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Ansible for Networks: Beyond Static Templates

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29% of IT professionals surveyed cited the integration between **network operations** and other **IT domains** as one of the biggest challenges facing their organizations' networking teams

Source: ESG Research Report, Trends in Data Center Networking, February 2016

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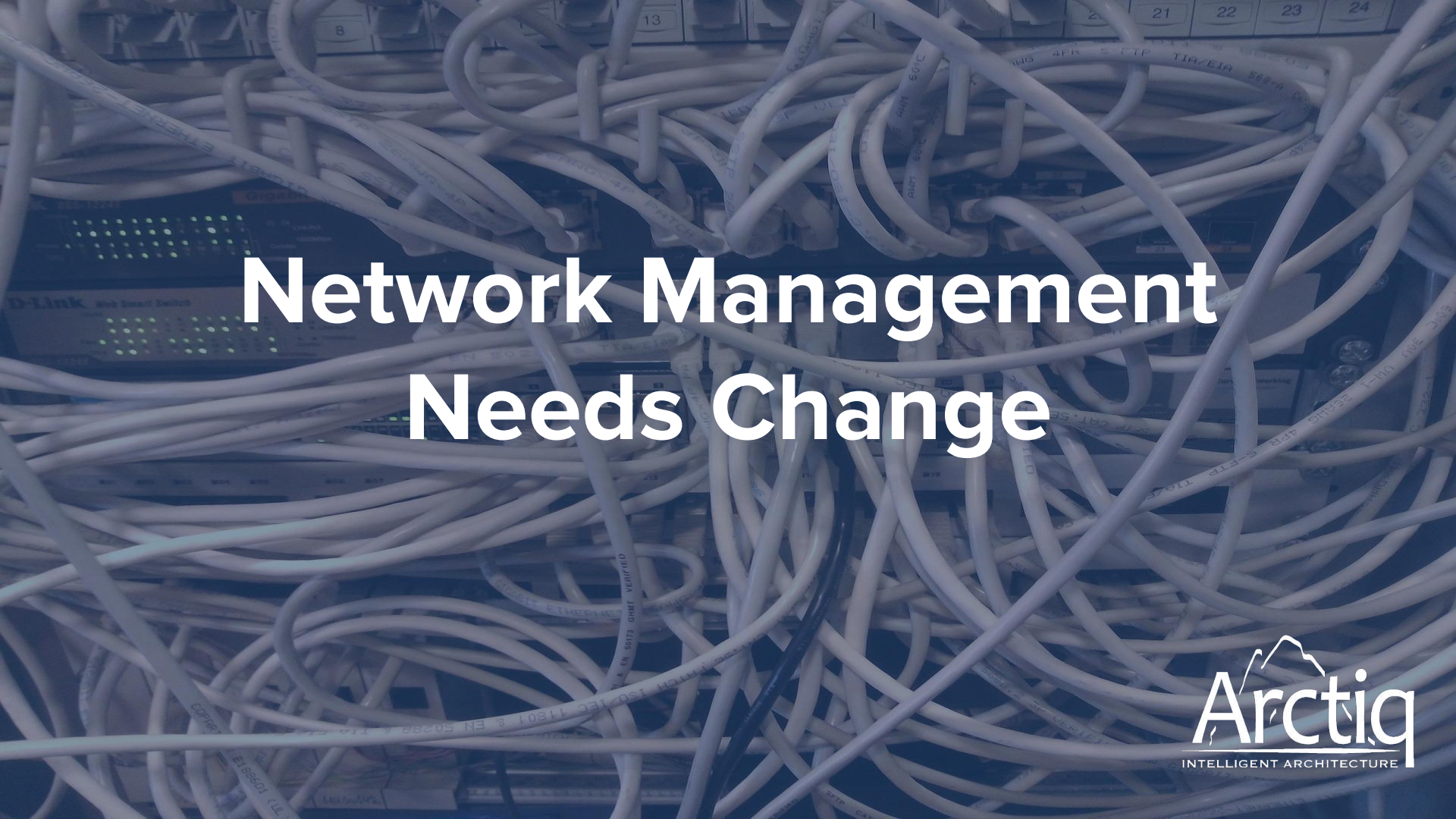
Network Management
Needs Change
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20% of IT professionals surveyed indicated that **consistent configuration due to the reduction of manual methods** was the most significant benefit realized from network automation, while **18% indicated agility in provisioning network devices, configuration, and services** through scripting and other automation methods. Additionally, **meeting service level agreements** was cited as the most significant benefit by **17% of respondents**, while **14% cited mitigating human error and misconfiguration**

Source: ESG Research Report, Network Automation: Enabler of IT Process Goals, to be published.

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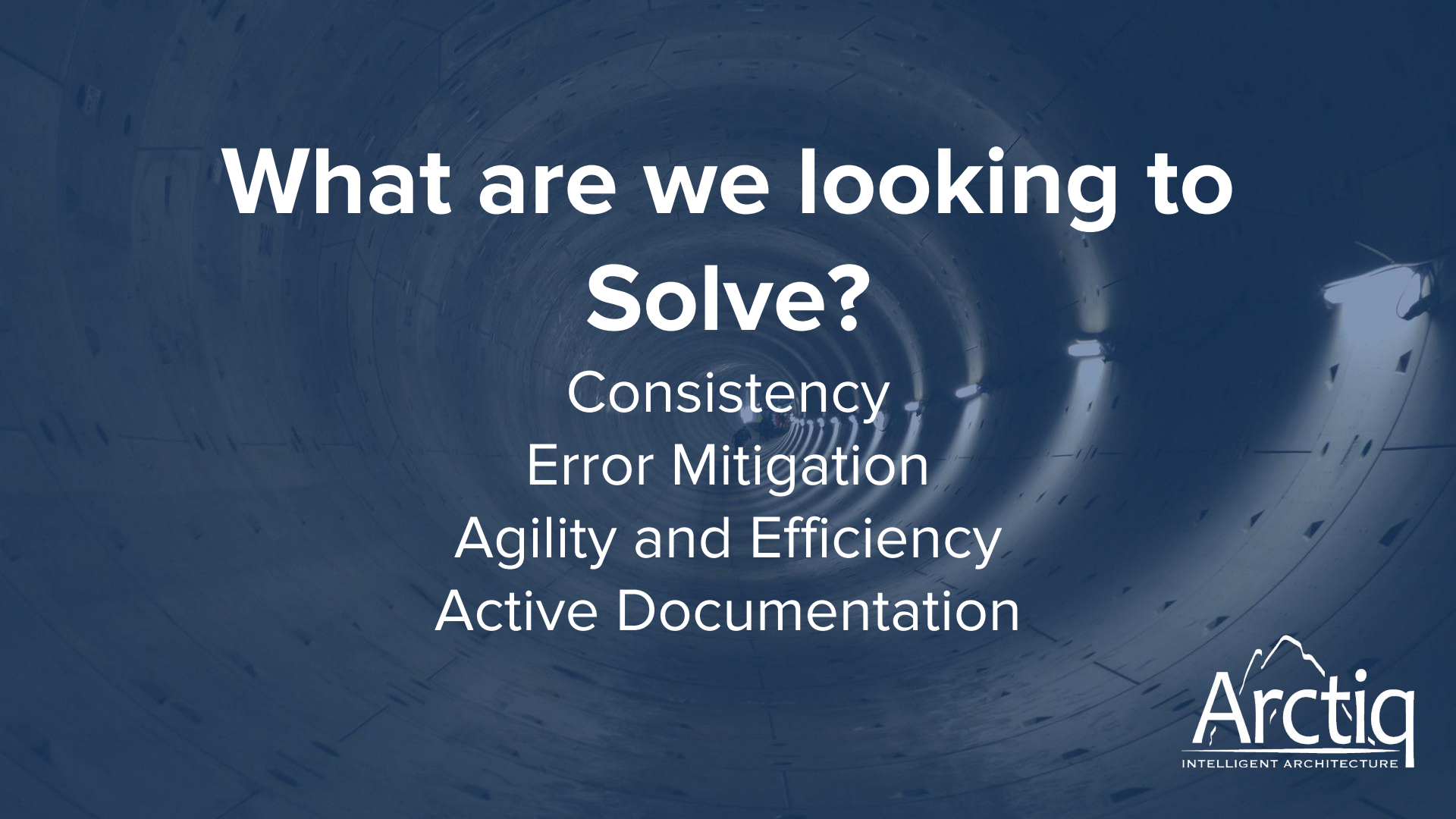
What are we looking to Solve?

Consistency
Error Mitigation
Agility and Efficiency
Active Documentation



MOPs to Playbooks

Declarative State
Infrastructure as Data

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```yaml
---
  - name: Juniper Configuration Playbook
    hosts: prod
    gather_facts: no
    connection: local
    tasks:
      - name: Install the Configuration to the Device(s)
        junos_config:
          src: "files/{{ inventory_hostname }}-interfaces.cfg"
          update: "{{ config_method | default('merge') }}"
          comment: "Configuration Updated by Ansible"
```

```
interfaces {
    et-0/0/1 {
        description "member interface for ae1";
        gigether-options {
            802.3ad ae1;
        }
    }
    et-0/0/2 {
        description "member interface for ae1";
        gigether-options {
            802.3ad ae1;
        }
    }
}
```

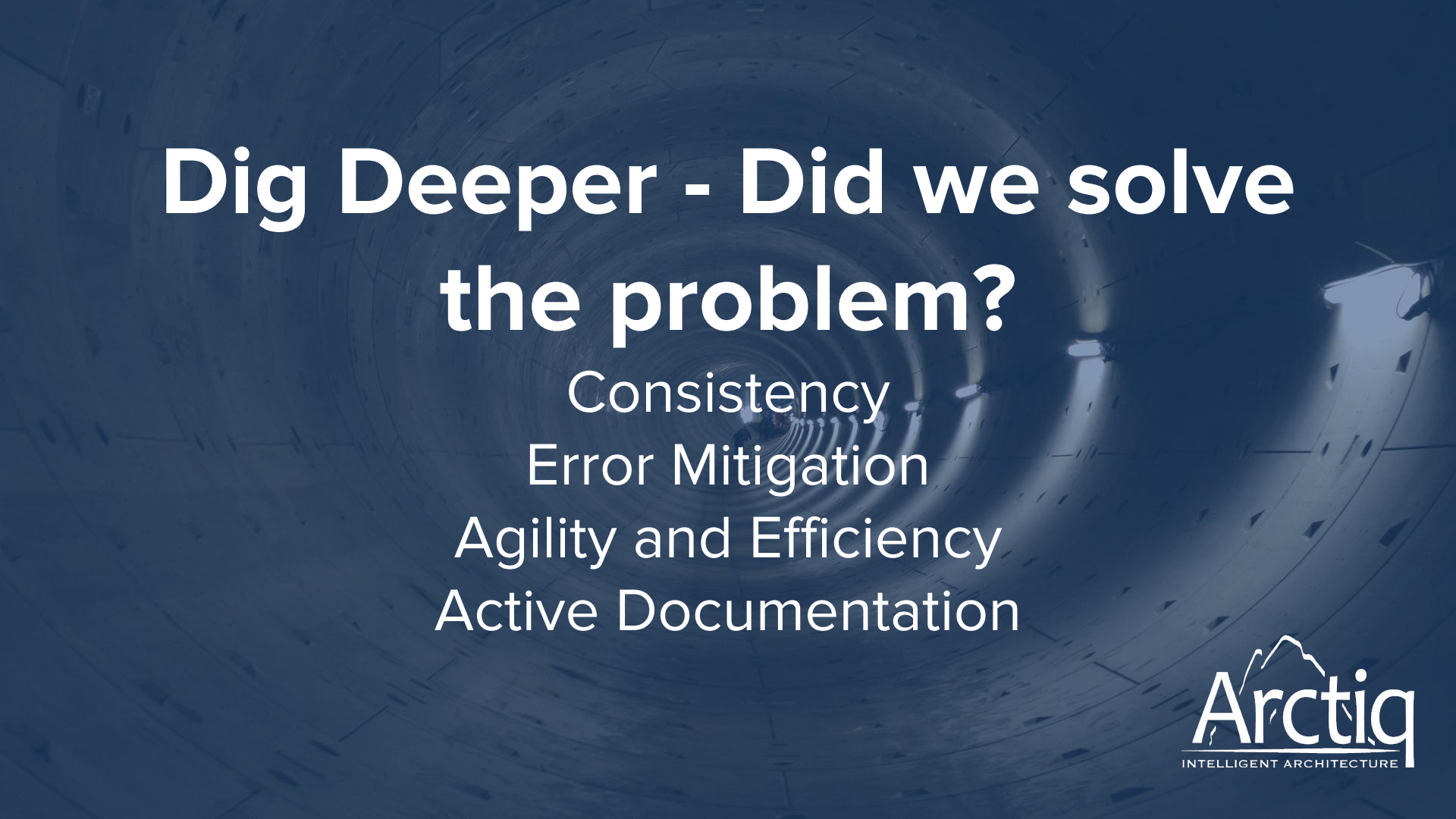
Dig Deeper - Did we solve the problem?

Consistency

Error Mitigation

Agility and Efficiency

Active Documentation



How does the flow need to change?

Build the config files dynamically first - using Jinja2
Assemble and organize config files as needed
Deploy the generated config files

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```yaml
---
  - name: Juniper Configuration Playbook
    hosts: prod
    gather_facts: no
    connection: local
    tasks:
      - name: Build the Template Dynamically
        template:
          src: "templates/interfaces.j2"
          dest: "files/{{ inventory_hostname }}-interfaces.cfg"
      - name: Install the Configuration to the Device(s)
        junos_config:
          src: "files/{{ inventory_hostname }}-interfaces.cfg"
          update: "{{ config_method | default('merge') }}"
          comment: "Configuration Updated by Ansible"
```

```yaml
---
  lag_interfaces:
    - name: et-0/0/1
      description: LAG-BUNDLE Interface
      lag: ae4
    - name: et-0/0/2
      description: LAG-BUNDLE Interface
      lag: ae0

```

```
#jinja2: lstrip_blocks: "True", trim_blocks: "True"
interfaces {
{% for interface in lag_interfaces %}
    {{ interface.name }} {
    {% if interface.description is defined %}
        description "{{ interface.description }} member of {{ interface.lag }}";
    {% endif %}
        gigether-options {
            802.3ad {{ interface.lag }};
        }
    }
{% endfor %}
}

```

```
interfaces {
    et-0/0/1 {
        description "member interface for ae1";
        gigether-options {
            802.3ad ae1;
        }
    }
    et-0/0/2 {
        description "member interface for ae1";
        gigether-options {
            802.3ad ae1;
        }
    }
}
```

Other Use Cases

NTP Configurations
SNMP Hosts and Traps
MOTD / Banner Messages

Apply These Variables in Group and Host Vars as Appropriate

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How Do You Maintain this?

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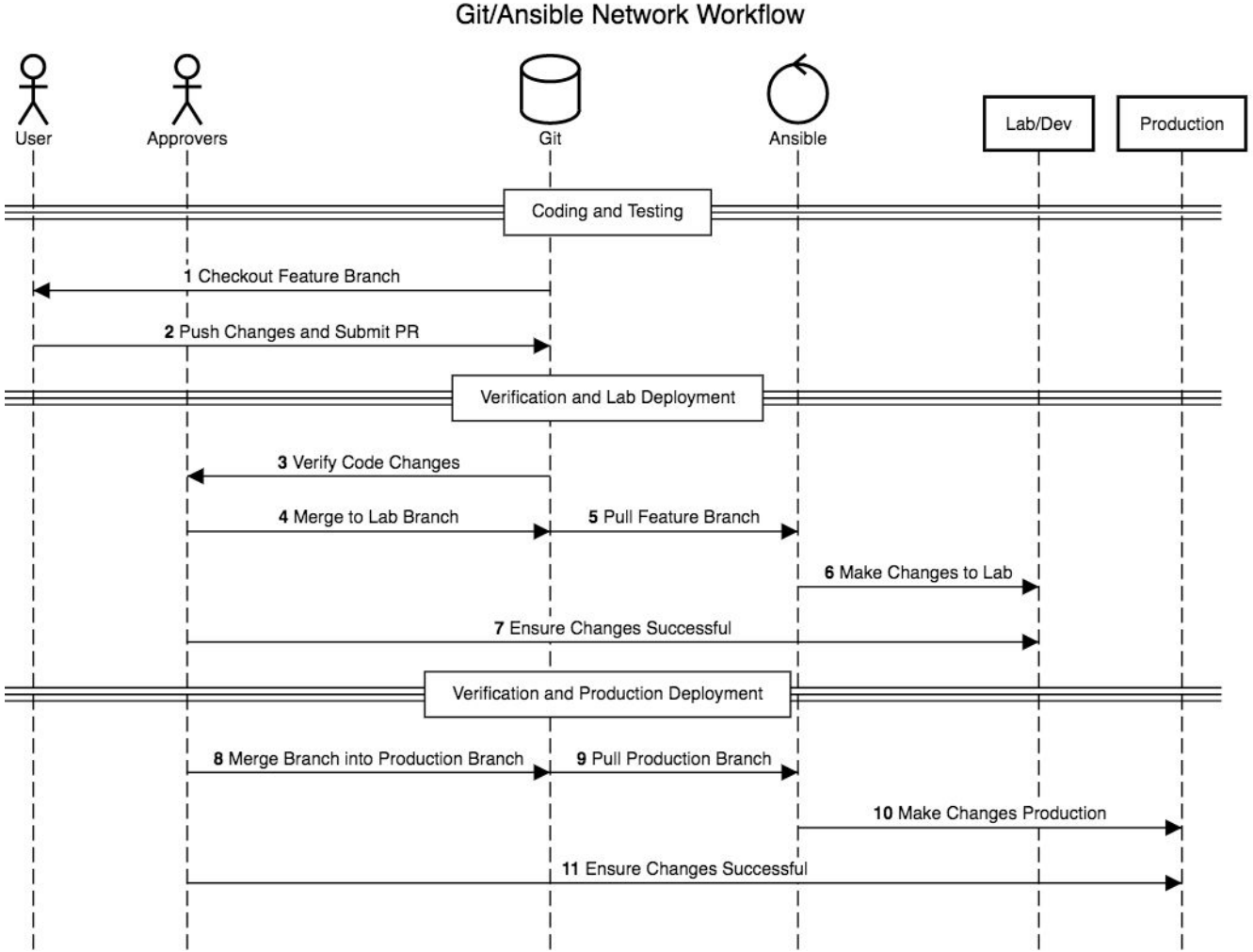
Git/Ansible Network Workflow
User
Approvers
Git
Ansible
Lab/Dev
Production
Coding and Testing
1 Checkout Feature Branch
2 Push Changes and Submit PR
Verification and Lab Deployment
3 Verify Code Changes
4 Merge to Lab Branch
5 Pull Feature Branch
6 Make Changes to Lab
7 Ensure Changes Successful
Verification and Production Deployment
8 Merge Branch into Production Branch
9 Pull Production Branch
10 Make Changes Production
11 Ensure Changes Successful

CI/CD for Networks

GitHub

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No More Snowflake Networks
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Get Creative - It’s the ONLY Limitation
Find a Use Case
Convert MOPs into Playbooks
Low Barrier to Entry
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