Network Transformation through Automation

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Most organizations' journey to network transformation is hampered by the lack of automation – specifically the manual tasks required by network engineers to adjust, maintain and operate their internal networks. IT organizations can benefit from a modern approach to network automation which employs a declarative data modeling to reduce hidden human errors.

The current situation (i.e., COVID-19) significantly impacts IT staff's physical access to network elements (e.g., the data center) which provides a further impetus for network automation. Now more than ever, networks must be operational at all times and IT needs tools to operate, tune and secure networks from remote locations. And, the networks that are critical to business operations can be easily adjusted to changing business conditions.

Network automation for business continuity means that organizations must eliminate time consuming home grown scripts which lead to error prone manual configurations. Network engineers find it difficult to develop, test and maintain reliable scripts. Network security is often compromised by unintended mistakes created by human operators.

New automation tools provide a single authoritative source of truth, so that operators can understand the intended configuration of the network and the network's true state. Thus, when changes are required to the network they can proceed without the risk of "breaking" the network or creating security vulnerabilities.

Gluware's mission is to make networks self-operating, so organizations can prevent outages, enhance security, increase agility and save money. The Terracon experience clearly illustrates the business value of automation tools in general and specifically Gluware's capabilities.

Automation challenges

IT operations are becoming increasingly complex to manage given the trends of virtualization, use of containers, pervasive mobility, and adoption of cloud-based applications. The need for IT to rapidly adjust to changing traffic patterns during 2020 highlights the requirement for an agile, highly automated network.

Enterprise networks are built with a number of ethernet switches, routers, and network security elements typically from a variety of suppliers. Each network element has a unique management and configuration system. The complexity of the rules for network behavior provides an environment that is difficult to administer and ripe for configuration error. Many networks have bloated configurations and underlying issues that create errors and prolong troubleshooting efforts.

Human error through manual configuration accounts for significant network downtime. The vast majority of network changes are still manual and these manual processes present significant risk in terms of network outages and security vulnerabilities. For example, provisioning for quality of service for a specific application requires many steps to classify policy and convert the

policy into an actual configuration – both network and security. Network troubleshooting is also performed manually – thus extending the time and impact of outages. Manual efforts also often leave the network at risk for being out of compliance for required standards (e.g., PCI-DSS and HIPAA).

Network automation can be an elusive goal given current management tools and legacy scripting. New software network tools can provide a map of the network elements and a declarative source of truth. They can provide centralization control and management to oversee activities on the network. For example, IT personnel can automatically push changes in access control lists from a centralized console to all distributed network/security elements.

Figure 1
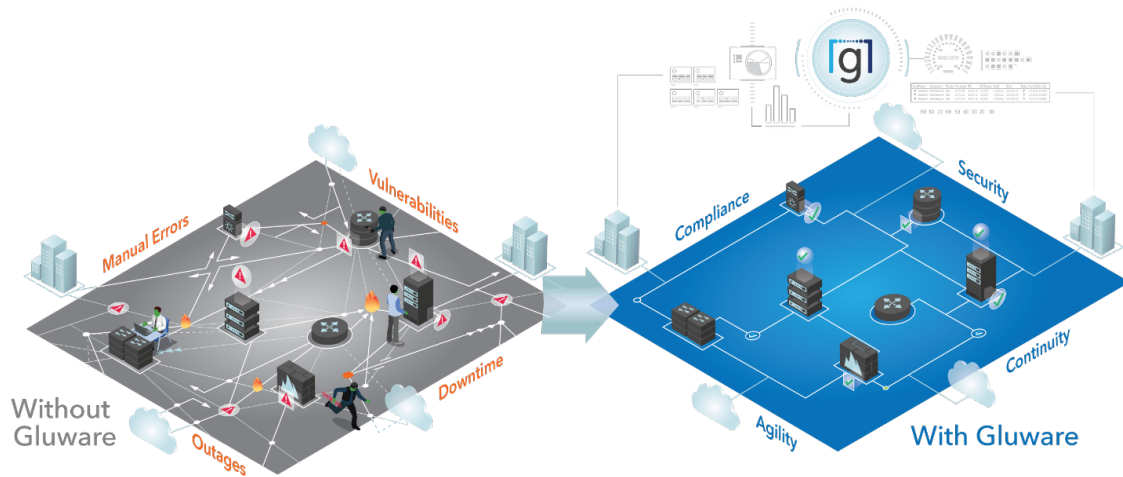
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Gluware® Intelligent Network Automation Transforms Complex Networks

Terracon Automates its Network

Terracon is a 5,000 person engineering firm which operates in all 50 states in the US.   It has grown through acquisition and is constantly adding, moving or discontinuing operations at specific locations. It must manage its operations and networks at these locations remotely with centralized IT staff.

Terracon's goal is to move from manual to automated network operations. It needs a complete infrastructure inventory, to understand security vulnerabilities and identify inconsistent configurations. It must support multi-vendor network equipment, including Cisco and a variety of other suppliers. Like many organizations, Terracon typically performed 95% of its network

changes manually. This resulted in numerous policy violations due to human error and significant time in troubleshooting these errors. Terracon has a small network operations team (lean IT) and does not have the resources to develop and maintain complex network scripts.

Terracon selected Gluware due to its robust automation tools and ease of implementation. Gluware requires no programming, is model-driven and declarative which enables highly reliable changes. It includes several applications enabling rapid network automation, including inventory, configuration drift, configuration audit and OS upgrades.

With Gluware adding new sites is easy as it enables IT to push out a standard configuration to remote location. Gluware is able to identify network anomalies and enable IT to take action. Terracon cites that Gluware enables the following benefits:

- 80% reduction in major network outages
- 90% reduction in time needed per change
- 40% less time spend on troubleshooting

Terracon benefits from improved network reliability, reduced security vulnerabilities and increased IT efficiency. It is able to turn up and turn down networks where and when it needs to without physical intervention of IT staff.

Recommendations for IT Leaders
Digital transformation, agility and business continuity requirements continue to place stress on network operations. IT organizations need to accelerate their journey to a more automated network. Legacy networking tools are hard to use, time consuming and typically lead to manual errors which create network outages and security vulnerabilities.

The business value of network automation is clearly demonstrated by Terracon's experience in times of network uptime and improved IT efficiency. IT organizations should select tools that support multi-vendor network and security environments, that are easy to learn and use, and powerful enough to automate manual network tasks.

Gluware enables customers to automate and orchestrate changes across a multi-vendor network. Gluware improves network reliability and can scale from small to very large network operations. With Gluware's network feature modeling and intelligent intent-based orchestration engine IT operations can rapidly automate their existing network operations.

Meet the Author

Lee Doyle is Principal Analyst at Doyle Research, providing client focused targeted analysis on the Evolution of Intelligent Networks. He has over 25 years' experience analyzing the IT, network, and telecom markets. Lee has written extensively on such topics as SDN, NFV, enterprise adoption of networking technologies, and IT-Telecom convergence. Before founding Doyle Research, Lee was Group VP for Network, Telecom, and Security research at IDC. Lee contributes to such industry periodicals as Network World, Light Reading, and Tech Target. Lee holds a B.A. in Economics from Williams College.