NetOps Meet DevOps: Automating Network Management

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Context

Working with Open Source Software, Data Center and Infrastructure Management Solutions for the past 20+ years.

• Management Solutions for network infrastructure
• Console Servers, Resilience Gateway
• More info at opengear.com and at the Lisa Expo
The State of Network Management

- Console Servers essential to network provisioning
- Copy&Paste CLI prevalent configuration method
- SNMP used monitoring, not for configuration management
- Configuration error or hardware failure cause downtime
NetDevOps
The Big Divide
Zero-Touch Provisioning (ZTP)
Zero-Touch Provisioning (ZTP)

- Config files served through DHCP are specifically targeted at each device based on Vendor ID, MAC address
- Can be used to fully automate network device provisioning and configuration
Orchestration Tools
# Orchestration Tools

<table>
<thead>
<tr>
<th>Tool</th>
<th>Master</th>
<th>Agent</th>
<th>Connection</th>
<th>Actions</th>
<th>Network Devices</th>
</tr>
</thead>
<tbody>
<tr>
<td>Puppet</td>
<td>Java</td>
<td>Ruby</td>
<td>SSL TCP</td>
<td>Resource/Manifest</td>
<td>Cisco, Arista, Huawei, Cumulus, Juniper</td>
</tr>
<tr>
<td>Chef</td>
<td>Erlang/Ruby</td>
<td>Ruby</td>
<td>TCP/Certificates</td>
<td>Recipe/Cookbook</td>
<td>Cisco, Arista, Cumulus, Juniper</td>
</tr>
<tr>
<td>Ansible</td>
<td>Python</td>
<td>N/A</td>
<td>SSH</td>
<td>Play/Playbook</td>
<td>Cisco, Arista, Cumulus, Juniper</td>
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</tbody>
</table>
Infrastructure as Code
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• Separate data from syntax
• Template and re-use configuration files
• Use revision control
• What version is your infrastructure?
Renewed drive towards Standards
Network Management Standards

- **NETCONF**
  IETF protocol for deploying, changing and removing configuration from network devices

- **YANG**
  Data Modeling language for NETCONF

- **OpenConfig**
  User-driven, vendor-agnostic, network management model
Network Engineers: Action Items

1. NetOps is NetDevOps
   Learn Python, Ansible, Git

2. Automate Everything
   Apply ZTP, Consider Orchestration

3. Infrastructure as Code
   Gather your config templates and put it in version control
Console Server Vendor: Action Items

1. Become a provisioning and automation tool
   Become the ZTP server for the rest of the infrastructure on Day One, support Orchestration tools

2. Be open, provide open interfaces
   Provide RESTful APIs and other programmatic interfaces, comply with and support emerging standards in network configuration
“We always overestimate the change that will occur in the next two years and underestimate the change that will occur in the next ten.”

Bill Gates

Don't let yourself be lulled into inaction.
Thank You

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