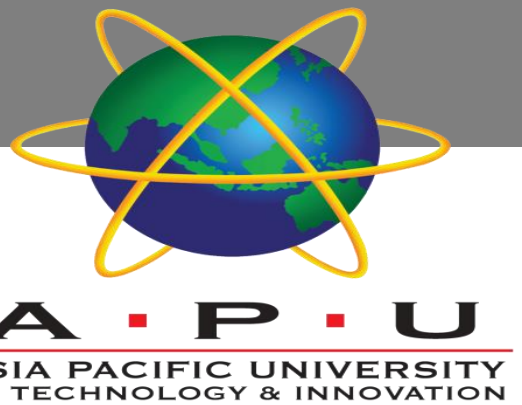
Data Protection and Management



Introduction to Data Protection

Upon completion of this session, you should be able to:

- Describe Data
- Why we need protection
- State data protection definition
- What is Availability
- Correlating Data Protection and Availability
- Measurement of Data Availability
- Causes of Data Unavailability

Data-Digital Data

It is stored as strings of binary values (0s and 1s)

What is data (Digital Data)?

Digital data is a collection of facts that is transmitted and stored in electronic form, and processed through software.

Data can exist in a variety of forms such as:

Photographs and drawings,
alphanumeric text and images,
tabular results of a scientific survey,..

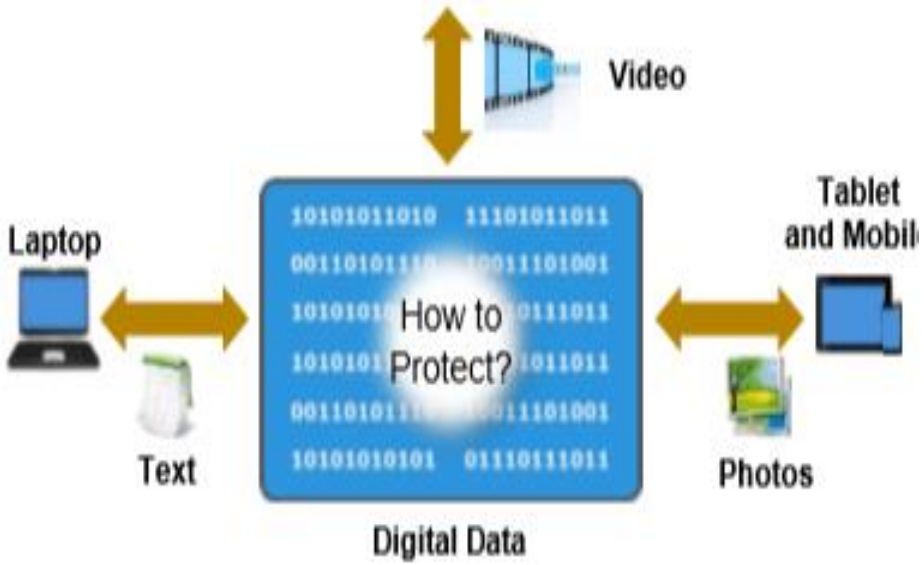
Digital data is generated by various devices such as

Desktops, laptops, tablets, mobile phones, and electronic sensors.

What Do You Do to Protect Your Data?

What Do You Do to Protect Your Digital Data?

- Create backups often
- Keep a copy of data to a remote site
- Archive older but important files
- Test data recovery
- Use security mechanisms
- Anything else?



Why do you spend money, time, and effort on data protection and management?

Need for Data Protection and Management

Application Dependency	Business applications rely on data protection techniques for uninterrupted and reliable access to data.
High-risk Data	Organizations seek to protect their sensitive data to reduce the risk of financial, legal, and business loss.
Data Protection Laws	Legal requirements mandate protection against unauthorized modification, loss, and unlawful processing of personal data.

Activity1

- Do an internet seach for understanding Data Protection Law in Malaysia.
- Each student need to explain one Data Protection Law in Malaysia

Data Protection Definition

Data protection is the

process of safeguarding data from corruption and loss. It focuses on technologies or solutions that can prevent data loss and recover data in the event of a failure or corruption.

What is Data Availability

Data availability refers to

the ability of an IT infrastructure component or service to function according to business requirements and end users' expectations during its **operating time**, ensuring that data is accessible at a required level of performance.

What is Operating Time

The operating time is the specified or agreed time of operation when a component or service is supposed to be available.

For example, a service that is offered from 9 AM to 5 PM Monday to Friday, 52 weeks per year, would have an operating time of 8 * 5 * 52 = 2080 hours per year.

Correlating Data Protection and Availability

Data Protection

Data Availability

Data Protection	Data Availability
Process of safeguarding data from corruption and loss	Ability of an IT infrastructure component/service to function as required during its operating time
Involves technologies/solutions that can prevent data loss and recover data	Involves technologies, strategy, procedure, and IT resource readiness appropriate for application/service
Helps in improving data availability	Drives the choice of data protection technologies/solutions

Measurement of Data Availability

Data availability is measured as percentage of uptime in a given year

$$\text{Data Availability} = \frac{\text{Operating Time} - \text{Downtime}}{\text{Operating Time}} \times 100$$

Measurement of Data Availability (contd.)

Data availability is also measured using reliability metrics

MTBF

Average time available for a component/service to perform its normal operations between failures

MTTR

Average time required to repair a failed component/service

$$\text{Data Availability} = \frac{\text{MTBF}}{\text{MTBF} + \text{MTTR}} \times 100$$

Example

- Annual uptime of a component is 9609 hours.
- Annual downtime is 11 hours.
- Component has failed 3 times in a year.

MTBF? Total uptime/number of failures
MTTR? Total downtime/ number of failures

Extra Note

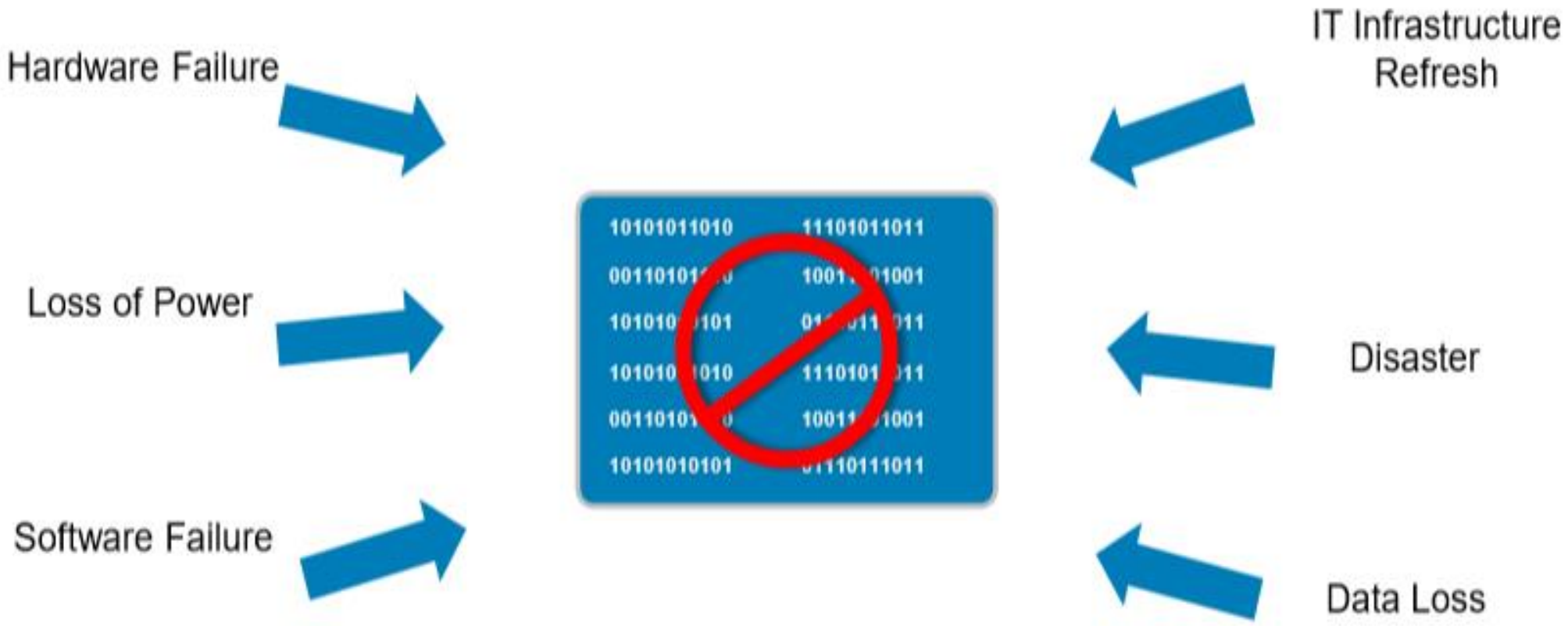
Mean Time to Restore Service (MTRS) is considered to be a better metric than MTTR for measuring data availability. MTRS is the average time taken to restore a failed component or a service.

Activity

Why MTRS is better than MTTR?

What is the problem with MTTR?

Causes of Data Unavailability



Outage Categorization

The outages can be broadly categorized into

Planned

Unplanned

Planned outages may include installation and maintenance of new hardware, software upgrades or patches, performing application and data restores, facility operations (renovation and construction), and migration.

Unplanned outages include failure caused by human errors, database corruption, failure of components, and natural or man-made disasters.

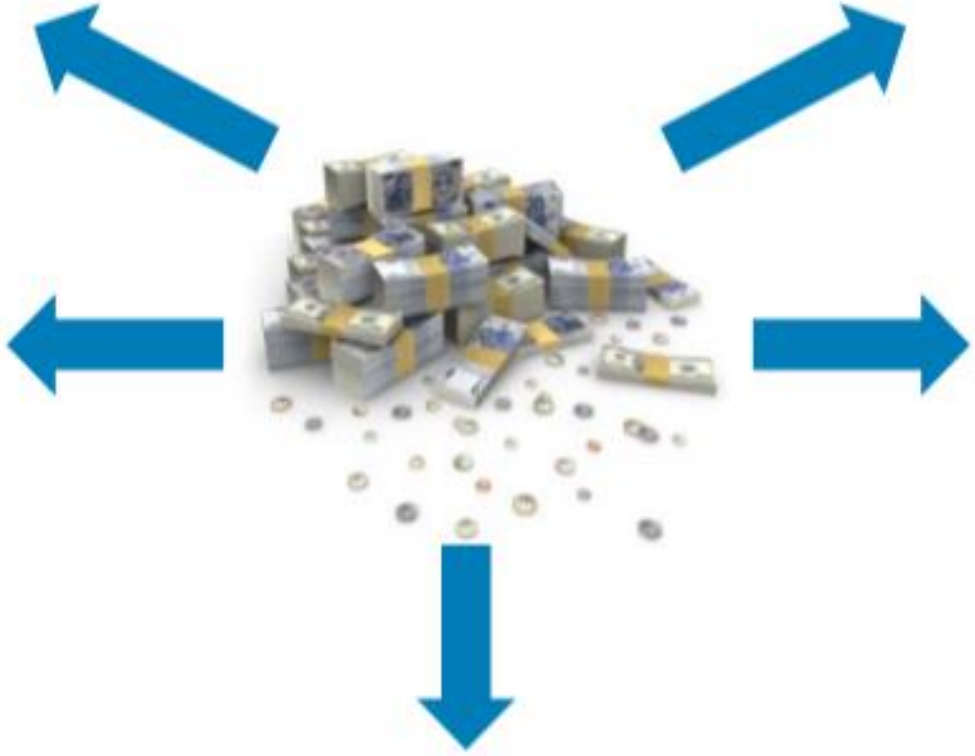
Impacts of Data Unavailability

Lost Productivity

- Number of employees impacted x hours of outage x hourly rate

Lost Revenue

- Direct loss
- Compensatory payments
- Future revenue loss
- Billing losses
- Investment losses



Damaged Reputation

- Customers
- Suppliers
- Financial markets
- Banks
- Business partners

Financial Performance

- Revenue recognition
- Cash flow
- Lost discounts
- Payment guarantees
- Credit rating
- Stock price

Other Expenses

- Temporary employees, equipment rental, overtime costs, extra shipping costs, travel expenses, and so on.

Quick Review Question

- What is the correlation between availability and data protection
- Why we need data protection
- How we measure the availability

Question and Answer Session

Q & A

What we will cover next

- Data Centers

Data Center

Organizations typically house their IT infrastructure within a **data center**.

A data center provides centralized data-processing capability. It is used to provide worldwide access to business applications and IT services over a network, commonly the Internet.

A data center usually stores large amounts of data and provides services to a vast number of users.

Data protection in a data center is vital for carrying out business operations.