

Proven techniques and best practices for managing infrastructure changes

When a business expands an existing facility, adds a new location, incorporates an influx of new users, or upgrades an existing infrastructure – it's vital to ensure network readiness and validate infrastructure changes to optimize network performance, minimize user downtime and reduce problems after implementation. This white paper describes a methodology to manage network changes that meets the need for speed of implementation without sacrificing accuracy.

[Table of contents](#)

Setting the stage	2
Avoiding future infrastructure issues.	2
A proven methodology	2
Scenarios:	
Finding a problem router after an upgrade	3
Acquisition requires network merging	4
Expanding network to a remote location	4
Solution: a portable network analyzer	5
Summary.	6

Setting the stage

Changes in business place demands on the network – and the network professionals who administer it – to expand and accommodate different users, additional users, remote locations and more. Situations driving this increased need to manage and validate infrastructure changes include:

- **Mergers and acquisitions:** The network established for 50 users must now accommodate 500.
- **Business growth into a new wing or facilities:** The current network must handle the increased load of new users, applications and infrastructure.
- **New technologies:** As part of a corporate-wide upgrade, a new technology must be validated for all users before implementation.
- **Upgrading the network:** When installing new infrastructure devices, the configuration must be validated as correct.

Regardless of what drives the change, one commonality is the need for rapid and accurate completion of the project. Too often, however, changes are reacted to rather than managed proactively, leading to future problems. In part, this is due to the need for fast deployment: All of these changes must happen as quickly as possible, so shortcuts are taken and steps skipped in the process. Accuracy suffers as a result. And ironically, both the network and IT staffs are slowed down because expanding or upgrading networks without upfront due diligence leads to time-consuming problems and troubleshooting later.

Avoiding future infrastructure issues

Following a proven methodology enables network professionals to accommodate growth and changes without cutting corners. This methodology involves three steps: discovery and baselining, design, and validation. These best practices are not news to network professionals, however, time constraints and other corporate pressures can often result in not adhering to proper processes.

There is a way to speed up the process without sacrificing precision. Using a portable, comprehensive network analyzer makes following the methodology easier and faster, enabling both speed and accuracy. Such a tool can combine all of the functionality needed into one interface, so an engineer can click from screen to screen instead of switching from tool to tool. And a portable tool can go to the source of a problem whether it's with the end-user, in the data center or at a remote site.

A proven methodology

Every business depends on its network to run efficiently at all times. No one can afford network outages or degradations due to poorly planned infrastructure changes. The following three steps help mitigate risks when managing network change, while also ensuring faster and more cost-effective implementations. If any one step is skipped or done incorrectly, costlier problems can potentially develop later.

The methodology

Discovery and baselining

Network professionals must first know what they're dealing with. Discovery means asking: What kind of equipment exists? What is the traffic today? Who are the users? It should include hardware inventory, applications, router configurations, switch configurations, network cabling and protocol usage. Engineers should evaluate current network performance, including traffic patterns, bandwidth optimization, Internet connectivity, and network vulnerabilities.

Baselining means creating documentation of the current state so there is something to work from to plan changes and measure against to validate them.

Design assistance

The next step is designing the plan for making the changes using the documentation as a guide. What is the end goal and how will you get there? This is the stage at which the IT team makes decisions about reconnecting, the addressing scheme, server location changes, etc., then creates a design to facilitate those decisions.

Validation

The third step is validating the design after implementation. Are all the devices configured correctly? Did a user get moved? Did the switch get changed? Network professionals verify that changes were made, then document, report and baseline the network again for future reference.

Using a portable analyzer makes following the process outlined above easier, particularly if the device includes all of the following capabilities:

- Network discovery
- Mapping/documentation
- SNMP polling to baseline switch and router performance
- Wire speed, hardware packet capture and protocol analysis to measure before/after network/application response times
- Traffic monitoring to determine which protocols are on the network
- Host management utilities (telnet/ssh) to view and change infrastructure device configurations

Scenario 1: Finding the problem router after an upgrade

A manufacturing company upgrades their infrastructure and changes the routing protocol from RIP to OSPF. Prior to making the changes, the network engineers use a handheld tool with multiple functions to conduct a comprehensive discovery of the network, router and switch configurations. Using that same tool, they document the existing state of the network in order to have something to measure and validate against. After the upgrade and routing protocol change, the tool is used to validate the changes, benchmarking against the earlier baseline. The network engineers still see RIP protocol on the network, but have no idea where it's coming from. Something has been misconfigured or missed completely. The engineers check protocol statistics and top hosts to identify the devices using RIP protocol. The tool's trace switch route feature enables them to track down exactly where the missed router is physically connected to the network, enabling them to make the change and ensure the entire network is using only the new protocol.

Scenario 2: Acquisition requires merging of networks

A high-tech company has acquired a smaller competitor and now the IT department needs to merge networks. However, all the IT staff members familiar with the smaller company's network were laid off with the acquisition. The engineers are charged with moving users and data into their own company's applications and even servers into a combined data center. But first they require some knowledge of what they're dealing with. Using an integrated, portable tool, they are able to conduct an in-depth discovery, from how the network is architected at the highest level, down to how the cabling is laid out. The team discovers and baselines the number of users, how they are connected, the applications they are using, the current bandwidth and more, including protocols, utilization, user location, switch layouts, switch connectivity and trunking. After using the tool to baseline their own network and that of their new acquisition, the engineers design an integration plan.

Following implementation, the engineers baseline the network again to check for problems. One department complains that a SQL server slows down when running backup. Using multi-port switch statistics, VLAN analysis and trace switch route features, engineers determine the server is plugged into the wrong switch. It's on the incorrect VLAN, and the path it's taking from server to backup server is convoluted. It turns out that in addition to the server being connected to the wrong switch, another switch was also misconfigured during integration. These issues were quickly resolved and the network was performing at an optimal level.

Scenario 3: Expanding the network to a remote location

A healthcare company is growing and adding a new clinic in a different city. The IT department must understand their current application bandwidth requirements so they can correctly size the WAN circuit to the new clinic. The last time the company added a clinic, the engineers had numerous problems and had to upgrade many times because they lacked a thorough understanding of needs and requirements starting out. This time, a tight deadline demands the network engineers get it right the first time. Bandwidth requirements are high because of the imaging technologies used for medical collaboration. The network must be able to support these demanding application requirements.

The engineers use an analyzer with a protocol mix feature to scrutinize current traffic and determine how much bandwidth is being utilized by each application so they can design for the increase. After implementation, they travel to the new site and use the portable tool to validate that data paths are running correctly to the home office and switches are up and operating correctly. Using the portable tool capable of throughput testing plus another one on the remote end, engineers conducted a WAN throughput test to ensure the carrier has correctly provisioned the T3 line. Testing paid off; they determined they did not need the OC3 that was recommended to them. They can get by with T3, which provides a substantial cost savings for the healthcare company.

The OptiView™ Series III Integrated Network Analyzer

The scenarios above illustrate how a portable analyzer can assist with managing change quickly, efficiently and accurately. The OptiView Series III Integrated Network Analyzer from Fluke Networks is such a tool. It's a portable network analyzer with multiple functions that enable network professionals to conduct the discovery, baselining, design through thorough documentation and validation required to better manage network infrastructure changes.

The OptiView analyzer integrates the results of multiple advanced network tests into one informative front page – including data from the devices already on the network with SNMP analysis, a unique capability for a portable analyzer. The OptiView analyzer also combines 10/100/Gigabit copper, Gigabit fiber, 802.11 a/b/g WLAN and spectrum analysis in one solution. In addition, it's the only integrated analyzer that combines network discovery, traffic analysis, infrastructure analysis, advanced packet capture/decode, and WAN, WLAN and VoIP capabilities into one portable tool.

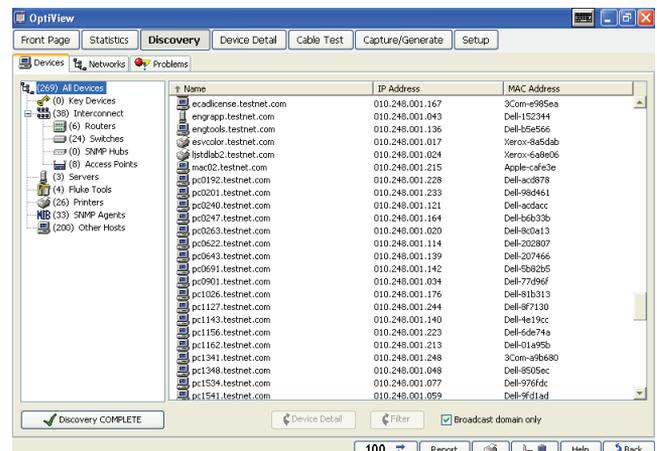
How the OptiView analyzer makes managing infrastructure changes easier

All the functionality of multiple tools is combined into one device, making managing and validating infrastructure changes easier and faster when engineers no longer have to switch from tool to tool to conduct a full array of tests. In addition, because it's portable, network professionals can conduct all the necessary tests on-site – at the end-user location, in the data center – even at remote sites. This is particularly helpful for larger organizations that usually have a WAN team, an infrastructure team, a network team, and more, and all must work together to make effective infrastructure changes. With the OptiView analyzer, network professionals can also work together when some staff members are off-site because data can be shared over the web for assisted analysis and collaboration during implementation.

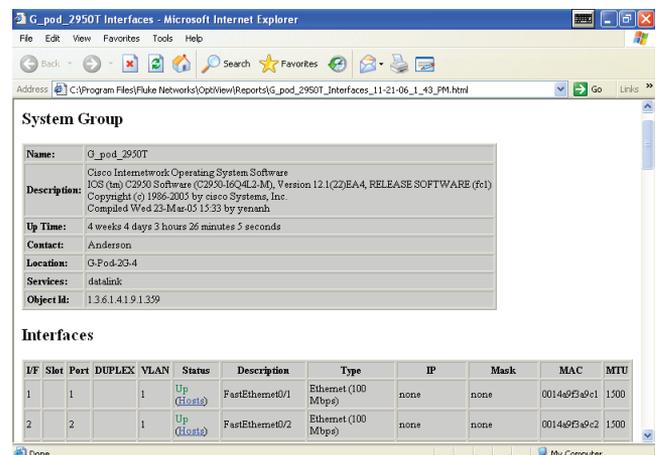
The OptiView analyzer plugs in anywhere on the network, then provides discovery information on network and device problems and identifies protocols in seconds. It also speeds reporting for complete infrastructure documentation. With the OptiView analyzer, network professionals can conduct a complete inventory of all network devices, where they're connected, and which services are running on them. It can do automated mapping, creating maps of the network in its current state. An engineer can plug the OptiView into the network, let it run the discovery, then go through a simple, multi-step process for printing the map. The OptiView Console formats discovery data and exports that data to Microsoft® Visio®, so network professionals get the data in a familiar format that can be easily used at the design stage for tackling changes and upgrades.

At the validation stage, network professionals simply go through the discovery process again using the OptiView analyzer and then use OptiView Console to create a new map so IT staff always has access to an up-to-date map, no matter what changes on the network.

Using the OptiView analyzer, network professionals can verify and prove network readiness for network expansions, mergers, consolidations, rebuilds and server/switch upgrades. They can validate and document performance, and verify new configurations to ensure the stability of the network. And they can use the OptiView analyzer to identify VLAN configurations, validate network health, and audit switch/router configurations and performance.



Device discovery



Device report

Summary

Whether a business is expanding an existing facility, adding a new location, incorporating an influx of new users, or upgrading an existing infrastructure, the OptiView analyzer can ensure network readiness and validate infrastructure changes to minimize user downtime and problems after implementation. It cannot be overstated: If network professionals fail to perform a step correctly, they are increasing the likelihood that problems will develop later. With the OptiView analyzer, engineers can adhere to the methodology, managing changes quickly to meet the need for speed without sacrificing accuracy. And accuracy is what matters in the end, when an organization can't afford the downtime caused by a faulty network implementation.

The business case for a portable, integrated network analyzer

The OptiView Series III Integrated Network Analyzer helps network professionals manage IT projects, solve network problems and support IT initiatives, resulting in reduced IT costs and improved user satisfaction. It gives you a clear view of your entire enterprise – providing visibility into every piece of hardware, every application, and every connection on your network. No other portable tool offers this much vision and all-in-one capability to help you:

- **Deploy new technologies and applications.**
- **Manage and validate infrastructure changes.**
- **Solve network and application performance issues.**
- **Secure the network from internal threats.**

It shows you where your network stands today and helps you accurately assess its readiness for the changes you need to make now and in the future. Leverage the power of OptiView to give you vision and control of your network, go to www.flukenetworks.com/seeoptiview to learn more.

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