esprit
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Initiation au Cloud

Chapter 3
Cloud Computing Deployment Models

4 IA

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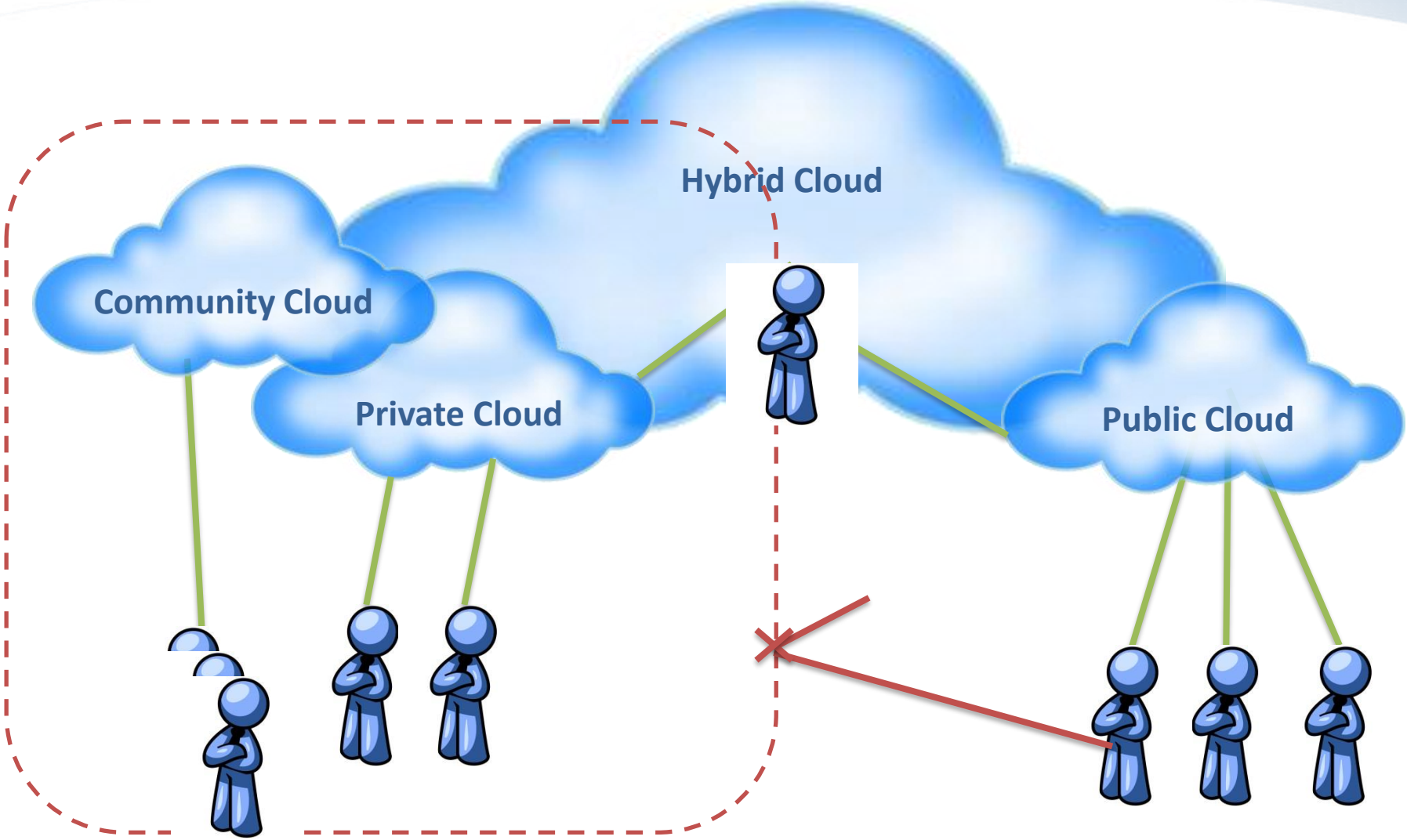
Lesson plan

1. Deployment models definition
2. Service deployment scenarios
3. Comparison between deployment models

Deployment models

- A cloud deployment model specifies how a cloud infrastructure is **built, managed, and accessed**
- NIST specifies four primary cloud deployment models:
  - Public
  - ***Private (On-premise, Off-premise)***
  - ***Community (On-premise, Off-premise)***
  - Hybrid
- Each cloud deployment model may be used for any of the cloud service models: IaaS, PaaS, and SaaS.

Deployment models



Public Cloud

- Available to the general public or a large industry group
- Exists externally to its end user
- Available with little restriction
  - who may pay can use it
- Accessed from Internet
- Owned by an organization (service provider)
  - Build out a high-capacity infrastructure
  - lease pieces of it to a variety of clients
- Data might be comingled on common storage devices
  - Security important: identity, access control, and encryption.

Private Cloud (1/2)

- Operated solely and dedicated to an organization
- Exist on-premises or off-premises
- Managed by the organization or a third party
- No comingling of data or sharing resources
  - Data + resources isolation
- Using organization's data center + Virtualization technology
- More constrained than public cloud.
- Security concerns ≠ Public cloud
  - Meet more needs than public cloud can address

Private Cloud (2/2)

- Private cloud does not mean more secure than public cloud
- Security concerns of public may not apply
  - Public cloud: relying on public provider
- Securing the virtualization environment
  - Hypervisor level security
  - Physical hardware
  - Software and firmware
- Public cloud or Private Cloud
  - Which is more secure?

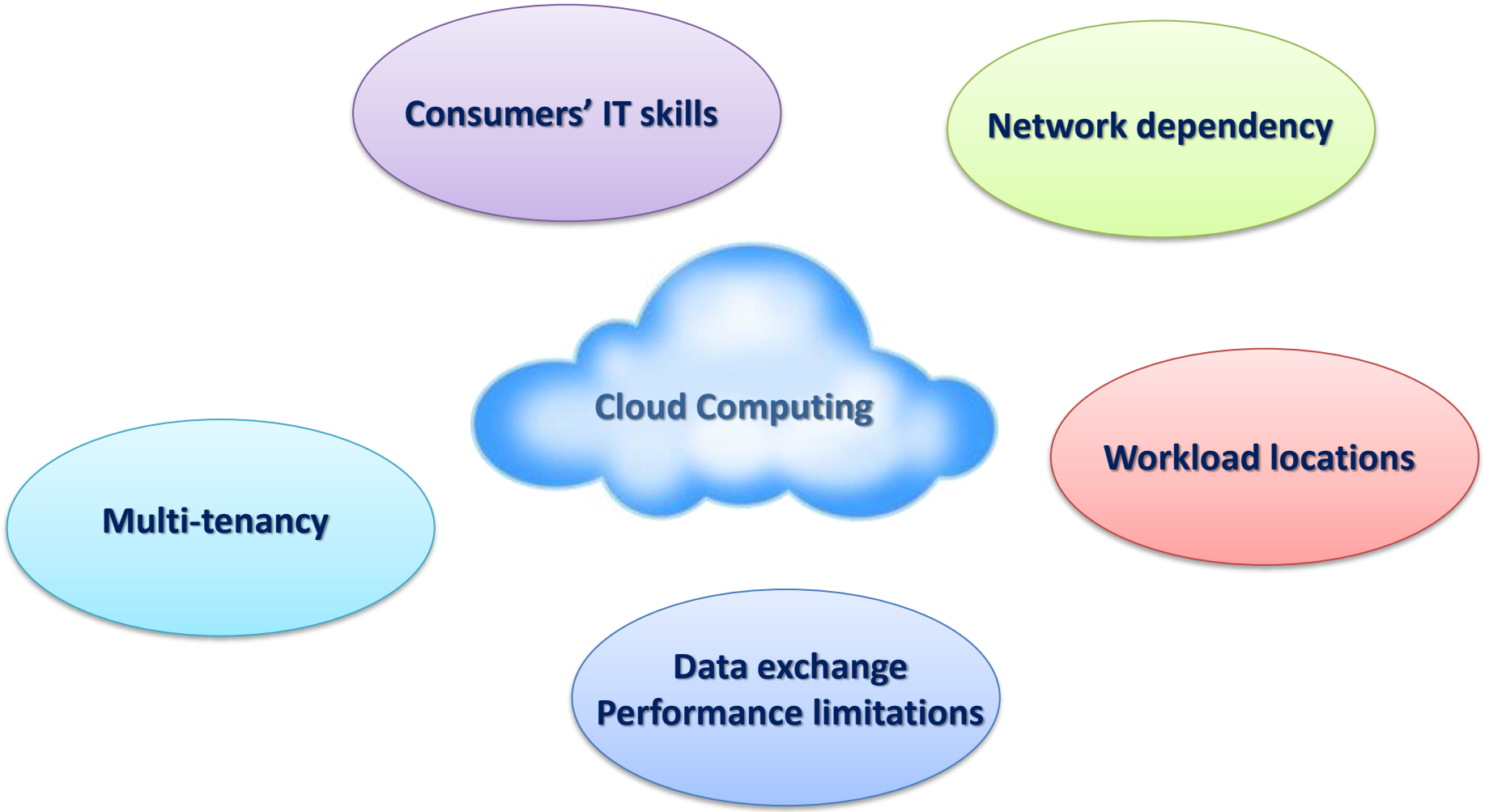
Community Cloud

- Shared nonpublic cloud
  - multiple independent entities
- Entities sharing concerns or subject to identical regulatory
  - mission, security requirements, policy, or compliance considerations
- Avoiding security and regulatory concerns associated with using a generic public cloud
- Managed by the organizations or a third party
- Exist on-premises or off-premises.

Hybrid cloud

- A combination of two or more clouds
  - Public, private or community
- Clouds are bound together (standardized or proprietary technology)
  - Enables data and application portability
  - Cloud bursting for load-balancing between clouds
  - Take advantage of the capabilities of the public cloud
- Maximum flexibility
- Complexity increased: security, risk and identity management

General statements



Comparison between deployment models

	Multi-tenancy	Network dependency	Workload locations	performance limitations	Consumers IT skills
Private	the workloads of different clients may reside concurrently on the same systems and local networks	may be limited to dependence on networking resources over which a consumer has control	determines the possible geographical locations of workloads	limits may be adjusted, although not eliminated	Consumers still need IT skills
Public	consumer's workload may be co-resident with the workloads of competitors or adversaries	depends on the Internet's infrastructure of (DNS) servers, the router infrastructure, and the inter-router links.	workloads may be relocated anywhere at any time	Depends only on network performance	No skills' need
Community	mitigates some of the multi-tenancy risks by **restricting the number of possible attackers**.	need to either provision controlled inter-site communication links or use cryptography over a less controlled communications media	workloads should remain within participant organizations if they have policies to keep workloads onsite	various levels of performance, security and reliability, based on the needs of the participant organizations	participant organizations need higher skills

Comparison between deployment models

	Cost saving	Elasticity	Control Level	Billing model / Utility usage
Public	★★★	★★★	★	★★★
Private	★	★	★★★	—
Hybrid	★★	★★	★★	★★