Workflow Discovery Training

Architecture Team

Last Review: March 2022
Original: November 2021

Agenda

- Introduction
- Workflow Discovery
- Interview Time
- Documentation
- Next steps

Introduction

WHAT

The process of gathering information to understand how a process is implemented, with it requirements and dependencies

WHEN

Be open to spot new workflow discovery opportunities **at any time!**
It's a specific process by its own and it can also be part of a SADA*

WHY

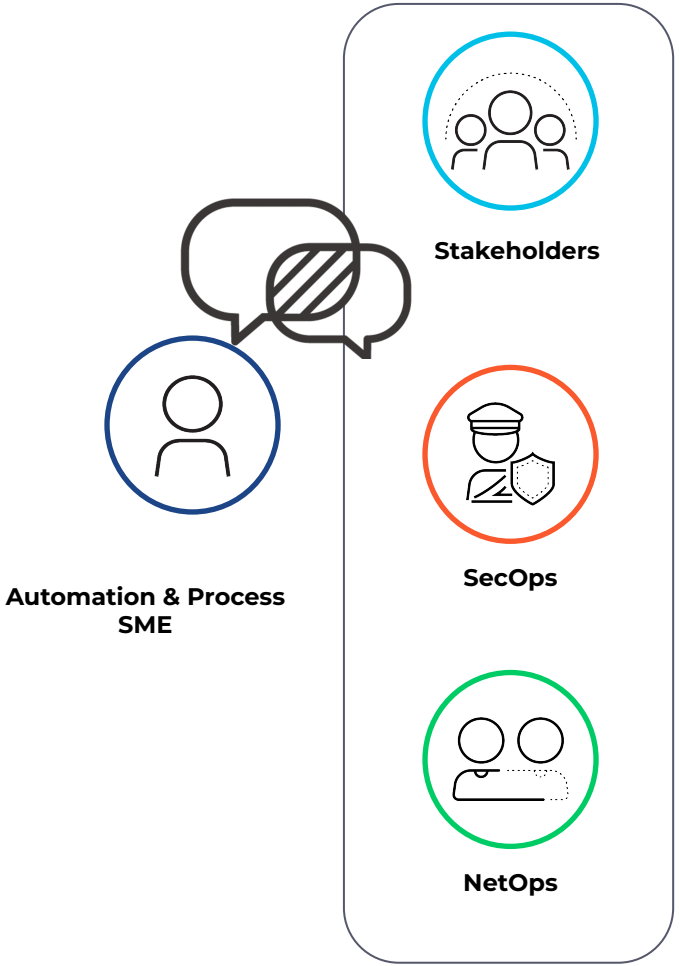
It's the prerequisite for any network automation proposal

** SADA: Strategic Architecture, Design Analysis*

>>> WHAT

*The process of gathering **information** to **understand** how a **process** is implemented, with it requirements, and dependencies*

- It is driven via multiple customer conversations with different personas
- Uses customer documentation and evidences to support the analysis
- The outcome is a detailed step-by-step flowchart and documentation that covers all the necessary steps to reproduce the workflow task



>>> WHEN

As part of a SADA or in a specific process

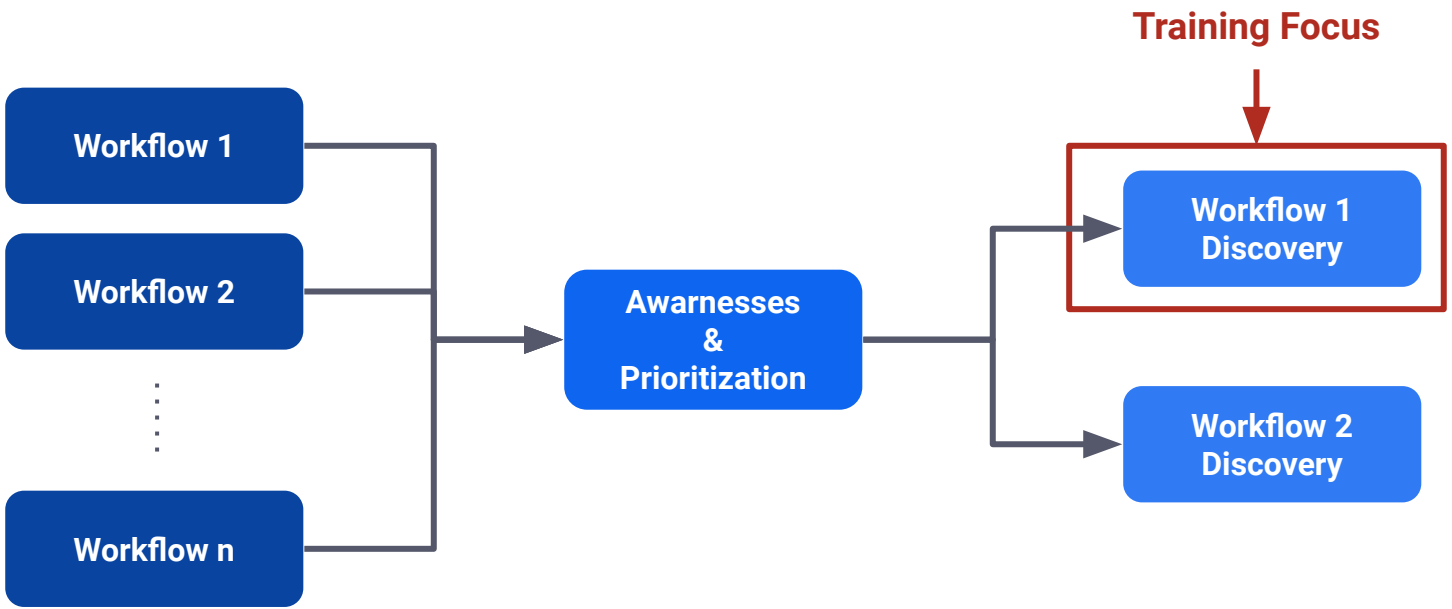
- Very often a Workflow Discovery process is part of a SADA but is not limited to it
- For more specific engagements, the Workflow Discovery process is the only topic, and drives the **High Level Design** (HLD)
- Any customer conversation could trigger an informal Workflow Discovery process, so we should keep our ears on to uncover potential workflow discovery opportunity **at any time!**

>>> WHY

It's the prerequisite for any network automation proposal

- You can only automate something when you understand how it works
- It's the starting point for defining key findings and recommendations, and eventually delivering solutions
- It helps us to identify new automation use-cases and understand how we could solve them

>>> Single vs Multiple* Workflow Discovery



** An example of Multiple Workflow Discovery process is a SADA or a Transformational Account, but the specific details are out of scope of this training*

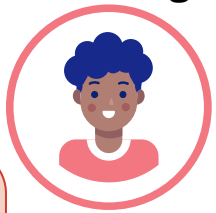
>>> Example: Multiple Workflow Discovery

Start with a one-liner overview of the workflows

Austin
Network Automation Engineer

Can I get a one-liner of the main workflows?

Mary
Network Manager



Well, we have firewall rules, but the thing about that process is infosec is unbearable, the customers do not know what they are requesting, and the application IDs never provided, it can go on for weeks……

We will get to that, let's cover all of them at high level and then prioritize, I heard Firewall Rules, great, what is the next one.

Ohh, sorry, yea, we have switchport configurations

>>> Workflow Metrics

Engineering Time invested in Request

How many engineering hours invested during the request process?

Time to Complete Request

How long it takes to resolve the request from its initial submit?

Frequency

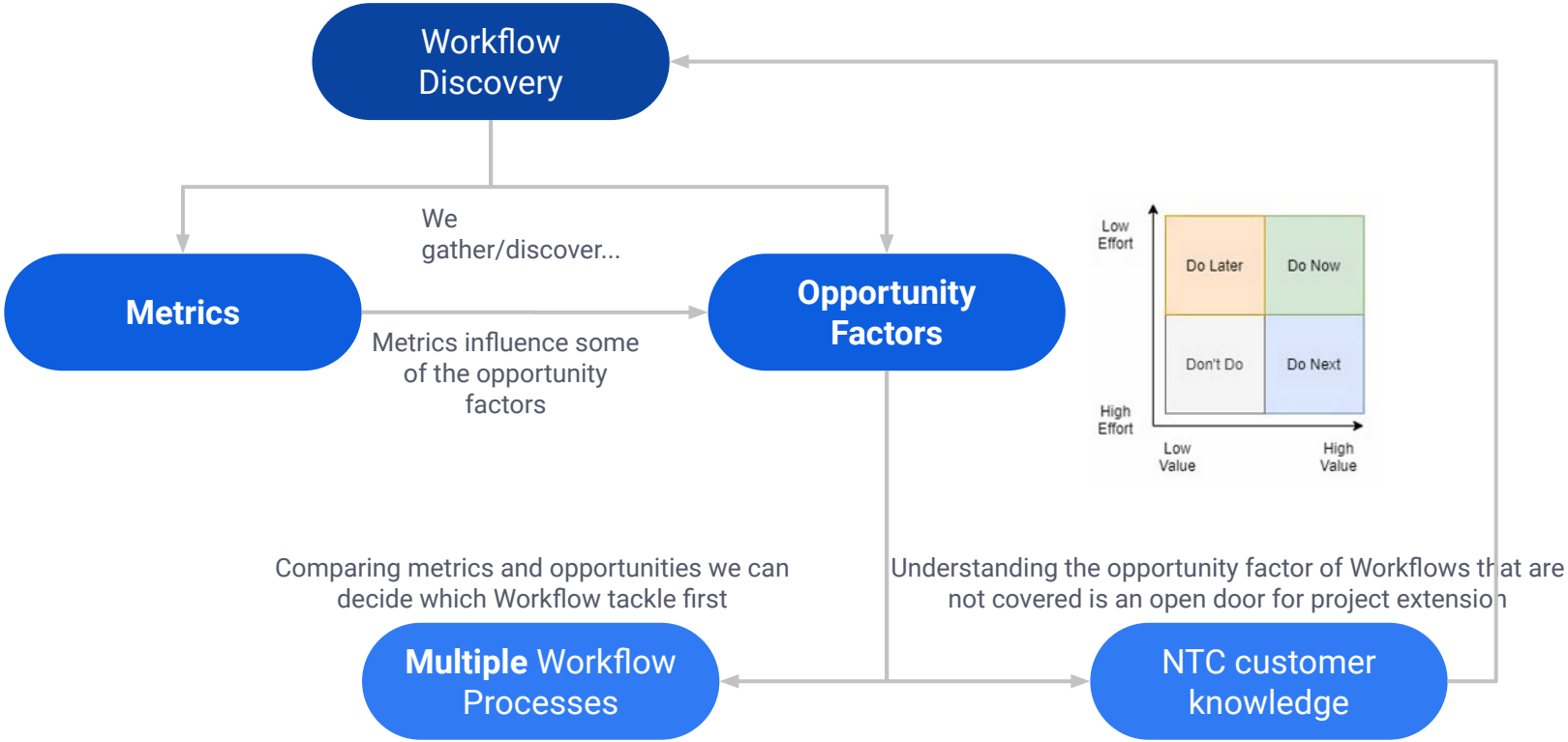
How many requests per month?

The success of the automation will be measured against these metrics

>>> Workflow Opportunity Factors

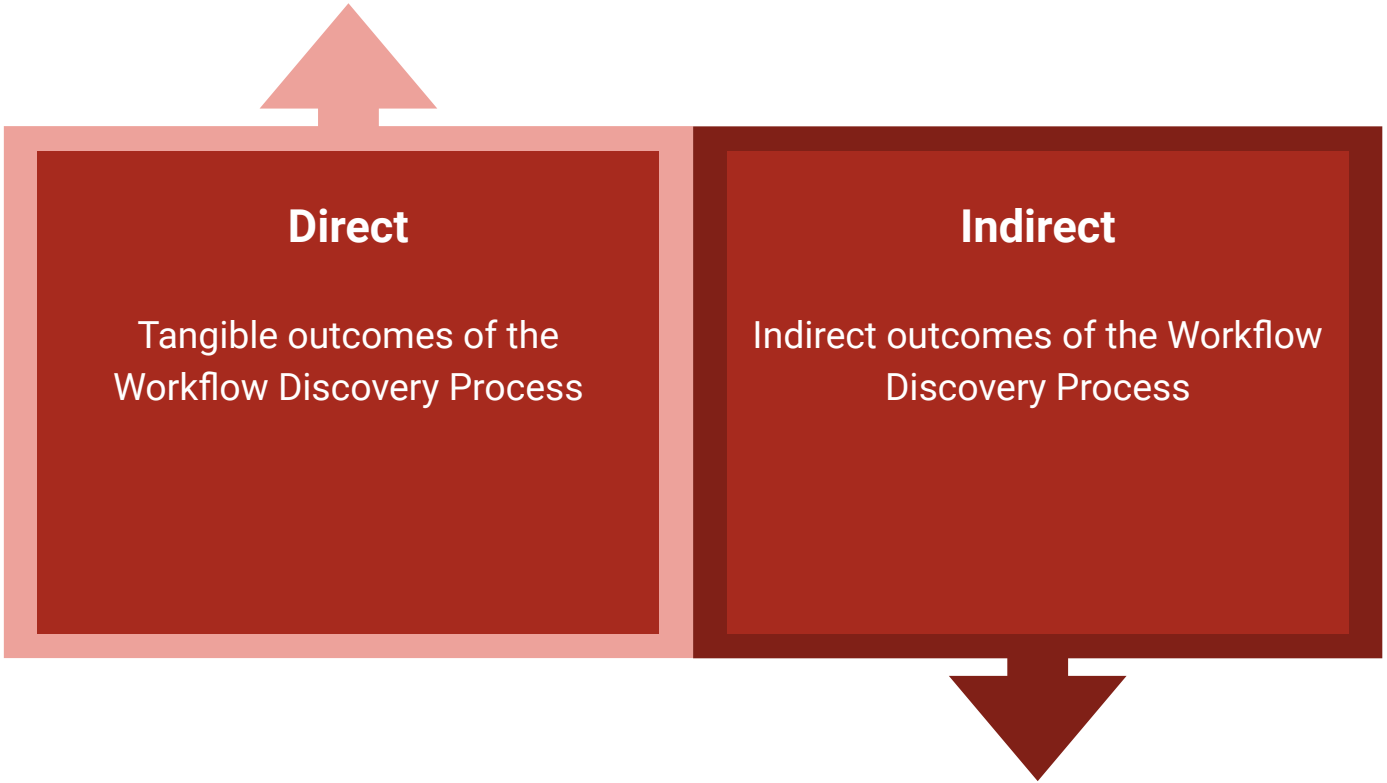
There are other business related topics to take into consideration to evaluate priority

Metrics & Opportunity Factors

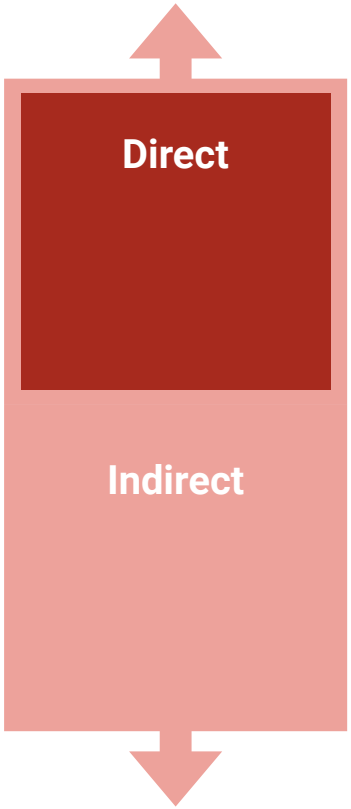


Workflow Discovery

Outcomes

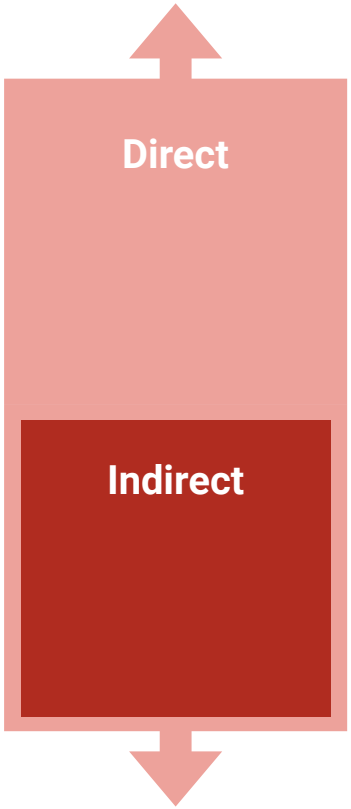

Direct
Tangible outcomes of the Workflow Discovery Process
Indirect
Indirect outcomes of the Workflow Discovery Process

>>> Direct Outcomes



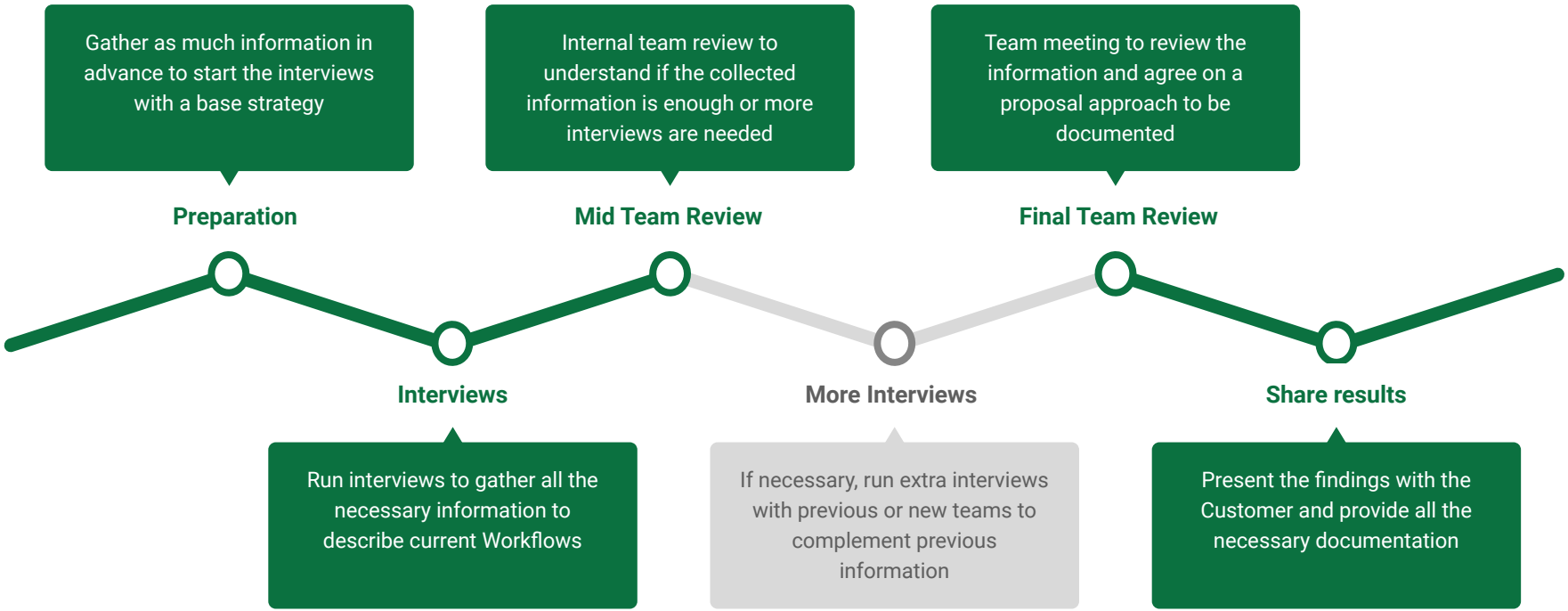
- **Workflow Metrics**
- **Diagram and step-by-step description of the Current Workflow**
  - Breakdown of tasks by activity
  - Breakdown of duration per task and overall
  - To the level of depth that someone else can pick up the automation from there
- **Diagram and step-by-step description of the Automated Workflow**

>>> Indirect Outcomes

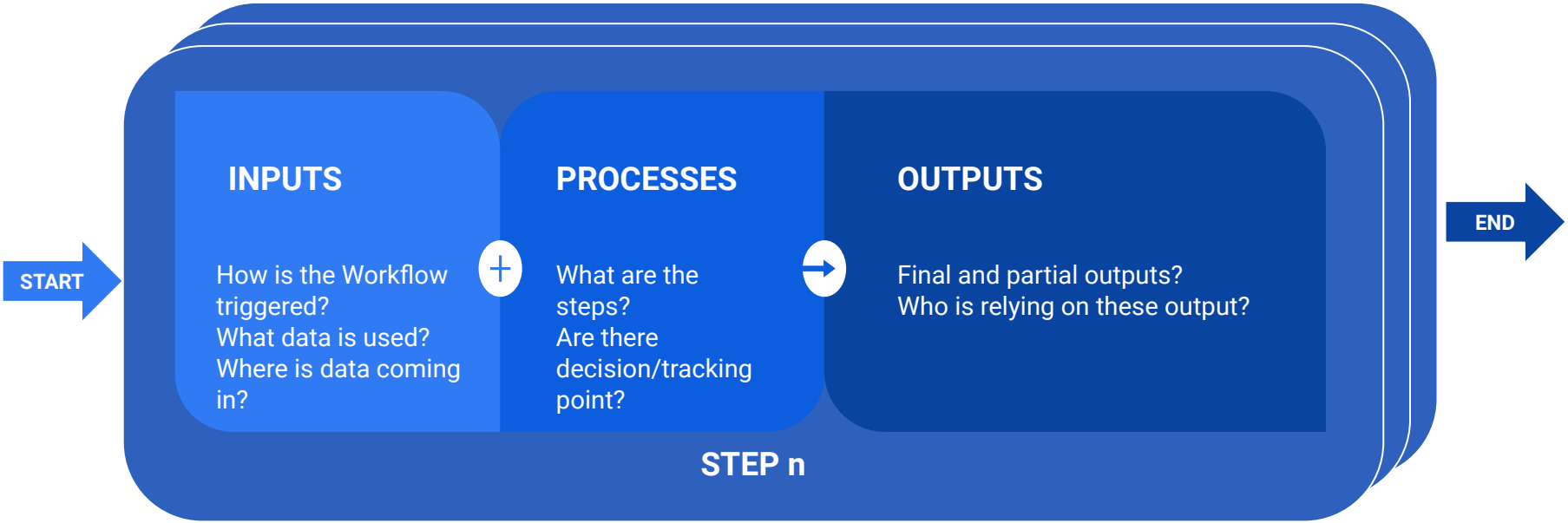


- List of all the integrations (SoRs and others) and dependencies
- Network design reference
- The key/real stakeholders
- The value this process being automated will have (useful for prioritization)
- Uncover institutional and tribal knowledge
- Validated assumptions about how this process works
- Reference to acronyms

>>> **Single** Workflow Discovery Timeline



>>> Workflow Components

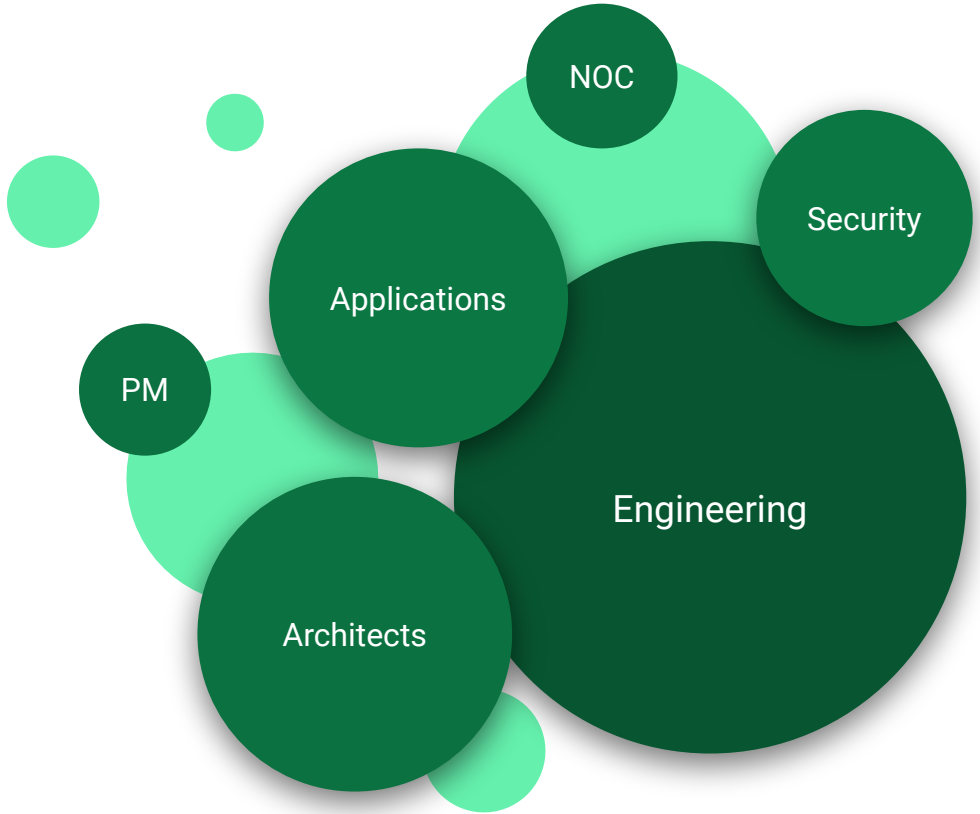


Each step should make sense as a network engineer

Workflow Stakeholders

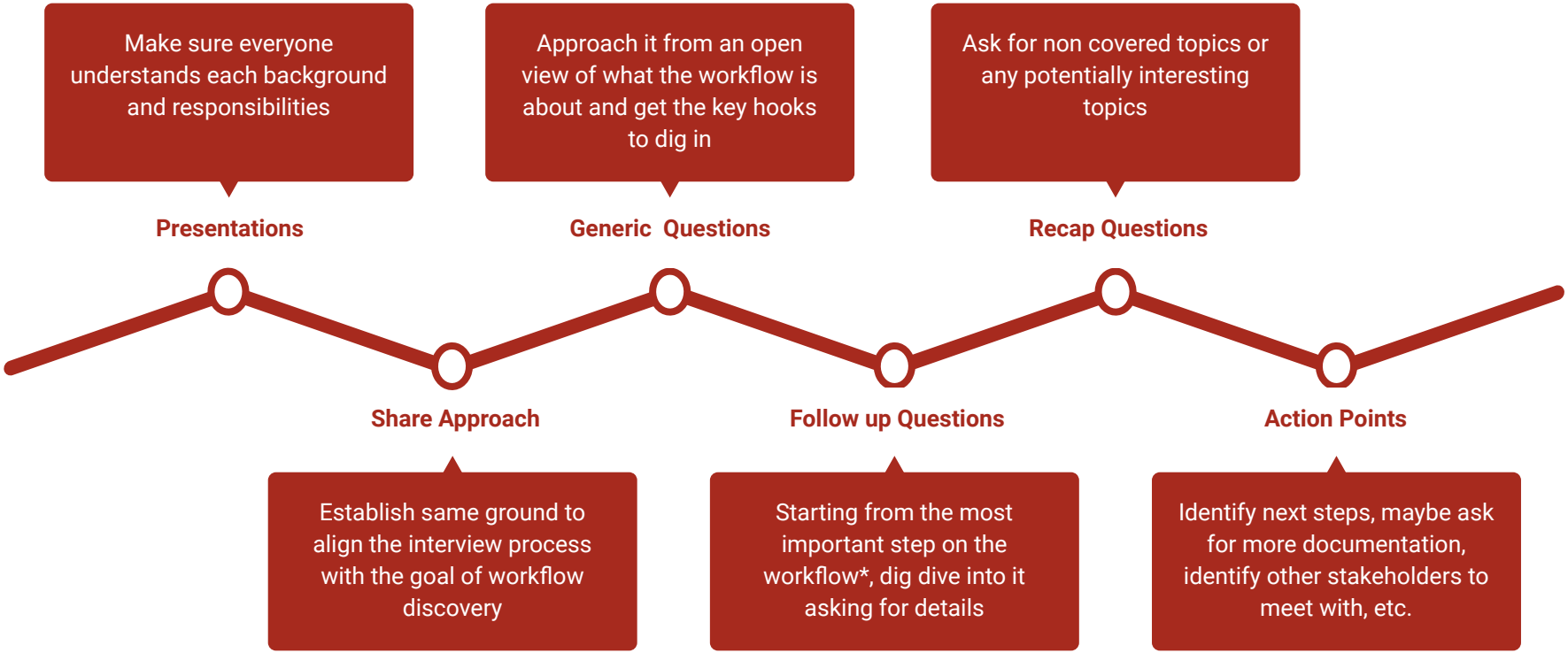
- Everyone may have a different perspective of the process and the key points (either managers and engineers). **All are necessary!**
- Be open to incorporate unexpected people during the discovery process
- Look for **unknown unknowns** and establish clear interfaces
- Limiting the number of attendees usually increases engagement

Extra focus on Key Stakeholders



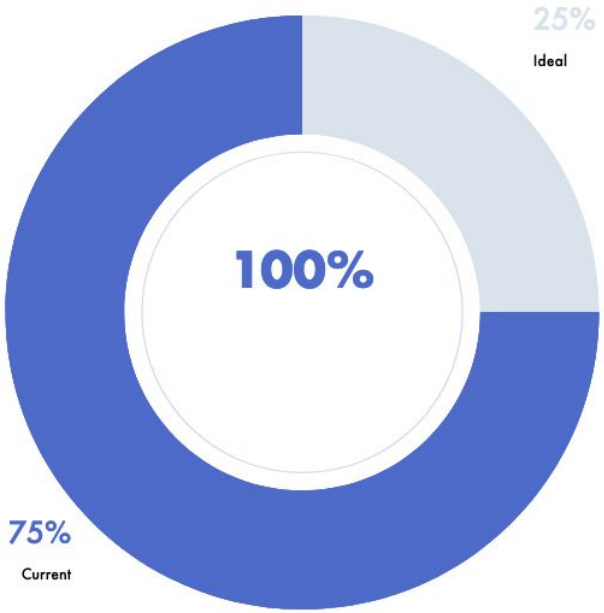

Interview Time
Drive the Conversation

Interview Timeline



Session Time distribution

- Understand what is the **current** process
- Do not provide solutions yet



- Potential improvements driven by automation
- Present related automation solutions that maybe the customer is not even aware of

>>> Workflow Team

Driver

Kicks off the meeting and **drives the conversation**, specially in critical points (conflict, loss of focus)
Summarizes the outcomes

Observer

Takes notes from customer answers
Adds documents and references
Identifies improvements in the process

Copilot

Understanding the Network Automation Framework asks **questions to clarify** missing information

These a reference roles, everyone can play multiple ones, but it's good to define a Driver and an Observer per session

How to Approach the Conversation

01 Acknowledge Common Ground

02 It is not about Automation

03 Do not provide Solutions

04 Drill down to Details and Metrics

05 Ask better Questions

Who drives the conversation, the one who speaks or the one who listens?

>>> Acknowledge Common Ground

- Have a conversation about the conversation
  - Be clear regarding methodology and expectation
- **Manage Expectations**, push back when necessary in an honest way
- Be ready to **Manage Objections**: the conversation is like a dance, not a war
- Define common languages, ask all Acronyms to be explained
- **Understand their priorities**, narrow down the scope
- Promote a “challenging” discussion where people can describe all the steps without feeling questioned.
- No assumptions, always validate them

Build a cooperative atmosphere emphasizing we are on the same ship

>>> Example: Share assumptions to validate them

When information is glossed over, make presumptions verbally

Austin
Network Automation Engineer

Nelly
Network Engineer

Ok, so I guess all tickets that week go the on call person

Ohh, no, actually, we rotate

Ok, then should I assume a fixed rotation call?

Yes, we define it in a spreadsheet

>>> It is not about Automation

- The right approach is as a Network Assessment to **understand how the network processes work**
  - Ask “How would you explain this process to a new engineer on the team?”
- Understand the business value of the workflow and related opportunity factors
- Starting with automation/tooling first would hide some important details about the reality
- Understanding any existent automation related process is relevant, but do not let the conversation go into a tool-centric conversation such as Ansible vs Nornir.
- Be willing to say what you don’t understand

You can’t automate what you don’t understand

>>> Example: Do not focus on Automation yet

Keep to the workflow, not the why not

Austin
Network Automation Engineer

So how do you figure out path analysis manually?

Nelly
Network Engineer

The thing is, you aren't going to be able to automate it, so I rather not spend all of our time on that

Let's concentrate on the workflow, not the potential solutions.

But, honestly, we tried, you can't automate it.

Well, let me document it, so I can better articulate to management why we can't automate it

>>> Do **Not** Provide Solutions

- Only focus on gathering information, not providing solutions
- Be clear that the goal of the Workflow Discovery interviews is to gather information, **we are not evaluating their network design, we are understanding it**.
  - Establish psychological safety, do not judge
- Early shared solutions could bias the discovery process
- We should keep our hands free to propose the solutions once we have gathered ALL the info

We should not bias the process, just observe it

In some occasions, someone could not be engaged in the conversation due lack of implementation details, so naming some potential solutions could reconnect them, but only as a rescue resource! Go back to your point quickly!

>>> Example: Keep solutions out of the conversation

Keep to the workflow, not the solution

Austin
Network Automation Engineer

Nelly
Network Engineer

Nice, now that you have a lot of info, do you thing that we should use Ansible or Nornir to provision the configuration?

Well, we are still getting information and even both suggestions could make sense, we have to get a better understanding from all the data to provide the right proposal

Ok, I understand, thanks.

>>> Drill down to Details and Metrics

- Start from top to bottom, digging into all the necessary details
- Without the details we won't be able to provide a proper automation alternative.
  - Imagine you are a new operator doing the job
- Without the Metrics we won't be able to measure the improvement of our proposals and the impact for the customer.
- **Remember that less is often more**. Choose carefully the topics to deep dive.
- Ask/force to precise a number by proposing outrageous options. **Avoid using un-quantifiable terms.**
- Use ***Persuasive Listening****, showing interest to uncover any hidden motivations that are implicit

Our solutions will be as good as the data we based them on

>>> Example: Avoid using unquantifiable terms

Ask/force to precise a number by proposing outrageous options

Austin
Network Automation Engineer

How long does it take to deploy a new software image on all network devices?

Nelly
Network Engineer

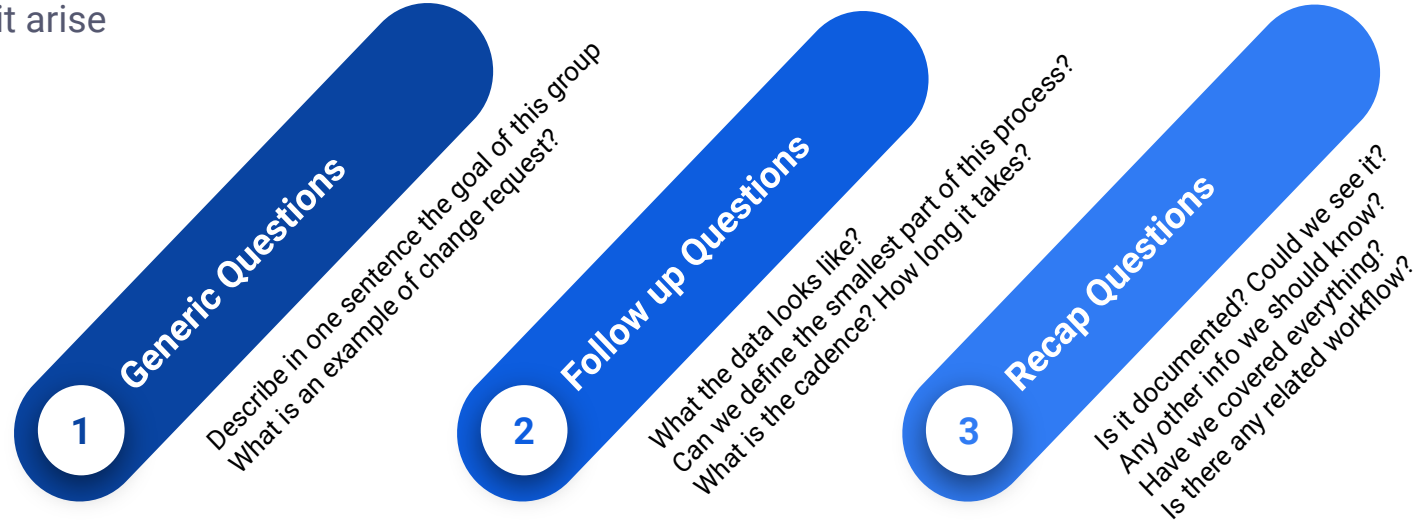
A lot of time

By “a lot of time”, you mean 2 - 3 years ?

Oh no, usually it’s closer to 4 - 6 months

>>> Ask Better Questions

- **Stay on topic**. Apologize in advance about it and do not hesitate to cut someone (politely) to drive the conversation towards our goal. Avoid **Rabbit Holes**!
- Question about bad solutions without being confrontal. **Question HOW rather than WHY**.
- Ask questions to **show what is not obvious**, the information is there, the proper questions will make it arise



>>> Example: Follow-up questions

Keep digging into details when in context

Austin
Network Automation Engineer

Nelly
Network Engineer

What the data of the request looks like?

It's a simple form with 3 fields

Good, and how do you validate that the data makes sense?

We did a quick check and with our experience we accept or not

Ah, and then what do you do with this data?

>>> What to **avoid** doing...

Avoid asking about configuration knobs

There will be plenty of time during implementation phase to understand the actual BGP configuration or some vendor specific feature

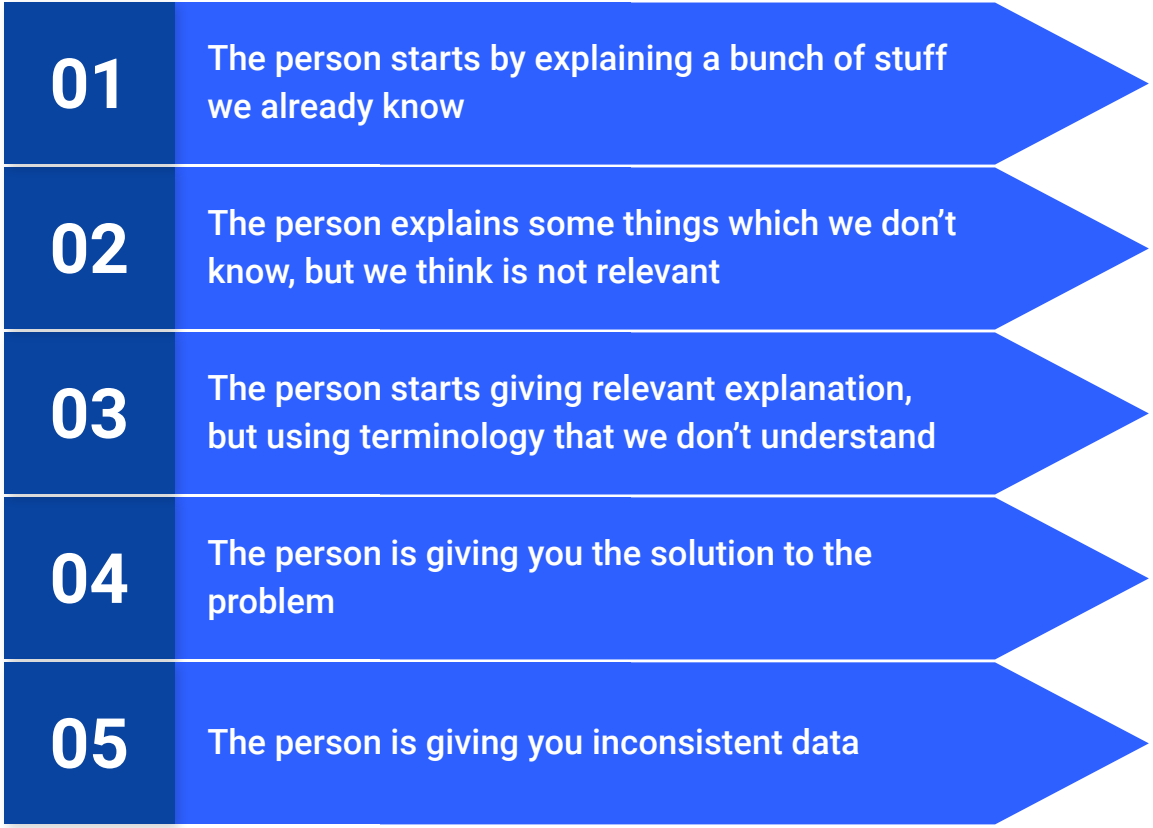
Avoid having unvalidated assumptions

You should start with as many context information but not assume anything not explicitly stated

Avoid committing to anything

This is only a discovery phase, don't commit on any delivery time of implementation details yet

>>> What could go wrong?



>>> How to get out of no productive situations?

- **State your current understanding**, so you state the goal and make some guesses that people can confirm/deny
  - Be willing to state what you don't understand
- Ask **yes/no questions**
- Don't accept responses that don't answer your question
- **Take a minute to think** (if you get an unexpected answer)
- Acknowledge proposed "solutions" but ask for how they reached that conclusion, what are the facts behind?
- **Do not trust all the data**, use common sense to understand if it's consistent with the rest of the information you have, and don't hesitate to clarify it

If someone goes off on a **very long explanation that isn't helping at all**, it's important to interrupt them.

This can feel rude, but ultimately **it's more efficient for everyone** (it's a waste of time)

We can **interrupt by asking a more specific question**

Some of these conversations fail, and that is ok

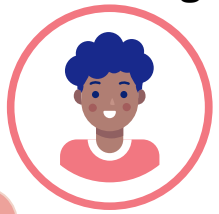
>>> Example: Get out of the Rabbit Hole

Understand when the answer is going nowhere and ask a Yes/No question

Austin
Network Automation Engineer

Could you explain how your workflow looks like?

Mary
Network Manager



Yes! It is really problematic! Requests come from different type of user: accounting, engineering, … and each one of them has different needs ...

After some minutes describing the company departments...

(ahem) yes, thanks. But, does the request data look the same in all the cases?

Yes, it does

>>> Interview Session Checklist

- ❑ Global workflow
  - ❑ Triggering, input data and outputs
  - ❑ Business value
- ❑ Breakdown of each one of the “steps” that compose the workflow:
  - ❑ Data in (format)
  - ❑ Data out (format)
  - ❑ Human interaction (approve? deploy? notify?) -> Stakeholders
  - ❑ Integrations with external tooling (dependencies)
  - ❑ Required tribal knowledge to complete the step (network design?)
  - ❑ Engineering time spent and on hold
- ❑ Summary of Metrics
  - ❑ How often? How many engineering hours? How long?
- ❑ List of Acronyms
- ❑ Follow-up items
  - ❑ Pending questions, assumption to solve and interviews


Documentation

>>> Workflow Documents

01	**Workflow Overview**	• Brief, free-form description of the workflow • Metrics table with the workflow metrics
02	**Existing Process**	• Workflow diagram with all the steps, inputs and outputs • Detailed documentation of every step
03	**Analysis and Recommendations**	• Review of the process with observations and potential optimizations • Mapping to how automated solutions can help to implement the improvements

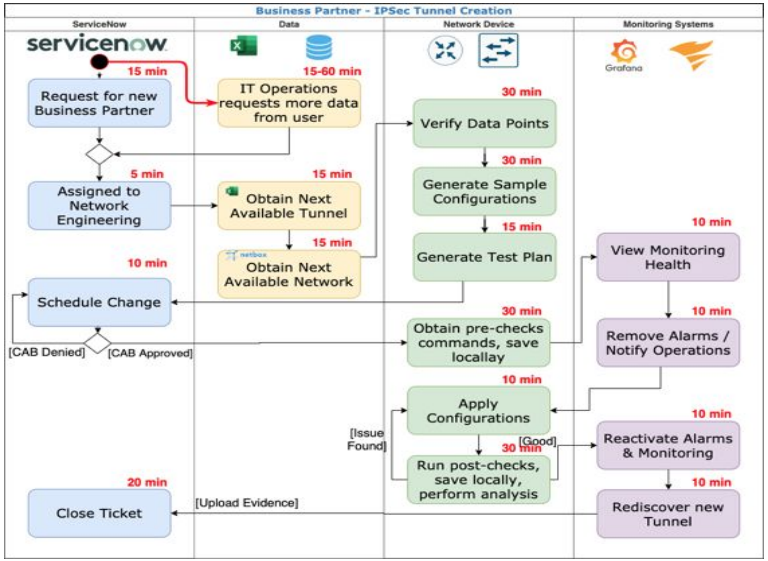
>>> Existing Process

Step-by-step description

Detailed description of each step, with all the necessary information to understand it and maybe with necessary references

Flow Diagram

- Start and End points
- Role responsibilities and interactions
- Decision and control points
- Dependencies with other workflows
- Show how big a task is
- Shared steps with other workflows



Automated Workflow Recommendations

Use Reference Network Automation Architecture to place the components, highlighting the ones participating in the workflow

Enumerate all interactions, and document them appropriately

An existing workflow could be splitted into several automated ones in order to facilitate comprehension and iterative deployment.

Identify human interactions

And remember, you don't need to automate 100%!

>>> OS Upgrade

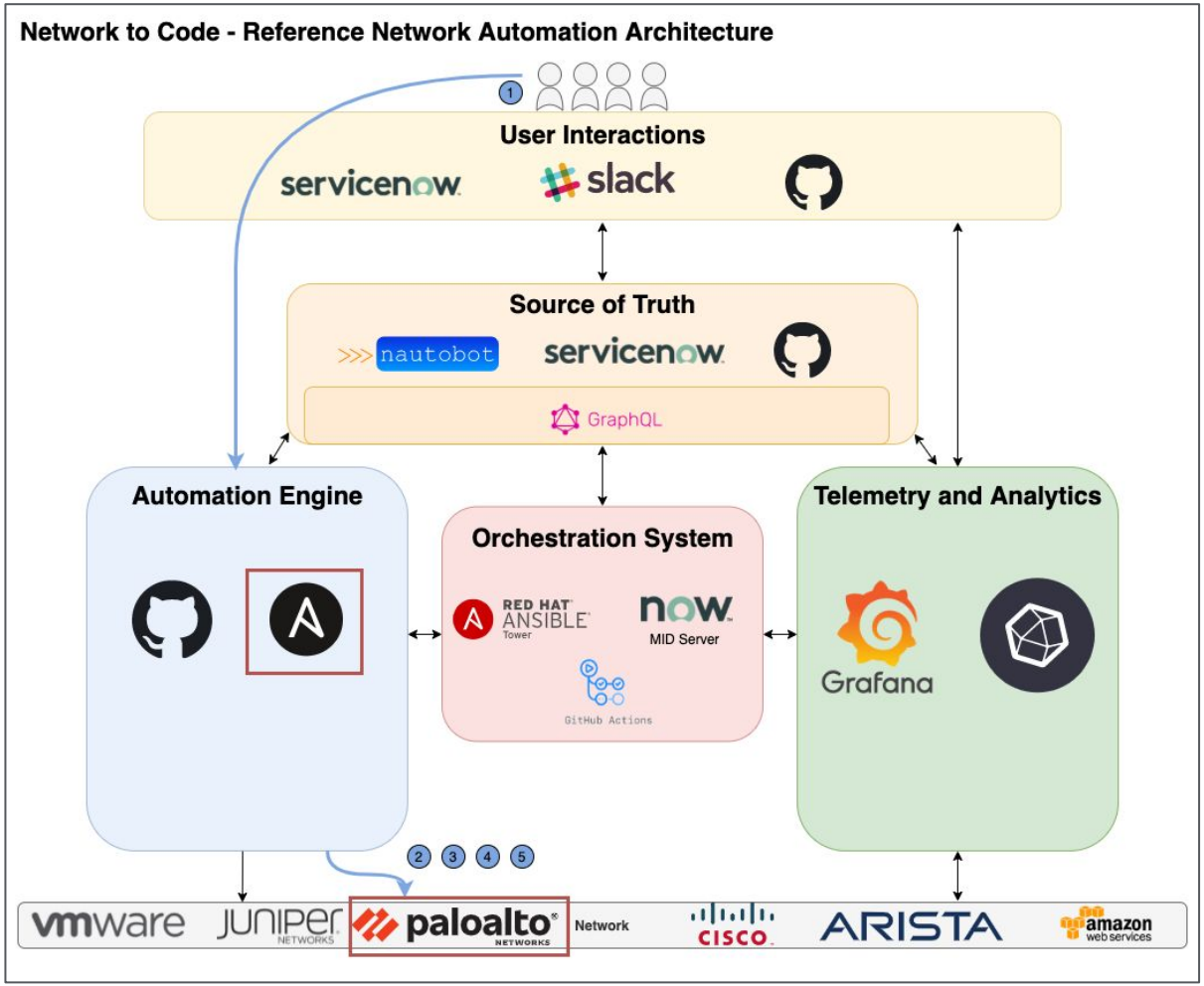
1. User runs ansible-playbook, providing target OS and device name in the inventory

2. The playbook runs “prepare” role, which downloads OS package and latest palo content

3. Runs pre-checks, which captures and saves
   a. Arp
   b. Sessions
   c. Resource state
   d. Counters
   e. HA state

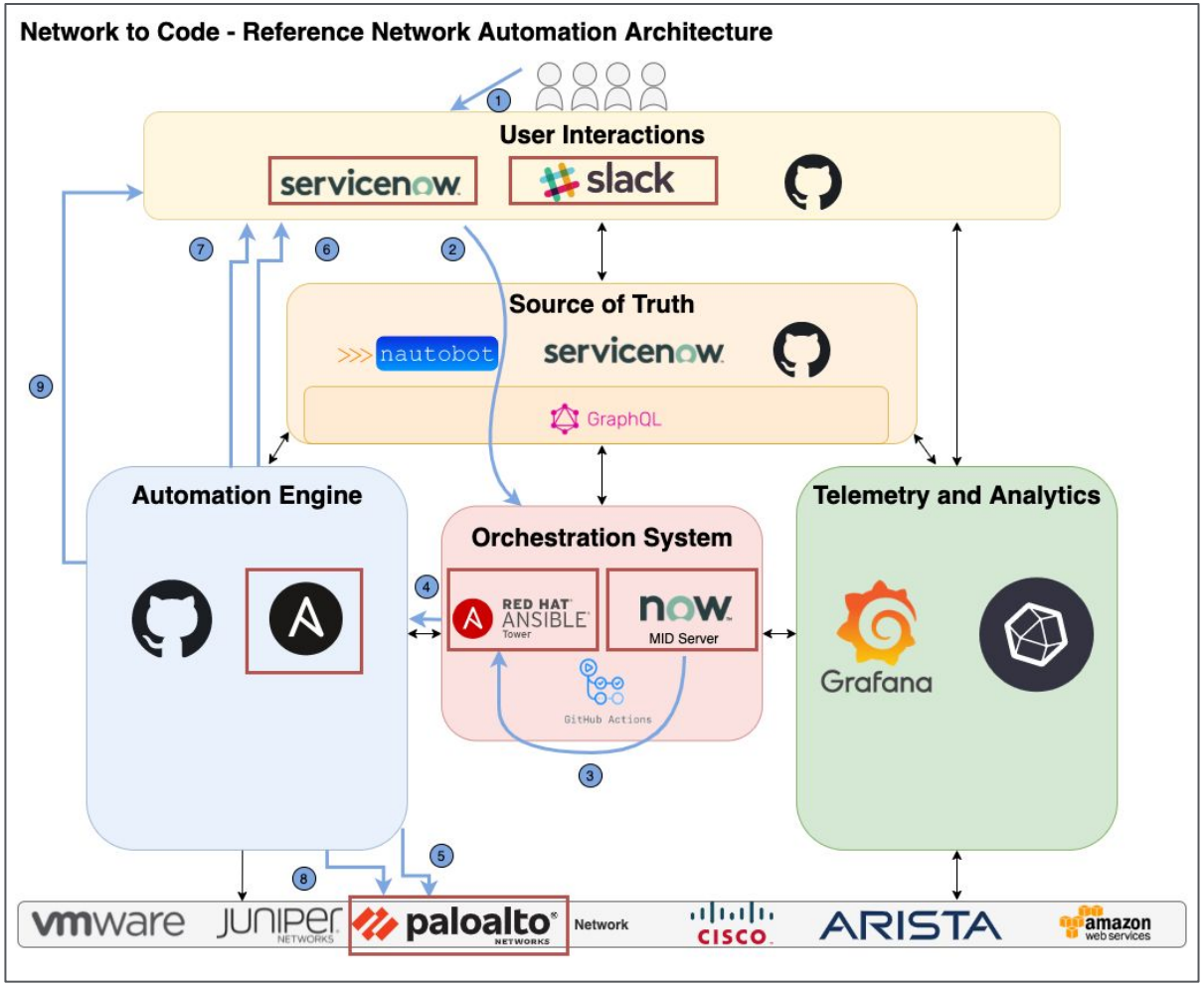
4. Performs upgrade, waiting for device to come back

5. Runs post-checks, which captures same data as pre-checks and performs comparison



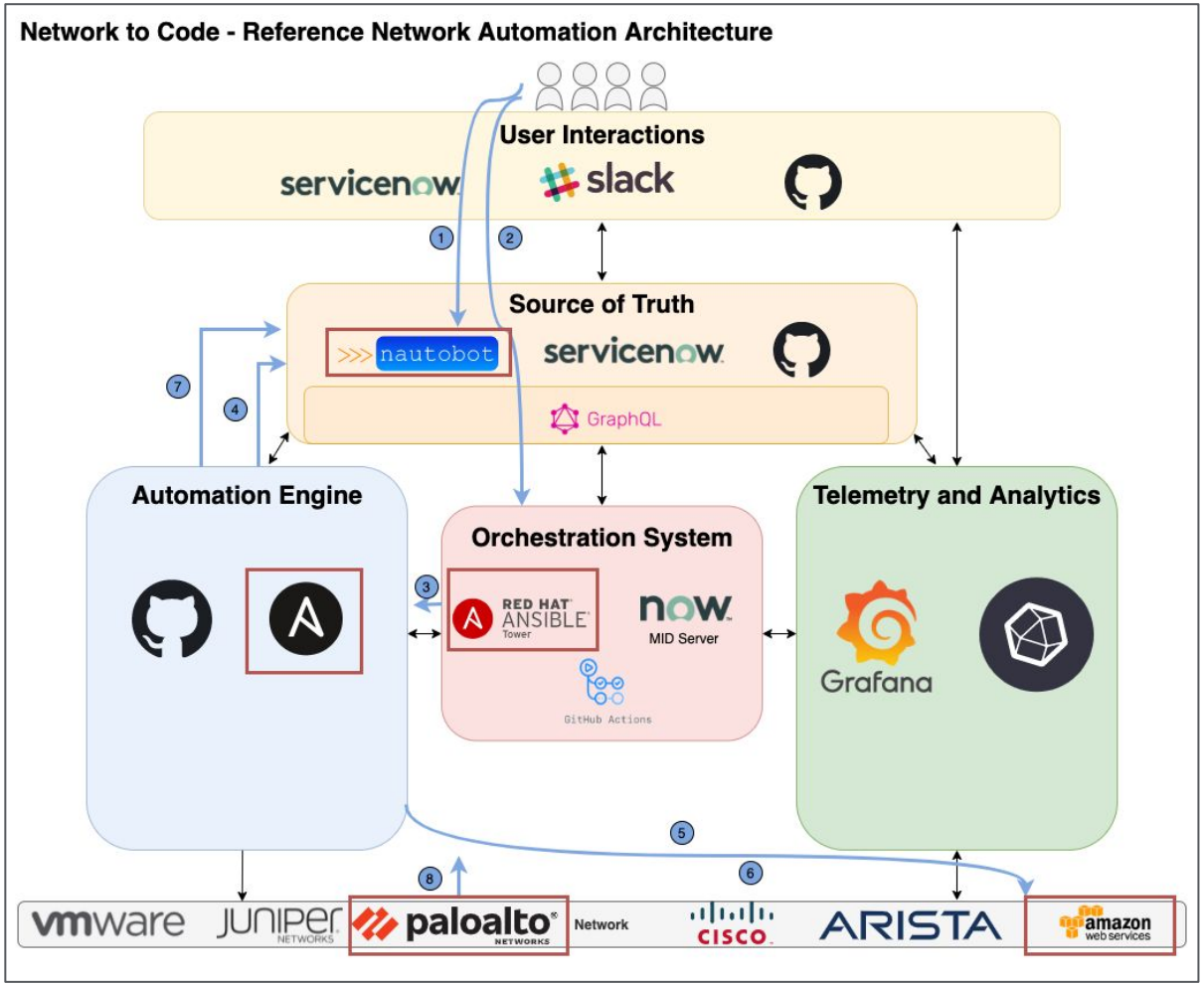
>>> Firewall Rule

1. User requests firewall change into Service Now, providing source, destination, port, etc.
2. The ServiceNow MID Server picks up job from Saas Service
3. The ServiceNow MID Server, makes an API call to Ansible Tower
4. Ansible Tower runs the Ansible Process
5. Run a series of prechecks, e.g. ensure the device is accessible, and pre-validation steps
6. Updates Slack, to inform change is happening
7. Update a ServiceNow Ticket
8. Push Configuration to the firewall
9. Close Ticket in ServiceNow



Deploy Apache

1. User adds apache server to Nautobot, with appropriate metadata, such as tag
2. Operator run a playbook in Ansible Tower
3. Ansible Tower runs the Ansible Process
4. Ansible reaches out to Nautobot for inventory
5. Based on that inventory, connect to AWS, and create apache server(s), deploy html to service, and update the Palo Alto External Dynamic List (EDL)
6. After servers are deployed, obtain IP information
7. Apply that IP information to the servers in Nautobot
8. Palo Alto EDL reaches out every 5 minute, and updates firewall objects

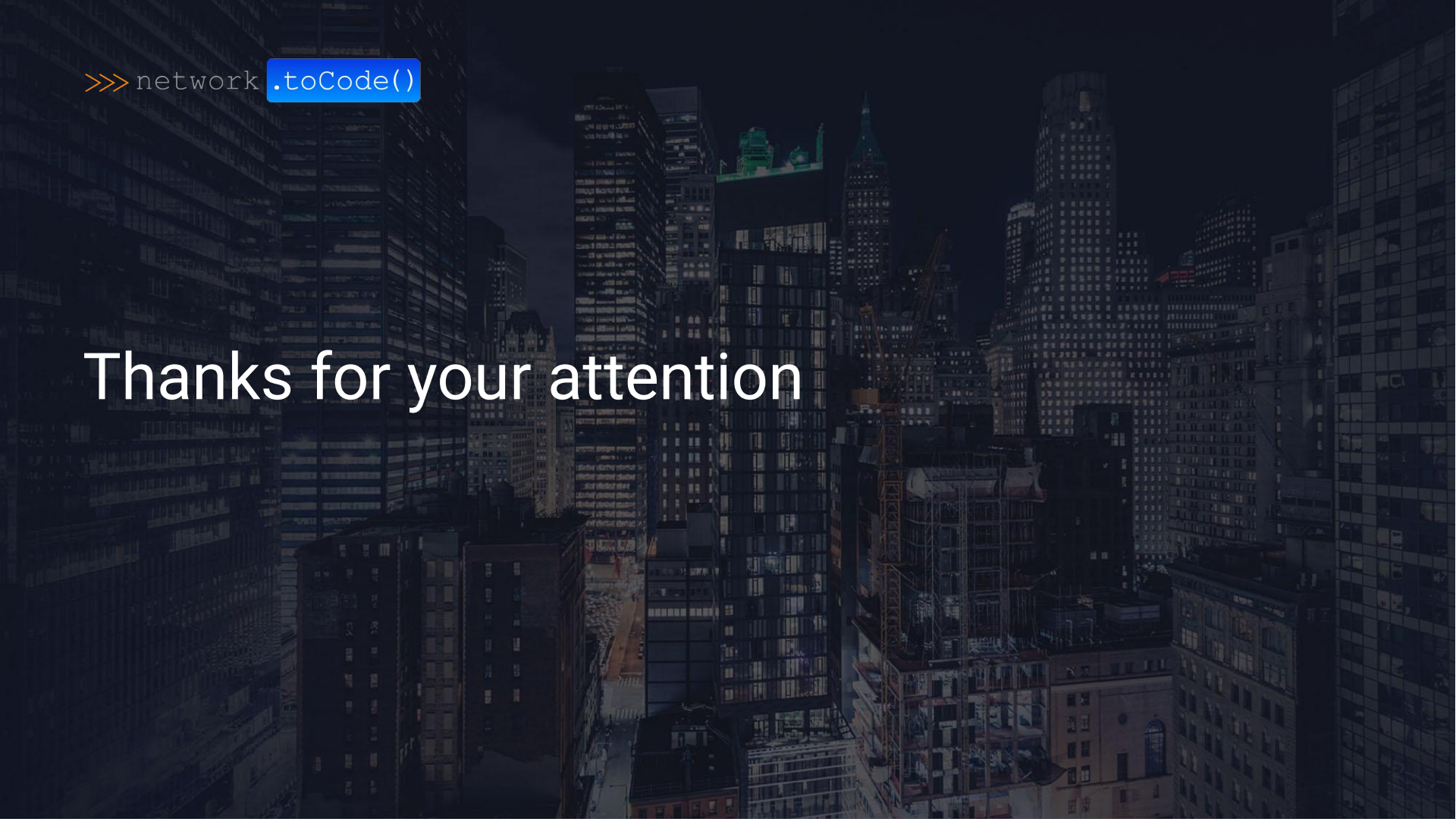


Next Steps

>>> Workflow Discovery Role Play

>>> References

- ***Think Again***, by Adam Grant
- ***Never Split the Difference***, by Chris Voss
- How to ask good questions, by Julia Evans


>>> network .toCode()
Thanks for your attention