Launching a Highly-regulated Startup in the Cloud

Poornaprajna Udupi (@poornaudupi)

Starting in the Cloud

86%

by 2020¶

¶ Cisco Global Cloud Index: Forecast and Methodology, 2015–2020

Building blocks, Cost, Scalability

Lean, Agile, Scrappy Disruptor

Experiment

Iterate

MVP

Growth


Security
Questionnaire

Heard on the field ...

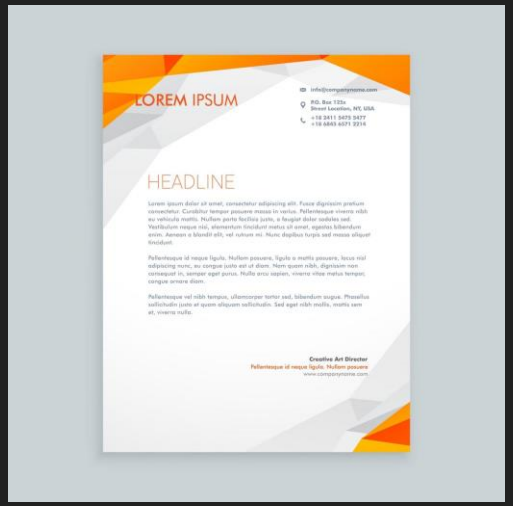
We use HTTPS

We use AWS

Military-grade encryption

Compliance Report:	Here is AWS SOC2 report
Incident Management:	Never happened so far, Yet to experience a security incident
Disaster Recovery:	99.95% uptime - from EC2 SLA, Enterprise-grade SLA
Vulnerability Management:	We use Sophos Anti Virus
Risk Assessment:	Free Qualys Scan Report

Coming of Age



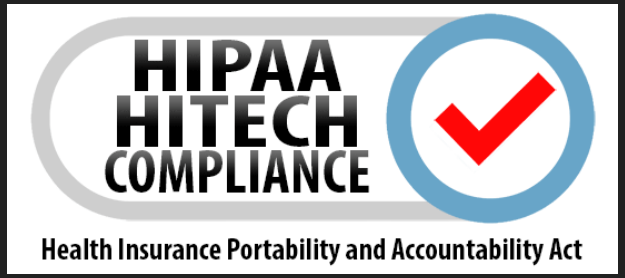
Security whitepaper
Self Assessment

Client Assessment

Compliance


HITRUST
Health Information Trust Alliance


PCI
DSS
CERTIFIED


HIPAA
HITECH
COMPLIANCE
Health Insurance Portability and Accountability Act

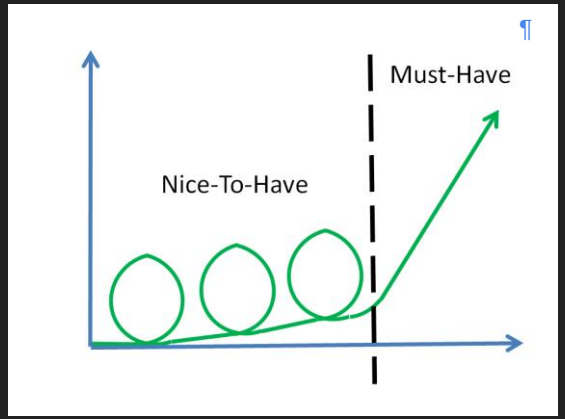

Information Security Management System
ISO
27001
Certified


FISMA / NIST
800-53
CERTIFIED
2013-2016


AICPA Service Organization Control Reports
SM
AICPA
SOC 2
Formerly SAS 70 Reports

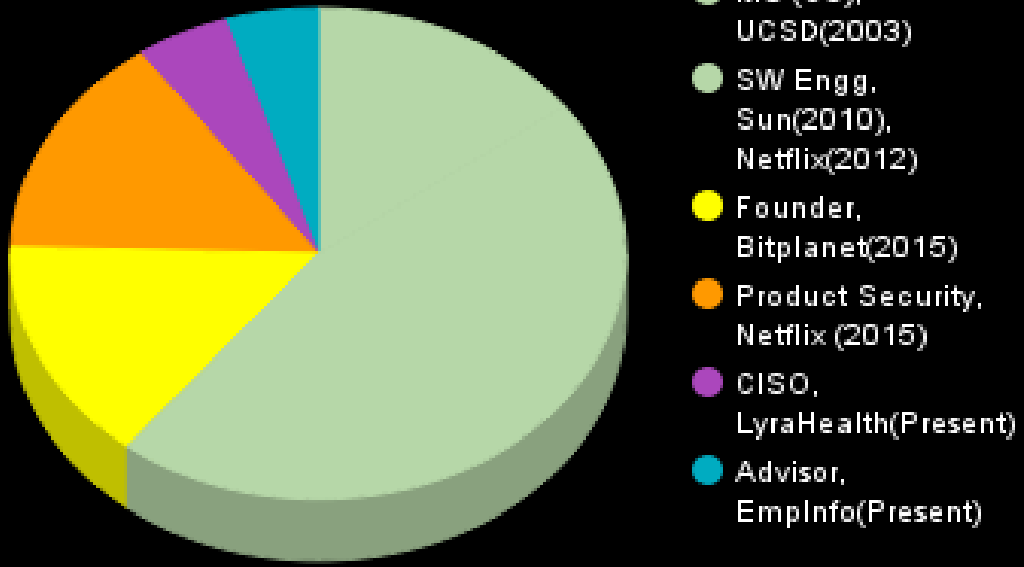

Security
Guidelines
Standardized
Assessments
Compliance

Guidelines

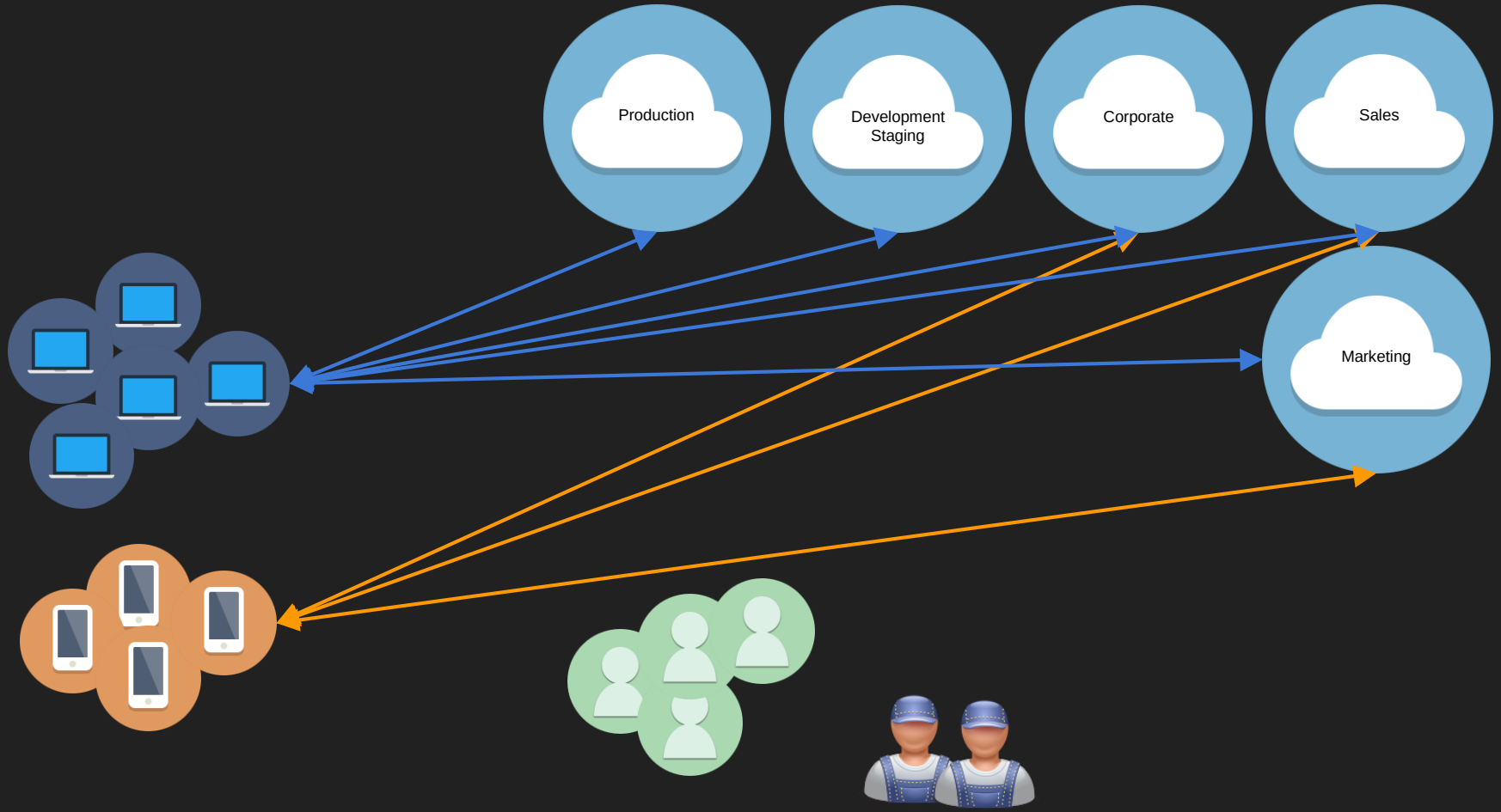


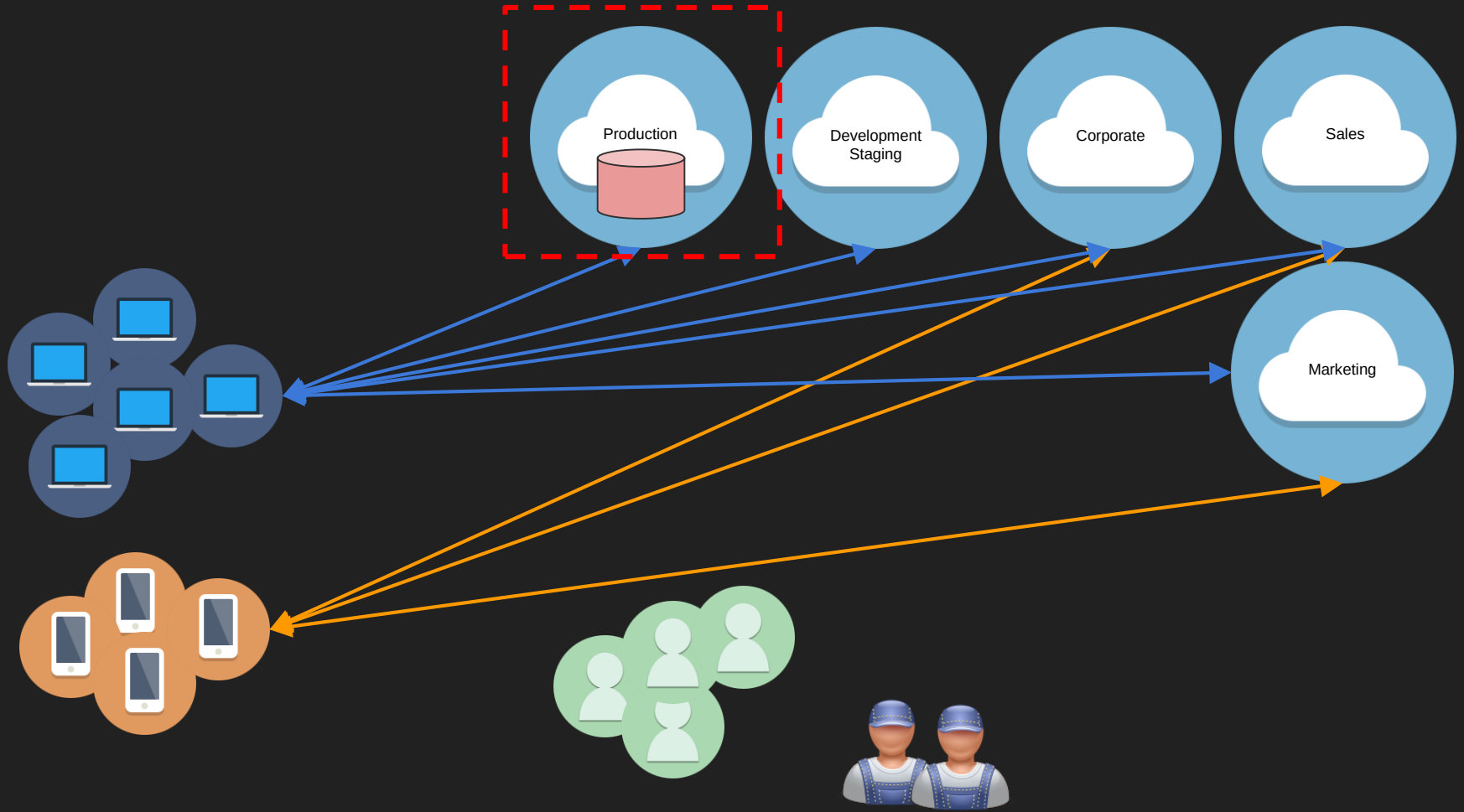
¶ http://smartfaststartup.com/2011/09/20/how-to-become-a-must-have/

About Me: Poornaprajna Udupi (@poornaudupi)



Designed by Freepik


Production
Development
Staging
Corporate
Sales
Marketing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Data Protection

Data Classification

- Scope
- Sensitivity
- AWS Tags

Encryption

- Storage
- Application (multi tenant)
- Amazon KMS, Azure Key Vault
- Confidant (by Lyft)

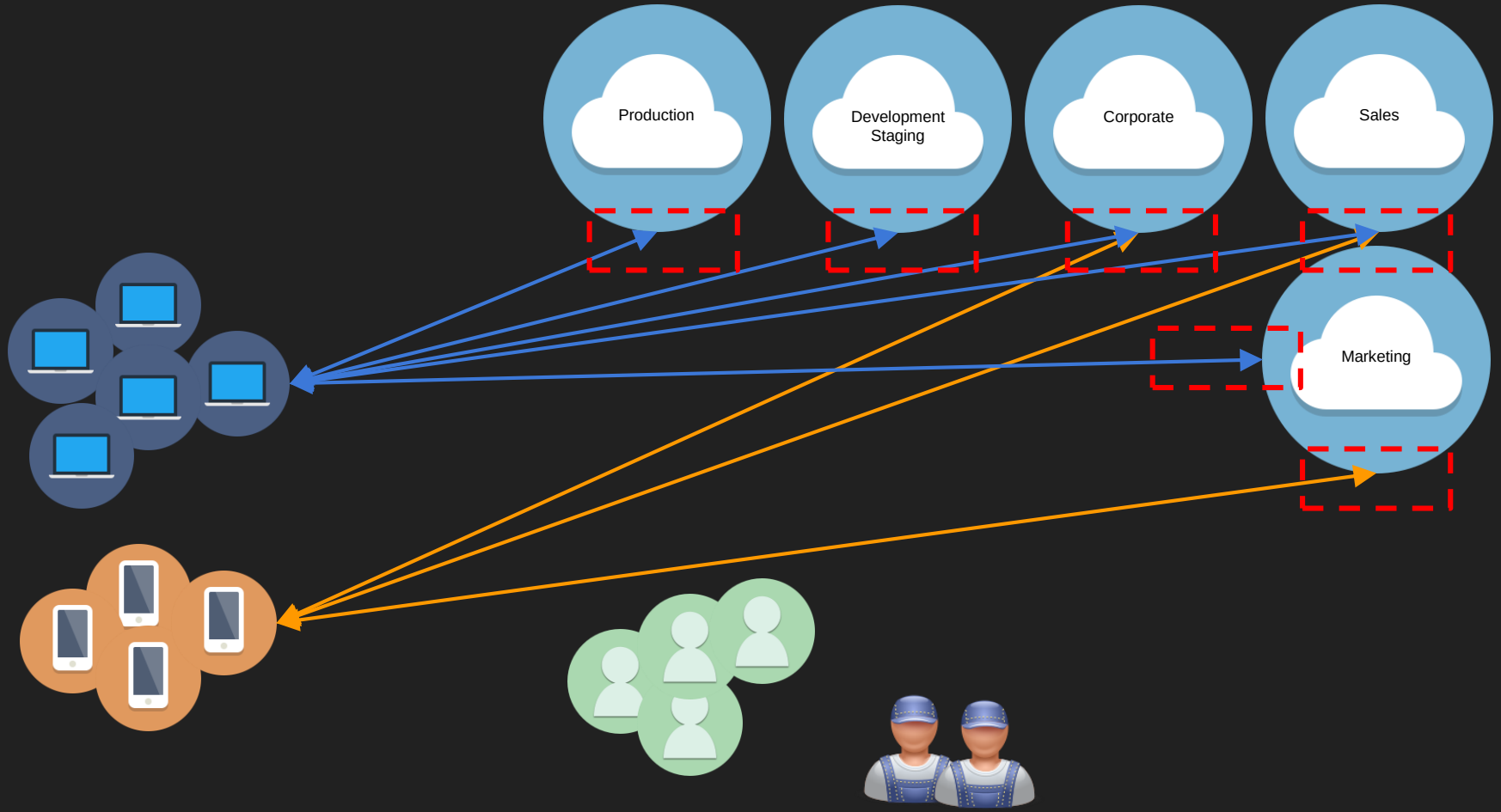
Backup & Recovery

- Periodic snapshots
- Periodic backups
- Server snapshots
- AWS RDS, AWS AMI snapshots, Azure SQL Database¶

Data Loss Prevention

- Alerts
- Monitoring
- AWS CloudWatch, Google Compute StackDriver Monitoring

¶ https://azure.microsoft.com/en-us/services/sql-database/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Network Access

Segregation

- Based on data classification
- AWS Virtual Private Cloud, Azure Virtual Network

Microservice Access

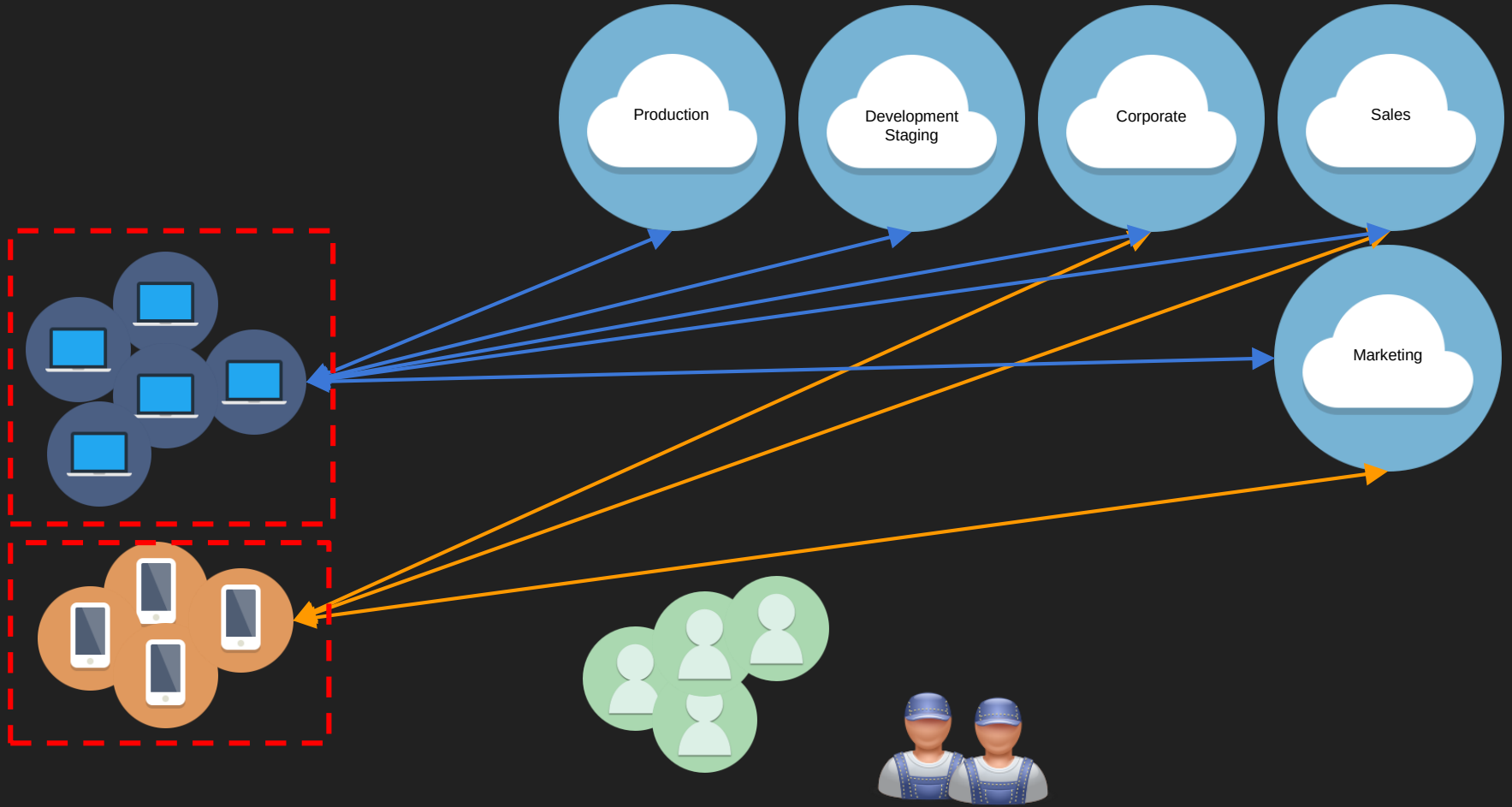
- Subnets
- NAT Gateway
- Security Groups
- Role based access

Application Access

- Allow port 443 only
- AWS Security Groups, AWS Certificate Manager, Azure Network Security Groups, AWS Web Application Firewall

Employee Access

- Virtual Private Network (VPN) Tunnel only
- SSH required
- WiFi, Network requirements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Endpoints

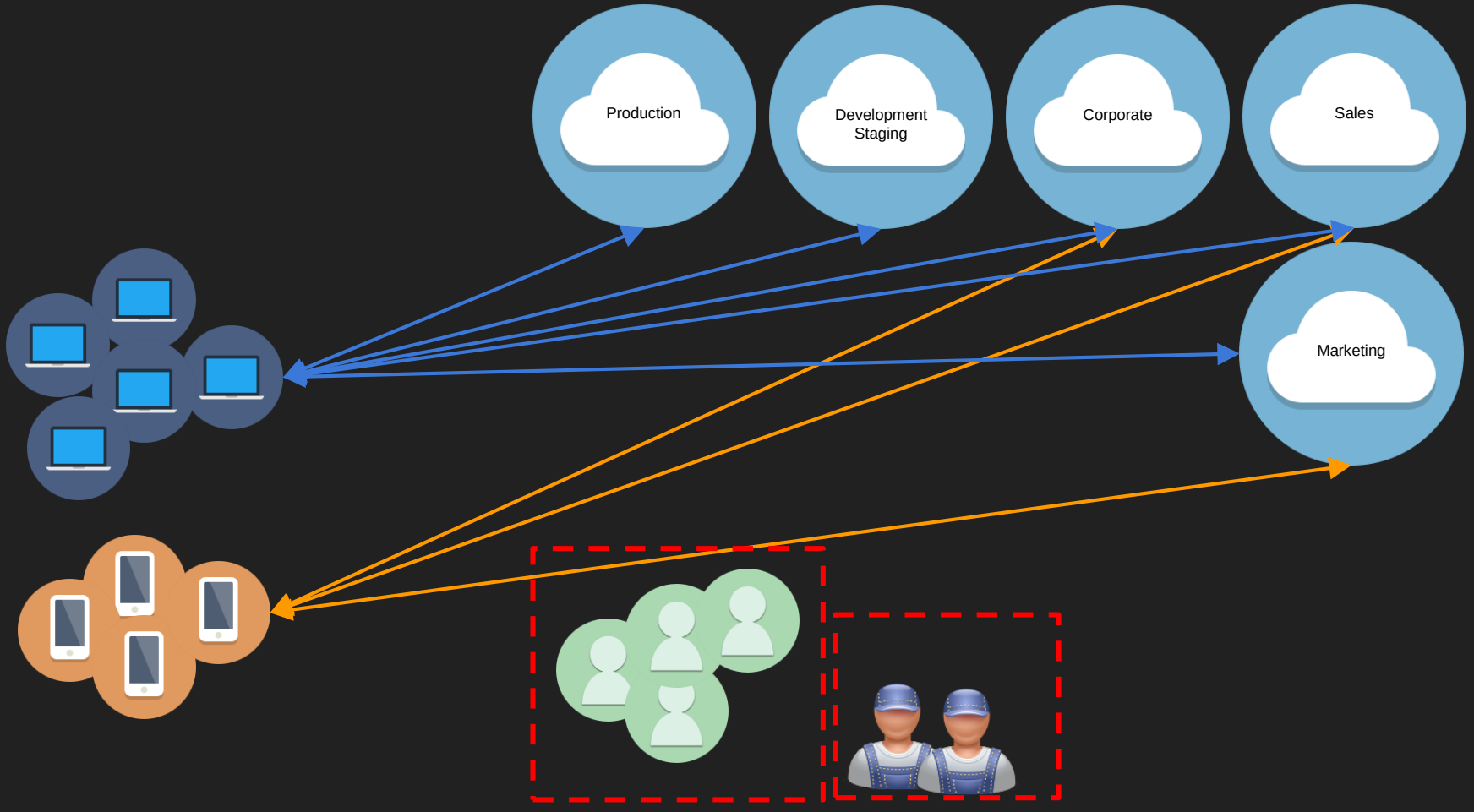
Mobile Device Management

- Installed applications
- Accessible data
- Disk encryption,
- Firewall
- Best practices (screen lock, password)
- JAMF Cloud for Apple Macs, iPhones, iPads,
  Microsoft Intune for PCs, Windows mobile,
  Google MDM for Androids

Anti Virus, Anti Malware

Removable Media

- Forbid.
- By Exception.
- Allow auditable transmission of data only.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Access Control

- Minimum Necessary, Least Privilege
  - Administrators
  - Cross-account access
  - Role-based access
  - Groups
  - AWS Security Policies, AWS Identity and Access Manager, Azure Active Directory, Google Cloud IAM
  - Bless (by Netflix)

Audit, Logging & Monitoring

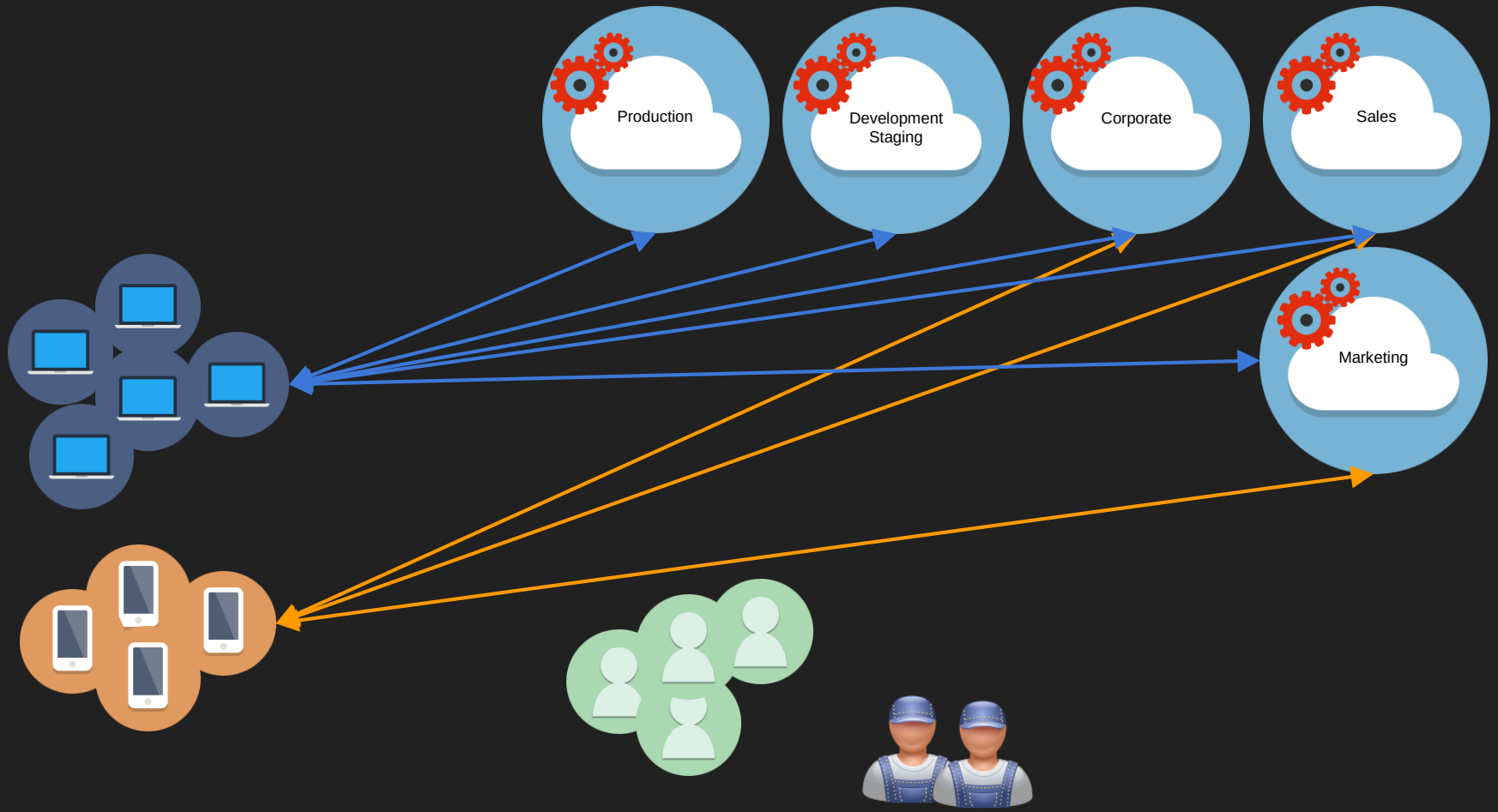
System Activities (create, read, update, delete) and Admin activities

- Application
- Servers
- Database
- Network

Report, Monitor and Audit periodically

AWS CloudTrail, AWS CloudWatch, AWS VPC Flow Logs, Azure Application Insights, Azure Operational Insights, Google StackDriver Monitoring

Security Monkey (by Netflix), ElastAlert (by Yelp), ElasticSearch (by Elastic)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Configure for best practices

- Password Management
  - Single Sign On
  - Multi-factor
  - Strength
  - Reuse
  - AWS IAM, Google Cloud IAM, Azure Active Directory
- Real time guidance on security, performance, cost, fault tolerance
  - AWS Trusted Advisor, AWS Config
  - Security Monkey (by Netflix), DbDat (by foospidy)
- Managed updates
  - Vulnerability management
  - Patching level
  - Time
  - Red/black
  - AWS ElasticBeanstalk, Azure CloudServices, Azure Websites and Apps, Google App Engine

Organizational Maturity

Physical and Environmental Security

- Lean on the clouds
- No local data storage & processing
- Visitor logs and system Changes
- Network access requirements

Vulnerability Management

- Up to date inventory of assets: servers, workstations, portable devices, software
- Up to date with vendor software
- Handling zero-day vulnerabilities
- AWS Config, JAMF, Google MDM, Microsoft Intune

Third-Party Risk Assessment

- Contractual guarantees
- Xfer compliance requirements
- Minimum required data sets, access
- Monitor SLAs

Incident Response

- Up to date procedures for handling incidents
- Organizational Structure for handlers and communicators

Organizational Maturity

Disaster Recovery & Business Continuity

- Up to date procedure to start from scratch
- Organizational Structure for handlers
- Recovery Time Objective
- Recovery Point Objective

Risk Management

- Know the risks and manage them
- Likelihood and Impact analysis
- Outsourcing (e.g. Business Associate Agreement)

Secure SDLC

- Secure coding practices
- Code reviews, OWASP Top 10
- Issue tracking, Change Management
- findbugs, find-sec-bugs

Education, Training and Awareness

- US-CERT
- SANS Newsletters
- Training
- Cybrary, Coursera, Udemy

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