25th February, 2022

CLASS PRESENTATION

COLUMBIA HOSPITAL DATA CENTER

Sagun Shrestha

Mahesh Bhandari

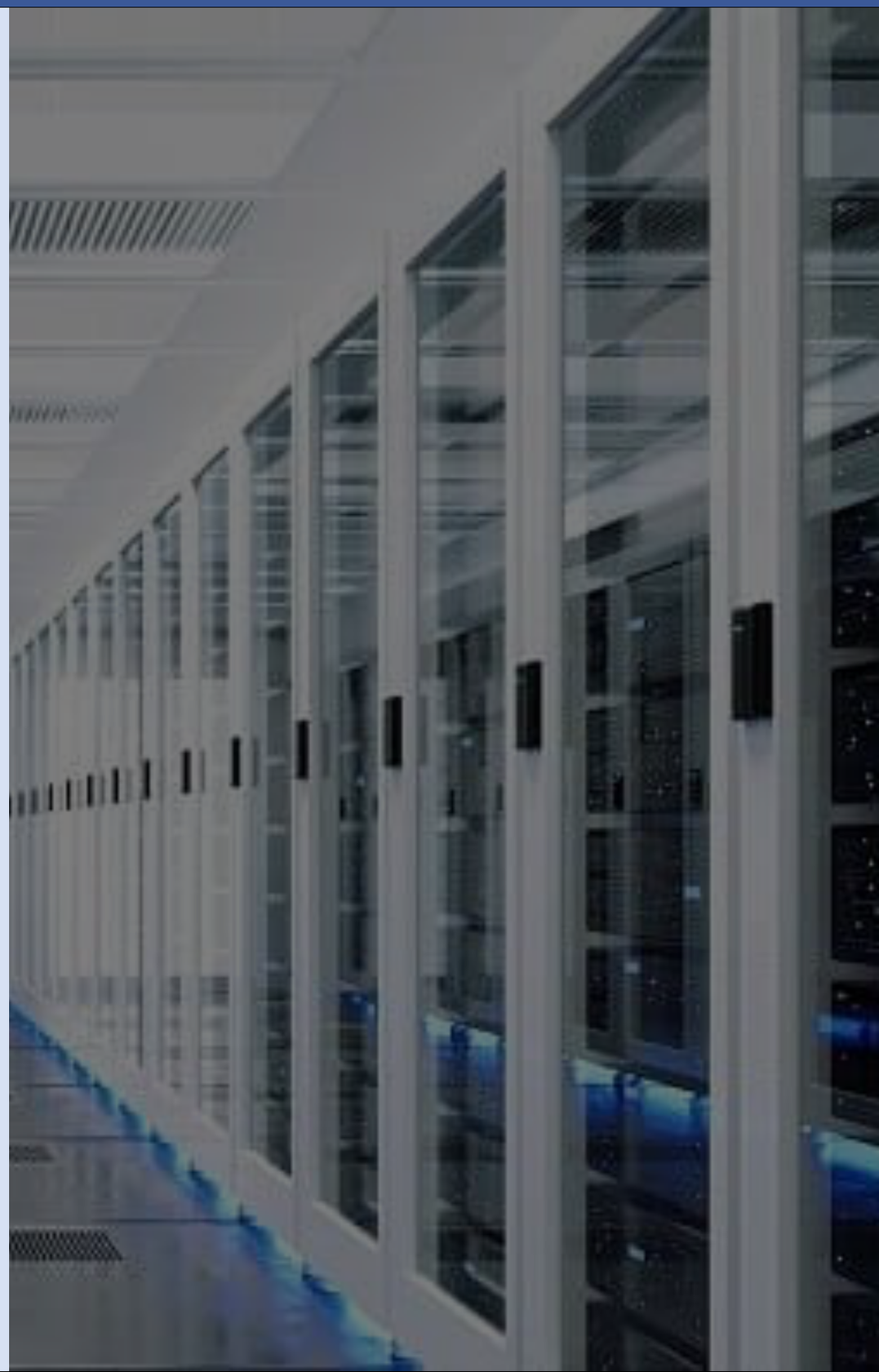
Sandesh Subedi ‘A’

Data Center Infrastructure

Yuvraj Sharma

INDEX

- Technical Goals
- Data Center Tier
- IT Hardware Devices
- Electrical Power Distribution
- Cooling Solution
- Fire Suppression System
- Physical Security

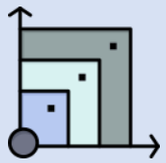


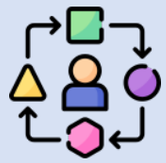
TECHNICAL GOALS

Security

Manageable

Scalability





Adaptability

Availability

Cost

FACTORS CONSIDERED

Location

Network Services

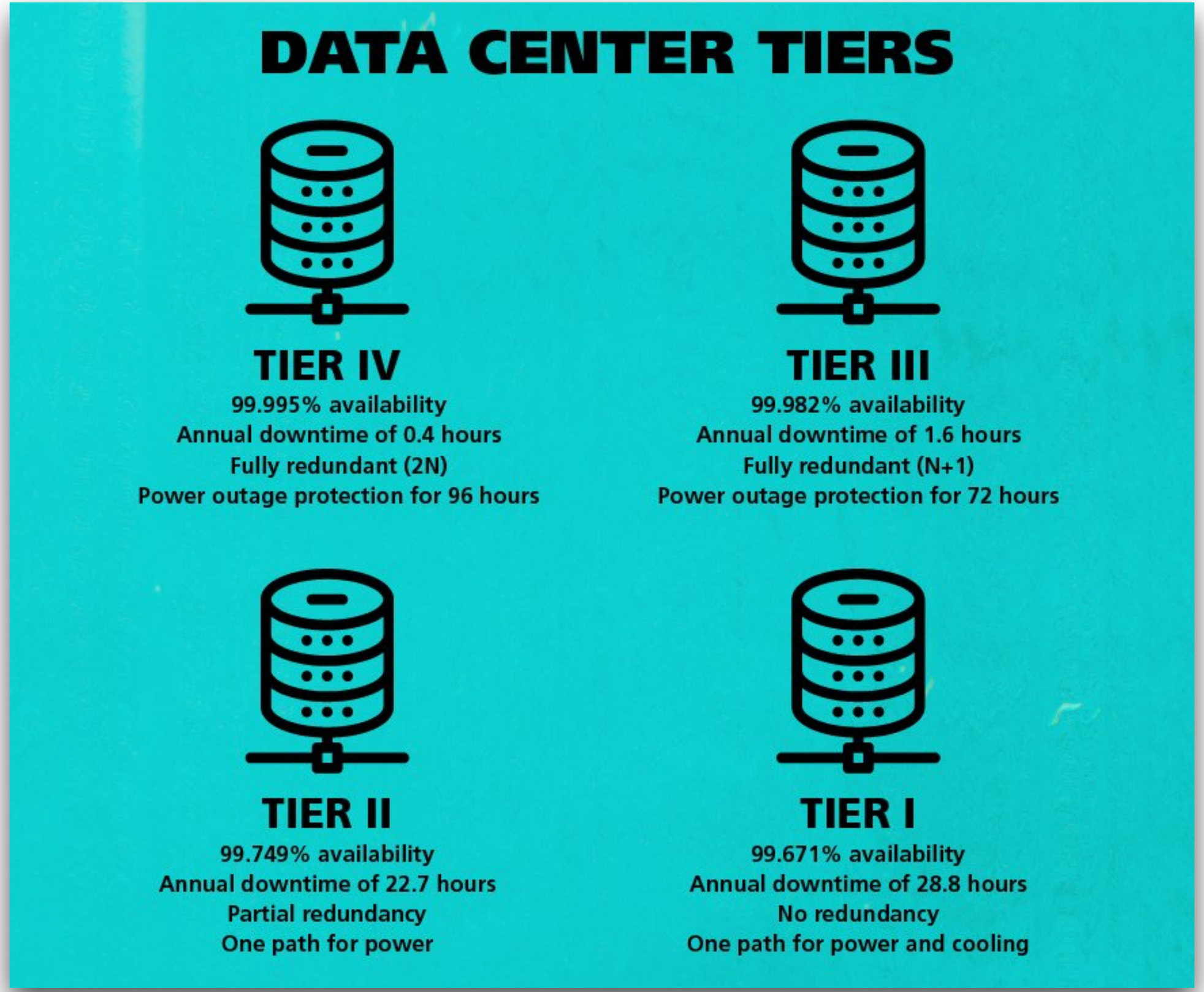
Security

Raised Floor and Perforated Tiles

Suspended ceiling

Insulated Walls

DATA CENTER TIER



DATA CENTER TIER

Chosen Tier : Tier IV

- Completely fault-tolerant data center
- Redundancy for each component
- Expected uptime of 99.995% per year
- Less than 26.3 minutes of downtime per year
- Ideal for consistently high level of traffic or processing demand

IT HARDWARE DEVICES

Rack Server

- also known as rack mounted server
- used as a server for providing services to the clients
- designed according to the rack mountable features and capabilities

Chosen Rack Server

Acoustic quiet soundproof rack

- Rack Unit : 44U
- Material : Extruded Aluminum
- Door Style : Solid/Solid
- Sound Reduction : 20.7 dbA

IT HARDWARE DEVICES

Router

- Connect different networks
- Receive, analyze and forward packets
- Chosen Router : Cisco CSR 1000v
- Supports public cloud such as Ms Azure

Chosen Router

CISCO Service Provider Core Router
& Ubiquiti Edge Router

IT HARDWARE DEVICES

Switch

- Scale and investment protection
- Deep visibility and security
- Lower TCO with IP Storage
- Chosen Switch : Cisco Nexus 9000

Chosen Switch

Cisco Nexus 9000 Switch for Data Center

IT HARDWARE DEVICES

Patch Panel

- multiple port panel
- connect many devices with each other and organize all the cables used
- used to set up various types of cables

Cabling

- considered as a transportation path for data
- Unshielded Twisted Pair (UTP)
- Fiber optic cables

ELECTRICAL POWER DISTRIBUTION

TRANSFORMER

- Used to either increase or decrease the voltage of the electricity
- Connected to switchgear for the distribution of the power to the devices

ELECTRICAL POWER DISTRIBUTION

Uninterruptible Power Supply (UPS)

Chosen : Online UPS

- Provides power instantly from its battery when the normal power source is cut off

- Soul purpose of this device is to save data, injuries, protect IT devices during the sudden power disruption

ELECTRICAL POWER DISTRIBUTION

Power Distribution Unit (PDU)

- Directly mounted in a rack

- Helps to distribute AC power to all the IT devices such as switch, router, servers etc

COOLING SYSTEM

Hot Aisle Containment System

Cold Aisle Containment System

RECOMMENDATION

Hot Aisle Containment System

- Higher efficiency and effective technology
- Comparatively cheaper
- Provides suitable temperature and environment

Water Sprinkler System

Clean Agent System

FIRE SURPRESSION SYSTEM

RECOMMENDATION

Clean Agent System

- Effective and efficient to use
- Free of corrosion, non-conductive and residue
- Faster to extinguish fire

BUILDING MANAGEMENT SYSTEM

- Helps to monitor and control lights, water, ups, backup generator, etc.

- Uses both hardware and software to monitor and control the entire system

- Uses microprocessor based controller

- Helps to make a data center environment friendly

PHYSICAL SECURITY

Physical Security	• First layer of security • Guarded with security personnel
Facility Control	• Second layer of security • Equipped with face recognition, thumb print, etc.
Computer Room Control	• Third layer of security • Restricted areas are constantly monitored
Cabinet Control	• Final layer of security • Equipped with a electronic locking mechanism

END OF PRESENTATION

THANK YOU !