

Network Automation

TechEx22



THE UNIVERSITY
of NORTH CAROLINA
at CHAPEL HILL

The background of the slide is a photograph of a university campus. The top half shows a dense canopy of green trees against a clear sky. A large, semi-transparent blue horizontal band covers the middle of the image, containing the title and subtitle in white text. The bottom half of the image shows a grassy lawn with several people sitting or walking, and a paved path with a stanchion system. The overall scene is bright and sunny.

Network Automation @ UNC

Are We There Yet?

A screenshot of a web browser window. The address bar shows 'https://rp.unc.edu'. The page content is split into two columns. The left column is titled 'Cisco Tools' and contains a list of links: 'Interface Statistics', 'Run an ICMP Command', 'Show Route' (with sub-links for IPv4 and IPv6), 'Show ARP' (with sub-links for IPv4 and IPv6), 'VLAN Trunking Change', 'Find L2 VLAN', 'Show Processes', 'Show ACL', and 'Show Logs'. The right column is titled 'Router: Datacenter-F' and contains text: 'IP Route Table for VRF "default"', '[x/y] denotes [preference/metric]', '% in via output denotes VRF', 'Routing entry for 152.2.90.97 in /', and 'Known via Datacenter-PAN, Vlan2715'.

← → ↻ 🏠 🔒 https://rp.unc.edu

Cisco Tools

- [Interface Statistics](#)
- [Run an ICMP Command](#)
- Show Route
 - [IPv4](#)
 - [IPv6](#)
- Show ARP
 - [IPv4](#)
 - [IPv6](#)
- [VLAN Trunking Change](#)
- [Find L2 VLAN](#)
- [Show Processes](#)
- [Show ACL](#)
- [Show Logs](#)

Router: Datacenter-F

IP Route Table for VRF "default"
'[x/y]' denotes [preference/metric]
'%' in via output denotes VRF

Routing entry for 152.2.90.97 in /

Known via [Datacenter-PAN](#), Vlan2715



- Maintain essential functionality
 - Who are the users? What do they really need?
- Use a team approach
 - Spread skills over multiple people, avoid skill silos
 - Extend opportunity to other ITS departments
 - Grow expertise among members
- Embrace new development and deployment patterns
 - Set up for future growth
- Consider security and plan appropriately



Backlog Management

- Jira Scrum Board
- Sprint Planning
- Task Tracking
- Product Owners

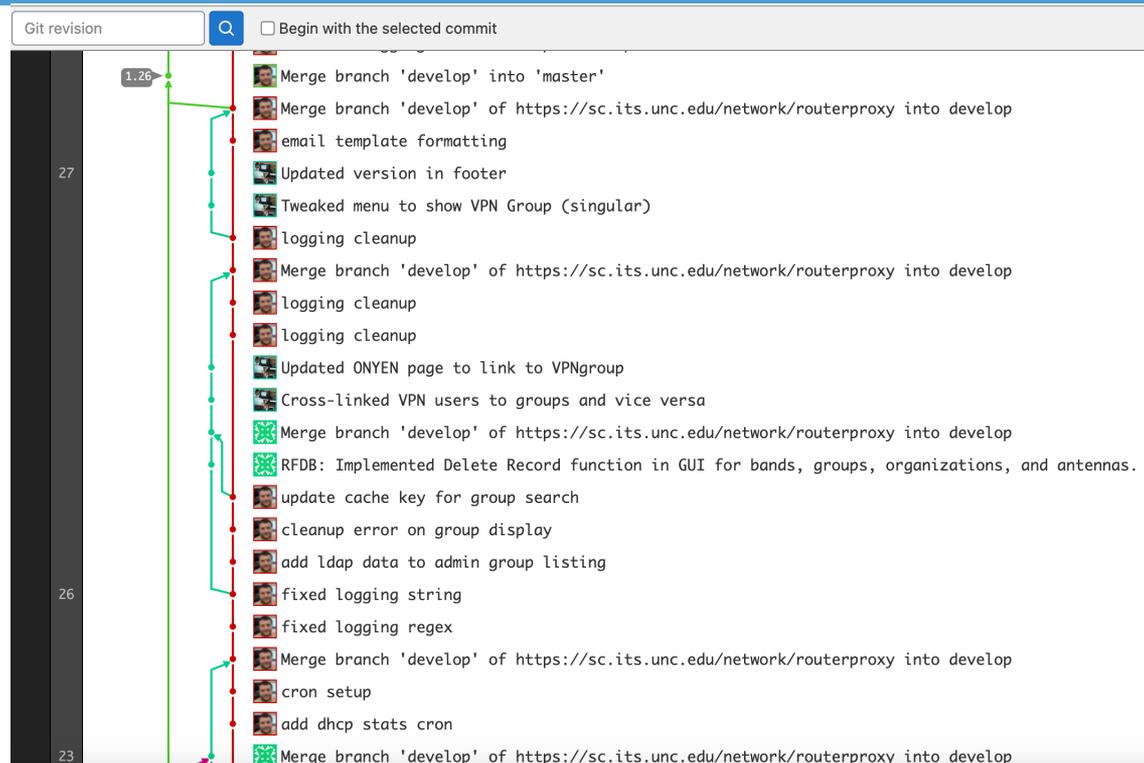
The screenshot shows a Jira Backlog for the RouterProxy project. The top section is for 'RouterProxy Sprint 48' which contains 7 issues. The bottom section is for the general 'Backlog' which contains 83 issues. Each issue is represented by a card with a key icon, a priority indicator, a title, and a 'Dashboard' button. The 'Create issue' button is visible at the bottom of the sprint view.

Sprint	Issue ID	Issue Description	Assignee
RouterProxy Sprint 48	IN-375	Build a production environment (via routerproxy project in cloudapps or some dedicated server setup with docker)	Dashboard
	IN-379	Acknowledge improvement: Add comment ability	Dashboard
	IN-384	Traps: Improve the device lookup to support alternate source IP addresses on a single device. Also, no longer as...	Dashboard
	IN-327	Add filtering to core switch comparison tool to reduce noise	InspectorGadget
	IN-331	Create user interface for requests with different inputs (i.e. mac vs switch_ip/port)	None
	IN-313	wipy error - wired oui tool	None
	IN-368	Supplement visualization with up/down data via akips/dashboard	None
Backlog	IN-153	Improve user flow from show route to firewall interface details	None
	IN-139	GUI interface for device provision wizard	Datacenter Wizard
	IN-132	Build an MLAG (pod switches)	Datacenter Wizard
	IN-387	Look at AKIPS backup/recovery model, document and update.	Dashboard

Source Code Management

- Git basics
- Branch planning
- Coding conventions

Pipeline Automation



Git revision Begin with the selected commit

1.26

27

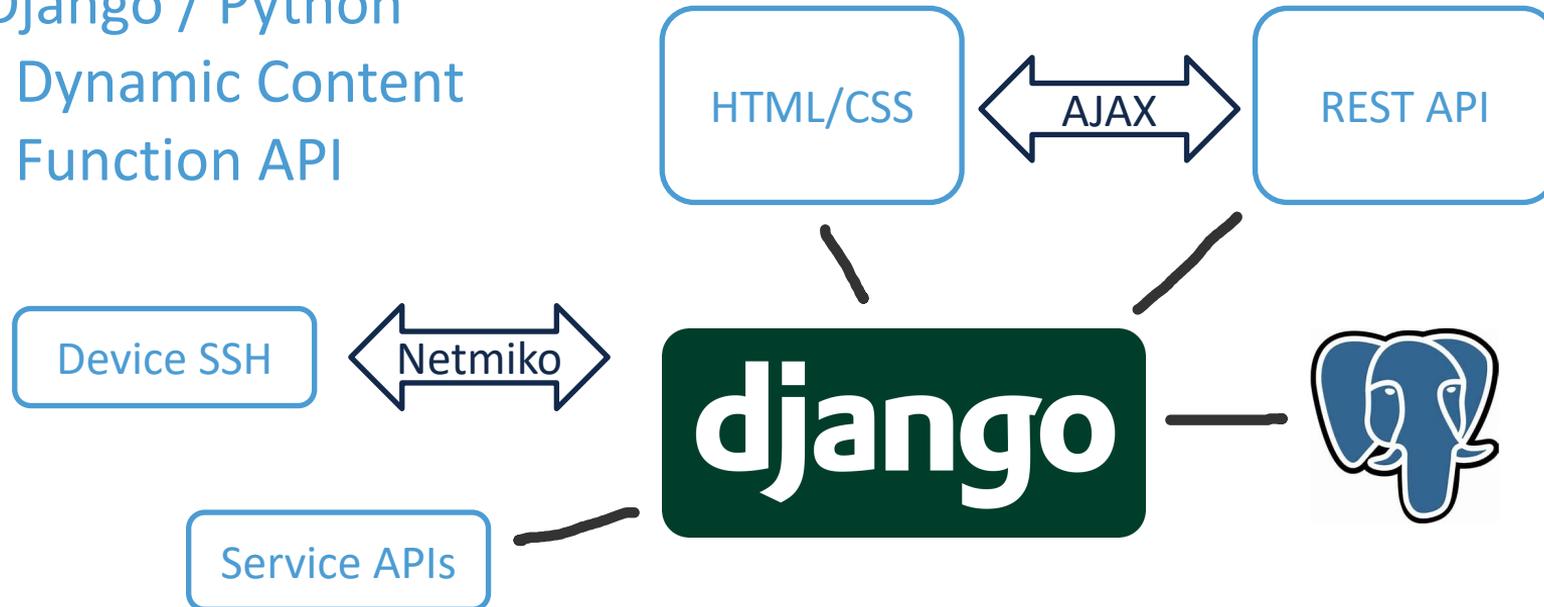
26

23

- Merge branch 'develop' into 'master'
- Merge branch 'develop' of https://sc.its.unc.edu/network/routerproxy into develop
- email template formatting
- Updated version in footer
- Tweaked menu to show VPN Group (singular)
- logging cleanup
- Merge branch 'develop' of https://sc.its.unc.edu/network/routerproxy into develop
- logging cleanup
- logging cleanup
- Updated ONYEN page to link to VPNgroup
- Cross-linked VPN users to groups and vice versa
- Merge branch 'develop' of https://sc.its.unc.edu/network/routerproxy into develop
- RFDB: Implemented Delete Record function in GUI for bands, groups, organizations, and antennas.
- update cache key for group search
- cleanup error on group display
- add ldap data to admin group listing
- fixed logging string
- fixed logging regex
- Merge branch 'develop' of https://sc.its.unc.edu/network/routerproxy into develop
- cron setup
- add dhcp stats cron
- Merge branch 'develop' of https://sc.its.unc.edu/network/routerproxy into develop



Django / Python
- Dynamic Content
- Function API



A screenshot of a web browser's developer tools interface. The 'Name' tab on the left shows a list of requests, with the first one selected: 'ping?host=fluffypan-p.its.unc.edu&target=152.2.198.50'. The 'Preview' tab on the right shows the response data in a JSON-like format. The response is a success, with a message 'ping completed' and a timestamp of 1670385444851.977. The output of the ping command is also visible: '\nPING 152.2.198.50 (152.2.198.50) 56(84) bytes of data.\n64 by'.

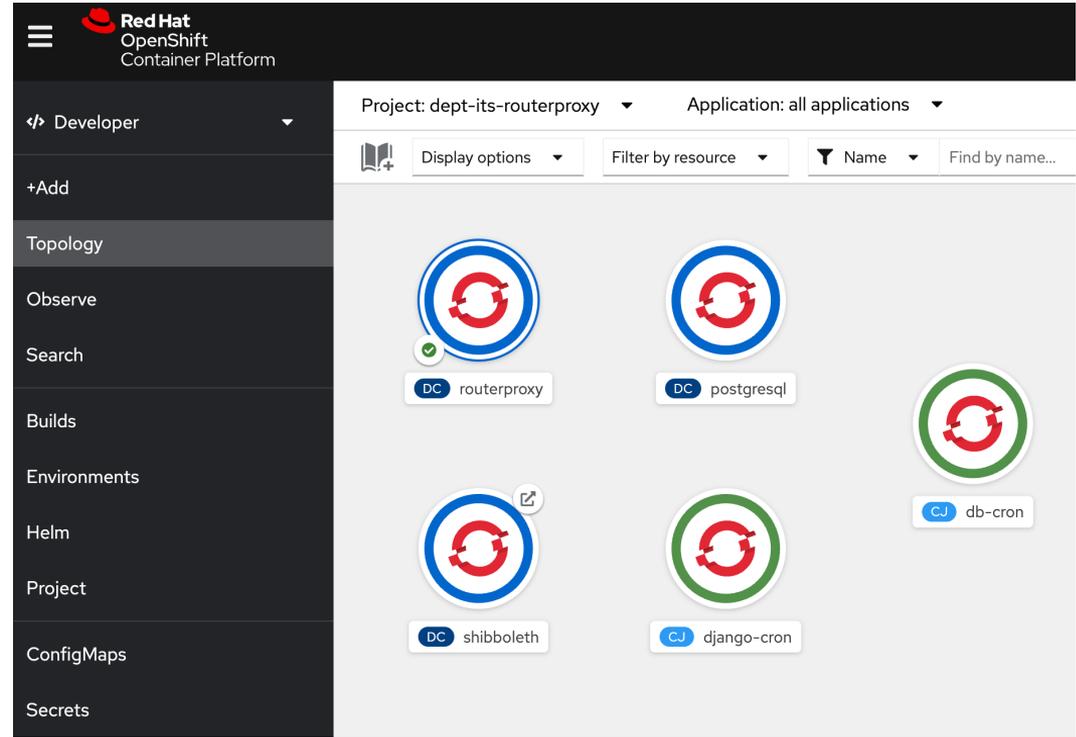
Name	Headers	Payload	Preview	Response	Initiator	Timing	Cookies
ping?host=fluffypan-p.its.unc.edu&target=152.2.198.50			<pre>{success: true, message: "ping completed", ...} cached: false message: "ping completed" output: "\nPING 152.2.198.50 (152.2.198.50) 56(84) bytes of data.\n64 by success: true time: 1670385444851.977</pre>				
?host=fluffypan-p.its.unc.edu&target=152.2.198.50							

Standardized requests and responses calls for operations interacting with other devices and APIs.



OpenShift (Cloudapps)

- Established campus offering
- Project layout
 - Production
 - Testing
- Triggered builds





Core	ping, arp, traceroute, vlan, interfaces, ACLs, block reporting
IPAM	Interface with Infoblox data, automate add/update/deletes
VPN Tools	AnyConnect client and group details, statistics
VoIP Tools	Automated porting between VoIP providers
Wireless Tools	AP management, bulk controller changes, reporting
RF Spectrum DB	RF usage, placement, ownership, mapping



Router Proxy
William Whitaker, Jr (wew)

- Home
- ROUTER PROXY APPLICATION
- ICMP Commands
- ARP Commands
- Show Route
- Find VLAN
- Show Blocks
- Interfaces
- Interface Details
- Show ACL
- Fluffy Port Toggle
- VLAN Trunk
- Device Inventory
- User Lookup
- User Access
- OTHER APPLICATIONS
- IPAM
- VPN Tools
- VniP Tools

About

RouterProxy intends to improve administrators' quality of life.

It is written in Python and hosted in CloudApps to facilitate repeatable processes and execute live commands on network infrastructure.

Network

ITS - Comm Technologies

[GitLab Group Members](#)

Monitoring and Alerting

- [ServiceNow / Service Portal](#)
- [ITS Status](#)
- [Cujo / Cujo Lite](#)
- [Entuity](#)
- [Spectrum CloudClick / OneClick](#)
- [xMatters](#)
- [Nagios](#)
- [Zabbix](#)

Configuration and Documentation

- [NIT / PIT](#)
- [Netsight](#)
- [Panorama](#)
- [Infoblox](#)
- [VMware vSphere](#)
- [Confluence](#)
- [SecureW2 Management](#)
- [euroam-US Administration](#)

Troubleshooting and Performance

- [Voyance](#)
- [AKIPS](#)
- [Cacti](#)
- [Smokeying](#)
- [Splunk](#)
- [nPerf](#)
- [Ookla Speedtest](#)
- [perfSonar](#)

Recent Users (last 24 hours)

Onyen	Name	Department	Access	Special Permissions	Last Access
wew	William Whitaker, Jr	ITS - IT Infrastructure	Admin	Core IPAM Trunk Wifi Limited Test	Dec. 6, 2022, 11:29 p.m.
eiselman	Dave Eiselman	ITS - Information Security	User	Core Security Trunk Test	Dec. 6, 2022, 4:36 p.m.
foscue	Mary Wezyk	ITS - IT Infrastructure	User	Core Trunk	Dec. 6, 2022, 2:36 p.m.
kmclayto	Kevin Clayton	ITS - IT Infrastructure	User	Core Trunk	Dec. 6, 2022, 12:58 p.m.
wadec	Chad Wade	ITS - IT Infrastructure	User	Core Trunk Wifi	Dec. 6, 2022, 12:32 p.m.



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