Management Information Systems

IT Infrastructure and Emerging Technologies

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IT infrastructure

– Set of physical devices and software required to operate enterprise

– Set of firmwide services including:

- Computing platforms providing computing services
- Telecommunications services
- Data management services
- Application software services
- Physical facilities management services
- IT management, standards, education, research and development services
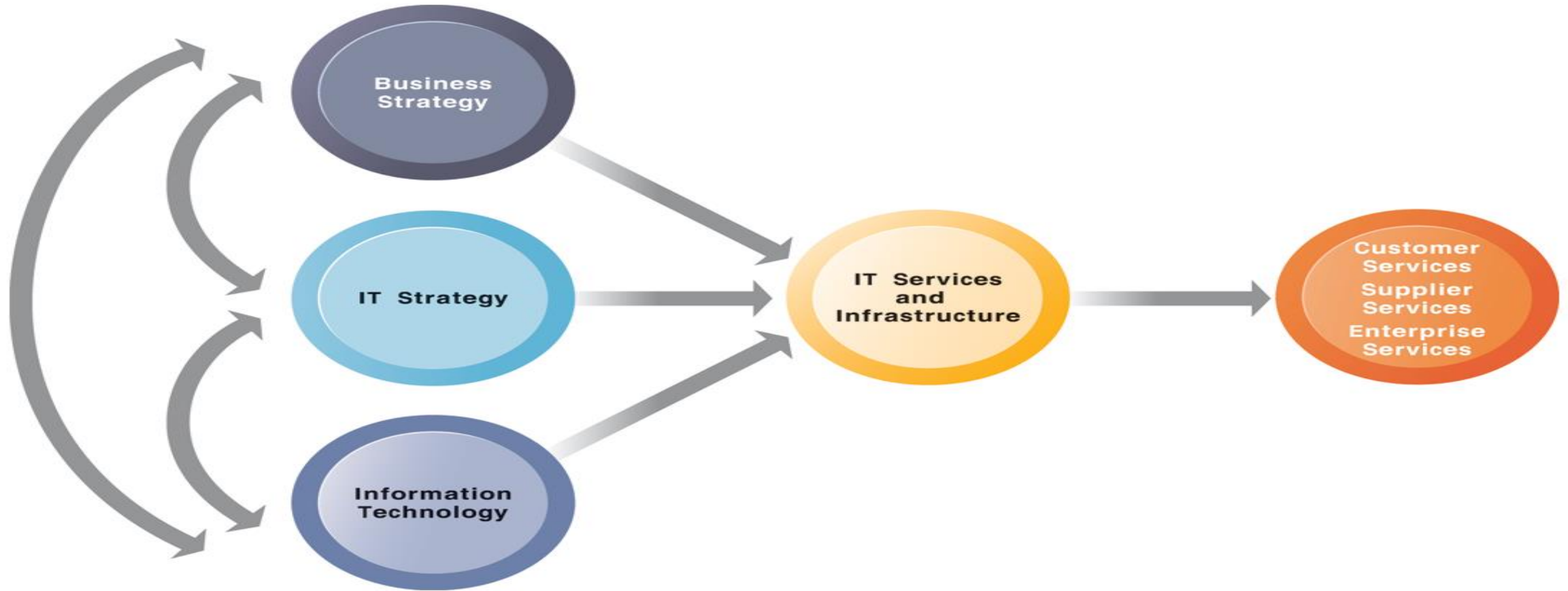
Evolution of IT infrastructure

– General-purpose mainframe & minicomputer era: 1959 to present
  - 1958 IBM first mainframes introduced
  - 1965 Less expensive DEC minicomputers introduced

– Personal computer era: 1981 to present
  - 1981 Introduction of IBM PC
  - Proliferation in 80s, 90s resulted in growth of personal software

– Client/server era: 1983 to present
  - Desktop clients networked to servers, with processing work split between clients and servers
  - Network may be two-tiered or multitiered (N-tiered)
  - Various types of servers (network, application, Web)

Evolution of IT infrastructure (Cont...)

– Enterprise computing era: 1992 to present

- Move toward integrating disparate networks, applications using Internet standards and enterprise applications

– Cloud Computing: 2000 to present

- Refers to a model of computing where firms and individuals obtain computing power and software applications over the Internet or other network
- Fastest growing form of computing

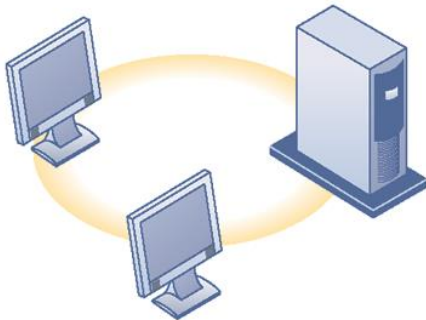Mainframe/Minicomputer (1959–present)
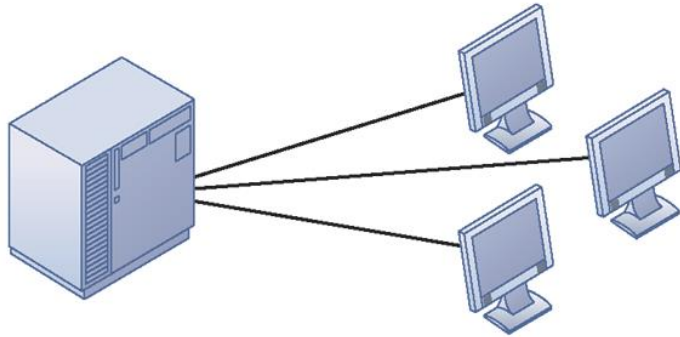
Personal Computer (1981–present)

Client/Server (1983–present)

Enterprise Computing 1992–present)

Enterprise Server
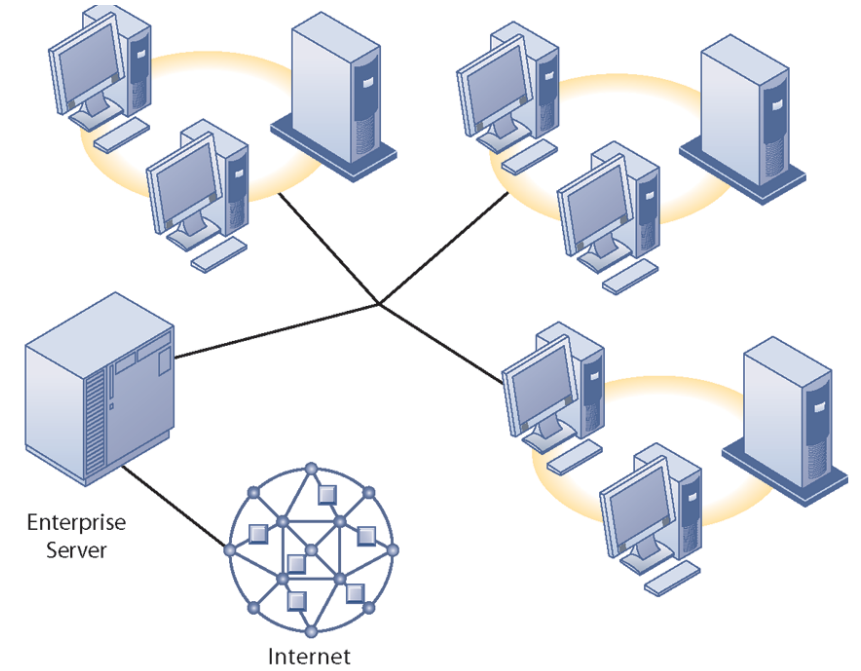
Internet

Cloud and Mobile Computing (2000–present)

- Hardware
- Software
- Services

THE INTERNET

A Multi-tiered Client/Server Network (N-tier)

Client — Internet — Web Server — Application Server — Sales Production Accounting HR — Data
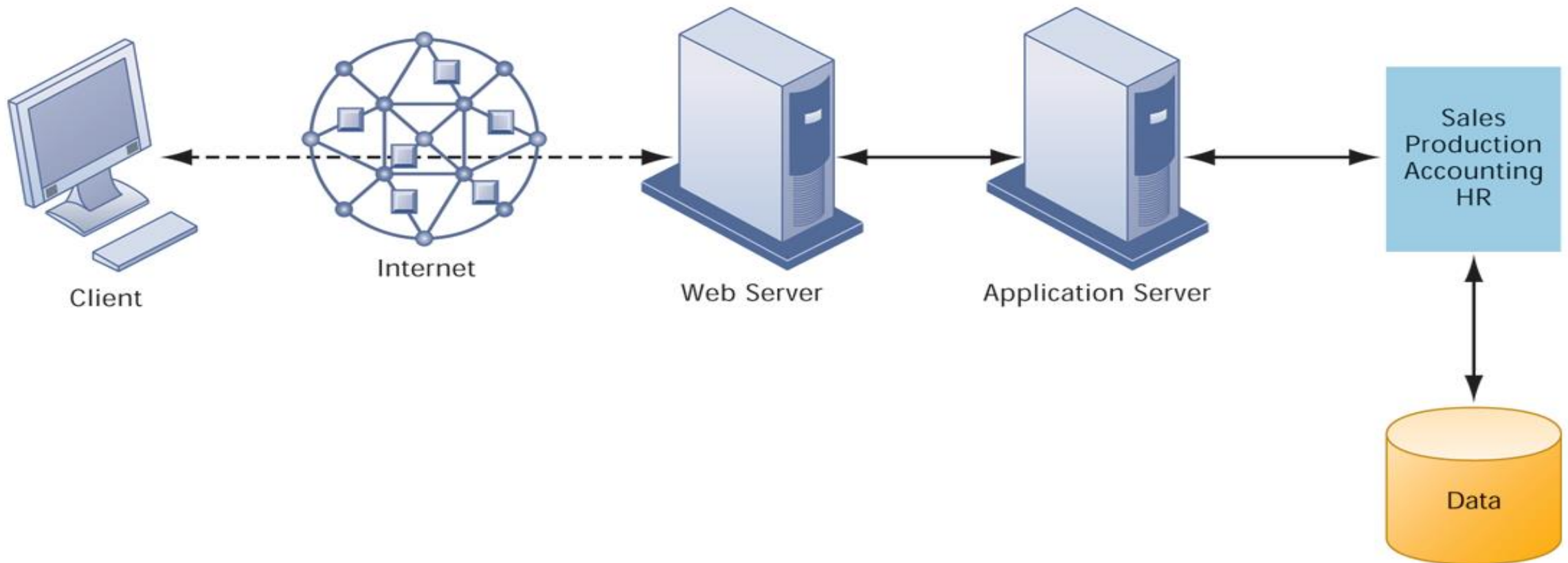
Infrastructure Components

- IT Infrastructure has 7 main components
  1. Computer hardware platforms
  2. Operating system platforms
  3. Enterprise software applications
  4. Data management and storage
  5. Networking/telecommunications platforms
  6. Internet platforms
  7. Consulting system integration services

Infrastructure Components

IT Infrastructure Ecosystem

Internet Platforms
Apache
Microsoft IIS, .NET
Unix
Cisco
Java

Computer Hardware Platforms
Dell
IBM
Sun
HP
Apple
Linux machines

Data Management and Storage
IBM DB2
Oracle
SQL Server
Sybase
MySQL
EMC Systems

Operating Systems Platforms
Microsoft Windows
Unix
Linux
Mac OS X
Google Chrome

Consultants and System Integrators
IBM
EDS
Accenture

Networking/ Telecommunications
Microsoft Windows Server
Linux
Novell
Cisco
Alcatel-Lucent
Nortel
AT&T, Verizon

Enterprise Software Applications
(including middleware)
SAP
Oracle
Microsoft
BEA

Infrastructure Components

- Computer hardware platforms
  - Client machines
    - Desktop PCs, mobile devices – PDAs, laptops
  - Servers
    - Blade servers: ultrathin computers stored in racks
  - Mainframes
    - IBM mainframe equivalent to thousands of blade servers
  - Top chip producers: AMD, Intel, IBM
  - Top firms: IBM, HP, Dell, Sun Microsystems

Infrastructure Components

- Operating system platforms
  - Operating systems
    - Server level: 75% run Windows; 25% run Unix or Linux
    - Client level:
      - 90% run Microsoft Windows (XP, 2000, CE, etc.)
      - Handheld device OS's (Android, iPhone OS)
      - Cloud computing OS's (Google's Chrome OS)
- Enterprise software applications
  - Enterprise application providers: SAP and Oracle
  - Middleware providers: BEA

Infrastructure Components

- Data management and storage
  - Database software:
    - IBM (DB2), Oracle, Microsoft (SQL Server), Sybase (Adaptive Server Enterprise), MySQL
  - Physical data storage:
    - EMC Corp (large-scale systems), Seagate, Maxtor, Western Digital

Infrastructure Components

- Networking/telecommunications platforms
  - Telecommunication services
    - Telecommunications, cable, telephone company charges for voice lines and Internet access
    - AT&T, Verizon
  - Network operating systems:
    - Windows Server, Novell, Linux, Unix
  - Network hardware providers:
    - Cisco, Alcatel-Lucent, Nortel, Juniper Networks

Infrastructure Components

- Internet platforms
  - Hardware, software, management services to support company Web sites, (including Web hosting services) intranets, extranets
  - Internet hardware server market: Dell, HP/Compaq, IBM
  - Web development tools/suites: Microsoft (FrontPage, .NET) IBM (WebSphere) Sun (Java), independent software developers: Adobe, RealMedia

Infrastructure Components

- Consulting and system integration services
  - Even large firms do not have resources for a full range of support for new, complex infrastructure
  - Software integration: ensuring new infrastructure works with legacy systems
  - Accenture, IBM Global Services, EDS, Infosys, Wipro

Contemporary Hardware Platform Trends

- The emerging mobile digital platform
  - Cell phones, smartphones (BlackBerry, iPhone)
    - Have assumed data transmission, Web surfing, e-mail and IM duties
  - Netbooks
    - Small, low-cost lightweight notebooks optimized for wireless communication and core computing tasks
  - Tablets (iPad)
  - Networked e-readers (Kindle)