



**UTM**  
**UNIVERSITI TEKNOLOGI MALAYSIA**

**FACULTY OF ENGINEERING**

**SCHOOL OF COMPUTING**

**SECR/SCSR1213 - 03**

**NETWORK COMMUNICATION**

**PROJECT - TASK 3**

**GROUP G**





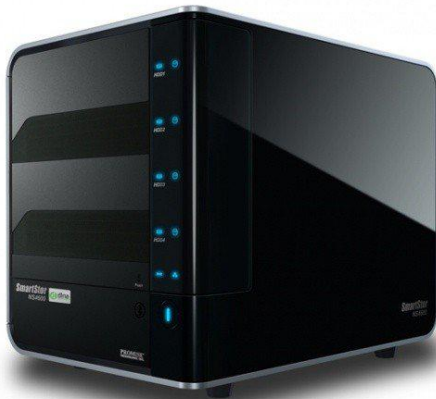

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Devices	Quantity	Price (RM) x Quantity = Total (RM)
Cisco ASR 1002-HX Router 	1	169,137.47 x 1 = 169,137.47
Cisco Catalyst 2960L 48 Port Switch 	4	4888.00 x 4 = 19,552.00
SOARNEX EP100-08-62 8 Port Switch 	2	290.00 x 2 = 580.00
TP-Link Deco M5 AC1300 Wireless Access Point 	2	259.00 x 2 = 518.00
SmartStor DS4600 Storage Server 	12	999.00 x 12 = 11,988.00
Toshiba Hard Disk P300 3TB Internal Hard Disk 	28	309.80 x 28 = 8,674.40

<p>Dell Precision 3630 Tower Workstation</p> 	124	$4315.00 \times 124$ $= 535,060.00$
<p>Samsung Monitor 24" / IPS LED 75Hz 5ms F24T350FHE</p> 	124	$409.00 \times 124$ $= 50,716.00$
<p>FANTECH Wired Keyboard and Mouse Combo KM100</p> 	124	$24.00 \times 124$ $= 2,976.00$
<p>CK-LINK UTP CAT5 NETWORK LAN CABLE 305M (1000FT)</p> 	2	$150.00 \times 2$ $= 300.00$
<p>CK-LINK UTP CAT6 NETWORK LAN CABLE 305M (1000FT)</p> 	1	$239.00 \times 1$ $= 239.00$

100 PCS/LOT Cat5 Cat5e Network Internet Connector RJ45 8P8C Cable Modular Plug Heads Connector 	2 (100 pcs each)	$7.50 \times 2 = 15.00$
Cat5/Cat5e RJ45 Connector Plug Socket 	9 (20 pcs each)	$79.92 \times 9 = 719.28$
Baoblaze Cable Rackmount or Wallmount 24 Port Patch Panel Unshielded Cat6/Cat5 UTP 	1	$17.00 \times 1 = 17.00$
Double RJ45 CAT5e Wall Socket/Plate 	70	$15.00 \times 70 = 1,050.00$
Epson EB-X41 XGA 3.600 Lumens Projector 	6	$2000.00 \times 6 = 12,000.00$
Total Price		<b>RM 813,542.15</b>

## **Report**

Based on the devices and quantities that we have listed out above, the total price is RM813,542.15. After finalized the list we were quite surprised by the cost since the budget given to our group is RM1.3M which we assumed to be moderately acceptable for this project. Since this is our first time doing research on such issue we can say that it is an eye opener for us because we get to learn how and which type of network and end-user devices such as routers, switches and cables to choose. In general, we are surprised and satisfied with the overall cost which is high yet does not exceeds our budget.

There are few factors that need to considered in choosing network devices and cost is one of it. This is because we have been given a specific budget so we cannot randomly choose each networking devices according to our interest. Besides, doing a thorough research is very important as we aim to maintain a cost effective environment in our building.

Network devices come in many brands such as Cisco and Huawei. There are few differences in both brand for each devices. For routers, the differences can be seen in the user experience, agility, advanced security and virtualization.

In user experience, Huawei has limited application high availability compared to Cisco. It only offers basic policy-based routing while Cisco not only monitor path performance but also provides an effective load-balance across path while delivers ideal application-level SLAs. Moreover, Huawei requires extra hardware in enhances application experience and does not support intelligent caching or WAN acceleration which are the opposite for Cisco.

Secondly, in terms of agility, Cisco is more beneficial than Huawei. As we know, both has various model routers. Thus, Cisco's offers NETCONF and YANG support across branch, WAN and cloud platforms meanwhile certain router model from Huawei do not support NETCONF/YANG. When choosing software license packages, Huawei offers perpetual license for basic and advance feature sets per-device whilst Cisco offers one software product for predictable OpEx which makes purchase easier.

Next, the difference in security is overwhelming between these two. Huawei only supports basic access control lists for filtering and encryption capability meanwhile Cisco integrates real-time contextual awareness, security automation, threat prevention, malware protection, EAL-4 certified perimeter defense and web security. For instance, Huawei AR

router lacks advanced security protection such as web security, threat prevention or malware protection. When it comes to security for end-to-end architecture, Huawei is limited as it does not publish its secure development life cycle and trustworthy system. Apart from that, Cisco provides cloud-delivered, integrated security service for branch routers, protection against real time threat such as malware, phishing and botnets. Cisco also provides network as sensor and enforcer where comprehensive network visibility enables faster anomalies detection and deeper forensics of internal and external threats compared to Huawei router which is insufficient as a network security sensor as it only offers sample-based network application visibility. Moreover, Cisco is a trustworthy system because its products have trust anchors, secure boot and run time prevention. The software is also digitally signed.

Last but not least, differences in terms of virtualization. While the enterprise network function for Huawei offers up to 8 VMs or VNFs yet uses basic supervisor hardware and capability limited to the chassis, Cisco simplifies operations and deployment of virtual routing, security and application services. In native application hosting, Huawei has limited service. The router OS (VRP) does not offer native integration with a third party tool unless it uses another VM. Cisco's compute and storage includes local resources for applications. Network functions or services, data backup and analytics meanwhile Huawei local compute and storage resources are neither replaceable nor upgradable and only offered in main supervisor module.

## **References**

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- Storage server 4bay 3TB per bay : <https://bit.ly/3nXea4r>
- 3TB SATA : <https://bit.ly/3fHr2IM>
- Workstation : <https://bit.ly/368nJaD>
- Router : <https://www.router-switch.com/asr1002-hx.html>
- Monitor : <https://shopee.com.my/Samsung-24-F24T350FHE-LF24T350FHEXXM-IPS-LED-75Hz-5ms-AMD-FREESYNC-FHD-HDMI-3-Years-Warranty-Monitor-i.229166966.4155035572>
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