# Resilience as an Engineered System Property

## Does it Make Sense?
## What Sense does it Make?

DRAFT WORKING PAPER

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**Abstract**

The concept of resilience as a property of engineered systems has garnered considerable attention in recent years. Yet the status of the concept remains unsettled and our ability to specify, realize, and assure resilience properties remains weak. We have conflicting conceptions of the origins of resilience, as either an engineered or organic property. The relationship of resilience to other recognized properties, such as survivability, is unclear. We have numerous but informal and inconsistent definitions of resilience. We have various *mechanisms* that support specific, often narrow notions of resilience. The resilience literature is sparse. We lack resilience specification languages and assurance methods. This paper presents a survey and analysis of work on resilience as a system property, distinct from mechanisms, and assesses the status of the concept and needs for future research and development.

# 1 Definitions

The International Council on Systems Engineering (INCOSE) defines resilience as "the ability of organizational, hardware and software systems to mitigate the severity and likelihood of failures or losses, to adapt to changing conditions, and to respond appropriately after the fact [**?**]."

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