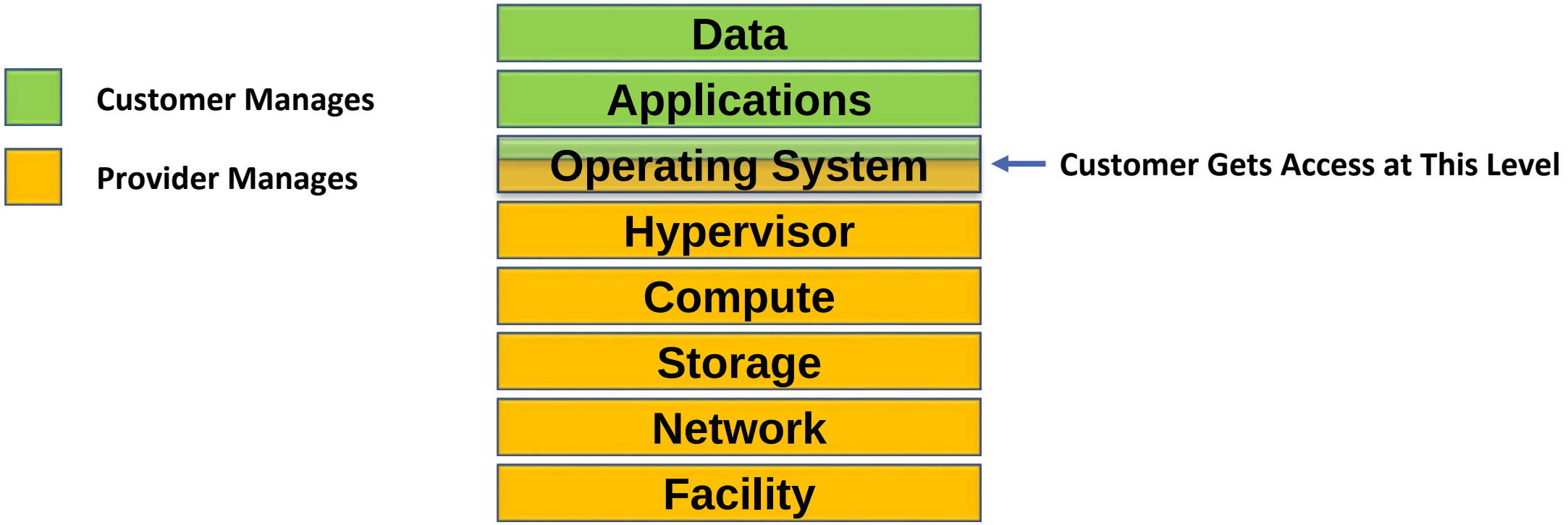
IaaS Infrastructure as a Service

- ‘The capability provided to the consumer is to provision processing, storage, networks, and other fundamental computing resources where the consumer is able to deploy and run arbitrary software, which can include operating systems and applications. The consumer does not manage or control the underlying cloud infrastructure but has control over operating systems, storage, and deployed applications; and possibly limited control of select networking components (e.g., host firewalls). ’ *NIST*

IaaS Infrastructure as a Service



Gartner IaaS Magic Quadrant

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IaaS Flavours

- Cloud Providers will often offer three distinct flavours of IaaS compute:
  - Virtual machines on shared physical servers
  - Virtual machines on dedicated physical servers
  - Dedicated bare-metal physical servers
- Customers can mix and match between the three types

Virtual Machines on Shared Physical Servers

- With virtual machines on shared physical servers, different customers can have their virtual machines on the same shared underlying physical servers
- This is the least expensive option
- It has the least amount of options in terms of how many vCPUs, RAM and storage
- The virtual machines can usually be provisioned more quickly than the dedicated options
- This is the most commonly deployed option

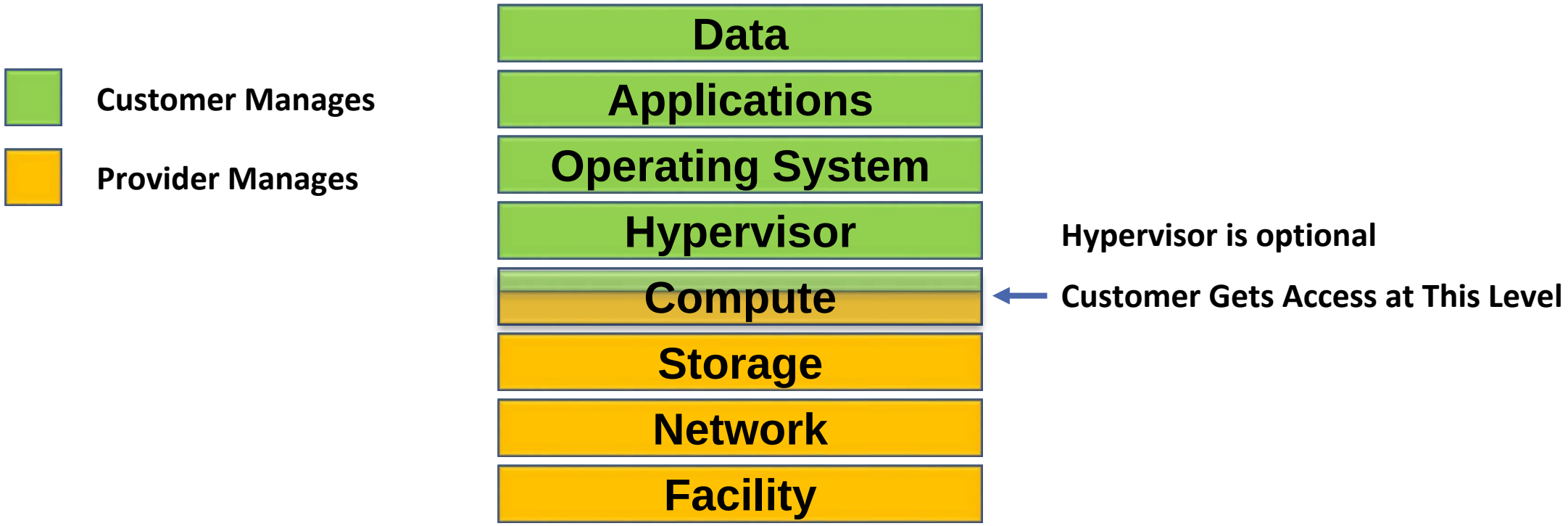
Virtual Machines on Dedicated Physical Servers

- With virtual machines on dedicated physical servers, a customer is guaranteed that the underlying physical server is dedicated to them
- This is a substantially more expensive option than virtual machines on shared physical servers
- There are typically more options in terms of how many vCPUs, RAM and storage
- The customer may be required to sign a minimum length contract

Dedicated Bare-Metal Servers

- With dedicated bare-metal servers, a customer is given access to their own physical servers
- A hypervisor is not installed and managed by the cloud provider
- The customer can either install an operating system directly on the server, or can install and manage their own hypervisor
- This is the most expensive option
- It typically has the most options in terms of how many vCPUs, RAM and storage
- The customer may be required to sign a minimum length contract
- AWS do not offer this option

Dedicated Bare-Metal Servers



Virtual Machines on Dedicated Physical Servers vs Dedicated Bare-Metal Servers

- The most common reason to choose virtual machines on dedicated physical servers is for compliance
- Dedicated bare-metal servers can fulfil the same compliance requirements
- Both require dedicated physical servers for the customer so the cost is typically similar
- A reason a customer may prefer virtual machines on dedicated physical servers is if they do not have expertise in-house to manage the hypervisor

Network Options

- Customers may be offered similar options for shared or dedicated firewalls and load balancers
- Customers can typically connect into the Cloud Provider's data center over the Internet and/or via a direct network connection

Storage Options

- Customers will typically have the option of local hard drives in the server, or external SAN or NAS storage
- The customer also has the option of managing their own storage operating system on a virtual machine or bare-metal server
- The customer may be able to install their own physical storage system in the Cloud Provider's data center

Management Options

- The customer can manage their servers (to install applications and patches etc.) through standard remote management methods, such as Remote Desktop for Windows servers, and Secure Shell for Linux
- An API is also typically available to allow for automation of common tasks such as provisioning a new virtual machine

Application Options

- The customer may also have the option of applications such as Microsoft SQL or Antivirus
- They can either install the application and look after the licensing themselves (CapEx), or have the Cloud Provider do it for them (OpEx)
- The Cloud Provider may also offer to manage the application

IaaS Billing

- For virtual machines on shared physical servers, CPU and RAM will typically be billed only when the virtual machine is powered on – the physical CPU and RAM in the underlying server hardware will be available for use by other customers when the virtual machine is powered off
- Network bandwidth will be billed as it is used. Some usage will typically be bundled with monthly plans
- Data storage will typically be billed whether the virtual machine is powered on or off, as the data will always be there and taking up physical storage space
- Optional software extras such as Windows OS or SQL server will be billed as a flat monthly fee
- Examples:
  - AWS EC2
  - Telstra IaaS

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