

NexTech Solutions has piloted the idea of everything as-a-Service. Automation should be no different. The NTS Automation Platform operates as a Joint environment for Infrastructure-as-Code (IaC) creation and sharing. It is a baseline for trainable, sustainable, and repeatable processes in the DoD. Part of the NTS Automation Platform is what we call the Automation Lab Enclave (ALE). ALE is a data center infrastructure that allows our personnel and customers to collaboratively develop IaC capabilities. Out of the ALE, we will architect, develop, and deploy all of your automation needs, much like any cloud service would do for you.

NTS provides the core infrastructure such as Servers, Networking, VPN, Power, and Security for both systems and facilities. We also provide the software applications as needed per each subscribed customer: apps like GitLab for a local repository for code; RedHat AWX for Ansible playbook development, testing, and deployment; and Nautobot/NetBox for an IaC single source of truth. These are just some baseline components that NTS provides to each of its subscribed customers under the ALE. Customers can also bring their own software to load and host into the ALE for their personal use. We have hosted everything from Kubernetes and various OS flavors, ACAS, Jenkins, Foreman, Forward Networks, and much more.

What this means is that by hosting the ALE within the NTS Automation Platform, not only do users have access via internally developed IaC from NTS, but also get access to a repository that is growing every day, created and added to by some of the DoD's best communicators. It is where our users can expedite knowledge transfer of automation code that has already been created, share their ideas for joint code development, and even contribute their own code to be used by others. Our goal is to create a repository that is built for and maintained by DoD communicators and the industry to help propel our edge-based communications into the future fight.

## HOW WE DO IT

The ALE works with technologies from companies such as RedHat, Microsoft, NetBox, VMware, Cisco, NetApp, Klas, Dell, HPE, and many more. Let us introduce you to a few of the tools we use.



NetBox is an open source web application designed to help manage and document enterprise networks. Initially conceived by the network engineering team at DigitalOcean, NetBox was developed specifically to address the needs of network and infrastructure engineers. NetBox was set up in the automation lab for use as a repository for site creation, tenants, device types, and nodes that organize the enterprise network information. It also includes Virtual Routing tables, Aggregates, Prefixes, IP Addresses, VLANs, and Clusters. This allows the customer to have complete oversight and organizational control of their network.



AWX is an open-source web application that provides a graphical user interface [GUI], REST API, and task engine for Ansible. It's the open-source version of the Ansible Tower. AWX allows you to manage Ansible playbooks, inventories, and schedule jobs to run via the web interface. The Automation Lab developed the ability to maintain a dynamic network inventory. This playbook calls into NetBox as the repository for the devices that the customer maintains, so that it can be easily updated. The Automation Lab provisioned an AWX to use GitLab in order to provide AWX with the ability to run automated updates when code is changed in GitLab. Workflows were then developed to automate the creation of their network device configurations. This includes Cisco-based routers and switches. The templated process can be applied to numerous other network vendors, including Juniper, Mellanox, Klas, and Extreme Networks. AWX can be used to create an operational checklist in order to validate the configuration and services of their edge data center infrastructure. An HTML report is then created and sent to predetermined accounts for notification and remediation.



GitLab is a complete DevOps platform, delivered as a single application, which is available in the Automation Lab or inside the customer's data center. The Automation Lab developed a number of Git repositories/projects across multiple network enclaves. The Git repository contains numerous playbooks and playbook templates ready for immediate consumption. The Automation Lab contains additional repositories that include OVA template images of virtual routers, to include Cisco 5921 and CSR-1000v. These repositories have established connections with NetBox and AWX, so that the customer can enjoy a one-touch automated network provisioning of their edge data center infrastructure.



MANTLE is NTS's proprietary automation platform. It provides technical and non-technical users with the ability to configure their deployable edge infrastructure quickly and reliably. The application is written primarily in Python and is built for use on Windows, Mac, and Linux. MANTLE allows for simple and quick creation of unintended VMware ESXi ISOs for CDROM and USB devices. Within the same interface, it allows for rapid installation of vCenter, vSAN, distributed virtual switches, NSX networking, and advanced services such as Rubrik or Cohesity. Configuration files can be saved and loaded into MANTLE, allowing for rapid, reliable, and repeatable provisioning of data center infrastructure. MANTLE is a malleable platform. Our agile development team is available to provide timely modifications to the interface as clients' needs evolve. Even as the platform is reworked to fit the customer's specific needs, the customer still gets a unified user experience across multiple application variants.

## ENDLESS FLEXIBILITY

In addition to the applications listed above, the Automation Lab has experienced successes in working with products such as Rubrik, Cohesity, Docker, Consul, OpenShift, Forward Networks, Jenkins, Foreman, and ACAS.

Since becoming operational, the ALE has created a robust repository of Ansible Playbooks, Python, PowerShell, and Linux based scripts. The following are just some of the tasks our customers can automate on Day 1:

- Domain Controller replication status
- Web application service validation
- Automated File Transfers (SSE on target to data lake)
- Configuration differentials (Configuration Drift Prevention)
- Network Routing Validation
- Network Service Validation
- Network EIGRP Keychain Rollover
- Network Failover Verification
- Network IP Management
- Network QoS Validation
- Network Operational Check (Report creation and admin notification)
- Cisco Router Configuration generation
- Cisco Switch Configuration generation
- AWS Environment Creation
- VMware ESXi, vCenter, vSAN, and NSX deployment
- vSphere environment manipulation
- Legacy application deployment automation

## AUTOMATION LAB ENCLAVE



NexTech Solutions implements customized cloud, hybrid, and edge solutions. Our holistic approach to problem solving means that we devote our time to truly understanding the unique mission requirements of our federal clientele before building mission-driven solutions that meet today's demands as well as tomorrow's. We offer a diverse and customizable set of classified and unclassified capabilities focused on mission support.

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