

CAB432 Cloud Computing

Lecture 2: Container as a Service

Faculty of Science



Queensland University of Technology

CRICOS No. 00213J



CaaS Offerings and Orchestration

CAAS SERVICES



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Amazon EC2 Container Service

The screenshot shows a web browser window for the Amazon ECS homepage. The URL in the address bar is <https://aws.amazon.com/ecs/>. The page title is "Amazon Elastic Container Service". The main content area features a dark background with a futuristic hexagonal grid pattern. A large white heading "Amazon Elastic Container Service" is centered at the top. Below it, a vertical orange line contains the text "Run containerized applications in production". A yellow button labeled "Get started with Amazon ECS" is positioned below the line. To the right, there is a sidebar with the heading "UPCOMING EVENT" and the text "Build with Containers 2018". It describes the event as covering AWS container experts and building with containers using Kubernetes, Amazon Elastic Container Service (ECS), and AWS Fargate. A "Learn More & Register »" link is at the bottom of the sidebar. The browser's header includes the AWS logo, navigation links like "Contact Sales", "Products", "Solutions", "Pricing", "Getting Started", "Documentation", and "More", and language and account settings.

<https://aws.amazon.com/ecs/> (2019 Image)



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Azure Container Services

The screenshot shows the Microsoft Azure website with the URL azure.microsoft.com/en-au/product-categories/containers/. The page title is "Container services". Below the title, a sub-headline reads "Accelerate your containerised application development without compromising security". A descriptive paragraph follows, detailing how Azure Container Services help users save costs by shifting existing applications to containers and building microservices. It mentions the integration with CI/CD tools, Kubernetes, and Azure Active Directory.

Azure Containers | Microsoft Azure

Microsoft Azure

Contact Sales Search My account Portal Sign in

Overview Solutions Products Documentation Pricing Training Marketplace Partners Support Blog More

Free account >

Container services

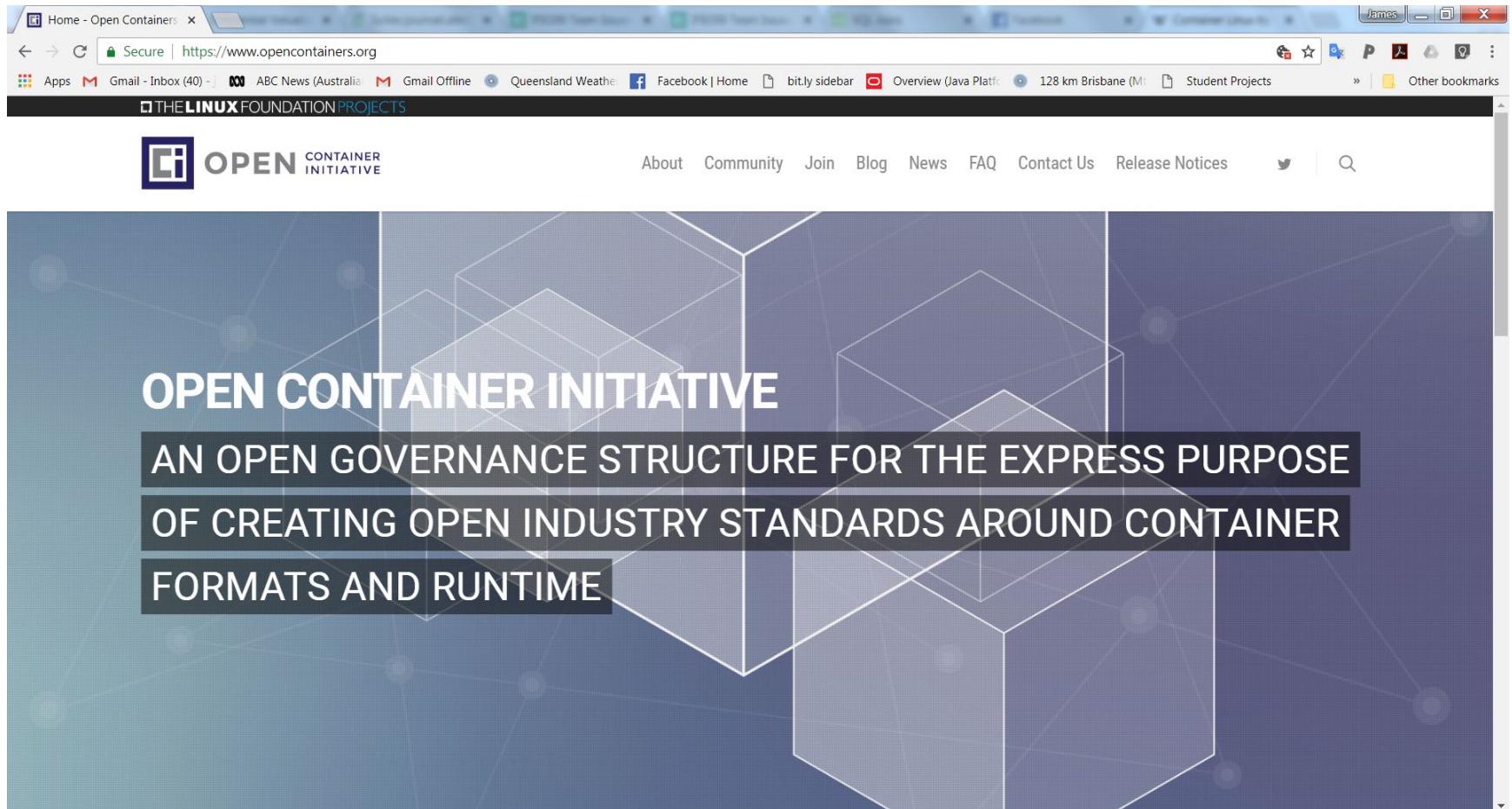
Accelerate your containerised application development without compromising security

Save costs by lifting and shifting your existing applications to containers, and build microservices applications to deliver value to your users faster. Use end-to-end developer and CI/CD tools to develop, update and deploy your containerised applications. Manage containers at scale with a fully managed Kubernetes container orchestration service that integrates with Azure Active Directory. Wherever you are in your app modernisation journey, accelerate your containerised application development while meeting your security requirements.

<https://azure.microsoft.com/en-au/product-categories/containers/>



Open Container Initiative



<https://www.opencontainers.org/>



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<https://www.opencontainers.org/about/members>



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Members



<https://www.opencontainers.org/about/members>

Container Orchestration

- We will discuss these, though others exist:
 - Kubernetes (<https://kubernetes.io/>)
 - Docker Swarm (<https://docs.docker.com/engine/swarm/>)
- Both designed to simplify the provision of multiple services to a cluster of servers.
 - “At the end of the day, both tools let you deploy 1 or more services onto a cluster of servers. Then, you can operate on that cluster instead of individual servers”
 - See <https://nickjanetakis.com/blog/docker-swarm-vs-kubernetes-which-one-should-you-learn>

Final Comments on Docker

- Swarm is Docker specific, built into the CLI.
 - <https://docs.docker.com/engine/swarm/swarm-tutorial/>
- For swarms, the idea is to deploy from a manager node to multiple worker nodes across a network.
- The docker daemon runs on the worker nodes and will handle the deployment when shared from the manager node.
- Simpler and easier to install than Kubernetes
- But not as a flexible as a container scheduler

Kubernetes

- Initially developed by Google and the open sourced.
 - <https://kubernetes.io/>
 - <https://kubernetes.io/docs/tutorials/kubernetes-basics/cluster-intro/>
- Supports Docker and other container images
 - Harder to do easier stuff, easier (able) to do harder stuff

Kubernetes

- Managed services from the majors
 - “GCP Kubernetes” <https://cloud.google.com/kubernetes-engine>
 - “CoreOS + Red Hat” (<https://coreos.com/blog/coreos-tech-to-combine-with-red-hat-openshift>)
 - AWS Kubernetes Service (<https://aws.amazon.com/eks/>)
 - Azure Kubernetes Service (<https://azure.microsoft.com/en-au/services/kubernetes-service/>)

Google

The screenshot shows a web browser window for the Google Cloud website, specifically the Kubernetes Engine page. The URL is cloud.google.com/kubernetes-engine. The page features a large title "Google Kubernetes Engine" and a summary text: "Secured and managed Kubernetes service with four-way auto scaling and multi-cluster support." Below this is a "Go to console" button. To the right, there is a video player showing two men discussing GKE features, with a timestamp of 30:22. The video is titled "Overview of GKE features". A sidebar on the left includes links for "Containers", "JUMP TO", "Contact Sales", and navigation icons.

Kubernetes - Google Kubernetes

cloud.google.com/kubernetes-engine

Google Cloud Why Google Solutions Products Pricing Getting Started Language Console Contact Sales

Containers JUMP TO

Google Kubernetes Engine

Secured and managed Kubernetes service with four-way auto scaling and multi-cluster support.

Go to console

- ✓ Start quickly with single-click clusters
- ✓ Leverage a high-availability control plane including multi-zonal and regional clusters
- ✓ Eliminate operational overhead with auto-repair, auto-upgrade, and release channels
- ✓ Secure by default, including vulnerability scanning of container images and data encryption
- ✓ Integrated Cloud Monitoring with infrastructure, application, and Kubernetes-specific views

VIDEO
Overview of GKE features

<https://cloud.google.com/kubernetes-engine>

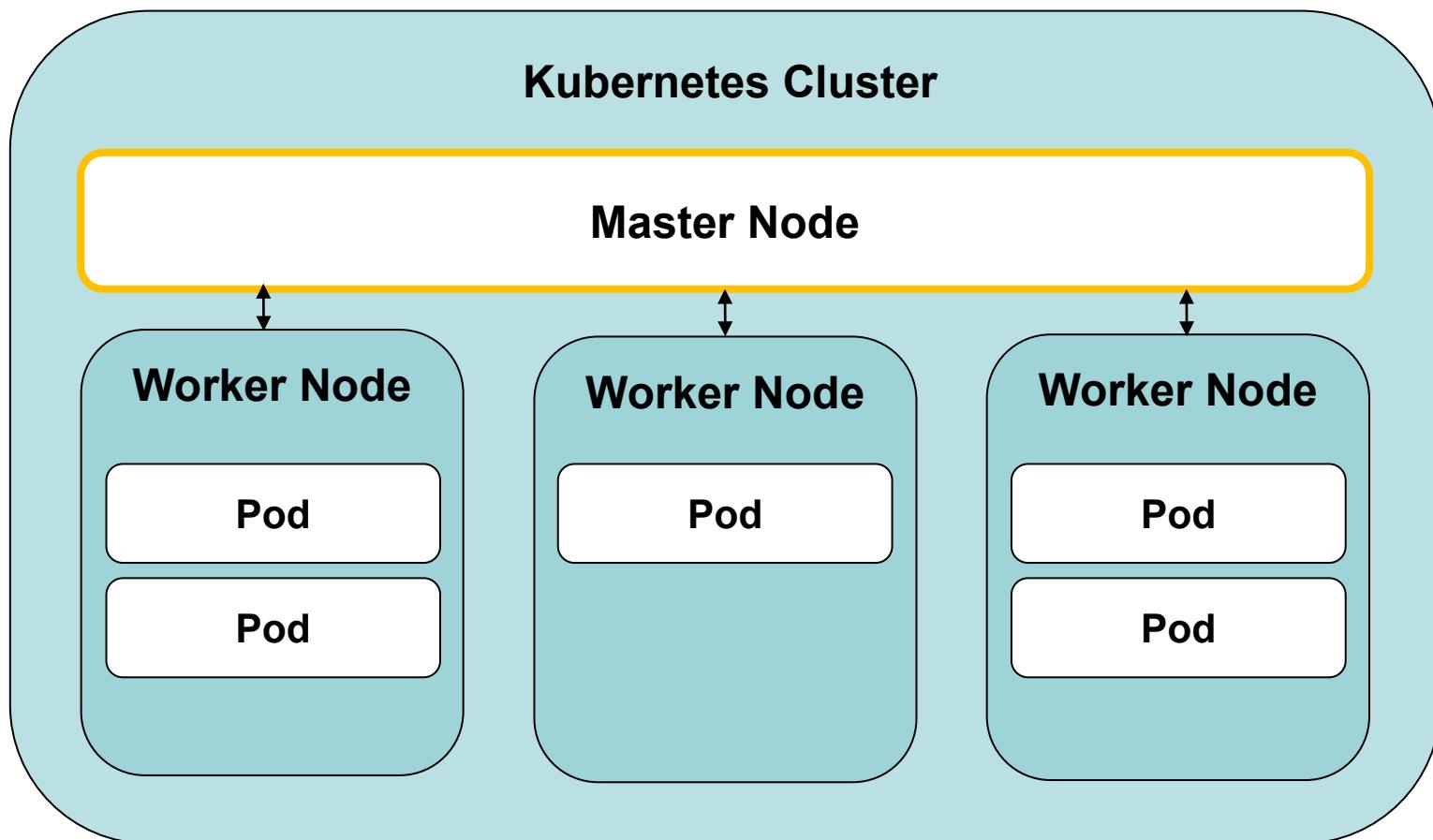


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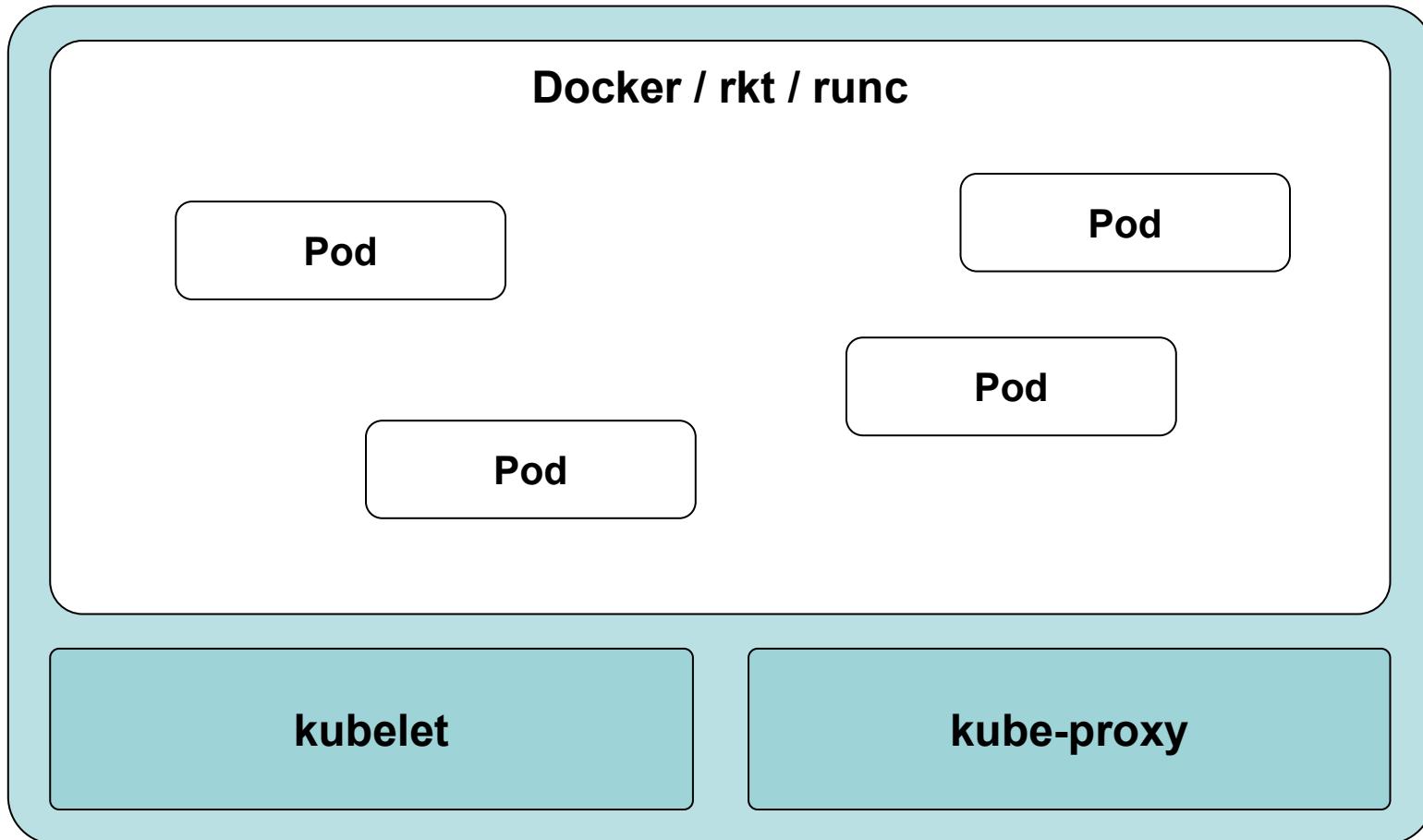
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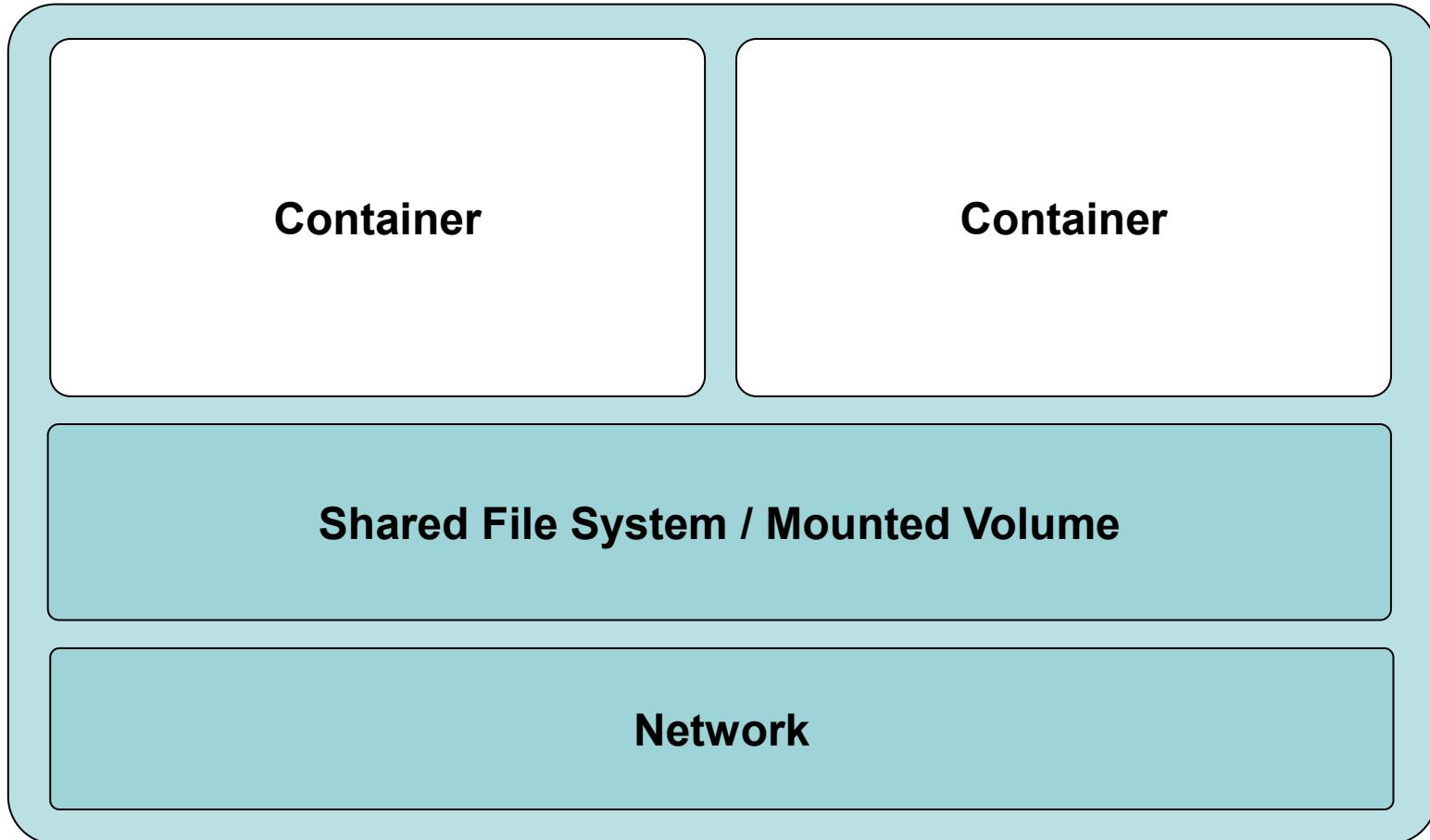
Architecture Visualisation



Inside a Worker Node



Inside a Pod



Azure Kubernetes Service

The screenshot shows the Microsoft Azure website with the URL <https://azure.microsoft.com/en-us/services/kubernetes-service/>. The page title is "Azure Kubernetes Service (AKS)". The main heading is "Azure Kubernetes Service (AKS)" with the subtext "Highly available, secure, and fully managed Kubernetes service". A blue button labeled "Explore Kubernetes learning path >" is visible. The background features a dark theme with a large blue hexagon containing a white Kubernetes steering wheel icon. Below the main heading, there is a navigation bar with links: Product overview, Features, Solution architectures, Pricing, Customer stories, Getting started, Documentation, Updates, and FAQs.

<https://azure.microsoft.com/en-us/services/kubernetes-service/>



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