Threat Modeling in the ☁

Paige Cruz
@paigerduty

chronosphere

What threats are *likely* for a vending machine?

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Your threat model is not my threat model: **Hospital edition**

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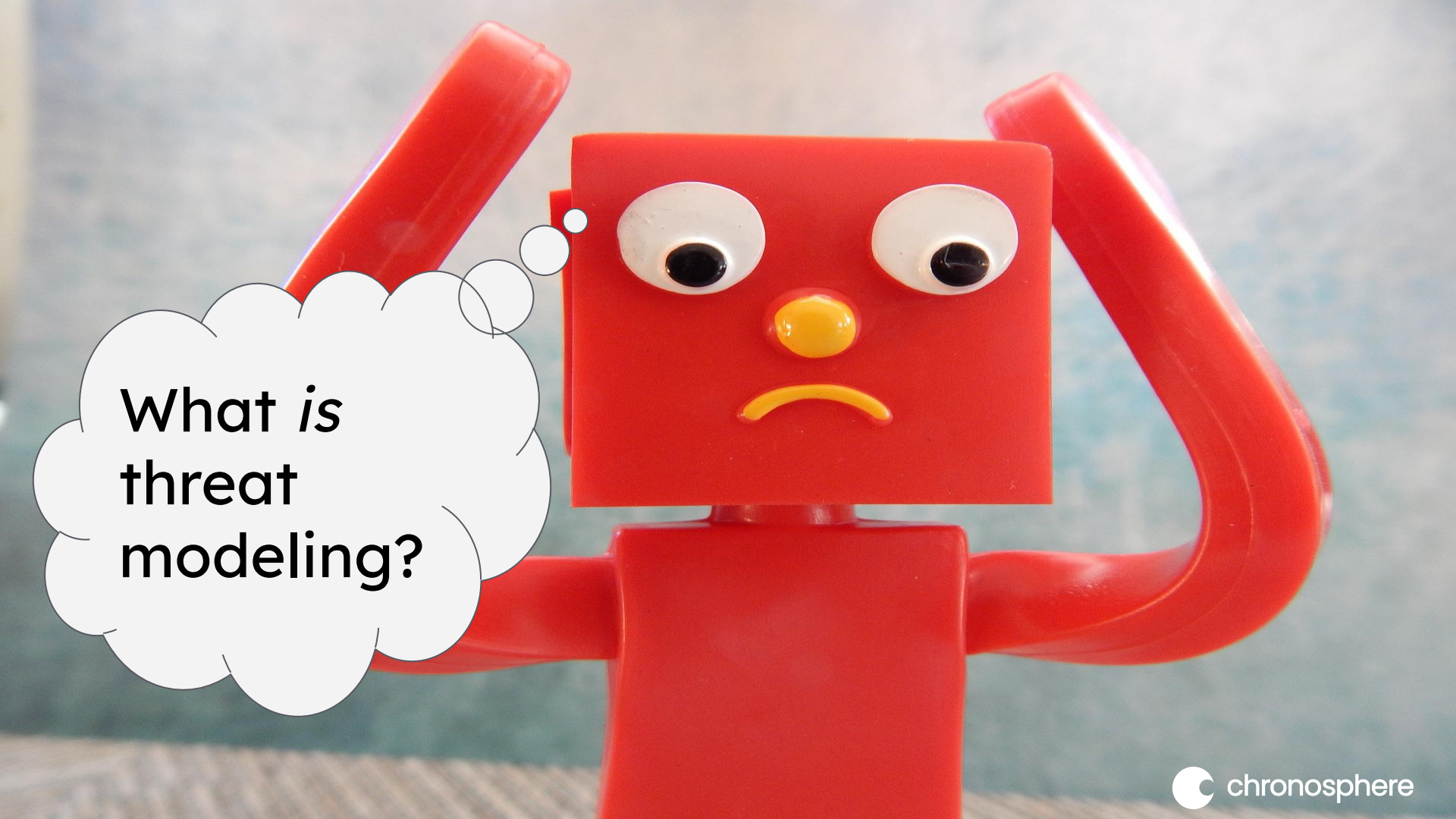
Warning

Do not use endoscopy equipment to steal chocolate from this vending machine.


What *is* threat modeling?
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The Official ™ Definition

*A structured process to **identify** security requirements, pinpoint threats and potential vulnerabilities, **quantify** threat and vulnerability criticality and **prioritize** remediation methods.*

Real World Definition

“

Threat modeling is a *conversation.*

- Matthew Coles

  Sr Principal Product Security Eng @ Dell

Guiding Questions

What are we working on?

Guiding Questions

What are we working on?

What can go wrong?

Guiding Questions

What are we working on?

What can go wrong?

What are we going to do about it?

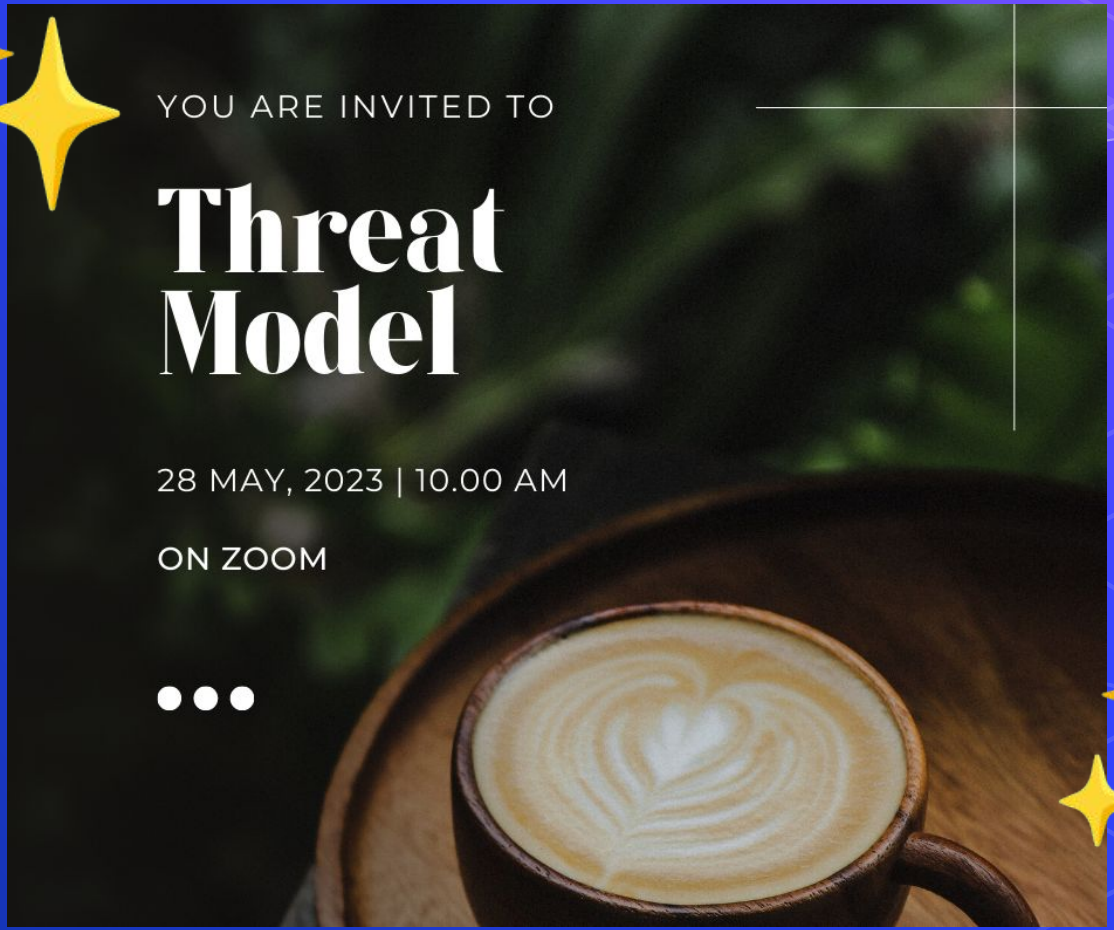
Guiding Questions

What are we working on?

What can go wrong?

What are we going to do about it?

Did we do a good enough job?



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Architect

Software Developer

Architect

Software Developer

Customer Support

Architect

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Architect

Software Developer

Customer Support

Quality Assurance (QA)

Architect

Software Developer

Customer Support

Quality Assurance (QA)

Tech Writer


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Threat Modeling in the *Cloud*

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Which make up the top 3 cloud threats?

- Weak Control Plane
- Account Hijacking
- Data Breaches
- Insufficient IAM and Key Management
- Metastructure + Applistructure Failures
- Abuse + Nefarious Use of Cloud Services
- Insecure Interfaces + APIs
- Insider Threat
- Misconfiguration and Inadequate Change Control
- Lack of Cloud Security Architecture + Strategy
- Limited Cloud Usage Visibility

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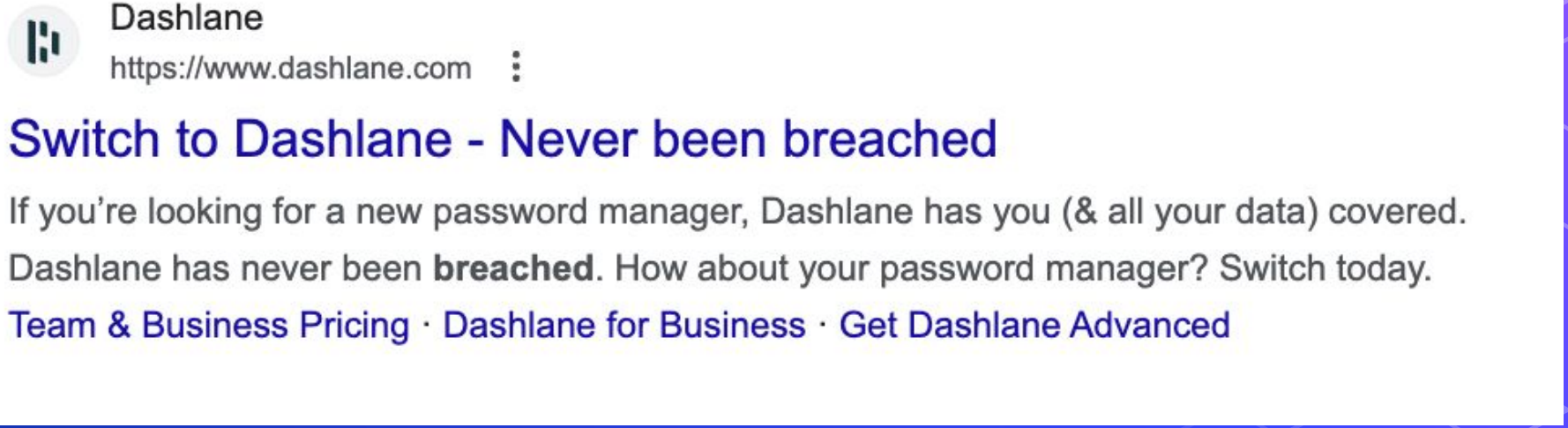
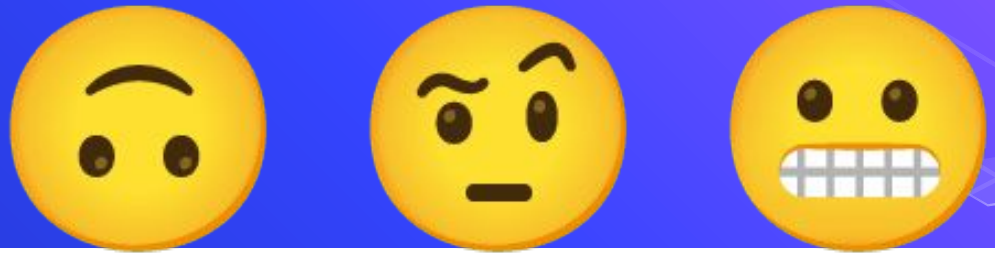
IT'S NOT A DATA BREACH
IT'S A SURPRISE BACKUP


Dashlane
https://www.dashlane.com
Switch to Dashlane - Never been breached
If you're looking for a new password manager, Dashlane has you (& all your data) covered.
Dashlane has never been **breached**. How about your password manager? Switch today.
Team & Business Pricing · Dashlane for Business · Get Dashlane Advanced



Dashlane

https://www.dashlane.com

Switch to Dashlane - Never been breached

If you're looking for a new password manager, Dashlane has you (& all your data) covered. Dashlane has never been **breached**. How about your password manager? Switch today.

Team & Business Pricing · Dashlane for Business · Get Dashlane Advanced

“If Defendant had disclosed the full extent of the breach in August **instead of waiting months**, Plaintiff/Class would have been on heightened alert and changed passwords to avoid theft that ensued.”


A MISCONFIGURED FIREWALL
imgflip.com

rsync

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I DON'T ALWAYS THINK ABOUT CYBERSECURITY
BUT WHEN I DO, IT'S USUALLY TOO LATE
memegenerator.net

accenture

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Egregious Eleven
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Case Study

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> While Argo services often support various risk or threat prevention methods, these are frequently **under-documented** or are provided on an **opt-in** basis rather than default

- Argo Project Threat Model

README.md

example

an example GitHub repository

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Minimal Service Documentation: Argo

Argo Workflows Findings

Argo Workflows is an engine for creating and managing multi-step workflows. Workflow steps are defined in their own containers. Like Argo CD, Argo Workflows depends on an API server that users access via a Web UI or CLI utility for creating and managing workflows. The API also serves as an authentication endpoint.

Within Kubernetes, Argo Workflows is defined as a set of Kubernetes CRDs, and each workflow is a custom Kubernetes resource that resides in the user namespace. Workflows can be started via API requests, webhooks, or cron jobs. Requests are then forwarded to the workflow-controller, which monitors the workflow namespace for changes and executes tasks accordingly. After a workflow has been completed, a copy of the workflow is made and stored in an SQL database. Produced artifacts are stored in services like s3 and MinIO.

Threat Modeling and You ✨

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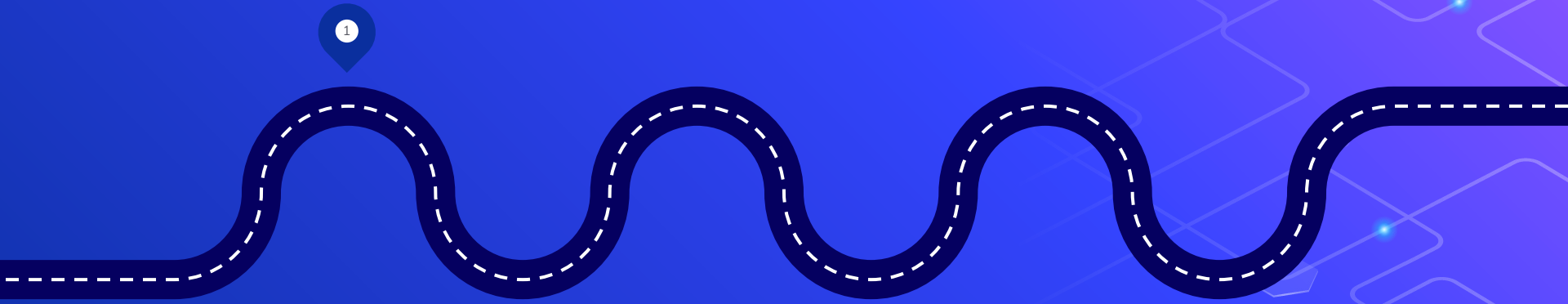
Identify 1 feature or service to begin threat modeling



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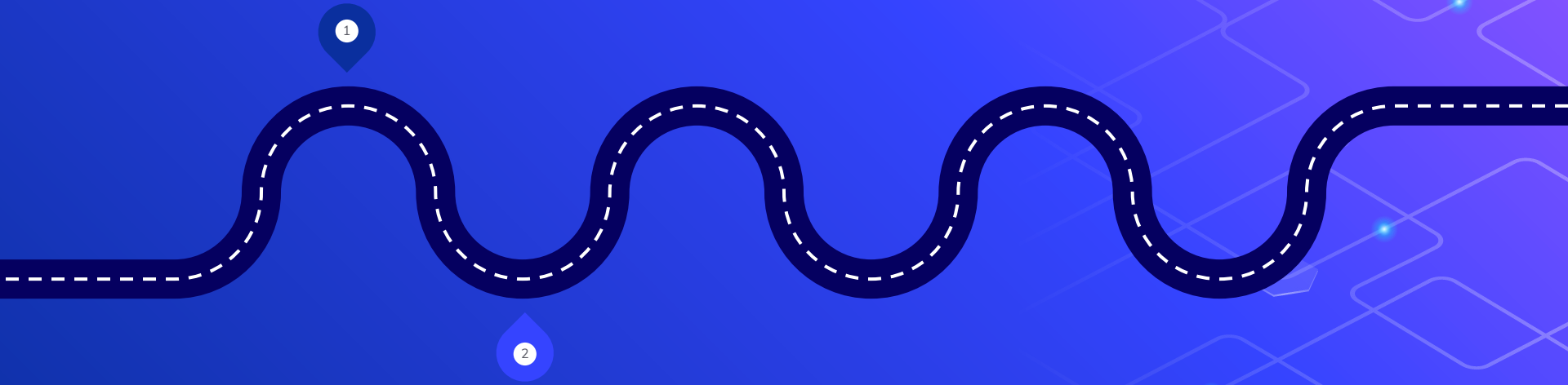

Schedule a meeting. Agenda: The 4 Guiding Questions

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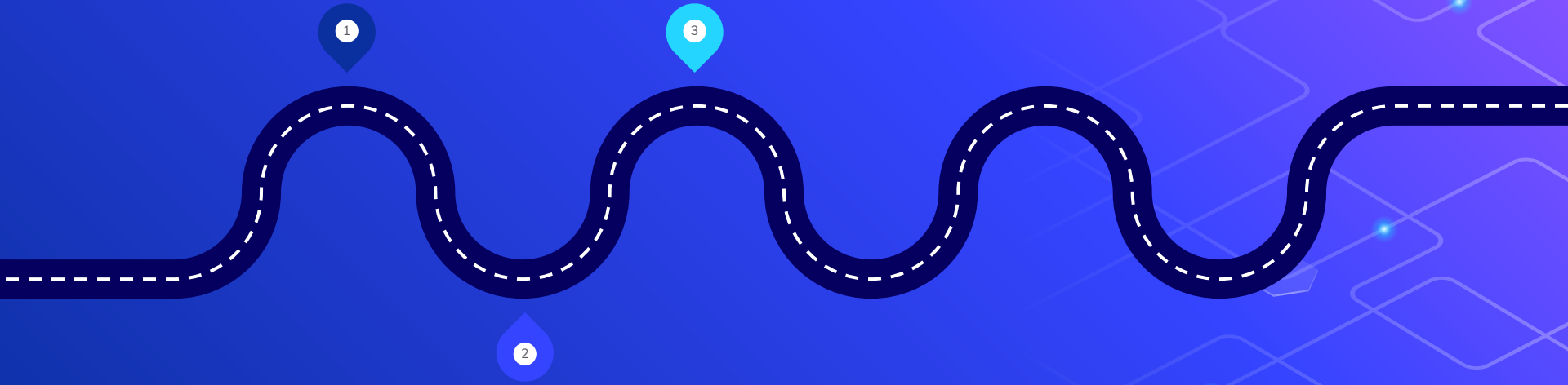
Identify 1 feature or service to begin threat modeling

Send pre-read of the Threat Modeling Manifesto



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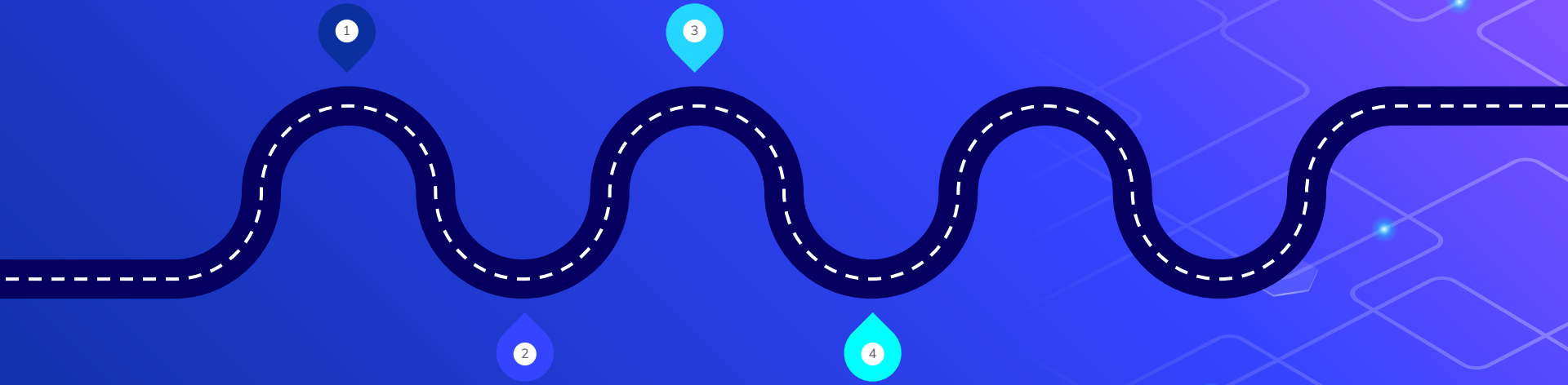

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Ensure minimal service documentation

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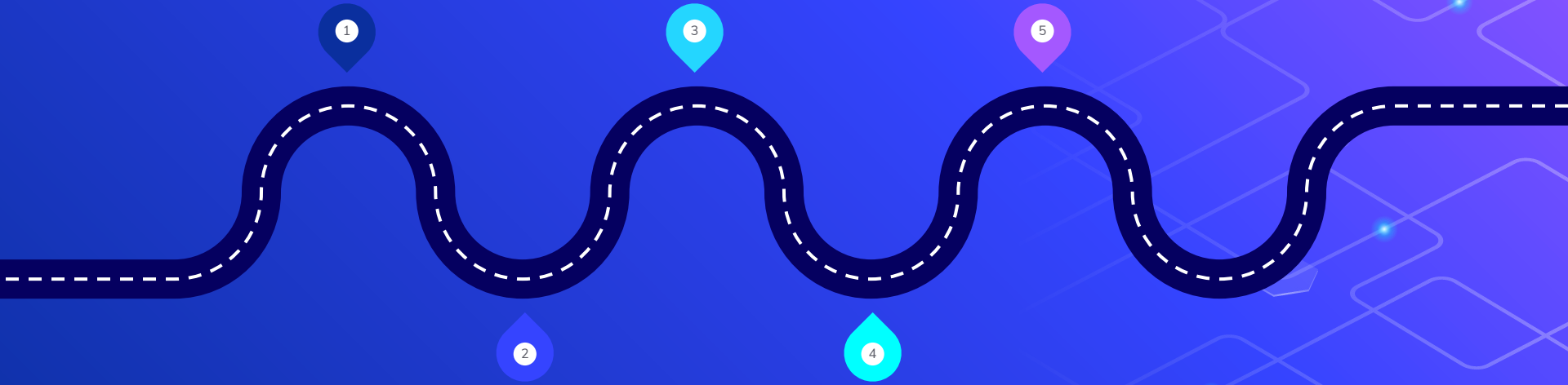
Assign a scribe and facilitator for the meeting



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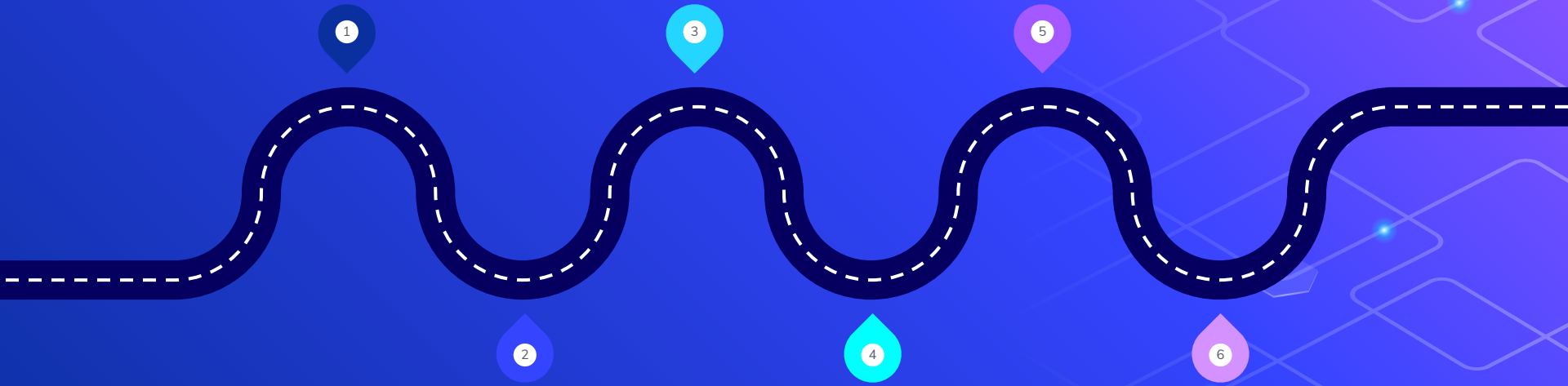

Schedule a meeting. Agenda: The 4 Guiding Questions

Ensure minimal service documentation

Rinse and repeat

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Case Study

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2019 Data Exposure

Threat Modeling is a *conversation*

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Further Resources

- Threat Modeling Manifesto
- OWASP Top Ten Web App Security Risks
- Hiding Malware in Docker Desktop <- srsly a hilarious and informative read
- MITRE ATT&CK adversarial knowledge base 101 blog post

Minimal Service Documentation

- How does the service work?
- Are there any subcomponents or shared boundaries?
- What communication protocols does it use?
- Where does it store data?
- What is the most sensitive data it stores?

Egregious Eleven

1. **Data Breaches**
2. **Misconfiguration and Inadequate Change Control**
3. **Lack of Cloud Security Architecture + Strategy**
4. Insufficient IAM and Key Management
5. Account Hijacking
6. Insider Threat
7. Insecure Interfaces + APIs
8. Weak Control Plane
9. Metastructure + Applistructure Failures
10. Limited Cloud Usage Visibility
11. Abuse + Nefarious Use of Cloud Services

Let’s Chat

@ CNCF Booth G3

Friday, 2:20 - 3:20

paigerduty.com

- @chronosphere.io
- @hachyderm.io

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