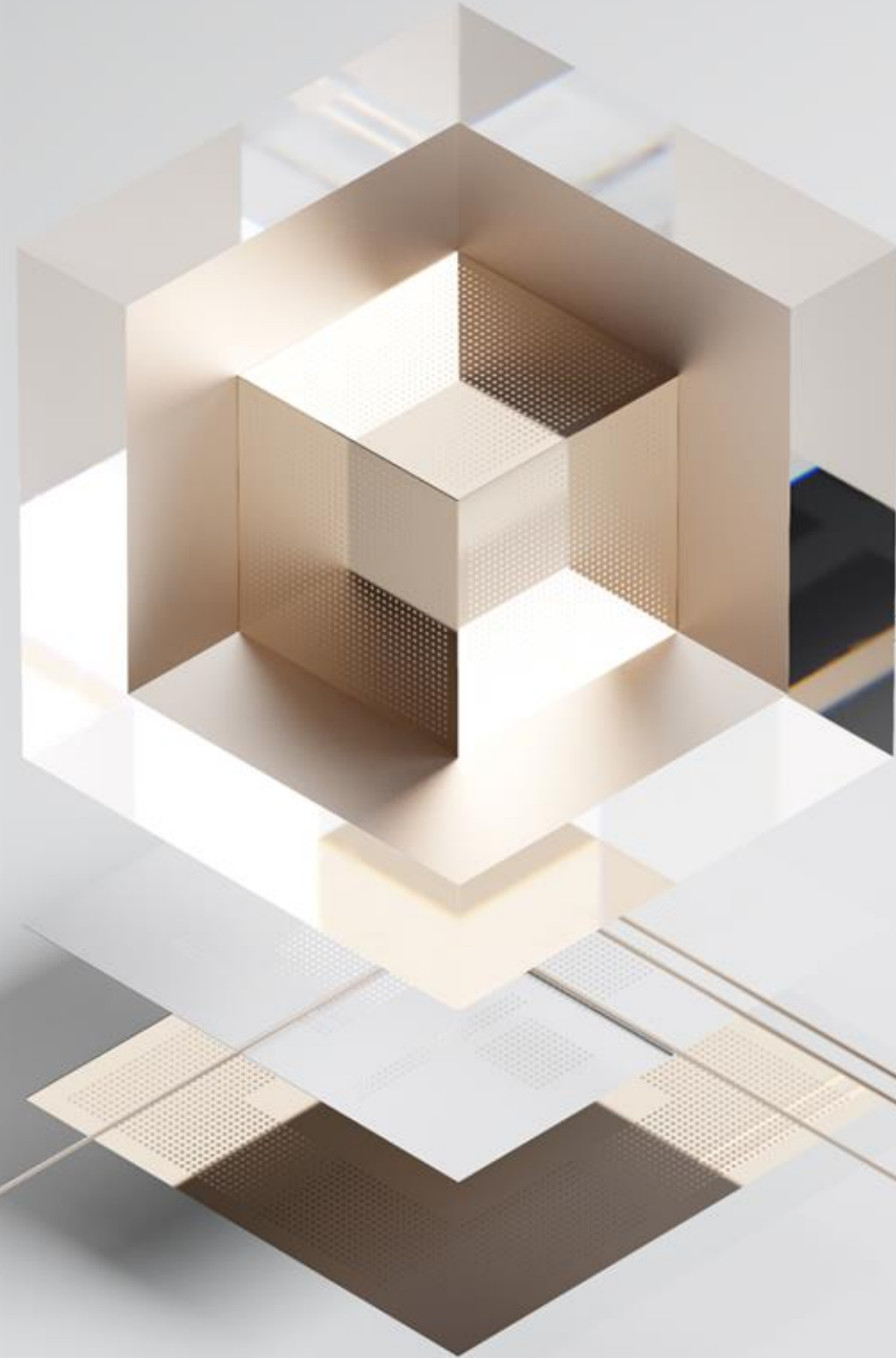


December 24, 2025

Root Cause Analysis and Mitigation Plan



Agenda

Incident summary

Incident impact

Root cause analysis

Incident timeline

Piano solutions

Summary

Incident date

December 24, 2025

Affected software modules

Activation: VX/ID

Affected environment or location

US

Incident scope

Complete outage

Incident duration

51 minutes (13:58 - 14:49 UTC)

Impact

Incident severity

High

Impact description

The incident resulted in a major service disruption lasting 51 minutes. Our nginx load balancer dropped the majority of incoming traffic at the ingress level for VX and ID products, which caused:

- User authentication failures preventing users from logging into their accounts
- Unavailability of content access for end users
- Publisher dashboard outages preventing publishers from accessing the Piano dashboard

Root cause

This incident resulted from a configuration parameter conflict in our nginx load balancer that occurred during a latency optimization deployment. Our analysis identified the following factors:

Primary Cause:

Invalid nginx buffer size configuration where `proxy_busy_buffers_size` was set to a value smaller than the required minimum threshold relative to `proxy_buffer_size` and `proxy_buffers` parameters.

Contributing Factors:

- **Configuration Management Gap:** Parameter combinations were deployed without proper testing and validation, creating inconsistencies with our other environments
- **Process Deviation:** Standard code freeze and verification procedures were not followed during deployment, based on an incorrect assessment that the changes posed minimal risk
- **Auto-Recovery System Limitation:** Our Helm auto-recovery mechanisms did not function as expected when processing ConfigMap updates
- **State Management Error:** The system incorrectly identified the invalid configuration as the authoritative state, which prevented automated recovery processes from executing successfully

Incident timeline

Minutes	Date / Time (UTC)	Description
0	13:58	nginx ingress configuration optimization deployed. Parameter conflict triggered immediately, causing traffic drop across all ingress servers
2-17	14:00-14:15	Automated rollback attempts failed. System was unable to determine the correct configuration version
17-42	14:15-14:40	Multiple manual remediation attempts were initiated but were unsuccessful due to system state conflicts
42	14:40	Engineering team initiated force low-level rollback procedure
51	14:49	Full service recovery achieved and traffic flow restored

Piano solutions and corrective measures

Code Freeze Violation Review

Complete review of deployment process violations with reinforcement of mandatory procedures. We are addressing the gap between changes perceived as low-risk and actual verification requirements to ensure all deployments follow proper validation protocols.

Status

Done

Delivery date

Dec 25, 2025

Enhanced Testing Framework

Tuning and enhancement of nginx-ingress controller auto-recovery mechanisms, including improved Helm ConfigMap handling and state management to prevent incorrect configuration validation.

Status

In Progress

Estimated delivery date

Jan 30, 2026

Auto-Recovery System Improvement

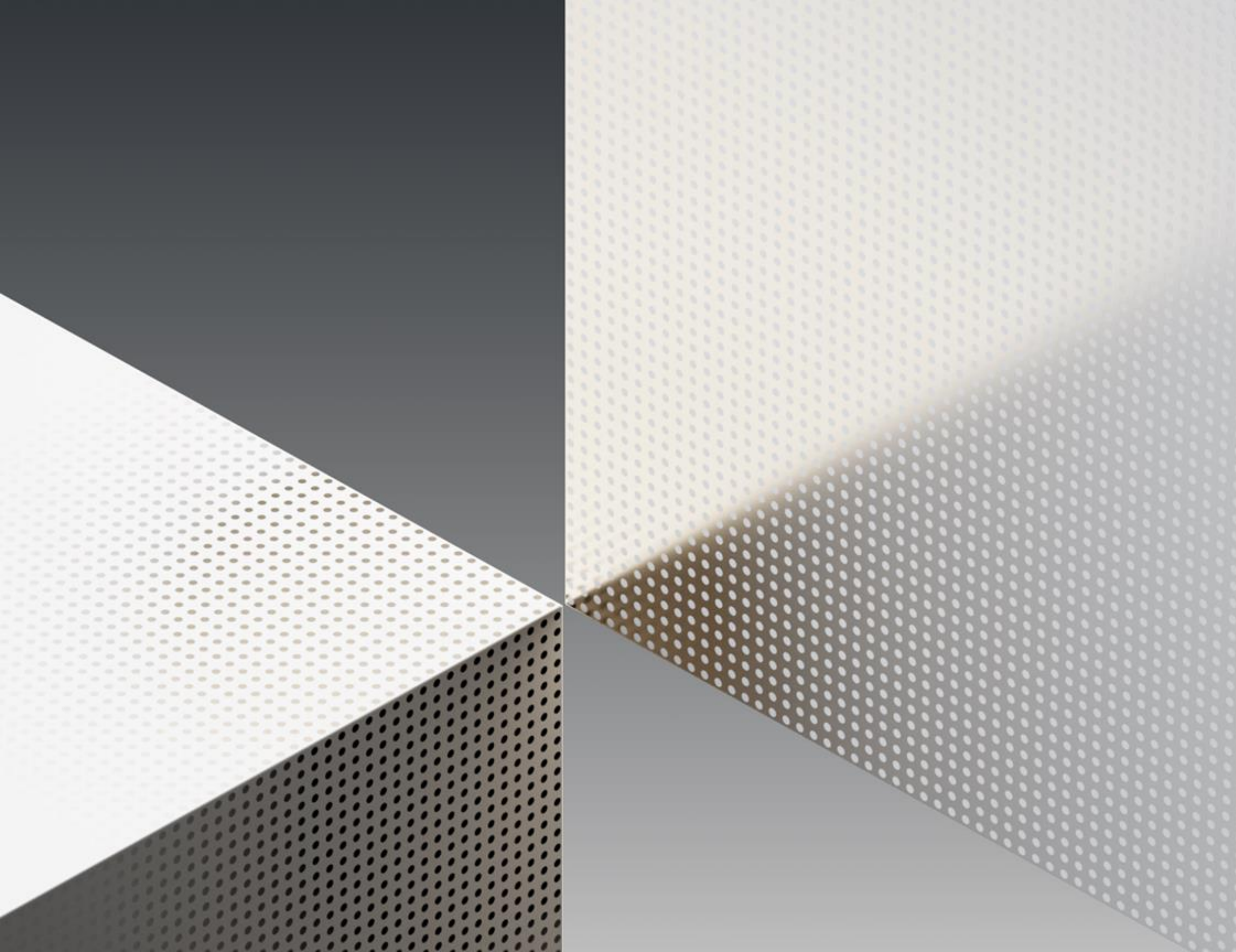
- Implementation of pre-deployment configuration validation checks
- Establishment of environment-specific parameter validation
- Enhanced monitoring and alerting specifically for ingress configuration changes
- Creation of standardized runbooks for force rollback procedures to reduce manual intervention time during incidents

Status

Planned

Estimated delivery date

Jan 30, 2026



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ANALYTICS + ACTIVATION

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