

## Prova 1

1. Come potrebbero essere implementate politiche di sicurezza informatica in un'organizzazione per proteggere i dati sensibili?
2. Il candidato descriva le caratteristiche preferibili per la configurazione di una workstation grafica, definendo tipologia, nomi e quantità dei componenti (es. che processori, quanta ram, ...).
3. Testo:

Before the 1960s, networking was mostly about connecting phone calls in circuit-switched Public Switched Telephone Networks (PSTNs). There continued to be active research all the way to the early 2000s, including dynamic routing as you will see in a homework problem. A revolution, which came to be known as the Internet, started during the 1960s–1970s, with a shift to packet switching as the fundamental paradigm of networking. In the early 1960s, researchers formally developed the idea of chopping up a session's messages into small packets, and sending them along possibly different paths, with each path shared by other sessions. Each circuit in circuit switching may occupy either a particular frequency band or a dedicated portion of timeslots. In contrast, in packet switching, there is no dedicated circuit for each session. All sessions have their packets sharing the paths. In 1969, sponsored by the US Advanced Research Project Agency (ARPA), UCLA and three other institutions put together the first prototype of a packet-switched network, which came to be known as the ARPANET. The ARPANET started to grow. In 1974, Cerf and Kahn developed a protocol, i.e., a set of rules for communication among the devices, for packet-switched networks, called the Transmission Control Protocol/Internet Protocol (TCP/IP). This protocol enabled scalable connectivity in the ARPANET. From 1985 to 1995, the US National Science Foundation (NSF) took over the next phase of development, sponsoring the creation and operation of an ever-increasing network of networks called the NSFNET. Starting in the early 1990s, commercial interests and entrepreneurial activities dramatically expanded this interconnected network of networks. Indeed, by 1994, the World Wide Web and web browser user-interface had matured, and the world quickly moved into commercial applications built on top of this network, known by then as the Internet. Today the Internet has blossomed into an essential part of how people live, work, play, talk, and think. There are now more Internet-connected devices than people in the world, and it is projected that by 2020 there will be six times as many connected devices as people. It has been a truly amazing five decades of technology development

## Prova 2

1. Descrivere le linee guida AgID e il loro scopo
2. Il candidato descriva cosa è il cablaggio strutturato e come si potrebbe implementare in un edificio di 3 piani
3. Testo:

P2P showcases a major success of the evolution of the Internet: make the basic design simple and allow overlay constructions. The architecture of the Internet focuses on providing simple, ubiquitous, stable, and economical connectivities, leaving the rest of the innovations to overlays to be constructed in the future for unforeseeable applications. Different types of applications, unicast as well as multicast, have been built using P2P overlays, including file sharing, video streaming, and on-demand multimedia distribution. Both Skype and BitTorrent are free (of course the Internet connection from your device might not be free).

Skype is free in part because it leverages peer capability to locate each other and establish connections. P2P is used for signaling in Skype.

BitTorrent is free in part because it leverages peer uplink capacities to send chunks of files to each other, without deploying many media servers. (And it is free in part because the content shared sometimes does not incur royalty fees). P2P is used for sharing content in BitTorrent.

Both Skype and BitTorrent are scalable. They illustrate a positive network effect whereby each additional node in the network contributes to many other nodes. We can therefore add many more nodes as the network scales up without creating a bottleneck. Of course this assumes the nodes can effectively contribute, and that requires some smart engineering design. As this chapter shows, this "P2P law" is a refinement of our intuition about the network effect codified in Metcalfe's law (named after the inventor of Ethernet that connects computers in a local area network): the benefit of joining a network grows as the square of the number of nodes. One of the underlying assumptions is that all connections are equally important.

## Prova 3

1. Quali sono le differenze tra i tre sistemi operativi Windows, Linux, Mac OSX?
2. Si vuole realizzare un'aula didattica per lezioni in presenza e a distanza: il candidato illustri quali componenti acquistare, la loro funzione e come configurare
3. Testo:

Much of the web services and online information is "free" today because of the advertisements shown on the websites. Compared with traditional media, online advertisements' revenue ranked right below TV and above newspapers.

In the early days of the web, i.e., 1994-1995, online advertisements were sold as banners on a per-thousand-impression basis. But seeing an ad does not mean clicking on it or buying the advertised product or service afterwards. In 1997, GoTo (which later became Overture) started selling advertisement spaces on a per-click basis. This middle ground between ad revenue (what the website cares about) and effectiveness of ad (what the advertisers care about) became a commonly accepted foundation for online advertising. With the rise of Google came one of the most stable online ad market segments: search ads, also called sponsored search. In 2002, Google started the AdWords service where you can create your ad, attach keywords to it, and send it to Google's database. When someone searches for a keyword, Google will return a list of search results, as well as a list of ads on the right panel, or even the main panel, if that keyword matches any of the keywords of ads in its database. This process takes place continuously and each advertiser can adjust her bids frequently. There are often many ad auctions happening at the same time too. We will skip these important factors in the basic models in this chapter, focusing just on a single auction.

## Prova 4

- 1) Spiega l'importanza del GDPR (Regolamento Generale sulla Protezione dei Dati) nell'ambito della gestione dei dati personali e aziendali
- 2) Strategie di Backup: metodologie e tipi.
- 3) Testo:

Netflix started its DVD rental business in 1997: instead of going to rental stores, you can just wait for DVDs to arrive by mail. Instead of incurring a late fee for each day you hold the DVD beyond the return date, you can keep holding the DVD as long as you continue to pay the monthly subscription fee, but you cannot receive a new DVD without returning the old one. Netflix also maintained an efficient inventory control and mail delivery system. It operated with great scalability (i.e., the per-customer cost is much lower as the number of customers goes up) and stickiness (i.e., users are reluctant to change the service). By 2008, there were about 9 million users in the USA and Canada. Then Netflix moved on to the next mode of delivering entertainment. This time it was streaming movies and TV programs from video servers, through the Internet and wireless networks, to your Internet-connected devices: TVs, set-top boxes, games consoles, smartphones, and tablets. With its branding, choice of content, and aggressive pricing, Netflix's subscriber base nearly tripled to 23 million by April 2011. Netflix video streaming generated so much Internet traffic that over one in every four bits going through the Internet that month was Netflix traffic. In September 2011, Netflix announced that it would separate the DVD rental and online streaming businesses. Soon afterwards, Netflix reversed the decision, although the pricing for DVD rental and for online streaming became separated.

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