# What is Network Optimisation?

## What this document is about?

This document defines the term 'network optimisation' and describes a simple approach to optimise a network infrastructure.

The document is designed to be short and sharp by introducing key points for further discussion.

Further information regarding this topic may be found at: www.m-net.com.au.

## The Concept of Network Optimisation

What is Network Optimisation?

From the authors perspective 'network optimisation' should include two key drivers:

1.  Ensure that an IT network design is efficient and purpose-built for the business to support maximum network traffic throughput.
2.  Ensure that an IT network design contains only the essential computer devices required to support the business traffic.

Network Optimisation must therefore ensure that the computer architecture is optimised for business traffic flows and contains only the essential devices required to support the business systems.

Having now defined the term how can network optimisation be achieved?

The process itself is not simple or prescriptive and typically requires the skills of an experienced network (and security) consultant.

While the actual tasks will vary based on the network under review, the fundamental approach remains the same:

1.  Perform an initial discovery session to understand goals, business processes, current limitations, traffic flows, business requirements and budgets
2.  Review the current network infrastructure and define project requirements
3.  Identify existing traffic flows and create detailed traffic flow diagrams for all critical applications – this will identify all in-path components
4.  Analyse in-path components for potential bottlenecks, misconfiguration and performance issues
5.  Provide recommendations for remediation

## Initial Discovery Session

This is an important starting point. During this stage important information about the organisation is discovered including: business purpose, key business processes, any current pain points or network limitations, performance issues, key business systems and applications.

The consultant and/or business should have a clear idea about the business at the conclusion of this stage.

## Review the Existing Network Architecture

This stage requires knowledge of the network design, key system elements, Wide Area Network (WAN) details, third party network access, wireless networks etc.

Hopefully the organisation can provide detailed network documentation and/or diagrams about the environment. From experience many consultants will tell you that while this information may be forthcoming, the documentation is often out of date or incomplete. Regardless it is important to have current network documentation (many compliance programs demand it) so ensure that this information is complete and accurate.

## Identify and Create Traffic Flows

A typical network consists of the following elements/devices: workstations, servers, printers, routers, switches, firewalls, and load balancers.

The key to network optimisation is to understand how these elements are connected together and how the traffic flows across the different elements. There are various methods that can be used to obtain traffic flow information:

- Review the network diagrams and map out the flows based on the information obtained during the initial discovery sessions (this information will need to be validated)
- Login to a core device (e.g. switch or firewall) and reverse-engineer the flows based on device configuration and session data (this technique requires a unique skill set best handled by an experience network professional)
- Install a packet analyser or similar device to capture flows and automatically produce traffic flow reportss

The network traffic flows will help to identify four key elements that are required for network optimisation:

1. Where is the traffic flowing from (source)?
2. Where is the traffic flowing to (destination)?
3. What elements are traversed along the path?
4. Is the path between source and destination optimal in terms of bandwidth, shortest path, and device type?

## Network Analysis

The analysis of traffic flows is probably best undertaken by an experienced professional however the concept is simple. Network traffic will only flow as fast as the slowest component in the path. Consider what happens to a high pressure water hose if the hose develops a kink in it. The water pressure drops and the water velocity slows. Same with a computer network.

There is no benefit having very fast servers over a very fast switch if network traffic must traverse a slow firewall to access the end user.

Your network is only as fast as the slowest component in the network.

Besides identifying inefficient network elements it is also important to identify obsolete or redundant network devices.

## Cost Optimisation

Redundant network devices are not required and cost money. As mentioned, network optimisation must not only cater for the efficient passage of network traffic but must also include a process to identify obsolete/redundant devices or provide for the re-purposing of existing devices to a more suitable role.

For instance a slow server might still be appropriate as a graphical workstation for the marketing department, or the old core firewall might be a suitable choice as a branch firewall.

Optimisation is also about finding the most suitable device to provide a network function in the most cost-effective manner.

## Network Remediation and Documentation

Once the business objectives and networking infrastructure is understood, a plan can be created to optimise the network.

An optimised network has lower running costs and increases business productivity.

## Summary

This document explained 'network optimisation' and outlined a simple approach to optimise a network environment.

## About the Author

Sydney-based IT consultant Mike Kleviansky has charted his own career path as an independent professional, for over 17 years. See http://blog.nvoi.com.au/blog/mike-kleviansky-inc

## More Information

For more information on how good network documentation can assist your organisation (or other related services), please refer to:

www.m-net.com.au, or contact Mike Kleviansky on 0414 3030 72.