

Insegnamento: Cloud and Datacenter Networking	
CFU: 3 CFU	SSD: ING-INF/05
Ore di lezione: 24	Ore di esercitazione: 0
Anno di corso:	
<p>Obiettivi formativi: The purpose of this course is to present network architectures employed in modern datacenters as well as the networking challenges deriving from the necessity of delivering Cloud Computing services. The course not only presents established technologies but also introduces to emerging groundbreaking paradigms, such as <i>Software Defined Networking</i>.</p>	
<p>Contenuti: <i>Datacenter Networking Infrastructures.</i> Datacenter network infrastructure architectures. The ANSI/TIA-942 standard. Top-of-Rack design. End-of-Row design. Evolution of network topologies. Spine-Leaf design. <i>Datacenter Networking Technologies.</i> Basic switching concepts. Clos networks. Evolution of the Ethernet technology over time. Different media types and their usage in a datacenter infrastructure. VLANs. Spanning Tree protocols. Load Balancers in datacenter. The TCP Incast problem and TCP variants for datacenter networks. Virtualization technologies and their role in a datacenter. KVM networking. Containers. Docker. Docker networking. Software switches. Open vSwitch. Impact of virtualization on datacenter networking. Multi-tenancy in virtualized datacenters. Geographic interconnection of datacenters. Ethernet over MPLS. Ethernet over IP. Storage Networking technologies: Fiber Channel, iSCSI, Fibre Channel over Ethernet (FcoE). <i>Networking aspects of Cloud Computing.</i> Public and private Cloud Computing Solutions. Amazon AWS services. Private Cloud networking. OpenStack. OpenStack networking. Networking in Amazon EC2. Amazon Virtual Private Cloud. Amazon CloudFront content delivery service. <i>Data Plane and Control Plane separation.</i> Software Defined Networking. OpenFlow. OpenFlow Controllers. POX, NOX, FloodLight. Sample OpenFlow applications tested with the Mininet emulator. Open vSwitch as a software OpenFlow switch. Role of SDN to support Cloud Computing. Network Function Virtualization (NFV).</p>	