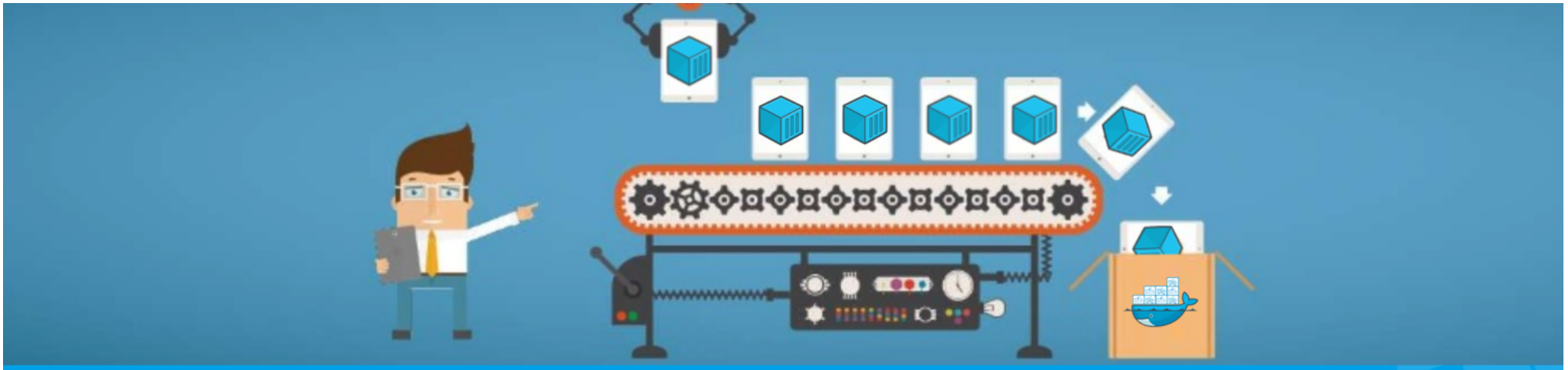

Digital transformation towards microservices on multi-cloud: how to remove the anxiety

Manuel Schuller

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@myDevOpsExpert

Let me briefly introduce myself…

Manuel Schuller,
DevOps Institute Ambassador

Digital transformation towards microservices on multi-cloud: How to remove the anxiety

Companies are transforming. Transforming towards what exactly? Sometimes the answer is “towards complexity, towards anxiety … because we do not know exactly. In this session, learn how to mitigate anxiety with adequate principles and tools.

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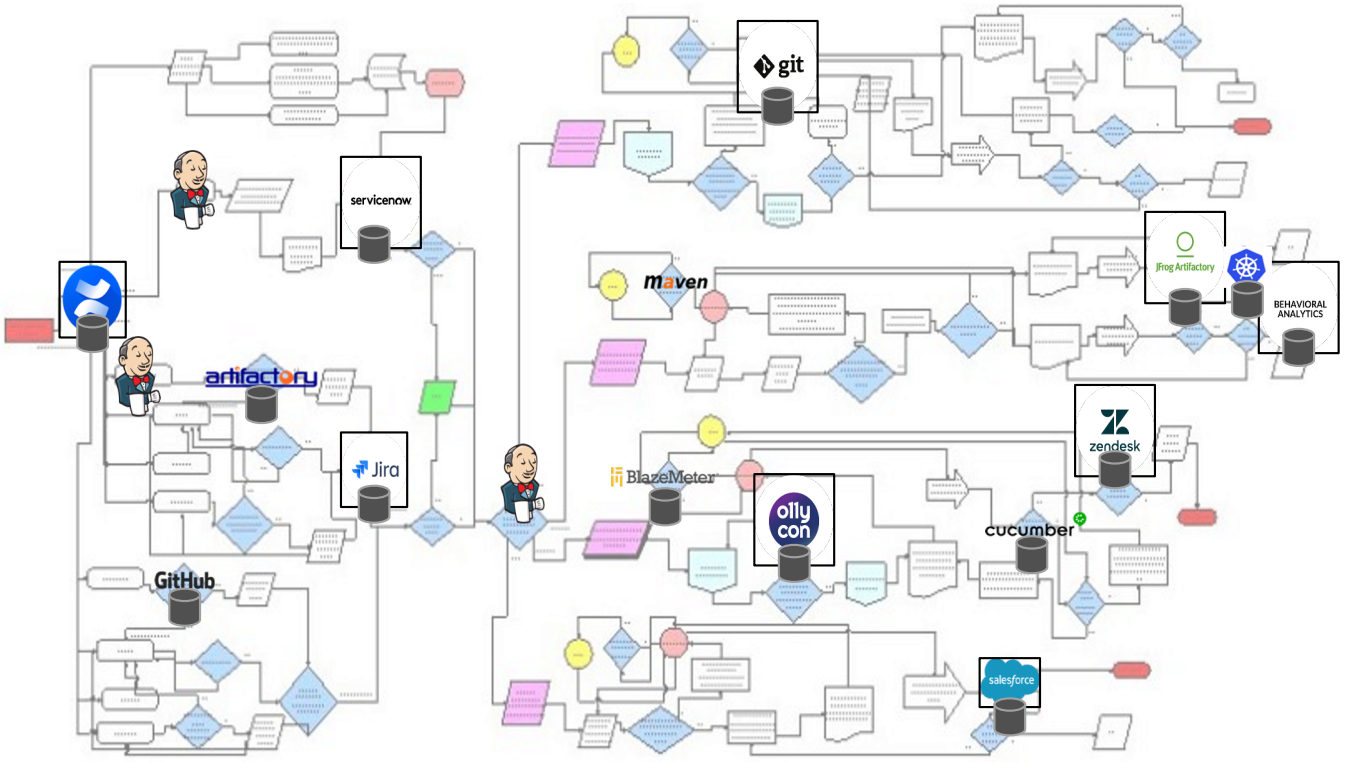
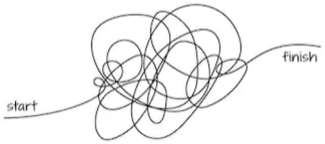
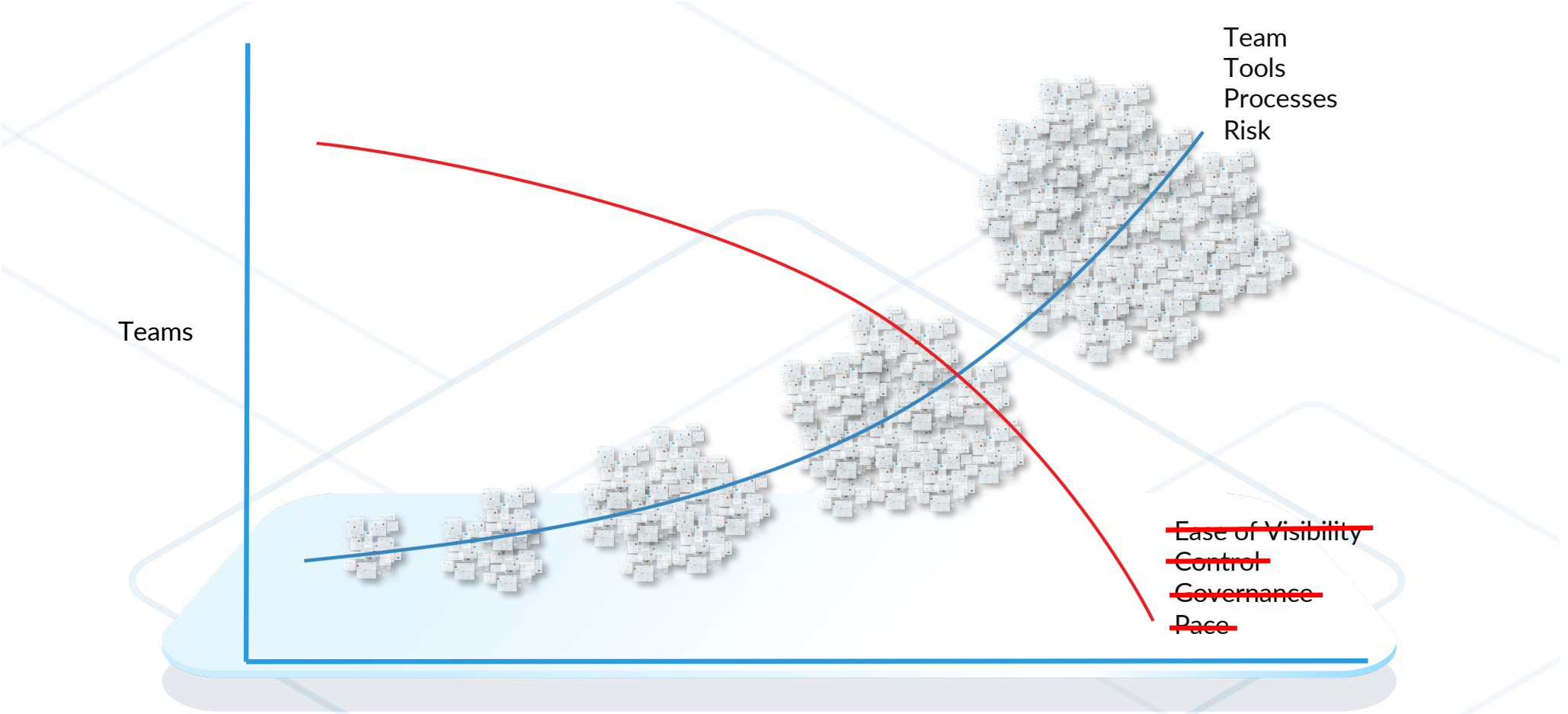
The problem is… building and releasing software is complicated.



THERE IS DISCONNECT!

artifactory Visual Studio ca technologies git
SUBVERSION eclipse GitHub IBM Rational
Nexus Stash mercurial
PERFORCE
maven VAGRANT Gant
gradle docker ANSIBLE
CHEF puppet labs SALTSTACK

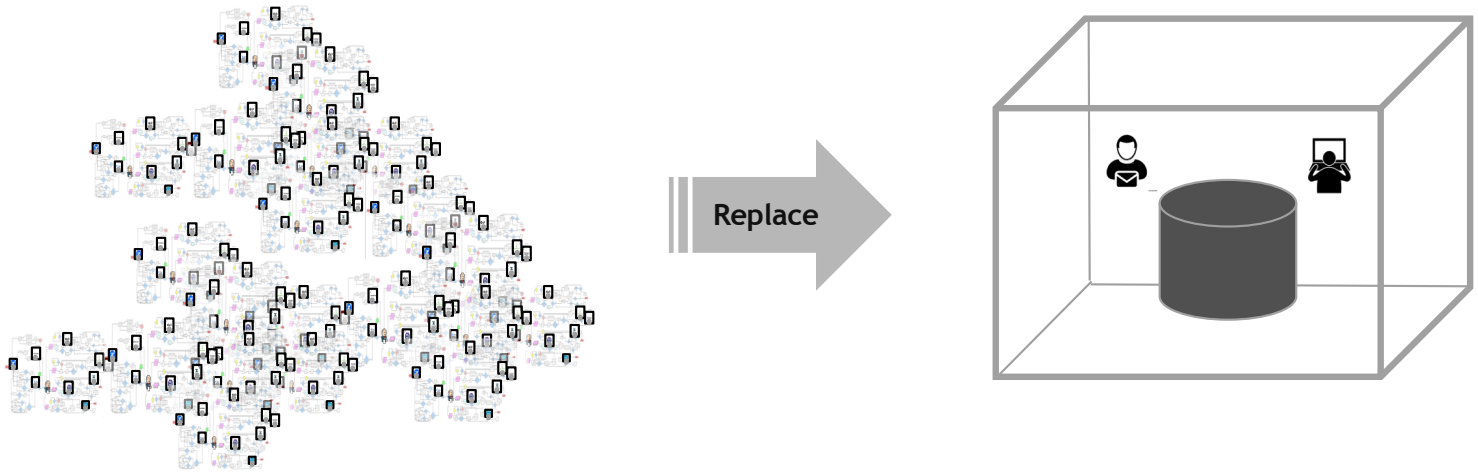




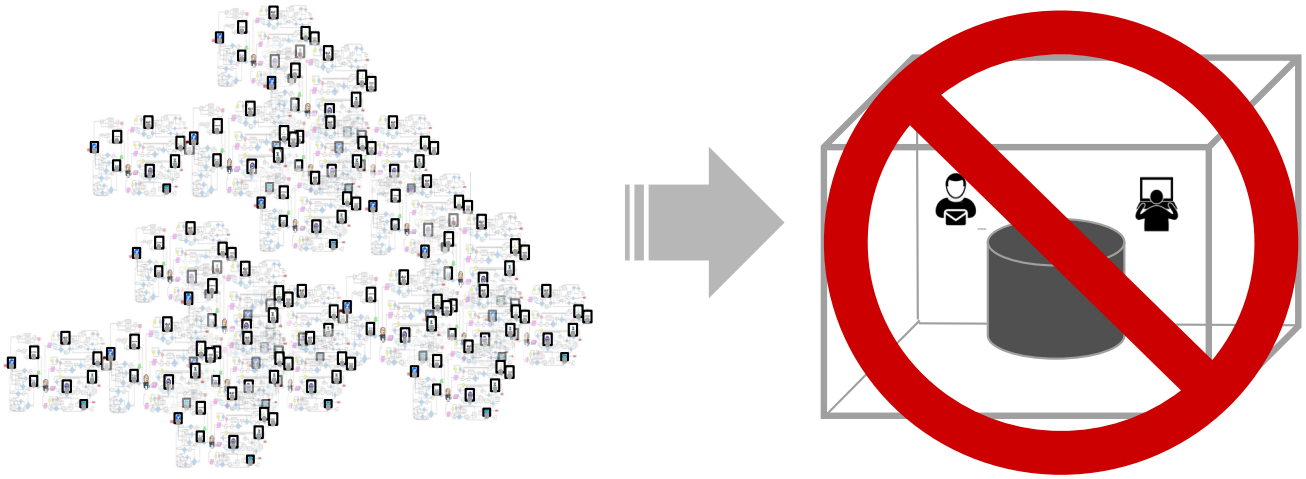
Scale and Complexity Exacerbate the Disconnect, and Break Traditional Tools and Methods

Some might tell you the solution is…

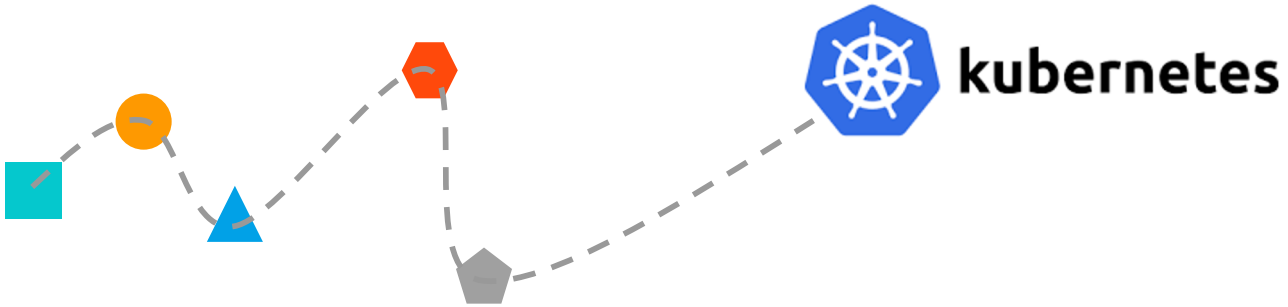
…replace with one giant all-in-one system.



But it’s a devops and software anti-pattern

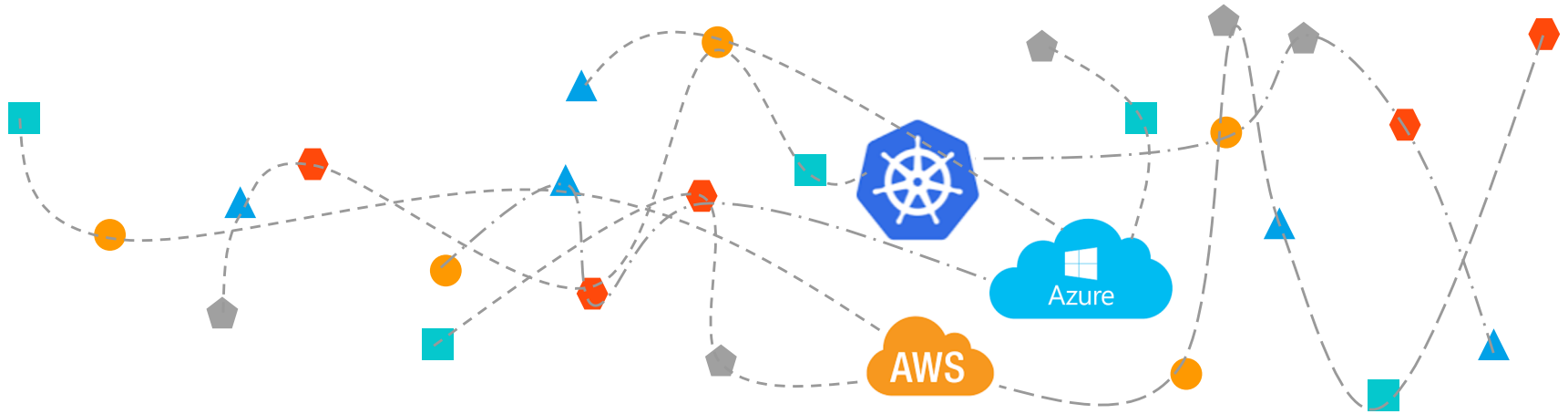


In a Perfect World...



= Various DevOps Tooling (eg, Jira, Jenkins, HPQC, Selenium)

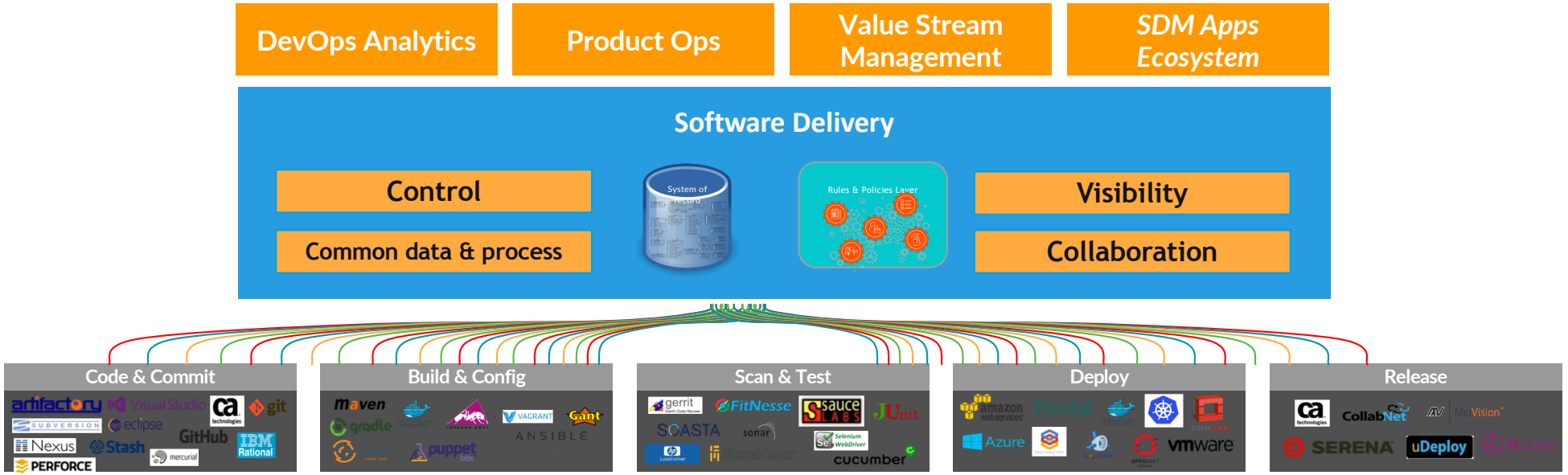
But In Reality...



= Various DevOps Tooling (eg, Jira, Jenkins, Nexus, Selenium)

What's better and more realistic …

But add above



Embrace not replace

2019 Definition

Building a combination of **deployment automation**, **pipeline and environment management**, and **release orchestration** capabilities to simultaneously improve the quality, velocity and governance of application releases. These tools enable enterprises to scale release activities across multiple, diverse and multigenerational teams (e.g. DevOps), technologies (from legacy to traditional to microservices), development methodologies (agile, etc.), delivery patterns (e.g. continuous), pipelines, processes and their supporting toolchains...

Three Key Ingredients

Deployment Automation & Environment Management

Predictably deploy applications and microservices to any environment, at any scale.

Pipeline Management & Release Orchestration

Manage release pipelines and dependencies across all teams, DevOps tools, and environments

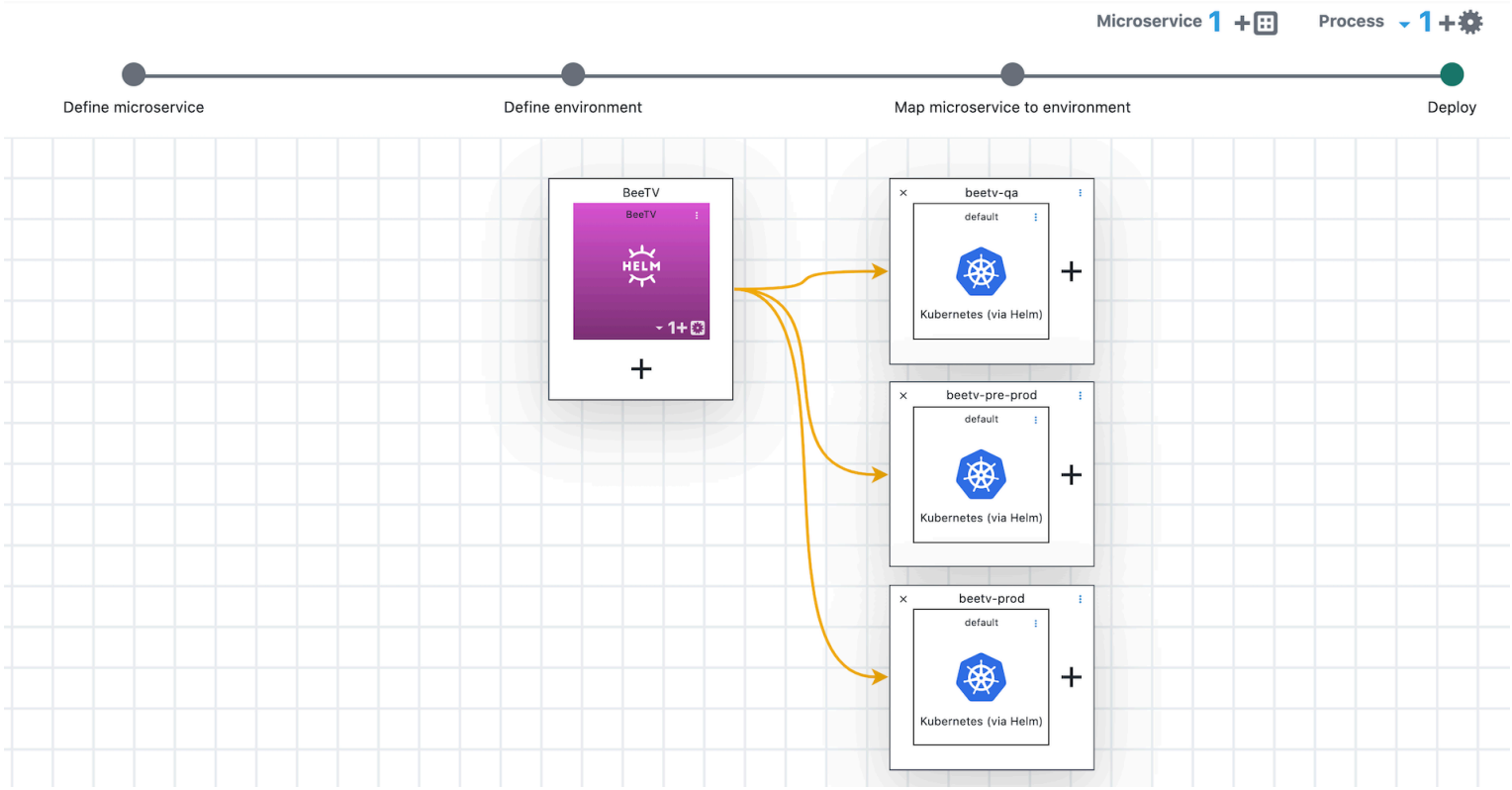
VSM

Track progress and identify patterns with 360º visibility into metrics across software supply chain.

Decouple Decouple Decouple Decouple Decouple

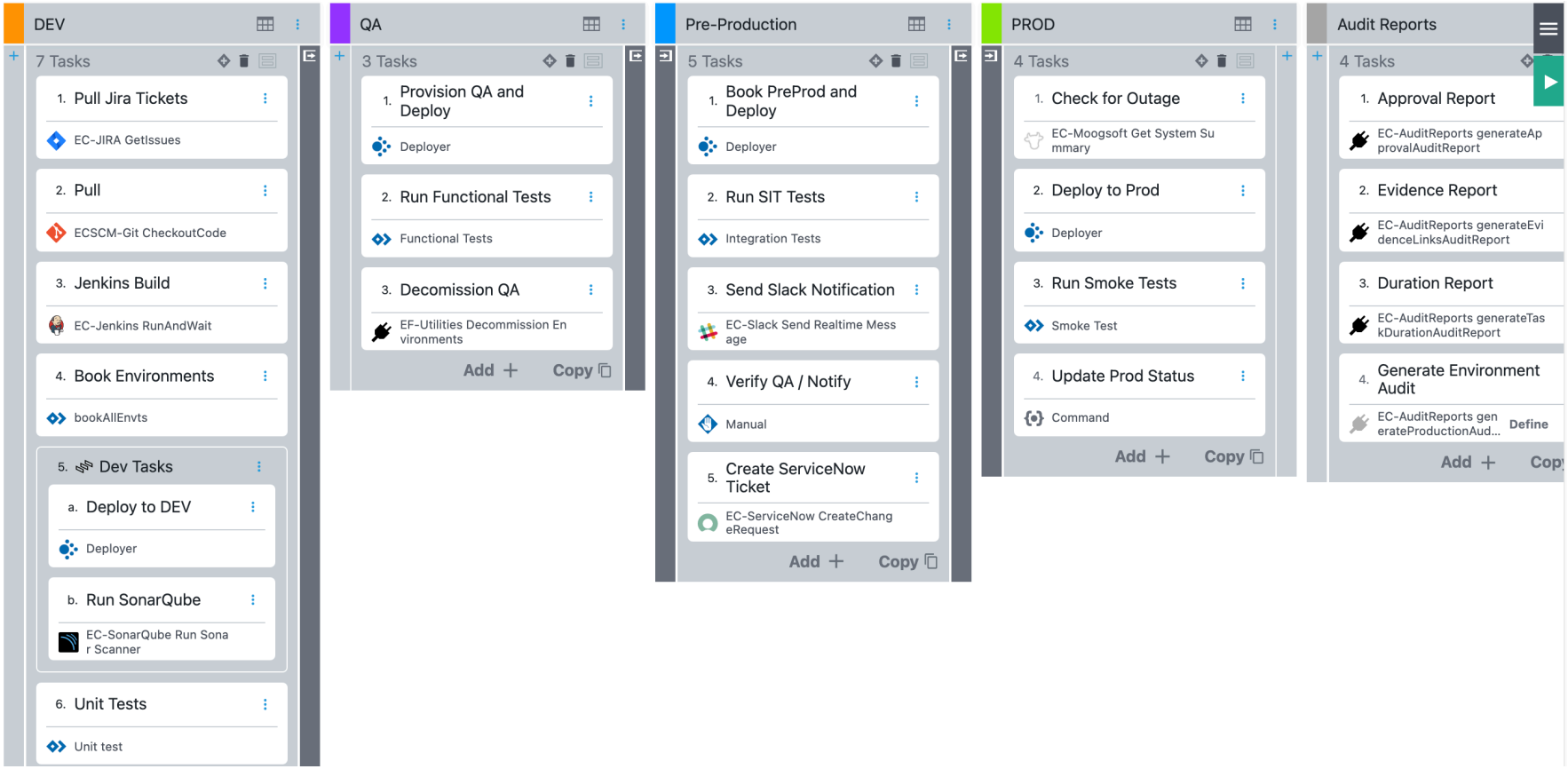
Deployment Automation & Environment Management

Predictably deploy applications and microservices to any environment, at any scale.



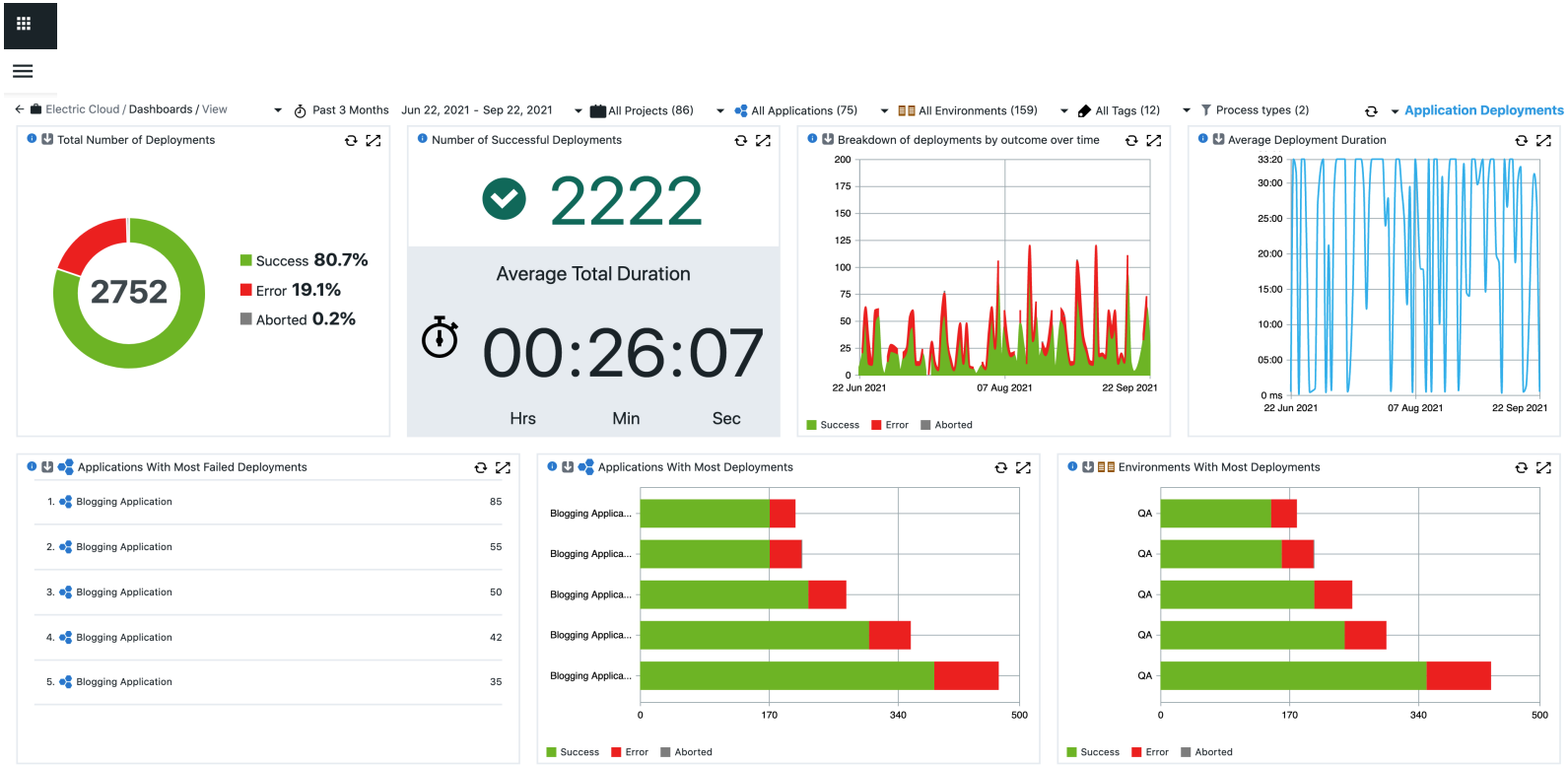
Pipeline Management & Release Orchestration

Manage release pipelines and dependencies across all teams, DevOps tools, and environments



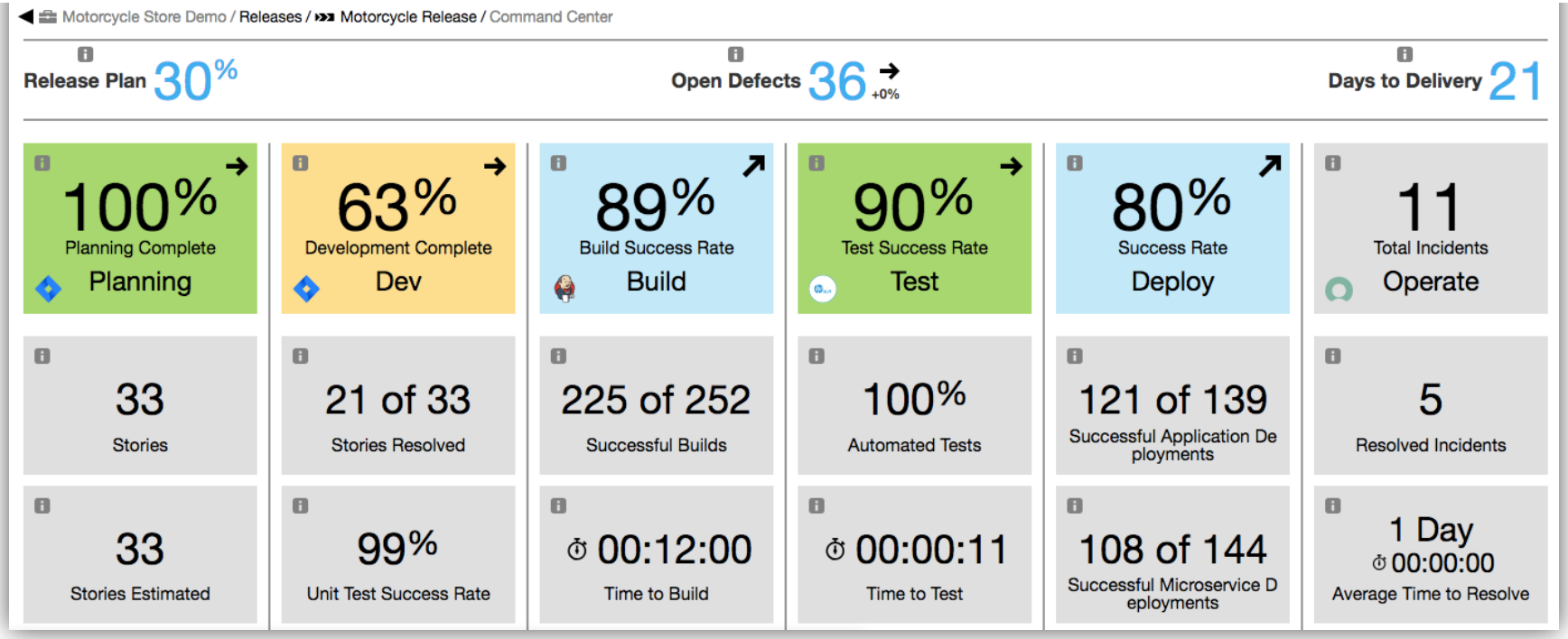
Insight

Track progress and identify patterns with 360º visibility into metrics across DevOps processes



Insight

Value stream



Insight

Production Audit Report

General Information

Label	Value
AWS_REGION	us-east-2
BUILD_ID_NUM	9766
CURRENT_APP_VERSION	1.2.1
CURRENT_RELEASE	2
CURRENT_VERSION	1

Microservice Information

MICROSERVICE	ARTIFACT_DIR	CURRENT_BUILD	CURRENT_IMAGE_TAG	DEPLOYMENT_TYPE	SCHEDULER_ORCH	SCM_USER	IMAGE_REPOSITORY	PULL_DIR	REGISTRY_TYPE	REGISTRY_VALUE	SCM_COMMENT	SCM_LAST_COMMIT	SCM_TYPE	SCM_ADDR
CARTS	/builds3/carts	160	1.2.159	CONTAINER	KUBERNETES	elektrikTomcat	carts	/builds3	AMAZON ECR REGISTRY	731977058523.dkr.ecr.us-east-2.amazonaws.com	Changed cart color	2017-06-13 04:03:07+00:00	GITHUB	https://github.com/elektrikTomcat/carts.git
CARTS-DB			latest	CONTAINER	KUBERNETES		mongo		DOCKER HUB					
CATALOGUE	/builds3/catalogue	157	1.2.156	CONTAINER	KUBERNETES	elektrikTomcat	catalogue	/builds3	AMAZON ECR REGISTRY	731977058523.dkr.ecr.us-east-2.amazonaws.com	Added merchandise item	2017-06-14 05:02:47+00:00	GITHUB	https://github.com/elektrikTomcat/catalogue.git
CATALOGUE-DB	/builds3/catalogue	149	1.2.1	CONTAINER	KUBERNETES	elektrikTomcat	catalogue-db	/builds3	AMAZON ECR REGISTRY	731977058523.dkr.ecr.us-east-2.amazonaws.com	Initial commit	2017-06-14 05:32:48+00:00	GITHUB	https://github.com/elektrikTomcat/catalogue.git
FRONT-END	/builds3/front-end	201	1.2.200	CONTAINER	KUBERNETES	elektrikTomcat	front-end	/builds3	AMAZON_ECR_REGISTRY	731977058523.dkr.ecr.us-east-2.amazonaws.com	Changed banner color, carousel pics	2017-08-08 10:53:28+00:00	GITHUB	https://github.com/elektrikTomcat/front-end.git
ORDERS	/builds3/orders	157	1.2.156	CONTAINER	KUBERNETES	elektrikTomcat	orders	/builds3	AMAZON ECR REGISTRY	731977058523.dkr.ecr.us-east-2.amazonaws.com	Added calculator functionality	2017-06-24 10:32:06+00:00	GITHUB	https://github.com/elektrikTomcat/orders.git
ORDERS-DB			latest	CONTAINER	KUBERNETES		mongo		DOCKER HUB					
PAYMENT	/builds3/payment	153	1.2.152	CONTAINER	KUBERNETES	elektrikTomcat	payment	/builds3	AMAZON ECR REGISTRY	731977058523.dkr.ecr.us-east-2.amazonaws.com	Added foreign currency	2017-06-16 04:12:41+00:00	GITHUB	https://github.com/elektrikTomcat/payment.git
QUEUE-MASTER	/builds3/queue-master	152	1.2.151	CONTAINER	KUBERNETES	elektrikTomcat	queue-master	/builds3	AMAZON ECR REGISTRY	731977058523.dkr.ecr.us-east-2.amazonaws.com	Modified exisiting queue	2017-06-19 11:00:58+00:00	GITHUB	https://github.com/elektrikTomcat/queue-master.git
RABBITMQ			3.6.8	CONTAINER	KUBERNETES		rabbitmq		DOCKER HUB					
SHIPPING	/builds3/shipping	154	1.2.153	CONTAINER	KUBERNETES	elektrikTomcat	shipping	/builds3	AMAZON ECR REGISTRY	731977058523.dkr.ecr.us-east-2.amazonaws.com	Modified shipping calculator	2017-06-22 01:30:02+00:00	GITHUB	https://github.com/elektrikTomcat/shipping.git
USER	/builds3/user	157	1.2.151	CONTAINER	KUBERNETES	elektrikTomcat	user	/builds3	AMAZON ECR REGISTRY	731977058523.dkr.ecr.us-east-2.amazonaws.com	Added Oauth	2017-06-20 02:02:08+00:00	GITHUB	https://github.com/elektrikTomcat/user.git
USER-DB	/builds3/user	158	1.2.10	CONTAINER	KUBERNETES	elektrikTomcat	user-db	/builds3	AMAZON ECR REGISTRY	731977058523.dkr.ecr.us-east-2.amazonaws.com	Updated db schema	2017-06-12 05:33:59+00:00	GITHUB	https://github.com/elektrikTomcat/user.git
ZIPKIN			latest	CONTAINER	KUBERNETES		zipkin		DOCKER HUB	openzipkin				
ZIPKIN-CRON			1.4.0	CONTAINER	KUBERNETES		zipkin-dependencies		DOCKER HUB	openzipkin				
ZIPKIN-DB			1.20.0	CONTAINER	KUBERNETES		zipkin-mysql		DOCKER HUB	openzipkin				

Insight

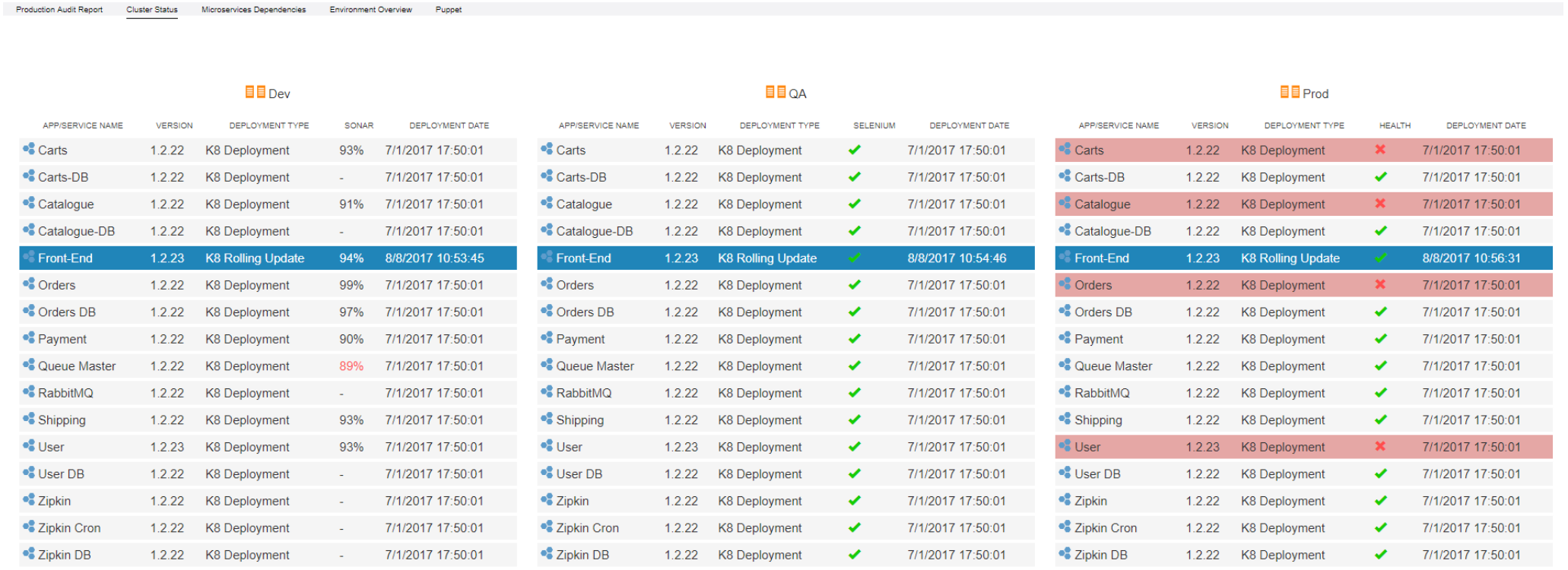
Environment Inventory Report

Search Filter:

Store	Current Inventory/Version	Inventory Deployment History Details - Date Deployed (Default)
104th Avenue-6024	oe 1.1 · oe-dtf 2.2 · voltage 2.2 · path 2.0 · ccm 1.0	oe version: 1.1 2017-10-04T18:50:38.660Z · oe-dtf version: 2.2 2017-10-04T18:50:39.066Z · voltage version: 2.2 2017-10-04T18:50:39.434Z · path version: 2.0 2017-10-04T18:50:39.760Z · ccm version: 1.0 2017-10-04T18:50:40.171Z
Albuquerque-7194	voltage 2.0 · oe-dtf 2.2 · oe 1.1 · path 2.2 · ccm 1.1	voltage version: 2.0 2017-10-04T18:50:51.900Z · oe-dtf version: 2.2 2017-10-04T18:50:52.204Z · oe version: 1.1 2017-10-04T18:50:52.414Z · path version: 2.2 2017-10-04T18:50:52.646Z · ccm version: 1.1 2017-10-04T18:50:52.841Z
Augusta-7209	oe-dtf 2.1 · path 2.2 · voltage 2.2 · oe 2.2 · ccm 2.0	oe-dtf version: 2.1 2017-10-04T18:51:09.930Z · path version: 2.2 2017-10-04T18:51:10.229Z · voltage version: 2.2 2017-10-04T18:51:10.480Z · oe version: 2.2 2017-10-04T18:51:10.664Z · ccm version: 2.0 2017-10-04T18:51:10.811Z
Austin South-7190	oe-dtf 2.2 · path 1.0 · oe 1.1 · voltage 2.2 · ccm 2.2	oe-dtf version: 2.2 2017-10-04T18:51:30.364Z · path version: 1.0 2017-10-04T18:51:30.671Z · oe version: 1.1 2017-10-04T18:51:30.821Z · voltage version: 2.2 2017-10-04T18:51:30.997Z · ccm version: 2.2 2017-10-04T18:51:31.172Z
Austin-7154	oe-dtf 2.2 · oe 2.1 · path 2.0	oe-dtf version: 2.2 2017-10-04T18:51:45.812Z · oe version: 2.1 2017-10-04T18:51:46.092Z · path version: 2.0 2017-10-04T18:51:46.258Z
Bakersfield-7281	path 2.0	path version: 2.0 2017-10-04T18:52:01.858Z
Baton Rouge-7187	voltage 1.1 · path 2.1 · ccm 1.1	voltage version: 1.1 2017-10-04T18:52:26.520Z · path version: 2.1 2017-10-04T18:52:26.930Z · ccm version: 1.1 2017-10-04T18:52:27.105Z
Beverton-7164	ccm 1.0 · oe 1.1 · path 2.0	ccm version: 1.0 2017-10-04T18:52:47.115Z · oe version: 1.1 2017-10-04T18:52:47.511Z · path version: 2.0 2017-10-04T18:52:47.696Z
Birmingham-7224	voltage 2.0 · path 2.0 · ccm 1.1 · oe 1.1	voltage version: 2.0 2017-10-04T18:53:10.171Z · path version: 2.0 2017-10-04T18:53:10.476Z · ccm version: 1.1 2017-10-04T18:53:10.796Z · oe version: 1.1 2017-10-04T18:53:10.992Z
Boynton Beach-7113	voltage 2.0 · oe-dtf 2.1 · path 2.2 · ccm 2.0	voltage version: 2.0 2017-10-04T18:53:30.698Z · oe-dtf version: 2.1 2017-10-04T18:53:30.953Z · path version: 2.2 2017-10-04T18:53:31.252Z · ccm version: 2.0 2017-10-04T18:53:31.427Z
Bradenton CBC-7955	oe 1.1 · voltage 2.0 · path 2.0	oe version: 1.1 2017-10-04T18:53:48.918Z · voltage version: 2.0 2017-10-04T18:53:49.309Z · path version: 2.0 2017-10-04T18:53:49.508Z
Brandywine-7257	oe 2.1 · oe-dtf 2.2 · path 2.0	oe version: 2.1 2017-10-04T18:54:09.297Z · oe-dtf version: 2.2 2017-10-04T18:54:09.576Z · path version: 2.0 2017-10-04T18:54:09.754Z
Brooklyn Park-6008	oe-dtf 2.2 · path 2.2 · oe 2.1 · voltage 2.1 · ccm 2.1	oe-dtf version: 2.2 2017-10-04T18:45:00.349Z · path version: 2.2 2017-10-04T18:45:00.541Z · oe version: 2.1 2017-10-04T18:45:00.696Z · voltage version: 2.1 2017-10-04T18:45:00.997Z · ccm version: 2.1 2017-10-04T18:45:01.215Z

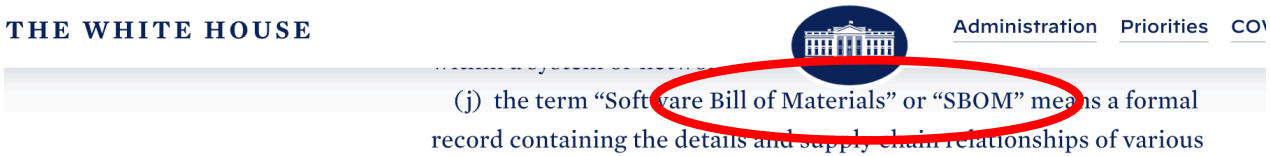
Insight

Track progress and identify patterns with 360º visibility into metrics across DevOps processes



Secure and Notarize

BoM is back (especially since May 12th)!



(j) the term "Software Bill of Materials" or "SBOM" means a formal record containing the details and supply chain relationships of various components used in building software. Software developers and vendors often create products by assembling existing open source and commercial software components. The SBOM enumerates these components in a product. It is analogous to a list of ingredients on food packaging. An SBOM is useful to those who develop or manufacture software, those who select or purchase software, and those who operate software. Developers often use available open source and third-party software components to create a product; an SBOM allows the builder to make sure those components are up to date and to respond quickly to new vulnerabilities. Buyers can use an SBOM to perform vulnerability or license analysis, both of which can be used to evaluate risk in a product. Those who operate software can use SBOMs to quickly and easily determine whether they are at potential risk of a newly discovered vulnerability. A widely used, machine-readable SBOM format allows for greater benefits through automation and tool integration. The SBOMs gain greater value when collectively stored in a repository that can be easily queried by other applications and systems. Understanding the supply chain of software, obtaining an SBOM, and using it to analyze known vulnerabilities are crucial in managing risk.

Typical use cases for the BoM

Automation

- Deploying and releasing software

Compliance

- Know what has been released
- Review, audit, cross-organization

Security

- Assessment, audit, DevSecOps automation

Understand the complexity

… and, like Unix' YACC (Yet another compiler-compiler) in 1975, BoM could be described as YAAA (Yet another artifact-artifact)!

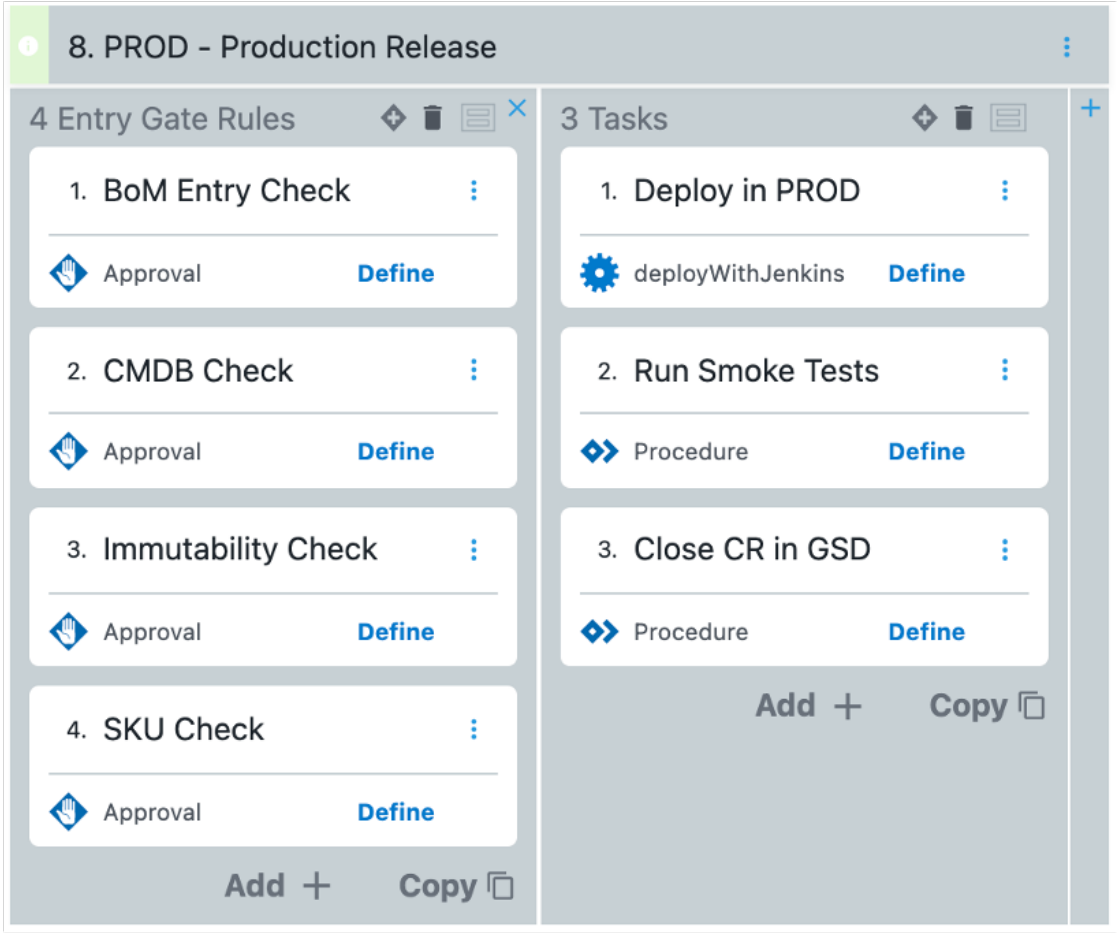
How DevOps principles can help

Continuous Integration - executes a set of steps that integrate the solution on a regular basis, ideally upon each change: typically upon check-in, a set of tests are executed that validates the process. From a software BoM perspective CI can also update the BoM with the current build, and then push a working version to an escrow repository owned and operated by the 3rd parties.

Continuous Delivery - delivers software in a working state on a frequent basis. In this sense the escrow can just be another deployment target to deploy the outputs to, albeit probably not actively spinning up infrastructure on the 3rd party fabric.

Containers - a straightforward way to package and deliver! But also the ability to quickly recreate a specific environment, ensuring the ability to recreate any product release build, hence that any app can be rebuilt.

Application Release Pipeline, stage: PROD

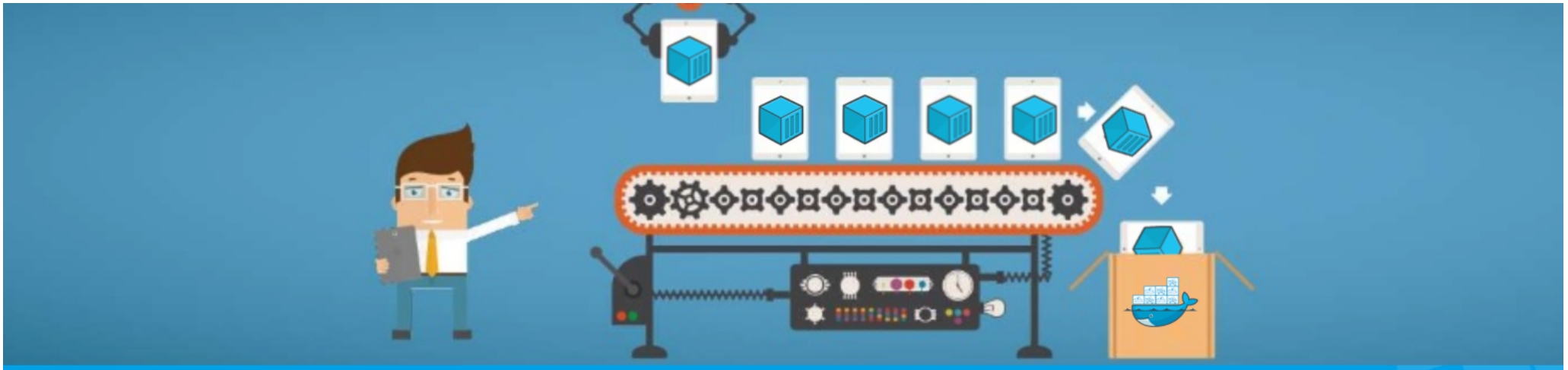


BoM: Single Source Of Software Delivery Truth

Where BoM (**B**ill **o**f **M**aterial) was meant to describe how a software was ***built***, is has now become how the software is ***released*** (***Delivered***)***.***

- Which, at the end of the day, is just an extension of the notion
- Extension which is comparable to audit and compliance evolutions over time
- Focused on Software Delivery Security (or *how to secure my supply chain*)
- Typically escrowed (just like you do at your notary)

Where BoM was made of *sources*, it is now also made of *results*, because results *will* change over time. BoM, as a consequence, depends on the time it is generated, and has become an artifact



Digital transformation towards microservices on multi-cloud: how to remove the anxiety

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Thank you!

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