



Computing Infrastructures

 POLITECNICO DI MILANO



DATACENTERS

A short intro



Data Center Definition



- Many definitions exist for the Data Center
 - «A building or portion of a building whose primary purpose is to house a computer room and its support areas» TIA-942
 - «A facility used to house computer systems and associated components, such as telecommunications and storage systems. It generally includes redundant backup power supplies, redundant communications connections, environmental controls (e.g. air conditioning, fire suppression) and various security devices»
 - «Centralized repository, either physical or virtual, for the storage, management and dissemination of data and information organized around a particular body of knowledge or pertaining to a particular Business»
- There is no a GOLDEN definition for DATACENTER, but there is a clear concept behind it

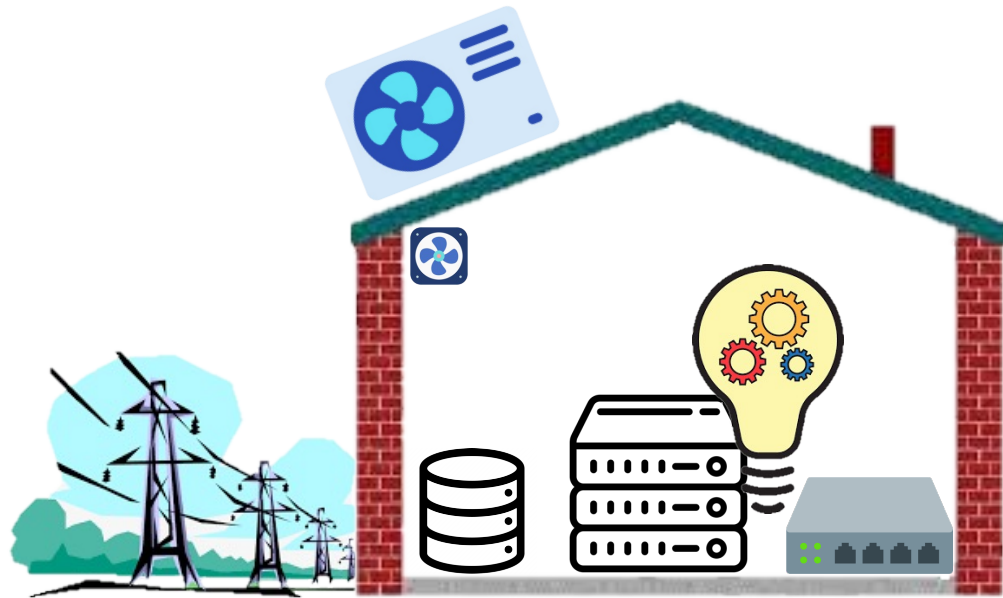


A simple story...



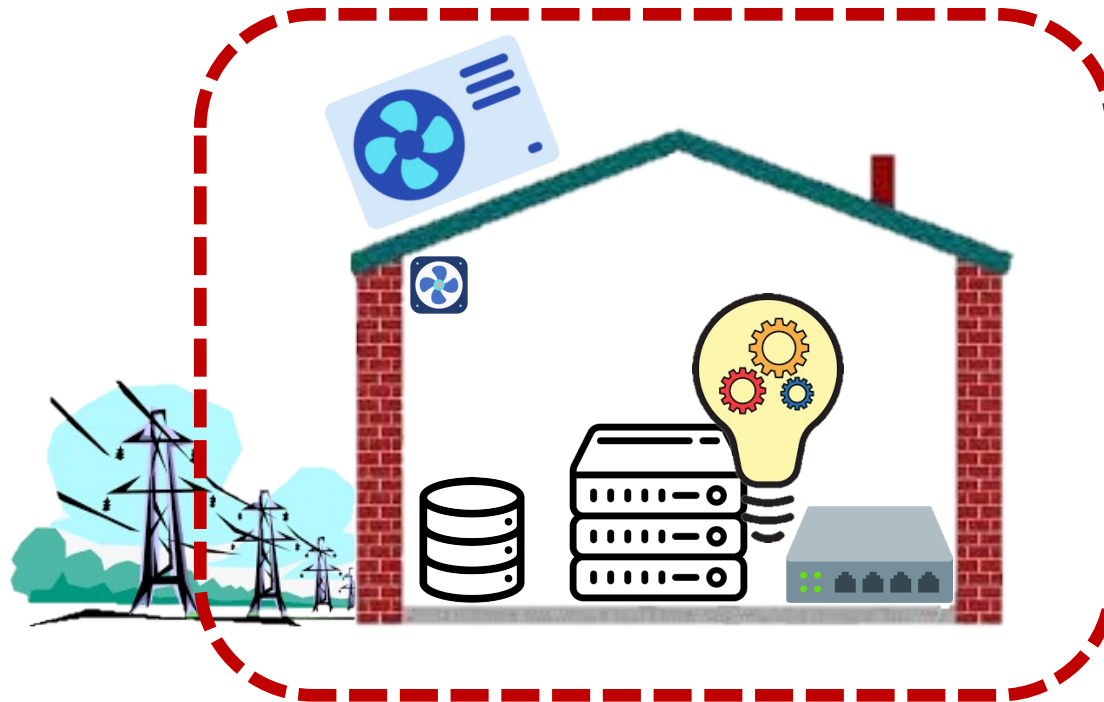


A simple story...





A simple story...



This is a simplified example of
DATACENTER

«A building whose primary purpose is to house a computer room and its support areas, so that services can run continuously and efficiently»

IT Equipments



Facility Equipments



Server Rooms and Support Areas





To Build or Not To Build: the datacenter dilemma



- **Enterprise Data Centers**

- Facilities wholly built, maintained, operated, and managed by the company providing the target service
 - *Pros: Asset for the company, complete control of the operational activities*
 - *Cons: High capital investment, requires necessary expertise to design and run the data center*

- **Typical facility pick list for a DC**

- Highly secure site (not only IT but also building)
- Redundant electrical, and current-conditioned, power distribution systems
- Redundant climate control systems
- Raised-floor system centers, integrated with multiple fire suppression systems
- Office space as required
- ... in addition to IT equipment:
 - Complex network infrastructure: Gateways, Routers, data cables
 - Multiple server complexes; Multiple data storage systems
 - Centrally-located systems monitors throughout the facility



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- Datacenters are always part of a business

- Business exists if there is the possibility of making money
- Not all money from your business should be spent on the datacenter

- Building a datacenters is not the only possibility, there are alternatives

- Co-location Datacenters
- Managed Hosting Platform/Third Party Datacenter





To Build or Not To Build: the datacenter dilemma



- **Colocation DataCenters**

- Large facilities built to accommodate multiple Businesses
- The business rents its own space within the datacenter
- Possibility to fill the space with proprietary IT equipment or to rent some part of it from the co-locator
 - *Pros: still high control on the IT equipment and operational environment, no need of DC design skills, lower capital investment, staff dedicated to guarantee operational and shared costs for high quality environment*
 - *Cons: The datacenter is not more an asset, restrictions on maintenance accesses with regards to time or resources, IT equipment purchase and updates are on your own*

FROM A COLOCATION DC PROVIDER WEBSITE

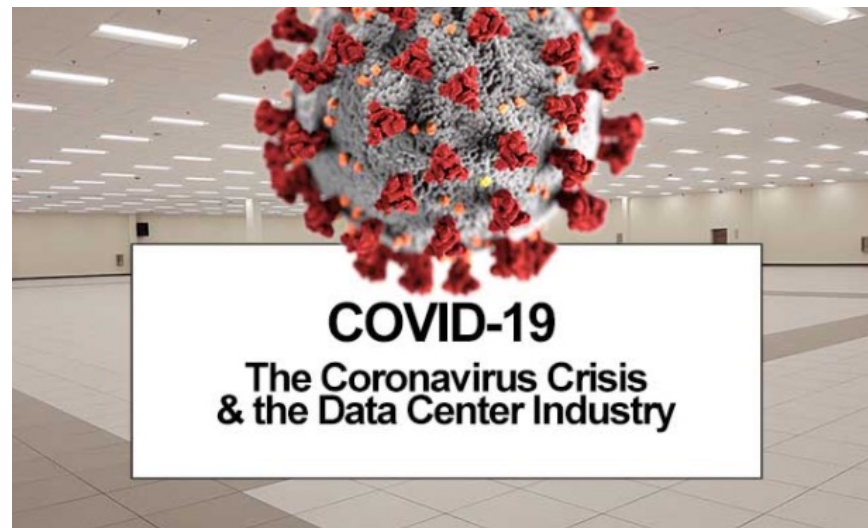
*Maximize the reliability of your business-critical computer systems. Build **primary and disaster recovery** centers with us and we **guarantee 99.995% uptime** for your data center facilities. Use our facilities for a **fraction of the cost of building your own**, while partnering with **unparalleled security experts**. We can provide **all possible colocation configurations**, including **all power options** needed to operate today's IT environment. We can provide **single cabinets in shared cages, dedicated cages, or large dedicated rooms**.*



To Build or Not To Build: the datacenter dilemma



- **Managed Hosting Platforms/Third Party Datacenter**
 - Data Centers managed by a Third Party
 - The business does not own or control the Data Center (or any space), the customer rents IT equipment and infrastructure it needs
 - Resources are not shared, **still a single-tenant solution**
 - *Pros: low capital investment, cost savings for small businesses, no need of expertise to design and run the datacenter.*
 - *Cons: Higher operational costs, lower control on the operational activities, possibility of customer «lock-in» problem.*





To Build or Not To Build: the datacenter dilemma



- Of course we are talking about physical computing infrastructures

... CLOUD solutions are additional solutions on the table

