# CH 10: Implementing Operational Procedures

- Use Appropriate Safety Procedures
- Environmental Impacts and Controls
- Create and Maintain Documentation
- Use Basic Change Management Best Practices
- Implement Disaster Prevention and Recovery Methods
- Basic Scripting Concepts
- Professionalism and Communication

# Topic A: Environmental Impacts and Controls

# Power Issues

- Caused by building power failures, not the computer's power system.

**Surge**: Abrupt, but brief change in the value of the voltage.

**Spike**: A powerful surge, such as that caused by lightning.

**Sag**: Power supply to components briefly dips below required levels.

**Brownout**: Power from the wall socket is insufficient to allow devices to function correctly.

**Blackout**: Complete loss of electrical power.

# Power Protection Controls

- Devices require stable power supply
- Electrical events can crash devices
- Use power protection devices to mitigate issues

**Surge protector:** A device intended to protect electrical devices against the damaging effects of a power spike.

**Line conditioner:** A device that adjusts voltages in under-voltage and over-voltage conditions to maintain a 120 V output.

**Power Distribution Unit (PDU):** A device designed to provide power to other devices that require it.

**Uninterruptible Power Supply (UPS):** A battery powered device designed to provide an alternative AC power supply during a power failure.

# Power Protection Controls

**Surge protectors:**

- Low cost
- Protect one or two devices
- Rated by various standards
  - UL 1449
- Characteristics:
  - Clamping voltage
  - Joules rating
  - Amperage

**Line conditioners:**

- Protect from surges or brownouts
- Cannot protect from blackouts

# Power Protection Controls

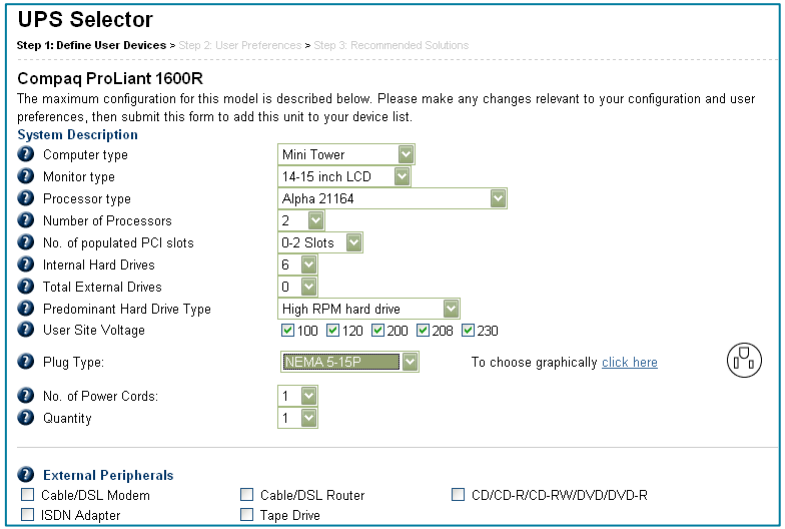

**Battery backups and UPS:**

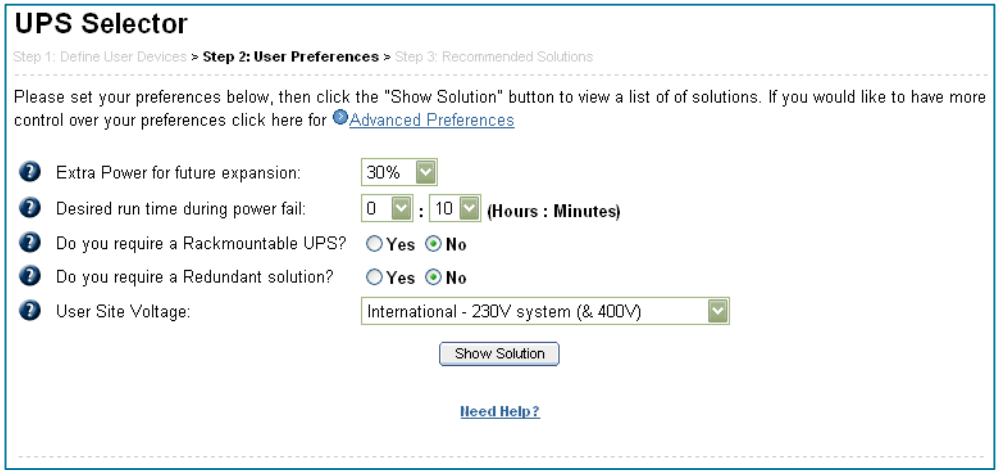
- Power redundancy:
  - Protection against blackouts
  - Battery backups provide temporary power at the component level
  - UPSs provide temporary power at the system level
- Length of protection depends on load and battery capacity
- Allows time to:
  - Switch to alternate power source
  - Shut down device properly
  - Save files

# Power Protection Controls

## UPS sizing:

- Considerations when purchasing UPS:
  - Reliability
  - Cost
  - Uptime
  - Maintenance
  - System performance and features



# Environmental Impacts

- **Mean Time Between Failures (MTBF):** The rating on a device or component that predicts the expected time between failures.

**Environment affects:**

- Operation
- Lifespan

**Keep away from:**

- Extreme temperatures
- Dampness and dust

**Regularly inspect and clean surroundings**

# Dust and Debris

## Dust/airborne particles:

- Drawn in through ventilation holes
- Can prevent heat dissipation
- Can clog keyboards and mice
- Can make displays hard to read

## Control dust by:

- Cleaning devices
- Maintaining HVAC filters
- Maintaining fan inlet air and dust filters
- If necessary, placing a system in enclosure with its own air filters and fans

# Temperature, Humidity, and Ventilation

Excessive heat affects computer reliability:

- Direct sunlight
- Placement near a heat source
- Airflow

Humidity levels:

- High can cause condensation
- Low can cause ESD risks
- Strive for around 50% relative humidity
- Allow moved equipment to adjust to room temperature before running

Make sure HVAC system adequately maintains proper temperature, humidity, and ventilation.

# General Preventive Maintenance

- Wear a mask and gloves when you are:
  - Using compressed air.
  - Working around toner spills or in a dusty environment.

- Compressed air dislodges dust from hard-to-reach areas.
  - Be aware of risk of contaminating the environment with dust.
  - Use in a controlled work area.
  - Use air filter mask and safety goggles.

- Use vacuums with caution.
  - For removing dust from inside a system unit, use a PC vacuum or one with a natural bristle brush.
  - Do not use home appliances due to ESD.
  - For toner spills, verify the vacuum is labeled “toner safe.”
    - Alternatively, use a toner cloth.

# Peripheral Device and Laptop Maintenance

- Clean peripherals with wipes or cloths and cleaning solutions designed for PC components:
  - Mice
  - Keyboard
  - Displays

- Laptop maintenance:
  - Keep vents clear of dust and debris
  - Use on a flat surface to allow airflow
  - If used on a lap, use a chiller pad or mat to allow airflow
  - Use compressed air to clean keyboard
  - Use soft cloth and approved cleaner for screen, touchpad, and case

# Disposal, Recycling, and Compliance

- OSHA-compliant employers must provide:
  - Workplace free of recognized hazards.
  - Personal protective equipment.
  - Labeling, MSDS, and hazmat training.
- Your responsibility:
  - Be informed of potential hazards.
  - Always use safe practices.
- Environmental protection:
  - Comply with environmental control requirements.
  - MSDS documentation for identifying potentially hazardous substances.

SAFETY DATA SHEET

PPG

Date of issue/Date of revision 16 July 2018
Version 9.01

**Section 1. Identification**

| | |
|---|---|
| Product name | : Metal Cleaner |
| Product code | : DX579 |
| Other means of identification | : Not available. |
| Product type | : Liquid. |

Relevant identified uses of the substance or mixture and uses advised against

| | |
|---|---|
| Product use | : Industrial applications. |
| Use of the substance/ mixture | : Coating. Paints. Painting-related materials. |

# Discussing Environmental Impacts and Controls

- **What are the principal characteristics of a surge protector?**

- **ANSWER:**
  - This is a circuit designed to protect connected devices from the effect of sudden increases or spikes in the supply voltage and/or current. Surge protectors are rated by clamping voltage (low values are better), joules rating (higher values are better), and amperage (the maximum current that can be carried).

# Discussing Environmental Impacts and Controls

- **When you are sizing the load for a UPS, how would you calculate the power used by a PC component?**

- **ANSWER:**
  - Multiply its Voltage (V) by the Current (I) it draws to calculate power drawn in Watts (W=V*I). You may then need to convert this to a VA rating by multiplying by 1.67. When power is supplied, some is lost through the function of inverters and capacitors. This means that the supply, measured as VA, must exceed the watts drawn by about 70%. This ratio is also described as the Power Factor (PF).

# Discussing Environmental Impacts and Controls

- **Why should you never use a home vacuum cleaner to clean a PC?**

- **ANSWER:**
  - Because they generate large amounts of static electricity that may damage sensitive components.

# Discussing Environmental Impacts and Controls

- **What are the principal environmental hazards to consider when installing PC equipment?**

- **ANSWER:**
  - Heat and direct sunlight, excessive dust and liquids, and very low or high humidity. Equipment should also be installed so as not to pose a topple or trip hazard.

# Discussing Environmental Impacts and Controls

- **When might you need to consult MSDS documentation?**

- **ANSWER:**
  - A Material Safety Data Sheet (MSDS) should be read when introducing a new product or substance to the workplace. Subsequently, you should consult it if there is an accident involving the substance and when you need to dispose of the substance.

# Topic B: Create and Maintain Documentation

# Equipment Inventory

- Well-documented inventory is crucial:
  - All hardware deployed
  - Spare systems and components
  - Network appliances and infrastructure
  - Software
- Asset management database

**Asset:** Hardware and software items found in an organization.

**Asset management:** A set of policies that includes information about the financial and contractual specifications of all hardware and software components present in an organization's inventory.

**Radio Frequency ID tag (RFID tag):** A tag that can be read by using a radio transmitter/receiver device.

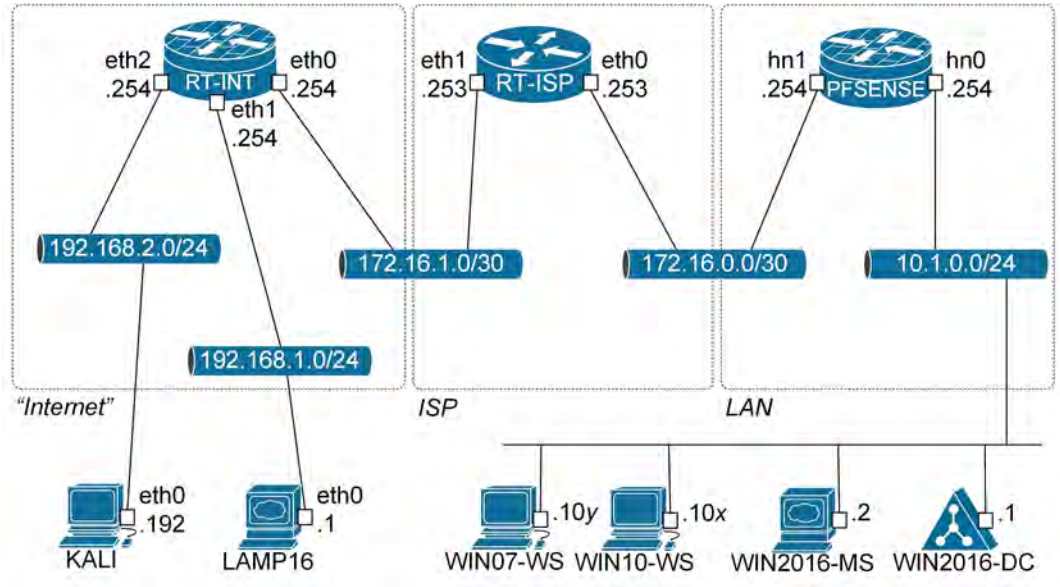
# Equipment Inventory

Typical assets:

- Standard and specialty workstations
- Servers
- Connectivity and backup hardware
- Operating system software
- Productivity and application software
- Maintenance utilities
- Backup documentation
- Overall asset inventory

# Network Topology Diagrams

**Network topology:** Physical or logical shape or structure of the network.



# Schematic Block Diagram

**Schematic:** A simplified representation of a system.

- Show the general placement of equipment and rooms
- Show device and port IDs
- Can represent the logical structure of the network
  - Security zones
  - VLANs
  - Subnets
- Can be drawn manually or compiled automatically

# Reference Documentation

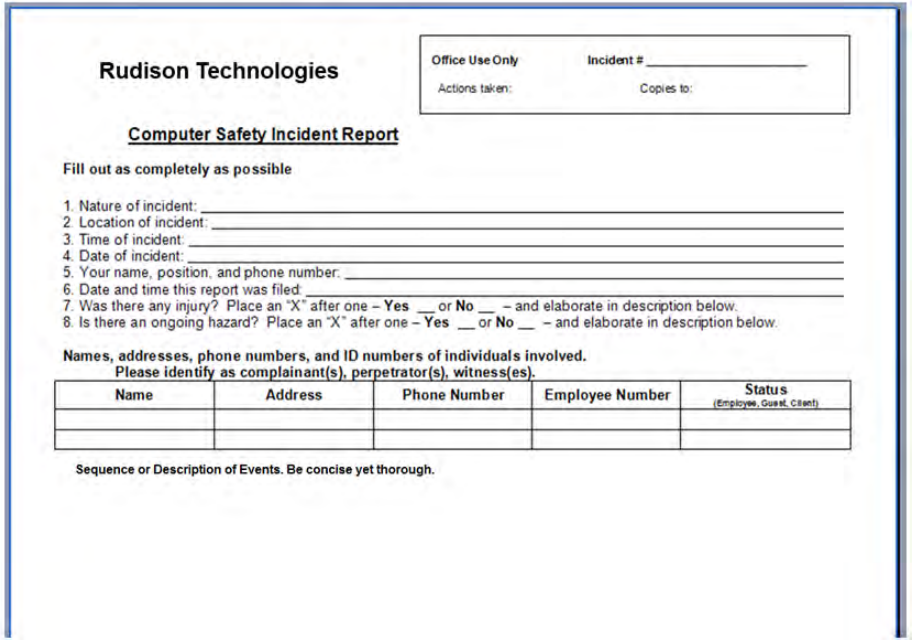
- User and Installation manuals
- Internet and web-based resources
  - Knowledge bases
  - Wikis
  - Articles
  - Quick reference materials
- Training materials



# Incident Documentation

**Incident management:** A set of practices and procedures that govern how an organization will respond to an incident in progress.

- Job ID
- Contact
- Priority
- Problem description
- Asset
- Details
- Follow up
- Dates



**Rudison Technologies**

Office Use Only Incident # _____
Actions taken: Copies to:

**Computer Safety Incident Report**

**Fill out as completely as possible**

1. Nature of incident: _____
2. Location of incident: _____
3. Time of incident: _____
4. Date of incident: _____
5. Your name, position, and phone number: _____
6. Date and time this report was filed: _____
7. Was there any injury? Place an "X" after one – **Yes** __ or **No** __ – and elaborate in description below.
8. Is there an ongoing hazard? Place an "X" after one – **Yes** __ or **No** __ – and elaborate in description below.

**Names, addresses, phone numbers, and ID numbers of individuals involved.**
**Please identify as complainant(s), perpetrator(s), witness(es).**

| Name | Address | Phone Number | Employee Number | Status (Employee, Guest, Client) |
|---|---|---|---|---|
| | | | | |
| | | | | |

**Sequence or Description of Events. Be concise yet thorough.**

# Organizational Policies

**Standard**: A measure for evaluating compliance with a policy.

**Procedure**: Inflexible, step-by-step listing of actions that must be completed for any given task. Also referred to as **Standard Operating Procedure**.

**Guidelines**: For areas of policy where there are no procedures, or where it is appropriate to deviate from a specified procedure.

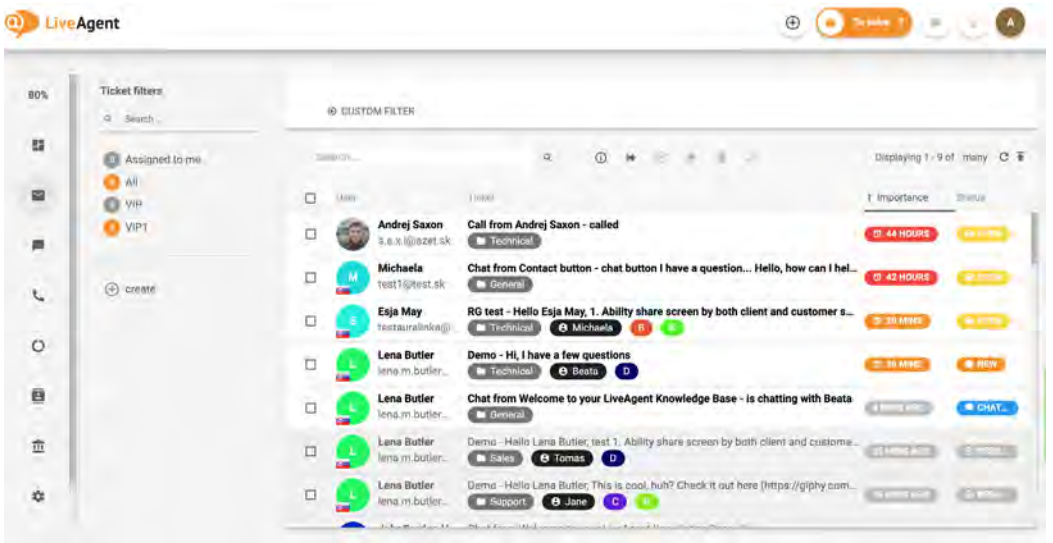
- Enforcement matters!
- Personnel management policies:
  - Recruitment and hiring
  - Operation
  - Termination or separation
- Password policies
- Acceptable use policy (AUP):
  - Rules of behavior
  - Use of work devices for personal use
  - Use of personal devices at work

# Guidelines for Creating and Maintaining Documentation

- Keep accurate records for hardware and software:
  - Deployed hardware (complete systems and components).
  - Deployed software (applications and OSs).
  - Spare hardware (complete systems and components).
  - Software that is not currently installed (applications and OSs).
- Use asset tags to track equipment.
- Document network components (physical and logical topology).
- Maintain a library of reference documentation, including:
  - User and installation manuals.
  - Links to Internet and web-based resources.
  - Training materials.

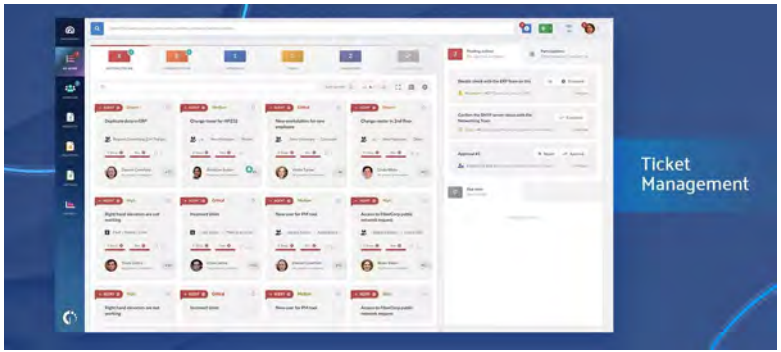
# Ticketing Systems

- User information
- Device information
- Description of problems
- Categories
  - Requests, incidents, problems
  - Customer-selectable categories
- Severity
  - Critical, major, minor



# Ticket Management

- Escalation levels
  - To third-party
  - To higher level of seniority
  - Support tiers
- Clear, concise written communication
  - Problem description
  - Progress notes
  - Problem resolution
- Incident report
  - Lessons learned/after action analysis and reporting



# Discussing Documentation Creation and Maintenance

- **What role do barcodes play in managing inventory?**

- **ANSWER:**
  - An inventory is a list of assets. To compile a list of assets, you must be able to identify each asset. A barcode label is a good way of doing this. You can use a scanner to link to the asset within the inventory database automatically, avoiding delays and mistakes that might be made by typing an asset ID.

# Discussing Documentation Creation and Maintenance

- **What are the two main types of network topology diagrams?**

- **ANSWER:**
  - You can create diagrams to show the physical topology or the logical topology. The physical topology shows the location of cabling and ports plus their bandwidth. The logical topology shows IP addresses and subnets plus security controls such as firewalls. There are lots of other types of network topology diagrams, of course, but physical and logical are the two basic distinctions you can make. It is best practice not to try to create a diagram that shows both.

# Discussing Documentation Creation and Maintenance

- **What is the purpose of a KB?**

- **ANSWER:**
  - A Knowledge Base (KB) is a reference to assist with installing, configuring, and troubleshooting hardware and software. A KB might be created by a vendor to support their products. A company might also create an internal KB, populated with guidelines, procedures, and information from service tickets.

# Discussing Documentation Creation and Maintenance

- **What three broad types of incident documentation might a business require?**

- **ANSWER:**
  - Incidents can be categorized as support/troubleshooting, security, and accident (whether to personnel or to assets). You should also consider the effect compliance with regulatory or legal requirements has on the documentation that must be kept.

# Discussing Documentation Creation and Maintenance

- **While you are answering a service call on a computer that is located in a common area of the office, you come across information showing that some unauthorized websites have been viewed. The activity has been linked to a particular user account. What is the appropriate action to take?**

- **ANSWER:**
  - This is likely to demonstrate a clear breach of Acceptable Use Policies (AUP) and will be the subject of disciplinary action by HR. You should not over-assume or over-react, however. Take care to follow best practices for incident response, such as establishing unambiguous evidence and documenting the entire incident.

# Topic C : Use Basic Change Management Best Practices

# Change Management

**Configuration management**: The practice of identifying all component of the ICT infrastructure and their properties.

**Change management**: The practice of adopting policies to reduce the risk of infrastructure changes affecting service or operations.

- ITIL configuration management model:
  - Service assets
  - CIs
  - Baselines
  - CMS

Information and communications technology (ICT)

- Documenting changes:
  - Configuration information
  - List of patches applied
  - Backup records
  - Details of suspected breaches
  - Hash result printouts

# Documented Business Processes

- Level and degree of documentation varies by organizational needs
- At a minimum:
  - Document systems for new employees
  - Changes to the systems when an employee leaves
  - Document how tasks are completed
- SOPs and work instructions
- Change management documentation
  - RFCs
- Change Advisory Board

# Process for Instituting Change to Operational Policies and Procedures

- Implementation of changes should be carefully planned
- Organizations should attempt a trial implementation for major changes
- Create a rollback or remediation plan
- Schedule changes to have minimal impact on workflow
- After the change is implemented, assess its impact
- Review the process and document the outcomes
  - Can be used to improve the process for future change management projects

# Guidelines for Using Change Management Best Practices

- Create a separate document for each item:
  - Describe its initial state
  - Identify all subsequent changes
- ITIL configuration management includes documenting:
  - Service assets
  - CIs
  - Configuration Management Database (CMDB)
  - Baselines
  - Configuration Management System
- Use RFCs to document the need or desire for a change.
  - RFCs should be considered at the appropriate level and affected stakeholders should be notified.

# Guidelines for Using Change Management Best Practices

- Major or significant changes:
  - Could be managed as a separate project.
  - Might require approval through a Change Advisory Board.
- Follow documented SOPs **Standard Operating Procedure** and Work Instructions.
- Implementation of changes should be carefully planned.
  - How will the change affect dependent components?

# Guidelines for Using Change Management Best Practices

- For most significant or major changes, use trial implementations.
- Always have a rollback (or remediation) plan.
- Schedule changes to minimize system downtime.
- When the change has been implemented:
  - Assess its impact, and review the process to identify any outcomes that could help future change management projects.

# Discussing Change Management Best Practices

- **Why are documented business processes essential for effective change management?**

- **ANSWER:**
  - Without documented processes, you do not have a means of measuring or specifying the effects of change. Of course, you could be introducing a change to start using documented business processes! But from that point, any project can be measured and evaluated by the changes it makes to documented procedures. Changes that are supported by documented procedures can also be communicated more clearly to staff.

# Discussing Change Management Best Practices

- **What are the main components of an RFC?**

- **ANSWER:**
  - A Request for Change (RFC) sets out the purpose and scope of the proposed change and a documented plan for carrying out the change. Ideally, it should perform a risk analysis of both performing the change and not performing the requested change. It should state the measures by which the change can be judged to have been completed successfully. Ideally, it would also include a backout plan for reversing the change.

# Discussing Change Management Best Practices

- **What is a change board?**

- **ANSWER:**
  - A change board is a committee of stakeholders who can approve the planned change.

# Topic D: Implement Disaster Prevention and Recovery Methods

# Disaster Prevention and Recovery

**Disaster Recovery Plan (DRP):** A documented and resourced plan showing actions and responsibilities to be used in response to critical incidents.

1

Identify scenarios for natural and man-made disasters and options for protecting systems.

2

Identify tasks, resources, and responsibilities for responding to a disaster.

3

Train staff in the disaster planning procedures and how to react well to change.

# Data Backup and Restoration (Slide 1 of 4)

**Data backup:** A system maintenance task that enables you to store copies of critical data for safekeeping.

**Data restoration:** A system recovery task that enables you to access and restore the backed-up data.

**Create data backups by:**

Copying files and folders to local or network locations.

Using dedicated backup software and hardware.

**Levels:**

File

Image

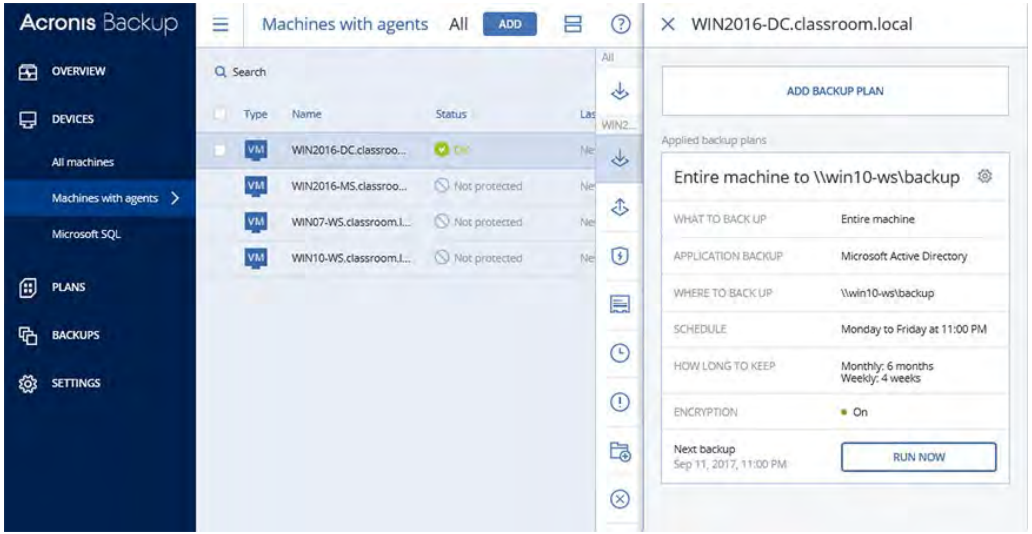
Critical applications

**When you use cloud storage, the service provider does the backups.**

# Data Backup and Restoration

**Backup management:**

- Plan execution and frequency of backups.
- Identify the recovery window via business continuity planning.
- Long- and short-term retention.



# Data Backup and Restoration

**Recovery images**

Windows computers come with a recovery image, but the image does not get updated unless you do it.

Custom recovery image should contain current OS state plus all desktop apps installed at the boot partition.

Any changes to apps or configuration requires a new recovery image to be created.

Use recovery images to restore a PC's or VM's functionality (OS and apps).

Use file-level backups to restore user profile information and data.

# Backup Testing

Try restoring some of the backed-up data into a test directory.

Make sure you don't overwrite any data when testing.

Configure the backup software to verify after it writes

Verify that the backup contains all the required files.

Test backup devices and media on a regular basis.

# Off-site and Local Storage

- Backups are usually stored offsite.
  - In case of disaster at the server, the backup media is not lost as well.
  - Safety deposit box or with a firm that specializes in securely storing backups.
- Keep a backup set on site for instant access
  - In case of accidentally deleted or corrupted files.
  - Consider using a fire-proof safe.
- Environmental considerations must be considered.
  - Do not store backups where there is high heat or humidity.
  - Do not store backups near magnetic equipment.



# Off-site and Local Storage

## Backup storage security:

- Authentication of users and backup clients to the backup server.
- Role based access control lists for all backup and recovery operations.
- Data encryption options for both backup transmission and storage.
- Backup of remote clients to a centralized location behind firewalls.
- Default data storage locations must be standardized.
- Create a policy that defines where documents are backed up from.
- Use segregation of duties enforced by policy for all personnel handling backup data.
- Document all access, testing, backup, and restore cycles.

# Account Recovery

Different things can happen to prevent logon.

- Mistyped or forgotten password.
- Error processing smart card or biometric credentials.

Many systems support account recovery through the use of challenge questions.

If account recovery methods don't work, you might need to re-create the account.

- You will need to import backed-up data to the new account.
- You will also need to reconfigure file permissions and group memberships.

# Guidelines for Implementing Disaster Recovery and Prevention Methods

| | |
|---|---|
| Remember | Remember, restoring data from backup provides data that is only as current as the last backup. |
| Test | Test backups after they are created. |
| Determine | Determine where backups will be stored both locally and offsite. |
| Document | Document the account recovery methods that will be needed for any systems, applications, or websites used by the organization. |

# Discussing Disaster Prevention and Recovery

- **At which general levels are backups made to facilitate disaster recovery?**

- **ANSWER:**
  - Backup levels include file, image, and critical application.
  - File level backups allow restoration of user-generated data files in a shared folder or user profile.
  - An image-level backup records a whole installation (OS, third-party software and drivers, and custom settings). This can be used to reinstall a computer or recover a Virtual Machine (VM).
  - A critical application backup saves data and settings kept by a specific software product. This is likely to involve some sort of database backup.

# Discussing Disaster Prevention and Recovery

- **What tests can you perform to ensure the integrity of backup settings and media?**

- **ANSWER:**
  - You can perform a test restore and validate the files.
  - You can run an integrity check on the media, such as using chkdsk on a hard drive used for backup. Backup software can often be configured to perform an integrity check on each file during a backup operation.
  - You can also perform an audit of files included in a backup against a list of source files to ensure that everything has been included.

# Discussing Disaster Prevention and Recovery

- **For which backup/restore issue is a cloud-based backup service an effective solution?**

- **ANSWER:**
  - The issue of provisioning an offsite copy of a backup. Cloud storage can also provide extra capacity.

# Discussing Disaster Prevention and Recovery

- **What provisions can you make for account recovery?**

- **ANSWER:**
  - You might implement a password recovery mechanism for users who have forgotten a password, though this mechanism can itself represent a security risk.
  - You should ensure that profile data is backed up so that it can be restored in the event of file corruption or damage to a disk. If a profile cannot be restored, the account would have to be recreated. This means that the account will have to be reassigned security group memberships and permissions.
  - This is easier if the allocation of those permissions has been well documented in the first place. There may also need to be some provision for configuring a recovery key to restore encrypted data.

# Topic E: Basic Scripting Concepts

# Script Files

You may need a command interpreter to execute the script.

You can open scripts in text editors or IDEs.

(**Integrated Development Environment)**.

**Script file:** A text document containing OS commands or instructions from a scripting language.

**Scripting language:** A programming language that is not compiled, and must be run within a particular environment.

# Scripting Languages

- Types of instruction sets:
  - Compiled programs (CPU performs instructions)
  - Scripts (OS or command interpreter performs instructions)

- File extensions differ for each scripting language:
  - Windows batch file: .bat
  - PowerShell script: .ps1
  - Linux shell script: .sh
  - VBScript file: .vbs
  - JavaScript file: .js
  - Python script: .py

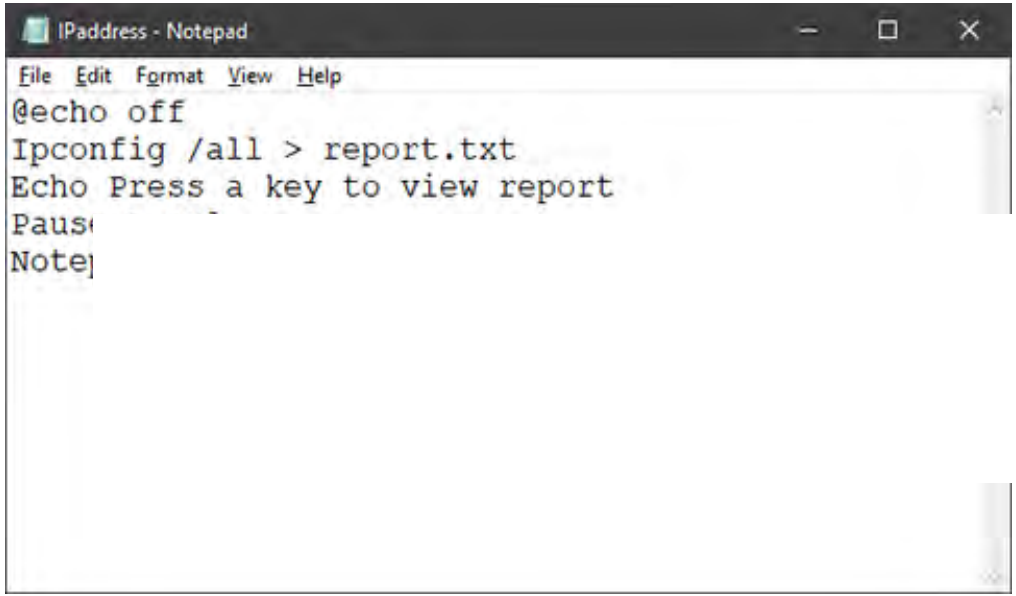
- Scripts often used for smaller, repetitive tasks

# Scripting Languages

## Batch files

- Stored in a .BAT file

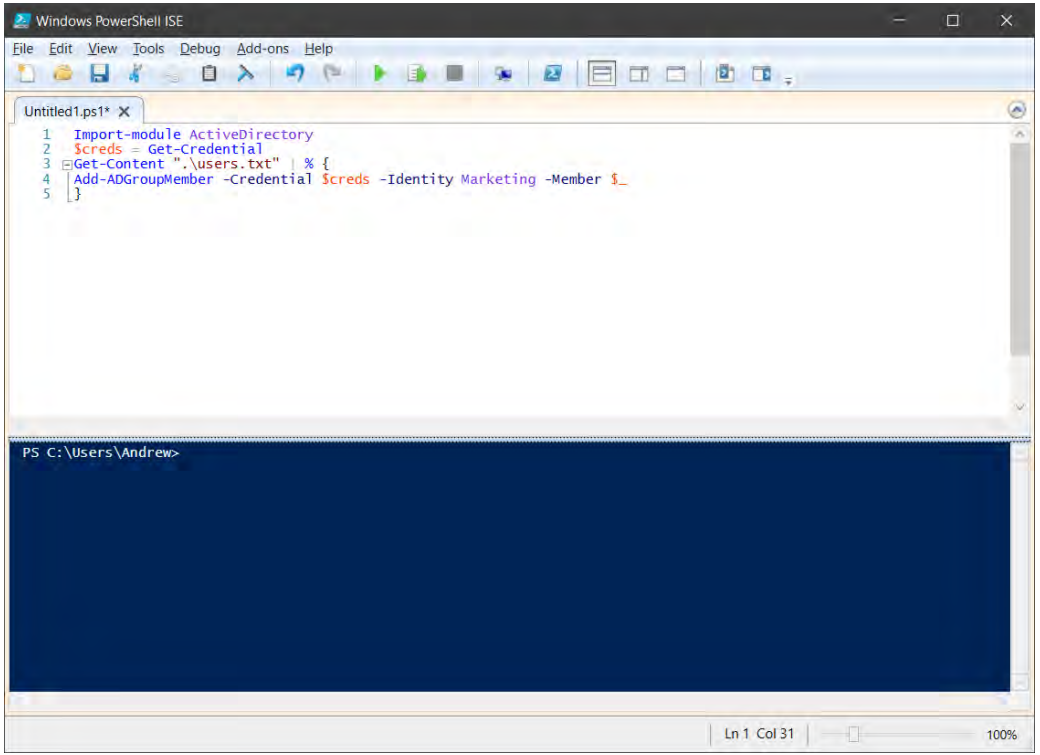
- Usually run end to end
  - Limited user input



# Scripting Languages

## Windows PowerShell

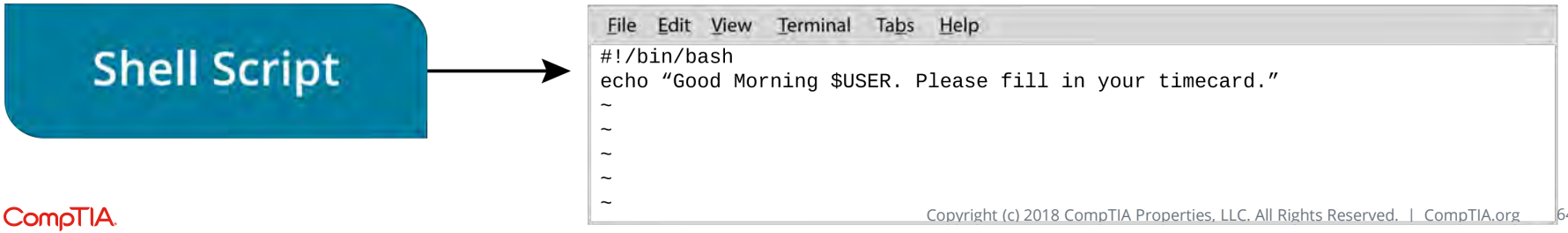
- Perform administrative tasks
- Can use PowerShell ISE
- Integrated Scripting Environment



# Scripting Languages

## Linux shell scripts:

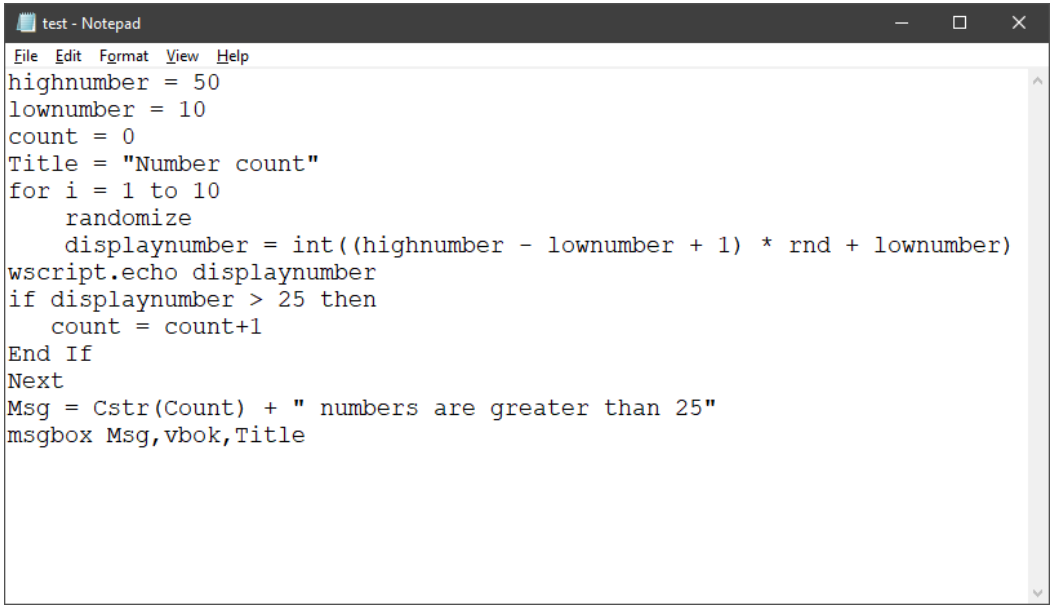
- Equivalent of batch files
- Starts with a line to designate the interpreter
- Automates commands for:
  - System administration
  - Troubleshooting
  - Simple applications
  - Manipulation of text or files



# Scripting Languages

**VBScript:**

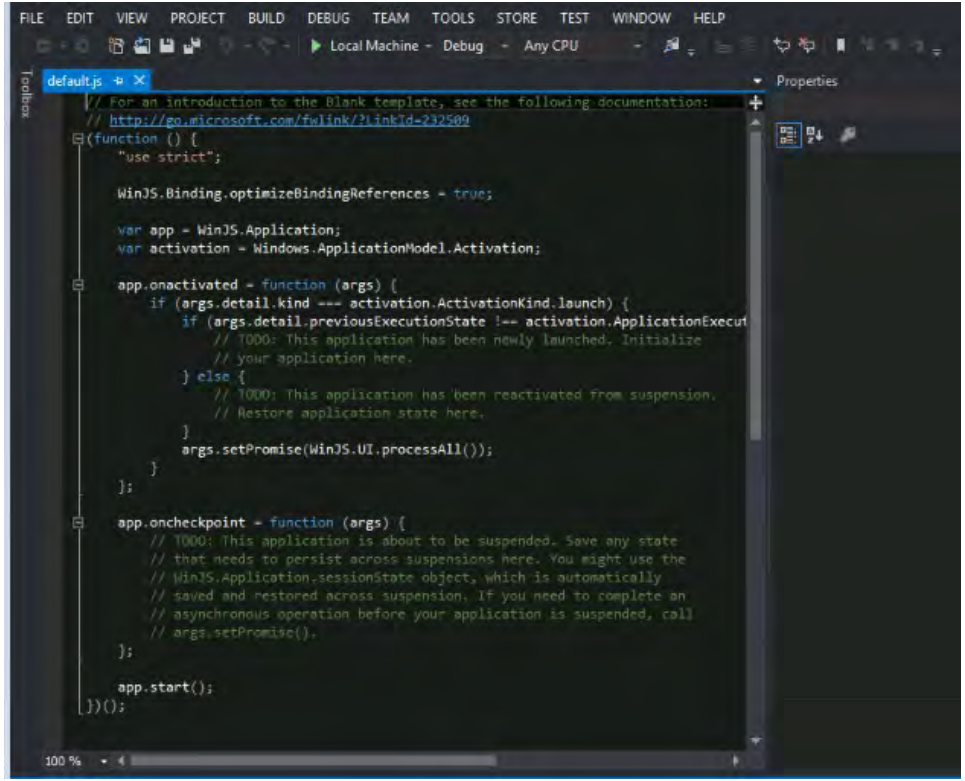
- Used for administrative tasks
- Run from command line or Windows GUI
- Must run within host environment
  - Internet Explorer
  - IIS
  - Windows Script Host (WSH)



# Scripting Languages

**JavaScript:**

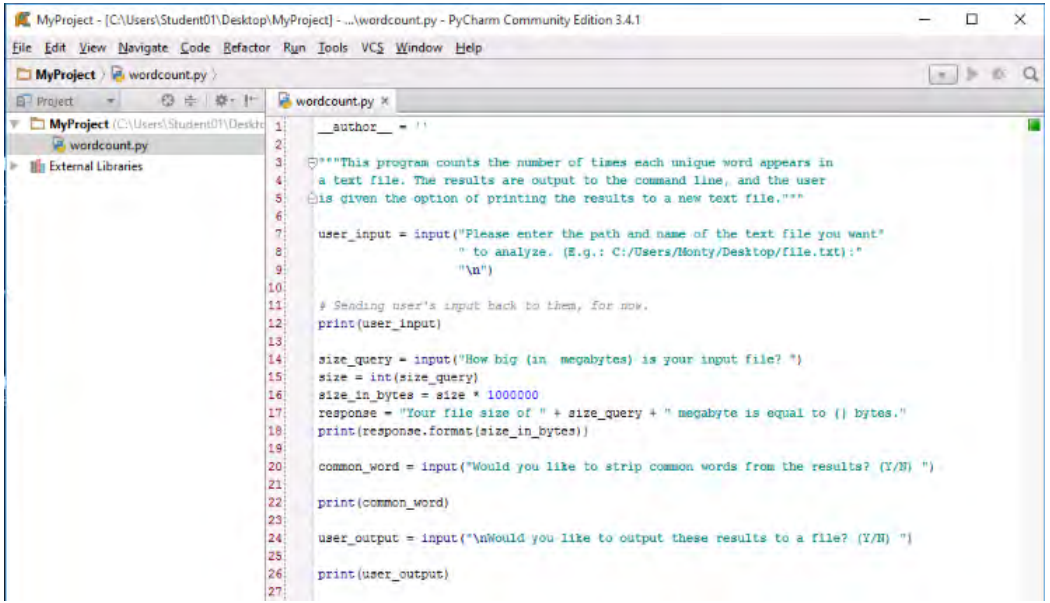
- Used for interactive web-based content and web apps
- Automatically executed by placing the script in web page HTML code



# Scripting Languages

**Python:**

- General purpose programming language
- Designed to be easy to read and program
- Code runs in an interpreter
  - Windows default is CPython



# Basic Script Constructs

- Each script language has its own structure and syntax.
- Similarities occur, but using the correct syntax for a particular language decreases the chances of errors.

| Scripting Language | Comment Syntax |
|---|---|
| Windows batch file | `Rem` Comment text is added here<br>Or<br>`::` Comment text is added here |
| PowerShell script | `#` Comment text is added here |
| Bash shell script | `#` Comment text is added here |
| VBScript | `'` Comment text is added here |
| JavaScript | `//` Comment text is added here |
| Python | `#` Comment text is added here |

# Identifiers

- **Identifier:** A computer programming component used to access program elements such as a stored value.

Labels for program components.

Identifiers that store data are either variables or constants.

Variables contain values that can change during program execution.

Constants contain values that do not change during program execution.

# Environment Variables

**Environment variable**: A storage location in the OS command shell.

Shell recognizes some variables and replaces with correct path.

Common environment variables include:

%SystemDrive%—for example, "C:"

%SystemRoot%—for example, "C:\Windows“

View Windows environment variables with the set command or through **System Properties→Advanced**.

View Linux environment variables with the printenv or env command.

# Branches and Loops

**Branch**: A programming technique used to control flow based on a logical condition and implemented with if or goto statements.

**Loop**: A programming technique used to repeat a task until a logical condition is met and implemented with for or while statements.

- Most scripts run from top to bottom unless you specify otherwise.
- You can specify logical conditions to change the order of execution.
  - Branches provide flow control
  - Loops provide repetition
- Comparison operators help define the condition.
- Logical operators enable testing multiple conditions simultaneously.

# Basic Data Types

| Data Type | Description |
|---|---|
| Integers | • Whole numbers.<br>• For example: 5, 21, or 65536.<br>• An integer data type consumes 1 to 8 bytes of computer storage. |
| Floating Point Numbers | • Supports decimal fractions such as 4.1, 26.4, or 5.62.<br>• Consumes between 4 and 8 bytes of storage.<br>• Can store a whole number too (4.0, for instance). |
| Boolean Values | • Indicates that something is either TRUE or FALSE (with a 1 or 0).<br>• Consumes a single bit of storage. |
| Characters | • A single textual character.<br>• For example: a, D, 7, $, @, #.<br>• These consume one byte of storage.<br>• Numbers cannot be used in computation. |
| Strings | • A string of text characters.<br>• For example: XYZ, Hello world.<br>• Storage size varies. Generally string length is determined when you define the data type. |

# Basic Data Types

**Escape character:** A character used to allow alternate use of a reserved character within a particular programming language.

| Scripting Language | Escape Character |
|---|---|
| Batch file | %% |
| PowerShell | There are different escape characters for different circumstances.<br>--%<br>`<br>\ |
| VBScript | • To escape a single quote, enter two single quotes: ''<br>• To escape a double quote, enter two double quotes: ""<br>• Use the Escape(charString) function |
| Linux Bash Shell script | \ |
| Python | \ |
| JavaScript | \ |

# Discussing Scripting

- **What is the file extension for Python script files?**

- **ANSWER:**
  - .py.

# Discussing Scripting

- **Which batch or scripting language is represented here?**

```
Set objShell = WScript.CreateObject("WScript.Shell")
Set lnk = objShell.CreateShortcut(%HOMEPATH% & "\Destkop\COMPTIA.LNK")
lnk.TargetPath = "\\COMPTIA-LABS\CERTS\ExamInfo.pdf"
lnk.Description = "CompTIA Exam Information"
lnk.Save
'Clean up
Set lnk = Nothing
```

- **ANSWER:**
  - VBScript.

# Discussing Scripting

- **What are the characteristics of a variable?**

- **ANSWER:**
  - A variable is a construct within programming code for some sort of value that can change during the execution of the script. The variable must be given a name.

  - A variable also has a data type, such as string or integer. The data type can be explicitly declared or set when the variable is initialized (given its first value). It is good programming practice to declare variables before they are used.

# Discussing Scripting

- **What command can you use to define an environment variable?**

- **ANSWER:**
  - In Windows, environment variables are defined using set.
  - In Linux, there are not only environment variables (env and printenv), but also variables specific to the current shell.
  - Shell variables are configured with set. The syntax of set is different between Windows and Linux

# Discussing Scripting

- **What type of script construct is "For … Next" an example of?**

- **ANSWER:**
  - The For … Next statement is one kind of loop. The script will execute statements within the loop repetitively until a logical condition is met.

# Discussing Scripting

- **What is a string?**

- **ANSWER:**
  - A string is a data type that represents a series of text characters.

# Topic E: Professionalism and Communication

# Customer Service Attitude

Be a good communicator:

Competent technicians with poor communication skills do not impress customers

Customers are any users or clients of a support service

Good customer service:

Be positive

Be clear, concise, and direct

Be consistent, fair, and respectful

# Communication Skills

- Use proper language.
  - Avoid the use of jargon, acronyms, and slang when applicable.
- Actively listen to the customer.
  - Avoid interrupting.
  - Use open and closed questions to elicit information.
- Provide feedback to gain rapport.
  - Avoid implying blame or responsibility.

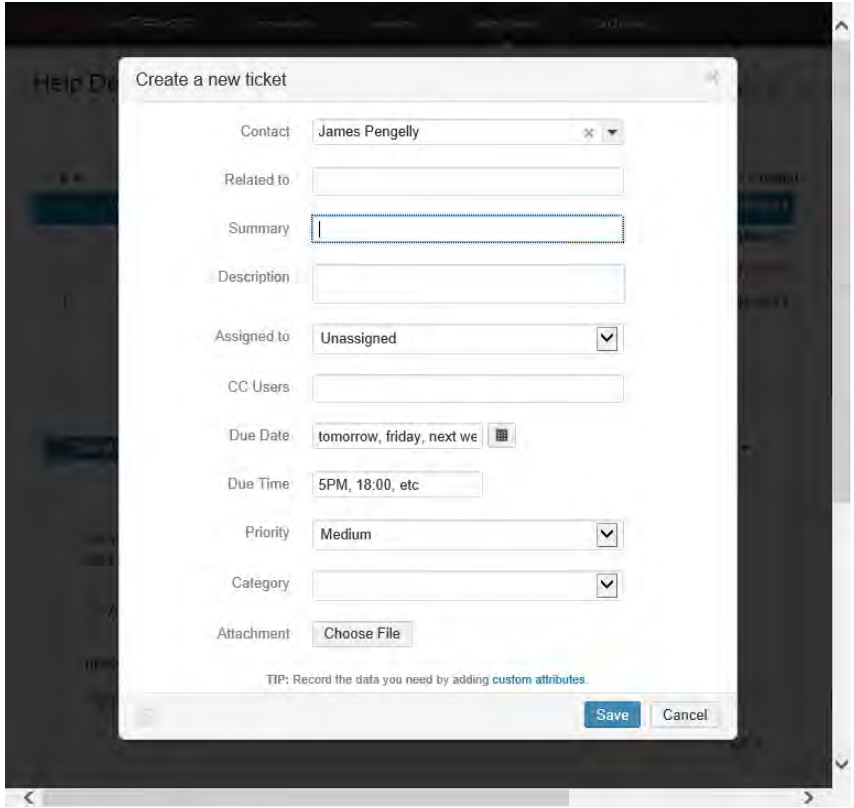
# Professionalism

- Proper documentation helps you set realistic expectations.
  - Contact information
  - Hours of operation
  - Items that are supported
  - How long to resolve incidents
  - When an item will be replaced rather than repaired

- Problem management
  - Clarify customer expectations of what will be done and when
  - Address customer concerns about cost or impact on business processes
  - Your constraints regarding time, parts, costs, contractual obligations, etc.
  - Reach a course of action that is realistic and achievable

# Professionalism

- Use a ticketing system to support proper documentation of all support requests.
  - Use proper spelling and grammar.
  - Be clear in case others need to use the information to resolve the issue.
  - Be aware that the customer might receive the contents of the ticket.



# Professionalism

| | |
|---|---|
| Strive | Strive for resolution in one service call.<br>• When this is not possible, manage customer expectations. |
| Communicate | When the issue is resolved, communicate the general cause and solution to the customer and thank them for their assistance. |
| Prioritize | Prioritize your work. |
| Be | Be punctual and accountable. |
| Be | Be flexible, and seek compromise when necessary. |

# Respect

## Avoid

Avoid distractions during a service call:

- Don't take personal calls or use texting
- Don't post on social media

## Be

Be respectful of property and confidentiality:

- Don't use customer equipment or services without permission
- Don't help yourself to food or drink, and don't snoop
- Ask before using the restroom
- Notify customers if confidential materials are in sight so they can deal with them
- Maintain a tidy work environment

## Be

Be culturally sensitive:

- Don't make assumptions
- If language or accents are making things difficult:

# Customer Complaints

- Maintain a positive attitude, Be accurate and honest

- When dealing with a difficult customer:
  - Identify signs that a customer is becoming angry
  - Don't take complaints personally
  - Listen and let the customer explain the problem

  - Hang up if the customer is abusive or threatening
    - Issue a caution first
    - Warn them about their behavior
    - End the call if they don't act reasonably

# Discussing Customer Service and Communication Skills

- **How would you cope with a user who is struggling to explain the problem that they are experiencing?**

- **ANSWER:**
  - Use closed questions that allow the user to give simple yes or no answers.

# Discussing Customer Service and Communication Skills

- **You have received an off-site service call to service a network printer at a customer location. When you arrive, the user is at the printer and starts talking about how the printer is not working properly, and he cannot get his reports handed in on time. How should you approach this user?**

- **ANSWER:**
  - Demonstrate empathy with the customer's situation and use active listening skills to show that you understand the importance of the issue and make the customer confident that you can help. Then use closed questioning techniques to start to diagnose the problem.

# Discussing Customer Service and Communication Skills

- **How would you deal with a customer who is becoming abusive because you have taken three separate calls to deal with their problem?**

- **ANSWER:**
  - Explain why the problem is taking so long to resolve, and get them to focus on helping you, rather than hindering you. If the abuse continues, warn them that it cannot be tolerated and that you will have to end the call if it persists.

# Discussing Customer Service and Communication Skills

- **You are trying to troubleshoot a problem over the phone and need to get advice from your manager. How should you handle this with the customer?**

- **ANSWER:**
  - Advise them that you will put them on hold while you speak to someone else or arrange to call them back.

# Discussing Customer Service and Communication Skills

- **You are troubleshooting a print problem, which turned out to be caused by user error. The user is not confident that the problem is solved and wants more reassurance. You have already explained what the user was doing wrong in some detail. What should you do?**

- **ANSWER:**
  - Run through the print process step-by-step to show that it works. It is very important to get a customer's acceptance that a problem is "closed."

# Discussing Customer Service and Communication Skills

- **A user known to your department as a "frequent flyer" with regard to support requests calls in with a genuine but non-urgent problem. You are in the middle of another important job that is urgent. What would be the best approach?**

- **ANSWER:**
  - Confirm that the problem is not impacting their work and get them to email a support request, which you will attend to within 48 hours.

# Discussing Customer Service and Communication Skills

- **What should you be wary of if a customer phones in with a problem you think you have solved already?**

- **ANSWER:**
  - Do not assume—allow the customer to describe the problem fully then make a proper assessment.

# Discussing Customer Service and Communication Skills

- **You are working on the training documentation for new A+ technicians in the organization. What should you include for dealing with difficult customers or situations?**

- **ANSWER:**
  - Answers will vary, but might include the following. Do not argue with customers and/or be defensive. Avoid dismissing customer problems and do not be judgmental. Try to calm the customer and move the support call towards positive troubleshooting diagnosis and activity, emphasizing a collaborative approach. Do not disclose experiences via social media outlets.