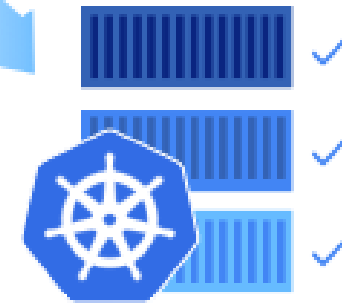
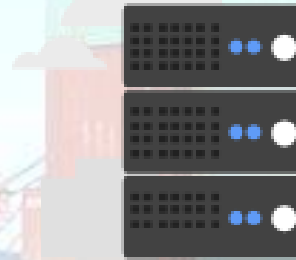


Google Cloud Professional DevOps Engineer Exam

Prep Notes by
Ammett

Class SRE implements DevOps



SLIs

SLOs













SLAs







oh my!



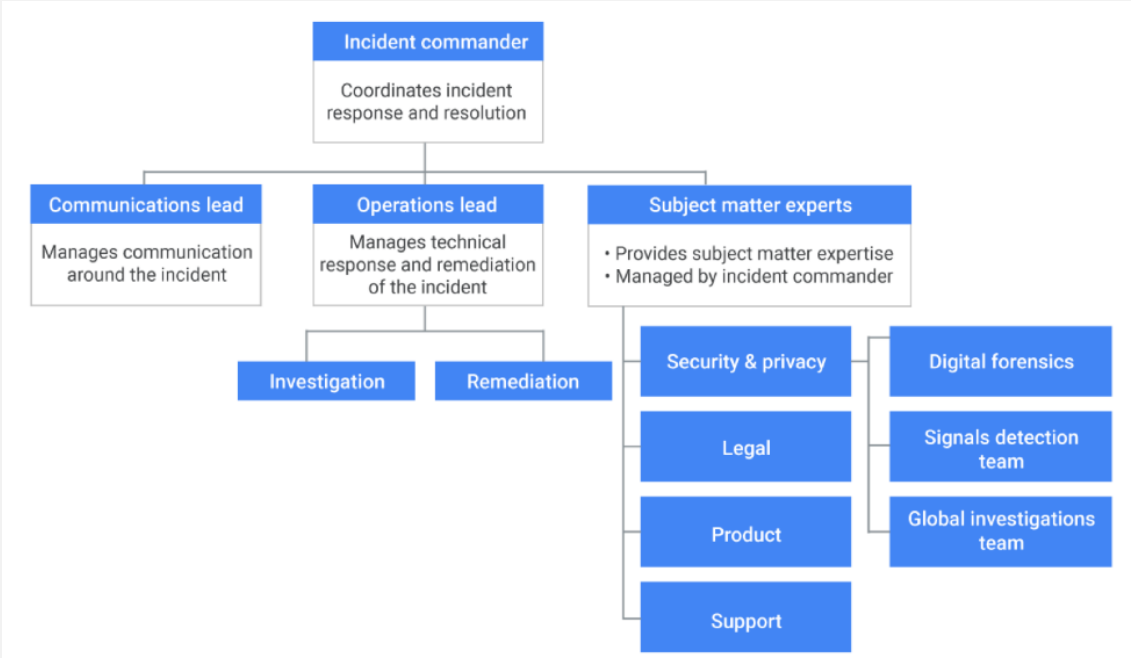
Google Cloud Professional DevOps Engineer Exam

Exam prep sheet by Ammett v.0

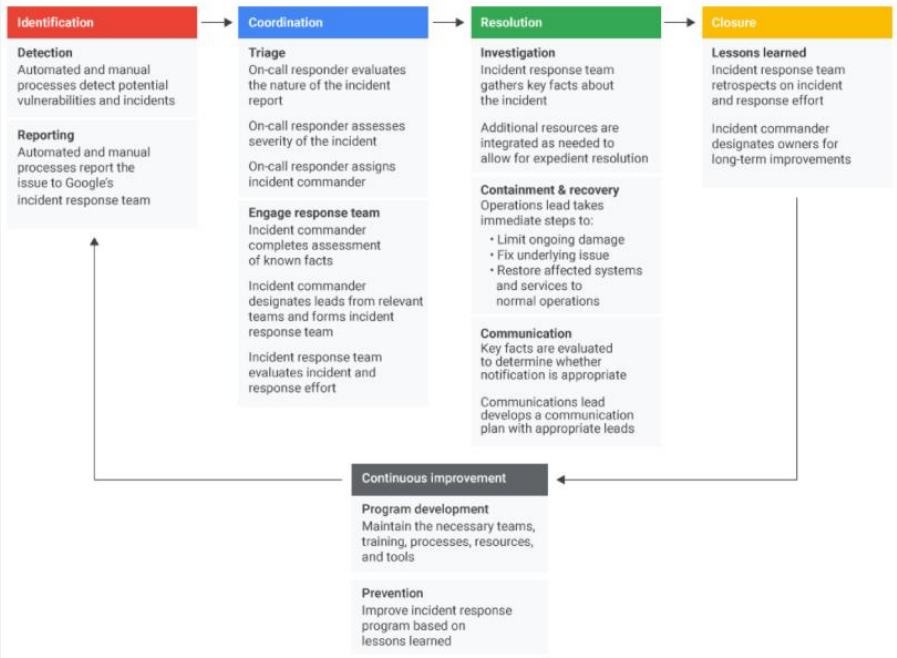
SRE						
<div>SRE</div> <div></div> <div>What it is In general, an SRE team is responsible for the availability, latency, performance, efficiency, change management, monitoring, emergency response, and capacity planning of their service(s)</div> <div>What you should know 1- What it is and how it aligns with DevOps</div> <div>Key Points 1- Services that need HTTPS Load balancing</div>	<div>SLO</div> <div></div> <div>What it is This is a target value or range of values for a service level that is measured by an SLI.</div> <div>What you should know 1- Actions to take when SLO are being met or not</div> <div>Key Points 1- Options, adjusts SLO & SLI, stop deployment until stable,</div>	<div>SLI</div> <div></div> <div>What it is This is a carefully defined quantitative measure of some aspect of the level of service that is provided.</div> <div>What you should know 1- How to set metrics 2- Freshness 3- Formulas</div> <div>Key Points 1- Understand the “math” what is being measured</div>	<div>SLA</div> <div></div> <div>What it is This is an explicit or implicit contract with your users that includes consequences of meeting (or missing) the SLOs they contain</div> <div>What you should know 1- These have penalties 2- Should be less strict than SLO's</div> <div>Key Points 1- Compare SLA to SLO targets point</div>	<div>Error budget</div> <div></div> <div>What it is Provides a clear, objective metric that determines how unreliable the service is allowed to be within a single quarter.</div> <div>What you should know 1- How is this determined 2- What happen when this is exceeded or in danger</div> <div>Key Points 1- How are these established and who is responsible.</div>	<div>Toil</div> <div></div> <div>What it is Toil is the kind of work tied to running a production service that tends to be manual, repetitive, automatable, tactical, devoid of enduring value, and that scales linearly as a service grows</div> <div>What you should know 1- What is toil 2- How to handle toil over time 3- What type of task are worth automating</div> <div>Key Points 1- What should be the aim of engineering task vs toil. Automate this year's toil away</div>	<div>Review documents SRE Book</div> <div>Video SRE playlist</div> <div>My experience Various element of the SRE topics combine to make some interesting questions. Spend some time on each area and learn to appreciate your SLI metrics. Generally, a good area to pick up some points and not too hard if you understand them well.</div>
<div>Toil Budgets</div> <div></div> <div>What it is Google aims to ensure that at least 50% of each SRE's time is spent doing engineering projects</div> <div>What you should know 1- Understand the general point of this toil budgets.</div>	<div>DevOps</div> <div></div> <div>What it is Organizational and cultural movement that aims to increase software delivery velocity, service reliability, and shared ownership among stakeholders.</div> <div>What you should know 1- Map SRE principles to DevOps</div> <div>Key Points 1- No Silos, Accidents are normal, Gradual change, Tooling, measurement is crucial.</div>	<div>Alerting</div> <div></div> <div>What it is While there may be many alerts ultimately, your goal is to be notified for a significant event: an event that consumes a large fraction of the error budget.</div> <div>What you should know 1- Precision, Recall, Detection time, reset time</div> <div>Key Points 1-.Target Error rate, Increased alert window, Incrementing duration, Burn rate,multiple burn rate, multiwindow, multi-burn-rate alerts</div>	<div>Monitoring</div> <div></div> <div>What it is Collecting, processing, aggregating, and displaying real-time quantitative data about a system, such as query counts and types, error counts etc.</div> <div>What you should know 1- Analyze long term trends. 2- Comparing over time</div>	<div>Managing Risk</div> <div></div> <div>What it is Item or risk that may cause you to not meet the SLO</div> <div>What you should know 1- Target risk that will bring you in the error budget 2. Quantify data</div> <div>Key Points 1- Controlling and identify risk helps you manage your SLO</div>	<div>Post-mortems</div> <div></div> <div>What it is A rolling update is an update that is gradually applied to all instances in an instance group until all instances have been updated</div> <div>What you should know 1- Writing post-mortems based on SRE principles.</div> <div>Key Points 1- No blame, root causes, action items</div>	<div>Review documents SRE Workbook</div> <div>Video Improving reliability</div> <div>My experience These topics make up the core of the SRE practice. Combined they will be featured and you can pick up a few points if you are prepared enough.</div>

SRE						
Handling Incidents 	API lifecycle 	IRM Dashboard 	Response Structure 	Tracing 	Communication 	Review documents Incident response API lifecycle IRM concept Video SRE playlist
What it is Things break so it is important to understand how and what to do when that happens.	What it is What is the process for your new deployment and life cycle of you API.	What it is Incident Response and Management (IRM) is a product within Stackdriver for managing and responding to incidents.	What it is Communication and structure is a key part of handling incident.	What it is Going deeper toward the source of the problem in the system	What it is Keeping stack holder in the loops. Communication is "KEY" the better it is the better for your incident management	My experience Handling incident is important. There are steps, roles, activities involved. Do not forget communication also.
What you should know 1- What options do you employ	What you should know 1 - Stages to replace an API	What you should know 1 - How to set metrics 2- Freshness 3- Formulas	What you should know 1- Who handle what role 2- Delegation 3- Communication	What you should know 1- Have a digital representation of where time is spent on your queries	What you should know 1- Who handle communication in what circumstances	
Key Points 1- Roll back, Connection draining, stop testing, A/B, scaling	Key Points 1 - The order of the process 2 - Is it chicken or egg		Key Points 1- Operation leader, Communication lead, incident commander	Key Points 1- This can be done in stackdriver	Key Points 1- Communication loops	

Incident response team

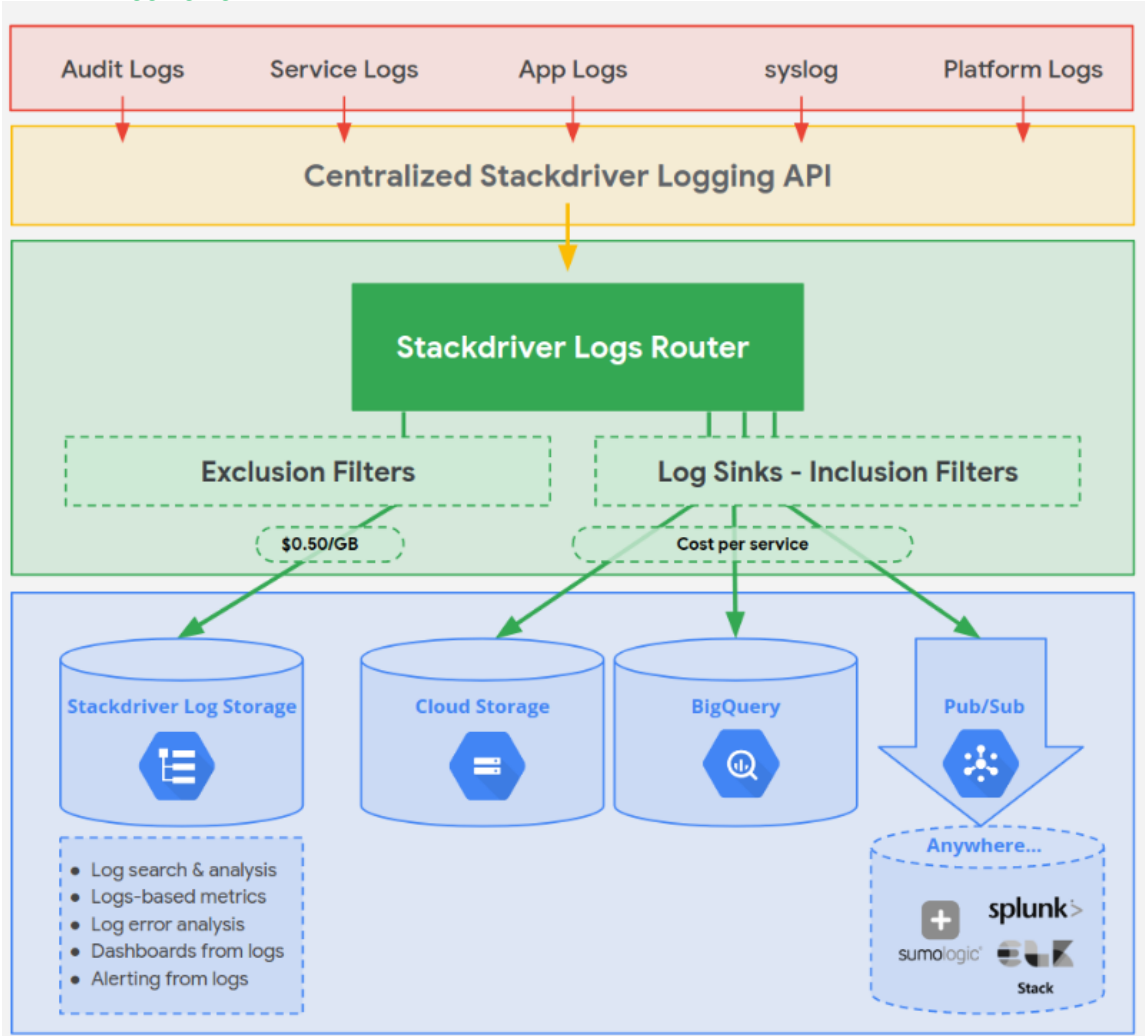


Incident response workflow



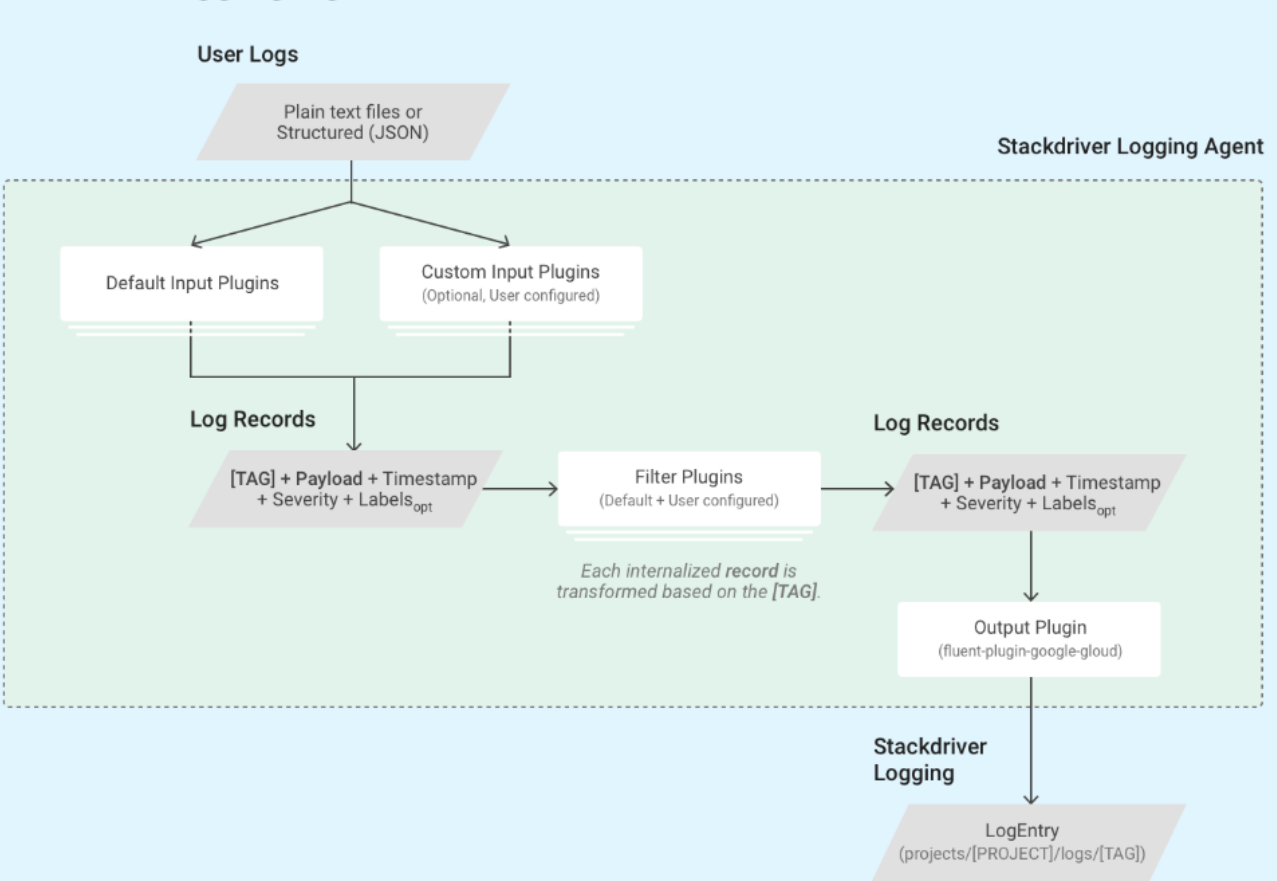
Stack driver						
Stack driver Monitoring 	What it is Stackdriver Monitoring discovers and monitors your cloud resources automatically, whether you are running on Google Cloud Platform or AWS	Key points 1- Metrics 2- Custom metrics 3- Alerting policies 4- Monitoring	What you should know 1- everything in depth about stackdriver	Review documents Monitoring docs	Video Intro to stackdriver Stackdriver monitoring	My experience Ok if you don't know stackdriver deeply don't do the exam. This means you should focus a lot of time testing an experimenting with all the features.
Sharing charts 	What it is If you want, you can share a chart with others by sending them a parameterized URL.	Key points 1- Sharing various chars is possible 2- understand how to customise the parameter 3- Know the tag used	What you should know 1- iframe 2- query parameters 3- keeping view updated 4-Static screen shot	Review documents Sharing charts		My experience This is something you may bypass but can pick you up a point.
Workspaces 	What it is A Workspace is a tool for monitoring resources contained in one or more Google Cloud projects	Key points 1- What it is 2- How to design 3- Every Workspace has a <i>host project</i> 4- Aadd existing account to workspace	What you should know 1- required roles, project owner, monitoring editor, monitoring Admin, stackdriver account editor	Review documents Stackdriver workspaces Managing work spaces		My experience This was a shocker but not anymore right
Python 	What it is You can write logs to Logging from Python applications by using the Python logging handler included with the Logging client library	Key points 1- How to use with App engine, GKE, compute engine, locally 2- IAM permission required	What you should know 1- Logging library for python	Review documents Stackdriver logging for python Google Cloud Client Libraries for Python		My experience This was a shocker but it's DevOps so how about that. What about the others languages?
Stackdriver agent / FluentD 	What it is The Logging agent, an application based on fluentd that runs on your virtual machine (VM) instances.	Key points 1- Stream log from VM and 3 rd party software packages to stack drive logging 2- Install agent	What you should know 1 - Based on fluentd 2 - Get syslog files 3 - Get third party logs	Review documents About the agent Configuring the agent Syslog	Video	My experience Ok if you don't know stackdriver don't do the exam. Please be warned in cased you missed it earlier.
Protect sensitive Data 	What it is Fluentd filter plugin mutates/transforms incoming event streams in a versatile manner	Key points 1- Remove sensitive or unwanted data 2- Add new fields 3- Update field in log entries 4- Delete fields in log entries	What you should know 1- filter record transformer	Review documents logging agent modifying records Fluentd		My experience Protecting data is important. This can pick you up a point or two.

How the logging agent works



Routing of log entries

How the Logging Agent works



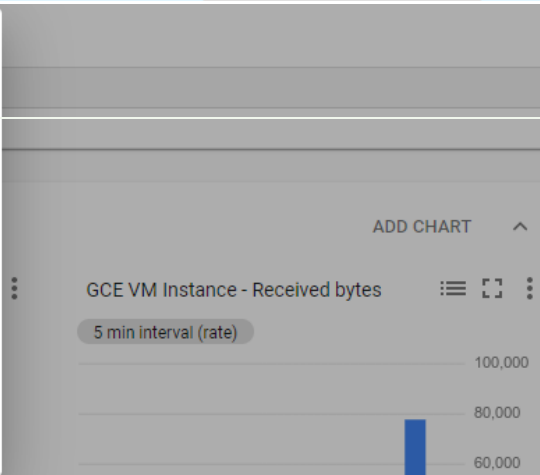
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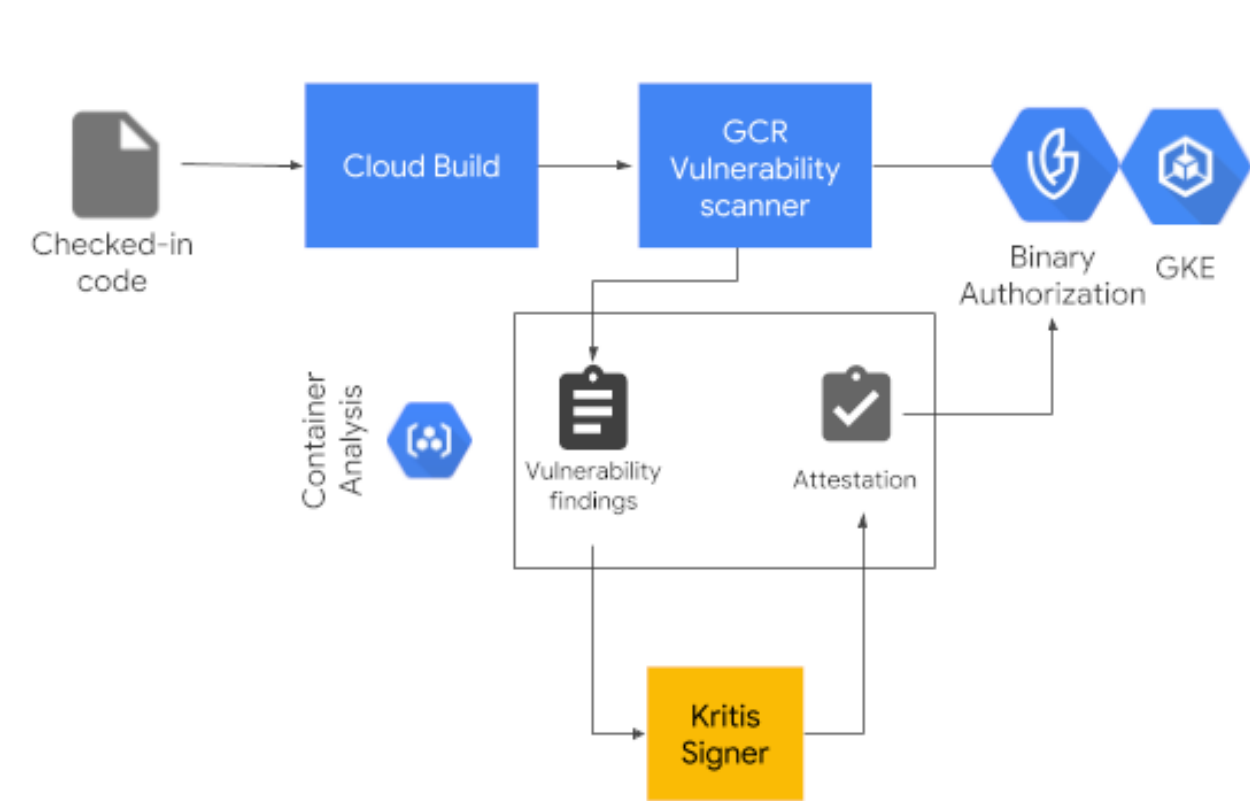


Stack driver – Trace – Debugger - profiler						
Stackdriver logging 	What it is Stackdriver Logging allows you to store, search, analyze, monitor, and alert on log data and events from Google Cloud Platform and (AWS).	Key points 1- Routing of logged entries 2- Log sinks 3- Storing logs 4- Third party SIEM	What you should know 1- As much as possible ☺	Review documents Log router	Video Stackdriver doctor Centralized logging	My experience Ok if you don't know stackdriver deeply don't do the exam. Repeating in cased you miss it earlier.
Trace 	What it is Trace is a distributed tracing system that collects latency data from your applications and displays it in the Google Cloud Platform Console.	Key points 1- What type of problems you would use trace for.	What you should know 1- Latency 2- Permission errors 3- How & when to create custom roles 4- Service account permissions	Review documents Trace	Video Stackdriver Trace	My experience Think latency and finding it's cause.
Debugger 	What it is Stackdriver Debugger is a feature of Google Cloud Platform that lets you inspect the state of a running application in real time, without stopping or slowing it down	Key points 1- View app state without adding logging 2- Use with test, development and production	What you should know 1- Less that 10ms of latency added	Review documents Debugger		My experience Get info without affecting the app.
Profiler 	What it is Profiler continuously analyzes the performance of CPU or memory-intensive functions executed across an application.	Key points 1- Capture characteristics of the code as <i>it runs</i> 2- Finds bugs 3- It does not require pervasive changes	What you should know 1- Show what happing within each service 2- Take random sample profiles	Review documents Profiler	Video Stackdriver profiles	My experience Know what your code is doing in real time, get analytics with profiler.
Alerting 	What it is You must configure most notification channels before you use them in alerting policies.	Key points 1- Different channels and how to use them for alerts	What you should know 1- Email, mobile apps, pagerduty, SMS, Slack, Webhooks	Review documents Notification Options		My experience Alerts can be sent using multiple channels. Understand the integrations.
Cloud IAM 	What it is With the logging data in a Google Cloud project, you must be a member and have an Cloud IAM role that grants you permission to use Logging	Key points 1- What are the various roles and the permissions they have to do various functions	What you should know 1- Permissions level necessary to export logs 2- (logging.configWriter, logging.admin owner)	Review documents Role etc Export logs		My experience Nice easy point right. Well IAM permissions are necessary to run most services. You may as well as get familiar with them.

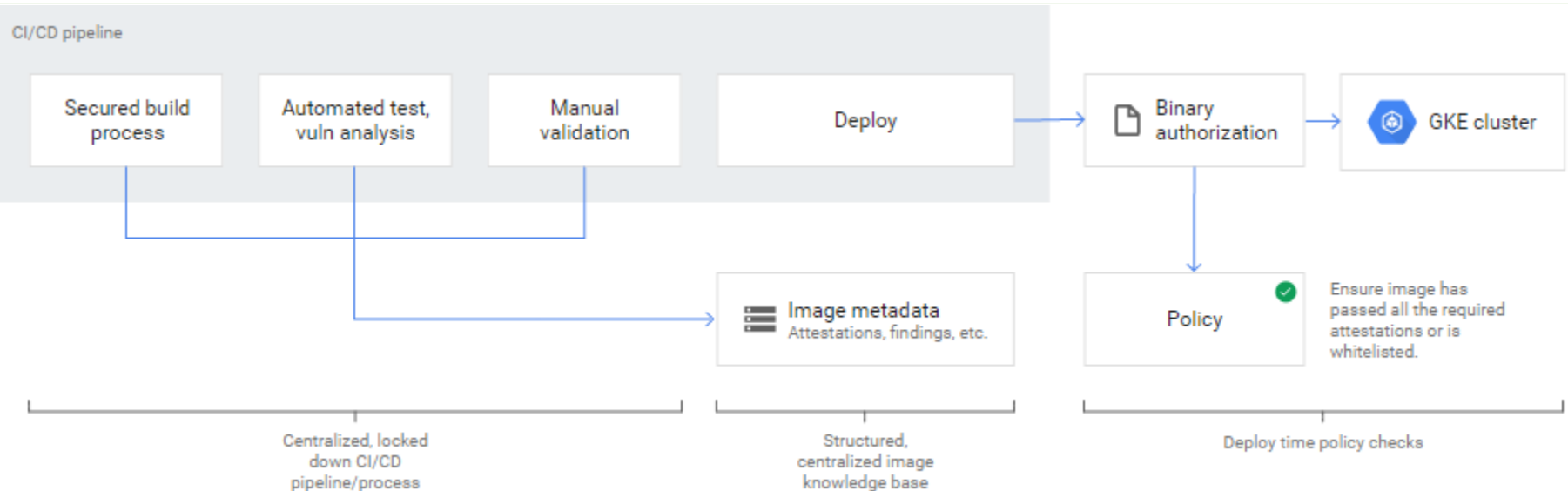
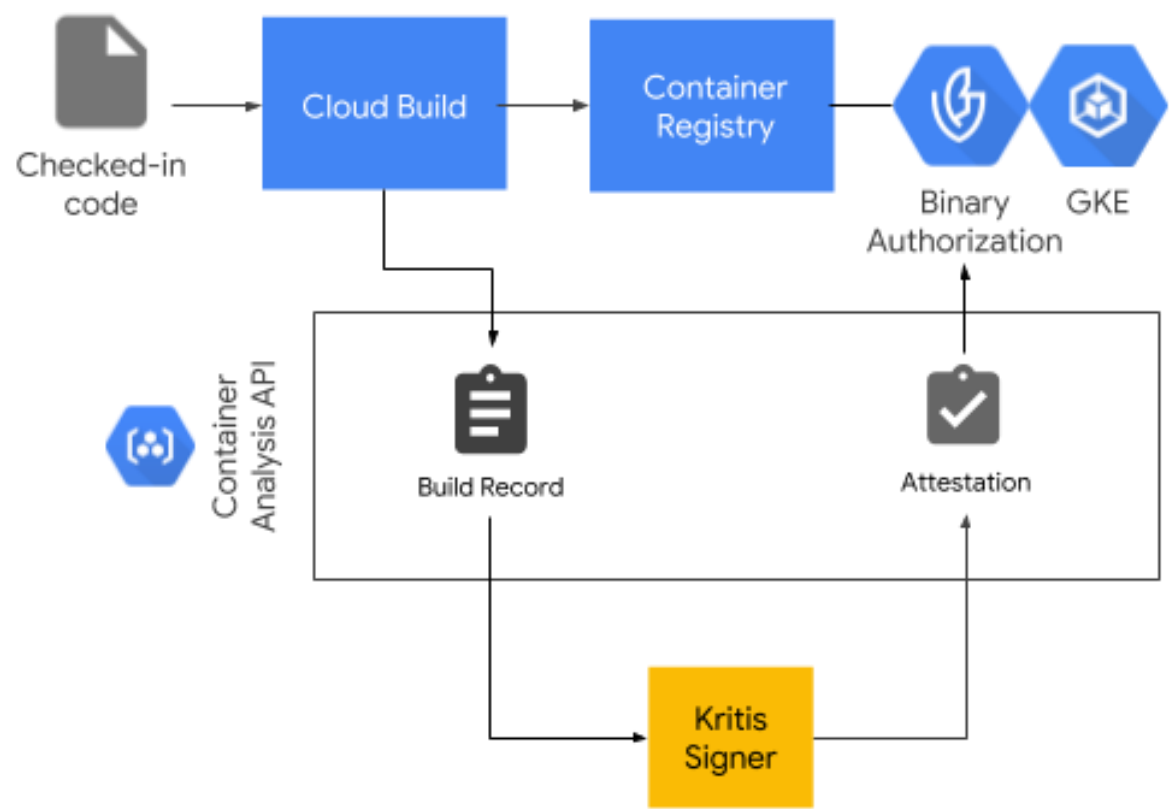
Data						
<div>BigQuery</div> <div></div> <div>What it is BigQuery is a serverless, highly scalable, and cost-effective cloud enterprise data warehouse that enables super-fast SQL queries using the processing power of Google's infrastructure.</div> <div>What you should know 1- How it work with stackdriver etc.</div> <div>Key Points 1- Sinks, viewing logs, exporting logs, ingesting logs</div>	<div>Data Studio</div> <div></div> <div>What it is Google Data Studio allows you to create branded reports with data visualizations to share with your clients.</div> <div>What you should know 1- Intergrating Google services with Data Studio</div> <div>Key Points What google service it integrates with</div>	<div>Cloud Storage</div> <div></div> <div>What it is Used for a range of scenarios including serving website content, storing data for archival and disaster recovery, or distributing large data objects to users via direct download.</div> <div>What you should know 1- What it does, classes 2- Integrations 3- Uses for DevOps</div> <div>Key Points</div>	<div>Pub/Sub</div> <div></div> <div>What it is Cloud Pub/Sub is a <i>publish/subscribe (Pub/Sub) service</i>: a messaging service where the senders of messages are decoupled from the receivers of messages</div> <div>What you should know 1- Multiple uses and intergration of PubSub</div> <div>Key Points 1- Be aware of the services that can use it as a trigger</div>	<div>Grafana</div> <div></div> <div>What it is Grafana is an open source metric analytics and visualization suite for visualizing time series data that supports various types of data sources</div> <div>What you should know 1- How does this work with Stackdriver</div> <div>Key Points 1- Integration</div>	<div>Datadog</div> <div></div> <div>What it is Datadog pulls metrics from Google Stackdriver Logging to: 1- Visualize the performance of your Stackdriver logs 2- Correlate the performance of your logs with your applications</div> <div>What you should know 1- What it is used for 2- How it integrate with Stackdriver</div> <div>Key Points 1- Intergration</div>	<div>Review documents Pub/Sub Grafana BigQuery Cloud storage</div> <div>Video BigQuery</div> <div>My experience Viewing data using different tools (integrations). Storage of logs, exporting logs, pub/sub, triggers and more.</div>
Networking / Compute						
<div>Computer engine</div> <div></div> <div>What it is Compute Engine delivers configurable virtual machines running in Google's data centres with access to high-performance networking infrastructure and block storage.</div> <div>What you should know 1- Monitor these with stack driver 2- Monitor application</div> <div>Key Points</div>	<div>Managed Instance groups</div> <div></div> <div>What it is A managed instance group (MIG) contains identical instances that are based on an instance template.</div> <div>What you should know 1- What it does (autoheal, load balancing, autoscaling an auto-updating.</div> <div>Key Points 1- Keep scenarios in mind where you would use these</div>	<div>Flow logs</div> <div></div> <div>What it is <i>VPC Flow Logs</i> record a sample of network flows sent from and received by VM instances, including instances used as GKE nodes</div> <div>What you should know 1- Log entry sampling (default 0.50 (50%)) 2- TCP/UDP traffic 3- Health checks</div> <div>Key Points 1-What you can monitor with it 2- Used for seeing what's happening in the network</div>	<div>Network service Tier</div> <div></div> <div>What it is Allows customers to optimize their cloud network for performance or price optimisation.</div> <div>What you should know 1- When to use. 2- What is the difference and trade-off</div> <div>Key Points 1- Managing cost (know the trade-offs also)</div>	<div>Preemptible VM's</div> <div></div> <div>What it is Best for short-lived compute instances suitable for batch jobs and fault-tolerant workloads.</div> <div>What you should know 1- How, when to use these to save cost or help processing</div> <div>Key Points</div>	<div>Committed use</div> <div></div> <div>What it is Committed use discounts are ideal for workloads with predictable resources needs.</div> <div>What you should know 1- Predictable work needs 2- Term 1-3 years 3- Billed weather used or not monthly</div> <div>Key Points 1- Requirements and recommendation for use.</div>	<div>Review documents Committed use Managed instances Preemptible VM Network Service Tier Flow logs</div> <div>Video Highly available deployments</div> <div>My experience The networking once again is a key point in any cloud infrastructure. Get familiar with these and pick up a point or 3</div>

Security						
IAM 	What it is IAM lets you manage who has access to what in your GCP environment.	Key points 1- All the services need some level of permissions to run. You might as well get familiar with the IAM roles required.	What you should know 1- Permission for logging, exporting and other aspects. I would recommend you get familiar with the IAM roles generally for the various services	Review documents IAM roles	Video Best practices for identity	My experience IAM is now like a staple on GCP exams just like Kubernetes. Ok that's all you need to know.
KMS 	What it is Cloud KMS is a cloud-hosted key management service that lets you manage encryption for your cloud services the same way you do on-premises.	Key points 1- You can generate, use, rotate, and destroy cryptographic keys	What you should know 1- Using cloud KMS with other GCP services (especially developer based) CMEK	Review documents Using cloud KMS with other products	Video Securing Kubernetes secrets	My experience KMS helps you in many ways. Figure out which ways you need to be helped.
Secret Manager 	What it is Secret Manager provides a secure and convenient tool for storing API keys, passwords, certificates, and other sensitive data.	Key points 1- Encrypt, store and audit (infrastructure and apps secrets) 2- You can address individual version of a secret 3- Rotation	What you should know 1- Applications often require access to small pieces of sensitive data at build or run time. These pieces of data are often referred to as <i>secrets</i> .	Review documents Secrets Manager		My experience Secrets will pop up somewhere, so now it's no longer a secret.
Cloud SCC 	What it is Security Command Center gives enterprises consolidated visibility into their Google Cloud assets across their organization.	Key points 1- What it does.	What you should know 1- What may be relevant for your pipeline.	Review documents Security Command Center	Video Cloud security cc	My experience Get familiar with this.
Binary Authorisation 	What it is Binary Authorization is a service on Google Cloud Platform (GCP) that provides software supply-chain security for applications that run in the Cloud.	Key points 1- Allows or blocks deployment of images to GKE based on policy 2- Attestation 3- Enforcement functionality 4 Authorization	What you should know 1-Know the flow of binary authorisation (Très important)	Review documents Secure software chains Codelab Binary authorization	Video Binary Authorisation Demo	My experience This is a bit confusing so study the flow and the stages (important to figure out the answers for this type of question)
Images 	What it is Container Analysis provides vulnerability information and other types of metadata for the container images in Container Registry.	Key points 1- Allow vulnerability scanning and metadata storage for software artifacts	What you should know 1- Performs scans on images in container registry and monitor vulnerability info to keep up to date. -Incremental scans -Continuous analysis	Review documents Get image vulnerabilities		My experience Think secured images and secure deployments
Security scanner 	What it is Automatically scan your App Engine, Compute Engine, and GKE apps for common vulnerabilities.	Key points 1- Detect 4 common OWASP top 10 vulnerabilities (XSS, Flash injection, mixed content, outdated/insecure libraries)				My experience This may pop up but then again who knows??

Binary Authorization/vulnerability



Binary Authorization/Cloud Build



To be added by end January 2020 (yes the exam is that heavy) last update 13-01-2020

- **DevOps and Tools**
- **Google DevOps Tools**
- **Performance**