

## **Research Assignment (15%) – 2023**

### **ID723 Advanced Networking – Level 7 – 15 Credits**

**Due:** on or before **Friday 12 April**

**Where to hand in:** email to [mholtz@op.ac.nz](mailto:mholtz@op.ac.nz)

**Individual Assignment**

**Completed out of class**

**Late Penalty:** 10% per day late

#### **Learning Objectives:**

- Investigate and critique new technologies within the networking industry.

#### **Requirement:**

Consider that a fictitious company is investigating several technologies for future investment that could help them gain a competitive edge in the market.

As an employee of this company, you have been asked to investigate / research one of the following topics of your choosing.

You are to provide a report that conveys your understanding of what the technology is, how it works, where it is best deployed etc. You must describe its benefits and shortcomings particularly in relation to your company's context.

Consider benefits as they relate to resolving problems, operational efficiency, cost, increased flexibility and sustainability.

Configuration examples are accepted where they enhance understanding of the report and are commented to show your understanding.

Supporting diagrams that help convey meaning are encouraged.

You must provide references for all sources of information and supporting materials. References must be in text and listed at the end.

#### **Audience:**

This report is intended to be received and reviewed by the IT manager. You can assume the IT manager has a good understanding of networking technologies in general.

#### **Topics:**

Each technology is paired with a context indicating the company's current environment as it relates to the new technology. The context gives you scope for analysing the pros and cons of the technology. Note that your report is not limited to this scope and you are free to make other sensible assumptions about the company network. You must document any assumptions you have made.

TOPIC	Context
Quality of service	The company experiences intermittent performance issues for its VOIP clients and video conferences both locally and across the WAN. In addition there are occasional complaints regarding its centrally located financial application. Included in your report will be descriptions of classification (DSCP), queueing strategies (CBWFQ, LLQ) and congestion avoidance (WRED).
Wireless	The company has a legacy deployment of autonomous access points across a few sites. It is looking to replace these and roll out to other sites a controller based solution. Ensure to describe how a WLC solution can provide centralised management, RF management, security and roaming. Provide detail of how the CAPWAP protocol is used in WLC deployments.
Network Automation	The company currently has several hundred network devices deployed over several sites. The company is struggling with the overhead of managing so many devices. Describe in detail best practice automation solutions that could be deployed to help manage bulk configuration changes, backups, software patch management and upgrades. Multiple tools can be described.
WAN optimisation	The company has several lower bandwidth sites that are suffering from sporadic poor performance. In addition the company has several WAN links where they are charged on data usage. Discuss in detail the suite of techniques employed by WAN optimisation. Discuss deployment options and considerations.

#### **Format:**

The report should not exceed 2000 words (excluding references) .

Text is to be 12 font, 1 ½ line spacing using either Times Roman, Arial or Calibri. Black on white printing of text.

Referencing must be used. You may choose the style.

You are otherwise free to choose the format of the report.

## Grading:

	A Range	B Range	C Range	D – E Range
Variety of external relevant sources / literature (10% of mark)	A wide range of relevant literature that supports your technical understanding and critical analysis of the technology	A range of relevant literature that supports your technical understanding and critical analysis of the technology	A limited range of relevant literature that supports your technical understanding and critical analysis of the technology	A minimal range of relevant literature that supports your technical understanding and critical analysis of the technology
Convey technical understanding of the technologies purpose and how it works (50% of mark)	Succinct and insightful explanation of the technologies purpose and how it works. Evidence of meaningful personal thinking applied to literature/sources.	Succinct and some insightful explanation of the technologies purpose and how it works. Evidence of personal thinking applied to literature/sources.	Generally succinct with limited insight explaining the technologies purpose and how it works. Evidence of some personal thinking applied to literature/sources.	Not succinct with minimal insightful explanation of the technologies purpose and how it works. Evidence of minimal personal thinking applied to literature/sources.
Critical analysis of its benefits and problems (30% of mark)	Demonstrates critical, insightful, in-depth analysis of the technologies benefits and any problems / issues it might introduce or to avoid.	Demonstrates some critical, insightful, in-depth analysis of the technologies benefits and any problems / issues it might introduce or to avoid	Demonstrates limited critical, insightful, in-depth and analysis of the technologies benefits and any problems / issues it might introduce or to avoid	Demonstrates minimal critical, insightful, in-depth analysis of the technologies benefits and any problems / issues it might introduce or to avoid
Presentation (10% of mark)	<p>Pass</p> <p>Few or No basic errors – spelling, grammar, referencing</p> <p>Formatting conventions accurate to include: 12 font, 1 ½ line spacing, font Times Roman, Arial or Calibri, black on white printing of text</p>			Legibility (spelling and grammar) interrupts communication of meaning. Referencing and formatting inaccurate.