

Sysdig Technology Preview - CI/CD and IaC

Mateo Burillo - Sysdig Secure Product Manager



(New) Vulnerability Management



New Image Analysis

	Scan Results (PREVIEW) > mon(Base OS: © alpine 3.11.12	go-express 👒 0.54.0 🖻			Scanned on February 15, 2022 2:11 PM
😵 Insights	Overview Vulnerabilities Content	Policies Detail			
🕑 Scanning					
Posture	Fixable Packages by Severity		View all	Vulnerabilities	View all
(+) Policies	Package and version	Suggested Fix Vulnerabilities		26	
ခင်္တီ Network	mongodb-query-parser 1.4.3	2.0.0		Detected	
C Events	busybox 1.31.1-r10	1.31.1-r11 - 9 1 -		4 Critical 2 Fixable	
[0] Investigate	ssl_client 1.31.1-r10	1.31.1-r11 9 1		18 High 18 Fixable	
«	bson 1.0.9	1.1.4 1		4 Medium	
	minimist 0.0.10	0.2.1	1 Exploit	0 Low	
				0 Negligible	
				U Fixable	
	Policy Evaluations		View all		
C Integrations	Policy Evaluation	Rule failings			
😥 Get Started	Sysdig Best Practices	Vulnerabilities 65			
Mateo Burillo Secure Team (Ca					
Chat with Us					



Highlights!

- Way faster: 8x on average, over a large dataset bench
- Binary scanner, trivial to embed
 - Self contained golang binary
- Additional vulnerability data
 - CVSS v3 and v2, break down displaying the risk factors
 - Public exploit available and PoC code
 - Fix date, Vuln added date, Exploit Date
 - Multiple feeds reporting on this particular vulnerability



The Road to risk and remediation

- Now we are faster, provide more comprehensive information and are improving the accuracy
- That is all required, but it's not the most ambitious goal for the new engine
- The real mid term goals are:
 - Noise filtering FP/FN
 - Risk evaluation and prioritization
 - Remediation flows





New Scanning Engine - CI Policies

- Policies are no longer tied to image names
- Additional criteria, including exploitability metrics
- More rule options coming soon:
 - Effective user
 - Environment variables
 - etc

Vulr	Ineratilities: Severities and Threats							
	With Severity V greater than or equal Critical V	AND						
 	Fixable since anytime V	AND						
 Image: A start of the start of	Disclosure date older than or equal 60 v days ago							
~	Exploitability Metrics							
	Public Exploit available and age older than 60 v days							
	No administrative privileges required							
	No User interaction required							
	Network attack vector							
	Vul	✓ With Severity ✓ greater than or equal Critical ✓ ✓ Fixable since anytime ✓ ✓ ✓ Disclosure date older than or equal 60 ✓ days ago ✓ Exploitability Metrics Public Exploit available and age older than 60 ✓ days No administrative privileges required No User interaction required Network attack vector						

OR



Runtime Policies

- Policies are tied to runtime metadata, not to image name
- Different environment do have different security standards
 - SOC2 environment
 - QA environment
 - DMZ
 - etc...

£ .	Scanning P	Volicies > New Kubernetes Workload Policy	Cancel
SECURE Secure Overview	Name	My Newest Shiny Policy	
Scanning	Description	Please describe your policy in a short sentence, this will help you quickly identify your policy goals and constrains	
Compliance	Scope		
Audit Events	Scope	kubernetes.cluste.name Image: Constraint of the second s	
Captures	Rule Bundles	See workloads in this scope	
Get Started		Assign Your First Rule Bundle Add a rule bundle from our lists of recommended one or create your own	
0 _		Assign bundle	
	Policy status c For any change of pi included in this scop	hange olicy status (e.g. from Fail to Pass), Sysdig can trigger a notification for each asset	
	Notifications	To create and configure your notification channels, visit Notifications. Select Notification Channel Select communication channel From Communication channel From Communication channel X	



Best in class runtime metadata

- Sysdig has the **best available runtime** information to enrich your scanning data
- One of the most important factors to assess **Risk** is the runtime impact
- Runtime workloads are automatically reevaluated and matched against newly discovered vulnerabilities
- Flexible scope to segment vulnerability exposure looking at Kubernetes, host-centric or cloud-centric metadata



New Scanning Engine - Reporting

- Reporting <u>redesign</u>
- Net new:
 - Direct data download API, optimized to integrate with third party software
 - **Run Now**, immediate execution of new schedule
 - Latest reports, log of recent executions, with download links in the UI and API

Reports	i	Report name This is the description, a have a description, a	on of this specific repor a really long description	t. Every report could	
2 Search		0i			
Name 🛧		Overview			Edit
High or Worse Vulnerabilities Runtime This is the description of this specific report.	ivery report could have a description, a really long description	Type Vulnerabilities	Entity Runtime	Export JSON	Format I, CVS
High or Worse Vulnerabilities Runtime This is the description of this specific report.	ivery report could have a description, a really long description	Scope kubernetes.cluster. Conditions	name in prod		
High or Worse Vulnerabilities Runtime This is the description of this specific report.	very report could have a description, a really long description	Severity <= Critical	AND Fix Available=Yes	s Lastn	ın
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High or Worse Vulnerabilities Runtime This is the description of this specific report.	very report could have a description, a really long description	 In progress Complete Complete Complete Complete Complete Complete Error 	 Download Download Download Download Download Download Download This is the error text and 	13/02/2022 2:38:03 pm 13/02/2022 2:38:03 pm 13/02/2022 2:38:03 pm 13/02/2022 2:38:03 pm 13/02/2022 2:38:03 pm 13/02/2022 2:38:03 pm	999 days ago 999 days ago 999 days ago 999 days ago 999 days ago 999 days ago



Focus your attention on EFFECTIVE vulns

- Sysdig is able to detect which binaries, libraries, dependencies, etc are being actually loaded during runtime
- A vulnerability is technically contained in the image, but is not being "run"
- Thus, is not part of the attack surface
- Looking at runtime status, we can drastically reduce the list of vulns that you really need to address first

10	Runtime images > Kubern	etes Workloads				
SECURE			×	In Execution Policy	✓ Po	licy Status 🗸 🗸
Overview Scanning Compliance	Total Vulnerabilities 3.4k Detector 18% 7	Policies 1k Evolutions 76% Passed • 15% Failed • 9% No Policy •	Vulnerabilities by criticality 1%, Critical 1%, Higt 4%, Medium 20%, Low 65%, Neglipble			In Execution
Events	Showing 16 of 86 results	1	In Execution ②	Vulnerabilities	Policy Eval	dd Scope to Policy
C Audit	demo-kube-gike > example-voting-app > deployment/turnelfrom docker.internal.sysdig.com/nuget-test > latest	1	1 3 7	99 99 99 99 99 999 Exploits	Policy Eval	903641f 10
0	demo-kube-gke + example-voting-app + doployment/turnelfrom docker.internal.sysclig.com/nuget-test + latest		3 1 2	99 99 99 99 99 99 909 Exploits	Passed	903641f 10
Captures	demo-kube-gke > example-voting-app > deployment:turnelfron docker.internal.sysclig.com/nuget-test > latest	1	5	99 99 99 99 99 999 Exploits	Passed	903641f ®
	demo-kube-gke > example-voting-app > deployment:turnelfron docker.internal.sysolig.com/nuget-test > latest			99 99 99 99 99 999 Exploits	Passed	903641f ©
	demo-kube-gke + example-voting-app > deployment/tunnelfrom docker-internal-syschig-com/nuget-test > latest			90 99 99 99 999 Exploits	Passed	903641f ®
~	demo-kube-gke + example-voting-app > deployment/turnel/ron docker.internal.sysdig.com/nuget-test + latest		32-	99 99 99 99 99 999 Exploits	Passed	903641f D
Get Started	demo-kabe-gie > example-voling-app > deployment:hummifron docker.internal.sysclig.com/nuget-test > latest		Profile pending	99 99 99 99 99 999 Exploits	Passed	903641f ©
AB	docker.internal.sysdig.com/nuget-test > latest		Profile pending	99 99 99 99 99 999 Exploits	Passed	903641f ©
0	docker.internal.sysciig.com/nuget-test > latest			99 99 99 99 999 Exploits	Passed	903641f ©
	docker.internal.sysdig.com/nuget-test > latest		Profile pending	99 99 99 99 99 Seploits	Passed	9036411 0



Risk Spotlight

Team Scope	Running Vulnerabilities We found vulnerabilities that are associat			
L Search Has running vulns howing 16 of 86 results	with packages that are actually ru in your instantiated image - becau those could be more targeted by a More info	nning se of this ttacks.		
Image Name	Running vulns ⊘ ↓	Vulnerabilities	Policy Eval	Image II
demo-kube-gke > example-voting-app > deployment:tunnelfront docker.internal.sysdig.com/nuget-test	1 3 7	99 99 99 99 99 999 Exploits	Passed	903641f
demo-kube-gke > example-voting-app > deployment:tunnelfront docker.internal.sysdig.com/nuget-test	3 1 2	99 99 99 99 999 Exploits	Passed	903641f
demo-kube-gke > example-voting-app > deployment:tunneifront docker.internal.sysdig.com/nuget-test	5	99 99 99 99 99 Exploits	Passed	903641f
demo-kube-gke » example-voting-app » deployment-tunnelfront docker.internal.sysdig.com/nuget-test » latest	2 10 67	99 99 99 99 99 Exploits	Passed	903641f
demo-kube-gke > example-voting-app > deployment:tunneifront docker.internal.sysdig.com/nuget-test	- 8 10	99 99 99 99 99 999 Exploits	Passed	903641f
demo-kube-gke » example-voting-app » deployment:tunneifront docker.internal.sysdig.com/nuget-test » latest	32-	99 99 99 99 99 999 Exploits	Passed	903641f
demo-kube-gke > example-voting-app > deployment:tunnelfront docker.internal.sysdig.com/nuget-test ⇒ latest	Waiting	99 99 99 99 99 Sxploits	Passed	903641f
demo-kube-gke > example-voting-app > deployment-tunnelfront docker.internal.sysdig.com/nuget-test > latest	Waiting	99 99 99 99 99 Sxploits	Passed	903641f
demo-kube-gke > example-voting-app > deployment:tunneifront docker.internal.sysdig.com/nuget-test		99 99 99 99 99 999 Exploits	Passed	903641f
demo-kube-gke > example-voting-app > deployment:tunnelfront docker.internal.sysdig.com/nuget-test >> latest	Waiting	99 99 99 99 999 Exploits	Passed	903641f
demo-kube-gke > example-voting-app > deployment:tunneifront docker.internal.sysdig.com/nuget-test	Waiting	99 99 99 99 99 Exploits	Passed	903641f
demo-kube-gke > example-voting-app > deployment.tunnelfront docker.internal.sysdig.com/nuget-test > latest		99 99 99 99 99 999 Exploits	Passed	903641f



Risk Spotlight

) ing	Eivable Packages				Vulgerabilities		
	Fixable Packages				vuinerabilities		
ince	Running vulns (2) Vulnerabilities	5			541 Vulnerabilities		
	Package and version	Suggested Fix	Vulnerabilities			 	
es	libc6-2.28-10	1.13	99 3 3		112 Fixable	1	
o vrk	libsqlite3-0-3.27.2-3+deb10u1	23.6.1 24.1.1 25.0	4 8 99		27 Fixable		
1	libelf1-0.176-1.1	4.3.0	3 5 99		32 Fixable 97 Low		
s	guava-11.0.1	23.6.1 24.1.1 25.0	99 99 99		67 Fixable 65 Negligible		
}	gpgconf-2.2.12-1+deb10u1	None	99 99 99		27 Unkown		
ate	openssl-1.1.1d-0+deb10u4	1.9.4	99 99 8		0 TIABLIE		
				\rightarrow			\rightarrow



Risk Spotlight

SECURE	Runtime images > azuremon Base OS O Debian 9.1 Runtime Context demo-kube-eks > example-voting-app =	Evaluated on March 17, 2021 21:31 PM (CET)			
Overview	Overview Vulnerabilities Content Deta	il)			
() Scanning	Q Search Violations	s 🗸 Is Running ruby × python × OS × × V ZSF × BSD × × V			
	Showing 16 of 86 packages				Ownload
Compliance	Package 🛧	Vulneratibilities	Туре	License	Suggested Fix
Policies	Running libsystemd0-241-7~deb10u6	99 99 99 - 4 Exploits	ruby	ZSF	1.13
.	Running libmount1-2.33.1-0.1	99 99 99 2	ruby	ZSF	1.13
Network	Running libc-bin-2.28-10	99 99 99	ruby	ZSF	1.13
لا میں Events	Running libsqlite3-0-3.27.2-3+deb10u1	99 99 99	ruby	ZSF	1.13
0	Running libbsd0-0.9.1-2	99 99 99	ruby	ZSF	1.13
investigate	Running libcurl4-7.64.0-4+deb10u1	99 99 99	ruby	ZSF	1.13
	Running gnupg-2.2.12-1+deb10u1	99 99 99 e	ruby	ZSF	1.13
	Running libssl1.1-1.1.1d-0+deb10u4	99 99 99 2	ruby	ZSF	1.13
Get Started	Running openssh-client-1:7.9p1-10+deb10u2	99 99 99 2	ruby	ZSF	1.13
AB	Running libsystemd0-241-7~deb10u6	99 99 99 2	ruby	ZSF	1.13
0	Running locales-2.28-10	99 99 99 2	ruby	ZSF	1.13
	Running less-487-0.1+b1	99 99 -	ruby	ZSF	1.13

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Mid-term Roadmap



Layered Analysis and Base Image detection

- Just using FROM clause in the Dockerfile is misleading and easy to bypass
- We will analyze the image layers that belong to the base image, accurately detecting the build chain
- Why:
 - Remediation: Update base image instead of patching individual vulns
 - **Policy:** Detect if image is built over an obsolete or non allowed base
 - **Ownership:** Different teams maintain the base image an the app
 - I.e create tickets with the correct owners





Ticketing integration

- We are going to start integrating with Jira and ServiceNow
- We will start by manually creating the ticket, second step is to **automatically** create the ticket once a certain even fires (i.e. policy violation)
- We want to start by attaching ticket to a policy violation
 - One ticket per workload, to facilitate ownership and assignment
- Possible Ticket subjects: Policy violation, Vuln, Package, Image
- Eventually we will move to more advanced integrations:
 - Notify when the vuln is no longer present in runtime





Guided mitigation

- In many cases, a vulnerability can be remediated easily, without actually changing the image at all
 - I.e. Remote exploit on an app that doesn't need to talk outside the namespace -> Sysdig NetSec
 - I.e. vulnerability requires elevated privileges -> detect run as root with Falco
- By including more information from the CVSS metrics we can provide advanced mitigation that does not require changing the image.







laC - Shifting "lefter"



Kubernetes IaC - Remediation

Code

Violations of policy controls Integrated with the PR mechanism as an approving gate

Runtime

Direct remediation to apply based on

- File modifications
- Templated YAMLs (real cluster config)
- Helm chart, etc...





Kubernetes IaC - Drift detection

Drift detection

IaC mechanism is particularly powerful when it can map runtime workloads to code entities (i.e. a YAML or helm chart) Why:

- Detect conditions in the runtime, feed back to the code level (and also live)
- Detect Drift
- Prevent using Admission
 Controllers



Auto-Remediate Drift and Close the Loop





Auto-Remediate Drift and Close the Loop





Auto-Remediate Drift and Close the Loop







Dig deeper