

Delivering SaaS and Software

Two Hearts, One Mind

NS1.

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#CodeBEAMSF

Introduction.

Who We Are And Why We Are in Business

- ▶ NS1 provides next generation DNS software and managed DNS services, purpose built to service today's deployment and delivery requirements



NS1 Snapshot

The NS1 logo consists of the letters "NS1" in a bold, black, sans-serif font, with a small red dot positioned to the right of the number "1".

Founded in 2013 by a team of internet infrastructure experts. The **leader in providing DNS software & services** to major enterprises.



Backed by **GGV, Two Sigma, Salesforce, Deutsche Telekom Capital Partners, Telstra,** and others



Headquartered in **New York City**, with offices in San Francisco, UK, Boston Metro and Singapore.

The NS1 logo, featuring the letters "NS1" in a bold, black, sans-serif font with a red dot to the right of the "1".

Proven and Trusted

verizon[✓]

yelp[®]

Dropbox

weightwatchers

salesforce

imgur

SQUARESPACE

catchpoint[®]
empowering quality

LinkedIn

AppNexus

tableau[®]

VAIL RESORTS[®]
EXPERIENCE OF A LIFETIME

OpenX

jetBlue

Taboola[™]

imgix

collective

Integral
Ad Science

Lexmark[™]

ASHLAND[®]

.dash

DocuSign[®]

Valvoline

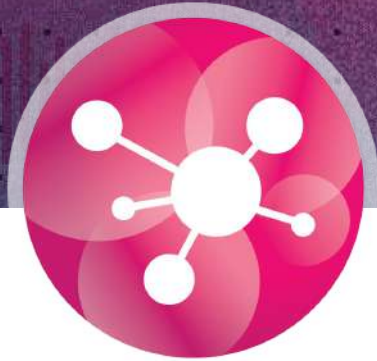
theguardian

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PART I

SaaS → Software

NS1 SaaS



Managed DNS

Cloud-based managed DNS for internet online services



Dedicated DNS

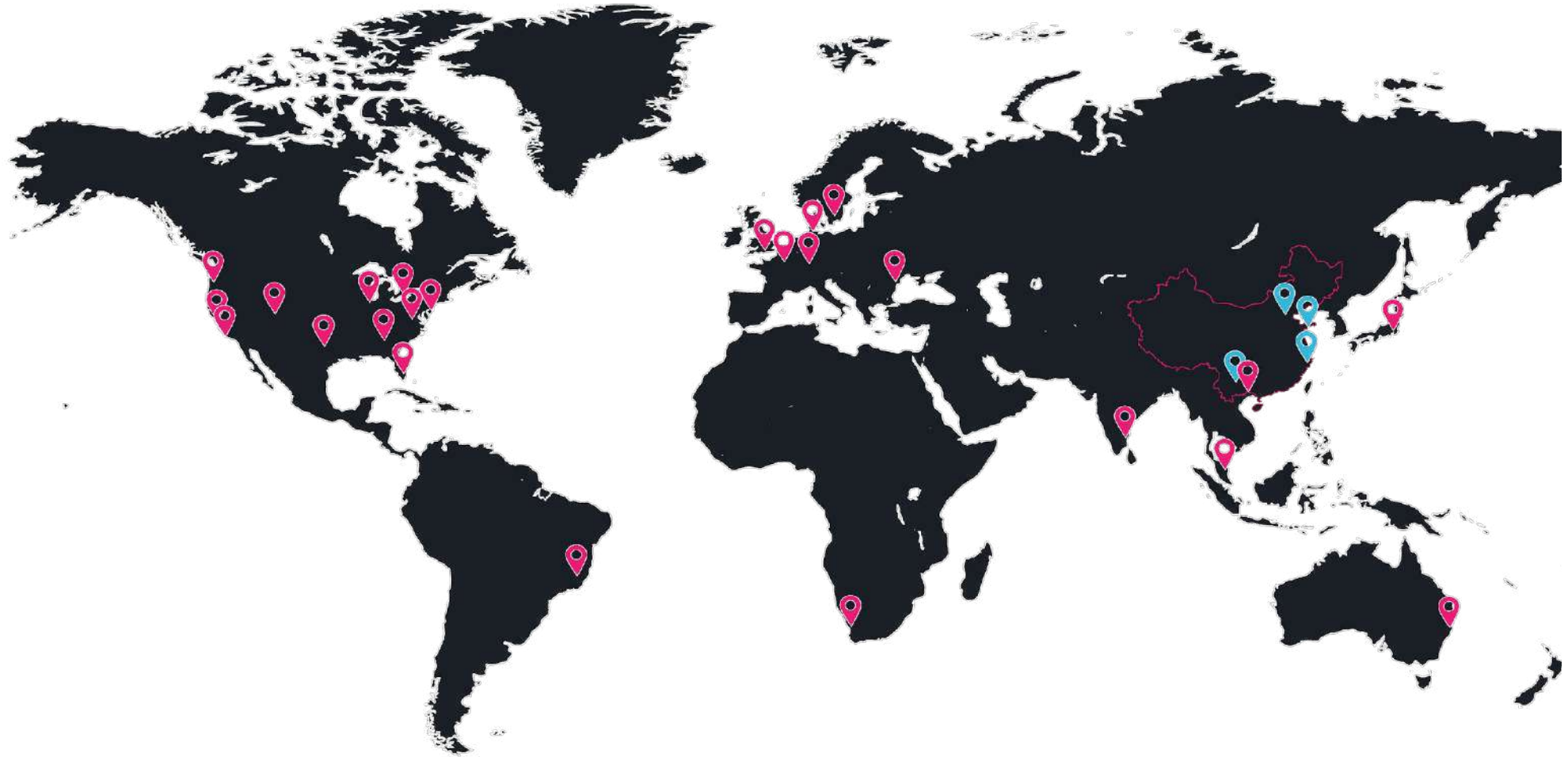
A single tenant managed solution for DNS redundancy



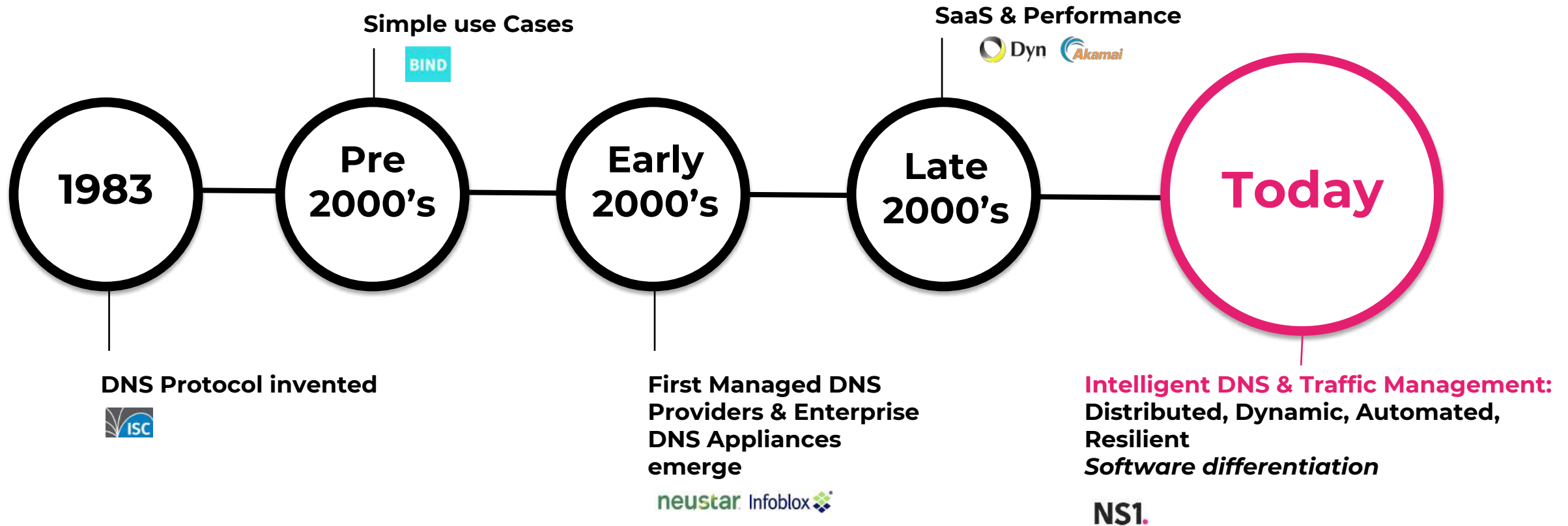
Pulsar RUM Steering

Real user measurement based traffic steering for application optimization

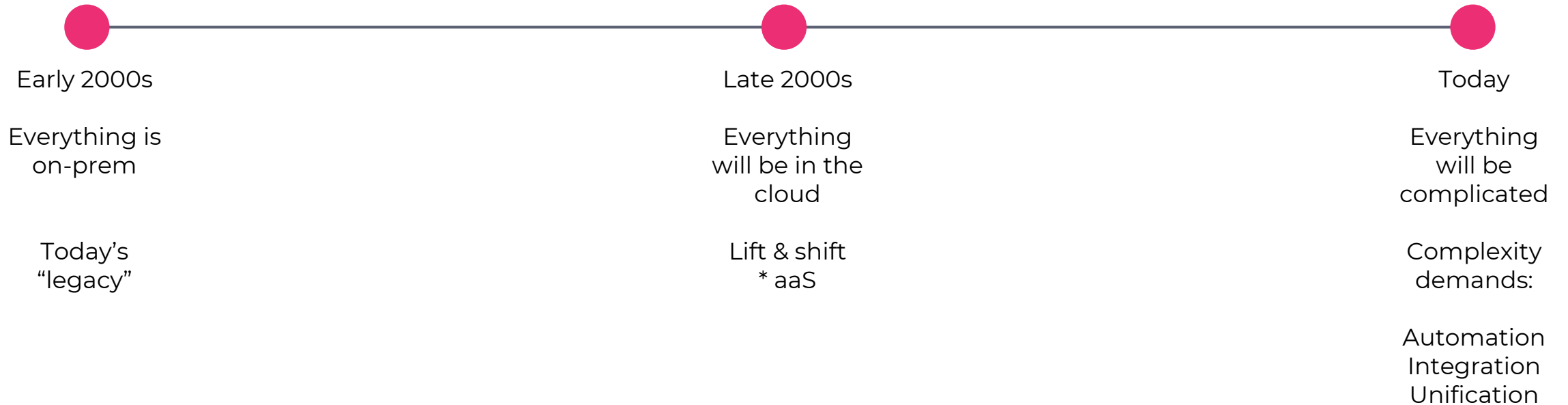
NS1 Managed DNS Global Infrastructure



Why DNS Needed Innovation



Where does your application live?



“

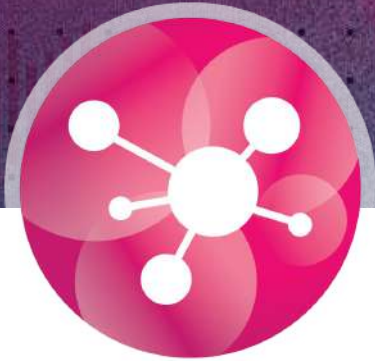
Enterprises have long had a focus on managing tool proliferation and don't want separate tools regardless of on-prem or cloud. Owning a layer that cuts across clouds—security, monitoring, logging, orchestration, network, data prep, for example—will put startups in the demand vein that enterprises desire.

”

- The Next Cloud Battle Will be Fought “On-Prem”
Scott Coleman, Business Development Partner

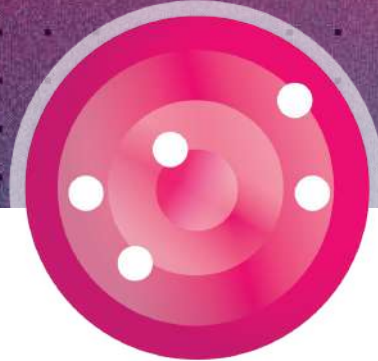
*[https://medium.com/@Ignition_Partners/
the-next-cloud-battle-will-be-fought-on-prem-1e5b9934887a](https://medium.com/@Ignition_Partners/the-next-cloud-battle-will-be-fought-on-prem-1e5b9934887a)*

NS1 Portfolio



Managed DNS

Cloud-based managed DNS for internet online services



Dedicated DNS

A single tenant managed solution for DNS redundancy



Private DNS

NS1's carrier grade DNS platform for self-hosted deployments



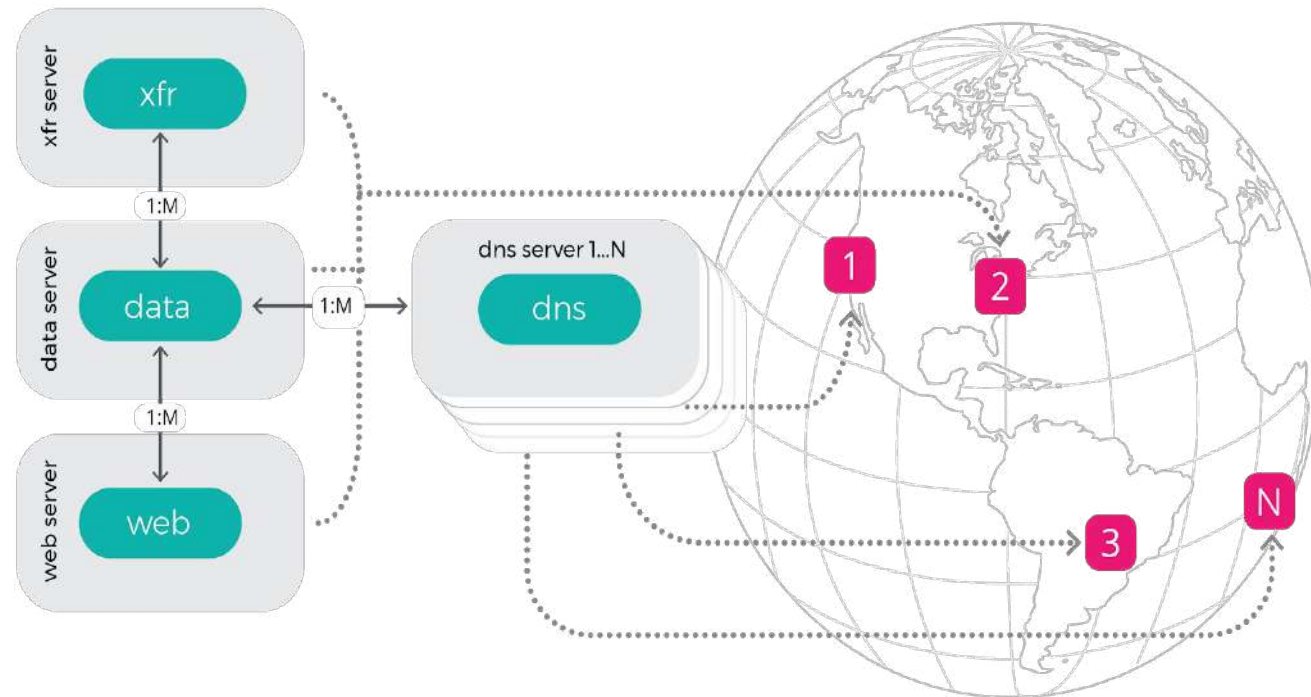
Pulsar RUM Steering

Real user measurement based traffic steering for application optimization

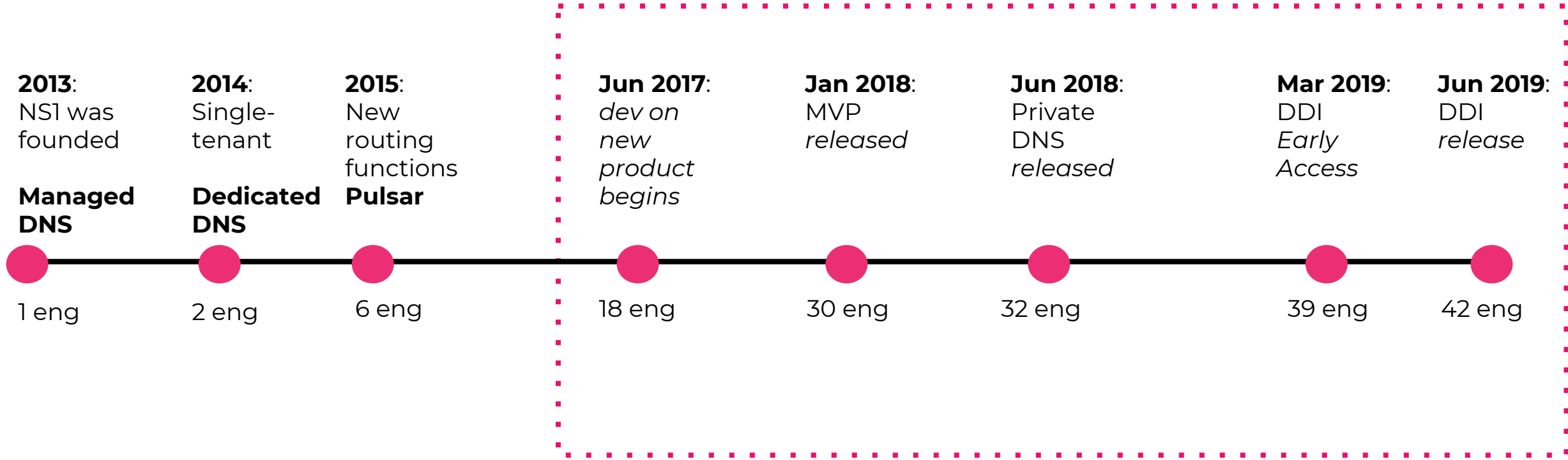


NS1 Private DNS

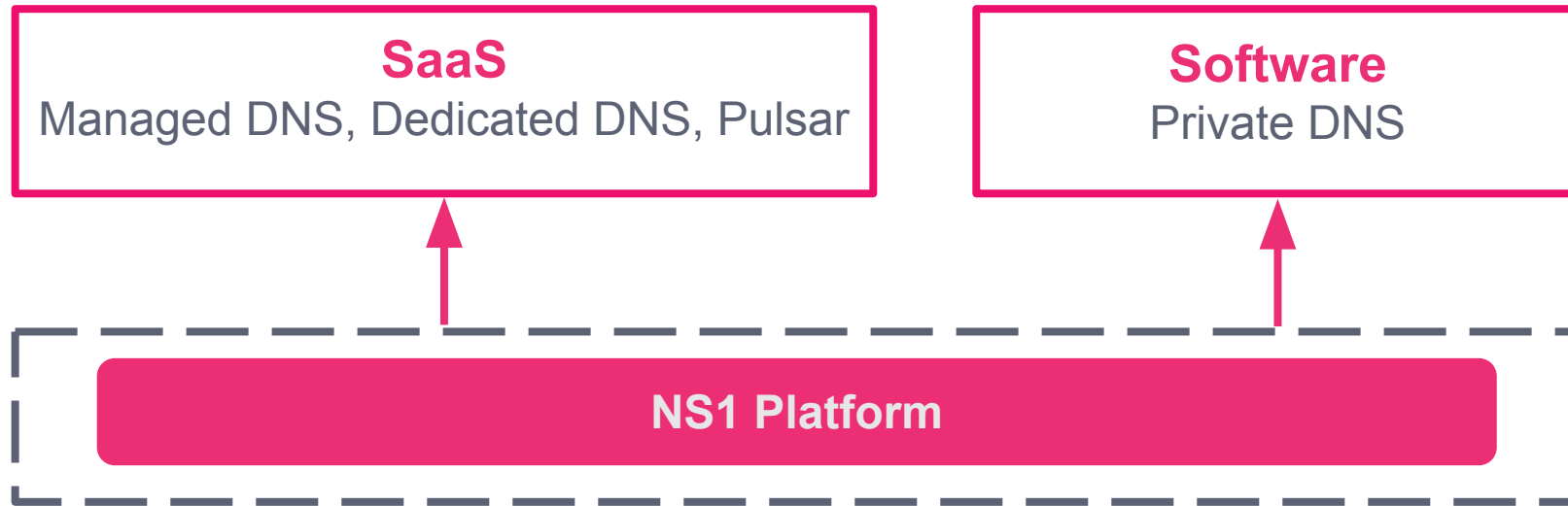
- ▶ Containerized DNS platform
- ▶ Robust & fully featured API
- ▶ High API rate capacity
- ▶ Rapid propagation of DNS changes (<10s)
- ▶ Advanced traffic steering
- ▶ Deployable in the cloud



On our recent org journey...



Product Unification: Two Hearts, One Mind



Product Unification

The *same* DNS technology is provided in both delivery models.

The *same* team develops both delivery models.

The NS1 operations team will operate the *same* technology as our customer operators.

A unified platform *avoids*:

- Maintaining two divergent code bases by two separate teams
- Duplication of effort by multiple teams
- Multiple testing environments and multiple staging environments

Operations Paradigm Shift

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Operators are specialists
Network environment is a known entity

*Mission: **consume** platform and run it as fast and reliably as possible for benefit of our SaaS customers*



Customers.

Operator skill sets will vary
Deployment topologies differ by use case

*Mission: **package** platform in highly automated way for customer devops teams to install/operate*

... a “**complex simplification**”

Engineering Org Evolution

Functional Segmentation (2015-2018)

Backend

DevOps

Frontend

“Release Engineering”

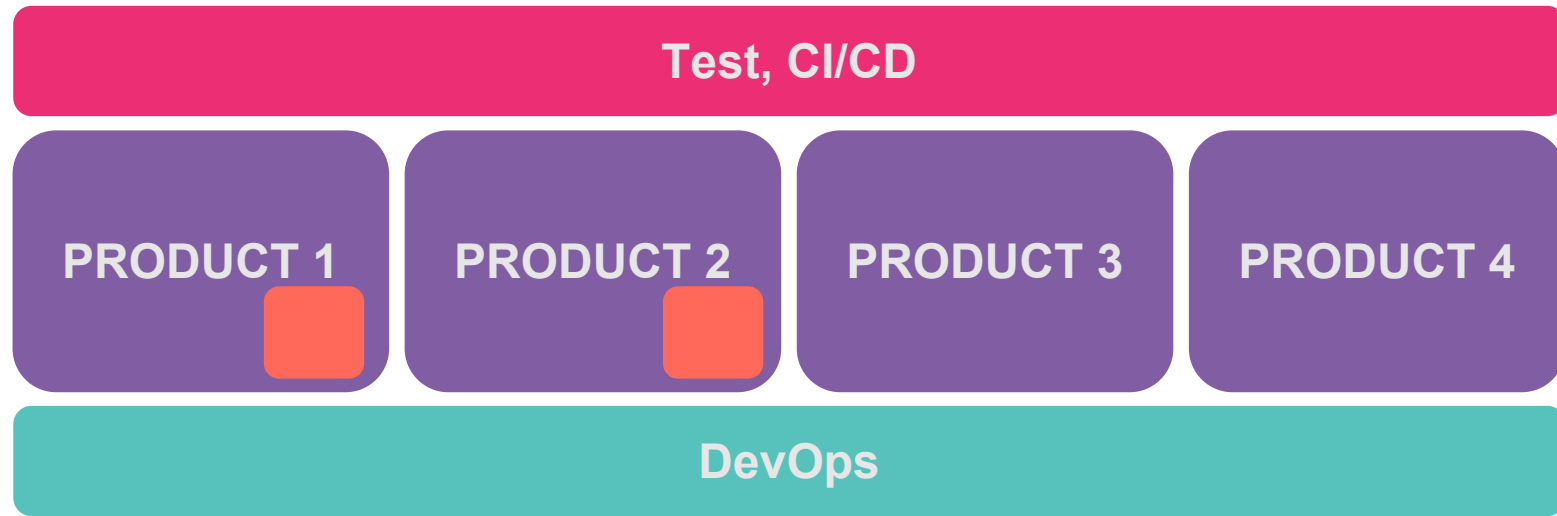
Backend

Release

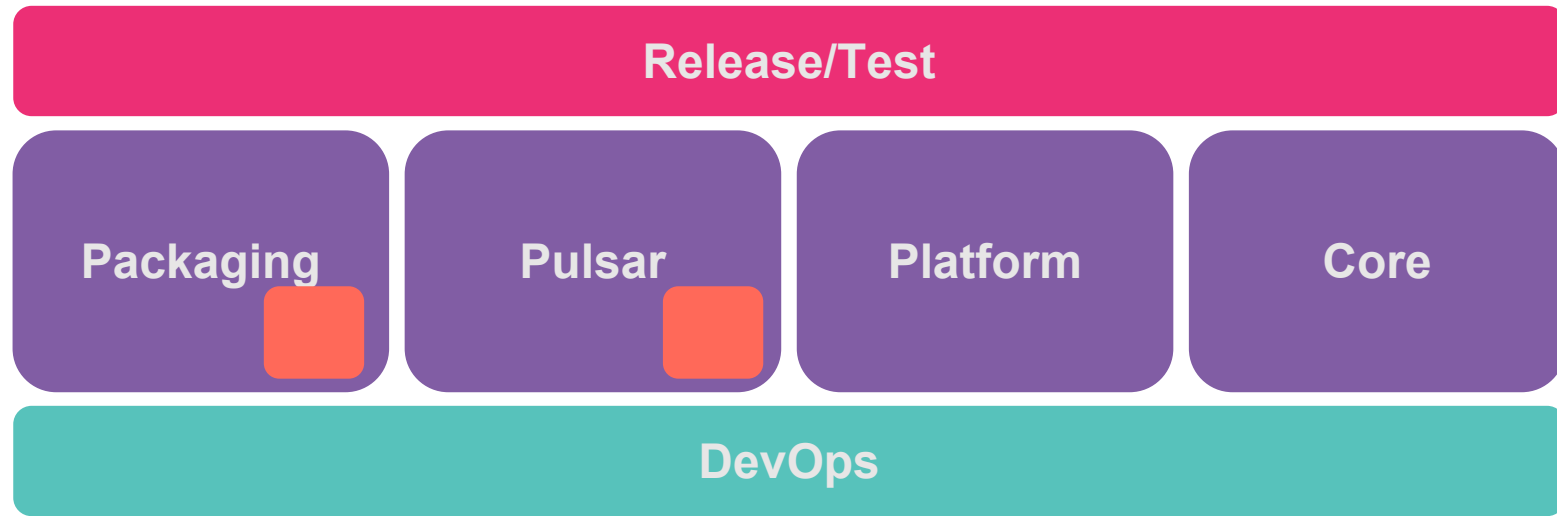
DevOps

Frontend

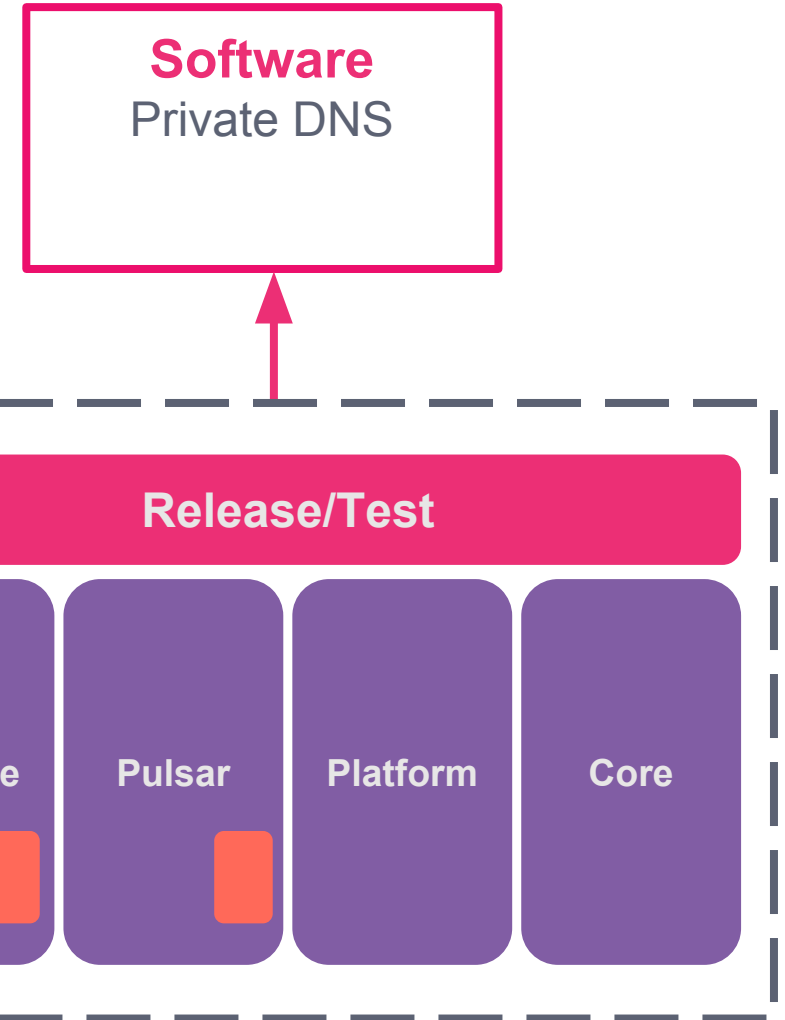
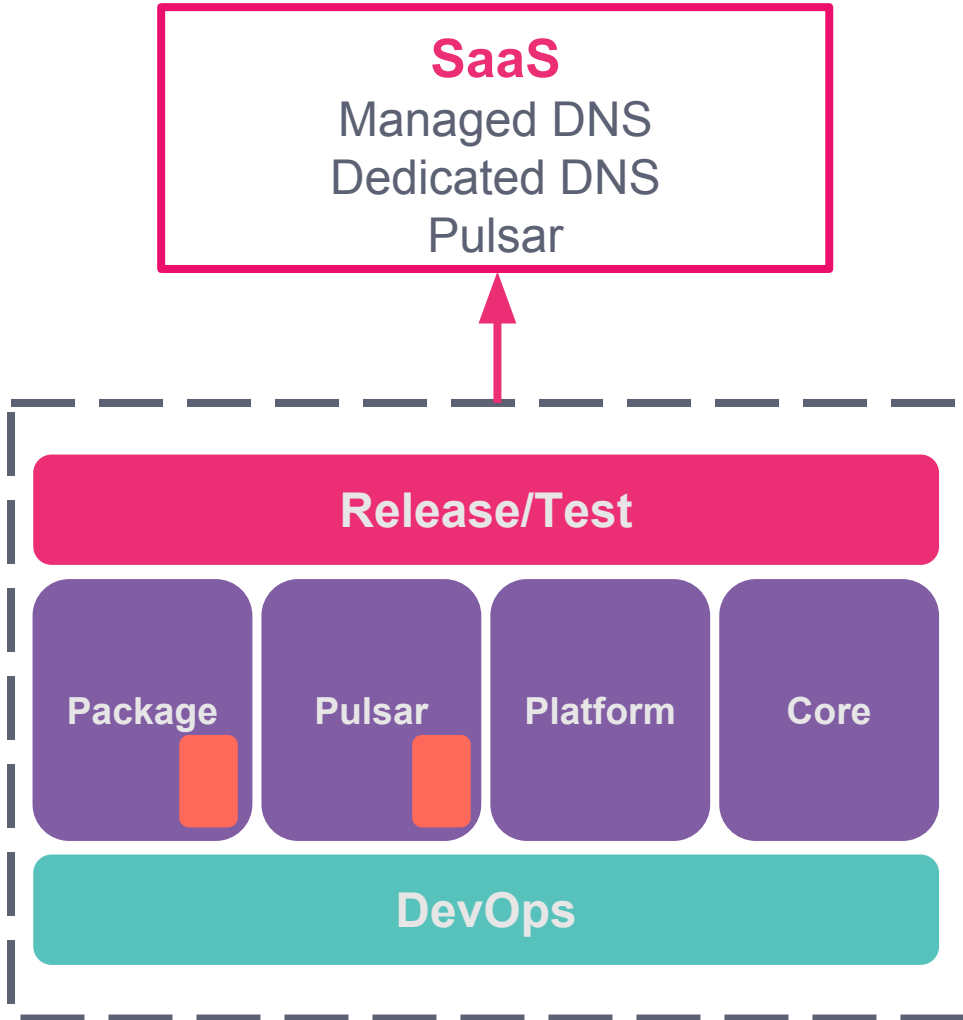
Segmenting by product is not an option



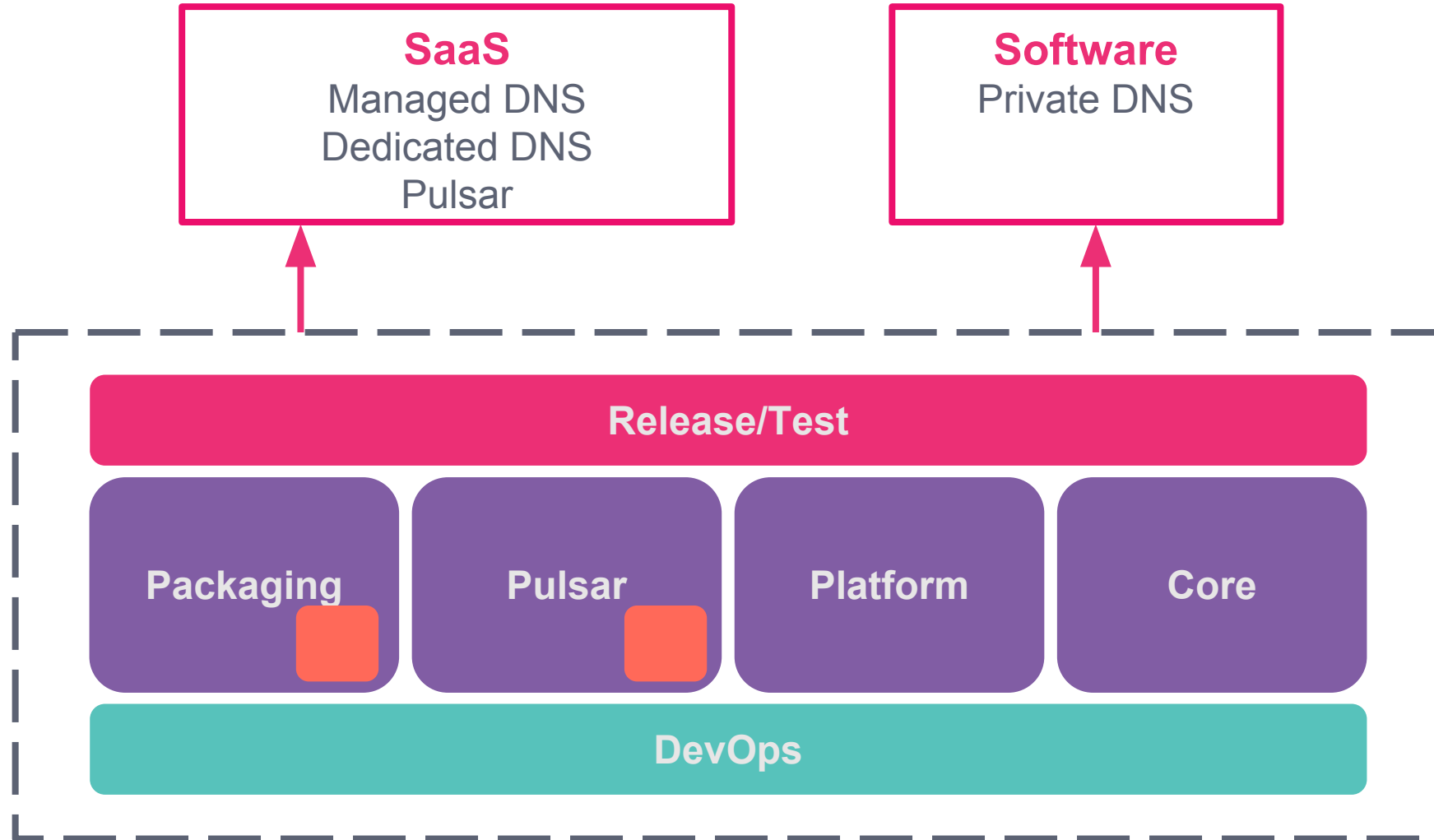
Segment by platform ownership



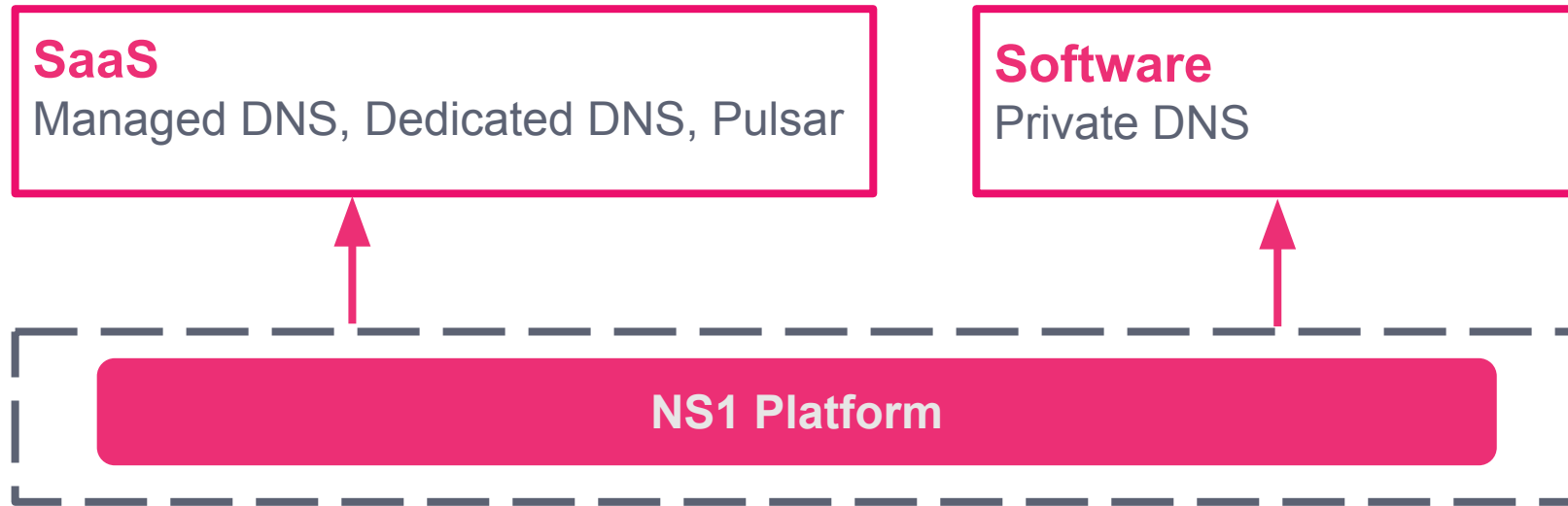
The Risk: 2 Teams



Segment by ownership



Segment by ownership → Product Unification



Continuous Delivery **VS.** Versioned Releases

Process...

- Diligence became mandatory
- Processes change only with a purpose
- Incremental changes move the team together

Developer Autonomy

- Autonomy downstream was relinquished to support planning upstream
- Versioned releases are product-centric. Done vs. Packaged
- Hot fixes are expensive for software versions. In prod, we manage

Continuous Integration

- CI is a tool for preparedness
- Always be “releasing”
- Supports *both* CD to Managed Production and versioned releases to customer environments

Takeaways for building our technology

- Using the same containers in our SaaS feeds large scale operational experience into the private product
- Our code turnaround time ultimately lengthened, but the end value of the product evolved significantly to offset this cost

Takeaways for building our team

- We are designing a single organization. The end value of this decision *also* outweighs the longer dev cycles
- Our new model both required and supported specialization (ex: Build/Test/QA)
- Our planning and management requirements increased

New product requirements + organic growth in a team can lead to imbalances and inconsistencies. Take moments to **reassess and realign as the team continues to grow.**

It's really helpful to add some **structure and methods** to your people planning.

Do not assume the obvious answer is the **best**.

With growth comes an opportunity to **optimize roles** on your team.

Amplify talent, rather than simply retain.

PART II

- Gap Analysis
- Role Design
- Making Hires

Blank templates available!

goo.gl/D4VbBV

Gap Analysis Templates

Template 1: Ownership

Template 2: Proximity

Gap Analysis Templates

Assesses as-is and to-be

Outlines complete set of tasks and responsibilities in a team's environment

Identifies the part to play for each role on a team

Template 1: Ownership

Quantifies the model with 3, 2, 1

Template 2: Proximity

Abstracts the model with an analogy

Build the template

Guidelines

Aim for roles not names of people. Ideally, your roles should be independent from your people, to ensure you reduce dependencies on specific individuals.

Aim for positive connotations and encouraging scenarios, rather than what to avoid. Categorize your team's aspirations rather than pitfalls.

Follow the clues:

- ▶ Color coding with conditional formatting
- ▶ Sorting options: by themes, by a role's 3s or Frogs, or by gaps
- ▶ Quantify ownership points

Instructions

Start with your tasks, and then categorize them by theme.

A	B
Tasks/Responsibilities to Focus on	Theme
Task 1	Theme 1
Task 2	Theme 2
Task 3	Theme 1

Examples:

Release Engineering

Develop integration for artifact repo	<i>Artifacts</i>
Maintain artifact repo	<i>Artifacts</i>
Optimizing build	<i>Build</i>
Developing build tools	<i>Build</i>
Developing local build environment	<i>Build</i>
Developing test fixtures	<i>CI/CD</i>
Maintaining build/test infrastructure	<i>CI/CD</i>
Maintaining Jenkins	<i>CI/CD</i>
Developing pipeline	<i>CI/CD</i>
Ensuring day to day build	<i>CI/CD</i>
Backfill build and test documentation	<i>Documentation</i>
Keeping build and test documentation current	<i>Documentation</i>
Hiring of new Rel-Eng	<i>Planning</i>
Research and design for build, release, and test systems	<i>Planning</i>
Maintaining Test Backlog	<i>QA</i>
Write post-unit tests (to integration and beyond)	<i>QA</i>
Write unit tests	<i>QA</i>
Ensure feature/test back compatibility	<i>QA</i>
Manual tests	<i>QA</i>
Develop release machinery	<i>Release</i>
Oversee release process and comms	<i>Release</i>
Run release automation	<i>Release</i>

Examples:

Network Operations

Open and follow-up on issues with facilities/transit providers	<i>Vendors</i>
Manage vendor queue	<i>Vendors</i>
Purchasing new equipment	<i>Vendors</i>
Deliver requirements on new facilities	<i>Vendors</i>
Set up pdu/oob/server/switch	<i>Platform</i>
Monitoring and responding to issues with performance	<i>Platform</i>
Standardize and automate hardware deployments	<i>Platform</i>
Developing, maintain dashboards and visibility tooling	<i>Internal</i>
Manage maintenance calendar	<i>Internal</i>
Manage IP resources	<i>Internal</i>
NetOps oncall	<i>Internal</i>
Internal corporate IT: access points for office	<i>Internal</i>
Troubleshoot networking issues	<i>CS</i>
Set up dedicated network deployment	<i>CS</i>
Implement new netops protocols, tooling	<i>Strategy</i>
Research and design evolution of netops architecture	<i>Strategy</i>

Examples:

Eng Leadership

Capacity Planning	<i>Technology Management</i>
Vendor Negotiations	<i>Technology Management</i>
Deployment	<i>Technology Management</i>
Codebase	<i>Technology Management</i>
Architecture	<i>Technology Management</i>
QA	<i>Technology Management</i>
Testing	<i>Technology Management</i>
CI	<i>Technology Management</i>
User testing	<i>Technology Management</i>
Onboarding	<i>Process</i>
Hiring Recruitment	<i>Process</i>
Product Roadmap	<i>Process</i>
Sprint Management	<i>Process</i>
On call management	<i>Process</i>
Personnel Hire/Fire	<i>Personal Development</i>
Career Advancement	<i>Personal Development</i>
Mentoring	<i>Personal Development</i>
Conflict Resolution	<i>Personal Development</i>
Performance Reviews	<i>Personal Development</i>
Feedback	<i>Personal Development</i>
Workplans per engineer	<i>Personal Development</i>

Instructions

Next identify the existing roles on the team. Then, think about the other roles or teams that your team intersects.

C	D	E	F	G	H	I	J
Role 1	Role 1	Role 2	Role 2	Other Team 1	Other Team 1	Other Team 2	Other Team 2
<i>Current</i>	<i>Future</i>	<i>Current</i>	<i>Future</i>	<i>Current</i>	<i>Future</i>	<i>Current</i>	<i>Future</i>

Examples

Team Lead: Rel Eng	Team Lead: Rel Eng (Jon)	Rel Eng	Rel Eng 1 (Andrew)	Infra	Infra	Dev	Dev	PM	PM
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Team Leads	Director Eng	TPM	CPO	CEO
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Team Lead (NJ)	Junior Engineer	Automation Engineer	DevOps Team	TechOps Team	IT Team	Backend Team	CPO: Sully	Dir Tech: Shannon
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Owner, Participant, Lurker

Template 1:

Ownership over a problem statement

When to use

- ▶ Require a tool to demonstrate who owns what.
 - ▶ Testing assumptions on where a new hire is needed.
 - ▶ Need identification of gaps that are missing an owner.
 - ▶ Working with individuals who respond well to visual indicators and numerical processes.
- Split roles and identify dropped tasks

The Terminology

3 = Owner

2 = Participant

1 = Lurker

(all positive connotations)

If any work is occurring on a line item, a member of the direct team cannot have a zero.

We operate under the assumption that an activity on a team implies some degree of overhead for everyone on that team.

NS1 Examples: what works well?

Generates a shared understanding

Forms consensus on **what** work exists, what **is and is not** getting done now, by whom.

Acknowledges the silent tasks.

Visualizes imbalances in responsibilities.

Tasks/Responsibilities to Focus on BLUE is current GREEN is future	Theme	Team Lead: Rel Eng	Rel Eng	Infra	Dev
3= owner, 2 = participant, 1 = lurker	Total	58	34	7	10
Maintain artifact repo	Artifacts				
Develop integration for artifact repo	Artifacts				
Developing build tools	Build	3	1		
Developing local build environment	Build	3	2	1	1
Optimizing build	Build	3	1		
Maintaining Jenkins	CI/CD	2	1	3	
Developing pipeline	CI/CD	3	1		
Developing test fixtures	CI/CD	2	3		
Ensuring day to day build	CI/CD	3	2		
Maintaining build/test infrastructure	CI/CD	2	1	3	
Keeping build and test documentation current	Documentation				
Backfill build and test documentation	Documentation				
Absorbing new features	Planning	3	2		
Coordinate test integration into build	Planning	3	2		
Write unit tests	QA	2	1		3
Write post-unit tests (to integration and beyond)	QA	2	3		3

Finds literal gaps

A brainstorming session to complete the first column can help elucidate the activities that *should* be owned by the team, but cannot be with the current bandwidth or skills available.

Tasks/Responsibilities to Focus on BLUE is current GREEN is future	Theme	Team Lead: Rel Eng	Rel Eng	Infra	Dev
3= owner, 2 = participant, 1 = lurker	Total	58	34	7	10
Maintain artifact repo	Artifacts				
Develop integration for artifact repo	Artifacts				
Developing build tools	Build	3	1		
Developing local build environment	Build	3	2	1	1
Optimizing build	Build	3	1		
Maintaining Jenkins	CI/CD	2	1	3	
Developing pipeline	CI/CD	3	1		
Developing test fixtures	CI/CD	2	3		
Ensuring day to day build	CI/CD	3	2		
Maintaining build/test infrastructure	CI/CD	2	1	3	
Keeping build and test documentation current	Documentation				
Backfill build and test documentation	Documentation				
Absorbing new features	Planning	3	2		
Coordinate test integration into build	Planning	3	2		
Write unit tests	QA	2	1		3
Write post-unit tests (to integration and beyond)	QA	2	3		3

New roles abound

Identifying a new role! Your CFO will love you! Actually, they will. Because you're providing a clear justification for why a new seat on a team is required.

Tasks/Responsibilities to Focus on BLUE is current GREEN is future	Theme	Team Lead: Rel Eng (Jon)	Rel Eng 1 (Andrew)	Rel Eng 2	QA	TPM	Missing	Role?
3= owner, 2 = participant, 1 = lurker	Total	49	47	36	31	19	30	
Maintain artifact repo	Artifacts	1	2	3			3	Rel Eng 2
Develop integration for artifact repo	Artifacts	2	3	1				
Developing build tools	Build	2	1	3			3	Rel Eng 2
Developing local build environment	Build	2	1	3	1		3	Rel Eng 2
Write post-unit tests (to integration and beyond)	QA	1	1	1	3		3	QA Eng
Manual tests	QA				3	1	3	QA Eng
Test planning	QA	2	1	1	3	2	3	QA Lead/Eng
Maintaining Test Backlog	QA	1	1	1	2	3	3	TPM
Ensure feature/test back compatibility	QA	1	2	1	3	2	3	QA Eng
Oversee release process and comms	Release	2	1	1		3	3	TPM
Develop release machinery	Release	3	2	1				
Run release automation	Release	1	2	3	1		3	Rel Eng 2

Quantifies!

We all love numbers. Seeing a quantification of a redistribution of ownership can help indicate you are on the right track.

Team Lead: Rel Eng	Team Lead: Rel Eng (Jon)	Rel Eng	Rel Eng 1 (Andrew)	Rel Eng 2	QA	TPM
58	49	34	47	36	31	19

Compares options

Can provide a visual comparison of two different team configurations

1

	B	C	D	E	M	N
Theme	Team Lead (NJ)	Junior Engineer	Automation Engineer		Team Lead (NJ)	NetOps Eng. #2
Total	42	40	31		41	41
Internal	2	2	3		1	2
Internal	2	3	2		1	1
CS	2	3	2		2	3
Platform	1	3	2		1	3
	3	2	2		2	3
Vendors	2	3	1		2	3
CS	2	3	1		1	1
Platform	2	3	1		2	3
Vendors	1	3	1		2	2
Internal	3	2	1		3	2
Platform	2	2	3		3	2
Platform	1	2	3		2	3
Internal	3	2	2		3	2
Internal	3	2	2		3	2
Vendors	3	1	2		3	2
	3	1	2		3	2
Vendors	3	2			3	2
Vendors	3				3	2
Internal	1	1	1		1	1

2

Outputs from gap exercises

Automate your job description: you're 80% of the way there with a completed gap analysis.

The line items that the role will own or participate in can be finessed into the responsibilities section of a job posting.

The responsibilities can help define any unique skills required.

Swampthings

Template 2:

Proximity to a problem statement



When to use

- ▶ When everyone likes to do everything.
 - ▶ High levels of shared ownership.
 - ▶ Many individuals involved in many things.
- Change the level of detail for different roles

The Swamp Metaphor

Think of your team and activities as one giant swamp. It's messy, muddy, lots of activity, murky and complicated. Now imagine the relationship these three different animals have with this swamp.

Frog: The frog is knee-deep in the middle of that swamp, and calls it home. They're in the muck, and there's nowhere else they should be.

Makes decisions based on details.

Owl: The owl perches in the trees above the swamp. The owl sees the landscape around the swamp better than the frog, and cannot hang out in the mud.

Makes decisions based on interconnections.

Eagle: The eagle soars above the swamp, and sees the full forest. The eagle knows what's on the other side of the forest, what's threatening the health of the forest, and knows when the river that feeds the swamp might start to flood.

Makes decisions based on full ecosystem.

NS1 Eng Leadership Example

Technology leadership categories

Topic	Theme	Team Leads		Director Eng		TPM		CPO		CEO		GAP
Capacity Planning	Technology Managemen	Owl	<i>Owl</i>	Owl	Owl	Eagle	<i>Eagle</i>	Owl	<i>Frog</i>	Owl	<i>Owl</i>	
Vendor Negotiations	Technology Managemen	Owl	<i>Eagle</i>	Owl	Eagle	Eagle	<i>Eagle</i>	Owl	<i>Owl</i>	Owl	<i>Owl</i>	Frog
Deployment	Technology Managemen	Frog	<i>Frog</i>	Owl	Owl	Eagle	<i>Eagle</i>	Owl	<i>Eagle</i>	Owl	<i>Eagle</i>	More eagle, less
Codebase	Technology Managemen	Frog	<i>Frog</i>	Owl	Owl	Eagle	<i>Eagle</i>	Eagle	<i>Eagle</i>	Eagle	<i>Eagle</i>	NONE
Root Cause Analysis	Technology Managemen	Frog	<i>Frog</i>	Frog	Frog	Eagle	<i>Owl</i>	Eagle	<i>Eagle</i>	Eagle	<i>Eagle</i>	NONE
Architecture	Technology Managemen	Frog	<i>Frog</i>	Frog	Frog	Owl	<i>Owl</i>	Owl	<i>Owl</i>	Owl	<i>Eagle</i>	NONE
QA	Technology Managemen	Owl	<i>Frog</i>	Eagle	Owl	Eagle	<i>Owl</i>	Eagle	<i>Eagle</i>	Eagle	<i>Eagle</i>	
Testing	Technology Managemen	Owl	<i>Frog</i>	Owl	Owl	Eagle	<i>Owl</i>	Eagle	<i>Eagle</i>	Eagle	<i>Eagle</i>	
CI	Technology Managemen	Frog	<i>Frog</i>	Owl	Owl	Eagle	<i>Owl</i>	Eagle	<i>Eagle</i>	Eagle	<i>Eagle</i>	
User testing	Technology Managemen	Eagle	<i>Eagle</i>	Eagle	Eagle	Eagle	<i>Owl</i>	Eagle	<i>Eagle</i>	Eagle	<i>Eagle</i>	FROG, PROCES

NS1 Eng Leadership Example

People and process management categories

Topic	Theme	Team Leads		Director Eng		TPM		CPO		CEO		GAP
Onboarding	Process	Frog	Owl	Frog	Eagle	Owl	Owl	Frog	Eagle	Eagle	Eagle	FROG
Hiring Recruitment	Process	Owl	Owl	Frog	Frog	Owl	Owl	Eagle	Owl	Owl	Owl	SWAP?
Personnel Hire/Fire	Personal Development	Frog	Owl	Frog	Owl	Owl	Eagle	Eagle	Owl	Owl	Owl	Eagle
Career Advancement	Personal Development	Eagle	Eagle	Owl	Owl	Eagle	Owl	Eagle	Owl	Owl	Owl	Frog
Mentoring	Personal Development	Owl	Owl	Owl	Owl	Owl	Frog	Eagle	Owl	Eagle	Owl	Frog
Conflict Resolution	Personal Development	Eagle	Eagle	Frog	Owl	Owl	Owl	Owl	Owl	Owl	Owl	FROG
Personal Goals	Personal Development	Eagle	Eagle	Frog	Owl	Owl	Owl	Owl	Owl	Owl	Owl	Frog
Performance Reviews	Personal Development	Owl	Owl	Frog	Owl	Eagle	Eagle	Owl	Owl	Owl	Owl	Frog
Feedback	Personal Development	Owl	Owl	Frog	Owl	Eagle	Owl	Owl	Owl	Owl	Owl	Frog

NS1 Eng Leadership Example

Outcome:

- ▶ **Designed** a Director of Engineering role focused on people, process, and communication.
- ▶ Elevated Team Lead role to include more **ownership** of in-the-details tasks.
- ▶ **Moved** founders/c-suite individuals towards more eagleship in daily eng activities

But what about current team members?

When to use

- ▶ Talented person wearing too many hats: must choose their hat!
 - ▶ High performer is interested in the challenge of a new path.
 - ▶ Daily tasks don't match a person's strengths.
 - ▶ Delegation to other team members required.
- Interrogate your daily effort distribution, and reallocate time

Role Analysis Template

Template 3:
Design your role

Benefit of being an early hire:

As more people join, you can launch into the direction of your strengths and interests.

Goldilocks Exercise

Identify the changes that you would like to see in your roles, and use vocabulary that matches your own exercise. It is most important that the words have meaning to *you*.

Tasks/Responsibilities	Theme	Current	Action	If delegating, to whom?	Notes
Task 1	Theme 1	Way Too Little ▾	Increase		
Task 2	Theme 2	Too Little ▾	Increase		
Task 3	Theme 1	Good ▾	Stay the course		
		Too Much ▾	Stay the course		
		Way Too Much ▾	Delegate	Role/Name	<i>Includes X, Y, and Z tasks. Discuss during next 1:1</i>

Tasks/Responsibilities	Theme	Current Involvement	Ideal Involvement	Action	If delegating, to whom?	Notes
Task 1	Theme 1	Hands-off ▾	Hands-on ▾	Increase a lot		
Task 2	Theme 2	Involved ▾	Involved ▾	Stay the course		
Task 3	Theme 1	Involved ▾	Hands-on ▾	Increase		
		Hands-on ▾	Hands-off ▾	Delegate	Role/Name	<i>Includes X, Y, and Z tasks. Discuss during next 1:1</i>

NS1 CEO Example

Surveyed his daily/weekly/monthly activities and polled for feedback from his team, board, and company on gaps/opportunities.

Key:

Hands-off	Low or no touch from CEO in this area
Involved	Some involvement but not deep attention
Hands-on	Lots of involvement from CEO in this area

NS1.

Current Involvement	Ideal Involvement	Gap?
Involved	Involved	
Hands-on	Involved	Too involved
Hands-on	Hands-on	
Involved	Involved	
Hands-off	Involved	Too uninvolved
Hands-off	Hands-on	Way too uninvolved
Hands-on	Hands-on	
Involved	Involved	
Involved	Involved	
Hands-on	Involved	Too involved
Hands-on	Hands-off	Way too involved
Hands-off	Hands-off	
Involved	Involved	
Involved	Involved	

A cautionary tale

These are **templates**, not a magic wands.

As with any good template, the second it stops working, **don't force it.**

Most of the value is in the **process** to complete it, not a polished finished product.

Save it, and **revisit** over time. Make new versions, and marvel at how far you've come.

Making Hires

3 Tenets

Candidates are different recipes for the same dish.

Identify what you want to teach.

Your next hire is not your last.

Templates + Instructions Available!

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Thank you.

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