Procuring support for and installation of Red Hat Enterprise Linux across an organization

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Proposal Overview

Problem Summary

Robert Code Solutions LLC is a mid-sized software development firm based in Huntsville, Alabama, with three hundred and twenty-seven employees. They have been working as a contracted software developer for multiple organizations and individuals. Recently, the operating system that previously failed an internal security audit, as well as reports from employees about general reliability issues and lost data that, after investigation, has been linked to longstanding issues within the operating system itself.

They have determined that the security issues and reliability issues pose a significant potential financial liability for the company, as there is a risk that core infrastructure or essential work can be lost, with backups having been a temporary solution, they have decided that the risks are no longer acceptable for their growing organization, and wish to alleviate the issue once and for all. Robert Code Solutions needs a stable, reliable operating system with a dedicated support contract for ongoing support. The previous operating system that Robert Code Solutions LLC used did not meet its stability or internal compliance requirements.

They have decided that they need an operating system that will provide versions of software that remain on a stable base and receive updates for security issues or severe bug fixes, an operating system where the update methodology prioritizes stability over new features.

IT Solution

The IT solution chosen for this problem is to procure Red Hat Enterprise Linux licenses for all workstations across the organization and support contracts with the Red Hat organization for the ongoing support of this operating system. Red Hat Enterprise Linux offers robust security and strongly emphasizes stability and reliability for organizations. It has very conservative update policies and provides security updates while maintaining high-security operating system standards.

Red Hat also provides software development platforms, tools, and environments that will be greatly beneficial to the software development team, such as OpenShift, Kubernetes, and easy-to-access groups of packages for the installation of a wide range of development tools available via the Red Hat Developer Toolset. These tools and platforms will save Robert Code Solutions time and capital, as less time will be spent maintaining the system, allowing more time to complete work.

Red Hat offers support contracts for Red Hat Enterprise Linux to aid organizations with any issues and help them develop solutions for their issues. This will comprehensively meet the needs of Robert Code Solutions, as Red Hat Enterprise Linux has a solution for every current issue that Robert Code Solutions is experiencing. Having a platform that has a

Implementation Plan

The IT manager will manage this plan, and the IT team will handle testing and implementation in collaboration with the software development team. In the beginning, the IT team will first audit or review audits of the Red Hat Enterprise Linux operating system and tools to ensure that they meet both regulatory and internal requirements. Then they will procure the license and support contract for the operating system and set up a temporary testing station with multiple workstations with Red Hat Enterprise Linux installed. The team will meet with the software development team to define a list of their required tools and collaborate with them to create an initial system with installed packages that meet the requirements of the software development team.

After this, the IT team will create a script to replicate this system state and roll it out to a controlled set of workstations to test and get initial feedback from a select set of employees to ensure it meets expectations.

After this feedback and the initial success of a controlled small rollout, the script will be implemented into a kickstart file to automate the installation across multiple workstations at a time. Red Hat defines a kickstart file as being (Red Hat, n.d.) a file that can be used to configure any aspect of installation, allowing installation without user interaction, and can be used to easily automate the installation of multiple instances of Red Hat Enterprise Linux.

After this, the IT team will roll out the operating system to all workstations and monitor them to ensure everything goes according to plan. They will perform maintenance as needed and utilize the support contract to ensure the ongoing reliability of the operating system.

This implementation plan is justified for the IT solution because it implements the operating system, tests to ensure that all of the requirements of the software development team are met, and offers ongoing maintenance to ensure the continued efficiency and reliability of the system, solving the issues faced by Robert Code Solutions.

Review of Other Work

Review #1

The first work supporting the implementation of Red Hat Enterprise Linux for Robert Code Solutions' requirements is the Red Hat Customer Portal itself. The life cycle and update policies section states that (Red Hat, n.d.) "Red Hat Enterprise Linux Version 8 and 9 delivers a ten-year life cycle in Full Support and Maintenance Support Phases followed by an Extended Life Phase."

This extended life phase and maintenance support period supports the requirements for a reliable system, as it will be supported with critical bug fixes and security updates for many years into the release of Red Hat Enterprise Linux, ensuring that it becomes more stable as time goes on. The article (Red Hat, n.d.) states that commercially reasonable efforts are taken to maintain binary compatibility across all minor releases and errata advisories. This assurance that there is a priority in maintaining a stable base is another positive point to consider for the organization's requirements.

As the life of a release continues, the production phases the article describes will cause the operating system to become more stable, with stable, in this sense being defined as unchanging. As time goes on, it will bias towards more and more critical and severe fixes as opposed to minor fixes, giving Robert Code Solutions LLC a stable base to work from, with less risk of new issues being introduced in the standard update cycle of other operating systems which are less conservative with their update policies.

Review #2

The second work supporting the implementation is a study of twenty-one companies conducted by IDC and posted by Red Hat. (Red Hat, n.d.) The study was conducted to find the efficiency of Red Hat Enterprise Linux compared to the previous Microsoft Windows platform across the organizations. The study found that Red Hat Enterprise Linux had 35% fewer hours lost to help desk incidents and 64% fewer hours lost due to downtime in production systems.

The study also details that large and reputable organizations made the migration and placed trust in the reliability of Red Hat Enterprise Linux, including the Lahore Stock Exchange, the second-largest exchange in Pakistan. In this publication, the senior IT manager of the GAP organization, Jeff Arcuri, states that Red Hat Enterprise Linux meets their organizational requirements of being secure, scalable, and manageable. These traits benefit the stability and reliability of an operating system.

This supports the implementation of Red Hat Enterprise Linux in Robert Code Solutions as this demonstrates a verifiable improvement in reliability compared to standard operating systems traditionally used in the enterprise.

Review #3

The third work supporting the migration to Red Hat Enterprise Linux for reliability is the Nationwide customer case study posted by Red Hat. In this document, Nationwide claims that (Red Hat, n.d.) Red Hat Enterprise Linux enabled them to achieve 99.999%-member service availability. Nationwide implemented Red Hat OpenShift on top of Red Hat Enterprise Linux to automate deployment and life cycle management across their platforms. This further emphasizes the ecosystem that Red Hat provides to organizations to ensure reliability and minimize downtime. They claim that now, instead of having to do time-consuming management steps, they can instead use DevOps methods to build and deploy automation for these tasks. This task would be well suited to a technology company such as Robert Code Solutions.

This further supports implementing Red Hat Enterprise Linux in the organization, as this article emphasizes the ecosystem provided by Red Hat to aid organizations in ensuring that their infrastructure can be automated and well-maintained, ensuring that more time can be focused on the primary tasks of the organization due to the reliable infrastructure and ecosystem that comes with a Red Hat environment.

Review #4

The fourth work supporting this migration is an IDC study focused on organizations using Red Hat products instead of non-paid open-source solutions. In this paper (Macatee, Jensen, Marden, & IDC, 2023), interviews with organizations found that the ease of rolling out updates and the faster speed benefit them greatly. They also reported that using Red Hat solutions limited business and operational risk associated with unplanned outages compared to other options.

The report goes deeper into the reduced likelihood of regulatory compliance issues from surveyed organizations. They stated that they were less likely to encounter regulatory problems with Red Hat and that when they occur, they are covered by Red Hat's capabilities to resolve the issue. Study participants also consistently pointed out that Red Hat offers them the potential for a more efficient and cost-effective IT infrastructure than they had with other open-source solutions across on-premises, cloud, and hybrid environments.

This report further supports implementing Red Hat Enterprise Linux at Robert Code Solutions. The testimonials for reliability and compliance that Red Hat provides give greater assurance that Red Hat will be a viable solution to the reliability issues the organization faces and meet the compliance requirements to be implemented.

Project Rationale

The rationale behind the decision to migrate to Red Hat Enterprise Linux with a support contract is based on Robert Code Solution's need for ongoing support and a stable operating system. Many solutions could have been chosen – Windows LTSC, Ubuntu Linux with a support contract from Canonical, Debian Linux, or other operating systems without a support contract. However, Red Hat Enterprise Linux holds a strong reputation for being stable and reliable, with dedicated support that will meet the needs of Robert Code Solutions.

Going with other solutions, while viable, does not fully meet the needs of Robert Code Solutions as well as others do. Since Red Hat Enterprise Linux has a robust infrastructure, great support, and a solid development platform for software development, Red Hat Enterprise Linux is a naturally viable solution to the problem.

Current Project Environment

Organizational Culture, Environment, and Strategy

The current organizational culture is to maintain sustainable growth, taking a conservative strategy that prefers stability and reliability rather than rapid organizational changes. The organization's strategy is to improve employee productivity and reduce costs over time, ensuring that it works the best with what it has. At Robert Code Solutions, work is structured using ticketing systems to keep track of tasks and monthly reports.

This culture and strategy align well with Red Hat Enterprise Linux, as it will help reduce downtime in the organization, improving productivity, as well as the operating system itself taking a more conservative approach to changes, ensuring that all changes are anticipated well ahead of release, and are well-tested before release so that the organization can decide when and what risks to take.

Physical environment

Currently, the physical infrastructure consists of multiple servers and workstations, connected on a star network topology to the "main" server that hosts the organization's git repository, with backup servers also installed, taking a daily backup of employee workstations. The system hardware is up-to-date, but systems have an outdated Linux distribution installed as the operating system without a support contract, causing Robert Code Solutions to diagnose and attempt to patch issues that occur manually.

The current software bottlenecks employee productivity by age and is a growing issue due to a lack of updates from the distribution maintainers, causing intermittent crashes and data loss. This environment affects employee morale, as it causes significant loss of work, hours, or up to a day in some cases, causes work efforts to be duplicated, and demoralizes employees greatly.
The standard workflow of this environment is that employees will pull the latest code from the central git repository to their workstations and perform their daily work, uploading and pulling new code as commits are made to the repository. At the end of each day, their workstations will back up their work to the backup server.

Impact of changes

The changes proposed will alter the physical environment by changing the operating system and adding a support contract. This will minimize the time Robert Code Solutions spends maintaining the operating system, ensuring reliability, less downtime, and data loss, leading to higher employee morale. Implementing Red Hat Enterprise Linux tools in software development, such as OpenShift, can lead to more efficient workflows.

In the long term, this will lead to significant cost savings, better performance, and improved customer satisfaction because the increased productivity from reducing downtime will lead to faster turnaround times for software development projects in the organization.

Methodology

This project will follow the Waterfall methodology. This project has well-defined requirements, steps to take, and processes to follow. It will benefit well from the structured process that a Waterfall methodology provides.

The Waterfall methodology would first be implemented by defining the project's requirements, namely, the overall migration, obtaining support and licensing, automating the installation process, and ensuring all regulatory and internal requirements are met.

The Design phase of Waterfall would be completed by mapping out the workflow of the migration, for example, by making a process chart of the steps required during the process of writing the script for automating installation, creating a testing suite, and the process for deploying the script in bulk across the workstation, as well as tools listed in the chart to implement the process. This would also be the phase where it is determined what portions of the organization's workflow are covered by the support contracts from Red Hat.

The Implementation phase would be completed by writing the scripts and implementing the tools to automate the installation, such as implementing the scripts into a "kickstart file." This is also when support contracts will be finalized with the Red Hat organization.

The Integration and Testing phase will be performed by rolling out Red Hat Enterprise Linux to a controlled set of systems separate from the organization's main workstations to test the process and ensure that all expected outcomes are present, with no issues arising, and fixing those issues when they arise. This is also the phase where the tools that the organization relies on daily are tested to ensure they function as expected.

After this, the deployment phase will begin. This is when Robert Code Solutions will implement the rollout of Red Hat Enterprise Linux installations across the entirety of the organization's workstations so that the software developers can begin using the new environment.
After a clean deployment, Robert Code Solutions will continue to maintain the new systems, using the support contract to ensure no issues arise while operating the new environment and performing their own maintenance on the Red Hat systems to further meet the organization's needs.

Project Goals, Objectives, and Deliverables

Goals, Objectives, and Deliverables Descriptions

The project's primary goal is to migrate Robert Code Solutions LLC to Red Hat Enterprise Linux and procure a support contract. To achieve this goal, several supporting objectives should be met. These goals are, first, to obtain support and licenses for the operating system and tools. This will be done via obtaining the support contract agreement with the Red Hat organization, obtaining licenses for Red Hat Enterprise Linux, and creating an internal knowledge base regarding the use and troubleshooting of the tools available. These deliverables ensure that Robert Code Solutions will have a well-supported environment to support its software development team.

The second main supporting objective is to automate the installation process. This will be done by creating scripts that will be the primary tool for automating the installation process, initialization, and setup of the needed tools. A testing suite will also need to be created to ensure that after initialization and configuration, each workstation will be in the expected state defined by the scripts. A process must also be designed to run these scripts simultaneously across multiple environments. This will be performed via a "kickstart file."

The third main supporting objective is to ensure that the requirements of Robert Code Solutions LLC are met. This will be achieved by performing or verifying audits on the Red Hat Enterprise Linux operating system and comparing the results of these audits to our internal and external requirements and government regulations for protecting personal data in our systems.

Goals, Objectives, and Deliverables Table

	Goal	Supporting Objectives	Deliverables Enabling the Project Objectives
	Migration to Red Hat Enterprise Linux	Obtain Support and licenses for the Operating System and tools	Support contract agreement
			Licenses for Red Hat Enterprise Linux
			Knowledge base established regarding the tools available on Red Hat Enterprise Linux
		Automate installation process	Script for installation
			Testing suite to ensure script works
			Process to run script simultaneously
		Ensure requirements are met	Audits performed or procured
			Evaluation results confirming internal and government regulations requirements are met
			Evaluation results confirming that the tools needed by the software development team are present

Project Timeline with Milestones

Milestone	Duration (hours or days)	Projected Start Date	Anticipated End Date
Acquire Support Agreement	14 days	3/12/2035	3/26/2035
Acquire Licenses for Red Hat Enterprise Linux	14 days	3/28/2035	4/11/2035
Knowledge base created	20 days	4/11/2035	5/1/2035
Installation script creation, testing, and automation	30 days	5/3/2035	6/2/2035
Verify that the operating system meets compliance and reliability requirements	90 days	6/3/2035	8/1/2035
Train users on Red Hat Enterprise Linux usage	60 days	8/2/2035	10/1/2035

Outcome

The criteria for success determined for this project implementation will be the completion of a rollout of the Red Hat Enterprise Linux operating system to all employee workstations, as well as confirmation of a support contract with the Red Hat organization to provide support. The success will be measured by measuring the downtime experienced across the organization and the data-loss rate and errors experienced by the software development team.

The measured downtime will be the last 6 months experienced by the organization before the operating system implementation, compared against the first six months of downtime post-implementation. The same time frame and measuring method will be used for the data loss rate and rate of errors. If the results are a 20% decrease or greater in all categories, this project will be considered a success.

The short-term benefits of a successful implementation include greater productivity and less downtime. The long-term benefits will appear as greater employee morale and customer satisfaction.

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