in plaintext.

- **AES-256-GCM Encryption:** All configuration secrets are encrypted using military-grade AES-256-GCM cryptography.
- **Machine-Bound Keys:** The cryptographic decryption key is dynamically derived from the host server's unique physical hardware identifiers (MachineGuid). If the configuration files or server backups are maliciously copied to an unauthorized machine, the credentials remain cryptographically locked and completely useless.

3.3 Data Sovereignty & Telemetry

The RF→RC Bridge is a localized routing engine, not a cloud service. It acts exclusively as a secure courier between your in-house RightFax server and your authenticated RingCentral tenant.

- **Zero Middleman Storage:** Fax documents are never uploaded to, processed by, or stored on any third-party infrastructure managed by JCH AI Software Solutions.

- **No Telemetry:** The application strictly enforces a zero-telemetry policy. It does not phone home, nor does it send operational metrics, logs, or routing data outside of your network.

4. Technical Specifications

Component	Specification
Operating System	Windows Server 2016 or later
Compatibility	RightFax 20.x architectures
Deployment	Local Windows Service (Start-on-boot)
Network Requirements	Outbound HTTPS (Port 443) access to RingCentral API (platform.ringcentral.com)
Resilience	Configurable auto-retry matrix for temporary network or destination failures

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