

# Leveraging Sidecars for a More Probabilistic Cyber Convergence

Invitational Keynote for NexTech Congress 2020

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## About the Presenter:

Steve is an IARIA Fellow, and he presented an experimental architectural stack at [Data Analytics 2015](#) (in Nice, France), discussed sidecars for the monitoring of [cyber-health](#) at [CYBER 2016](#), sidecars to mitigate the [cyber attack surface](#) at IARIA 2018, and the use of sidecars and container orchestration for [anomaly detection at scale](#) at [CYBER 2019](#). For [Cyber 2020](#) (back in Nice, France), he will discuss how sidecars can help bridge legacy and emerging functionalities.

# Technical Discussion Progression



How **Sidecars** Can Help Achieve a Form of Cyber Convergence



# Welcome to CYBER 2020!

How **Sidecars** Can Help Achieve a Form of Cyber Convergence



Today's computing environment (e.g. polycloud, hybrid-cloud, etc) typically involves numerous distributed services.



As a microservices architecture for these numerous services has grown in popularity, the exposure via Application Programming Interfaces (APIs), as just one example, has resulted in an increased attack surface area.



To mitigate against the complexities of this increased attack surface area, a paradigm of sidecars can be utilized.

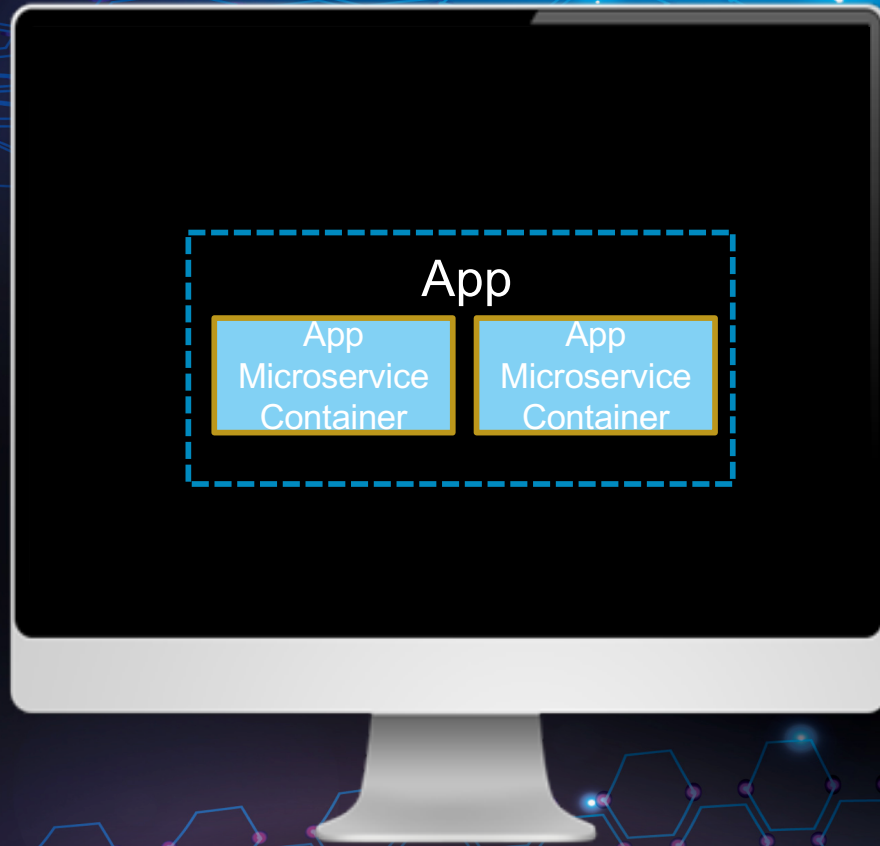


# Containers

The Building Block for Distributed Systems

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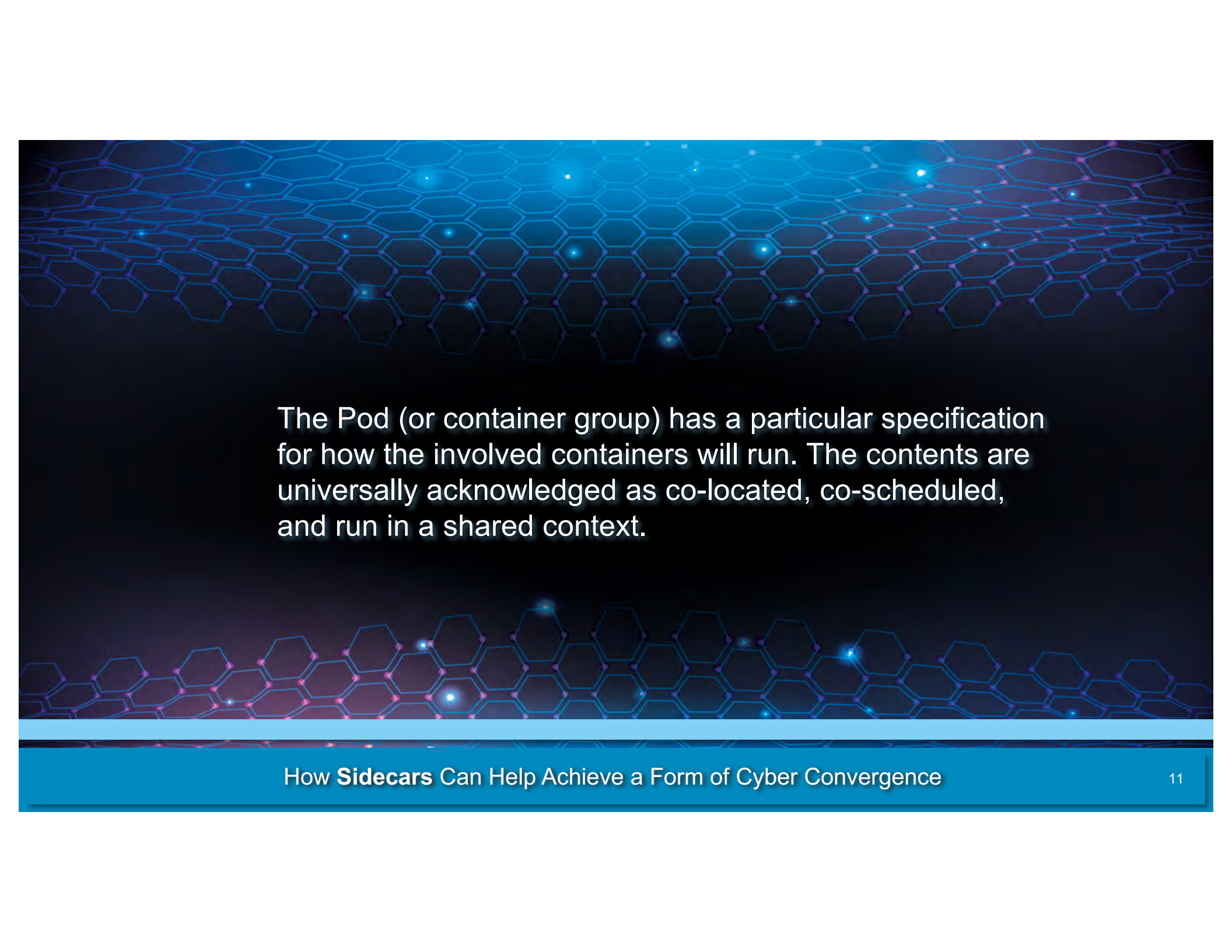
In a fashion similar to object-oriented thinking, the notion of containers facilitates abstraction away from the lower-level details of code and focuses on higher-level patterns so as to leverage the commonalities among the involved Applications (Apps).



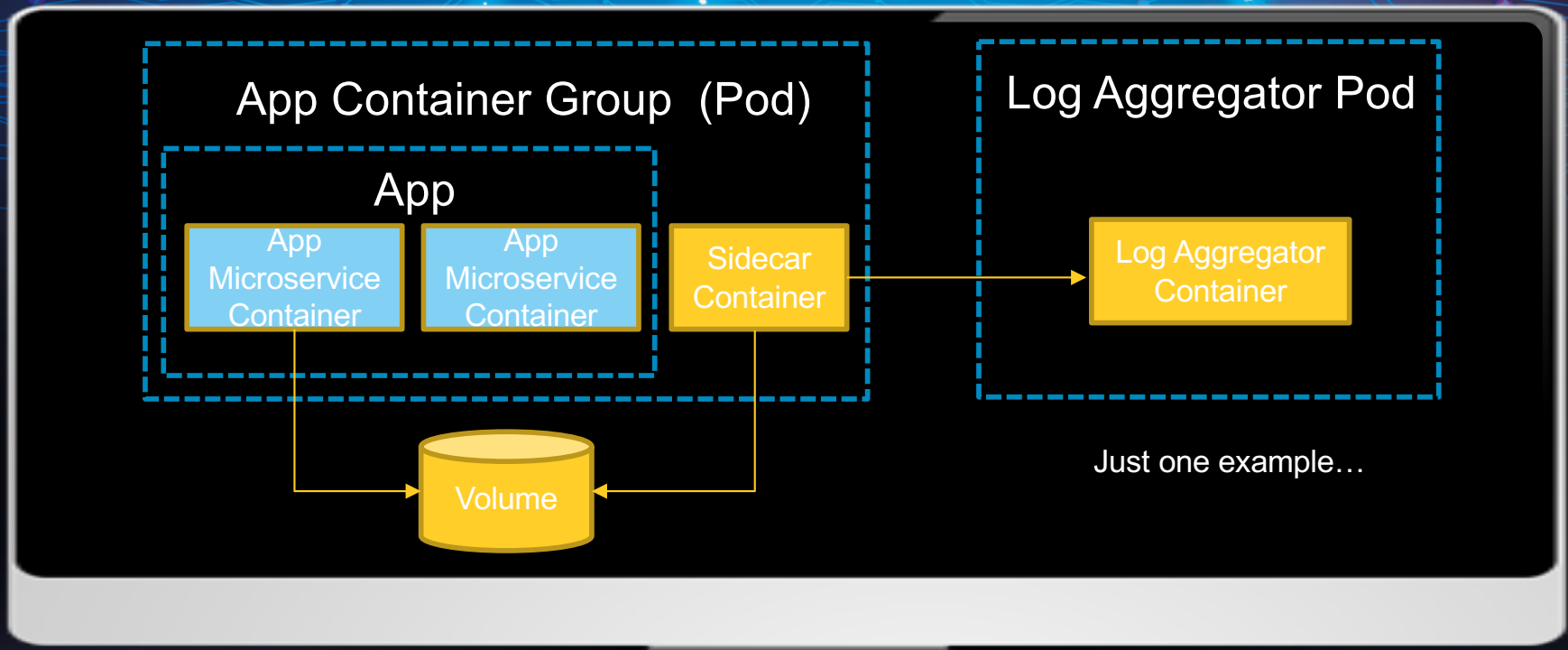
# Container Group (Pod)

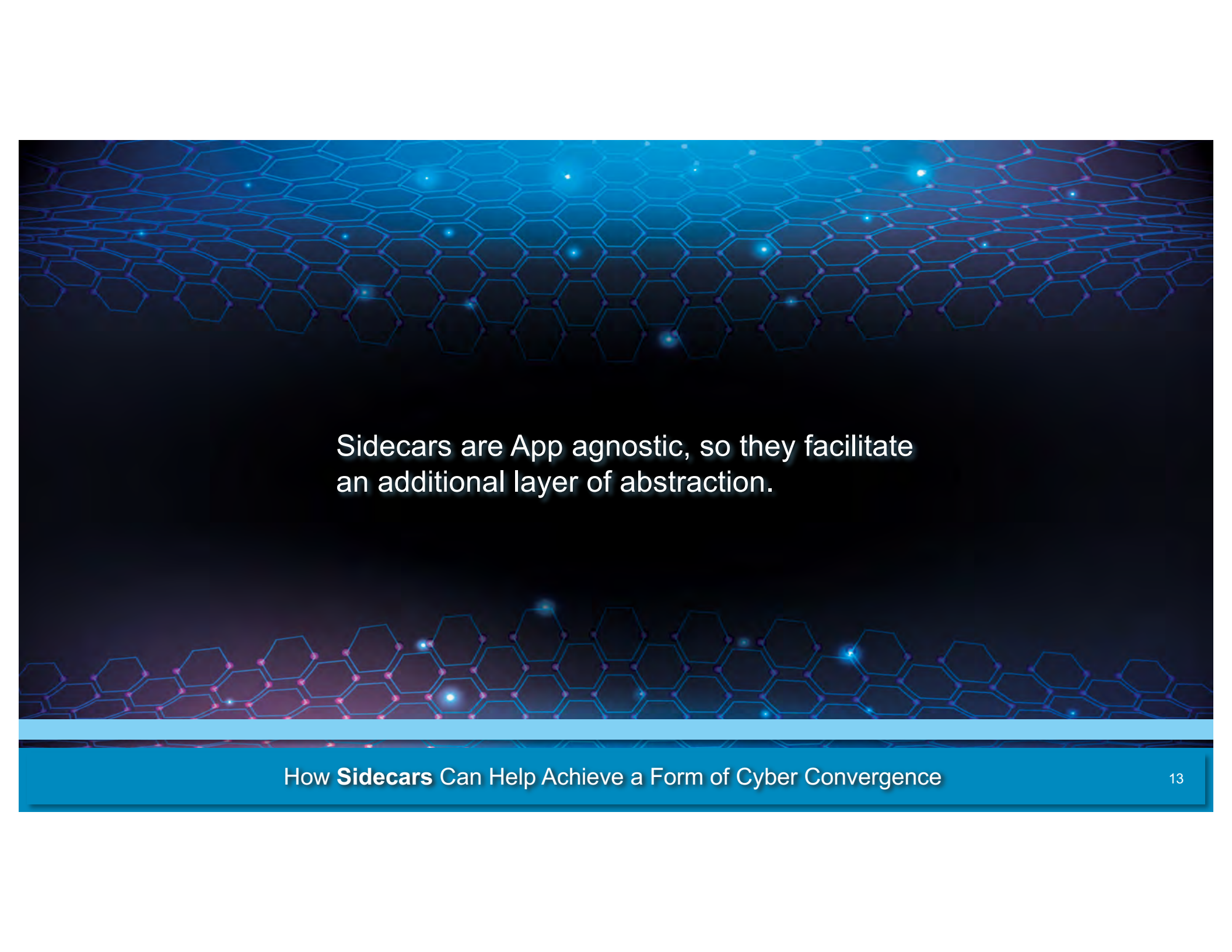
Application Container and Sidecar Container

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The Pod (or container group) has a particular specification for how the involved containers will run. The contents are universally acknowledged as co-located, co-scheduled, and run in a shared context.





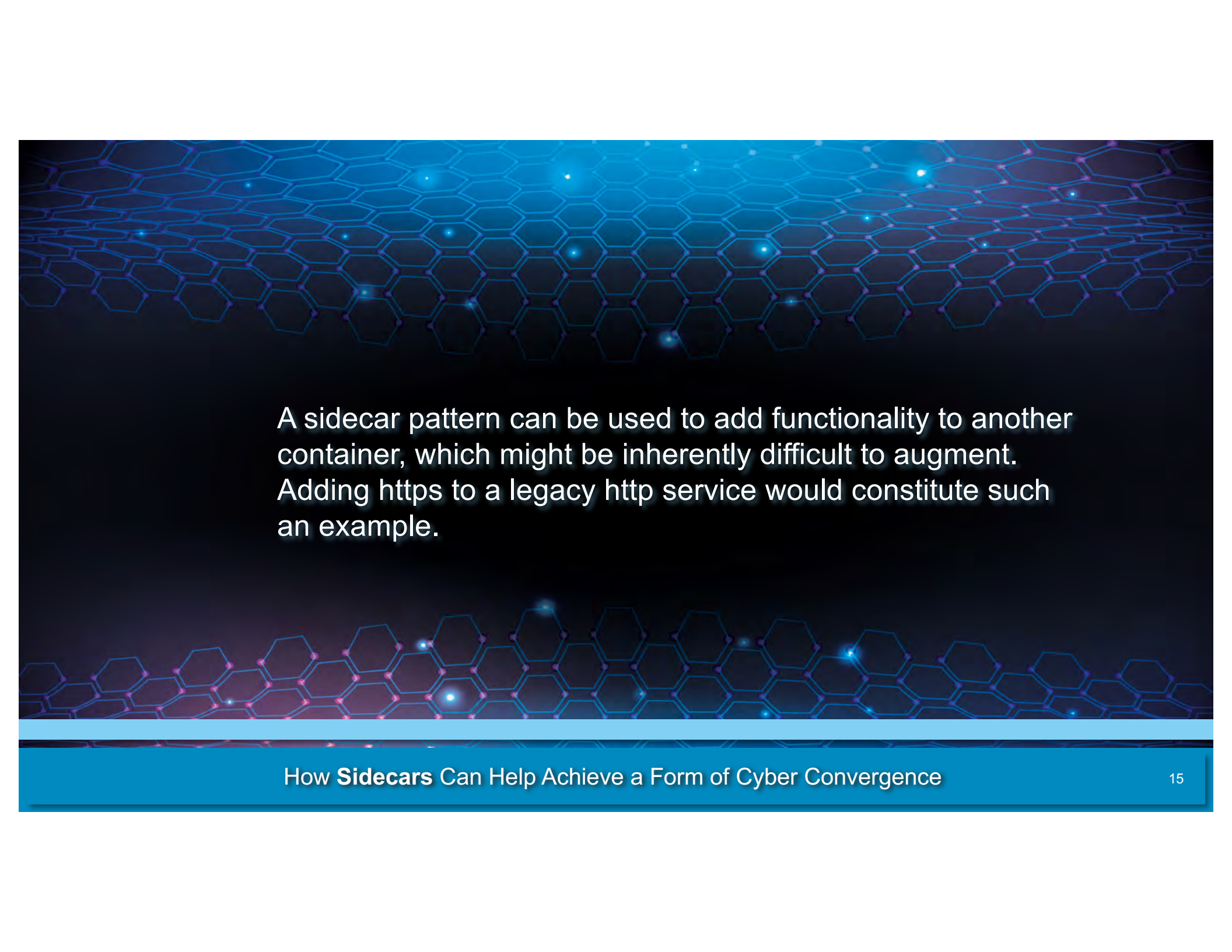
Sidecars are App agnostic, so they facilitate an additional layer of abstraction.



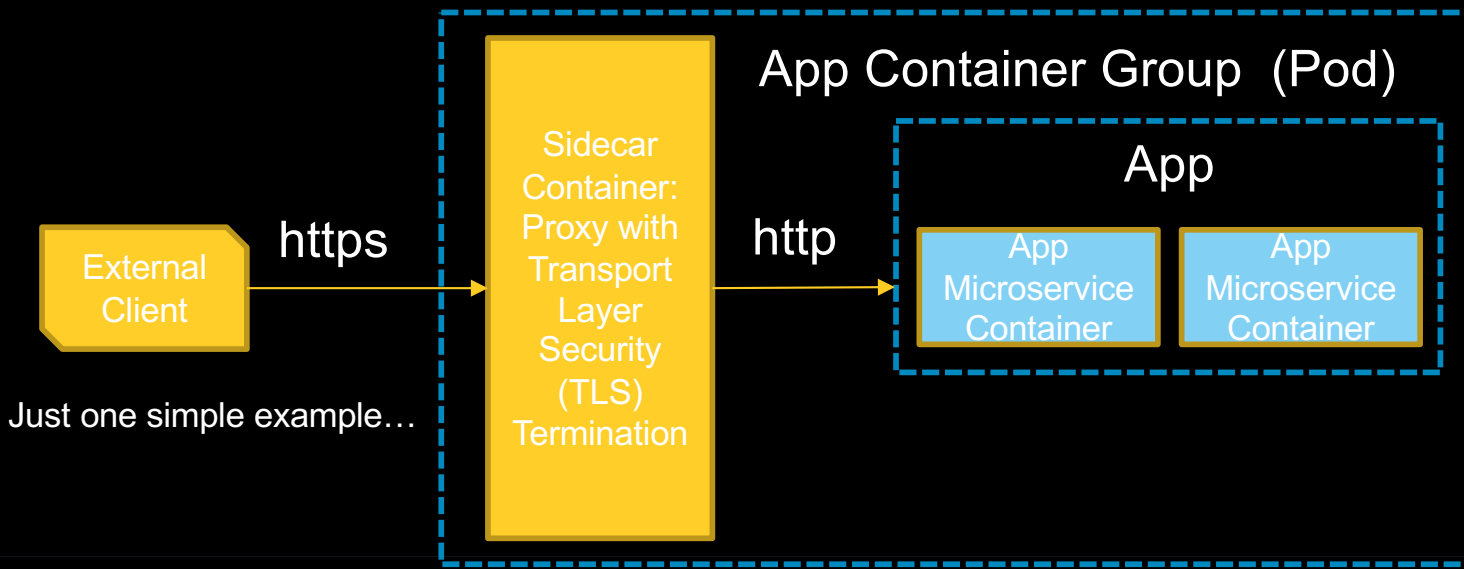
# Simple Sidecar Design Pattern

Adding Https to a Http Legacy Service

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A sidecar pattern can be used to add functionality to another container, which might be inherently difficult to augment. Adding https to a legacy http service would constitute such an example.





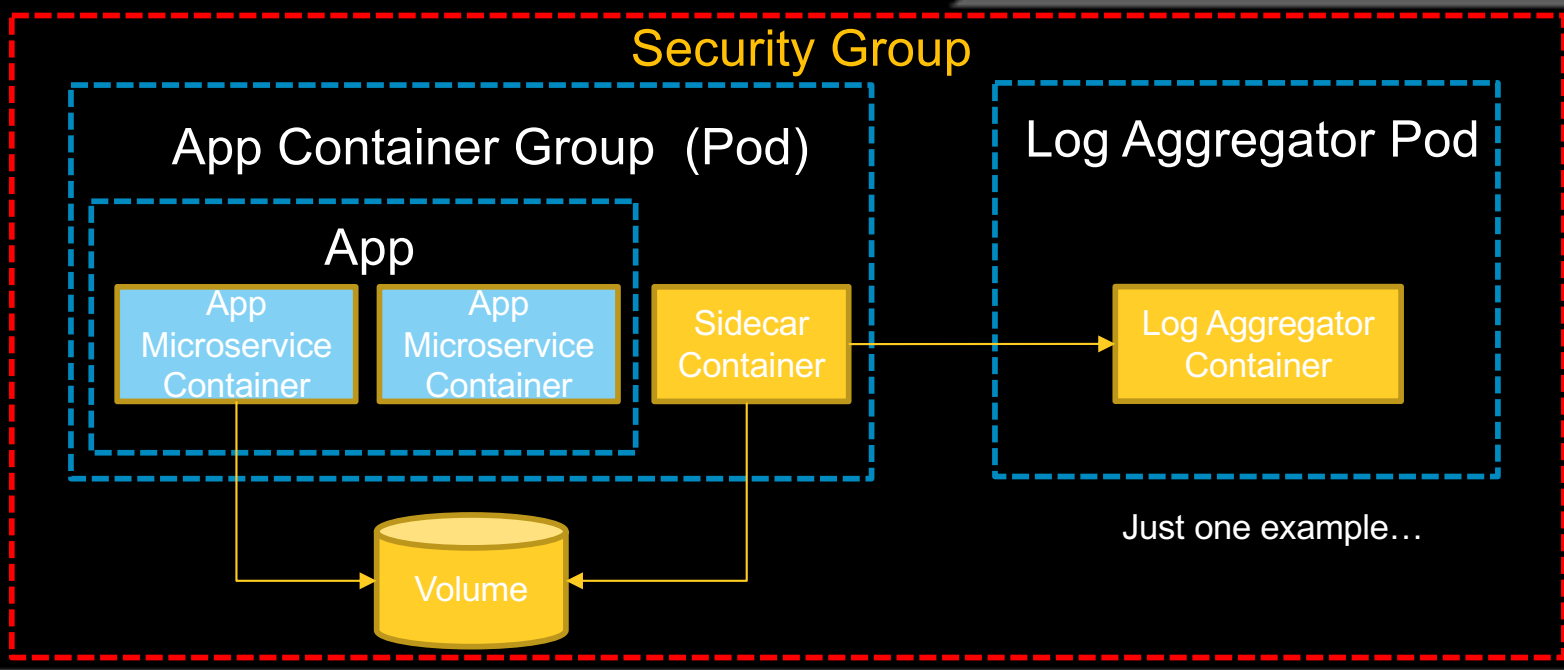


# Sidecar Security Design Pattern

Enables a more secure API surface for containers, thereby facilitating the convergence of emergent applications with legacy applications



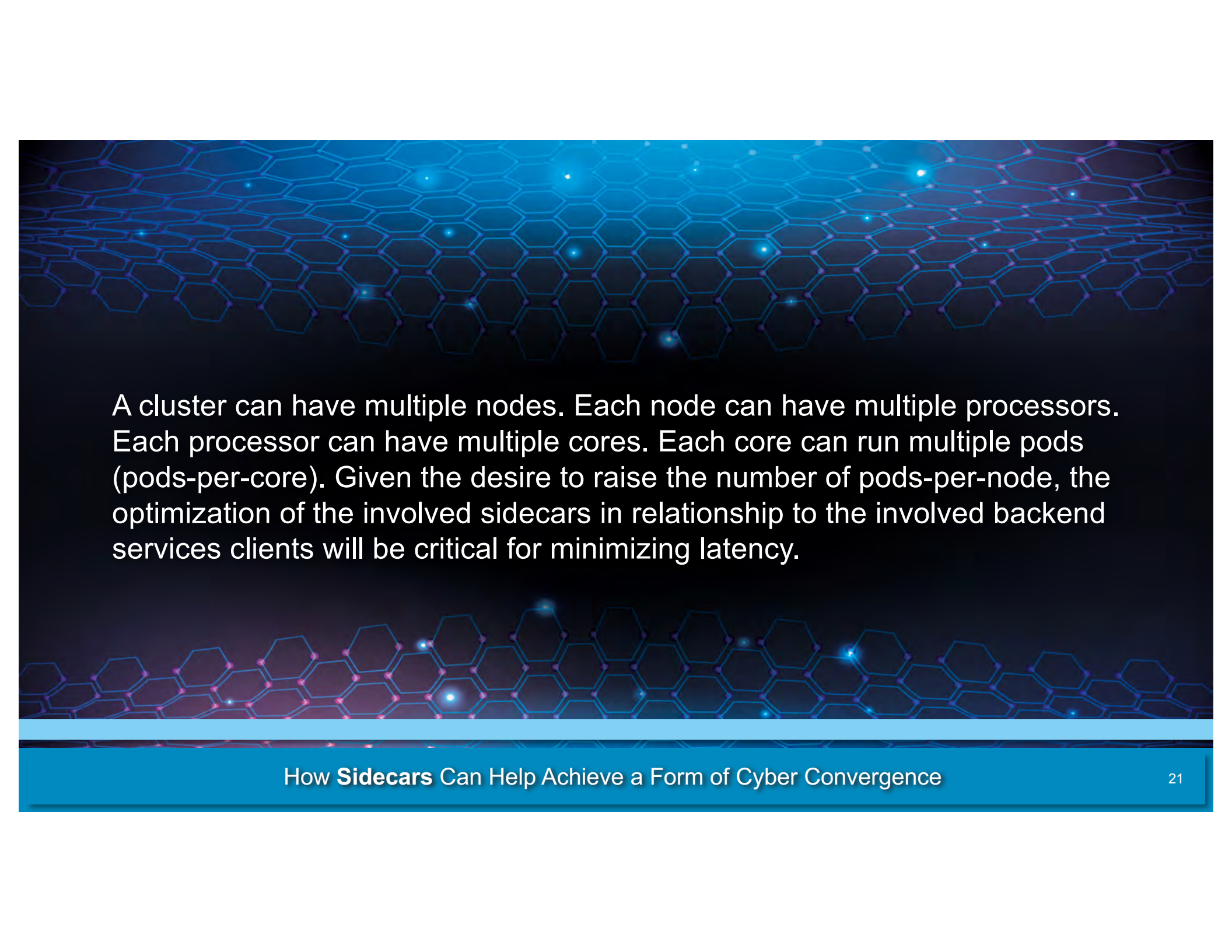
To reduce the complexity (and enhance dynamic resiliency and persistent security), **Security Groups** can be assigned directly to pods.



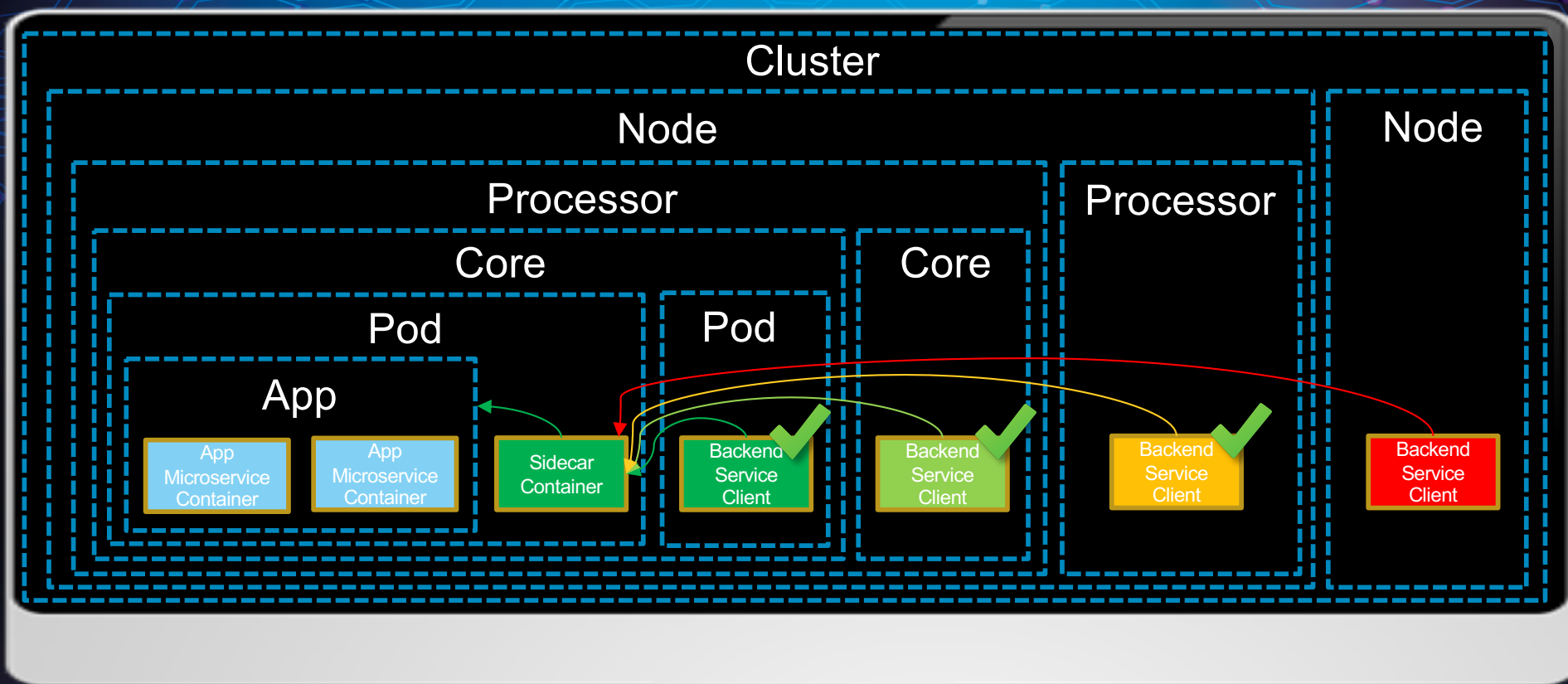


# Sidecar Latency Mitigation

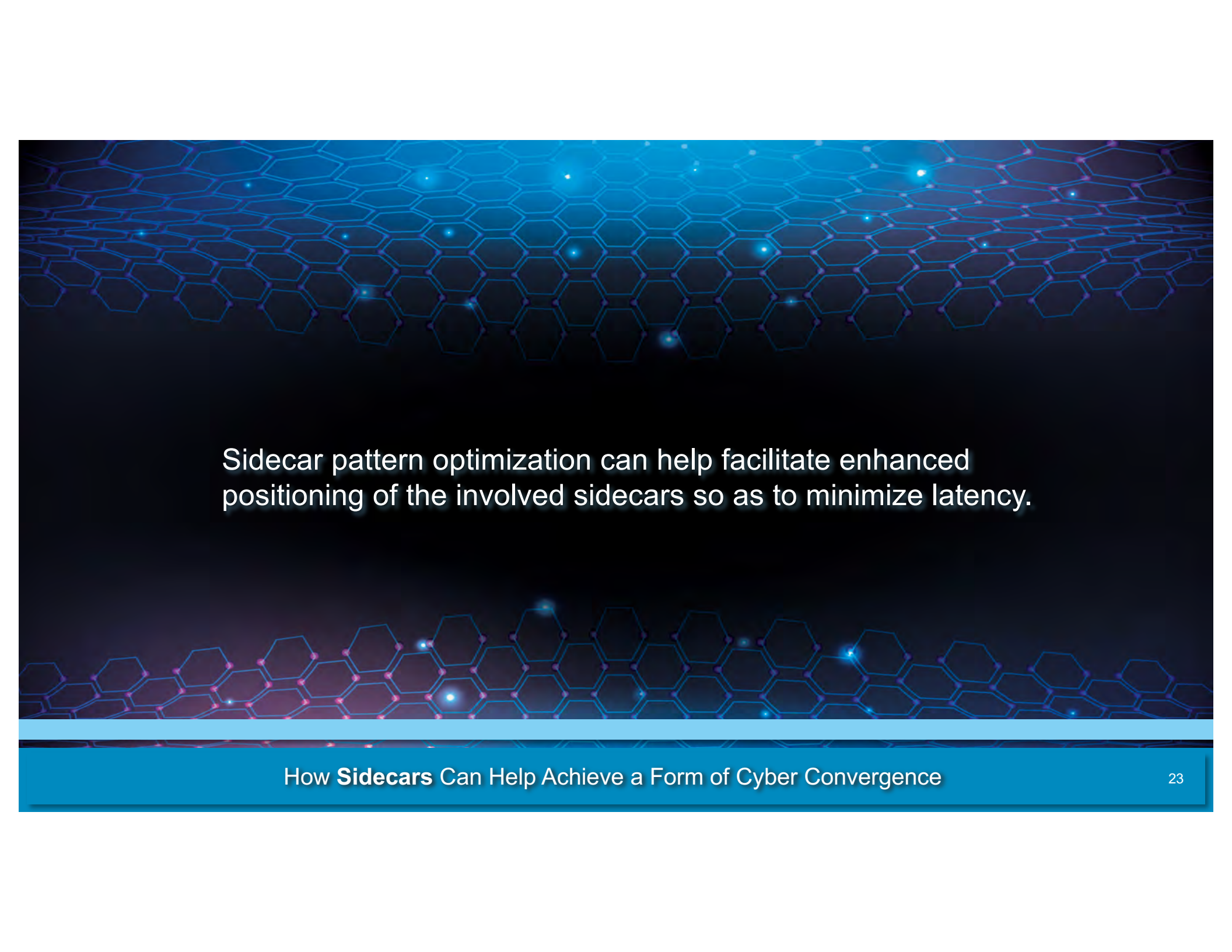
To facilitate enhanced sidecar performance, sidecar pattern optimization is ongoing so as to position the sidecar as close to the backend service client as possible.



A cluster can have multiple nodes. Each node can have multiple processors. Each processor can have multiple cores. Each core can run multiple pods (pods-per-core). Given the desire to raise the number of pods-per-node, the optimization of the involved sidecars in relationship to the involved backend services clients will be critical for minimizing latency.



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Sidecar pattern optimization can help facilitate enhanced positioning of the involved sidecars so as to minimize latency.



# The Takeaway...

Sidecar pattern optimization can make the usage of sidecars much more advantageous and useful for bridging legacy and emerging functionalities.





Thank you for your time  
and attention!  
Have a great  
CYBER 2020!

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