Fast data access over cloud technologies

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accenture

Strategy | Digital | Technology | Operations

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Agenda

- Digital Business Goals
- Customer context and major needs
- Proposed solution
- Architecture framework
- Technology stack
- Achievements
- Project timeline
- Roadmap and possible extensions
- Collaboration value

A new paradigm for the Telco Italian market

Connected generation of customers raise the competition bar for service satisfaction and excellence

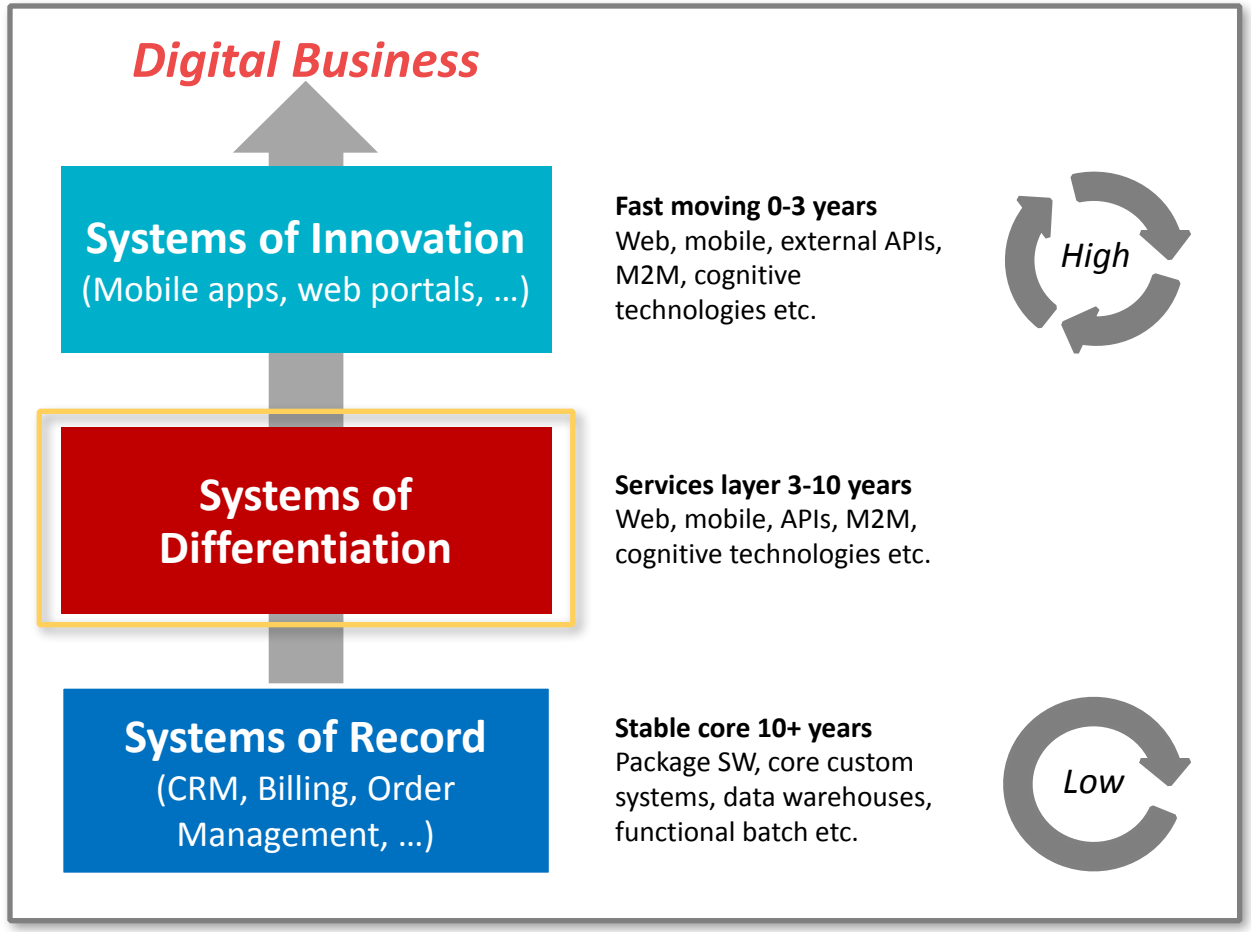
- Smartphone penetration **constantly grows** & customers become **more diverse**
- Mobile Apps users are Digital Natives as well as Digital Immigrants:
  45% of those **over 50 years old** use mobile internet
- Users spend over **30 hours per month** any time of the day with their Smart handy devices
- Even in the Italian context self-caring mobile app usage for a telco player is above **tenths of thousands sessions per hour**, night and day

Customer context and major needs

Innovative, digital business enabling platforms must be supported by elastic infrastructure providing highest versatility and SLAs

Needs for an architecture with:

- 100% availability / zero downtime
- High performance (throughput, response time)
- Flexibility
- Stop investment on legacy systems
- Decouple (as much as possible) channels from legacy operational systems
- Horizontal, seamless scalability
- Commodity off the shelf infrastructure / Private Cloud
- Streamlined Service Operations (platform, customer data flows, end user view)

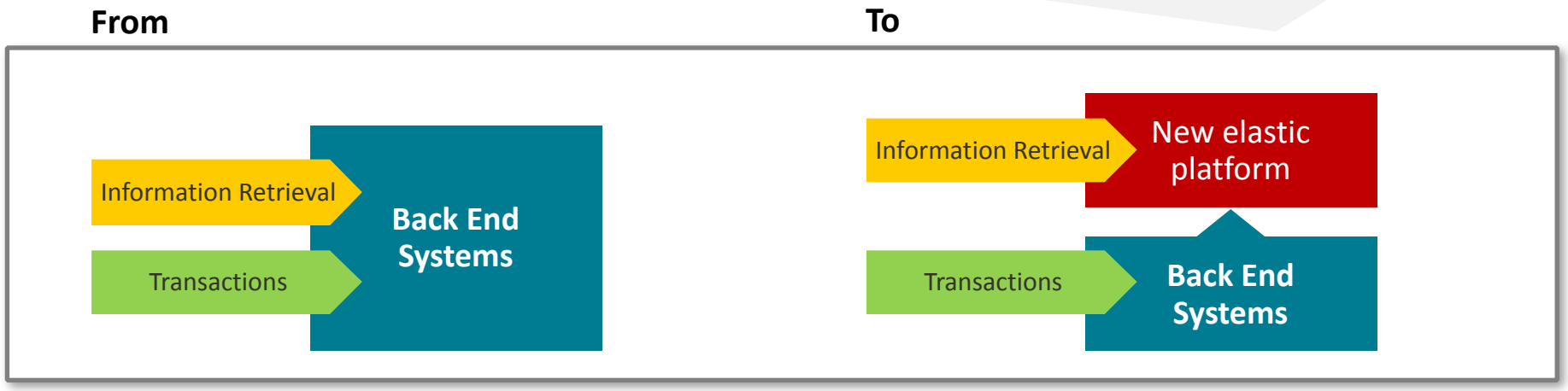


Proposed Solution

Accenture and Redhat helped a major worldwide mobile and wireline telco operator to design and realize a new decoupling platform, leading on premise cloud technologies

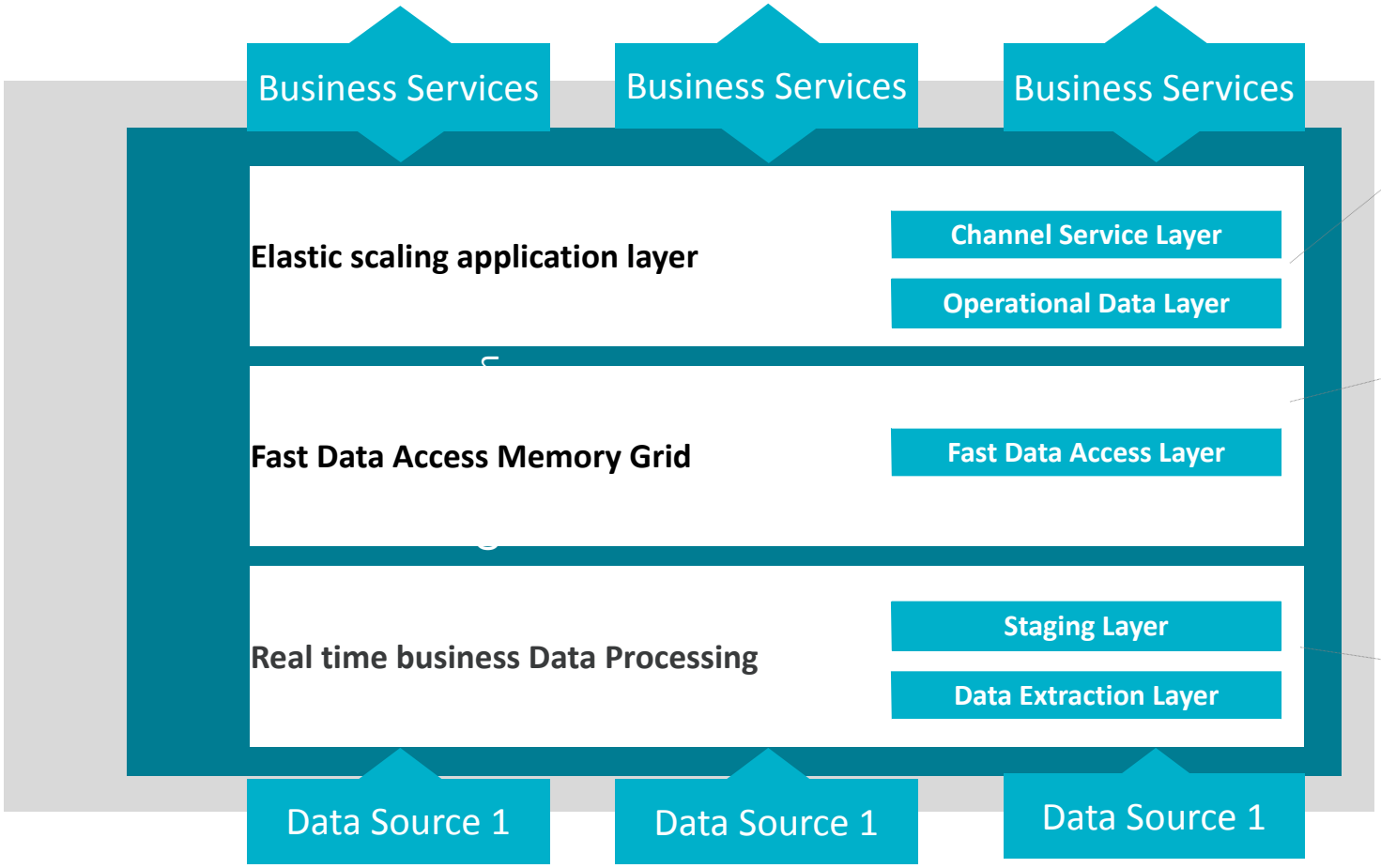
- **New architecture** to serve **large amounts of diverse business data at high speed**
- An enterprise platform, leveraging private cloud technologies
  - **Always up & running**
  - **Low cost horizontal scalability**
- The best way to serve the growing demand from channels in a heavy legacy environment…

…decoupling information retrieval from customer transactions



Architecture framework

Open standards based, high redundant streamlined platform, seamless linkable into the BSS ecosystem of the client with zero impacts on surrounding systems



PaaS deployment
Centralized logging and monitoring
Integrated configuration management
Hot release management

Read optimized common business data model

Hybrid model

Continuous near real-time data replication
Reconciliation
Data models unification

Technology stack

Leading technologies integrated together in order to match requirements on all layers

IAAS / PAAS			Description	Technologies
Channel Service Layer	Service Gateway Components		This is the access point for Client Applications. It exposes interfaces for both internal and external clients.	PaaS: Read Hat Open Shift 2.1
Operational Layer	Data Access Manager	Other External Service Proxy	DAM exposes reusable, fast and reliable data access methods. Proxy module directly interfaces network systems in order to retrieve rela time values. Application logs are collected centrally on a scalable MongoDb cluster	MongoDB 2.6
Fast Data Access Layer	In Memory Data Grid		IMDG is a data structure that resides entirely in RAM. Distributed among multiple servers. IMDG is suited to retrieve data with velocity and high volumes.	IM Data Grid Pivotal Gemfire 7.02
Staging Layer	Staging Data Base (DB)		RDBMS database used to prepare data to be loaded on IMDG. Can also be used for certain data sets or in yellow / red mode	Oracle RDBMS RAC 11g
Data Extraction Layer	Extract Transform Load (ETL)		ETL extracts data (via Extractor) from Data Sources replica to create de-normalized view of the information accessible by the channels providing Common Data Model	Transformation: Oracle ODI 12c
	Data Replicas			Extractor: Oracle Golden Gate 11
Backend Legacy Source Systems Layer	Data Source 2	Data Source 2	Primary BSS platforms where the data needed for front-end channels reside.	

IaaS: VMWare VSphere 5.0

Platform core capabilities

Multi-Mode
Red/Yellow /Green

Each service for each client channel may run in different ways, depending on various working conditions of internal components or integrated data sources. **Client channels get a clear message in every condition.**

Common Data Model

Data collection and processing stages realize a clean, flat, unified business data model, de-coupled from involved source systems and flexible in order to accommodate client channel needs

Caching

Each service accessing data from external systems may use advanced **caching capabilities**. Caching kicks in to overcome external data source unavailability, pace and lower server-side workload and increase services performance.

Throttling

Monitor and **limit client channels throughput, requests/ transactions to/from external systems,** use queues to decouple and manage throughput gap between clients requests and external source systems.

Log Management

Provides a **centralized log collection platform**, realized on a non relational databases in order to better scale versus high transaction volumes. **Log can be easily accessed** by both command line and web consoles for troubleshooting and analytics.

Configuration Management

A **unified web console** allows administrators to monitor all services operational statuses, alarms, notifications, etc. It allows also for **channel configuration**, **throttling** management, **green/yellow/red mode switching**

SLA Management

The platform is able to guarantee defined SLAs thanks to its capability of providing a **dynamical scalability** of the computation engine due to the number of interrogations. **Guaranteed SLAs can be different for each channel**.

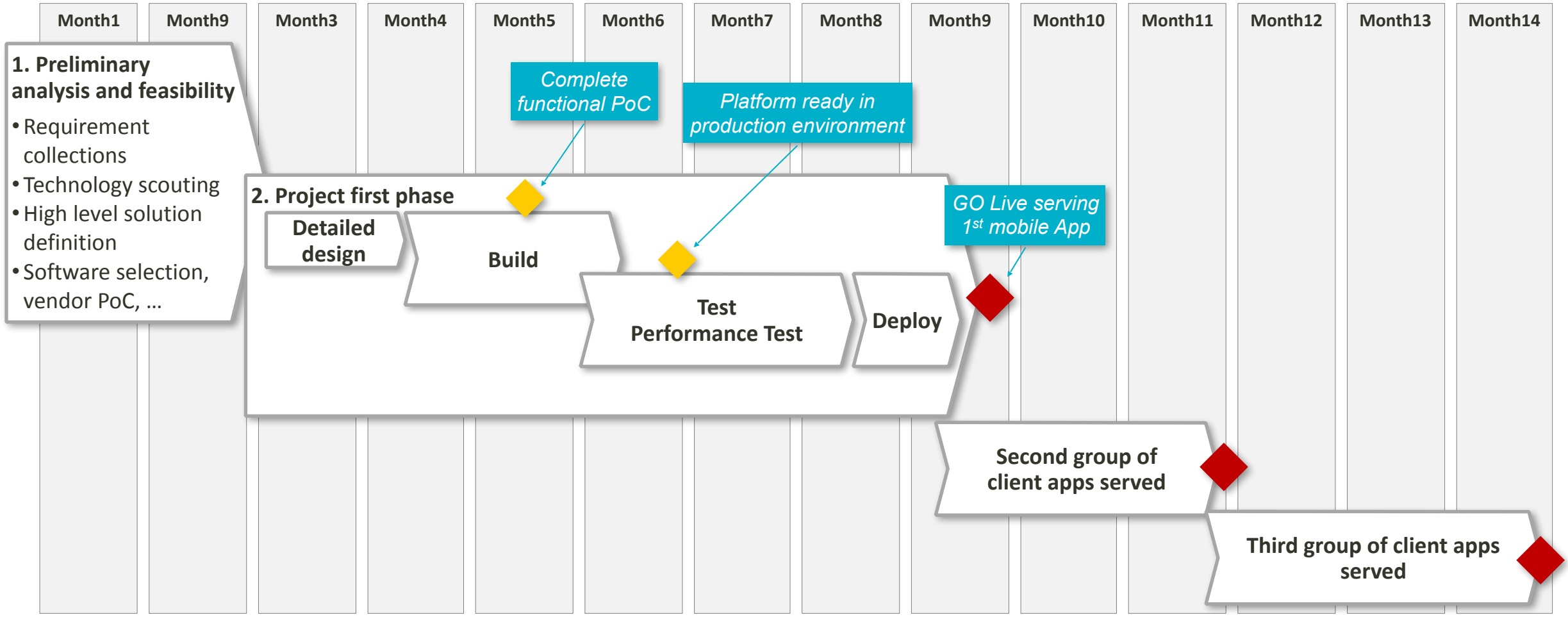
Hot Deployment

Software updates can be executed **without any service unavailability**, thanks to both PaaS native capabilities (i.e. continuous deployment and rolling reboots of application components) and specific architecture design (i.e. data redundancies, yellow mode for temporary data access, etc.)

Some achievements

- Service Access
  - **> 30Million** user sessions per month
  - Deployed for up to **2.000 interactions per seconds**, hundreds of concurrent client sessions
- Platform Core Engine
  - **24x7x365**: Always up & running
  - More than **100 hundred standard x86 virtual** machines involved
  - > **1TByte of In memory data grid** total RAM space
- Legacy Systems integration
  - More than 1.1Bln record retrieved from source systems
  - 30GB/hour of update throughput

Project timeline



Further extensions

- Enable new functionalities, leveraging the common data model
  - Real time analytics
  - Push services/notification
- Complete «multi-tenancy» capability of the whole platform in order to host different application context on the same scalable platform
- Leverage the current platform Service Exposure Interface in order to start an holistic API strategy program
  - Per user AAA functionalities; improved security
  - Service composition/orchestration
  - Paradigm shift in the whole software lifecycle for new business services

Customer, Accenture and RedHat collaboration value

- Result based approach: availability and performance KPI driven
- “End to End” accountability, shaping to delivery and platform operation.
- Deep knowledge of existing BSS systems and related processes
- Aggressive timeline introduction (6 month from “ok to go” to the first production GO LIVE)
- Leveraging of main Open Source project and cloud related initiatives

Thank you very much for your time!

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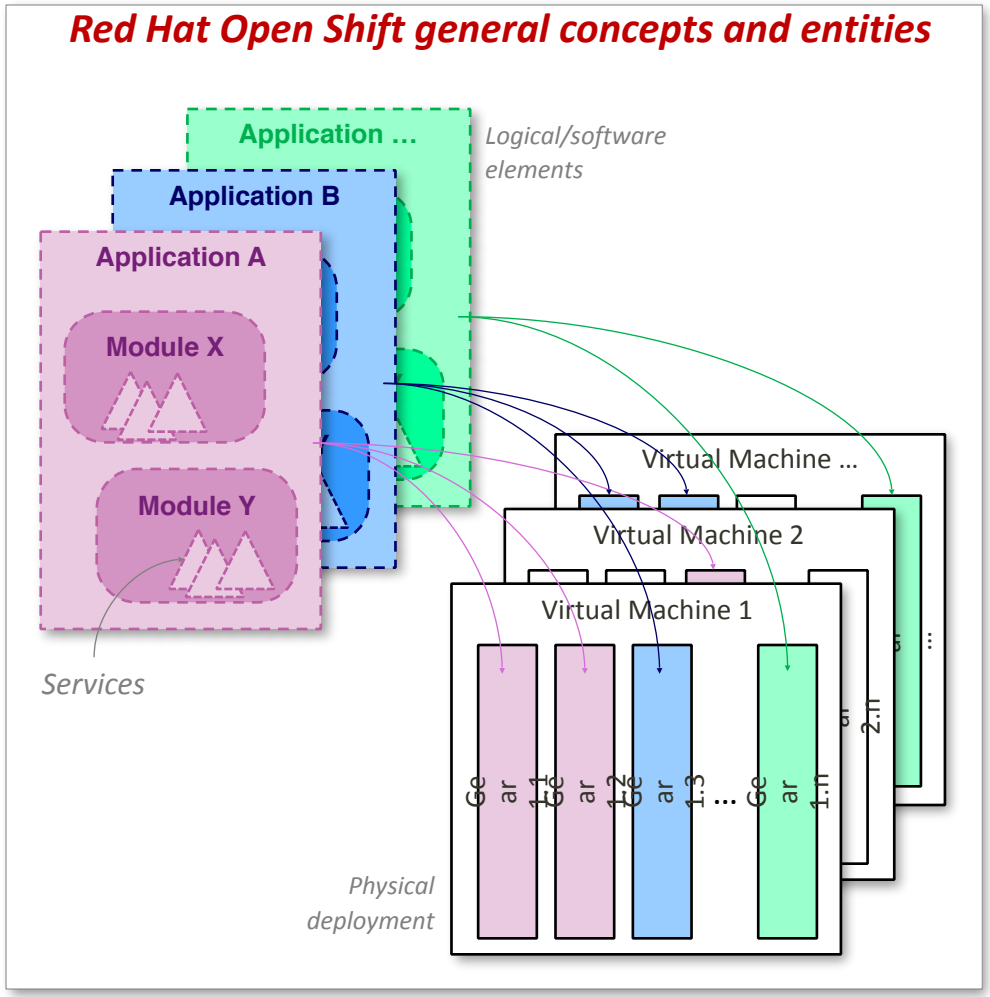
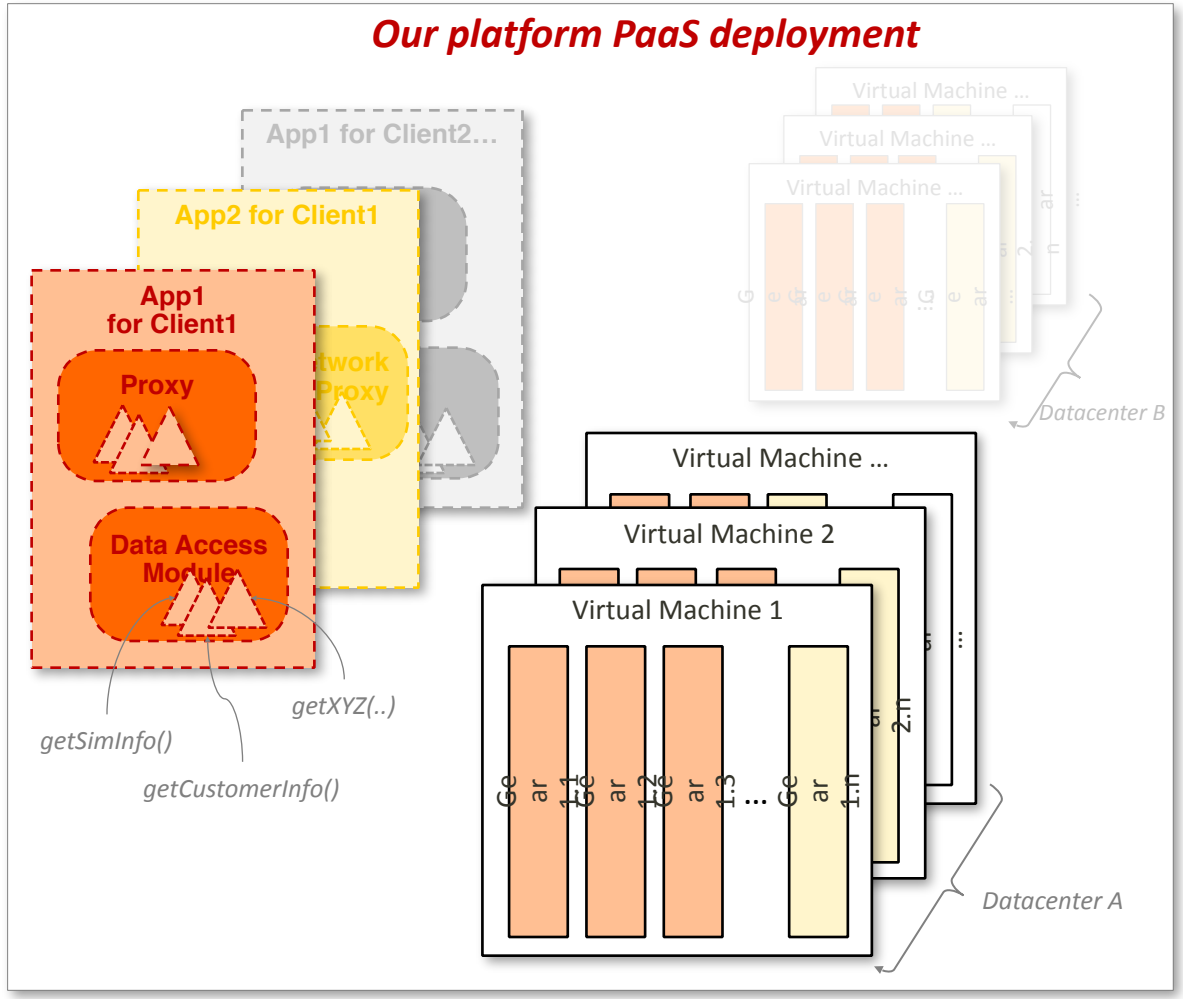
Backup Slides

- PaaS Deployment schema on OpenShift Enterprise
- MongoDB logging schema

PaaS Deployment schema on OpenShift Enterprise





Centralized log schema

MongoDB shard labelling to reduce single point of failures