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| KMS Technology |
| Technology Assessment |
| Discussion Framework |

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**Technology Assessment of**

A SaaS Co.

Contents

[Product and Organization Overview 1](#_Toc79757657)

[Architecture and Hosting 3](#_Toc79757658)

[Development Practices and Tooling 5](#_Toc79757659)

[Test Practices and Tooling 7](#_Toc79757660)

[DevOps 9](#_Toc79757661)

[Security 10](#_Toc79757662)

[Customer Support/Customer Success 11](#_Toc79757663)

**KMS Technology Assessment Team:**

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# Product and Organization Overview

## Describe your Product Management Organization. [Please provide any associated documentation, i.e., Organization Chart, Roles, Responsibilities & Experience.]

Product management has always ultimately been led by the chief officers. They bring in market feedback and coordinate with sales and marketing. The director of product" has been managing IT support and product engineering. the director of product coordinates the collection of feedback from existing customer through the it/product support infastructure. We've never had anyone solely dedicated to true product management. Just this year we've hired a product specialist and established an IT manager and support team in an effort to allow for some time dedicated toward product management. We have two software development managers, two internal QA analysts, and 4 remote development teams at an average size of 3 developers.

## Describe your Requirements Management Process. [Include all phases, ideation through selection, prioritization, and execution.]

Never had a formalized process. Ultimately, enhancements and bugs often come from the IT/product support processes. This may be from internal or external customer requests. Those requests are documented in the development backlogs. New features can come through the IT/product support channel, or from sales or the executive officers. All epics were listed on an internal "product roadmap" and the piorities roughly assigned. When development was ready for the next epic to begin analyzing, the director of product would work with the executive team and development mangers to determine if the next priority was the correct next item. Then, it would be mapped out into the next sprint(s) and the development managers would take over with development, testing, and delivery. Upon delivery, functionality is communicated with any applicable stakeholders.

### When were the last changes made to the Requirements Management Process?

It's not a well defined process, so it's been somewhat fluid in nature. As feedback on the process was given, the process was adjusted.

## Please provide an overview of your short- and long-term Product Roadmap.

The yearly and quarterly roadmap as well as epic backlogs can be shared. There are 3 main applications with 2 minor/new applications which each have their own roadmap.

## Where do ideas for new features/enhancements come from? [Are they driven by Customers, Sales/Marketing, Technology, etc.?

As mentioned in point 1/2 above, they come from all of those areas. Customers make requests through customer support, account managers and technical support. The technology team often has network and security changes that are requested as well as support mitigation requests. Sales and the executive team bring the request from the field as well as their vision of the future direction/needs.

## Are security considerations included in Feature and Roadmap planning?

Yes, in the past it had been mostly driven by external audit findings. Now, we have more tools and plans in place from a technology standpoint.

## What metrics/analytics are in place to measure customer feature use, engagement, satisfaction, etc.?

We have audit logging in place, but it's rarely been used to measure customer behavior. For much of our current volume today, we are just the API services backend that is plugged into our integration partners' platforms. As such, there hasn't been a huge focus on the cusomter engagement in our own interfaces. With our end customer platform, processing.network, we have monitored and analyzed a number of metrics: registrations vs loads, which tranfer types are chosen based on pricing, etc.

## How do you describe Customer Satisfaction Levels today?

Based on the feedback we receive, average customer satisfaction is relatively high. Most frustration comes from lack of training or poor/incomplete integrations done by integration partners.

## What are your most common customer complaints?

Most common complaints are when the are unable to load a card, don't know how to use a card, or about fees that may be incurred.

## What are your most highly used and liked features?

Our load function is really our main feature on the issuing side. For the end customer, we have a majority of customers that just use the debit card. Many utilize our IVR for support, balance checks, PIN changes, etc. About 20% of our end customers use our online banking platform for additional transfer options or account management.

## What is your release plan or timeline?

We release on Tuesday nights. Each project roughly follows a two week sprint cycle but can adapt to shorter or longer cycles based on the epic/requirements. Items are released in the next window as soon as all testing is completed and reviews/approvals completed.

## How are releases managed?

We typically release per sprint although occasionally due to testing or urgent requests, multiple sprints will be merged into a single release.

## How do you determine scope for a release?

Most often a release is synonymous to a sprint. It's dependent on the impactfulness or co-dependancy of a particular function or epic. Usually if an epic requires more then one sprint, we release each sprint seperately and use permissions/configurations to prevent unintended impact until the entirety of the epic is released.

## What is your revenue model for the product? [Subscription based, one time purchase, Freemium, support fees, etc.]

There is no revenue model directly tied to the technology currently. Revenue is transactional fees incurred by the middle or end customer. The technology is the tool that enables customers to perform transactions and get the support they need. Although, we do use the technology to influence end customer behavior to encourage use of more profitable transaction options (cards, instant transfer, etc.) while still supporting the applicable free options.

## Do you conduct Alpha/Beta tests?

We have on a very limited basis around different fee structures but not really from product usage standpoint.

## How do you onboard new Product team members?

We have a small team internally with very low turnover so there isn't much onboarding. Developers are all third-party organization that manage turnover and cross training. When we do bring on new individuals, we start with a high level product design training. Then we introduce them to our processes and they work closely with their manager on any questions.

## What would be your investment priorities for a capital infusion?

It depends on the direction we want to go. If we are going to continue to focus on being a program manger, then we would want to invest in sales/marketing and relationship managers. Our technology already meets the needs of our current space and can grow and adapt into the additional requirements of adjacent use cases. If we want to move more towards being a service provider we would need to invest in a few priorities. We would need a dedicated product team to drive product, additional development resources to enhance the technologies to be designed for better scalability, and sales/marketing to chase the "new" market.

# Architecture and Hosting

## Please describe current state architecture at a high level. Please include any descriptive system documentation, schematics and pattern standards.

We are currently using Dell SonicWall as our boundary device. We have different subnets for web/application servers, databases, and "internal" servers. ACLs are in place for communication between the different subnets.

We currently have 2 physical connections (Cisco devices) to/from PULSE supporting partner service integration.

Backups are stored on Synology devices and synchronized to an alternate data center (DC).

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| Computing Environment: Data Center  Cloud  Hybrid Cloud  Multi-Cloud | Hosting: On-Premise  Colocation Facility  AWS Cloud  Azure Cloud  GCP Cloud  Other hosting provider:  Click or tap here to enter your response. |
| Please list front-end stack components: HTML, CSS, Javascript | Please list back-end stack components: Java, PHP, IIS, Tomcat |
| Please list system database technologies: [ex: PostGres, Maria, S3,SQL Server, Oracle | Please list service integrations: WorldPay, PULSE |
| Please describe tenancy models for system databases: single tenancy |  |

## Please describe future state plans for current products within scope of the assessment.

Our plan is to move from a colocated data center to Oracle Cloud Infrastructure (OCI). Initially stacks will remain the same, but leveraging the cloud service offering where applicable. Future growth will be into API gateways, WAF, and serverless functions.

## What are major areas of concern with the current state architecture?

For example, performance, security, scalability, resilience, extensibility.

redundancy, scalability and resiliency

## What Design Principles and Patterns are applied? [Examples: SOLID, Cloud vs On Prem, Cloud Native, Cloud Agnostic, SPA, PWA, Mobile Friendly/Mobile First, Serverless, Microservices, Caching, Event Handling, Redundancy, User Experience]

Currently: On-prem and User Experience

Future: Cloud adoption, serverless, API Gateway, WAF, event-driven, redundancy

## How are architecture level decisions made?

Decisions are made by the Systems Engineer with input from the product and development teams.

## Are security considerations included in architectural decisions?

Yes, PCI compliance and zero trust are considerations

## What are the main factors considered when making changes to existing architecture?

Security, stability, performance, impact to customer

## What are typical loads placed upon the system?

Not sure how to answer this. Many different ways on each platform. To be discussed.

### Have you established performance and load requirements?

Not specifically. We monitor if transaction response times get slow but we have never established load testing with any baselines.

## What are stability and availability requirements?

We do maintenance in a set window on Tuesday nights. Otherwise we are typically up all the time. No specific SLAs other than the bank which is 3 nines if I remember correctly. Nothing that we've come up against. Pulse also requires a certain amount of uptime but also nothing that we come up against. Otherwise, it's just customer perception/expectation of uptime/stability but nothing that was officially contracted.

### What SLAs are in place?

We have sponsor bank and Pulse SLAs for us to meet, but no commited SLAs to customers.

## Describe the users of the system. [Who are they; what are their roles; how do they access; when do they typically work; what devices do they use?]

We have administrator users (Our employees) who do operational functions in our web portal. This is very few users and they access from desktops during business hours. Then we have our agents who access our web portals. There are a few hundred agent users which access from desktops mostly during business hours, but it is 24/7 for some of them. Some agents use our SFTP for transmitting files for loading card. The vast majority of our loads are through API integrations. Finally, our end cardholders. There are 80,000 new cardholders a month. Many just use their cards and don't use our system. There is heavy usage of our IVR which allows them to check balances, change PINs, etc or contact support. It is 24/7 from a technology standpoint but we only have support reps from 7-7 for normal cardholder questions. We do have 24/7 agent support and critical card issues (lost card). Our cardholder web portal has about 15,000 new users a month, and is used 24/7 by cardholders.

## Describe your data processing requirements.[Examples include online, batch, asynch, reporting, analytics, etc.]

Online, batch, and reporting. Everything is realtime except the SFTP. Reporting is available on request and has some scheduled/automated reports which are shared via SFTP in some cases and emailed out in other cases. Otherwise reports are also realtime.

## Describe your security model. [Please include your approach to authentication and authorization, encryption, and SSO.]

Portals:

Core Issuing admin and agent portals are publicly accessible and secured by HTTPS and passwords meeting PCI standards (Expires 90 days, length, special character requirements etc)

Core Acquiring admin and merchant portals are publicly accessible and secured by HTTPS and passwords. Passwords do not currenlty expire.

Legacy Portals are whitelisted by IP at server level and required password meeting PCI standards.

RPN portals have HTTPS and passwords with 2 factor authentication and device recognition.

APIs:

Core Issuing APIs are whitelisted by IP address at server and application level. Oauth tokens and API "keys" are required to be passed with each API call. A in app implementation of OAuth manages the tokens.

Core Acquiring APIs are whitelisted at the application level. Oauth tokens and merchant identifiers are required to be passed with each API call. A in app implementation of OAuth manages the tokens.

All external traffic using HTTPS TLS 1.2. There are internal network communications between apps that are unencrypted. These could be easily switched to encrypted as well.

### Is system data encrypted in motion?

All external traffic using HTTPS TLS 1.2. There are internal network communications between apps that are unencrypted. These could be easily switched to encrypted as well.

### Is system data encrypted at rest?

Core Issuing and Acquiring:

Sensitive customer information like Card Number and SSN are encrypted by the application using 3DES. Encrypted string stored in DB columns. Passwords are stored using Spring Security with BCrypt algorithm.

Legacy:

Some sensitve customer information encrypted using Oracle crypto library with 3DES algorithm. Note some sensitive card data can still be found in other tables unencrypted. Password are stored using MD5

Logs mask or leave out any sensitive data

## Describe your data security/privacy requirements. [Does the system handle sensitive business, personal, healthcare or other confidential information?]

We do have annual audits and are using a system called Tugboat that allows us to meet all of our requriments in all areas of security and privacy. This includes annual training for our employees as well as internal audits of our systems. Our websites have the required security and privacy statements and are reviewed by the compliance team.

### Are you required to comply with the California Consumer Privacy Act requirements? Have you met the requirements?

Yes we are required to comply with the California Consumer Privacy Act and we have met the requirements.

### Are you required to comply with the General Data Protection Regulation requirements? Have you met the requirements?

I am not clear what this is.

## Is there anything non-conventional, unique, or truly custom in the architecture - where a known solution does not exist?

No

## How do you onboard new Architecture team members?

This is done by our Systems Engineer in conjunction with our IT manager and all access is requested and managed through Tugboat.

# Development Practices and Tooling

## Describe your Development Organization. [Org Chart, Roles, Responsibilities, Experience]

Director of Product works to put together a roadmap for delopment efforts and oversees timelines. There are two software development mangers, each managing two development teams. They are responsible to write up the stories, work with the development teams to get it developed and delivered for testing. They also oversee our two internal QA testers. Ultimately they sign off that the sprints are ready for production release after reviewing QA efforts. QA testers test through standard regression test cases and feature specific tests.

## Please provide a brief description of your current development process. Please include any associated process documentation and standards.

Easier to discuss, but will also share the JIRA development workflow and change management workflow for context.

## Are security considerations addressed in the development process?

Yes, the development teams are responsible to evaluate the code against the security checklists. Also, one is code checked in it is scanned by Github for vulnerabilities. Any major updates or vulnerabilities are typically scheduled into the sprints.

## When was the last change made to your development process?

We just recently adjusted the Girmiti teams to be more accountable for their QA efforts. We also, just changed the Bansoft team to consider sandbox a "Production" level environment. Also, the workflows and change management processes are being simplified to cut overhead after working with and confirming the changes with the SOC and PCI auditors.

## What IDE do your dev teams use?

Our PHP team uses Sublime Text and VSCode. Our Java teams still use Eclipse if I'm not mistaken

## What code repository is used?

Github

## How is your development environment managed?

Development companies manage their own environment outside of our datacenters/accounts.

## How do you onboard new developers to the team?

Developers are all third-party organizations that manage team turnover/onboarding.

## How is the quality of development measured?

There hasn't been an official measure other than sprints output and bugs. We did just recently implement some KPIs last week.

## What languages/frameworks are used?

Core Issuing and Acquiring use OpenJDK 11 and Spring 5.3 Framework. UI uses mostly html and jquery in jsp pages. Custom SQL queries and procedures.

Legacy uses Java 1.7, javascript and Spring 2 Framework, Custom SQL queries and procedures. Also dependent on a handfull of individual java utilties run by windows scheduler.

RPN use PHP 7 and a custom built framework. Some tools like bootstrap framework used for frontend.

### What is the level of expertise within the current team for each?

Overall our development teams are proficient in these languages and frameworks. Developer experience level varies. As developers are 3rd parties we're not always privy to the experience level of the individual coders. We have seen setbacks due to experience coders being swapped out for coders in training.

## How is developers’ performance measured?

We have an internal "blackbox" QA team that tests each new build and reports any bugs, bad implemenation or incorrect functionality by the developers. We are in the process of implementing weekly post mortem meetings and KPIs around scope, amount of rework and delivery times.

## What are the most common problems developers run into during the development cycle?

As the developers are third parties we do not always get details about internal team challenges. The most common frustrations raised to us are: 1) Changing scope in the form of new tickets added to the sprint or unanticipated impact and scope of existing tickets. 2) Lack of access to servers, databases and logs necessary to troubleshoot issues.

## Is there a peer review or QA review process in place?

We do have coders on the Company side that do peer review of code. We do have our "blackbox" QA team doing user acceptance and functional review of all tickets.

## How are defects found during development managed?

Our 3rd party developers have internal QA teams that test daily builds and report them to developers. When the build is deemed ready for production by our 3rd party dev teams the changes are moved to Company's QA servers. Companys QA team then does another round of testing. Any issues found are noted in Jira ticket comments and the ticket is moved to "Rework" status for the developers to review and make appropriate changes. This process repeats until all tickets are deemed ready for production release by Company QA team.

## What is your exception handling strategy or approach?

Assuming this question is referring to code exceptions. Exceptions in code excution that aren't specifically handled are written to logs as errors. Errors are reviewed over time, ticketed then addressed depending on scope and impact.

## Are any development standards in place today?

The 3rd party devs have some basic coding standards for things like naming conventions in the code and databases. We require them to follow OWASP guidelines and occassionally run SonarQube to check the code for bad practices.

### Are particular design patterns used?

Core Issuing, Acquiring and Legacy Platforms use MVC architectural design pattern through Spring Framework. Hibernate and C3PO are used for connection pooling and ORM.   
  
RPN team has their own custom framework and design philosophy.

With all coding teams being outsourced 3rd parties we are not aware of any more specific design patterns.

## What are the strengths and weaknesses within your dev teams today?

Strengths: All our teams have lead developers with many years of experience on the platforms and in the code bases.

As they are 3rd parties we don't have to worry about staffing or HR problems. But the relationship does make us blind to some challenges and delays occurring behind the scenes.

Our india teams have significantly different work hours (time zone).

We've had challenges getting scope and implementation reviews done before coding begins. Coders like to jump right in and start coding.

## What gaps exist within existing tooling, languages and frameworks?

There are many gaps. Simply put we are not taking advantage of newer technologies and capabilities available in our programming languages, frameworks, deployments and servers. Our priorities have been new feature development and backward compatibility. The 3rd party relationship tends to put upgrades, refactoring, maintainability and standarization in the background.

# Test Practices and Tooling

## Is there a specific delivery or technology mindset you expect the testing team to adopt?

No, our testing team does "blackbox" testing that focuses on user acceptance of requested changes and stablility. We are implementing XRay in JIRA to help standarize our testing.

### If yes, please elaborate on the characteristics of the desired mindset. [Examples: Shift-Left, no manual testing, Developers assisting in test automation, etc]

We do mostly manual testing of new featured and regression testing of critical functions. The focus is on minimal disruption to our existing customers.

## How many members in each work team are dedicated testers?

Our 3rd parties have their own internal QA teams. The Company QA team consists of two full time testors that cover our 5 different platforms.

### How many members have experience with automation?

We have one QA team member with some basic experience in test automation.

## Please provide a quick overview of your current testing lifecycle in the team.

The Company QA team tests the initial build prepared for us by the developers. Any issues are reported in comments on the Jira tickets and the tickets status is put in "rework". The developers make necessary changes, release a new build and put tickets in "Ready for testing" status. The process repeats until Company QA determines the most recent build is good and ready for production deployment.

### What are the different activities, responsibilities, communication, escalations, reporting etc. performed by the testers?

Companys QA team is responsible for ensuring that new builds deliver the requested changes, are stable, and no loss to existing functions. They test with a variety of tools and note on ticket any issues found. Returning them to rework status for developer to address with another build before we release to production

## Are security considerations part of the testing process?

Our Developers internal QA team's testing includes providing us a security checklist indicating they are testing and following OWASP security guidelines. Companys QA team does not do security related testing unless a specific ticket in the sprint addresses a security vulnerability.

## Do testers work in a dedicated test environment?

Yes

## Do testers work with actual mobile devices (if applicable)?

Yes

## Do testers create manual test cases for testing?

Yes, we have a stored repository of test case with X-Ray and they create ticket specific manual test cases.

## What test artifacts are typically created or considered necessary for completing a project?

All test cases in a ticket and and sprint must be successfully executed or justified.

## What testing tools (for traceability, test progress/documentation, defect reporting) and frameworks (for data management & automation) are used?

Jira, Jira Xray

## Are tools used to de-identify and/or create test data?

XRay, Jmeter, Postman

## How is new and changing data, such as network attributes, updates/patches, etc., refreshed in test environments?

We schedule and coordinate with our Data Center Admin when updates are being made to the test environment is made. We take the change into consideration while our QA is testing current application build.

## What are the current team challenges? [Examples: Test coverage, domain knowledge, communication, limited time to test, no automation, etc.]

No Automation and missing documentation of correct functionality for existing features. Also sometimes in adequate details on tickets to determine best test cases.

## Can you share some sample artifacts - plans, test cases, automation scripts - and access to a test environment with the reviewing team?

We can, to be provided on request.

## Are there any specific areas where automation coverage is needed?

It would be great to automate our regression test cases. Also, I would love to implement automated load/performance tests. Currenlty all regression is manual. The minimal load/performance testing we've done has always been manaully setup with a tool such as Jmeter for "bulk" activity.

## What gaps exist with current automation tool?

We don't have a current automation tool.

## What gaps exist in testing automation skills?

Thomas has some experience using testing automation but may lack technical ability to implement.

## How much performance testing is done?

Very little, only if we are concerned about a specific changes impact on performance. We then manually test before and after the change to compare the impact.

### What performance testing or monitoring tools are in use?

On our test environment there aren't any in use.

# DevOps

## Please provide a brief overview of your current DevOps lifecycle.

Any issues identified come through our technical support queues. If development is required the changes are added into sprints (current or future) depending on criticality/impact. Any critial bug would require an "emergency" sprint or rollback if the bug was recently introduced. We haven't had an emergency sprint in the last year that I can remember. Most bugs are minimal in nature and come out with future sprints. We do not have continuous deployments. Enhancement feedback is always scheduled in future sprints.

## What gaps exist with current approaches or tools?

We recently got our developers to start developing on our Github accounts so that we can move towards a more automated/continuous approach.

## What gaps exist in DevOps team skills?

Bugs and feature request come through our support queues. Troubleshooting can then escalate to the software development managers and director of product who can typically identify the issue. They have DB access to see if/how the data is impacting the bug. If it gets to the code level to identify an issue, we do a devops engineer in office who can help. Otherwise the story with all details, data, and logs are shared with the development teams to dig deeper.

## How is communication handled between teams regarding build status, quality levels, and issue resolution?

Communication (summaries) is recorded through JIRA for statuses, testing, etc. There is IM with development teams, email, and twice a week calls at a minimum.

## How is the build process managed?

Developer commit code changes to github and provide a builds to deployed in QA. For Issuing, Acquiring and Legacy builds are deployed to test servers by Development Manager copying war files into Tomcat. For RPN developers deploy changes to test servers.

## Is CI/CD in place?

No

## What tools support your pipeline?

Jira, Github

## How is security incorporated into the DevOps process?

Changes are done through the development process which includes developer security checklist.

## Which tasks are automated?

We have various custom monitoring utilities in place and alerts for any important issues.

## Which tasks remain manual?

Most changes are manual. We do have some basic scripts in place for doing some types of updates.

## What are your current release cycles in terms of frequency and size?

Depending on the platform we release every 2 weeks or Montlhly.

## Is there a mobile component to your offering?

Out of our three main applications, only one is used on mobile devices at a significant ratio. We have ensured that the webpages are responsive. We do have two mobile offerings but they are independent of our main services.

# Security

(Note - some of this may be covered during the Architecture session as well)

## Please provide an overview of information security policies and procedures.

All policies and procedures are held in our Tugboat tool with documented reviews and document revision history. We can provide access to the tools or walk you through the system in an interview.

### Do you have a designated individual or group responsible for cyber-security?

Yes it is our executive team.

## Are Penetration Tests performed?

Yes

### Provide a list of third-party tools or vendors used, frequency of tests, and examples of past results and mitigation actions taken.

ControlCase is the thrid-party group that does our PCI audit. Part of their service is automated and manual penetration tests. On top of external penetration tests, we provide users of different permission levels so that they can test privledge escalation, sql injection, etc from within the applications as well. Example results and mitigation actions can be shared. I do think there's a weakness in their testing around APIs. Any "critial" issues are resolved before the audit can be closed and non-critical recommendations are scheduled in to be addressed over the next year. In the early years there were issues identified that improved our security footing, but more recent years have found only minimal recommendations with low risk.

## Are vulnerability scans conducted?

Yes

### Provide a list of third-party tools or vendors used, frequency of tests, and examples of past results and mitigation actions taken.

Code is scanned by Github for vulnerabilities. We have also periodically done some testing with Sonarqube. Other than Github, nothing is scheduled. Past results and actions taken can be shared.

## Has the organization experienced a cybersecurity breach in the past five years?

No

## How do you manage the use of open-source software?

This is not managed well currently.

## Do you have a strategy or process around software selection, approval, and inventory?

Supporting software and access control is managed through the IT queues/processes.

## Do your teams actively contribute code to open-source communities?

No

# Customer Support/Customer Success

## Describe your Customer Support and Maintenance Organization. [Org Chart, Roles, Responsibilities, Experience]

The tier 1 and 2 customer success as well as account management, onboarding, and client success have all recently been changed (are in the process still) by the CEO. Ulitmately all of those represent the first level of contact for our customers with the exception of integrations and partner support. What that means is that all cardholders and agents get support from other departments. Technical support can assist as needed but only if an internal support ticket is raised. Other than that, we have a partner support queue which can be used by partners for issues or questions during integrations. The partner queue and IT queue are montiored and triaged during business hours by our technical support representative who we hired about a month ago. We also implemented an IT manager about a month ago who oversees the requests. Also, we hired a techncial support representative (hardware) about a month ago who assists with IT tickets. Prior to a month ago this was all manged by the director of product. We have an integrations manager who has been with us for about 4 years that had been the one managing the queue. Our now IT manager has been with us about 4 years and had been managing the hardware amongst other things previously. Software development managers and the director of product spend a lot of time previously assiting with technical support. The new organization and individuals were all in an effort to separate IT from Product so that there could be more focus on product without the bandwidth issues and interruptions that techncial support caused. So now there is an IT manager with essentially three team members to support customers: technical support (triage and troubleshoot), technical support (hardware/access) and integration manager.

## Describe the processes used by the Customer Support and Maintenance teams.

The process is controlled by the JIRA service desk projects with associated workflows, queues, etc.

## When was the last change made to this process?

As mentioned above, the team changed/grew recently which has allowed us to put more formal processes in place. Also, we are enforcing documentation in Confluence for troubleshooting to allow for future scalability. In the past, the documentation was usually just what informaiton was documented with the resolutions.

## What customer support tools are in place?

Monitoring, Alerting, Reporting (Dashboards), etc.

Most customer support is managed through the JIRA service desk queues. On top of that we do have automated monitoring, alerting in place in a couple ways. We have Automate in place, which monitors physical hardware (servers and workstations). We have an internal utility that montiors every 30 seconds for fraud, performance, etc. Applications are also montiored by Uptime.com for availability and response times. Non-critial alerts are sent into the IT queue for review during business hours. Critial alerts are sent to alerts@company.com which is our on-call process. This emails critial internal individuals and texts and calls the currently on-call individual for immediate attention.

## Do you have a formal NOC or SOC in place?

Yes, we rotate on-call internally.

## How are Critical outages handled?

The on-call individual is the first response and has most of the training/access to handle critial outages. Most critial outages simply require a reboot. All on-call individuals have the personal contact information of the rest of the team and includes them as needed.

## Are security considerations included in the Customer Support process?

We strive to follow change management and access control policies.

## Are procedures in place for handling Data Security/Privacy Breach?

Not exactly sure what this is asking. We have procedures for handling data security although I feel that some data transmission has room for improvement. As far as a breach, we have an incident response plan which addresses the process in the event of a breach.

## Are Business Continuity Plans in place?

To some extent, but there is definitely room for improvement. Backups and hot spares of many critical pieces of infastructure are in place, and there is some colocation availability. Ultimately this is one of the major drivers for a push to cloud.

## Provide Key Measures for availability and stability for all products and infrastructure.

We lacking much of what I wish we had here, but we have the majority of impact addressed. Currently we measure availability and stability using uptime pings, response times, and application and server health metrics (CPU, memory, storage). We don't measure error rates or user satisfaction.

## How is End User Documentation managed?

Currently we have a mix of internally hosted documentation that is manually shared as well as public confluence documentation.

## How are critical maintenance items incorporated into the Product Roadmap/Release schedule?

As they are identified, they are scheduled in based on the impact, criticality, and potential change dates. Minor items are worked into the cycles. Major items are given their own time slots/sprints.