

# 14 Network Automation

## 14.1 Automation Overview

## 14.2 Data Formats

- HTML
- XML
- JSON
- YAML

## 14.3 APIs

- Availability
  - Open APIs
  - Internal APIs
  - Partner APIs
- Types of Web Service APIs
  - SOAP
  - REST
  - XML-RPC
  - JSON-RPC

## 14.4 REST

- RESTful API
  - Client-Server
  - Stateless
  - Cacheable
- CRUD
  - POST
  - GET
  - PUT/PATCH
  - DELETE
- Web resources
  - URN: `www.example.com/author/book.html`
  - URL: `https://www.example.com/author/book.html`
  - Fragment: `#page155`
  - URI: `https://www.example.com/author/book.html#page155`
- API Request
  - API Server: `https://www.mapquestapi.com/`
  - Resources: `directions/v2/route`
  - Query: `?outFormat=JSON&key=KEY&from=San+Jose,Ca&to=Monterey,Ca`

- Format: outFormat=JSON
- Key: key=KEY
- Parameters: from=San+Jose,Ca&to=Monterey,Ca
- RESTful API Applications
  - Developer Website
  - Postman
  - Python
  - Network Operation Systems (z.B. NETCONF)

## 14.5 Configuration Management

- Traditional: CLI, SNMP
- Network Automation: REST, Ansible, Puppet, Chef, Python, JSON, XML, ...
- Configuration Management Tools
  - Ansible: Python, Agentless, Controller, Playbook
  - Chef: Ruby, Agent-based, Chef Master, Cookbook
  - Puppet: Ruby, both, Puppet Master, Manifest
  - SaltStack: Python, both, Salt Master, Pillar
- Network Operation Systems (z.B. NETCONF)

## 14.6 IBN and Cisco DNA Center

- IBN (Intent-Based Networking)
  - Translation: Ist-Zustand und business-Intent in Soll-Zustand (Policies) übersetzen
  - Activation: Übertragung der Policies auf die Infrastruktur (Orchestration)
  - Assurance: Sicherheit, Überwachung der Infrastruktur
- Cisco DNA: Cisco Digital Network Architecture
  - Continuous Implementation of Business Intent
  - DNA Center  $\longleftrightarrow$  Intent-based Network Infrastructure
  - SD-Access
  - SD-WAN
  - Cisco DNA Assurance
  - Cisco DNA Security