NetFixGo: Automated Network Troubleshooting and Validation

NetFixGo (*Network Fix Go*) is a Python-based CLI tool for automated network troubleshooting and validation. It focuses on comparing network device configurations and OSPF neighbor states against predefined golden states and golden configuration, resolving detected issues dynamically, and notifying you via Slack. It simplifies the management of network reliability and ensures compliance with golden configurations.

The primary functionalities include:

- Dynamic comparison of device configurations with golden configurations.
- Validation of OSPF neighbor states.
- Automated resolution of detected issues, such as:
    - Fixing mismatched OSPF timers.
    - Resolving OSPF shutdown configurations.
- Real-time Slack notifications for issues and resolutions.

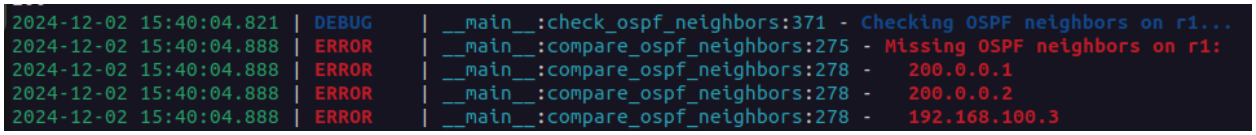
Note: While the tool currently only supports OSPF automated resolution, this can be further enhanced to include more protocols and features.

Features

1. Configuration Comparison: NetFixGo compares the current device configuration against the golden configuration. It detects any divergences, removes unwanted configurations, and restores compliance by applying the golden configuration.

Screenshot 1: Netflix identifying divergences on device R1

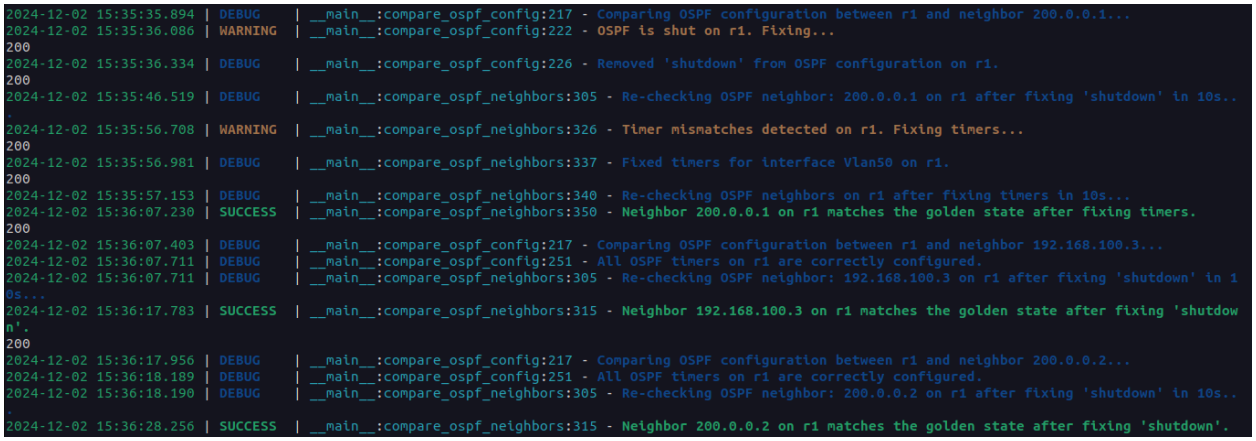
2. OSPF Neighbor Validation: The tool validates OSPF neighbor states against the golden state. It identifies and logs missing or unexpected neighbors, mismatched OSPF timers, or incorrect neighbor states (*e.g., non-FULL/2WAY states*).



Screenshot 2: NetfixGo identifying missing neighbors

3. Automated Issue Resolution: NetFixGo dynamically resolves common OSPF issues, such as:

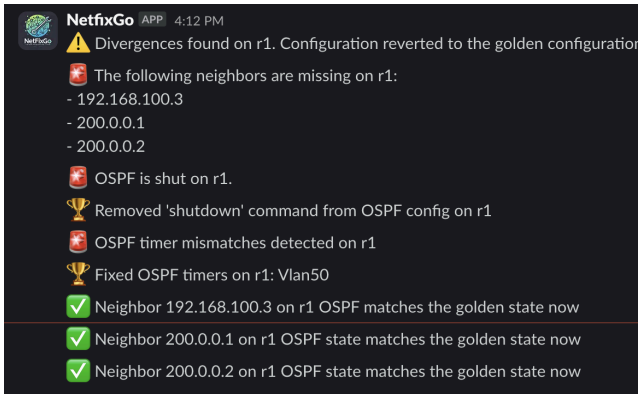
- Removing shutdown from OSPF configurations.
- Correcting OSPF interface timer mismatches.



Screenshot 4: NetFix go dynamically detecting and fixing OSPF config and timer issues

4. Slack Integration The tool integrates with Slack for real-time notifications:

- Reports missing neighbors or mismatched states.
- Notifies successful resolutions and unresolved issues.
- Uses emoji annotations to highlight severity and status.



Screenshot 5: Slack notifications

Usage

NetFixGo can be run directly via the CLI. It reads device information from a CSV file (*sshInfo.csv*), establishes SSH connections, and validates device configurations.

Key Functions

1. compare_configs

- Compares the running configuration of a device with its golden configuration.
- Resolves mismatches by applying golden configurations.
- Sends Slack notifications for detected differences and applied fixes.

2. compare_ospf_neighbors

- Compares OSPF neighbor states against the golden state.
- Logs and resolves:
    - Missing neighbors.
    - Mismatched neighbor states.
    - Unexpected neighbors.
- Automatically fixes detected issues using the *compare_ospf_config* function.

3. compare_ospf_config

- Validates OSPF configurations for:
    - Shutdown conditions.
    - Timer mismatches (*hello, dead, retransmit intervals*).

- Applies necessary corrections and rechecks OSPF states.

4. send_slack_notification

- Sends formatted messages to a predefined Slack webhook URL.
- Supports emoji-based annotation for urgency and success statuses.
