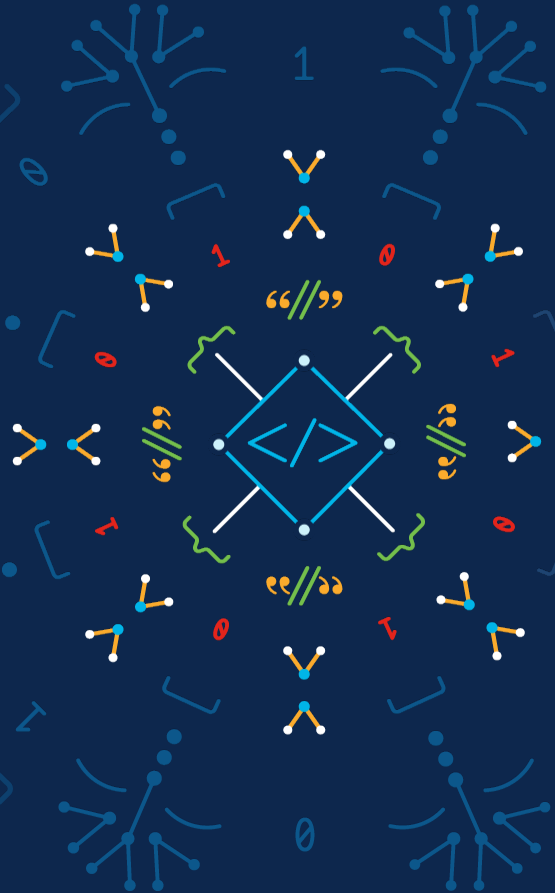
Developer Days
Automation

cisco
The bridge to possible

Auto Healing with NSO

Using NSO & Opensource Monitoring Tools



Eswaramoorthy Ramasamy
Software Consulting Engineer
11-May-2022

Agenda

1. Typical Service Delivery
2. Solution Components
3. Demo
4. Pillars of Automation Strategy
5. Approach for Automation Journey
6. Benefits & Use cases

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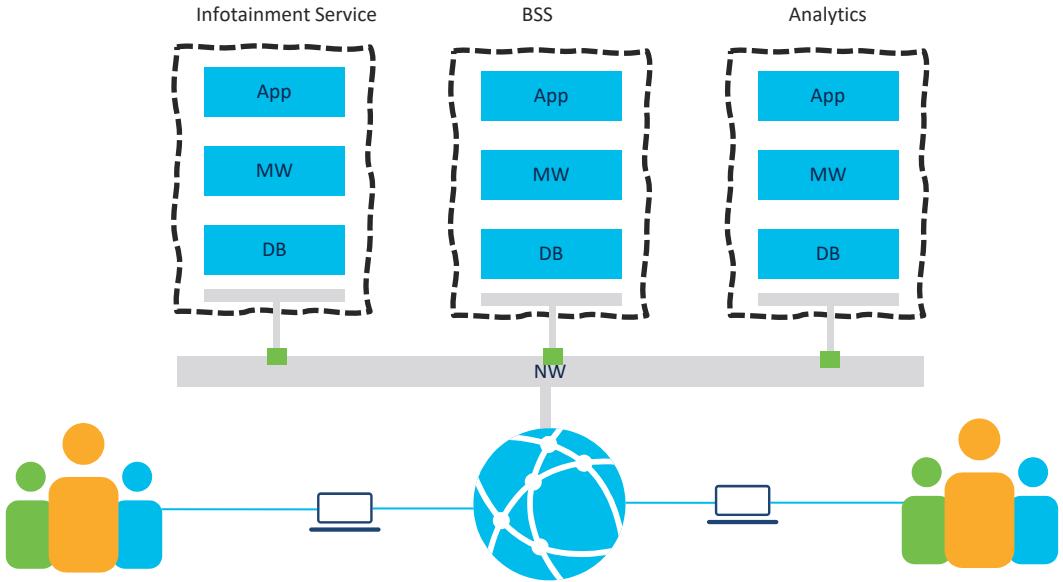
Typical Service Delivery Environment



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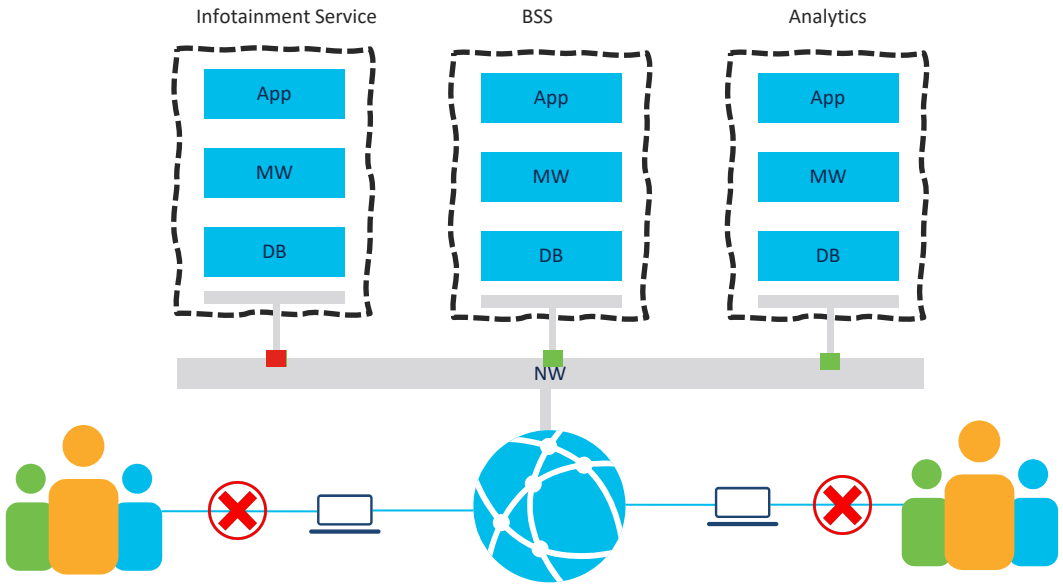
Typical Service Delivery Environment



Application Team

MW Team

Database Team

Network Team

Storage Team

Server Team

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What happens next ?

App Team

Network Team

MW Team

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Problem Resolution Flow

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Problem Resolution Flow

Common	Memory CPU Storage Hardware
NetworK	Bandwidth Access List Inteface Links
App	Requests Connections
Storage	Disk LUN
Database	Replication Tablespaces

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Problem Resolution Flow

Common	CPU	HIGH/LOW
	Memory	HIGH
	Storage	LOWSPACE
	Hardware	FAILURE/HIGH TEMP
NetworK	Bandwidth	NO ADDITIONAL BW Available
	Access List	NO ACCESS
	Inteface	UP/DOWN
	Links	UP/DOWN
App	Requests	HIGH
	Connections	NO CONNECTION
Storage	Disk	LOWSPACE/ DISK FAILED
	LUN	OFFLINE
Database	Replication	SYNC-ISSUE
	Tablespaces	HIGH

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Problem Resolution Flow

Initial Trouble Shooting → Identify the Issue Category → Identify issue Type → Check KB & Identify Solution → Apply the Solution → Verify if the service is backup → Close the Issue

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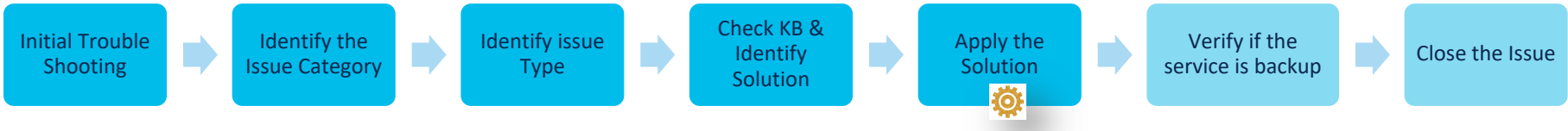
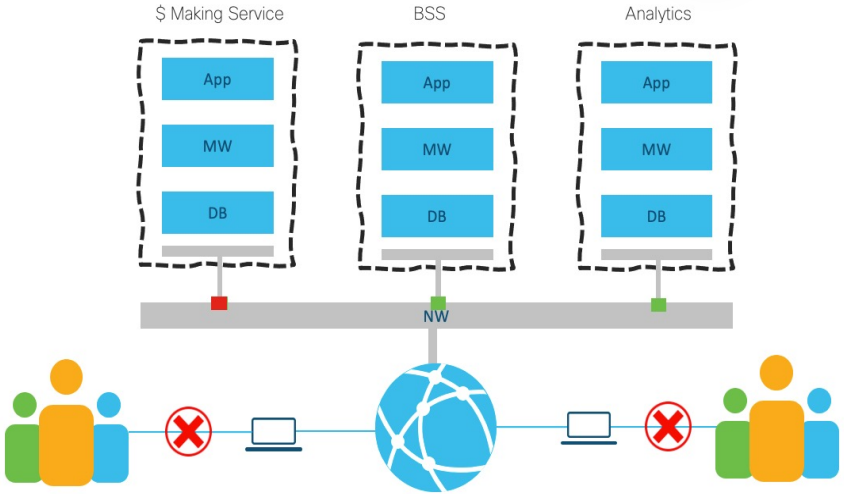
Problem Resolution Flow





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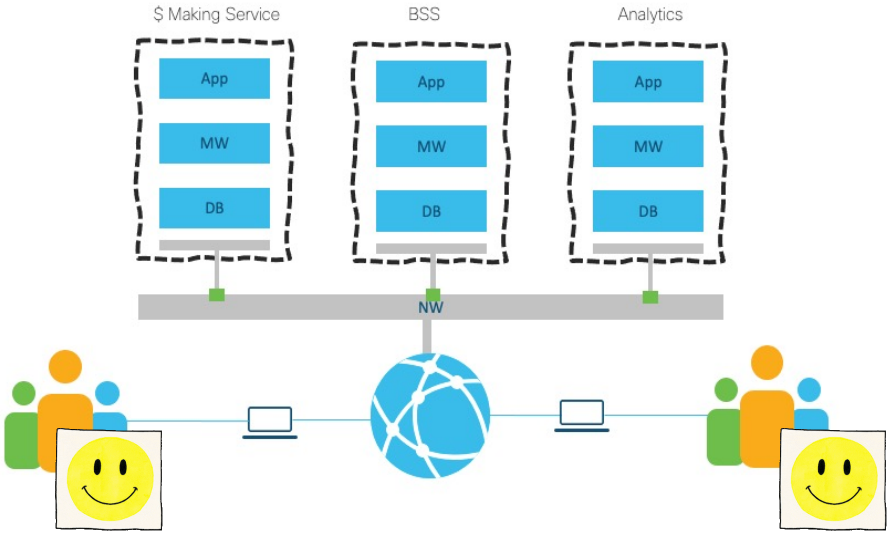
Problem Resolution Flow

Initial Trouble Shooting → Identify the Issue Category → Identify issue Type → Check KB & Identify Solution → Apply the Solution → Verify if the service is backup → Close the Case



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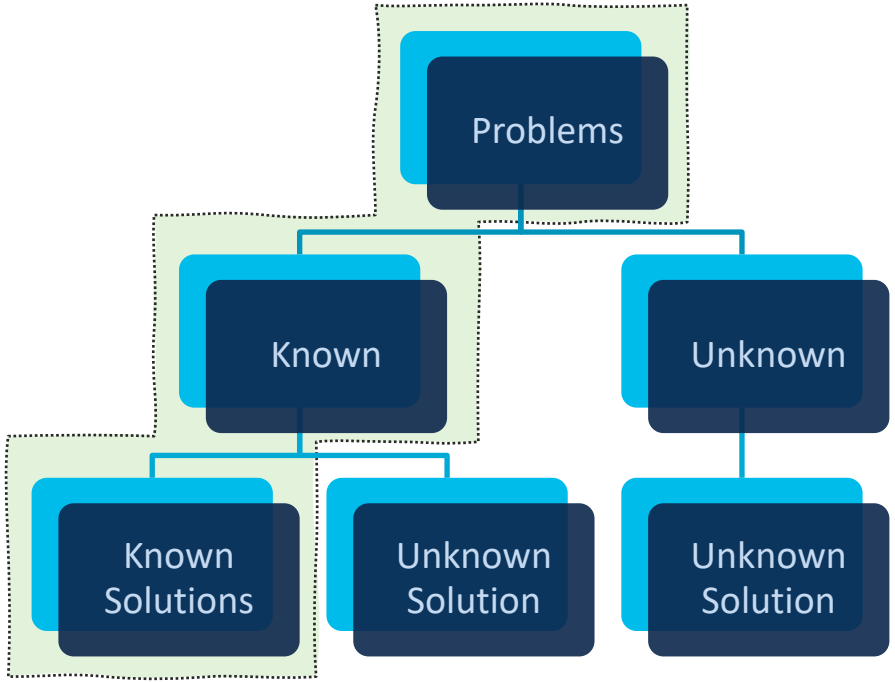
How NSO can be used to Automate this entire process of Problem Resolution?

Problem Classification



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Solution Components

- **Network Services Orchestrator**
  - Event Log History
  - Device Group Mapper
  - Knowledge Base Intent Identifier
  - Knowledge Base Definitions
- **Nagios**
  - Event Handler
- **Nexus Device**

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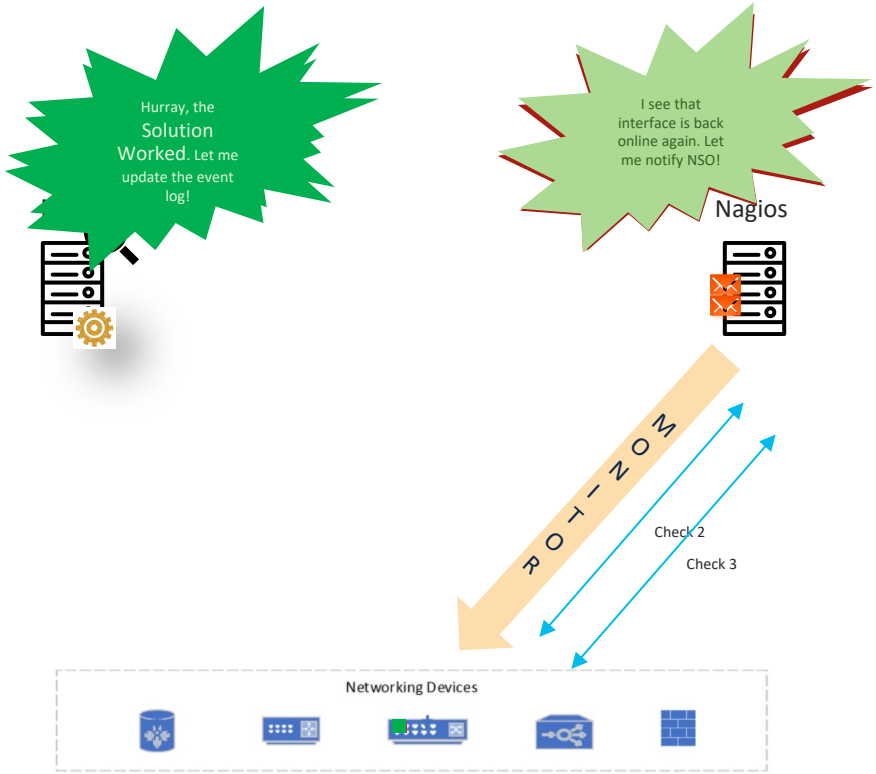
Solution Architecture

Auto Healing

No Human Intervention



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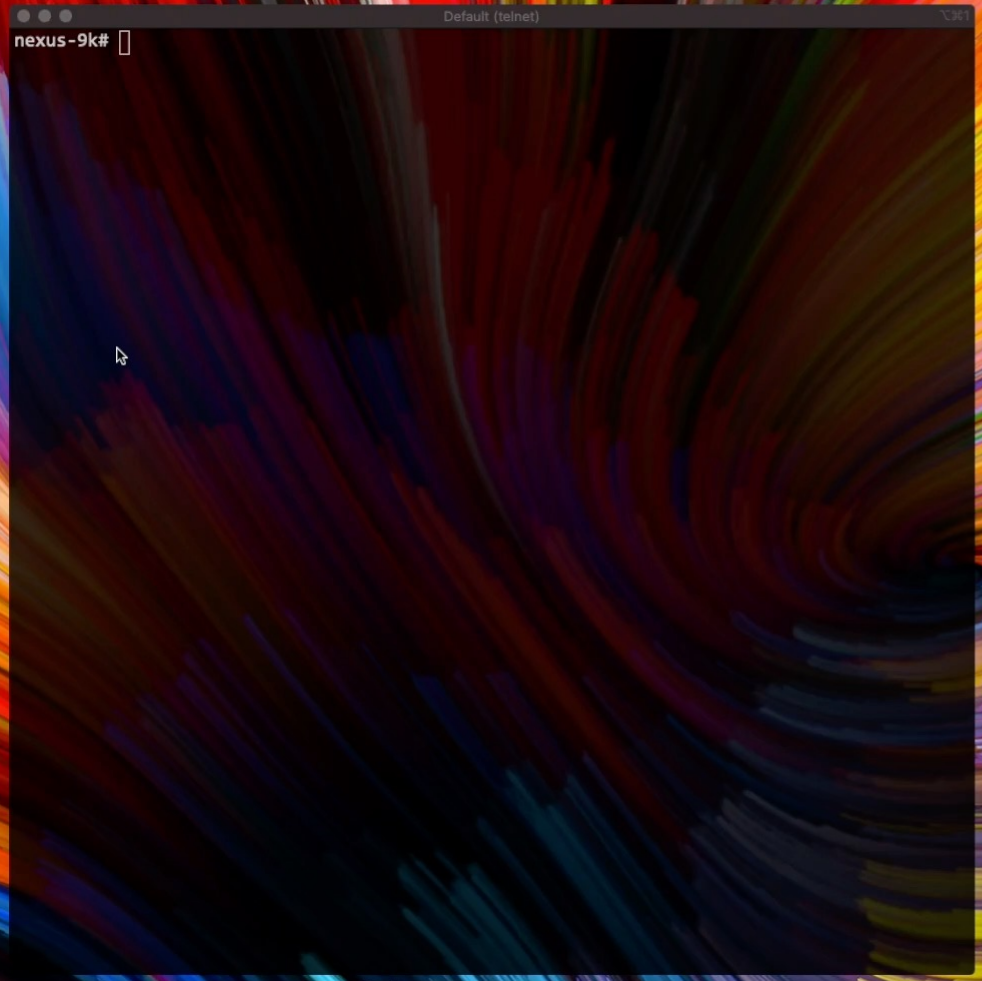
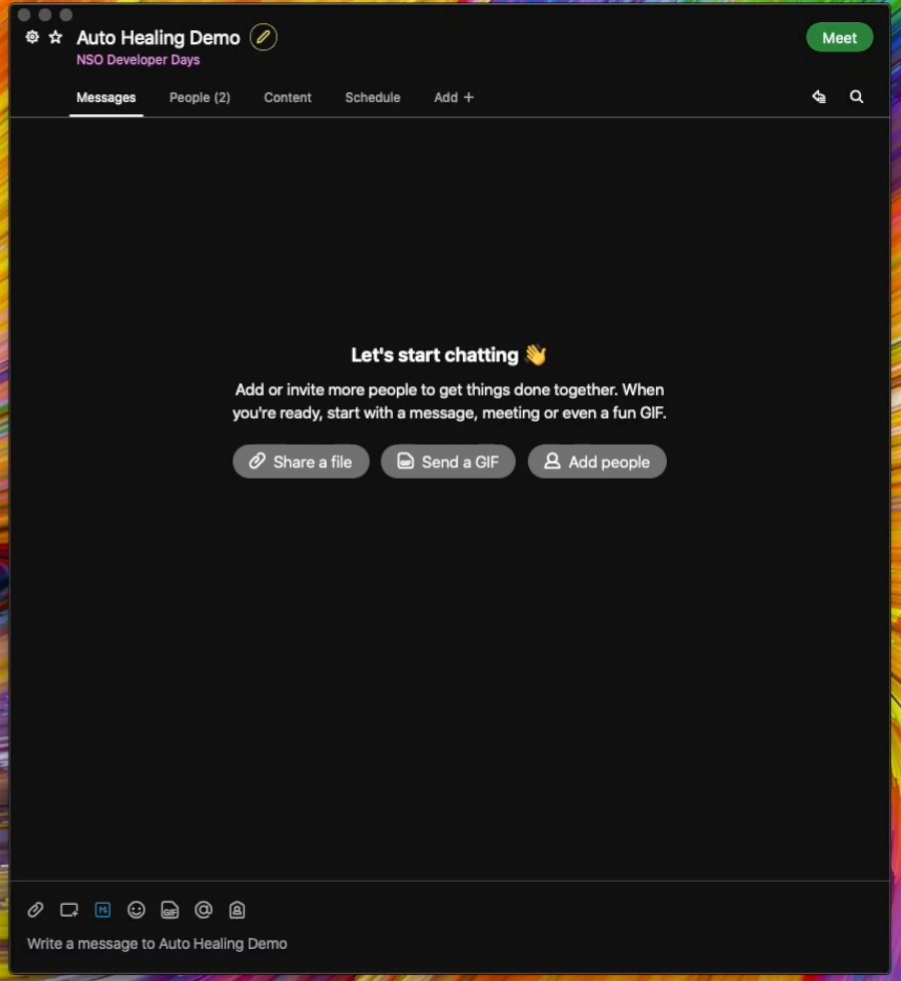
Demo


Default (telnet)
nexus-9k#


Auto Healing Demo
NSO Developer Days
Meet
Messages
People (2)
Content
Schedule
Add +
Let's start chatting 👋
Add or invite more people to get things done together. When you're ready, start with a message, meeting or even a fun GIF.
Share a file
Send a GIF
Add people
Write a message to Auto Healing Demo

Pillars of Self Heal Automation

- **Strong Knowledge Base**
  - Manual Build
  - Automatic build using Machine Learning
  - Machine Understandable Fixes
- **Fully mapped CMDB**
  - Effective Correlation
  - Situation Analysis
- **Technology & Process**
  - Configuration Management
  - Monitoring & Correlation
  - Process Standardization
- **Effective Handover**
  - Not everything can be Self-Healed. Expert's support is still required to Solve Unknown Problems

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Benefits & Possible Use cases

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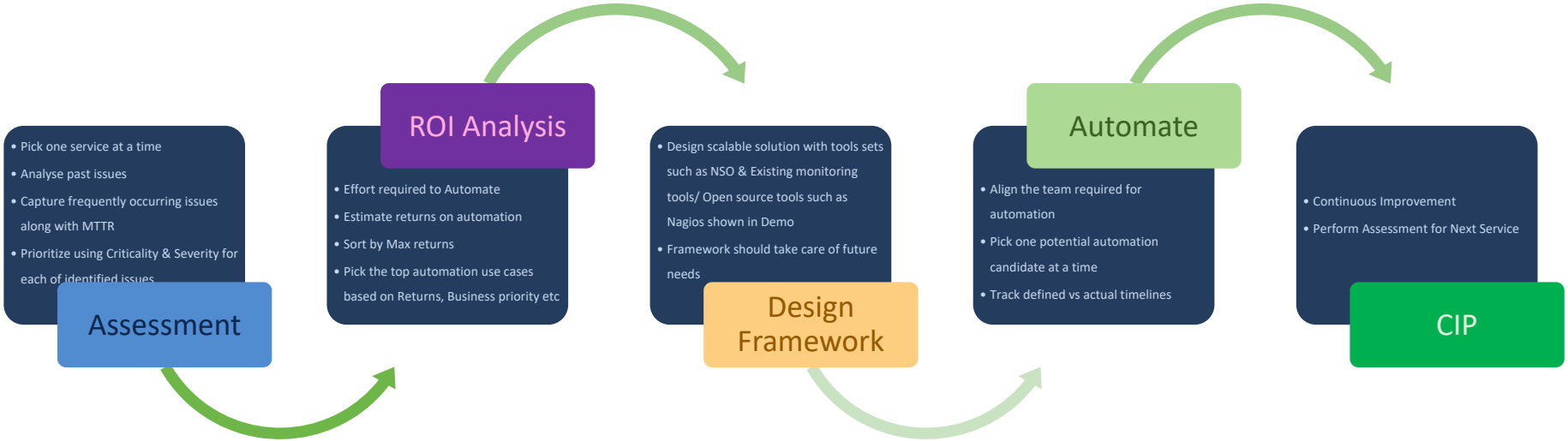
No Human Intervention	Improved MTTR	Improved Customer Satisfaction

- On Demand Link Addition to Ether Channel
- Dynamic VNF Scaling based on CPU & Memory Usage
- Dynamic Route Addition/Change based on the Load
- Automatically Switch Between Active to Standby Devices and Vice-Versa
- Restart any service within Switch/Router once pre-conditions are met
- Perform Automatic Checks and provide a report of results for Unknown problems

Approach for Successful Automation Journey



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- Have more questions?
- Want to know more ?

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Got Feedback?

http://cs.co/autoheal

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