Compute Resources:

Jetflix is a video streaming application. As new features of the app were developed the computing resources required grew as shown in the table below:

Routes	vCPUs	Memory (GiB)	Storage (GB/TB)
User Management	0.5	2	0
Billing	1.5	2	100
Streaming	2	8	200
Recommendation Engine	2	6	50
Total	6	18	350

How can this application be deployed such that the technical requirements are satisfied at a reasonable cost?

Mem & CPU Pricing of AWS Compute Resources:

Our preferred cloud host AWS provides the following option for VM compute and Storage resources.

Instance Type	vCPUs	Memory (GiB)	Storage (Typical)	Hypothetical Monthly Cost
t3.micro	2	1	EBS-Only	$8
t3.small	2	2	EBS-Only	$16
t3.medium	2	4	EBS-Only	$32
t3.large	2	8	EBS-Only	$50
m5.large	2	8	EBS-Only	$70
m5.xlarge	4	16	EBS-Only	$140
m5.2xlarge	8	32	EBS-Only	$280
c5.xlarge	4	8	EBS-Only	$130
c5.2xlarge	8	16	EBS-Only	$260
r5.large	2	16	EBS-Only	$90
r5.xlarge	4	32	EBS-Only	$180

Storage - AWS EBS Pricing:

$0.10 per GB/Month

Monolithic Approach Cost:

You can provision a single VM that runs the entire application. This means it must cover the sum of all of the resources required by all features.

CPU: 6 cores
Memory: 20 GB
Storage: 350 GB

Monolithic Architecture

Components	Resource Requirements	Monthly Cost
EC2 Instance	`m5.2xlarge` (8 vCPUs, 32 GiB Memory)	Approx. $280
Storage (EBS)	General Purpose SSD (gp2) - 350GB	Approx. $35
Total		$315

Microservices Architecture

However consider a microservice-esque approach where we group together features such that in individual group is much smaller than the previously mentioned monolith

Group 1

Routes	vCPUs	Memory (GiB)	Storage (GB/TB)
User Management	0.5	2	0
Billing	1.5	2	100
Total	2	4	100

Group 2

Routes	vCPUs	Memory (GiB)	Storage (GB/TB)
Streaming	2	8	200
Recommendation Engine	2	6	50
Total	4	14	250

Each group has much smaller total requirements and thus may be deployed in two smaller VMS.

Components	Resource Requirements	Monthly Cost
User Management & Billing EC2 Instance	t3.medium (2 vCPUs, 4GiB memory)	$32
Streaming & Recommendation Engine EC2 Instance	m5.xlarge (4 vCPUs, 16GiB memory)	$140
Storage (EBS)	General Purpose SSD (gp2) - 350GB	$35
Total		$207

Here we see how a microservice approach may bring cost savings but there are other advantages such as:

- Feature Isolation: If Streaming has high usage it would not affect User Management
- Independent Scaling: If User management now requires extra resources we would require a slightly larger EC2 instance in the microservice approach instead of scaling the already large monolith further.