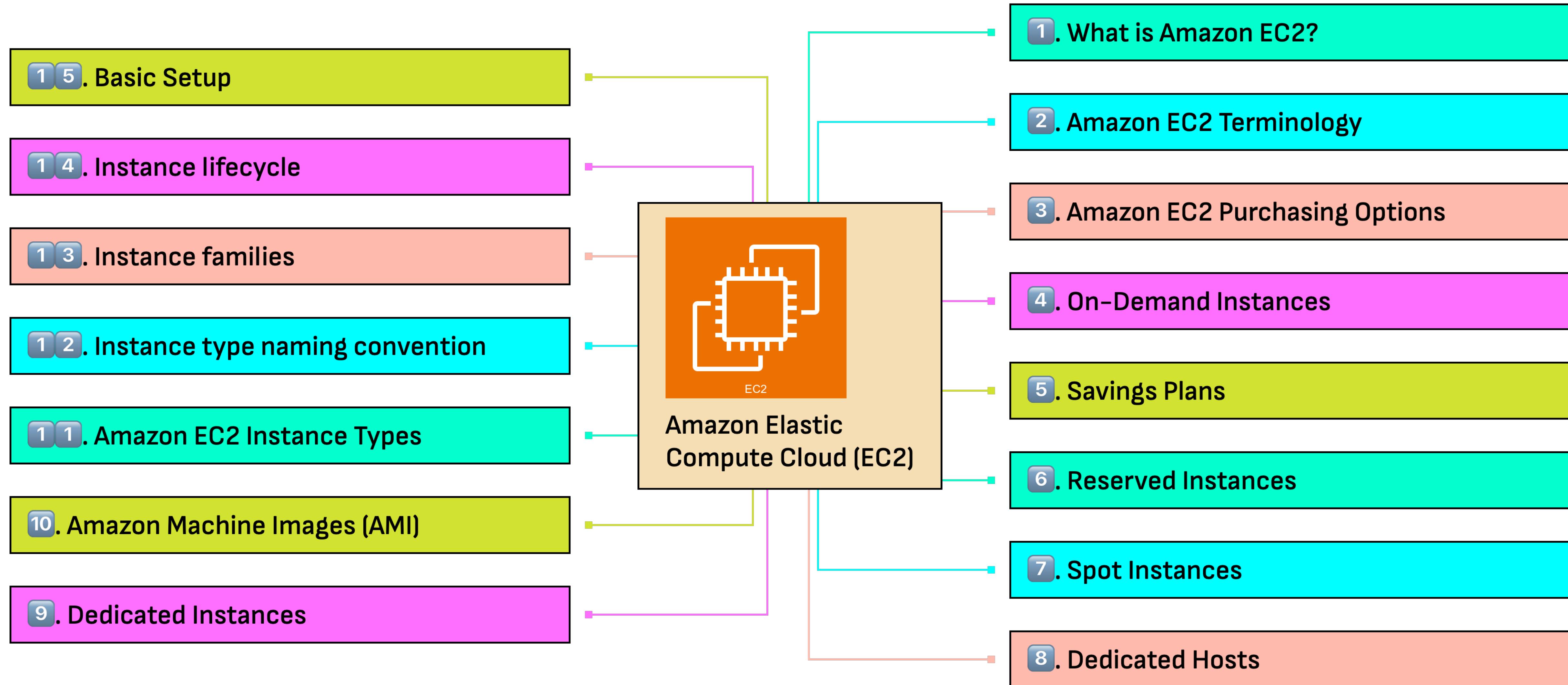


Amazon Elastic Compute Cloud (EC2)

Table of Contents



What is Amazon EC2?

1. Virtual Server in AWS Cloud

Instance type determines hardware

Balance of resources:

Compute

Memory

Network

Storage

AWS Cloud



1. Hosts

VPC



9. Hosts

IAM

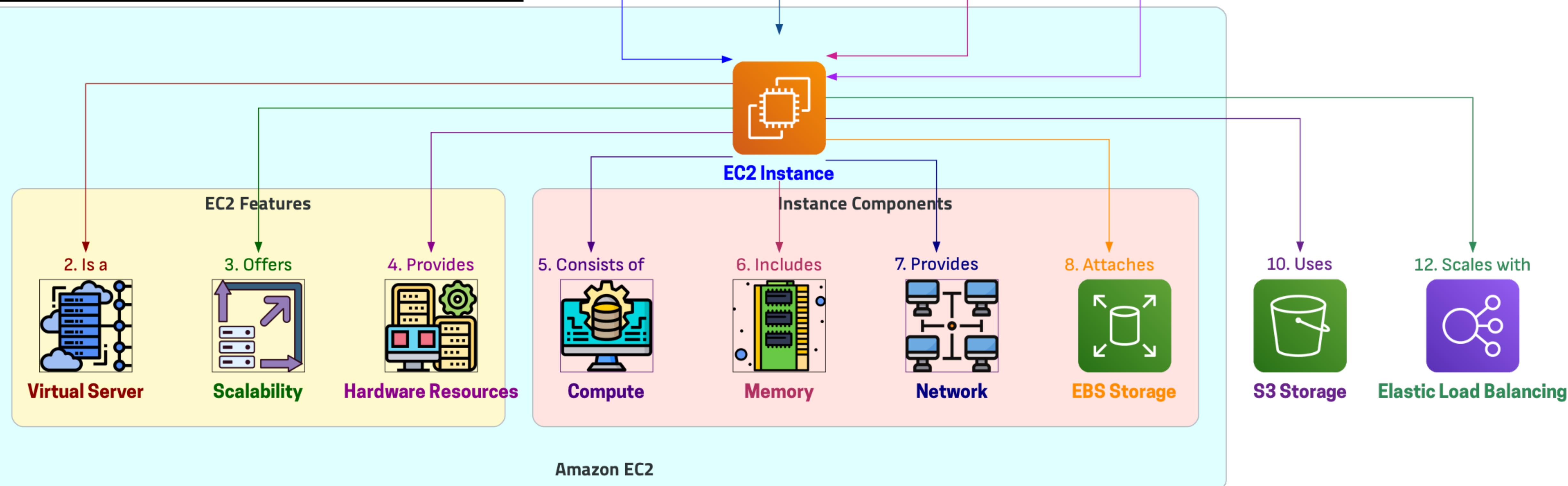


11. Secures

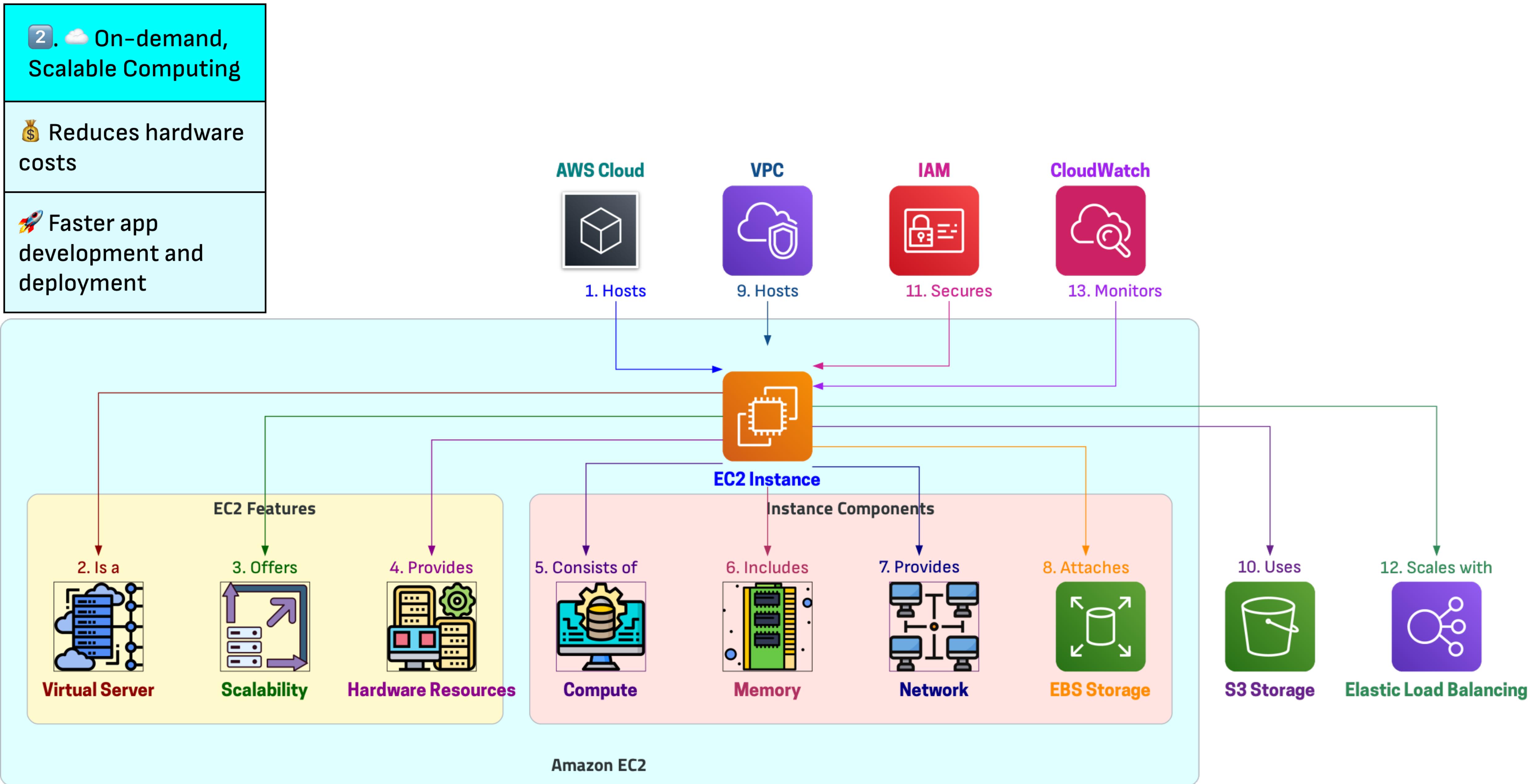
CloudWatch



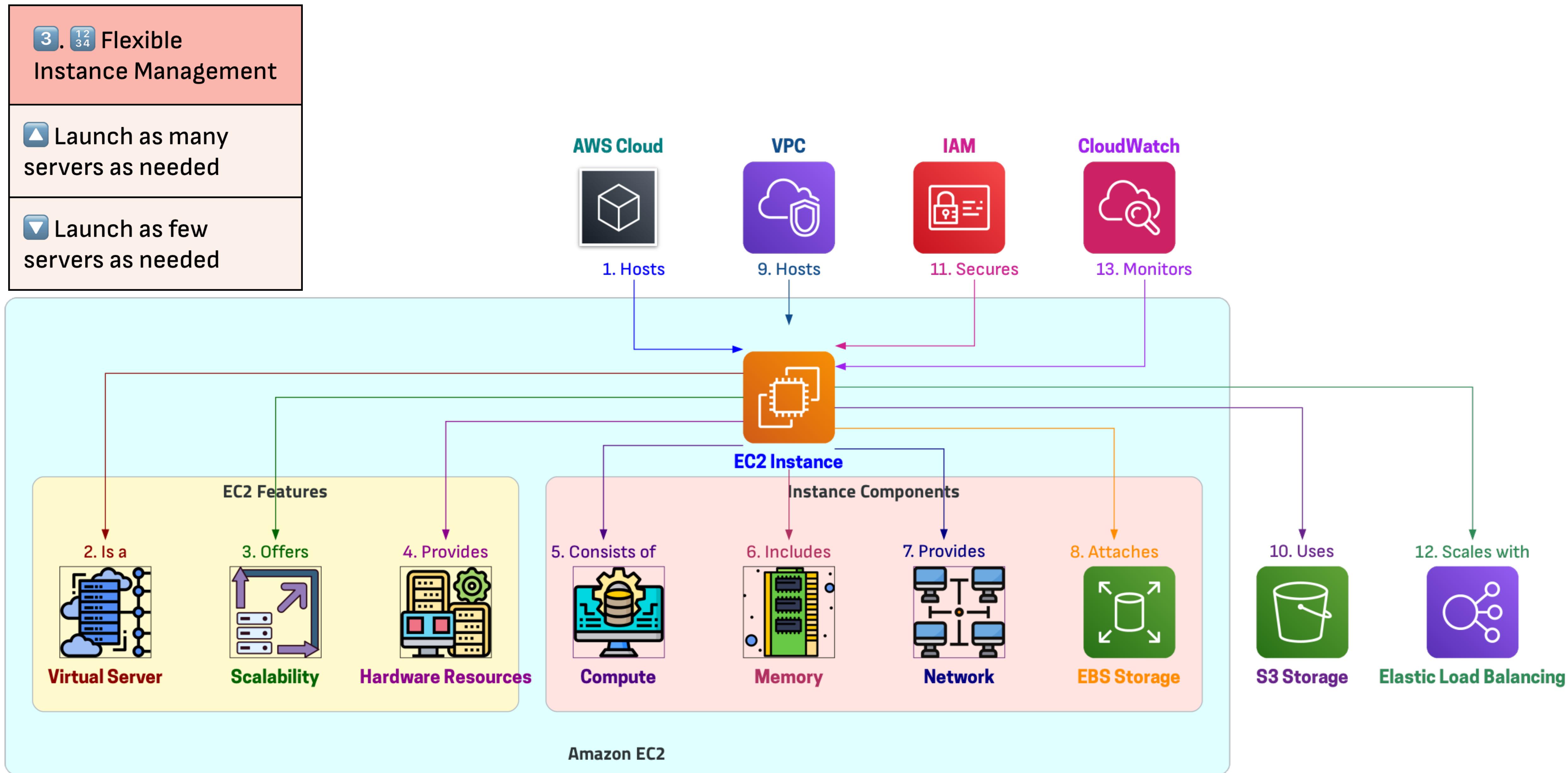
13. Monitors



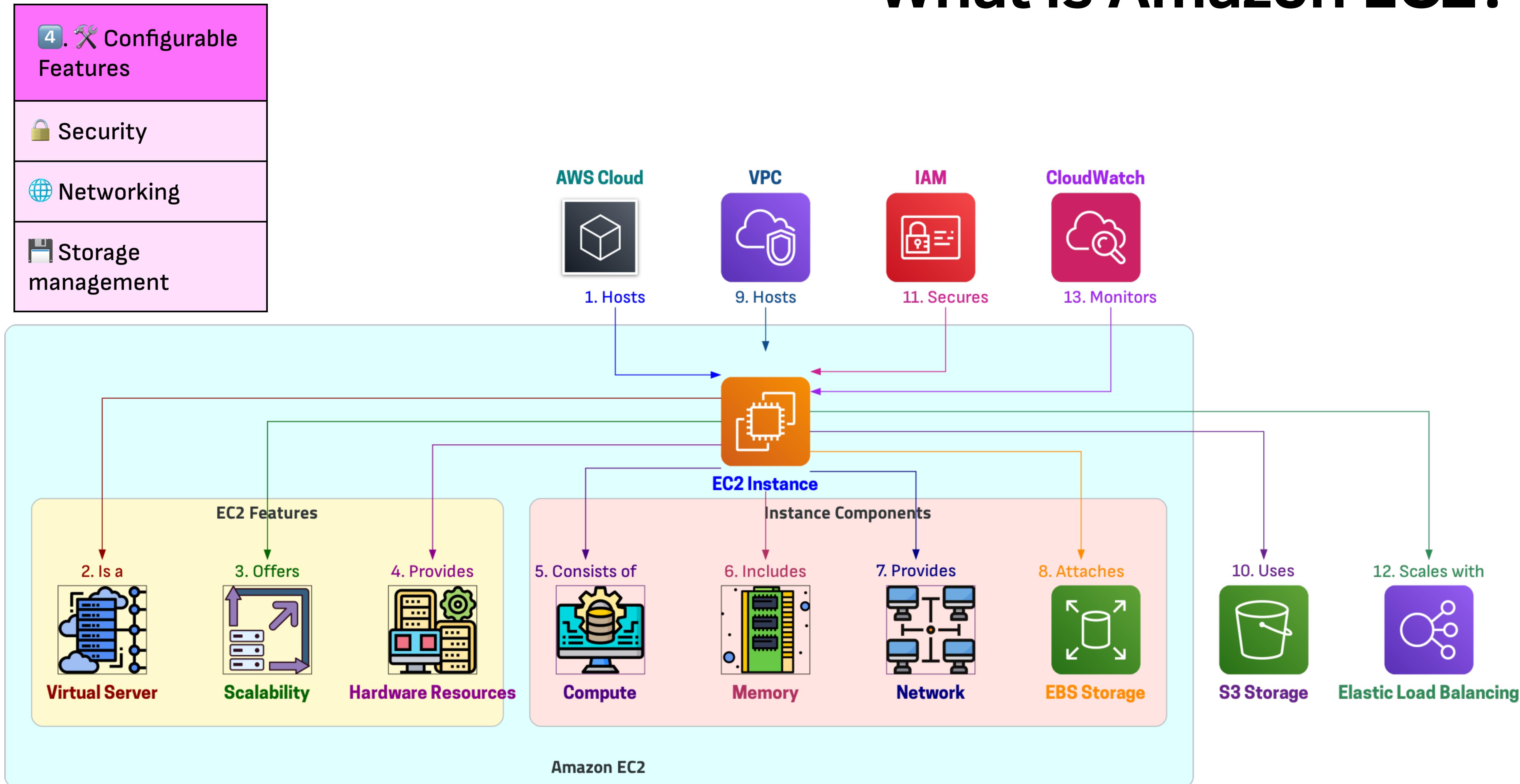
What is Amazon EC2?



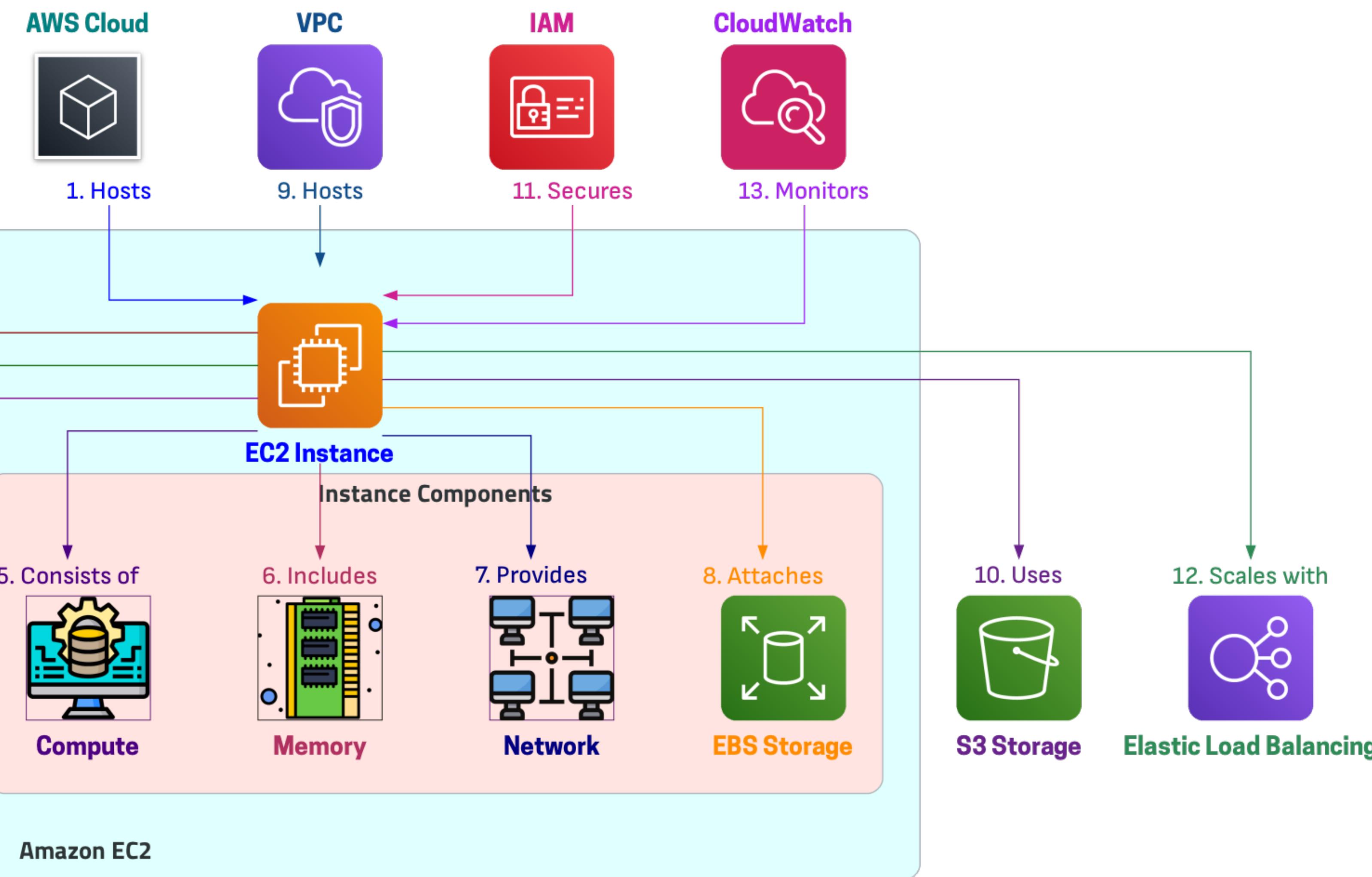
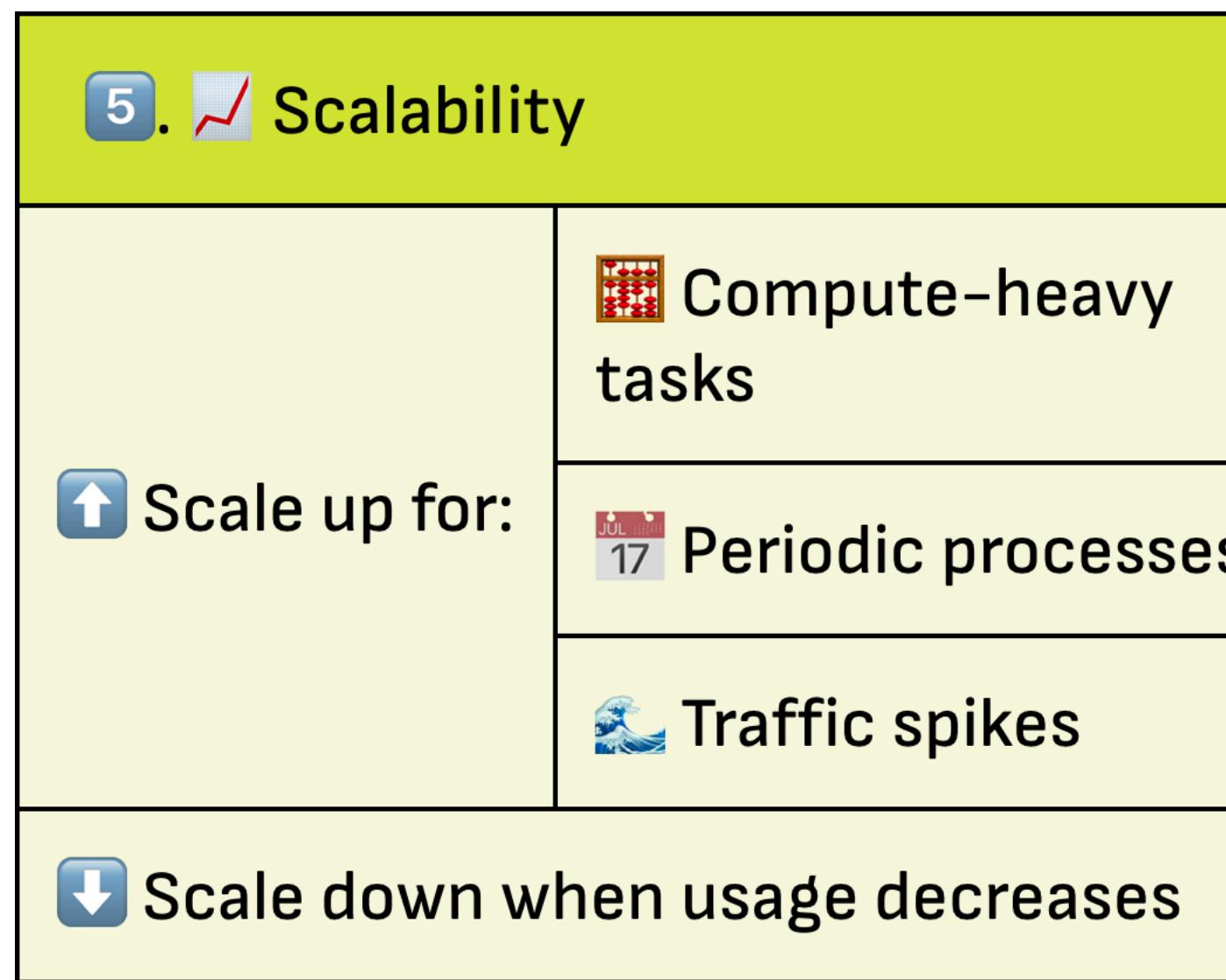
What is Amazon EC2?



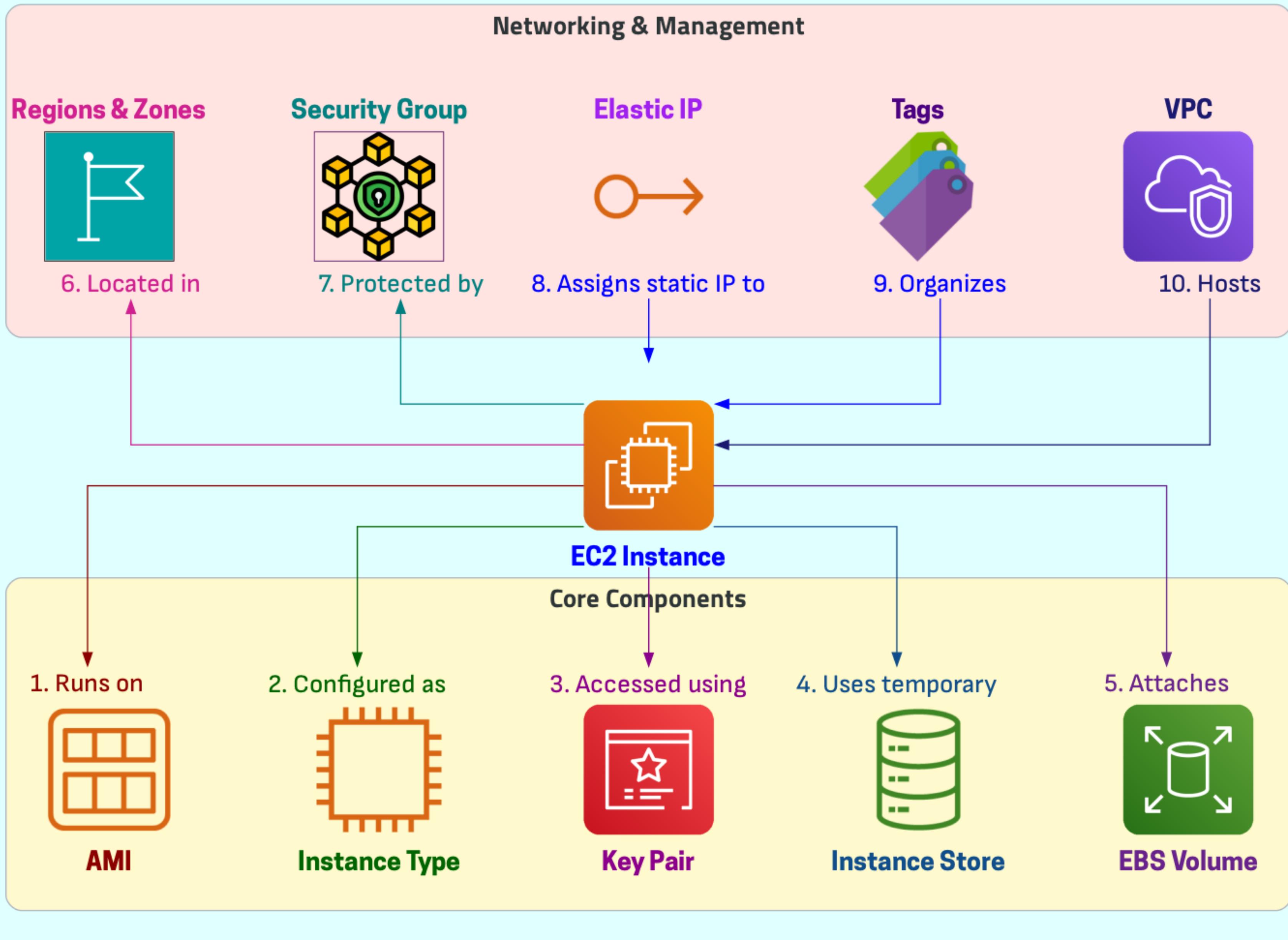
What is Amazon EC2?



What is Amazon EC2?



Amazon EC2



1. Instances

Launch virtual servers

Run applications

2. AMIs

Preconfigured templates

Streamline server setup



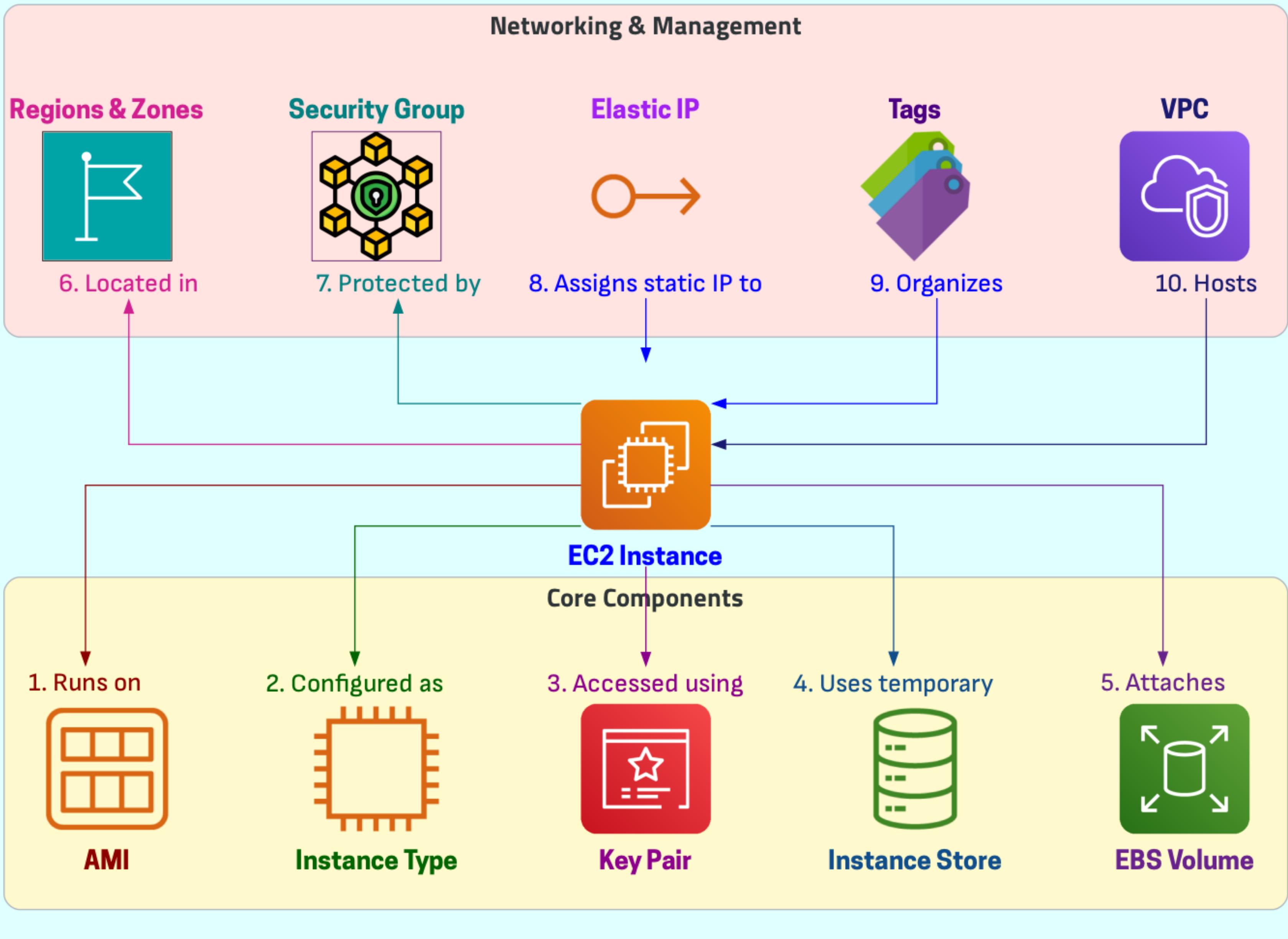
OS

3. Instance types

Range of configurations

Meet specific computing needs

Amazon EC2



4. ⚔️ Key pairs

Secure access management

AWS-stored public keys

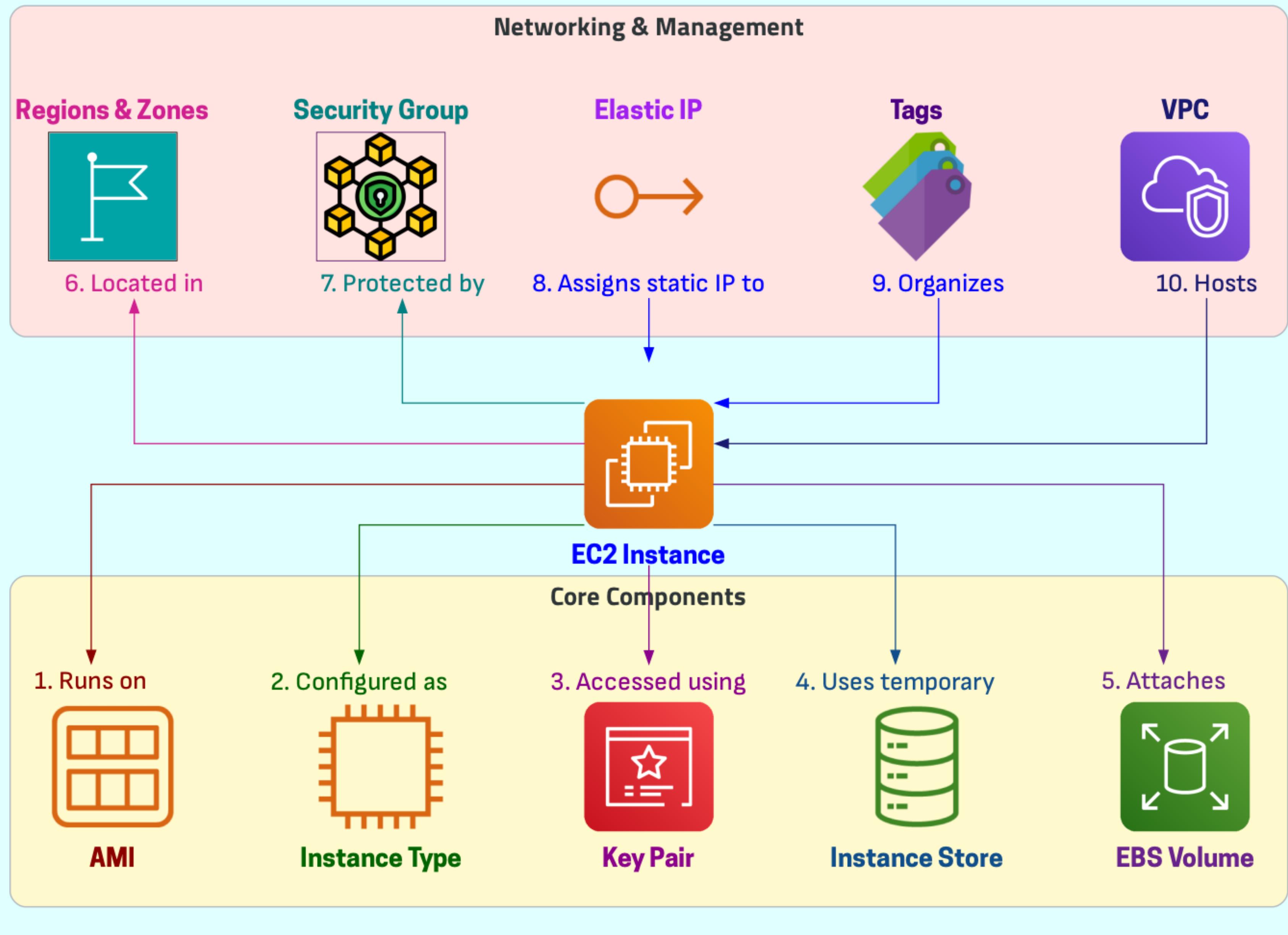
Privately stored keys

5. 💾 Instance store volumes

Temporary storage

Data deleted on instance stoppage/termination

Amazon EC2



6. Amazon EBS volumes

Persistent storage options

Elastic Block Store

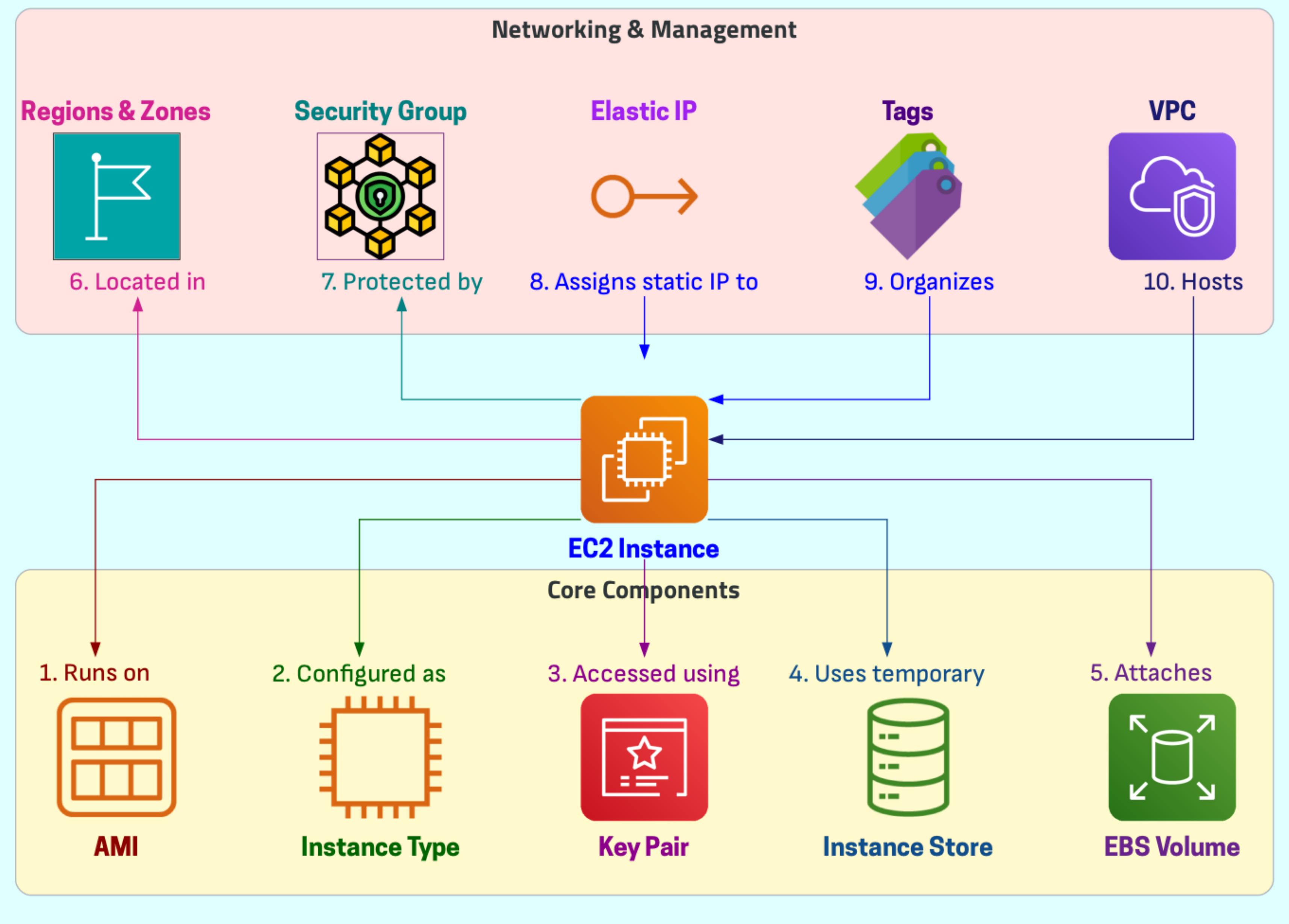
7. Regions and Zones

Optimize latency

Enhance redundancy

Various geographical locations

Amazon EC2



8. Security groups

Virtual firewall rules

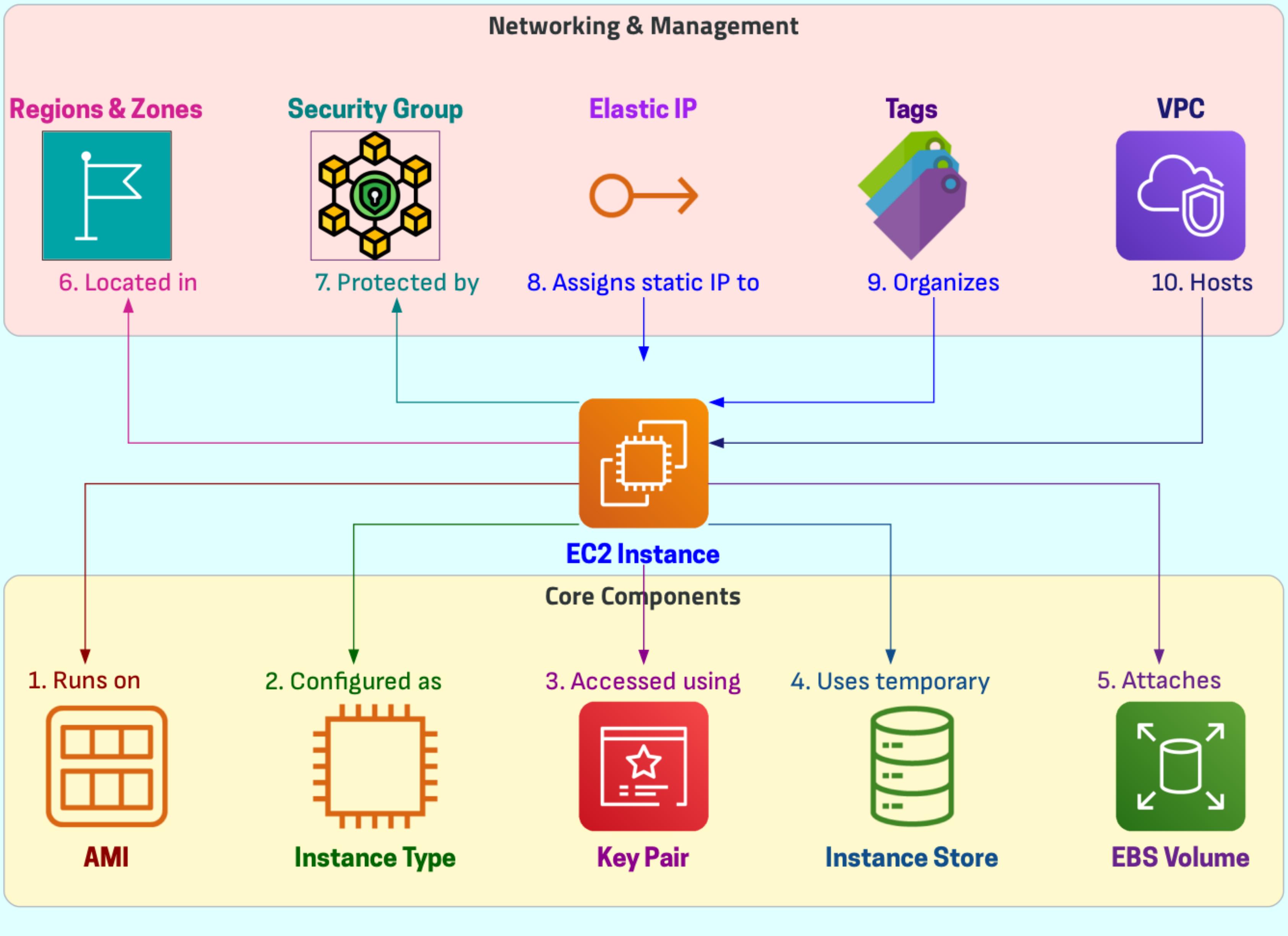
Control access to instances

9. Elastic IP addresses

Static IPv4 addresses

Dynamic computing needs

Amazon EC2



10. Tags

Metadata for organization

Manage EC2 resources

11. VPCs

Isolated networks

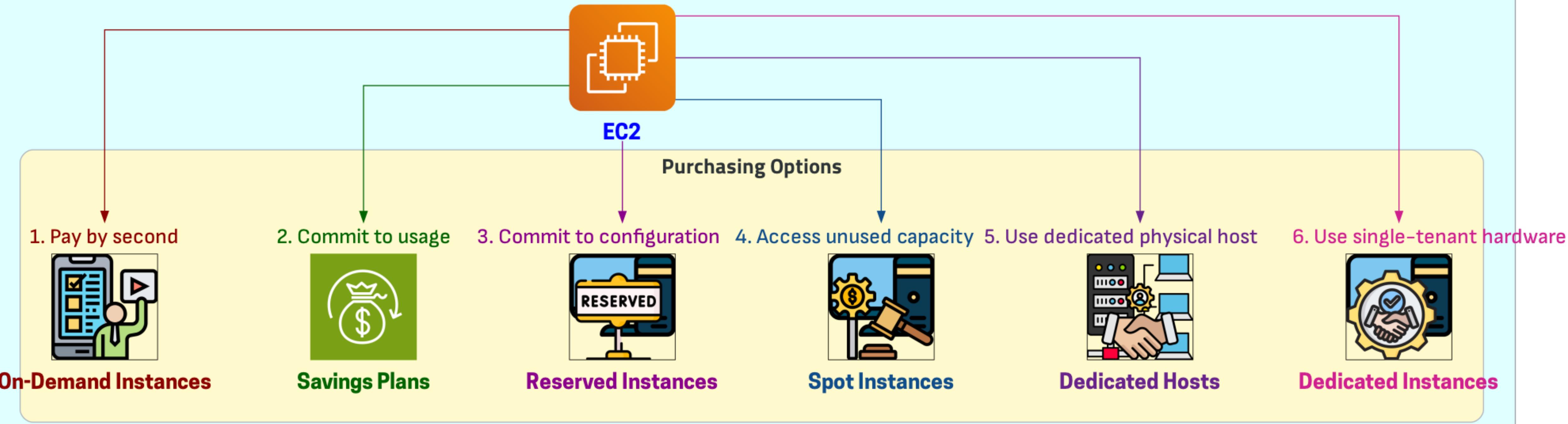
Enhanced security

Network management



Amazon EC2 Purchasing Options

Amazon EC2 Purchasing Options



1. ⏳ On-Demand Instances

💳 Pay by the second

🔄 Maximum flexibility

🚫 No long-term commitments

2. 💰 Savings Plans

🤝 Commit to consistent usage

📉 Reduce costs

⏳ 1 or 3-year terms

3. 📅 Reserved Instances

🔒 Commit to specific configuration

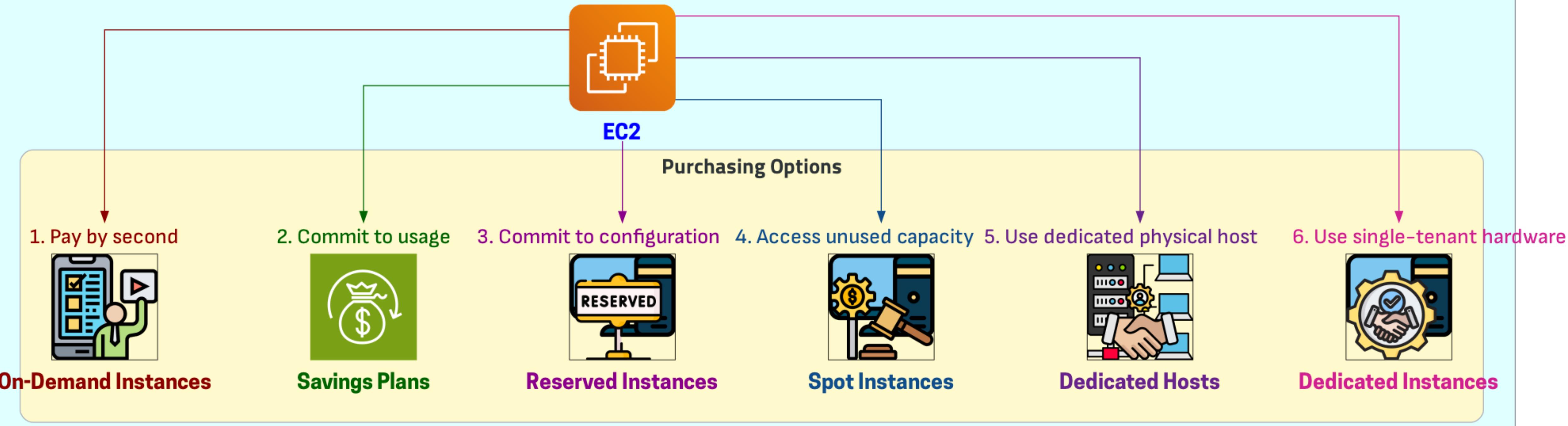
⌚ 1 or 3-year terms

💰 Lower costs further



Amazon EC2 Purchasing Options

Amazon EC2 Purchasing Options



4. 📁 Spot Instances

🔍 Access unused EC2 instances

\$ Lower prices

💹 Significant cost savings

5. 🏠 Dedicated Hosts

💻 Physical host dedicated to your instances

📜 Ideal for using existing licenses

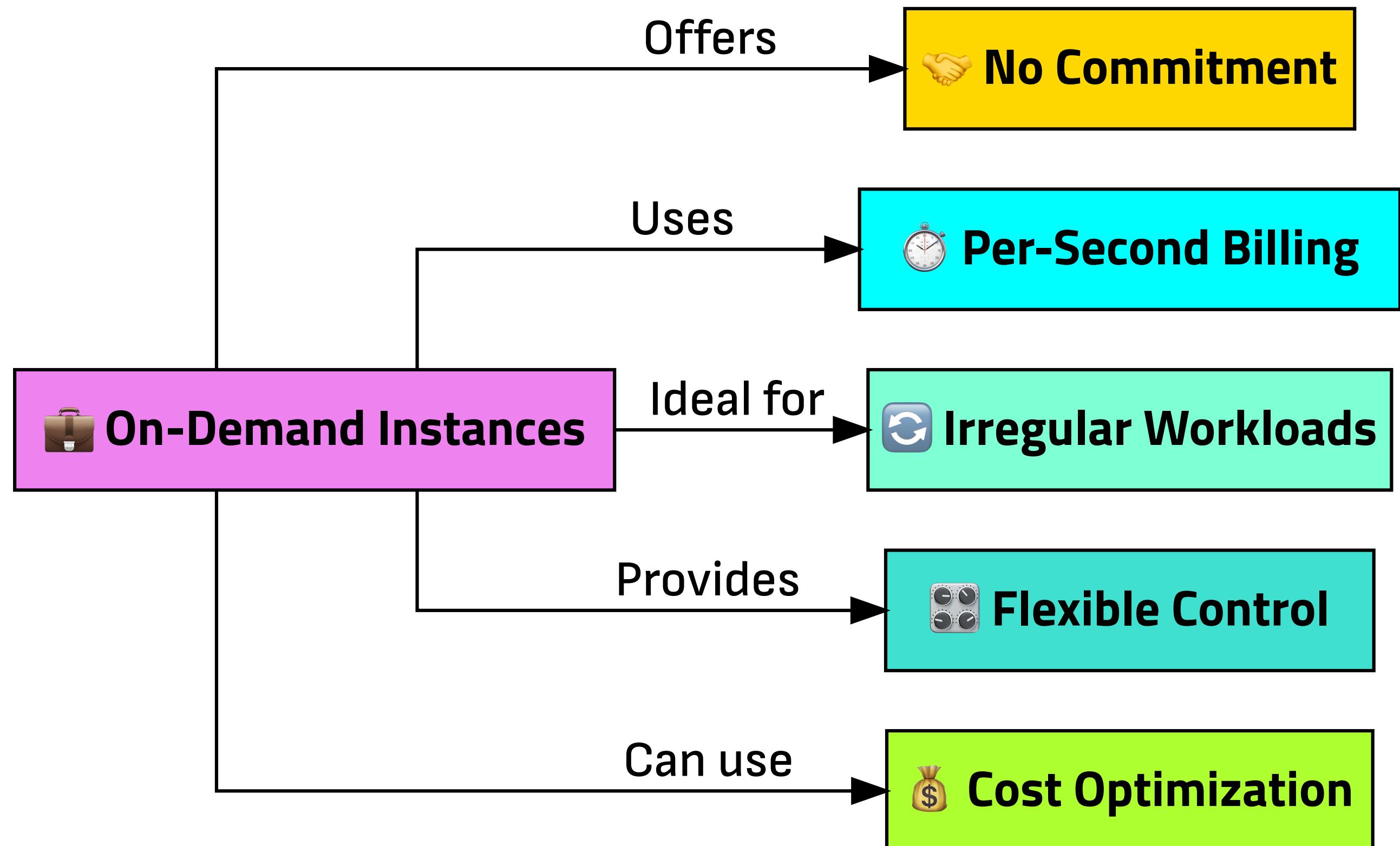
💰 Save on costs

6. 🛡️ Dedicated Instances

⌚ Pay by the hour

💻 Single-tenant hardware

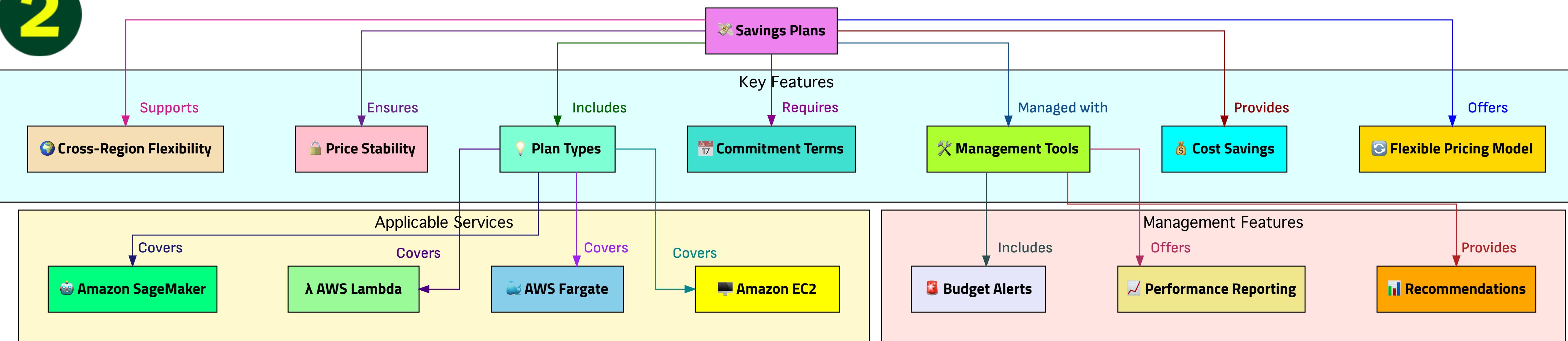
🔒 Physical isolation



On-Demand Instances

1. 💰 **No long-term commitment:** ⏪
2. ⏳ **Pay per second:** ⏳ Precise billing, 💲 Minimum 60 seconds
3. 🔧 **Ideal for irregular workloads:** ⏪ Short-term, sporadic, 🛡 Reliable, stable
4. 📈 **Usage flexibility:** ⏪ Full control over lifecycle, 🔧 Launch, stop, hibernate, start, reboot, terminate
5. 💡 **Significant savings options:** 💲 AWS Savings Plans, Spot, Reserved Instances, ⏪ Significant savings over On-Demand

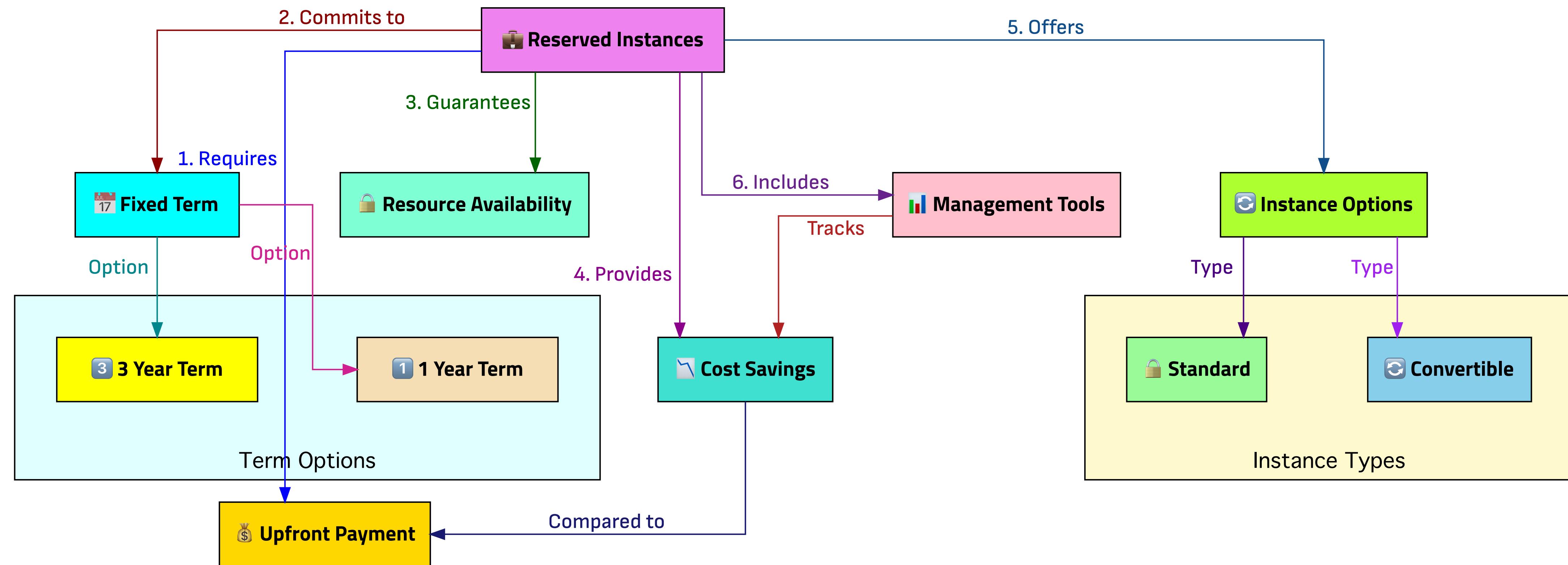
2



💰 Savings Plans

1. ⏱️ **Flexible Pricing Model:** 💼 AWS usage savings, 🛠️ Accommodates compute needs
2. 💰 **Save up to 72% on AWS compute workloads:** 📈 Significant savings, 🌐 EC2, Fargate, Lambda
- 3.💡 **Compute & SageMaker Savings Plans:** 🔎 Differentiated by usage, 📊 Discounts on AWS services
- 4.📅 **One or Three Year Commitments:** 🔒 Locks in discount, ⏲️ Savings beyond On-Demand
- 5.🛠️ **Manage with AWS Cost Explorer:** 📈 Performance reporting, 🎗️ Budget alerts
- 6.🔒 **Price Stability:** 📝 Fixed prices, 💸 Financial predictability
- 7.🌐 **Applies Across Regions & Services:** 🔄 Flexibility across instances, 🔄 Workload & region changes

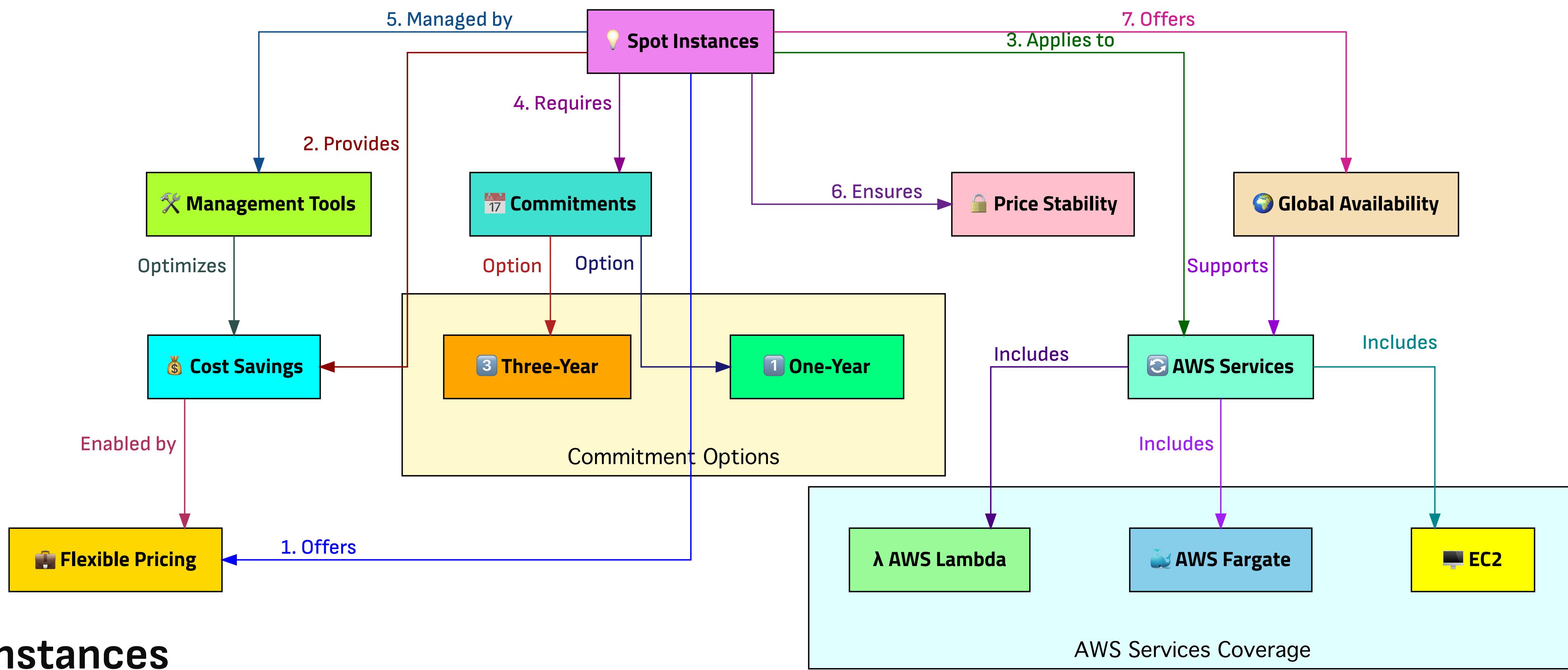
3



Reserved Instances

1. **Upfront Payment for Capacity:** Offers discount on hourly charge, Requires upfront payment
2. **Fixed Term of 1 or 3 Years:** Provides pricing stability, Commitment for 1 or 3 years
3. **Guaranteed Resource Availability:** Ensures access to computing resources
4. **Cost Savings Compared to On-Demand:** Offers financial efficiency, Significantly reduces costs
5. **Convertible vs. Standard Options:** Flexibility vs. higher savings, Option to change instance type
6. **Usage Reports and Management Tools:** Helps track savings, optimize investments, Provides detailed reports, tools

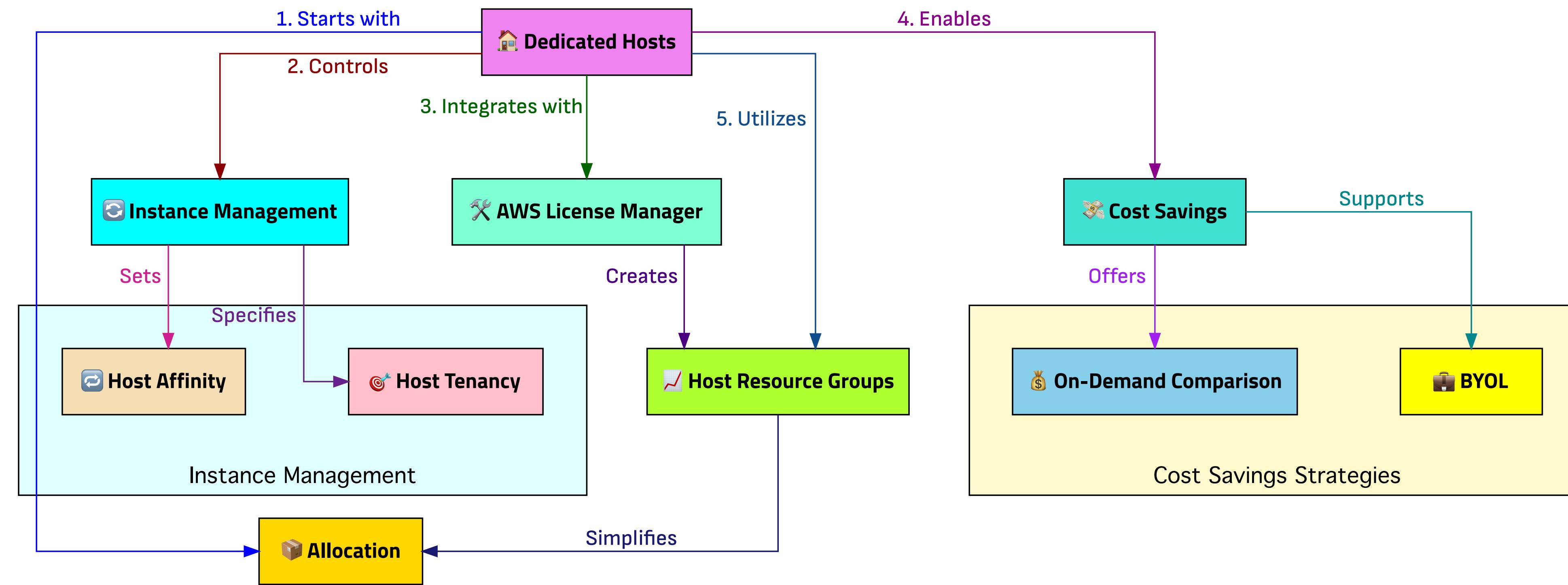
4



💡 Spot Instances

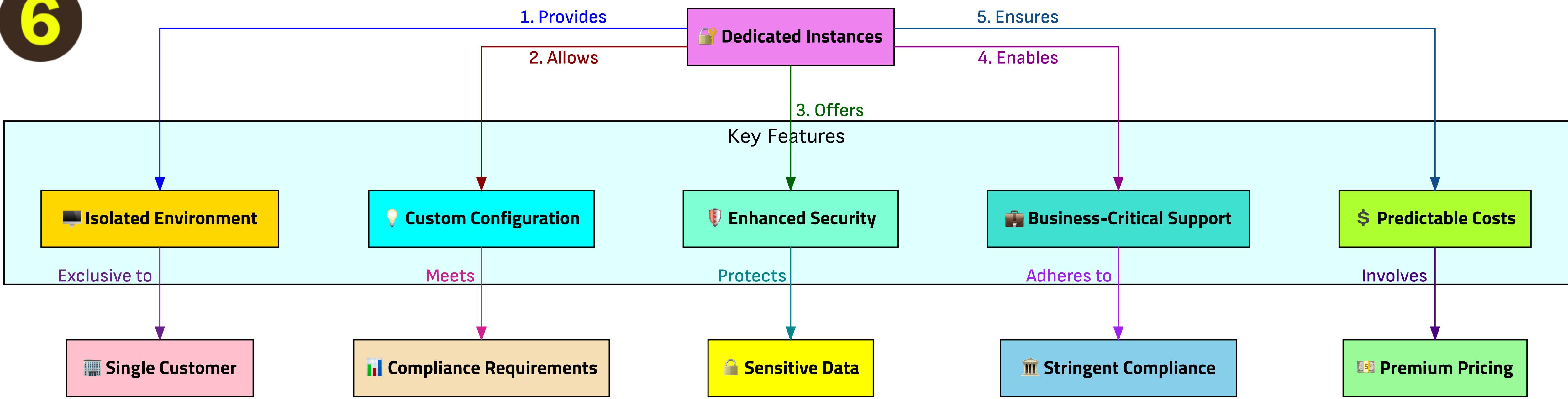
1. **💼 Flexible Pricing Model:** 🛒 Purchase unused EC2 capacity, 💰 Lower prices
2. **💰 Up to 72% Savings:** ⚡ Significant cost savings, 🔻 Compared to On-Demand prices
3. **🔄 Apply Across AWS Services:** 📈 EC2, Fargate, Lambda discounts
4. **📅 Commitments Options:** 🔒 One or three-year commitments, 💰 Locks in savings
5. **🔧 Tools for Management:** 🔎 AWS Cost Explorer insights, 📊 Performance, budgeting tools
6. **🔒 Price Stability:** 💡 Constant cost throughout term
7. **🌐 Global Availability:** 🌐 Flexibility across regions, services, ✨ Instance families, sizes, OS

5



🏡 Dedicated Hosts

1. 📦 **Allocate and Launch Instances:** 💰 Allocate Hosts, 🚀 Launch Instances, 🎯 Specify Tenancy
2. ⚡ **Instance Tenancy and Affinity:** 📍 Control Launch Location, ⚡ Host Affinity Settings
3. 🔧 **AWS License Manager Integration:** 👤 Create Host Resource Groups, 🛡 Auto-Allocation & Release
4. 💰 **Cost Savings and BYOL Support:** 💰 Significant Cost Savings, 💰 BYOL Compliance
5. 🚀 **Flexibility with Host Resource Groups:** ⚡ Manage as Single Entity, 🚀 Simplify Operations



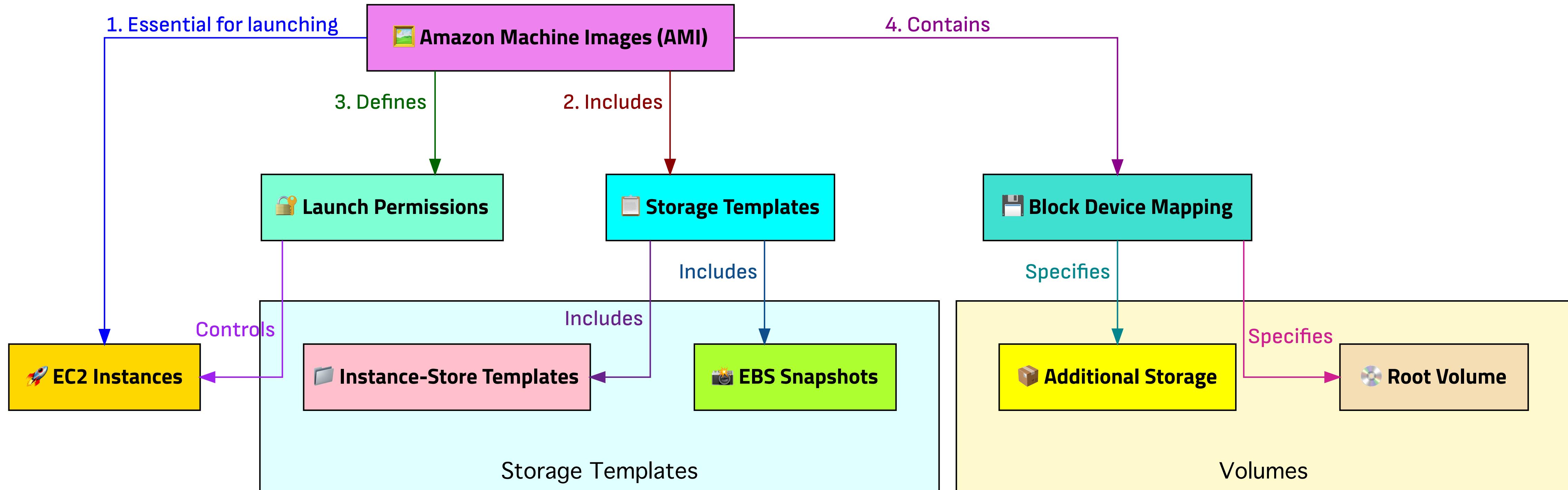
🔑 Dedicated Instances

1. **💻 Isolated compute environment:** 🌴 Runs in VPC, ✨ Exclusive hardware use
2. **💡 Custom hardware configuration:** 🔧 Server configurations, 📊 Meets compliance, performance
3. **🛡 Enhanced security features:** 🔒 Physically isolated, 💰 Ideal for sensitive data
4. **💼 Business-critical applications support:** 🏢 Dedicated resources, 💡 Stringent compliance
5. **\$ Predictable cost structure:** 📈 Premium, predictable costs, 💰 Eases budgeting

Feature	Dedicated Hosts	Dedicated Instances
Physical Server Visibility	Provides full control over a physical server.	No control over the physical server placement.
Instance Placement	Instances are placed on a specific, single-tenant host.	Instances run on dedicated hardware without specifying the physical server.
License Management	Allows BYOL (Bring Your Own License) and visibility into socket/core usage.	Limited license management capabilities.
Affinity (Instance to Host)	Can use affinity to keep instances on the same host.	No direct control over instance placement on hardware.
Billing	Billed per host, regardless of the number of instances running.	Billed per instance, based on dedicated instance pricing.
Use Cases	Ideal for server-bound licensing and compliance needs.	Suitable for regulatory compliance or isolation from other customers.
Hardware Isolation	Full physical isolation from other AWS customers.	Also isolated from other customers, but without visibility into the hardware.
Host-Level Metrics	Provides host-level metrics like CPU, memory, and storage usage.	No host-level metrics available.
Available Instance Types	All instance types that are supported by the selected host can be launched.	Supports most instance types, but no host control.



Amazon Machine Images (AMI)



1. 🚀 Essential for launching instances

Contains necessary information

Prerequisite for instance creation

2. 📁 Includes EBS snapshots or instance-store templates

EBS snapshots

Root volume template

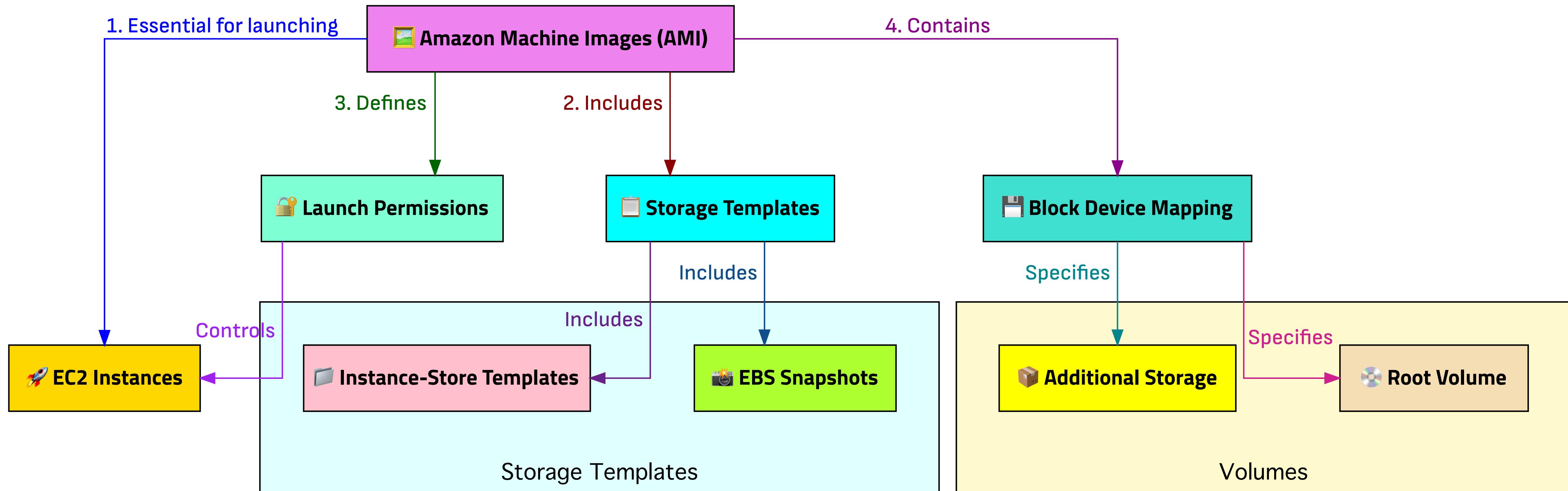
Operating system

Applications

Instance-store templates



Amazon Machine Images (AMI)



3. 🔒 Launch permissions for AWS accounts

Defines authorized accounts

Ensures security

Ensures compliance

4. 📁 Block device mapping for volumes

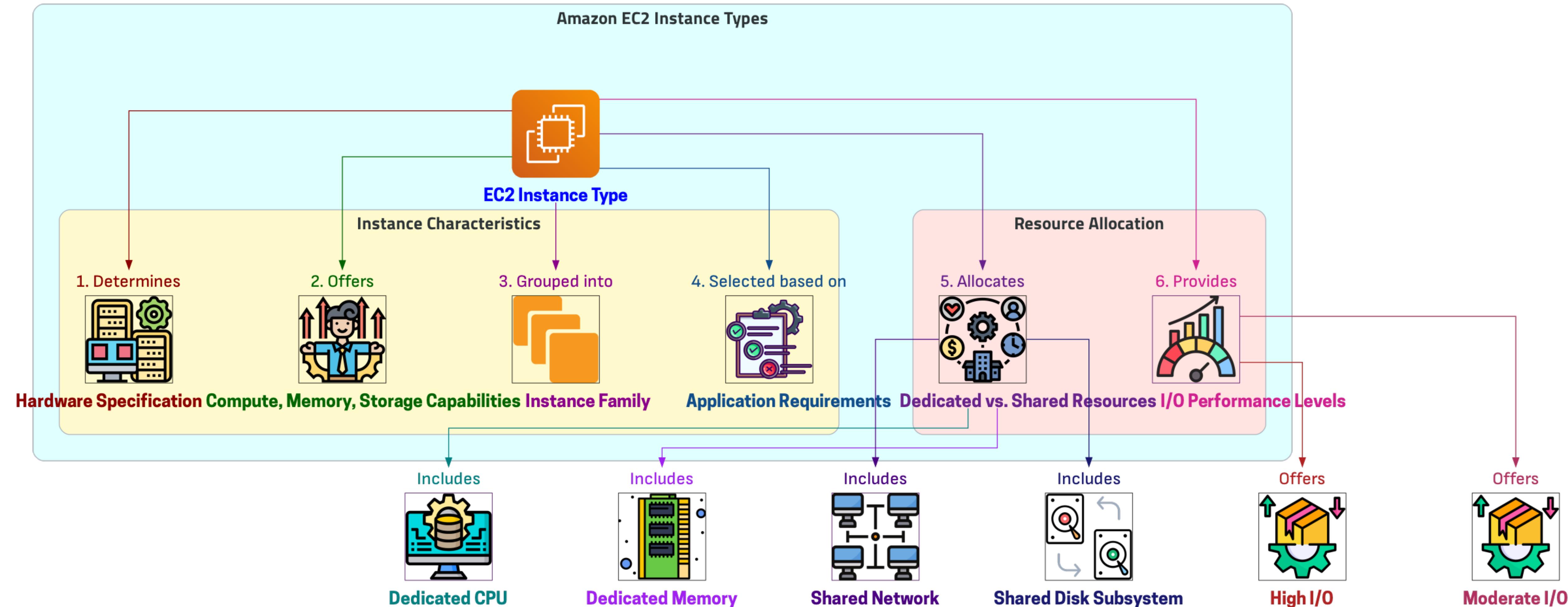
Details attached volumes

Root volume

+ Additional storage



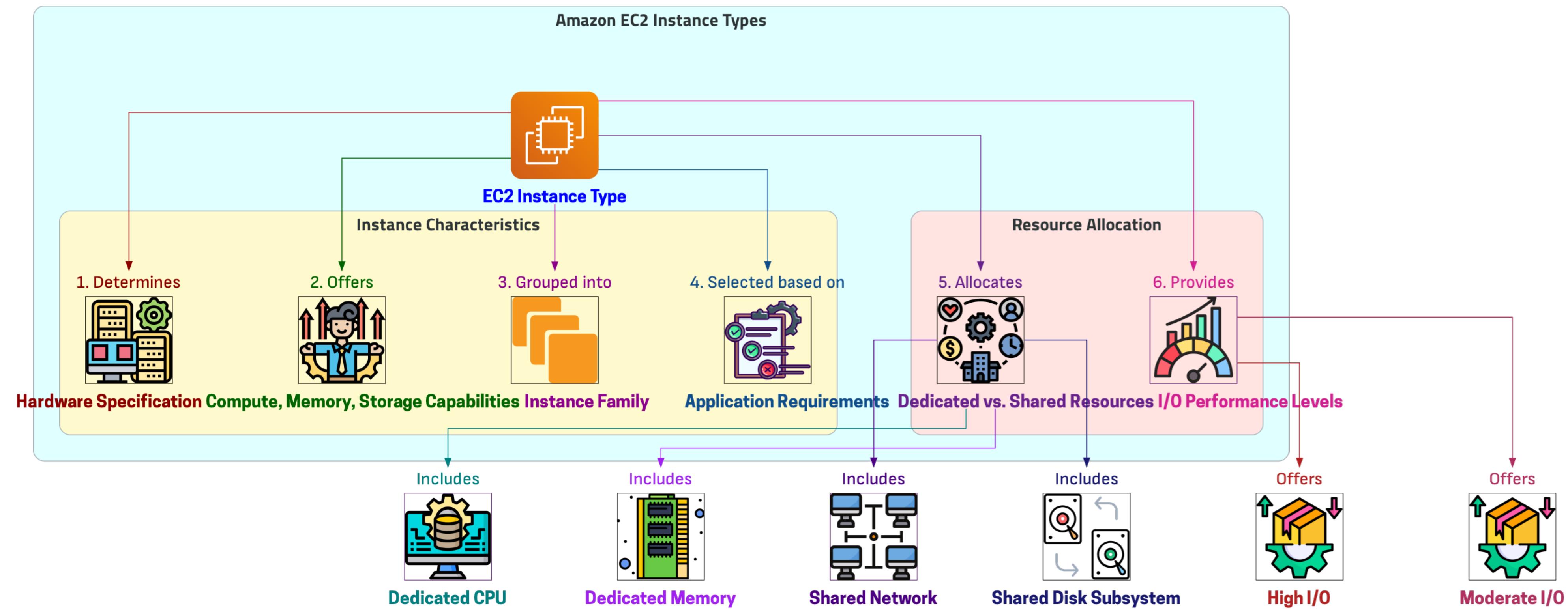
Amazon EC2 Instance Types



1. Determines hardware for your instance



Amazon EC2 Instance Types



2. Different compute, memory, storage capabilities

Varied levels of compute power

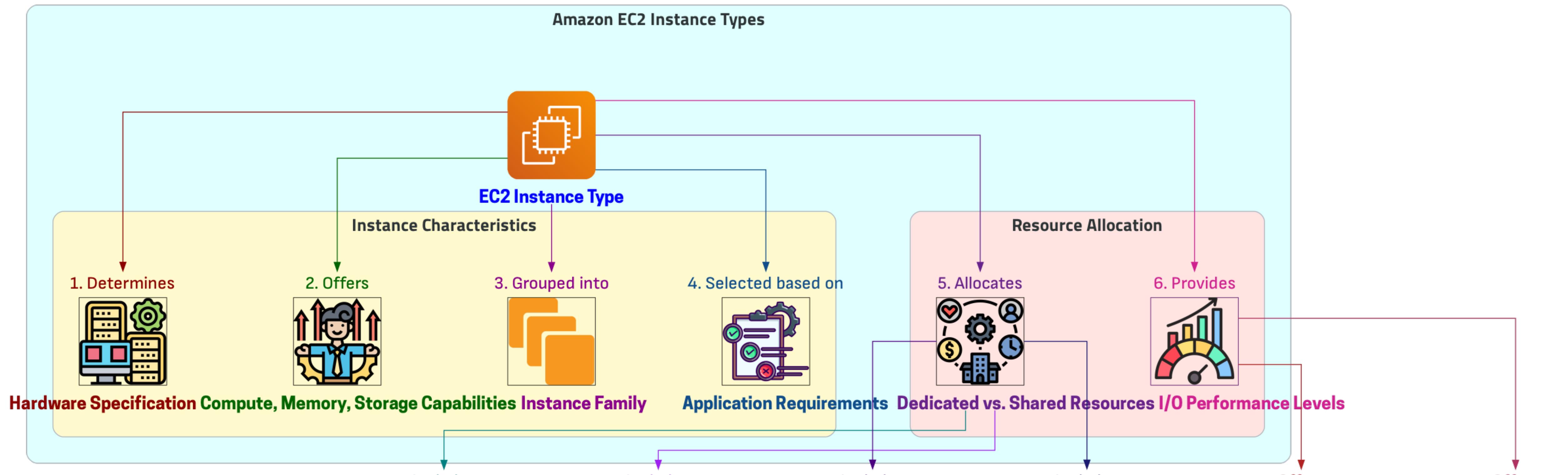
Different memory capacities

Various storage options

Caters to diverse application needs



Amazon EC2 Instance Types



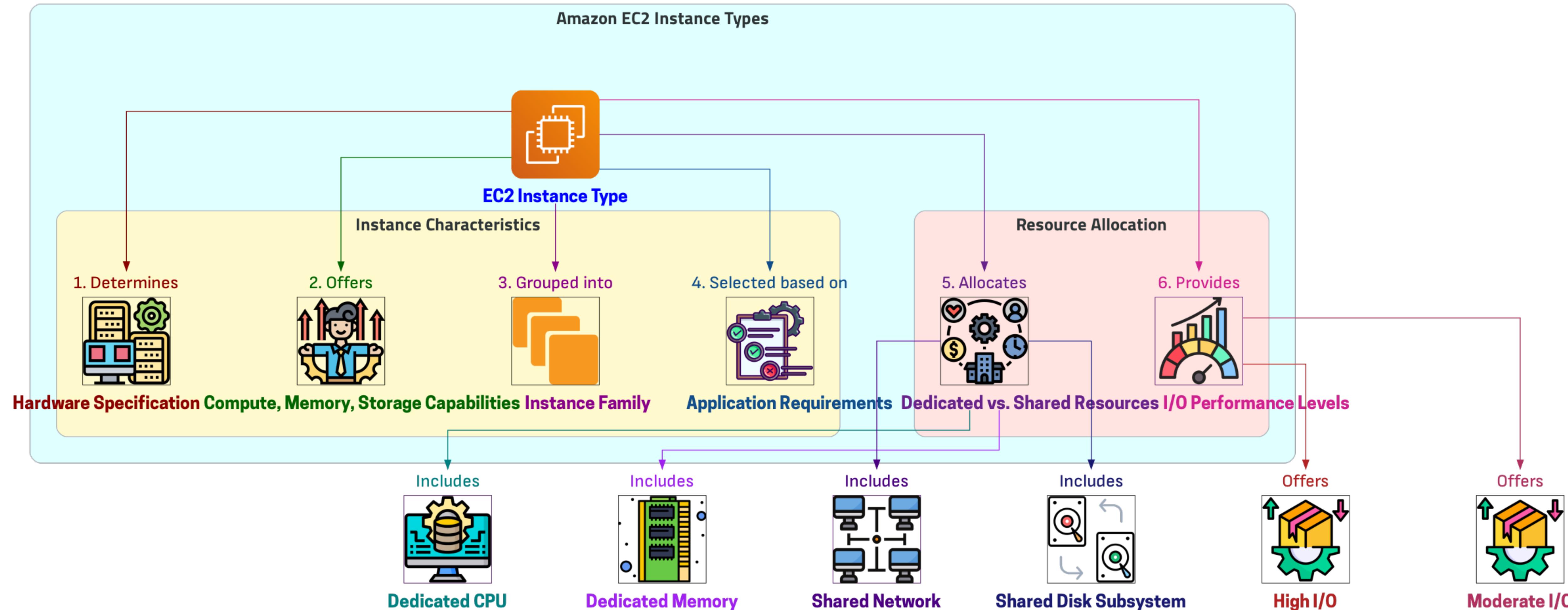
3. 🛠️ Grouped by instance family

📁 Categorized based on capabilities

🔍 Simplifies selection process



Amazon EC2 Instance Types



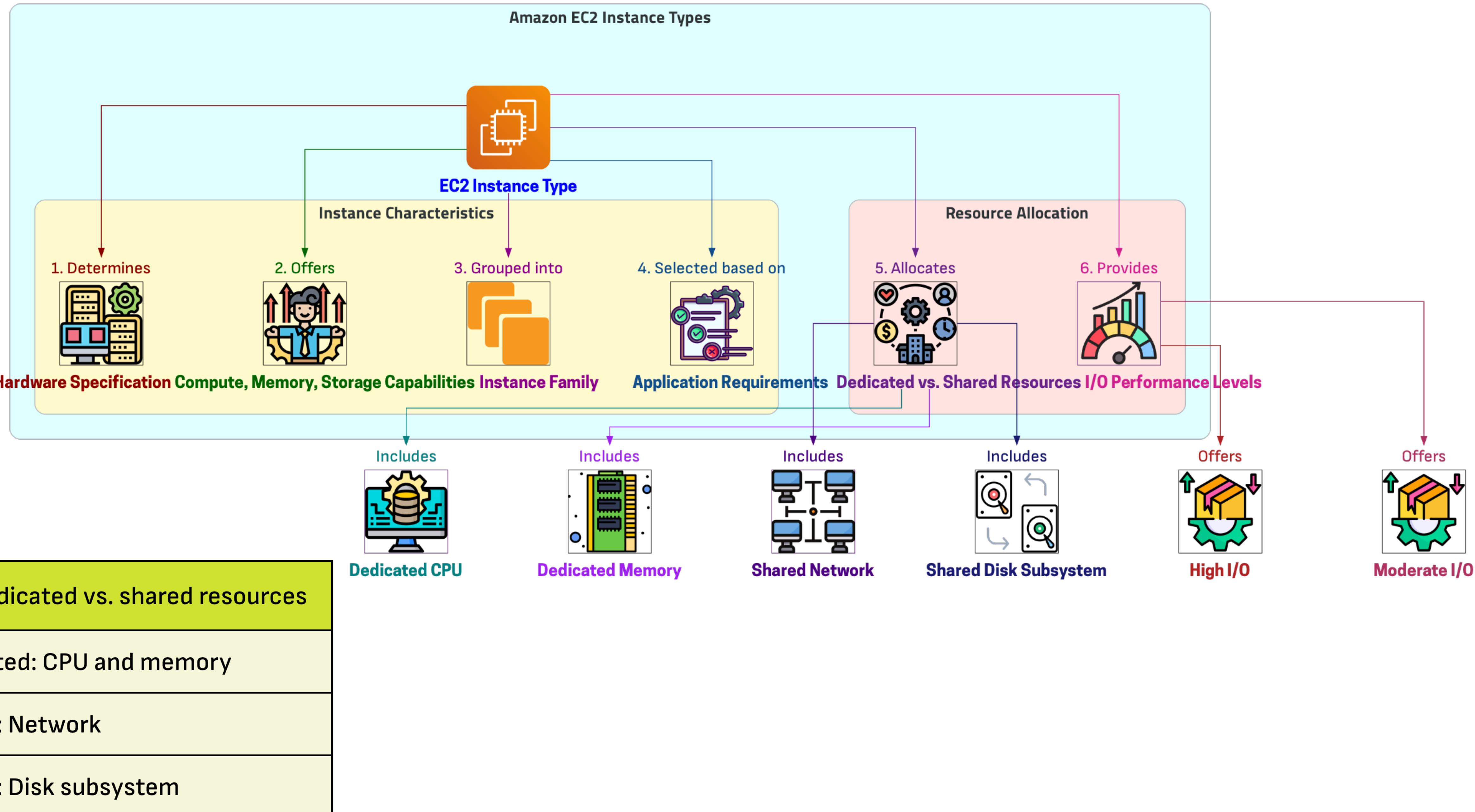
4. Select based on application requirements

Match to specific software demands

Choose for planned application needs

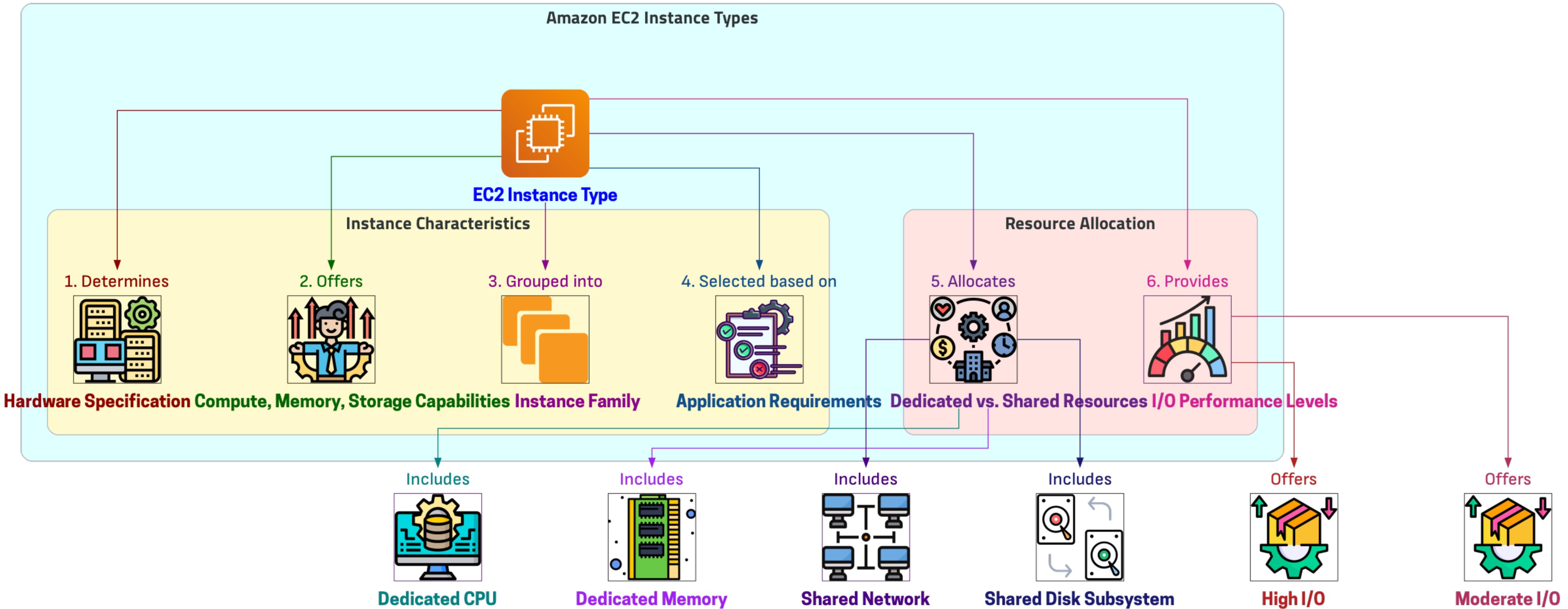


Amazon EC2 Instance Types





Amazon EC2 Instance Types



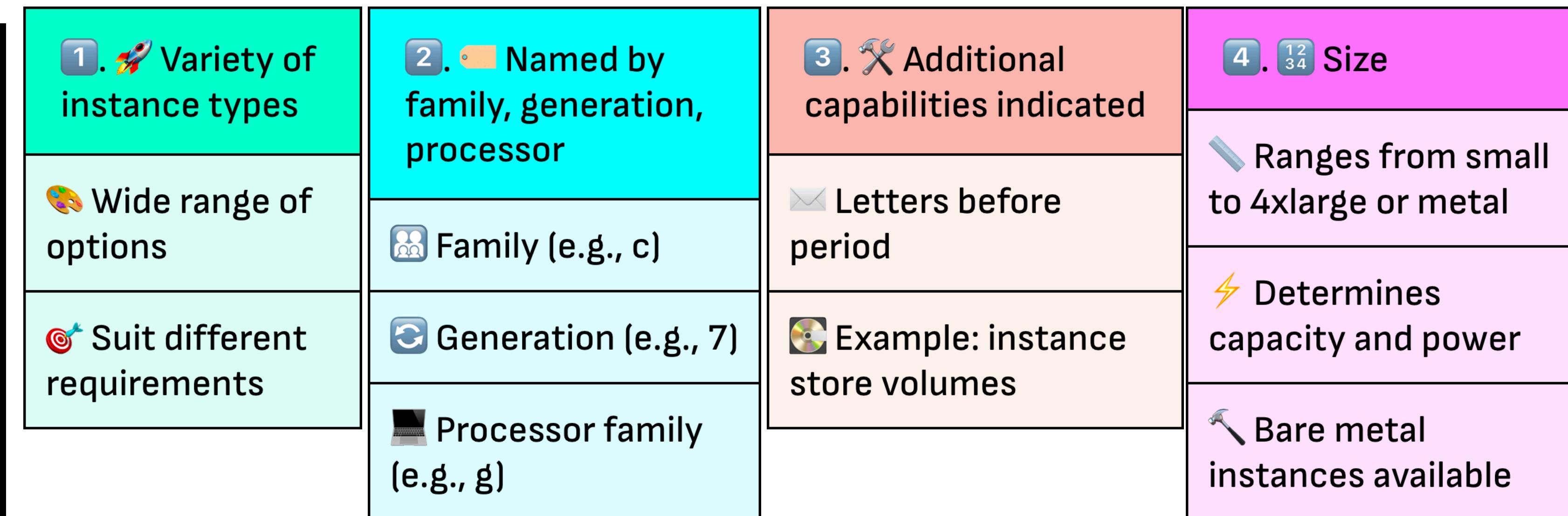
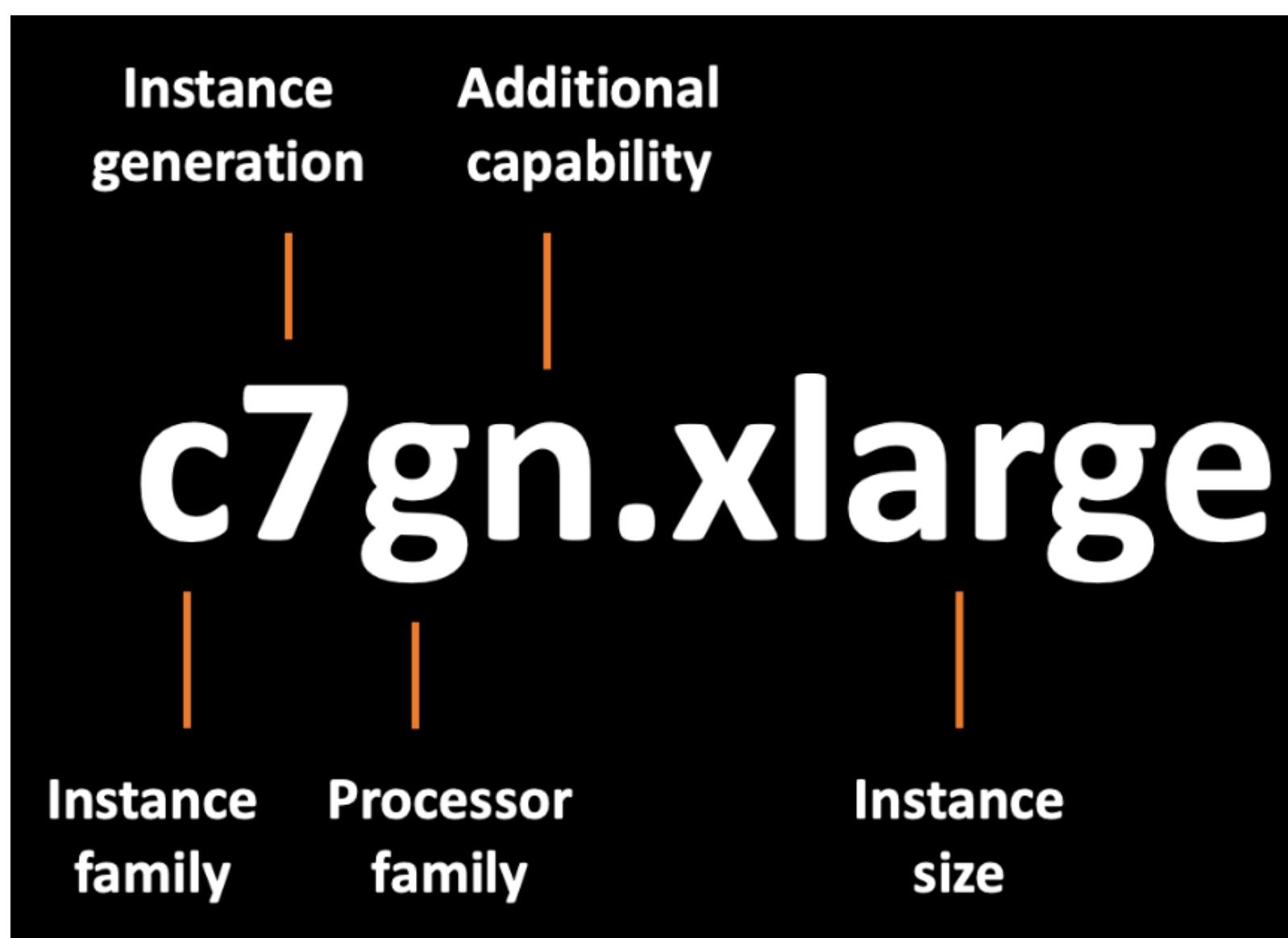
6. ⚡ High vs. moderate I/O performance

🚀 High I/O for demanding applications

🏃 Moderate I/O for standard needs

🔧 Accommodates different application demands

Instance type naming convention



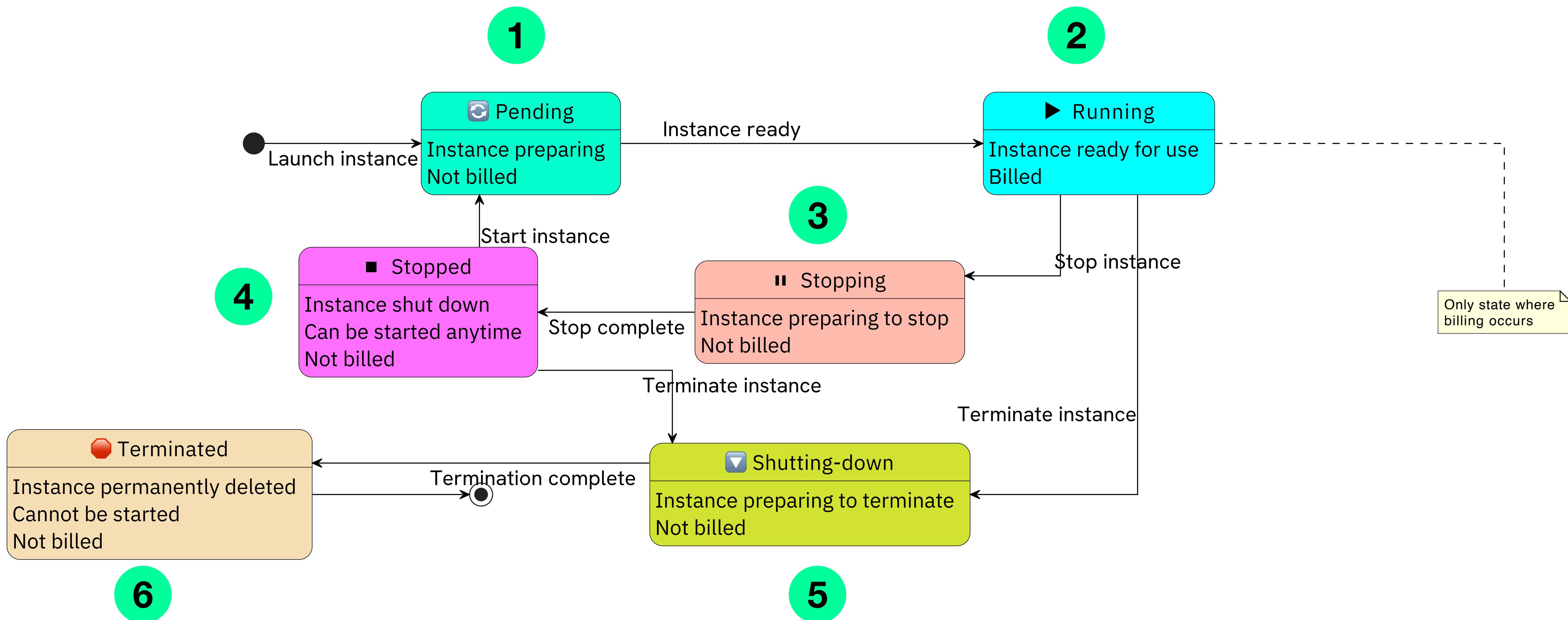
Instance family	Processor family	Instance generation	Additional capability	Instance size
m	6	g	d	12xlarge
r	7	gn	a	16xlarge
c	5	a	n	24xlarge
i	4	d	z	8xlarge
g	3	en	t	4xlarge
p	2	g	i	2xlarge
f	1	gd	h	xlarge
x	7	g	n	large
z	6	a	d	medium
t	4	g	b	small

Instance Family	Description	Processor Families	Additional Capabilities
C	Compute optimized	a, g, i	b, d, n, e, z
D	Dense storage	a, g, i	b, d, n, e, z
F	FPGA	a, g, i	b, d, n, e, z
G	Graphics intensive	a, g, i	b, d, n, e, z
Hpc	High performance computing	a, g, i	b, d, n, e, z
I	Storage optimized	a, g, i	b, d, n, e, z
Im	Storage optimized (1:4 vCPU:memory)	a, g, i	b, d, n, e, z
Is	Storage optimized (1:6 vCPU:memory)	a, g, i	b, d, n, e, z
Inf	AWS Inferentia	a, g, i	b, d, n, e, z
M	General purpose	a, g, i	b, d, n, e, z
Mac	macOS	a, g, i	b, d, n, e, z
P	GPU accelerated	a, g, i	b, d, n, e, z
R	Memory optimized	a, g, i	b, d, n, e, z
T	Burstable performance	a, g, i	b, d, n, e, z
Trn	AWS Trainium	a, g, i	b, d, n, e, z
U	High memory	a, g, i	b, d, n, e, z
VT	Video transcoding	a, g, i	b, d, n, e, z
X	Memory intensive	a, g, i	b, d, n, e, z

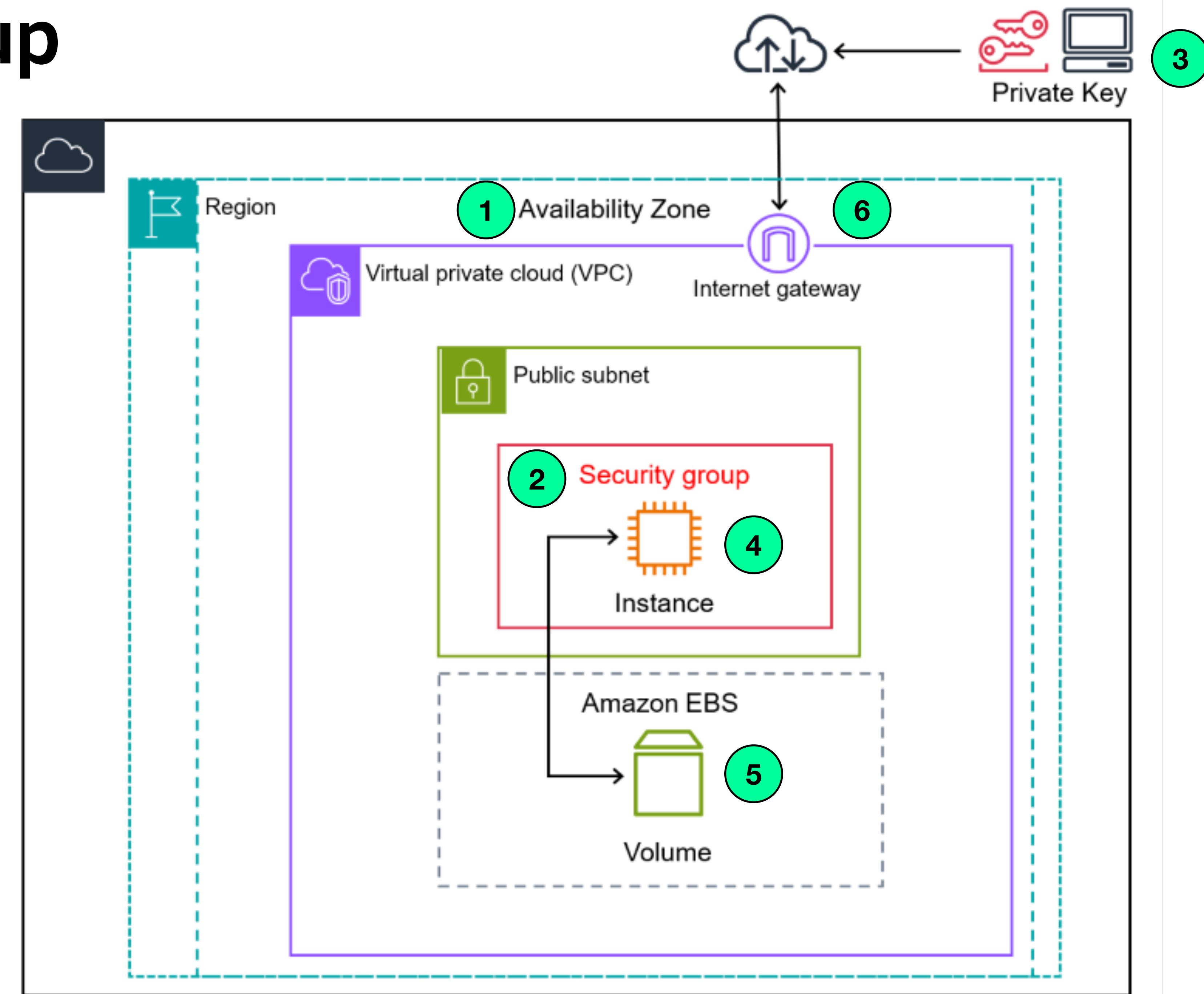
Processor Key	Description
a	AMD processors
g	AWS Graviton processors
i	Intel processors

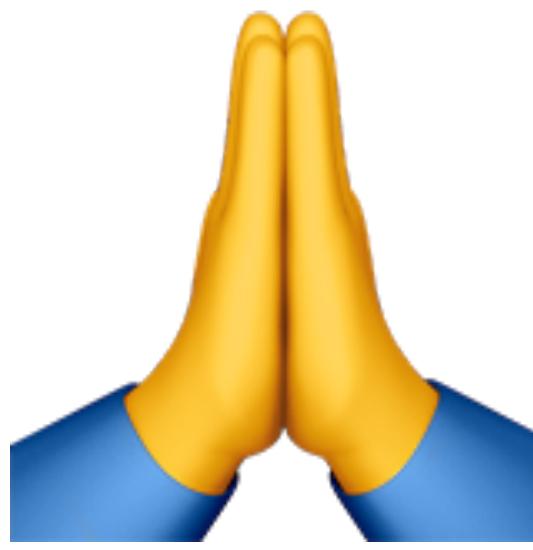
Capability Key	Description
b	EBS optimized
d	Instance store volumes
n	Network and EBS optimized
e	Extra storage or memory
z	High performance
q	Qualcomm inference accelerators
flex	Flex instance

Instance lifecycle



Basic Setup





**Thanks
for
Watching**