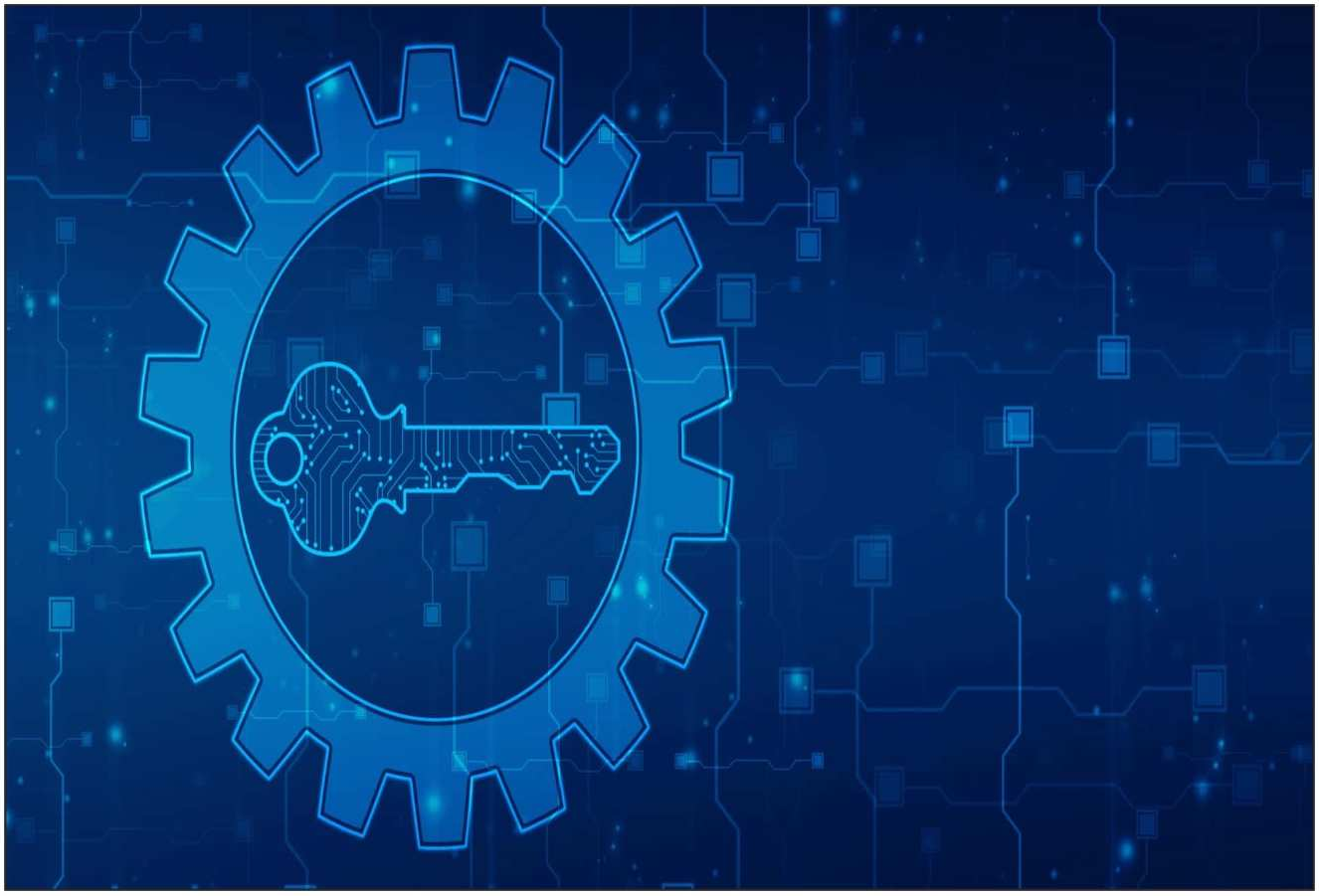
FACTION NETWORKS

WHITE PAPER

END-TO-END ENCRYPTION

Owner-Controlled Trust & Zero Knowledge

Why keys belonging to the owner — not the vendor — change the security model at a structural level. And what Zero Knowledge actually means in practice.



Faction Networks
Generation 3 Zero Trust

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factionnetworks.com

1 The Problem with Vendor-Held Trust

Most security architectures protect data by controlling access to systems. Faction protects data by controlling the keys — and keeping them with the owner, not with the platform.

This distinction sounds subtle. It is not.

In the dominant model of enterprise security, an organization's encryption keys, certificates, and identity credentials are issued and held by a vendor's cloud infrastructure. The vendor controls the Certificate Authority. The vendor controls the key management system. The vendor controls the authentication server.

This means that what protects your organization is ultimately trust in your vendor — not ownership of your security. If the vendor is breached, compelled, or misconfigured, the keys that protect your data are reachable by someone other than you.

It also means your security depends on the vendor's infrastructure being available, correct, and untampered-with at all times. The vendor's control plane becomes a shared attack surface — and a single high-value target for nation-state actors and advanced adversaries.

2 What Owner-Controlled Trust Means

In Faction's Generation 3 architecture, the network owner is the Certificate Authority (CA) — the trusted root that issues and signs the network's credentials. Keys are generated on the owner's device. The owner controls who joins the network, what they can reach, and when their access ends.

Faction's infrastructure routes encrypted traffic and manages the mechanics of the network — but it holds no keys, no CA private keys, and no content-decryption keys. The control plane is not reachable from the public internet; accessing it requires first authenticating into a Faction network.

> **What this means for your organization**
>
> Your protection is grounded in what you hold — not in what a vendor promises. A vendor compromise, cloud outage, or legal compulsion does not reach what the vendor does not hold. The root of trust is yours.

3 Zero Knowledge in Practice

"Zero Knowledge" is a term used loosely in the industry. In Faction's architecture it has a specific, structural meaning.

Faction's infrastructure has no access to the content you protect. The application layer — your files, communications, and data — is encrypted with keys the platform does not hold. A compromise of Faction's infrastructure yields encrypted data without the means to decrypt it.

> This is not a policy commitment. It is an architectural property. **What the platform cannot hold, it cannot expose.**

It is important to be precise: Faction's Waypoint infrastructure does see routing metadata — the mechanics required to move encrypted traffic between members of a network. What it cannot see is the content of that traffic. The application layer remains protected end to end.

4 Why This Changes the Model

Owner-controlled trust and Zero Knowledge have practical consequences across your security posture:

Breach containment
A compromise of Faction's infrastructure yields only encrypted payloads the attacker cannot read. Your keys and data remain out of reach.

Reduced third-party dependency
Your security does not degrade when a vendor's cloud is unavailable, misconfigured, or subject to legal compulsion.

Micro-segmentation without central authority
Groups within a Faction network carry their own keys — managed by Group Managers, not a central IT team. A segment compromise does not propagate.

Auditability
Access requires cryptographic identity, not just a username. Every action is tied to a verified member. There is no anonymous movement on the network.

5 The Foundation of Generation 3 Zero Trust

Owner-controlled trust is not a feature. It is the architectural premise on which everything else in Faction is built.

It is why the network is invisible on the public internet. Why data stays encrypted at rest and in transit under keys you control. Why the control plane is not a public target. And why a breach of the platform does not translate into a breach of what you protect.

The shift from vendor-held trust to owner-controlled trust is the defining characteristic of Generation 3 Zero Trust — and the reason it represents a materially different security posture from what came before.