Port & Terminal Vulnerability Mapping: A Global Assessment

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Executive Summary

This report presents the findings of PLIANT's 2026 global port and terminal vulnerability assessment, covering 84 major logistics nodes across all primary trade corridors. Using the composite fragility index developed in prior PLIANT research, we identify 19 nodes presenting High or Critical fragility ratings, concentrated in the Asia-Pacific and Middle East corridors. Recommendations for allied logistics continuity planning and targeted infrastructure investment are provided.

1. Assessment Scope and Methodology

The 2026 global assessment extends PLIANT's prior regional work to encompass all major trade corridors, including the North Atlantic, Mediterranean, Indian Ocean, and trans-Pacific routes. Node selection was based on throughput volume, strategic chokepoint position, and partner-identified priority designations. Data collection combined open-source infrastructure analysis, port authority disclosures, AIS vessel tracking aggregates, and primary data obtained through PLIANT's partner network.

Node vulnerability was assessed along four dimensions: physical infrastructure resilience, digital systems exposure, throughput concentration, and geopolitical risk exposure. Each dimension was scored on a standardized scale and aggregated into a composite fragility index using weights derived from expert elicitation. The resulting index permits cross-node comparison while preserving dimensional detail for operational use.

2. Global Findings

Of the 84 nodes assessed, 19 (23%) received High or Critical composite fragility ratings. Asia-Pacific nodes account for 11 of the 19 high-fragility designations, reflecting the region's combination of elevated geopolitical exposure and concentrated throughput dependencies. Middle East nodes account for 5 high-fragility designations, driven primarily by territorial dispute proximity and limited bypass routing capacity. North Atlantic nodes score consistently lower on composite fragility but present elevated digital exposure relative to their physical resilience scores.

> **The Strait of Malacca corridor remains the single highest-risk chokepoint in the global assessment. Port Klang, Singapore's Tuas Terminal, and the Batam transshipment complex collectively handle 28% of global containerized trade with no viable bypass routing capable of absorbing more than 15% of diverted volume in a disruption scenario.**

3. Digital Vulnerability Findings

Digital systems exposure has increased significantly since PLIANT's 2024 baseline assessment, driven by accelerating terminal digitization without commensurate cybersecurity investment. Busan and Kaohsiung present the most acute digital exposure profiles — both nodes operate legacy terminal management systems with documented vulnerability to ransomware-class attacks, and both have experienced cyber incidents at adjacent

facilities within the past 18 months.

Across the full node sample, 34 of 84 nodes (40%) present digital exposure scores that exceed their physical resilience scores — meaning their cyber vulnerability profile is more severe than their physical infrastructure fragility. This pattern is most pronounced in the Asia-Pacific and North Atlantic corridors and represents the most significant shift in the global vulnerability landscape since the 2022 baseline assessment.

4. Recommendations

- Prioritize alternative routing capacity investment for the Malacca corridor within allied infrastructure funding frameworks
- Accelerate terminal operating system modernization at Busan and Kaohsiung under existing security cooperation frameworks
- Establish formal data-sharing protocols between allied port authorities to enable real-time anomaly detection across high-fragility nodes
- Commission independent cyber resilience assessments at all nodes rated High or Critical before end of Q1 2027
- Develop contingency routing plans for Malacca corridor disruption scenarios involving more than 20% throughput reduction