Serverless Computing

Introduction, Architecture and Economics

Presented by
Khizer Naeem
kxn8888@rit.edu

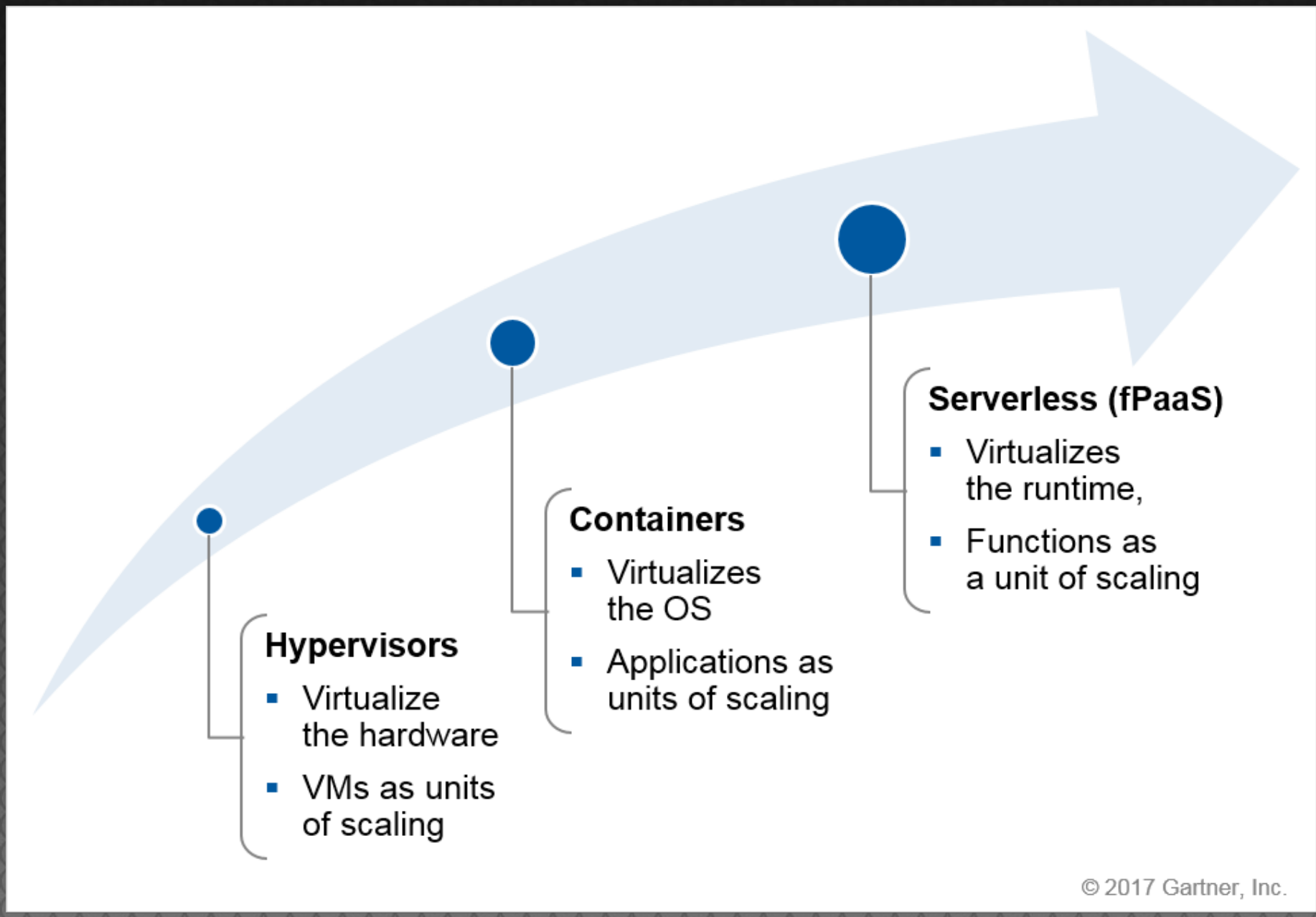
Today's Topics

1. Introduction
2. Architecture
3. Economics

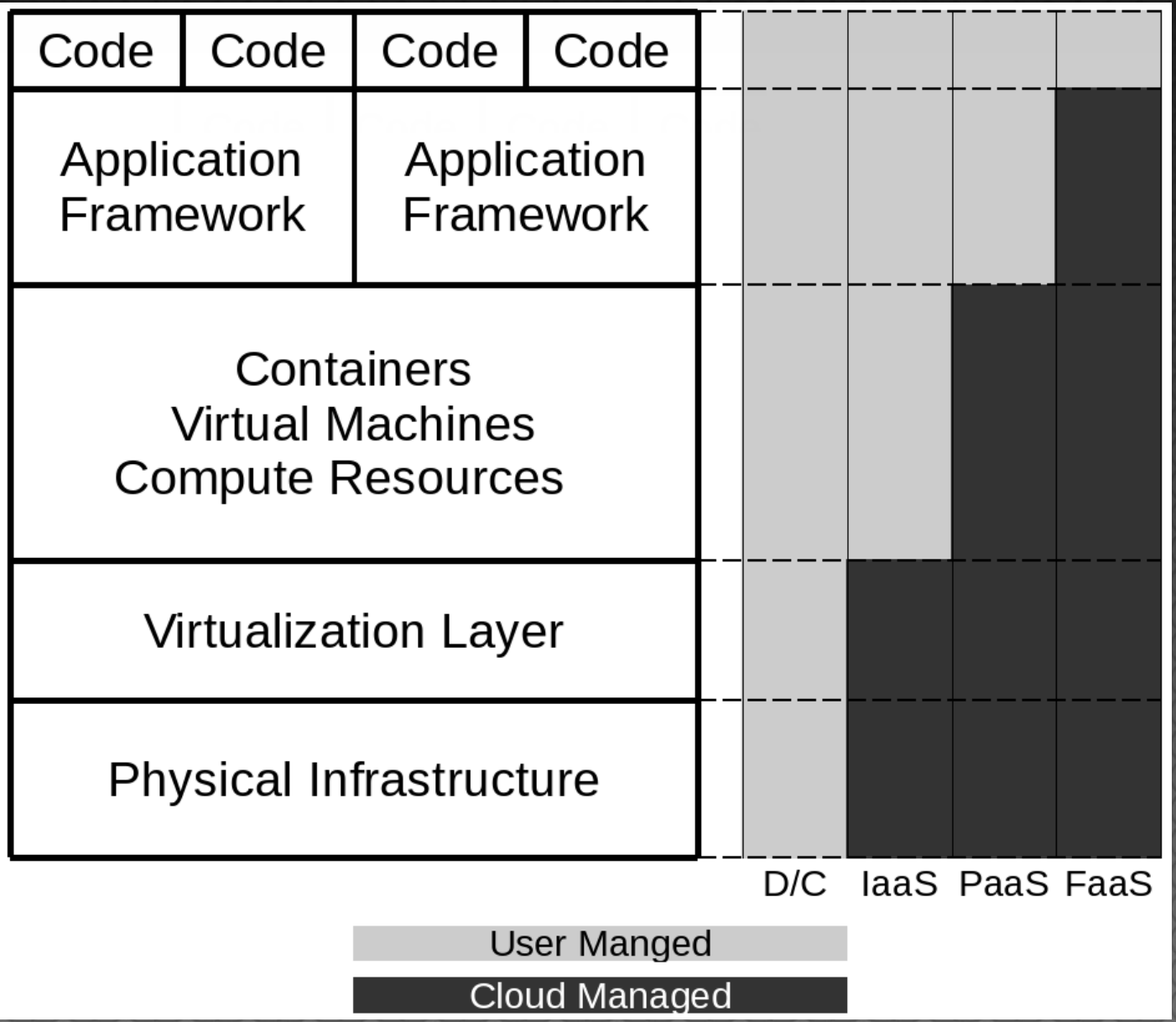
Introduction

- Serverless is not serverless
  - Actually involves servers
  - Not under your Administration
- Function as a Service (FaaS)
  - Tightly coupled to providers
    - AWS Lambda
    - Google Fucntions
    - Azure Functions
- Highest level of cloud philosophy
  - Pay for what you use
  - Transparent scaling

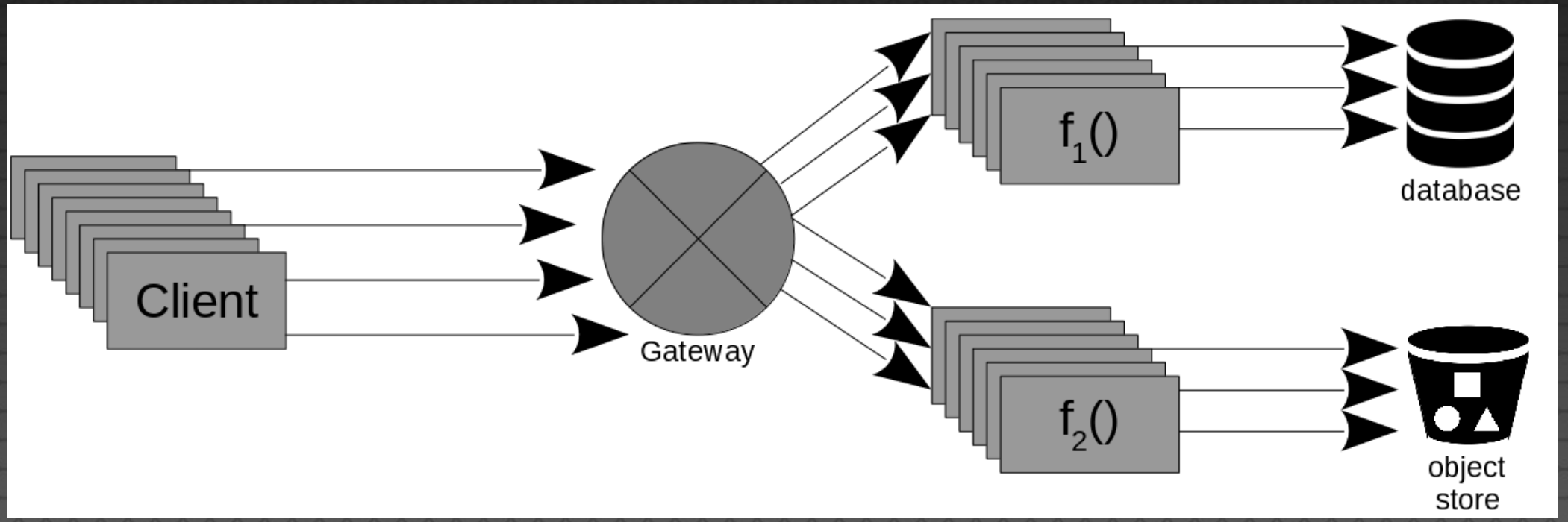
Architecture



Architecture



Architecture



Economics

- Priced on resources used and time
  - IaaS vs Serverless
  - Rent a Car vs Taxi
- Memory
- Time
  - Per millisecond
  - Limited by timeout

Economics

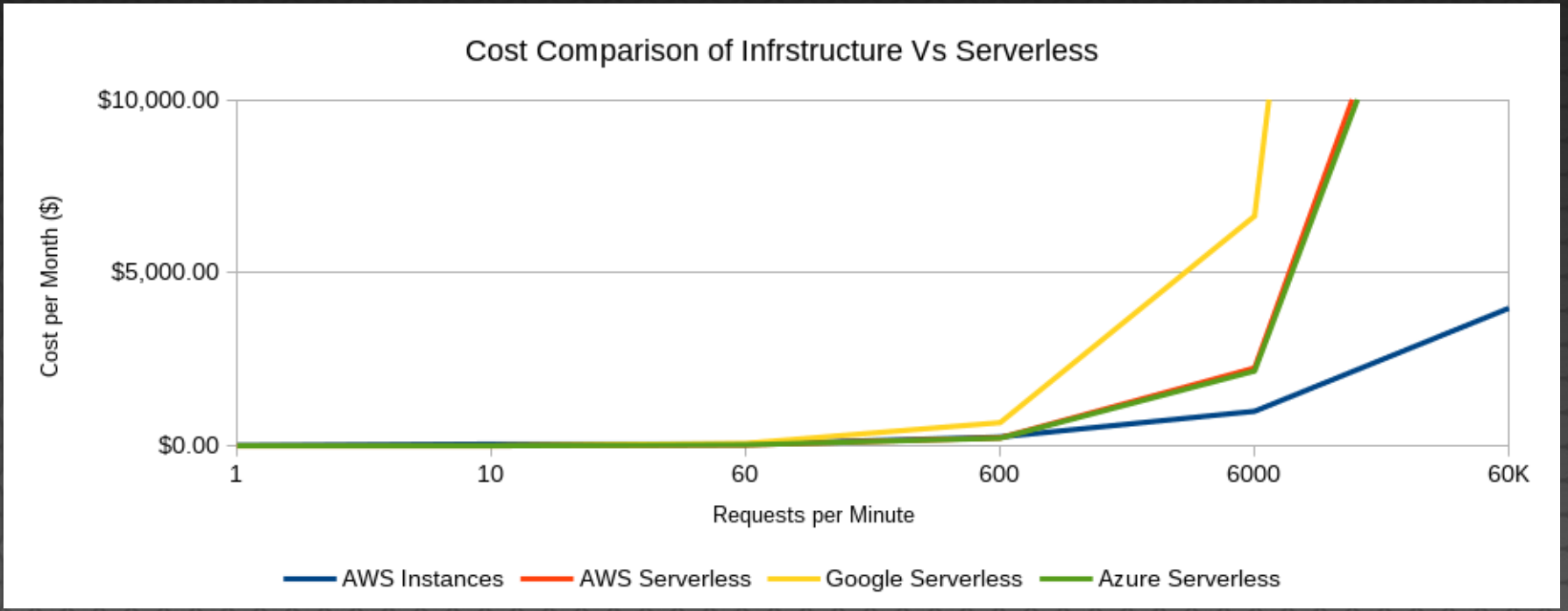
TABLE 1. SERVERLESS PRICES FOR FIXED 1024 MB MEMORY

Cloud Vendor	1 Million GB-Seconds Cost	1 Million Invocation Cost
AWS Lambda	$ 16.67	$ 0.20
Azure Functions	$ 16.60	$ 0.20
Google Functions	$ 25.00	$ 0.40

Economics

Cost Calculation for a 1s Request of size 512 MB				
Instance Type	**Memory (GB)**	**Req/sec Capacity**	**IaaS Cost/Month**	**FaaS Cost/Month**
t2.nano	0.5	1	$4	$22
t2.micro	1	2	$8	$45
t2.small	2	4	$17	$90
t2.medium	4	8	$34	$179
m4.large	8	16	$73	$359
m4.xlarge	16	32	$146	$718
m4.2xlarge	32	64	$292	$1,436
m4.4xlarge	64	128	$584	$2,871
m4.10xlarge	160	320	$1,460	$7,178
m4.16xlarge	256	512	$2,336	$11,484

Economics


Cost Comparison of Infrstructure Vs Serverless
$10,000.00
$5,000.00
$0.00
Cost per Month ($)
1
10
60
600
6000
60K
Requests per Minute
AWS Instances
AWS Serverless
Google Serverless
Azure Serverless

Questions?