



IGEL & Hummingbirds AI Guacamole™:

Continuous Human Verification for Secure Cloud Workspaces

As organizations accelerate adoption of virtual desktops, cloud workspaces, AI-assisted workflows, and Zero Trust architectures, a critical security gap remains: identity verification ends at login. Once authenticated, users maintain access to sensitive applications, privileged systems, and AI-powered workflows without continuous verification that the authorized human remains present.

Unlike traditional MFA solutions, Guacamole by Hummingbirds AI addresses this challenge by providing continuous human verification throughout an active session. Combined with IGEL Adaptive Secure Endpoint Platform™, the industry's leading secure operating system for cloud workspaces, organizations gain a powerful solution that continuously validates user presence while maintaining a secure, immutable endpoint foundation.

The result is a new layer of identity assurance that extends Zero Trust principles beyond authentication and into the active user session.

The Challenge

Identity Verification Is Still a Point-in-Time Event

Traditional security controls verify identity during authentication, but once a session begins:

- Privileged access remains active
- Virtual desktop sessions stay open
- AI agents execute actions on behalf of users
- Sensitive applications remain accessible
- Shared and mobile devices become vulnerable to unauthorized use

This creates significant risk in healthcare, financial services, government, manufacturing, and other highly regulated environments where accountability and auditability are critical.

Why It Matters Now

Three market forces are converging:

Session Risk Expansion

- Hybrid work and mobile users leave active sessions unattended.
- Session hijacking and shoulder-surfing risks continue to increase.

AI Acting on Behalf of Users

- AI copilots and autonomous agents increasingly execute sensitive workflows.
- Organizations need proof that a verified human authorized those actions.

Growing Governance Requirements

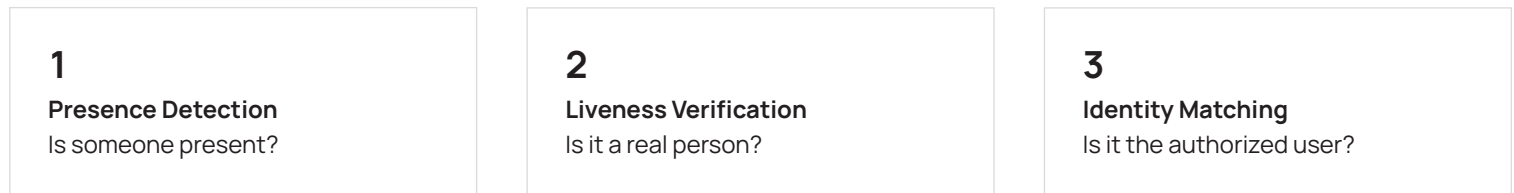
- Regulators and enterprise risk teams require stronger accountability.
- Organizations must demonstrate who was actually present during critical actions.

The Solution

Guacamole Continuous Human Verification

Guacamole provides a continuous trust signal throughout an active session rather than relying solely on authentication events. The platform operates entirely on the endpoint using standard RGB cameras already present on enterprise devices without requiring specialized hardware.

Three-Step Verification Engine



The platform then generates a simple session-level signal:

Present → Verified → Anomaly

Why IGEL + Guacamole

Secure Endpoint Foundation Meets Continuous Identity Assurance

IGEL Adaptive Secure Endpoint Platform delivers an immutable, trusted, and governed endpoint foundation designed specifically for cloud workspaces and virtual desktop environments. The platform incorporates:

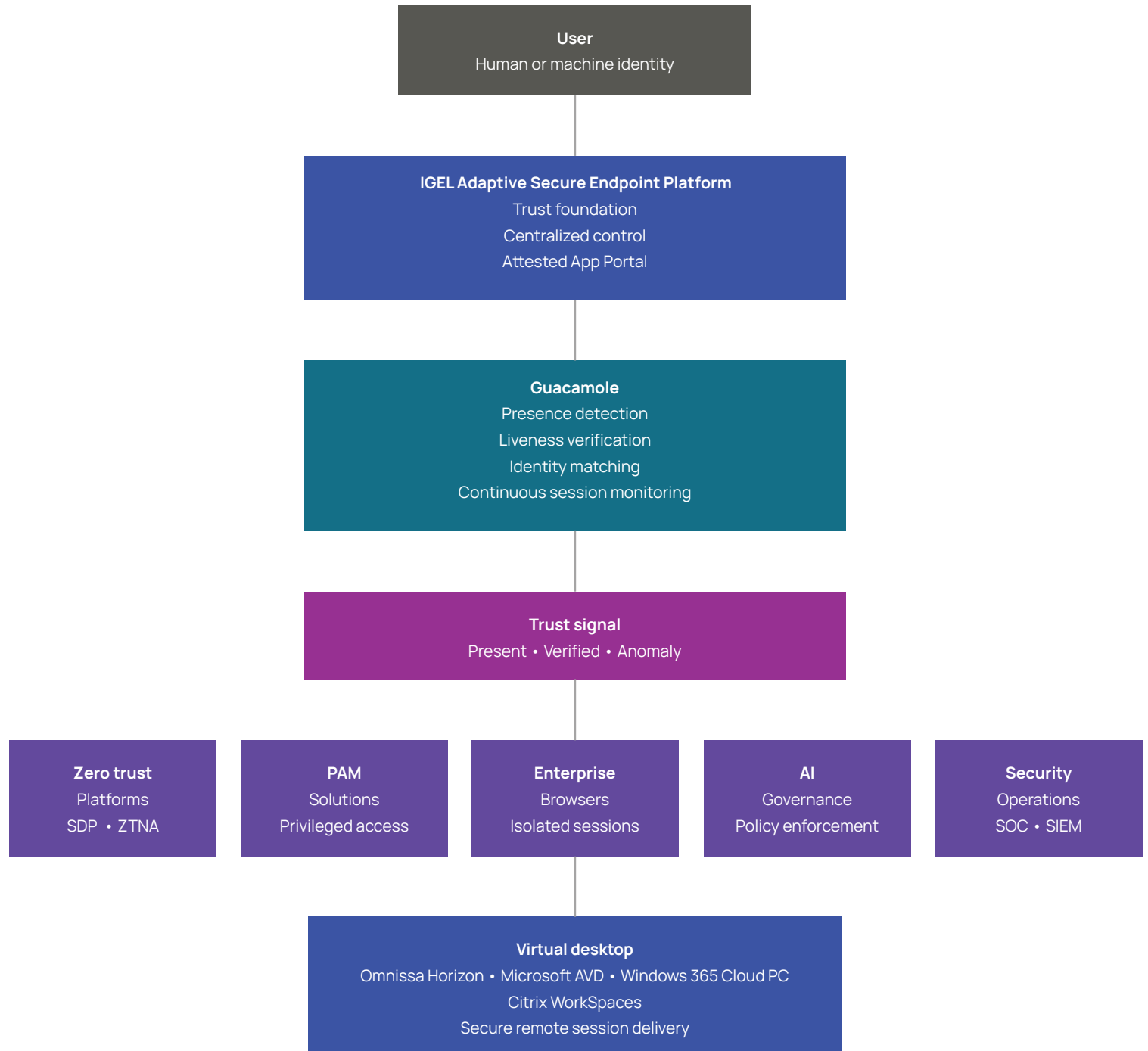
- Immutable OS architecture
- Centralized management and governance via UMS
- Omnissa, Citrix, Azure Virtual Desktop, and Amazon WorkSpaces support
- Hardware-agnostic deployment
- Zero Trust-ready architecture

When combined with Guacamole™, organizations gain:

IGEL OS	Guacamole
• Secure endpoint foundation • Immutable operating system • Zero Trust endpoint security • Centralized management • Cloud workspace delivery	• Continuous identity assurance • Continuous human identity verification • Zero Trust session security • Continuous audit trail • Human-gated AI workflows

Together they create a complete endpoint-to-session trust framework.

Architecture Overview



Key Benefits

Continuous Session Protection

Unlike traditional authentication solutions, Guacamole continuously verifies that the authorized user remains present throughout the session. When absence is detected, sessions can automatically lock, suspend, or trigger policy actions.

Privacy-First Architecture

All inference occurs locally on the endpoint:

- No biometric data leaves the device
- No facial images are transmitted
- No cloud processing required
- Privacy compliance by design

AI Workflow Governance

As enterprises deploy AI copilots and autonomous agents, Guacamole provides human authority validation before sensitive AI-driven actions execute.

This creates an auditable chain of accountability for AI-assisted decisions and actions.

Enhanced Zero Trust

IGEL secures the endpoint.

Guacamole secures the session.

Together they extend Zero Trust enforcement beyond authentication into continuous verification.

Performance Optimized for AI PCs

Hummingbirds AI is an Intel Gold Partner and has worked to optimize its software; Guacamole for modern Intel® AI PCs utilizing Intel OpenVINO™ and NPU acceleration. Internal testing demonstrated:

Battery Efficiency Benefits

- Approximately 1.5W power consumption
- Up to 1.45 additional hours of battery life compared to GPU execution
- NPU-optimized continuous identity assurance for mobile users

This makes the solution particularly attractive for:

- Clinicians
- Executives
- Field personnel
- Remote workers
- Financial traders
- Mobile government users
- And more

Use Cases

Healthcare	Financial Services	Government & Defense	AI-Driven Enterprises
Protect unattended clinical workstations accessing EHR and EMR systems. Benefits: • Automatic session locking • Continuous clinician verification • Improved HIPAA accountability • Enhanced shared workstation security	Protect privileged trading and administrative workstations. Benefits: • Continuous accountability • Reduced insider risk • Verified user presence • Audit-ready activity tracking	Strengthen identity assurance on high-security workstations. Benefits: • Continuous operator validation • Enhanced Zero Trust compliance • Improved auditability • Protection against unauthorized access	Validate human oversight of AI agents and copilots. Benefits: • Human-gated actions • Verified AI authorization • Governance and compliance • Risk reduction for autonomous workflows

Business Value

Reduce Security Risk	Continuous verification closes the gap between authentication and session activity.
Improve Compliance	Provides a verifiable audit trail of human presence during sensitive actions.
Enhance User Experience	Passive, hands-free operation eliminates repeated authentication prompts.
Accelerate Zero Trust	Adds the missing human-presence signal to existing Zero Trust architectures.
Enable Responsible AI	Creates accountability and governance for AI-assisted decisions and actions.

Conclusion

Organizations have spent years securing authentication, endpoints, and access policies. The next challenge is securing the active session itself.

By combining Guacamole Continuous Human Verification with IGEL Adaptive Secure Endpoint Platform, enterprises gain a privacy first, hardware-agnostic solution that continuously validates human presence, strengthens Zero Trust enforcement, and provides accountability for both human and AI-assisted actions.

**IGEL secures the endpoint. Guacamole secures the human behind it.
Together they deliver the next generation of secure digital workspaces.**

Schedule a strategy session to explore how an IGEL + Hummingbirds AI can:

- Reduce Security Risk
- Improve Compliance
- Enhance User Experience
- Accelerate Zero Trust
- Enable Responsible AI

About IGEL

IGEL is a global software company delivering the Adaptive Secure Endpoint Platform for modern digital workspaces and secure access. Through its secure endpoint OS, Universal Management Suite™ (UMS), and IGEL App Portal, IGEL enables a Preventative Security Model designed to reduce endpoint complexity, strengthen control, and support secure access across distributed environments. The platform delivers the Adaptive Secure Desktop™, providing secure reliable access to SaaS, DaaS, VDI, and enterprise applications. Backed by more than 130 technology partners, IGEL helps organizations extend Zero Trust and SASE strategies to the endpoint. Founded in 2001, IGEL is headquartered in Germany and operates globally, including in the United States.

About Hummingbirds.ai

Hummingbirds AI is a vision AI company focused on building trusted human-AI interactions through privacy-first, on-device intelligence. Drawing from neuroscience, biology, and machine learning, the company develops technologies that help organizations establish trust, accountability, and situational awareness in digital environments.

Its flagship platform, Guacamole, applies these principles to continuous identity verification and human presence assurance, enabling organizations to strengthen security, compliance, and governance while preserving user privacy. Hummingbirds AI works with enterprise, government, healthcare, and technology partners to advance responsible AI adoption and the future of human-centered digital workspaces.



The Adaptive Secure Endpoint
OS Platform for Now & Next

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