**Objectives**

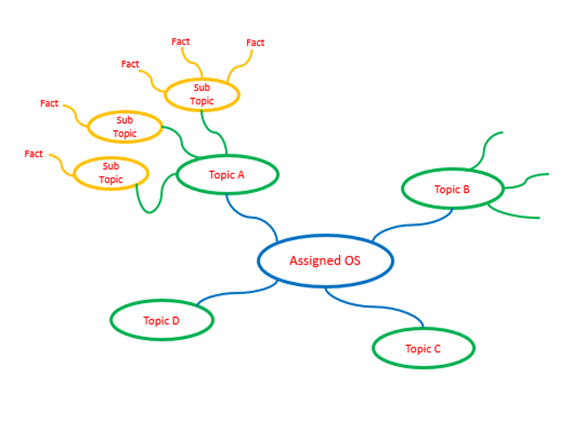
**Objectives**

1. Research information about software for a specific operating system (OS) environment. You will be assigned one of the operating systems form the list below. You will also be provided with a list of topics to investigate.

2. Organize your rough research information into a list of topics, sub-topics and facts. This process will involve identifying sub-topics, rearranging your rough research notes, and selecting (or highlighting) interesting facts.

3. Report a summary of your research in the form of a “concept map”. Use the PowerPoint template provided as a starting point. The concept map should only include the best and most interesting information from your organized research notes.

4. Your concept map can be created using: Smart Ideas, Prezi, PowerPoint or other similar applications.



**Step 1 – Organized Research**

Research information about your assigned operating system (OS) environment.

· Guide your research according to the suggested topic list below

· Feel free to copy-and-paste as long as you keep track of your bibliographic references.

· Do not be too picky or concerned about formatting as you will organize this information later in step 2

· Select things that look interesting and don’t forget to include graphics images as well

· Upload your rough research notes to your repository when you are done.

Topic A – Application Software

Provide a summary of most important user application software targeted by this operating system and how it is similar to and deferent from standard PC software. Suggested sub-topics include:

· User (client) or network (server) applications

<https://www.ssh.com/a/EULA_Tectia_SSH_Server_IBM_zOS_20180101.pdf>

· Batch (run without user input) or interactive (user focused) processing

* z/OS Batch Runtime allows for this interoperability between PL/I, COBOL, and Java applications that run on z/OS. It is a program designed to provide a managed environment that enables shared access to a DB2 connection by PL/I, COBOL, and Java programs. Updates to DB2 are committed in a single transaction. (Note that updates to multiple databases are not supported.)

· Off-the-shelf (purchased) or custom developed applications

* Monolithic (uniquely hardware-assisted) Default user interface. ISPF, **z**/**OS**Management Facility

Custom developed applications

* Designing for z/OS: Batch or online?
* Designing for z/OS: Data sources and access methods
* Designing for z/OS: Availability and workload requirements
* Designing for z/OS: Exception handling
* Using mainframe character sets
* Using an interactive development environment (IDE)
* Differences between the various programming languages.

You can design batch online or online, data sources and access methods, availability and workland requirements and exception handling.

· Programming environment and languages supported

* supports stable mainframe systems and standards such as CICS, COBOL, IMS, DB2, RACF, SNA, IBM MQ, record-oriented data access methods, REXX, CLIST, SMP/E, JCL, TSO/E, and ISPF, among others.

Topic B – Hardware

Provide a summary of the hardware targeted by this operating system and how it is similar to and deferent from standard PC hardware. Suggested sub-topics include:

· Batch (run without user input) or interactive (user focused) processing

* z/OS Batch Runtime allows for this interoperability between PL/I, COBOL, and Java applications that run on z/OS. It is a program designed to provide a managed environment that enables shared access to a DB2 connection by PL/I, COBOL, and Java programs. Updates to DB2 are committed in a single transaction. (Note that updates to multiple databases are not supported.)

· Off-the-shelf (purchased) or custom developed applications

* Monolithic (uniquely hardware-assisted) Default user interface. ISPF, **z**/**OS**Management Facility

Topic C – User Interface

Provide a summary of the user interface and input devices targeted by this operating system and how it is similar to and different from a standard PC. Suggested sub-topics include:

· Does it support a windowed environment, command line, or network users

* Does it support multiple users at a time or single users
* With the multi-user access option specified, an IODF is kept in exclusive update mode for a user only for the duration of a single transaction. If the updates of this transaction are committed, another user may update the IODF without requiring the first user to release it.

· Does it support multiple applications or a single application at a time

* Does it get rebooted (powered on / off) or is it always on.
* z/OS systems are designed to run continuously with many months between reloads, allowing important production workloads to be continuously available. Change is the usual reason for a reload, and the level of change on a system dictates the reload schedule.

Topic D – Device Management

Provide a summary of the devices (disks, printers, etc.) and memory managed by this operating system and how it is similar to and deferent from a standard PC. Suggested sub-topics include:

·

What types of disk drives and file systems does it support

* An HFS data set is a z/OS data set of HFS type, rather than VSAM or PDSE type. An HFS data set is a collection of files and directories organized in a hierarchical structure on local hard drives. Each hierarchical file system is structured like a tree, based on a root directory with various subdirectories and files. You can share HFS data sets in a sysplex.You can access the files in a hierarchical file system by using z/OS UNIX System Services. UNIX provides a way for z/OS to access hierarchical file systems, and for UNIX applications to access z/OS data sets. You can use many of the standard BSAM, QSAM, BPAM, and VSAM interfaces to access files within a hierarchical file system. Most applications that use these access methods can access HFS data sets without reassembly or recompilation.

· What type of input devices does it support

* file organization can be sequential, line sequential, indexed, or relative. Decide on the file types and devices to be used when you design your program.

· What type of output devices does it support

* file organization can be sequential, line sequential, indexed, or relative. Decide on the file types and devices to be used when you design your program.

Topic E – Security

Provide a summary of the security features provided by this operating system and how it is similar to and deferent from a standard PC. Suggested sub-topics include:

· What types of user accounts and user permissions does it support

* Access to the Time Sharing Option (TSO) and Interactive System Productivity Facility (ISPF) environments.
* The ability to create temporary data sets.
* Sufficient virtual memory to run Java™
* Sufficient virtual storage limits, if the agent is running as a started task.
* A protected ID (which can not be used to log in) can be used as the agent ID.

· How does it protect against conflicts / interference between legitimate application processes

· How does it protect against malicious software

that is, to prevent them from gaining access, circumventing, disabling, altering, or obtaining control of key z/OS systemprocesses and resources unless allowed by the installation. Specifically, z/OS “System Integrity” is defined as the inability of any program not authorized by a mechanism under the installation’s control to circumvent or disable store or fetch protection, access a resource protected by the z/OS Security Server (RACF®), or obtain control in an authorized state; that is, in supervisor state, with a protection key less than eight (8), or Authorized Program Facility (APF) authorized. In the event that an IBM System Integrity problem is reported to IBM, IBM will always take action to resolve it in the specified

· How does it support software updates and security updates

An RACF FACILITY class profile, STGADMIN.IGWSHCDS.REPAIR, controls access to the IDCAMS SHCDS command functions, which you can use to list outstanding SMSVSAM recovery requirements and control that recovery. If you do not use RACF to secure your installation, ensure that your security product supports the new class name and the new FACILITY class profile.

Topic F – Network Connectivity

Provide a summary of the network connectivity provided by this operating system and how it is similar to and deferent from a standard PC. Suggested sub-topics include:

· Is the computer stand-alone or part of a larger network

The mainframe is capable of serving a **large** number of **network** nodes

· What type of network and internet connections does it provide

* In the past, a mainframe backbone network used SNA. With the prevalence of TCP/IP and the introduction of SNA/IP integration technology and additional tools, current mainframe networks are migrating to IP-based networks.

· Does it provide other services such as backup, firewall, etc.

In the past, a mainframe backbone network used SNA. With the prevalence of TCP/IP and the introduction of SNA/IP integration technology and additional tools, current mainframe networks are migrating to IP-based networks.

**Step 2 – Concept Map**

Create a “concept map” as a final report of your organized research.

· Use the diagram in the introduction as a starting point.

· You should have six (6) first level topics from “Application Software”

to “Network Connectivity”

· Each first level topic should have at least three (3) sub-topics

· Each sub-topic should be supported by a number of facts / items of interest

Select the best and most interesting information from your organized research.

· Summarize and edit your information to fit on the concept map.

Upload your Research Notes and Concept Map to your GitHub Repository

· Your concept map can be created using: Smart Ideas, Prezi, PowerPoint or other

similar applications.

· Option1: Create and upload a PDF of your concept map

· Option2: Include a link to your Concept Map in your Student Questions

o Make sure that your link is Sharable so Mr. Nestor can open your map

**Appendix A**

|  |  |  |
| --- | --- | --- |
| **Operating System** | **Student 1** | **Student 2** |
| Ubuntu  (Linux) |  |  |
| z/OS  (IBM) |  |  |
| Solaris  (Oracle) |  |  |
| HP-UX  (Hewlett Packard) |  |  |
| Windows NT  (Windows Server) |  |  |
| Red Hat Enterprise (IBM Summit) |  |  |
| QNX  (Blackberry) |  |  |
| VxWorks  (Wind River) |  |  |
| AOSP  (Android Alphabet) |  |  |
| Ubuntu  (Linux) |  |  |
| z/OS  (IBM) |  |  |
| Solaris  (Oracle) |  |  |
| HP-UX  (Hewlett Packard) |  |  |
| Windows NT  (Windows Server) |  |  |
| Red Hat Enterprise (IBM Summit) |  |  |
| QNX  (Blackberry) |  |  |
| VxWorks  (Wind River) |  |  |
| AOSP  (Android Alphabet) |  |  |
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