AutOSImage

by

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in Information Technology

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Abstract

As of 2019, Windows 7 has been discovered to possess 1283 security vulnerabilities, according to the Common Vulnerabilities and Exploits including 250 this year alone. In addition, effective January 2020, Microsoft will discontinue providing support, updates, and software patches and fixes for Windows 7. According to both CVE and Microsoft, the main solution to remediate these vulnerabilities is to upgrade to Windows 10. However, due to its user-friendly interface and stability, most companies still contain several computer workstations that run Windows 7 causing a major increase in security risks. AutOSImage provides the IT personnel with a cutting-edge software solution that can automate an upgrade from Windows 7 to Windows 10 on multiple computers at a time. This is done by utilizing features that perform the necessary tasks in the following order: Automatically backup user data; determine software and driver compatibility prior to beginning the upgrade, deploy the Windows 10 image to Windows 7 systems.

Introduction

Problem

As a part of the Windows 7 Support Lifecycle, Microsoft Corporation has agreed to provide 10 years of support to this particular Operating System. This agreement took place on October 22, 2009, about 10 years ago, give or take. With that being stated, Windows 7 will reach its end of life support, effective January 14, 2020. As a result, Microsoft will no longer provide software updates or technical support to any PCs still running Windows 7 for free. Companies will have to pay for extended support of Windows 7 Professional and Enterprise Edition. This will be effective until 2023. If the company decides to not upgrade right away, they can spend up to $200 dollars per device in one year. As a result, it is in the company's best interest to upgrade their devices as soon as possible to avoid an unnecessary fee every year when they must upgrade anyway in 2023. If they do not upgrade at all, then their laptop will be unsecured.

Solution

AutOSImage is an enterprise software application solution that will empower various companies with the ability to perform an automatic upgrade of multiple computers from Windows 7 to Windows 10. The upgrade process will not affect the current data stored locally on each client PC. The product will be available via thin-client as well as web-based. The product will be more user friendly than simply accessing the image package via SCCM directly. AutOSImage will provide a much greater experience for both the end-user and the IT professional. Speaking of the IT Professionals, this solution can be managed and outsourced by

our company or it can be implemented internally within your organization. We offer the option of both.

There is currently not an application that can centralize the upgrading process within a matter of clicks. Because of this, most IT departments will manually upgrade systems using standalone Microsoft based tools such as MDT, Sysprep and more commonly, SCCM. In order to receive the upgrade, an end user would have to schedule a time with an IT staff member to start the manual upgrade. In this process, intermittent issues may rise. These issues may consist of incompatible drivers and software. As a result, the IT department must diagnose said issues. The typical IT diagnostic process consists of retrieving and retaining the computer for long periods of time while the client no longer has a device to work on, thus resulting in a loss of productivity. We can offer a solution that works for both the user and the IT team. Remotely, we can use tools to get the system ready and speed up the process.

Project Goals

Develop a web-based application that will provide Businesses, Organizations, and Enterprises the ability to create, and develop Windows 10 Operating System image packages to deploy to computers without the hassle of reformatting, which can potentially cause data loss.

The features of AutOSImage will perform the following:

- Upgrading from Windows 7 (Professional or Enterprise) to Windows 10 (Professional or Enterprise)
    - Perform a compatibility check
        - Notify users if their system hardware will not support Windows 10

        - Notify users is their system has a software application that is incompatible with Windows 10
        - Notify users if they have a device driver that will not work with Windows 10
    - Give users the option to back-up and restore their Windows profile via the User State Migration Tool (USMT).

Overview

The remainder of this report outlines in detail how the project came to be from the beginning to its conclusion. The report includes the following sections: origins, design philosophy, methodology. testing procedures, budget, timeline and problems encountered.

Discussion

Project Concept

AutOSImage was inspired by Derrick Chandler and Kent Tran. Kent initially proposed an idea to the team that involved creating an application that would allow businesses with several client PCs to have a solution that would update multiple PCs at a time, thus increasing the amount of productivity without falling out of compliance with any security parameters (CVE vulnerability). Derrick theorized the suite of features, roles, and interactions between user groups and crafted its name. Kent and Derrick planned out the software structuring and suggested using Visual Studios, or NetBeans to utilize Java Programming.

Prior to the first day of classes, the team met to narrow down their list of ideas and the others fell quickly to this final one. Finally, after determining the potential of the project, the group decided on the idea, and AutOSImage was established.

Design Objective

We wanted to create a simple application that would help users and their end clients to upgrade their machines from Windows 7 to Windows 10 in a company environment. We would be able to prepare the upgrade remotely, schedule one, backup all the users' profiles and data, check for compatibility and then execute it.

Initially, we wanted to create an application that would be accessible via a client/server program as well as web based. We decided that the application will be web-based only, due to certain constraints and restrictions. One of the main restrictions being a major learning curve as we (Kent and Derrick) are both in the IT Networking Systems major and we both felt that creating a standalone app on top of the web based portion would require a lot of time with

regards to learning more about programming and coding than necessary. We also decided to abandon the option of creating Windows 10 image packages within the app. Reason being, we agreed that simply storing and deploying the base Windows 10 ISOs on the SCCM Server was more feasible, as it cuts out an extra step.

Methodology/Technical Approach

We concluded that the client-server approach would have been much too intricate to develop. Therefore, for our technology solution we decided to create a web application. In this design, a user can access the system by entering their login information. Based on the credentials, the user will be redirected to a specific webpage. This procedure was deemed a security necessity as we did not want End-Users to have the same permissions as IT Administrators. While one webpage has more options than others, both will ultimately include the most important tools:

- Upgrade to Windows 10
- Backup and Restore User Data

We chose this design approach for the following reasons: The system can be implemented for a company's internal network; This system can also be hosted on various cloud-based platforms (Azure, AWS, etc.); the buttons are utilizing PowerShell scripts that can be edited as needed.

Technical Elements

Figure 1: Network Diagram shows the infrastructure after deployment of servers and test machines.

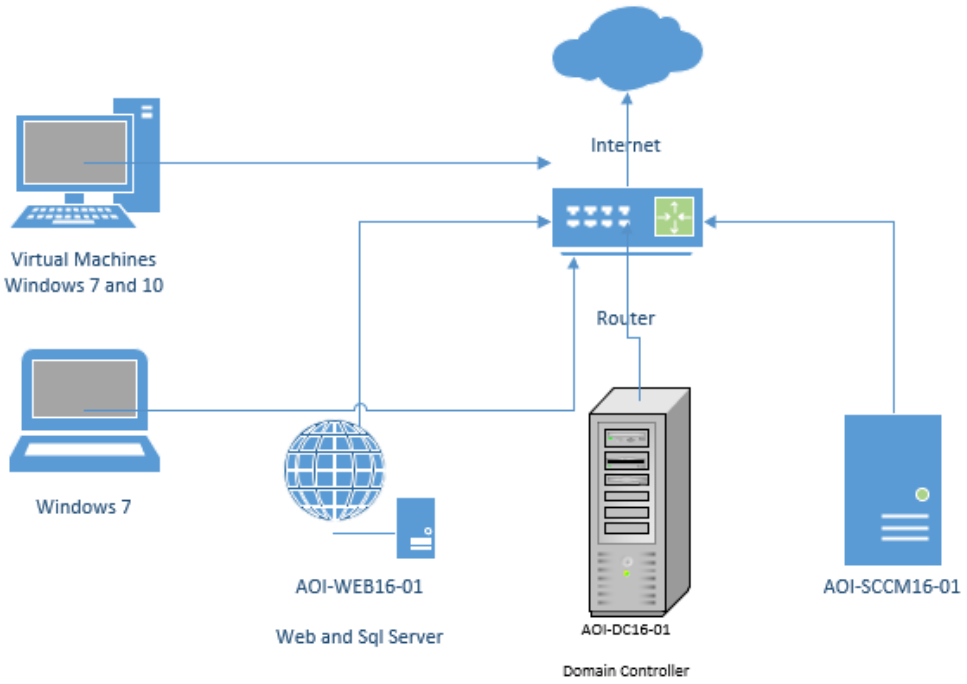


Figure 1: Network Diagram

- Application Overview
    - AutOSImage is an ASP.NET Web Application built using Visual Studios.
    - C# is the programming language used to develop the web app.
    - SQL Server Database is used to verify the login credentials. The applicable user credentials are stored in an SQL DB Table called UserCred
- Security Elements Deployed
    - Implemented an offsite secure connection to the webapp using OpenVPN GUI
    - Enabled System.Web.Security reference in the code behind file for our login page (login.aspx.cs) within Visual Studios. The button on the login page needed an event handler which communicates with the SQL Server DB to verify the user input.

- Created an SQL DB user (aoi_dba) with database owner privileges. Specified db user's credentials within the connection string element of the web.config file. The app needs to connect to said DB for the user to be verified. Otherwise, the webpage will generate a Network Instance Error.

Figure 2: Client and Admin Page: Below is a screenshot of the webpages based on the client login and the admin login.

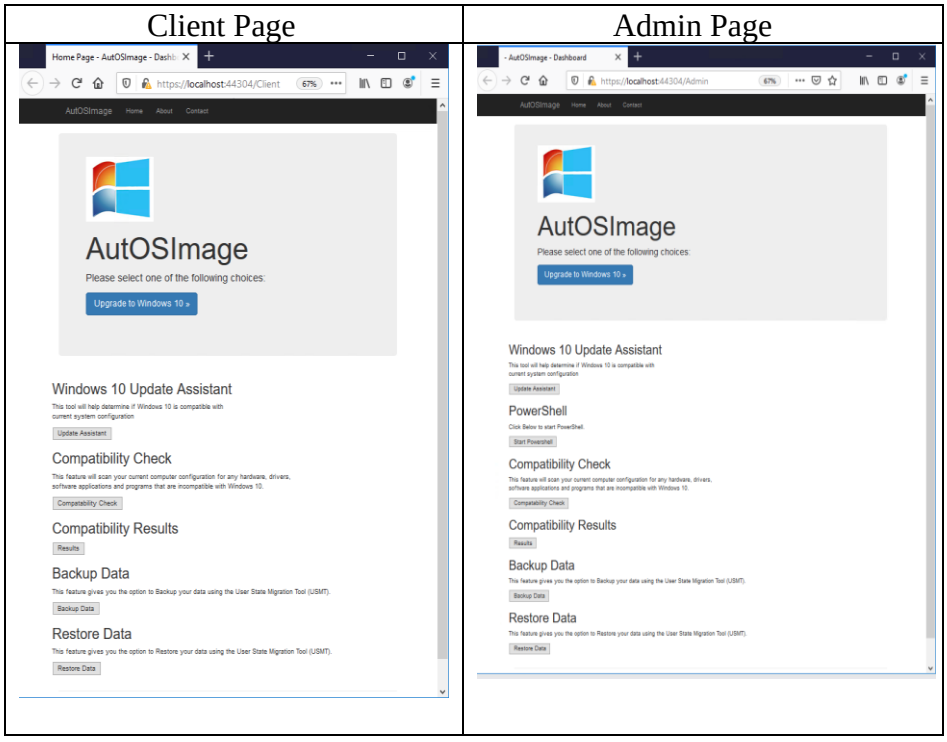


Figure 2: Client Page(left) and Admin Page

Upgrade to Windows 10:

This button is the whole purpose of this Web Application: To upgrade a Windows 7 machine to a Windows 10 machine. This button uses MDT (Microsoft Deployment Toolkit) to push a Standard Windows 10 OS image to a Windows 7 workstation.

Windows 10 Update Assistant:

With this button, the end user can run the Windows 10 Update Assistant which will prompt them to download and install the update assistant, which will perform the full compatibility check (Software, drivers, etc.)

Compatibility Check:

Much like the Update Assistant, the Compatibility Check Tool checks the software, and drivers on the workstation. Although the Update Assistant will require administrator input, this button utilizes a PowerShell script that will run without administrative privileges. This was more of a failsafe for the IT Administrators to utilize just in case an end-user requires further assistance.

Compatibility Results:

This button will take the findings of the Compatibility Check button and convert them from an xml format to a .txt file, making the results easier to comprehend.

Backup Data:

This button will utilize the User State Migration Tool (USMT). Once the command prompt screen opens, the end-user or the IT administrator will enter in a username (which normally coincides with the name of their Windows Profile folder) and hit Enter. From there, the USMT will back up their profile to a file server.

Restore Data:

This button also utilizes USMT and will require an IT Admin or an end-user to enter in a username for their profile to be restored to the newly installed Windows 10 Operating System.

This was created by though ASPX.Net Core using the System Management Automation library that allows us to run these PowerShell scripts.

Budget

Table 1: Budget represents the project budget. These numbers are an estimation of how much it would cost for a business to set this up in a real-world environment. We decided to purchase a physical server for this project instead of using the cloud for ease of use, but this should work the same way. Hourly wages were estimated. other equipment and software used were either provided by the college or donated by the members of the group. We originally had estimated this to be around $6,000.

No.	Item	Unit, Hours	Unit Price	Unit Total
Hardware				
1	Dell PowerEdge R710	1	$700.00	$700.00
2	Dell Latitude E7440	2	$100.00	$200.00
	Subtotal			$900.00
Software				
3	VMware ESXi	1	$0.00	$0.00
4	Visual Studio Code	1	$0.00	$0.00
5	Microsoft SQL Server Management Studio Express	1	$0.00	$0.00
6	Windows 10 Professional	2	$199.00	$398.00
7	Windows 7 Professional	2	$199.00	$398.00
8	Windows Server 2016	3	$972.00	$2,916.00
9	SCCM	1	$1,323.00	$1,323.00
	Subtotal			$5,035.00
Labor				
10	Programming	40	$40.00	$1,600.00
11	Additional Environment Configuration	16	$40.00	$640.00
	Subtotal			$2,240.00
Total				
	Total Cost			$8,175,00

Table 1: Budget

User Profile

This is our user profile with the tasks and experience that we expect for each of our end users.

Project

- AutOSImage

Potential Users

- IT Administrators
- Basic Users

Software, Interface, and Related Experience

This project will be most useful for the IT administrators trying to upgrade devices from Windows 7 to Windows 10. They will be the most technically advanced users that would be able to use this application effectively. The application would be able to check if the drivers and applications on the device would be compatible with the upgrade to Windows 10. They can also backup the user profiles using the USMT. It would be able to start the upgrade process itself.

For the general, or basic users, they can notify the IT group when they are ready via instant messaging or email when they are ready to perform the update. Most users will need to use their computer throughout the day to work so they will not always be available to update. Others may take other computer home for the night. They can also use this application to back up their files with the USMT if there is not a system in place. The accessibility is always there because the application will have a web interface.

Experience with Similar Applications

- SCCM
- MDT
- PowerShell
- Command Prompt
- USMT

Task Experience

- Basic Users can use application to save files
- They can optionally run the application to check compatibility
- IT group can use the application to do the same thing as the basic users with more options
- After everything checks out, the IT team can start the upgrade process

Frequency of Use

This is intended to only be used once per machine for Windows 7 to Windows 10 Upgrade. You may use it for other operating systems, but you will not really need to use it that often unless you have a ton of machine that fit the scenarios.

Key Project Design Requirements that the Profile suggests

- Easy to use
- Functional
- Minimalistic

Use Case Diagram

Figure 3: Use Case Diagram below shows the potential users and what capabilities they will have with our application

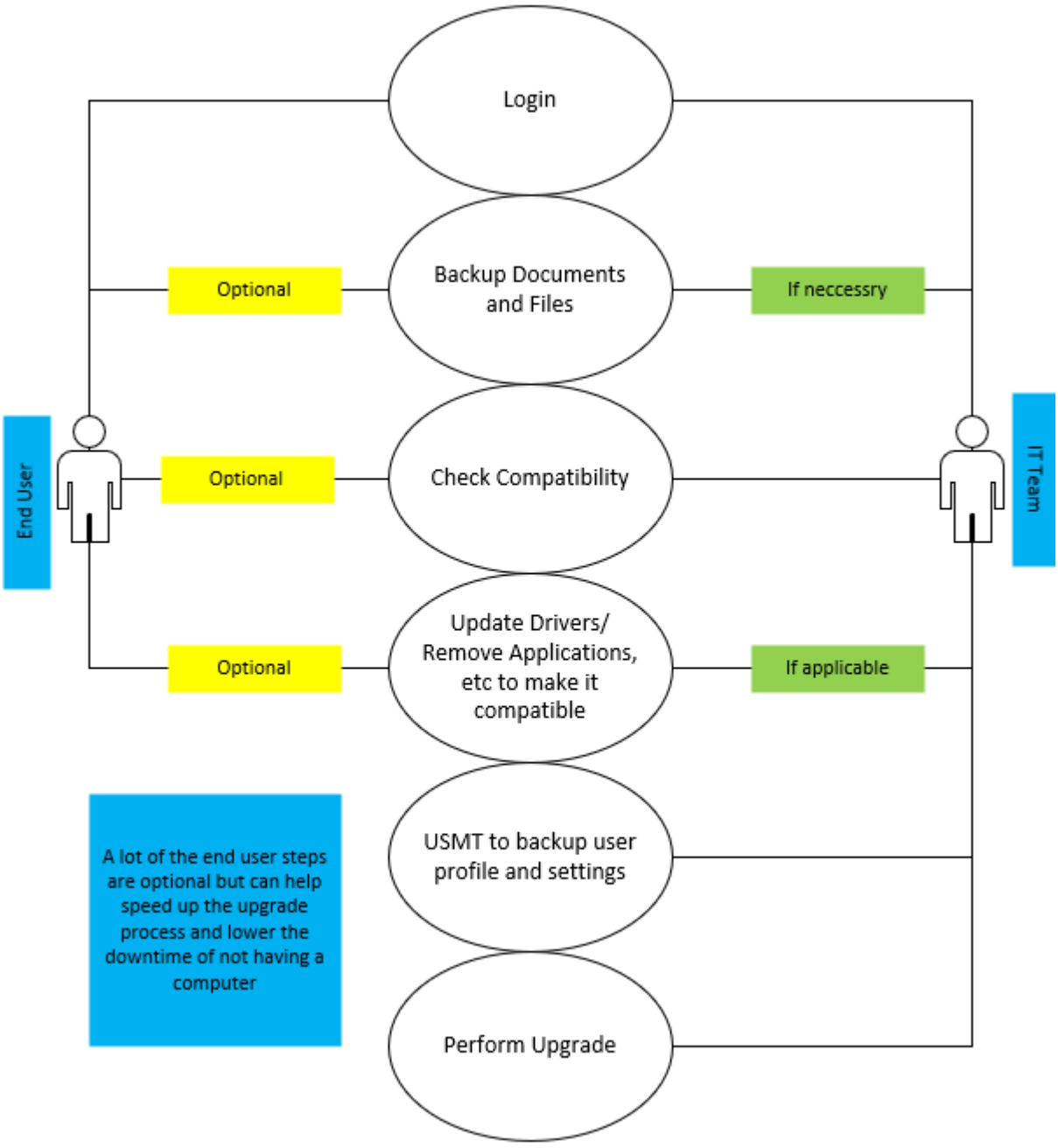


Figure 3: Use Case Diagram

Gantt Chart

Table 2: Gantt Chart is our project schedule with the major events.

AutOSImage

Project Start: Mon, 8/26/2019

Display Week: 6

TASK	COMPLETED DAYs	DURATIONS (DAYS)	PROGRESS	START	END
1.0 Project Management and Deliverables					
1.1 Team Building	7	7	100%	8/26/19	9/2/19
1.2 Ideas and Brainstorming	7	7	100%	8/26/19	9/2/19
1.3 Fall Semester Assignment 0: Team Members & Project Name	7	7	100%	8/26/19	9/2/19
1.3.1 Project Name	7	7	100%	8/26/19	9/2/19
1.3.2 Project Logo and Branding	7	7	100%	8/26/19	9/2/19
1.4 Fall Semester Assignment 1: Team Contract	21	21	100%	9/2/19	9/23/19
1.4.1 Project Approval	21	21	100%	9/2/19	9/23/19
1.4.2 Gantt Chart	21	21	100%	9/2/19	9/23/19
1.4.3 Work Breakdown Structure	21	21	100%	9/2/19	9/23/19
1.5 Fall Semester Assignment 2: Project Abstract for Tech Expo	21	21	100%	9/23/19	10/14/19
1.6 Fall Semester Assignment 3: Team Contract Resubmission	21	21	100%	9/23/19	10/14/19
1.7 3 Minute Elevator Speech	14	14	100%	10/7/19	10/21/19
1.8 Fall Semester Assignment 4: User Profile	14	14	100%	10/7/19	10/21/19
1.9 Fall Semester Assignment 5: Use Case Diagram	14	14	100%	10/7/19	10/21/19
1.10 Fall Semester Assignment 6: Draft Report	14	14	100%	10/21/19	11/4/19
1.11 Fall Semester Assignment 7: Final Fall Semester Report	21	21	100%	11/4/19	11/25/19
2.0 Research					
2.1 Software Requirements	35	35	100%	9/9/19	10/14/19
2.2 Network Requirements	42	42	100%	9/9/19	10/21/19
2.2.1 Determine Hosting Environment	42	42	100%	9/9/19	10/21/19
2.2.2 Determine Database Environment	21	21	100%	9/9/19	9/30/19
2.3 Security Requirements	42	42	100%	9/9/19	10/21/19
2.4 Miscellaneous Research	35	35	100%	9/16/19	10/21/19
3.0 System Design					
3.1 Create System Diagrams	35	35	100%	9/16/19	10/21/19
3.1.1 Create Network Diagrams	7	7	100%	9/16/19	9/23/19
3.1.2 Create Database Diagrams	14	14	100%	9/16/19	9/30/19
3.1.3 Create Interaction Diagrams	21	21	100%	9/16/19	10/7/19
3.1.4 Create Wireframe Diagrams	21	21	100%	9/30/19	10/21/19
4.0 Environment Set-Up					
4.1 Initial setup of servers	7	7	100%	9/23/19	9/30/19
4.2 Initial setup of domain Controller	7	7	100%	9/30/19	10/7/19
4.3 Initial setup of DHCP	7	7	100%	9/30/19	10/7/19

Display Week: 6

TASK	COMPLETED DAYs	DURATIONS (DAYS)	PROGRESS	START	END
4.3.1 Configure IP Range	7	7	100%	9/30/19	10/7/19
4.4 Set up Web Server	7	7	100%	9/30/19	10/7/19
4.5 Initial setup of VPN Server	7	7	100%	9/30/19	10/7/19
4.6 Initial setup of Database Server	28	28	100%	10/7/19	11/4/19
5.0 Development					
5.1 Install and configure SCCM	28	28	100%	9/30/19	10/28/19
5.1.1 Setup upgrade for Window 7 to Windows 10	14	14	100%	9/30/19	10/14/19
5.1.2 Setup Imaging Process	14	14	100%	10/14/19	10/28/19
5.2 Develop Application	28	28	100%	9/30/19	10/28/19
5.2.1 Utilize NetBeans to create Java Application	14	14	100%	9/30/19	10/14/19
5.2.2 Setup Parameters within Application	14	14	100%	9/30/19	10/14/19
5.2.3 Make application available online (Web Server)	7	7	100%	9/30/19	10/7/19
5.3 Create Database Server	14	14	100%	10/7/19	10/21/19
6.0 Testing					
6.1 Setup test machines to upgrade	7	7	100%	1/13/20	1/20/20
6.2 Full Regression Test	7	7	100%	1/20/20	1/27/20
6.2.1 Regression Test for End Users	7	7	100%	1/20/20	1/27/20
6.2.2 Regression Test for End User Administrator	7	7	100%	1/20/20	1/27/20
6.2.3 Regression Test for Administrator	7	7	100%	1/20/20	1/27/20
6.3 Security Test	21	21	100%	1/27/20	2/17/20
6.3.1 Firewall Test	7	7	100%	1/27/20	2/3/20
6.3.2 Penetration Test	7	7	100%	2/3/20	2/10/20
6.3.3 SQL Injection Test	7	7	100%	2/10/20	2/17/20
6.4 User Acceptance Test	14	14	100%	3/2/20	3/16/20
6.4.1 User Acceptance Test for End Users	14	14	100%	3/2/20	3/16/20
6.4.2 User Acceptance Test for End User Administrator	14	14	100%	3/2/20	3/16/20
6.4.4 User Acceptance Test for Administrator	14	14	100%	3/2/20	3/16/20
6.5 Final Certification Test	7	7	100%	3/23/20	3/30/20

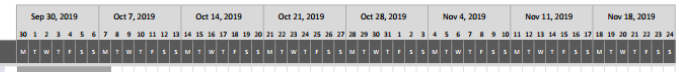


Table 2: Gantt Chart

Work Breakdown Structure

Table 3: Work Breakdown Structure is our project schedule with the major events.

Task Name	Duration (Days)	Start Date	End Date
1.0 Project Management and Deliverables	242	8/26/19	4/24/20
1.1 Team Building	7	8/26/19	9/02/19
1.2 Ideas and Brainstorming	7	8/26/19	9/02/19
1.3 Fall Semester Assignment 0: Team Members & Project Name	7	8/26/19	9/02/19
1.3.1 Project Name	7	8/26/19	9/02/19
1.3.2 Project Logo and Branding	7	8/26/19	9/02/19
1.4 Fall Semester Assignment 1: Team Contract	21	9/2/19	9/23/19
1.4.1 Project Approval	21	9/2/19	9/23/19
1.4.2 Gantt Chart	21	9/2/19	9/23/19
1.4.3 Work Breakdown Structure	21	9/2/19	9/23/19
1.5 Fall Semester Assignment 2: Project Abstract for Tech Expo	21	9/23/19	10/14/19
1.6 Fall Semester Assignment 3: Team Contract Resubmission	21	9/23/19	10/14/19
1.7 3 Minute Elevator Speech	14	10/7/19	10/21/19
1.8 Fall Semester Assignment 4: User Profile	14	10/7/19	10/21/19
1.9 Fall Semester Assignment 5: Use Case Diagram	14	10/7/19	10/21/19
1.10 Fall Semester Assignment 6: Draft Report	14	10/21/19	11/4/19
1.11 Fall Semester Assignment 7: Final Fall Semester Report	21	11/4/19	12/2/19
1.12 Fall Semester Oral Presentation	14	11/4/19	11/18/19
1.12.1 Presentation Practice	14	11/4/19	11/18/19
1.13 Spring Semester Assignment 1: Testing Plan/Report	28	1/13/20	2/10/20
1.14 Spring Semester Assignment 2: Abstract	7	2/10/20	2/17/20
1.15 Spring Semester Assignment 3: Draft Tech Expo Poster	14	2/17/20	3/2/20
1.16 Spring Semester Assignment 4: Final Poster	7	3/2/20	3/9/20
1.17 Spring Semester Oral Presentation	14	3/9/20	3/23/20
1.17.1 Presentation Practice	14	3/9/20	3/23/20
1.18 Spring Semester Assignment 5: Final Report	14	3/23/20	4/6/20
1.19 Spring Semester Assignment 6: Safe Assign Final Report	14	3/23/20	4/6/20
1.20 IT Expo	8	4/6/20	4/14/20
1.20.1 IT Expo Exhibit and Preparation	8	4/6/20	4/14/20
1.21 Spring Semester Assignment 7: Final Library Copy	14	4/15/20	4/29/20
2.0 Research	42	9/9/19	10/21/19
2.1 Software Requirements	35	9/9/19	10/14/19
2.2 Network Requirements	42	9/9/19	10/21/19
2.2.1 Determine Hosting Environment	42	9/9/19	10/21/19

2.2.2 Determine Database Environment	21	9/9/19	9/30/19
2.3 Security Requirements	42	9/9/19	10/21/19
2.4 Miscellaneous Research	35	9/16/19	10/21/19
3.0 System Design	42	9/16/19	10/28/19
3.1 Create System Diagrams	35	9/16/19	10/21/19
3.1.1 Create Network Diagrams	7	9/16/19	9/23/19
3.1.2 Create Database Diagrams	14	9/16/19	9/30/19
3.1.3 Create Interaction Diagrams	21	9/16/19	10/7/19
3.1.4 Create Wireframe Diagrams	21	9/30/19	10/21/19
4.0 Environment Set-Up	42	9/23/18	11/4/19
4.1 Initial setup of servers	7	9/23/19	9/30/19
4.2 Initial setup of domain Controller	7	9/30/19	10/7/19
4.3 Initial setup of DHCP	7	9/30/19	10/7/19
4.3.1 Configure IP Range	7	9/30/19	10/7/19
4.4 Initial setup of Web Server	7	9/30/19	10/7/19
4.5 Initial setup of VPN Server	7	9/30/19	10/7/19
4.6 Initial setup of Database Server	28	10/7/19	11/4/19
5.0 Development	182	9/30/19	3/16/20
5.1 Install and configure SCCM	28	9/30/19	10/28/19
5.1.1 Setup upgrade for Window 7 to Windows 10	14	9/30/19	10/14/19
5.1.2 Setup Imaging Process	14	10/14/19	10/28/19
5.2 Develop Application	28	9/30/19	10/28/19
5.2.1 Utilize NetBeans to create Java Application	14	9/30/19	10/14/19
5.2.2 Setup Parameters within Application	14	9/30/19	10/14/19
5.2.3 Make application available online (Web Server)	7	9/30/19	10/7/19
5.3 Create Database Server	14	10/7/19	10/21/19
6.0 Testing	77	1/13/20	3/16/20
6.1 Setup test machines to upgrade	7	1/13/20	1/20/20
6.2 Full Regression Test	7	1/20/20	1/27/20
6.2.1 Regression Test for End Users	7	1/20/20	1/27/20
6.2.2 Regression Test for End User Administrator	7	1/20/20	1/27/20
6.2.3 Regression Test for Administrator	7	1/20/20	1/27/20
6.3 Security Test	21	1/27/20	2/17/20
6.3.1 Firewall Test	7	1/27/20	2/3/20
6.3.2 Penetration Test	7	2/3/20	2/10/20
6.3.3 SQL Injection Test	7	2/10/20	2/17/20
6.4 User Acceptance Test	14	3/2/20	3/16/20
6.4.1 User Acceptance Test for End Users	14	3/2/20	3/16/20
6.4.2 User Acceptance Test for End User Administrator	14	3/2/20	3/16/20

6.4.4 User Acceptance Test for Administrator	14	3/2/20	3/16/20
6.5 Final Certification Test	7	3/23/20	3/30/20

Table 3: Work Breakdown Structure

Problems Encountered

We had some issues with setting up VMware EXSi on hardware they claim was unsupported but after research, we were told to ignore it basically. We also used more resources than expected since we did not know how much we needed in terms of processing power and memory capacity. The VMware vCenter Server Appliance took a good chunk of unallocated memory from us.

Unable to use NetBeans because payment was required for Java Development Kit (JDK), a programming entity which is what NetBeans utilizes. Instead, we used Visual Studios 2019. Learning how to program an ASP.NET webpage and writing scripts for PowerShell. This is a work in progress, we are continuously learning throughout the whole process.

In the process of having a better understanding programming logic and concepts, we learned that Visual Basic would not work for what we were intending to do. Therefore, we had to delete the previous ASP.NET web application and build a new one centered around the C# programming language. In Visual Studios, we learned that most of our web application's event handler errors came from not rebuilding the solution after making changes in the code. The design portion of the web application was easier to manage as most errors were syntax specific. One character in a wrong place can cause the entire web application to completely malfunction.

In addition to the learning curve of Visual Studios, we struggled to redirect users to specific pages based on their logins. We ended up creating an SQL Server Database with the users' credentials in a table. During the publishing of the web application, the SQL Server connection kept failing during the login, due to a server instance error. The solution to that problem was to create an SQL Server DB user and specify their credentials within the

Connection String, located within the web.config file of the app. Once this was done, we were able to publish the solution to our IIS (Web) server and the database connections were included.

We also concluded that this web application will not be a one-click tool.

Future Recommendations

Primarily, we would have chosen a project that was less elaborate and time-consuming. However, if we could do this project all over again, we would have formed a group that represents each BSIT track within UC. Because of the lack thereof, we went overboard with our expectations, given our team members' experience and background. It was suggested that we watch video tutorials to better understand ASP.NET C# (and MVC). If we had more time for this project, we would have incorporated more software programmer input. We also would have integrated the client/server technology piece with the web application. Finally, we would have researched and implemented a more enterprise-based VPN environment, rather than using an Open Source client such as OpenVPN. We may attempt to use it to upgrade Windows 7 machines to Windows 10, but we will not commercialize it, and after a year, we will decommission the application.

Testing

Objective

The overall goal of these tests is to make sure the application is working as intended for both the employee and the IT administrator on the other side. Each part will be tested individually for optimization.

System Testing

Testing will be done on the entire website where our application will be hosted. This will allow us to view things from the prospective of each end user and IT Administrator.

Testing Procedures

There will be pass/fail conditions with a table to list success and failures for every attempt.

List of parts that will be tested.

1. Login page Test: Make sure the users are logging in with their passwords and having the correct permissions/pages.
2. Compatibility Check: Run Compatibility check to see Windows 10 readiness
3. Viewing Compatibility Results: Open compatibility results to be viewed.
4. USMT Backup: Making sure that user profiles are backed up.
5. USMT Restore: Making sure that user profiles are restored.
6. SCCM Upgrade Test: Testing whether the upgrade works from Windows 7 to Windows 10 from SCCM Software Center

7. MDT Backup Upgrade Test: Testing whether the upgrade works from Windows 7 to Windows 10 for MDT Backup Upgrade

Testing Results

Table 4: Testing Results contains the results from the testing procedures.

Tester	Date	Scenarios	Expected Result	Pass/Fail	Notes
Employee 1	3/16/2020	Login Page	Login into the web application with the correct credentials and permissions	Pass	
Employee 1	3/16/2020	Compatibility Check	Running Windows 10 compatibility check	Pass	
Employee 1	3/16/2020	Viewing Compatibility Results	Open compatibility results text file to be stored and viewed later	Pass	
Employee 1	3/16/2020	USMT Backup	Backing up user profile after entering in username	Pass	
Employee 1	3/16/2020	USMT Restore	Restoring user profile after entering in username for new computer	Pass	
Employee 1	3/16/2020	SCCM Upgrade	Run Upgrade from SCCM Software Center	Pass	
Employee 1	3/16/2020	MDT Backup Upgrade	Run upgrade from MDT Task sequence as an alternative	Fail	Disconnected from network after reboot causing fail. Reran shortly afterwards to see if it would work again.
Employee 2	3/30/2020	Login Page	Login into the web application with the correct credentials and permissions	Pass	
Employee 2	3/30/2020	Compatibility Check	Running Windows 10 compatibility check	Pass	
Employee 2	3/30/2020	Viewing Compatibility Results	Open compatibility results text file to be stored and viewed later	Pass	
Employee 2	3/30/2020	USMT Backup	Backing up user profile after entering in username	Pass	
Employee 2	3/30/2020	USMT Restore	Restoring user profile after entering in username for new computer	Pass	
Employee 2	3/30/2020	SCCM Upgrade	Run Upgrade from SCCM Software Center	Pass	Took a while for SCCM Software Center Task Sequence to appear
Employee 2	3/30/2020	MDT Backup Upgrade	Run upgrade from MDT Task sequence as an alternative	Pass	User said it took longer than expected hour.

Tester	Date	Scenarios	Expected Result	Pass/Fail	Notes
Admin 1	3/16/2020	Login Page	Login into the web application with the correct credentials and permissions	Pass	
Admin 1	3/16/2020	Compatibility Check	Running Windows 10 compatibility check	Pass	
Admin 1	3/16/2020	Viewing Compatibility Results	Open compatibility results text file to be stored and viewed later	Pass	
Admin 1	3/16/2020	USMT Backup	Backing up user profile after entering in username	Pass	
Admin 1	3/16/2020	USMT Restore	Restoring user profile after entering in username for new computer	Pass	
Admin 1	3/16/2020	SCCM Upgrade	Run Upgrade from SCCM Software Center	Fail	SCCM failed with generic error but still finished successfully?
Admin 1	3/16/2020	MDT Backup Upgrade	Run upgrade from MDT Task sequence as an alternative	Pass	
Admin 2	3/30/2020	Login Page	Login into the web application with the correct credentials and permissions	Pass	
Admin 2	3/30/2020	Compatibility Check	Running Windows 10 compatibility check	Pass	
Admin 2	3/30/2020	Viewing Compatibility Results	Open compatibility results text file to be stored and viewed later	Pass	
Admin 2	3/30/2020	USMT Backup	Backing up user profile after entering in username	Pass	
Admin 2	3/30/2020	USMT Restore	Restoring user profile after entering in username for new computer	Pass	
Admin 2	3/30/2020	SCCM Upgrade	Run Upgrade from SCCM Software Center	Pass	Took longer than expected upgrade time.
Admin 2	3/30/2020	MDT Backup Upgrade	Run upgrade from MDT Task sequence as an alternative	Pass	User said it took longer than expected hour.

Table 4: Testing Results

Conclusion

Fall

We learned more about programing in .NET and writing scripts for CMD and PowerShell. We got more experience setting up VMware ESXi and got a better understanding on pooling our resources and requirements. We also got a better understanding of how SCCM can be used and other tools such as MDT and creating task sequences. We understood the importance of teamwork, meeting on a regular basis to provide updates and create plans to get necessary work done before the next meeting.

Spring

Since the Fall Semester, we have successfully accomplished building, testing, and deploying our ASP.NET web application to IIS. We have also accomplished creating, configuring and linking an SQL Server database to that same web application, something that we have never done before as we never had to in our occupations.

On the technical side, we learned more about programming in Visual Studios. More specifically, we learned about programming in C# vs Visual Basic (VB) and now we understand why C# is preferred over VB in web applications. We have received a better knowledge of writing scripts for Command Prompt (CMD) and PowerShell. We obtained more knowledge and experience with setting up VMware ESXi. We also got a better understanding of how SCCM can be used and other tools such as MDT and creating task sequences.

From a less technical standpoint, we understood the importance of teamwork. This consisted of meeting on a regular basis to provide updates, created plans to complete our weekly assignments and tasks before our next meeting, established a better understanding about pooling our resources and requirements. This consisted of meeting on a regular basis to provide updates,

created plans to complete our weekly assignments and tasks before our next meeting, and established a better understanding about pooling our resources and requirements. We even learned about the importance of having adequate public speaking skills. Not to mention, the effect that User Experience (UX) has on the design and functionality of an application, be it web or client based.

References

[1] **“Microsoft " Windows 7 : Vulnerability Statistics.” Microsoft Windows 7 : CVE Security Vulnerabilities, Versions and Detailed Reports. Accessed September 2, 2019.** https://www.cvedetails.com/product/17153/Microsoft-Windows-7.html?vendor_id=26.

[2] **“Windows 7 Support Ended on January 14, 2020.” support.microsoft.com. Accessed January 24, 2020. https://support.microsoft.com/en-us/help/4057281/windows-7-support-ended-on-january-14-2020.**

Appendix A. Poster

Figure 4: Poster for Expo is the visual presentation for the expo.

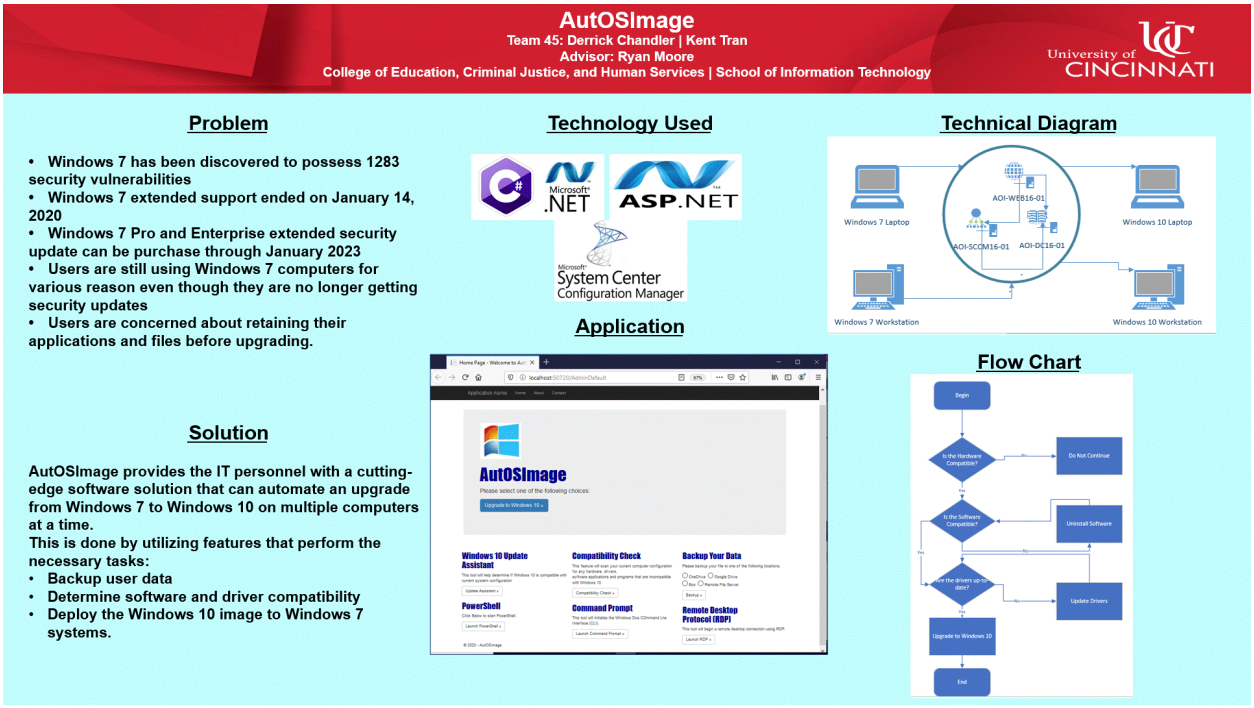


Figure 4: Poster for Expo

Appendix B. Acronyms

CVE – Common Vulnerabilities and Exposures

ASP - Active Server Pages

VB – Visual Basic

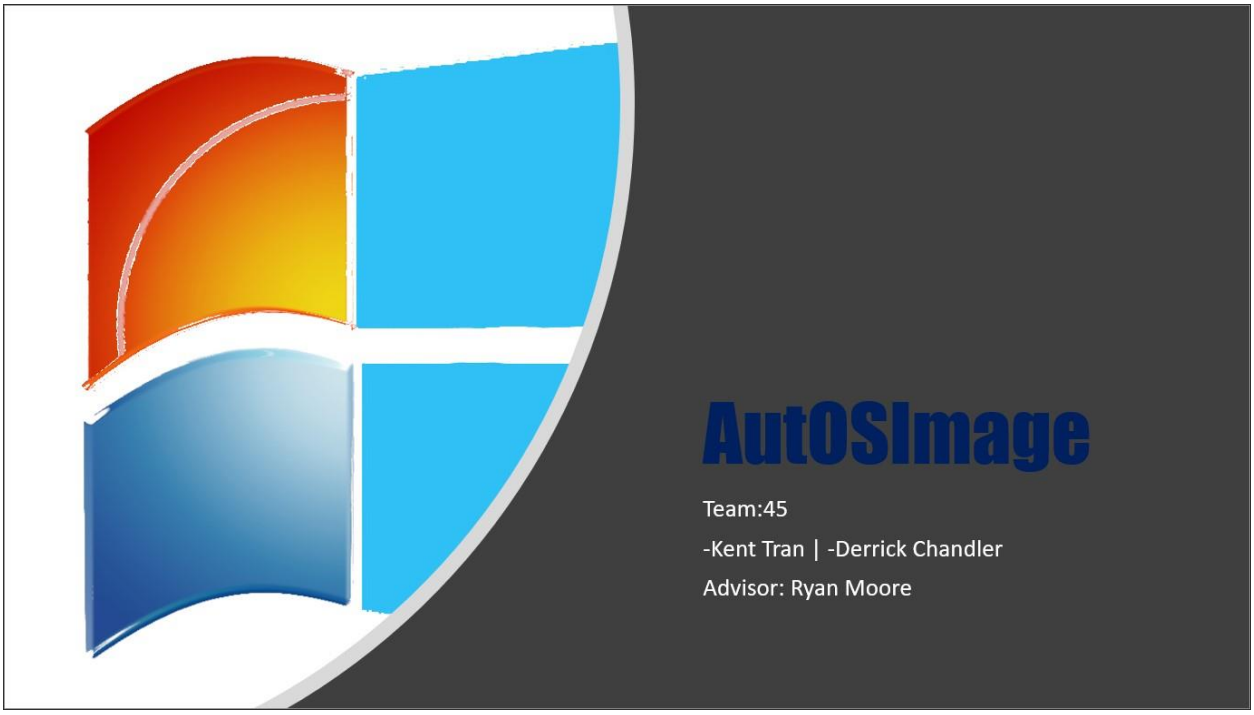
SCCM – System Center Configuration Manager

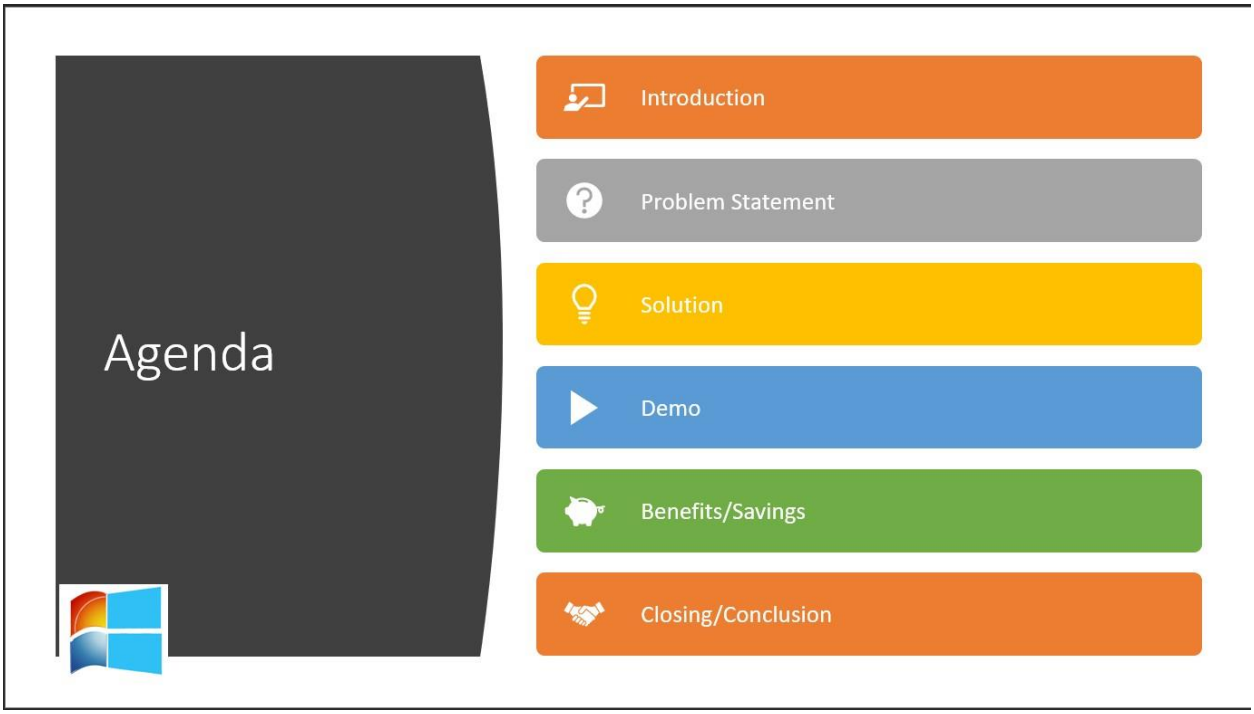
USMT – User State Migration Tool

MDT – Microsoft Deployment Tools

RDP – Remote Desktop Protocol

Appendix C. Presentation



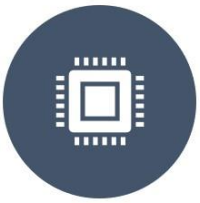


Introduction

- Derrick Chandler
  - Application Developer/Programmer
  - Database Administrator
- Kent Tran
  - Project Manager
  - Server Administrator
  - Network Administrator

Problem Statement

AS OF JANUARY 14, 2020, MICROSOFT HAS ENDED ITS SUPPORT FOR WINDOWS 7. EXTENDED SECURITY UPDATES CAN STILL BE PURCHASED UP UNTIL JANUARY 2022.



SECURITY UPDATES ONLY AVAILABLE FOR WINDOWS 7 PRO AND ENTERPRISE. COST IS $25 PER COMPUTER IN 2020. BY 2021 THE COST WILL DOUBLE TO $50, AND BY 2022, THE COST WILL BE $100.

AS OF 2019, A TOTAL OF 250 THREATS AND VULNERABILITIES HAVE BEEN DISCOVERED IN WINDOWS 7 AND REPORTED TO CVE.

Solution

- AutOSImage: A Web Application that automates the upgrade process from Windows 7 to Windows 10.
  - This app includes scripts to perform the following tasks:
    - Run a Compatibility Check
    - Backup User Data
    - Restore/Transfer User Data
    - Run the upgrade from Windows 7 to 10 using SCCM
      - MDT as Backup/Alternative method

Technology Used

- **Front-End (Derrick)**
  - Visual Studios.NET
  - ASP.NET C#
  - SQL Server

- **Back-End (Kent)**
- VMWare ESXI
- OpenVPN
- Windows Server 2016 Datacenter

Benefits

Alleviate the need to pay for MS Security Updates per computer.

Little to no infringement on the company's computer lifecycle/refresh

Environmentally friendly (reduce the need to waste computers by replacing them)

Conclusion

AutOSImage does the work with the click of a button.

Saves time and productivity

-No need for IT to keep user computer over an extended period of time

-No need for any additional software (Web-Based)

An Enterprise Solution…to an Enterprise Problem