

AI for Network Ops

Hype or Real?

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Speaker Introduction



Google
8 yrs

- **Product and Program Leader - Generative AI and Automation**
Dec 2022 - Present · 1 yr 7 mos
Dubai, United Arab Emirates
- **Product Manager, Strategic Program Manager, Startup Advisor, Agile Coach**
Jul 2016 - Nov 2022 · 6 yrs 5 mos
Zurich, Switzerland



Founder, Head of Product, Interim CEO, Advisor
Jawdat Group
2012 - 2020 · 8 yrs



Founder of Communities and Non-Profit to Enable Indonesian Youngsters
CCIE93, SDN Warriors, GEM Foundation
2010 - 2016 · 6 yrs



Solutions Architect - Cloud and IT Transformation
Cisco Systems
2006 - 2016 · 10 yrs

Google Peering

What

Peering is the direct interconnection between Google's network and another network to support the exchange of traffic.

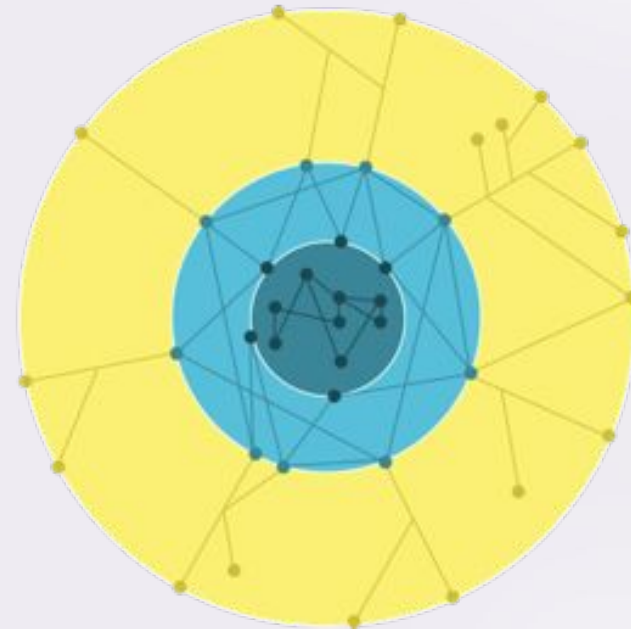
Why

Networks peer to gain some combination of economic, performance and traffic control benefits.

How

Submit request via isp.google.com/iwantpeering for Peering (Public Peering IX, Private Peering PNI, IPv6 Addition to PNI), GGCs, ISP Portal Access. SMS/Voice, Cloud, Other

- Core data centers
- Edge Points of Presence (PoPs)
- Edge caching and services nodes (Google Global Cache, or GGC)

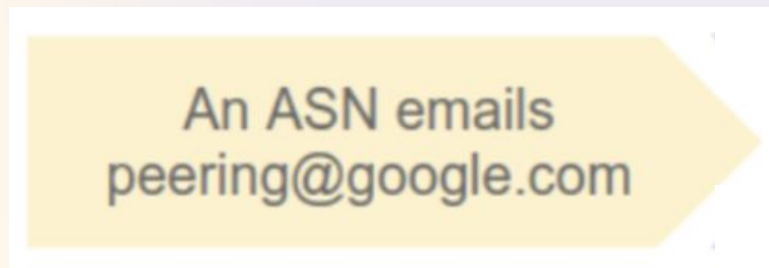


What We Wish AI Can Help

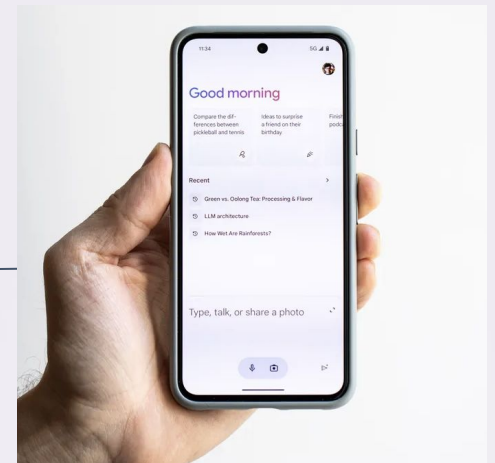
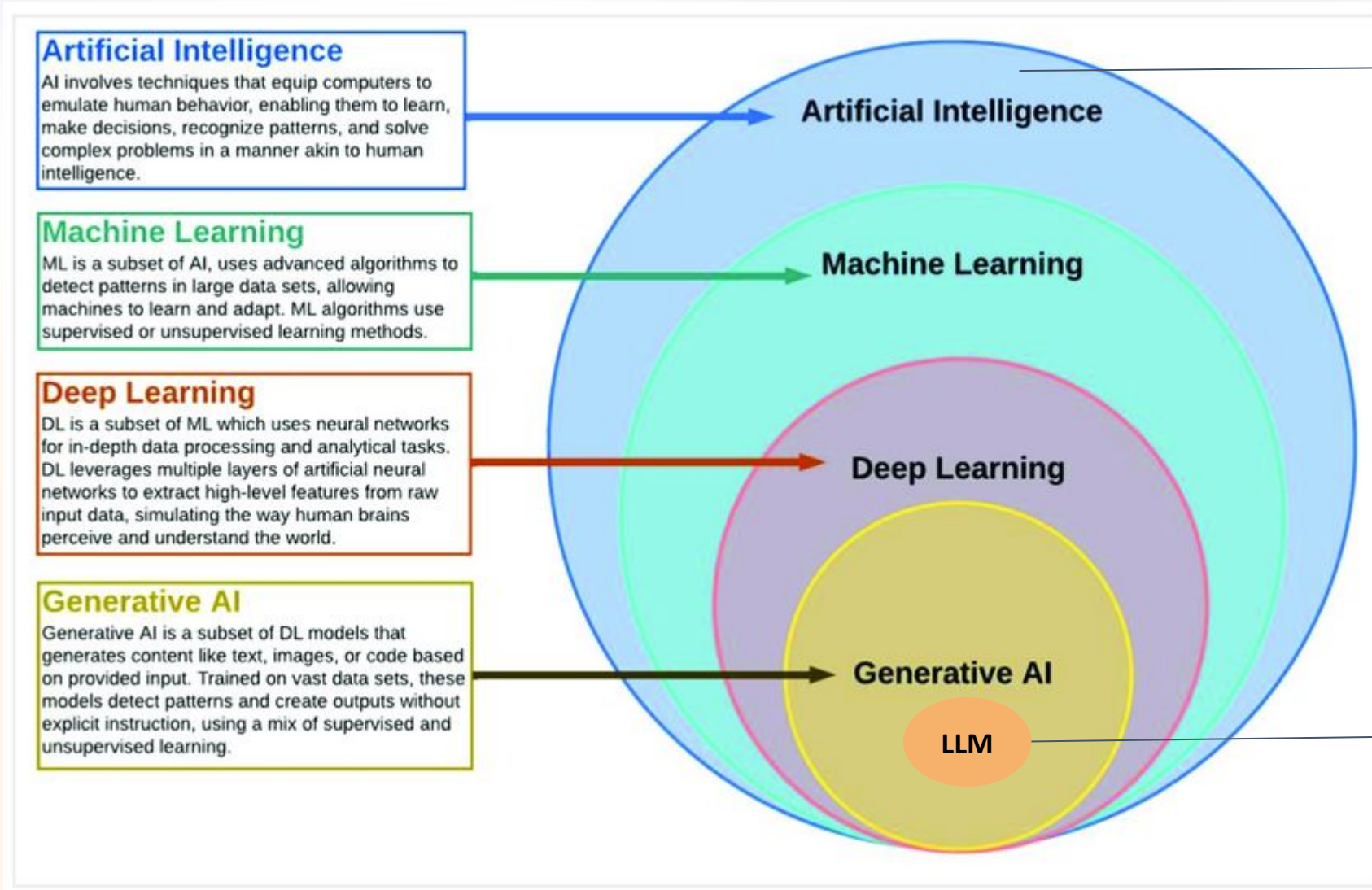
Peering Request Before AI



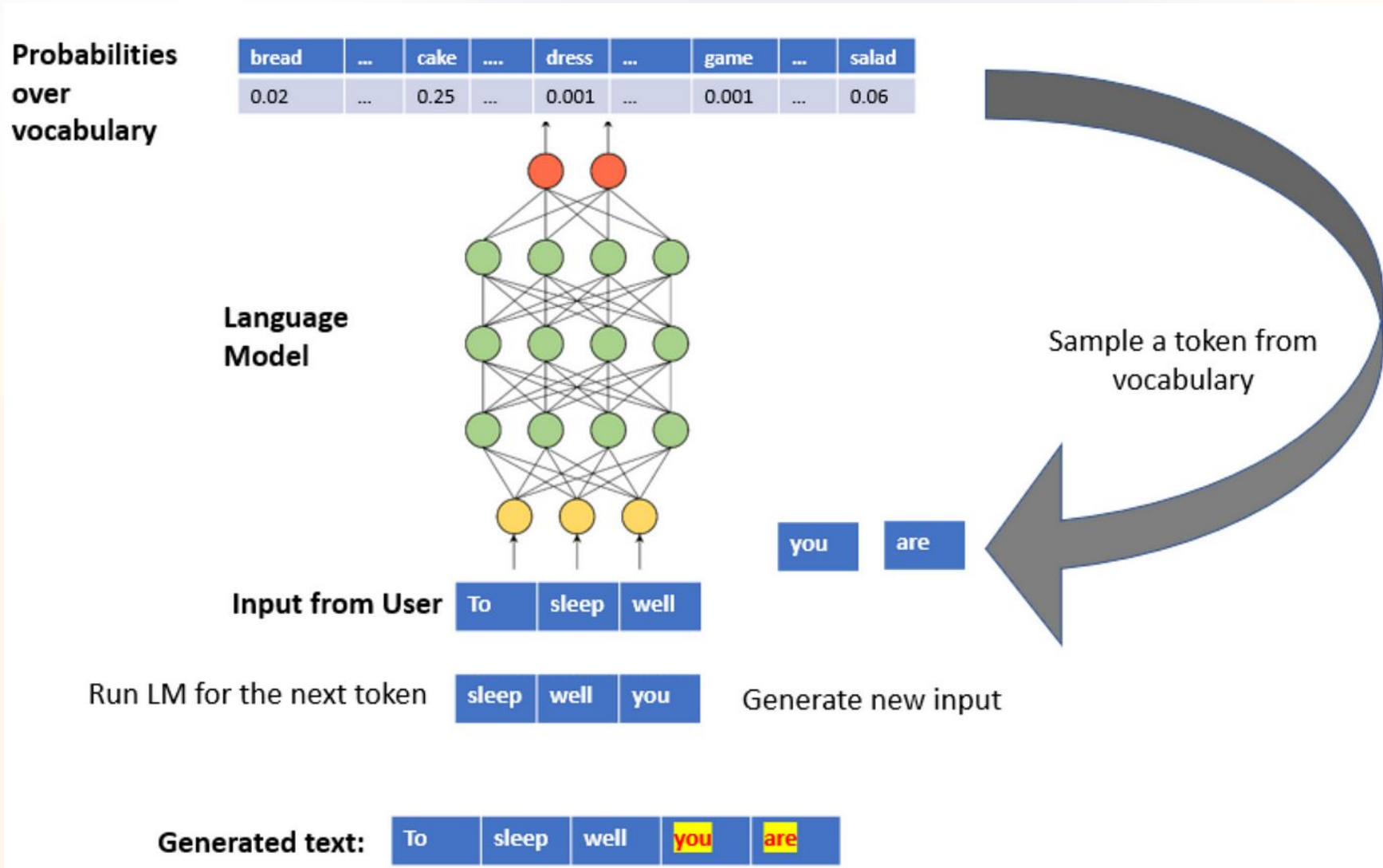
Peering Request With AI



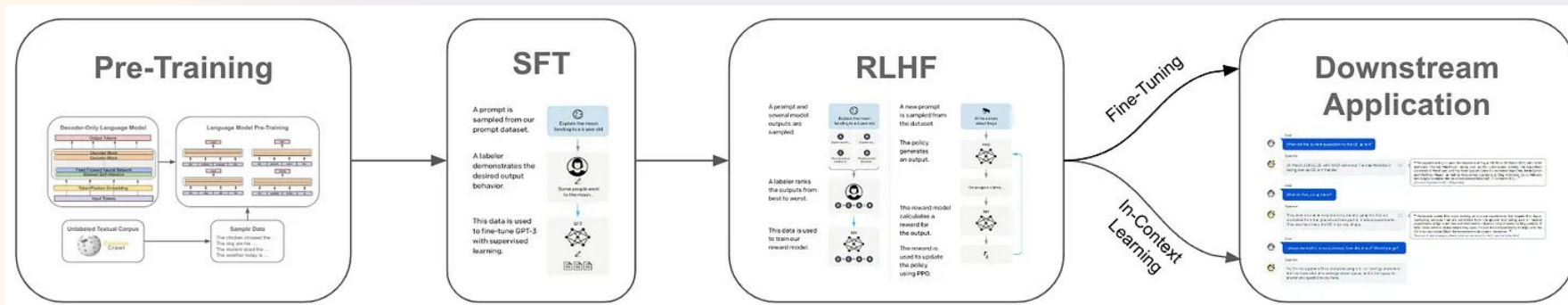
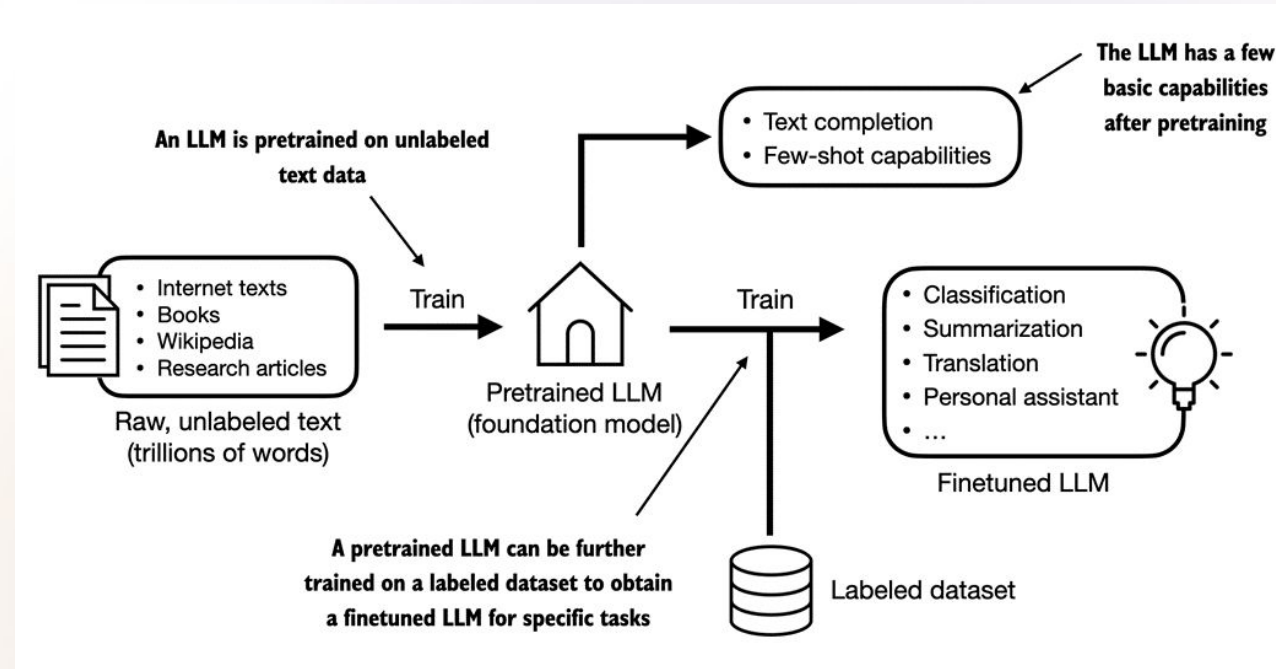
What is AI Anyway?



How LLM Works



How LLM is Trained



Can AI Really Help Network Ops?

What problem are we trying to solve?

Who are the target users?

How are they solving the problem today?

What are the benefits of solving the problem?

**What is the advantage of the new solution
compared to the existing one?**

What resources (time, persons, budget) would
be required to solve the problem?

How do we define success?

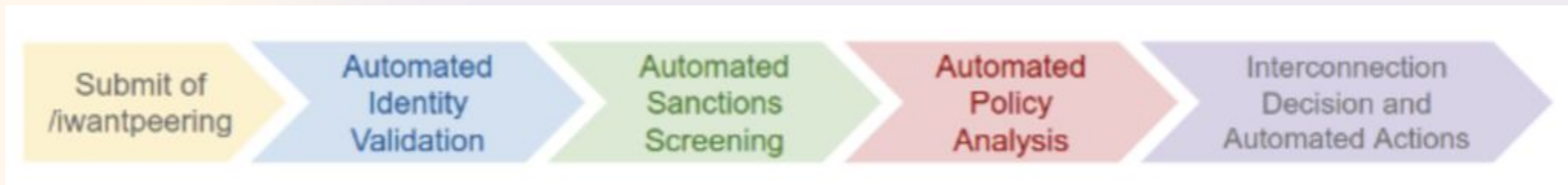
And all other boring questions...

How Google Solve Peering Request Today

Peering Request Before Automation



Peering Request After Automation



Life of a Peering Request

**Collect
required
information
from the
requesting
network**

**Ensure we are
complying with
with applicable
sanctions and
embargoes against
select entities.**

**Take action on
the request
based on the
results of the
previous
results**

Submit of
/iwantpeering

Automated
Identity
Validation

Automated
Sanctions
Screening

Automated
Policy
Analysis

Interconnection
Decision and
Automated Actions

**Ensure we are
actually talking
to a
representative of
the network
requesting
peering**

**Use collected
data to
evaluate
peering
policies
against the
request.**

From User Input to Intent (Internal Ticket)

Google ISP

Contact Request

You can contact Google network teams via this form to request GGC hardware, new or additional peering connections, or access to the ISP peering portal.

Please choose the main topic for your request:

Request Type: Peering

Google Peering Request

This form is intended for networks who want to establish direct peering with Google, via an Internet Exchange or private interconnect facility, or wish to augment existing capacity. Peering is the direct interconnection between Google's network and another network for the exchange of traffic between these networks. Google has a generally open peering policy, subject to certain technical, commercial and legal requirements as defined in Google's Peering Policy.

Technical requirements for peering:

- A publicly routable ASN
- Publicly routable address space (at least one /24)
- A complete ASN record at PeeringDB
- 24x7 NOC contact capable of resolving BGP routing issues
- Presence at one or more of the private peering interconnection facilities listed at Google's PeeringDB entry
- Sufficient traffic volume (as determined by Google, at its discretion)

If you do not meet any of these requirements, you will not qualify for direct peering with Google.

If you believe you meet the technical requirements, please fill out the following form.

Contact Details

Full Name* Job Title

Email Address* Phone Number

Organization Details

Organization Name* Organization Country or Territory*

ASN* Website*

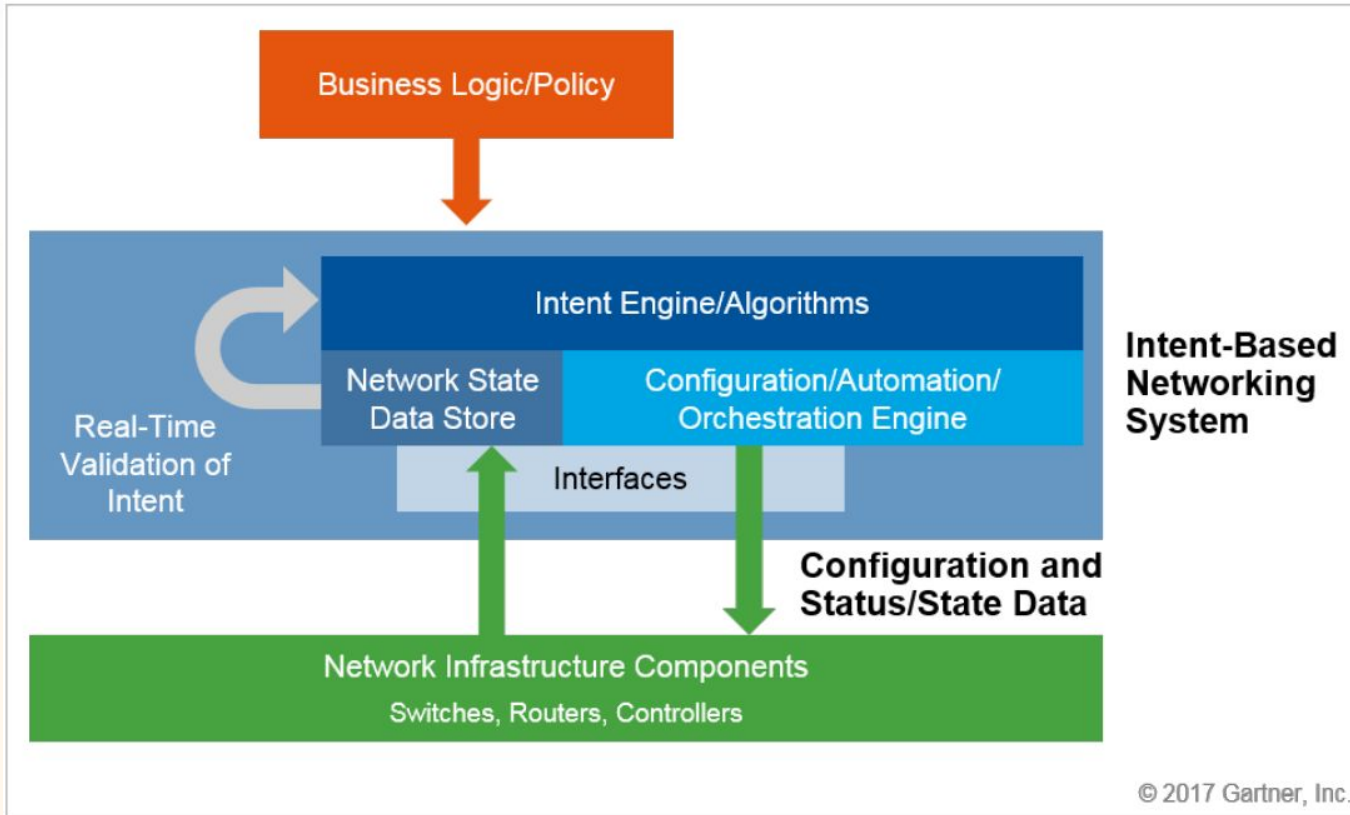


Google Internal Ticketing

CREATE Partner Requests

P2	R	TV Alphaville	Partner Request: [Peering] - [Brazil] - [TV Alphaville] - [AS265303]
P1	U	OzarksGo, LLC	Partner Request: [Peering] - [United States] - [OzarksGo, LLC] - [AS395662]
P2	R	Access Northeast	Partner Request: [Peering] - [United States] - [TierPoint] - [AS17113]
P2	R	Xand Corporation	Partner Request: [Peering] - [United States] - [TierPoint] - [AS11383]
P2	R	Dbz International	Partner Request: [Peering] - [United States] - [TierPoint LLC] - [AS17378]
P2	R	Sharktech	Partner Request: [Peering] - [United States] - [Sharktech Inc.] - [AS46844]
P2	P	RM dos Santos Info...	Partner Request: [Caches (GGC)] - [Brazil] - [RMS] - [AS61893]
P2	R	Claro RJ (Brazil)	Partner Request: [ISP Portal Access] - [Brazil] - [CLARO] - [AS22085]
P2	U	VITAL	Partner Request: [Caches (GGC)] - [Brazil] - [COMARCA PIUMHI VITAL NET] - [AS262766]
P2	P	MaxxNet Telecom	Partner Request: [Caches (GGC)] - [Brazil] - [Maxx Net Telecom] - [AS52765]
P2	P	CMDnet Internet & I...	Partner Request: [Caches (GGC)] - [Brazil] - [CMDNet Internet & Informática Ltda] - [AS263652]
P2	P	Telemidia Sistema...	Partner Request: [Caches (GGC)] - [Brazil] - [Telemidia Sistemas de Telecomunicação] - [AS262729]
P2	W		Partner Request: [Caches (GGC)] - [Brazil] - [UGNet Provedor de Internet] - [AS263283]
P2	R	CABASE (Argentina)	Partner Request: [ISP Portal Access] - [Argentina] - [Cabase] - [AS52376]

Intent Based Automation



Translation and Validation

Converts higher-level business policy (what) as input from end users and converts it to the necessary network configuration (how)

Automated Implementation

Uses network automation and/or network orchestration to configure the appropriate network changes (how) across existing network infrastructure

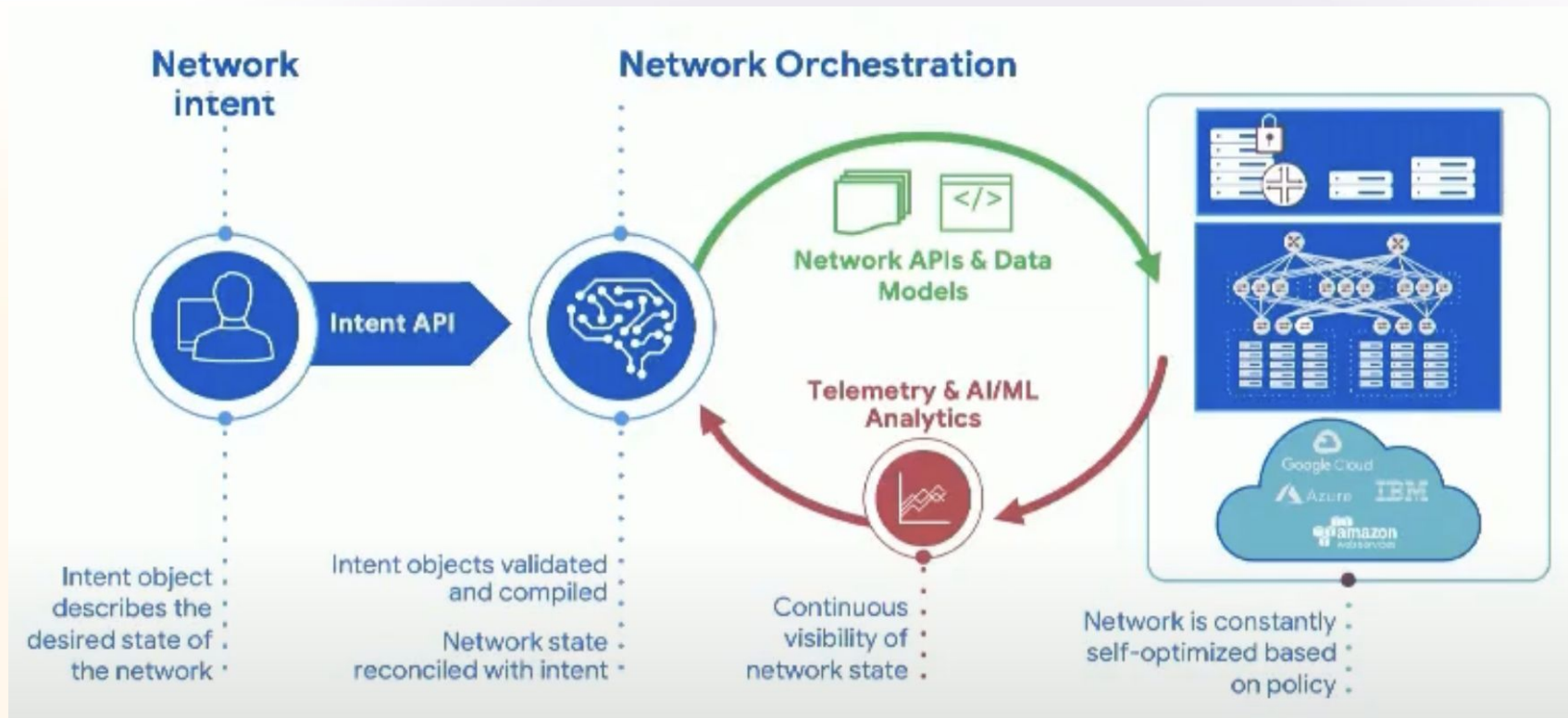
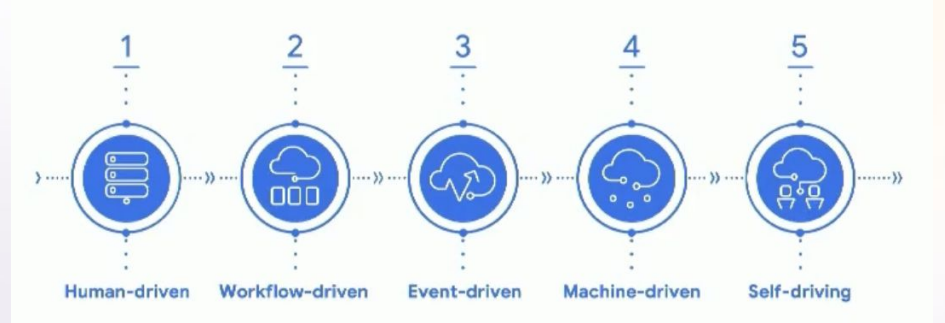
Awareness of Network State

Ingests real-time network status for systems under its administrative control, and is protocol- and transport-agnostic

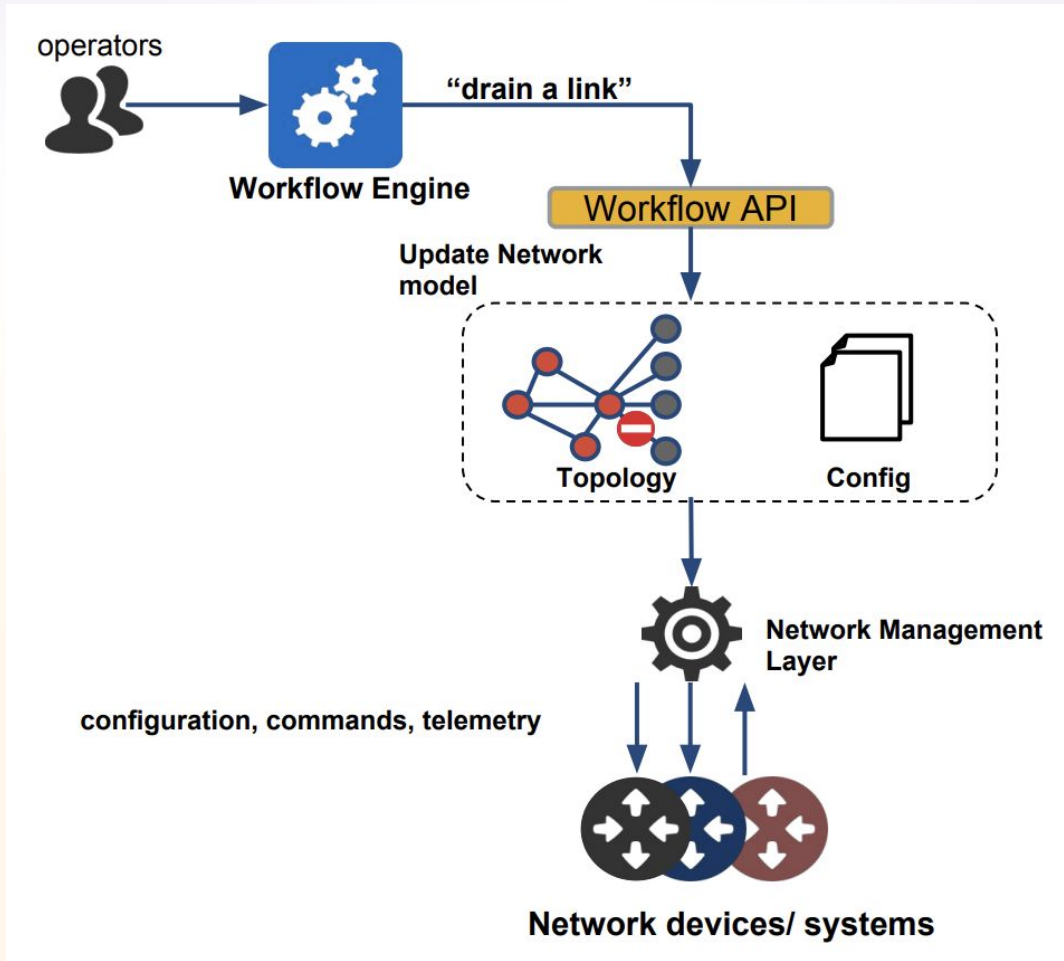
Assurance and Dynamic Optimization/Remediation

Continuously validates in real time that the original business intent is being met, and can take corrective actions when it is not met

Google Networking 3.0 Vision



Google Intent Based Automation



Workflow Engine

Workflow Engine executes a goal-seeking workflow graph. Workflows are expressed in a meta-language. All interesting metrics of execution logged. Workflows have the same test coverage as any software system

Workflow API

Workflow engine interacts with the intent-based network management infrastructure over transactional APIs. Workflow intents are expressed at the network-level, as changes to Topology, Config, Functional calls.

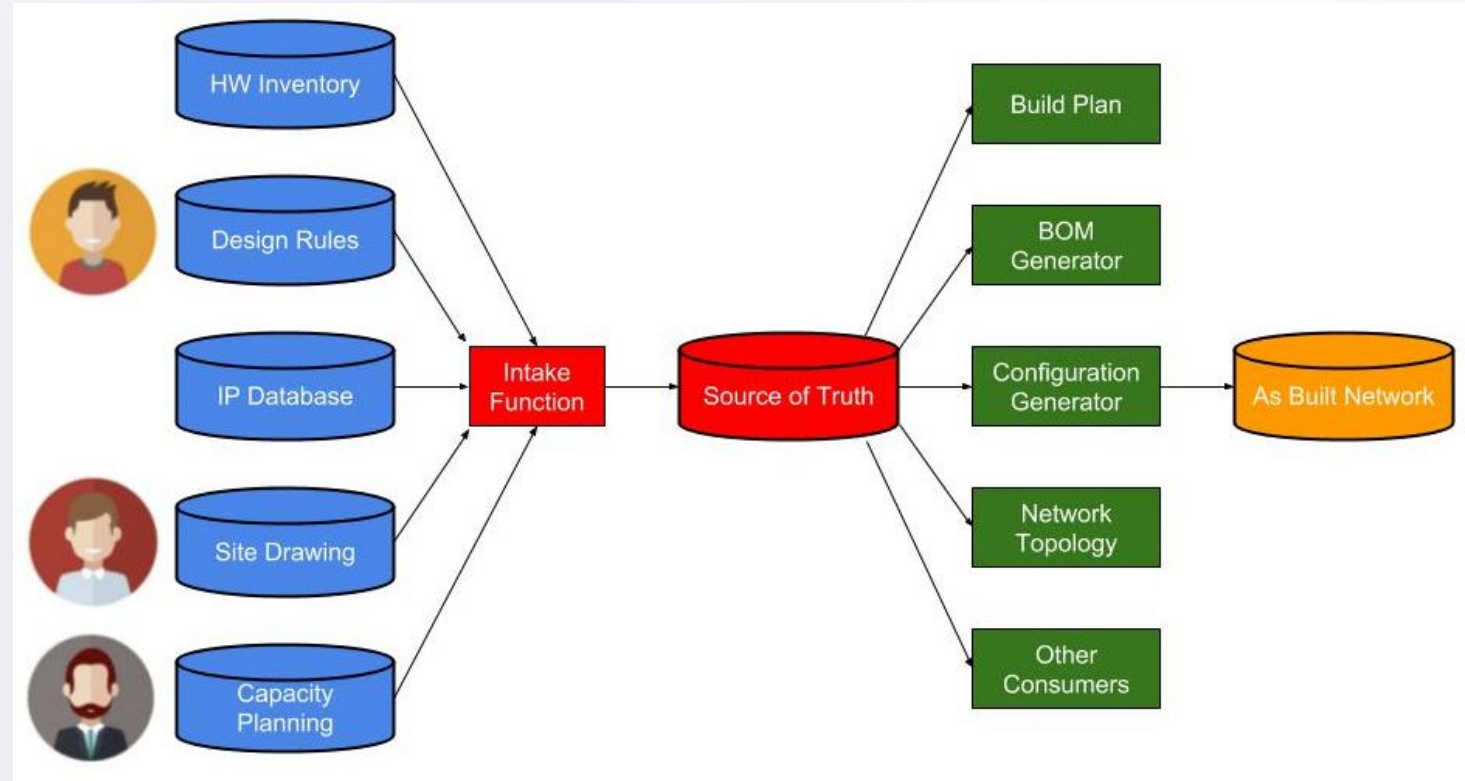
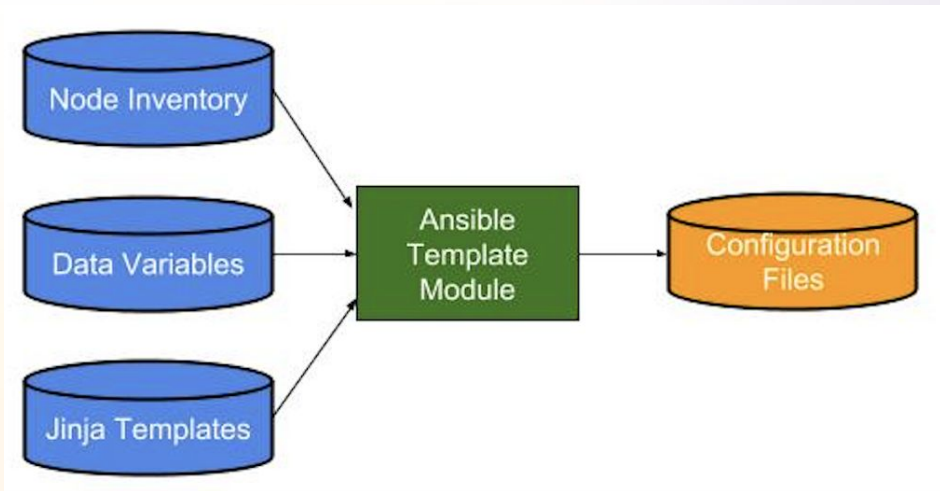
Network Model

OpenConfig (www.openconfig.net) for vendor-neutral configuration model. BGP, MPLS, ISIS, L2, Optical-transport, ACL, policy. "Unified Network Model" is Protocol Buffer based Google internal schema for topology describes all layer-0/1/2/3

Network Management Services

Compose full config (vendor-neutral and vendor-specific) from topology/config intent update. Provides secure transport of full config to network elements (OpenConfig+gRPC). Enforce Operational Policies

Automation Can Start Simple



AI for Network Ops: Hype or Real?

Understand problem we are trying to solve

Understand the target users

Understand how we are solving the problem today

Identify parts of problem that provide the most benefit

Verify if automation can solve the problem

Identify requirement to enable automation

Start small

Next: Find where (Gen) AI can help with automation

**Realize it will not be “plug and play” (Prepare data set,
select model, perform fine tuning etc.)**

Questions?
Let's Build It.

Zafar Labs
“We Transform Dreamers to Builders”
Coming Soon