

Sample case studies for the Professional Cloud Architect exam

Worksheet: Case Study Analysis Template

This worksheet is available for you use to practice analyzing cases.

The worksheet is available in both Google Docs and as a PDF.
The links are in your Qwiklabs resources.

Google doc link:

https://docs.google.com/document/d/1JtrKKkcq70ZS3A3_e_dVAURYfMttWxopnyZgTdYLMZo/copy

Short link: **<https://goo.gl/XMHgKo>**

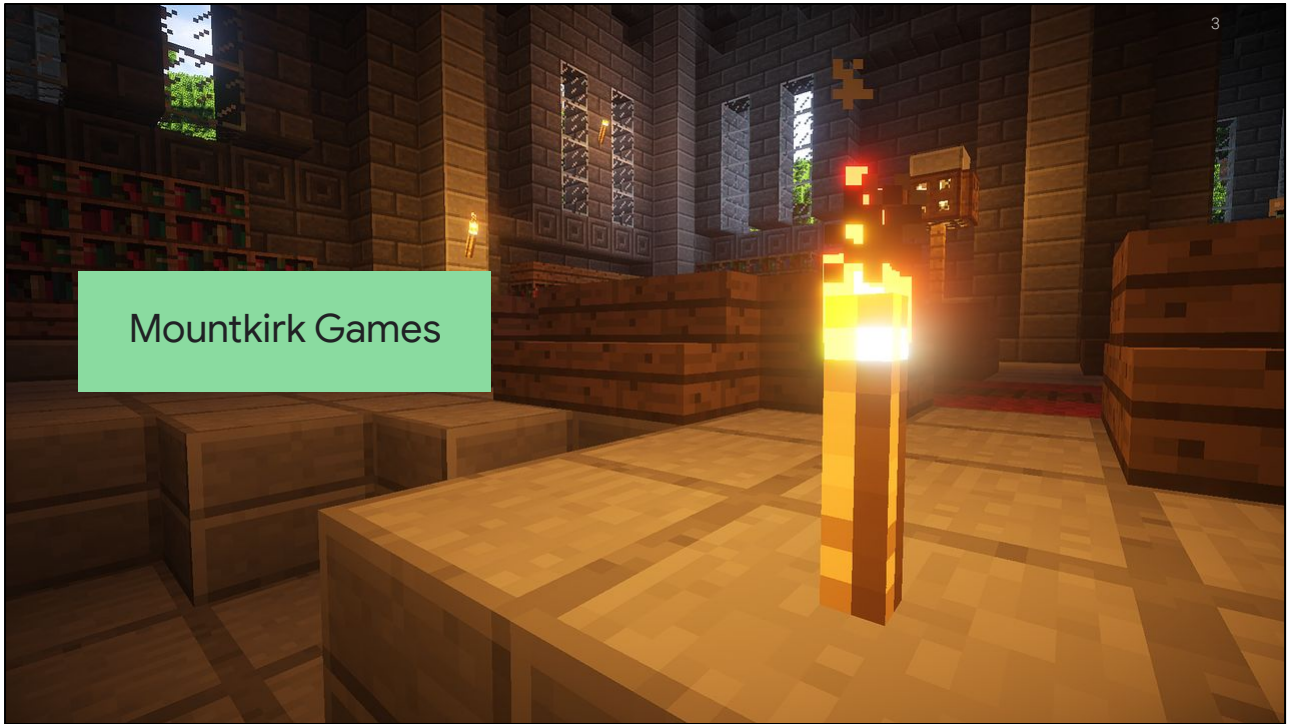
Business Evaluation		
Client	Values	Immediate Goals

Technical Evaluation		
Existing Environment	Technical Watchpoints	Proposed Solution



It is recommended that you use a worksheet similar to the one provided to analyze cases, especially the sample cases provided for the certification exam.

https://docs.google.com/document/d/1JtrKKkcq70ZS3A3_e_dVAURYfMttWxopnyZgTdYLMZo/copy
<https://goo.gl/XMHgKo>



<https://cloud.google.com/certification/guides/cloud-architect/casestudy-mountkirkgames>

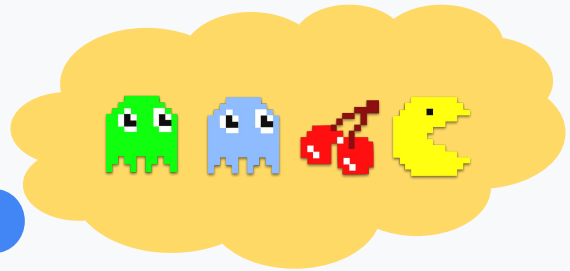
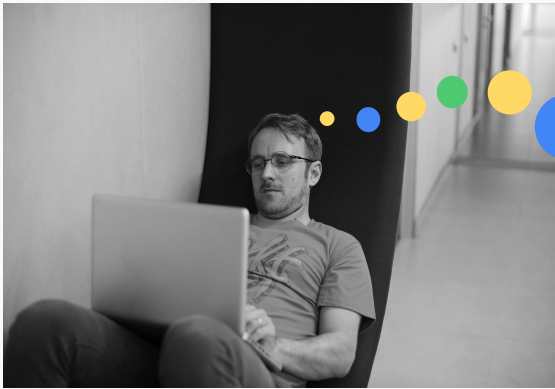
Mountkirk Games builds all of their games with some server-side integration, and has historically used cloud providers to lease physical servers. A few of their games were more popular than expected, and they had problems scaling their application servers, MySQL databases, and analytics tools.

Mountkirk's current model is to write game statistics to files and send them through an ETL tool that loads them into a centralized MySQL database for reporting.

<https://cloud.google.com/certification/guides/cloud-architect/casestudy-mountkirkgames>

<https://pixabay.com/en/minecraft-video-game-blocks-block-1106261/>

Mountkirk's newest game is predicted to be a global hit!



<https://pixabay.com/en/people-adult-man-indoors-3324398/>
<https://pixabay.com/en/virtual-reality-simulator-virtual-2874659/>
<https://pixabay.com/en/pacman-pac-man-computer-game-c64-149704/>

Key Business Points

Online games platform

Unexpected popularity of some games has created scaling problems; app servers, MySQL, analytics.

Core values

Already have a plan in place with general design for the infrastructure and some requirements

Issues with previous cloud provider

Immediate business goals

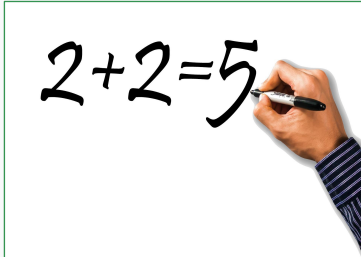
Increase global footprint

Improve downtime

Need for KPIs on speed and stability + other deeper insights



Key Business Assumptions



Planned solution might
not be ideal



Strong focus on analytics and
custom metrics



Potentially different storage
solutions for game itself and
analytics



<https://pixabay.com/en/mistake-error-mathematics-1966460/>
<https://pixabay.com/en/financial-analytics-blur-business-2860753/>
<https://pixabay.com/en/archive-boxes-documents-folders-1850170/>

Technical Evaluation

Existing Environment	Technical Watchpoints	Proposed Product/Solution
On-premises and servers in different DCs, not to be replaced immediately; only for the new game.	Compute <ul style="list-style-type: none">• Compute Engine with hardened Linux distro• Autoscaling, low latency• Load balancing, global• Data not lost due to backlogs	
MySQL database that needs to be replaced; currently have scaling issues	Storage <ul style="list-style-type: none">• Managed NoSQL database• Transactional DB for profiles/state• SQL querying of 10 TB historic data• Time series database for analytics	
Analytics workflow <ul style="list-style-type: none">• Statistics written to file• ETL > storing data in MySQL• Reporting	Data ingestion <ul style="list-style-type: none">• Live metrics from game server• "Late data" due to slow mobile networks• Regularly uploaded data from mobile devices	





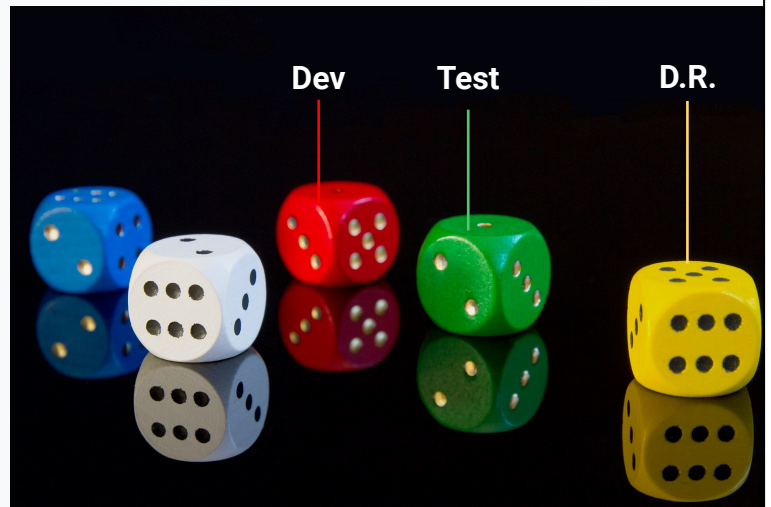
Dress4win is a web-based company that helps their users organize and manage their personal wardrobe using a website and mobile application. The company also cultivates an active social network that connects their users with designers and retailers. They monetize their services through advertising, e-commerce, referrals, and a freemium app model.

<https://cloud.google.com/certification/guides/cloud-architect/casestudy-dress4win>

<https://pixabay.com/en/store-clothing-shop-bouique-984393/>

Dress4Win

Proof of Concept



Dress4Win is going to "try" cloud solutions using three tests to provide Proof of Concept. Development processes, Testing process, and Disaster Recovery are their first three experiments with cloud computing.

<https://pixabay.com/en/cube-gambling-gamble-risk-luck-3116778/>

Key Business Points

Online service

Online web-based wardrobe management service

Serves user base via web UI + mobile app

Taps into social networks for user signals

Monetizes using ads, e-commerce, referrals

Has grown very fast from >10 servers to >100 servers

Core values

Capacity not enough for future growth

Decided on moving to cloud

Building a disaster recovery site

Immediate business goals

Preference for managed services

Considerations:

- Competition
- New features
- Elastic
- Autoscaling
- Cost



Key Business Assumptions

Phased Migration

Disaster Recovery

High Availability

Phase 1: Dev/test

Optimize migration

Future migration depends on phase 1

Migrate least critical software first

Reduce Ops Costs

Move towards DevOps model

CICD

Increased velocity of product/feature releases



- Will migrate in phases - phase 1 will be dev/test
- Future migration will be dependent on phase 1 - need to be optimised early on
- Disaster recovery and HA will be consideration
- Will migrate least critical software components first
- Plans to reduce Ops cost
- Wants to move towards DevOps model
- Increased velocity of product / feature releases (CICD approach)

Technical Evaluation

Existing Environment	Technical Watchpoints	Proposed Product/Solution
Databases: <ul style="list-style-type: none">- MySQL: static data, inventory, user data- Redis: social graph, metadata, caching	Two types of data: <ul style="list-style-type: none">- Static stored in relational DB- In-memory/high throughput solution for social/metadata/caching	
Application servers: <ul style="list-style-type: none">- TomCat: micro-services- Nginx: static content- Apache Beam: batch processing	Microservices-based architecture Also serving static content If VMs are "lifted and shifted," multi-regional approach required	
Storage: <ul style="list-style-type: none">- iSCSi for VMs- Fiber Channel for DBs- 1 PB storage, 400 TB available- NAS for logs and backups, image storage- 100 TB storage, 35 GB available	Already using virtual machines; lift and shift possible Different classes of storage used for various services	



Technical Evaluation

Existing Environment	Technical Watchpoints	Proposed Product/Solution
Hadoop/Spark: <ul style="list-style-type: none">- Data analysis- Real-time trending	Offline batch processing probably for social graph etc. Analytics also done using the same platform	
MQ servers: <ul style="list-style-type: none">- Messaging, social notifications, events		
Networking Encryption Security scanners Jenkins	If Google supplied encryption not enough Security and access controls CICD	



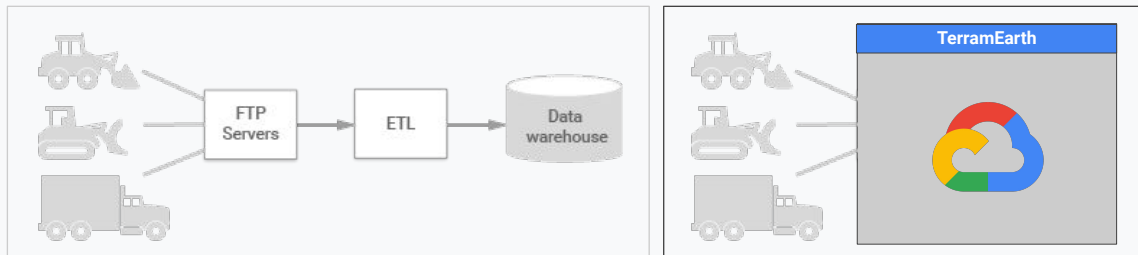


TerramEarth manufactures heavy equipment for the mining and agricultural industries: About 80% of their business is from mining and 20% from agriculture. They currently have over 500 dealers and service centers in 100 countries. Their mission is to build products that make their customers more productive.

<https://cloud.google.com/certification/guides/cloud-architect/casestudy-terramearth>

<https://pixabay.com/en/industry-heavy-equipment-machine-3286042/>

TerramEarth is ready for IoT but needs a data warehouse upgrade



The workload is divided between 9TB per day delivered streaming over a cell service, that's the IoT part, and 900TB per day delivered viz gzip csv file.

Currently, the gzip csv data from the field takes about 3 weeks to make it into the data warehouse. That means some customers have vehicles out of service for 4 weeks waiting for parts.

The company knows that IoT is coming and is preparing to meet the changes as traffic shifts from the file transfer model to the cell IoT model. However, the Data Warehouse is behind technically and also is not meeting customer business needs.

They need a Data Warehouse upgrade that will handle both problems.

Key Business Points

Family-owned business

80/20 :
Mining/Agriculture

500 dealers, service
centers over 100
countries

Core values

Grow globally and
develop skills needed
for future success in
the changing industry

Immediate business goals

Decrease downtime max
4 weeks -> avg < 1 week

Give dealers more
visibility to data on
customers

Ability to partner with
different partner in AG
industry



Vehicle Composition

2,000,000 vehicles

Connected to cellular network
Data collected directly
120 fields data/sec
22 hours of ops per data
9 TB/day



20 million vehicles

Data stored on vehicle
120 fields data/sec
Downloaded when vehicle is serviced

Data visibility 3-week delay -> Cause increase in planned parts stock



<https://pixabay.com/en/combine-harvester-harvest-harvester-1562988/>

Key Business Assumptions



Supply chain partners/processes for parts delivery stays the same

OK with carrying current level of surplus inventory



Change management team and training team are in play

Address Executive concerns

Training tech to staff



<https://pixabay.com/en/forklift-warehouse-machine-worker-835340/>

<https://pixabay.com/en/board-arrow-shield-note-change-978179/>

Technical Evaluation

Existing Environment	Technical Watchpoints	Proposed Product / Solution
Infrastructure <ul style="list-style-type: none">• OS - Linux based in DC Data transfer <ul style="list-style-type: none">• Gzip CSV files -> FTP server -> ETL -> Data warehouse• Currently 3 weeks delay real to serve	<ul style="list-style-type: none">• Able to handle 900 TB per day• Do not need low latency I/O• 120 fields of structured data• Smart machines	
Vehicles - Connected <ul style="list-style-type: none">• Connected to cellular (200k)	<ul style="list-style-type: none">• 9 TB/day• Over cellular network• Potential cellular network outages• Assumed that connected device can update config	



Moving the data warehouse to BigQuery will handle a lot of the main customer and business issues having to do with parts delay.

It will need a front-end that can handle today's IoT demands and will grow and adapt to the changing categories of demand as more streaming solutions are employed and fewer file-based solutions.

Technical Evaluation

Existing Environment	Technical Watchpoints	Proposed Product / Solution
Vehicles - Batch <ul style="list-style-type: none">Data dump during service (19.8M)	<ul style="list-style-type: none">991 TB/dayComes in batchUpdates configuration when serviced	
Data visualization <ul style="list-style-type: none">Nonexistent or minimal	<ul style="list-style-type: none">Would like to give info to supply chain partners	



Keep in mind that Cloud IoT Core doesn't suffice to get your data to Cloud Storage. Cloud IoT Core brokers between IoT devices and Pub/Sub. You almost certainly want a Dataflow job to get the data to the next place.