



















 OBJECTIVES - 11/16
 Questions from 11/9
 Term Project Proposals - update by 11/19
 Tutorial 5 - Intro to FaaS II - Files in S3, CloudWatch
 Tutorial 6 - Intro to FaaS III - Serverless Databases
 Question 6 - Intro to FaaS III - Serverless Databases
 Question 1 - Group Presentation Overview: Cloud Technology or Research Paper for 11/30 - 12/9
 Term Project Check-in - due Wed 12/1 @ 11:59p
 Ch. 5: Cloud Enabling Technology
 Team planning
 Movember16,202







14



15













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21









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KERNEL BASED VIRTUAL

MACHINES (KVM)

KVM integrates hypervisor functionality directly into the

Linux kernel (as of Linux kernel version 2.6.20 - 2007) Machine "boots" the hypervisor kernel, because the Linux kernel itself <u>is the hypervisor kernel</u> • KVM could be considered a "hybrid" (blend)

 KVM converts Linux into a type-1 (bare-metal) hypervisor
 KVM users Linux memory manager, process scheduler, input/output (I/O) stack, device drivers, security

VMs are implemented as regular Linux processes.

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manager, network stack, and more

scheduled by the Linux scheduler • KVM requires HW-level support to run

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TYPES OF ABSTRACTION IN THE CLOUD • Virtual Machines - original laaS cloud abstraction OS/Application Containers - seen with CaaS • OS Container - replacement for VM, mimics full OS instance, heavier OS containers run 100s of processes just like a VM App Container – Docker: packages dependencies to easily transport and run an application anywhere Application containers run only a few processes Micro VMs - FaaS / CaaS Lighter weight alternative to full VM (KVM, XEN, VirtualBox) Firecracker = Unikernel Operating Systems - research mostly Single process, multi-thread operating system Designed for cloud, objective to reduce overhead of running too many OS instances TCSSS62: Software Engineering for Cloud Computing [Fall 2021] School of Engineering and Technology, University of Washingtor November 16, 2021 L13.33





35









39



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42





41

Slides by Wes J. Lloyd





44















 CONTAINER SERVICES

 Public cloud container cluster services

 Azure Kubernetes Service (AKS)

 Amazon Elastic Container Service for Kubernetes (EKS)

 Google Kubernetes Engine (GKE)

 Octaliner-as-a-Service

 Azure Container Instances (ACI – April 2018)

 AWS Fargate (November 2017)

 Google Kubernetes Engine Serverless Add-on (alpha-July 2018)

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56





- Supersedes SOAP Simple Object Access Protocol
- Access and manipulate web resources with a predefined set of stateless operations (known as web services)
- Requests are made to a URI
- Responses are most often in JSON, but can also be HTML, ASCII text, XML, no real limits as long as text-based

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HTTP verbs: GET, POST, PUT, DELETE, ...

58

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63

