



## ESI's SD-WAN Solutions powered by Rabbit Run™

### Router Feature Matrix

SD-WAN Router Feature Matrix										
	Max # of Voice End-Points	WAN Speed	WAN Ports	LAN Speed	LAN Ports	WiFi 802.11a/b/g/n/ac	4G LTE Failover	* Voice Data Overlay	Redundancy Options	Part Number
<b>Gateway, RRT-200 Managed Router Single Link</b> <b>Use Case:</b> SIP-ALG Bypass & Network Throttling	30	500 Mbps	2 (only 1 active)	1 Gbps	3	Yes	No	Yes	None 1 Wired ISP	9090-0099
<b>Gateway, RRT-200 Failsafe with LTE</b> <b>Use Case:</b> Failover LTE, SIP-ALG Bypass, & Network Throttling	30	500 Mbps	2	1 Gbps	3	Yes	Yes	Yes	1 Wired ISP & 1 Cellular ISP	9090-0100
<b>Gateway, RRT-300 Managed Router Single Link</b> <b>Use Case:</b> SIP-ALG Bypass & Network Throttling	200	1 Gbps	2 (only 1 active)	1 Gbps	3	Yes	No	Yes	None 1 Wired ISP	9090-0111
<b>Gateway, RRT-300 Failsafe/Dual WAN</b> <b>Use Case:</b> Failover to backup ISP, SIP-ALG Bypass & Network Throttling	200	1 Gbps	2	1 Gbps	3	Yes	No	Yes	2 Wired ISPs	9090-0107
<b>Gateway, RRT-300 Failsafe with LTE</b> <b>Use Case:</b> Failover LTE, SIP-ALG Bypass, & Network Throttling	200	1 Gbps	2	1 Gbps	3	Yes	Yes	Yes	1 Wired ISP & 1 Cellular ISP	9090-0108
<b>Gateway, ESI Emergency Failover Kit</b> <b>Incl:</b> RRT200 Router w/ LTE, 8-port FXS GW, 24hr battery backup, & enclosure <b>Use Case:</b> Analog Emergency Call Box, Elevator Phone, Point-of-Sale, & Security Panels.	30	500 Mbps	2	1 Gbps	3	Yes	Yes	Yes	1 Wired ISP & 1 Cellular ISP	9090-0112
* Voice Data Overlay - All Routers included Overlay service. Overlay service provides a VPN tunnel for encryption and bypassing ISP VoIP issues, such as SIP-ALG bypass. ESI Emergency Connection Kit includes Overlay Plus service. Overlay Plus included the same services as Overlay with store forward switching. Store forward switching is used to reorganize out of order packets and provide continued service during brownouts.										

# Network Throttling

**What is ISP Network Throttling?** ISP network throttling occurs when an ISP intentionally slows down your internet connection. This practice can limit the speed at which you download, stream, or browse online, often without clear notice to the user.

## How ISP Network Throttling Impacts VoIP Calls:

- **Latency (Delay):** Throttling increases the time it takes for data packets to travel between endpoints. This delay can cause noticeable lags in conversations, making it difficult to communicate in real time.
- **Jitter:** VoIP relies on a steady stream of data packets. Throttling can cause uneven packet delivery, leading to jitter, where words or sentences sound choppy or scrambled.
- **Packet Loss:** ISPs might drop or slow down packets as part of throttling. For VoIP, dropped packets result in missing parts of the conversation, creating silence, distortion, or robotic-sounding voices.
- **Reduced Call Quality:** Throttling reduces available bandwidth, which VoIP depends on for transmitting audio data. Lower bandwidth can lead to poor audio clarity, echo, and inconsistent voice quality.
- **Increased Call Drops:** In extreme cases, throttling can interrupt the connection entirely, causing calls to drop or fail to connect.
- **Inability to Handle Multiple Calls:** If bandwidth is throttled, it can limit the ability to handle multiple VoIP calls simultaneously, impacting businesses or households that rely on multiple connections.

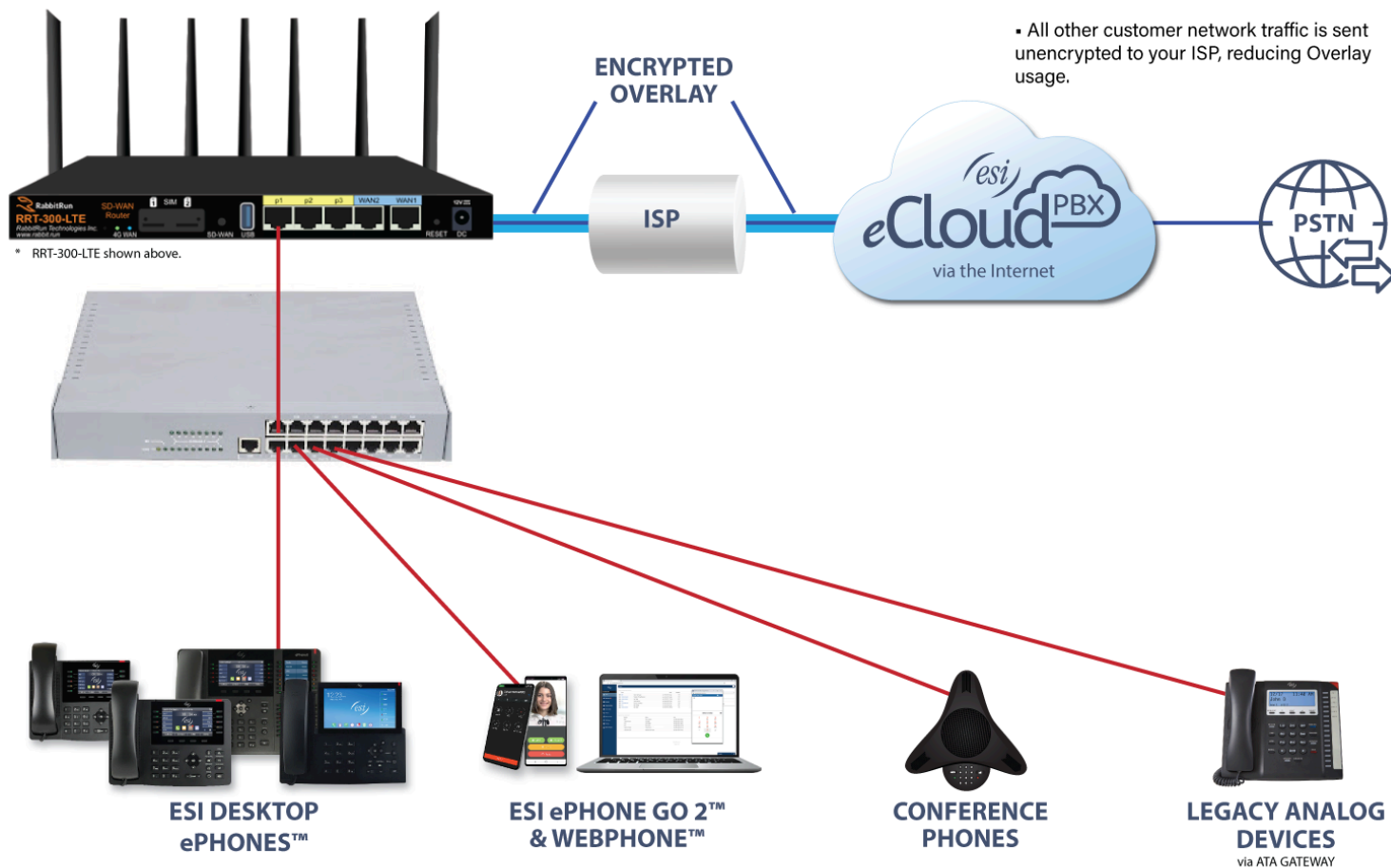
## **SIP-ALG (Session Initiation Protocol - Application Layer Gateway)**

**What is SIP-ALG?** SIP-ALG rewrites SIP headers and SDP payloads to modify IP addresses and ports for NAT traversal. However, incorrect modifications can corrupt the packets, leading to signaling failures. While SIP-ALG is designed to help with SIP traffic, it often causes more problems than it solves, especially for VoIP communications and is required by ESI to be disabled.

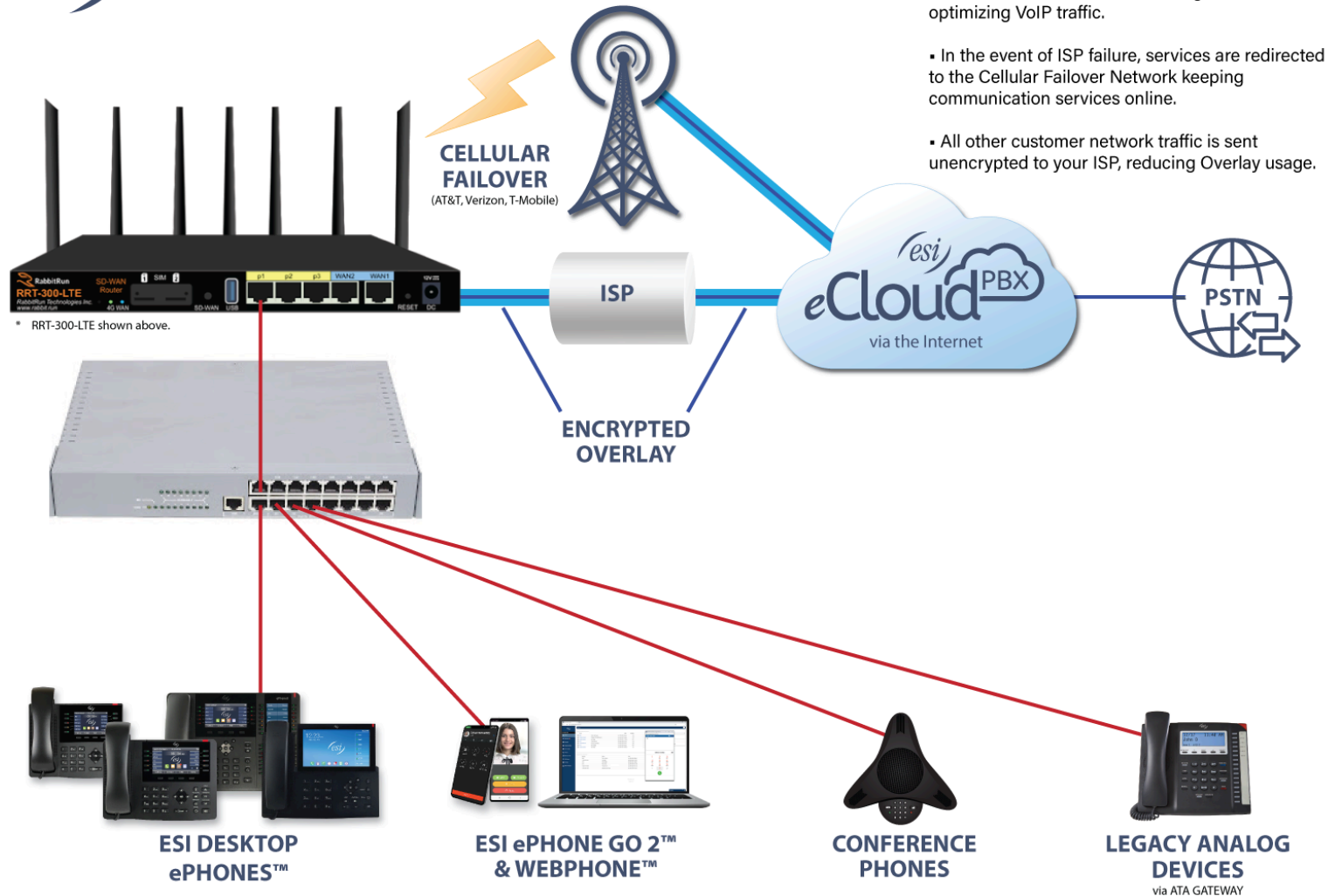
### **How SIP-ALG Impacts VoIP Calls:**

- **Call Drops or Incomplete Calls:** SIP-ALG modifies VoIP traffic, potentially corrupting SIP headers, causing calls to drop or fail to connect properly.
- **One-Way Audio Issues:** It can interfere with NAT traversal, resulting in one party being unable to hear the other during a call.
- **Registration Failures:** SIP-ALG may distort SIP messages, causing VoIP devices or softphones to fail registration with the VoIP server.
- **Delayed Call Setup:** The altered packet flow may introduce delays in call signaling, making call setup slower.
- **Inconsistent Behavior:** It can lead to random or unpredictable VoIP performance issues, depending on the network conditions and the SIP-ALG implementation.

# esi Single Link (Encrypted Overlay)



# esi Failsafe LTE (with Encrypted Overlay)



- ESI's Cloud Services are sent over an encrypted Overlay, bypassing SIP-ALG and Internet Service Providers' (ISP) Network Throttling limitations, optimizing VoIP traffic.

- In the event of ISP failure, services are redirected to the Cellular Failover Network keeping communication services online.

- All other customer network traffic is sent unencrypted to your ISP, reducing Overlay usage.

# Emergency Failover Kit

